

Nation-wide study of covid-19 care in Swedish hospitals – 81 % discharged alive

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Sweden's National Board of Health and Welfare (NBHW) has compiled care data for COVID-19 patients admitted to Swedish hospitals between 15 March and 30 April 2020. The analysis is based on the national patient register, the national register for social services for the elderly and disabled; the national prescribed drug register, the national cause of death register (all NBWH), the Swedish Intensive Care Registry (Region Värmland) and the national notification system for notifiable diseases, SmiNet (Swedish Public Health Agency). These registries aim to cover individual data on all persons who live in Sweden and reporting to all these registers (except for intensive care) is mandatory by law. The registers were linked at individual-level using the unique national personal identification number provided to all Swedish residents.

The aim was to describe characteristics of covid-19-patients: age, gender, type of residence and support resources, comorbidities, care duration and, mortality. The statistics is based on all patients in Sweden who had a positive PCR result for SARS-Cov-2-RNA and a care period in hospital with discharge code U07.1 or U07.2 (COVID-19), according to the 10th International Statistical Classification of Diseases and Related Health Problems (ICD-10), according to the national patient register and SmiNet. Mortality was measured as death in hospital, regardless of cause.

TABLE 1: Characteristics of hospital-treated patients with final diagnosis COVID-19 in Sweden

Characteristic	All patients	Non-ICU treated patients	ICU treated patients
Total number in group	9,213	7,802	1,411
Male, n (%)	5,416 (58.8)	4,379 (56.1)	1,037 (73.5)
Median age (IQR)	65 (52-78)	67 (52-80)	61 (52-69)
Age Group, n (%)			
< 9	52 (0.6)	50 (0.6)	2 (0.1)
10–19	57 (0.6)	53 (0.7)	4 (0.3)
20–29	298 (3.2)	250 (3.2)	48 (3.4)
30–39	589 (6.4)	528 (6.8)	61 (4.3)
40–49	931 (10.1)	763 (9.8)	168 (11.9)
50–59	1,663 (18.1)	1,288 (16.5)	375 (26.6)
60–69	1,710 (18.6)	1,288 (16.5)	422 (29.9)
70–79	1,787 (19.4)	1,507 (19.3)	280 (19.8)
80–89	1,583 (17.2)	1,533 (19.7)	50 (3.5)
> 90	542 (5.9)	541 (6.9)	1 (0.1)
Nursing home or home care, n (%)	2,234 (24.3)	2,164 (27.7)	70 (5.0)
≥ 1 comorbid condition¹, n (%)	7,188 (78.0)	6,054 (77.6)	1,134 (80.4)
The most frequent comorbid conditions¹, n (%)			
Hypertension	5,230 (56.8)	4,508 (57.8)	722 (51.2)
Diabetes	2,387 (25.9)	1,971 (25.3)	416 (29.5)
Chronic pulmonary disease	1,912 (20.8)	1,649 (21.1)	263 (18.6)
Cancer	1,577 (17.1)	1,460 (18.7)	117 (8.3)
Ischemic heart disease	1,530 (16.6)	1,393 (17.9)	137 (9.7)
Congestive heart failure	1,295 (14.1)	1,202 (15.4)	93 (6.6)
Kidney disease	1,062 (11.5)	958 (12.3)	104 (7.4)
Neuromuscular disease	924 (10.0)	817 (10.5)	107 (7.6)
Stroke	880 (9.6)	797 (10.2)	83 (5.9)
Days with symptoms before hospital admission², median (IQR)	7 (3 – 10)	7 (3 – 10)	7 (6 – 10)
Hospital treatment days, median (IQR)	8 (4 – 15)	7 (4 – 12)	22 (14 – 36)
Outcome			
Discharged alive	7,490 (81)	6,468 (82.9)	1,022 (72.4)
Died in hospital	1,707 (18.5)	1,331 (17.1)	376 (26.7)
Outcome unclear ³	16 (0.2)	3 (0.0)	13 (0.9)

¹In the past five years, at least one record in either the national patient register or the national prescribed drug register (NBHW) for any of the following diagnoses defined by ICD or ATC-codes: ischaemic heart disease; congestive heart failure; hypertension; atrial fibrillation; stroke; diabetes; chronic pulmonary disease; dementia; cancer; chronic liver disease; kidney disease; alcohol abuse; drug abuse; organ transplant (history of); neuromuscular diseases; obesity; mental disorder; rheumatoid arthritis; or, immunodeficiency. ²Incomplete or missing data for 30 percent of the individuals. ³Still receiving treatment/unclear. (IQR= Interquartile range, %= percent)

TABLE 2: Characteristics of ICU and non-ICU treated patients with final diagnosis COVID-19 discharged alive or died in hospital

