

# Outbreak Of COVID-19 In Nepal: An Overview of The First 1042 Cases and Public Health Response

Udesh Pandey

Chhetrapati Family Welfare Centre, Dallu, Kathmandu; Medical Officer

Correspondence:

Dr. Udesh Pandey; Email/Contact: [udeshpandey1@gmail.com](mailto:udeshpandey1@gmail.com) ; Contact: +977-9849580446

## ABSTRACT

**Background:** COVID-19 caused by SARS-CoV-2 originated from Wuhan, China has caused a worldwide pandemic of which Nepal is not an exception. Nepal got its first case on January 2, 2020, and as of May 28, 2020, a total number of 1042 cases, from 51 districts are reported to be positive on RT-PCR. After an initial gap of about 2 months between first and second confirmed cases, cases have shown a rapid increase in number despite continued nationwide lockdown. This report presents major events in the timeline of the outbreak, an overview of first 1024 cases and analysis of their epidemiological features.

**Methods:** Relevant data concerning COVID-19 cases and RT-PCR tests were derived from daily situation reports as published by the Ministry of Health and Population. It was compared with global data and population structure of the country.

**Results:** When compared with initial reports from China, the proportion of asymptomatic cases are much higher and compared with global data mortality rate is very low (6.5% worldwide vs 0.45% in Nepal). Younger age group in their 20s and 30s are disproportionately affected than older age groups. Males (77%) are affected much more than females (23%).

**Conclusion:** The rate of laboratory testing with RT-PCR has increased significantly but serological antibody tests should be used with caution. In upcoming days, a massive mobilization of resources may be required across the country to contain the infection and treat moderately and critically ill patients.

**Key words:** COVID-19; Coronavirus; SARS-CoV2; Nepal; Epidemiology

| Access this article Online  | Article Info.   |
|---|---|
| Quick Response (QR) Code  | How to cite this article in Vancouver Style?  |
|    | Pandey U. Outbreak Of COVID-19 In Nepal: An Overview Of The First 1042 Cases. Journal of Karnali Academy of Health Sciences. 2020; 3(COVID-19 Special Issue)  |
|   | <b>Received:</b> 21 September 2020 <b>Accepted:</b> 29 December 2020 <b>Published:</b> 30 December 2020   |
|   | <b>Source of Support:</b> Self <b>Conflict of Interest:</b> None  |
|   | <b>Copyright &amp; Licensing:</b> ©2020 by author(s) and licensed under CC-BY 4.0  license in which author(s) are the sole owners of the copyright of the content published. |
| <p><b>Open Access Policy:</b> The Journal follow open access publishing policy, and available freely in the <a href="#">website of the Journal</a> and is distributed under the terms of the <a href="#">Creative Commons Attribution International License 4.0</a> under the CC-BY 4.0 license, and the author(s) retain the ownership of the copyrights and publishing rights without restrictions for their content, and allow others to copy, use, print, share, modify, and distribute the content of the article even in commercial purpose as long as the original authors and the journal are properly cited.</p> <p><b>Disclaimer:</b> The statements, opinions and data contained in this publication are solely those of the individual author(s) and contributor(s). Neither the publisher nor editor and reviewers are responsible for errors in the contents nor any consequences arising from the use of information contained in it. The Journal as well as publisher remain neutral with regards to any jurisdictional claims in any published articles, its contents and the institutional affiliations of the authors.</p> |   |

## BACKGROUND

An outbreak of new strain of coronavirus, initially referred to as 2019-nCoV, causing SARS-like illness was identified in Wuhan, China in December of 2019. This disease is believed to have been originated from the local seafood market and is probably of bat origin.<sup>1</sup> Later WHO named the disease as COVID-19 (coronavirus disease 2019) and the causative virus as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).<sup>2</sup> Direct person-to-person transmission via respiratory droplets in hospital and community settings has been identified as the primary means of transmission, which has led to a massive outbreak in China and all over the world.<sup>3</sup> WHO declared the outbreak as a public health emergency of international concern on January 30, 2020, and as a 'global pandemic' on March 11, 2020.<sup>4</sup> As per the initial study from the Chinese Center for Disease Control, most of the cases were asymptomatic or with mild illness (81% cases). However, 14% of cases were severe and 5% had critical illness requiring mechanical ventilation with an overall case fatality rate of 2.3%.<sup>5</sup>

The first case of COVID-19 was identified in Nepal early on, on January 2, 2020, and as of May 28 of the same year, the total number of cases, as reported by the Ministry of Health and Population (MoHP) is 1042, with five deaths attributed to COVID-19.<sup>6</sup> As of the same date, the total number of cases of COVID-19 reported worldwide stands at 5,593,631 with 353,334 deaths attributed to it, which gives a mortality rate of 6.3%.<sup>7</sup>

This aim of this study is to analyze early epidemiological features of this pandemic in Nepal and initial public health response by the government. These findings can be used as reference for comparison of epidemiological characters of affected population in the future.

