

Status of Patient Flow in the Emergency Department of Kathmandu Medical College Before and After the National Level Lockdown for Pandemic

Manish Nath Pant¹, Neeti Ranjitkar², Tuls Raj Khanal³, Bishnu Singh⁴

¹Lecturer, Department of General practice and Emergency Medicine, Kathmandu Medical College and Teaching Hospital, Sinamangal, Kathmandu, Nepal

²Medical Officer, Department of General practice and Emergency Medicine, Kathmandu Medical College and Teaching Hospital, Sinamangal, Kathmandu, Nepal

⁴Medical Officer, Himal Hospital Private Limited, Thirbom Sadak, Kathmandu, Nepal

Corresponding Author: Dr. Manish Nath Pant; Email/Contact: life.live004@gmail.com , 9851243722

ABSTRACT



Background: Emergency visits during pandemic also comprise the patients with various complains other than symptoms of COVID. It is prudent to identify the variation of non- COVID-19 cases (cases that do not have fever or cough or travel history or contact history or health professional) that visit emergency department during pandemic and their outcome for proper division of resources including human resources during pandemic.

Methods: This is a cross sectional study done in emergency department of Kathmandu Medical College Teaching Hospital (KMCTH) Data were collected from the record book from 24th March 2020 to 21st July 2020 (lockdown period) and four months prior to 24th March. The variation in emergency admissions, demographic profile, outcome of the patients, departments admitting the patients and place of admission was evaluated using SPSS.

Results: Total of 6944 cases were seen during the pre-lockdown period and 2503 cases during the lockdown period, which is 63.95% less than the pre-lockdown era. Males (53.14% and 53.40% during pre-lockdown and lockdown respectively) visited emergency more frequently than females during both the periods. The number of cases that were admitted from the ER during the lockdown had fallen by 67.5% from the pre-lockdown era. Likewise, the patients admitted in ward, high care, ICU had decreased by 76%, 49%, 64% respectively compared to pre-lockdown period. However, the rate of admissions in intensive care unit had risen from 32.58% to 35.73% during lockdown. (There was decrease in injury, poisoning or certain consequences of external causes and external causes of morbidity and mortality by 57.5% and 52% respectively).

Conclusion: The overall rate of admissions was low both for the COVID. However, the admission in intensive care units increased during the lockdown period which gives the idea that people were only visiting hospital when their symptoms were worse.

Keywords: COVID-19; emergency service, hospital; lockdown; pandemic.

Access this article Online	Article Info.
QR Code	How to cite this article in Vancouver Style?
	Pant MN, Ranjitkar N, Raj Khanal T, Singh B. Status of Patient Flow in the Emergency Department of Kathmandu Medical College Before and After the National Level Lockdown for Pandemic. Journal of Karnali Academy of Health Sciences. 2021; 4(1)
	Received: 30 September 2020 Accepted: 29 December 2020 Published Online: 30 December 2020
	Source of Support: Self Conflict of Interest: None
<p>Copyright: © 2020 by author(s) in which author(s) are the sole owners of the copyright of the content published.</p> <p>Licensing: The Journal follow open access publishing policy, and available freely in the website of the Journal and is distributed under the terms of the Creative Commons Attribution International License 4.0 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>Disclaimer: 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>	

INTRODUCTION

After the WHO declared Coronavirus Disease 2019 (COVID-19) a Pandemic on March 11 2020, Nepal decided to go for its first nation-wide lockdown from 24th March, 2020 with multiple extensions until 21st July when it was lifted.^{1,2} The spread of COVID-19 has been severely disruptive worldwide resulting in a heavy work load on the limited health facilities. Emergency department (ED) remains the major frontline dealing with COVID cases which probably could result in compromising the quality care for NON COVID patients. To safe guard the right to health of these patients too, it is prudent to find the number of cases visiting the ER, the admission rates and places where the most admissions of non-COVID cases occur, which ultimately could help redistribute human and other resources in order not to compromise the patient care during the outbreak.^{3,4}

Studies have shown that there has been decrease in the ED visits after the lockdown has been enforced in many countries ranging from 25% to 63% compared to the pre COVID era.⁵⁻⁷ The fear to contract COVID from the hospital might have restrained the people from visiting ED for minor ailments, but people have stopped to come to ED for major problems like chest pain resulting in increase in mortality and morbidity.⁵ This study thus aims to identify the variation of cases that visit the emergency and their outcome during the period of lockdown and compare it with the pre-lockdown period.

