Research Article

Detailed Study for COVID-19 Vaccination Record in Bardiya and Dang District of Nepal

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Abstract

The world got hit by lethal viral infection in the year 2019, spreading from Wuhan city of China. It affected the lives of people all around the world. So to control the situation, rich countries made different vaccines which eventually got access in developing and poor countries too. To minimize the death toll Nepal too initiated the vaccination program on Jan 27, 2021. This project shows the detailed results of the study of COVID-19 vaccination of Dang and Bardiya districts. The main objective is to analyze and study the collected vaccination data. The collected data are presented in the form of charts, bars and tables for its better understanding. The data is collected on the basis of age, gender and types of vaccines used etc. Qualitative and Quantitative approaches were used to collect data. 6 different types of vaccines were used including Verocell, COVID-SHIELD, Astrazeneca, Moderna, J & J and Pfizer. The government of Nepal aimed to vaccinate the total population of Dang and Bardiya districts. Out of 6.69 lakhs population of Dang 53.8% were fully vaccinated whereas only 32.9% were fully vaccinated out of 4.86 lakhs population of Bardiya district. The world got hit by lethal viral infection in the year 2019, spreading from Wuhan city of China. It affected the lives of people all around the world. So to control the situation, rich countries made different vaccines which eventually got access in developing and poor countries too. To minimize the death toll Nepal too initiated the vaccination program on Jan 27, 2021. This project shows the detailed results of the study of COVID-19 vaccination of Dang and Bardiya districts. The main objective is to analyze and study the collected vaccination data. The collected data are presented in the form of charts, bars and tables for its better understanding. The data is collected on the basis of age, gender and types of vaccines used etc. Qualitative and Quantitative approaches were used to collect data. Six different types of vaccines were used including Verocell, COVID-SHIELD, Astrazeneca, Moderna, J& J and Pfizer. The government of Nepal aimed to vaccinate the total population of Dang and Bardiya districts. Out of 6.69 lakhs population of Dang 53.8% were fully vaccinated whereas only 32.9% were fully vaccinated out of 4.86 lakhs population of Bardiya district.

Keywords

SARS-CoV-2, COVID-19, Vaccination, Doses, Nepal, Dang, Bardiya

1. Introduction

1.1. Background

Corona virus is a viral infection caused by RNA (Ribonucleic acid) related viruses. This virus mainly causes respiratory tract infections that can range from mild to lethal. The first known case was identified in Wuhan, China, in December 2019. The disease has since spread worldwide, leading to an ongoing pandemic.

Figure 1. Corona Virus (www.who.int/health-topics/coronavirus).

The first case of COVID-19 reported in Nepal was on January 13, 2020, in a 32-years-old man who had returned to Nepal from Wuhan, China [9].

The Government of Nepal announced an immediate countrywide lockdown after the single case itself. The second case was reported only after two months, i.e., in March 2020. However, despite the countrywide lockdown, travel restriction and border closures, the cases of COVID-19 started to rise from April 2020 and peaked during September–October 2020 and due to this the COVID-19 vaccination program was initiated on Jan 27th, 2021 [10]. The second dose of vaccine as a booster was planned to be administered after 28 days.

Figure 2. Covid 19 Vaccination https://plan-international.org/nepal.

The vaccine types used in Nepal include COVISHIELD, Japanese-made COVID-19 AstraZeneca vaccine, Swedish AstraZeneca, Sinopharm COVID-19 vaccine Verocell, and J&J/Janssen COVID-19 Vaccine and as of 26 October 2021, 67,09,905 individuals have received full doses of vaccines [4]. This report focuses on the analysis of covid 19 vaccination data of Bardia and Dang districts of Nepal in different statistical forms.

1.2. Problem Statement

The data provided by "Ministry of Health and Population" are mostly based on national level.

Various websites only show the overall data of the nation. The district wise data are scarcely available. The available data are outdated and in dire need of being updated. Proper analysis of district level data and pictorial representations cannot be found. The local level data related to vaccines are difficult to find and access. The comparative data on the basis of age, gender etc. cannot be found anywhere. Accurate data of the situation of local level is needed by different bodies to make effective plans and policies to carry out. Hence, with this project proper collection, analysis and evaluation of the chosen districts can be carried out.

1.3. Objectives

Our main objectives include analysis of the data in different graphic forms.

The secondary objectives that the project includes are:
a. To find out the COVID-19 vaccination coverage of Dang and Bardiya District.
b. To compare the proportions of different types of covid 19 vaccine used in Dang and Bardiya District.

1.4. Scope

The project includes the data of the respective province, district, municipality and ward. It can be helpful in figuring out the status of vaccinated population in respective districts. The local level can make further planning of vaccination regarding this data.

1.5. Limitations

This Project is best way to study the corona virus spread, different types of vaccines used in the Dang and Bardiya District. Though this study collected data in district level and their municipality but there were some limitations,
a. This study is based on secondary data and information published on the websites.
b. The study is based on quantitative aspects and ignores the qualitative aspects.
c. This study has been easier for web surfing to collect data if we were provided with the strong internet facility.
d. If data providing procedure in government offices would have been easier and hassle free, we could have gotten data easily and comfortably.

