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Dr. Fawzi Hashim Atshan
MBChB, High Diploma of
Hospital Administration,
Director of Al-Salama Hospital,
Al-Amriya, Iraq

Dr. Huda Hamid Mohsen
M.M.V.M&S, Iraqi Industry
Ministry, Baghdad, Iraq

Dr. Yahya Fawzi
M.P.V.M&S, Baghdad Alkarkh
Health Directorate, Baghdad,
Iraq

Dr. Ibtisam Faraj Hasan
MBchB, FICMS-CM, Ministry of
Health, Iraq

Dr. Munir Talib Salman
Department of Public Health,
Baghdad Health Directorate -
Al-Karkh, Iraq

Health status of COVID-19 cases at health facilities of Baghdad Alkarkh health directorate from 1st March 2020 to 31st March 2023 retrospective study

Dr. Fawzi Hashim Atshan, Dr. Huda Hamid Mohsen, Dr. Yahya Fawzi, Dr. Ibtisam Faraj Hasan and Dr. Munir Talib Salman

Abstract
Background: There are three major coronaviruses leading to disease outbreaks, beginning with the severe acute respiratory syndrome coronavirus (SARS-CoV) in 2002, followed by the Middle East respiratory syndrome coronavirus (MERS-CoV) in 2012, on December 2019 reported the 1st case of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) in china and on March 2020 the WHO announced it as pandemic worldwide. On 5 May 2023, WHO stated that 'COVID-19 is now an established and ongoing health issue which no longer constitutes a public health emergency of international concern'.
Goal: To identified the Health status of COVID-19 cases at health facilities from 1st March 2020 to 31 March 2023.
Methods: Descriptive statistics are used to present data confirmed by the epidemics section of Department of Public Health in Bagdad Alkarkh health directorate, the World Health Organization, and statistical unit of involved health facilities in the study. The data included all screened and infected COVID-19 cases. Analyzed data by Excel Word-10 and summarized as tables and graphs.
Results: Total screened case (1913962) which represented (57%) of all population of Bagdad Alkarkh (3373543), total confirmed cases (383111), (377855) recovered and (3184) dead, (54% male), age group (26-35 years) (25%), about (82%) of confirmed cases are mild to moderate treated at home while severe and critical case (15%) need hospitalization the rest (3%) treated on his responsibility, recovery ratio 99% and case fatality ratio 1%., (71%) of pop with at least take one dose and (31%) full vaccination.
Conclusion: COVID-19 does not discriminate between nationalities, sexes, or ages. It is important to not let fear lead to stigma toward friends, neighbors, or members of the community. Treat all people with compassion and speak up if you hear others making statements that cause stigma against people in your community.

Keywords: COVID-19 pandemic, confirmed cases, case fatality ratio, home care, health status, vaccination

Introduction

Coronaviruses can cause common colds, warts, Ebola, Spanish flu, and COVID-19. Compared to past pandemics, COVID-19 is less lethal. The Spanish influenza pandemic killed 30% of infected cases, while Ebola kills up to 50%. COVID-19's (Al-Jumaili, 2021) [1] Coronaviruses cause severe acute respiratory syndrome and Middle East respiratory syndrome, which can kill. 1-3% of all infected cases (Chen Y, *et al*., 2020) [2]

From February 24, 2020, in Najaf, an Iranian religious student tested positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). After further COVID-19 cases were reported, (https://m.andrafarm.com) [3].

On 2022 January, the confirmed cases are highest in Bagdad, Alkarkh (102646), Al Rusafa (76255), and Medical City (15877), while the deaths are greater in Rusafa (1418), Alkarkh (950), and Medical City (587) and the recovery cases are highest in Bagdad. Rusafa (73,562) Alkarkh (96,991) Medical city (15,067) (https://ar.wikipedia.org/wiki) [4] in other side the Last reported statistic of WHO (https://www.worldometers.info/coronavirus/country/iraq) [5] On April 20, 2023, Iraq had 2, 465, 545 confirmed cases, 25, 375 deaths, 2, 439, 497 recovered cases, and 23, 339, 577 cases in the Eastern Mediterranean, 351258 deaths globally had confirmed cases 763, 740, 140 and deaths 6, 908,554.

