COVID-19 Wave 1 and 2; A study on the State of Azad Jammu & Kashmir During Pandemic

Ali Abidi
Data Analyst, WHO/AJK
aliabidi14@gmail.com

Dr. Qaeser Nazeer
COVID-19 Technical Focal Person/
Provincial Surveillance Officer WHO/AJK
nazeerq@who.int

ABSTRACT

The current study summarizes the incidence of COVID-19 in Azad Jammu & Kashmir (AJ&K) since the beginning of pandemic. It presents the statistics on current statistics of Pakistan and AJ&K. The study presents Epidemiological insights on COVID-19 in AJ&K. It adopted exploratory research design to summarize the prevalence of COVID-19. It presents positivity rate, deaths and fatality rate. The study also compares the numbers and percentages in AJ&K during COVID-19 wave 1 and wave 2. It also presents demographic profile of AJ&K confirmed cases. The study also highlights the outcome of prevention measures adopted during wave 2 for COVID-19 control.

Keywords: Epidemiology, Demographic profile, Prevention measures, AJ&K

1. Introduction

1.1. About Azad Jammu & Kashmir Pakistan

The State of Azad Jammu & Kashmir (AJ&K) has land of 222,236 sq.km with an area of 13,297 sq.km. The north of AJ&K is bordered by Gilgit Baltistan, Indian held State of Jammu and Kashmir on east, Punjab Province on south and Punjab & Khyber Pakhtunkhwa (KP) on the west. The line of control stretch is almost 555km with Indian Occupied Kashmir on east and 277km, 206km and 212 km on west bordered with Punjab, Khyber Pakhtunkhwa and Gilgit Baltistan respectively. The first census after independence was conducted in 1951 in Pakistan and AJK. Since then, five more nationwide censuses were carried out during 1961, 1972, 1981, 1998 and 2017. As per census 2017 the total population of AJK is 4.045 Million with 1.64% growth rate.

1.2. Significance of the Study

The study is significant in the sense that it is first ever study of its kind on AJ&K. It provides brief description of the pandemic in AJ&K by comparing the two waves.

1.3. COVID-19: A Pandemic

COVID-19 pandemic breaks the wheel of the running world, transitioning towards new global era. This has cause such a severe devastation throughout the world. In history, there were pandemic contained in a specific region or continent and transferred slowly to the outer world. However, COVID-19 spread was quick and within no time it affected billions of people and millions of them are dead around the globe. A worldwide situation of the pandemic is depicted in the map below;
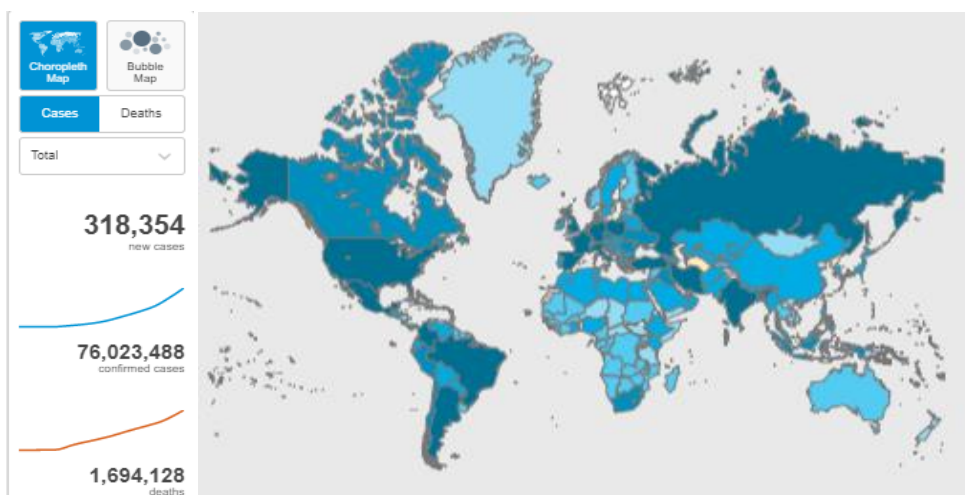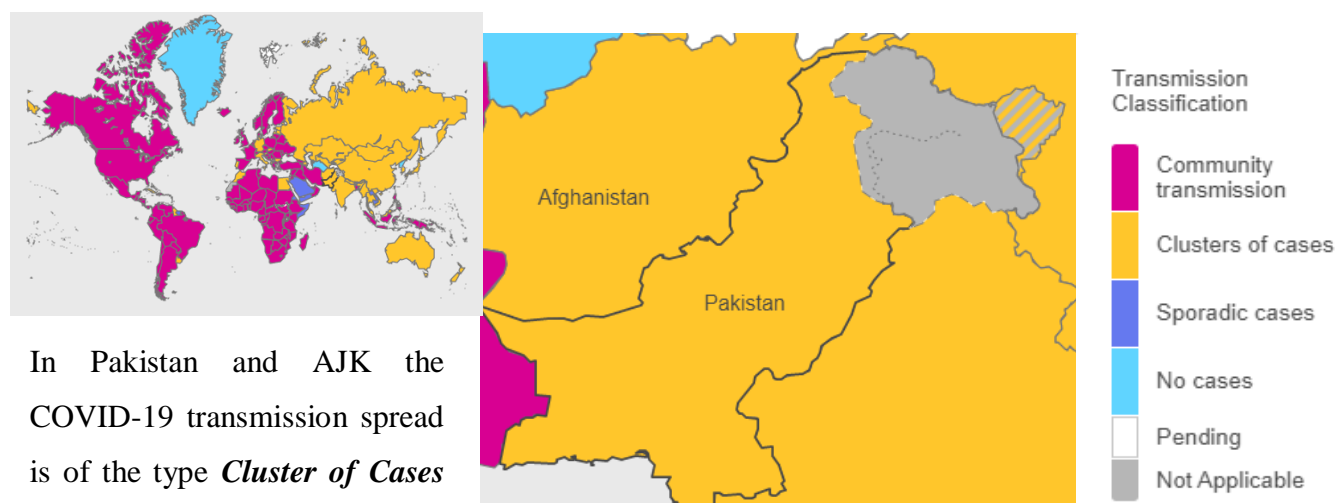
Figure 1: COVID-19 Worldwide Situation as of 08 Dec 2020