1.6. Study Area

Our study areas are Dang and Bardiya districts of Nepal which are the districts of Lumbini Province. Both the districts are of terai region. Dang district covers the area of 2955 km^2 and according to the census 2021 it has the total population of 676,277. Similarly, Bardiya district covers the area of 2025 km^2 and its total population according to the Census 2021 is 426,576.
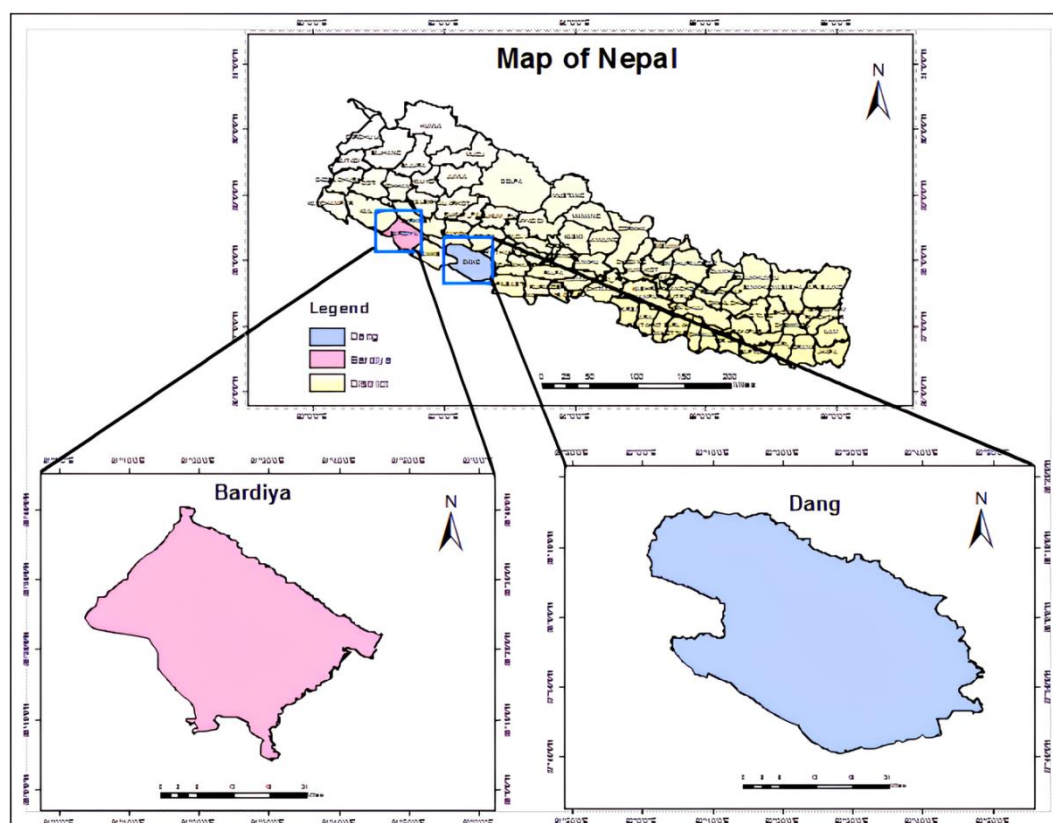
Figure 3. Study Area.

2. Literature Review

In December 2019, health authorities in Wuhan, China, identified a cluster of pneumonia cases of unknown aetiology linked to the city's South China Seafood Market. Subsequent investigations revealed a novel coronavirus, SARS-CoV-2, as the causative agent later at the heart of a major outbreak [6]. Coronavirus disease 2019 (COVID-19) rapidly spread worldwide, and it was officially declared to be a pandemic by the World Health Organization (WHO) on March 11, 2020 [8]. It imposed cataclysmic changes across the globe. As of late October 2021, there were more than 243 million cases of infections and 4.9 million deaths worldwide [11].

Figure 4. Deaths due to Covid 19 (Source: NDTV.com).

The clinical disease termed COVID-19 is caused by a novel beta corona virus, named SARS-CoV-2. SARS-CoV-2 shares 79% sequence identity with SARS-CoV, the virus which caused a major outbreak in 2002-2003 [6]. The symptoms of COVID-19 illness range from very mild (fever and respiratory symptoms such as cough and shortness of breath) to severe (pneumonia, severe acute respiratory syndrome and kidney failure) with a mortality rate around 4% [8]. The world took a significant measure to cope with this disease, from increasing personal protection equipment (PPE) production and emphasizing the importance of social distancing/masking [3]. However, the disease started spreading in an unrelenting fashion and caused widespread health, social, and economic disruption. Therefore, effective vaccines were urgently needed to end this pandemic and help society return to normalcy. Vaccination is the most effective preventive measure of COVID-19 available at present, but its success depends on the global accessibility of vaccines and the willingness of people to be vaccinated [1].

Many COVID-19 candidate vaccines were researched, developed, tested, and evaluated. The fact that several COVID-19 vaccine candidates entered into clinical trials in less than 6 months and were conditionally approved in 10 months since the beginning of the COVID-19 outbreak demonstrates a record-breaking speed in vaccine development history and since the beginning of the COVID-19 pandemic, there has been a worldwide race to develop vaccines against this disease. By the end of February 2021, more than 40 countries and regions were

working on developing COVID-19 vaccines, and at least half of these countries have had one or more vaccines in clinical trials, based on the analysis of vaccine development data from the World Health Organization (WHO) [7].
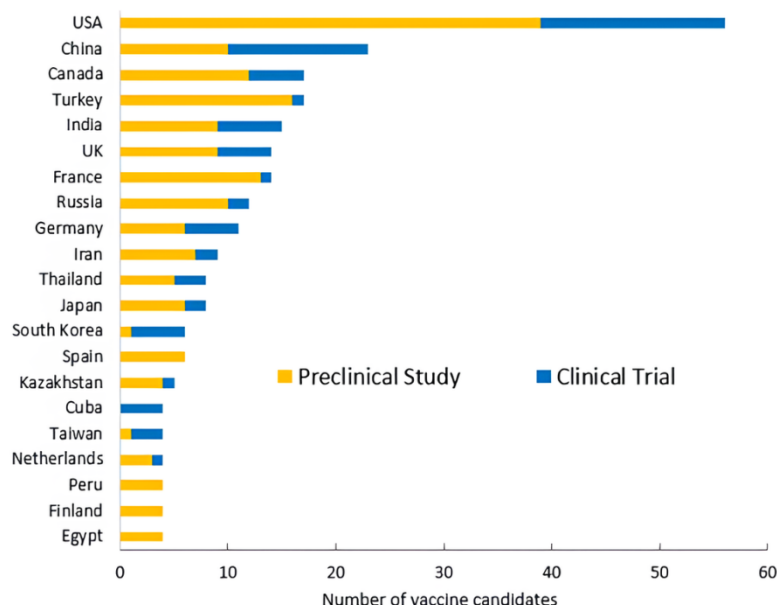

Figure 5. Top 21 countries by number of COVID-19 candidate vaccines in the development [7].

The effectiveness of the COVID-19 vaccination program depends on mass participation, the greater the number of people vaccinated, the less risk to the population [2]. In case Nepal as of April 20, 2021, there have been a total of 287 567 confirmed cases and 3102 deaths in, a country with a population of more than 28 million [5]. A vaccination drive started on Jan 27, 2021, and as of April 20, 2021, 1·7 million doses of COVID vaccines were administered to selected populations as a first dose [11]. The vaccine types used in Nepal include COVISHIELD (SII, India), Japanese-made COVID-19 AstraZeneca vaccine, Swedish AstraZeneca, Verocell (China), and J&J/Janssen COVID-19 Vaccine (USA) and as of 26 October 2021, 67,09,905 individuals have received full doses of vaccines [4].

