

FUSE REPORT

IMPACT OF COVID 19 PANDEMIC AND THE LOCKDOWN ON THE CONSUMPTION OF FOOD WATER AND ENERGY RESOURCES IN PUNE CITY

GIPE, ÖFSE, UFZ and Stanford University

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Preface

The FUSE (Food, Water and Energy for Urban Sustainable Environment) is a transdisciplinary research project involving the Food-Water-Energy Nexus (FWE) in Pune (India) and Amman (Jordan). The project develops a systems model that can be used to identify viable paths to long-term sustainability. Under narratives of future changes in climate, demographics, land use, and economic development, it will develop and evaluate policy interventions and innovative governance forms to identify implementable sustainability options. The project is a collaborative effort between Stanford University (USA), UFZ (Germany), IIASA and ÖFSE (both in Austria), with its local cooperation partner GIPE.

Within the framework of the project, UFZ and GIPE conducted a citywide survey project in Pune in early 2021 to examine and understand the growing need for food, water and energy resources in Pune city. Pune is becoming an increasingly industrialized and vibrant city and has expanded significantly. The city has seen unprecedented in-migration as a result of its growth and its highly dynamic prospects. As such, this survey provided important insights on the exceeding strain this expansion is exerting on food, water and energy and the challenges this poses for sustainable growth of the city.

This report is a part of the FUSE project and attempts to put the earlier study in a fresher perspective by trying to understand how the COVID-19 pandemic affected food water and energy consumption patterns of households in Pune Municipal Corporation (PMC) limits.

This report is based on a survey of 194 households in Pune city that were interviewed between July-August 2021. This research project is primarily focused on establishing the impact of COVID-19 on access to Food, Water and Energy resources for households belonging to different income groups. We also attempt to understand broad changes in sources of FEW resources and changes in their consumption patterns. The experiences of people belonging to different income groups were starkly distinct in this respect.

This report is a humble attempt at documenting these experiences. The economically well-off were faced mainly with significant lifestyle changes. While, the shared experiences of the poor, the migrant laborers, the daily wage workers were grim and egregious.

The aspiration is that this plight and the lifestyle changes alike, find a voice in the planning of sustainable and cosmopolitan cities. In planning for cities and their food, water, energy and sustainability considerations, what remains fundamental is that we preserve a universal and

meaningful right to cities.

Acknowledgements

On behalf of the team, we would like to express our gratitude towards the people whose support, effort and encouragement have made this study possible. Many thanks to Dr. Ashish Kulkarni and Ms. Saylee Jog, professors of economics at the Gokhale Institute of Politics and Economics, Pune. Their mentorship has proven to be pivotal in this project. They have been ever appreciative of the team's effort and been approachable for any assistance that we sought throughout the duration of the study. They have been instrumental in helping us design and implement the survey. Their critical comments and suggestions have helped us build this report better. We are grateful to them for their continued guidance.

Many thanks to Dr. Vishal Gaikwad for the insights on how his team accomplished the previous FUSE survey. The recommendations he made for methodology and design were very instructive. We acknowledge and thank professor Vasundhara Sen for teaching and guiding us through the qualitative analysis. Gratitude to Prof. Steven Gorelick, Karin Küblböck, Christian Klassert, Yuanzao Zhu, Ines Omann and Hannes Grohs for their constant support and motivation. Project discussions and their continued counsel were essential building blocks in the research process.

Thanks to Ms. Rupali for helping us with some of the contacts of potential respondents. We are grateful to all the people we may have missed out unknowingly, without whose guidance, motivation and assistance this project wouldn't have become possible. Errors and omissions if any, remain ours.

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Introduction

Over the years, Pune has grown rapidly as an urban agglomeration and has experienced tremendous growth. This has also led to steep pressure on resources in the city and posed significant challenges. The gravest difficulty pertains to water, followed by problems in energy especially electricity distribution and transition to cleaner energy sources. Despite the ambitious 24x7 water project being announced in 2019 and efforts for installation of meters gaining pace, faulty pipes and poor infrastructure has led to extensive water wastage in Pune. This wastage has compounded the difficulties of the citizens and put the corporation under pressure to meet the rising demands for water.

The pandemic has also worsened the troubles of MSEDCL, the only electricity distribution company in the city. All of this put together with the economic slowdown, loss of livelihoods for people and reduced industrial demand for electricity exacerbated the financial vulnerability of MSEDCL.

The lockdowns during the pandemic disproportionately affected the vulnerable sections of the society. Migrant and casual workers were severely affected as all economic activities stopped. A general observation was that the government provided assistance by opening shelters and gave food to citizens throughout the lockdowns. The shutting down of the public transport system posed commute problems for people who did not own vehicles.

In view of these developments and challenges faced by Pune to move toward urban sustainability, it was crucial to study how the pandemic affected household consumption of these food, water, and energy resources for the city. In terms of city planning, it is important to understand the mechanisms of inequity and absolute poverty and to build city infrastructure that would be resilient to such crises. This report tries to elucidate the effects of the pandemic from the perspective of people's lived experiences. The interviewees remain anonymous during the survey but this study is an attempt to ensure they don't remain voiceless.

Methodology

This section is dedicated to explain our research methodology under the constraints of the pandemic. The pandemic and the subsequent lockdowns engendered significant difficulties in conducting primary survey-based research. The best way to undertake this research project would have been to conduct an in-person primary survey for a requisite sample size using stratified random sampling to get representative data at the ward (a division or district of a city or town, as for administrative or political purposes) level across sub-sections of income, caste, religion and other socio-economic parameters, as was done in the case of the earlier studies in the FUSE project. But the pandemic exposed the surveyors and respondents to the risk of COVID infection and thus, on-field primary surveys were difficult to administer. Therefore, as an alternative to on-field surveys, we chose to administer the survey via telephone calls /video conferencing.

This method minimized contact between respondents and the interviewer and hence it is the next obvious choice as the safety of each respondent and each surveyor is paramount. However, telephonic interviews are susceptible to acquiescence and other biases. Response rates for telephone interviews also tend to be low. These factors impose limitations on how we choose our sampling frame, sample size and sampling method for a telephone survey. Where possible, we utilized video conferencing to administer the surveys to ensure that the conversations remained engaging and we did not miss out on any non-verbal cues.

Sampling method

Administering the survey to any unit of randomly chosen observation, even though it is the first best choice, poses its own difficulties, which were difficult to surmount during the lockdown. The first and the most important difficulty was to identify respondents and acquire contact information for randomly sampled units. Identifying contacts of potential respondents from a single source made the sample susceptible to common-source bias. So, we tried to get contact information of potential respondents from multiple sources.

We didn't use contacts who were direct acquaintances of anyone involved in the project to avoid any social desirability bias. We further attempted multistage sampling where a snowball sample was additionally obtained from the list of contacts determined as mentioned above. But the snowball sample, especially when chosen where the interaction of the surveyor with the respondent is virtual and not physical, is also susceptible to community bias.

Combining limitations as observed above, to optimize for the response rate and quality of responses while ensuring that the sample is representative, we must choose purposive stratified sampling. This was a qualitative survey thus we reached saturation across income groups with this size. There was no problem of estimation error to tackle. We chose a sample size of 194. The sample was stratified at the ward levels in proportion to 2018 population estimates. Ideally, the sample should be stratified further for income subgroups within each ward. But that was not feasible in a remote setting. The sample was chosen such that a roughly equal proportion of respondents across income backgrounds were obtained from each ward.

Respondent profile

We interviewed respondents from a sample of 194 within Pune city corporation boundaries. The number of observations from each ward was chosen by the *probability proportional to sample size* method. The number of observations is roughly proportionate to the population of the respective wards as per the 2011 Census. The sample size being small and for a largely unknown population, the sample has not been weighted for finding population estimates.

Fig.1a and 1b show the ward-wise composition of the sample. The cell colour in Table 1. indicates the ward in the pie chart.

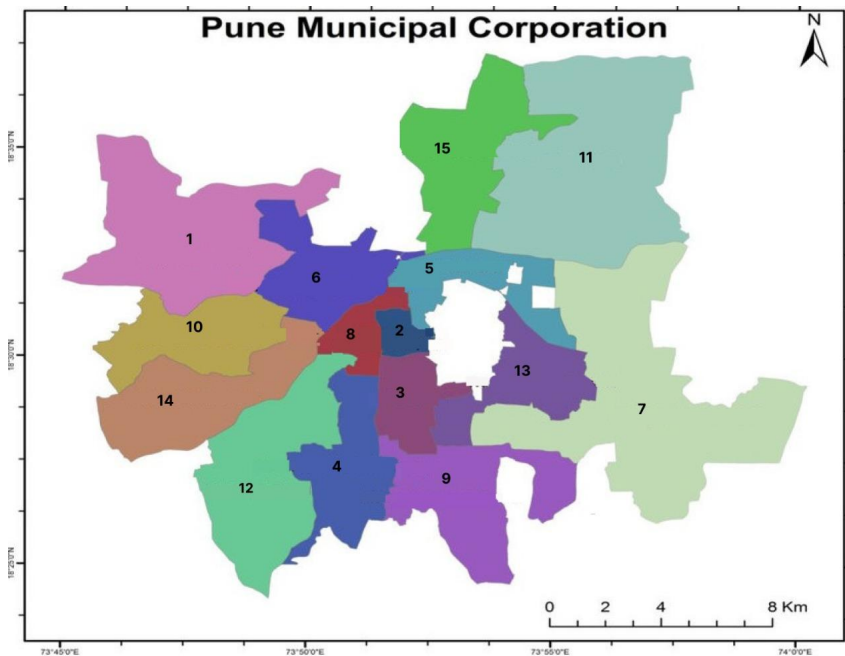


Fig 1a. Study Area: Ward map of Pune Municipal Corporation

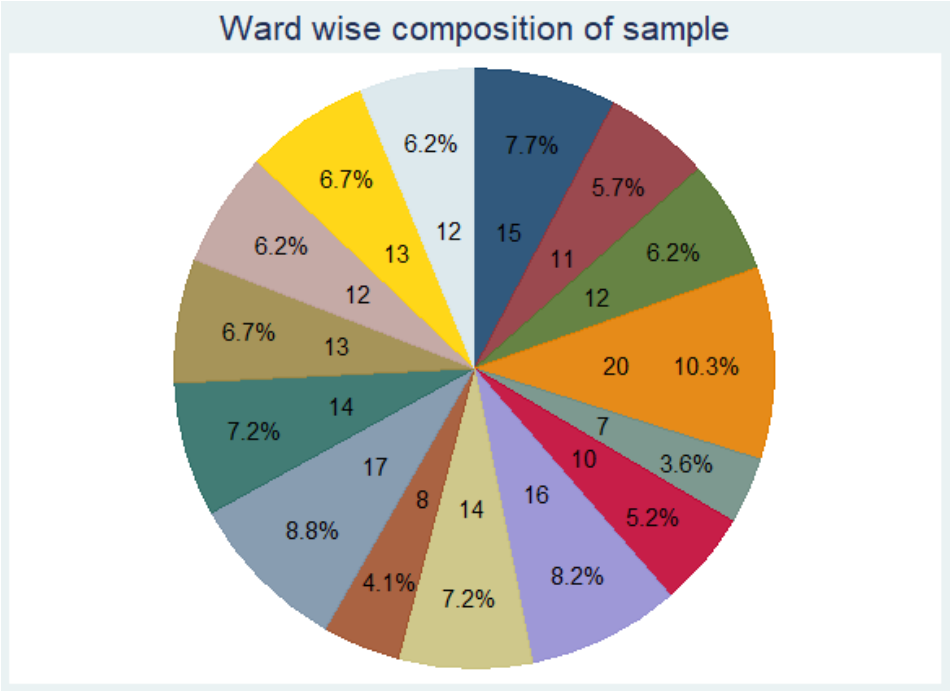


Fig. 1b Ward-wise composition of the sample in this study

WN. 1 Aundh Baner	WN. 2 Bhavani Peth	WN. 3 Bibwewadi	WN. 4 Dhanakwadi Sahakarnagar	WN. 5 Dhole Patil Road
WN. 6 Ghole Road	WN. 7 Hadapsar	WN. 8 Kasaba	WN. 9 Kondhwa	WN. 10 Kothrud Bavdhan
WN. 11 Nagar Road	WN. 12 Sinhagad Road	WN. 13 Wanowrie	WN. 14 Warje	WN. 15 Yerwada

Table 1. Ward number

Household income profile

The aim was to ensure equal representation of the relatively richer households with income >0.8 million and households with income <0.8 million (See fig. 2). 43.2% of households reported an annual income of above 8 lakh rupees. 7.4%, which amounts to 14 households, had a reported income of less than 50 thousand annually. The sample is representative across income categories with roughly half the sample size with income above 0.8 million rupees and half of the sample below 0.8 million rupees. As the sample reaches saturation faster with qualitative data, this sample size was enough to extract meaningful information.

