COVID -19: Impact, Spreading Pattern and cause of corona in Rural Areas with special reference to Ujjain district of M. P., India

[1*]Dr. Shuchita Chandorkar, [2] Dr. Shobha Shouche and [3]Deepika Tiwari

[1*]Department of Zoology, Government College Kaytha Dist. Ujjain (M.P.) India; *Corresponding Author
[2]Department of Zoology and Bioinformatics, MVM, Ujjain (M.P.) India
[3]Department of Zoology and Bioinformatics, MVM, Ujjain (M.P.) India

Abstract- In India, the health care crisis prompted through the second one wave of the coronavirus pandemic is moving from big towns to small cities and rural regions. But as ill-prepared scientific infrastructure in villages leave human beings suffering to address the lethal virus, health experts said fighting its unfold in rural regions has emerged as the country's new challenge. In Ujjain: The pace at which corona is spreading in urban and rural areas has become a matter of concern for the administration. Total 12703 confirmed cases were recorded daily during the period in Ujjain district including both urban and rural areas out of which 2425 cases of nearby villages were involved in the study village wise. The daily new cases started rising from mid of March and attended peak between first to second week of May recorded 117 cases on May, 12, 2021 and thereafter, started decreasing gradually. Maximum no. of cases was recorded in Badnagar followed by Mahidpur > Tarana > Ghatia > Khachroad. Least no. of cases was recorded in Khachroad. Out of 12703 cases in Ujjain district during the period 19.1% of the cases were found to be from rural areas. Rural areas also have assets, strengths, and protective factors that can be used by public health to tailor policies and communications to lessen the likelihood of COVID-19 spreading throughout the community, and improve rural residents' overall health, potentially reducing the severity of COVID-19.

Keywords: COVID-19 spread in rural areas, causes, impact.

I.INTRODUCTION

The second wave of the coronavirus epidemic has shifted the health-care crisis in India from big cities to small towns and rural areas. However, as people in villages struggle to cope with the fatal illness due to a lack of medical facilities, health experts say controlling its spread in rural areas has emerged as the country's new challenge (Pasricha, 2021).The coronavirus disease has spread its tentacles in villages across India; unfolding one of India's most feared problems of tackling the pandemic with a frail health infrastructure in rural parts of the country (https://www.india.com/news/india/rajasthan-coronavirus-cases-nearly-70-per-cent-cases-from-villages-4658853/). Unlike last year during the first wave of the COVID-19 pandemic, the second wave witnessed the virus making inroads into rural areas of India as well. The second wave of the COVID-19 pandemic poses serious challenges that need immediate attention (https://www.cprindia.org/news/9855). The breakdown of an already stressed health system, a scarcity of vaccines, an unprecedented economic crisis, and rising inequality are all circumstances that raise serious concerns. As of the end of May, India was ravaged by the second wave of Covid-19, with approximately 25.5 million cases and 283,248 deaths reported. Rural India accounts for 66.5 percent of the country's population. Nearly 60% of hospitals, 80% of doctors, and 75% of medical facilities, on the other hand, are located in metropolitan regions. Cases increased in urban areas first, then extended to rural regions (65 percent, including semi-rural areas by September 2020) in the first wave, with the second wave following a similar trend (Madan, 2021). The district of Ujjain has a population of over 18 lakh people, with 60-70 percent of them living in rural areas. In Ujjain, the authorities is concerned about the rate at which corona is spreading in both urban and rural regions. If its spread in the rural areas is not stopped, then it may be difficult to manage treatment facilities. As per official figures all 6 tehsils of the district, reported 54 positive cases on January, 18 in February and 138 positive cases in March 2021. Thus only 210 positives cases were reported in 3 months. In contrast, till April 26 a whopping 882 new cases have been found in the rural areas. This way new cases in just 26 days of April are over 400% times the number of new patients recorded in the first quarter of 2021 (https://www.freepressjournal.in/indore/ujjain-corona-spread-in-rural-areas-a-concern).

