



Characteristics of SARS-CoV-2 patients dying in Italy Report based on available data on June 4th, 2020

1. Sample

The present report describes characteristics of 32,448 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 June 4th, 2020.

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

REGION	N	%
Lombardia	16,172	49.8
Emilia Romagna	4,147	12.8
Piemonte	2,770	8.5
Veneto	1,934	6.0
Liguria	1,503	4.6
Toscana	1,060	3.3
Marche	929	2.9
Lazio	741	2.3
Puglia	514	1.6
Trento	467	1.4
Abruzzo	431	1.3
Campania	361	1.1
Friuli Venezia Giulia	337	1.0
Sicilia	293	0.9
Bolzano	292	0.9
Valle d'Aosta	143	0.4
Sardegna	132	0.4
Calabria	94	0.3
Umbria	76	0.2
Basilicata	29	0.1
Molise	23	0.1
Total	32,448	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 82, range 0-100, IQR 74 -88). Women were 13,386 (41.3%). *Figure 1* shows that median age of patients dying for SARS-CoV-2 infection was 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

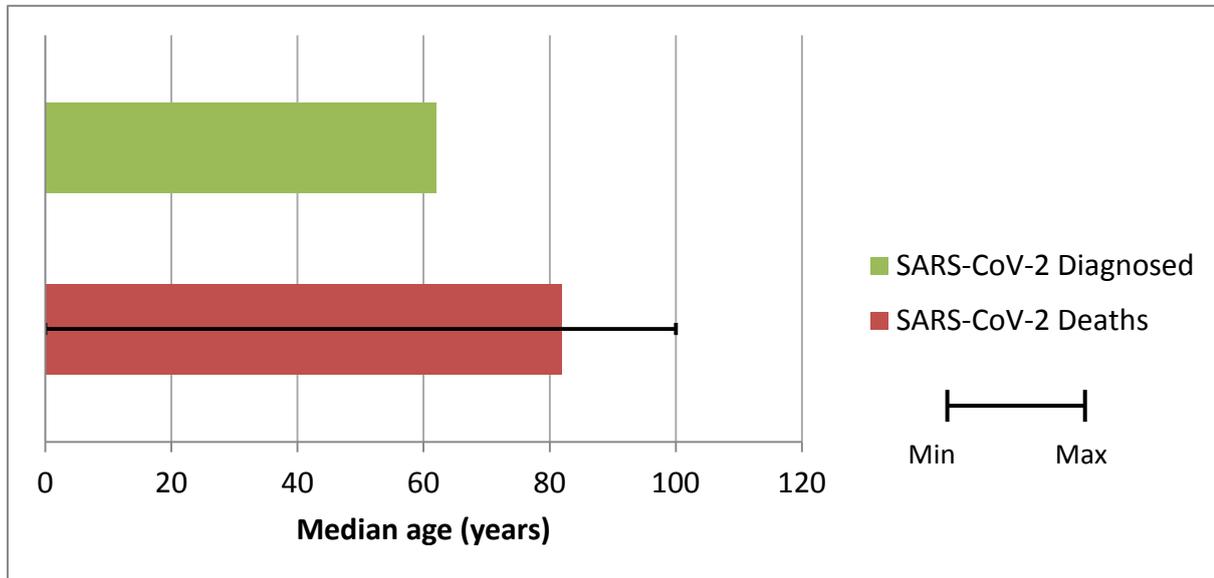
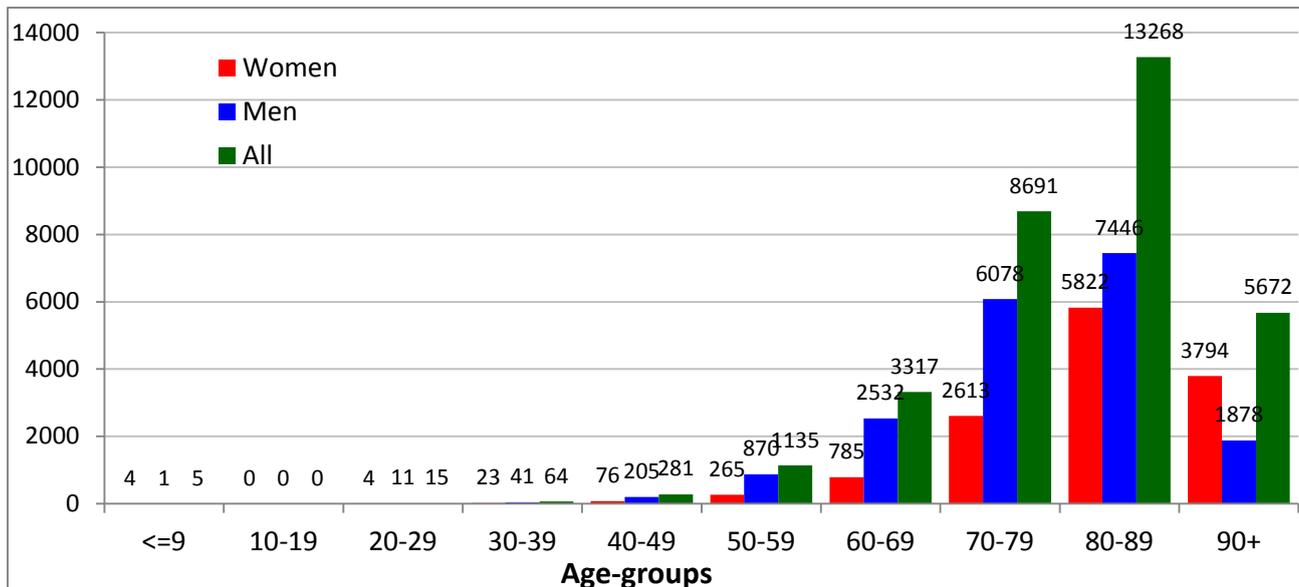