Corresponding Author:
Dr. Fawzi Hashim Atshan
MBChB, High Diploma of
Hospital Administration,
Director of Al-Salama Hospital,
Al-Amriya, Iraq

The case fatality ratio are (1%), (1.5%) and (0.95%) respectively. Iraq's health system has faced many challenges, as biggest mass displacement in2014-2016 and internal conflict few years ago, The Government of Iraq faced the battle against COVID-19 spreading with a few actual measures including boycott for gathering places, lockdown, school closure, social distance, and mass quarantine to reduce COVID-19 morbidity https://covid19.who.int [6]. lastly the vaccination program started on 2 March 2021 with 1st dose given, the situation of vaccination in Bagdad Alkarkh (2418127) persons vaccinated with at least one dose, (71%) of population with at least (31%) full vaccination, in Compariseme with vaccination situation in Iraq there is (19557364) dose administered, 49% population persons vaccinated with at least one dose and 19% full vaccination and globally 5, 549, 376, 645 persons vaccinated with at least one dose with 65% of population. (https://covid19.who.int/table) [7]

Methods
Our study used data from the epidemics section of the Department of Public Health in Bagdad, Alkarkh health directorate, and statistical unit of involved health facilities (ALsalama, Al fur at, Al-Kadhimiya Medical City, Al-Hakim, Al-Tarmiyah, Abu Ghraib, Al-Mahmudiyah, ALeskan pediatric, Al-Karkh maternity, General Karkh, alkarama, Yarmouk, the Economic Council, and Dar Al-Salam hospitals) and (Tarmiya AL- aeilam, Abu Ghraib, Al-Taji, Al-Kadhimiya, Al-Karkh, Al-Dora, Al-Mahmudiyah, Al-Adl and Al-Amel health districts). Age, sex, residence, fate, co-morbidity, hospitalization period, occupation, and cause of death according to ICD-10. Who are attending the difference health institutions with symptoms suggestive of COVID-19 and confirmed by clinical picture plus rapid test or PCR and lung CT scan.
Case fatality ratio for all cases: Number of deaths cases during the period of study divided by all confirmed.
Recovered case ratio for all cases: Number of cured cases during period of study divided by all confirmed reported cases over the same period.
Confirmed Positive Case A confirmed case is where the reverse transcription polymerase chain reaction (RT-PCR) tests are positive regardless of presenting symptoms (Da'ar *et al*, 2020) [8].
Used EXCEL word -10 for analysis and summarized of data as tables and graphs.

Results and Discussion
This is one of the first studies in Bagdad Alkarkh to identify the health condition of COVID-19-infected cases throughout three years, from March 2020 to March 2023. The active and passive survey conducted 1913962 screening tests, representing 57% of Bagdad Alkarkh 3.373.543 population, to find positive cases and limit disease spread. Iraq had fewer (RAPID AND PCR tests) than Lebanon and Jordan (Nazih A. Bizri, *et al*., 2021) [9]. So the recorded positive cases over the study period fluctuated, similar to adjacent governorates and countries. (Max Roser, 2021) [10] explain that the Stringency Index effects on positive cases and death and The Stringency Index uses nine metrics: school closures, workplace closures, cancellation of public events, restrictions on public gatherings, public transport closures, stay-at-home requirements, public information campaigns, internal movement restrictions, and international travel controls. The Nazih A. Bizri, *et al*., 2021 [9] and (Max Roser, 2021) [10] revealed that the Jordan had the highest government response stringency index (100) early in the epidemic, declining to 58, whereas Palestine had the most steady rating (80-96). While other countries' indices ranged from (50 to 85).
There is (383111) positive cases in our study, which represented (15%) of all Iraq's (2131500) positive cases and (3184) death which represented (12%) of all Iraqis (25375) death (https://www.worldometers.info/coronavirus/country/iraq) [11]. All screening tests in our study sent from different health facilities to laboratories of AL-Yarmouk and medical city of Imam ALkadeimya show spikes in confirmed cases due to increased laboratory testing capability during the study period (Table 1).

Table 1: Total screened population with confirmed cases and types of procedures

Types of test	Total tests	Confirmed
Rapid Test	347.261	86.846
PCR	1566701	383024
Total	1913962	383111

