Status of distribution of coronavirus disease (COVID-19) in Ethiopia within first three months

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Abstract

Introduction: Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). COVID-19 started in China Wuhan town for the first time and spread over the world in short period of time. The virus transmits through contact and infected droplet in closed distance and it affects the breathing system and cause the death. The general objective of this study was to assess the distribution of COVID-19 in Ethiopia within three months.

Method: The retrospective study conducted by using secondary data extracted from the Federal Minister of Health daily report, from March 13/2020 to June 12/2020. The data-extracting format developed to record data daily according to reports from Federal minister of health. Descriptive statistical analysis applied to assess the distribution of coronavirus disease (COVID-19) and Microsoft Excel and SPSS version 24 was used to analyzed data.

Result: This study revealed that out of 2,915 cases within three months 74(2.74%) were between March, 13/2020 and April 13/ 2020, and increased to 189(6.48%) between April 14/2020 and May, 14/ 2020 and to 2652 (90.98) between May, 15-June, 12/ 2020. It implies that the increment of COVID-19 from the onset of first month to the second month was 3.74% and from the second month to the third month was 84.5%. According to the results of sources of contamination of COVID-19, the unknown source was highly prevalent than contact with coronavirus suffered individuals and travel history from other countries. The death rate was highly increased from first two months to third month by 82.98% and the recovery rate increased by 53.44%. This result reveals that the death rate extremely increased than recovery rate. The distribution was very high in Addis Ababa and very low in Gambella region within three months. **Conclusion:** According to this study, male individuals more exposed than females and unknown sources of contamination of COVID-19 were higher than other sources. Washing hands often with soap and water, using alcohol based hand sanitizer, keeping distance and disinfecting most frequently touching surface may reduce the spread of COVID-19 infection from unknown sources.

Key Words: COVID-19, Descriptive analysis, New cases.

1. INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease was first identified in 2019 in Wuhan, the capital of Hubei China, and has since spread globally, resulting in the 2019–20 coronavirus pandemic (Hui, et al., 2020). The common symptoms of Covid-19 include fever, dry cough, and difficulty in breathing but muscle pain, sputum production, diarrhea, and sore throat are less common (CDC, 2020). While the majority of cases result in mild symptoms, some progress to pneumonia and multi-organ failure. In the month of March 2020, the rate of deaths per number of diagnosed cases is 4.4 percent; however, it ranges from 0.2 percent to 15 percent, according to age group and other health problems (Li, 2020).

The Official name announced for the virus responsible for COVID-19 (previously known as "2019 novel coronavirus") and the disease it causes. The official names are: coronavirus disease (COVID-19) and the Virus name is severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Viruses named based on their genetic structure to facilitate the development of diagnostic tests, vaccines and medicines. Virologists and the wider scientific community do this work, so the International Committee on Taxonomy of Viruses (ICTV) names viruses. Diseases named to enable discussion on disease prevention, spread, transmissibility, severity and treatment.

Human disease preparedness and response is WHO's role, so diseases are officially named by WHO in the International Classification of Diseases (ICD). ICTV announced "severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)" as the name of the new virus on 11 February 2020. This name was chosen because the virus is genetically related to the coronavirus responsible for the SARS outbreak of 2003. While related, the two viruses are different (WHO , 2020).

According to Worldometer report, June 2020; On June 12, 2020 the total reported cases were 7,626,751 and total deaths were 424436, while total recovery was 3,862,794. On this day, among 3,339,521 active cases 3,285,542 (98%) were in mild condition while 53,979(2%) were in serious or critical. In addition; from 4,287,230 total closed cases, 3862, 794(90%) were recovered and 424,436(10%) were death cases. In Africa, the first case of COVID-19 reported on 14 February 2020. Since February 14,220,558 cases; the five countries reporting most cases are South Africa (58 568), Egypt (39, 726), Nigeria (14 554), Algeria (10 589) and Ghana (10,856). The total deaths from Africa were 5,892 and total recoveries were 101,306 (Africa CDC, June 2020). On March 13, 2020, The Federal Ministry of Health has confirmed a coronavirus disease (COVID-19) case in Addis Ababa, Ethiopia. The case, which was announced on the 13th of March 2020, is the first one to be reported in Ethiopia since the beginning of the outbreak in China in December 2019. From onset of COVID-19 count three months in Ethiopia therefore, this study aimed to assess the distribution status of coronavirus disease (COVID-19) in Ethiopia using descriptive analysis.