In Pakistan, from Jan 3 to 3:47pm CET, 7 December 2020, there have been 416,499 confirmed cases of COVID-19 with 8,361 deaths. Cluster Cases. Transmission Type: Pakistan V/s Rest of the World

In Pakistan and AJK the COVID-19 transmission spread is of the type *Cluster of Cases* as evident from the figure

1.4. Current Situation in Pakistan

In Pakistan, the first case reported on 26th Feb. 2020 and the virus transmitted quickly and within no time it spread to whole country. The current stats of Pakistan as of 7 Dec 2020 on coronavirus is presented in the table;

Table 1.5.1: COVID-19 Pakistan At A Glance

Province	Total Test Conducted	Positive Cases	Positivity Rate	Died
AJK	88037	7390	8	182
Baluchistan	151298	17501	12	169
Gilgit Baltistan	57458	4746	8	98

Islamabad	707989	33061	5	341
Khyber Pakhtunkhwa	646900	50078	8	1419
Punjab	2099651	124191	6	3218
Sindh	2076519	186212	9	3060
Pakistan Total	**58,27,852**	**4,23,179**	**7**	**8,487**

1.5. COVID-19 Spread in Pakistan

The spread of COVID-19 depends upon number of factors such as population density. In case of Pakistan, the province Punjab is highly dense and a populous area. The total area is 205,344 km2 consisted of 36 districts (Briney, 2018). Due to the highly dense population residing in the province, it seems a major cause of spreading coronavirus in the city.

The second-largest province of Pakistan is Sindh having a total area of 140,914 km^2 with 29 districts. Karachi is the largest city of the province. Karachi is famous for the largest South Asia's deepest water seaport and handles almost 60% of the nation's cargo and a major industrial hub. One of the many reasons the spread of virus happened due to the partial lockdown and wide ignorance and misconception among the residents about the disease. Similarly, in other provinces the virus spread due to ignorance about the disease for example in Khyber Pakhtunkhwa, which is due to low literacy rate. Baluchistan is the fourth province of the country and it has the privilege to get the largest land area in a country. The total land area is 347,190 km2. Quetta is the largest and capital city of the province. The COVID-19 cases are slightly less than the rest of the provinces; however, it seems that inadequate healthcare infrastructure leads to cause more coronavirus cases in the province. The numerous studies confirmed their findings in the context of Pakistan to see for detailed review (Waris et al. 2020; Muhammad et al. 2020; Ilyas et al. 2020).

