

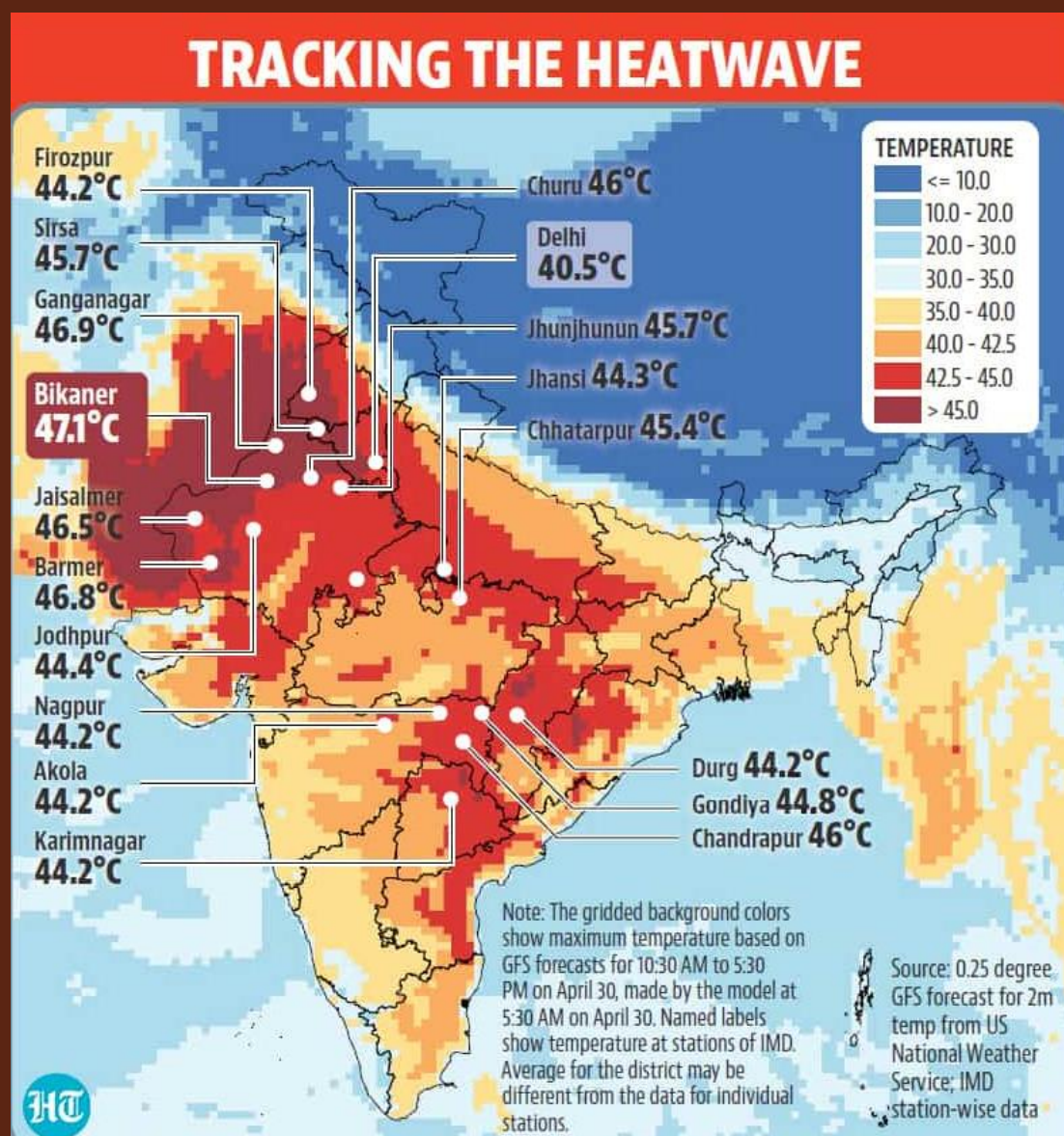


Sphere India

National Coalition of Humanitarian Agencies in India

Joint Rapid Need Assessment Report Bihar, Delhi, Madhya Pradesh, Maharashtra, Haryana, Rajasthan & Uttar Pradesh **Heat Wave 2022**

May 2022



Heat Wave JRNA Report

(Bihar, Delhi, Madhya Pradesh, Maharashtra, Haryana, Rajasthan & Uttar
Pradesh)

Heat Wave 2022

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And, above all, the communities of affected areas of the states Bihar, Madhya Pradesh, Maharashtra, Haryana, Delhi, Rajasthan & Uttar Pradesh, who, even amidst the adversities took out time and patiently provided answers to all the questions put to them, without any reservations.

Sphere India

11th May, 2022

About JRNA and Disclaimer

As per Sphere India Standard Operating Procedures, adapted to address the emergency situation, a Joint Rapid Needs Assessment (JRNA) was conducted across the heat wave affected districts of the states of Bihar, Delhi, Madhya Pradesh, Maharashtra, Haryana, Rajasthan & Uttar Pradesh; data collection was conducted through secondary sources, field visits, personal interviews, key informant interviews, observations, and information provided by local CBOs. The organizations engaged in response have also shared their observation notes to incorporate in the report. Also, on ground information was collected using smart phones through data collection mobile application and collated by core team taking due consent from the villagers. The aim was to gather information on the impact of heat waves on the community members and understand their recovery needs, collate and analyze the findings, and disseminate the information to the State, National and International level agencies.

Disclaimer

The interpretations, data, views and opinions expressed in this report are collected from various sources including Government led institutions, line departments, field assessments by volunteers and team members deployed by Organizations who took initiative in Humanitarian Assistance activities and from secondary media sources. It does not necessarily carry the views and opinions of Sphere India or any humanitarian organization as a collective directly or indirectly. It is interpreted only for assessment purpose.

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1. EXECUTIVE SUMMARY

1.1. Background

India experienced severe heat wave across its different states with record temperature rise in the month of April. These prolonged and frequent heatwaves affected major parts of the country during April, taking the maximum temperatures at many places including west Rajasthan, east Uttar Pradesh, west Madhya Pradesh, Vidarbha in Maharashtra to over 45 degrees Celsius. 11 meteorological stations in the country – across Himachal Pradesh, Odisha, Jharkhand, Uttar Pradesh, Rajasthan, Madhya Pradesh, Punjab, Karnataka and Lakshadweep – surpassed their existing temperature records for April. Other heat wave affected states and union territories include Delhi, Gujarat, West Bengal, Chhattisgarh, and Himachal Pradesh.

Sphere India with support from local organizations conducted a Joint Rapid Need Assessment (JRNA) in highly affected districts of Bihar, Delhi, Madhya Pradesh, Maharashtra, Haryana, Rajasthan and Uttar Pradesh. From the affected population, a sample of total 677 households were selected from the mentioned States. Key informant interview with district administration, hospitals and schools were also conducted to understand the situation and needs at institutional level.

TABLE 1 RECORDED TEMPERATURES AT DIFFERENT DISTRICTS, SOURCE: FIRST

State	District	Temperature (in Degree Celsius) on 28 th April, 2022
Bihar	Patna	39.4
	Gaya	43.6
	Nawada	
	Samastipur	
Rajasthan	Bikaner	47.1
	Sri Ganganagar	46.9
Madhya Pradesh	Jhabua	45.7
	Chhatarpur	45.6
Uttar Pradesh	Prayagraj	45.9
	Chitrakoot	46
Maharashtra	Nashik	41.67
	Latur	41.7
Delhi	Sports Complex	46.0
Haryana	Gurgaon	45.6

1.2. Key Findings of JRNA

Water, Sanitation and Hygiene (WASH):

Water services were affected as a result of heatwave in the surveyed states. The percentage of households which reported that their water services were affected are as follows – Uttar Pradesh (46%), Rajasthan (53%), Maharashtra (58%), Madhya Pradesh (9%), Haryana (33%), Delhi (45%) and Bihar (51%). Shortage of safe drinking water is also a major concern. The affected HHs who got the assistance to meet their water needs are as follows - Uttar Pradesh (38%), Rajasthan (16%), Maharashtra (29%), Madhya Pradesh (18%), Haryana (27%), Delhi (40%), and Bihar (44%).

Shelter, Settlements and Non-Food Items:

The surveyed households reported that their family members travel on daily basis during heat wave. This include, Uttar Pradesh (23%), Rajasthan (35%), Maharashtra (47%), Madhya Pradesh (15%), Haryana (57%), Delhi (38%) and Bihar (46%). The availability to take shelter when outdoor by these family members travelling on daily basis are Uttar Pradesh (17%), Rajasthan (31%), Maharashtra (77%), Madhya Pradesh (14%), Haryana (0%), Delhi (13%) and Bihar (41%).

Health

6% of respondent HHs in Uttar Pradesh, 52% of respondent HHs in Rajasthan, 16% of respondent HHs in Maharashtra, 21% of respondent HHs in Madhya Pradesh, 13% of respondent HHs in Delhi, and 38% of respondent HHs in Bihar, responded that their family members suffered from heat related illnesses like Hyperthermia, Heat stroke, Heat exhaustion, Heat cramps, and Heat rash, while none of the surveyed HHs in Haryana responded that their family members suffered from heat related illness. The current situation demands more resources at the public health centers. There is rising need for drinking water, ORS, and other resources which must be provided to the communities in the affected areas.

Education

The effects of heat wave on education reported are as follows – Accessibility to schools affected due to extreme heat (20%), Online education disrupted due to power failure/network unavailability/inaccessibility (1%), School timings changed (41%) and schools closed (38%). The per cent of respondents who reported that heatwave policy was released for schools by the government are as follows – Uttar Pradesh (62%), Madhya Pradesh (25%), Rajasthan (22%), Maharashtra (9%), and Haryana (3%). Precautionary and response measures such as change in school timings, closing of schools, etc. were taken by the schools.

Livelihood

The per cent of affected HHs which responded that their livelihoods are affected due to heatwave are as follows: Uttar Pradesh (27%), Rajasthan (52%), Maharashtra (25%), Madhya Pradesh (15%), Haryana (10%), Delhi (20%), and Bihar (45%). Death of livestock, deteriorated crop quality, increased risk of equipment fire due to overheating, increased risk of forest fire, negative impact on livestock, insufficiency of water and irrigation requirements, and loss of crop are the effects of heat wave on livelihoods.

The impact of heatwaves on agriculture and animal husbandry was majorly reported by the affected households where the assessment was conducted. Shortage of water makes it difficult for the farmers to irrigate their farmlands. A rise in the need for fodder for livestock is also reported from Rajasthan.

Protection

People who work in the extreme hot environment face many challenges such as difficulty in accessing rehydration because of their work location, heat from extremely hot or molten material, sun exposure due to outdoor work, wearing high levels of personal protective equipment, etc. The per cent of affected HHs which had family members working or active in extreme environment are as follows – Uttar Pradesh (33%), Rajasthan (49%), Maharashtra (31%), Madhya Pradesh (3%), Delhi (10%), and Bihar (49%).

They are specifically exposed to different types of difficulties such as difficulty in accessing rehydration because of work location, difficulty in accessing shade or places of respite from the heat during breaks, heat from extremely hot or molten material, sun exposure due to outdoor work, and wearing high levels of personal protective equipment.

There is a rising need for spreading awareness of the risks of heat wave at the grass-root level. The respondents during the Key Informant Interviews raised the need of inclusive awareness programs that can reach out to vulnerable groups like women, children, PwDs, Trans genders, etc.

2. OVERVIEW OF JOINT RAPID NEEDS ASSESSMENT REPORT

2.1. Timeframe

TABLE 2 TIMEFRAME - JRNA

Timeline	Activity
05 th May, 2022	Emergency IAC Committee Meeting on Heat Wave in India
06 th May, 2022	Initial training to volunteers on assessment tool in Maharashtra and Bihar
07 th May, 2022	Data collection and analysis
08 th May, 2022	Inputs from Sectoral Experts on Preliminary Findings and Emerging Trends Report
09 th May, 2022	Heat Wave JRNA - Preliminary Findings and Emerging Trends Report dissemination
9–10 th May, 2022	Training to field volunteers on assessment tool in Haryana, Delhi, Madhya Pradesh, Bihar and Uttar Pradesh
9–10 th May, 2022	Field survey for data collection on JRNA in Haryana, Madhya Pradesh, Bihar, Delhi, and Uttar Pradesh
10–11 th May, 2022	Data cleaning, data analysis and Report writing
11 th May, 2022	Heat Wave JRNA Report Dissemination

2.2. Methodology:

Based on the emergency situation, the Inter Agency Coordination Committee coordinated with its existing NGO partners working in affected districts. The NGOs, Action Aid, EFICOR, IGSSS, MahaPECONet and its partners CYDA and SSP, Save the Children and World Vision India have taken initiative to assess the urgent needs of heat wave affected communities in the affected states – Bihar, Delhi, Haryana, Maharashtra, Madhya Pradesh, Rajasthan and Uttar Pradesh. It was decided to conduct a Joint Rapid Needs Assessment to identify the urgent, mid-term and long-term needs of affected community based on Food & Nutrition, Health, Water, Sanitation and Hygiene (WASH), Education Shelter, Livelihood, and Protection, and to flag out the vulnerability of affected community to access the basic services and entitlements.

The JRNA involved joint efforts from Member organizations in the affected districts facilitated by Sphere India with the field support from local NGOs, Government led institutions, line departments providing support and necessary information & data.

Volunteers were oriented to carry out data collection using household and key informant interview tools in these affected districts. The collected data got analyzed by the Sphere India team, and the draft report was reviewed by the respective sectoral experts. The reviewed and then revised report also incorporates the inputs and insights shared by the Sectoral committee leads.

During JRNA, urgent needs of affected communities have been identified through direct data collection from the field, government's damage assessment reports, pre-disaster information from respective line departments, and secondary data from various sources, media reports and discussions with grassroots functionaries. Data was collected based on the indicators of the specific tools/questionnaires used during the interviews/ discussions. The methodology was based on:

- a) Structured one-to-one interviews with affected households (ensuring prioritizing of random households from most affected villages giving equal representation to all sections of the local community).
- b) Key Informant Interviews with the authorities at the respective district administrations, hospitals and schools.
- c) Secondary data from IMD and various media sources to examine the observation and facts.

2.3. Rational behind the Sampling for Assessment:

The sampling sizes were determined based on secondary data information available from government reports and media sources. Affected districts were chosen from each states of Bihar, Delhi, Maharashtra, Madhya Pradesh, Haryana, Rajasthan and Uttar Pradesh. The states were selected on the basis of the impact data and data related to the rise in temperature. Districts were chosen after having thorough discussion with the local NGOs and in consideration of their situational awareness and impact of the event. The villages were selected with the support of the local NGOs. The schools and hospitals for conducting the key informant interviews were finalised based on the impact of the heat wave and the number of reported heat wave cases, respectively. The households for the survey were selected in a way that ensures the participation of vulnerable groups like pregnant women, elderly people, PwDs, children and marginalised communities.

2.4. Primary Data Collection

The primary data collection process was initiated by conducting household surveys and key informant interviews at the affected districts covering households, schools, hospitals and district

administrations. The questions were designed to grasp the needs and challenges in the sectors like Food and Nutrition Security, Shelter, Protection, Health, Livelihood, Education, and WASH. Household level questionnaires have been filled through the KoBo Collect Tool, wherein the format was designed by national level experts, and has also included suggestions from the local humanitarian actors. In order to keep the assessment neutral, unbiased, and reflective of the ground reality, local volunteers were engaged, physically visiting and recording responses from the affected population.

TABLE 3 HOUSEHOLD SURVEY

State & districts	No. of HH Surveys	Community			
		General	SC	ST	OBC
Bihar (Patna, Gaya, Muzaffarpur, Samastipur, Purnea, Madhepura, Khagaria, Vaishali, Saharsa, Nawada)	301	6%	40%	1%	53%
Delhi (West Delhi, North Delhi)	40	23%	33%	13%	33%
Haryana (Gurugram)	30	20%	40%	3%	37%
Madhya Pradesh (Jhabua, Chhatarpur)	96	7%	17%	48%	28%
Maharashtra (Latur, Nashik)	55	60%	4%	2%	35%
Rajasthan (Alwar, Bharatpur, Pratapgarh and Jaisalmer)	103	12%	12%	42%	33%
Uttar Pradesh (Balrampur, Sitapur)	52	29%	35%	2%	35%

2.4 Primary Data Analysis

Quantitative Data Analysis

Once data was collected from KoBoCollect Tool, Sphere India team carried out data cleaning and data analysis using Microsoft Excel. The key findings were analyzed and highlighted in the form of graphs and charts to provide a better understanding of the emerging trends to the readers.

3. SECTORAL ASSESSMENT & RECOMMENDATIONS

3.1. RESPONDENT'S PROFILE

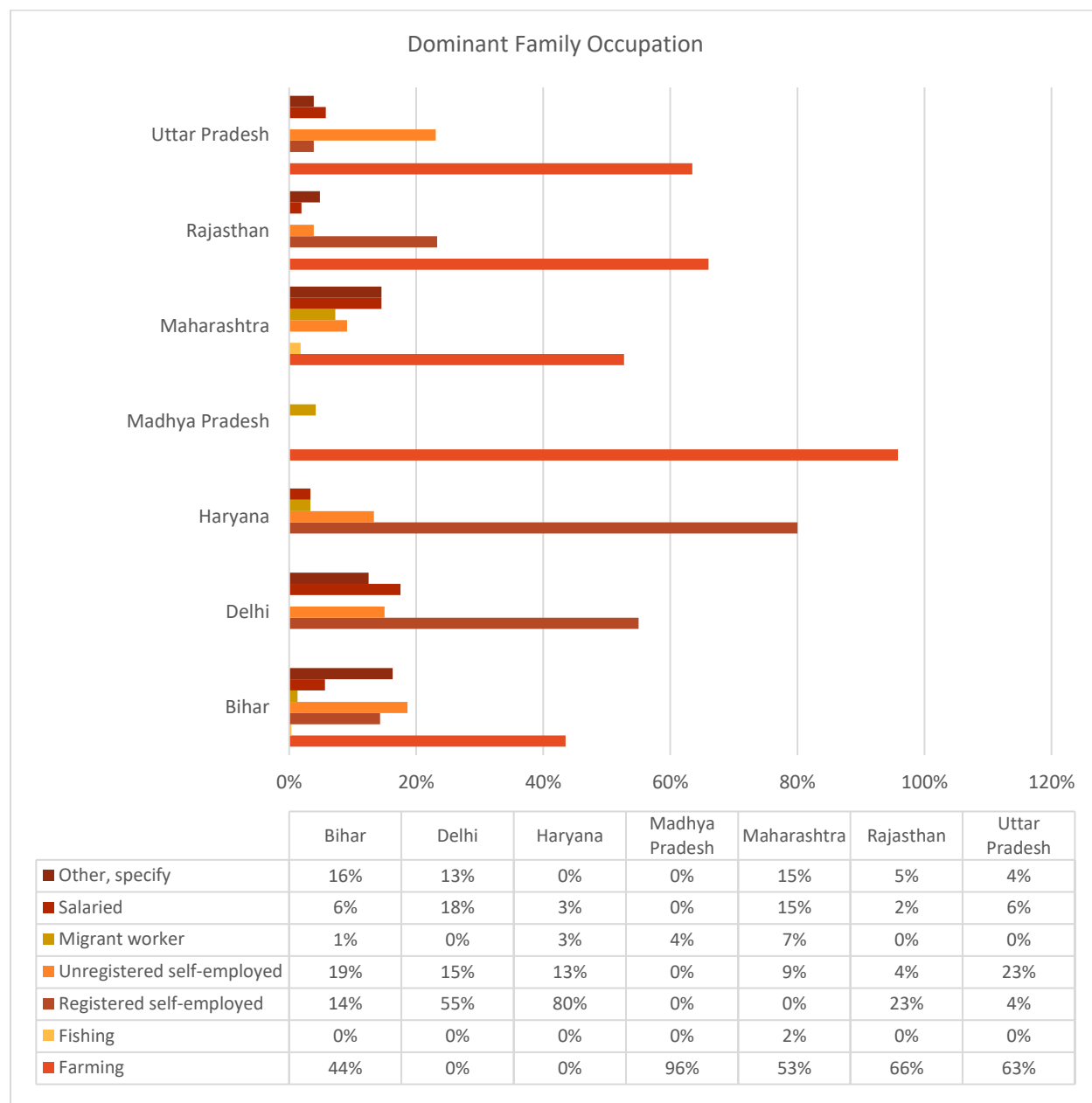


FIGURE 1: DOMINANT FAMILY OCCUPATION OF THE RESPONDENTS

- Among the 677 households assessed during the heatwave JRNA, the dominant household occupation was observed to be farming (52%), registered self-employed (17%), unregistered self-employed (13%), other (10%), salaried (6%) and migrant worker (2%). State-wise details on the dominant family occupation is provided in Fig 1.

