

Who was Impacted and How? Covid-19 Pandemic and the Long Uneven Recovery in India

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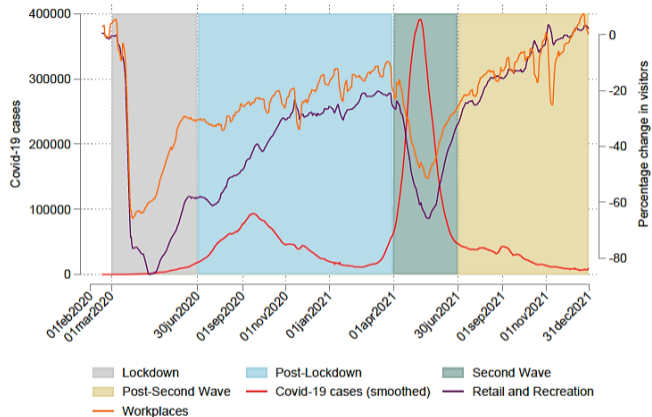
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Manifestation of the Pandemic



Note: Data Source [Ritchie et al. \(2020\)](#)

Figure: Pandemic Phases, Infection, and Mobility Rates

Manifestation of the Pandemic

- ▶ The economic impact of the Covid-19 pandemic may be classified in two broad categories -
 - ▶ Employment
 - ▶ Income

Manifestation of the Pandemic

- ▶ The economic impact of the Covid-19 pandemic may be classified in two broad categories -
 - ▶ Employment
 - ▶ Income
- ▶ This paper documents the immediate impact of the pandemic on incomes, inequality, and poverty; and tracks the nature of recovery till Dec'21.

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- ▶ Sharp rise in poverty and inequality.
- ▶ Inequality returned to pre-pandemic levels, poverty continues to remain elevated.

Consumer Pyramids Household Survey Dataset

- ▶ Collected by the Centre for Monitoring Indian Economy.
- ▶ High-frequency panel survey data wherein each household is interviewed three times a year.
- ▶ Close to 200,000 households (900,000 individuals) across the country.
- ▶ Variable of interest - per capita household income.

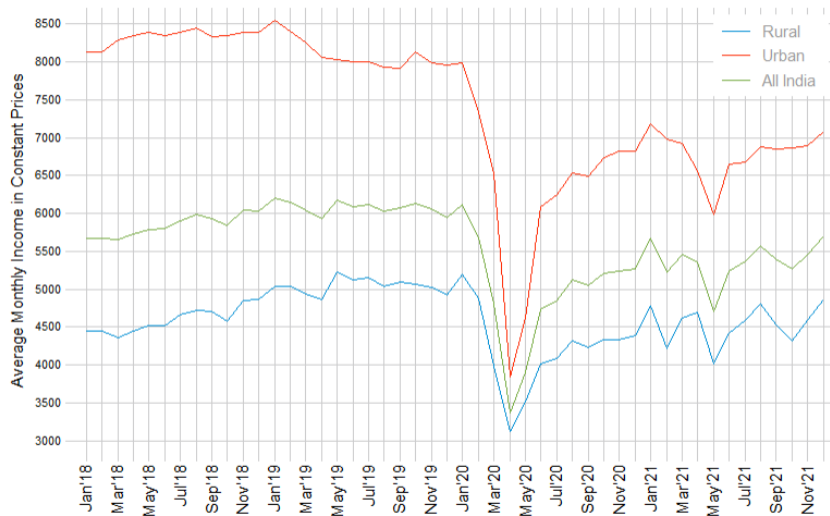
Income Metrics

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- ▶ **Trend Analysis** – Track monthly changes in incomes between January 2018 and December 2021.

Trend Analysis

Income trends by region over time



Income Metrics

- ▶ Trend Analysis – Track monthly changes in incomes between January 2018 and December 2021.
- ▶ **Cumulative Analysis** – Compare the average real per capita cumulative household income in *five time periods*.

Pre-Pandemic - Jan'19-Feb'20,

Lockdown - Mar'20-May'20,

Post-Lockdown - Jun'20-Mar'21,

Second wave - Apr'21-Jun'21,

Post-Second wave - Jul'21-Dec'21.

Cumulative Analysis

Proportionate change in average per capita household income for each percentile between the different periods - Rural.