1.6. COVID-19 Spread in Azad Jammu & Kashmir

On 14 March, the local Government declared a health emergency after a meeting of the National Security Council and decided to implement lockdown in the whole state. The first case reported on 18 March 2020 and the disease started to spread in the community. However, it was slow transmission in its early phase due to number of possible reason i.e. the strict lock down, zero mobility and active district administration control i.e. only one family member was allowed to go outside for food or other essentials. A glimpse COVID-19 AJK historic perspective is given below;
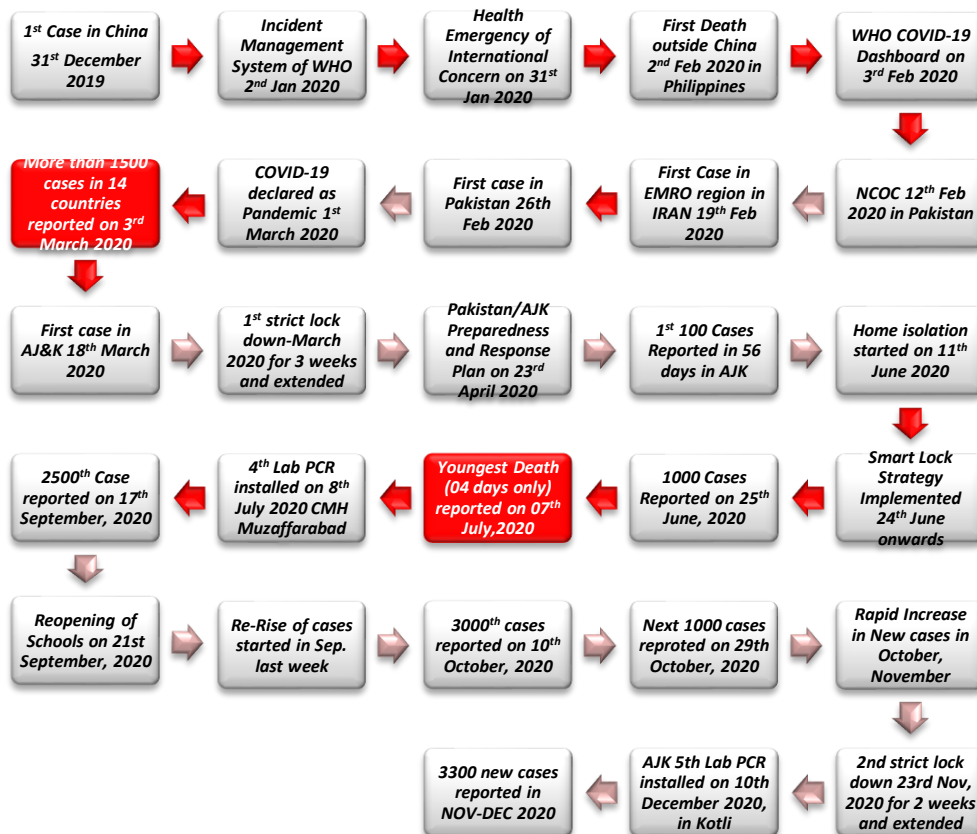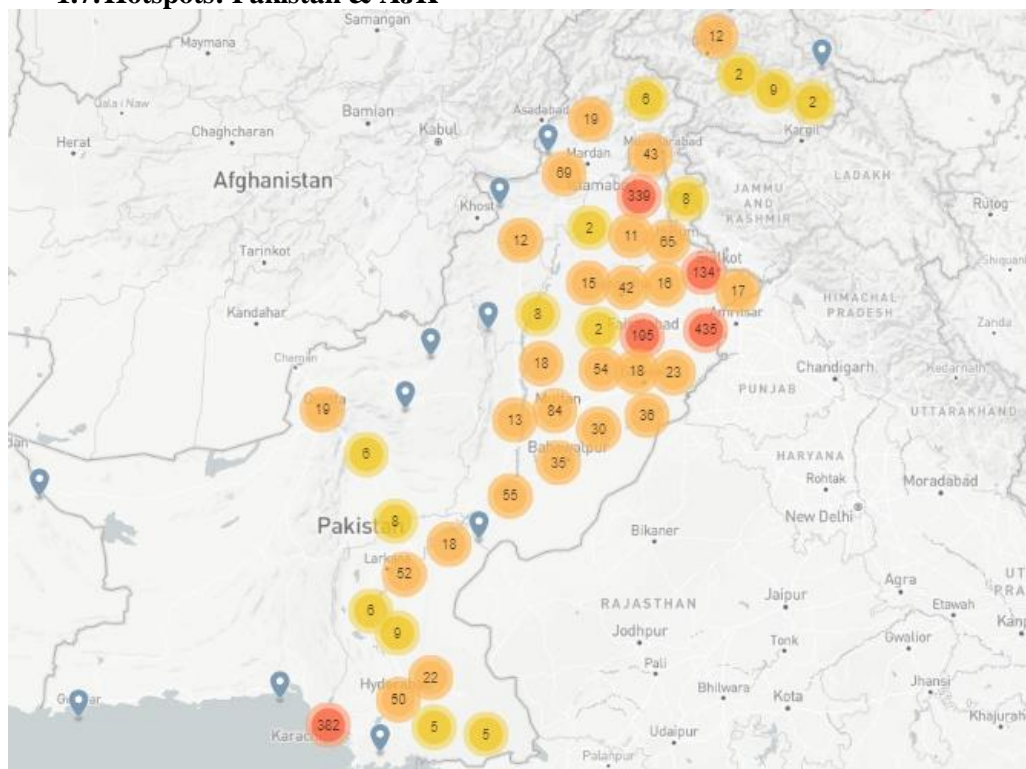
Figure 1.7.1: Historic Perspective of COVID-19 AJK
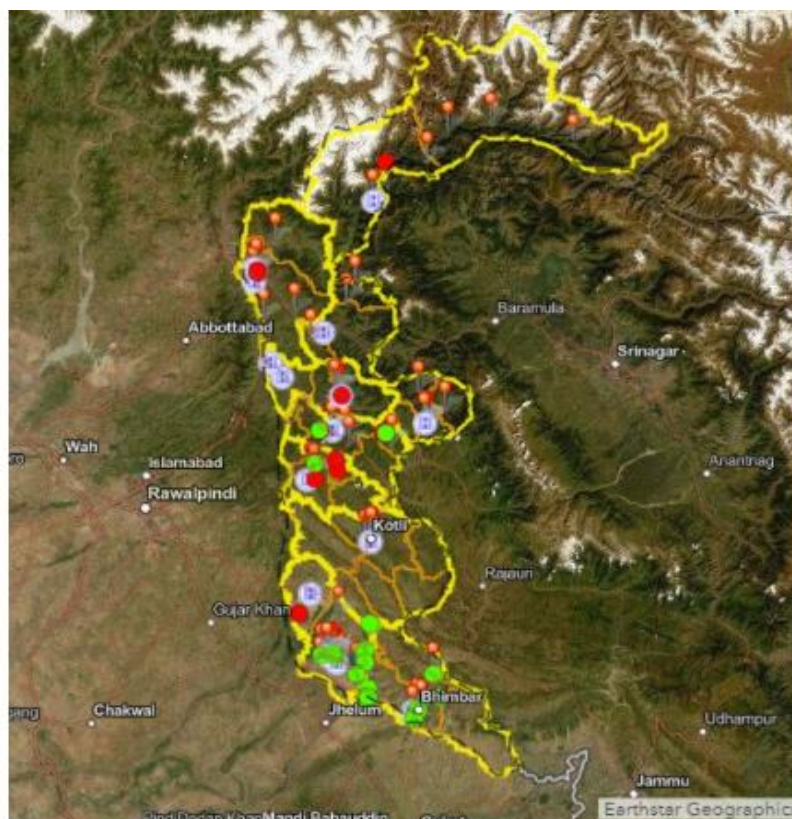
1.7. Hotspots: Pakistan & AJK

Figure 1.8.1: Hotspots in Pakistan and AJ&K

2. Literature Review

2.1. COVID-19 impact analysis

Zia and Farooq (2020) stressed that countries are working hard to reduce the incidence of COVID-19 with their strategic healthcare strategies, the positive effects of avoiding large-scale gatherings, maintaining social distance, and promoting screening and dissemination of information is also included in controlling the pandemic.

