Characteristics, Comorbidities, and Outcomes Among Hospitalized Patients with COVID-19 in Montreal, Quebec

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Abstract

Background: The province of Quebec has been the epicenter of the COVID-19 crisis in Canada, accounting for over half of Canada's cases and mortality. Initial COVID-19 cases occurred in returned travelers and their contacts, then shifted in mid-April to the elderly nursing home population. We describe the clinical characteristics and outcomes of hospitalized patients with COVID-19 and how this changed over time in Montreal.

Methods: We conducted a retrospective case series of all hospitalizations with laboratory confirmed SARS-CoV-2 infection at the Jewish General Hospital in Montreal from March 4 to April 27, 2020. Demographic, co-morbidities, and clinical outcomes were collected by reviewing electronic medical records and laboratory data.

Results: Among 330 hospitalizations, the mean age was 71.9 $\pm$ 18.6 years, 56.1% (185/330) were females and 22% (74/330) were admitted to ICU. The overall mortality rate was 15.8% (52/330); 10.8% (8/74) in the ICU and 25.6% (33/129) among nursing home (NH) residents. The proportion of NH resident admissions increased from 20.1% (39/194) between March 4-April 2 to 66.2% (90/136) from April 13-26, 2020. NH residents were older (85.0 vs 63.4 years), more likely to be female (69.8% vs 47.3%), and had more co-morbidities (82.2% vs 46.8% had ≥ 2 co-morbidities) versus non-NH residents.

Interpretation: A large and increasing proportion of COVID-19 admissions over the study period occurred among NH residents who had a high mortality rate. Policies and practices that prevent outbreaks of COVID-19 in long term care settings should be established to prevent high mortality in this vulnerable population.

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Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causing Coronavirus disease 2019 (COVID-19) has swept across the world affecting all countries resulting in more than 9.5 million cases and 480 000 deaths since it was first described in December 2019, in Wuhan China.(1) COVID-19 leads to severe disease in 15-20% of cases who require hospitalization, one third of whom may require intensive care support and mechanical ventilation.(2) The Province of Quebec has been the epicenter of the COVID-19 health crisis in Canada, accounting for more than one half of Canada's cases and mortality. As of June 20, over 54 600 cases and more than 5 400 deaths have been attributed to COVID-19 in Quebec.(1, 3) Montreal has been especially affected, accounting for more than half of all provincial cases and 61% of all provincial deaths.(3)

Early transmission dynamics were driven by returning travelers who imported SARS-CoV-2 from other countries, with the first case in Quebec diagnosed on February 27 2020.(4) In addition, several large gatherings with attendees coming from not-yet recognized epicenters such as New York City, led to many infections and disease. These newly infected cases included the elderly who lived in seniors' residences and long term care facilities (LTCF) that led to transmission within these institutions. Simultaneously, health care workers (HCWs) who frequently worked in multiple facilities, led to further spread within and between these institutions.(5) Finally, the HCWs unknowingly imported SARS-CoV-2 into the community. Many of these HCWs were of lower socioeconomic status and lived in crowded environments, thus facilitating spread within their households and potentially spreading disease through transportation to and from work.(6, 7)

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The Jewish General Hospital (JGH) in Montreal was one of two adult hospitals initially designated to receive patients with COVID-19 infection in Quebec, and had the largest number of COVID-19 admissions. The aim of this study is to describe the clinical characteristics and outcomes of hospitalized patients at the JGH and how the population and their outcomes changed over the study period.

Methods

We conducted a case series of all COVID-19 positive persons who were hospitalized at the JGH from March 4, 2020 to April 27, 2020, with outcomes measured up until April 27, 2020. The JGH is a McGill affiliated 637 bed acute care and tertiary care hospital in Montreal, Quebec and was one of the initial designated adult referral center for COVID-19 positive patients in Quebec. Confirmation of SARS-CoV-2 was by a positive polymerase chain reaction (PCR), developed and validated by the Quebec provincial lab targeting the envelope gene (E-gene), with specimens obtained from the nasopharynx or lower respiratory tract. Data were obtained from patient charts, the electronic medical record, and the laboratory system. Demographic data, past medical history including medical co-morbidities and medications, onset of and description of presenting symptoms, initial physical examination, initial laboratory data and clinical outcomes and disposition (death, discharged, still admitted) were collected throughout the hospital admission. Data was extracted by co-authors (PA, AT, SB, VY, JM, AL) and data queries were verified by two infectious disease staff (CG, LK). The level of medical intervention (LOI) and goals of care are established for each patient admitted to the hospital, we assigned the last LOI for each patient.(8) This is classified into 4 categories; Level 1 includes provision of all