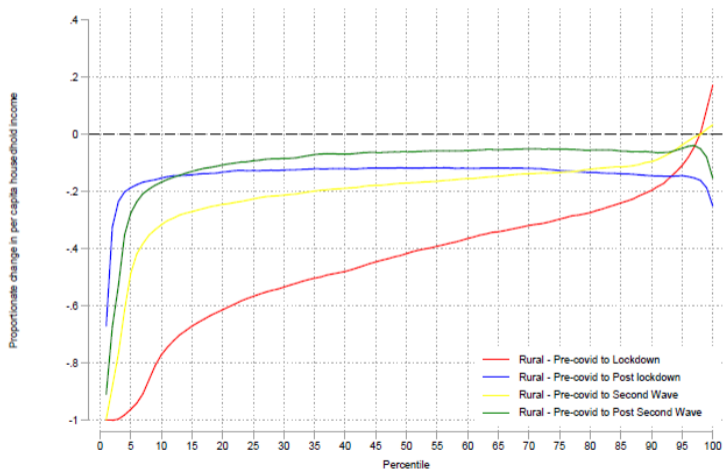


Figure: Growth Incidence Curve

Proportionate change in average per capita household income for each percentile between the different periods - Urban.

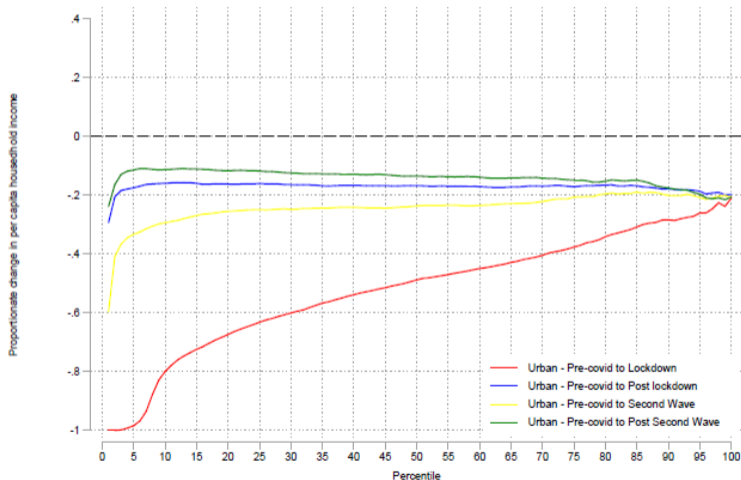


Figure: Growth Incidence Curve

Percentage of individuals below various poverty lines in various cumulative periods

	Pre-Covid	Lockdown	Post-Lockdown	Second Wave	Post-Second Wave
National Minimum Wage					
Rural (Rs. 2900 PC per month)	32.27	62.32	41.04	45.99	35.80
Urban (Rs. 3344 PC per month)	17.83	55.88	27.93	34.60	24.11
Seventh Pay Commission Minimum Wage					
Rural (Rs. 7000 PC per month)	85.87	90.91	90.48	89.08	87.29
Urban (Rs. 7000 PC per month)	63.73	81.83	73.14	74.79	70.82
World Bank International Poverty Line \$2 PPP					
Rural (Rs. 1281 PC per month)	1.13	28.69	3.94	8.75	4.70
Urban (Rs. 1281 PC per month)	0.08	21.16	0.73	2.35	0.45

Income inequality measures by different periods

Period	Mean	Median	Gini	GE(0)	GE(2)	P90P10
Rural						
Pre-Covid	4655	3390	0.44	0.39	0.88	6.82
Lockdown	3751	2534	0.51	0.51	0.94	20.80
Post-Lockdown	3928	2985	0.45	0.39	0.63	14.98
Second Wave	4400	2890	0.49	0.47	0.85	8.89
Post-Second Wave	4455	3394	0.44	0.37	0.61	10.50
Urban						
Pre-Covid	7724	5482	0.41	0.30	0.46	6.24
Lockdown	5572	3913	0.46	0.38	0.53	9.76
Post-Lockdown	5884	4321	0.41	0.29	0.41	6.11
Second Wave	5960	4344	0.39	0.27	0.37	5.74
Post-Second Wave	6168	4648	0.37	0.24	0.32	5.04

Income Metrics

- ▶ Trend Analysis – Track monthly changes in incomes between January 2018 and December 2021.
- ▶ Cumulative Analysis – Compare the average real per capita cumulative household income in five time periods.
- ▶ **Impact Analysis** – Use an event study framework to ascertain the impact of the pandemic on household incomes while controlling for the different characteristics of households.

