Tracking Lives and Livelihoods Through the Pandemic:

Preliminary Results from Delhi Metropolitan Area Study (DMAS)

NCAER National Data Innovation Centre

2 March 2022

Delhi Metropolitan Area Study (DMAS)

- DMAS originally planned as an incubator to experiment with innovations in data collection across various substantive domains
- Technological innovation
  - Computer-assisted personal interviewing (CAPI)
  - Computer-assisted telephone interviewing (CATI)
  - Audio computer-assisted self-interviewing (ACASI)
- Innovation in questionnaire designing
  - Question wording, sequence of questions, length of the questionnaire
  - Reference period of different types of questions (trade-off between recall bias and variation)
  - Develop and evaluate scalable modules for domains received little attention in Indian context (Income, time use, mental health, women's access over parental land)
  - Adaptation to changing socio-economic conditions (digital literacy, financial inclusion)
  - Adaptation to technology-based modes of data collection

Objectives of DMAS

1. Experiment with questionnaire designing and technology-based modes of data collection to reduce biases and measurement errors in survey data
2. Demonstrate the implementation of best practices involved in scientific data collection process
3. Remote monitoring of data collection activities using real-time survey process data (paradata) and survey data
4. Mainstream best practices in existing data collection efforts in India through stakeholder engagement at various levels

Overarching objective: improved data quality

DMAS survey specifics

- Target population: National Capital Region
- Sampling design: Multi-stage stratified cluster sampling design
- Sample size: Baseline includes 5,253 HHs (27,417 individuals)
- Study design: Randomized experiments
- Software used for data collection:
  - **Blaise 5**: developed by Statistics Netherlands (written in .NET)
    - CAPI: Baseline, 3 quarterly follow up surveys, Endline, 2 Gender surveys during Endline
    - CATI: 30 monthly telephone follow up surveys of employment
    - ACASI: Contraceptive use data (compare CAPI and ACASI group)
  - **SurveyTrak**: Sample management and survey management software developed by Survey Research Operations (SRO) at University of Michigan
  - **SurveyTrak integrated Blaise**

- Target population: Households in the national capital region (NCR)

- Comprises 31 districts spread over four states
  - National Capital Territory (NCT) of Delhi (9 districts)
  - Rajasthan (2)
  - Uttar Pradesh (7)
  - Haryana (13)

- Includes both urban and rural areas

DMAS Scientific data collection process

Survey design
- Sampling design: multistage stratified cluster sampling
- Sample size: to ensure precision or power

Construction of sampling frame
- At different stages of sample selection- use of auxiliary information
- Choice between sampling frames (Census vs NSS)

Selection of sampling units
- FSU (districts), SSU (Village/ UFS blocks), USU (HHs/ Individuals)
- Collection of UFS block maps from NSS

Hiring of field team
- Supervisors, monitors, listers and interviewers
- Specific criteria for selection, given the innovations

Houselisting
- Selection of USUs based on houselisting data
- Pre-loads (for pilot and final): basis of Sample ID (SID) in STrak

DMAS Survey implementation process

Questionnaire designing
- IHDS and NSS as the base: revision and refinement
- Some sections involved more work (starting from scratch)

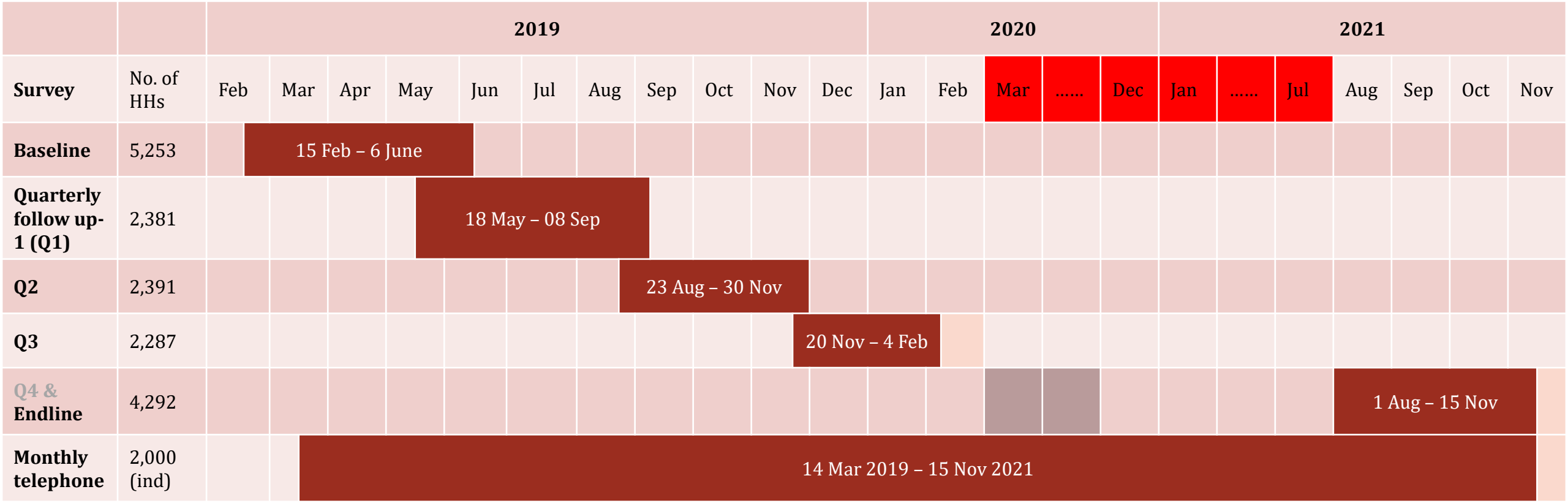
Finalizing the QNR
- Multiple rounds of discussion and feedback sharing
- Multiple rounds of Pre-testing in the field using both PAPI and CAPI

Development of CRQ
- Converting the paper QNR into Blaise programmer's language (CAPI reference questionnaire- CRQ)
- Involved an extensive amount of work

Blaise standalone Data Model
- Testing of the Data Model (DM) and sharing of feedback
- Finalizing the DM
- Translation of the DM and testing of translated DM

Integration of Blaise with STrak
- Survey management
- Allocation of SIDs to interviewers
- Call wizard (Result code, call notes, contact obs)

Timeline of various DMAS activities: Feb 2019 to Nov 2021



Survey happened

Supposed to happen (as per original plan)

Pandemic

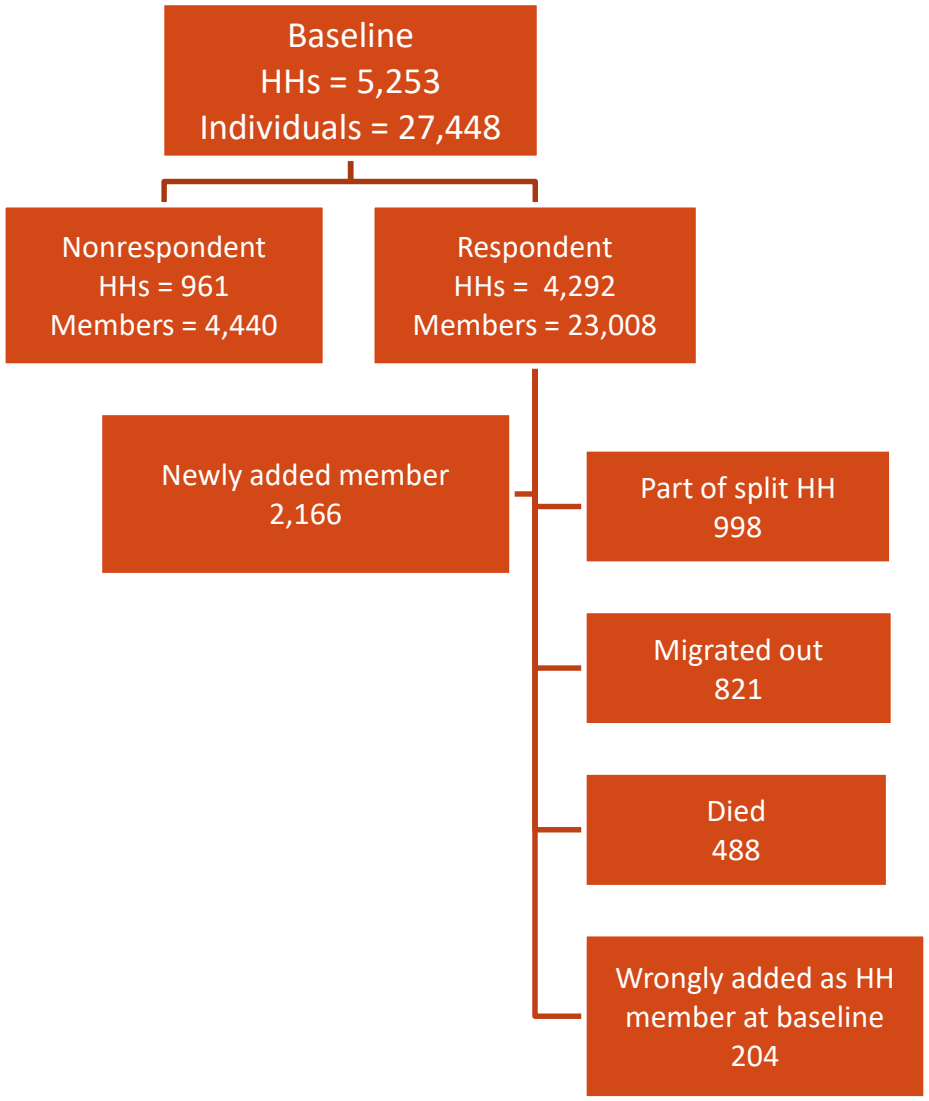
Household characteristics	Sample characteristics of baseline and endline households		Nonresponse rate by demographic
	Baseline: n (%)	Endline: n (%)	
Overall	5,253 (100%)	4,292 (100%)	18.3%
State (NCR part)			
DELHI	1,233 (23%)	854 (20%)	31%
HARYANA	1,736 (33%)	1,492 (35%)	14%
RAJASTHAN	900 (17%)	827 (19%)	8.1%
UTTAR PRADESH	1,384 (26%)	1,119 (26%)	19%
Area of residence			
Rural	2,639 (50%)	2,455 (57%)	7.0%
Urban	2,614 (50%)	1,837 (43%)	30%
Religion			
Hindu	4,517 (86%)	3,731 (87%)	17%
Muslim	625 (12%)	491 (11%)	21%
Other	111 (2.1%)	70 (1.6%)	37%
Caste			
General	1,887 (36%)	1,376 (32%)	27%
Other Backward Class	1,970 (38%)	1,695 (39%)	14%
Scheduled Caste	1,296 (25%)	1,135 (26%)	12%
Scheduled Tribe	84 (1.6%)	73 (1.7%)	13%
Other	16 (0.3%)	13 (0.3%)	19%
Economic status			
Poorest	1,342 (26%)	1,189 (28%)	11%
Poorer	838 (16%)	720 (17%)	14%
Middle	1,315 (25%)	1,116 (26%)	15%
Richer	1,039 (20%)	827 (19%)	20%
Richest	719 (14%)	440 (10%)	39%

Types of attrition at DMAS Endline

Disposition code	N	%
Households attempted	5,253	100.0%
IW completed	4,292	81.7%
Out of sample	327	6.2%
Refusal	271	5.2%
Other non-IW	362	6.9%

Sample characteristics of household members at endline	N = 22,663 n (%)
Gender	
Female	11,048 (49%)
Male	11,615 (51%)
Age	
0-6	2,909 (13%)
7-17	4,470 (20%)
18-29	5,447 (24%)
30-39	3,132 (14%)
40-49	2,500 (11%)
50-59	1,834 (8.1%)
60-74	1,979 (8.7%)
75+	392 (1.7%)
Marital status	
Married	10,701 (47%)
Unmarried	10,837 (48%)
Widowed	1,023 (4.5%)
Separated/Divorced	89 (0.4%)
Married no gauna	13 (<0.1%)
Education completed	
Never attended school	5,542 (24%)
Below primary	3,213 (14%)
Primary	3,014 (13%)
Middle	3,017 (13%)
Secondary	2,683 (12%)
Higher secondary	2,948 (13%)
Bachelors & above	2,231 (9.9%)

