COVID-19 CASES IN SELECTED HOSPITALS OF CEBUDOC GROUP FROM MARCH 2020 TO MARCH 2021

Emmalyn B Cutamora, Cris Bon C. Sabugal, Devie Elis M. Anonas, Jean Shelou M. Maga, Prince Myrielle B. Leornas, Queeny Beb B. Rendon

Department of Medical Technology, College of Allied Medical Sciences
Cebu Doctors' University

Corresponding Author: Emmalyn B. Cutamora, Department of Medical Technology, College of Allied Medical Sciences, Cebu Doctors' University, Mandaue City, Cebu, Philippines

Abstract: This study determines the number of COVID-19 cases in the three selected tertiary hospitals of the CebuDoc Group. Results showed that most of the patients confined in the three tertiary hospitals were aged 60-69 (21.7%), the majority of them were males (55.3%) and patients admitted in these three hospitals did not have comorbidities (67.9%). For those who had comorbidities, the most common were cardiovascular disease (42.24%), followed by systemic disease (30.53%) and renal disease (15.39%). In Cebu Doctors University Hospital (CDUH), March 2021 had the most number recorded with 155 cases. In Mactan Doctors Hospital (MDH), July 2020 had the most number recorded with 55 cases, while in North General Hospital (NGH), February 2021 had the most number with 69 COVID-19 cases. Overall, there were 760 COVID-19 cases in the three selected hospitals in the CebuDoc Group from March 2020 to March 2021.

Keywords: Comorbidity, COVID-19 cases, CebuDoc Group, demographic profile

---

I.   INTRODUCTION

The global outbreak of the new coronavirus disease called COVID-19 has caused an immense threat to the lives of many individuals around the globe since the first recorded case in Wuhan, China was reported. The SARS-CoV-2 virus causes a respiratory illness characterized by fever, cough, shortness of breath, myalgia, headache, and diarrhea (Guan et al., 2020). According to a local study, the spread of the disease causes prolonged hospital stay, intensive care unit (ICU) confinement, dependence on invasive mechanical ventilation, and mortality due to respiratory

failure (Espiritu et al., 2020). By the month of March 2020, the number of local positive cases had risen followed by strict lockdowns in Cebu City and Cebu Province. Due to the rising number of cases of COVID-19, healthcare facilities were frequently filled to capacity and had no choice but to turn away many patients, including non-COVID-19 cases. Local healthcare facilities were the primary frontliners in combating the COVID-19 virus.

The Centers for Disease Control and Prevention (CDC) studied the COVID-19 case fatality rate in 16 countries and found that patients who were 55 to 64 years old had 8.1 times higher COVID-19 mortality rate than individuals younger than 55 years of age (IRR= 8.1, 95% CI = 7.7, 8.5) and that those aged 65 or older had a 62 times higher mortality rate compared to those in the youngest age group (IRR= 62.1, 95% CI= 59.7, 64.7). Mortality rate of persons aged 65 or older was 7.7 times higher than those between the ages of 55 and 64 years (IRR= 7.7, 95%CI = 7.4, 7.9). The association between age and sex shows that the number of cases who were males was higher (63.8%) compared to those who were females (36.2%), and that men had a significantly higher mortality rate of 2.8% vs. 1.7% (Alkhouli et al., 2020). The global data reveal that risk factors, which include behavioral (e.g. lifestyle habits such as smoking) and biological factors (e.g. strong immune responses), place men at a greater risk. The increasing number of cases is predominantly from the following countries: China, Italy, Iran, India, Spain, the United States, the United Kingdom, Austria, Belgium, Brazil, Canada, France, Germany, Israel, Netherlands, Portugal, Russia, South Korea, Switzerland, and Turkey.

The data from the Centers for Disease Control and Prevention [CDC] (2020) suggest that those 18 years and older and with underlying medical conditions are at higher risk for severe illness. The study observed that medical conditions such as heart failure, coronary artery disease and cardiomyopathy, cancer, smoking, and diabetes can increase the risk of serious illness from COVID-19. Children's symptoms are milder than those of adults and they do not acquire serious forms of the disease (Mayo Clinic Staff, 2022). It was found in the study that children become sick with COVID-19 at a lower rate than adults. Children may become infected with the virus that can cause COVID-19, become ill from it, and spread the virus to others. Children and adults that have COVID-19 but have no signs (asymptomatic) can also infect others (WHO, 2020).

Local reports showed that Cebu City was not exempted from the surge of COVID-19 cases. The Cebu City COVID-19 Response Team was deployed to 80 barangays of Cebu City to trace contacts of the COVID-19 cases (City of Cebu, n.d.). With these heightened measures to control transmission of the virus, patients confirmed to have COVID-19 were brought to a health isolation facility, the Temporary Treatment Monitoring Facility (TTMF), which was equipped with the necessary medical facilities for treatment of the infection (Erram, 2021). At the height of the surge of COVID-19 cases in Cebu, the national government sent more doctors and other resources to augment Cebu's health workers (Dancel, 2020). In addition, community quarantine was enforced to control the rising number of cases (Macasero, 2021). The Inter-agency Task Force for the Management of Emerging Infectious Diseases (IATF-EID, 2021) strictly implemented COVID-19 policies to prevent further virus transmission.