1. Method and Materials

The study taken place in Ethiopia using secondary data extracted from the report of Federal Minister of Health. Descriptive analysis used to show the status of coronavirus (COVID-19) distribution in Ethiopia. The study design was register based series analysis on reports of FMOH in each day between March 13, 2020 and June 12, 2020. A structured data extraction form was prepared and used to collect information on cases of COVID-19 in each day, based the region of the patient, sex of the patient, sources of contamination, status of recovery and death within three months.

1.1. Statistical analysis

Microsoft Excel and SPSS version 24 window was used for data analysis. Descriptive statistics used to summarize the case status. Trend analysis performed using the new cases across the regions, recoveries and death status within three months.

2. Results

2.1. Descriptive Statistics

Descriptive analysis Describes the nature of data briefly and it shows the trends of new cases, distribution of new cases among the regions, the sources of transmission, the recovery status and death status within three months.

Table 1: Descriptive statistics of sources of transmission of COVID-19 in Ethiopia

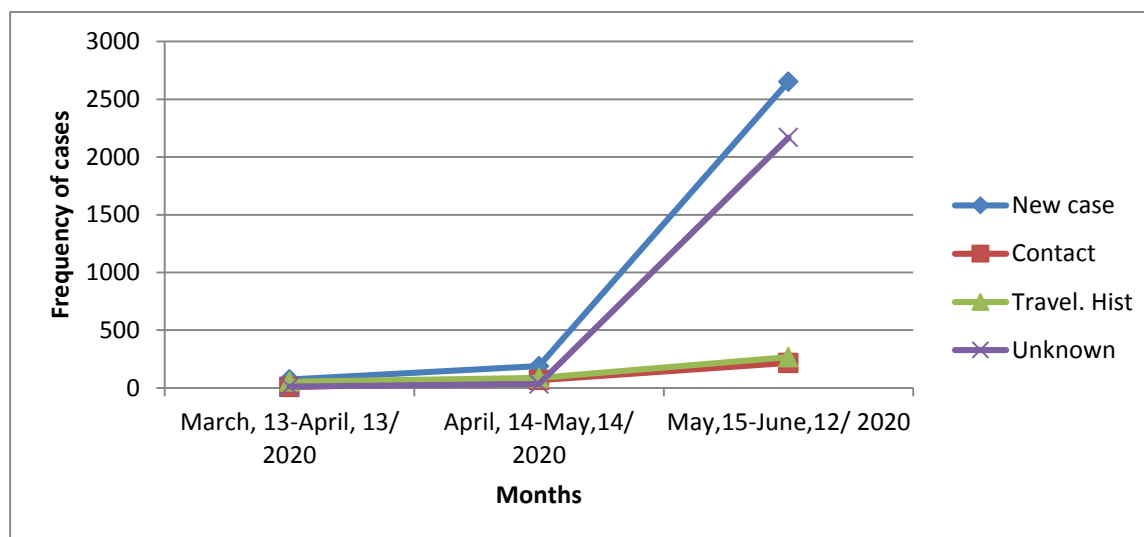| Moths	Number of cases (%)	Contact (%)	Travel History (%)	Unknown (%)
March, 13-April, 13/ 2020	74 (2.54)	8 (10.81)	55 (74.33)	11 (14.86)
April, 14-May,14/ 2020	189 (6.48)	68 (35.98)	88 (46.56)	33 (17.46)
May,15-June,12/ 2020	2652 (90.98)	217 (8.18)	266 (10.03)	2169 (81.79)
Total	2915	293 (10.05)	409 (14.03)	2213 (75.92)