Figure 2. Absolute number of deaths by age group



3. Pre-existing conditions

Table 2 presents most common comorbidities diagnosed before SARS-CoV-2 infection. Data on diseases were based on chart review and was available on 3,335 patients dying in-hospital for whom it was possible to analyse clinic charts. Mean number of diseases was 3.3 (median 3, SD 1.9). Overall, 4.1% of the sample presented with a no comorbidities, 14.8% with a single comorbidity, 21.5% with 2, and 59.7% 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 2. Most common comorbidities observed in SARS-CoV-2 positive deceased patients

Diseases	N	%
<i>Ischemic heart disease</i>	933	28.0
<i>Atrial Fibrillation</i>	739	22.2
<i>Heart failure</i>	524	15.7
<i>Stroke</i>	341	10.2
<i>Hypertension</i>	2256	67.6
<i>Type 2-Diabetes</i>	1011	30.3
<i>Dementia</i>	538	16.1
<i>COPD (Chronic Obstructive Pulmonary Disease)</i>	555	16.6
<i>Active cancer in the past 5 years</i>	529	15.9
<i>Chronic liver disease</i>	142	4.3
<i>Chronic renal failure</i>	674	20.2
<i>Dialysis</i>	65	1.9
<i>Respiratory failure</i>	172	5.2
<i>HIV Infection</i>	7	0.2
<i>Autoimmune diseases</i>	130	3.9
<i>Obesity</i>	366	11.0
Number of comorbidities		
<i>0 comorbidities</i>	136	4.1
<i>1 comorbidity</i>	493	14.8
<i>2 comorbidities</i>	716	21.5
<i>3 comorbidities and over</i>	1990	59.7

Table 3 presents the most common pre-existing chronic pathologies in patients who died, separately in men (n = 2,228 and women (n = 1,107). 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 2.0).

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

	Women		Men	
Diseases	N	%	N	%
<i>Ischemic heart disease</i>	232	21.0	701	31.5
<i>Atrial Fibrillation</i>	255	23.0	484	21.7
<i>Heart Failure</i>	203	17.8	321	14.1
<i>Stroke</i>	116	10.5	225	10.1
<i>Hypertension</i>	763	68.9	1493	67.0
<i>Type 2-Diabetes</i>	317	28.6	694	31.1
<i>Dementia</i>	258	23.3	280	12.6
<i>COPD (Chronic Obstructive Pulmonary Disease)</i>	140	12.6	415	18.6
<i>Active cancer in the past 5 years</i>	179	16.2	350	15.7
<i>Chronic liver disease</i>	33	3.0	109	4.9
<i>Chronic renal failure</i>	200	18.1	474	21.3
<i>Dialysis</i>	19	1.7	46	2.1
<i>Respiratory failure</i>	58	5.2	114	5.1
<i>HIV Infection</i>	0	0.0	7	0.3
<i>Autoimmune diseases</i>	64	5.8	66	3.0
<i>Obesity</i>	121	10.9	245	11.0
Number of comorbidities				
<i>0 comorbidities</i>	31	2.8	105	4.7
<i>1 comorbidity</i>	158	14.3	335	15.0
<i>2 comorbidities</i>	244	22.0	472	21.2
<i>3 comorbidities and over</i>	674	60.9	1316	59.1