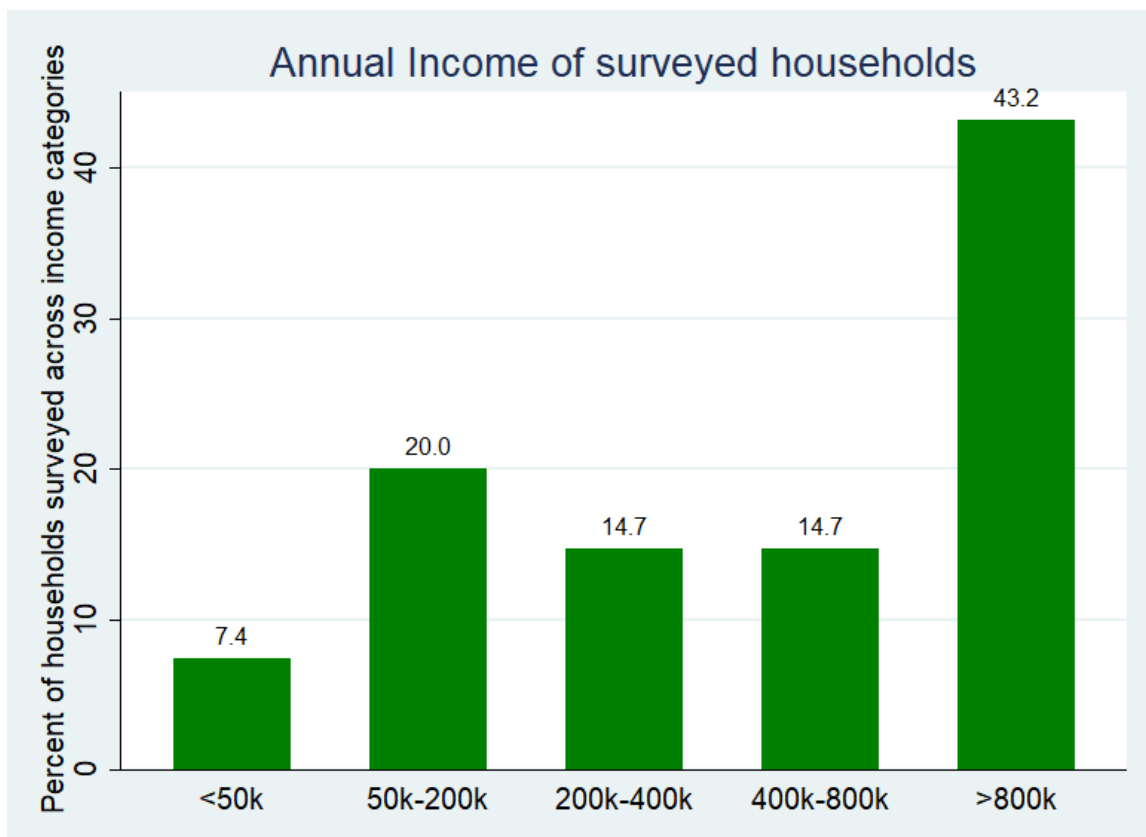


Fig. 2 Proportion of households in each income category

Fig.3 shows the change in household members. Around 11% of households also reported a decrease in the number of members in their household over the pandemic owing to migration, death, or other reasons. 4% of households reported an increase while the number of members of the household remained the same for the remaining 85% of households. A change in the number of household members affects household consumption and savings which has an impact on the household income.

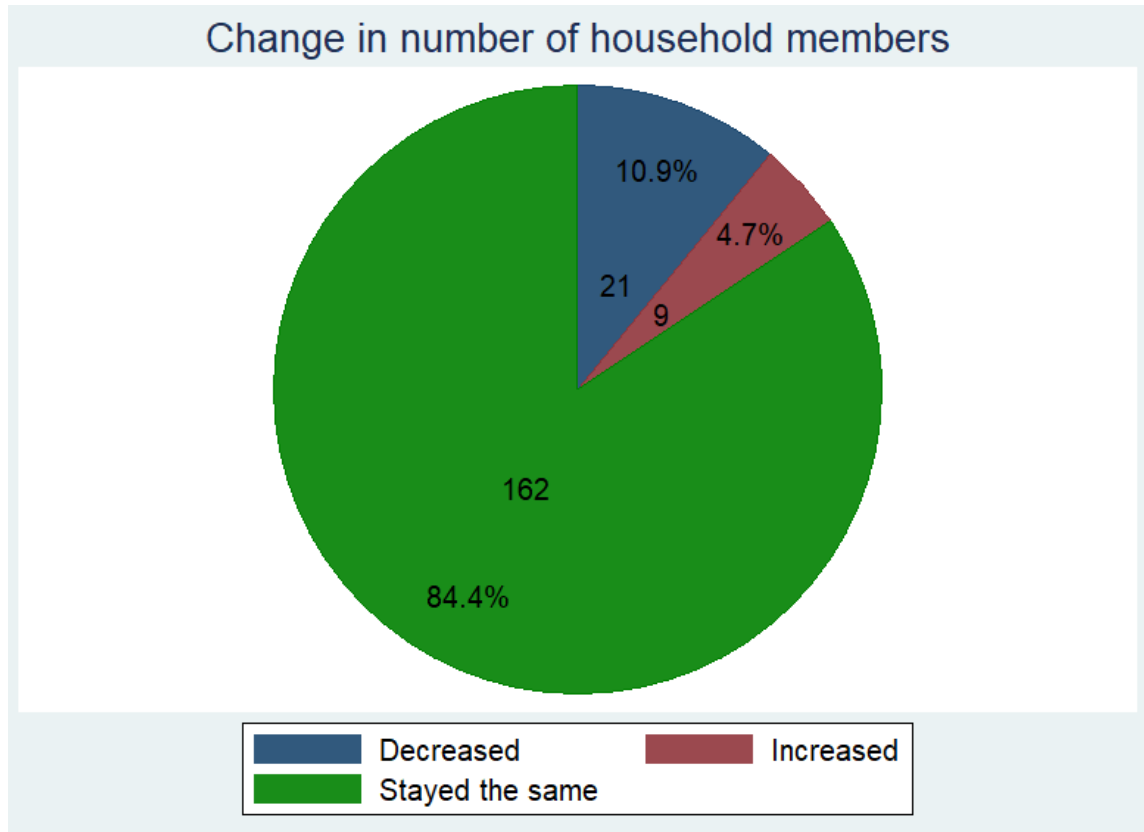


Fig.3 shows change in the number of household members

The average household size within PMC is 4.22. The study showed similar family size as well (see Fig.4). Fig. 5 and 6 show the housing type and ownership status of the respondents. With the lockdown restricting movement and owing to the pandemic, it is necessary to see the change in household size.

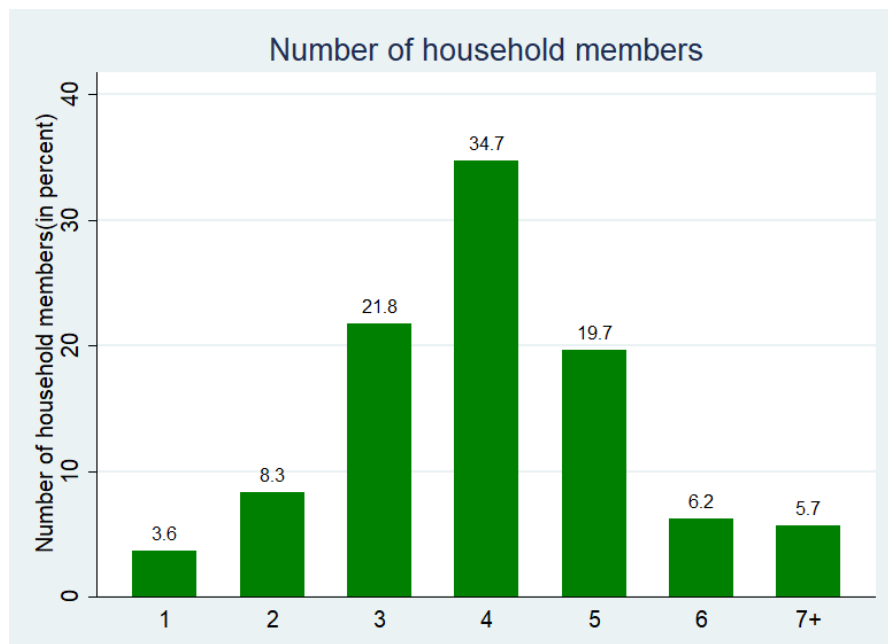


Fig. 4 Number of members in the households interviewed

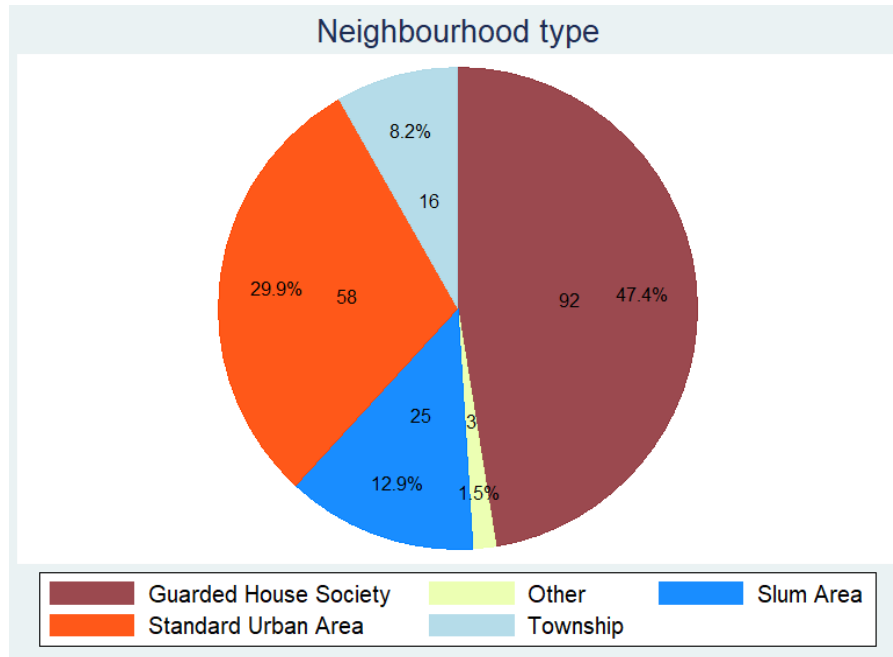


Fig. 5 shows the distribution of neighborhood type of the households

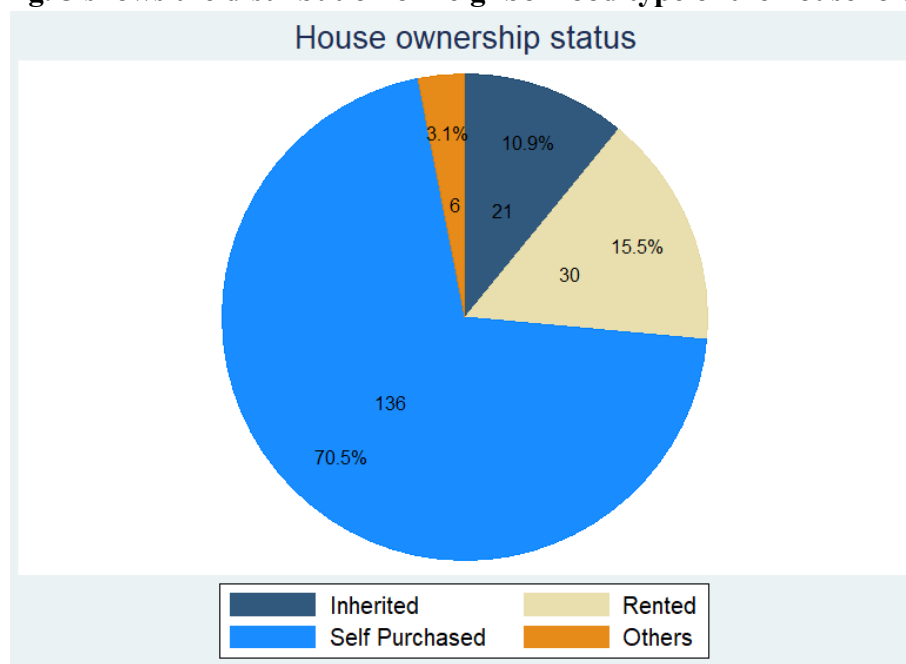


Fig.6 Whether the household was self-owned or rented

Head of household (Hoh) is defined as the highest income contributor. The median age of the Hoh is 48 years (See fig. 7) and the distribution is roughly gaussian. The age of respondents is bimodal (See fig. 8) and is concentrated in the classes 18-20 and 41-50. There is a possible age bias in these responses as a fourth of all observations belong to the category 18-20. Further, this is confirmed by the fact that a 27.3% proportion of the respondents were students by profession. But as the responses and most questions pertain not to the person themselves but to the household overall, the noise from such bias, if any, is very limited.