The objective of this study is to determine the demographic profile of patients and the number of COVID-19 cases from March 2020 to March 2021 in the three selected hospitals of the CebuDoc Group.

II.   METHODOLOGY

The study used a clinical record review. The locales of this study were the three selected hospitals of the CebuDoc Group, namely Cebu Doctors University Hospital (CDUH), Cebu North General Hospital (CNGH), and Mactan Doctors Hospital (MDH).

This study utilized the medical records from March 2020 to March 2021 in the selected three hospitals of the CebuDoc Group located in Cebu province. The researchers used record sheets in Microsoft Excel to record information on the number of COVID-19 cases.

Through the information provided, the researchers categorized the patients that were positive for COVID-19, whether they died or if they recovered, as well as the age, gender, and any comorbidities present. The researchers anonymized the records by using code numbers to substitute for the patients' names. The patient's medical records were organized into categories.

Next, the tally was gathered for data analysis. Analysis of the data was performed to determine the group with the highest number of reported COVID-19 cases in each of the categorizations. The data were stored in Google Drive and only the researchers could access the data collected in the study with strict restrictions.

Age grouping followed that of the World Health Organization: 0-9, 10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, and 80+, while sex was categorized as male and female. Frequency count and percentage distribution, were used to determine the profiles of the COVID-19 patients as to age, sex, and comorbidities. Frequency was computed to determine the number of COVID-19 patients from March 2020 to March 2021. Frequency was also analyzed to determine the number of patients across the profiles. The data were reflected in the record sheets, and each variable was separated into tables. To present the frequency of the variables, the researchers presented the data in a tabular form to better analyze the trend.

III.   RESULTS AND DISCUSSION

The following tables in this section present the distribution of patients according to demographic profile, comorbidities, specific comorbidities, and number of COVID-19 cases in selected hospitals of the CebuDoc Group from March 2020 to March 2021.

Table 1. Distribution of Patients According to Demographic Profile

Demographic Profile		Frequency	Percent
Age	0- 9	13	1.7
	10-19	9	1.2
	20-29	63	8.3
	30-39	97	12.8
	40-49	91	12.0
	50-59	157	20.7
	60-69	165	**21.7**
	70-79	95	12.5
	80+	70	9.2
Sex	Male	420	**55.3**
	Female	340	44.7
Comorbidities	Without	516	**67.9**
	With	244	32.1

Results showed that a large number of the patients were in the 60-69 age group (165, 21.7%), the majority of them were males (420, 55.3%) and did not have comorbidities (516, 67.9%). Patients with comorbidities are most likely to develop a severe COVID-19 infection because of suppressed immunity (*People With Certain Medical Conditions, 2022*).

According to an immunologist, Dr. Jessica Lancaster, as one gets older, the immune system tends to deteriorate and has a much slower immunological response when one is infected. A middle-aged person's immune system begins to deteriorate in terms of function and response speed, but this decline accelerates at age 65 (Stiepan, 2020). Patients over 50 years of age who were proven to have SARS-CoV-2 infection showed a 15.4-fold higher risk of death than patients younger than 50. Comparing these age groups for the risk of SARS-CoV-2 infection, it was discovered that individuals under 50 had only a 3.45-fold greater risk to test positive for SARS-CoV-2 compared to those over 50. Individuals over the age of 50 have high expression of ACE2 encoded by the ACE2 gene, and there are other traditional factors such as weakened immunity, decreased organ function, and comorbidity, all of which can significantly increase the risk of death (Biswas et al., 2021).

Studies reveal that women have more robust innate and adaptive immune responses than men because of the sex-specific inflammatory response resulting from X-chromosomal inheritance. In women, the X chromosome contains more immune-related genes. Men have higher plasma ACE II levels than women; SARS-CoV-2 uses ACE II to enter the host cell, located in the respiratory epithelial cells (Sama et al., 2020). Men tend to downplay the destructive potential of the virus. The majority of women reported that they avoid large public gatherings, frequently hand wash, wear masks, and effectively and proactively seek medical help (Baker et al., 2020).