2.2. Economics & Commerce

Ahmad (2020) concluded that, due to the high prevalence of corona virus and its negative health consequences, the government has introduced job security, emergency relief packages for those in need, and refinancing schemes for them, introduced a number of labor market regulations, so it helps to reduce the tightness of the labor market in a country.

2.3. The Climatic condition

Climate conditions in Pakistan are mild, as it includes both high and low temperatures which can be seen in different parts of a country and also in Azad Jammu and Kashmir. A number of preliminary studies have provoked widespread outrage that regional climatic conditions would be helpful in accessing the severity of coronavirus cases, for example, Iqbal et al (2020) found that COVID-Cases of 19 are much higher than in the region of relatively lower temperatures. Other countries located in the hot climate zone. Bukhari and Jamil (2020) argue that although there is some evidence of support for COVID-19 cases in the region with low climate temperatures, effective public health interventions to reduce new cases Need to use Dawn News (2020) updated the press release of the Prime Minister of Pakistan who hopes that socio-economic and environmental reforms will reduce the coronavirus. There is an urgent need for unified

economic and environmental policies that will help reduce the risk of the virus worldwide.

According to Kubiak et.al (2009), The 2009 pandemic flu in the United States was very much reduced during the summer, and then came back rapidly in September[1].

2.4. Health Care Workers

Ali et. al (2020) found that "Major factors for COVID 19 infection among HCWs include, lack of understanding of COVID-19 infections, inadequate use and availability of PPE, uncertain diagnostic criteria and unavailability of diagnostic test; and psychological stress". Similarly, Khan et al. (2020) also concluded that fewer of the health care workers, students and academicals are aware of the vulnerability of coronavirus, and majority needs a substantive amount of precautionary information of coronavirus. Mukhtar (2020) found that, "the coronavirus pandemic puts mental stress on healthcare workers that are directly exposed to the virus in isolation centers to take care of patients, while feeling the sense of losing loved ones is higher in the general public that causes mental stress".

2.5. Immune Levels

Some researcher has insinuated that "nations like European Unions and United States where the Bacille Calmette Guerin (BCG) immunization, an effective immunization against tuberculosis, was not mandatory are greatly impacted by COVID-19", as reported by Miller et.al 2020. In Pakistan, the BCG vaccination is required for newborns. As indicated by the administration's expanded immunization program, since 1949, all babies in Pakistan have been given a portion of the BCG immunizations at birth[2].

2.6. Comorbidity

Yusuf (2020) found that, cancer patients are at risk of contracting the corona virus due to a weakened immune system, while delays in the treatment of cancer patients due to lockdowns and other issues can undoubtedly increase their discomfort.

2.7. COVID-19 Prevention

According to Muhammad et. al. (2020), "Prevention is better than cure" strategy is essential to minimize the spread of coronavirus epidemics in a country. There is a need to follow government-led policies and World Health Organization (WHO) guidelines that will help reduce the impact of COVID-19 across the country.

"It should be clear to the international community that we must fight the corona virus, not be afraid of this epidemic. The growing demand for precautionary masks and hand sanitizers leads to shortages, as both safety precautions are out of the market and prices are rising. It is recommended to wash your hands with soap and water to reduce the chance of contact with the virus for at least 20 seconds. Antiseptic spray cleaners need to clean houses, offices and streets, so it can reduce the risk of coronavirus outbreaks" (Omar et al. 2020). "Avoid places and areas that touch high. Social distance is a preventative measure in which states have expressed extreme provocation to protect humans through the Corona virus epidemic" (World Economic Forum 2020).

2.8. Travel & Transportation

Inamullah et al. (2020) concluded that, "intercountry traveling is considered the root cause to transmit coronavirus in a country".

2.9. Diet

Hakeem and Sheikh (2020) found that "nutritional diet is important to prevent the human body from any diseases, while it is the same case with COVID-19, if the policy-makers include nutritional intervention in the COVID-mitigating policies, then there will be higher chances to minimize the risk of negative health effects of coronavirus into the human body".