Figure 1: Source of Contamination of COVID-19

Out of 2915 cases within three months 74(2.74%) were between March, 13/2020 and April 13/ 2020, 189(6.48%) were between April 14/2020 and May, 14/ 2020 and 2652 (90.98) were between May, 15-June, 12/ 2020. It implies that the spread of COVID-19 after onset in Ethiopia in the first month is slower than second month and the spread of second month was very slower than third month. Also from figure 2 we can see that the spread rate of COVID-19 was slow from first month up to second month and after second month is was extremely increasing. According to source of contamination of COVID-19, 293 (10.05%) were due to contact with COVID-19 suffered individuals, 409 (14.03%) had travel history from other country and 2213 (75.92%) had unknown sources of contamination. This result reveals that unknown sources of contamination is highly prevalent than other cases. The figure 1 shows the similar information.

Table 2: Descriptive statistics of COVID-19 mortality rate in Ethiopia within three month

Moths	Number of recovery (%)	Number of Death (%)
March, 13-April, 13/ 2020	20 (4.43)	3 (6.38)
April, 14-May,14/ 2020	85 (18.85)	1(2.13)
May,15-June,12/ 2020	346 (76.72)	43 (91.49)
Total	451 (15.47)	47 (1.61)
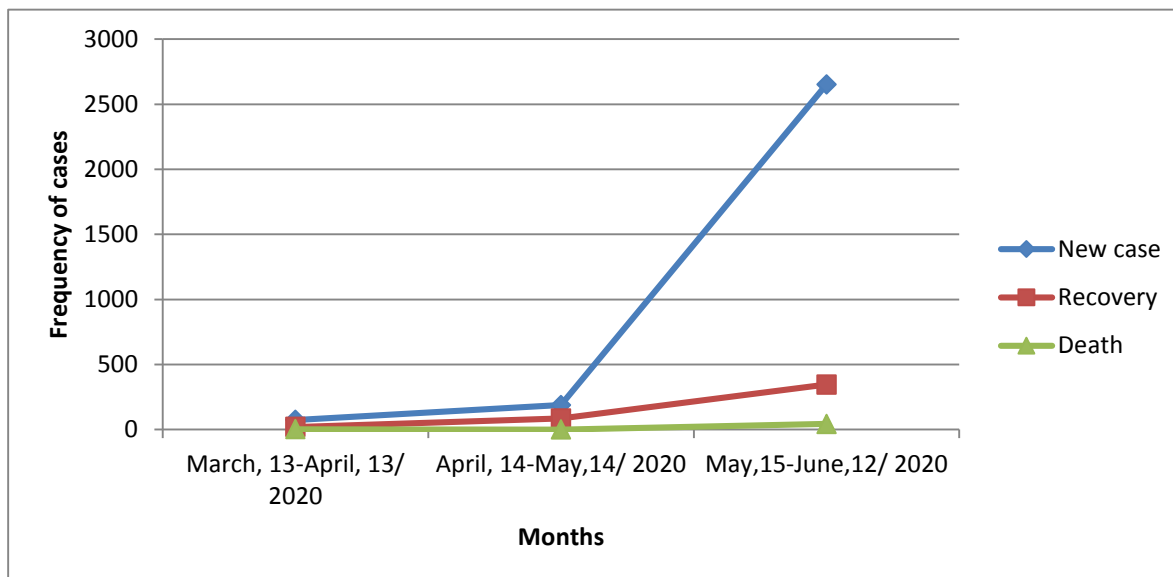
From 2915 confirm cases 451(15.47%) were recovered and 47(1.61%) were died within three months. The recovery rate within three months was 4.43%, 18.85% and 76.72% respectively and the death rate was 6.38%, 2.13% and 91.49% respectively. This result implies that the recovery rate of patients was better than death rate. The death rate extremely increased from second month of onset of COVID-19 up to third month. Figure 2 shows the results in the table clearly.
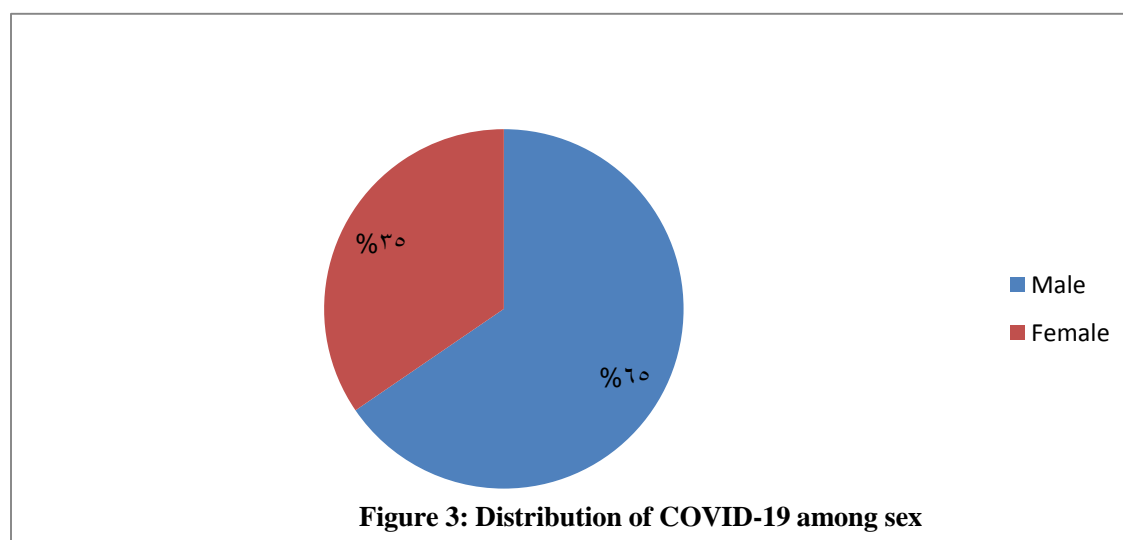