Table 1.1. Distribution of Patients According to Comorbidities

Comorbidities	Frequency	Percentage
Cardiovascular Disease	321	42.24
Systemic Disease	232	30.53
Renal Disease	117	15.39
Pulmonary Disease	81	10.66
Liver Disease	46	6.05
Cancer	30	3.95
Gastrointestinal Disease	23	3.03
Non-disease Comorbidities	15	1.97
Neurological Conditions	11	1.50

Table 1.1 shows the distribution of patients according to comorbidities. The most common were cardiovascular disease (321, 42.24%), followed by systemic disease (232, 30.53%) and renal disease (117, 15.39%). According to more recent studies, older adults and individuals with chronic health problems, such as cardiovascular disease (CVD), are at greater risk for COVID-19-related mortality and morbidity than the general population. Although respiratory symptoms are the most common clinical manifestations of COVID-19, cardiovascular involvement may occur through various mechanisms. The most common cardiovascular abnormality in

COVID-19 is acute cardiac injury, which occurs in 8–12% of all patients. A higher risk of death can be associated with underlying CVD and the development of acute cardiac injury (Basu-Ray et al., 2021).

An article by Thomas (2021) mentions that molecular mimicry is one fundamental mechanism of autoimmune disease/systemic disease. This can mean that COVID-19 infection may promote molecular mimicry using human molecular chaperones and mostly heat shock proteins, which cause autoimmune polyneuropathic syndromes. In the recent emergence of

COVID-19, studies have shown that kidney disease has been predominantly named as one of the factors leading to the infection's severity in any age group (Menon et al., 2021). A study conducted in China presented a retrospective and observational analysis of the relationship between COVID-19 and kidney dysfunction.

The data collected showed that kidney dysfunction was common amongst COVID-19 patients. This could gradually worsen during the period of hospitalization to acute kidney injury (AKI) (Li et al., 2020).

Table 1.2 Distribution of Patients According to Comorbidities

Comorbidities	Frequency	Percent
Diabetes Mellitus Type 2	209	27.50
Hypertension	204	26.84
Hypertensive Cardiovascular Disease	59	7.76
Chronic Kidney Disease	55	7.24
Hepatitis B	38	5.00
Bronchial Asthma	31	4.08

For the specific comorbidities, the most common were diabetes mellitus type 2 (209, 27.50%) and hypertension (204, 26.84%) followed by hypertensive cardiovascular disease (59, 7.76%), chronic kidney disease (55, 7.24%), hepatitis B (38, 5.0%) and bronchial asthma (31, 4.08%). Diabetes has been repeatedly named as one of the comorbidities associated with increased severity of infection compared to those without the condition. According to the study presented by Barron et al. (2020), both types of diabetes show an underlying relationship with in-hospital deaths since the emergence of the COVID-19. Another study by Shi et al. (2020) also presented the statutory need for Intensive Care Unit (ICU) admission for diabetic patients due to its increasing fatality rate. Hypertension also increases the severity of COVID-19, just like diabetes. In the study presented by Bauer et

al. (2020), hypertension is an independent predictor of severe COVID-19 infection, necessitating Intensive Care Unit admission for the patient as well. In cases of kidney disease, patients present with elevated C-reactive protein, low lymphocyte count, and lactate dehydrogenase levels upon hospitalization resulting in a higher chance of a more severe infection. Hepatitis also shows subsequent risks, particularly in adults aged 65 years old or older with pre-existing medical conditions. Extra precautions must be taken in these patients because of possible progression of the disease leading to death. Pakhchanian et al. (2021) also noted a cohort of older age groups from 67±15 with a higher number of males from the data of CKD patients. In the case of asthma, Robinson et al. (2021) stated a lower requirement for intensive

care unit admissions, usage of ventilators, and mortality.

Table 2. COVID-19 Cases in Selected Hospitals in CebuDoc Group from March 2020-2021

Year	Month	Hospital			Total
		CDUH	MDH	CNGH	
2020	March	3	0	0	3
	April	1	1	0	2
	May	9	3	0	12
	June	17	36	6	59
	July	28	55	48	131
	August	5	27	15	47
	September	6	2	13	21
	October	2	4	3	9
	November	0	4	0	4
	December	4	0	0	4
2021	January	41	2	16	59
	February	110	21	69	200
	March	155	27	27	209
Total		381	182	197	760

Data shows the highest number of cases was recorded in CDUH in March 2021 with 155 cases and in February 2021 with 110 cases. For MDH, the highest number of cases was recorded in July 2020 with 55 cases; for CNGH, the highest number of COVID-19 cases was recorded in February 2021 with 69 cases. Data also showed that the most number of cases reported in the three hospitals was in March 2021 with 209 cases, followed by February 2021 with 200 cases, and by July 2020 with a total of 131 cases. The least number of cases due to COVID-19 were in April 2020 with only 2 cases.

When the outbreak began, patients waited for swab results for up to a week, and many were not tested when isolated (CNN Philippines Staff, 2021b). From June 16 to 30, Cebu City was placed on Extended Community Quarantine (ECQ) due to an increase in new cases, widespread community infection, case doubling time of less than seven days, and a significant increase in the utilization of critical care facilities. Talisay City and Cebu City were placed under MECQ from July 15 to July 31 (US Embassy Manila, 2020).