## METHODOLOGY

This report is an analysis of the early epidemiological features and the major events on the timeline of the outbreak of COVID-19 in Nepal. Data concerning COVID-19 cases and RT-PCR testing and public health measures adopted by the government were

derived from daily situation reports published by the Ministry of Health and Population and available in MoHP's website (assessed on May 29, 2020).<sup>6</sup> These figures were compared with global data from WHO's daily Coronavirus disease situation report, reports from Chinese Central for Disease Control, OurWorldInData.org, and the population structure of the country.<sup>8,5,9,10,11</sup> Daily data were tabulated in Microsoft excel and graphs were created.

## Major events in COVID-19 outbreak in Nepal

The first confirmed case in Nepal identified on January 23, 2020, was a 32 years old male from Kathmandu who was a student in Wuhan University of Technology, Wuhan, China and had come to Nepal on Jan 13, 2020. He was admitted to Sukraraj Tropical and Infectious Disease Hospital, Kathmandu and was discharged on Jan 17, 2020, with instructions for self quarantine.<sup>12</sup> Second confirmed case was only seen two months later on March 23, 2020 in a 19 years old female from Kathmandu, who had come from France via transit in Doha, Qatar. Following the identification of the second case, nationwide lockdown was announced on March 24 (an upgrade to partial lockdown announced on March 18), with closure of international borders, which has been extended up to June 2, as of May 29, 2020.

The first case outside Kathmandu valley, and third case overall, was identified on the Dhading district of Bagmati Province on March 25, 2020. Later, 2 more cases were identified in the month of March in Sudurpaschim province and Gandaki Province on March 27 and 28 respectively. A total of 5 cases were thus detected by the end of March.

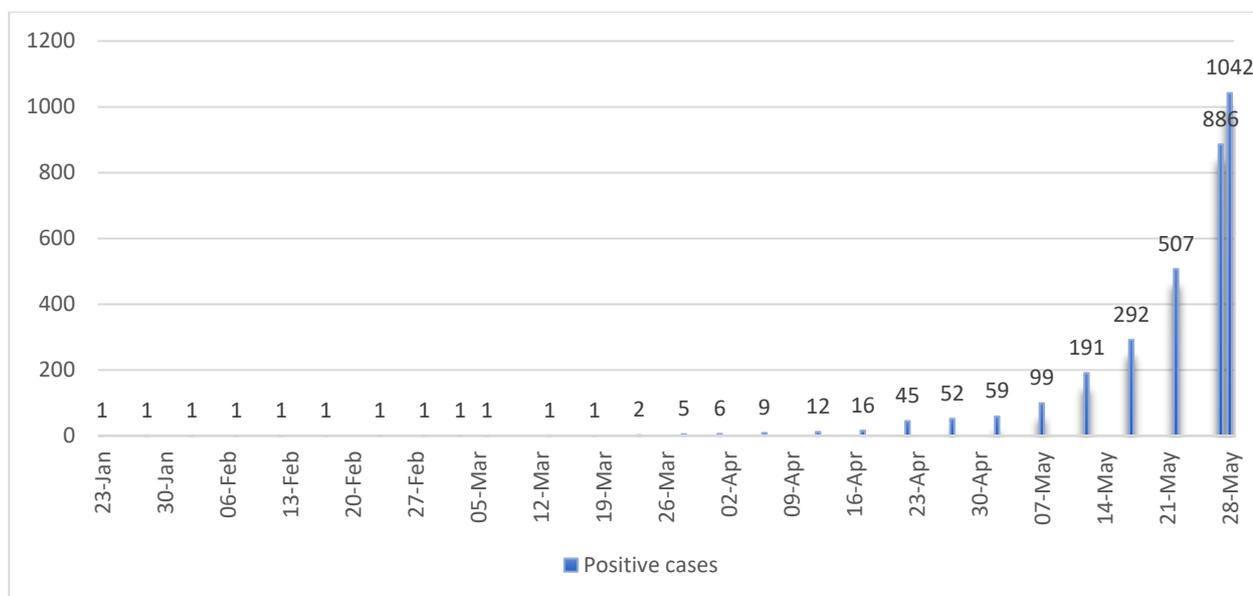
The first case of local transmission was seen on the 7th case of the country on April 4, 2020 in a 34 years old female in Kailali district of Sudurpaschim province.

On April 11, 2019, three Indian nationals were found to be positive for COVID-19 in Parsa district of Province 2 and 12 more Indian nationals from Udayapur district of Province 1 were added to the list of positive cases on April

19, 2019. These were considered as the first two cluster of cases identified.<sup>13</sup> With this, total of 57 cases were detected by the end of April.