Event Study - Model I

$$(y_{itj} - y_{\delta j})/y_{\delta j} = \sum_{\substack{\tau=-26 \\ \tau \neq -1}}^{\tau=15} \beta_{\tau} \cdot 1[\tau = t - e] + \alpha_i + \epsilon_{itj} \quad (1)$$

wherein,

y_{itj} = seasonally adjusted per capita income in real terms for household i in month t for group j .¹

δ = pre-pandemic period (month of February 2020)

$y_{\delta j}$ = seasonally adjusted average per capita income in real terms for households belonging to group j in February 2020.

τ = indexed event time (time relative to the month of lockdown – March 2020)

e = base month (March 2020)

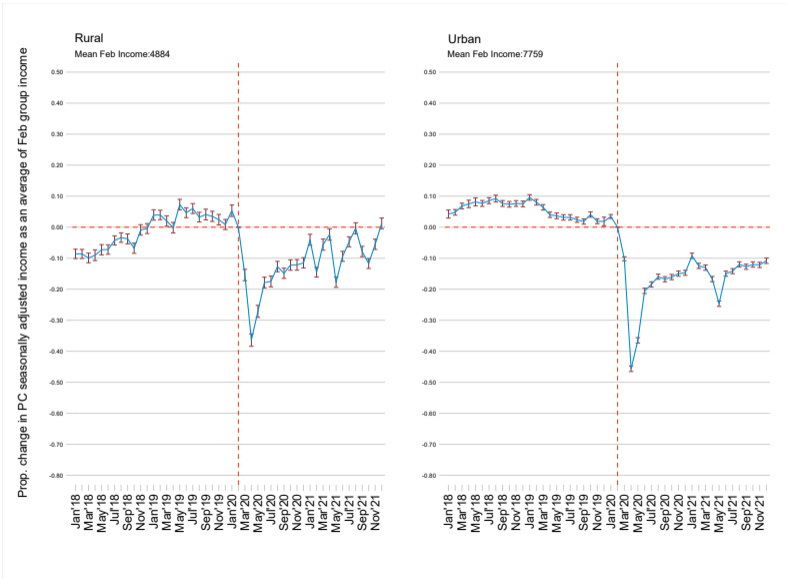
α_i = household fixed effects

ϵ_{itj} = error term (clustered at the household level)

¹ j can refer to all-India, region(rural/urban), income deciles, caste categories, religion, occupation categories, state groupings using HDI, state groupings using migrant population.