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interventions offered by the medical team including admission to the Intensive Care Unit (ICU), intubation and cardiopulmonary resuscitation (CPR). Level 2 has some specific restrictions including no CPR and/or no intubation. Level 3 aims at treating reversible conditions with directions for no transfer to ICU and no CPR; Level 4 focuses on palliation. Nursing home (NH) residents were defined as those living in residences for seniors or long-term care facilities (LTCF) that provide care for adults with decreased independence and who usually require more than 3 hours of care per day. Acute kidney injury was defined as a 25% decrease from baseline GFR, lymphopenia as an absolute lymphocyte count <1.0 x 10^9/L, hypoxemia was defined as O2 sat <88% on room air and/or the need for supplemental oxygen.

Analysis

Descriptive statistics were used to summarize baseline demographic characteristics, clinical characteristics, laboratory values on admission, complications during hospitalization, and disposition at the end of the study period (death, discharged or still admitted). Continuous variables were presented as a mean and a standard deviation (SD) or a median and an interquartile range (IQR), as appropriate. Categorical variables were presented as a total number and a proportion. Kaplan Meier survival analysis was used to estimate crude cumulative incidence of death at 30 days of follow-up. Estimates were stratified by nursing home and non-nursing home residents. No imputations was made for missing data. All analyses were done in SAS, version 9·4 (SAS Institute, Cary, NC).

Results

Between March 4, 2020 and April 27, 2020, there were 330 patients with a laboratory-

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confirmed diagnosis of SARS-CoV-2 admitted to the JGH. The mean age ± standard deviation of patients was 71.9 ± 18.6 years (range; 21 to 101 years); 185 (56.1%) were female and the median time of onset of symptoms prior to hospitalizations was 6.0 days [Interquartile range (IQR) 3.0-10.0]. Baseline demographic and clinical characteristics are shown in Table 1. Two hundred (60.6%) patients had ≥ 2 co-morbidities, the most common co-morbidities being hypertension (194 patients, 58.8%), dementia (101 patients, 30.6%), and diabetes (84 patients, 25.5%). A total of 129 (39.1%) admissions were among NH Residents. The LOI was level 3 or 4 in 123 (37.3%) patients. Fever, cough or upper respiratory tract symptoms were present in 246 (74.5%) patients and 65 (19.7%) had diarrhea as a presenting symptom. The majority of patients presented with tachypnea [224 (71.6%)], defined as a respiratory rate >20 breaths per minute. Just under half of admissions [144 (43.6%)] were hypoxic and required supplemental oxygen. Lymphopenia on admission was present in 161 (49.2%) cases. A total of 230 patients (69.7%) received both hydroxychloroquine and azithromycin after admission, as this was the routine practice at the JGH between March 22 and April 24, 2020, unless there was prolong QTc or another contraindication. A total of 88 patients (26.7%) received steroids, eight patients (2.4%) Lopinavir/Ritonavir and six patients (1.8%) received Tocilizumab.

Nursing Home Residents

Over the course of the study period the characteristics of the patient population changed (Figure 1). The proportion of NH residents increased from 20.1% (39/194) of admissions from March 4-April 12 to 66.2% of admissions (90/136) from April 13-26, 2020. The mean age increased between these two periods from 68.1 to 77.3 years. The demographics and clinical outcomes for NH or non-NH residents is presented in Table 2. NH residents were older

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compared to non-NH residents (85.0 ± 11.0 years vs. 63.5 ± 17.6 years) and were more likely to be female (69.8% vs. 47.3%), had a higher number of co-morbidities [82.2% vs 46.8% had ≥ 2 co-morbidities] and were more likely to have dementia (69.0% vs 6.0%). The majority of NH residents were LOI 3 or 4, thus not eligible for admission to ICU. Five (3.9%) patients from NH were admitted to the ICU for a median of 3.0 days (IQR 3.0-7.0); none were intubated. At the end of the study period 25.6% of NH residents had died, 26.4% had been discharged from hospital, and 48.1% were still admitted. The median length of hospital stay for NH residents was 9.0 days (IQR 6.0-13.0) and the median time to death after admission was 7.0 days (IQR 5.0-11.0). Nursing home residents died earlier in hospital than those not from a NH (Figure 2).