When the 58th case was identified on May 1, 2020, in Province 5, cases of COVID-19 were identified in 6 out of 7 provinces of the country. The first case of Province 6 was identified only on May 19, 2020.

First COVID-19 related death occurred on May 14, 2020, in a 29 years old female, who was on her 8th post-partum day following normal vaginal delivery. As of May 28, 2020, a rapid surge in cases has been seen with total of 1042 cases (Figure 1) and 5 COVID-19 related deaths.



**Figure 1: Total cumulative number of RT-PCR confirmed COVID-19 cases** (source: MoHP daily situation reports)

The return of Nepalese migrants from India, mainly through informal routes, has been suggested as one of the major cause of the rapid rise in the number of cases. The inability of the local as well as the central government to welcome them to proper quarantine facilities and test them before allowing them to return back to the community has been criticized widely.<sup>14</sup> This has made several districts of the Terai belt of the country, with an adjoining border with India, a hotspot for infections. As of May 28, 2020, 51 districts out of 77 districts have positive cases. Out of which top nine districts with the highest number of cases reported are all bordering districts with India: Banke-171, Rautahat-128, Kapilvastu-109, Parsa-95, Jhapa-79, Bara-46, Rupandehi-44, Dhanusa-42 and Sarlahi-41.

In these areas and other parts of the country, including the capital city, contact tracing and isolating affected individuals have been

deemed unsatisfactory.<sup>15</sup> Lack of human resources and proper guidelines for the local bodies and social discrimination towards the affected population may have contributed to worsening the situation.<sup>16</sup>

### Testing for COVID-19 in Nepal

Due to the unavailability of reagents required for laboratory diagnosis of COVID-19 by RT-PCR, a swab of the first identified case was sent to the WHO laboratory in Hongkong.<sup>12</sup>

On January 27, 2020 testing via RT-PCR was started in the National Public Health Laboratory (NPHL), Kathmandu. Due to lack of testing facilities, equipment, and reagents initially, less than 1000 total tests were done up to the end of March. In the following months, however, with an increase in the number of testing facilities, PCR machines and reagents, the total number of tests done has relatively increased, with a total of 60,916 RT-PCR tests

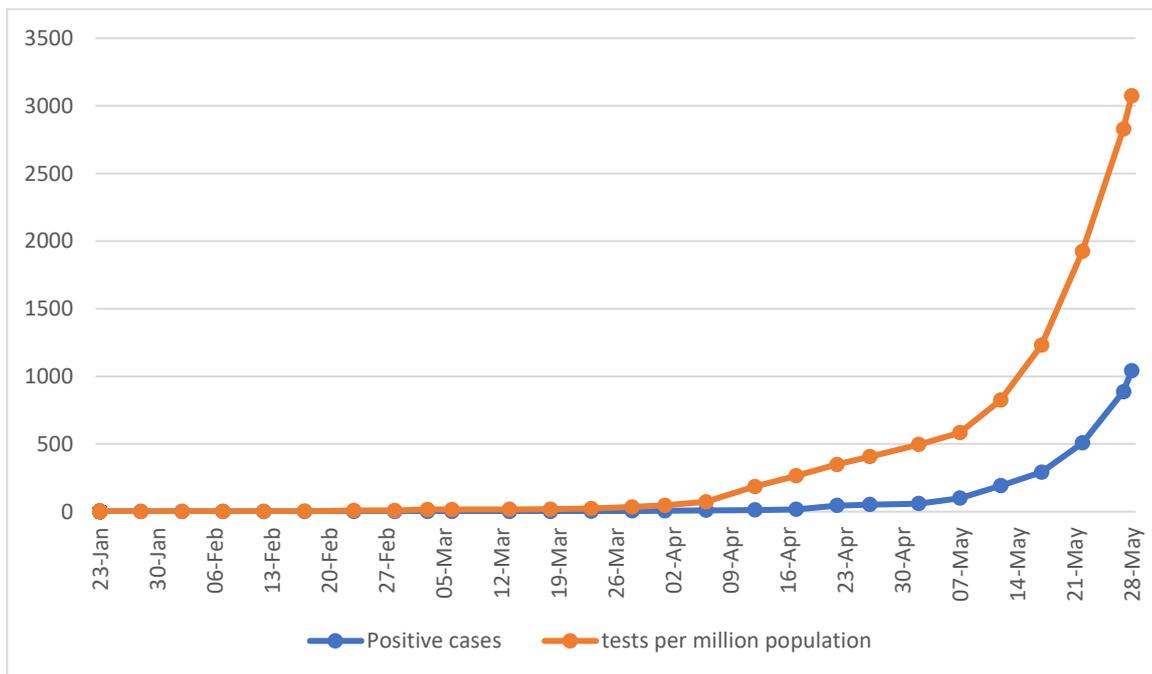
were done up to May 28, 2020 which roughly corresponds to 2.00 tests per 1000 population (Total estimated population of Nepal in 2020 is 29.99 million).<sup>11</sup> For comparison, as of same date, per 1000 population, United Arab Emirates (UAE) had done 215.65 tests, United States of America (USA) had done 47.56 tests, United Kingdom (UK) had done 45.35 tests and South Korea had done 16.51 tests. In South Asia, Maldives had done 40.03 tests, India had done 2.44 tests, Pakistan had done 2.30 tests and Bangladesh 1.13 tests per 1000 population (as of May 28, 2020).<sup>17</sup>