Figure 3: Distribution of COVID-19 among sex

Out of total confirmed cases, 65% were males and 35% were females, this result shows that males more exposed to COVID-19 than females. This may be due to job status of an individual, means that most of time females are stay at home compared to males, this is because they gives care to their child's and they are also house wife. It may reduce the risk of COVID-19 among the sex categories. The result shown in the figure 3 gives more clarification among sex.

Table 3: Descriptive statistics of COVID-19 new cases among regions within three month

| Regions	Months			
	March,13- April, 13/ 2020	April,14- May,14/ 2020	May,15- June,12/ 2020	Total
	n(%)	n(%)	n(%)	n(%)
Addis Ababa	55 (2.57)	111 (5.18)	1976 (92.25)	2142 (73.48)
Dire Dawa	2 (18.18)	6 (54.55)	3 (27.27)	11 (0.38)
Amhara	3 (1.80)	6 (3.59)	158 (94.61)	167(5.73)
Oromia	5 (2.99)	16 (9.58)	146 (87.43)	167 (5.73)
Tigiray	1 (0.94)	9 (8.41)	97 (90.65)	107 (3.67)
SNNPR	6 (15.38)	8 (20.52)	25 (64.10)	39 (1.34)
Somalia	2 (0.94)	18 (8.49)	192 (90.57)	212 (7.27)
Afar	0 (0.00)	15 (51.72)	14 (48.28)	29 (0.99)
Benibeshangule	0 (0.00)	0 (0.00)	5 (100.00)	5 (0.17)
Gambella	0 (0.00)	0 (0.00)	1 (100.00)	1 (0.03)