Intensive Care Unit (ICU) admissions

A total of 74 (22.4%) patients were admitted to the ICU, 47 (63.5%) directly from the emergency room and 27 (36.5%) from the ward. The clinical characteristics and outcomes of ICU vs non-ICU patients are presented in table 3. Persons admitted to the ICU were younger (63.4 ±13.3 vs 74.3 ±19.2 years) and were more likely to be male (58.1% vs. 39.8%) compared to those not admitted to the ICU. The median number of days of symptoms before ICU admission was 8.0 (IQR 4.0-11.0). A total of 50 (68.5%) ICU patients were intubated and the median length of intubation was 11.0 days (IQR 6.5-14.5). Patients admitted to the ICU had several complications including Acute Respiratory Distress Syndrome (38 patients, 64.4%), bacterial pneumonia (14 patients, 24.1%), thromboembolic disease (pulmonary embolism/deep vein thrombosis; 7 patients, 12.1%) and acute kidney injury (20 patients, 34.5%). The median length of ICU stay was 11.0 days (IQR 5.0-17.0) and the median length of hospital stay for ICU-admitted patients was 18.0 days (IQR 10.0-25.0). Steroids were given to 52.7% (39/74) of ICU

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admissions and to 58.0% (29/50) of those intubated. Five intubated patients received Tocilizumab. At the end of the study period, 10.8% (8/74) of people admitted to the ICU had died, 55.4% (41/74) were discharged, and 33.8% (25/74) were still in hospital. The median time to death for people admitted to ICU was 17 days (IQR 11.5-19.0).

Hospital Disposition: Discharge, death, and still admitted

The characteristics and clinical outcomes of patients with COVID-19 by disposition (discharge, death, still admitted) is shown in Table 4. The majority of deaths (43 patients, 82.7%) occurred in those over age 70, having been admitted from a NH (33 patients, 63.5%), having ≥2 medical co-morbidities (47 patients, 90.4%), and with LOI 3 or 4 (44 patients, 84.6%). Of those still admitted more than half were from an NH (62 patients, 58.5%) and almost one quarter were in the ICU (25 patients, 23.6%).

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Interpretation

We present a comprehensive overview of a cohort of COVID-19 hospitalized patients from Montreal, Quebec, the Canadian epicenter, demonstrating an important shift in epidemiology over the study period to elderly, nursing home patients with dementia and multiple co-morbidities. This reflected the changing epidemiology of COVID positive cases in the community over the study period. The overall mortality rate in hospitalized patients was similar to previously reported in the USA and China (15.7%), but mortality was high in nursing home patients (25.6%) and increased with age and underlying co-morbidities. Despite the proportion of hospitalized patients admitted to the ICU being comparable to other centers (22.4%), our ICU mortality was lower (10.8%) than that reported in the USA and Italy, yet similar to another Canadian setting.(9-11)

In early March, at the beginning of the pandemic, the majority of COVID-19 cases occurred in returned travelers and their contacts. By mid-April several outbreaks in seniors residences and LTCF had occurred. The characteristics of the hospitalized patients in our study reflected this shift in community epidemiology. LTCF have been the center of the COVID-19 epidemic in Canada and in many cities across North America.(12, 13) Transmission within LTCF was facilitated and amplified by health care workers (HCW). Many HCWs in Canadian LTCF work part-time at low wages without benefits, and therefore work in several facilities to earn a living wage.(5) These facilities often have shared bedrooms or bathrooms, communal dining areas, and often lacked adequate person protective equipment, factors that promoted the transmission of the virus between residents and HCW. Transmission was likely further amplified

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by pre-symptomatic or asymptomatic infected residents, or those with atypical COVID-19 clinical presentations.(14) The later, including fatigue, delirium, falls, and general deterioration, symptoms more common in the elderly, lead to a delay in diagnosis. (12, 14)

Nursing home residents are particularly vulnerable to severe COVID-19 infection as they are elderly and usually have multiple medical co-morbidities. Consequently, they have represented more than 80% of COVID-19 deaths in Canada. (3, 5) The average age of residents of LTCF in Canada is 82 years old.(5, 13) They are predominantly female (65%), frail with multiple comorbidities, and have a high prevalence of dementia.(13, 15, 16) The case fatality rate from COVID-19 among residents in Canadian LTCF is estimated to be 36% (range 20 to 42%).(3, 5) The NH population in our study had similar age, sex and frequency of dementia as reported in Canadian LTCF residents and had a similar case fatality rate (26%) compared to national estimates.(5) Nursing home residents in our study died earlier than non-NH residents (60% within 7 days and 94% within 14 days), and likely reflects the LOI of 3 or 4.