As shown in figure (1), COVID-19 cases increased slightly from March to September to get the 1st epidemic wave, then slightly decreased in 2020, then peaked in March and September 2021, to get 2nd and 3rd waves, respectively. In 2022, there were two waves, the 4th on Jan. and 5th on Jul. (https://covid19.who.int/region/emro/country/iq) [12].
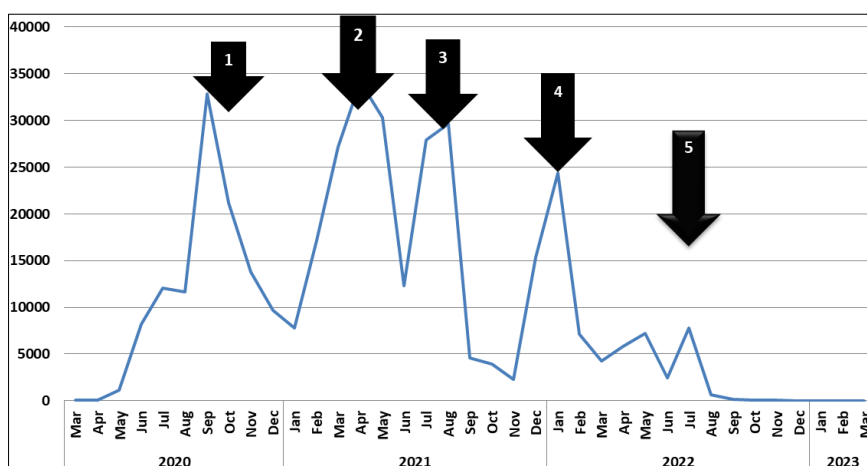

Fig 1: Confirmed cases and epidemic waves

(Yan Ma *et al*., 2021) [13] Found that early onset of a high-level response to COVID-19 is connected with early arrival of the peak number of daily new cases. To avoid such pandemic wave, enhance stringency index (More than 80-100). This may speed up epidemic curve flattening to low spread.

Regarding the Age and gender: Table 2 shows The most frequently affected age groups were(26 - 35 year) was (24%), male more affected (54%) than female (46%).

The study of (Lami *et al*., 2021) [14] The biggest proportion of affected patients was in the age groups 30-39 (25%), 20-29 (21.6%), and 40-49 (20.2%).while the study (Ricardo *et al*, 2021) [26] Over the COVID-19 pandemic, widespread research has detected that adult men of all ages have higher chances of developing serious complications compared with women. In addition, post-menopausal women who contract COVID-19 have been shown to have more severe complications.

Table 2: Distribution of COVID-19 cases reported in Bagdad health directorate during 2020-2023, by age and sex

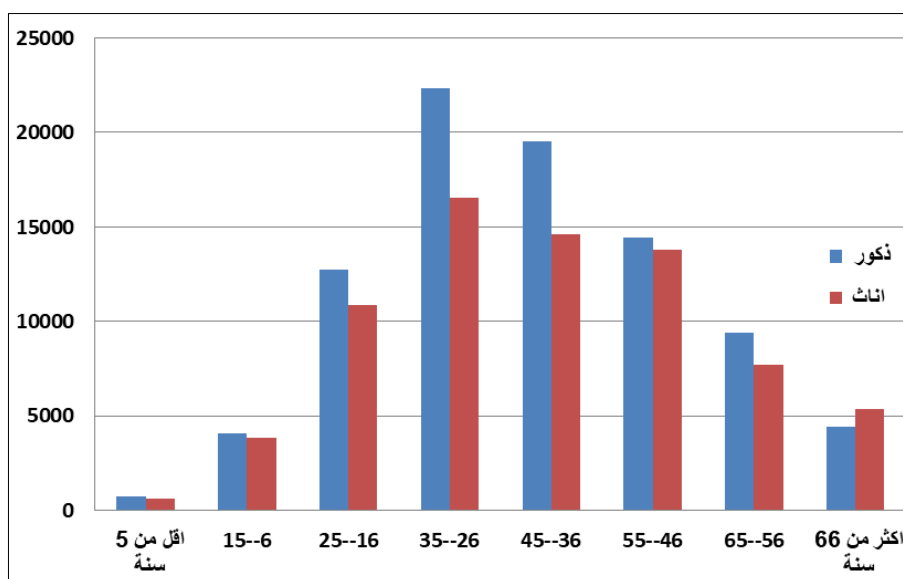| Age groups	Number	percentage
Age (Years)		
Less than 5	3019	1
15--6	22157	6
25--16	63870	17
35--26	91609	24
45--36	69763	18
55--46	61142	15
65--56	45473	12
More than 66	26079	7
total	383111	100
Sex		
Male	207345	54
Female	175766	46
Total	383111	100