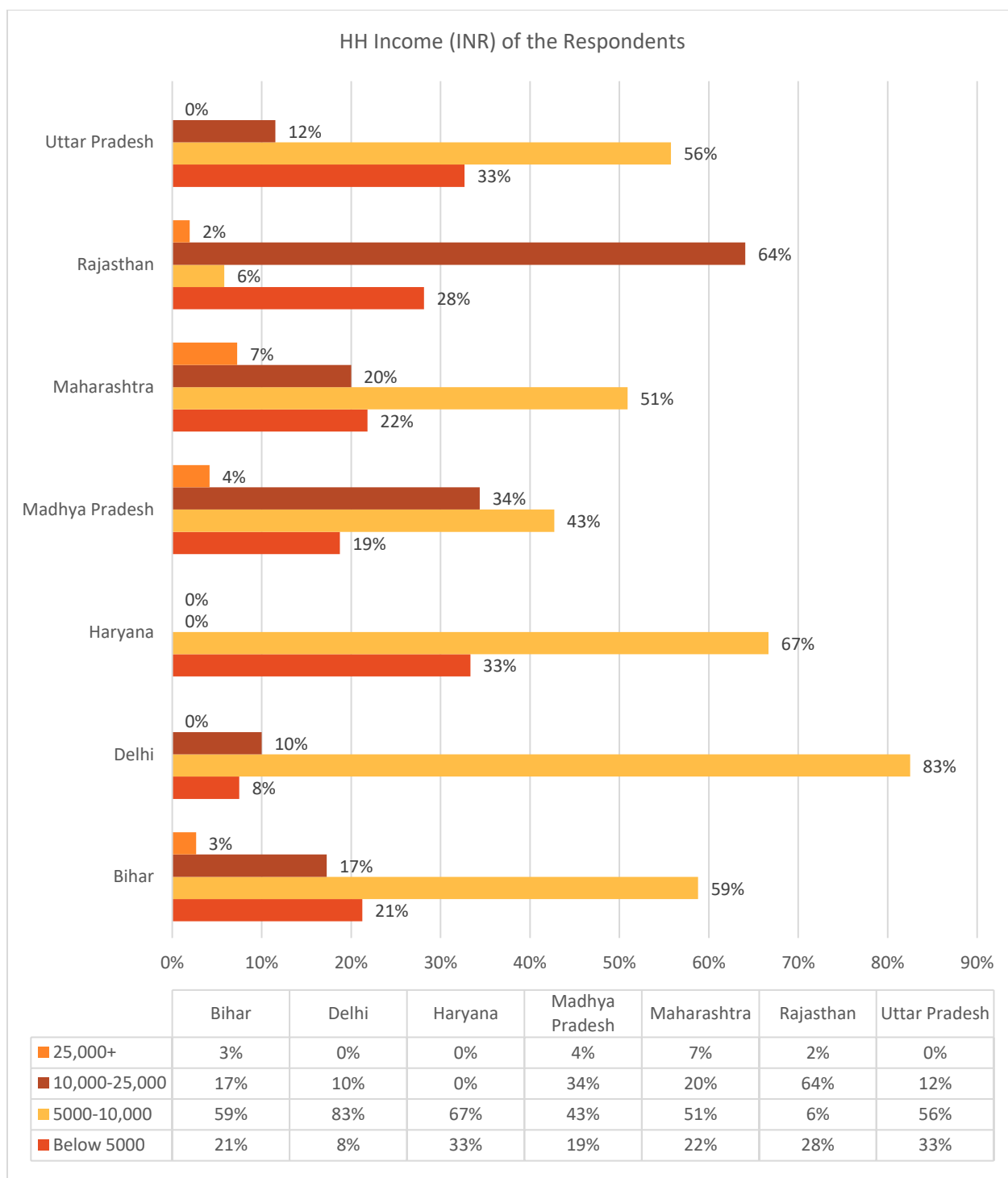


FIGURE 2: HH INCOME (INR) OF THE RESPONDENTS

- The monthly household income was observed to be below 5,000 (23%), 5,000-10,000 (49%), 10,000-25,000 (25%), 25,000+ (3%). State-wise details are mentioned in Fig 2.

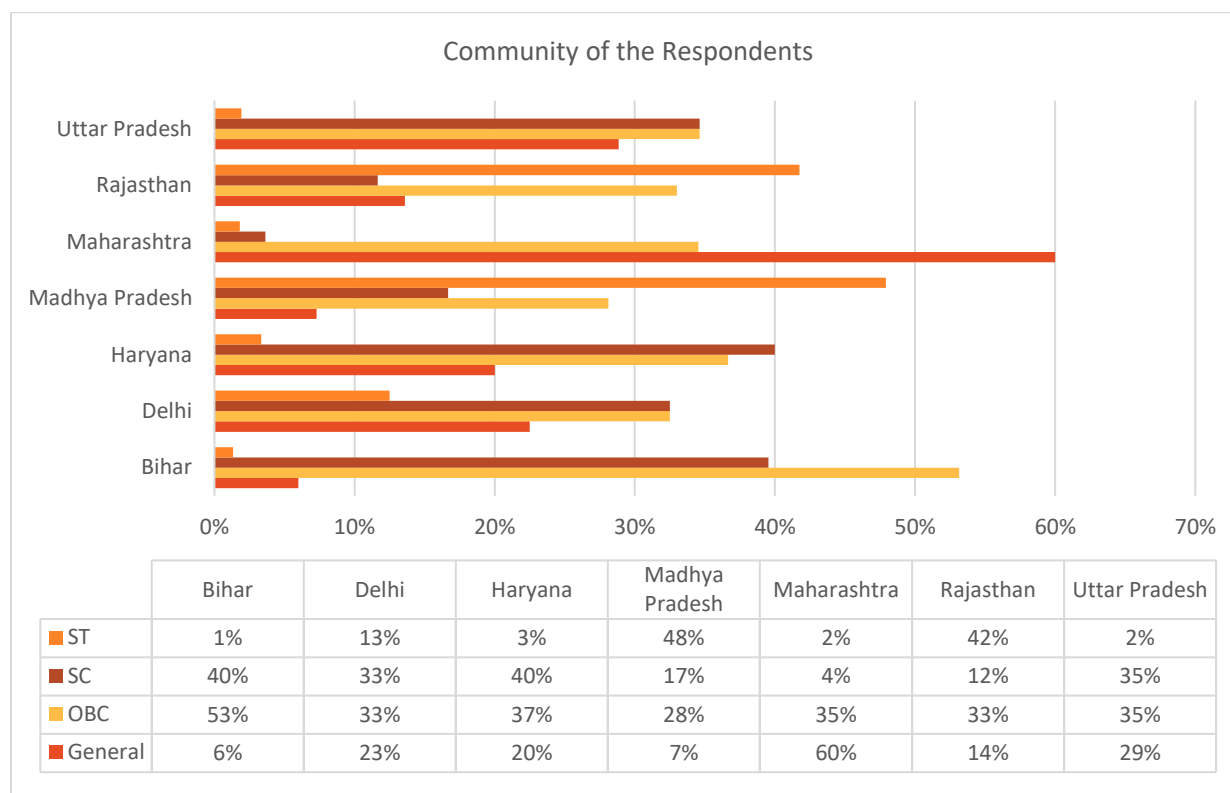


FIGURE 3: COMMUNITY OF THE RESPONDENTS

- The community of the surveyed population is SC (28%), ST (15%), OBC (42%) and General (15%). State-wise details on the community of assessed households are mentioned in Fig 3.

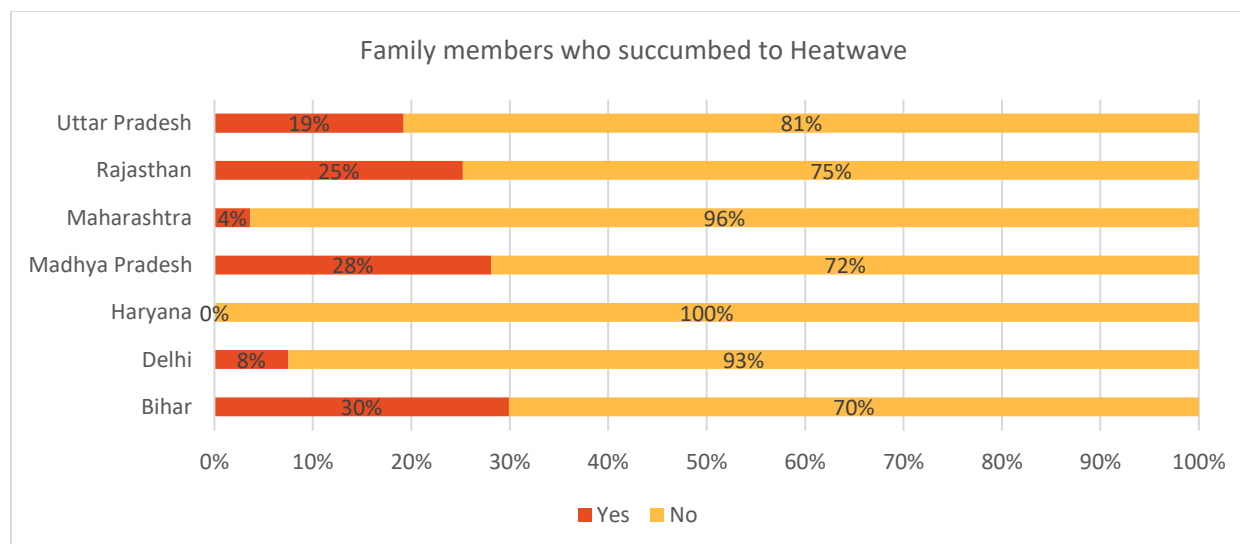


FIGURE 4: FAMILY MEMBERS WHO SUCCUMBED TO HEATWAVE

- Among the 677 households surveyed, 23% of the households reported that their family members succumbed to heatwave. State-wise details are provided in Fig 4.

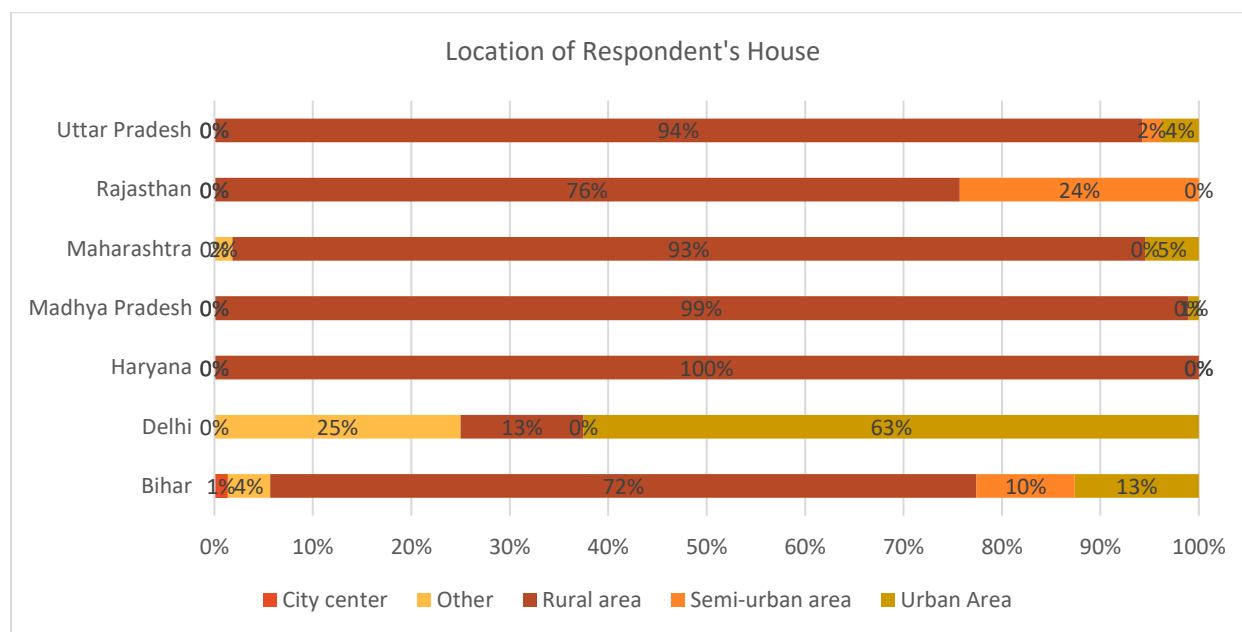


FIGURE 5: LOCATION OF RESPONDENTS HOUSE

- The location of the surveyed households is in city center (1%), rural area (77%), semi-urban area (8%), urban area (10%) and other (4%). State wise details on HH locations are provided in Fig 5.

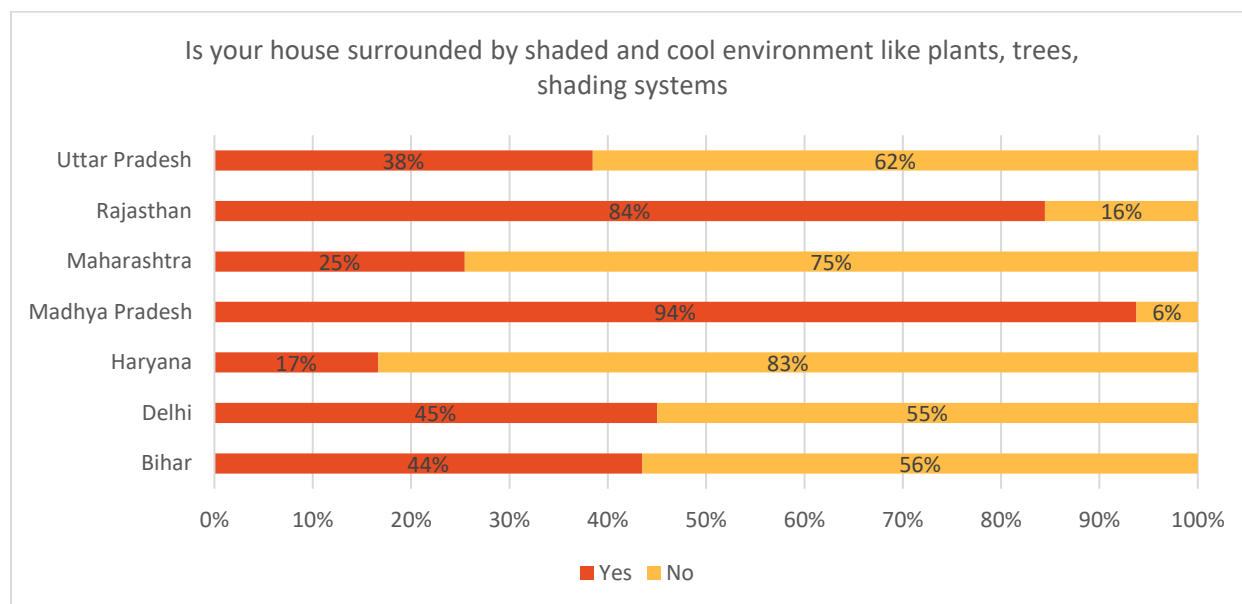


FIGURE 6: SURROUNDING ENVIRONMENT

- Among the surveyed, 54% of the HHs reported that their houses are surrounded by shaded and cool environment like plants, trees and shading systems. The state-wise details are provided in Fig 6.

3.2. WATER SANITATION AND HYGIENE (WASH)

Overview

Pre-disaster context

Water, Sanitation and Hygiene areas calls for action as the facilities related to WASH are still poorly maintained in many of the states. Given the COVID context, the need for handwashing is high among the communities. *Rajasthan* – 96.5% of the population living in households use an improved drinking water source and 71.1% use an improved sanitation facility (NFHS-5). Wells and tanks are the major sources of water in the State. In Rajasthan, 26.90% of rural and 82.60% of urban households have access to Piped water supply. The rural communities in the state still faces issues related to menstrual health and hygiene. *Bihar* – 99.2% of the population living in households use an improved drinking water source and 49.4% use an improved sanitation facility (NFHS-5).

Madhya Pradesh – 89% of the population living in households use an improved drinking water source and 65.1% use an improved sanitation facility (NFHS-5). The HHs depend majorly on underground water. The rural communities in the state still faces issues related to menstrual health and hygiene. There is a huge difference in the number of rural and urban households having access to piped water. Only 9.90% of rural households have access to the piped water supply comparing to 62.20% of urban households having access to piped water. *Haryana* – 98.6% of the population living in households use an improved drinking water source and 85% use an improved sanitation facility (NFHS-5). According to the Union Jal Shakti Ministry, all households in 21 of the 22 districts in Haryana have tap water supply. Notable interventions under scheme like Har Ghar Jal is gaining attention in the state. 63.60% of rural and 77.50% of urban households have access to Piped water supply in Haryana.

Uttar Pradesh – 99.2% of the population living in households use an improved drinking water source and 68.8% use an improved sanitation facility (NFHS-5). According to the Census 2011, 20.20% of rural households and 51.50% of urban households of Uttar Pradesh have access to Piped water supply. *Maharashtra* – 93.5% of the population living in households use an improved drinking water source and 72% use an improved sanitation facility (NFHS-5). 50.20% of the rural and 89.10% of urban households have access to piped water supply. *Delhi* – 99.4% of the population living in households use an improved drinking water source and 81.1% use an improved sanitation facility (NFHS-5). 59.40% of rural households and 81.90% of urban households have access to piped water supply in Delhi.

Post-disaster analysis

Water services were affected as a result of heatwave in the surveyed States. The percentage of households which reported that their water services were affected are as follows – Uttar Pradesh (46%), Rajasthan (53%), Maharashtra (58%), Madhya Pradesh (9%), Haryana (33%), Delhi (45%) and Bihar (51%). The affected HHs reported that the effect on water as a result of water services being affected as deteriorated quality of water (14%), no accessibility (9%), no availability (10%), reduced quantity (62%) and other reasons (5%). State-wise details on water services affected and their effects on water services are provided in Fig 9.