Event Study Model

By Region



Source: Author's calculations using CMIE-CPHS

By Income Deciles - change vis-a-vis Feb '20

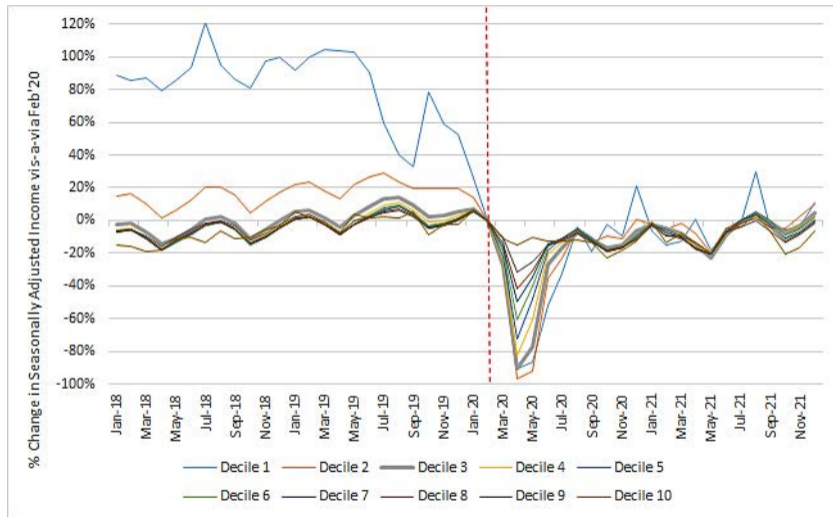


Figure: Change in Income by Deciles - Rural

By Income Deciles - change vis-a-vis Feb '20

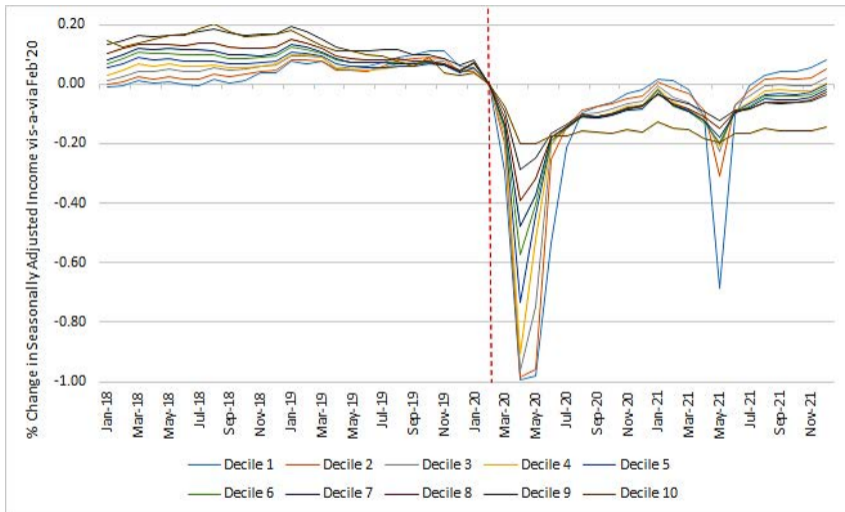


Figure: Change in Income by Deciles - Urban

Mechanism - Occupation Channel

- ▶ Contact-intensive, informal, and less secure occupations (daily wage work, low-wage service sector jobs) were impacted severely during the lockdown and recovered quickly as the economy opened up.
 - ▶ Households with daily wage workers populate the lower deciles.
 - ▶ Lower deciles witnessed a sharp drop and a speedy recovery.

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 - ▶ Households with daily wage workers populate the lower deciles.
 - ▶ Lower deciles witnessed a sharp drop and a speedy recovery.
- ▶ Less contact-intensive, formal sector jobs, with some protections from sudden changes were relatively less impacted, but those impacted saw a slow recovery.
 - ▶ Household with white-collar workers tend to belong to the upper deciles.
 - ▶ Upper deciles saw a much muted drop but a slower recovery.

Mechanism - Occupation Channel

Table: Distribution of Occupation Categories within each Income Quintile for Urban Sector

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	% in Total Population
Wage Labour	27.58	19.78	16.3	10.98	3.98	15.41
Agricultural Labour	5.01	4.27	3.74	2.83	1.53	3.49
Entrepreneur	32.48	36.28	35.73	31.47	23.99	32.04
Non-Technical Worker	16.54	14.76	12.69	10.41	5.38	11.87
Industrial Worker	8.23	9.31	9.91	9.64	8.16	9.17
Retired	6.07	7.92	8.98	11.49	16.21	10.21
Formal White-Collar	4.09	7.58	12.64	23.19	40.75	17.81
Total	100	100	100	100	100	100

Note: The table gives the share of different household occupation groups in each income quintile in the rural areas between a one year period of Mar'19 and Feb'20.

Impact by Occupation - Urban

Table: Change in Urban Monthly Household Per-Capita Income by Occupation Groups

	Agricultural Labour	Formal White-Collar	Industrial Worker	Retired	Wage Labour	Entrepreneurs	Non-Technical Worker
Jan-20	0.04	0.01**	0.07***	0.06***	0.03***	0.03***	0.04***
Feb-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar-20	0.23***	-0.06***	-0.06***	-0.08***	-0.18***	-0.17***	-0.09***
Apr-20	-0.23***	-0.26***	-0.44***	-0.22***	-0.75***	-0.65***	-0.45***
May-20	-0.23***	-0.25***	-0.36***	-0.23***	-0.52***	-0.48***	-0.37***
Jun-20	-0.01	-0.20***	-0.19***	-0.18***	-0.24***	-0.24***	-0.19***
Jul-20	-0.34***	-0.19***	-0.17***	-0.17***	-0.20***	-0.18***	-0.14***
Aug-20	-0.18***	-0.19***	-0.16***	-0.15***	-0.17***	-0.16***	-0.11***
Sep-20	-0.14***	-0.20***	-0.17***	-0.17***	-0.18***	-0.16***	-0.11***
Oct-20	0.23***	-0.20***	-0.15***	-0.19***	-0.18***	-0.16***	-0.12***
Nov-20	0.07	-0.20***	-0.09***	-0.19***	-0.15***	-0.14***	-0.10***
Dec-20	-0.12***	-0.18***	-0.12***	-0.19***	-0.14***	-0.14***	-0.08***
Jan-21	0.15***	-0.14***	-0.08***	-0.13***	-0.07***	-0.09***	-0.02*
Feb-21	-0.16***	-0.15***	-0.09***	-0.18***	-0.13***	-0.12***	-0.03***
Mar-21	0.12**	-0.16***	-0.08***	-0.21***	-0.14***	-0.13***	-0.05***
Apr-21	0.26***	-0.19***	-0.11***	-0.24***	-0.18***	-0.19***	-0.08***
May-21	-0.03	-0.22***	-0.19***	-0.24***	-0.30***	-0.32***	-0.17***
Jun-21	-0.04	-0.19***	-0.10***	-0.21***	-0.14***	-0.16***	-0.06***
Jul-21	-0.23***	-0.18***	-0.11***	-0.23***	-0.12***	-0.13***	-0.04***
Aug-21	-0.08*	-0.17***	-0.10***	-0.21***	-0.10***	-0.09***	-0.03***
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Oct-21	0.27***	-0.18***	-0.10***	-0.22***	-0.09***	-0.11***	-0.04*
Nov-21	0.10**	-0.19***	-0.10***	-0.20***	-0.08***	-0.10***	-0.04***
Dec-21	-0.03	-0.17***	-0.08***	-0.18***	-0.06***	-0.09***	-0.03**
Observations	128,460	720,894	309,944	421,904	678,127	1,420,348	463,025