However, as different countries are at different stages of pandemic, a better way to compare is to look at the total number of RT-PCR tests done per confirmed case. From this perspective, Nepal stood at a better position with 68.8 RT-PCR tests per confirmed cases as of May 28, 2020. As of same date, South Korea

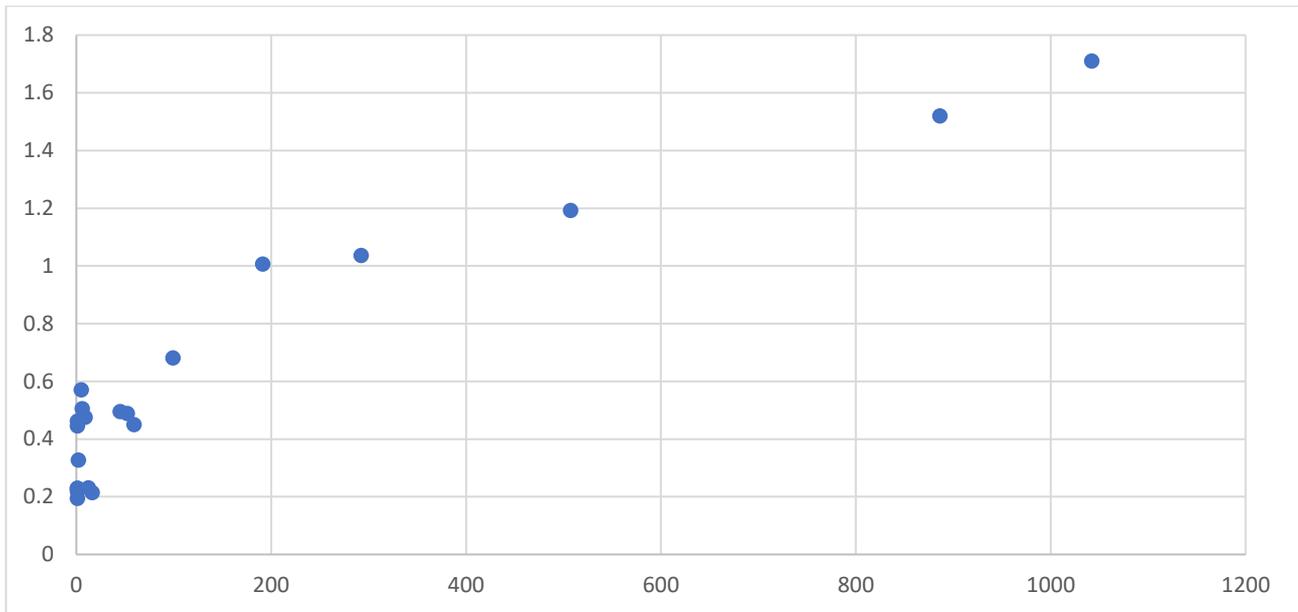
had done 74.6 tests, UAE had done 66.7 tests, India had done 21.2 tests, whereas UK and USA had done 12.3 and 9.3 tests per confirmed case.<sup>18</sup>

Government of Nepal is also conducting widespread serological antibody tests for COVID-19 via Rapid Diagnostic Tests (RDT) kits. 1,02,034 RDT tests have been done as a tool for primary screening as of May 28, 2020.<sup>6</sup> Use of RDTs in the face of the pandemic has been criticized in national and international level, owing to its inability to detect all active cases, lack of adequate data on sensitivity and specificity and questionable efficacy of available RDT kits available in the market.<sup>19,20</sup>

When plotted in a line diagram, an increase in the total number of positive cases corresponds with the increase in tests per million population (Figure 2).