3. Methods

The current study has adopted exploratory research design and presented analysis in graphical form and tabular form. The descriptive design allowed us to describe the state of pandemic in AJ&K. The data has been taken from AJK Situation Reports and http://www.covid.gov.pk/ and
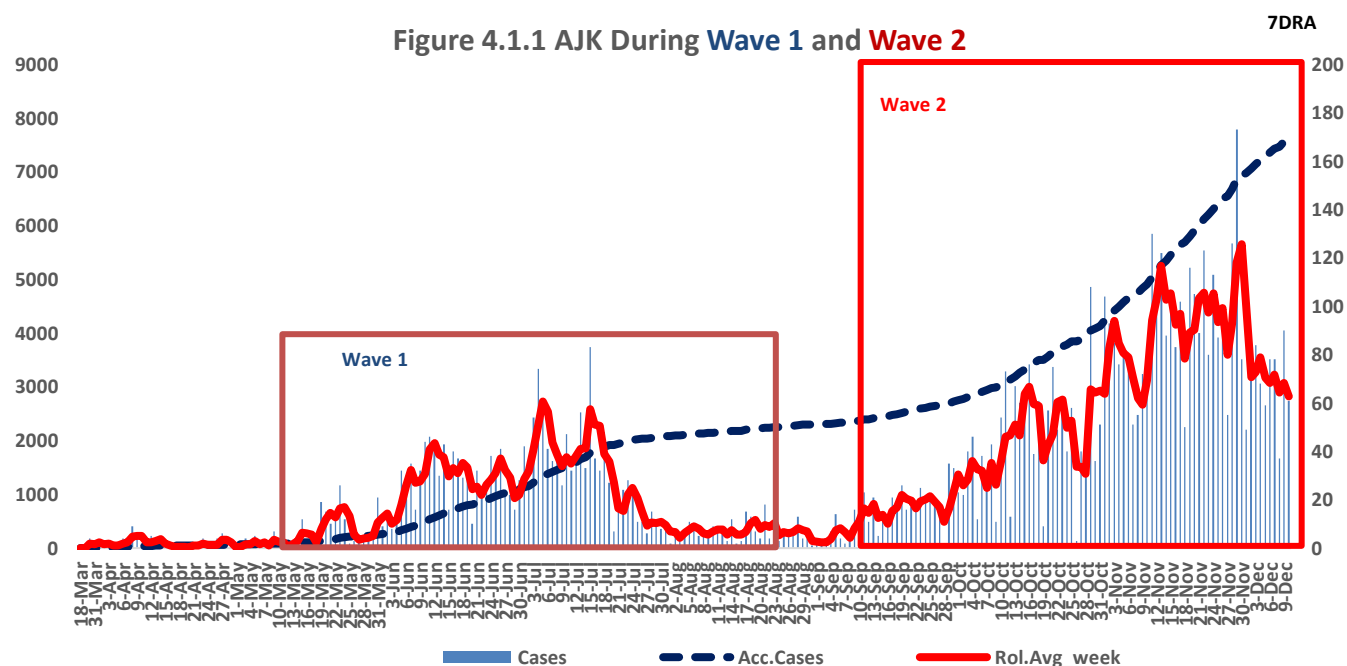
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[1]

Huang KE, Lipsitch M, Shaman J, Goldstein E. The US 2009 A (H1N1) Influenza Epidemic. 2014;25(2):203- 206. doi:10.1097/EDE.0000000000000055.

[2] Preliminary studies show countries with universal BCG vaccine programs have much lower mortality rates from Covid-19. https://www.dawn. com/news/1547450/is-tb-vaccine-the-reason-behind-covid-19s-less-deadly-effect-in-pakistan-experts-are-finding-out. Accessed April 15, 2020
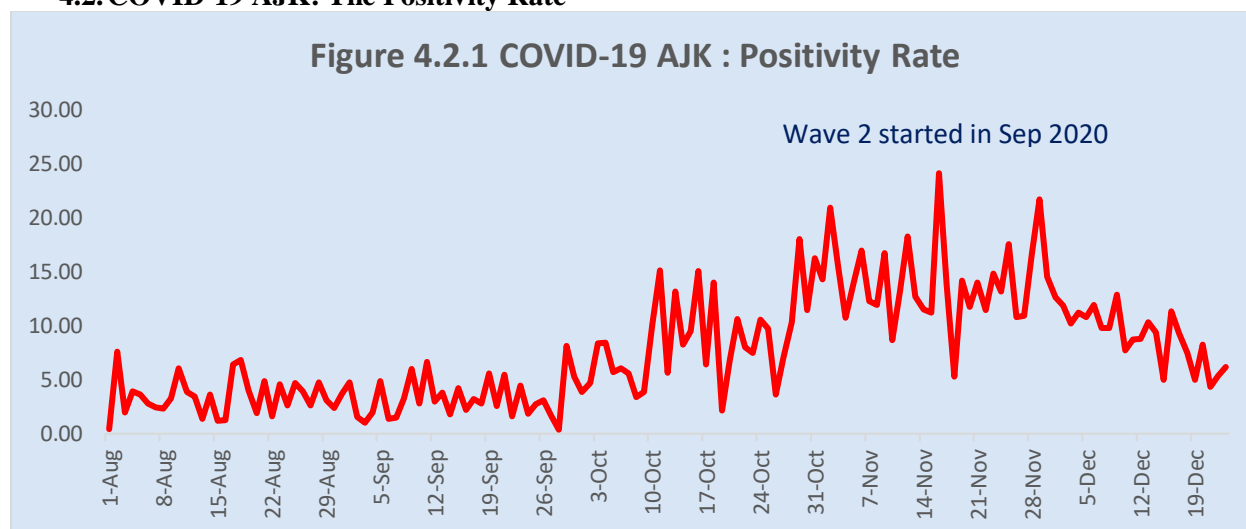
https://www.nih.org.pk/.

4. COVID-19 AJK: Epidemiological Insights & Discussion
4.1. COVID-19 AJK: The EPI Curve

Figure 4.1.1 AJK During Wave 1 and Wave 2

The above figure shows the rise in disease over time during the pandemic in wave 1 and wave 2. Wave 2 was comparatively much higher than wave one, where positivity rate was twice the wave 1 i.e. greater than 10% and depicted in the graph below;

4.2. COVID-19 AJK: The Positivity Rate

Figure 4.2.1 COVID-19 AJK : Positivity Rate

4.3. COVID-19 AJK: Deaths & The Case Fatality Rate

The table below summarizes the case fatality rate of AJK compared to rest of the districts.