Event Study - By Heterogeneous Groups

- ▶ States with higher percentage of migrants saw a slower recovery. ([Event Study by Migration](#))
- ▶ High HDI states saw a slower recovery. ([Event Study by HDI](#))
- ▶ OBC, SC households were harder hit during the months of lockdown. Recovery remains incomplete. ([Event Study by Caste](#))
- ▶ Incomes dropped by 60% for Muslims, 40% for Hindus. ([Event Study by Religion](#))

CMIE-CPHS Data Issues

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- ▶ Documentation of changing composition of CPHS over time.
- ▶ Leading to a significantly worsening bias against the poor and uneducated between 2016 and 2020.

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- ▶ **Drop in response rates during the lockdown.**

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- ▶ **Drop in response rates during the lockdown.**

- ▶ Response rate in 2019 - 84% .
- ▶ Response rate during the wave that included the lockdown months (May'20 to August'20) - 44%.
- ▶ Response rate has fluctuated between 65% to 75% since then.

Implications for our findings

- ▶ Poor representation of the bottom + the top - conservative estimates on inequality.
 - ▶ If the bottom segment of the income distribution is not getting captured in the survey, and given that they suffered disproportionately more, it is likely to underestimate inequality.
 - ▶ With individuals in the top end of the distribution making unprecedented profits during the pandemic, their inclusion too should exacerbate the inequality estimates reported above.

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- ▶ **Rise in poverty** during the pandemic, which continues to persist.
- ▶ **Inequality** spiked during the lockdown but has **returned to pre-pandemic levels**, though income levels have declined across the distribution.

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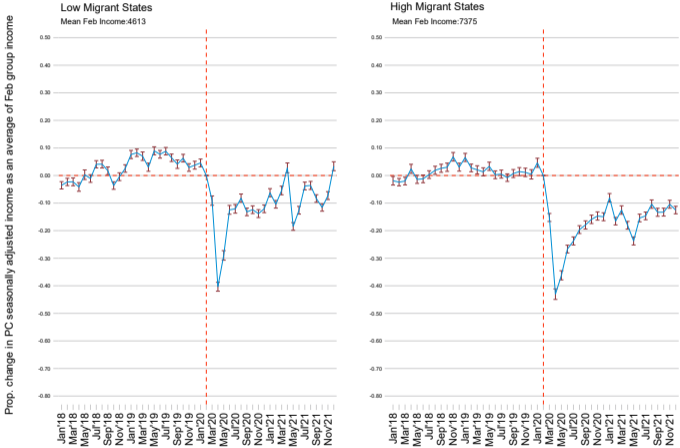
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 - ▶ Jobs that could be done remotely - formal sector jobs like white-collar professionals - were impacted minimally during the lockdown.
 - ▶ These households typically tend to earn more and belong to the upper end of the income distribution.
 - ▶ Accordingly, the top of the distribution saw a much muted immediate drop, a delayed impact, but a slower recovery.

Thank you!

Appendix

Slower recovery for states with higher percentage of migrants.