**Figure 2: Total number of RT-PCR positive test results compared with RT-PCR tests per million population (source: MoHP's daily situation reports)**

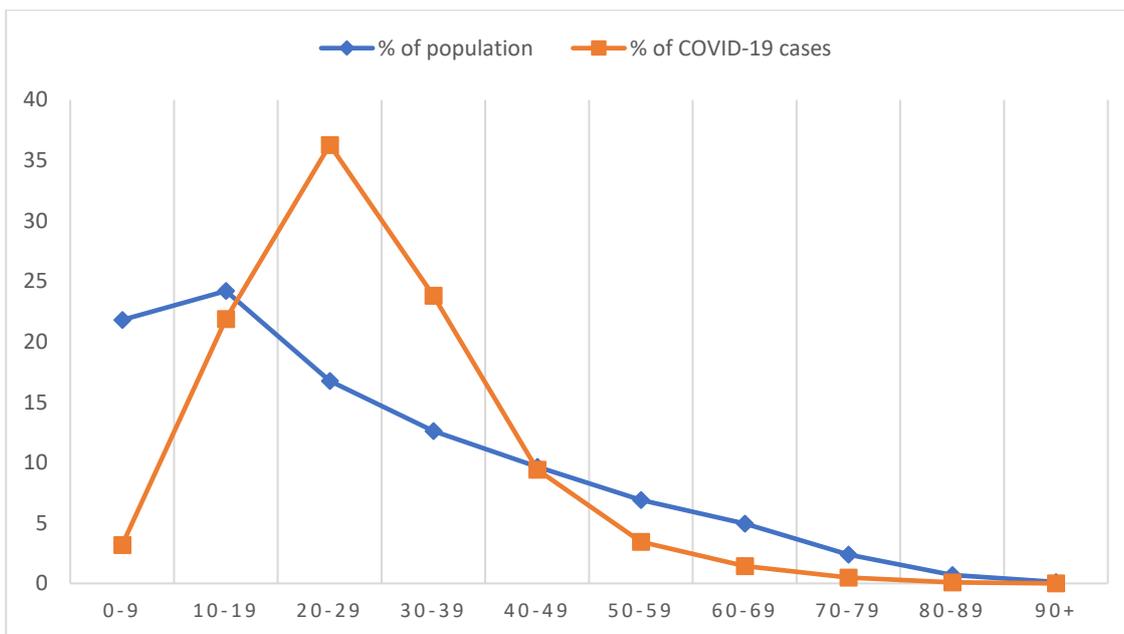


**Figure 3: Change in percentage of positive RT-PCR positive results with increase in total number of tests (source: MoHP's daily situation reports)**

But, as we can see in Figure 3, the percentage of positive test results has also increased significantly. On average 1 positive case was detected per 100 tests done when the total cases were about 200. When total cases reached 1000, almost 1.7 cases were positive per 100 tests. This shows that the total number of cases has increased disproportionately to increase in the number of testing.

Figure 4 shows the age distribution of the confirmed cases as of May 28, 2020 compared with the population structure of the country. This age distribution of confirmed cases shows bell-shaped curve with a peak at 21-30 years age group. When compared with the age structure of the population as per the National Population and housing census 2011, the younger age group in their 20s and 30s seems to be disproportionately more affected.<sup>10</sup>

**Age and Sex distribution**



**Figure 4: A comparison of Age-wise distribution of COVID-19 cases with Age-wise population distribution (source: MoHP's daily situation reports; National Population and Housing census 2011)**

**Sex Distribution:** Among the first 1024 cases in Nepal, 942 were males and only 102 were females. When expressed in percentage, only 23% are females in comparison to 77% of males (Figure 5). This distribution also correlates with the distribution of mortality. Out of total deaths, 20% are females and 80% are males, as of May 28, 2020.

**Clinical features and Mortality rates:** Compared with initial reports from Chinese CDC, where about 18% of the total infected patients had moderate to severe illness, a much

larger fraction in Nepal is reported to be asymptomatic or with mild symptoms.<sup>21</sup>

As of May 28, out of 1042 total cases, 5 deaths have been attributed to COVID-19. This gives the mortality rate of 0.47% as compared to the worldwide mortality rate of 6.5% on the same date.<sup>7</sup> The age of the deceased ranges from 25 years to 70 years and only the first case, out of five, was a female. Table 1 shows the description of deceased patients. Out of 5 reported deaths, 3 of them tested positive only after their death