The higher proportion of females in our study population (56.1%) reflects the high proportion of females (69.8%) in nursing homes.(16) In our study, men were more likely to be admitted to the ICU (58.1%) and accounted for the majority of ICU deaths (6/8; 75.0%), as well as the majority of the deaths among non-NH residents (14/19; 73.7%). This is consistent with other studies.(17-19) The higher risk of severe COVID-19 among males is well described.(20) These differences may be due to sex-specific mechanisms modulating the course of disease, which include increased expression of the viral entry receptor angiotensin converting enzyme 2 and

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the impact of sex hormones on receptor expression, and/or innate and adaptive immune responses and immunosenescence.(20)

The characteristics of patients in our study admitted to the ICU are similar to those in other studies from Canada, the US and Europe. (9-11) Overall, 22.4% of patients were admitted to the ICU. The proportion requiring intubation (68.5%), the median length of intubation, and ICU stay of 11.0 days is similar to that reported in other settings in North America. (9-11) Mortality in COVID-19 patients admitted to the ICU has ranged from 15% - 30% in Canada, the USA, China and Italy, and up to 60% - 80% in New York City.(2, 9-11, 21, 22) The lower ICU mortality rate may be due to the fact that 52.7% of the population in our study received steroids. A recent randomized controlled trial found that mortality among ICU patients decreased by 30% if they were given dexamethasone.(23) The lower mortality in our study may also be underestimated, as one third of patients were still admitted at the end of the study period.

Our study has several limitations. This was a retrospective study and some characteristics such as obesity and racial/ethnic origin associated with severe COVID-19 outcomes were not reported in the medical chart and are not accounted for.(17, 24) The duration of follow up was short and all outcomes were not available for the 32.1% of the population that was still admitted. This is a single center study in Montreal, Canada and may not be applicable to all other jurisdictions, however it is the largest case series of hospitalized COVID-19 patients in the epicenter of the Canadian COVID-19 pandemic.

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Conclusions

We report a large case series of hospitalized COVID-19 cases in Montreal, Canada that captures the shift of the hospitalized patients from younger returned travelers at the beginning of the epidemic to the elderly nursing home population. COVID-19 has highlighted the need to reassess processes and policies in LTCF in Canada. Given the frailty and vulnerability of residents in LTCF, proper implementation of infection prevention and control policies will be critical to reducing infection and disease in this population, and will have benefits for possible subsequent waves of COVID-19 and for other infectious disease outbreaks.

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Titles for Figures
Figure 1: Hospital admissions between March 4 to April 27, 2020 stratified by nursing home residents and non-nursing home residents and mean age

Figure 2: Time to Death in Nursing home vs Non-Nursing Home Residents

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Table 1. Demographic, initial clinical, and laboratory values in hospitalized COVID positive patients

	Total N = 330
Demographics	**N (%)**
Age (Mean ± SD years)	71.9 (18.6)
Age Group	
<50	39 (11.8)
50-59	49 (14.8)
60-69	42 (12.7)
70-79	63 (19.1)
>=80	137 (41.5)
Female	185 (56.1)
Length of symptoms days*	6.0 (3.0-10.0)
Level of Intervention	
1	190 (57.6)
2	17 (5.2)
3	90 (27.3)
4	33 (10.0)
Nursing Home Resident	129 (39.1)
Number of Comorbidities	
0	64 (19.4)
1	66 (20.0)
≥2	200 (60.6)
Hypertension	194 (58.8)
Coronary Artery Disease	55 (16.7)
Congestive Heart Failure	33 (10.0)
Diabetes	84 (25.5)
Asthma	29 (8.8)
COPD	38 (11.5)
Dementia	101 (30.6)
Symptoms on Admission	
Fever/Cough/URTI	246 (74.5)
Fever	218 (66.1)
Cough	205 (62.1)
Dyspnea	202 (61.2)