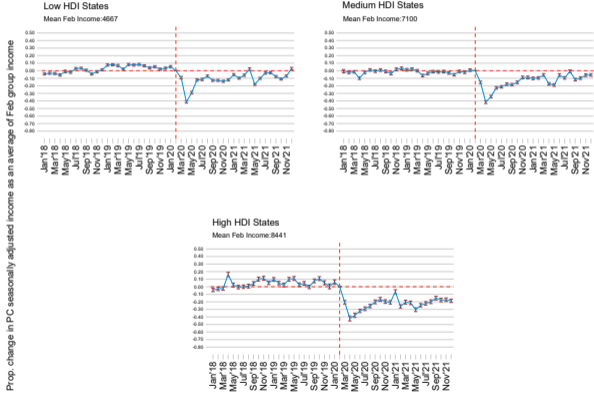
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Source: Author's calculations using CMIE-CPHS

Incomes dropped by close to 40% for all categories. Recovery slower for states with high HDI.

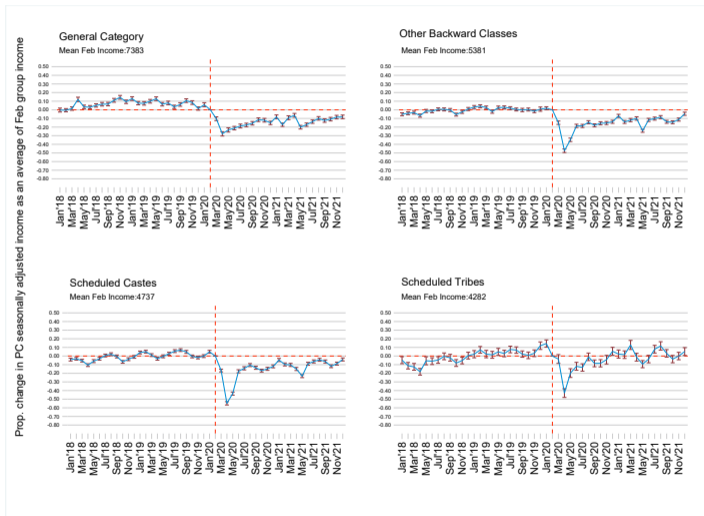
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Source: Author's calculations using CMIE-CPHS

OBC, SC harder hit. Recovery never complete for anyone except ST.

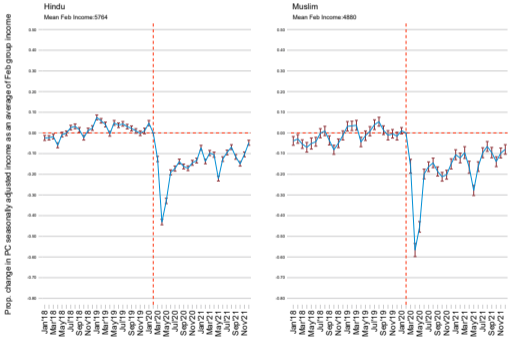
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Source: Author's calculations using CMIE-CPHS

Incomes dropped by 60% for Muslims, 40% for Hindus. Downward trend again in the second wave.

◀ back



Source: Author's calculations using CMIE-CPHS

CPHS PLFS Income Distribution

			Mean	Median	10th Percentile	25th Percentile	75th Percentile	95th Percentile
CMIE-CPHS PLFS	All India	With 0	14531	10215	0	5820	16759	45124
		Without 0	17354	12155	5664	8337	19048	47794
		Overall	11233	8038	3010	4990	12399	32239
CMIE-CPHS PLFS	Rural	With 0	12286	8971	0	4551	14061	37635
		Without 0	15147	10288	5178	7497	15867	41799
		Overall	8419	6986	2666	4306	10035	20238
CMIE-CPHS PLFS	Urban	With 0	19207	145612	0	8953	23644	53134
		Without 0	21533	15721	7731	10558	25930	55856
		Overall	17038	112367	4345	7352	20065	47762

Seasonality Adjustments

- ▶ Seasonality adjustment factors for each month are estimated by calculating the average deviation in monthly incomes from the trendline experienced in the 2017-2019 period.
- ▶ estimate incomes for each individual month by calculating a moving average of the monthly incomes of the surrounding ten months (five months prior to the month under consideration; five months post).
- ▶ The observed income in the month is then divided by the estimated income to get a ratio of the deviation from the trendline.
- ▶ This is done for every month's data between June 2017 and September 2019. The month specific seasonality adjustment factor is then derived by taking an average of all the ratios for a given month over the two-year period. This adjustment is done separately for rural and urban sectors.
- ▶ Rural income for January 2019 is estimated by taking an average of monthly incomes five months prior to that month (August 2018 to December 2018), and five months after that month (February 2019 to June 2019). This is then divided by observed income in January 2019 to obtain a ratio of the estimated to observed incomes. Similarly, a corresponding ratio for January 2018 is estimated.