Table 4.3.1: COVID-19 Case Fatality Rate

Province	Case Fatality Rate
AJK	2
Baluchistan	1
Gilgit Baltistan	2
Islamabad	1
Khyber Pakhtunkhwa	3
Punjab	3
Sindh	2
Pakistan Total	**2**

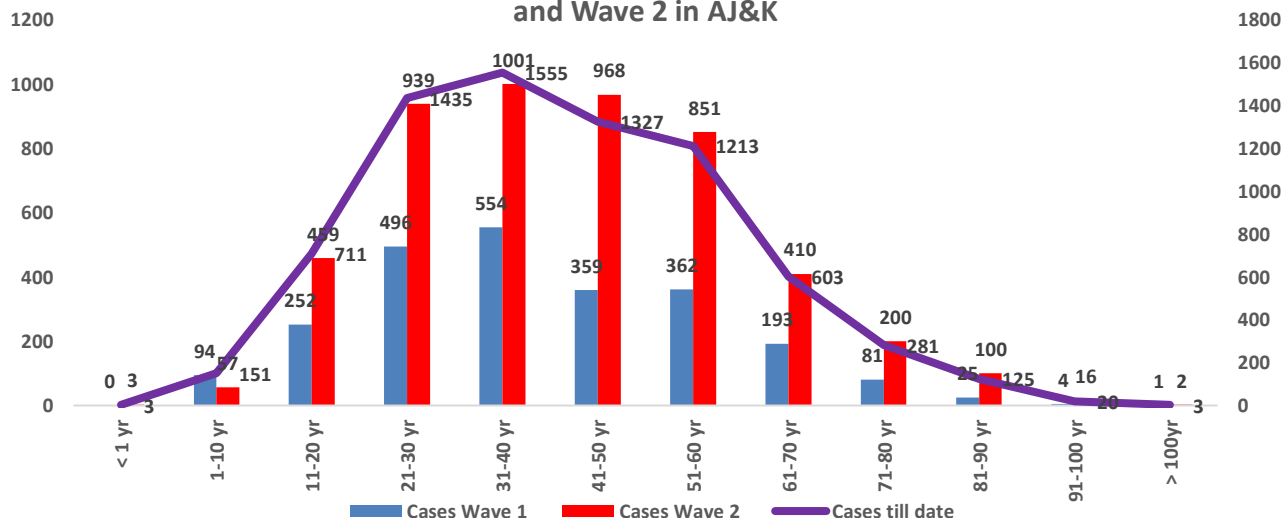**Figure 4.3.1 COVID-19 AJK: Deaths-District wise**

In AJ&K, district Muzaffarabad has recorded highest number of deaths due to coronavirus disease i.e. 48 deaths compared to Mirpur which is second in the lead with 37 deaths. District Poonch recorded 34 deaths, Bagh 26, Kotli 20, Bhimber 13, Neelum 8, Sudhnoti 5 and Jhelum valley and Haveli has recorded least number of deaths i.e. 4 in the both districts.

4.4. COVID-19 AJK: Demographic Insights

This section presents the evidence on age wise confirmed cases and deaths during wave 1 and wave 2 respectively in the graphs below;
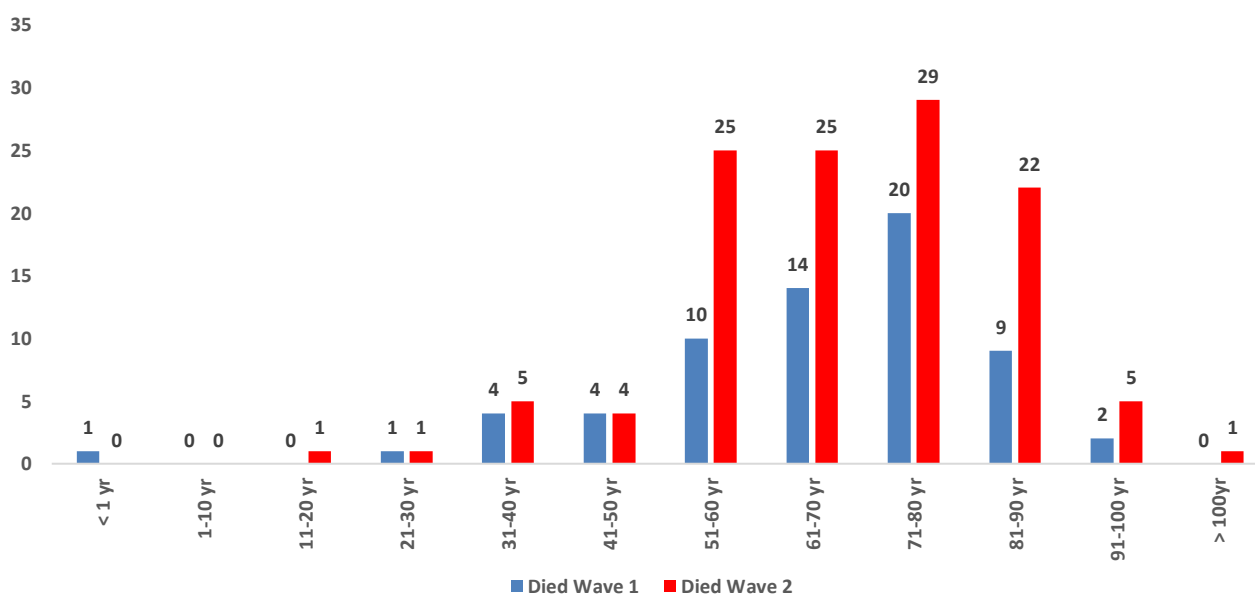
Figure 4.4.1: COVID-19 Age Distribution of Confirmed Cases During Wave 1 and Wave 2 in AJ&K

