Characteristics of SARS-CoV-2 patients dying in Italy
Report based on available data on May 21st , 2020

1. Sample

The present report describes characteristics of 31,096 SARS-CoV-2 patients dying in Italy.* Geographic distribution across the 19 regions and 2 autonomous provinces of Trento and Bozen is presented in the table below. Data are update to May 21st, 2020.

Tabel 1. *Geographic distribution of deceased patients SARS-CoV-2 positive*

REGION	N	%
Lombardia	15,662	50.4
Emilia Romagna	4,008	12.9
Piemonte	2,616	8.4
Veneto	1,842	5.9
Liguria	1,382	4.4
Toscana	991	3.2
Marche	907	2.9
Lazio	631	2.0
Puglia	478	1.5
Trento	459	1.5
Abruzzo	379	1.2
Campania	354	1.1
Friuli Venezia Giulia	327	1.1
Bolzano	291	0.9
Sicilia	281	0.9
Valle d'Aosta	145	0.5
Sardegna	128	0.4
Calabria	91	0.3
Umbria	74	0.2
Basilicata	28	0.1
Molise	22	0.1
Total	**31,096**	**100.0**

* SARS-CoV-2 related deaths presented in this report are those occurring in patients who test positive for SARS-CoV-2RT by PCR, independently from pre-existing diseases.

2. *Demographics*

Mean age of patients dying for SARS-CoV-2 infection was 80 years (median 81, range 0-100, IQR 74 -87). Women were 12,615 (40.6%). *Figure 1* shows that median age of patients dying for SARS-CoV-2 infection was about than 20 years higher as compared with the national sample diagnosed with SARS-CoV-2 infection (median age 62 years). *Figure 2* shows the absolute number of deaths by age group. Women dying for SARS-CoV-2 infection had an older age than men (median age women 85 - median age men 79).

Figure 1. *Median age of patients with SARS-CoV-2 infection and SARS-CoV-2 positive deceased patients*

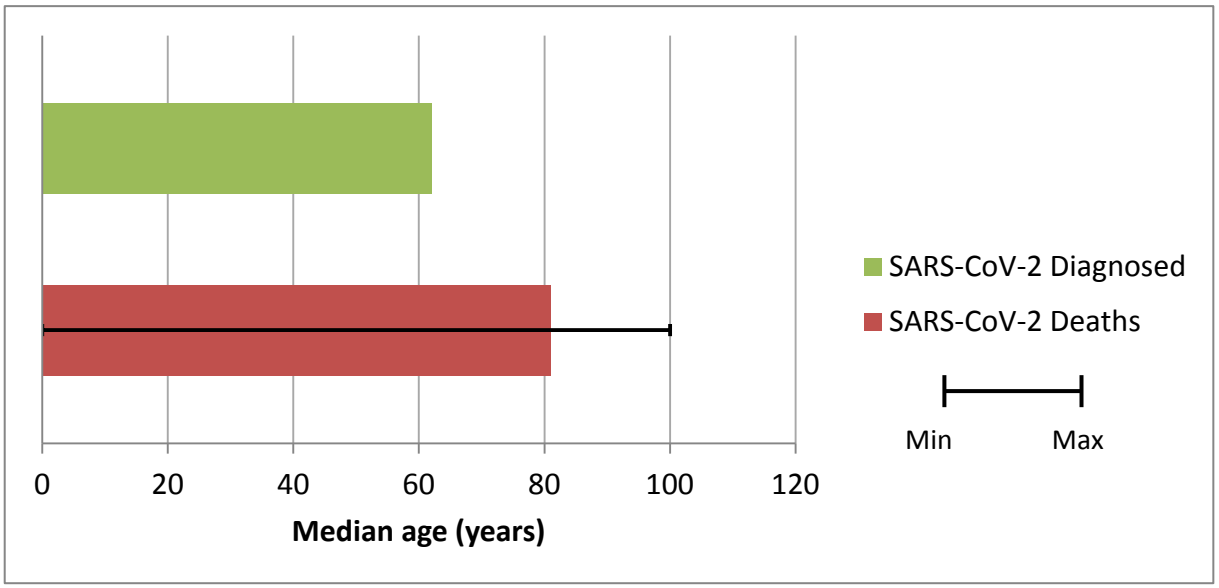
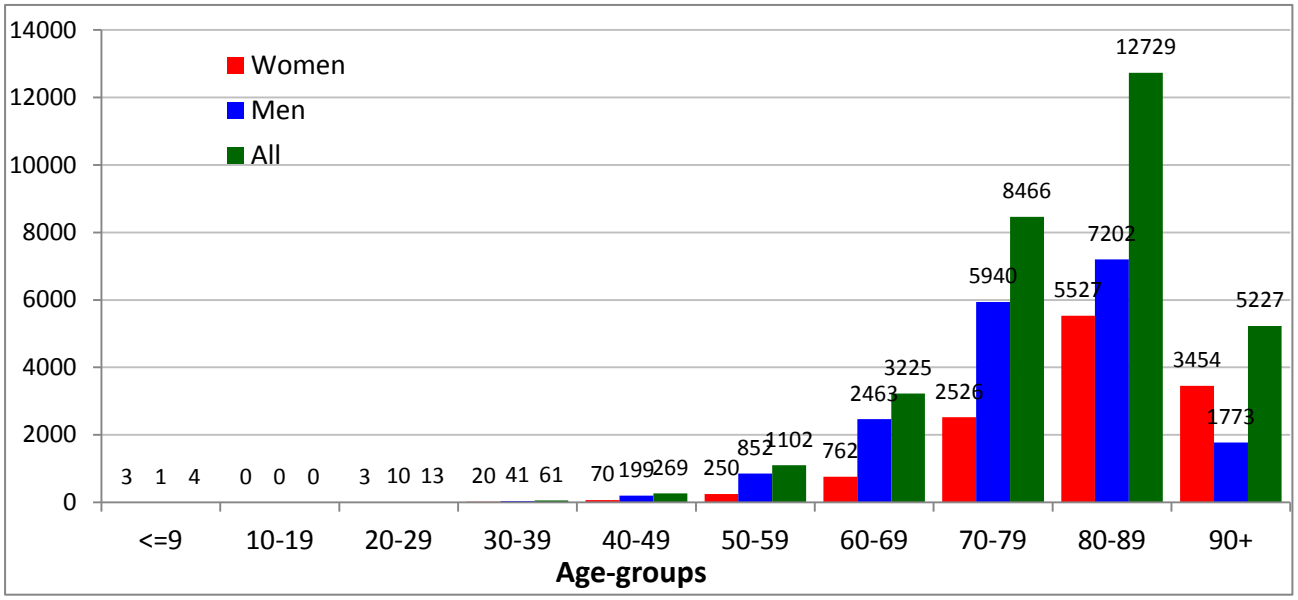