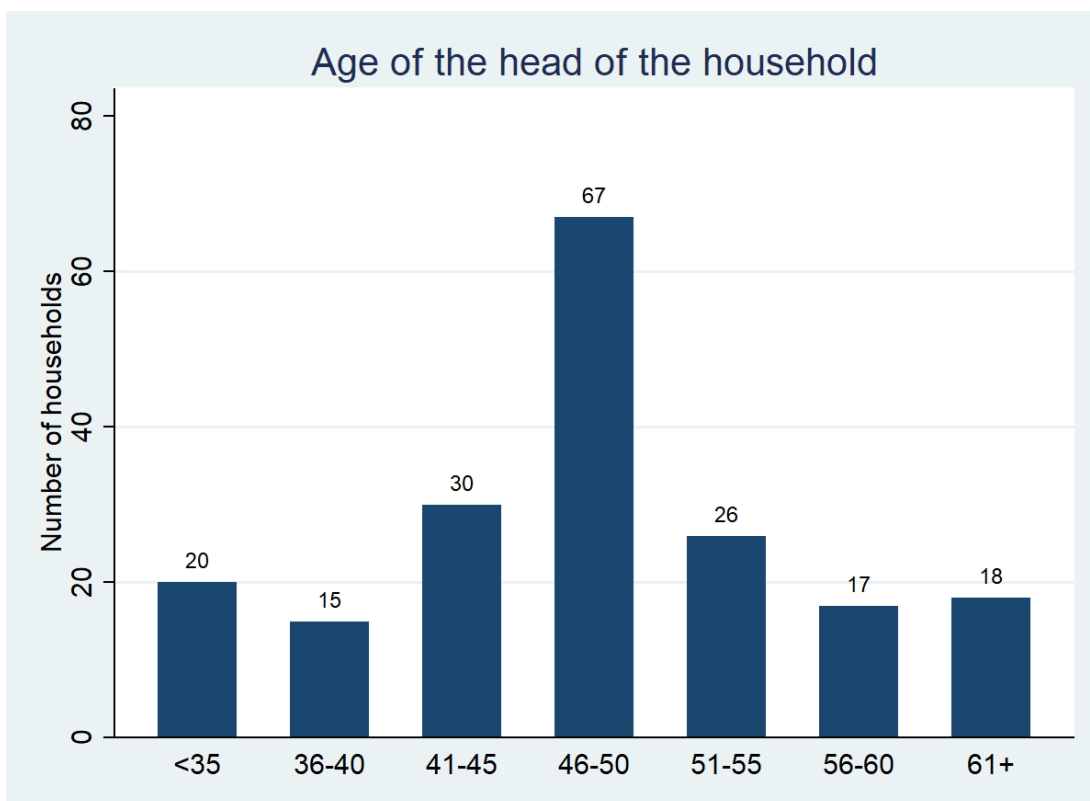


Fig. 7 Distribution of households according the age of the HoH

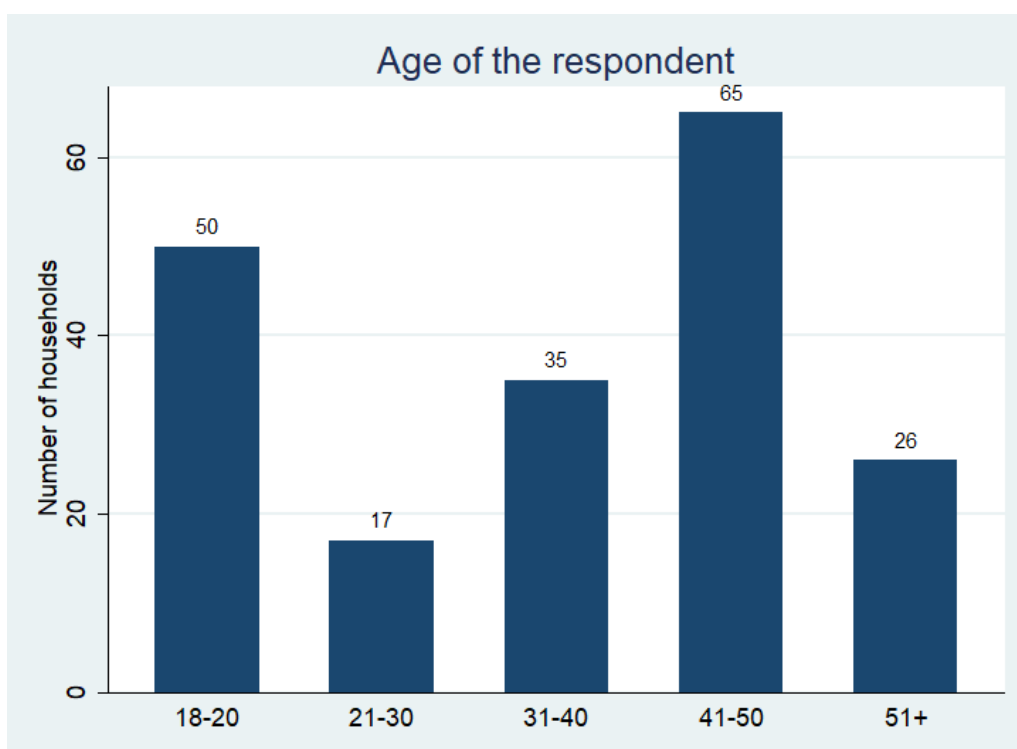


Fig. 8 Age of respondents surveyed

There was a sample balance in the gender of the respondents with only a little more female respondents than male while the head of the household was predominantly male (71.7%). It must be emphasized that HoH has been defined as the person with the highest income contribution in the household.

Table 2

	Gender of the Hoh	Gender of the Respondent
Female	28.35%	56.70%
Male	71.65%	43.30%
Total	194	194

Around 60% of the household heads were salaried or self-employed. A few were retired, unemployed or employers. The respondents too were mostly salaried employees followed by others who were students and unemployed. Fig. 9 & Fig. 10 show a detailed occupation profile of the respondents and the head of the households in the sample.

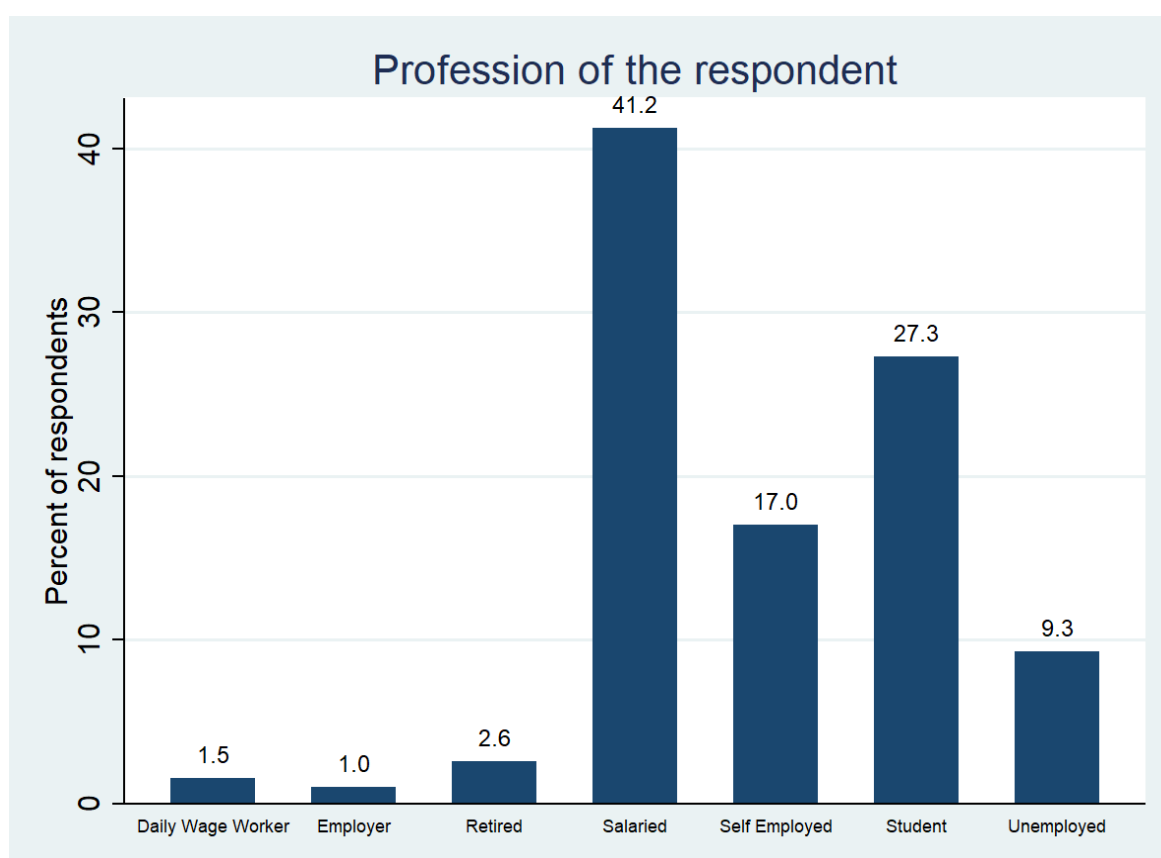


Fig. 9 Profession of the respondents surveyed

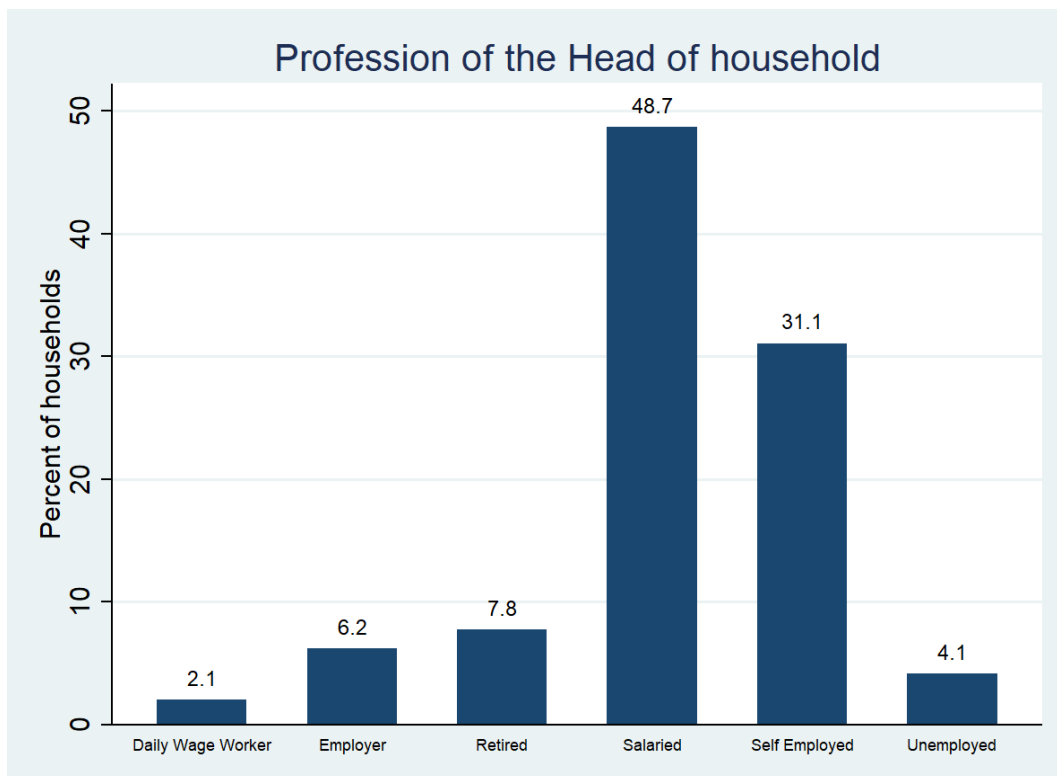


Fig. 10 Profession of the Head of households surveyed

Results

Income and Employment

The economic impact of the COVID-19 pandemic and the subsequent lockdowns were devastating. In this section we attempt to understand how the pandemic affected the income and livelihoods of people in the city. The lower income categories, being employed in informal jobs or self-employed in small ventures were affected disproportionately highly due to the economic slowdown and fall in demand across sectors leading to job losses. The suffering witnessed by the migrants was reported widely in sections of the media. But some people still had to migrate to cities out of lack of choice despite not wanting to do so. This section tries to document these experiences.

From our sample, upto the August of 2021, 32.6% respondents reported that they and/or their family members had been infected with COVID while 67.4% remained uninfected (see Fig.11). There was no significant variation across income groups or residence types identifiable in the sample. This result should be read with caution because the question only considered those who took the COVID test and got a positive report.

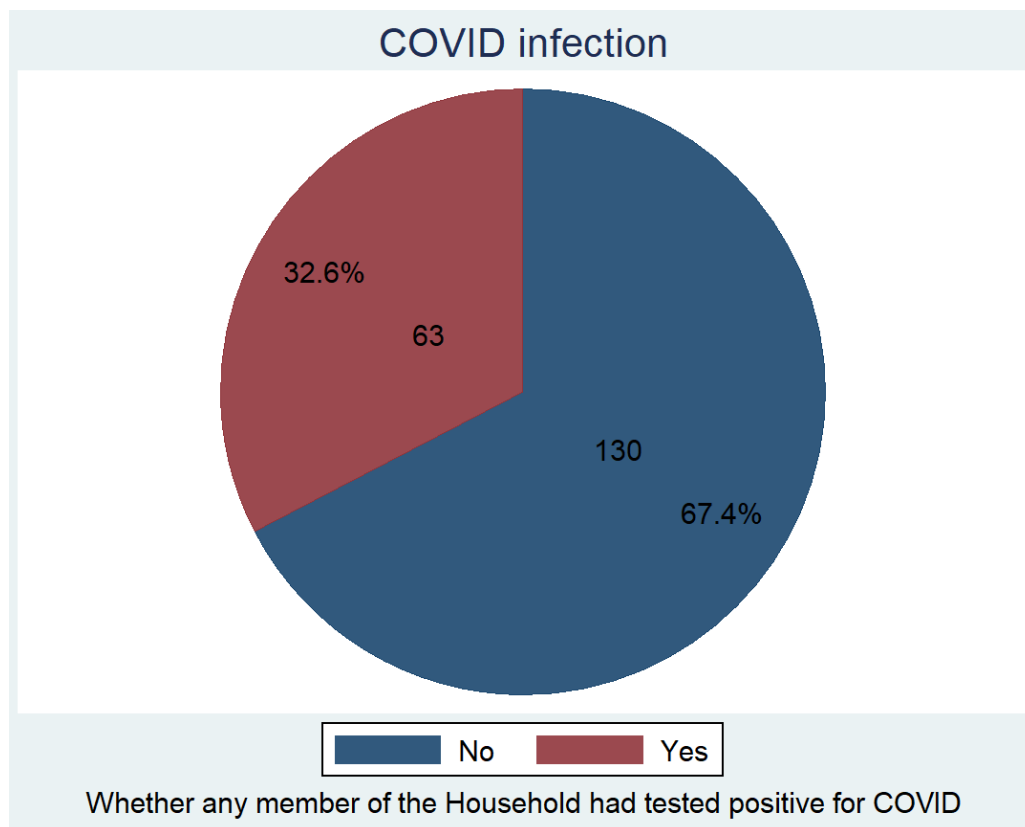


Fig. 11 Whether any member of the household has tested positive for COVID-19 at the time of survey

Fig.12 shows the effect of the pandemic on income. More than half of the respondents

interviewed reported a decrease in their monthly income level. 15% of the total respondents reported that their income had been reduced by more than half.