MATERIALS AND METHODS

This is a cross-sectional study done at the emergency department of Kathmandu Medical College and teaching hospital. For convenience, we included all the cases that had visited the ED from November 24, 2019 to 21st July, 2020. Since the first lockdown was imposed from March 24, 2020, the period before this was called pre-lockdown era and the period after that was considered as post lockdown era. All the data

were collected from the ED register for that duration. The ethical approval (reference no.207202005) was taken from the Institutional review committee on July 2020.

Before entering the ED, all the patients were triaged into COVID and non-COVID based on history. If the patient had presented with two or more of the following history i.e. fever, cough, history of travel in last 14 days, a health professional, any contact history with COVID, they were sent to the fever clinic which was away from the ED. Since all suspected cases were segregated before entering the ED, only non-COVID cases were entertained in the ED.

All the cases that had entered the emergency department during this period were taken into consideration to evaluate for the demographic profile, time of presentation to ED, the outcome of the patient, the department admitting the case and the place of admission which could be ward, high care, intensive care unit (ICU) or operation theatre (OT) for emergency operation. We also evaluated for different type of diseases presentation after classifying the diagnosis into broad headings of 11th international classification of disease, eleventh revision (ICD-11) using the web-based tool available. To make categorization simple, only the first single diagnosis made in the ER was taken into consideration for classification, even if it consisted of multiple diagnosis tailed to the main diagnosis. For example, if a patient had acute exacerbation (AE) of chronic obstructive lung disease (COPD) with cor-pulmonale with hypertension and diabetes mellitus, only AE of COPD was considered for categorisation.

The data were analyzed using the Statistical Package of the Social Sciences version 25. Descriptive statistics were calculated and expressed as frequency and proportion.

RESULTS

Monthly distribution of total ED admissions in 2018/19 and 2019/20 from November 24 to

January 21 (figure 1). Overall, during the first 4 months i.e. November 24 to march 23 of 2018/19(Y1) and 2019/20(Y2), the ED admissions was almost constant with less variation compared to the following four months from march 24 to July 21) where there was a vast difference in ED admissions between Y1 and Y2. In L period of Y1,

there was a rise in number of ED admissions by 14.97%. A sharp dip in the number of cases in May/June of L resulted from the closure of ED for four days for contact tracing of staffs. There was a sharp rise of patients towards the end of the lockdown period after the ED resumed functioning properly. (Figure 1, Table 1)