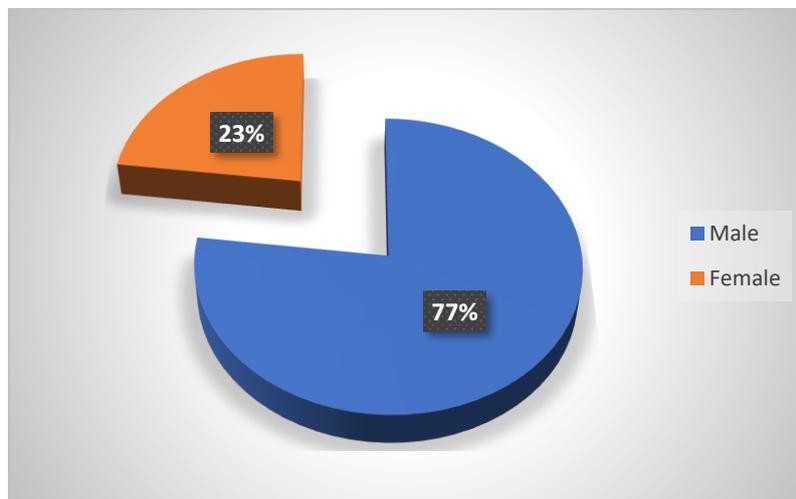


Figure 5: Gender distribution of COVID-19 cases as of May 28, 2020 (source: MoHP's daily situation reports)

Table 1: Mortality in COVID-19 patients in Nepal as of May 28, 2020

| Mortality no. | Mortality date             | Total cumulative nationwide positive cases on that day | Age | Sex | Residence district/ Province      | Place of death                             | Condition at death/Remarks  |
|---------------|----------------------------|--|-----|-----|-----------------------------------|--|---|
| 1             | May 14, 2020 <sup>22</sup> | 281  | 29  | F   | Sindhupal chowk/ Bagmati Province | On the way to Dhulikhel Hospital, Kabhre   | Fever and SOB ; 8th day post-partum; tested positive post-mortem                              |
| 2             | May 17, 2020 <sup>23</sup> | 292  | 25  | M   | Banke/ Province 5                 | Quarantine facility in Narainapur in Banke | Fever and diarrhea; Had came to Nepal on May 12, 2020 from India; Tested positive Post-mortem |

|   |   |                    |    |   |                           |                                   |   |
|---|---|--------------------|----|---|---------------------------|-----------------------------------|---|
| 3 | May 21, 2020 <sup>24</sup>                                | 453                | 41 | M | Gulmi/Province 5          | Crimson Hospital, Rupandehi       | MODS; was under ventilator support  |
| 4 | May 17, 2020 <sup>25</sup> (confirmed positive on May 25) | 682 (as of May 25) | 70 | M | Bara/Province 2           | National Medical College, Birjung | Admitted with diagnosis of TB and Pneumonia and was under being treated in ICU; tested positive post-mortem |
| 5 | May 28, 2020 <sup>26</sup>                                | 1024               | 56 | M | Lalitpur/Bagmati Province | KIST Hospital, Lalitpur           | Had underlying liver disease  |

## DISCUSSION

Early events in the timeline of COVID-19 pandemic in Nepal and early epidemiological features from January 3, 2020 to May 28, 2020 were analyzed in this study. This analysis shows that young males in their 20s and 30s are affected more and majority of cases are asymptomatic. COVID-19 has spread to all 7 provinces and 51 out of 77 districts with predominance in districts bordering with India.

Nationwide lockdown, early on from March 24, 2020, after identification of the first two cases, may have initially helped to limit the spread of disease. However, there has been a rapid surge in number of cases in the month of May (57 at the end of April to 1,042 at the end of May). Return of migrant workers from India has been considered one of the major contributors in this rapid rise.<sup>14</sup>

It is not surprising that the younger age group is affected more, as this age group comprises the most mobile population which is socially and economically active. Also, the younger population comprise a major fraction of migrant workers who came from India amidst the lockdown. As with the predominance of young adults, disproportionate burden in the male population is likely due to their larger social and economic mobility.

Lower fraction of symptomatic cases with lower mortality rates have been seen in many underdeveloped and developing parts of the world, where existing health systems are already weak, the population is dense and the

general public less aware.<sup>27</sup> Many suggestions have been put forward to explain this paradox including- younger average population size, varying immune response, cross-immunity from vaccines like BCG, and inefficient record-keeping system.<sup>28,29</sup> It is still a matter of further study and research in the upcoming days.

This scope of this study is limited to public data provided by MoHP in its daily briefings. This may not represent the true picture of prevalence at national level due to limitations in testing at community level.

## CONCLUSION

Nepal was one of the first few countries in the world, after China, to have a RT-PCR positive COVID-19 case. In spite of early nationwide lockdown, which initially slowed down the spread of COVID-19, a major outbreak with a rapid surge in cases has been witnessed. Lack of adequate contact tracing and isolation measures, the increasing influx of people from India to the Terai belt along with increased testing capacities could be the key causes of this exponential rise. Although the majority of cases are asymptomatic and compared to the global figures, the mortality rate is significantly low (0.7% compared with 6.5% worldwide), upcoming days could show a massive increase in confirmed cases and mortality rates. Continuing increase in cases of COVID-19 in Nepal warrants a large scale mobilization of resources and manpower across the country for contact tracing, identifying and isolating the positive cases as

well as for treatment of serious and critical patients.