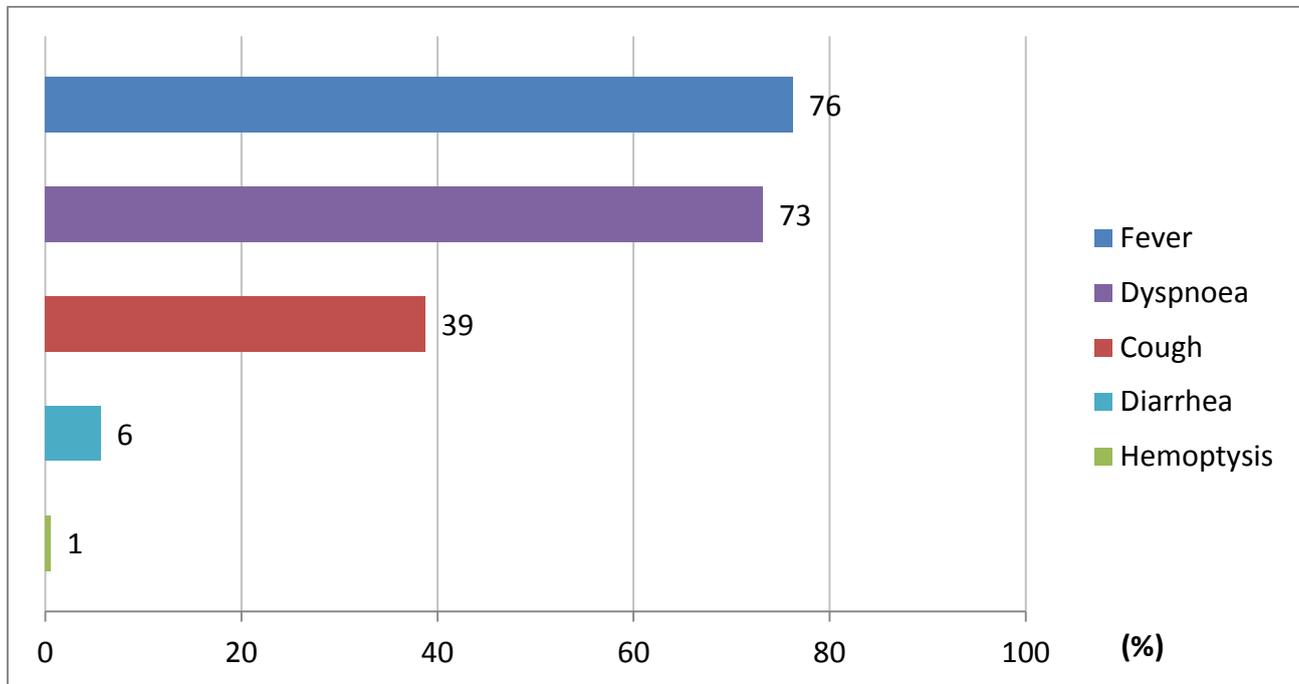
4. Diagnosis of hospitalization

In 92.5% of hospitalizations, conditions (e.g. pneumonia, respiratory failure) or symptoms (e.g. fever, dyspnoea, cough) compatible with SARS-CoV-2 were mentioned. In 231 cases (7.5% of cases) the diagnosis of hospitalization was not related to the infection. In 36 cases the diagnosis of hospitalization concerned exclusively neoplastic pathologies, in 85 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 82 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 (97.0% of cases), followed by acute renal failure (22.3%). Superinfection was observed in 12.9% and acute cardiac injury in 11.0% of cases.