	Total N = 330
URTI	35 (10.6)
Myalgia	48 (14.5)
Fatigue	79 (23.9)
Diarrhea	65 (19.7)
Vitals on Admission	
Tachycardia (HR>100) (N=324)	73 (22.5)
Tachypnea (RR>20) (N=313)	224 (71.6)
Temperature >38.0 (N=314)	87 (27.7)
Hypoxia (O2 Sat <88 or Fio2 >0.21)	144 (43.8)
Lab Values on Admission*	
WBC (N=327)	7.0 (5.2-9.4)
Lymphocyte Count (N=327)	1.0 (0.7-1.4)
Lymphopenia* (N=327)	161 (49.2)
Platelets (N=325)	200 (155.0-265.0)
Creatinine (N=320)	84.0 (66.5-114.0)
ALT (N=260)	24.0 (16.0-38.5)
Procalcitonin (N=233)	0.1 (0.1-0.3)
LDH (N=221)	327.0 (263.0-410.0)
D dimer (N=177)	934 (604-1333)
IL 6 (N=74)	38.1 (17.3-78.4)

*Expressed as Median and interquartile range (IQR)

Table 2 Demographic characteristics and clinical outcomes in Nursing Home compared to Non-nursing home residents

	Nursing Home N = 129 (39.1%)	Non Nursing Home N = 201 (60.9%)
Demographics		
Age (Mean ± SD years)	85.0 (11.0)	63.4 (17.6)
Age Group		
<50	1 (0.8)	38 (18.9)
50-59	3 (2.3)	46 (22.9)
60-69	7 (5.4)	35 (17.4)
70-79	21 (16.3)	42 (20.9)
>=80	97 (75.2)	40 (19.9)
Female	90 (69.8)	95 (47.3)
Length of symptom (days) (N=314)*	4.0 (2.0-8.0)	7.0 (4.0-10.0)
Level of Intervention		
1	24 (18.6)	166 (82.6)
2	11 (8.5)	6 (3.0)
3	69 (53.5)	21 (10.4)
4	25 (19.4)	8 (4.0)
Number of Comorbidities		
0	4 (3.1)	60 (29.9)
1	19 (14.7)	47 (23.4)
≥2	106 (82.2)	94 (46.8)
Dementia	89 (69.0)	12 (6.0)
Fever/Cough/URTI	83 (64.3)	163 (81.1)
Hypoxia	62 (48.4)	82 (40.8)
Hospital Course and Outcome		
ICU Admission	5 (3.9)	69 (34.3)
Intubated		50 (67.6)
Length of Intubation (days)*		11.0 (6.5-14.5)
Length of ICU stay (days)*	3.0 (3.0-7.0)	12.0 (6.0-17.0)
Length of Hospital stay (days)*	9.0 (6.0-13.0)	8.0 (5.0-16.0)
Disposition at Discharge		
Death	33 (25.6)	19 (9.5)

	Nursing Home N = 129 (39.1%)	**Non Nursing Home N = 201 (60.9%)**
Discharged	34 (26.4)	138 (68.7)
Still Admitted	62 (48.1)	44 (21.9)
Time to Death (days) (N=52)*	7.0 (5.0-11.0)	8.0 (5.0-18.0)
Complications In Hospital		
Bacterial Pneumonia (N=261)	13 (15.1)	22 (12.6)
ARDS (N=263)	9 (10.3)	41 (23.3)
Thomboembolic disease(PE/DVT) (N=261)	4 (4.7)	9 (5.1)
Acute kidney Injury (N=260)	20 (23.5)	33 (18.9)
Dialysis (N=260)		5 (2.9)
Liver enzyme abnormalities (N=259)	3 (3.6)	37 (21.1)

*Expressed as Median and interquartile range (IQR)

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Table 3 Demographic characteristics and clinical outcomes in ICU admitted compared to non-ICU admitted