Assessment Findings

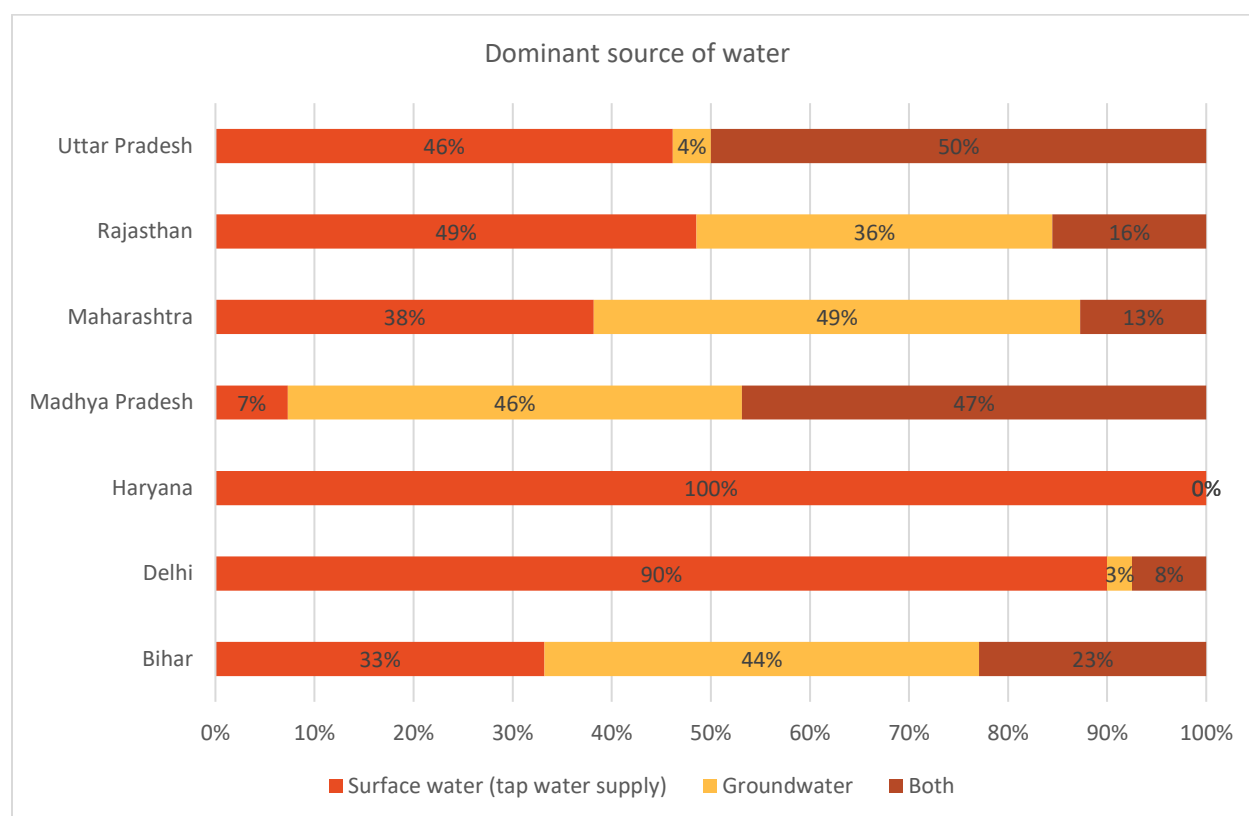


FIGURE 7: DOMINANT SOURCE OF WATER IN HOUSEHOLD

Dominant source of water in the surveyed HHs are reported as the following

- Uttar Pradesh – surface water (46%), ground water (4%) and both (50%),
- Rajasthan – surface water (49%), ground water (36%) and both (16%),
- Maharashtra – surface water (38%), ground water (49%) and both (13%),

- Maharashtra – surface water (7%), ground water (46%) and both (47%),
- Haryana - surface water (100%)
- Delhi – surface water (90%), ground water (3%) and both (8%),
- Bihar – surface water (33%), ground water (44%) and both (23%),

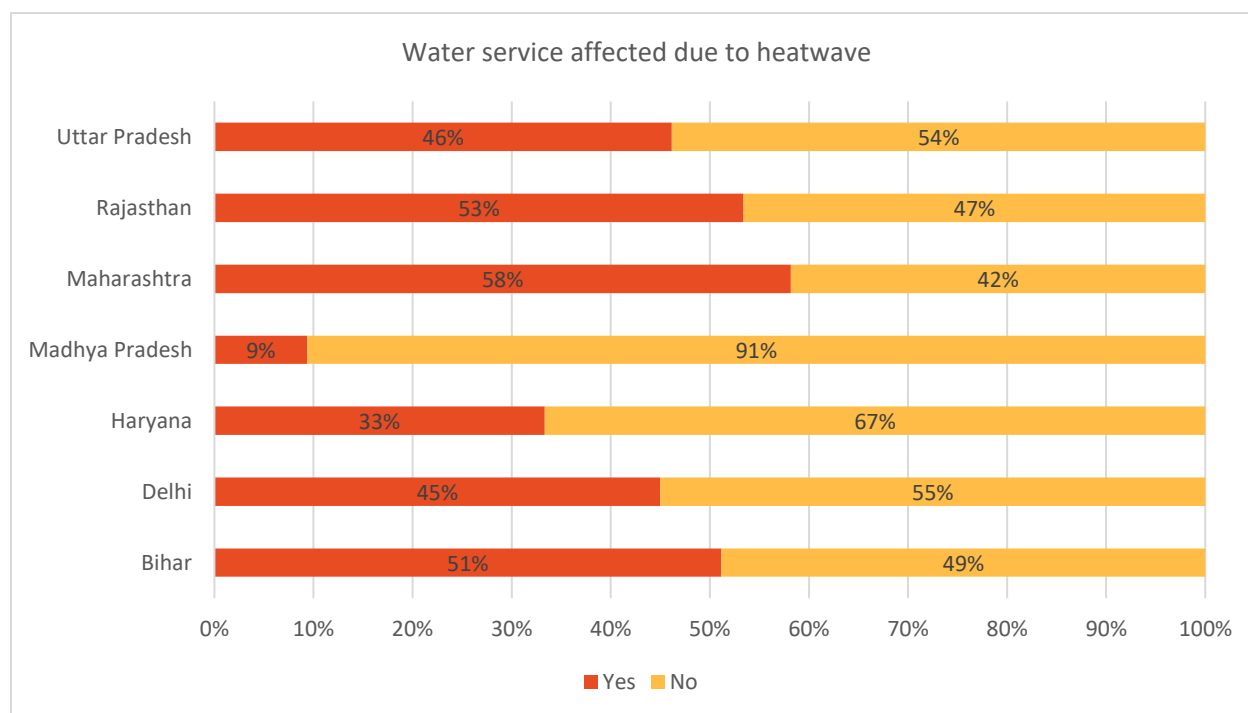


FIGURE 8: WATER SERVICE AFFECTED

Households reported that water services were affected due to the heatwave. The details are as follows-

- Uttar Pradesh (46%), Rajasthan (53%), Maharashtra (58%), Madhya Pradesh (9%), Haryana (33%), Delhi (45%) and Bihar (51%).

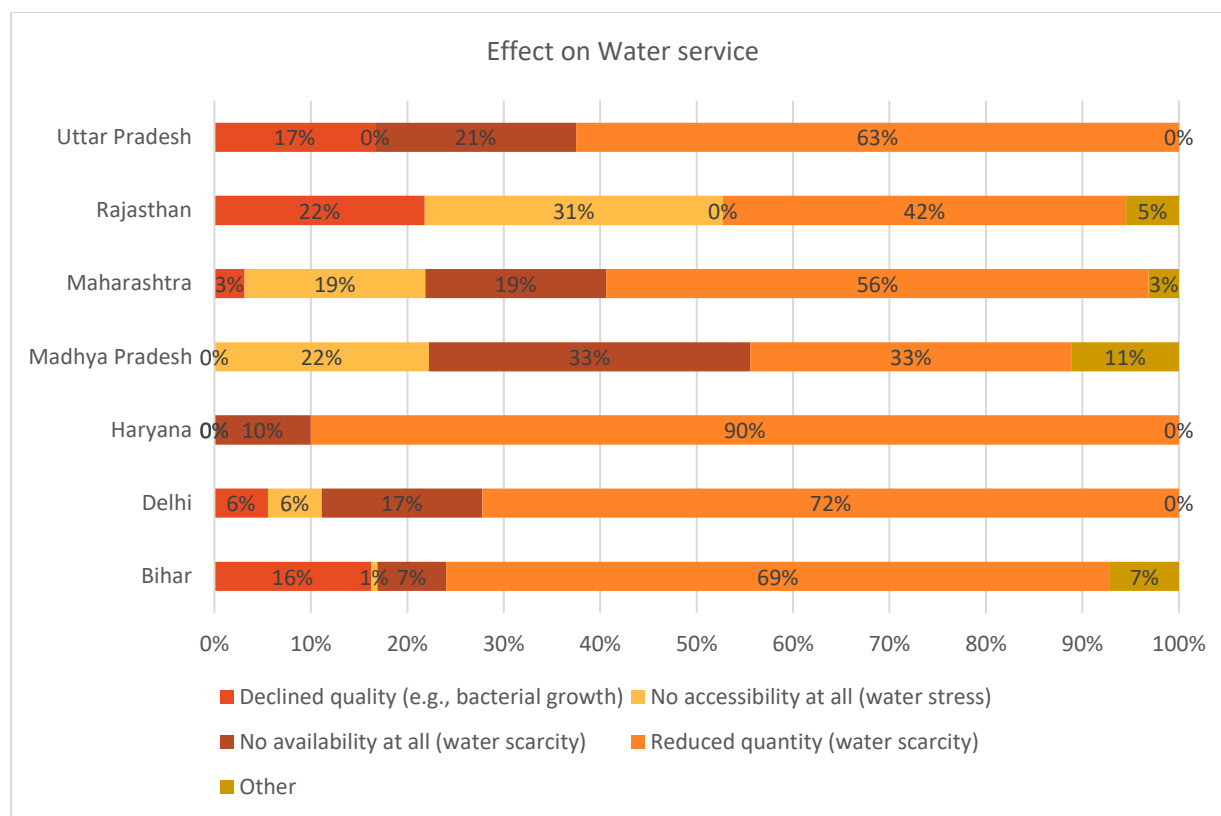


FIGURE 9: EFFECT ON WATER SERVICE

Effect on the water services reported state-wise are as follows-

- Uttar Pradesh – Declined water quality (17%), no availability (21%), reduced quantity (63%),
- Rajasthan – Declined water quality (22%), no accessibility (31%), reduced quantity (42%), other (5%),
- Maharashtra – Declined water quality (3%), no accessibility (19%), no availability (19%), reduced quantity (56%), other (3%),
- Madhya Pradesh – no accessibility (22%), no availability (33%), reduced quantity (33%), other (11%),
- Haryana – no availability (10%), reduced quantity (90%),
- Delhi – Declined water quality (6%), no accessibility (6%), no availability (17%), reduced quantity (72%),
- Bihar – Declined water quality (16%), no accessibility (1%), no availability (7%), reduced quantity (69%), other (7%),

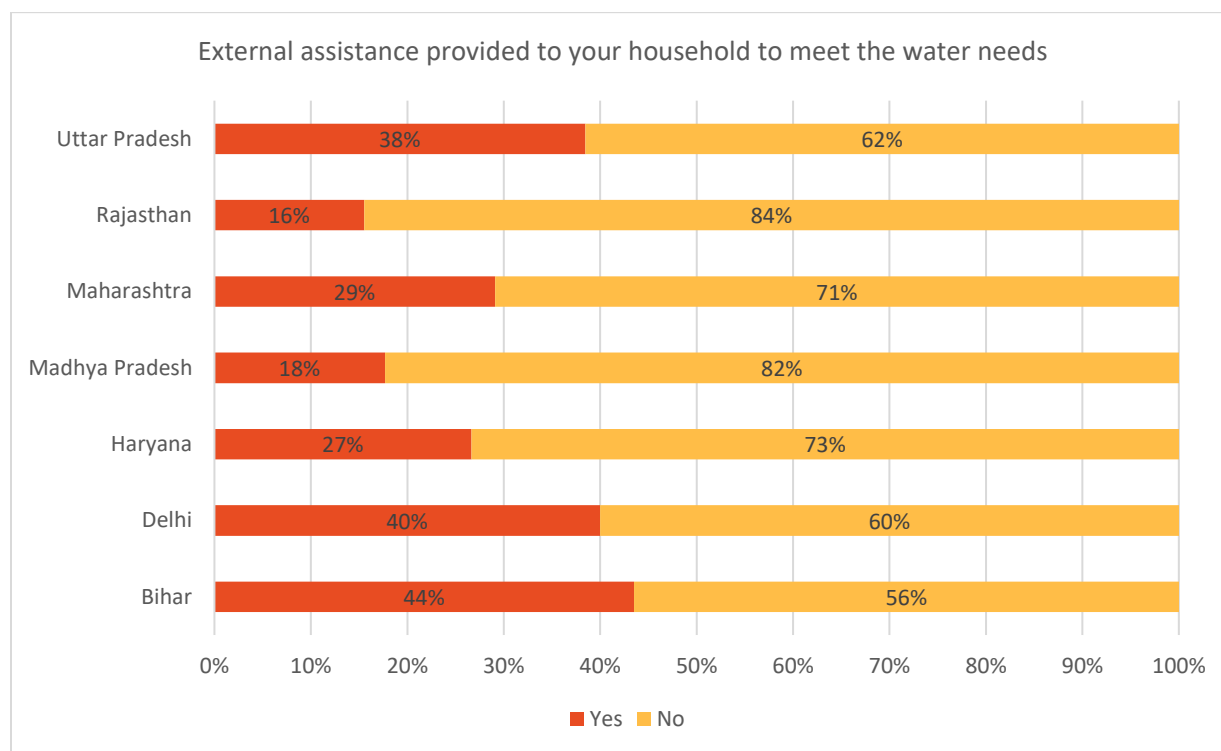


FIGURE 10: EXTERNAL ASSISTANCE PROVIDED

The households which reported external assistance provided to them to meet their water needs are as follows-

- Uttar Pradesh (38%), Rajasthan (16%), Maharashtra (29%), Madhya Pradesh (18%), Haryana (27%), Delhi (40%) and Bihar (44%).

Recommendations

Short term for immediate response

Immediate measures for WASH include all measures to ensure provision for safe, healthy and dignified living for affected populations, including women, adolescent girls, and children. These measures are aimed at mitigating immediate risks to health and safety and providing basic needs to carry out normal daily activities.

- Immediate measures should target on providing safe and clean drinking water in the affected areas where scarcity of water, deteriorated quality of water has been reported.
- Water purifying items must be distributed to areas with poor water quality.
- Provision for arranging immediate water services in areas where accessibility issues have been reported.

- d) Water testing should be carried out in order to monitor the concentration of trace minerals since the water sources are depleted.

Medium term recommendations for recovery

Medium -term measures should focus on restoration of water and sanitation facilities to normal time, till a more robust, improved and resilient infrastructure, services and facilities are placed.

- a) Provision of safe drinking water from alternate or multiple sources for communities and cattle.

Long term and resilience building

Long term measures in WASH focuses on building resilient systems to withstand future hazards.

- a) Water recharge and rain water harvesting can be adopted for water security, in areas having water scarcity.

3.3. SHELTER

Overview

Pre-disaster context

There exists a share of population who do not have permanent shelters in Maharashtra. This group includes women, juveniles, elderly, different pastoral communities, etc. Around 65.3% of the total homeless population of India lives in five states such as Uttar Pradesh, Maharashtra, Rajasthan, Madhya Pradesh, Andhra Pradesh and Gujarat.¹ According to Census 2011, Uttar Pradesh ranks first among the Indian states followed by Maharashtra, Rajasthan, and Madhya Pradesh. Haryana and Delhi stands at the 9th and 11th positions in terms of homeless population.

Post-disaster analysis

Access to shelter is a must for protection from the heatwave situation. The members of households are exposed to heatwave conditions mainly during their travel to work, work location, etc. The households in the affected areas where their family members are traveling during these conditions are dependent on public buildings and covered workplace for shelter from heatwave. The condition of shelters, and their ability to protect the members from heatwave situation must be assessed in detail to understand the conditions.

Assessment Findings

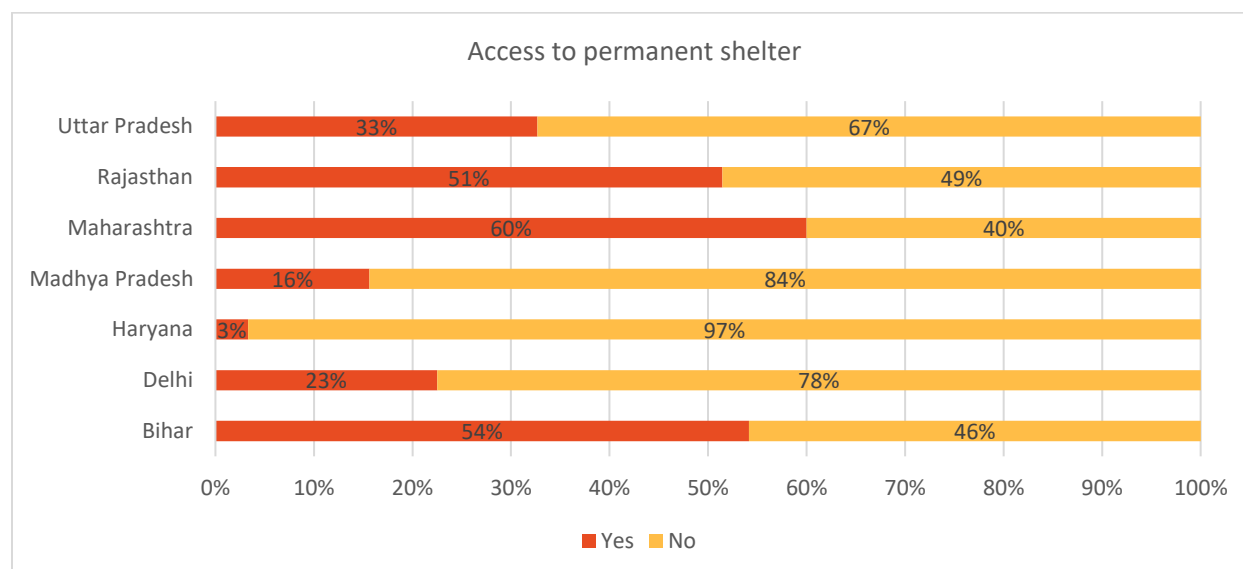


FIGURE 11: ACCESS TO PERMANENT SHELTER

¹ [Surviving in the Street: A Study of Urban Homeless in Jaipur, Rajasthan](#)

- The HHs having access to permanent shelters are as follows - Uttar Pradesh (33%), Rajasthan (51%), Maharashtra (60%), Madhya Pradesh (16%), Haryana (3%), Delhi (23%) and Bihar 54 (%).