Possible causes for the spread of corona in rural areas

1. *Slowed down economic activity in urban areas has an effect on rural areas as well:* Slowed down economic activity in urban areas has an effect on rural areas as well. Migration and daily-wage employees account for a major share of rural household income, according to numerous research and field experience. The informal economy in cities has been severely impacted, resulting in a loss of rural income. Furthermore, large layoffs and a lack of relief measures are driving migrants back to their villages, increasing the likelihood of the virus spreading (Mitra, 2021).

2. *Covid inappropriate behavior:* COVID restrictions were relaxed in rural areas compared to metropolitan areas, and social separation and wearing masks were prohibited. The primary reason for this was that rural people were unaware of COVID and mistook it for a typical cold. They believe that a common cold, cough, and fever can all be treated with folk remedies. (https://www.npr.org/2021/05/22/998489469/in-rural-india-less-covid-19-testing-more-fear-and-a-few-ventilators-for-million).
3. *Fragile health infrastructure:* The majority of COVID-19 cases in India were limited to urban areas when infections were growing at a slower rate. In later stages, not only have the cases expanded at a faster rate, but the focus has also shifted to rural areas with shaky health facilities (Radhakrishnan et al, 2020). The impact of the outbreak, according to experts, might be much more deadly in rural areas, where health care infrastructure is generally weaker and medical facilities are scarce. Rural areas also house about 73 percent of the country's inhabitants (Hindustan Times, New Delhi, May 16, 2021). Experts believed that even in large cities, well-equipped hospitals, isolation and testing centres are overburdened as illnesses spread exponentially and individuals and hospitals battle with oxygen shortages. In rural areas, such facilities are lacking, with small basic health care clinics ill-equipped to deal with the increase in infections. 2021 (Pasricha). Around 26,000 of the roughly 150,000 patients diagnosed with influenza-like symptoms in Madhya Pradesh's rural districts since April 5 have tested positive for Covid, showing a positivity rate of 17.3 percent, which is not far behind the state's total figure of 23 percent as of April 27. These rural patients constitute about 14 per cent of the total 189,055 new cases reported in MP between April 5 and 25 (Noronha, 2021). Therefore, experts are concerned as neither the beds nor the oxygen is available in the city hospitals. Shortage of medicines, injections and doctors has exposed the condition of health system. Because rural homes lack rooms with associated toilets, isolating patients at home poses a risk. Isolated patients might have a negative impact on the entire family. The entire rural area's population was put in jeopardy. Patients in remote areas are at danger due to a lack of skilled doctors. As a result of the unequal distribution of qualified doctors, people in rural and low-income areas are denied access to high-quality healthcare, leaving them vulnerable to quacks. (https://www.freepressjournal.in/ujjain/ujjain-lack-of-qualified-doctors-puts-rural-patients-at-risk-dr-purohit).
4. *Mass gatherings during political and religious events*: In recent weeks, religious festivals and political gatherings drew tens of thousands of people, making them "super spreader" events. The Indian media aggressively covered the large political and religious events, which delivered confusing messages about the severity of the outbreak. (Laxminarayan, 2021). In religious events such as *Kumbh mela* huge crowd included people from rural areas as well.
5. *Very low testing, reporting:* While testing for the disease was done on occasion, it appears that only a small percentage of individuals who died were ever examined. Some stories state explicitly that none of the deceased were tested, while others clearly imply that this was the case. The villagers sometimes refer to the fatalities as "mysterious," or even as being caused by other diseases like typhoid or malaria. Some reports describe a reluctance to get tested and even denial that the epidemic was real (https://thewire.in/health/in-rural-india-covid-19-outbreaks-have-one-standout-feature-speed).
6. *Low vaccination drive:* With less or no access to technology (bots/applications), lack of smartphone accessibility, no or disrupted internet connectivity, language disconnect, and local health care centres being located miles away, access to vaccination centres is significantly disrupted, especially for socioeconomically weaker sections who are digitally illiterate. While India has 450 million smartphone users in 2019, just 25% of the country's rural residents possessed one. Only 4% of Indians in rural regions and 23% of Indians in cities have access to computers. Internet access isn't universal however; only about 34% of Indians get it. As a result, about 550 million Indians continue to use feature phones with crucial phone numbers set on speed dial in areas of India with weak network signal. It's a stretch to expect people to use CoWin after that. As a result, the inoculation campaign in rural areas has been pushed backwards (Madan, 2021).
7. *Vaccine hesitancy:* Vaccine scepticism persists in rural India, despite the second wave of infections and deaths. Due to a lack of awareness regarding Covid-19, misinformation has been circulating in various sections of the country. Many people believe that the vaccine is causing more harm than good due to rumours on chatting apps that blame vaccines for untimely deaths and a variety of ailments, as well as fake news that the vaccines include pig flesh and cow blood and can cause infertility and even death. The biggest roadblocks to immunisation are apprehension and misinformation (Madan, 2021).