Fig 2: Age groups and sex

Figure 3 shows the prevalent clinical presentation of cases in our study (85%) fever, (75%) headache. According to the study of (Sadie *et al*., 2021) [17], cough (63.5%), fever (50%), respiratory distress (46.1%), and muscular pain (40.8%) were the most common symptoms. In the study of Yousef *et al*., 2022) [15] explain that most common: cough (63%), fever (50%), respiratory distress (46%), and muscular pain (40.8%).
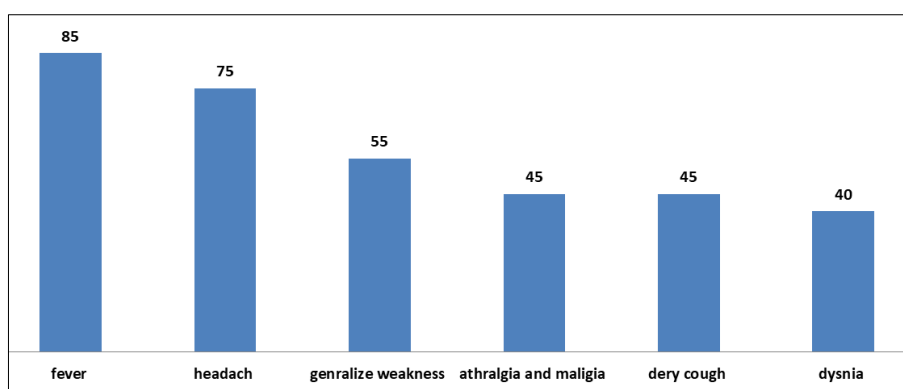

Fig 3: Clinical presentation

Tens of thousands of Bagdad Alkarkh residents are isolated at home or hospitals, and as cases spiked, the health directorate built quarantine centers (economic council, Dar ALsalama, and letter ALsalama). (377855) recovery cases, recovery ratio 99%. Most people don't require special treatment when infected with COVID-19. However, the people with underlying medical problems develop serious illness such as diabetes, chronic respiratory disease, and cardiovascular

disease (Al-Jumaili,*et al*, 2021) [1]
Other need hospitalization specially the older age and a more complex set of comorbidities such as diabetes and blood pressure compared with young patients effected by COVID-19 severity and death Ciardullo, *et al*., 2021, [22] but the Diabetes causes an increase in risk of thromboembolic events as it is tied to a prothrombotic state, which led to increases in coagulation activity by COVID-19 infection (Zhou Y, *et al*., 2021 [23] while the study of (Jianjun Bai1 *et al*., 2020 [24] find that most chronic diseases or underlying diseases, hypertension accounts for the largest proportion-61%, then 29% for diabetes, 27% for cardiovascular diseases, 12% for respiratory diseases, and 6% for cancer
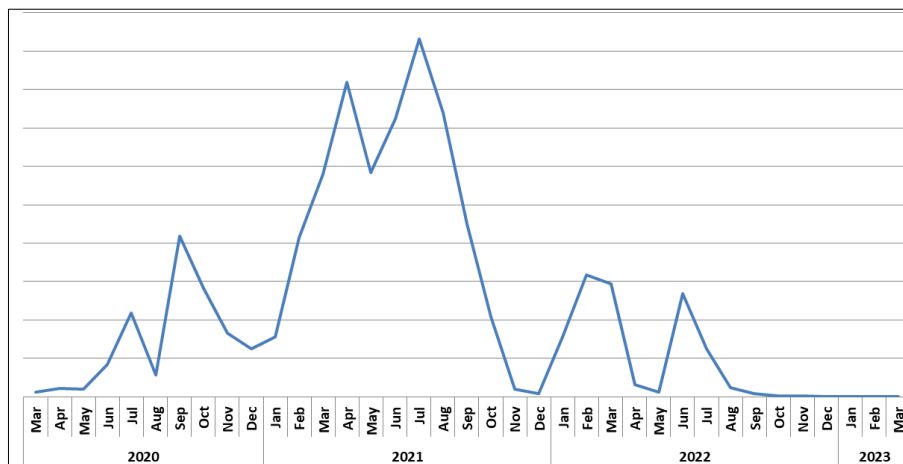

Fig 5: Home care "isolation"

1. **Home care or isolation:** 312335 cases were treated at home, representing 82% of confirmed cases (figure 5). About (52) of cases death during home care same the result finding of (Sudipta *et al*., 2020) [27], explained that 81% cases were classified as mild (no pneumonia or mild pneumonia)
2. **Hospitalization:** (55590) patients both severe and critical cases represented (15%) of confirmed illnesses the study of (Sudipta *et al*., 2020) [27] explain that (5%) as critical (respiratory failure, septic shock, and/or multiorgan failure)
3. The remaining of (15186) confirmed cases (3%) were treated at their own responsibility due to family consideration, stigma, fear of treatment, or refusal to be referred to hospitals, as shown in table 3

Table 3: Confirmed cases and way of treatment

Place	No. of treated cases	%
Home isolation	312335	82%
Hospital and Quarantine centers	55590	15%
Rest of cases treated on their responsibility	15186	3%
Total	383111	100%