Despite the rising number of COVID-19 cases and the detection of virus mutation in the area, Cebu Governor Gwen Garcia rejected the plans to place the province under enhanced community quarantine on February 20, 2021. Cebu City, Lapu Lapu City, Mandaue City, and Talisay City's positivity rates remained high. These patterns, according to OCTA, show that the epidemic was still not under control. Despite the mutation, no other protocols were imposed (CNN Philippines Staff, 2021a).

While the number of COVID-19 cases in the National Capital Region continued to climb, the number of cases in Cebu City had plateaued after a rebound in March 2021. From February 2021 to early March 2021, Cebu City became a source of concern after the number of active cases jumped to over 3,000 (Magsumbol, 2021).

Table 3.0 Distribution of COVID-19 Cases in Selected Hospitals in CebuDoc Group Across the Demographic Profiles

Demographic Profile		Hospital			Total
		CDUH	MDH	CNGH	
Age	0- 9	5 (38.5%)	3 (23.1%)	5 (38.5%)	13
	10-19	4 (44.4%)	3 (33.3%)	2 (22.2%)	9
	20-29	28 (44.4%)	14 (22.2%)	21 (33.3%)	63
	30-39	43 (44.3%)	30 (30.9%)	24 (24.7%)	97
	40-49	36 (39.6%)	31 (34.1%)	24 (26.4%)	91
	50-59	75 (47.8%)	37 (23.6%)	45 (28.7%)	157
	60-69	89 (53.9%)	34 (20.6%)	42 (25.5%)	165
	70-79	51 (53.7%)	18 (18.9%)	26 (27.4%)	95
	80+	50 (71.4%)	12 (17.1%)	8 (11.4%)	70
Sex	Male	221 (52.6%)	95 (25.6%)	104 (27.4%)	420
	Female	160 (47.1%)	87 (22.6%)	93 (24.8%)	340
Comorbidities	Without	275 (53.3%)	133 (25.8%)	108 (20.9%)	516
	With	106 (43.4%)	49 (20.1%)	89 (36.5%)	244
	Total	381	182	197	

Table 3.0 shows that the highest number of patients aged 60 to 69, 70 to 79, and 80+ were admitted at CDUH. The number of males admitted at CDUH was higher compared to females (52.6% vs. 47.1%), and the findings were similar in MDH (25.6% vs. 22.6%) and in CNGH (27.4% vs. 24.8%). More than half of those without comorbidities (53.3%) and many patients with comorbidities (43.4%) were admitted to CDUH. COVID-19 is more likely to make older people sick. Over 80% of deaths from COVID-19 occur in people under the age of 65. The risk of severe disease steadily increases with age (CDC, 2021). Patients who have many comorbidities are vulnerable to this condition. According to the CDC, the risk of COVID-19-related severe illness, which can lead to hospitalization and death, rises with age. Those aged 65 and older account for eight out of ten deaths caused by COVID-19. The ones who are more susceptible to COVID-19 infection are males and the elderly population. They develop more severe COVID-19 and are hospitalized (Haghpanah et al., 2021). The overall case fatality rate of COVID-19 is about 2.4 times higher for men than for women because of the following factors: biological, psychosocial, and behavioral factors (Griffith et al., 2020). Women's innate and adaptive immune responses are more robust than men's (Sama et al., 2020).

Table 3.1 Distribution of COVID-19 Cases in Selected Hospitals in CebuDoc Group Across the Specific Comorbidities

Comorbidities	Hospital		
	CDUH	MDH	CNGH
Acute Appendicitis	2 (100%)	0 (0%)	0 (0%)
Acute Coronary Syndrome	6 (54.5%)	5 (45.5%)	0 (0%)
Acute Gastritis	2 (40%)	0 (0%)	3 (60%)