Characteristic	Non-ICU treated patients		ICU treated patients	
	Discharged alive	Died	Discharged alive	Died
Total number in group	6,468	1,331	1,022	376
Male, n (%)	3,583 (55.4)	794 (59.7)	732 (71.6)	294 (78.2)
Median age (IQR)	62 (49 – 76)	83 (77 – 88)	58 (50 – 66)	68 (60 – 74)
Age Group, n (%)				
0–19	103 (1.6)	0 (0)	6 (0.6)	0 (0)
20–69	3,981 (61.5)	134 (10.1)	849 (83.1)	214 (56.9)
≥ 70	2,383 (36.8)	1,197 (89.9)	167 (16.3)	162 (43.1)
Nursing home or home care, n (%)	1,388 (21.5)	776 (58.3)	39 (3.8)	31 (8.3)
≥ 1 comorbid condition¹, n (%)	4,745 (73.4)	1,306 (98.1)	794 (77.7)	328 (87.2)
The most frequent comorbid conditions¹, n (%)				
Hypertension	3,370 (52.1)	1,136 (85.4)	482 (47.2)	233 (62.0)
Diabetes	1,495 (23.1)	476 (35.8)	300 (29.4)	115 (30.6)
Chronic pulmonary disease	1,309 (20.2)	340 (25.5)	177 (17.3)	84 (22.3)
Cancer	1,044 (16.1)	416 (31.1)	69 (6.8)	48 (12.8)
Ischemic heart disease	945 (14.6)	448 (33.7)	77 (7.5)	60 (16.0)
Congestive heart failure	741 (11.5)	461 (34.6)	44 (4.3)	47 (12.5)
Kidney disease	592 (9.15)	366 (27.5)	72 (7.1)	32 (8.5)
Neuromuscular disease	558 (8.6)	259 (19.5)	81 (7.9)	23 (6.1)
Stroke	527 (8.15)	270 (20.3)	45 (4.4)	36 (9.6)
Days with symptoms before hospital admission², median (IQR)	7 (3 – 11)	3 (0 – 7)	8 (6 – 10)	7 (5 – 10)
Hospital treatment days, median (IQR)	6 (4 – 12)	8 (5 – 12)	26 (16 – 42)	15 (9 – 22)

¹In the past five years, at least one record in either the national patient register or the national prescribed drug register (NBHW) for any of the following diagnoses defined by ICD or ATC-codes: ischaemic heart disease; congestive heart failure; hypertension; atrial fibrillation; stroke; diabetes; chronic pulmonary disease; dementia; cancer; chronic liver disease; kidney disease; alcohol abuse; drug abuse; organ transplant (history of); neuromuscular diseases; obesity; mental disorder; rheumatoid arthritis; or, immunodeficiency. ²Incomplete or missing data for 30 percent of the individuals. (IQR= interquartile range, %= percent)

During the observation period, 9,213 patients were admitted to hospitals in 20 of the 21 regions of the country. Of the patients, 41 percent were female and 59 percent male. The median age was 65 (IQR 52–78), table 1. One in four patients lived in nursing home or had home care. 78 percent of the patients were registered as having at least one comorbid condition. The most frequent comorbidity was hypertension, followed by diabetes and chronic pulmonary disease. Mortality was 19 percent. For the 2,025 patients with no documented comorbidity, mortality was 3.6 percent (n = 73), table 2.

Of the admitted patients, 15 percent were treated in intensive care units (ICUs). The mortality of those not treated in ICUs was 17 percent. For those treated in ICUs, mortality was 27 percent. Ventilators were used for 83 percent of ICU patients. Hospital mortality for this group was 30 percent.

Amongst both ICU and non-ICU patients, those who died were generally older than those who were discharged alive, table 2. They also had more comorbid conditions and, to a greater extent, lived in nursing home or had home care. For the entire population, the median time before admission to hospital was 7 days. However, for the non-ICU treated patients who died, it was, surprisingly, 3 days. The short duration of symptoms can probably be explained by the patients being older and, compared with other patient groups, showing a higher degree of comorbidity. This meant that they needed hospital resources at an earlier stage. However, because the data on days with symptoms before hospital admission is based on the patient's case history and only available for 70 percent of the population, these results should be interpreted with caution.

Epidemiological studies of hospital-treated patients with covid-19 in China, Italy, the United Kingdom and the USA have recently been published [1-4]. As the present Swedish study, these studies show that the 0–19 age group had very few covid-19 cases (and almost no mortality), males needed hospital treatment more often than females and had a higher mortality and the majority of the patients had comorbid conditions. Hypertension, diabetes and chronic heart or pulmonary diseases were the most common of the latter.

The present Swedish comprehensive study enables a clear comparison between ICU and non-ICU treated patients. It is clear that ICU patients in Sweden were younger, more often men and came to a lesser extent from nursing home (or had home care) compared to patients who had not received treatment in ICU. The patients discharged alive from hospital (both ICU and non-ICU treated) were also younger, came to a lesser extent from nursing home (or had home care) and had fewer comorbidities.

In comparison to the levels reported in other countries, the mortality (27 percent) of covid-19 patients treated in Swedish ICUs seems low. Reports from Italy, the United Kingdom and the USA [2-4] showed that 25–30 percent of the patients treated in ICUs died, however a large percentage of covid-19 patients were still being treated when the studies were published. Thus, the outcome for these patients was still unclear at the time of publication.

The present study illustrates the large disease burden and mortality attributable to the covid-19 pandemic in Sweden in spring 2020. It also shows that 83 percent of the patients in general hospital wards and 73 percent of patients in ICU's survived.

The NBHW is continuously monitoring the development of the disease covid-19. This webpage presents a selection of the published statistics translated into English: <https://www.socialstyrelsen.se/en/statistics-and-data/statistics/statistics-on-covid-19/>.

All published statistics are available on the NBHW Swedish webpage: <https://www.socialstyrelsen.se/statistik-och-data/statistik/statistik-om-covid-19/>

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