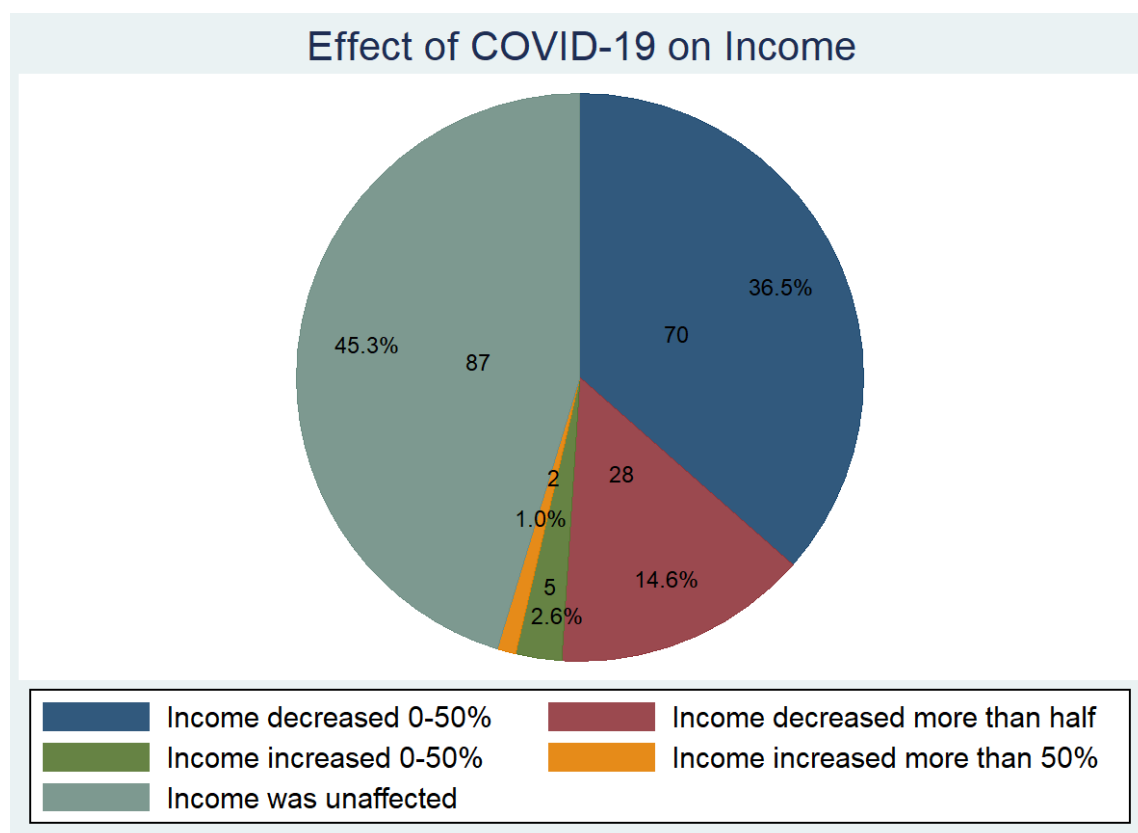


Fig. 12 Effect of the pandemic and the lockdown on the income of surveyed households

The biggest cause of vulnerability and worry was job insecurity. Many amongst those who lost jobs were the sole breadwinners. *“My husband is ill so he is unemployed. And my mother-in-law had a housekeeping job in a school. But now, because of the lockdown, the schools are closed. So, she is also unemployed. My son was also working before the lockdown but now he doesn’t have a job.”* said Rashmi (Name changed).

The impact of the pandemic was disproportionately higher on the poor. Employment change refers to the shift in jobs or loss of jobs. Fig. 13 shows how employment status changed for any member(s) in the household across different income categories whereas Fig. 14 shows how employment changed for the respondent across income categories. As can be seen in the figures, the change in employment status of respondents and members of the household was much higher for people belonging to the lowest income groups.

Sharda (name changed), an anganwadi worker whose husband worked as a daily wage construction worker and lost his earnings owing to the pandemic said, *“Earlier there were 4-5 daily work sites active. Now there isn’t even one. I joined IPHM three months ago. But there too, I get only 2,000 rupees as payment.”* Their sustenance was based on their meagre savings and some money they had borrowed. *“There has been no work since the lockdown.*

Even now there is only one work.” said another respondent who had lost work as a housemaid. Teachers and school staff among the respondents also mentioned how closing down schools had led to job losses. With the temporary closure of schools and a switch to the online mode of education due to the pandemic, multiple respondents in the teaching profession were either laid off or had to stop working for a while. After the lockdown was imposed, various small businesses were shut down which compelled numerous people to either return to their native places or migrate to different cities in search of employment. *“I owned a paan shop in Uttar Pradesh. But it closed down due to covid to I shifted to Pune in search of employment”* said Ramesh about why he had to migrate. *“During the lockdown, I lost my job as a security(guard) in Indore, and went back to my village,”* said another man who had to migrate back to the city.

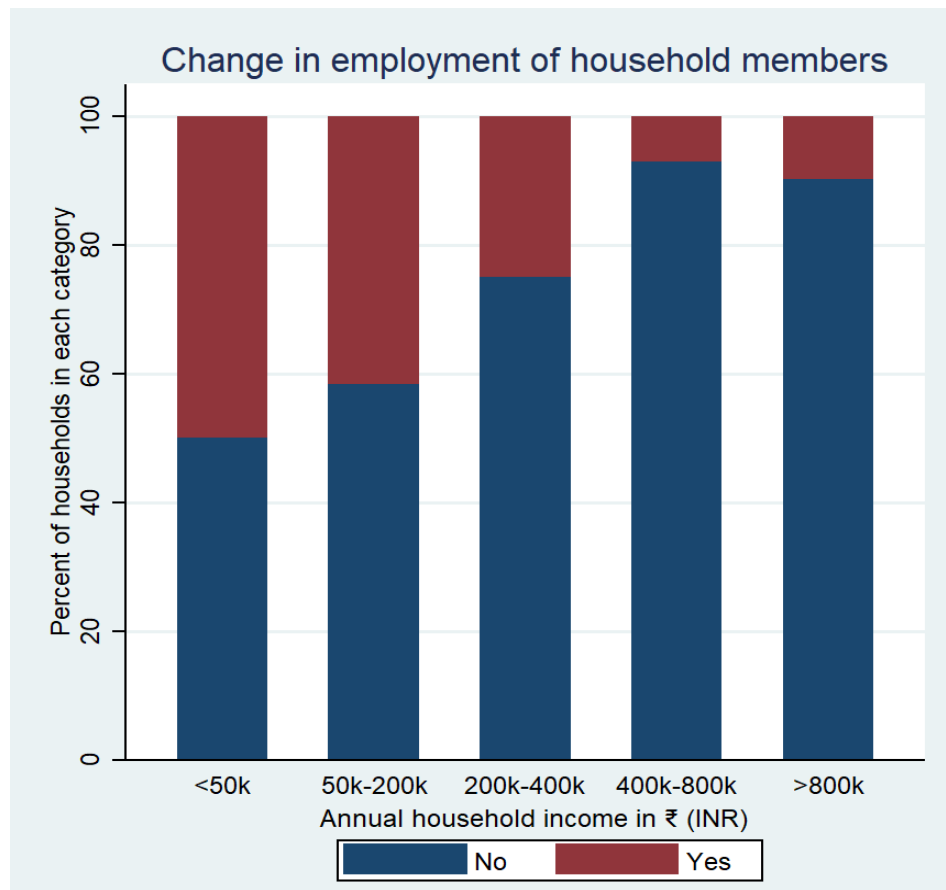


Fig. 13 Higher income categories were at a lower risk of employment change

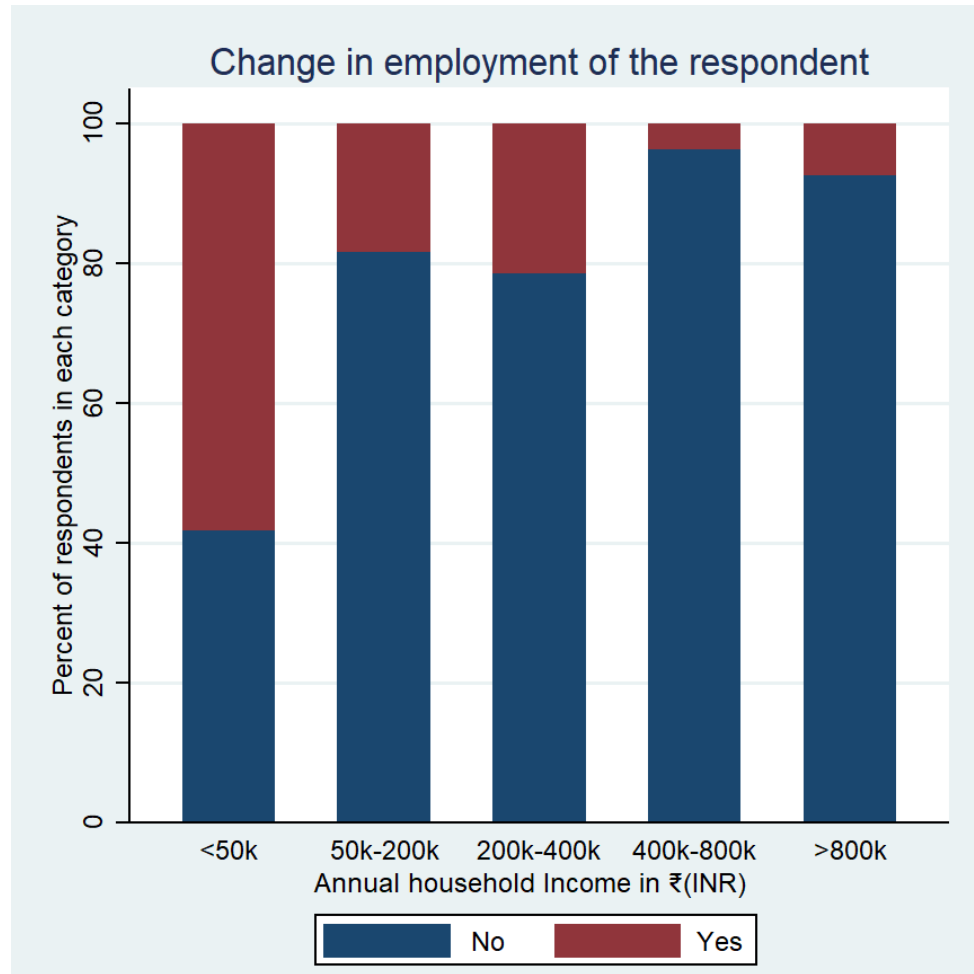


Fig.14 shows the number of respondents who had a change in employment status

Casual workers who juggled between various jobs throughout the day were left in a lurch with a lesser number of jobs available post pandemic and had to also rely on government initiatives, for example. All the sectors were severely impacted which resulted in multiple people from the same household losing their jobs. *"Both my sons and my husband have lost their jobs,"* whimpered an old woman as she talked about how the pandemic had completely overturned her life. Due to the pandemic, some respondents with higher incomes in the private sector also saw salary cuts. Two respondents had to quit their job because their firms were not able to generate enough revenues to pay them their salary.

Fig 15 shows how the people from the lower income categories were affected more by the pandemic than was expected. A major proportion of the respondents from lower income categories reported that their income had been reduced by half or more than half during the pandemic. This is in stark contrast to respondents from higher income categories where the majority reported that their income remained unaffected. While about half of the respondents in the lowest income category reported that their income had decreased by more than half, on the other side, about half of the respondents in the highest income category reported that their

income remained unaffected. This represents the sad reality of how the pandemic disproportionately affected the poor more.