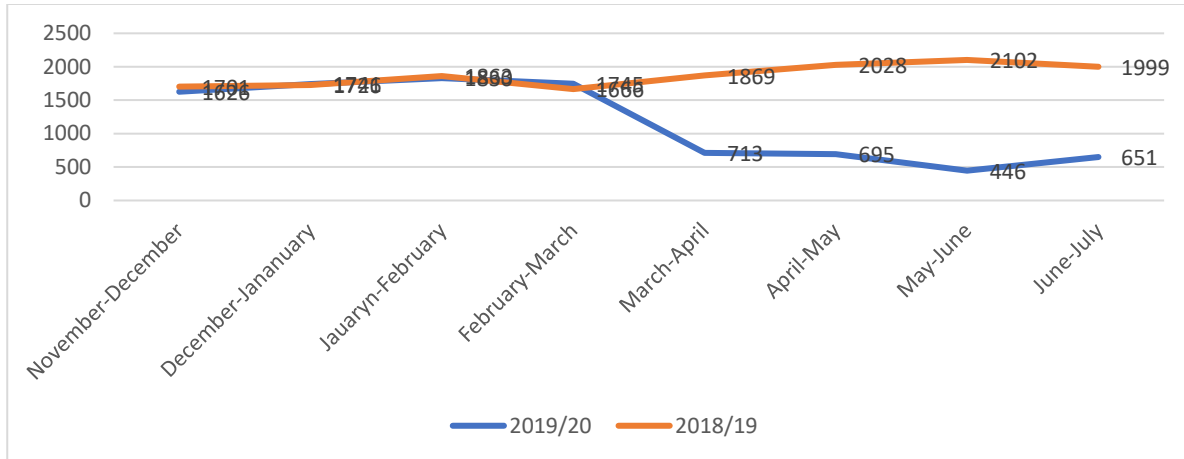


Table 1. Patient Characteristics during pre-lockdown and lockdown period

	Total	Pre-Lockdown(N)	Rate (%)	Lockdown	Rate(%)	%Change
2019/20	9447	6944		2503		63.95
2018/19	14954	6956		7998		14.98
Gender						
Male	5029	3690	53.14	1339	53.50	63.71
Female	4418	3254	46.86	1164	46.50	64.23
Shift of duty						
Morning	2547	1890	27.22	657	26.25	65.24
Evening	3068	2282	32.86	786	31.40	65.56
Night	3718	2671	38.46	1047	41.83	60.80
no records	114	101	1.45	13	0.52	87.13
age group (years)						
0-14	1974	1620	23.33	354	14.14	78.15
15-29	2597	1943	27.98	654	26.13	66.34
30-44	1971	1330	19.15	641	25.61	51.80
45-59	1296	854	12.30	442	17.66	48.24
60-74	1023	738	10.63	285	11.39	61.38
>=75	586	459	6.61	127	5.07	72.33
police case						
yes	888	670	9.65	218	8.71	67.46
address						

within valley	7538	5458	78.60	2080	83.1003	61.89
outside valley	1761	1357	19.54	404	16.1406	70.23
International	27	20	0.29	7	0.27966	65.00

Table 2. Outcome of the Patients

Outcome of patients	Total	Pre-lockdown	Rate(%)	Lockdown	Rate (%)	Total % change
admitted	2680	2013	28.99	667	26.65	66.87
discharged	5443	3938	56.71	1505	60.13	61.78
expired	13	8	0.12	5	0.20	37.50
brought dead	87	62	0.89	25	1.00	59.68
LAMA	578	431	6.21	147	5.87	65.89
DOPR	336	241	3.47	95	3.80	60.58
Referred	140	100	1.44	40	1.60	60.00
No records	41	35	0.50	6	0.24	82.86
Absconded	56	51	0.73	5	0.20	90.20
sent to out-patient department	73	65	0.94	8	0.32	87.69
Place of admission						
General ward	1257	1011	50.22	246	36.88	75.67
High Care	453	297	14.75	156	23.39	47.47
Intensive Care Unit	895	656	32.59	239	35.83	63.57
Operation theatre	75	49	2.43	26	3.90	46.94
	2680	2013	100.00	667	100.00	66.87
Departments admitting						
a. Internal Medicine	1251	949	47.14	302	45.28	68.18
b. General Surgery	473	340	16.89	133	19.94	60.88
c. Gynecology and obstetrics	165	126	6.26	39	5.85	69.05
d. Ear nose and throat	30	25	1.24	5	0.75	80.00
e. Psychiatry	45	38	1.89	7	1.05	81.58
j. Neurosurgery	345	253	12.57	92	13.79	63.64
k. Orthopedics	248	180	8.94	68	10.19	62.22
l. Pediatrics	123	102	5.07	21	3.15	79.41

A total of 9394 cases were evaluated during the 8 months period with 6944 cases was seen during the pre-lockdown period and 2503 cases during the lockdown period, which is 63.95% less than the pre-COVID era. In both the period males (3690 and 1339 in pre-lockdown and lockdown respectively) were more commonly visiting the ED than the female. Most of the cases presenting to the ED during the lockdown period was from

within Kathmandu valley which was 62.6% lesser than the pre-lockdown period and there was a decrease by 70% in patients that were from outside Kathmandu valley. Similarly, there was a decrease in the number of cases that was needed to be informed to the police by 67%. More than 70% decrease in ED admission was seen in age group 0-14 years (78.15%) and ≥ 75 years (72.33%). (Table 1)