Acute Gastroenteritis	3 (50%)	2 (33.3%)	1 (16.7%)
Acute Kidney Disease	0 (0%)	0 (0%)	1 (100%)
Acute Kidney Injury	16 (57.1%)	10 (35.7%)	2 (7.1%)
Acute Lung Injury	0 (0%)	1 (100%)	0 (0%)
Acute Myocardial Injury	0 (0%)	3 (100%)	0 (0%)
Acute Pancreatitis	0 (0%)	1 (100%)	0 (0%)
Acute Renal Failure	2 (100%)	0 (0%)	0 (0%)
Acute Respiratory Distress Syndrome	2 (33.3%)	3 (50%)	1 (16.7%)
Acute Respiratory Failure	0 (0%)	1 (50%)	1 (50%)
Acute Respiratory Infection	1 (100%)	0 (0%)	0 (0%)
Alzheimer's Disease	1 (100%)	0 (0%)	0 (0%)
Anemia	3 (30%)	6 (60%)	1 (10%)
Anterior Cerebral Artery	1 (100%)	0 (0%)	0 (0%)
Anxiety Disorder	0 (0%)	1 (33.3%)	2 (66.7%)
Appendicitis	1 (50%)	1 (50%)	0 (0%)
Autism Spectrum Disorder	1 (100%)	0 (0%)	0 (0%)
Auto-Immune Hemolytic Anemia	0 (0%)	1 (100%)	0 (0%)
Autoimmune Disease (Non Specific)	1 (100%)	0 (0%)	0 (0%)
Benign Prostatic Hyperplasia	13 (100%)	0 (0%)	0 (0%)
Benign Prostatic Hypertrophy	1 (50%)	1 (50%)	0 (0%)
Breast CA	3 (75%)	0 (0%)	1 (25%)
Bronchial Asthma	22 (71%)	6 (19.4%)	3 (9.7%)
Bronchiectasis	1 (100%)	0 (0%)	0 (0%)
Cardiovascular Disease	2 (33.3%)	2 (33.3%)	2 (33.3%)
Cerebrovascular Disease	0 (0%)	2 (50%)	2 (50%)
Cerebrovascular Stroke	0 (0%)	1 (100%)	0 (0%)
Cervical CA	1 (100%)	0 (0%)	0 (0%)
Cholangiocarcinoma	1 (100%)	0 (0%)	0 (0%)
Chronic Glomerulonephritis	1 (33.3%)	2 (66.7%)	0 (0%)
Chronic Kidney Disease	43 (78.2%)	10 (18.2%)	2 (3.6%)
Chronic Renal Deficiency	0 (0%)	0 (0%)	1 (100%)
Colon Cancer	4 (100%)	0 (0%)	0 (0%)
Congenital Heart Defects	1 (100%)	0 (0%)	0 (0%)
Congestive Heart Failure	0 (0%)	0 (0%)	2 (100%)
COPD	7 (70%)	2 (20%)	1 (10%)
Coronary Artery Disease	8 (66.7%)	4 (33.3%)	0 (0%)
Coronary vascular Disease	1 (100%)	0 (0%)	0 (0%)
Dementia	2 (100%)	0 (0%)	0 (0%)
Diabetes Mellitus Type 1	0 (0%)	1 (100%)	0 (0%)
Diabetes Mellitus Type 2	114 (54.5%)	47 (22.5%)	48 (23%)
Diabetic Nephropathy	0 (0%)	0 (0%)	1 (100%)
Diabetic Neuropathy	0 (0%)	1 (100%)	0 (0%)
Down Syndrome	1 (100%)	0 (0%)	0 (0%)
End-Stage Renal Disease	0 (0%)	0 (0%)	1 (100%)
Endometrial CA	1 (100%)	0 (0%)	0 (0%)
Gastric Ulcer	2 (66.7%)	0 (0%)	1 (33.3%)
Gastritis	0 (0%)	0 (0%)	1 (100%)
GERD	0 (0%)	0 (0%)	2 (100%)

Gestational Diabetes	0 (0%)	1 (100%)	0 (0%)
Gestational Diabetes With Mild Anemia	0 (0%)	1 (100%)	0 (0%)
Gestational Hypertension	0 (0%)	1 (100%)	0 (0%)
Hemolytic Anemia	1 (100%)	0 (0%)	0 (0%)
Hepatitis A	1 (100%)	0 (0%)	0 (0%)
Hepatitis B	2 (5.3%)	34 (89.5%)	2 (5.3%)
Hepatitis C	1 (50%)	1 (50%)	0 (0%)
Hypertension	140 (68.6%)	25 (12.3%)	39 (19.1%)
Hypertensive Arteriosclerotic Cardiovascular Disease	0 (0%)	5 (100%)	0 (0%)
Hypertensive Cardiovascular Disease	30 (50.8%)	26 (44.1%)	3 (5.1%)
Infarct Pulmonary Tuberculosis	0 (0%)	1 (100%)	0 (0%)
Invasive Ductal CA	1 (100%)	0 (0%)	0 (0%)
Ischemic Cardiomyopathy	0 (0%)	4 (80%)	1 (20%)
Ischemic Heart Disease	1 (50%)	1 (50%)	0 (0%)
Kawasaki Disease	1 (100%)	0 (0%)	0 (0%)
Kidney Disease	0 (0%)	1 (100%)	0 (0%)
Liver Abscess	0 (0%)	0 (0%)	1 (100%)
Liver CA	0 (0%)	0 (0%)	1 (100%)
Liver Cirrhosis	1 (33.3%)	2 (66.7%)	0 (0%)
Moderate Acute Pancreatitis	0 (0%)	1 (100%)	0 (0%)
Myelofibrosis	0 (0%)	1 (100%)	0 (0%)
Nasopharyngeal CA	1 (100%)	0 (0%)	0 (0%)
Non-Hodgkin's Lymphoma	1 (100%)	0 (0%)	0 (0%)
Obesity	1 (100%)	0 (0%)	0 (0%)
Obstructive Jaundice	1 (100%)	0 (0%)	0 (0%)
Pancreatic Cancer	3 (100%)	0 (0%)	0 (0%)
Papillary Thyroid CA	2 (100%)	0 (0%)	0 (0%)
Parkinson's Disease	1 (100%)	0 (0%)	0 (0%)
Polycythemia Vera	1 (50%)	0 (0%)	1 (50%)
Pregnant	8 (57.1%)	4 (28.6%)	2 (14.3%)
Prostate CA	2 (100%)	0 (0%)	0 (0%)
Pulmonary Congestion	1 (100%)	0 (0%)	0 (0%)
Pulmonary Embolism	1 (100%)	0 (0%)	0 (0%)
Pulmonary Tuberculosis	3 (100%)	0 (0%)	0 (0%)
Renal Cell CA	1 (100%)	0 (0%)	0 (0%)
Renal Disease	7 (70%)	3 (30%)	0 (0%)
Respiratory Distress Syndrome	2 (100%)	0 (0%)	0 (0%)
Rheumatic Heart Disease	1 (100%)	0 (0%)	0 (0%)
Squamous Cell CA	1 (100%)	0 (0%)	0 (0%)
Stroke	0 (0%)	1 (100%)	0 (0%)
Systemic Illness	1 (100%)	0 (0%)	0 (0%)
Systemic Lupus Erythematosus	2 (100%)	0 (0%)	0 (0%)
Thalassemia	1 (100%)	0 (0%)	0 (0%)
Thyroid CA	1 (100%)	0 (0%)	0 (0%)
Tuberculosis	0 (0%)	1 (100%)	0 (0%)
Upper Respiratory Tract Infection	6 (30%)	0 (0%)	14 (70%)
Uterine Malignancy	1 (100%)	0 (0%)	0 (0%)