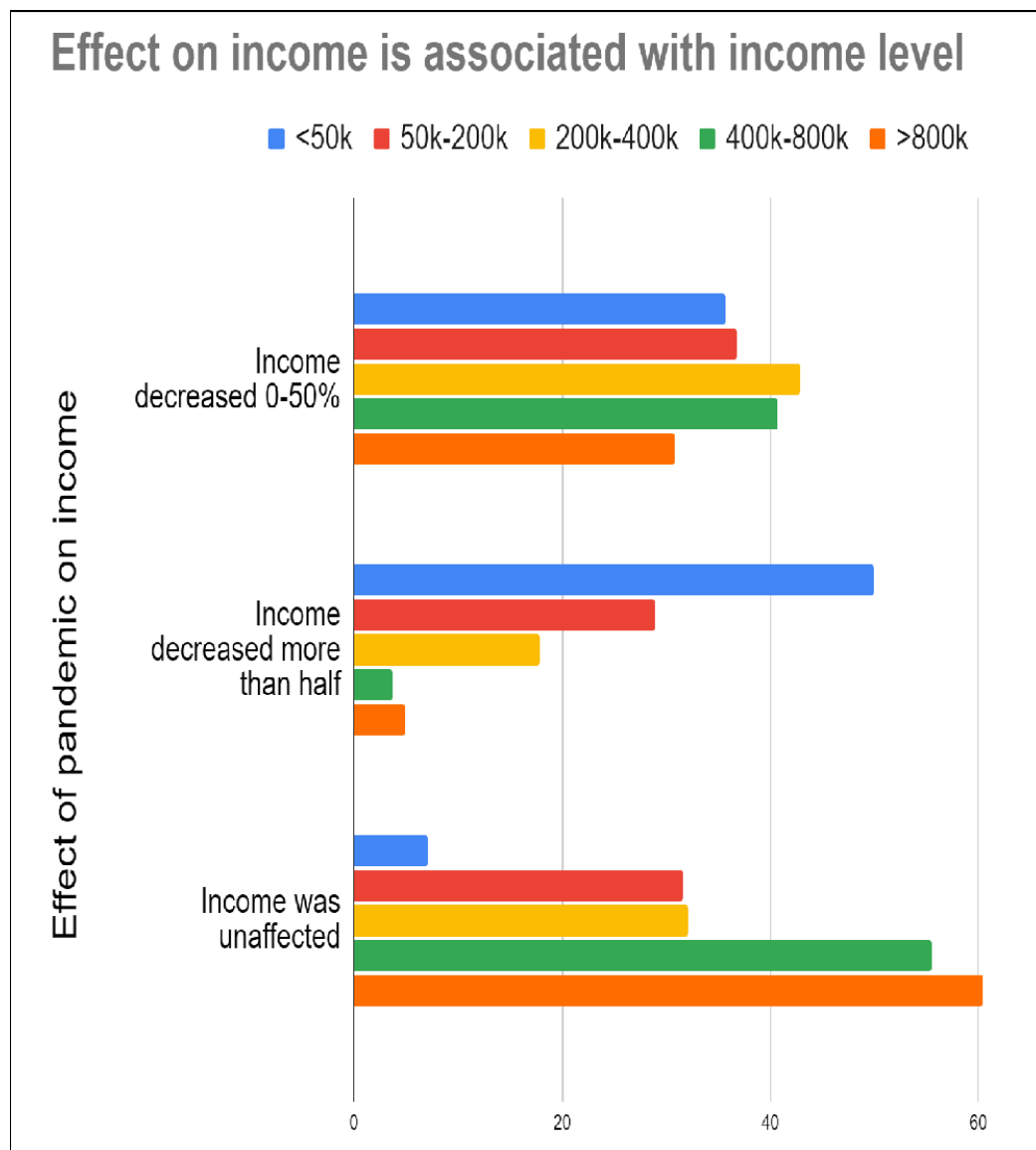


Fig. 15 Perceived variation in effect on income by income levels of the household at the time of interview

Work from home

In this sample, eight people were working from home before the pandemic hit, but they were all self-employed. The number of members of the household working from home was higher for higher-income households as the higher-income households held formal sector professional jobs. Fig.16 shows how people across income categories shifted to working from home. The respondents at the very low end of the income spectrum were engaged mainly in manual labor and couldn't work from home. People in the higher income categories are mainly the ones that sifted to working from home. Around 35% of the respondents from this sample were working from home during the pandemic and the lockdown period. This significantly affected domestic energy and food consumption as we shall see in the subsequent sections. Some amongst them were also working partly from home and partly from an office.

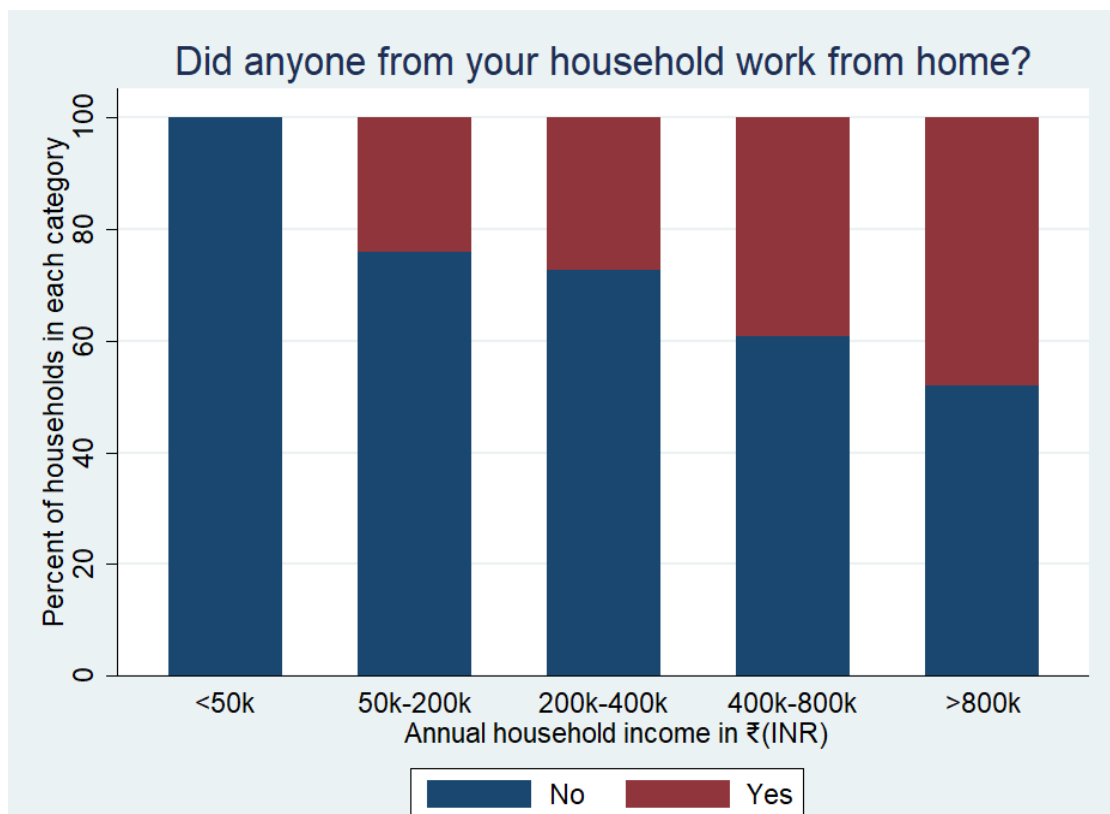


Fig. 16 Whether any member of the household was working from home at the time of the interview

Food

The pandemic changed people's food habits significantly. Most people were at home due to the lockdown. Moreover, the pandemic affected people's purchasing power significantly. One cause was the absolute decrease in income and the second was rising food inflation. People also changed their dietary preferences for egg, meat, pulses, fruits and vegetables during the pandemic to improve immune response and maintain general health.

76% of the total household surveyed used LPG cylinders as their main source of cooking fuel. 22% of the households used piped gas. The remaining 1% used other sources such as kerosene.

Fig.17 shows that owing to the pandemic, the workload for the members primarily responsible for cooking increased for 51% of the total households while it remained the same for 42.19% of respondents. For the other 8% of respondents, their workload owing to cooking had decreased.

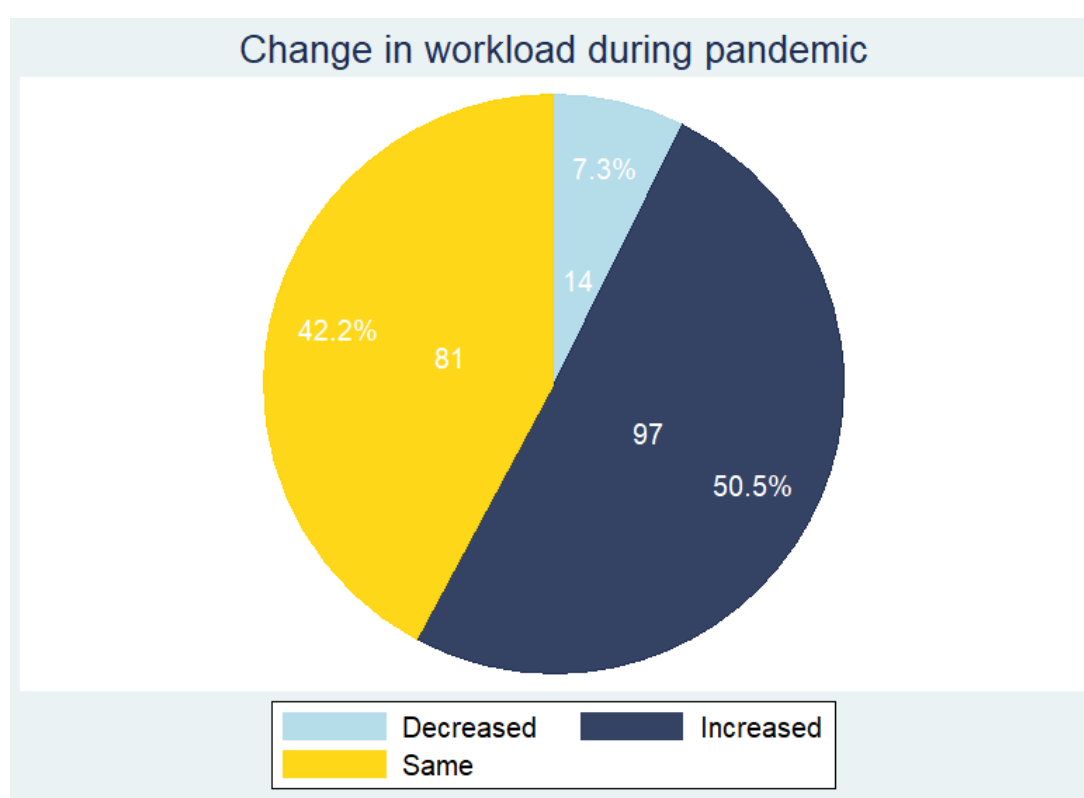


Fig.17 Change in the workload of housemakers

The main reason for the increase in cooking time was that there were more people at home. 38% of households also noted an increase in the number of meals they cooked and consumed after the pandemic. One of the major sources of increase in workload was that during the lockdown, all house-help had to stop work during the lockdown. Moreover, the workload increased for some as home delivery of food was not possible. For 44% of households, time

spent cooking had changed in some way due to the pandemic. 49% of these households further reported that the change in time spent cooking had persisted. This association was positively and significantly associated with income class. The households with income greater than 0.8 million spent much higher time during the day cooking and they also reported a higher increase in the number of meals cooked per day. As women cooked in most households, this had important implications for their time-use and increased workload.

Change in dietary habits:

58% of respondents in the income category >800k reported an increase in the absolute quantity of food they consumed. 35.6% of respondents in the other income categories reported an increase in food quantity. As people were increasingly at home and because of more meals being cooked we see a significant increase in the quantity of food consumed. Overall, 46.3% of respondents reported no change in the quantity of food consumed. The quantity of food consumed decreased by 6.3% of the total respondents. This was mainly related to a shift to more modest diets to remain fit and healthy. Some people reported that the quantity of food had actually decreased during the lockdown as they cut down on the number of meals, but as things got normal their diet normalized too. Two respondents noted that their income levels had fallen drastically and that had affected the quantity of food they consumed during the lockdown.

22 people reported that their consumption of meat had increased over the pandemic. Some people reduced their consumption during the pandemic only to increase it back to the normal level. Some other households had to cut down on the consumption of meat and fish due to financial constraints. People also responded by eating more non-veg, especially eggs, as they believed it was rich in protein and hence helpful for health and wellbeing during the pandemic.

A similar trend was seen for pulses but at least three households had to cut down their consumption of dal because they couldn't afford it. *“Earlier if we used to buy one kg of daal, now we only get half a kilo,”* said a woman. One other lady claimed that during the time when they got free ration they could get more dal, but now it had significantly reduced. A 40-year-old man said that *“the rising prices of oil and pulses hurt the food basket budget and they had to reduce the consumption of daal.”*

People largely did not change their consumption of fruits and vegetables. The poorer households had to either consume fewer fruits or had to reduce their consumption

because of affordability concerns. *“We used to get vegetables only once a week, we had to use water fearfully due to the uncertainty in its supply in the future. We also used electricity a little less because our income sources could have been compromised.”*

Some households did eat more fruits during the lockdown for health benefits or when they were infected with COVID19 and because the prices had fallen sharply. Initially, right after the lockdown, there were concerns regarding the availability of fresh fruits and vegetables but these receded as the supply jumped back to normalcy.