Figure 2. *Absolute number of deaths by age group*



3. Pre-existing conditions

Table 1 presents most common comorbidities diagnosed before SARS-CoV-2 infection. Data on diseases were based on chart review and was available on 3,032 patients dying in-hospital for whom it was possible to analyse clinic charts. Mean number of diseases was 3.2 (median 3, SD 1.9). Overall, 4.1% of the sample presented with a no comorbidities, 15.0% with a single comorbidity, 21.4% with 2, and 59.6% with 3 or more.

Before hospitalization, 23% of SARS-CoV-2 positive deceased patients followed ACE-inhibitor therapy and 16% angiotensin receptor blockers-ARBs therapy. This information can be underestimated because data on drug treatment before admission were not always described in the chart.

Table 1. *Most common comorbidities observed in SARS-CoV-2 positive deceased patients*

Diseases	***N***	***%***
Ischemic heart disease	*856*	*28.2*
Atrial Fibrillation	*681*	*22.5*
Heart failure	*490*	*16.2*
Stroke	*310*	*10.2*
Hypertension	*2071*	*68.3*
Type 2-Diabetes	*914*	*30.1*
Dementia	*480*	*15.8*
COPD (Chronic Obstructive Pulmonary Disease)	*498*	*16.4*
Active cancer in the past 5 years	*480*	*15.8*
Chronic liver disease	*120*	*4.0*
Chronic renal failure	*618*	*20.4*
Dialysis	*55*	*1.8*
Respiratory failure	*150*	*4.9*
HIV Infection	*6*	*0.2*
Autoimmune diseases	*115*	*3.8*
Obesity	*335*	*11.0*
Number of comorbidities		
0 comorbidities	*124*	*4.1*
1 comorbidity	*454*	*15.0*
2 comorbidities	*648*	*21.4*
3 comorbidities and over	*1806*	*59.6*

Table 3 presents the most common pre-existing chronic pathologies in patients who died, separately in men (n = 2,027) and women (n = 1,005). The average number of pathologies observed in women is 3.3 (median 3, Standard Deviation 1.9). In men the average number of pathologies observed is 3.2 (median 3, Standard Deviation 1.9).