3. Methodology

3.1. Dataset Description

Our project represents the dataset of COVID-19 of two major districts Bardiya and Dang of Lumbini Province, Nepal. The study is mainly focused in quantitative research techniques; and the quantitative data were collected. The local level authorities of Bardiya and Dang were visited for primary source of data. The data which includes the types of vaccination used and the number of doses based on various age groups were collected. According to the population census data of 2068, the total population of Dang and Bardiya districts is 6.69 lakhs and 4.86 lakhs respectively. Out of which 53.8% were full dose vaccinated in Dang and 32.9% were full

dose vaccinated in Bardiya till 29, January, 2022. The area of collected data includes 10 palikas of Dang and 10 palikas of Bardiya. According to our study, the types of vaccination used in those districts includes: COVISHIELD, Vero cell, J & J, AstraZeneca, moderna and Pfizer.

3.2. Flowchart

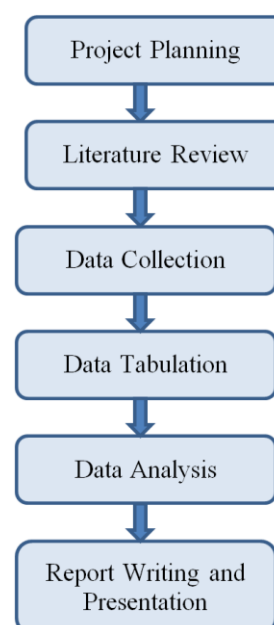The flow chart diagram of project is shown below:

Figure 6. Flow Chart.

While doing this project the first task taken was planning of the project. In planning phase the division of group was done and selection of districts to carry out this project was finalized. After that many literatures were reviewed regarding corona virus and vaccination of it in Nepal as well as in other countries. Now the collection of data was done in Dang and Bardiya districts from the respective health offices and also by visiting each ward of each district. The group members were divided into two for the collection of data. After completing the data collection task they were organized in tabulated form and analyzed in different ways in excel sheet using pie charts, bar diagrams and others. And finally, report writing and presentation was done.

3.2.1. Data Sources Used

For data sources in our project, the local level authorities of Bardiya and Dang were visited for primary source of data. We also visited the District Public Health Office of both districts and got the latest vaccination data of the respective districts.

3.2.2. Software Used

The software we'll use for the completion of this project is Microsoft Package that includes Microsoft Word, Microsoft PowerPoint and Microsoft Excel. The software like GIS and Gantt project are used. Mendeley is used for citation purpose.

4. Data Analysis

The analysis is mainly done by statistical analysis.

The following charts are prepared with the help of secondary data collected and the analysis is done accordingly.

4.1. Name of Used Vaccines in Analysis

Table 1. Vaccines used in report.

DANG	BARDIYA
Covidshield	Covidshield
Verocell	Verocell
J&J	J&J
Pfizer	-
AstraZeneca	AstraZeneca
Moderna	Moderna

Table 2. District wise vaccine coverage.

Variables	Target Population		District	
	Dang District	Bardiya District	Dang n (%)	Bardiya n (%)
Age				
12-17 year	74376	54838	31.4% (23380)	41692 (76%)
Above 18 years	432573	319056	372877 (86.2%)	245354 (76.9%)
Vaccine coverage	659603	486508	53.5%	60.2%
Covid shield Dose	659603	486508		
1st			29265 (4.44%)	34851 (7.16%)
2nd			26046 (3.95%)	26641 (5.47%)
Additional			4077 (0.62%)	3161 (0.65%)
Verocell	659603	486508		
1st			225651 (34.2%)	92970 (19.1%)
2nd			203044 (30.8%)	706602 (1.45%)
Additional			1209 (0.18%)	2163 (0.4%)
Pfizer	659603	486508		
1st			1159 (0.17%)	-
2nd			1078 (0.16%)	-
Moderna	659603	486508		

Variables	Target Population		District	
	Dang District	Bardiya District	Dang n (%)	Bardiya n (%)
1st dose			22455 (3.4%)	47274 (9.71%)
2nd dose				41458 (8.52%)

Table 3. Palika wise Vaccine Coverage of Dang.

Variables	Target Population	Banglachuli RMn (%)	Ghorahi SMCn (%)	Tulsipur SMCn (%)	Shantinagar RM n (%)	BabaiRM n (%)
AGE						
12-17 years	74376	31.4%				
18 or more than 18 years	432573	49.9%	84%	77.8%	75.5%	69.2%
Vaccine coverage		32.7%	67.45	51%	49.5%	45.4%
J&J		1192 (4.21%)	28341 (14.91%)	14570 (8.52%	3402 (11.31%	2074 (1.41%
Covid shield Dose						
1st		733 (30.03%)	13886 (36.39%)	5726 (3.35%)	1094 (3.63%)	1252 (3.87%)
2nd		7852 (2.64%)	62393 (4.03%)	58712 (4.36%	8869 (0.58%	9209 (2.11%
Additional		-	1125 (0.59%)	1322 (0.77%)	138 (0.45%)	-
Verocell						
1st		8505 (30.03%)	69017 (36.39%)	65180 (38.12%)	9389 (31.21%)	10727 (33.16%)
2nd		7852 (27.72%)	62393 (32.8%)	58721 (34.35%)	8869 (29.4%)	9209 (28.47%)
Additional		25 (0.088%)	538 (0.28%)	319 (0.187%)	49 (0.16%)	_
Pfizer						
1st		-	1078 (0.60%)		-	
2nd		-	1078 (0.56%)		-	-
Moderna		-	22455 (11.81%		-	-

Table 3. Continued.

Variables	Dangisharan RM n (%)	LamahiM n (%)	Rapti RM n (%)	Gadhawa RM n (%)	Rajpur RM n (%)
AGE					
12-17 years					
18 or more than 18 years	72.1%	81.4%	70.1%	67.2%	66%
Vaccine coverage	47.3%	53.4%	45.9%	44.1%	43.3%
J&J	1894 (7.39%)	7363 (12.8%)	6773 (13.82%)	4965 (10.74%)	2363 (7.98%)
Covid shield Dose					

Variables	Dangisharan RM n (%)	LamahiM n (%)	Rapti RM n (%)	Gadhawa RM n (%)	Rajpur RM n (%)
1st	950 (3.7%)	1570 (2,74%)	1758 (3.59%)	1473 (3.18%)	817 (2.76%)
2nd	7561 (2.98%	19662 (4.25%	15260 (9.85%	10369 (1.96%	3148 (1.80%)
Additional	122 (0.47%)	906 (1.57%)	406 (0.82%)	58 (0.13%)	-
Verocell					
1st	8589 (33.53%)	22263 (38.72%)	16562 (33.81%)	11883 (25.72%)	3536 (11.93%)
2nd	7561 (31.08%)	19662 (34.19%)	15260 (31.1%)	10369 (22.4%)	3148 (10.64%)
Additional	21 (0.08%)	168 (0.292%)	84 (0.171%)	5 (0.01%)	-
Pfizer					
1st					
2nd	-	-	-	-	-
Moderna	-	-	-	-	-

Table 4. Palika wise vaccine coverage of Bardiya.