	Non-ICU N = 256 (77.6)	ICU N = 74 (22.4)
Demographics		
Age (Mean ± SD years)	74.3 (19.2)	63.4 (13.3)
Age Group		
<50	30 (11.7)	9 (12.2)
50-59	34 (13.3)	15 (20.3)
60-69	21 (8.2)	21 (28.4)
70-79	38 (14.8)	25 (33.8)
>=80	133 (52.0)	4 (5.4)
Sex (Female)	154 (60.2)	31 (41.9)
Length of Symptom (days)* (N=314)	5.0 (3.0-9.0)	8.0 (4.0-11.0)
Nursing Home resident	124 (48.4)	5 (6.8)
Level Of Intervention		
1	125 (48.8)	65 (87.8)
2	13 (5.1)	4 (5.4)
3	87 (34.0)	3 (4.1)
4	31 (12.1)	2 (2.7)
Comorbidity		
0	44 (17.2)	20 (27.0)
1	52 (20.3)	14 (18.9)
≥2	160 (62.5)	40 (54.1)
Fever / Cough / URTI	174 (68.0)	72 (97.3)
Hypoxia (N=329)	100 (39.2)	44 (59.5)
Hospital Course and Outcome		
Intubated (N=87)		50 (68.5)
Length of Intubation(days)* (N=36)		11.0 (6.5-14.5)
Length of ICU stay (days)*		11.0 (5.0-17.0)
Total Length of Hospital stay (days)*	7.0 (5.0-12.0)	18.0 (10.0-25.0)
Disposition at Discharge		
Death	44 (17.2)	8 (10.8)
Discharged	131 (51.2)	41 (55.4)

	Non-ICU N = 256 (77.6)	ICU N = 74 (22.4)
Still Admitted	81 (31.6)	25 (33.8)
Time To Death (days)* (N=52)	7.0 (4.5-11.0)	17.0 (11.5-19.0)
Complications In Hospital		
Bacterial Pneumonia (N=261)	21 (10.3)	14 (24.1)
ARDS (N=263)	12 (5.9)	38 (64.4)
Thomboembolic disease(Pe/Dvt) (N=261)	6 (3.0)	7 (12.1)
Acute kidney Injury (N=260)	33 (16.3)	20 (34.5)
Dialysis (N=260)		5 (8.6)
Liver enzyme abnormalities (N=259)	16 (8.0)	24 (41.4)

*expressed as a median and interquartile range

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Table 4 Demographic characteristics and clinical outcomes of patients with COVID-19 by Disposition

	Total N = 330	Death N = 52 (15.8)	Discharged N = 172 (52.1)	Still Admitted N = 106 (32.1)
Demographics				
Age Group (in years)				
<50	39 (11.8)	1 (1.9)	36 (20.9)	2 (1.9)
50-59	49 (14.8)	3 (5.8)	36 (20.9)	10 (9.4)
60-69	42 (12.7)	5 (9.6)	26 (15.1)	11 (10.4)
70-79	63 (19.1)	8 (15.4)	35 (20.3)	20 (18.9)
>=80	137 (41.5)	35 (67.3)	39 (22.7)	63 (59.4)
Sex (Female)	185 (56.1)	25 (48.1)	94 (54.7)	66 (62.3)
Level of intervention				
1	190 (57.6)	4 (7.7)	142 (82.6)	44 (41.5)
2	17 (5.2)	4 (7.7)	5 (2.9)	8 (7.5)
3	90 (27.3)	18 (34.6)	23 (13.4)	49 (46.2)
4	33 (10.0)	26 (50.0)	2 (1.2)	5 (4.7)
Nursing home resident	129 (39.0)	33 (63.5)	34 (19.7)	62 (58.5)
Comorbidities				
0	64 (19.4)		50 (29.1)	14 (13.2)
1	66 (20.0)	5 (9.6)	45 (26.2)	16 (15.1)
>=2	200 (60.6)	47 (90.4)	77 (44.8)	76 (71.7)
Fever /Cough / URTI	246 (74.5)	40 (76.9)	138 (80.2)	68 (64.2)
Hypoxia (N=329)	144 (43.8)	34 (65.4)	68 (39.8)	42 (39.6)
Length of symptoms (days)* (N=314)	6.0 (3.0-10.0)	4.0 (2.0-7.0)	8.0 (4.0-11.0)	5.0 (3.0-9.0)
Hospital Course and Outcome				
ICU Admission	74 (22.4)	8 (15.4)	41 (23.7)	25 (23.6)
Intubated	50 (57.5)	7 (50.0)	24 (51.1)	19 (73.1)
Length of Intubation* (days)	11.0 (6.5-14.5)	9.0 (6.0-18.0)	11.0 (6.0-14.0)	12.0 (8.0-18.0)
Length of ICU stay* (days)	11.0 (5.0-17.0)	12.5 (7.5-17.0)	9.0 (4.0-14.0)	16.0 (9.0-26.0)
Length hospital stay* (days)	9.0 (5.0-14.0)	7.0 (5.0-12.0)	8.0 (5.0-13.0)	11.0 (6.0-19.0)
Complications In Hospital				
Bacterial Pneumonia (N=261)	35 (13.4)	9 (18.0)	21 (12.3)	5 (12.5)
ARDS (N=263)	50 (19.0)	18 (36.0)	24 (14.0)	8 (19.0)