Harar	0 (0.00)	0 (0.00)	23 (100.00)	23 (0.79)
Driver	0 (0.00)	0 (0.00)	12 (100.00)	12 (0.42)
Total	74 (2.54)	189 (6.48)	2652 (90.98)	2915
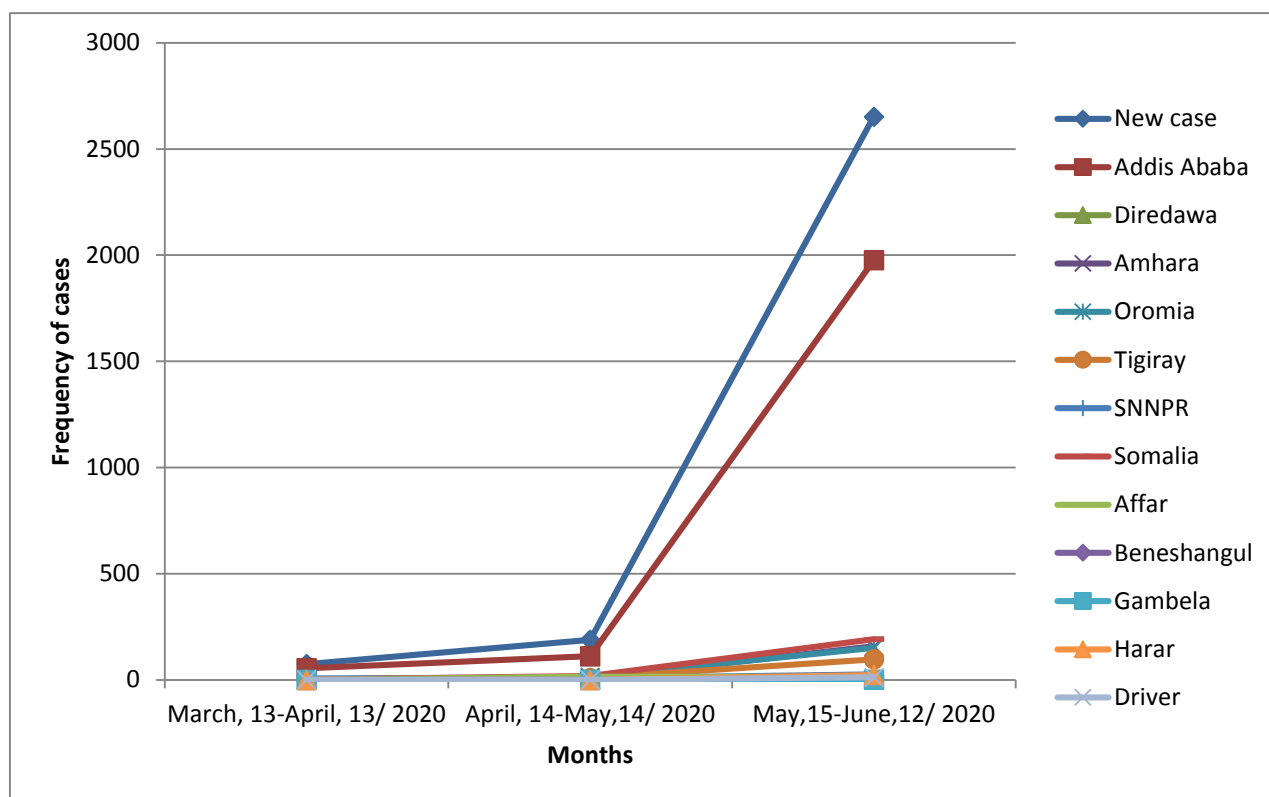
Figure 4: Distribution of COVID-19 cases among regions

Out of total patients 73.48 % were from Addis Ababa city administration, 0.38% were from Dire Dawa city administration, 5.73% from Amhara region, 5.73% from Oromia region, 3.67% from Tigiray region, 1.34% from SNNPR, 7.27% from Somalia region, 0.99% from Afar region, 0.17% from Benishangule Gumuz region, 0.03% from Gambella region, 0.79% from Harar region and 0.42% were cross boundary driver. According to onset of COVID-19 within three months from total cases 2.54% occurred between March 13/2020 and April 13/ 2020, and it increased to 6.48% between April 14 /2020 and May 14/ 2020 and to 90.98% between May,15/2020 and June,12/ 2020. The results in the table 3 revealed that the prevalence of COVID-19 was higher in the Addis Ababa city administration, Somalia region, Amhara and Oromia region compared to other regions. The spread of the virus was highly increasing from one month to the next month. It was also illustrated in the figure 4 about the distribution of COVID-19 cases among the regions.