	Target Population	Bansghadi M n (%)	Barbardiya M n (%)	Thakurbaba M n (%)	Geruwa M n (%)
AGE					
12-17 years	54858	88%	82.8%	80%	82.7%
18 or more than 18 years	319056	75%	72%	73.8%	69.7%
Vaccine coverage		59.1%	56.6%	59.9%	55%
J&J		3556 (5.6%)	7960 (10.27%)	4159 (8.10%)	2429 (6.14%)
Covid shield Dose					
1st		4663 (7.3%)	3222 (4.15%)	3493 (6.8%)	2373 (5.87%)
2nd		2941 (4.589%)	5127 (6.61%)	2681 (5.22%)	1763 (4.45%)
Additional		471 (0.74%)	111 (0.14%)	437 (0.85%)	62 (0.15%)
Verocell					
1st		8063 (12.69%)	9769 (12.60%)	6933 (13.50%)	15284 (38.522%)
2nd		6200 (9.765%)	9117 (0.117%)	5773 (11.24%)	12372 (31.25%)
Additional		175 (0.27%)	243 (0.31%)	161 (0.31%)	140 (0.57%)
Moderna					
1st		6300 (9.92%)	7234 (9.33%)	5904 (11.5%)	3689 (7.18%)
2nd		5619 (8.85%)	6511 (8.4%)	5185 (10.1%)	3340 (8.43%)

Table 4. Continued.

	Rajapur M n (%)	Madhuban M n (%)	Gulariya M n (%)	Badhaiyataal RM n (%)
AGE				
12-17 years	73.6%	93.7%	77.7%	97.97%

	Rajapur M n (%)	Madhuban M n (%)	Gulariya M n (%)	Badhaiyataal RM n (%)
18 or more than 18 years	81.3%	76.7%	85.4%	76.9%
Vaccine coverage	61.6%	60.9%	64.8%	61.4%
J&J	3783 (5.51%)	2767 (5.19%)	5141 (6.61%)	3645 (6.64%)
Covid shield Dose				
1st	5018 (7.3%)	2774 (5.211%)	10264 (13.19%)	3090 (5.62%)
2nd	3941 (5.73%)	2340 (4.45%)	5332 (10.45%)	2543 (4.62%)
Additional	664 (0.96%)	268 (0.503%)	941 (1.20%)	207 (0.37%)
Verocell				
1st	30368 (44.33%)	6378 (11.98%)	9322 (11.98%)	6853 (12.47%)
2nd	22930 (33.39%)	5762 (10.89%)	8231 (10.56%)	6217 (11.31%)
Additional	398 (0.29%)	155 (0.9%)	707 (0.330%)	184 (0.31%)
Moderna				
1st	5695 (5.37%)	5622 (10.69%)	6820 (8.71%)	6010 (10.94%)
2nd	5119 (7.45%)	4891 (9.18%)	5384 (6.92%)	5409 (9. 84%)

4.2. Comparison of Vaccines in Dang and Bardiya Districts in Different Angle

4.2.1. Target Population

The given pie chart represents the age wise target population of Dang and Bardiya district. In Dang district, the target population of 12-17 year age group is comparatively lower than the Population who are more than 18 year whereas in Bardiya district, the proportion of population targeted for vaccination is higher for 12-17 age group than the population who are above 18.
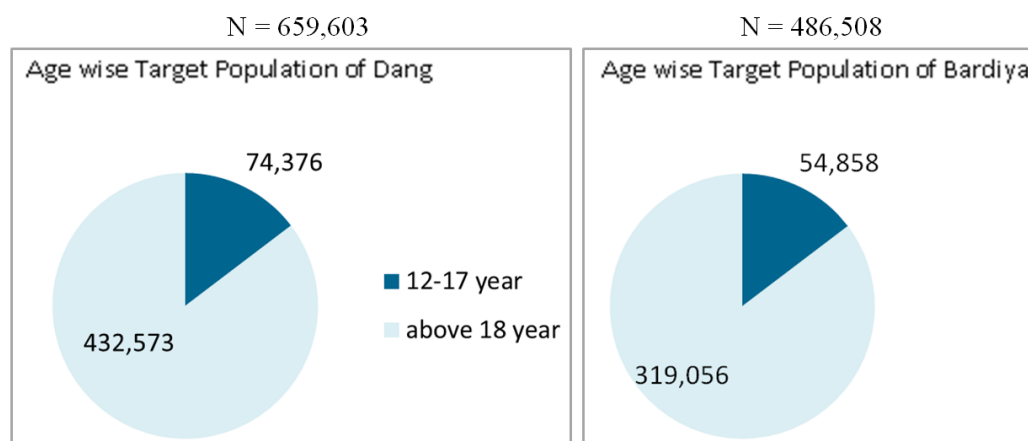
N = 659,603   N = 486,508

Figure 7. Age wise vaccination coverage of Dang and Bardiya District.

4.2.2. Age Wise Vaccination

With respect to age higher proportions of more than 18 years received the covid 19 vaccines. The diagram further showed that people aged 12-17 years more than three fourth (76%) received covid 19 vaccine in Bardiya District whereas only 31.4% received in Dang district out of the total targeted population.
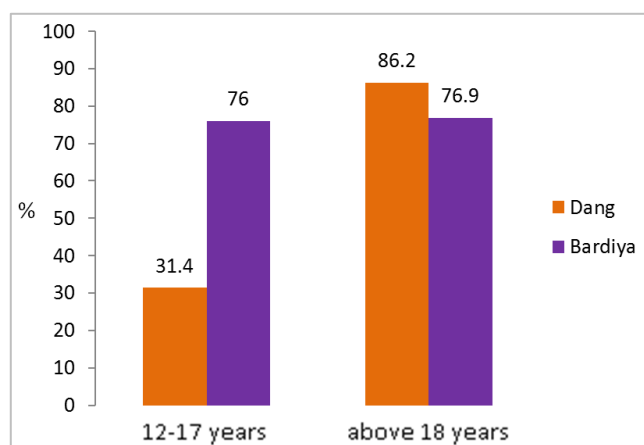
Figure 8. *Age wise vaccination coverage of Dang and Bardiya District.*