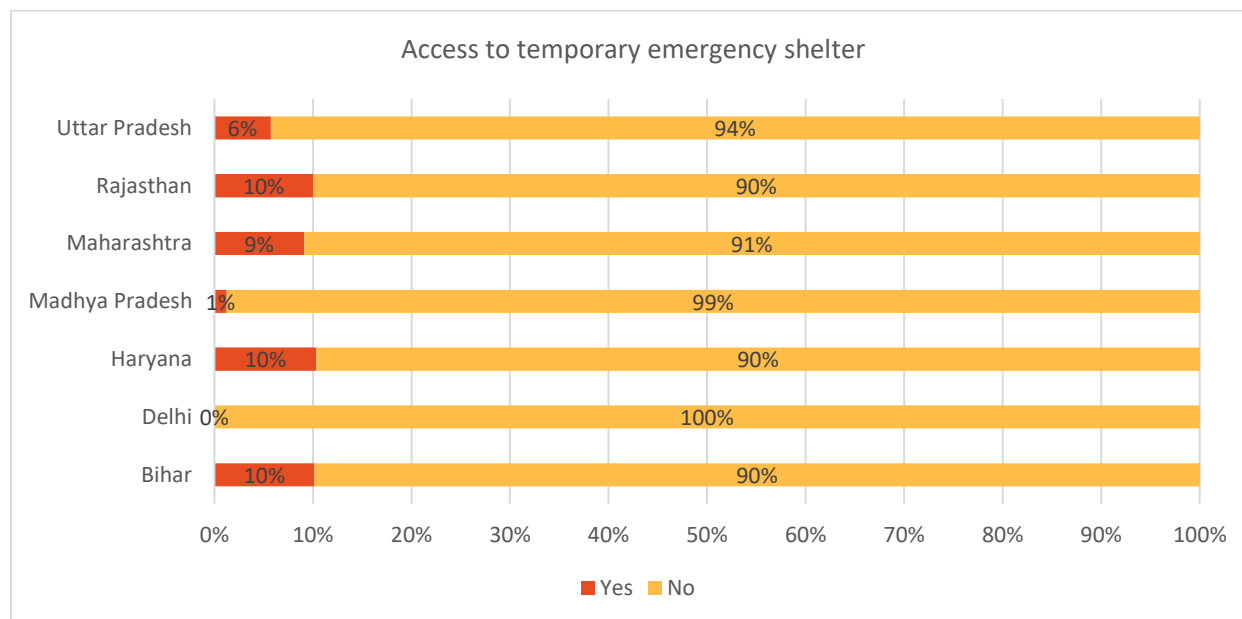


FIGURE 12: ACCESS TO TEMPORARY EMERGENCY SHELTER

- The access to temporary emergency shelter in the surveyed households reported Uttar Pradesh (6%), Rajasthan (10%), Maharashtra (9%), Madhya Pradesh (1%), Haryana (10%), Delhi (0%) and Bihar (10%).

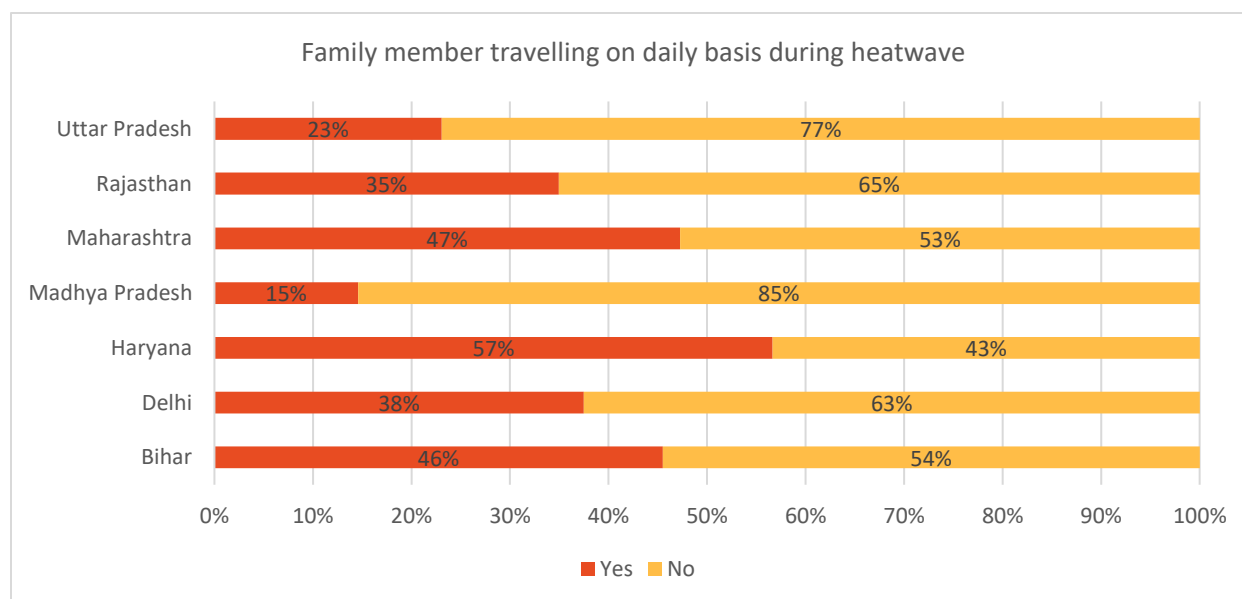


FIGURE 13: FAMILY MEMBER TRAVELLING

- The family members travelling on daily basis during heat wave as reported by the HHs are as follows – Uttar Pradesh (23%), Rajasthan (35%), Maharashtra (47%), Madhya Pradesh (15%), Haryana (57%), Delhi (38%) and Bihar (46%).

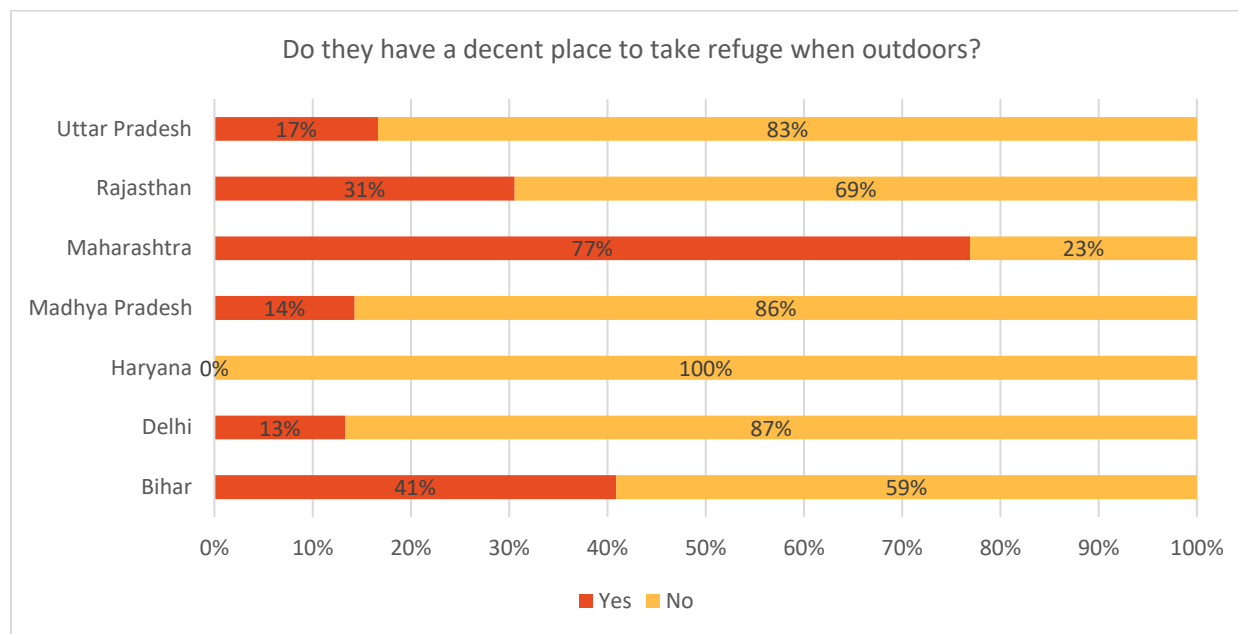


FIGURE 14: DECENT PLACE TO TAKE REFUGE

- The availability to take shelter when outdoor by the family members travelling on daily basis as reported by the HHs are as follows – Uttar Pradesh (17%), Rajasthan (31%), Maharashtra (77%), Madhya Pradesh (14%), Haryana (0%), Delhi (13%) and Bihar (41%).

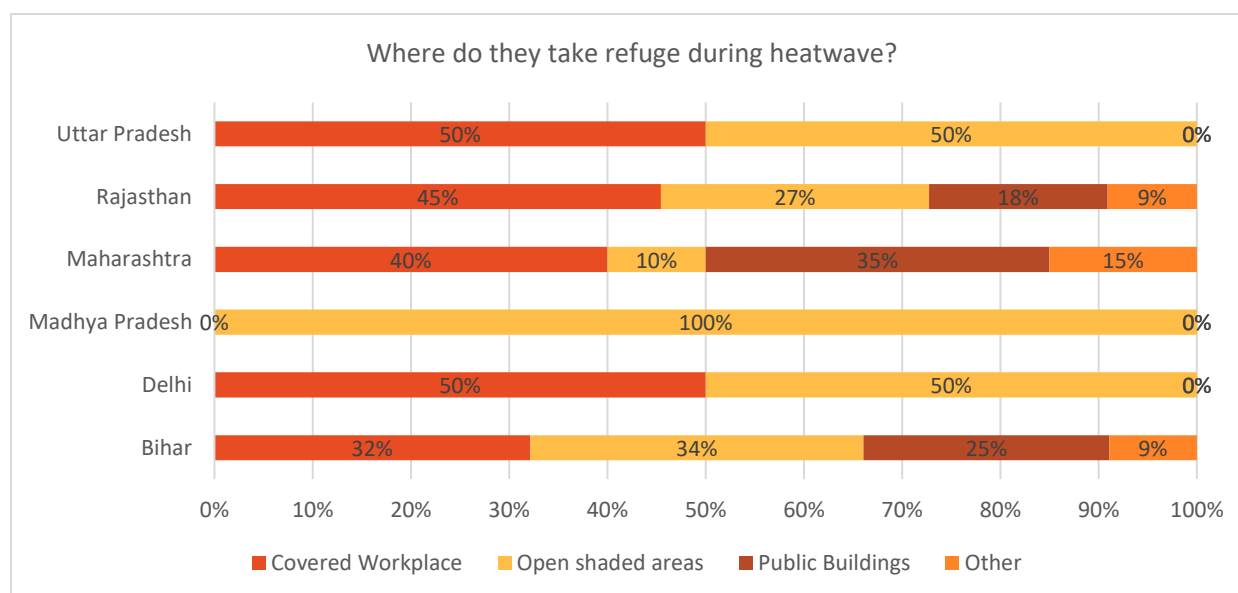


FIGURE 15: WHERE DO THEY TAKE REFUGE

The places where the travelling members take refuge during the day are as follows –

- Uttar Pradesh – Covered workplace (50%), Open shaded areas (50%)
- Rajasthan – Covered workplace (45%), Open shaded areas (27%), Public buildings (18%) and other (9%)
- Maharashtra – Covered workplace (40%), Open shaded areas (10%), Public buildings (35%) and other (15%)
- Madhya Pradesh – Open shaded areas (100%)
- Delhi – Covered workplace (50%), Open shaded areas (50%)
- Bihar – Covered workplace (32%), Open shaded areas (34%), Public buildings (25%) and other (9%)

Recommendations

Short term for immediate response

Immediate measures in this sector should focus on basic and survival needs of affected population, taking into account needs of men, women and children, people with disabilities, and other vulnerable groups, including displaced population.

- a) Support the communities in keeping their shelters as cool as possible.
- b) If there is a case of displacement of the community due to the heat wave, make sure that the people are getting alternate shelter meeting the minimum standards of relief.
- c) Setting up of water points and shaded areas at public places, distribution of ORS packets and awareness about heat wave.

Medium term recommendations for recovery

Medium term measures include initiation of reconstruction rehabilitation activities, taking into consideration long term objectives. Reconstruction measure should also emphasise on principles of 'Build Back Better' and 'Do No Harm', while considering environmental sustainability in approach and method of reconstruction.

- a) Conduct study on how to set up temporary heat resilient shelters.

Long term recommendations and resilience building

Long term measures in Shelter sector should focus on building resilient and sustainable housing stock and infrastructure. A multi hazard risk reduction approach should be adopted so that shelter

contributes to build resilience and enhance coping capacities of communities against various hazards.

- a) More focus should be given to developing heat resilient infrastructure, and making it available and affordable for the community.
- b) Keep it a priority to ensure that the community is able to access a temporary shelter in the case of an emergency.
- c) Identify and locate the vulnerable groups who are homeless or socially isolated, and make sure that they are being included in providing a safe shelter.

3.4. HEALTH

Overview

Pre-disaster context

According to the National Family Health Survey-5 data, the health profile of Bihar shows that about 41.0% children below the age of 5 years are underweight, 69.4% children between the age group of 6-59 months are anaemic and about 25.6% women have body mass index (BMI) below normal. 71.0 % Children aged 12-23 months are fully vaccinated based on information from either vaccination card or mother's recall. A decrease trend of infant mortality rate (IMR) that is 46.8% and neo natal mortality rate (34.5 %) can be observed when compared to NFHS -4 (48.1% & 36.7% respectively).

The health profile of Maharashtra shows that about 36.1% children below the age of 5 years are underweight, 68.9 % children between the age group of 6-59 months are anaemic and about 20.8% women have body mass index (BMI) below normal. 73.5% Children aged 12-23 months are fully vaccinated based on information from either vaccination card or mother's recall. There is a slight decrease in the infant mortality rate (IMR) from 23.7% to 23.2% while comparing the NFHS -4. and NFHS -5 data. A slight increase in neo natal mortality rate (16.5%) can be observed when compared to NFHS -4 (16.2 %).

Haryana's health profile shows that about 21.5% children below the age of 5 years are underweight, 70.4 % children between the age group of 6-59 months are anaemic and about 15.1% women have body mass index (BMI) below normal. 76.9 % Children aged 12-23 months are fully vaccinated based on information from either vaccination card or mother's recall. There is a slight increase in the infant mortality rate (IMR) from 32.8% to 33.3% while comparing the NFHS -4 and NFHS -5 data. A slight increase in neo natal mortality rate (21.6 %) can be observed when compared to NFHS -4 (22.1%).

Delhi's health profile shows that about 21.8% children below the age of 5 years are underweight, 69.2% children between the age group of 6-59 months are anaemic and about 10.0 % women have body mass index (BMI) below normal. 76.0 % Children aged 12-23 months are fully vaccinated based on information from either vaccination card or mother's recall. There is a decrease in the infant mortality rate (IMR) from 31.2 % to 24.5% while comparing the NFHS -4 and NFHS -5 data. A very slight decrease in neo natal mortality rate (17.5%) can be observed when compared to NFHS -4 (17.8%).

The health profile of Uttar Pradesh shows that about 32.1% children below the age of 5 years are underweight, 66.4% children between the age group of 6-59 months are anaemic and about 19.0% women have body mass index (BMI) below normal. 69.6% Children aged 12-23 months are fully vaccinated based on information from either vaccination card or mother's recall. There is decrease in the infant mortality rate (IMR) from 63.5% to 50.4% while comparing the NFHS -4 and NFHS -5 data. A decrease in neo natal mortality rate (35.7 %) can be observed when compared to NFHS -4 (45.1 %).

Madhya Pradesh's health profile shows that about 33.0% children below the age of 5 years are underweight, 72.7% children between the age group of 6-59 months are anaemic and about 23.0% women have body mass index (BMI) below normal. 77.1% Children aged 12-23 months are fully vaccinated based on information from either vaccination card or mother's recall. There is decrease in the infant mortality rate (IMR) from 51.2% to 41.3% while comparing the NFHS -4 and NFHS -5 data. A decrease in neo natal mortality rate (29.0 %) can be observed when compared to NFHS -4 (36.9%).

Post-disaster analysis

30% of the HHs surveyed reported that their family members are experiencing heat related illness. State-wise details on the number of HHs which reported heat related illness are provided in Fig 17. The heat related illness reported by the HHs are heat rash (29%), heat cramps (21%), heat exhaustion (24%), heat stroke (16%) and **hyperthermia (10%)**. State-wise information on heat related illness are provided in Fig 18 and Table 4.

The health facilities in the affected districts where the assessment has been conducted showcases the need for more resources at health centres. The need for providing water, ORS, awareness generation to the public was reported by hospitals. Even though most of the household members in the surveyed affected areas do not have prior medical conditions there have been cases reported in hospitals due to heatwave conditions. Heat exhaustion and heat rashes are reported commonly due to the heatwave condition in the affected areas.

Assessment Findings

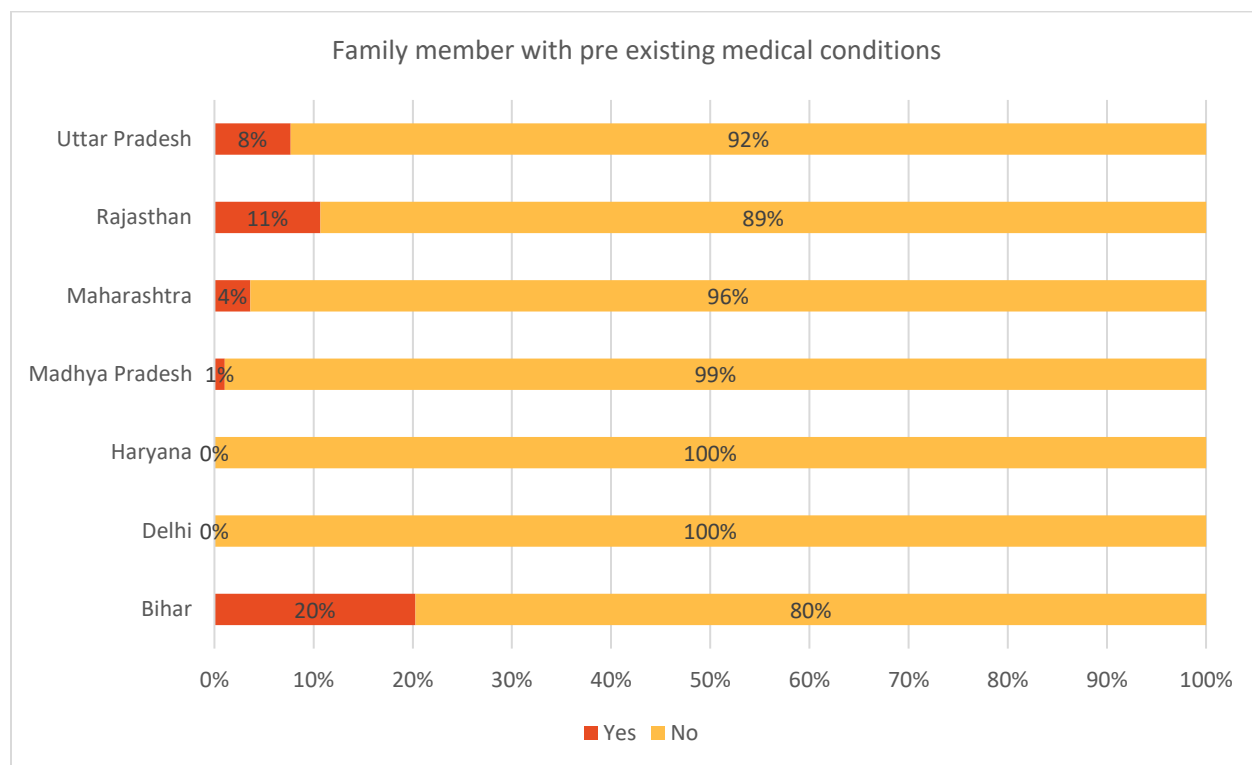


FIGURE 16: FAMILY MEMBER WITH PREEXISTING MEDICAL CONDITIONS

Fig16 shows the per cent of family members with preexisting medical conditions like diabetes, asthma, Blood pressure etc in the surveyed HHs.