Tabella 3. *Most common comorbidities observed in SARS-CoV-2 positive deceased patients by gender*

	Women		**Men**	
Diseases	***N***	***%***	***N***	***%***
Ischemic heart disease	*214*	*21.3*	*642*	*31.7*
Atrial Fibrillation	*236*	*23.5*	*445*	*22.0*
Heart Failure	*187*	*18.1*	*303*	*14.6*
Stroke	*106*	*10.5*	*204*	*10.1*
Hypertension	*701*	*69.8*	*1370*	*67.6*
Type 2-Diabetes	*289*	*28.8*	*625*	*30.8*
Dementia	*228*	*22.7*	*252*	*12.4*
COPD (Chronic Obstructive Pulmonary Disease)	*126*	*12.5*	*372*	*18.4*
Active cancer in the past 5 years	*157*	*15.6*	*323*	*15.9*
Chronic liver disease	*27*	*2.7*	*93*	*4.6*
Chronic renal failure	*183*	*18.2*	*435*	*21.5*
Dialysis	*16*	*1.6*	*39*	*1.9*
Respiratory failure	*48*	*4.8*	*102*	*5.0*
HIV Infection	*0*	*0.0*	*6*	*0.3*
Autoimmune diseases	*61*	*6.1*	*54*	*2.7*
Obesity	*115*	*11.4*	*220*	*10.9*
Number of comorbidities				
0 comorbidities	*27*	*2.7*	*97*	*4.8*
1 comorbidity	*146*	*14.5*	*308*	*15.2*
2 comorbidities	*222*	*22.1*	*426*	*21.0*
3 comorbidities and over	*610*	*60.7*	*1196*	*59.0*

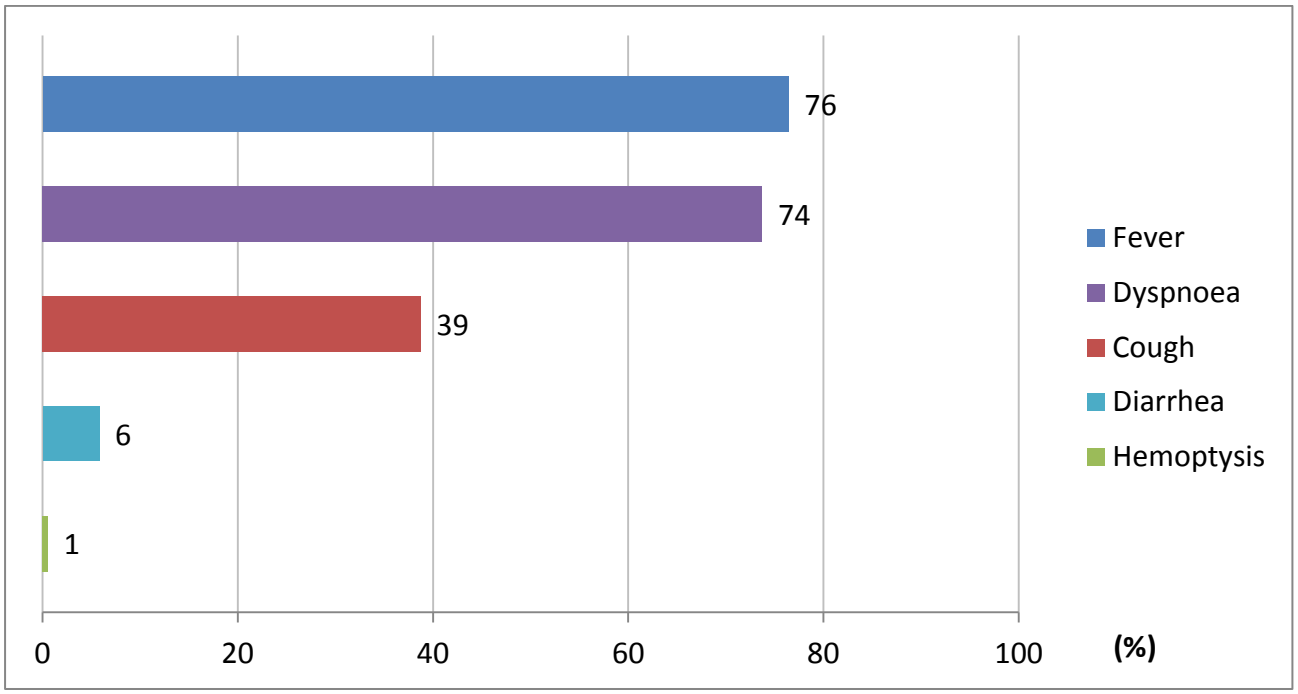
4. Diagnosis of hospitalization

In 92.3% of hospitalizations, conditions (e.g. pneumonia, respiratory failure) or symptoms (e.g. fever, dyspnoea, cough) compatible with SARS-CoV-2 were mentioned. In 217 cases (7.7% of cases) the diagnosis of hospitalization was not related to the infection. In 29 cases the diagnosis of hospitalization concerned exclusively neoplastic pathologies, in 81 cases cardiovascular pathologies (for example Acute Myocardial Infarction-AMI, heart failure, stroke), in 28 cases gastrointestinal pathologies (for example cholecystitis, perforation of the intestine, intestinal obstruction, cirrhosis), in 79 cases other pathologies.