7. Treatments

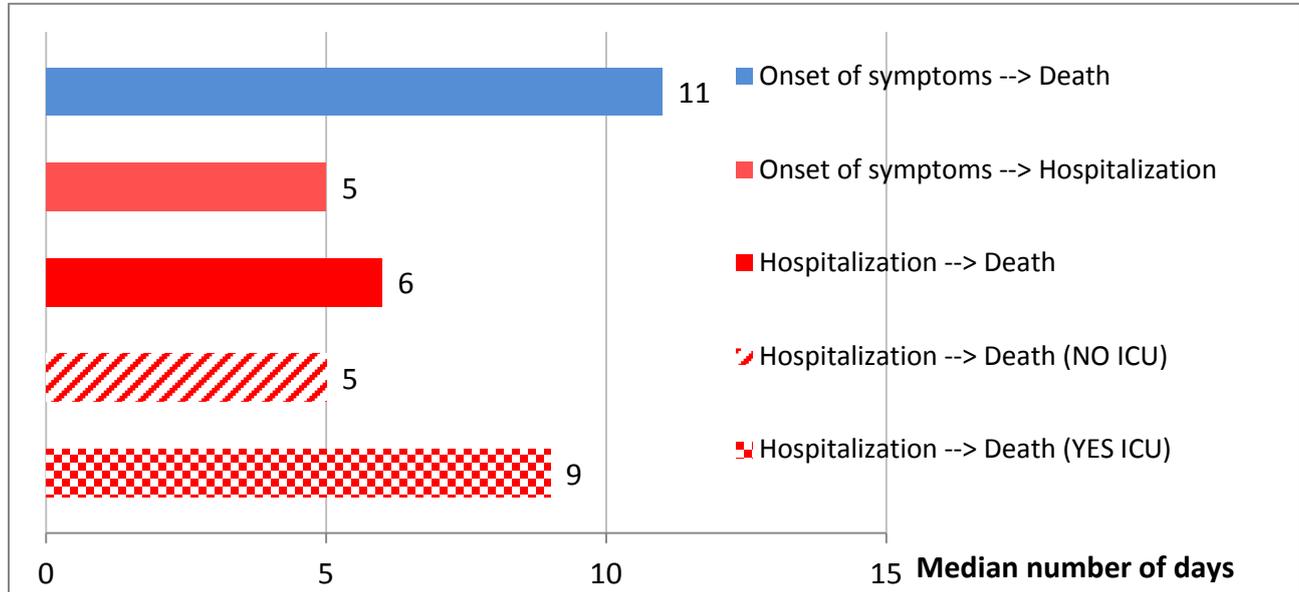
Antibiotics were used by 86% of patients during hospital stay, while less used were antivirals (59%) and corticosteroids (38%). Concomitant use of these 3 treatments was observed in 23.1% of cases.

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 June 4th, 365 out of the 32,448 (1.1%) positive SARS-CoV-2 patients under the age of 50 died. In particular, 84 of these were less than 40 years (53 men and 31 women), age range between 0 and 39 years. For 8 patients under the age of 40 years no clinical information is available; out of the remaining ones, 62 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

Members of the SARS-CoV-2 Surveillance Group

Luigi Palmieri, Xanthi Andrianou, Pierfrancesco Barbariol, Antonino Bella, Stefania Bellino, Eva Benelli, Luigi Bertinato, Stefano Boros, Gianfranco Brambilla, Giovanni Calcagnini, Marco Canevelli, Maria Rita Castrucci, Federica Censi, Alessandra Ciervo, Elisa Colaizzo, Fortunato D'Ancona, Martina Del Manso, Chiara Donfrancesco, Massimo Fabiani, Francesco Facchiano, Antonietta Filia, Marco Florida, Fabio Galati, Marina Giuliano, Tiziana Grisetti, Yllka Kodra; Martin Langer, Ilaria Lega, Cinzia Lo Noce, Pietro Maiozzi, Fiorella Malchiodi Albedi, Valerio Manno, Margherita Martini, Alberto Mateo Urdiales, Eugenio Mattei, Claudia Meduri, Paola Meli, Giada Minelli, Manuela Nebuloni, Lorenza Nisticò, Marino Nonis, Graziano Onder, Lucia Palmisano, Nicola Petrosillo, Patrizio Pezzotti, Flavia Pricci, Ornella Punzo, Vincenzo Puro, Valeria Raparelli, Giovanni Rezza, Flavia Riccardo, Maria Cristina Rota, Paolo Salerno, Debora Serra, Andrea Siddu, Paola Stefanelli, Manuela Tamburo De Bella, Dorina Tiple, Brigid Unim, Luana Vaianella, Nicola Vanacore, Monica Vichi, Emanuele Rocco Villani, Amerigo Zona, Silvio Brusafferro.