Uterine Sarcoma	1 (100%)	0 (0%)	0 (0%)
Valvular Heart Disease	1 (100%)	0 (0%)	0 (0%)

The most common comorbidities in CDUH were hypertension (140 cases) followed by diabetes mellitus type 2 (114 cases). In MDH, the most common comorbidities were diabetes mellitus type 2 (47 cases) followed by hepatitis B (34 cases). In CNGH, the most common comorbidities were diabetes mellitus type 2 (48 cases) followed by hypertension (39 cases). COVID-19 in diabetic patients can be immensely life-threatening due to it having a detrimental effect on the body's B-cell function, and also predisposing to high prevalence of diabetic ketoacidosis (Apicella et al., 2020). A study shows that the presence of diabetes poses a higher risk for mortality compared to the absence of diabetes (Palaiodimos et al., 2020).

Since hypertension is strongly associated with age, severity of COVID-19 and mortality are higher in the elderly. Hypertension causes many pathophysiological changes especially in the cardiovascular system and can increase susceptibility to COVID-19 (Kulkarni et al., 2020). Hepatitis also shows significant risks, particularly in adults aged 65 years old or more with pre-existing medical conditions.

IV.   CONCLUSION

Based on our findings, a total of 760 COVID-19 cases were identified in the three selected hospitals of CebuDoc Group from March 2020 to March 2021. There were three hundred eighty-one COVID-19 cases in CDUH, 182 cases in MDH, and 197 cases in CNGH. The most common comorbidities were cardiovascular disease, systemic disease, and renal disease. In the specific comorbidities, the most common were diabetes mellitus type 2, hypertension, and hypertensive cardiovascular disease.

References

Alkhouli, M., Nanjundappa, A., Annie, F., Bates, M., Bhatt, D. (2020). Sex differences in case fatality rate of COVID-19: insights from a multinational registry. *Mayo Clinic Proceedings.* Vol 95 *8(*1613-1620). https://doi.org/10.1016/j.mayocp.2020.05.014

Apicella, M., Campopiano, M. C., Mantuano, M., Mazoni, L., Coppelli, A., & Del Prato, S. (2020). COVID-19 in people with diabetes: understanding the reasons for worse outcomes. *The Lancet Diabetes & Endocrinology, 8*(9), 782–792. https://doi.org/10.1016/s2213-8587(20)30238-2

Baker, P., White, A., & Morgan, R. (2020). Men's health: COVID-19 pandemic highlights need for overdue policy action. *The Lancet*, *395*(10241), 1886–1888. https://doi.org/10.1016/s0140-6736(20)31303-9

Barron, E., Bakhai, C., Kar, P., Weaver, A., Bradley, D., Ismail, H., Knighton, P., Holman, N., Khunti, K., Sattar, N., Wareham, N. J., Young, B., & Valabhji, J. (2020). Associations of type 1 and type 2 diabetes with COVID-19-related mortality in England: a whole-population study. *The Lancet Diabetes & Endocrinology*, *8*(10), 813–822. https://doi.org/10.1016/s2213-8587(20)30272-2

Basu-Ray, I., Almaddah, N. K., Adeboye, A., & Soos, M. P. (2022). Cardiac manifestations of Coronavirus (COVID-19). In *StatPearls.* StatPearls Publishing.