- In Bihar, 20% of the respondent HHs had family members with preexisting medical conditions.
- Rajasthan had 11% of the respondent HHs with family members having preexisting medical conditions.
- Only 4% and 1% of the respondent HHs had family members with preexisting medical conditions in Maharashtra and Madhya Pradesh.
- None of the respondent HHs in Delhi and Haryana had family members with preexisting medical conditions.

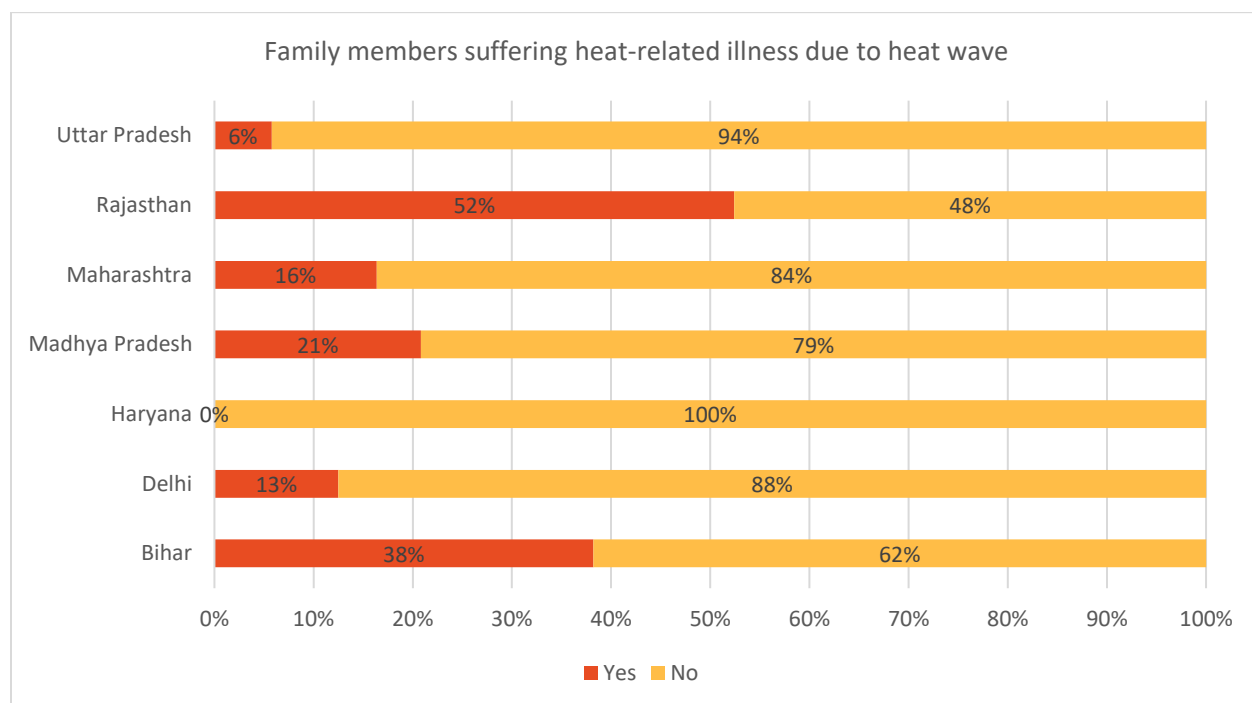


FIGURE 17: FAMILY MEMBERS SUFFERING HEAT-RELATED ILLNESS

Fig 17 shows the per cent of the people surveyed who are suffering from heat-related illness due to heat wave.

- Rajasthan had 52% of the surveyed population suffering from heat related illness due to heat wave followed by Bihar (38%).
- In Madhya Pradesh, 21% of the surveyed population suffered from heat related illness due to heat wave.
- In Maharashtra, 16% of the surveyed population suffered from heat related illness due to heat wave.
- 6% of the survey population from Delhi and 13% of the surveyed population from Uttar Pradesh reported that the family members are suffering heat-related illness due to heat wave.
- None of the respondent HHs in Haryana reported that the family members suffer heat related illness due to heat wave.

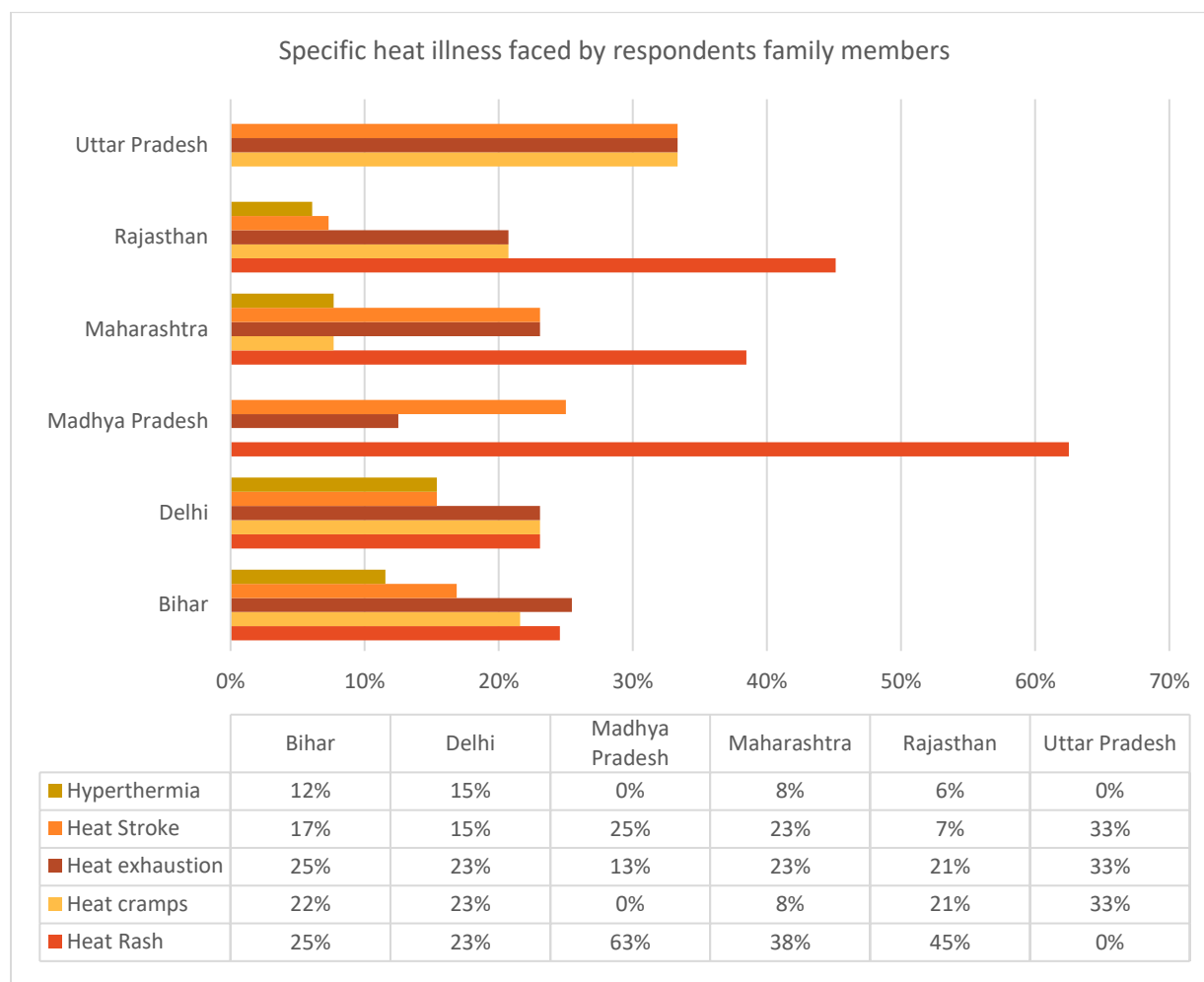


FIGURE 18: SPECIFIC HEAT ILLNESS FACED BY RESPONDENTS

Fig 18 refers to the specific heat illness faced by respondents. The specific heat illness faced by respondents include Hyperthermia, Heat stroke, Heat exhaustion, Heat cramps, and Heat rashes.

- 12% of the respondents in Bihar, 15% of the respondents in Delhi, 8% of respondents in Maharashtra and 6% of respondents in Rajasthan responded that they faced Hyperthermia.
- None of the respondents in Uttar Pradesh and Madhya Pradesh experienced Hyperthermia.
- Uttar Pradesh had high per cent of respondents (33%) who experienced Heat stroke followed by Madhya Pradesh (25%). In Maharashtra, 23% of the respondents experienced Heat stroke.
- 17% of respondents in Bihar, 15% of respondents in Delhi, and 7% of respondents in Uttar Pradesh responded that they have experienced heat stroke due to heat wave.
- Uttar Pradesh stands at first position with 33% of its respondents suffering from heat exhaustion followed by Bihar (25%).

- Both Delhi and Maharashtra had 23% of its respondents reported that they have experienced heat exhaustion.
- 13% and 21% of surveyed population responded that they experienced heat exhaustion in Madhya Pradesh and Rajasthan respectively.
- 33% of the respondents responded that their family members have experienced heat cramps due to heat wave. In Delhi, 23% of the respondents responded the same.
- 22% of respondents in Bihar, 21% of respondents in Rajasthan, and 8% of respondents in Maharashtra responded that the family members have experienced heat cramps due to the heat wave.
- None of the respondents in Madhya Pradesh responded that they experienced heat cramps due to heat wave.
- 63% of the respondents in Madhya Pradesh and 45% of the respondents in Rajasthan responded that their family members had experienced heat rashes due to heat wave.
- 38% of the respondents in Maharashtra, 25% of the respondents in Bihar, and 23% of the respondent in Delhi responded that they have experienced heat rashes. None of the respondents in Uttar Pradesh responded that they experienced heat rashes.

TABLE 4: NUMBER OF PEOPLE SUFFERING SPECIFIC ILLNESS

		Bihar	Delhi	Madhya Pradesh	Maharashtra	Rajasthan	Uttar Pradesh
Heat Rash	Male	73	2	8	7	40	
	Female	43	3	5	4	36	
	Children	98	1	7	3	45	
Heat cramps	Male	72	1		3	17	1
	Female	57	2			15	
	Children	76	2			20	
Heat exhaustion	Male	73	1	2	1	16	
	Female	50	2	2	1	15	1
	Children	77	2	3	2	11	
Heat Stroke	Male	57	1	3	3	9	
	Female	38	1	2	1	9	1
	Children	70	1	3		7	
Hyperthermia	Male	43			1	8	
	Female	34	2		1	7	
	Children	73			1	6	

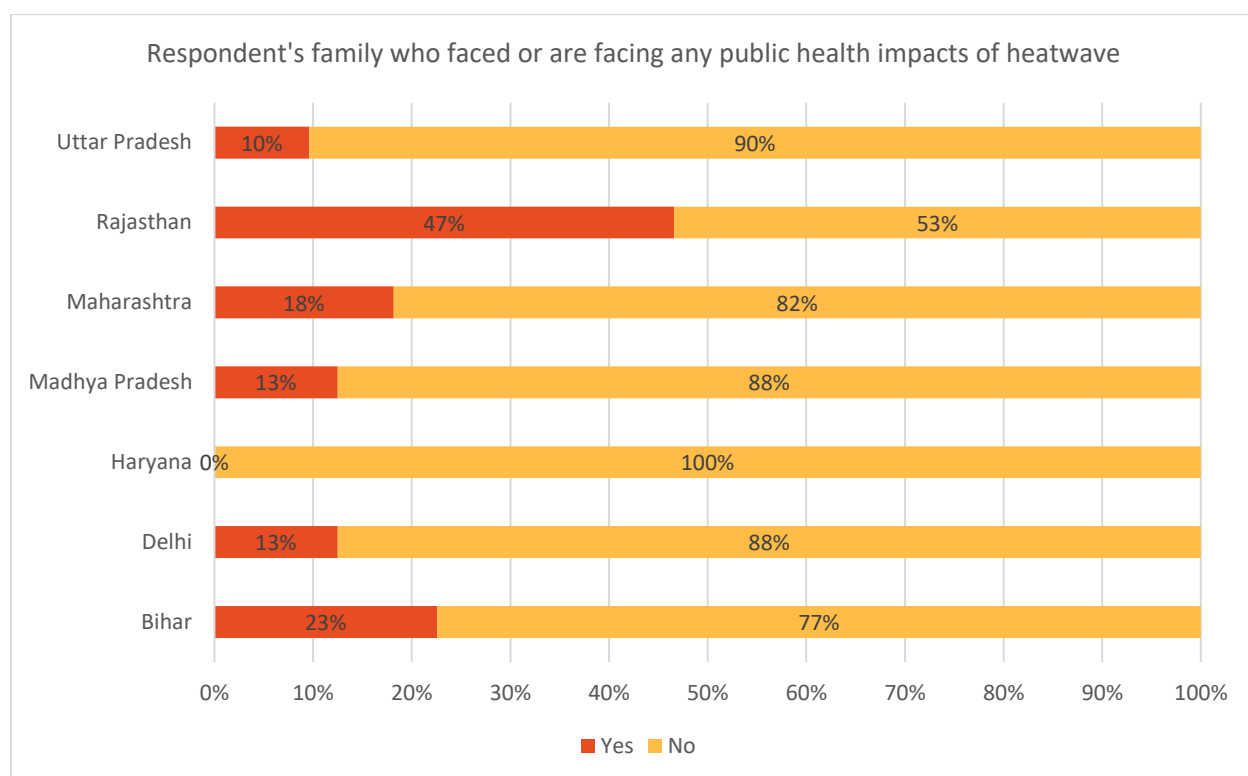


FIGURE 19: PUBLIC HEALTH IMPACTS OF HEATWAVE

TABLE 5: PUBLIC HEALTH IMPACTS OF HEATWAVE

State	Bihar	Delhi	Madhya Pradesh	Maharashtra	Rajasthan	Uttar Pradesh
Food-borne disease (due to stresses in food production)	41	5	9	4	13	3
Food-borne illness (due to lack of power to refrigerate food)	44	4	10	3	30	2
Untreated water-related illness (due to power shutdown in water treatment facilities)	46	2	8	6	8	1
Vector-borne disease like dengue (due to long term heatwaves)	32		3	1	8	2

Recommendations

Short term for immediate response

- Ensuring 24*7 heat health facilities in strategic crowded locations and healthcare facilities with adequate provision of basic medicine like ORS, Glucose etc.

- b) Ensure that the people who work and walk during the heat wave are following safety measures to protect themselves from heatwave.
- c) Change the timing of the vaccination drives from high temperature period to safer timings to avoid the exposure of women, children, and elderly to the heat wave.
- d) Encourage the youth and other community volunteers to check on the elderly population and provide support if they needed in terms of mobility, or for getting immediate medical support.
- e) To ensure standard heat wave management protocol in healthcare facilities.
- f) Ensure that routine medical checkups are being taken up the affected people
- g) Public should recognize the symptoms of heat exhaustion – tiredness, weakness, thirst, giddiness, cramps. Awareness generation for local people about heatwave, preventive measures for the same through IEC material like posters, banners, pamphlets etc. at strategic locations like bus stops, railway stations, auto stands, market areas etc.
- h) Identify and map the vulnerable groups that are more exposed to the potential risk factors of heat wave.

Medium term recommendations for recovery

- a) Sensitize the youth and other community members to undertake urgent actions during the incidence of heat wave.
- b) Confirm that proper psycho social support is being given to people who are in need of it.

Long term and resilience building

- a) Heat wave action plan for hospitals must be prepared to address the issues in vulnerable areas.
- b) Equip the health centers with necessary resources considering the exposure to hazards affecting the communities.
- c) To add heat wave management in school curriculum to sensitize school children and local people.
- d) Training and capacity building of healthcare providers/stakeholders on symptoms, signs, and clinical management of heat stroke.

3.5. EDUCATION

Overview

Pre-disaster context

Literacy rate in Uttar Pradesh is 67.68% as per the 2011 population census. According to National Family Health Service-5, 66.1 percent of women age 15-49 and 82.0 percent of men age 15-49 are literate. 39.3% of Women have 10 or more years of schooling whereas 48.6% of Men have more years of schooling.

Haryana has a literacy rate of 75.55%. The National Family Health Survey-5 shows that the 79.7percent of women age 15-49 and 91.5 percent of men age 15-49 are literate. 49.5% of Women have 10 or more years of schooling whereas 62.2 % of Men have more years of schooling.

Literacy rate in Rajasthan is 66.11% as per 2011 population census. According to National Family Health Survey-5, 64.7 percent of women age 15-49 and 88.9 percent of men age 15-49 are literate. 33.4% of Women have 10 or more years of schooling whereas 51.9% of Men have more years of schooling.

Maharashtra's literacy rate is 82.34% as per 2011 population census. According to National Family Health Survey-5, 82.3percent of women age 15-49 and 90.2 percent of men age 15-49 are literate. 50.4% of Women have 10 or more years of schooling whereas 61.0% of Men have more years of schooling.

Bihar is the least literate states according to the population census of 2011 with a literacy rate of 61.80%. According to National Family Health Survey-5, 55.0 percent of women age 15-49 and 76.4 percent of men age 15-49 are literate. 20.6 % of Women have 10 or more years of schooling whereas 43.6 % of Men have more years of schooling.

Delhi's literacy rate is 86.21% according to the population census of 2011. As per the National Family Health Survey-5, 83.7 percent of women age 15-49 and 90.2 percent of men age 15-49 are literate. 59.7% of Women have 10 or more years of schooling whereas 60.9 % of Men have more years of schooling.

Literacy rate in Madhya Pradesh is 69.32% as per 2011 population census. According to National Family Health Survey-5, 65.4 percent of women age 15-49 and 81.3 percent of men age 15-49 are literate. 29.3% of Women have 10 or more years of schooling whereas 39.9% of Men have more years of schooling.

Post-disaster analysis

52% of the households surveyed reported that the education of children has been affected due to the heatwave. The extreme hot weather conditions are making it difficult for the children to go to schools and Anganwadis. Many of the states have issued redemption in the working hours of schools. Most of the affected areas have reported that education have been affected due to the heatwave condition. There has been disruption in education service due to changed school timings, closed schools, etc.

The effects reported are as follows – Accessibility to schools affected due to extreme heat (20%), Online education disrupted due to power failure/network unavailability/inaccessibility (1%), School timings changed (41%) and schools closed (38%). State-wise details on the impacts are provided in Fig 21.