4.2.3. Coverage

The given chart shows that covid vaccination coverage in Bardiya district (60.20%) is higher than Dang district.
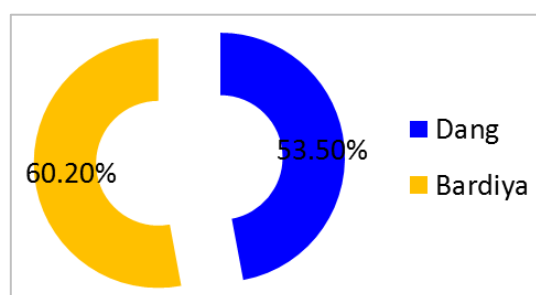

Figure 9. *Coverage of vaccination.*
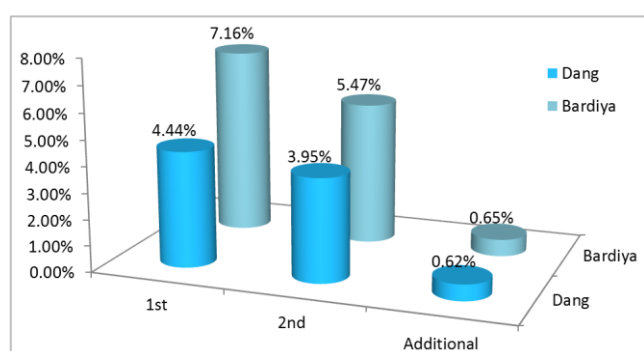
4.3. Comparison of COVID Shield

Figure 10. *Covidshield 1st, 2nd and 3rd dose according to district.*

The above bar graph shows that about 4.44% population of Dang district and 7.16% population of Bardiya district are vaccinated with 1st dose of covidsheild whereas percentage is comparatively low in second dose since 3.95% and 5,47% people received second dose of covidshield in Dang and Bardiya respectively. The ratio further decreased exponentially for additional dose where 0.62% (Dang) and 0.65%(Bardiya) of total population are vaccinated with additional dose of covidshield.
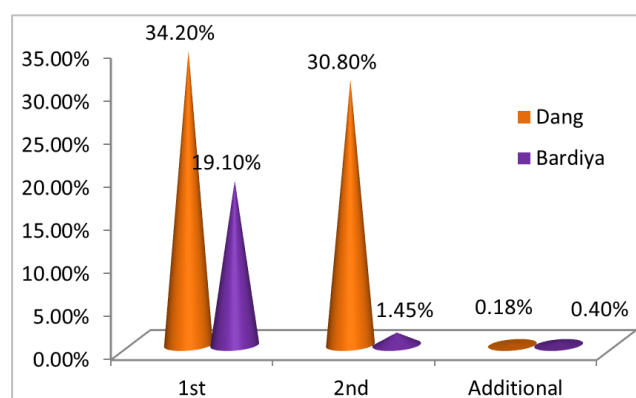
4.3.1 Comparison of Vero Cell

Figure 11. *Vero cell 1st, 2nd and additional dose according to district.*

The above shown conical graph shows that among the total targeted population 34.20% and 19.10% of Dang and Bardiya District respectively are immunized with Vero cell first dose. The percentage is not very different with second dose in Dang district but the value is very low in Bardiya district. In case of additional dose of Vero cell, only 0.18% (Dang) and 0.4% (Bardiya) of total population were vaccinated.

4.3.2. Vaccines in Bardiya

The given pie chart informs about the different types of vaccines (covidsheild, Verocell, AstraZeneca, Moderna and J &J) used in Bardiya district with their proportion. About one fourth populations are vaccinated with AstraZeneca and about one fifth populations are immunized with verocell. Similarly, proportion of covidshield, Moderna and J&J distributed in Bardiya district is 19.1, 7.16, and 6.87 respectively. This shows that the AstraZeneca vaccine is widely distributed in Bardiya whereas small proportion of population is vaccinated with J&J.
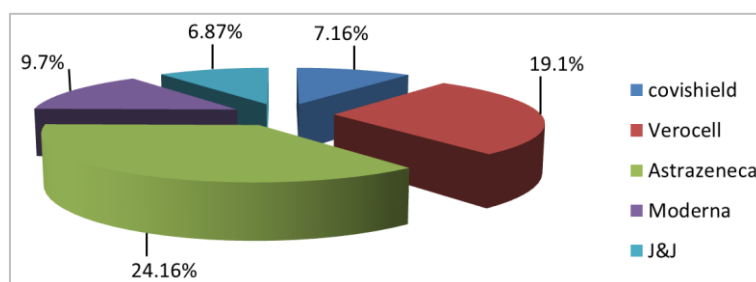
Figure 12. Proportions of different vaccines used in Bardiya (at least 1 dose).
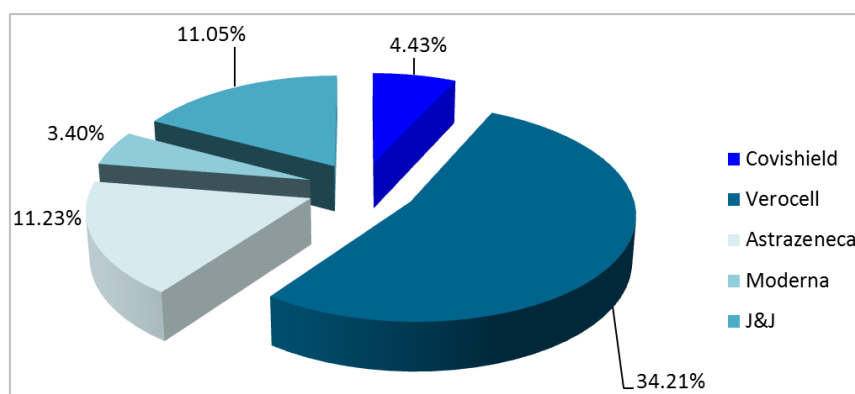
4.3.3. Vaccines in Dang

Figure 13. Proportion of different vaccines used in DANG district (at least 1 dose).

The given pie chart informs about the different types of vaccines (covidsheild, Verocell, AstraZeneca, Moderna and J&J) used in Dang district with their proportion. In Dang district more than one 3rd proportion of population is vaccinated with verocell. The proportion AstraZeneca vaccine distribut-ed is about 11.23%, which is somehow similar to that if J&J vaccine distribution (11.05%). Few proportion of population i.e. 4.43% and 3.4% are immunized with covidshield and Moderna respectively in Dang district.