https://pubmed.ncbi.nlm.nih.gov/323
10612/

Bauer, A. Z., Gore, R., Sama, S. R., Rosiello, R., Garber, L., Sundaresan, D., McDonald, A., Arruda, P., & Kriebel, D. (2020). Hypertension, medications, and risk of severe COVID-19: a Massachusetts community-based observational study. *The Journal of Clinical Hypertension, 23*(1), 21–27. https://doi.org/10.1111/jch.14101

Biswas, M., Rahaman, S., Biswas, T. K., Haque, Z., & Ibrahim, B. (2021). Association of sex, age, and comorbidities with mortality in COVID-19 patients: a systematic review and meta-analysis. *Intervirology, 64*(1), 36–47. https://doi.org/10.1159/000512592

Centers for Disease Control and Prevention (2022, June 15). Science brief: evidence used to update the list of underlying medical conditions associated with higher risk for severe COVID-19. https://www.cdc.gov/coronavirus/201 9-ncov/science/science-briefs/underl ying-evidence-table.html#print

City of Cebu (n.d.). *Contact tracing strategy help boost Cebu City response.* Retrieved October 15, 2022, from https://www.cebucity.gov.ph/contact-t racing-strategy-help-boost-cebu-city-response/.

CNN Philippines Staff. (2021a). *DOH confirms new COVID-19 mutations in Central Visayas.* CNN Philippines. Retrieved October 14, 2022, from https://www.cnnphilippines.com/news /2021/2/18/two-covid-mutations-of-co ncern-cebu-doh-central-visayas.html ?fbclid=lwAR2

CNN Philippines Staff. (2021b). *Despite increase in positivity rate, Cebu gov*

rejects recommendation of lockdown. CNN Philippines. https://www.cnnphilippines.com/regio nal/2021/2/20/cebu-governor-rejects-placing-province-under-ecq.html

Dancel, R. (2020, June 29) Cebu City looms as Philippines' new Covid-19 epicentre. *The Straits Times.* Retrieved September 25, 2022, from https://www.straitstimes.com/asia/se-asia/cebu-city-looms-as-philippines-n ew-covid-19-epicentre

Espiritu, A. I, Sy, M. C., Anlacan, V. M., & Jamora, R. D., (2020). The Philippine COVID-19 outcomes: a retrospective study of neurological manifestations and associated symptoms (The Philippine CORONA study): a protocol study. *BMJ Journal, 10*(11), e040944. https://doi.org/10.1136/bmjopen-2020 -040944

Erram, M. (2021). Cebu province beefs up facilities, equipment for COVID patients. *CDN.* Retrieved October 2021 from https://cebudailynews.inquirer.net/39 3837/cebu-province-beefs-up-facilitie s-equipment-for-covid-patients

COVID-19 patients. Retrieved October 14, 2022, from https://cebudailynews.inquirer.net/39 3837/cebu-province-beefs-up-facilitie s-equipment-for-covid-patients

Guan, W. J., Ni, Z. Y., Hu, Y., Liang, W. H., Ou, C. Q., He, J. X., Liu, L., Shan, H., Lei, C. L., Hui, D. S., Du, B., Li, L. J., Zeng, G., Yuen, K. Y., Chen, R. C., Tang, C. L., Wang, T., Chen, P. Y., Xiang, J., . . . Zhong, N. S. (2020). Clinical characteristics of coronavirus disease 2019 in China. *New England Journal of Medicine, 382*(18), 1708–1720. https://doi.org/10.1056/nejmoa20020 32

Griffith, D. M., Sharma, G., Holliday, C. S., Enyia, O. K., Valliere, M., Semlow, A. R., Stewart, E. C., & Blumenthal, R. S. (2020). Men and COVID-19: a biopsychosocial approach to understanding sex differences in mortality and recommendations for practice and policy interventions. *Preventing Chronic Disease, 17*. https://doi.org/10.5888/pcd17.200247

Haghpanah, A., Masjedi, F., Salehipour, M., Hosseinpour, A., Roozbeh, J., & Dehghani, A. (2021). Is COVID-19 a risk factor for progression of benign prostatic hyperplasia and exacerbation of its related symptoms?: a systematic review. *Prostate Cancer and Prostatic Diseases, 25*(1), 27–38. https://doi.org/10.1038/s41391-021-00388-3

Inter-Agency Task Force for the Management of Emerging Infectious Diseases (2021). Creation of the Inter-agency task force for the management of emerging infectious diseases in the Philippines. Retrieved October 15, 2021 from https://iatf.doh.gov.ph/?fbclid=IwAR1Gz5rRCr3-DcXeKIGstGoxeIgh9DT-DvOU5y5mIVRQa4x2IWeJwsZbgv0

Kulkarni, S., Jenner, B. L., & Wilkinson, I. (2020). COVID-19 and hypertension. *Journal of the Renin-Angiotensin-Aldosterone System, 21*(2), 147032032092785. https://doi.org/10.1177/1470320320927851

Li, Z., Wu, M., Yao, J., Guo, J., Liao, X., Song, S., Li, J., Duan, G., Zhou, Y., Wu, X., Zhou, Z., Wang, T., Hu, M., Chen, X., Fu, Y., Lei, C., Dong, H., Xu, C., Hu, Y., . . . Yan, J. (2020). Caution on kidney dysfunctions of COVID-19 patients. *SSRN Electronic Journal*.