The number of cases that was admitted from the ER during L had fallen by 67.5% from the PL era. Likewise, psychiatry, ear nose and pediatrics had more than 75% decrease in their admission During the lockdown, the patients admitted in ward (241), high care (151), ICU (233) and OT (26) were 76%, 49%, 64% and 46% less compared to the pre lockdown period. Even though there was decrease in ICU occupancy in lock down period by 64%, we can see that the rate of admission to ICU among admitted patients from ED was 35.73% (233) during L compared to only 32.58% (656) in the PL (Table 2). There was overall decline in all the disease pattern presenting to the ED. More than 80% decrease in cases were seen in disease of visual system (100%), disease of the ear or mastoid process (88.7%), disease of the respiratory system (83%), disease of the musculoskeletal or connective tissue (84.7%). However, there was only 26% decrease in the

disease of the skin and only 57.5% and 52% decrease in injury poisoning or certain consequences of external causes and external causes of morbidity and mortality respectively. Even though there was a decrease in injuries, poisoning and external causes of morbidity and mortality during L compared to PL, but there was increase in the proportion of these cumulatively from 22.79% (1582) during PL to 27.96% (710) in L (Table 3).

There is increase in the proportion of use of high care and ICU by medicine (52.52% to 76.48%) and surgery (37.86% to 43.6%) as compared to PL period while there is decline in admission rate (88.1% to 86.92%) from the neurosurgery department and paediatrics department (68.92% to 61.88). We can see increase in the admission rate in the wards of orthopaedics department (86.66% to 92.64%) (Table 4).

Table 3: ICD-11 classification of disease presenting to the ED.

ICD-11 classification of disease	Total	Pre-lockdown	Rate(%)	Lockdown	Rate(%)	Total % change
01: certain infectious and parasitic disease	492	390	5.62	102	4.08	73.85
02: neoplasms	25	12	0.17	13	0.52	8.33
03: disease of blood and blood forming organs	33	22	0.32	11	0.44	50.00
04: disease of the immune system	59	49	0.71	10	0.40	79.59
05: endocrine, nutritional or metabolic	183	127	1.83	56	2.24	55.91
06: mental, behavioral or neurodevelopmental disorders	461	322	4.64	139	5.55	56.83
08: disease of nervous system	817	630	9.07	187	7.47	70.32
09: disease of visual system	9	9	0.13	0	0.00	100.00
10: disease of ear or mastoid process	79	71	1.02	8	0.32	88.73
11: disease of the circulatory system	320	225	3.24	95	3.80	57.78
12: disease of the respiratory system	778	664	9.56	114	4.55	82.83
13: disease of the digestive system	1122	799	11.51	323	12.90	59.57
14: disease of the skin	40	23	0.33	17	0.68	26.09
15: disease of msk or connective tissue	159	138	1.99	21	0.84	84.78
16: disease of genitourinary	926	637	9.17	289	11.55	54.63
17: condition related to sexual health	4	4	0.06	0	0.00	100.00
18: pregnancy, child birth and puerperium	260	187	2.69	73	2.92	60.96
19: conditions arising from the perinatal period	17	9	0.13	8	0.32	11.11

21: symptoms signs or clinical findings not elsewhere classified	1219	916	13.19	303	12.11	66.92
22: injury poisoning or certain other consequences of external causes	1737	1215	17.50	522	20.85	57.04
23: external causes of morbidity and mortality	545	367	5.29	178	7.11	51.50
24: Factors influencing health status or contact with health services	162	128	1.84	34	1.36	73.44
Total:		6944	100.00	2503	100.00	