COVID-19 and Healthcare Workers
The covid-19 diseases infected the Healthcare Workers from beginning of disease even before announced as pandemic by WHO more than (11644) healthcare workers (3.5%) of total positive cases in our study Most of the HCWs affected with COVID-19 did not require hospitalization; however, (39) deaths were recorded across all age groups and Differences in job titles and duties. This reflects the need to protect HCWs in this pandemic, as they are probably the most at-risk population for contracting the disease. The figure (6) revealed (56%) of HCWs infected cases are technician.
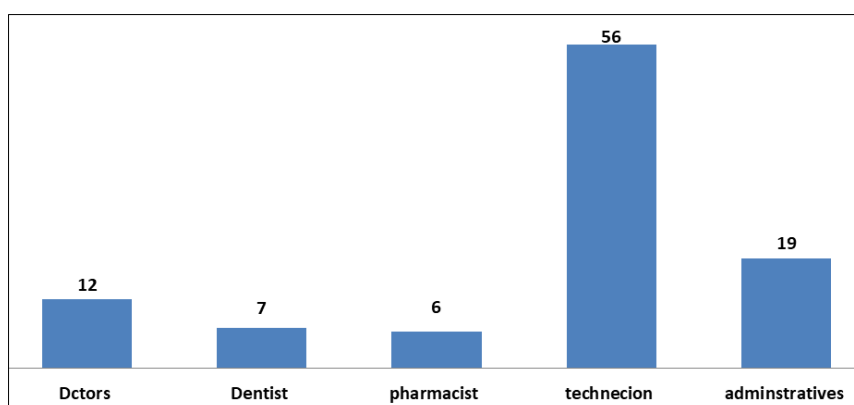

Fig 6: Health care workers

The last fate of cases (3184) is death due to COVID-19 complications of COVID-19 the CFR (1%), most of which occurred in April and September 2021. 43% of patients were female and 57% were male. As shown in figures (6) and (7),

males had a greater infection and death rate than females, and older patients had a higher mortality rate (Rasha *et al*., 2021). [17].
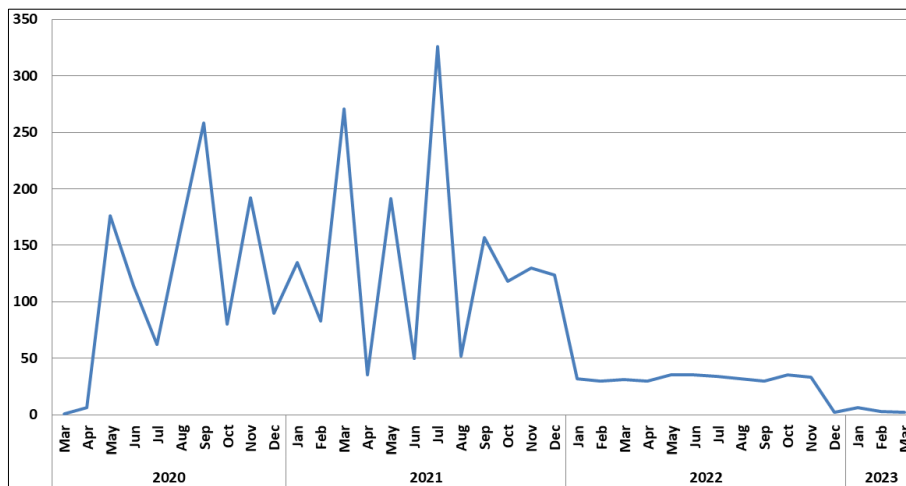

Fig 7: Death

The study of (Sadie *et al*., 2021) [18] The Impact of Age, Sex, and Race on the Association of Risk Factors and Mortality in COVID-19 Patients found that patients with diabetes, hypertension, and renal disease have a higher mortality risk. While (Yousef *et al*., 2022) [15], found hypertension (29.5%), diabetes (24.7%), and cardiovascular disease (21.8%).
According to study of (Nagham *et al*., 2022) [19], 55.1% of cases were male and 67.5% were between 30 and 60 years old. Males accounted for 62.7% of deaths, and 50.0% were over 50. Both genders were 30-60 years old. Males had a greater case fatality rate (1.3% vs. 1.1%) (Yang Cao *et al*., 2020) [25] explain that the CFR vary between populations and over time, depending on the interplay between the causative agent of the disease, the host and the environment, as well as available treatments and quality of patient care (Yang Cao *et*