## REFERENCES

1. Zhou P, Yang X lou, Wang XG, Hu B, Zhang L, Zhang W, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. Nature [Internet]. 2020 Mar 12 [cited 2020 May 29];579(7798):270–3. Available from: <https://doi.org/10.1038/s41586-020-2012-7> [Google Scholar](#); [Pubmed Abstract](#)
2. World Health Organization. WHO Director-General’s remarks at the media briefing on 2019-nCoV on 11 February 2020 [Internet]. [cited 2020 May 29]. Available from: <https://www.who.int/director-general/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020>
3. Chan JFW, Yuan S, Kok KH, To KKW, Chu H, Yang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. The Lancet [Internet]. 2020 Feb 15 [cited 2020 May 29];395(10223):514–23. Available from: [https://doi.org/10.1016/s0140-6736\(20\)30154-9](https://doi.org/10.1016/s0140-6736(20)30154-9) ; [Google Scholar](#); [Pubmed Abstract](#)
4. World Health Organization. Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV) [Internet]. [cited 2020 May 29]. Available from: [https://www.who.int/news/item/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-\(2005\)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-\(2019-ncov\)](https://www.who.int/news/item/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov))
5. Wu Z, McGoogan JM. Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72314 Cases from the Chinese Center for Disease Control and Prevention [Internet]. Vol. 323, JAMA - Journal of the American Medical Association. American Medical Association; 2020 [cited 2020 May 29]. p. 1239–42. Available from: <https://doi.org/10.1001/jama.2020.2648> ; [Google Scholar](#); [Pubmed Abstract](#)
6. Ministry of Health and Population- Situation Reports COVID-19 [Internet]. [cited 2020 May 29]. Available from: <https://moHP.gov.np/eng/>
7. World Health Organization. Coronavirus disease (COVID-19) Situation Report-129 [Internet]. [cited 2020 May 29]. Available from: [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200528-covid-19-sitrep-129.pdf?sfvrsn=5b154880\\_2](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200528-covid-19-sitrep-129.pdf?sfvrsn=5b154880_2)
8. World Health Organization. Coronavirus Disease (COVID-19) Situation Reports [ 1 to 129 ] [Internet]. [cited 2020 May 29]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>
9. Roser M, Ritchie H, Ortiz-Ospina E, Hasell J. Coronavirus Pandemic (COVID-19) [Internet]. Our World in Data. 2020 [cited 2021 May 2]. Available from: <https://ourworldindata.org/coronavirus>
10. Central Bureau Of Statistics. National Population and Housing Census. 2012.
11. Government of Nepal National Planning Commission Secretariat Central Bureau of Statistics. POPULATION MONOGRAPH OF NEPAL VOLUME I (Population Dynamics) [Internet]. 2014 [cited 2020 May 29]. Available from: <https://nepal.unfpa.org/sites/default/files/pub-pdf/PopulationMonograph2014Volume1.pdf>