45.5% of the respondents ordered food online during the lockdown from food delivery apps. There was a statistically significant pattern of association between income group and ordering and higher-income groups, who also ordered more often. 69.1% of people in the higher income category ordered food from food delivery apps. Moreover, 54.1% of the people who ordered food during the lockdown ordered it more frequently than before the pandemic. The pandemic and the lockdown were initially a setback for the online delivery industry, but as covid protocols were in place and confidence regained, we saw an increasingly high number of people ordering food online.

61.4% of the respondents reported that they had ration cards. 30% of the respondents used the ration card during the pandemic. The usage is significantly associated inversely with income levels. The experiences of people using the ration cards were mostly positive. People mostly get their share of wheat and rice and occasionally also sugar, dals and oil. The response on the quality of grain provided was mixed but that is largely primed by expectations. Few people, however, couldn't get their share of rationed food due to technical and legal difficulties. *“My ration card wasn't working because it didn't have a stamp. So, I didn't get anything for free. The person at the PDS shop takes extra money to get that done.”* said a user. Another user had to face difficulties because her ration card wasn't seeded to her AADHAR¹ card. One other person couldn't get his ration card in time after having applied. The main objective of the ration card is the provision of food grains and other commodities to weaker sections of the society at subsidized prices.

¹ Aadhaar is an individual identification number issued by the Unique Identification Authority of India on behalf of the Government of India that serves as a proof of identity and address, anywhere in India.

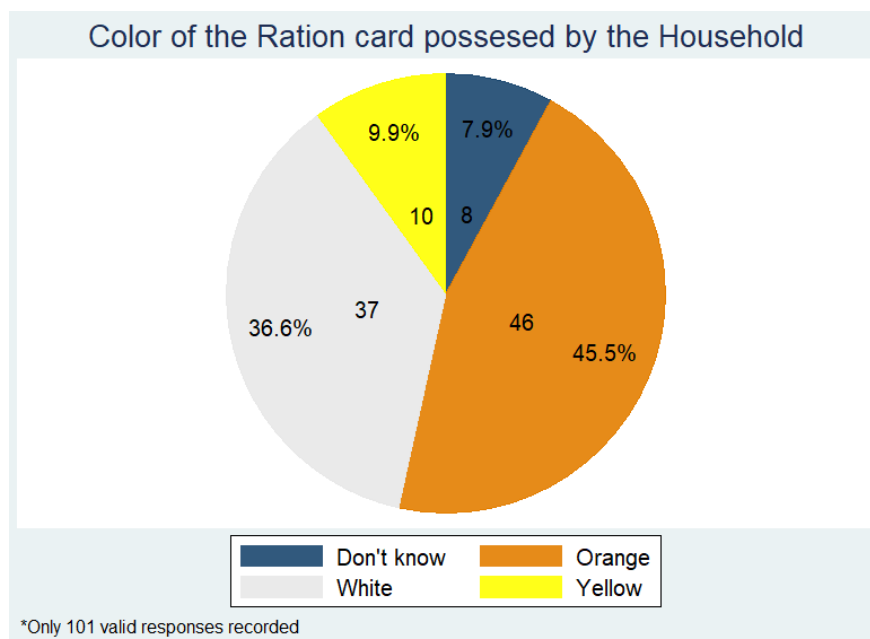


Fig. 18 Ration cards possessed by interviewed households

Fig. 18 shows the color² of ration cards possessed by the households. The entitlements received through a ration card varies state by state.

Energy

The pandemic and the consequent lockdown sharply increased household consumption of electricity. 68.6% of people surveyed reported that their household electricity consumption increased due to the lockdowns. 29.1% people observed no change in their electricity consumption and 2.3% said that their household electricity consumption decreased during the pandemic. Fig. 19 shows the distribution of various vehicles that the households have.

² In Maharashtra, yellow ration cards are issued to people who fall in the below poverty line (BPL) category. Orange ration cards are issued to people whose annual income is more than 15,000 and less than 100,000. Orange ration card holders are above the poverty line but classified very poor. White ration cards are issued to people whose annual income is more than 100,000

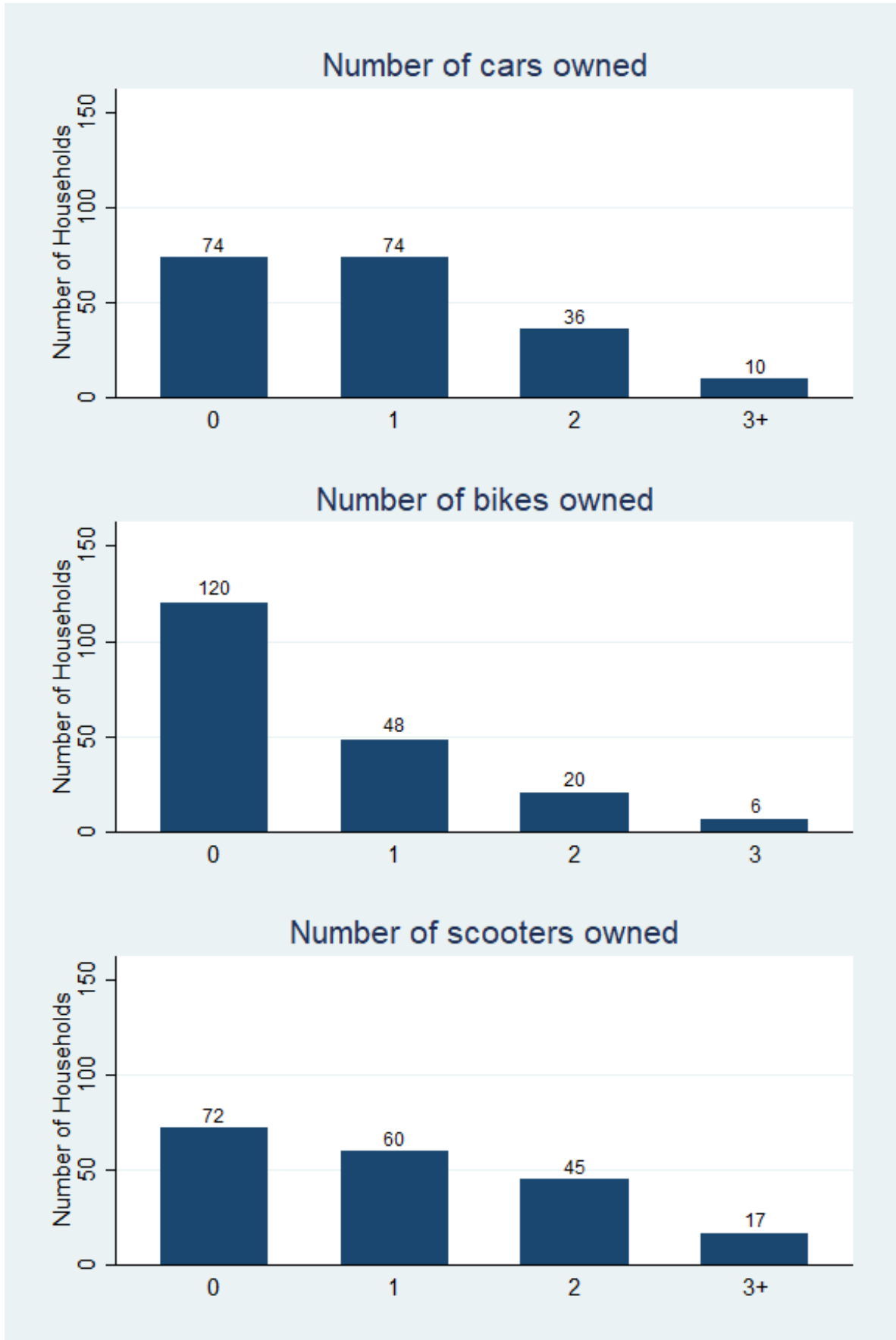


Fig 19 Vehicles owned by surveyed households

Higher incomes are statistically significantly associated with the number of cars. There isn't any apparent association of other vehicles with income.

5.7% of the respondents reported buying a new vacuum cleaner during the pandemic.

Fig 20 shows the distribution of various electrical appliances owned by the households prior to the pandemic.

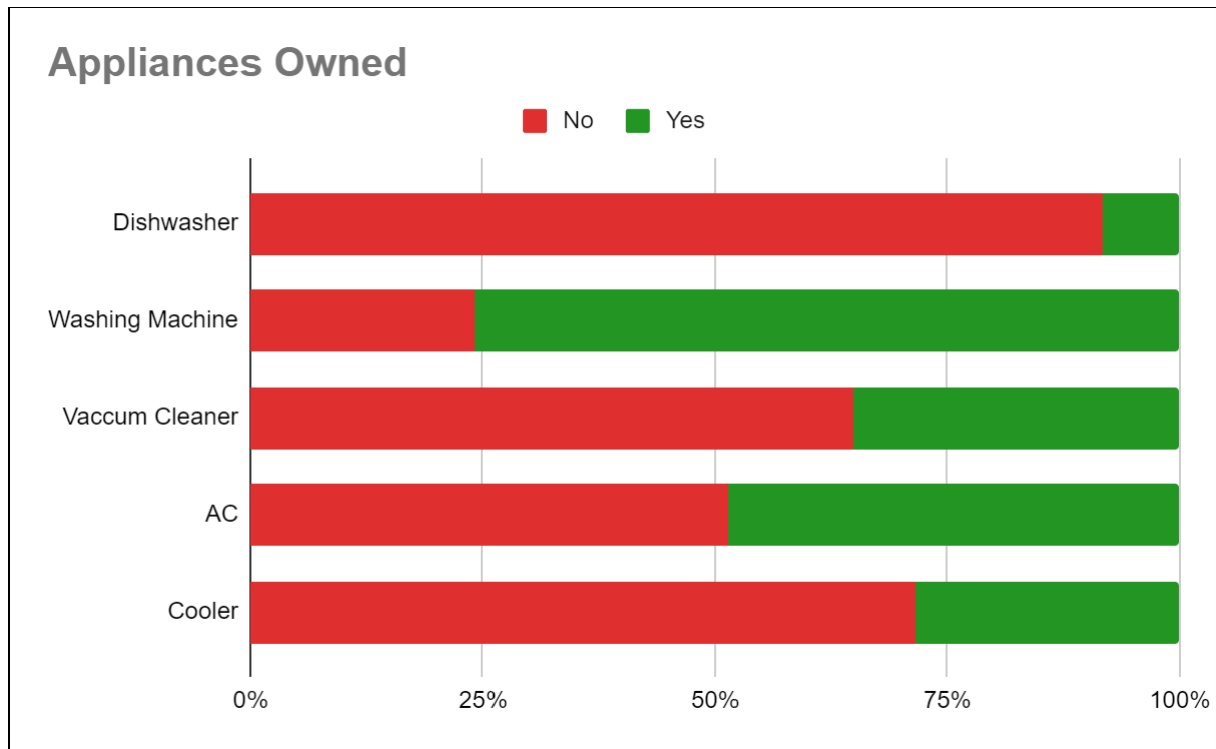


Fig. 20 Appliances owned by the surveyed households

Of the respondents who own a vacuum cleaner, 25.8% reported a change in its usage, 51.6% reported no change in usage and 22.68% reported that they don't use it often.

Fig 21 depicts the frequency of usage of washing machines. 30.8% of the respondents said that they were using their washing machines more frequently, 54.1% reported that there was no change in usage while 15.1% were using it less frequently during the pandemic. One respondent reportedly bought a new washing machine with advanced technologies at the start of the pandemic for the purpose of efficient cleaning and because it provided greater assurance of hygiene.

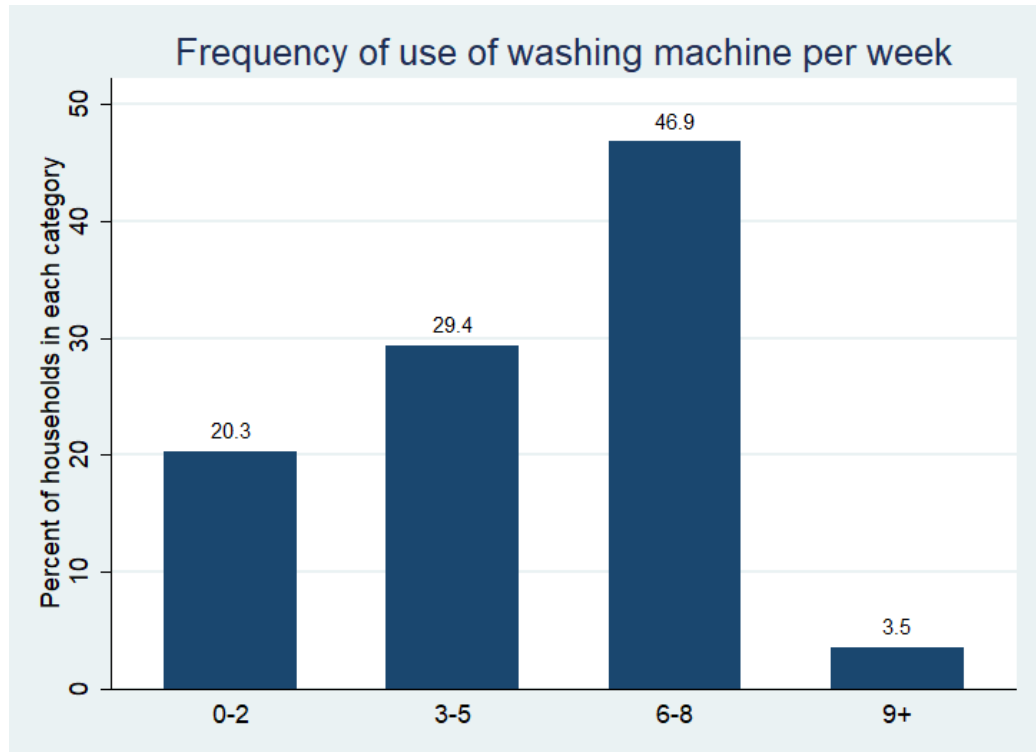


Fig. 21 Frequency of using washing machine per week

17.7% said that their usage of AC has decreased while 28.8% said there was an increase in usage. Some people described how they had stopped using ACs since the onset of the pandemic altogether or during the first and second waves as a measure to avoid the infection. For coolers, 77.3% reported no change in usage while 18.2% said their usage increased. For 4.6% households, the usage decreased.