5. *Symptoms*

Figure 3 shows symptoms most commonly observed at hospital admission. Fever, dyspnoea and cough were the most commonly observed symptoms, while diarrhoea and haemoptysis were less commonly observed. Overall, 5.7% of patients did not present any symptoms at hospital admission.

Figure 3. *Most common symptoms observed in SARS-CoV-2 positive deceased patients*



6. *Acute conditions*

Acute Respiratory Distress syndrome was observed in the majority of patients (**96.6% of cases**), followed by acute renal failure (21.8%). Superinfection was observed in 12.4% and acute cardiac injury in 10.7% of cases.

7. *Treatments*

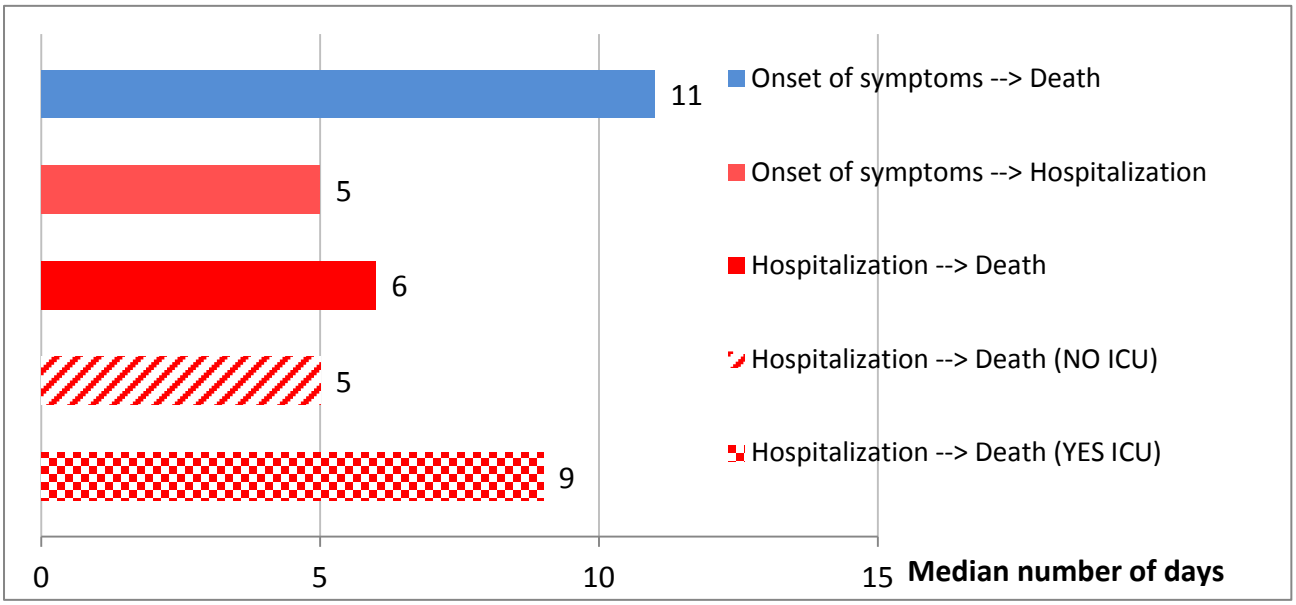
Antibiotics were used by 86% of patients during hospital stay, while less used were antivirals (59%) and corticosteroids (37%). Concomitant use of these 3 treatments was observed in 22.4% of cases.

Out of SARS-CoV-2 positive deceased patients, 3.9% were treated with Tocilizumab during hospitalization.

8. *Time-line*

Figure 4 shows, for SARS-CoV-2 positive deceased patients, the median times, in days, from the onset of symptoms to death (11 days), from the onset of symptoms to hospitalization (5 days) and from hospitalization to death (6 days). The time from hospitalization to death was 4 days longer in those who were transferred to intensive care than those who were not transferred (9 days vs. 5 days).

Figure 4. *Median hospitalization times (in days) in SARS-CoV-2 positive deceased patients*



9. *Deaths under the age of 50 years*

As of May 21st, 347 out of the 31,096 (1.1%) positive SARS-CoV-2 patients under the age of 50 died. In particular, 78 of these were less than 40 years (52 men and 26 women), age range between 0 and 39 years. For 11 patients under the age of 40 years no clinical information is available; out of the remaining ones, 53 had serious pre-existing pathologies (cardiovascular, renal, psychiatric pathologies, diabetes, obesity) and 14 had no major pathologies.

This report was produced by SARS-CoV-2 Surveillance Group

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