II.MATERIAL AND METHODS

Authors have collected data of corona cases from the list declared by the CHMO of Ujjain district (M.P.) India. The lists of corona cases include cases of main Ujjain city and nearby villages – Badnagar, Ghatia, Mahidpur, Tarana and Khachrod (Fig. 1). The data is considered from 19th March 2021, when the cases of corona started rising to 20th May 2021, where the cases began to decline again - total period of 63 days. Following analysis was done using the above data:

1) Day wise number of active cases. Tabulation of list was done, separating number of cases village wise
2) Seven days moving average was calculated so as to know the average time when cases were at peak cases
3) Graphical representations of above data were done.
4) Calculating what percentage of cases in village areas of overall cases in Ujjain district.

III.RESULTS AND DISCUSSIONS

Total 12703 confirmed cases were recorded daily during the period in Ujjain district including both urban and rural areas out of which 2425 cases of nearby villages were involved in the study (Table 1). Fig.1. shows Ujjain confirmed cases per day village wise. The daily new cases started rising from mid of March and attended peak between first to second week of May recorded 117 cases on May, 12, 2021 as evident from Table 1 (Fig. 2) and thereafter, started decreasing gradually. Seven days moving average also represented the same (Fig. Maximum no. of cases was recorded in Badnagar followed by Mahidpur > Tarana > Ghatia > Khachroad. Least no. of cases was recorded in Khachroad (Table 1, Fig.). Out of 12703 cases in Ujjain district during the period 19.1% of the cases were found to be from rural areas. In rural areas illiteracy and unawareness was may be one of the major cause about corona and its lethality. If one family member is affected by corona then other members did not follow the COVID protocols due to emotional causes. Also for or investigation patient is taken to the urban area, and whole family and other relatives go to the hospital with the patient, and social distancing could not be followed. According to Mishra and Hacque with 7.2 million rural households having no exclusive rooms, the process of self-isolation remains jeopardized (Mishra and Hacque, 2020). In such conditions, the returned migrant's isolation is not at all possible. On the other hand high population densities may also catalyzed the spread of COVID-19 (Rocklov and Sjodin, 2020). During second wave transportation was also open from urban to rural and rural to urban area. A myth was spreading about the vaccination, so villagers were not ready to get vaccinated. All above reasons can be the possible reasons for spread of corona to rural areas from urban areas.