39.2% said that their change of fan usage had increased while 2.7% said that it had reduced. The increase in usage can be explained by the fact that most respondents reported that as they were staying inside their houses more, the usage of fans increased. Some of the respondents also described that lockdown occurring during summers could be the reason for the increase in fan usage.

With the shift of work from offline to online, the usage of laptops and personal computers also increased. 25% of the respondents bought a new laptop or pc during the pandemic. Fig. 22 shows that a significant association exists between income whether the household has bought a new laptop. This portrays a very grim picture showing how the needs of lower income households could not be met. Electronic devices became an essential need during the pandemic for work and educational purposes. *"I gave my computer to the driver because he has two kids"* said a

respondent, who helped her driver because he didn't have the resources to educate his children when education shifted to online mode.

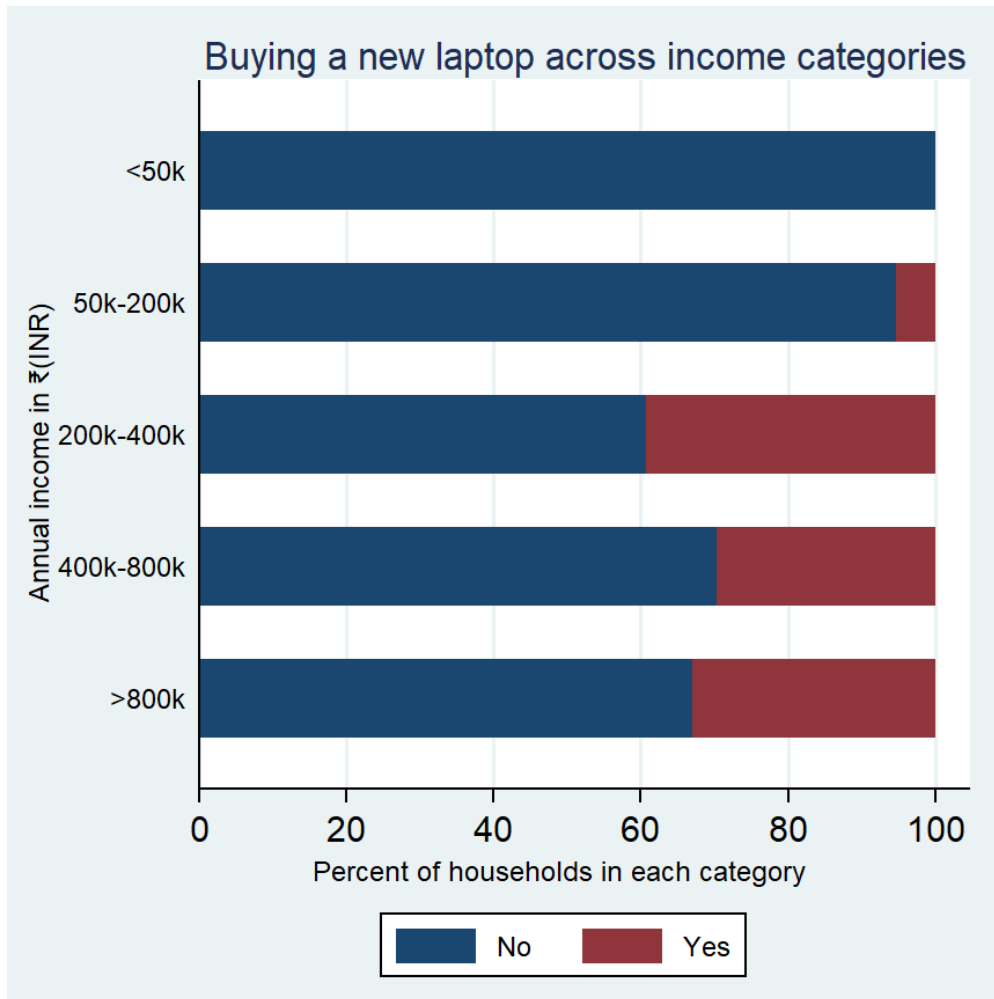


Fig. 22 Purchase of new laptop for use during the pandemic by income categories

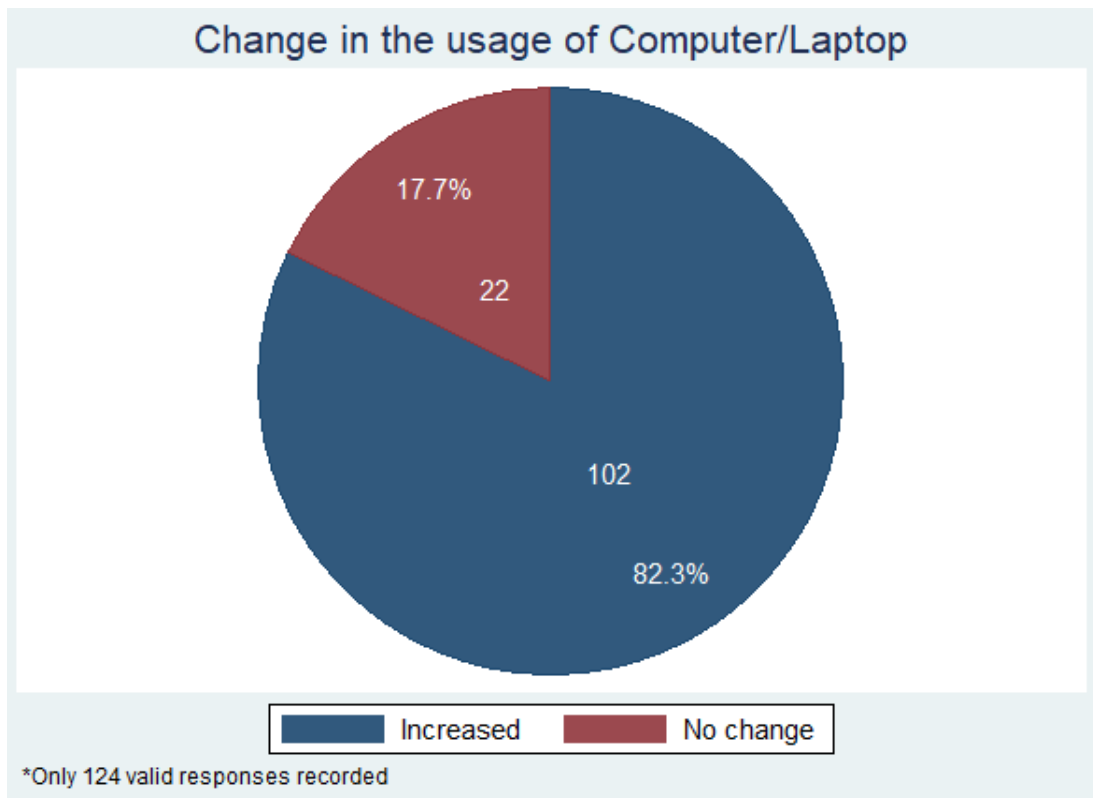


Fig. 23 How the pandemic affected use of laptops and computers for surveyed households

Fig.23 shows that 82.3% of people said that their usage of laptops had increased. This increase in usage was expected with the online shift of work. Some of the respondents reported that there was a drastic increase in the usage of electronic devices and sometimes, the devices were being used during the entire day.

Water

Increasing population in the city has put immense pressure on water resources. The pandemic has affected the consumption of water resources significantly. This section studies the change in the usage of water and related resources by households due to the pandemic.

The majority of the respondents reported that their main source of water supply was from the Municipal corporation, followed by borewell and tankers. Some had the availability of both corporation and borewell. 90.2% (175) respondents sourced their water from the corporation, 68.7% connections of these were metered. Besides this, 3% of the households also had wells as one of their sources of water. Fig 24 shows the different water sources that the households use.

Along with water sources, focus on sustainable development is also crucial. Fig 25 shows the proportion of households having rainwater harvesting and solar energy alternatives. A very small proportion of the total households interviewed in the survey had rainwater harvesting facilities. Both choices were also largely restricted to higher income households as is expected.

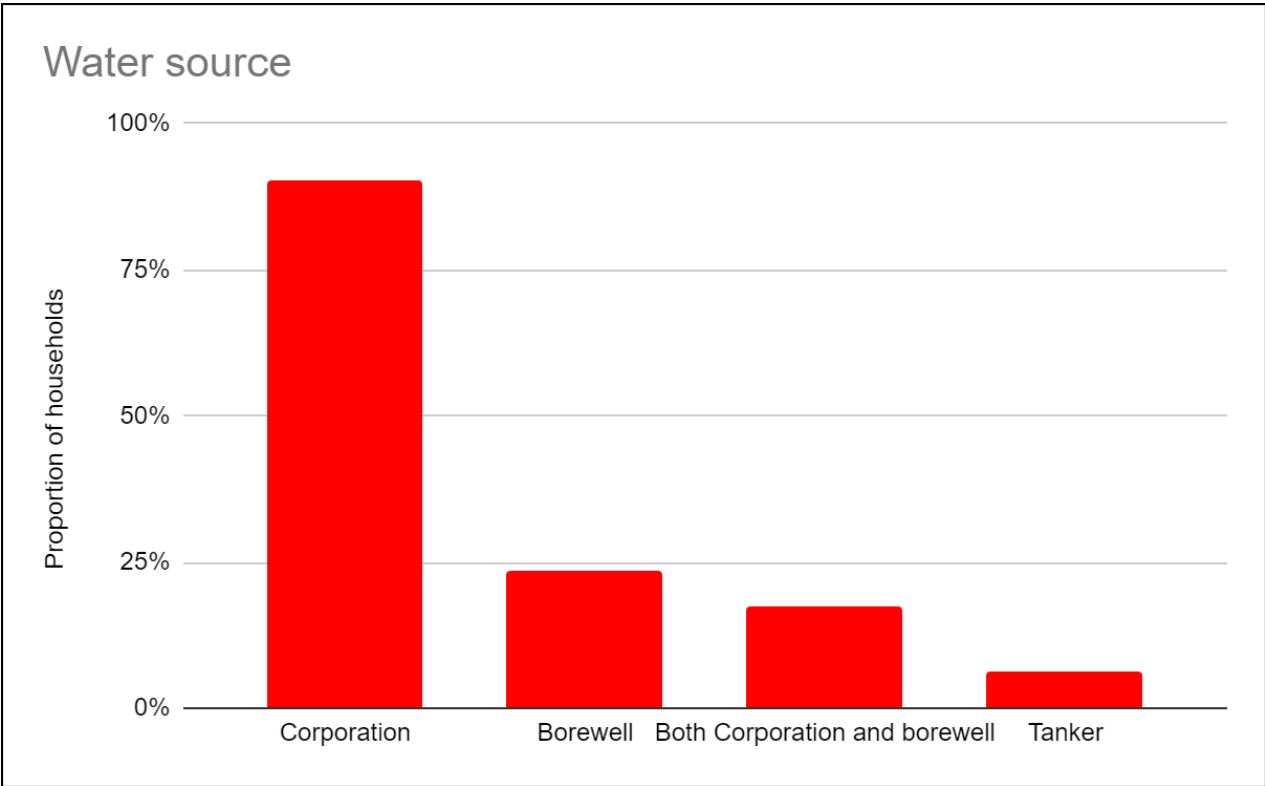


Fig. 24 Source of water for households

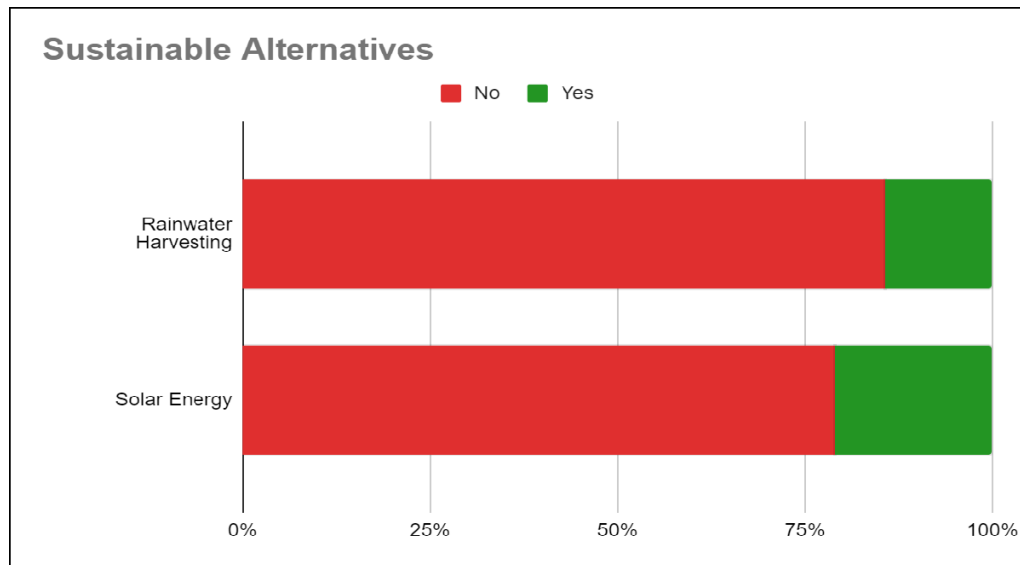


Fig. 25 Proportion of households who have adopted sustainable methods

Water sources changed over the pandemic for only 4.1% of respondents and 90.1 % respondents received regular water supply before the pandemic.