Table 4: Department wise distribution of different level of care in hospital

Department admitting	General ward (%)		High Care (%)		Intensive Care Unit (%)		Operation Theatre (%)	
	Pre-lockdown	Lockdown	Pre-lockdown	Lockdown	Pre-lockdown	Lockdown	Pre-lockdown	Lockdown
Internal Medicine	450(47.46)	71(23.51)	70(7.38)	70(23.18)	428(45.14)	161(53.3)	0	0
Surgery	180(53.25)	53(39.84)	84(24.85)	41(30.82)	44(13.01)	17(12.78)	30(8.87)	22(16.54)
Gynae/Obs	113(88.97)	32(82.05)	3(2.36)	1(2.56)	3(2.36)	4(10.25)	8(6.29)	2(5.12)
ENT	20(83)	4(80)	2(8.3)	0	1(4.1)	1(20)	1(4.1)	0
Psychiatry	30(78.94)	4(57.14)	0	0	8(21.05)	3(42.85)	0	0
	1(100)	0	0	0	0		0	0
Neurosurgery	30(11.85)	11(11.95)	115(45.45)	39(42.36)	108(42.68)	41(44.56)	0	1(1.08)
Orthopaedics	156(86.66)	63(92.64)	7(3.88)	2(2.94)	8(4.44)	2(2.94)	9(5)	1(1.47)
Paediatrics	32(31.06)	8(38.09)	15(14.56)	3(14.28)	56(54.36)	10(47.6)	0	0

DISCUSSION

The people coming to the ED had to go through a triage system trying to segregate the COVID and non-COVID patients before entering the patients based on their clinical history, travel history and occupational history. Thus, patients in the ED were supposed to be not affected by COVID. There has been a decrease in the number of cases visiting the ED drastically. The pattern of patients visiting the ER was similar during the first four months in both the years, however the cases plummeted steeply during the lockdown months which is in contrast to the previous year of same duration. There was a fall in patients visiting the ER during the pandemic which is similar to the US and other parts of the world where the fall was noted to be from 25% to 63% compared to the pre COVID era which was similar to our study.⁵⁻⁷ There is similar experience of decline in the ED visits during Severe Acute Respiratory Symptoms (SARS) outbreak in Hongkong.⁸ In Africa, where there had been outbreak of Ebola, the health care utilization had

decreased by 18% which was not seen in other places of Africa which didn't see much cases.⁹ Possible causes can be linked with changes in community behavior and fear of contracting disease.⁸ Nevertheless, the vast migration of people of nearly 300,00 out of Kathmandu valley just after the government plan to lockdown the country on march 18¹⁰ might also have caused the decrease in the people visiting ED.¹⁰

The children aged 0-14 and old age more than 75 years experienced a great drop in hospital visits during the lockdown period. Similarly, admission in the pediatrics department had also scumbled. These age group people had less excess to the community, especially school by the younger age group, thus decreasing exposure for infection and trauma. The lockdown also has improved quality of air which might have decreased the respiratory and cardiovascular related diseases.¹¹

If we see the occupancy of ICU and high care among all the cases admitted, 58.88% was seen during lock down period compared to pre-

lockdown (47.33%). “The fear of what we can get might be greater than the fear of what we have” might have resulted the delay in hospital visit for check-up resulting in increased severity of disease presenting to the ED thus increasing the use of the high-care and ICU even though there was decrease in the number of cases during lockdown compared to the same duration of time before the lockdown.¹² A study of case series of 12 paediatric cases¹³ of delayed presentation of non-COVID cases resulted in 50% admission in ICU and four deaths which all was attributed to fear of contracting COVID.¹³

A decrease in the proportion on patients with diagnosis involving the respiratory system from 9.56% to 4.55% can be attributed to the triaging of the patients with respiratory symptoms decreasing their entrance into the ED. Secondly, improved air quality and less crowding and less frequency of contact with people might also have decreased the transmission of pathogens responsible for respiratory disease.¹¹

Even though there was a decrease in the ED admissions, there has been increase in rates of injuries, poisoning and external causes of morbidity and mortality which includes road traffic injuries (RTIs), falls, suicide, poisoning, sharp injuries, homicidal, physical assaults etc. during the lockdown period. Injuries from RTIs are still prominent problem even during the lockdown due to pandemic even though there are less vehicles in the road which can be attributable to over speeding in open roads.¹⁴ Suicide in Nepal has risen by 20% during the lockdown that could be related to loss of jobs, economic burden and intimate partner violence.² The rate of poisoning was seen to have increased during the pandemic in china as well.¹⁵ Some Studies has shown that there is overall decrease in the cases related to trauma and injuries, as well as the pattern of injuries which now was related more to sharp objects and more centered at home and farm.^{16,17} Firstly, the study is a cross sectional study using the hospital records and only represents the early