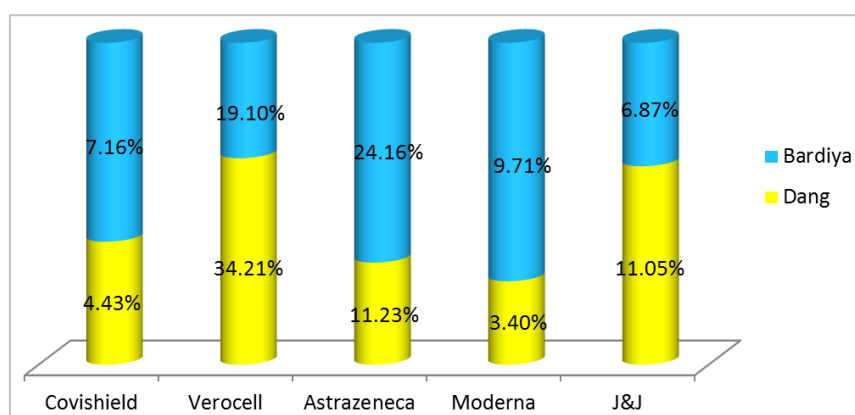### 4.3.4. Vaccine Comparison Between Two Districts

Figure 14. Proportion of different vaccine used in Dang and Bardiya District.

The analysis of given cylindrical bar graph show that most of the population (34.21%)are vaccinated with verocell in Dang district however the distribution of Astra Zeneca vaccine is greater in Bardiya district. Similarly, Moderna is least distributed in Dang District whereas Janssen and Janssen (J&J) is distributed in lower quantity in Bardiya district.
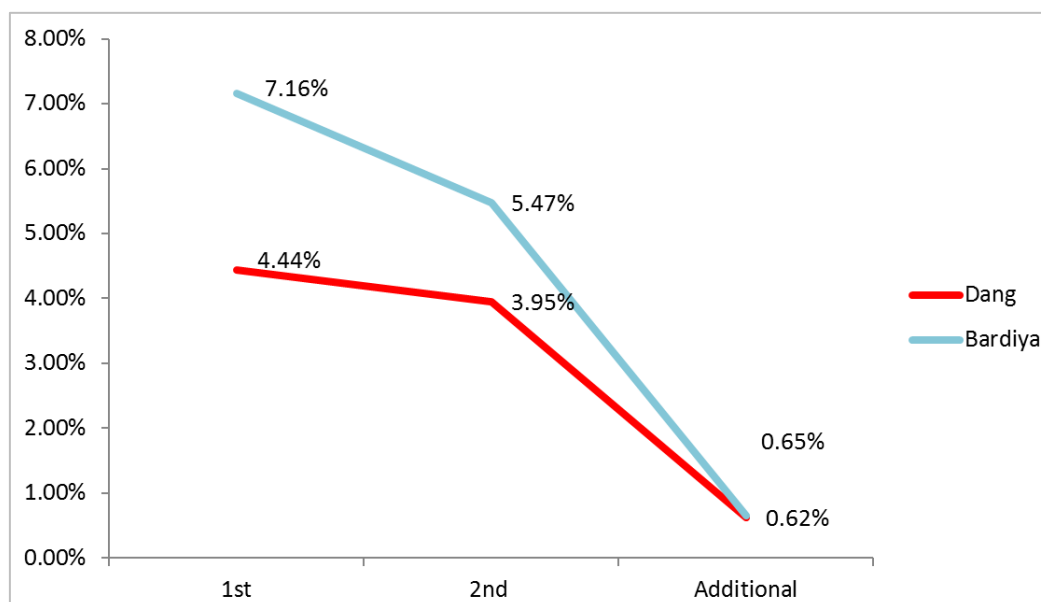
4.3.5. Covidshield in Two Districts

Figure 15. Covishield 1st, 2nd and 3rddose according to district.

The above diagram show that about 4.44% population of Dang district and 7.16% population of Bardiya district are vaccinated with 1st dose of covidsheild whereas percentage is comparatively low in second dose since 3.95% and 5.47% people received second dose of covidshield in Dang and Bardiya respectively. The ratio further decreased exponentially for additional dose where 0.62% (Dang) and 0.65% (Bardiya) of total population are vaccinated with additional dose of covidshield.

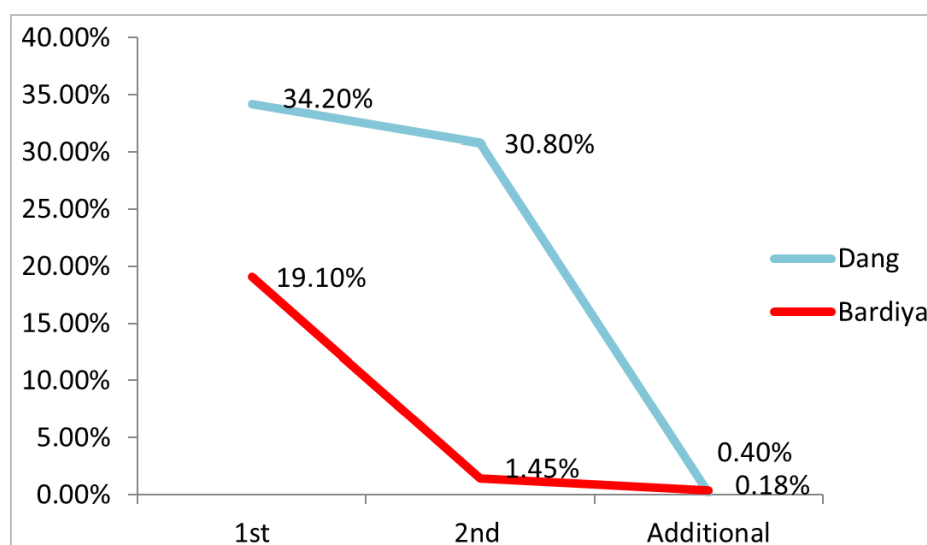### 4.3.6. Verocell in Two Districts

Figure 16. Vero cell 1st, 2nd and additional dose according to district.