Assessment Findings

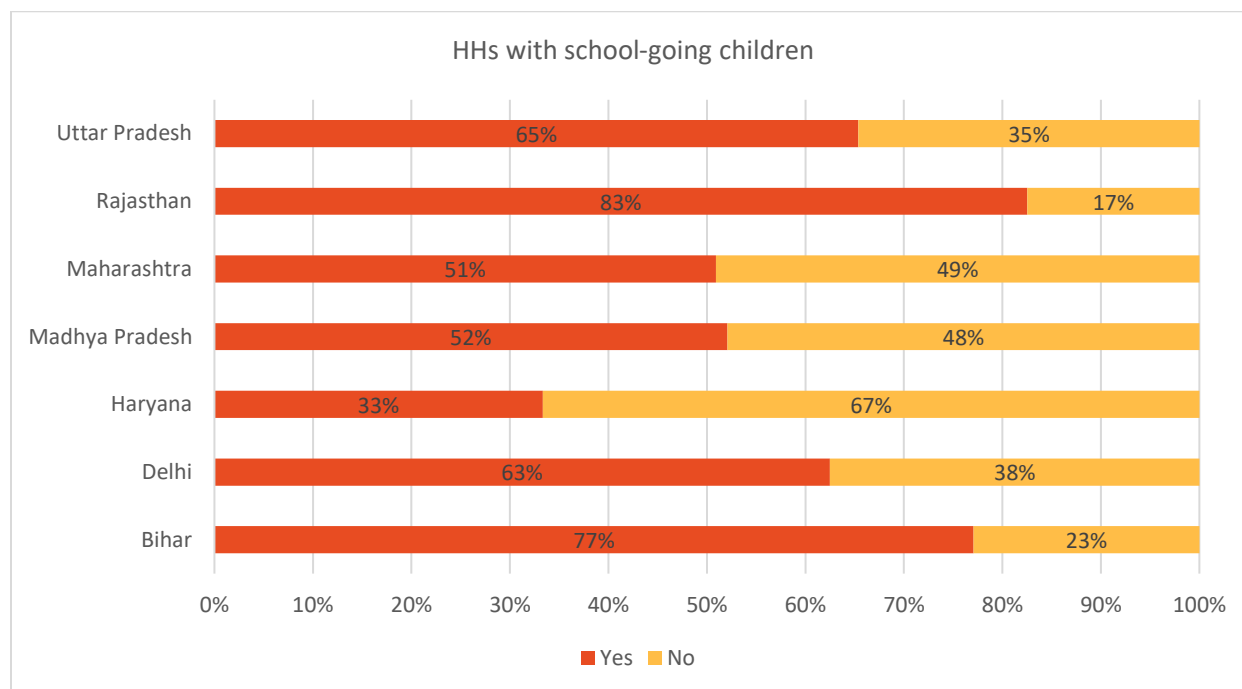


FIGURE 20: HHs WITH SCHOOL-GOING CHILDREN

Fig 20 refers to the per cent of surveyed HHs with school-going children.

- 83% of respondent HHs Rajasthan, 77% of respondent HHs in Bihar, 65% of respondent HHs in Uttar Pradesh have school going children.
- 63% of respondent HHs in Delhi, 52% of respondent HHs in Madhya Pradesh, 33% of respondent HHs in Haryana and 51% of respondent HHs in Maharashtra have school going children.

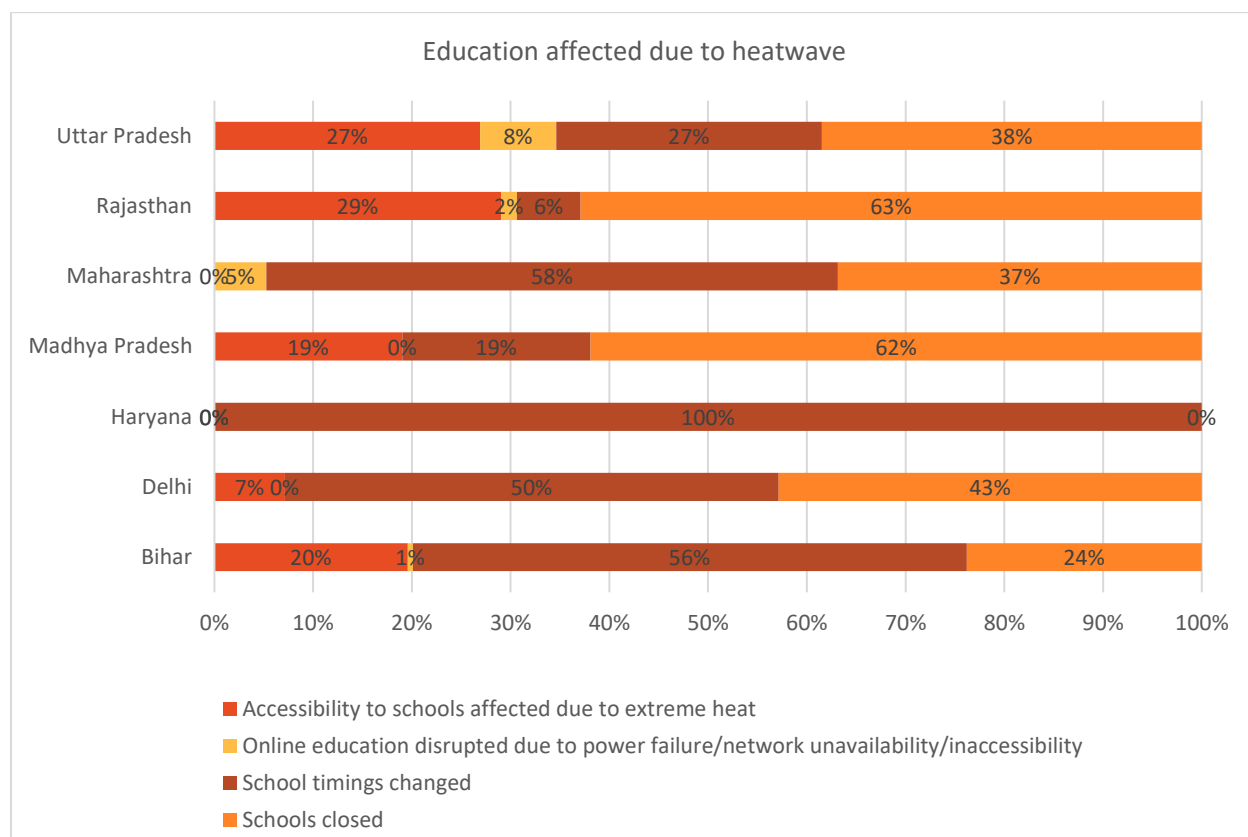


FIGURE 21: EDUCATION AFFECTED DUE TO HEATWAVE

The fig 21 shows whether education affected due to heatwave among the respondent HHs. Some of the reasons for education getting affected due to the heatwave are accessibility to schools affected due to extreme heat, online education disrupted due to power failure/network unavailability/inaccessibility, change in the school timings, and closing of schools due to heat wave.

- 29% of respondent HHs in Rajasthan, 27% of respondent HHs in Uttar Pradesh, 20% of respondent HHs in Bihar, 19% of respondent HHs in Madhya Pradesh, and 7% of respondent HHs in Delhi responded that accessibility to schools got affected due to extreme heat.
- None of the respondent HHs in both Maharashtra and Haryana responded that the accessibility to schools got affected due to extreme heat.
- 8% of respondent HHs in Uttar Pradesh, 5% of respondent HHs in Maharashtra, 2% of respondent HHs in Rajasthan and 1% of respondent HHs in Bihar responded that online education disrupted due to power failure/network unavailability/inaccessibility.
- None of the respondent HHs in Haryana, Delhi, and Madhya Pradesh responded that online education disrupted due to power failure/network unavailability/inaccessibility.

- 100% of the respondent HHs in Haryana responded that change in school timings has affected education. 58% of the respondent HHs in Maharashtra, 56% of the respondents in Bihar, and 50% of the respondent HHs in Delhi responded that the education got affected by the heat wave due to the change in the timings of the schools.
- 27% of the respondent HHs in Uttar Pradesh, 19% of the respondent HHs in Madhya Pradesh, and 6% of the respondent HHs in Rajasthan also responded that the change in school timings has affected education.
- 63% of the respondent HHs in Rajasthan and 62% of the respondent HHs in Madhya Pradesh responded that the education got affected due to heatwave because of the closing of schools. 43% and 38% of respondent HHs in Delhi and Uttar Pradesh respectively, responded that the education got affected due to the school closing. None of the respondent HHs in Haryana responded so.

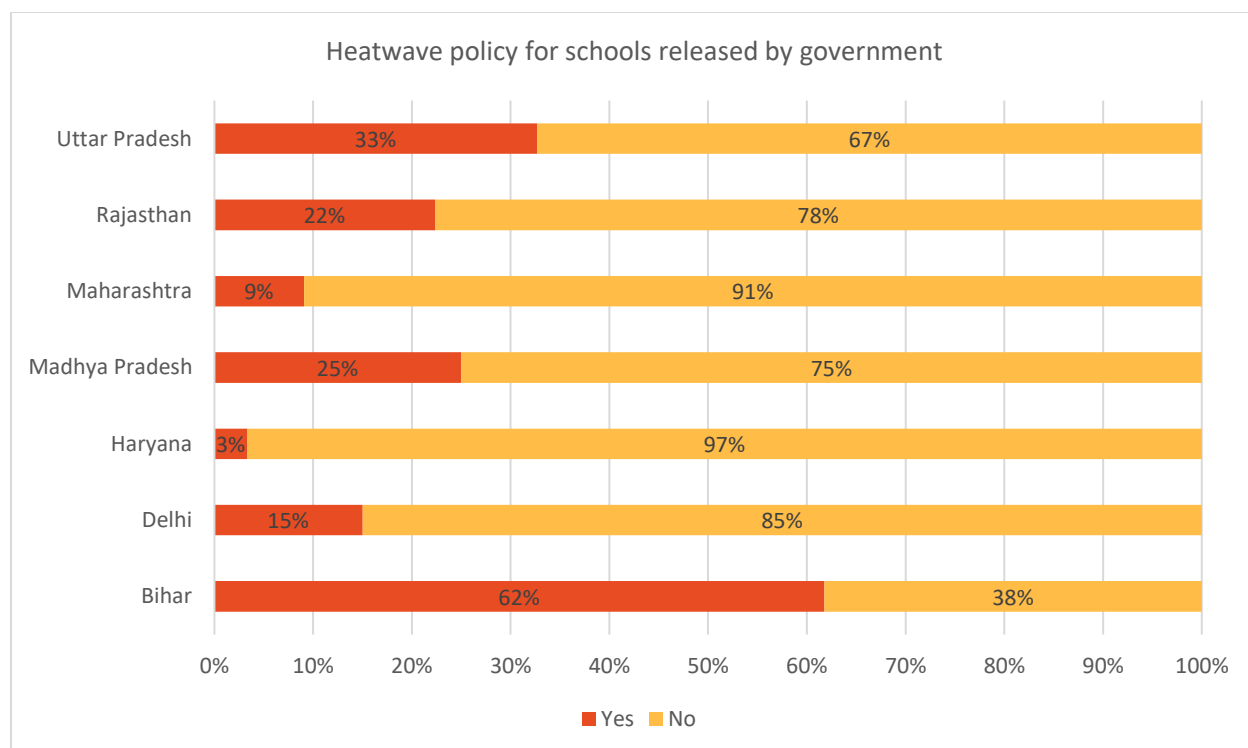


FIGURE 22: HEATWAVE POLICY FOR SCHOOLS RELEASED BY GOVERNMENT

In fig 22, it is clear that the governments in the respective states have come up with heatwave policy for schools.

- 62% of respondents in Bihar and 33% of respondents in Uttar Pradesh responded that heatwave policy was released for schools by the government. 25% of the respondents in

Madhya Pradesh and 22% of the respondents in Rajasthan also responded that heatwave policy was released for schools by the government.

- Only 9% and 3% of the respondents in Maharashtra and Haryana have responded that the government has released heatwave policy for the schools.

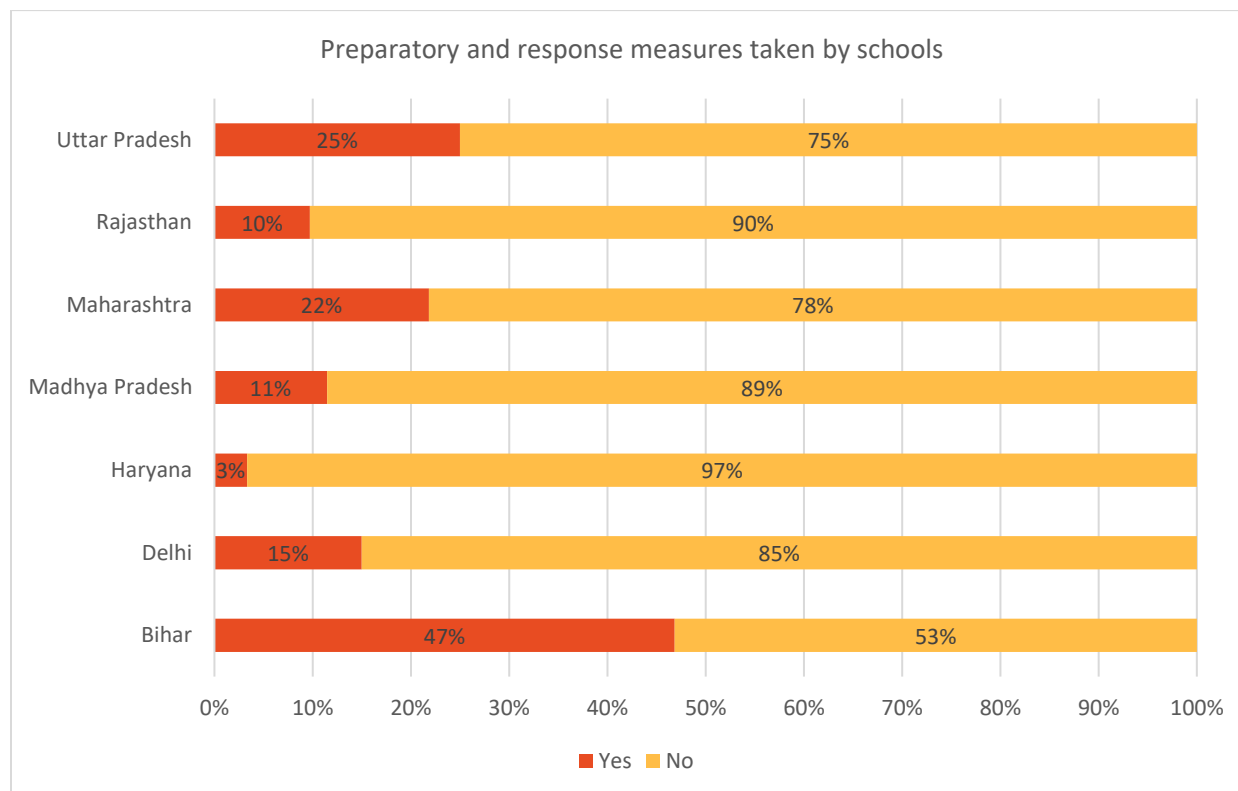


FIGURE 23: PREPARATORY AND RESPONSE MEASURES TAKEN BY SCHOOLS

Fig 23 shows the take of respondents on whether preparatory and response measures were taken by schools, in Uttar Pradesh, Rajasthan, Maharashtra, Madhya Pradesh, Haryana, Delhi, and Bihar.

- 47% of the respondent HHs Bihar responded that preparatory and response measures were taken by schools. 25% and 22% of the respondent HHs also reported that preparatory and response measures were taken by schools.
- 10%, 11% and 15% of the respondent HHs in Rajasthan, Madhya Pradesh, and Delhi responded that the schools have taken preparatory and response measures.
- Only 3% of the respondent HHs in Haryana responded that preparatory and response measures were taken by schools.

TABLE 6: MEASURES TAKEN BY SCHOOLS

	Bihar	Delhi	Haryana	Madhya Pradesh	Maharashtra	Rajasthan	Uttar Pradesh
Pick up and drop facility	35	1		5	3	10	7
Potable and cool water	35	1	1	3	2	10	12
Healthy meals	52	6	1	2	1	10	6
Awareness on heatwaves, impacts and precautions	56	2				10	1
Sufficient open and green areas within school premises	20	4	1			10	
Active cooling mechanism (coolers)	4					10	1
Others, Specify	14			1	7	10	

Some of the other measures taken by schools in the affected states include change in school timings.

Recommendations

Short term for immediate response

- Reschedule the timings of the Schools and Anganwadis.
- Shift to online classes so as to reduce the exposure of the children to the heat wave

Medium term recommendations for recovery

- Strengthening the e-learning platform at community and household level.
- Schools and Anganwadis can be utilized as a platform to showcase visible advisories on heatwaves with do's and don'ts for both staff and children/families accessing the services of the centre. They should also stock up on restoratives.

Long term and resilience building

- Making arrangements in the schools to have a heat resilient infrastructure.
- Panchayat and rural department (local panchayat) can prepare a list of potential shelters in villages which acts as a relief shelters during any disasters. This can avoid schools turning into relief camps during any disaster and children can have regular schooling.

3.6. FOOD & NUTRITION SECURITY

Overview

The extreme heat conditions can affect both food availability and food accessibility. It is important to ensure food and nutrition security of the communities with special focus on children, pregnant and lactating women, children, PwDs, and elderly population. India's policy framework for health and nutrition is robust and includes most evidence-based nutrition and health interventions.

As per the National Family Health Survey 5, Maharashtra has 54.2 percent of women in the age group 15-49 years are anemic and 68.9 percent of Children age 6-59 months are anemic. The prevalence of stunting and wasting are 35.2 per cent and 25.6 per cent respectively. Such nutritional deficiencies adversely affect the health of the mothers and the children.

Bihar's health profiles indicate that 63.5 percent of women in the age group 15-49 years are anemic and 69.4 percent of Children age 6-59 months are anemic. The prevalence of stunting and wasting are 42.9 per cent and 22.9 per cent respectively

Madhya Pradesh's health profiles indicate that 54.7 percent of women in the age group 15-49 years are anemic and 72.7 percent of Children age 6-59 months are anemic. The prevalence of stunting and wasting are 35.7 per cent and 19.0 per cent respectively

As per the National Family Health Survey 5, Uttar Pradesh has 50.4 percent of women in the age group 15-49 years are anemic and 66.4 percent of Children age 6-59 months are anemic. The prevalence of stunting and wasting are 39.7 per cent and 17.3 per cent respectively.

Delhi's 49.9 percent of women in the age group 15-49 years are anemic and 69.2 percent of Children age 6-59 months are anemic as per the National Family Health Survey 5. The prevalence of stunting and wasting are 30.9 per cent and 11.2 per cent respectively.

As per the National Family Health Survey 5, Haryana has 70.4 percent of women in the age group 15-49 years are anemic and 60.4 percent of Children age 6-59 months are anemic. The prevalence of stunting and wasting are 27.5 per cent and 11.5 per cent respectively.

Rajasthan's health profile shows that it has 54.4 percent of women in the age group 15-49 years are anemic and 71.5 percent of Children age 6-59 months are anemic. The prevalence of stunting and wasting are 31.8 per cent and 16.8 per cent respectively

Such nutritional deficiencies adversely affect the health of the mothers and the children. Planned interventions should be in place to tackle the issues associated with food and nutrition security during emergencies.

Recommendations

Short term for immediate response

- a) Food kits should be made available to the people who find it difficult to go to shops.
- b) Special focus should be given to pregnant women, elderly, children, and lactating mothers.
- c) Help with food supply the people who have issues with mobility.
- d) Distribute non-food essential items to empower households with supplies and reduce wastage of low shelf-life product.

Medium term recommendations for recovery

- a) Strengthening the inter-department and inter-sector coordination for ensuring inter-sectoral linkages among, Education, WASH, food & nutrition, shelter & health.
- b) Distribution of IEC materials on issues pertaining to food and nutrition.
- c) Improving the nutrition management of community through different interventions.
Construction of storage houses for nutrition supplements required during emergencies

Long term and resilience building

- a) Mapping of AWCs which are at high risk and identifying safe areas for relocation during emergencies for the continuation of food and nutrition supplements to the target groups.
- b) Establish direct nutrition-based interventions including counselling for behaviour change, supplementary food and micronutrient supplements.

3.7. LIVELIHOOD

Overview

Pre-disaster context

The unemployment rates of Rajasthan, Bihar, Maharashtra, Madhya Pradesh, Uttar Pradesh, Delhi, and Haryana, is 28.8%, 21.1%, 3.1%, 1.6%, 2.9%, 4.0, 34.5%, respectively.