Tracking of individual household members from baseline to endline



23,008 – 998 – 821 – 488 – 204 + 2,166 = 22,663

Perceptions about initial lockdown In Retrospect

Results from DMAS Endline

The question asked:

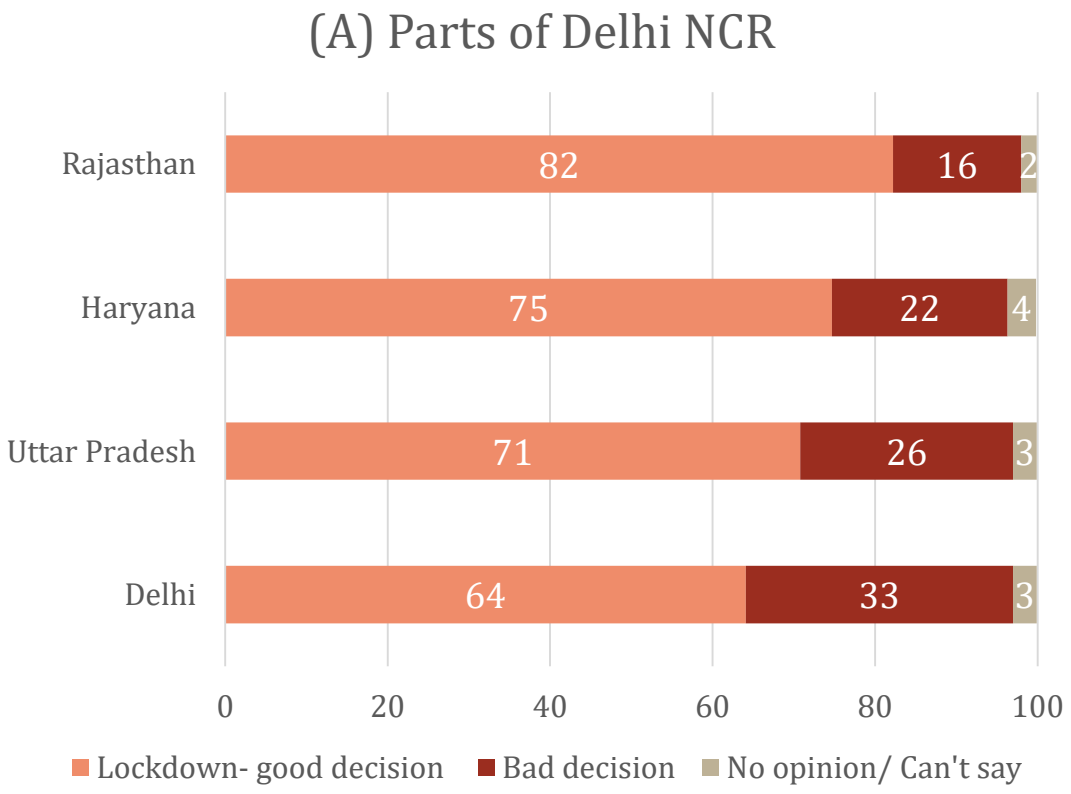
When the pandemic began, the government announced a nationwide lockdown on March 24, 2020 which continued for more than two months. Taking everything into considerations, do you think it was a good decision or bad decision?

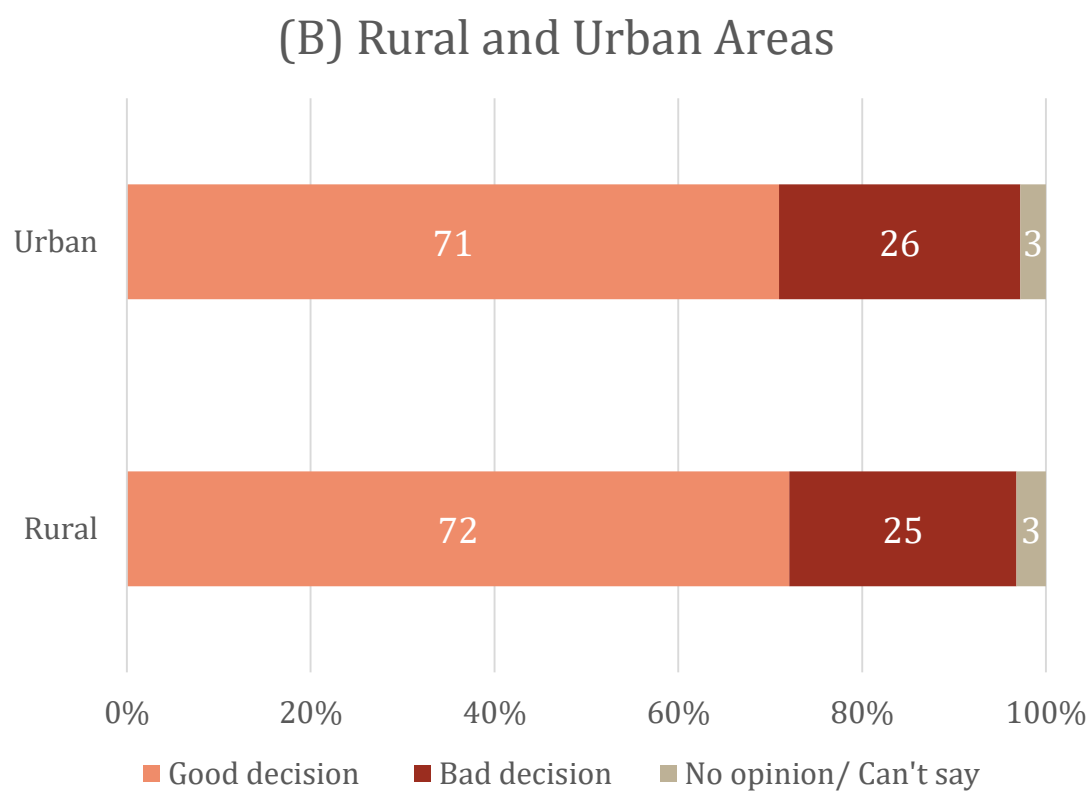
Option categories on a scale were:

(1) Good decision (2) Bad decision (3) No opinion/ Can't say

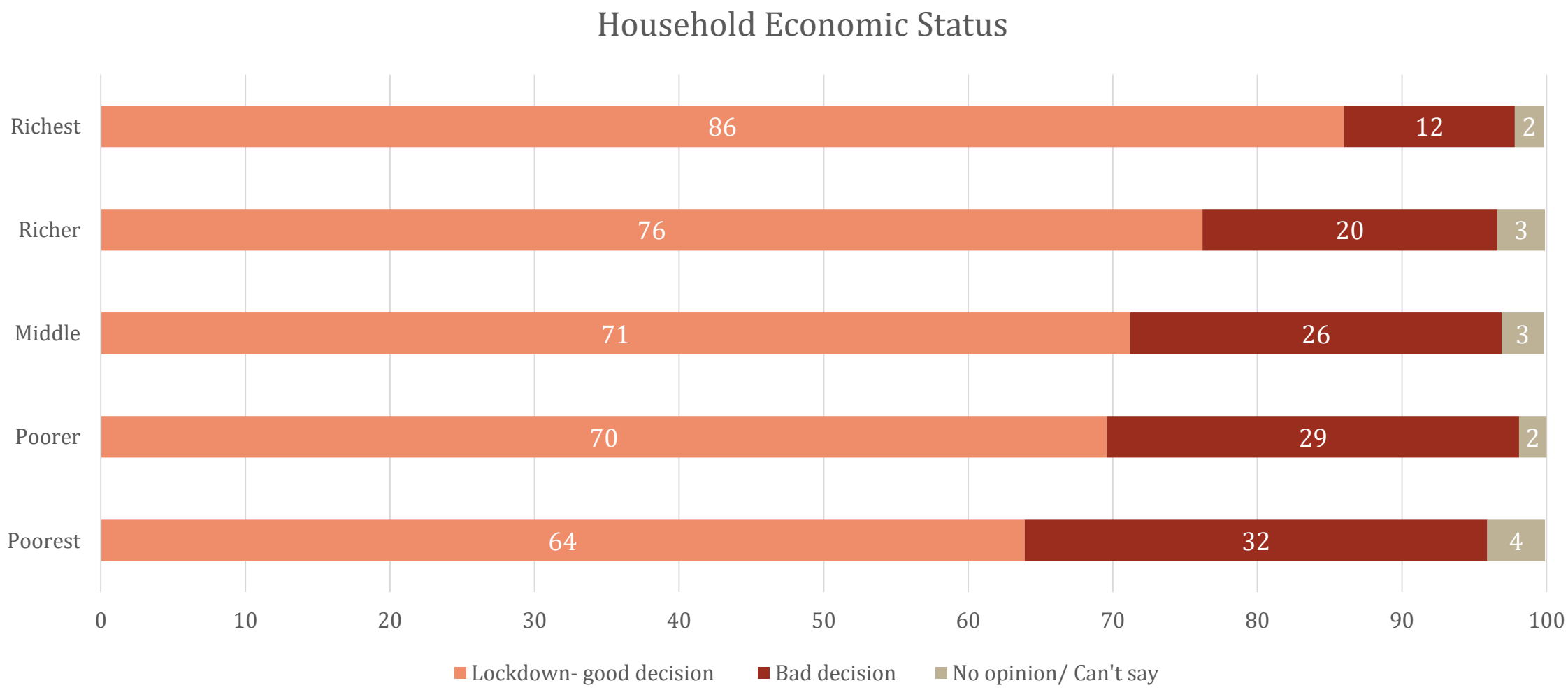
In retrospect, for NCR, 71.4% people perceive national lockdown during early phase as good decision, 26% thought it was bad and remaining 3% have no opinion

Perception of National Lockdown during Early Phase of Pandemic by Area of Residence





Perception of National Lockdown during Early Phase of Pandemic by Economic Status



Experiencing the Pandemic

Results from DMAS Endline

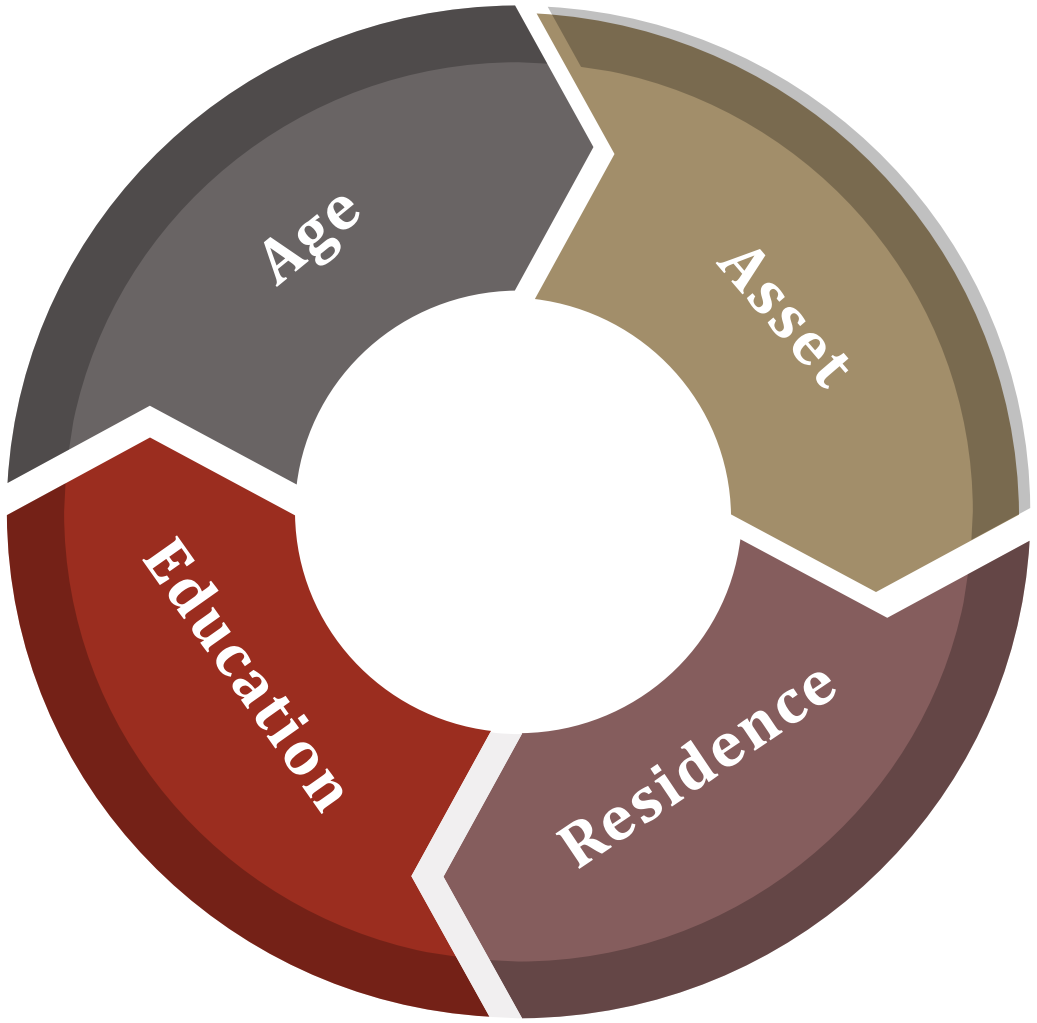
Who tested for COVID 19?