12. Bastola A, Sah R, Rodriguez-Morales AJ, Lal BK, Jha R, Ojha HC, et al. The first 2019 novel coronavirus case in Nepal [Internet]. Vol. 20, The Lancet Infectious Diseases. Lancet Publishing Group; 2020 [cited 2020 May 29]. p. 279–80. Available from: [https://doi.org/10.1016/S1473-3099\(20\)30067-0](https://doi.org/10.1016/S1473-3099(20)30067-0) Google Scholar; Pubmed Abstract
13. World Health Organization. WHO Nepal Situation Updates on COVID-19, Situation Update #1 [Internet]. [cited 2020 May 29]. Available from: [https://www.who.int/docs/default-source/nepal-documents/novel-coronavirus/who-nepal-sitrep/who-nepal--sitrep-covid-19-20apr2020.pdf?sfvrsn=c788bf96\\_2](https://www.who.int/docs/default-source/nepal-documents/novel-coronavirus/who-nepal-sitrep/who-nepal--sitrep-covid-19-20apr2020.pdf?sfvrsn=c788bf96_2)
14. Nepal's COVID-19 Struggle Continues Amid a Concerning Surge – The Diplomat. [cited 2020 May 29]; Available from: <https://thediplomat.com/2020/05/nepals-covid-19-struggle-continues-amid-a-concerning-surge/>
15. The Kathmandu Post. Health experts warn of multiple outbreaks if contact tracing efforts are not ramped up. [cited 2020 May 29]; Available from: <https://kathmandupost.com/health/2020/05/08/health-experts-warn-of-multiple-outbreaks-if-contact-tracing-efforts-are-not-ramped-up>
16. The Kathmandu Post. Contact tracing is getting complicated as test subjects are not providing genuine personal details. [cited 2020 May 29]; Available from: <https://kathmandupost.com/health/2020/05/22/contact-tracing-is-getting-complicated-as-test-subjects-are-not-genuine-personal-details>
17. Roser M, Ritchie H, Ortiz-Ospina E, Hasell J. Total COVID-19 tests per 1,000 people [Internet]. Our World In Data. [cited 2020 May 29]. Available from: <https://ourworldindata.org/grapher/full-list-cumulative-total-tests-per-thousand>
18. Roser M, Ritchie H, Ortiz-Ospina E, Hasell J. Total number of COVID-19 tests per confirmed case, May 28, 2020 [Internet]. [cited 2020 May 29]. Available from: <https://ourworldindata.org/grapher/number-of-covid-19-tests-per-confirmed-case?time=2020-05-28&country=BGD~IND~MDV~NPL~PAK~KOR~ARE~GBR~USA>
19. World Health Organization. Advice on the use of point-of-care immunodiagnostic tests for COVID-19 Rapid diagnostic tests based on antigen detection [Internet]. 2020 [cited 2020 May 29]. Available from: [https://www.who.int/docs/default-source/coronaviruse/sb-2020-1-poc-immunodiagnosics-2020-04-08-e.pdf?sfvrsn=4c26ac39\\_2](https://www.who.int/docs/default-source/coronaviruse/sb-2020-1-poc-immunodiagnosics-2020-04-08-e.pdf?sfvrsn=4c26ac39_2); Google Scholar
20. Bell J. Trouble in testing land | Research | University of Oxford [Internet]. [cited 2020 May 29]. Available from: <https://www.research.ox.ac.uk/Article/2020-04-05-trouble-in-testing-land>
21. WHO Country Office for Nepal. Situation Update#6- Coronavirus Disease 2019 (COVID-19) [Internet]. 2020 [cited 2020 May 29]. Available from: [https://www.who.int/docs/default-source/nepal-documents/novel-coronavirus/who-nepal-sitrep/6-who-nepal--situpdate-covid-19-27052020.pdf?sfvrsn=fbbb9836\\_2](https://www.who.int/docs/default-source/nepal-documents/novel-coronavirus/who-nepal-sitrep/6-who-nepal--situpdate-covid-19-27052020.pdf?sfvrsn=fbbb9836_2)
22. The Kathmandu Post. Nepal reports its first Covid-19 death. [cited 2020 May 29]; Available from: <https://kathmandupost.com/national/2020/05/16/no-evidence-yet-that-covid-19-patient-s-death-on-thursday-was-due-to-the-disease>
23. The Kathmandu Post. Nepal reports second Covid-19 death. [cited 2020 May 29]; Available from: <https://kathmandupost.com/province-no-5/2020/05/17/nepal-reports-second-covid-19-death>

24. The Kathmandu Post. Nepal reports its third Covid-19 death. [cited 2020 May 29]; Available from: <https://kathmandupost.com/health/2020/05/21/nepal-reports-its-third-covid-19-death>
25. The Kathmandu Post. Nepal reports fourth Covid-19-related death. [cited 2020 May 29]; Available from: <https://kathmandupost.com/health/2020/05/25/nepal-reports-fourth-covid-19-related-death>
26. The Kathmandu Post. Nepal reports its fifth Covid-19 death and 156 new cases; national tally crosses 1,000. [cited 2020 May 29]; Available from: <https://kathmandupost.com/national/2020/05/28/nepal-reports-its-fifth-covid-19-death-and-156-new-cases-national-tally-crosses-1-000>
27. Schellekens P, Diego M. Sourrouille DM. Covid-19 Mortality in Rich and Poor Countries: A Tale of Two Pandemics? by Philip Schellekens, Diego M. Sourrouille :: SSRN [Internet]. [cited 2020 May 29]. Available from: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3614141](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3614141); [Google Scholar](#)
28. O'Connor, E., Teh, J., Kamat, A.M. and Lawrentschuk, N., 2020. Bacillus Calmette Guérin (BCG) vaccination use in the fight against COVID-19—what's old is new again? *Future Oncol.* 2020;16(19):1323-1325. doi:[10.2217/fon-2020-0381](https://doi.org/10.2217/fon-2020-0381) ; [Google Scholar](#); [Pubmed Abstract](#)
29. The curious case of South Asia's 'low' coronavirus deaths | Coronavirus pandemic News | Al Jazeera [Internet]. [cited 2020 May 29]. Available from: <https://www.aljazeera.com/news/2020/5/18/the-curious-case-of-south-asias-low-coronavirus-deaths>