As depicted in the graph, the age group 11 years and above up to 80 years shows high frequency of confirmed cases. It is because these age groups have higher exposure to outside environment due to schooling, work and business etc. where chance of infection is very high, as it happened in the whole world.
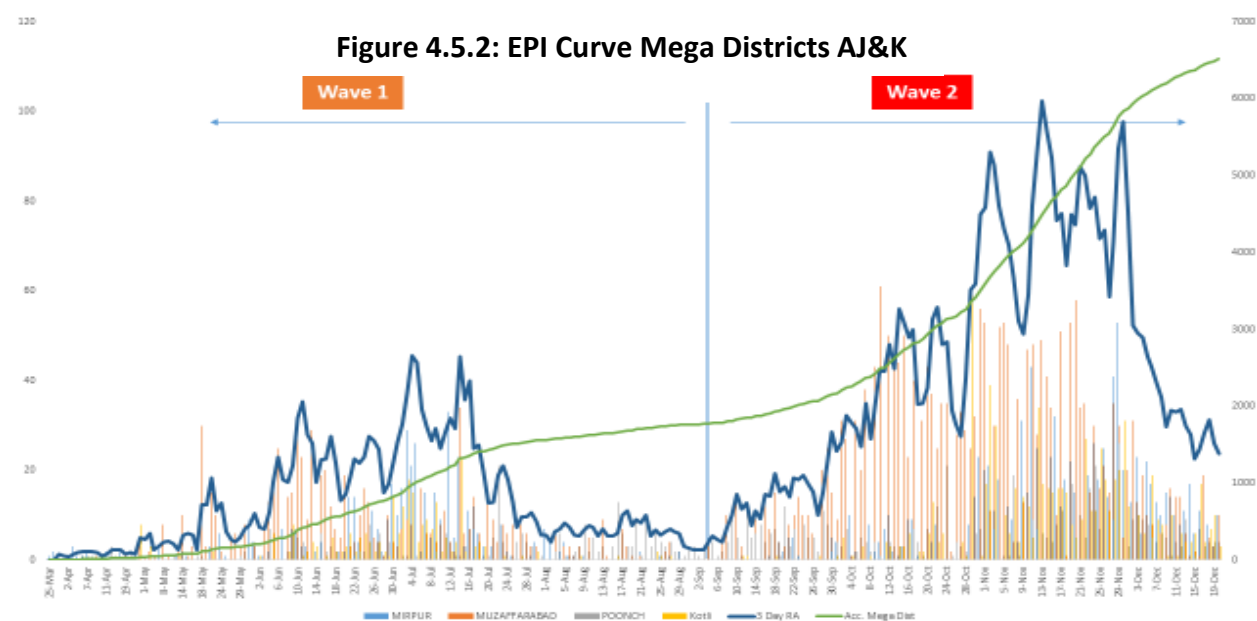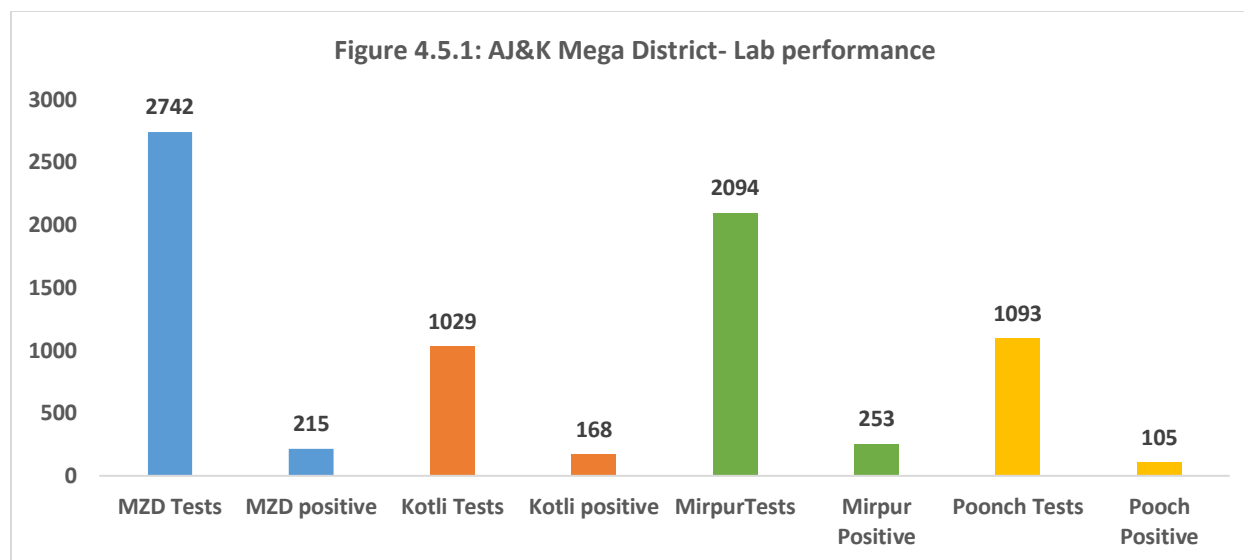
Figure 4.4.2: COVID-19 Age wise Deaths During Wave 1 and Wave 2 in AJ&K

The graphs above let us concluded that in AJK, younger and adult population has been infected more as compared to elder population. One of the main reason is that, these two groups have more exposure to epidemic because of several activities including job and other household activities. On the other hand, elderly population or aging population is mostly retired pensioners and living in joint families with their children, which produce the risk of their exposure to the disease. But, it is pertinent to mention here that those infected elderly had recovered as well, however some of them were died. This number of deaths are higher in elderly age group compared to its counterpart as depicted in the second graph. Also, it is to be noted that, AJ&K has one youngest deaths of patient having age less than one year.