a) *Have you or any member of your household ever been tested for COVID?*

   If yes,

b) *Which of the following household members tested positive for COVID?*

Demographics



Characteristic	Tested for COVID n (%)*	Test Positivity rate n (%)*
Age (χ^2 0.000)		
0-17 years (7,379)	708 (10.7%)	15 (1.9%)
18-24 years (3,310)	760 (26.1%)	24 (4.0%)
25-44 years (6,621)	1,854 (31.4%)	144 (8.1%)
45-59 years (2,982)	856 (32.2%)	72 (11.1%)
60+ years (2,371)	533 (26.7%)	59 (13.5%)
Sex (χ^2 0.059)		
Male (11,615)	2,625 (24.9%)	191 (8.1%)
Female (11,048)	2,086 (21.9%)	123 (6.9%)
Education (χ^2 0.000)		
Illiterate (6,424)	786 (13.5%)	36 (3.9%)
Upto 12th (13,484)	2,942 (24.3%)	165 (6.1%)
Bachelors & above (2,728)	977 (41.4%)	113 (14.7%)
Place of residence ($\chi^2$0.000)		
Rural (13,341)	1,901 (14.4%)	88 (3.9%)
Urban (9,386)	2,860 (31.6%)	243 (9.1%)
Asset Quintile (χ^2 0.000)		
Poor (9,617)	1,445 (17.2%)	38 (2.2%)
Middle Class (5,989)	1,273 (23.4%)	62 (5.8%)
Rich (7,121)	2,043 (32.9%)	231 (12.9%)

* n is sample size and survey-weighted percentages are given in parenthesis

- Testing rate was lowest among the children
- Testing rate was higher among urban, better educated and the affluent people
- Test positivity rate was highest among the age group 60+
- It was also higher among urban, better educated and rich individuals
- No significant difference was observed by gender for testing and positivity rate

Summary- Testing and Test positivity

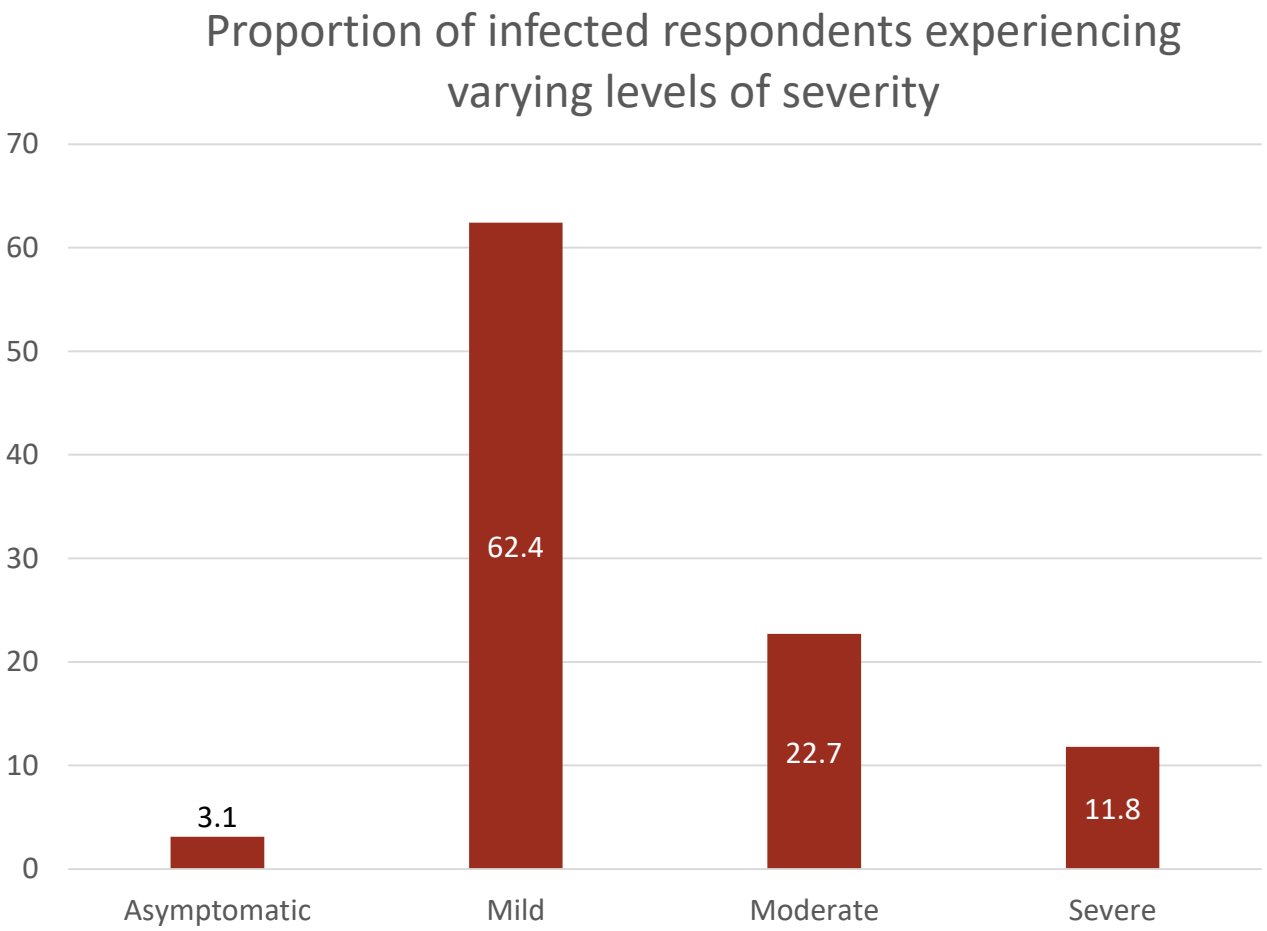
- Our findings show that testing rates are higher in urban areas and among better educated and rich people. This is expected because they have better access to testing facilities. However, it's surprising to see that test positivity is also higher among this group of people.

- World Bank data says that the urban areas are the hardest hit as they have a high density which leads to more interaction at the social or physical level resulting in a high speed of spread.

- Studies show that people living in low and middle-income countries may have been able to stave off severe forms of the infection because of exposure to various pathogens from childhood, which gives them better immunity to Covid-19 and that might be the reason for low infection and case fatality rate due to COVID in India.

- A study comparing data from 106 countries on parameters like the density of population, demography, the prevalence of diseases, and quality of sanitation, found more people had died of COVID in high-income countries. "People in poorer, low-income countries seem to have a higher immunological response to the disease compared to high-income peers."

Severity of COVID-19 infection



Among the infected, about two-third of them had mild infection, one-fourth were moderately infected and one in every tenth infected person had severe symptoms.

Vaccination in Delhi-NCR

Results from DMAS Endline

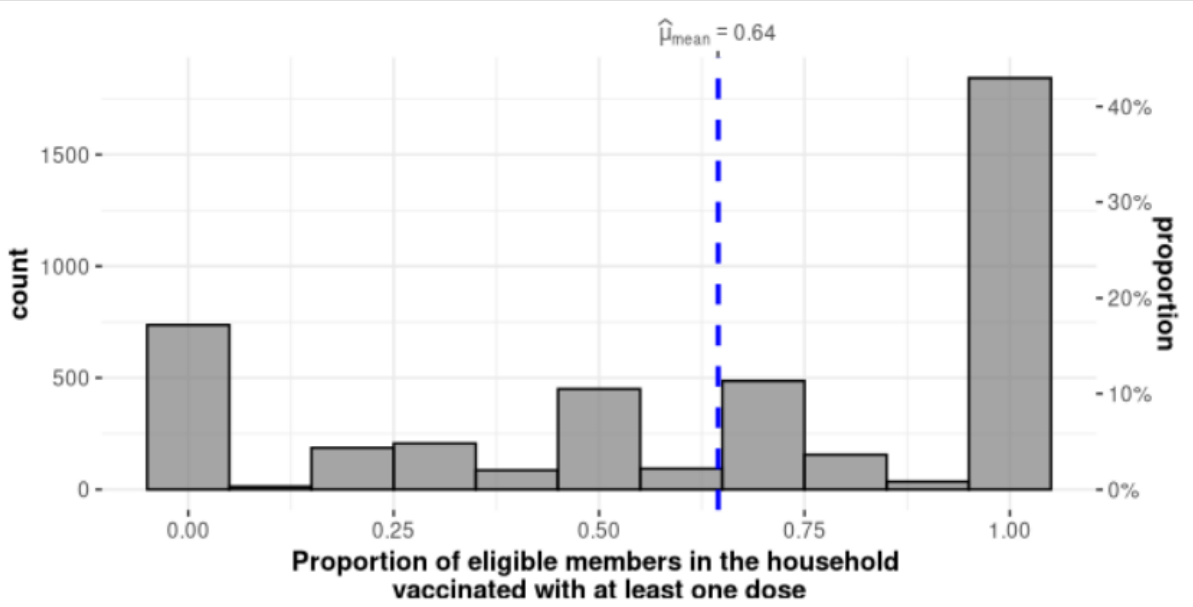
Results

- As vaccination was only open to individuals 18 years or above during the survey time period (August to November 2021), our analytic sample at the member level consists of 15,285 eligible individuals.

81% of the Households reported that at least one member of their household has received COVID-19 vaccine

Did any member of your household receive COVID vaccine?	N = 4292[1]
Yes, at least one member received vaccine	3,569 (81%)
Nobody received vaccine	723 (19%)
[1] Unweighted sample size (weighted percentage)	

About 43% of the households report that **all** eligible adult members of their household have had at least onc dose of vaccination.



Details of Vaccinated Individuals

63% of the eligible adult members reported to have received at least one dose of vaccination.

Of the 9,791 adults who have reported to have received at least one dose of vaccination:

- Majority (77%) received COVISHEILD.
- About 14% of the respondents do not know which vaccine they received.
- 39% were vaccinated with two doses.
- A small minority (1.8%) reported to have experienced a serious health issue or was needed to be hospitalized within 10 days following vaccination. These closely follow the severe or serious events as per the State Guidance Document for AEFI Surveillance.