The major livelihoods of Rajasthan are agriculture, mining, and tourism. It is the first Indian state to establish the mission on livelihoods in order to face the challenges of unemployment and to ensure job for all. Agriculture is the main livelihood of Maharashtra. Bihar is the largest producer of vegetables and stands at eight position in terms of fruits production in India. Being a services based economy, some of the major livelihoods of Bihar are agriculture, Food processing, sugar, dairy, health care, and manufacturing. Madhya Pradesh is an agrarian state that also focuses on progressing in industrial and service sector as well. Haryana's major livelihoods are agriculture, dairy farming, manufacturing, and digital economy.

Post-disaster analysis

36% of the surveyed households reported that their livelihoods have been affected due to heat wave. The livelihoods impacted are as follows – agriculture (59%), animal husbandry (10%), secondary sector (6%), tertiary/service sector (2%) and other 22%.

The extreme heat conditions have affected the livelihood sector to a great extent. The effect can be cascading as it influences the upcoming harvest as well. The extreme heat condition can result in loss of working hours for the daily wage workers. Shortage of water for irrigation and crop loss due to the heat wave is reported from the affected areas. The impact of heatwaves in agriculture and animal husbandry is majorly reported by the affected households where the assessment was conducted. Reduction in crop yield is a major impact in agriculture due to heatwave reported by the households.

Assessment Findings

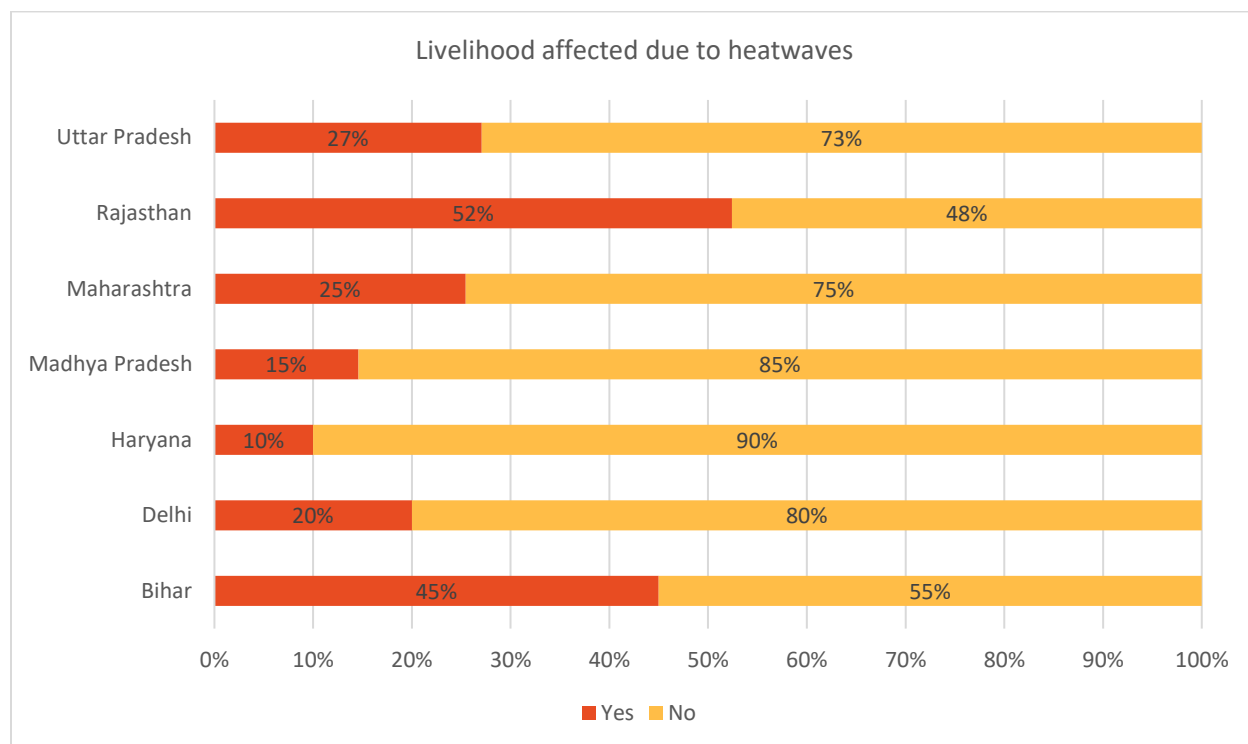


FIGURE 24: LIVELIHOOD AFFECTED DUE TO HEATWAVES

Fig 24 shows the responses of the respondents on whether their livelihoods got affected due to heatwaves or not.

- 52% of the surveyed population in Rajasthan responded that their livelihoods got affected due to heatwaves. 45% of the surveyed population in Bihar also responded that heatwave affected their livelihood.
- 27% of the respondents in Uttar Pradesh, 25% of the respondents in Maharashtra, and 20% of the respondents in Bihar responded that their livelihoods got affected by the heatwaves.
- 10% and 15% of the respondents in Haryana and Madhya Pradesh responded that their livelihoods got affected by heatwave.

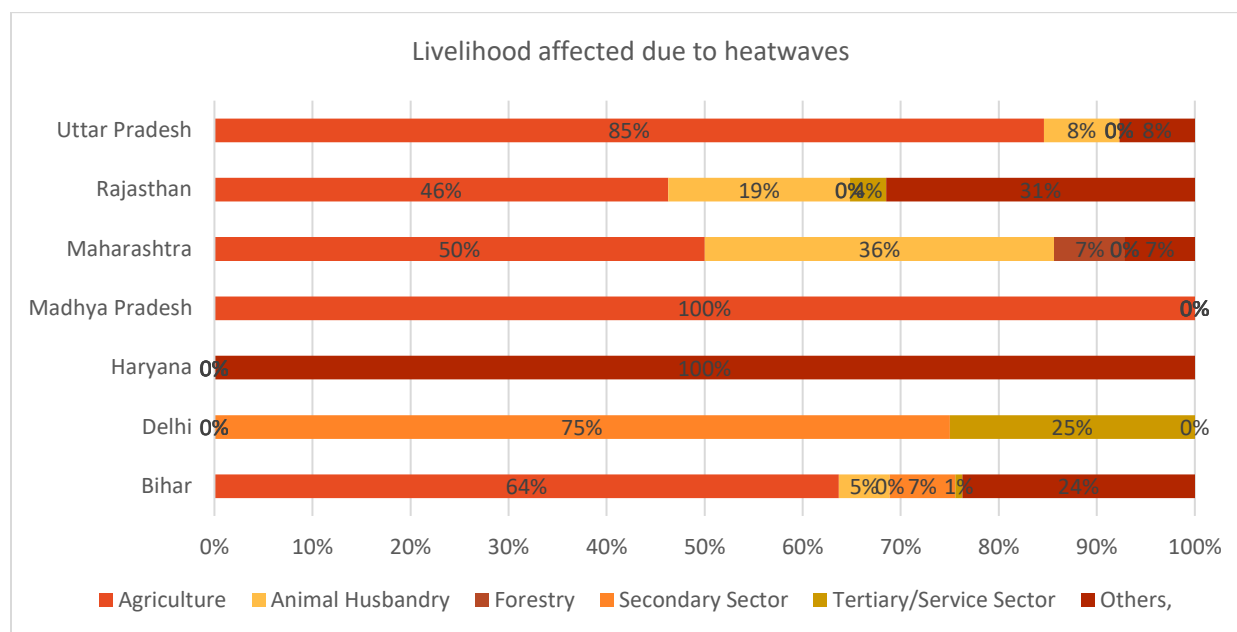


FIGURE 25: LIVELIHOOD AFFECTED DUE TO HEATWAVES

Fig 25 provides the graphical representation of different livelihoods affected due to heatwave in different states.

- In Bihar, 64% of respondent HHs engaged in Agriculture responded that their livelihood got affected by heatwave. 24% of respondents engaged in other sector and 7% of the respondents in secondary sector responded that their livelihoods got affected by the heatwave. 5% of the animal husbandry related livelihoods have also got affected by the heatwave.
- In Delhi, 75% of the secondary sector and 25% of the tertiary sector got affected by the heatwave. None of the livelihoods associated with agriculture, animal husbandry, forestry, and others were reported to get affected by the heatwave.
- In Haryana, 100% of the other sectors got affected while the remaining sectors were unaffected.
- In Madhya Pradesh, the 100% of the surveyed population responded that the agriculture related livelihoods were affected due to the heatwave.
- In Maharashtra, 50% of agriculture, 36% of animal husbandry, 7% of forestry, and 7% of other livelihoods got affected by the heatwave as per the responses from the surveyed population.
- In Rajasthan, 46% of the agriculture, 19% of the animal husbandry, 31% of other livelihoods and 4% of the tertiary sector engaged by the surveyed population got affected by the heatwave.

- In Uttar Pradesh, 85% of the agriculture, 8% of animal husbandry, and 8% of other livelihoods were affected due to the heatwave as per the responses of the surveyed population.

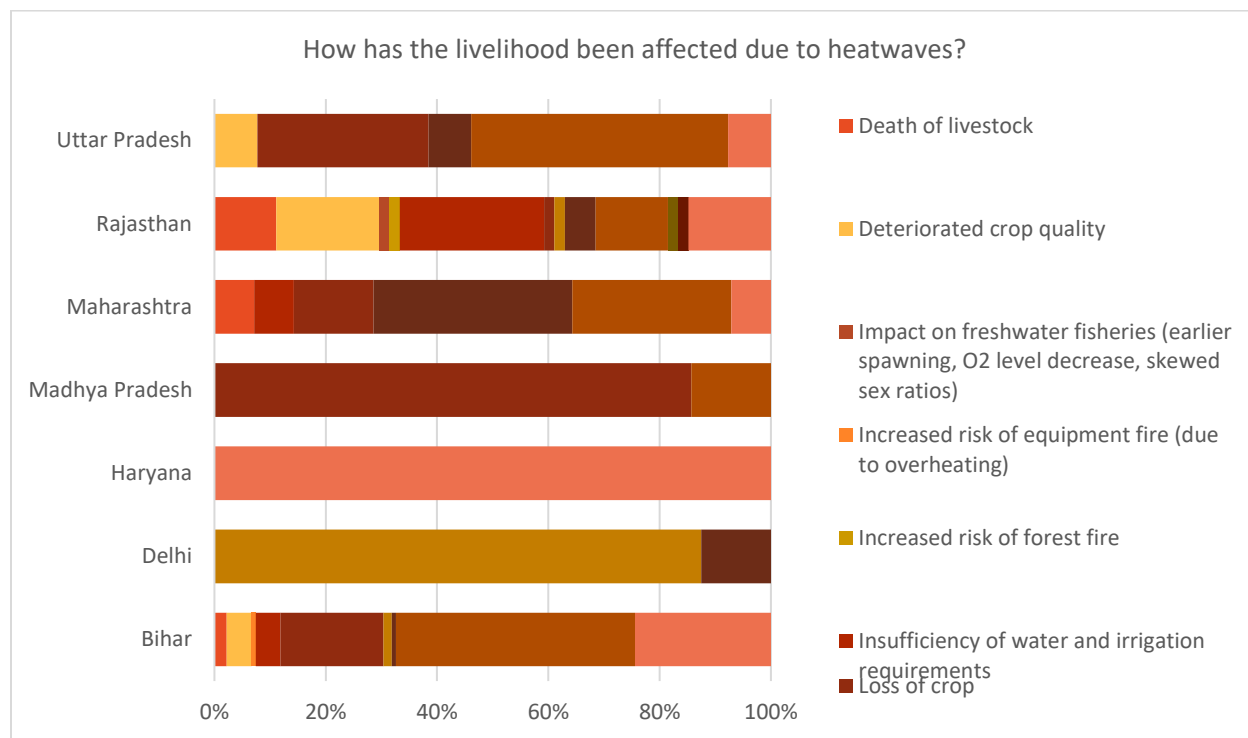


FIGURE 26: HOW THE LIVELIHOOD HAS BEEN AFFECTED

Fig 26 clearly depicts how the livelihood has been affected due to the heatwaves. The reasons include death of livestock, deteriorated crop quality, impact of freshwater fisheries, increased risk of equipment fire due to overheating, increased risk of forest fire, negative impact on livestock, insufficiency of water and irrigation requirements, and loss of crop.

- In Bihar, the livelihoods are mostly affected because of the reduction in crop yield (43%). It is followed by loss of crop (19%), deteriorated crop quality (4%), insufficiency of water and irrigation requirements (4%), negative impact on health of livestock (1%), reduced productivity of livestock (1%), and other reasons (24%).
- In Delhi, the livelihoods are mostly affected by negative impact on health of livestock followed by reduced productivity of livestock (13%)
- In Haryana, the heatwave affected livelihoods are facing stress and shocks due to other reasons (100%).

- In Madhya Pradesh, the livelihoods are getting affected by heatwaves due to loss of crop (86%) and reduction in crop yield (14%).
- In Maharashtra, the reasons behind the distress in livelihoods due to heatwaves are as follows: reduced productivity of livestock (36%), reduction in crop yield (29%), loss of crop (14%), death of livestock (7%), insufficiency of water and irrigation requirements (7%), and other reasons (7%).
- The reason for the stress and shocks on livelihoods due to the heatwaves in Rajasthan are as follows: Insufficiency of water and irrigation requirements (26%), deteriorates crop quality (19%), other reasons (15%), reduction in crop yield (13%), death of livestock (11%), reduced productivity of livestock (6%), impact of freshwater fisheries (2%), increased risk of forest fire (2%), loss of crop (2%), and negative impact on health of livestock (2%).
- In Uttar Pradesh, the livelihoods are getting affected by heatwaves due to reduction in crop yield (46%), loss of crop (31%), reduced productivity of livestock (8%), deteriorated crop quality (8%), and other reasons (8%).

Recommendations

Short term for immediate response

- a) Provision of support to farmers who have lost livestock due to heat wave
- b) Ensure assistance to farmers who lost crops

Medium term recommendations for recovery

- a) Skill training can be imparted to the affected population. Government schemes can be tapped and CSR & NGOs can be approached for support.
- b) Imparting training to the farmers on new techniques of heat resilient farming, skill boost up activities etc. and promotion climate resilient agricultural methods.
- c) Provision of farmers insurance for crop loss due to heat wave

Long term and resilience building

- a) The issue of food security, nutritional security and improved livelihood in the rural areas is very essential. Efforts needs to be undertaken to strengthen the systems so that damage and loss can be minimized.
- b) Promoting sustainable and resilient infrastructure to minimize the damages caused by various disasters

3.8. PROTECTION

Overview

The communities which are already suffering from the COVID-19 related problems, is now facing issues because of the heatwave. High chances are there for the rise of protection related issues such as violence, discrimination and neglect towards the vulnerable groups of the society. It is important to ensure that the rights and entitlements of the affected population are being protected.

PwDs, women, children, elderly, HIV/AIDS, trans-genders, and socially isolated groups are often vulnerable in the wake of disasters. Focused mapping and intervention should be done in order to provide protection to these groups. Women, adolescent girls, children, and trans-genders continue to remain as the victims of sexual violence and psychological abuse. The National Family Health Survey shows that 0.9% of young women age 18-29 years in Rajasthan experienced sexual violence by age 18. The percent of young women age 18-29 years experienced sexual violence by age 18 in Madhya Pradesh and Uttar Pradesh are 1.0% and 0.7% respectively. 0.4% and 6.2% of Young women age 18-29 years in Haryana and Maharashtra have experienced sexual violence by age 18. 1.6% of Young women age 18-29 years in Delhi have experienced sexual violence by age 18. A disaster can exacerbate the existing conditions of violence and abuse. Proper measures have to be taken to tackle them.

Assessment Findings

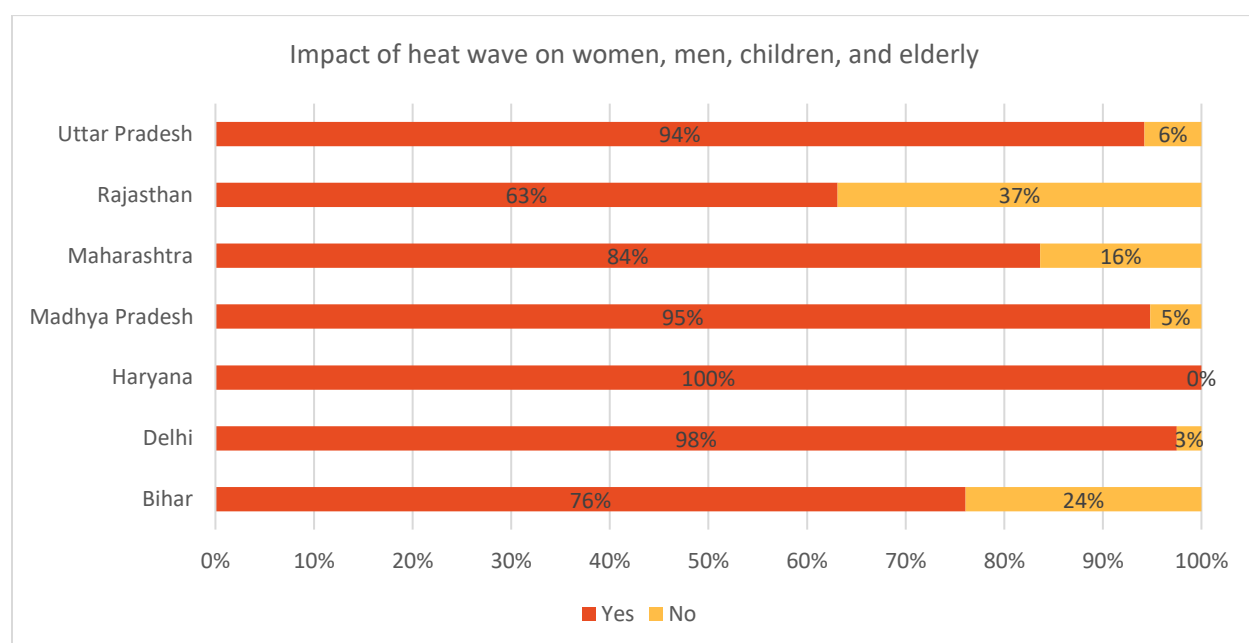


FIGURE 27: IMPACT OF HEAT WAVE ON WOMEN, MEN, CHILDREN, AND ELDERLY

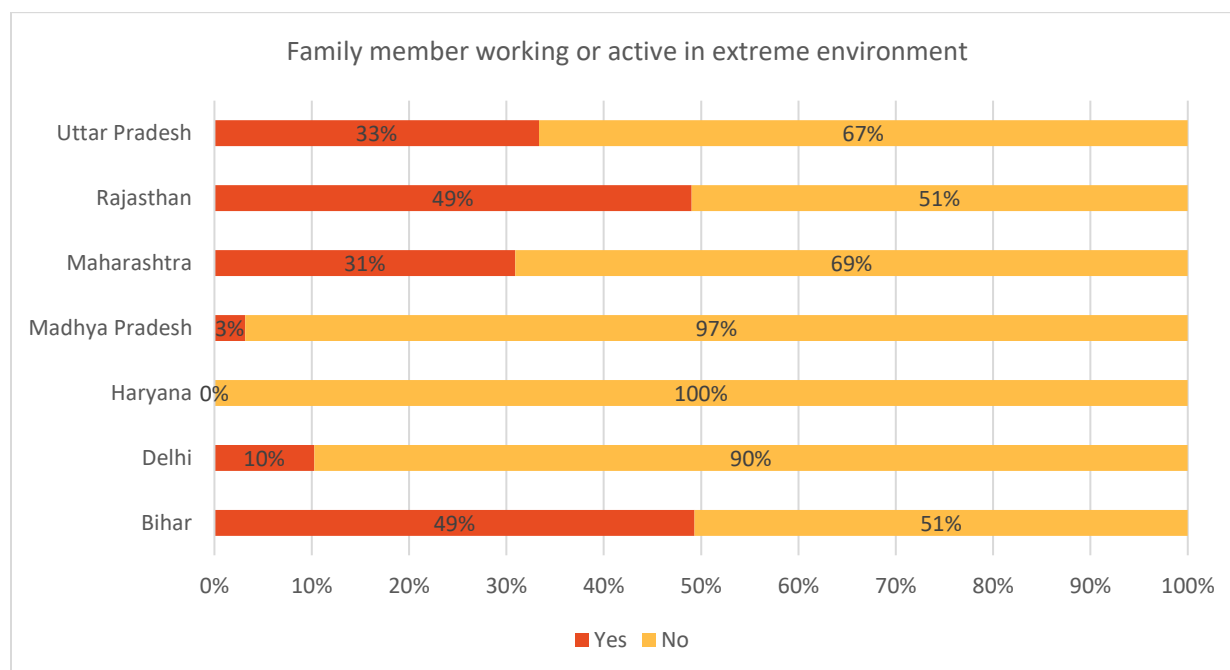


FIGURE 28: FAMILY MEMBER WORKING OR ACTIVE IN EXTREME ENVIRONMENT

Fig 28 refers to the graphical representation of per cent of surveyed population working or active in extreme environment.