3. **Discussion**

The general objective of this study was to assess the status of COVID-19 distribution within three months in the Ethiopia. The study was based on the data that was report every day by FMOH in Ethiopia and the report include total cases, new cases, sex of patients, sources of contamination, recovery and death. Within three months, federal ministry of health reported 2,915 cases, 47 deaths and 451 recoveries. In addition, 2,415 were active cases and 38 were series cases and founds in quarantine from report of (EPHI, June 12, 2020). COVID-19 is highly spreading across the world wide currently. This study revealed that the coronavirus disease is spreading extremely in Ethiopia within three months. According to the results of sources of contamination of COVID-19, the unknown source was highly prevalent than contact with coronavirus suffered individuals and travel history from other countries. This result supports the recommendation of WHO, EPHI, FMOH and CDC reports, means that as it indicates the prevalence of COVID-19 was high for unknown sources, so it reveals that an individuals who infected with coronavirus but he/she did not understand the place where they infected, it is very difficult to identify the infected places in these situation. So Clean and disinfect frequently touched surfaces, Wash your hands often with soap and water for at least 20 seconds, or use an alcohol based hand sanitizer that contains at least 60% alcohol as reported by (CDC, 2020).

The new cases was increasing from day to day as shown in the result that out of 2,915 cases within three months 74(2.74%) were between March, 13/2020 and April 13/ 2020, and increased to 189(6.48%) between April 14/2020 and May, 14/ 2020 and to 2652 (90.98) between May, 15-June, 12/ 2020. It implies that the increment of COVID-19 from the onset of first month to the second month was 3.74% and from the second month to the third month was 84.5%. The total death and recovery within three months was 1.61% and 15.47% respectively. The death rate was highly increased from first two month to third month by 82.98% and the recovery rate increased by 53.44%. This result reveals that the death rate extremely increased than recovery rate.

From total patients 65% were males and 35% were females, this implies that male patients were more expose to COVID-19 than females and this result is in line with study conducted in Italy by (Remuzzi A. & Remuzzi, G., 2020) that is men represent 58% of COVID-19 infected patients in

Italy and 70% of COVID-related deaths. This finding reveals that staying at home is the best way to struggle against the pandemic COVID-19 virus. In Ethiopia COVID-19 first occurred in Addis Ababa capital city of Ethiopia and then after slowly spread to regional states and city administrations in different directions. The prevalence of COVID-19 in Addis Ababa was 73.48%, which is higher, and in Gambella 0.03% which is lower within three months.

4. **Conclusion**

This study was used descriptive analysis to assess the status of COVID-19 in Ethiopia based on the daily reports of FMOH, in first three months of onsets of coronavirus disease (COVID-19). The results of this study revealed that unknown sources of contamination of COVID-19 highly increased from month to month. Individuals must care about themselves by washing hands often with soap and water for at least 20 seconds, or use an alcohol based hand sanitizer. The prevalence of COVID-19 was high for males compared to females and this implies directly or indirectly related with staying at home recommendation of FMOH and WHO. The distribution rate of COVID-19 was very high in Addis Ababa capital city of Ethiopia and very low in Gambella region. The concerned body should focus on the sources of contamination or on the means of contamination with the COVID-19 pandemic. Give attention to disinfect the surfaces where an individual touches.

Reference

CDC. (2020). Symptoms of Novel Coronavirus (2019-nCoV)". www.cdc.gov.

CDC. (2020). What you should know about COVID-19 to protect yourself and others.

EPHI, June 12, 2020. Daily report of COVID-19 in Ethiopia

Hui, D. S., E., I. A., Madani, T. A., Ntoumi, F., Kock, R., Dar, O., et al. (2020). "The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health.The latest 2019 novel coronavirus outbreak in Wuhan, China". Int J Infect Dis. , 91: 264–66.

Li, Q. G. (2020). Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia. N Engl J Med.

Remuzzi A. & Remuzzi, G. (2020). COVID-19 and Italy: what next? The Lancet, 395(10231).

WHO . (2019). Coronavirus disease (COVID-19) technical guidance: The Unity Studies: Early
Investigations Protocols.

WHO . (2020). Naming the coronavirus disease (COVID-19) and the virus that causes it.

WHO. (2020). FIRST CASE OF COVID-19 CONFIRMED IN ETHIOPIA.