Details of Vaccinated Individuals

	N = 9791[1]
Vaccine Type	
Covishield	7,647 (77%)
Covaxin	822 (9.6%)
Others	6.0 (<0.1%)
Don't Know	1,316 (14%)
Doses Received	
One Dose	5,732 (60.9%)
Two Doses	4,053 (39.1%)
Don't Know	6 (0.0%)
Adverse Event Following Immunization (AEFI)	
Experienced serious health issue	150 (1.81%)
No serious health issue experienced	9,635 (98.15%)
Don't Know	6 (0.04%)

[1] Unweighted sample size (weighted percentage)

Key reasons for not getting vaccinated

When probed on why the members of the household were not vaccinated:

- 24% reported that they were planning to vaccinated soon.
- About 15% cited pre-existing health conditions as the reason.
- About 15% reported lack of trust in vaccine efficacy and safety.
- About 9% were worried about side effects of vaccine.

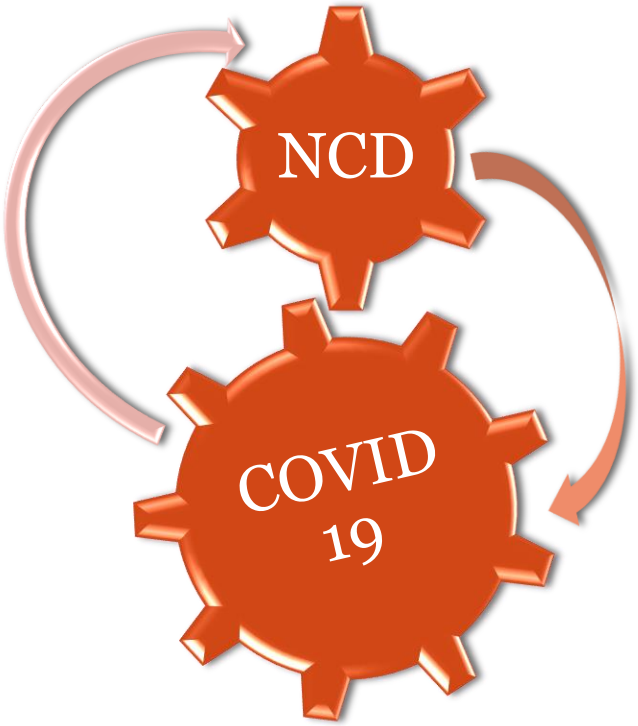
Why didn't member of your household take COVID vaccine?

	N = 3671[1]
Did not find time to get vaccinated yet	219 (6.4%)
For some existing health conditions	582 (15%)
Planning to get vaccinated soon	952 (24%)
Vaccine/Appointment not available	506 (14%)
Don't think it's needed	186 (5.2%)
Lack of trust in vaccine's efficacy	230 (6.6%)
Lack of trust in vaccine's safety	345 (9.5%)
Worried about side effects of vaccine	385 (9.1%)
Worried about wage loss	82 (2.5%)

[1]Unweighted sample size (weighted percentage)

With rising attention to the pandemic, did NCD management get crowded out?

COVID19 and NCD Interplay



- Greater risks of COVID-19 to people with cardiovascular and metabolic health conditions well recognized.
- Emerging evidence that experience of COVID-19 leads higher rates of NCD
  - ✓ Nature Review| Endocrinology (2020)
  - ✓ Nature Review| Cardiology (2020)
- Continued screening and treatment of NCD even more important in post-COVID era

Disease profile of people living in NCR: DMAS baseline and endline

- Long-term chronic conditions and acute illnesses of each member of the household were recorded in a separate health roster
- Details of their treatment seeking was registered for each episode of outpatient visit
- Those who did not visit a doctor/health facility, were asked if they were already on medication for those illnesses
- Not treated are those, who neither visited a doctor nor were taking regular medicine for long-term disease conditions

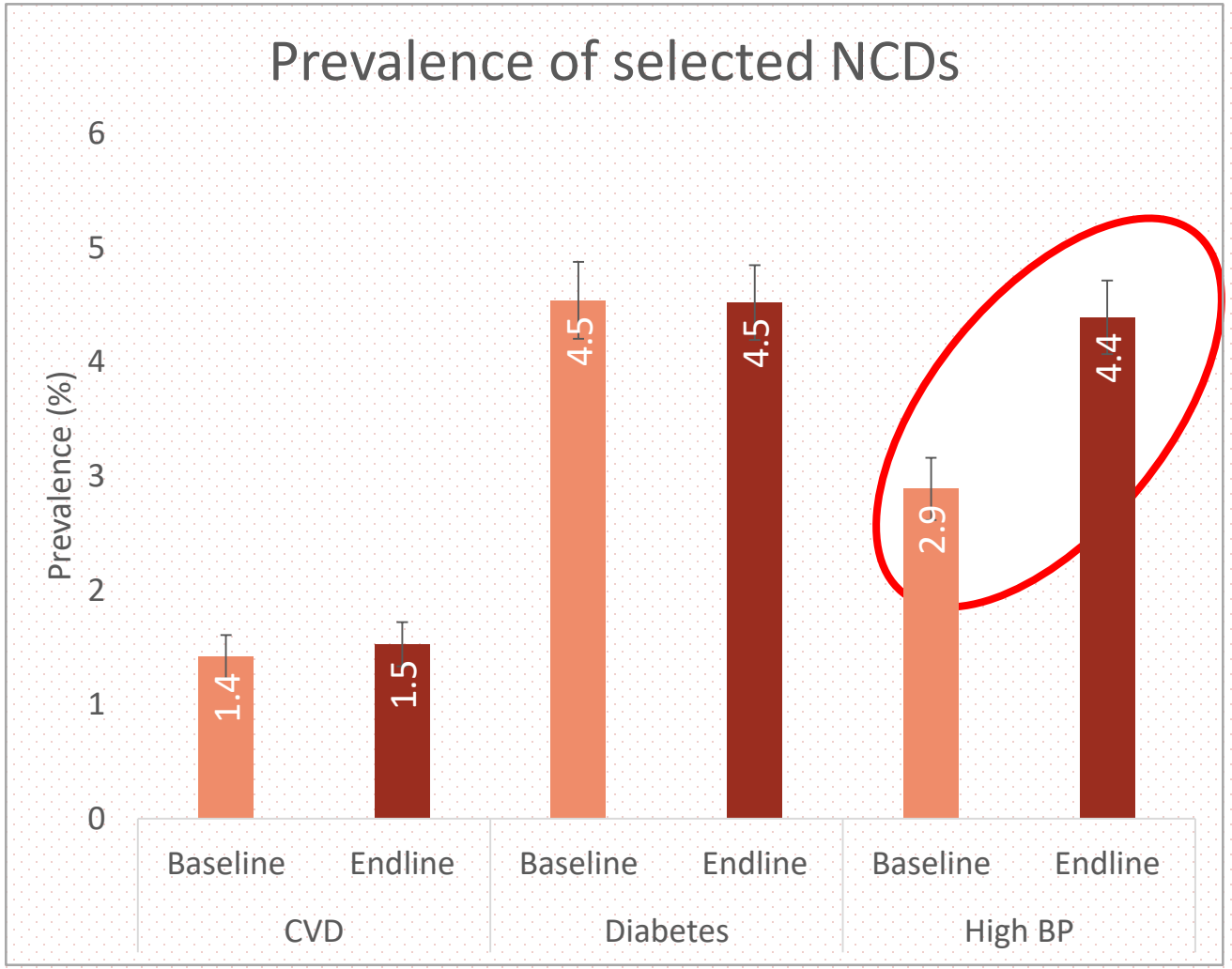
Specific questions asked were –

Question1: *Did [Name] seek treatment for this illness in last 15 days?* Yes/No

IF NO**: Qiestion2**: *Why did [Name] not seek treatment for this illness in last 15 days?*
(0) Already on medication (1) Treatment not required (2) Specific services not available/too far (3) Quality not satisfactory
(4) Long waiting time (5) Financial constraints (6) Other

There was a significant increase in prevalence of High BP

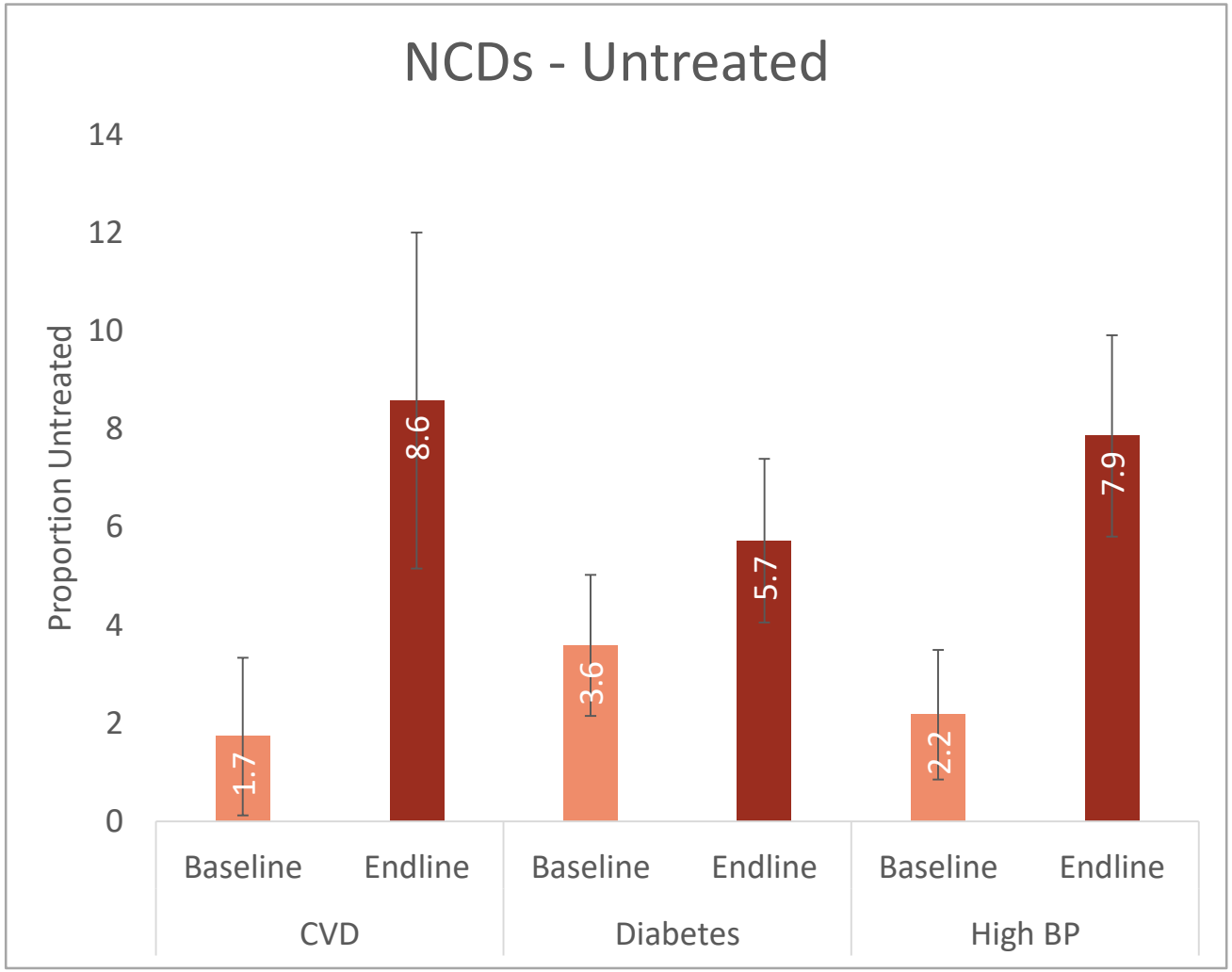
- The prevalence of CVD and diabetes was almost same between baseline and endline
- We see a significant increase in prevalence of high BP during the same period



**For adults of age 15 years or above only*

Less number of people avoided treatment in the baseline, but the number has gone up significantly during the endline

- Non-treatment for CVD and High BP increased significantly between the two rounds