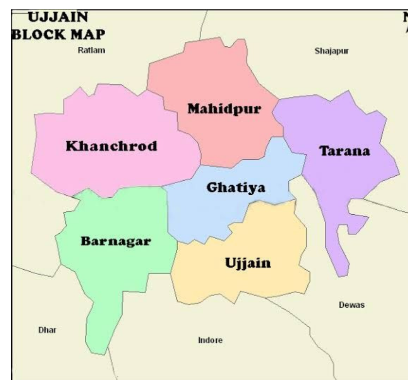

Fig.1. Ujjain Block Map
(Source: www.kvkujjain.org)

Table1. No. of COVID cases in urban and rural areas of Ujjain dist. during second wave (19 March, 2021 to 20 May, 2021)

Date	Urban areas		Rural areas					Over all cases
	Ujjain	Nagda	Badnagar	Ghatia	Mahidpur	Tarana	Khachroad	
19/03/21	20	3	0	1	1	0	2	27
20/03/21	25	3	0	0	0	0	0	28
21/03/21	27	0	0	0	0	0	0	28
22/03/21	32	0	0	0	1	0	0	33
23/03/21	38	2	2	0	0	1	1	44
24/03/21	48	5	4	0	1	0	0	58
25/03/21	82	0	0	0	0	1	0	83
26/03/21	62	9	11	1	1	0	1	85
28/03/21	58	8	4	1	0	1	0	72

Date	Urban areas		Rural areas					Over all cases
	Ujjain	Nagda	Badnagar	Ghatia	Mahidpur	Tarana	Khachroad	
29/03/21	28	2	1	0	0	1	0	32
30/03/21	67	0	0	1	1	1	0	70
31/03/21	84	0	1	0	0	1	0	86
1/4/2021	77	5	0	0	2	0	1	85
2/4/2021	83	1	4	0	1	0	0	89
3/4/2021	80	2	5	0	3	4	0	94
4/4/2021	87	2	5	3	3	1	0	98
5/4/2021	66	4	2	1	0	1	0	74
6/4/2021	111	3	2	2	0	4	1	123
7/4/2021	83	3	5	0	3	0	0	94
8/4/2021	110	10	1	2	2	4	1	130
9/4/2021	124	4	4	5	5	6	2	150
10/4/2021	160	8	31	1	12	4	2	218
11/4/2021	181	5	8	2	0	0	0	212
12/4/2021	287	6	9	6	0	9	0	317
13/04/21	205	5	4	6	8	19	2	249
14/04/21	243	0	2	0	5	7	0	267
15/04/21	229	8	22	2	1	13	0	275
16/04/21	252	6	22	4	8	27	4	323
17/04/21	190	8	4	0	7	27	0	236
18/04/21	262	0	12	1	2	34	0	311
19/04/21	206	12	10	0	0	26	1	255
20/04/21	161	4	6	2	9	6	1	188
21/04/21	210	10	6	0	5	17	1	249
22/04/21	217	3	18	1	3	16	1	259
23/04/21	294	6	15	1	6	24	4	350
24/04/21	257	4	12	5	7	16	3	304
25/04/21	250	0	23	3	6	15	1	304
26/04/21	273	1	20	3	10	18	1	326
27/04/21	180	8	16	3	22	18	2	249
28/04/21	246	2	17	5	14	21	3	308
29/04/21	259	4	23	6	26	14	0	332
30/04/21	235	1	21	4	16	7	0	284
1/5/2021	262	3	11	1	12	13	1	262
2/5/2021	172	3	30	6	5	17	0	233
3/5/2021	213	2	43	31	23	11	2	325
4/5/2021	233	39	29	7	29	16	2	355
5/5/2021	299	23	26	3	34	22	3	410
6/5/2021	268	14	32	3	29	23	1	370
7/5/2021	232	22	22	3	3	11	15	308
8/5/2021	220	14	20	4	13	8	7	286
9/5/2021	203	5	46	8	10	9	0	281
10/5/2021	170	19	33	7	22	21	3	275
11/5/2021	172	9	29	7	32	9	15	273

Date	Urban areas		Rural areas					Over all cases
	Ujjain	Nagda	Badnagar	Ghatia	Mahidpur	Tarana	Khachroad	
12/5/2021	151	8	36	5	56	14	6	276
13/5/2021	176	23	32	4	25	4	5	269
14/05/21	182	28	35	2	15	2	6	270
15/05/21	204	8	11	8	18	1	0	250
16/05/21	136	27	29	4	22	6	8	232
17/05/21	124	2	14	2	9	2	1	154
18/05/21	81	13	20	0	28	2	7	151
19/05/21	98	4	47	3	38	6	1	197
20/05/21	70	2	14	2	31	6	2	127