4.5. COVID-19 AJK Mega Districts Incidence

This section presents the district wise comparison of Lab performances in AJK Mega districts namely; Muzaffarabad, Kotli, Mirpur and Poonch in the first graph[3]. Secondly, it also presents the EPI curve of the mega districts in the second graph.

Figure 4.5.1: AJ&K Mega District- Lab performance

Figure 4.5.2: EPI Curve Mega Districts AJ&K

It can be clearly observed in the graph above that during the wave 2, percentage of COVID-19 confirmed cases is much higher than wave 1 in each of the four districts.
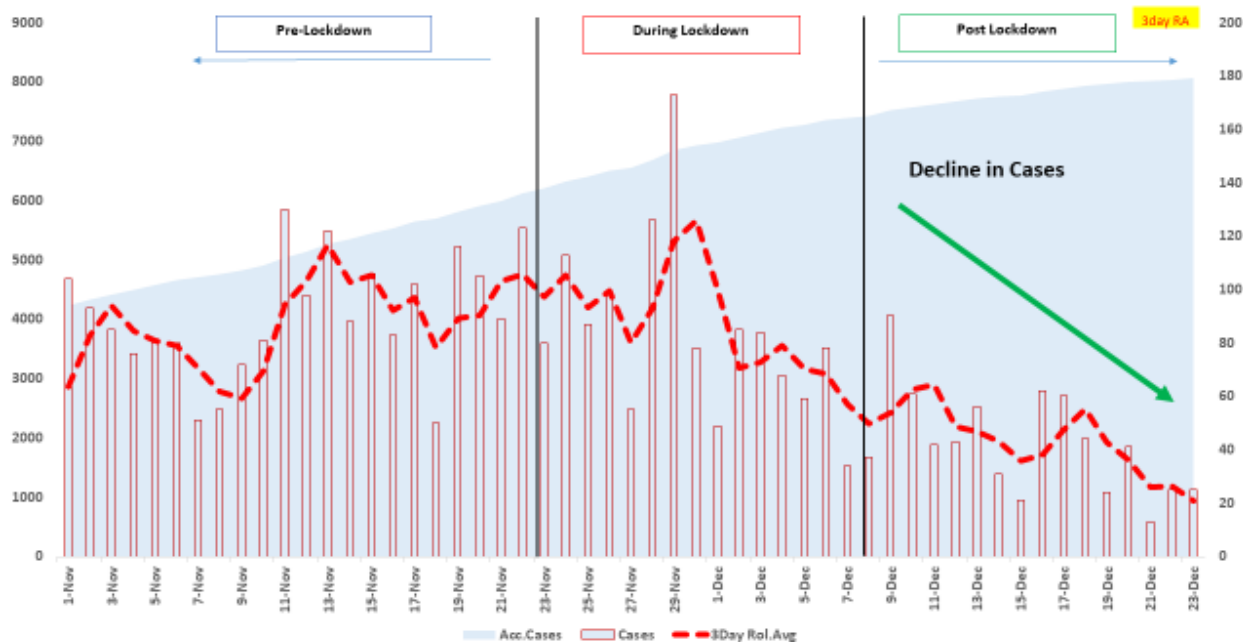
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[3] There are five labs working in AJ&K, however with limited capacity.

4.6. COVID-19 AJK: Prevention Measure in AJK and Its Impact

The graph below shows that implementation of strict lock down has significantly resulted in decrease of spread of the disease. However, lock downs are expensive policy in terms of general public and those who are daily wagers. The graph depicted the scenario of second strict lock down in AJ&K whereas, the state went to couple of months lock down since the arrival of first case in Pakistan which also resulted in slow spread of the disease in the community in the state of Azad Jammu & Kashmir.

Figure 4.6.1: AJK Lock down Assessment (wave2)

4.7. COVID-19 AJK: The Case Doubling Time

During Wave 1, first 100 cases were reported in 56 days, then 200 cases were reported in 20 days, then next 200 cases were reported in 8 days & then next 200 cases were reported in 6 days. On average, till August 31st the case doubling time was 9-11 days.

During Wave 2, (1st Sep Onwards), first 200 cases were reported in 17 days, then 200 cases were reported in 11 days, then next 200 hundred cases were reported in 7 days, then next 200 hundred cases were reported in 5 days. On average till date, the cases doubling time was 3-5 days till 8 Dec i.e. ease of lock down in AJK.

Figure 4.7.1: Case Doubling Time During Wave 1

Figure 4.7.2: Case Doubling Time During Wave 2

5. Future challenges

The state of Azad Jammu & Kashmir is a developing state, the government is facing one of the major challenge currently and also in the future is the limited testing capacity. If the testing capacity is increased in the state, the situation could be worsened. Secondly, the health infrastructure is not up to par, as it is required for dealing with the patient of coronavirus. Thirdly, there is need of capacity building of the health care workers and staff fighting against coronavirus.

6. Recommendations

The current study has the following recommendations for Government of Azad Jammu & Kashmir;

- The state should have the better health care polices for preventing further infection and spread of disease.

- The government must ensure the accessibility of basic healthcare services to all citizens, especially the people living in the towns, rural and slums areas.
- Special concentration and treatment should be given to elderly population till the discovery of vaccine for coronavirus.
- The government should make a strategy related to testing services in all the districts of the state in order to timely detect the disease.
- The policy of smart locks, micro smart lock downs are helpful in containing coronavirus disease compared to strict/full lock down as it prevents poor community from poverty on one hand and hunger on the other hand.

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