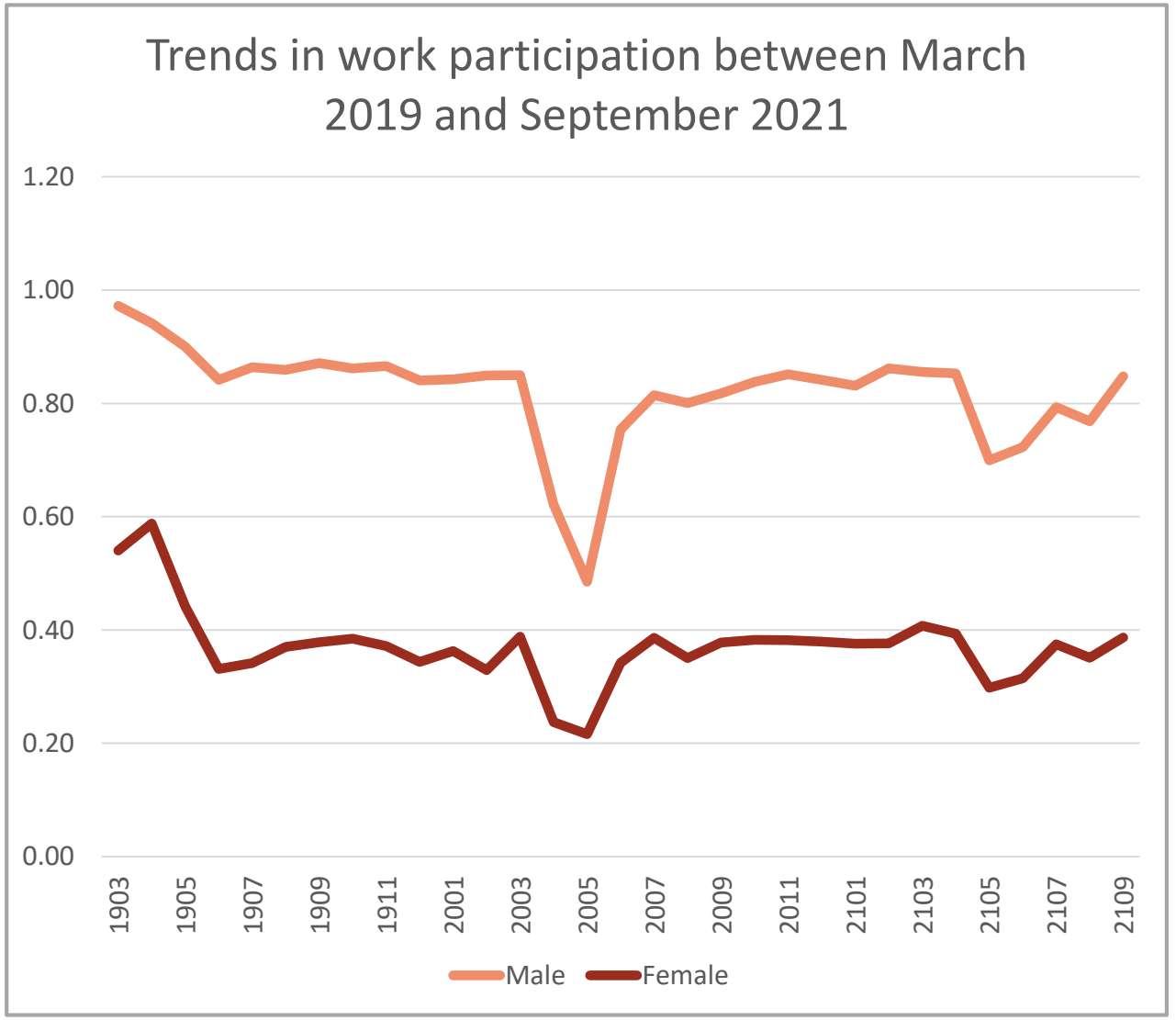


**For adults of age 15 years or above only*

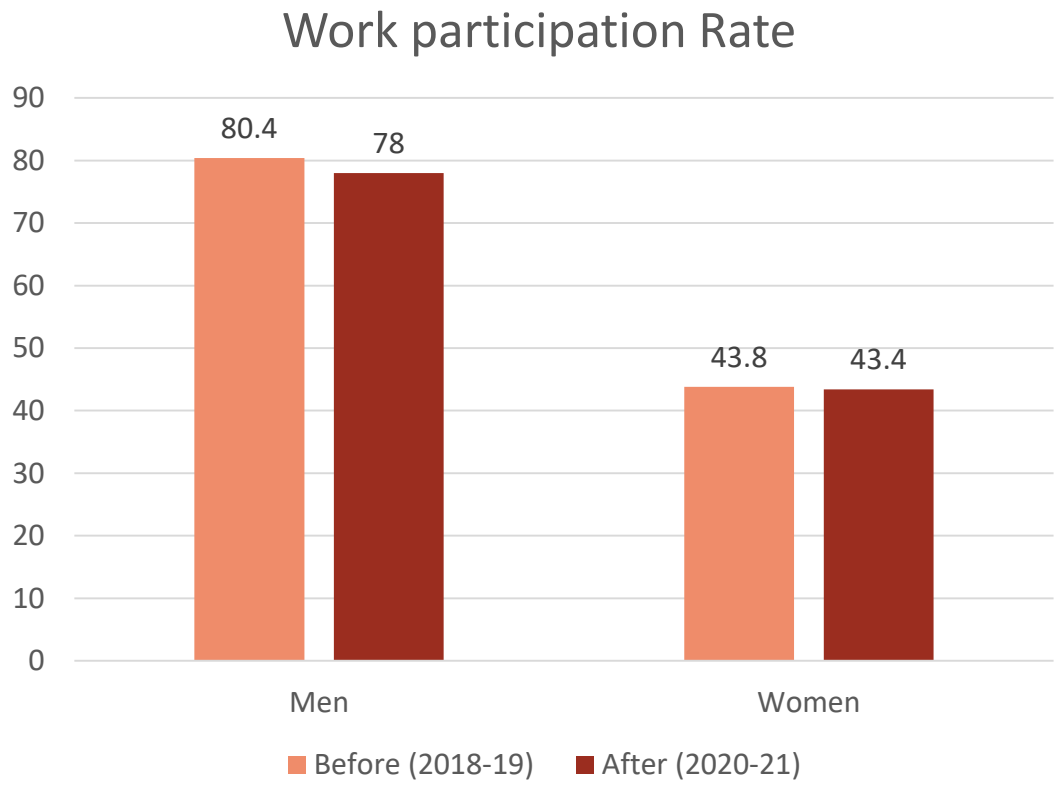
Beyond Lockdown: Fragile Employment Recovery

Employment decline in second wave smaller than in the first

- DMAS included a component of monthly telephone surveys for about 2200 men
- These provide contemporaneous information
- Note early interviews began with rural areas and hence, have higher work participation rates

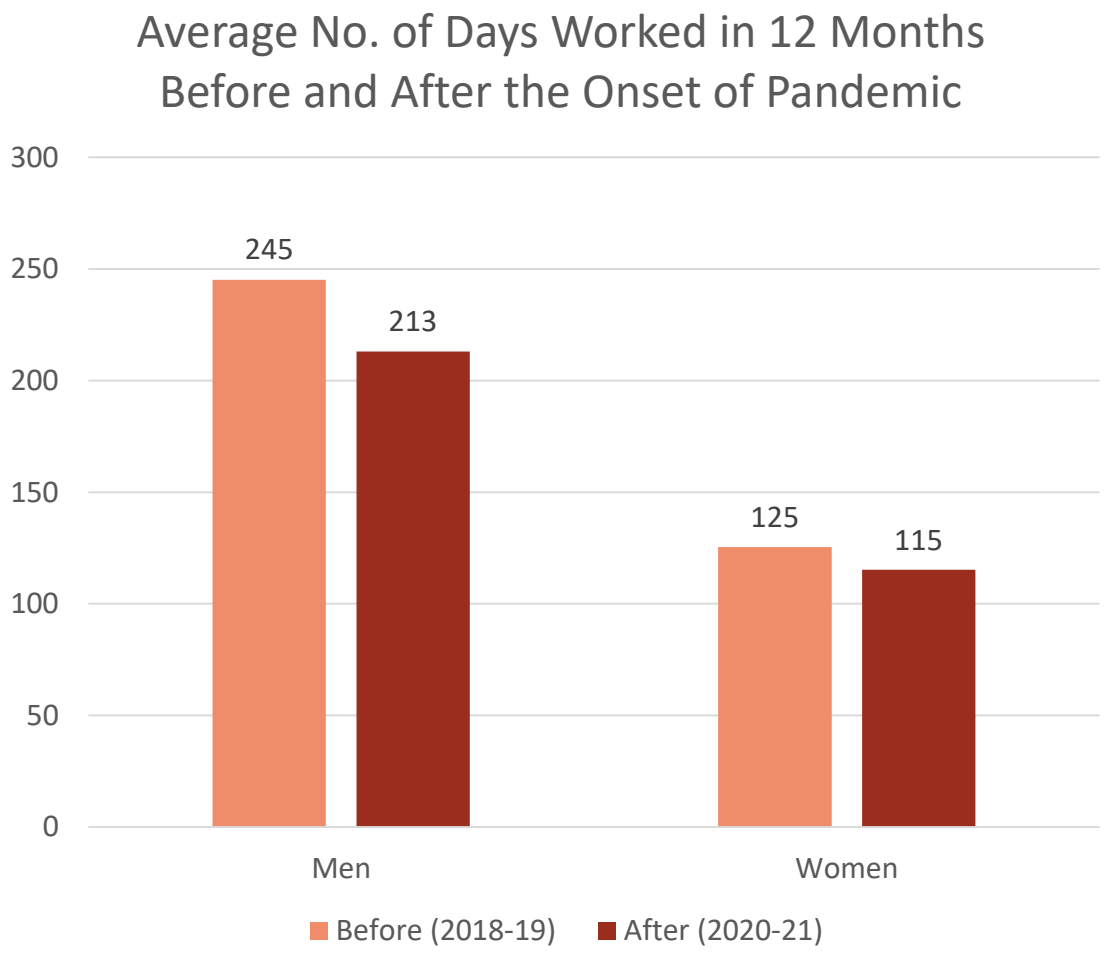


DMAS detailed surveys with larger sample also show that employment declined only slightly between 2018-19 and 2020-21 for men and women ages 15-59