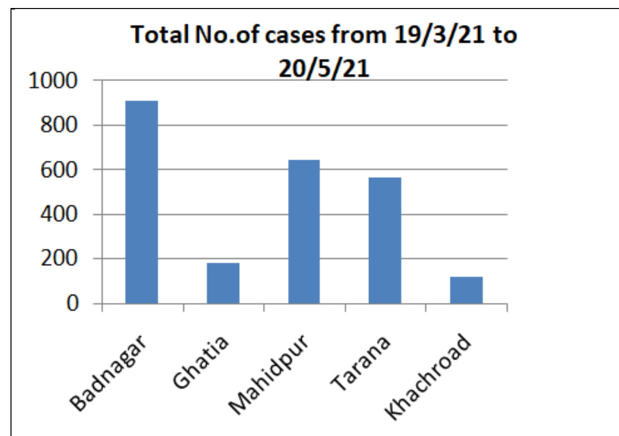

Fig.2. Total no. of cases village wise

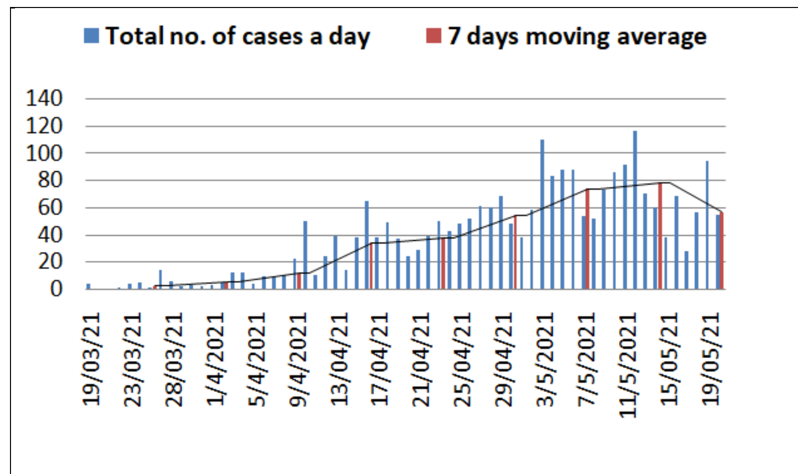

Fig.3. Total no. of cases a day in rural areas and 7 days moving average

IV.CONCLUSIONS

The pace at which corona is spreading in urban and rural areas has become a matter of concern for the administration. Rural areas also have assets, strengths, and protective factors that can be used by public health to

tailor policies and communications to lessen the likelihood of COVID-19 spreading throughout the community, and improve rural residents' overall health, potentially reducing the severity of COVID-19. On the other hand rural residents must also adhere to COVID protocols, which include wearing masks, social distancing, and vaccination.

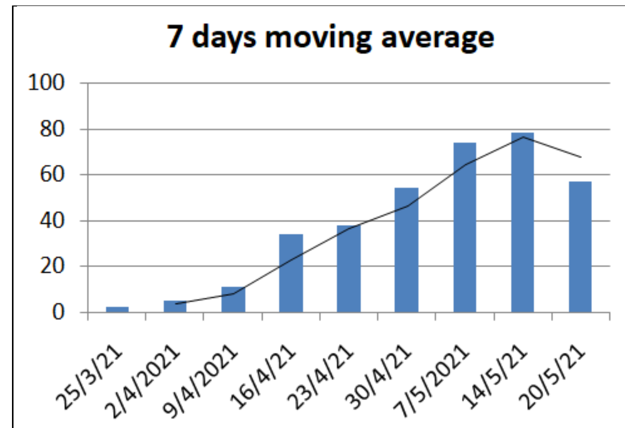

Fig.4. 7 days moving average

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