Only 6.0% people reported a reduction in their supply of water. *“During the lockdown, they did not let us use a lot of water. As we all stayed at home, the water usage increased. But they imposed a limit on how much water we could withdraw each day. The limit was 200 liters per household”* said one of the respondents describing how their water supply had reduced over the pandemic.

35.7% people in the income category <50k and 23.7% in the income category 50-200k do not own a private toilet. These households share sanitation facilities with their settlements. All households in the higher income categories than these have a private toilet in the household. Fig. 26 shows the change in bathing habits as reported by the households during the pandemic. 62.4% people reported that bathing habits had changed for the members of their family due to the pandemic. The change in bathing habits varied for two reasons. People who had to go out for work reported that they were bathing after returning as a measure to prevent infection. On the other hand, people who were working from home and did not have to go out much reported that their frequency of bathing had reduced over the pandemic.

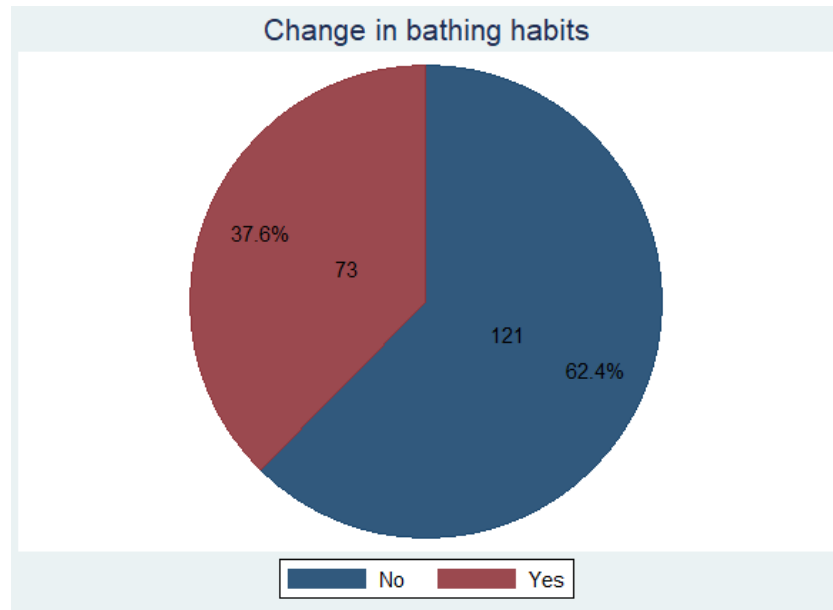


Fig.26 Change in bathing habits during the pandemic

Treatment of water is done to remove all infectious particles and ensure that the water quality is safe for consumption. 78.9% of respondents treat water before drinking. The variation is significantly associated with income. 66.5% people have some sort of filtration system with them ? 49.2% of the respondents stored water in some form or the other in their houses. Fig 27 shows the number of years the households have been using filtering devices.

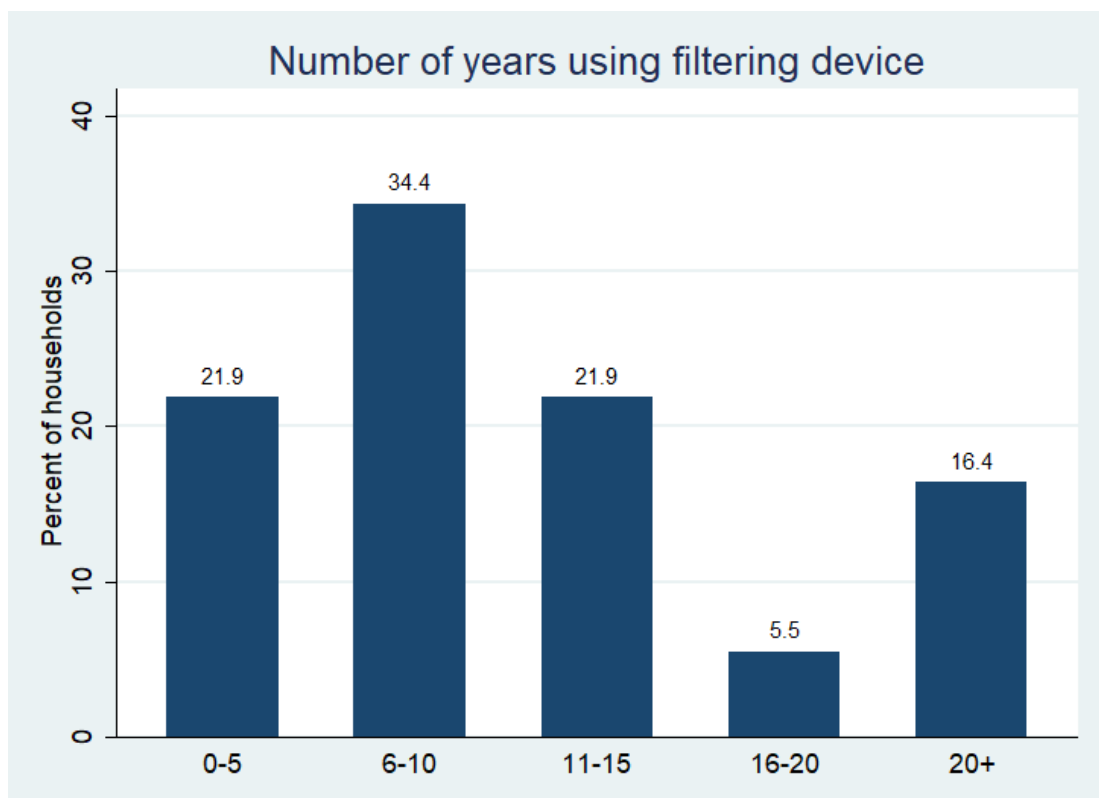


Fig. 27 Number of years since the households started using filtering devices

Fig 28 studies if there is an association between number of years of education of the Head of the household and whether that household treats³ water before drinking. As we can see from the graph below, more than 50% of the households whose HoH is educated for less than 10 years do not treat drinking water. As a general trend the proportion reduces with an increase in the education level of the HoH. a similar statistically significant association is found with household income. With Cramer's V being high we can conclude that there is an association between number of years of education of the Head of the household and whether that household treats water before drinking.

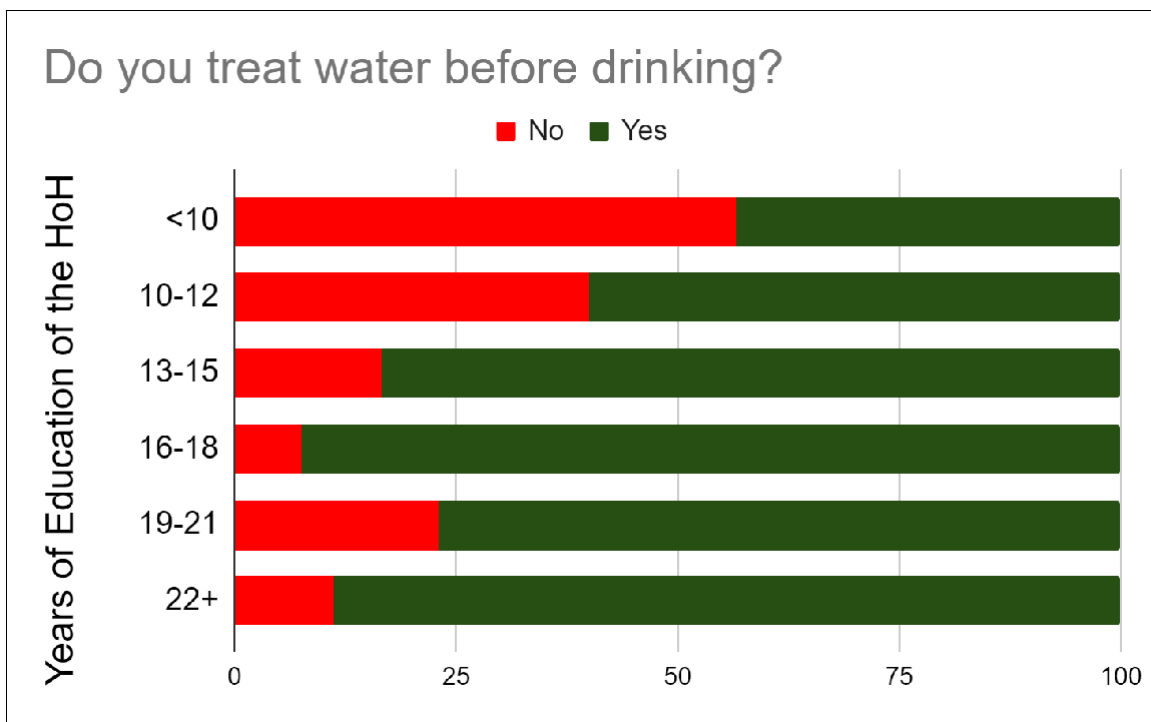


Fig. 28 Treatment of water before drinking

³ Treating water includes filtering or boiling water

Epilogue- Voices of the people

The pandemic and the subsequent lockdown significantly affected the choices people faced, and their lifestyle. Some people made interesting switches in their taste for things. For instance, one of the respondents said since the pandemic he had switched to consuming frozen meat instead of fresh meat. The early phases of the lockdown constricted supply chains and made people vulnerable in terms of being able to meet their needs, especially food. The poor people were affected disproportionately in their ability to get access to food resources and square, balanced meals. Food was a big problem for Varsha, a slum dweller who worked as a house help. She had to borrow money from the homes where she worked, she was helpless. Raging prices of essentials like pulses and dal added to their agony. With a few exceptions, public distribution of cereals and dals and even sugar and oil at times was fairly successful. It could act as a safety net to a large proportion of the population and also relieve the pressure on their already constricted purse for at least six full months. Energy supply in the city was also resilient but there were significant distribution related issues, especially billing. The door-to-door collection of meter readings wasn't possible and the collective billing for three four months was a source of panic amongst residents who were already reeling under financial stress. *"For electricity, we were not sent the bill for 3 months."* said a respondent. Another respondent added that *"... we couldn't pay our bills on time due to the immense pressure from the loans we have."* Some respondents claimed that their bills were unjustifiably high. *"During the lockdown, our consumption was not that much, but still, the corresponding bills used to skyrocket. Our 1BHK flat used to get electricity bills upwards of 5k in one month."* said Rohit who stayed with his family in a one BHK⁴ house. *"We faced a lot of trouble with the electricity bill, it was as high as ₹ 25000 for no reason. We were also very short on finances since all four of us had covid and had to pay for the treatment but both my husband and I had lost our jobs. food and groceries also became very expensive."* said another woman while talking about her pandemic vulnerabilities. The bill of ₹ 25000 was either the accumulated bill for a few months or a faulty bill. It posed a difficulty to balance given fixed monthly budgets. Other people also complained of abnormal electricity bills despite no significant change in usage.

The vulnerabilities in food, water and energy were compounding. As a young woman respondent put it *"We used to get vegetables only once a week, we had to use water fearfully*

⁴ One standard-size bedroom, hall and kitchen. Usually around 400-500 sq ft

due to the uncertainty in its supply in the future. We also used electricity a little less because our income sources could have been compromised.” The uncertainty and insecurity made people anxious and took a toll on their mental health too.

Employment certainty and income volatility were the biggest sources of worry for a large proportion of the population, especially the poor and the slum dwellers. For some, education of their children was a priority and that it was affected put them in deep worry. Ramita, a 32-year-old mother residing in a slum said, *“...my children's education was my biggest concern. They don't study regularly. They don't do it regularly. We have only one phone. And even if we force them to sit together and study sometimes there's no range. So, it's a bit of a mess. Teachers never really pay any attention to the kids the way they did in school.”* Rashid, a migrant worker from Orissa said he was more anxious about what was happening back in his hometown where his family lived. He would send money but anxiety about them contracting infections always remained.

Some people were satisfied with the state response to the pandemic. A young respondent affirmed, *“There was always a fear because there was no income but through the government provided rations and help from other organizations we never actually had any shortage.”* Some slum dwellers were deeply unsatisfied. One respondent from Kashewadi minced no words; *“The Government has done nothing to us, not even basic food, water facilities”*, she said. Another woman respondent vocalized her disappointment, *“Since we are very poor in this area, I feel we could have done better with help from the government in aspects of proper food and sanitation during the pandemic.”*, she contended. An old couple residing in Pune talking about how COVID has affected their lifestyle expressed calmly, *“We learnt to live with fewer things.*

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