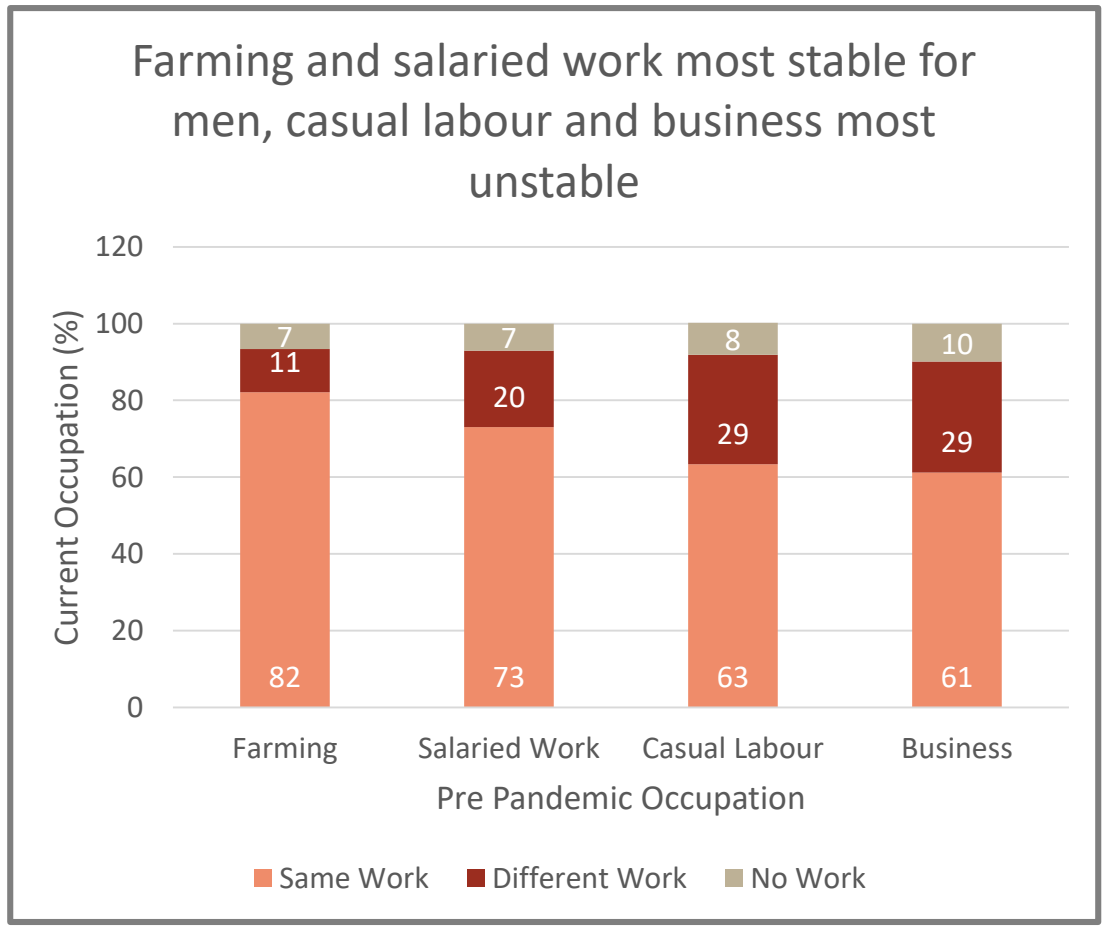
- Employment declined slightly for both men and women
- Definition of employment is quite expansive, including wage employment, business and farming and allied agricultural activities such as animal care
- This decline is statistically significant but small

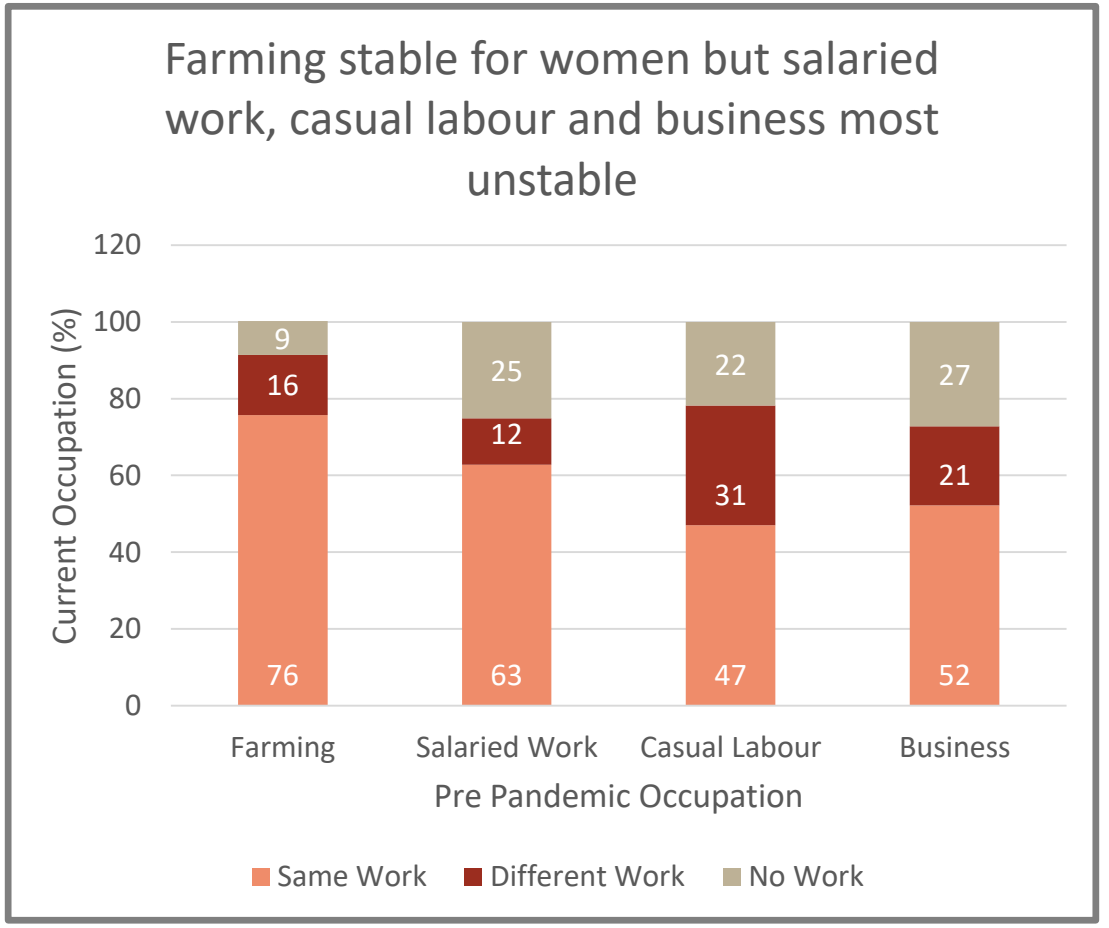
Substantial decline in number of days worked in the preceding 12 months



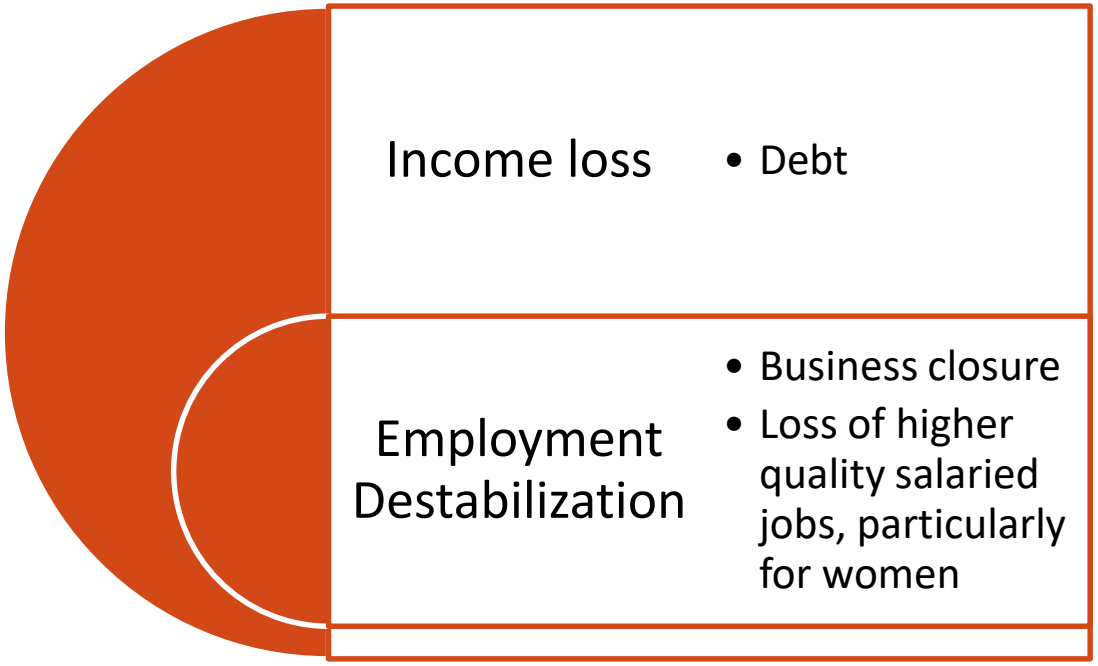
- Lockdowns and disease combined to reduce the amount of work individuals could do
- Decline for both men and women but somewhat greater decline for men due to higher base

Destabilization of work as individuals, particularly women, scramble to cope





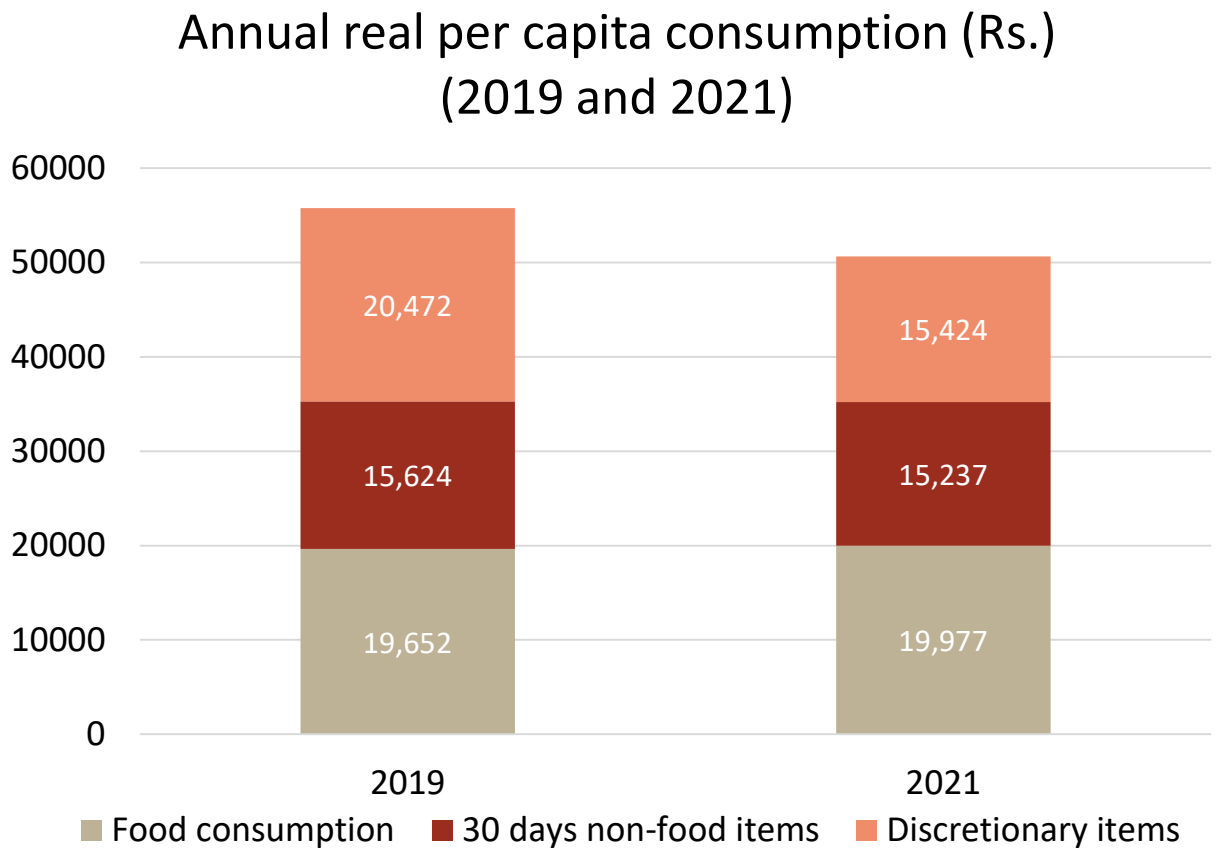
Coping with Long-term Scarring



- While overall employment has recovered, some long-term vulnerabilities may have emerged

Consumption and Food Subsidy

Change in mean per capita consumption between 2019 and 2021



- Drop in real per capita consumption (in 2019 prices) was driven by drop in discretionary consumption items.
- Real per-capita consumption expenditure (in 2019 prices) in food and non-food essential items remained relatively stable.
- Sample consists of matched panel of 4,292 households.