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3559601

Macasero, R. (2021, March 30). Metro Cebu finally sees COVID-19 cases drop after 3-month surge. *Rappler.* https://www.rappler.com/nation/coronavirus-cases-metro-cebu-march-29-2021/

Magsumbol, C. N. (2021, March 25). Fewer cases, more deaths in Cebu City in March 2021. *The Freeman.* https://www.philstar.com/the-freeman/cebu-news/2021/03/25/2086856/fewer-cases-more-deaths-cebu-city-march-2021

Mayo Clinic Staff. (2022, September 14). *Coronavirus disease 2019 (COVID-19)*. Mayo Clinic. https://www.mayoclinic.org/diseases-conditions/coronavirus/symptoms-causes/syc-20479963 .

Menon, T., Gandhi, S. A. Q., Tariq, W., Sharma, R., Sardar, S., Arshad, A. M., Adhikari, R., Ata, F., Kataria, S., & Singh, R. (2021). Impact of chronic kidney disease on severity and mortality in COVID-19 patients: a systematic review and meta-analysis. *Cureus.* https://doi.org/10.7759/cureus.14279

Pakhchanian, H., Raiker, R., Mukherjee, A., Khan, A., Singh, S., & Chatterjee, A. (2021). Outcomes of COVID-19 in CKD patients. *Clinical Journal of the American Society of Nephrology*, *16*(5), 785–786. https://doi.org/10.2215/cjn.13820820

Palaiodimos, L., Chamorro-Pareja, N., Karamanis, D., Li, W., Zavras, P. D., Chang, K. M., Mathias, P., & Kokkinidis, D. G. (2020). Diabetes is associated with increased risk for in-hospital mortality in patients with COVID-19: a systematic review and meta-analysis comprising 18,506

patients. *Hormones*, *20*(2), 305–314. https://doi.org/10.1007/s42000-020-00246-2

People with Certain Medical Conditions. (2022, September 2). Centers for Disease Control and Prevention. Retrieved September 25, 2022, from https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html

Robinson, L. B., Fu, X., Bassett, I. V., Triant, V. A., Foulkes, A. S., Zhang, Y., Camargo, C. A., & Blumenthal, K. G. (2021). COVID-19 severity in hospitalized patients with asthma: A matched cohort study. *The Journal of Allergy and Clinical Immunology: In Practice*, *9*(1), 497–500. https://doi.org/10.1016/j.jaip.2020.10.021

Sama, I. E., Ravera, A., Santema, B. T., van Goor, H., ter Maaten, J. M., Cleland, J. G. F., Rienstra, M., Friedrich, A. W., Samani, N. J., Ng, L. L., Dickstein, K., Lang, C. C., Filippatos, G., Anker, S. D., Ponikowski, P., Metra, M., van Veldhuisen, D. J., & Voors, A. A. (2020). Circulating plasma concentrations of angiotensin-converting enzyme 2 in men and women with heart failure and effects of renin–angiotensin–aldosterone inhibitors. *European Heart Journal, 41*(19), 1810–1817. https://doi.org/10.1093/eurheartj/ehaa373

Shi, Q., Zhang, X., Jiang, F., Zhang, X., Hu, N., Bimu, C., Feng, J., Yan, S., Guan, Y., Xu, D., He, G., Chen, C., Xiong, X., Liu, L., Li, H., Tao, J., Peng, Z., & Wang, W. (2020). Clinical characteristics and risk factors for mortality of COVID-19 patients with diabetes in Wuhan, China: a two-center, retrospective study.

Diabetes Care, 43(7), 1382–1391. https://doi.org/10.2337/dc20-0598

Stiepan, D. (2022, March 22). COVID-19: *Keeping seniors, immunocompromised people safe.* Mayo Clinic News Network. Retrieved September 25, 2022, from https://newsnetwork.mayoclinic.org/discussion/covid-19-keeping-seniors-immunocompromised-people-safe/

Thomas, L. (2021, August 11). *COVID-19 and autoimmune diseases.*News-Medical.net. Retrieved September 25, 2022, from https://www.news-medical.net/health/COVID-19-and-Autoimmune-Diseases.aspx

U.S. Embassy Manila. (2020, June 16). *United States Embassy Manila, Philippines.* U.S. Embassy in The Philippines. Retrieved December 4, 2021, from https://ph.usembassy.gov/health-alert-u-s-embassy-manila-june-16-2020/

WHO (2020, April). Coronavirus disease 2019 (COVID-19) Situation Report – 89. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200418-sitrep-89-covid-19.pdf