- In Uttar Pradesh, 33% of the respondent HHs had family members working or active in extreme environment.
- In Rajasthan, 49% of the respondent HHs had family members working or active in extreme environment.
- In Maharashtra, 31% of the respondent HHs had family members working or active in extreme environment.
- Only 3% of the respondent HHs in Madhya Pradesh had family members working or active in extreme environment.
- None of the surveyed population had family members working or active in extreme environment in Haryana
- 10% of the respondent HHs in Delhi had family members working or active in extreme environment.
- In Bihar, 49% of the respondent HHs had family members working or active in extreme environment.

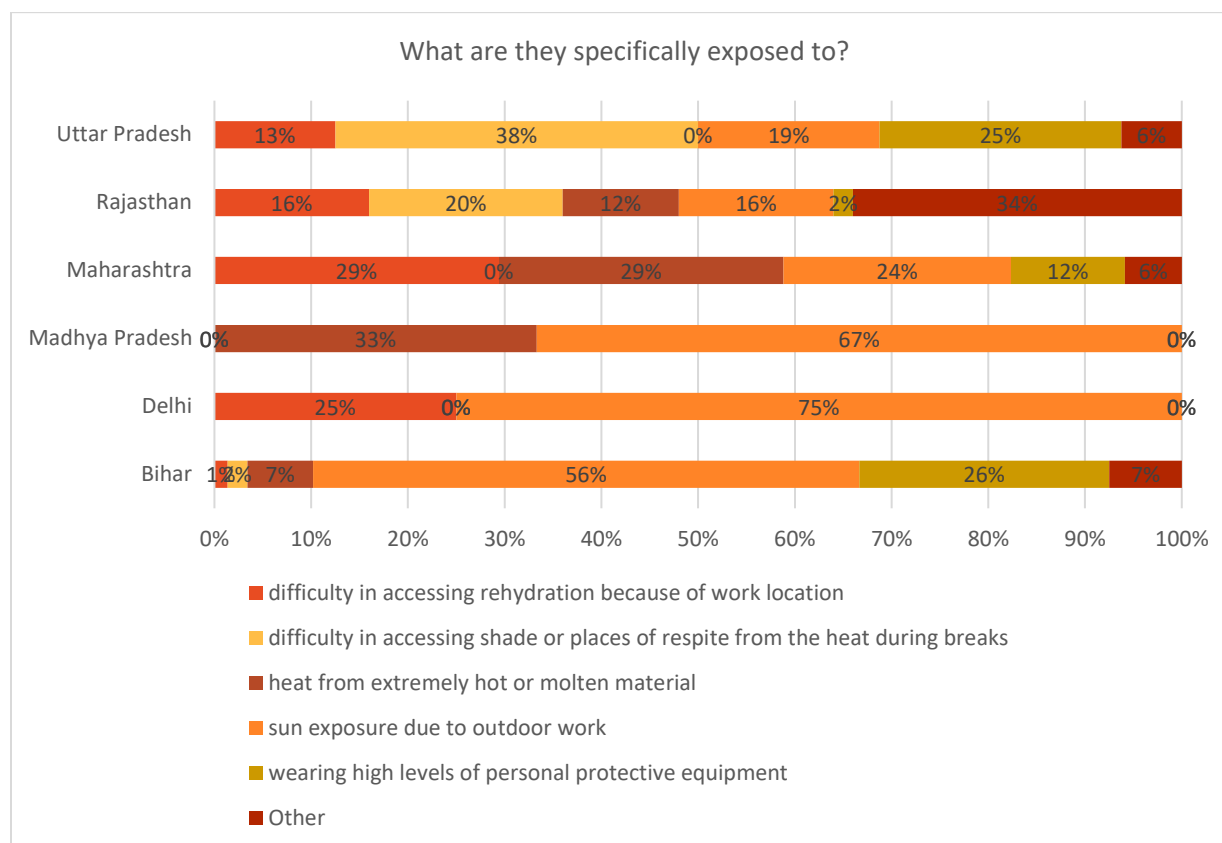


FIGURE 29: WHAT ARE THEY SPECIFICALLY EXPOSED TO?

Exposure to extreme environment during heat wave can have adverse effects on the health of the people. Fig 29 shows the kind of problems people are specifically exposed to while working or being active in an extreme environment.

- In Bihar, out of the people who are exposed to the extreme environment, 26% suffer from heat due to wearing high levels of personal protective equipment, while 56% suffers due to the sun exposure because of the outdoor work. 7% are exposed to heat from extremely hot or molten material, 2% suffer from the difficulty in accessing shade or places of respite from the heat during breaks. 7% are exposed to other difficulties due to heat.
- In Delhi, out of the people who are exposed to the extreme environment, 25% suffer from difficulty in accessing rehydration because of work location while 75% suffers due to the sun exposure because of the outdoor work.
- In Maharashtra, out of the people who are exposed to the extreme environment, 29% suffer from difficulty in accessing rehydration because of work location and 29% are exposed to the heat from extremely hot or molten material. 24% of the respondents are facing difficulty

because of the sun exposure due to outdoor work. 12% faces difficulty due to wearing high levels of personal protective equipment. 6% are facing difficulties due to other reasons.

- 67% of the surveyed population in Madhya Pradesh who are exposed to the extreme environment suffer because of sun exposure due to outdoor work, while 33% are exposed to heat from extremely hot or molten material.
- 20% of the surveyed population in Rajasthan who are exposed to the extreme environment suffer because of difficulty in accessing shade of places of respite from the heat during breaks. 16% of them have difficulty in accessing rehydration because of work location while 12% are exposed to heat from extremely hot or molten material. 16% of them are exposed to the sun due to outdoor work and 2% suffer heat wearing high levels of personal protective equipment.
- In Uttar Pradesh, out of the people who are exposed to the extreme environment, 38% suffer from difficulty in accessing shade or places of respite from the heat during breaks. 25% of them suffer from heat because of wearing high levels of personal protective equipment. 19% are exposed to sun due to outdoor work and 13% have difficulty in accessing rehydration because of work location. 6% face difficulties due to other reasons.

TABLE 7: MEMBERS AGE BELOW 13 AND ABOVE 45

	Bihar	Delhi	Haryana	Madhya Pradesh	Maharashtra	Rajasthan	Uttar Pradesh
Below 13	816	46	3	203	58	206	89
Above 45	1579	31	1	148	99	185	70

Recommendations

Short term for immediate response

- Locate the vulnerable groups and communities residing in the isolated areas.
- Women, girls and PwDs should have access to information related to support services for redressal of GBV, exploitation, abuse and harassment.
- There is a high chance of children getting into labour or getting married off to ease the financial burden. Hence activation of community level Child Protection mechanisms is very important. If they are already available, it can start from the immediate response phase. Coordination with the DCPU for safety and security of children through active village level monitoring mechanisms like VLCPC should also be part of the medium term responses. In the long term coordination with the SCPCR on redressal is also important

- d) Access to safe drinking water, well lit, sanitation facilities, menstrual health and hygiene products should be ensured in the temporary shelters as well.

Medium term recommendations for recovery

- a) Services for women, girls and children facing protection risks like short stay homes, legal aid, and medical help should be considered as essential services during and in the post disaster situation.

Long term and resilience building

- a) Awareness generation programs aims at spreading awareness among the vulnerable groups regarding their rights and entitlements.

3.9. EARLY WARNING AND INFORMATION DISSEMINATION

Assessment Findings

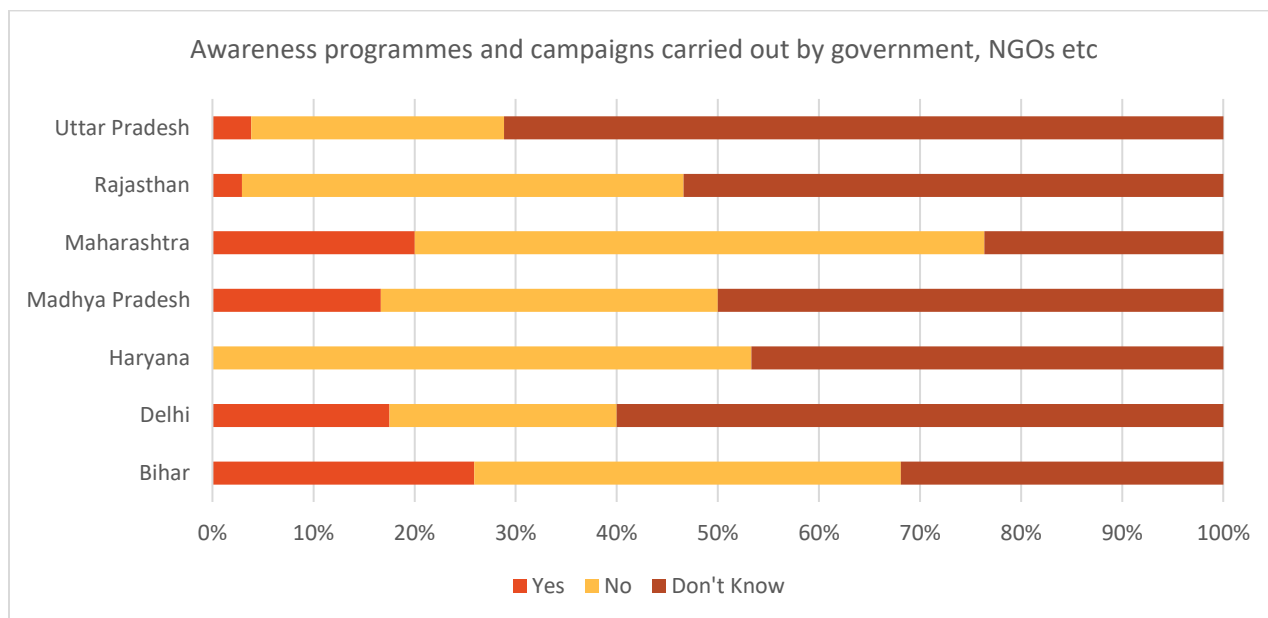


FIGURE 30: INFORMATION ON AWARENESS CAMPAIGNS

- Only 17% of the surveyed households were aware about the heatwave risk campaigns and awareness conducted by government, NGOs, etc. State-wise details are provided in Fig 30.

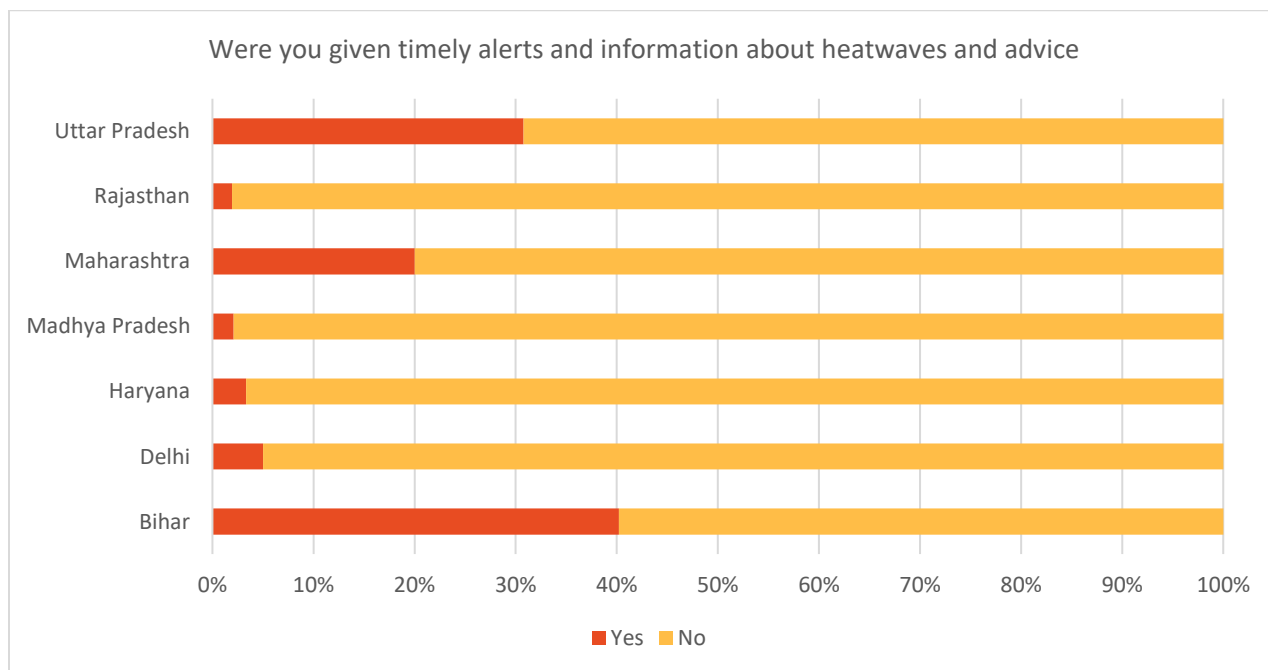


FIGURE 31: TIMELY ALERTS AND INFORMATION

- 23% of the surveyed HHs reported that they received timely alerts, advice and information on heatwave. State-wise details are provided in Fig 21.
- 27% of the surveyed HHs reported that they received early warnings/forecast predicted on high temperatures.

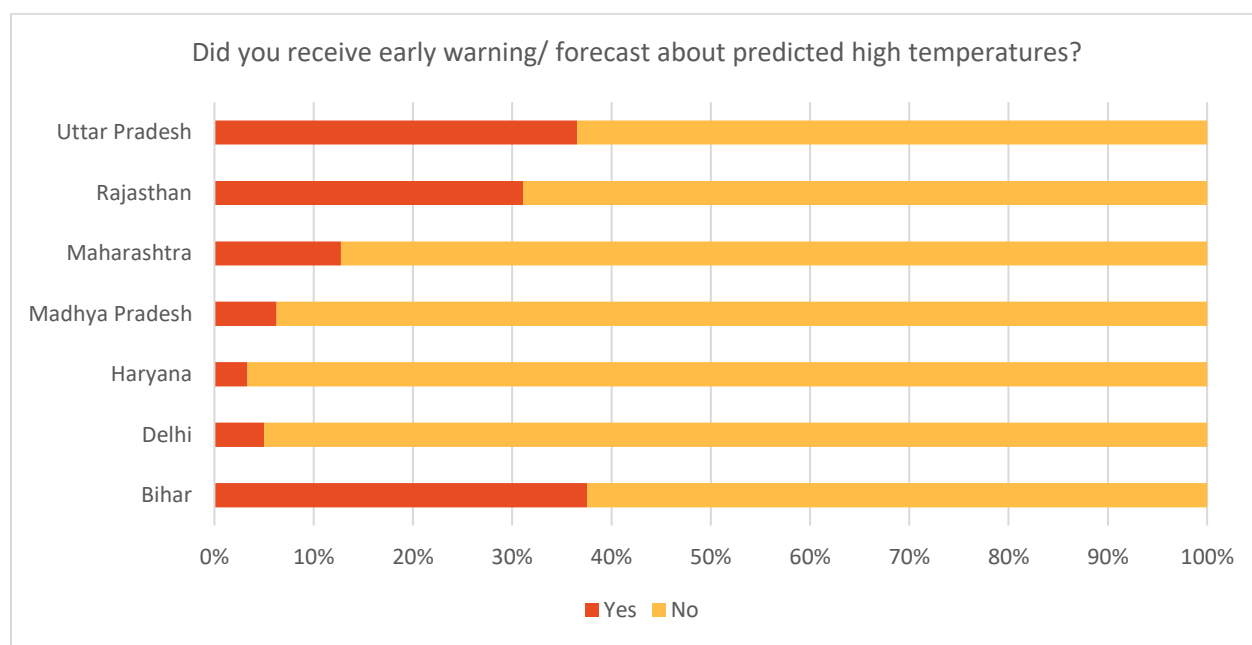


FIGURE 32: EARLY WARNING/FORECAST

Recommendations

Short term for immediate response

- A communication strategy to target the most vulnerable groups with heat-health messaging,
- Public service announcements to be made in areas where vulnerable population is located e.g. homeless people, people in makeshift shanties, etc.
- Awareness generation sessions through local NGO networks
- Engaging health front line workers to disseminate awareness

Annexure

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Name	District	Name	District
Bihar		Maharashtra	
Subosh Kumar	Gaya	Yogesh Nerpagar	Nashik
Sachin Kumar Tendulkar	Gaya	Bhausahab Shelke	Nashik
Amit	Muzaffarpur	Pankaj Rathod	Nashik
Prakash Yadav	Muzaffarpur	Priyanka Tawde	Latur
Vijay kumar	Madhepura	Leela Jadhav	Latur
Randhir Kumar	Madhepura	Rajabhau Jadhav	Latur
Mithlesh Kumar	Khagaria	Madhya Pradesh	
Radheshyam kumar	Saharsa	Jitendra Kumar Pal	Chattarpur
Rajnandani Singh	Patna	Thakur Prasad Vishwakarma	Chattarpur
Vikas Kumar	Khagaria	Haridas Raikwar	Tikamgarh
Md Irsad	Muzaffarpur	Harish	Jhabua

Rakesh Yadav	Muzaffarpur	Delhi		
Madhav Kumar	Samastipur	Kavita	North Delhi	
Sushma Singh	Samastipur	Rekha	West Delhi	
Jyoti Kumari	Madhepura	Rajkumari	North Delhi	
Pravin Kumar	Khagaria	Haryana		
Uttar Pradesh		Ajay	Gurugram	
Rupesh Kumar	Sitapur	Ravi	Gurugram	
Manoj Kumar Mishra	Balrampur	Rajasthan		
Ramsurat Prajapati	Balrampur	Jeevraj Katara	Dungarpur	
Rahman Ali	Balrampur	Prem Shankar	Bharatpur	
Aman Deep	Sitapur	Suresh Kumar	Pratapgarh	
Kallu Ram	Balrampur	Mag Singh Rathore	Jaisalmer	
		Peparam Barupal	Badmer	

JRNA Questionnaire

1. [Household tool](#)
2. [Key Informant Interview](#)

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