2021 values have been adjusted by state-level sector (rural/urban) disaggregated CPI

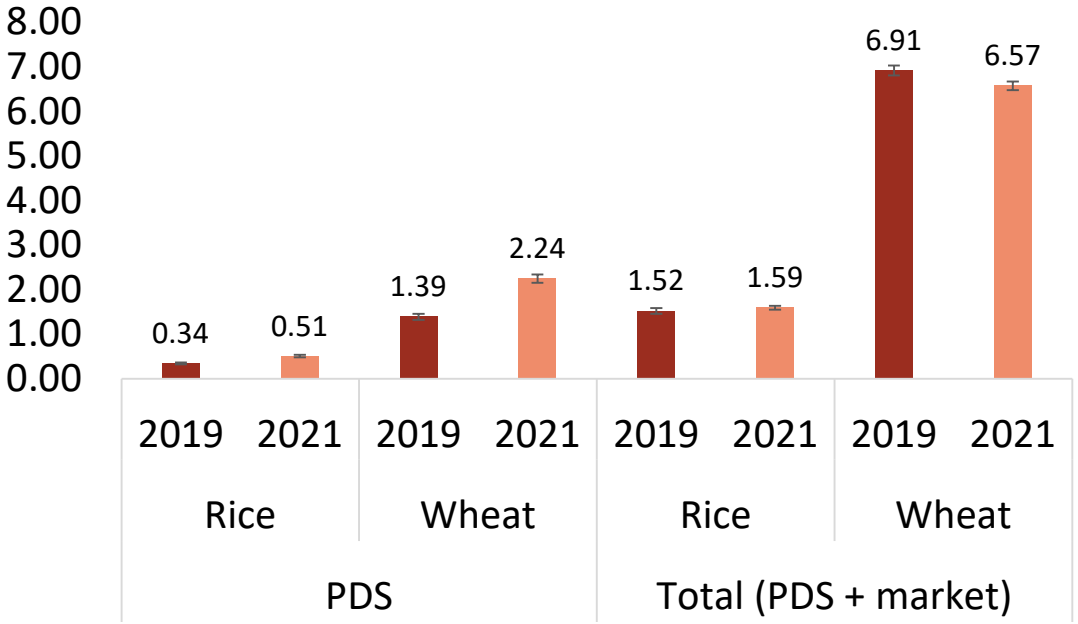
Another way of looking at food consumption

- Per capita cereal consumption was more or less stable over this time
  - Rice 1.5 kg before, 1.6 kg after
  - Wheat 7 kg before, 6.6 kg after

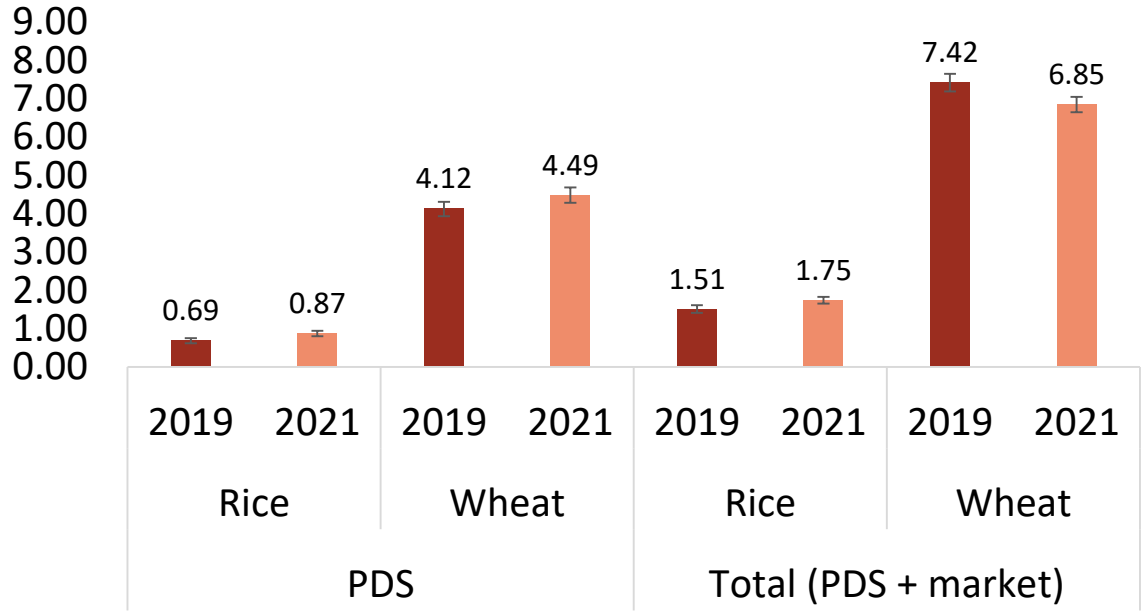
- PDS measures account for this
  - Consumption from PDS went up for every one, even for non-BPL since government allocated to all households regardless of BPL status

Increased uptake of cereal from PDS shops

Mean per capita cereal consumption (kg) by Non-BPL households

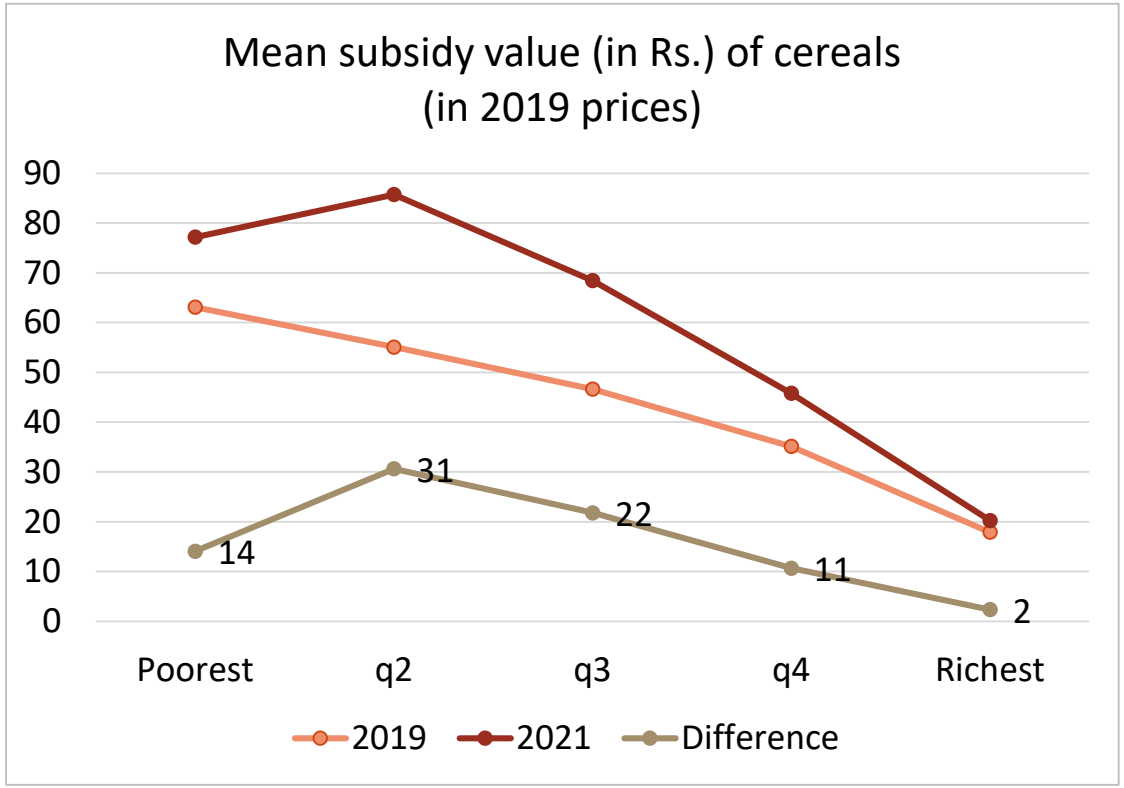


Mean per capita cereal consumption (kg) by BPL households



- While overall there is a marginal drop in the quantity of per capita consumption of wheat between 2019 and 2021, the drop is minimal primarily because of enhanced distribution of these items through the PDS shops as part of the Covid-19 relief package.
- Consumption of pulses remained the same for both BPL and non-BPL households.

PDS subsidies were pro poor in nature



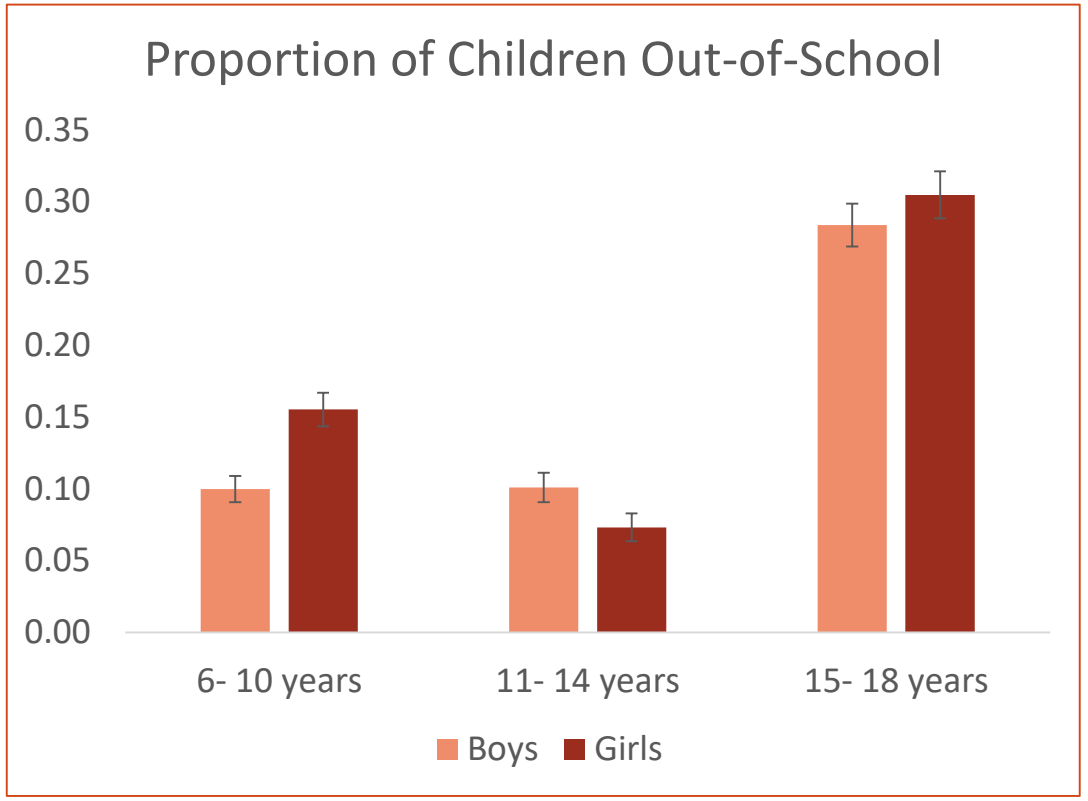
- 46% of sample households (matched panel) bought food grains (rice or wheat) from PDS shops in 2019. This increased to 53.6% in 2021. Of these nearly 50% were BPL card holders.
- Higher per capita quantity of cereal consumption backed by higher value of subsidy availed for cereals in 2021.
- Shows the broad based nature of food support program extended by the government during the pandemic

Learning disruptions in times of COVID

Marginally higher proportion of children are out-of-school

Children age (in years)	Percentage of dropout children	
	DMAS- Baseline (2019)	DMAS- Endline (2021)
6- 10	1.4	6.5
11- 14	4.6	0.08
15- 18	23.0	27.5

About 4.3% of children who were never enrolled at baseline in 2019; the comparable percentage at end line is 5.9%.