	Total N = 330	Death N = 52 (15.8)	Discharged N = 172 (52.1)	Still Admitted N = 106 (32.1)
Thomboembolic disease(PE/DVT)	13 (5.0)	2 (4.0)	8 (4.7)	3 (7.5)
Acute kidney Injury (N=260)	53 (20.4)	18 (36.0)	24 (14.0)	11 (28.2)
Liver enzyme abnormalities (N=259)	40 (15.4)	5 (10.0)	29 (17.0)	6 (15.8)

*Expressed as Median and interquartile range

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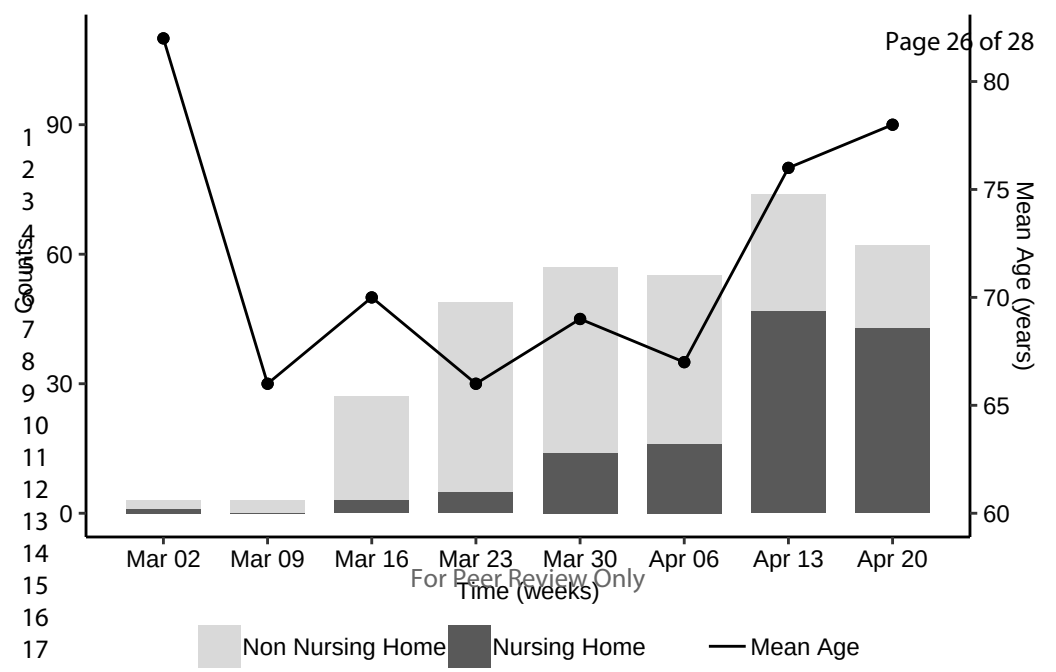