stage of pandemic and lockdown when there was no community transmission of the disease. Secondly, not all the cases here represent the non-COVID patients as the patients might give wrong history to sneak their way into the ED to avoid misconception of poor consultation by the attending physician. This study only has included the cases that don't meet the clinical definition of COVID, thus unknown of their PCR status of COVID infection, thus, not giving the exact volume of non-COVID cases that was admitted through ED. The classification of disease by ICD-11 might not be consistent as many diagnoses in the record book was incomplete thus resulting in wrong classification. For example, there are many instances where diagnosis was just soft tissue injury without mentioning the mode of injury and also the site of injury. Whenever there was mode of injury and also the site of injury, which ever came first, we classified into either external cause of morbidity and mortality or injury poisoning or certain other consequences of external causes. This might produce variation in number of cases in each group.

CONCLUSION

Overall, the pandemic and the lockdown have decreased the number of visits to the ED and also admission from the ED in the hospital compared to the pre-lockdown era. Age less than fourteen and greater than 75 years were visiting less to the ED of the hospital. Out of all the departments, psychiatry and ENT department being the ones with the lowest admission rates from the ED. Even though the number of cases admitted from ED to ICUs and high care ward had decreased during lockdown, the rate of utilization was high which gives the idea that people are visiting hospital when their symptoms were worse.

Allocating a dedicated separate wing to look after the NON-COVID patients would be ideal in order to decrease the risk of transmission. Since there is decrease in the cases compared to pre-lockdown period, redistribution of the resources would help

in quality care and also separate medical team for COVID and NON-COVID care would decrease the transmission rate of the disease amongst the healthcare professionals.

However, this is the earliest study done in an emergency department and screening criteria have changed along with the increase in the number of cases of COVID in Kathmandu, a follow-

up study is required to observe the changes in pattern of cases after the lockdown is lifted.

ACKNOWLEDGEMENT: We would like to thank the Department of General Practice and Emergency Medicine, Kathmandu Medical College and Teaching hospital, Kathmandu, Nepal, and Dr. Prashant Maharjan and Dr. Aruna Luitel