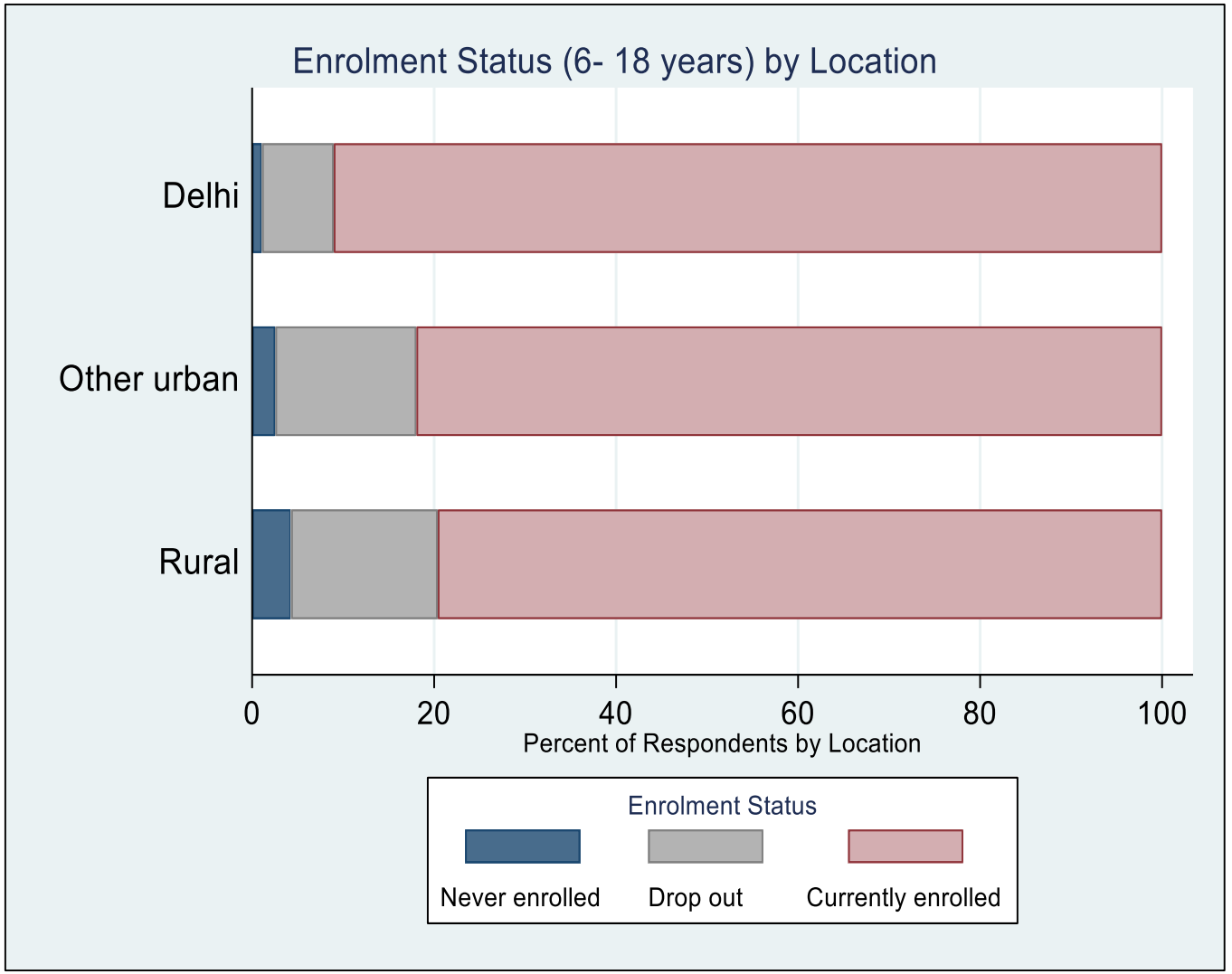


Out-of-school children is lower in Delhi than other areas

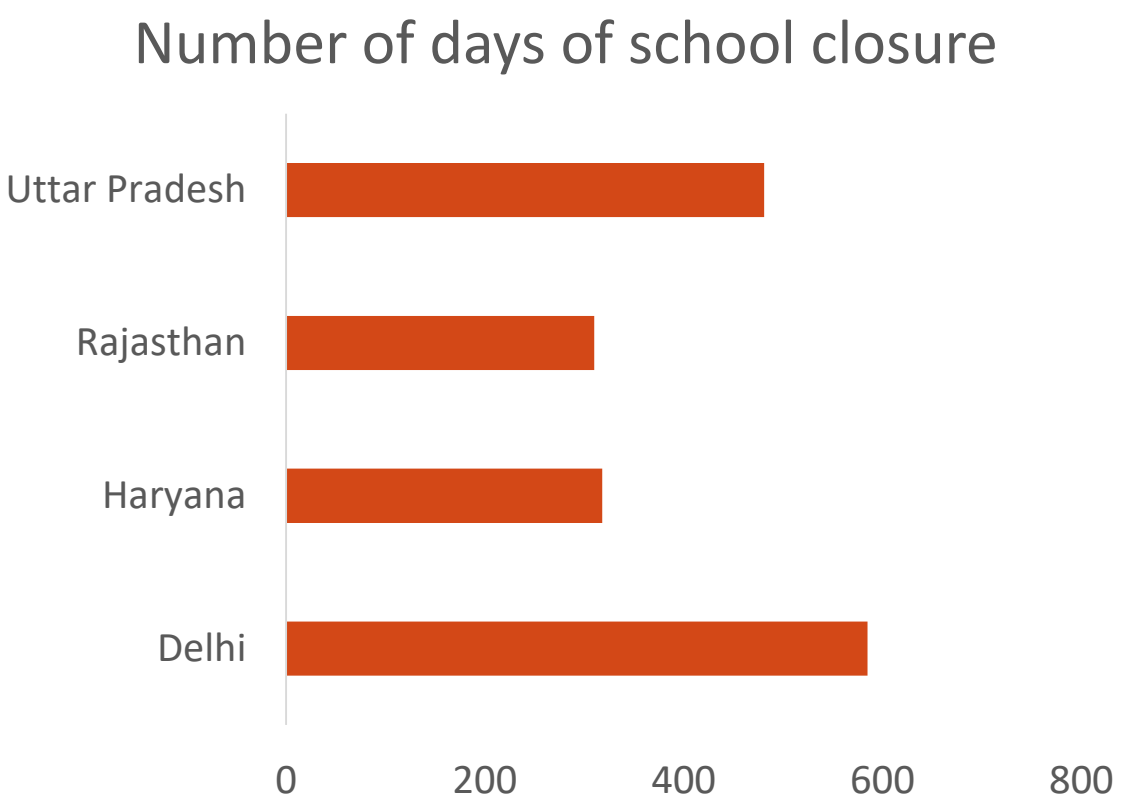
- Difference in enrolment status by location is statistically significant.
- Between 6- 10 years, never-enrolment in rural areas was 7.8% compared to 4.6% in other urban areas and 3.1% in Delhi.

Note:

- Delhi includes only the Union Territory of Delhi.
- Other Urban areas includes urban areas of Haryana, Rajasthan and Uttar Pradesh. Likewise rural areas includes rural areas of NCR part of these three states.



School closures in Delhi NCR (March 2020- October 2021)



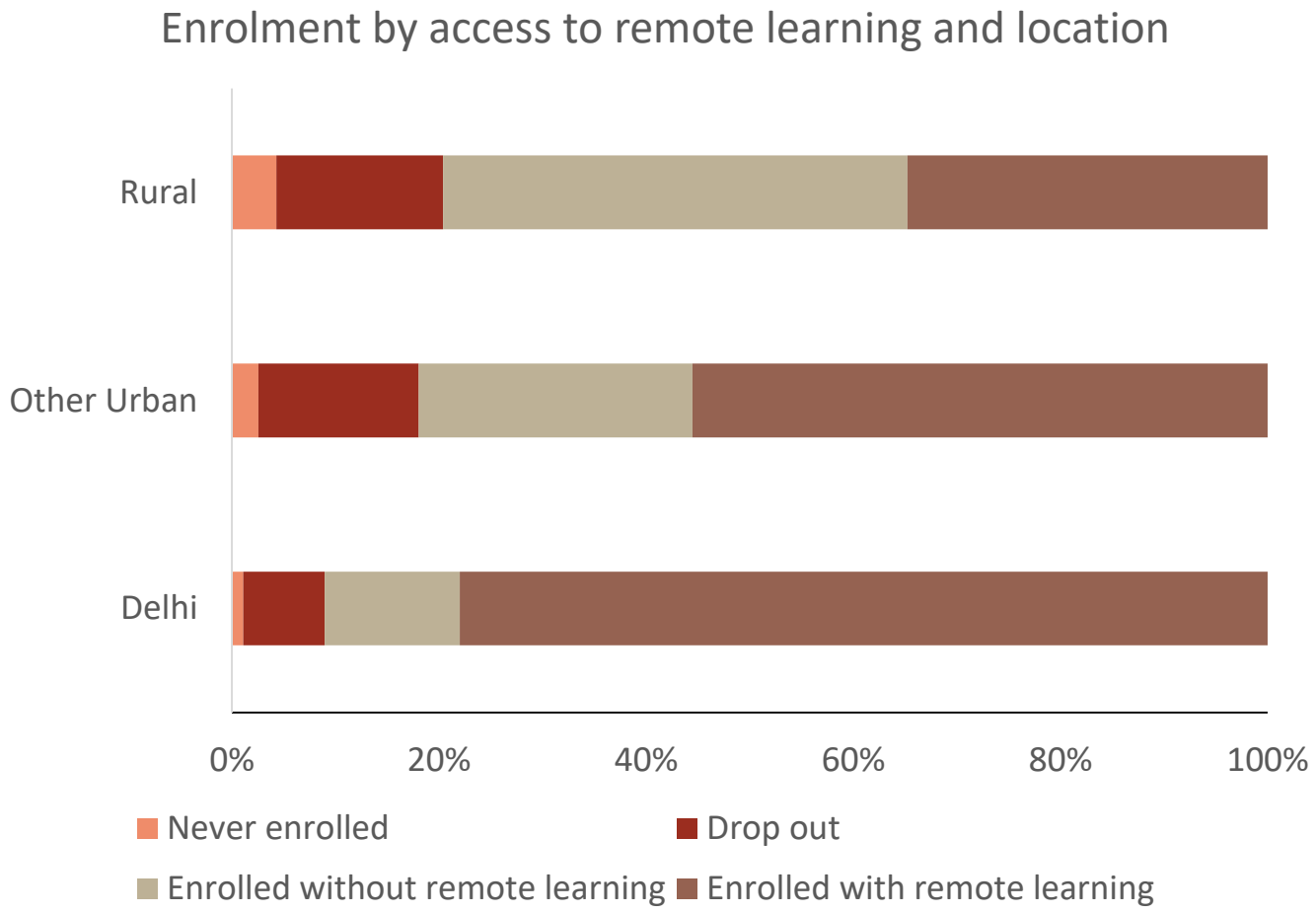
- Delhi has the highest number of days for when it was closed during the period March 2020- October 2021.

Note:

- Schools opened briefly for in- person teaching for grades between Class IX- Class XII.
- In Haryana, Rajasthan and Uttar Pradesh, schools were also reopened for VI- VIII grades before opening for all.
- Number of days of closure includes both closure due to COVID as well as academic break.

Substantial percentage of students were without remote learning during school closure

	Percentage among 6-18 year old children
Never Enrolled	3.1
Drop out	13.9
Currently Enrolled without remote learning	32.3
Currently Enrolled with remote learning	50.7



Recommendations

- Findings confirm significant learning disruptions on account of school closure due to COVID; thereby, pointing to the need for urgent interventions.

- As schools re- open post the third wave, focus should be to help children overcome the losses faced due to these disruptions. This calls for efforts on two fronts:

  - Special efforts be made to bring those children who are not part of the schooling system, particularly those between the ages 6- 14 years.

  - Rather than teaching to the syllabus, the focus ought to be to help children recoup the learning loss on account of a prolonged period of school closure.

About NCAER and NCAER NDIC

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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 www.ncaer.org.

NCAER National Data Innovation Centre

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. The DCVTS is an example of our rapidly building a quick response telephone survey on top of our existing Delhi Metropolitan Area Study, which is a panel study.

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