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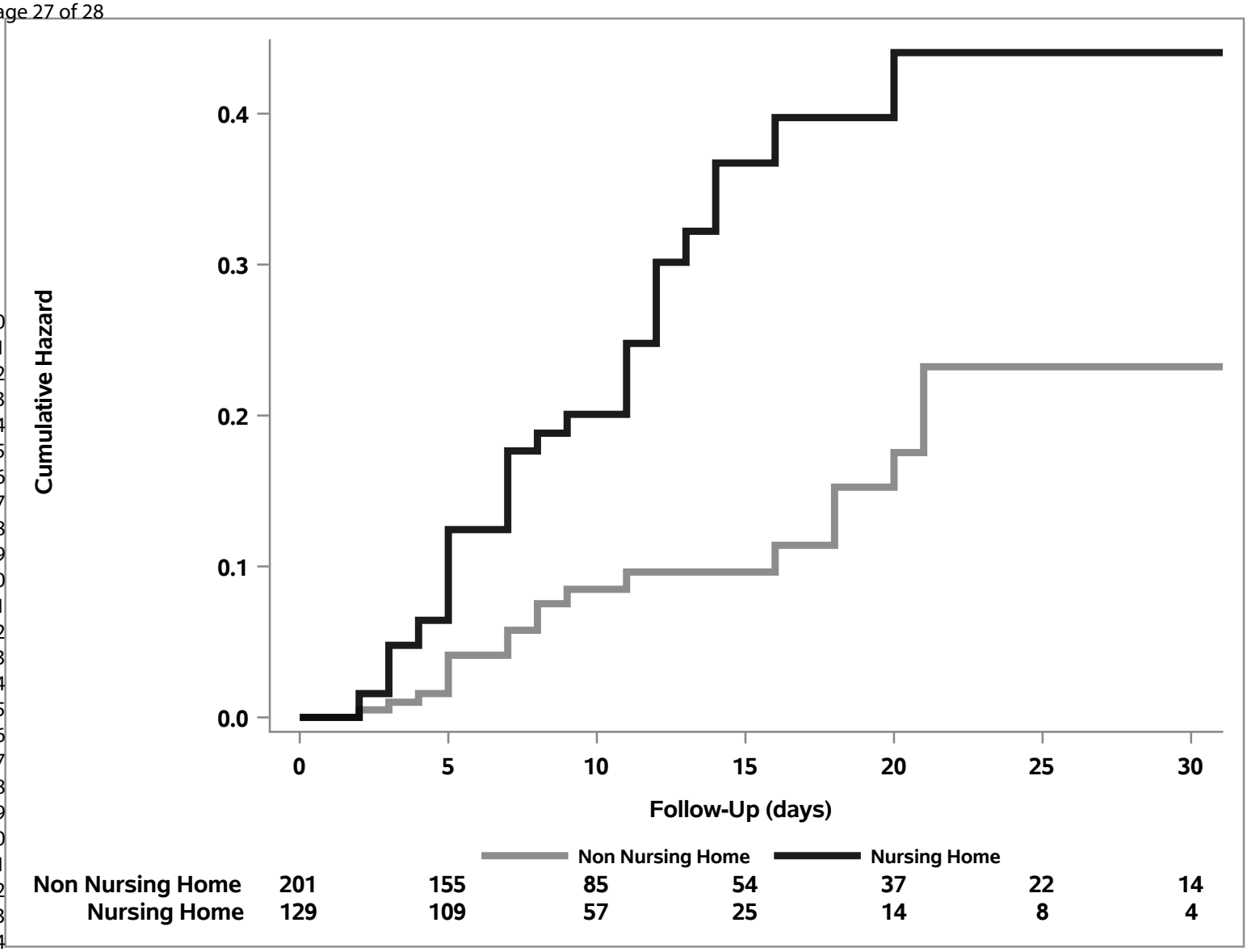
Cumulative Hazard
0.4
0.3
0.2
0.1
0.0
0
5
10
15
20
25
30
Follow-Up (days)
Non Nursing Home
Nursing Home
Non Nursing Home 201 155 85 54 37 22 14
Nursing Home 129 109 57 25 14 8 4

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3-4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	4
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	4-5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	4-5
Bias	9	Describe any efforts to address potential sources of bias	11
Study size	10	Explain how the study size was arrived at	4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	5
		(*b*) Describe any methods used to examine subgroups and interactions	5
		(*c*) Explain how missing data were addressed	5
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	5-8 Tables 1-4
		(b) Indicate number of participants with missing data for each variable of interest	Tables 2-4
Outcome data	15*	Report numbers of outcome events or summary measures	6-8 Tables 2-4

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Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	N/A
		(*b*) Report category boundaries when continuous variables were categorized	5-8 Tables 1-4
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Figure 2
Discussion			
Key results	18	Summarise key results with reference to study objectives	9-11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	9-12
Generalisability	21	Discuss the generalisability (external validity) of the study results	11
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	13

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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