al., 2020) [25]
and added that the Distribution of COVID-19 CFR of the 209 countries/ territories included in the study The mean and median CFR worldwide are 3.31% and 2.19%, respectively with the highest rates found in Yemen (27%), West and North Europe (14%-19%), and North America (9%-12%, figure 2). Study of Yousef *et al*., 2022 [15] included several countries revealed that South America had the highest hospital period of stay is 21 day whereas Africa had the lowest at 9 day the >60 age group had the highest hospitalization period of 16.day while the 40 age group had the lowest hospitalization period of 10day so this duration varies depending on a number of factors, including the patient's age and the availability of resources.
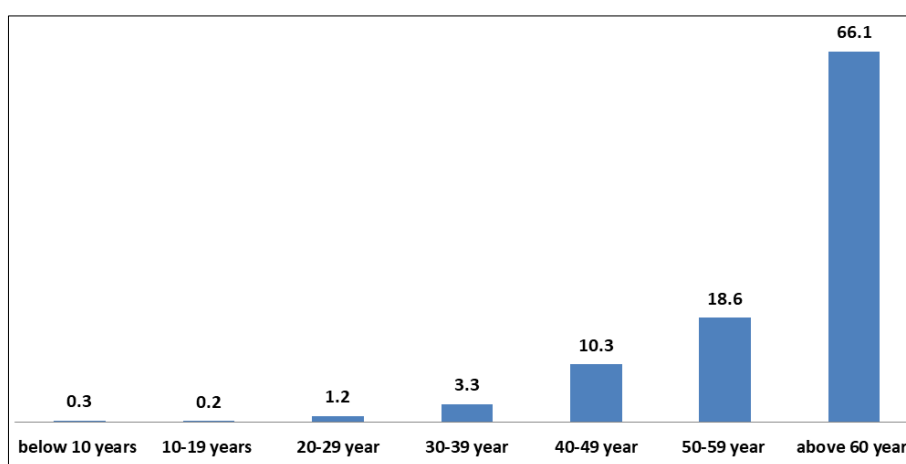

Fig 8: Age groups of death

The figures (7, 8 and 9) revealed that (66%) of death at age group above 60 yards, male more than female death and even receved resuscitation with (SPAP and DC) mimic the study of

(Veena *et al*, 2021) [16] In England and Wales, That patients aged 60-69 (26.7%) and 50-59 (22.1%) died most with COVID-19. 60% of cases and 65% of deaths were male.
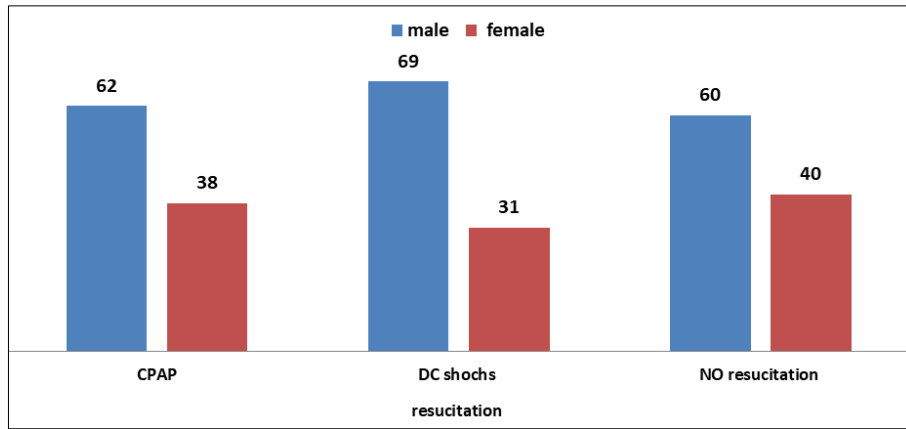
Fig 9: Recucitation types

The Period of Infectivity and severity of covid- 19 as seen in figure (9)