REFERENCES

1. Chavez S, Long B, Koyfman A, Liang SY. Coronavirus Disease (COVID-19): A primer for emergency physicians. *Am J Emerg Med*. [journal on the Internet]. 2020;0(0). <https://doi.org/10.1016/j.ajem.2020.03.036> [Epub ahead of print] [Google Scholar] | [Full Text]
2. Singh R, Baral KP, Mahato S. An urgent call for measures to fight against increasing suicides during COVID-19 pandemic in Nepal. *Asian J Psychiatr*. 2020 Jun 20;54:102259. <https://doi.org/10.1016/j.ajp.2020.102259>. [Google Scholar] | [PMC] [Full Text]
3. Nuñez J, Sallent A, Lakhani K, Guerra-Farfan E, Vidal N, Ekhtiari S et al. Impact of the COVID-19 Pandemic on an Emergency Traumatology Service: Experience at a Tertiary Trauma Centre in Spain. *Injury*. 2020;51(7):1414-1418. <https://doi.org/10.1016/j.injury.2020.05.016> [Google Scholar] | [PMC] [Full Text]
4. Whiteside T, Kane E, Aljohani B, Alsamman M, Pourmand A. Redesigning emergency department operations amidst a viral pandemic. *The American Journal of Emergency Medicine*. 2020;38(7):1448-1453. <https://doi.org/10.1016/j.ajem.2020.04.032> [Google Scholar] | [PMC] [Full Text]
5. Kocher KE, Macy ML. Emergency Department Patients in the Early Months of the Coronavirus Disease 2019 (COVID-19) Pandemic—What Have We Learned? *JAMA Heal Forum*. 2020 Jun 9;1(6):e200705. Available from: <https://jamanetwork.com/channels/health-forum/fullarticle/2767238> [Google Scholar] | [Full Text]
6. Barten D, Latten G, van Osch F. Reduced Emergency Department Utilization During the Early Phase of the COVID-19 Pandemic: Viral Fear or Lockdown Effect?. *Disaster Medicine and Public Health Preparedness*. 2020:1-4. <https://doi.org/10.1017/dmp.2020.303> [Google Scholar] | [PubMed] | [PMC]
7. Hartnett KP, Kite-Powell A, DeVies J, et al. Impact of the COVID-19 Pandemic on Emergency Department Visits — United States, January 1, 2019–May 30, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:699–704. Available from: <https://www.cdc.gov/mmwr/volumes/69/wr/mm6923e1.htm> [Google Scholar] | [PMC] [Full Text]
8. Man CY, Yeung RS, Chung JY, Cameron PA. Impact of SARS on an emergency department in Hong Kong. *Emerg Med Australas*. 2003 Oct 1;15(5–6):418–22. <https://doi.org/10.1046/j.1442-2026.2003.00495.x> [Google Scholar] | [PubMed] |
9. Wilhelm JA, HELLERINGER S. Utilization of non-Ebola health care services during Ebola outbreaks: A systematic review and meta-analysis. *J Glob Health*. 2019; 9(1). <https://doi.org/10.7189/jogh.09.010406> [Google Scholar] | [PubMed] | [Full Text]
10. People leaving Kathmandu on the rise. *The Rising Nepal*. [newspaper on the internet]. 2020 MArch 24[cited 2020 Oct 6];. Available from: <https://risingnepaldaily.com/mustread/people-leaving-kathmandu-on-the-rise-photo-feature> [Full Text]
11. Lee B, Kim B, Lee K. Air Pollution Exposure and Cardiovascular Disease. *Toxicological Research*. 2014;30(2):71-75. <https://doi.org/10.5487/TR.2014.30.2.071> [Google Scholar] | [PubMed] | [PMC] [Full Text]
12. Mantica G, Riccardi N, Terrone C, Gratarola A. Non-COVID-19 visits to emergency departments during the pandemic: the impact of fear. *Public Health*. 2020; 183:40-41. <https://doi.org/10.1016/j.puhe.2020.04.046> [Google Scholar] | [PubMed] | [PMC] [Full Text]
13. Lazzerini M, Barbi E, Apicella A, Marchetti F, Cardinale F, Trobia G. Delayed access or provision of care in Italy resulting from fear of COVID-19. *The Lancet Child & Adolescent Health*. 2020;4(5):e10-e11. [https://doi.org/10.1016/S2352-4642\(20\)30108-5](https://doi.org/10.1016/S2352-4642(20)30108-5) [Google Scholar] | [PubMed] | [PMC] [Full Text]

14. Park C, Sugand K, Nathwani D, Bhattacharya R, Sarraf K. Impact of the COVID-19 pandemic on orthopedic trauma workload in a London level 1 trauma center: the “golden month”. *Acta Orthopaedica*. 2020;:1-6. <https://doi.org/10.1080/17453674.2020.1783621> [Google Scholar] | [PubMed] | [Full Text]
15. Sun H, Liu K, Li M, Tang S, Monte A, Wang J et al. The influence of coronavirus disease 2019 on emergency department visits in Nanjing, China: A multicentre cross-sectional study. *The American Journal of Emergency Medicine*. 2020;38(10):2101-2109. <https://doi.org/10.1016/j.ajem.2020.07.086> [Google Scholar] | [PubMed] | [PMC] [Full Text]
16. Christey G, Amey J, Campbell A, Smith A. Variation in volumes and characteristics of trauma patients admitted to a level one trauma centre during national level 4 lockdown for COVID-19 in New Zealand. *The New Zealand Medical Journal* [Internet]. 2020 [cited 7 October 2020];133(1513). Available from: <https://www.nzma.org.nz/journal-articles/variation-in-volumes-and-characteristics-of-trauma-patients-admitted-to-a-level-one-trauma-centre-during-national-level-4-lockdown-for-covid-19-in-new-zealand> [Google Scholar] | [PubMed] | [Full Text]
17. Morris D, Rogers M, Kissmer N, Du Preez A, Dufourq N. Impact of lockdown measures implemented during the Covid-19 pandemic on the burden of trauma presentations to a regional emergency department in Kwa-Zulu Natal, South Africa. *African Journal of Emergency Medicine*. 2020;10(4):193-196. <https://doi.org/10.1016/j.afjem.2020.06.005> [Google Scholar] | [PubMed] | [Full Text]