The above shown figure shows that among the total targeted population 34.20% and 19.10% of Dang and Bardiya District are immunized with Vero cell first dose. The percentage is not very different with second dose in Dang district but the value is very low in Bardiya district. In case of additional dose of verocell, only 0.18% (Dang) and 0.4% (Bardiya) of total population received additional dose of Vero cell.
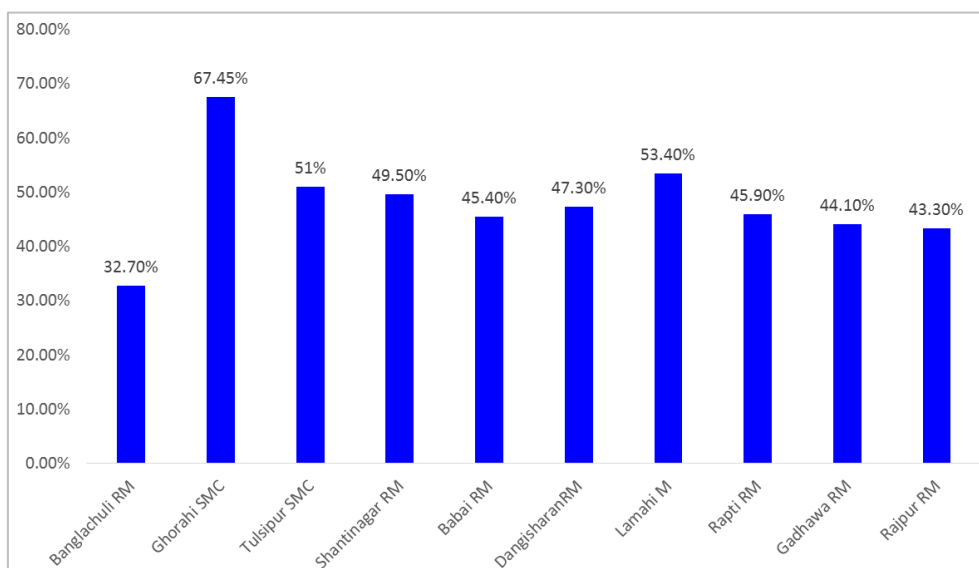
4.3.7. Palika Wise Comparison of Dang

Figure 17. Coverage of COVID-19 vaccine indifferent Palika of Dang District.

The bar graph show that the distribution of covid vaccination is highest in Ghorahi municipality i.e. (67.45%) since the targeted population of Ghorahi sub metropolitan city is higher than other municipality. After Ghorahi, vaccinated percentage of Lamahi municipality is maximum. The chart shows the vaccination coverage is above 50% in Tulsipur sub metropolitan city. Similarly, the value is about average in Shantinagar, Babai, Rapti, Gadhawa and Rajpur municipality. The vaccination coverage is mimimum in Banglachuli Rural Municipality.

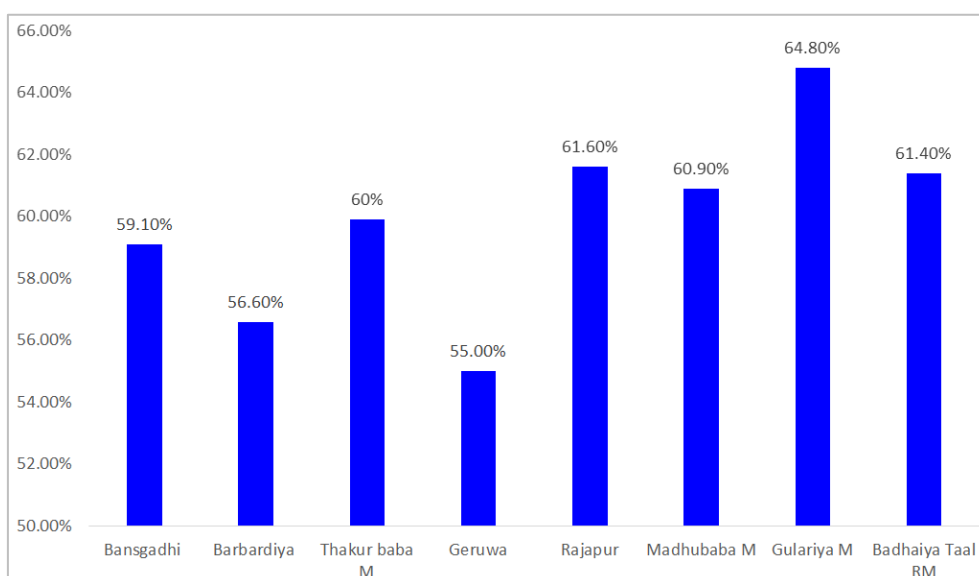### 4.3.8. Palika Wise Comparison of Bardiya

Figure 18. Coverage of COVID-19 vaccine indifferent Palikas of Bardiya District.

The given Bar-Graphs inform us about the coverage of COVID-19 in different municipalities of Bardiya District where max. Coverage is in Gulariya municipality i.e. near about 65% and least in Geruwa municipality i.e. near about 55%.

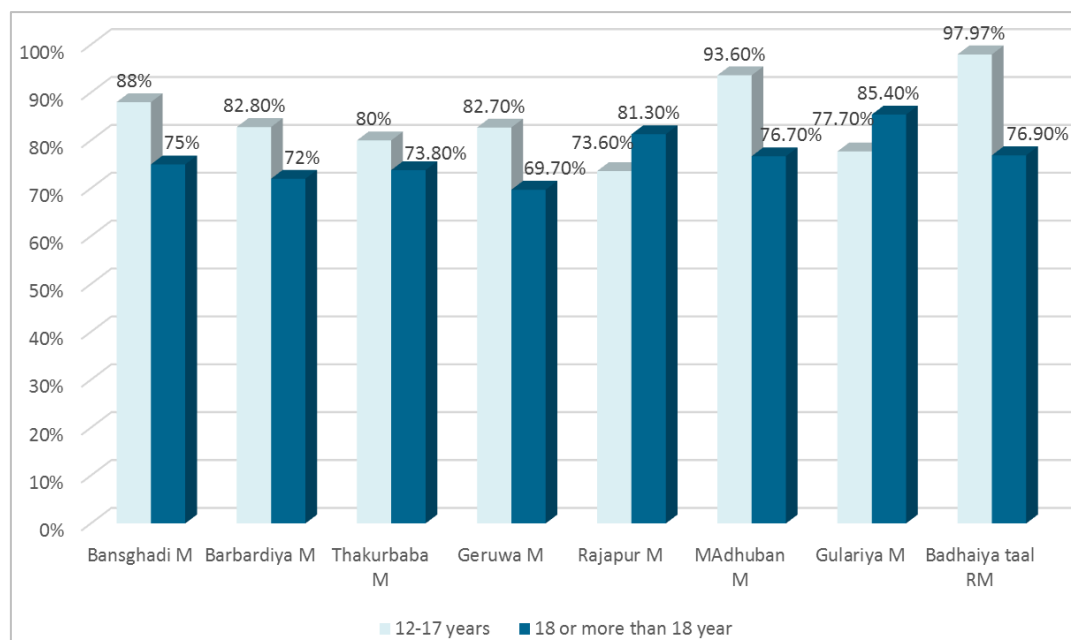### 4.3.9. Age Wise Comparison in Each Palika of Bardiya

Figure 19. Coverage of COVID-19 vaccines in different palika of Bardiya District according to age.