(Sudipta *et al*., 2020) [27] revealed that that In a study from China, the median duration of virus shedding was 20 days (In mild cases tend to clear the viruses early, while severe cases can have prolonged viral shedding. Data from studies using twin respiratory and fecal sampling have shown viral shedding can persist in stools for more than 4 weeks even when respiratory samples are negative (Xu *et al*., 2020) [28] identified male sex, delayed hospitalization after illness, and invasive mechanical ventilation as risk factors for prolonged viral shedding.
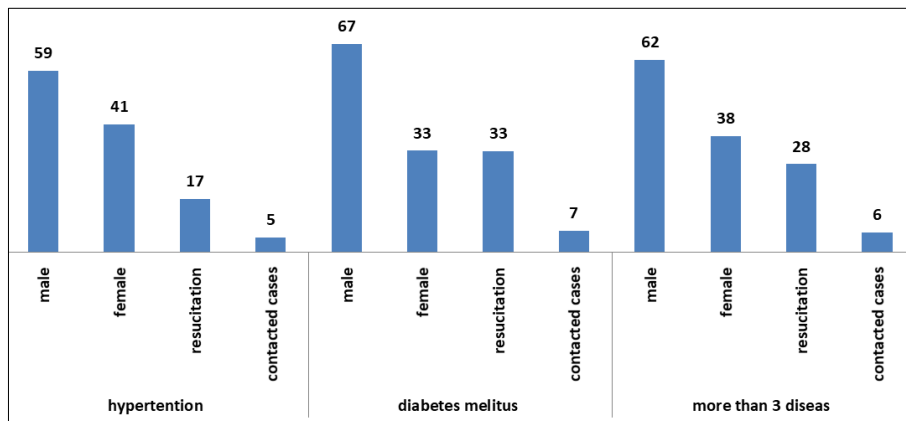

Fig 10: Risks factores at death

As indicated in figure (11), most deaths occurred within three days (48%), with several dying on arrival. The longest hospital stay was 33 days. (Yousef *et al*., 2022) [15] found a median hospital stay of 6 days.
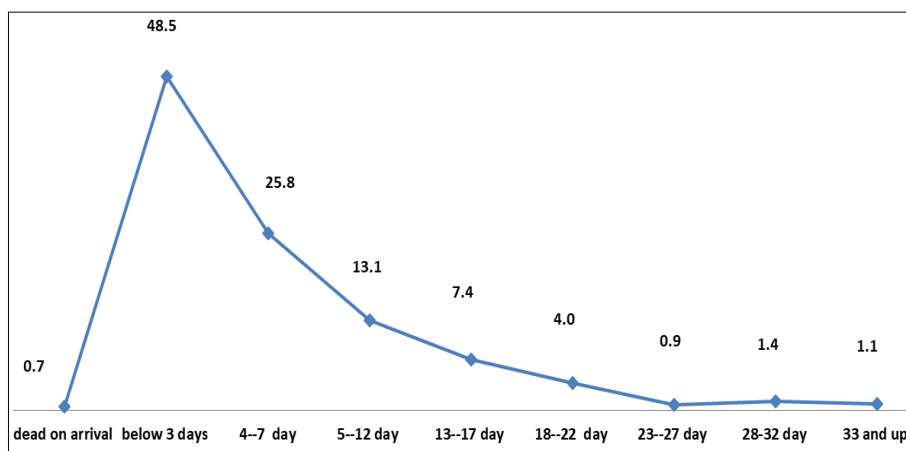

Fig 11: Period of hospitalization /days

Figure (12) shows that 35% of COVID-19-infected people are retired and 33% are housewives. In the first year of the pandemic, nurses, social care professionals (including home cares, transport workers, sales and shop assistants, and other public-facing workers had higher Covid-19 mortality rates. yet (Veena *et al*., 2021) [16].
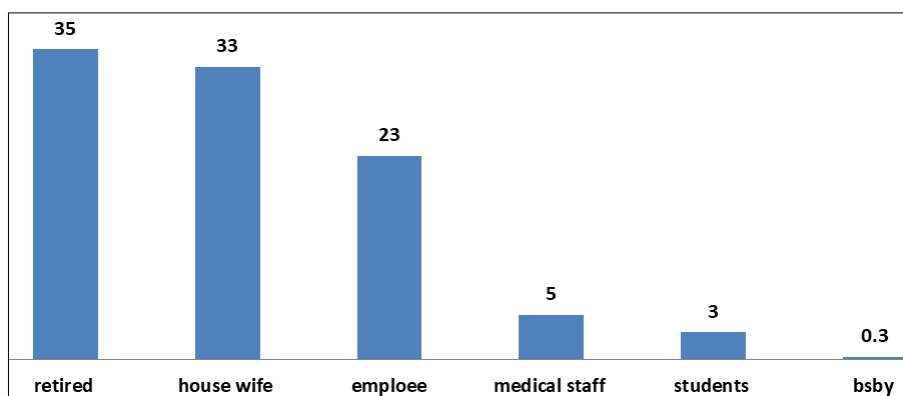
Fig 12: Ocupation

The table (5) revealed the total confirmed and death at home and during hospitalization with CFR most of death reported at Al-Kadymia (622) death and less at Tarmyia (68) death while the CRF higher at Alellam and lower in Tarmyia (1.27%) and (0.47%) Respectively.

Table 5: Distribution of confirmed COVID-19 cases and death according to heath districts

Districts	Confirmed cases	Death		CFR
		Home	Hospital	
Tarmyia	14400	0	68	0.47
Taje	23234	2	84	0.37
Al-Kadymia.	72067	18	604	0.86
Abo-Greb	26742	0	143	0.53
Adel	41410	1	203	0.49
Alkarkh	47564	1	522	1.10
Alamil	38926	3	285	0.74
Al elam	41122	2	520	1.27
Aldora	45084	13	489	1.11
Almahmodia	32563	12	212	0.69
total	383111	52	3132	0.83

The cause of death according to ICD-10 codes was(62%) coded with U07.1 (identified COVID-19) and (38%) coded with U07.2 (https://icd.who.int/ ICD-10 Version: 2019) [20] Finally the outcomes of health status of cases infected with COVID-19 is revealed in figure (10) the study of (Nikkil *et al.*, 2020) [21] revealed that The overall observed CFR varies widely, with the highest rates in Italy (9.3%) and the Netherlands (7.4%) and the lowest rates in South Korea (1.6%) and Germany (0.7%).

Vaccine situation
The vaccination program started on 2 March 2021 with 1st dose given, there are three types of vaccine used, total doses given were (2418127) dose, 71% of population persons vaccinated with at least one dose and (31%), The highest percentage was recorded at Alkarkh districts (15.5%) and the lowest at Alyarmuk hospital (0.5%) as in table (6), the figure (13) showed that people prefer to take Pfizer (70%), senopharme (21%) and AstraZeneca (9%).
While figure (14) revealed that (41%) of vaccinated people take 1st dose, (29%) 2nd dose, (2%) 3rd and very low percentage with 4th dose.

Table 6: Revealed total vaccination three fore doses and percentage

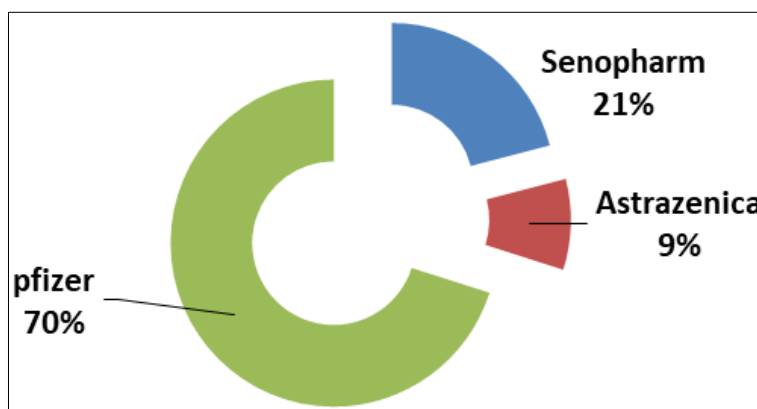| Districts and hospitals	Quantity	%
Almahmodia	184375	7.6
Al elam	248704	10.3
Adel	242475	10.0
Abo-Greb	192866	8.0
Taje	117627	4.9
Aldora	274584	11.4
Alamil	275027	11.4
Tarmyia	82572	3.4
Al-Kadymia.	237851	9.8
Alkarkh	374068	15.5
Al-Kadymia. Medical city	24407	1.0
Alkarkh hospital	14057	0.6
Alyarmook hospital	11788	0.5
Sama Al kadymia	137726	5.7
Total	2418127	100.0

Fig 13: Types of vaccines
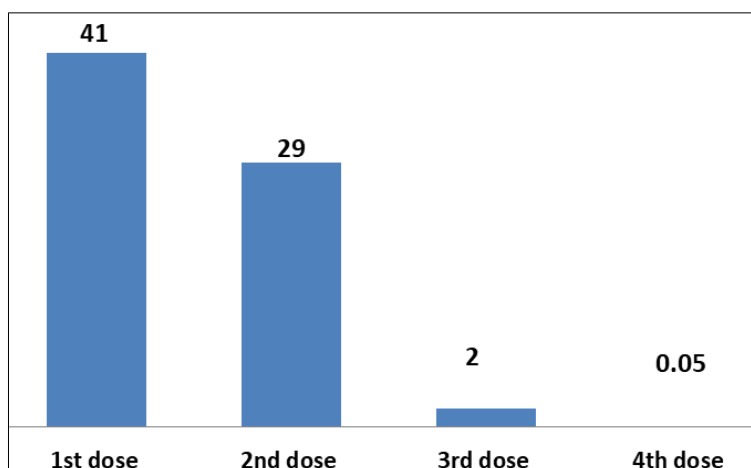
Fig 14: Vaccine doses

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