The above Bar-Graph shows the coverage of COVID-19 in different municipalities of Bardiya and Dang district on the basis of age. Where out of the total targeted population max. number of vaccinated people age of 12-17 years are in Bardiya municipality (97.97%) and Rajapur municipality has least (73.60%) and Gulariya municipality have max. number of vaccinated people (85.40%) of age group greater or equal to 18 years and Geruwa has least (69.70%).

5. Results and Discussion

To make the public and local authorities more aware of the data and situation of pandemics and to recommend ways to tackle the contemporary situation of COVID-19 is the main focus of the report. The report the number of cases of COVID-19 of two districts (Bardiya and Dang) on the basis of gender and age. After the data collection as we tabulated the data in the form of bar diagram, we come to know females are more vaccinated than males in the chosen district. It is clearly seen that in each district male infected population is more than double the female population since the female population in our country is more than the male population, males are infected more than females in Dang and Bardiya. Though we live in a society where the majority of the females are confined to household activities and males are engaged in income-generating activities. Males have to go out to support their families financially. Some are compelled to work even in

the pandemic for their hand to mouth. Besides this, majority of males return from abroad during this pandemic time and they are highly prone to be infected. Hence due to this all the reasons males have high probability to be infected than those of females but the contrast to the situation, female's involvement in vaccination campaigns is more than male.

Because of the lack of proper awareness and carelessness among the ordinary residents and also lack of well-equipped hospital and facilities, vaccination campaign was slow in first phase but increased exponentially in second phase of lockdown. We can also clearly see that the bar representing male is higher than that of female it is because in the context of Nepal male are comparatively active than female in social sector or outer-world which result as male are more infected by the virus than in female. Males have to go out to support their family financially. Some are compelled to work even in the pandemic for their hand to mouth. Besides this, majority of males return from abroad during this pandemic time and they are highly prone to be infected. Although female population is higher than male population in our country, males are more infected than females. So, we can conclude that working population is more likely to be infected. The Covishield 1st, 2nd and 3rd dose according to district analysis shows that among the total targeted population 34.20% and 19.10% of Dang and Bardiya District are immunized with Vero cell first dose. The percentage is not very different with second dose in Dang district but the value is very low in the Bardiya district.

In case of additional dose of verocell, only 0.18% (Dang) and 0.4% (Bardiya) of total population received an additional dose of Vero cell.

Dang and Bardiya District are immunized with Vero cell first dose. The percentage is not very different fromthe second dose in the Dang district but the value is very low in the Bardiya district. In case of an additional dose of Vero cell, only 0.18% (Dang) and 0.4% (Bardiya) of total population received an additional dose of Vero cell. The distribution of covid vaccination is highest in Ghorahi municipality i.e. (67.45%) since the targeted population of Ghorahi sub-metropolitan city is higher than other municipalities. After Ghorahi, the vaccinated percentage of Lamahi municipality is maximum. The chart shows the vaccination coverage is above 50% in Tulsipur sub-metropolitan city. Similarly, the value is about average in Shantinagar, Babai, Rapti, Gadhawa and Rajpu rmunicipalities. The vaccination coverage is minimum in Banglachuli Rural Municipality. The data shows, that vaccine coverage is highest in Gulariya municipality i.e. near about 65%, and least in Geruwa municipality i.e. near about 55%. On the basis of age out of the total targeted population maximum number of vaccinated people are of age 12-17 years in Bardiya municipality (97.97%) and Rajapur municipality has the least (73.60%) and also Gulariya municipality has a maximum number of vaccinated people (85.40%) of age group greater or equal to 18 years and Geruwa has least (69.70%). The distribution of vaccines seems to be well managed by the local bodies of Dang and Bardiya, but it is could be better with more visionary planning and effective implementation of legislated policy. Corruption, black marketing of masks, sanitizer, and vaccines were highlighted in media in the Bardiya district. Enhance the public awareness of COVID-19 and its impact on the layman population was the major motive of this project. Local bodies should be aware of the present scenario of COVID-19 and take strong action so that future outbroke of such disease in future would be manage effectively.

6. Conclusion

Bardiya and Dang District has fully vaccinated population against COVID-19, 60.20% and 53.20% respectively of its total population. Similarly, adolescents aged 12-17 years more than three fourth (76%) received covid 19 vaccine in Bardiya whereas only one in three received in Dang district. More than half of the population of Bardiya and Dang district has received at least one dose of vaccine respectively. Population of Dang district has more dropout for 2nd dose of vaccine in comparison to Bardiya District. Mostly used vaccines in both districts are Verocell, AstraZeneca, Covishield, J&J, Moderna and Pfizer.

The viral disease has been detected in all provinces and districts of the country, with Dang Province and Bardiya being the worst hit district respectively. According to WHO Nepal was considered one of the highest risk areas for the pandemic, and also one of the least prepared However, WHO later re-classified Nepal to less at risk from its initial classification as "Very Vulnerable". Nepal focused its effort on planning, prevention and preparation. Different chart and diagram shows, that male is higher than that of female in infection it is because in the context of Nepal male are comparatively active than female in social sector or outer-world which result as male are more infected by the virus than in female. Males have to go out to support their family financially. Some are compelled to work even in the pandemic for their hand to mouth. However, vaccination is satisfactory in case of women. It is difficult to get the precise data related to COVID-19 on district and local levels. ¬ Only national and province level of data can be found in the authorized sites and governmental sites. ¬ District wise comparison of data on COVID-19 on the different basis such as age, gender etc. cannot be found anywhere. Comparative data analysis is rarely found.

It seems the concerned authorities have given less effort for the management and visualization of COVID-19 statistics of the local levels. Moreover, local people are unable to get COVID-19 statistics of their district on different basis such as age, sex, death rate, rate of new cases, quarantine place and testing centers for the study and visualization of the past and present scenario of COVID-19 in their local level was not feasible with easeness. Preparation of data base. ¬ To collect and compare the data related to COVID-19 of two districts of Nepal on different basis such as age, gender, rate of new case, death rate, etc. ¬ To assess the highly affected and least affected districts among the two different districts which are under our study, Analyze the COVID-19 statistics on the basis of age group, gender, etc were the major consideration of project.

Abbreviations

RNA	Ribonucleic Acid
WHO	World Health Organization
COVID-19	Coronavirus Disease 2019
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
PPE	Personal Protection Equipment
COVIDSHIELD	COVID-19 Vaccine Produced Under License by the Serum

Author Contributions

Sudipta Poudel: Conceptualization, Data curation, Formal Analysis, Project administration, Resources, Software, Writing – original draft, Writing – review & editing

Ishwor Prasad Dhital: Formal Analysis, Funding acquisition, Investigation, Validation, Visualization

Conflicts of Interest

The authors declare no conflicts of interest.

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