Characteristics of SARS-CoV-2 patients dying in Italy
Report based on available data on June 11th, 2020

1. Sample

The present report describes characteristics of 32,938 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 11th, 2020.

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

REGION	N	%
Lombardia	16,349	49.6
Emilia Romagna	4,192	12.7
Piemonte	2,846	8.6
Veneto	1,964	6.0
Liguria	1,547	4.7
Toscana	1,084	3.3
Marche	940	2.9
Lazio	772	2.3
Puglia	530	1.6
Trento	468	1.4
Abruzzo	453	1.4
Campania	365	1.1
Friuli Venezia Giulia	341	1.0
Sicilia	295	0.9
Bolzano	293	0.9
Valle d'Aosta	144	0.4
Sardegna	131	0.4
Calabria	96	0.3
Umbria	76	0.2
Basilicata	29	0.1
Molise	23	0.1
Total	**32,938**	**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 13,692 (41.6%). *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).

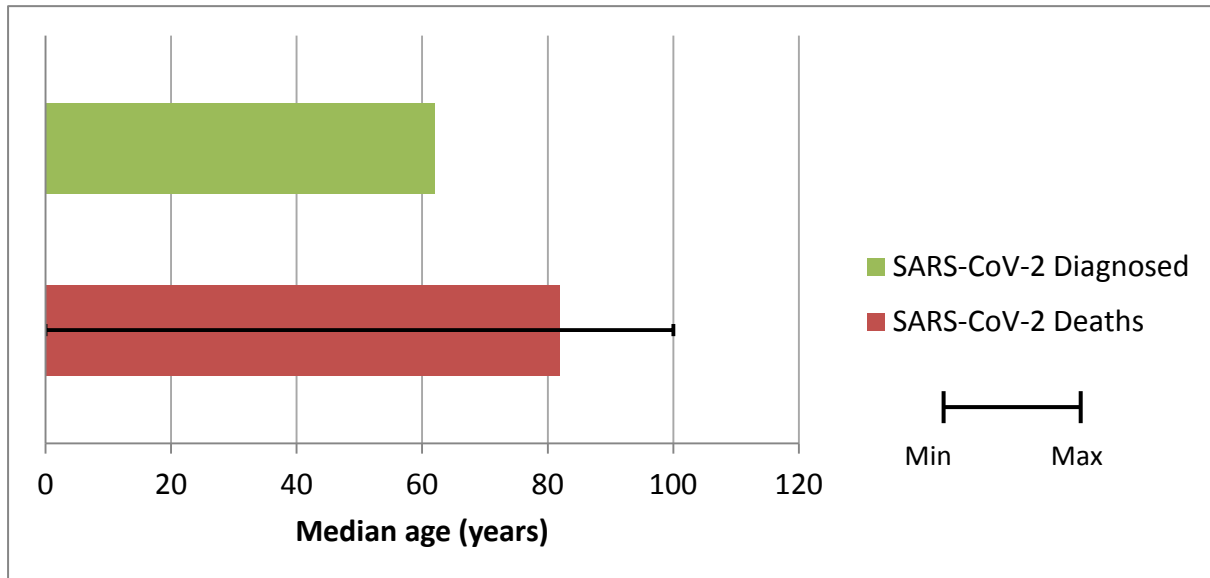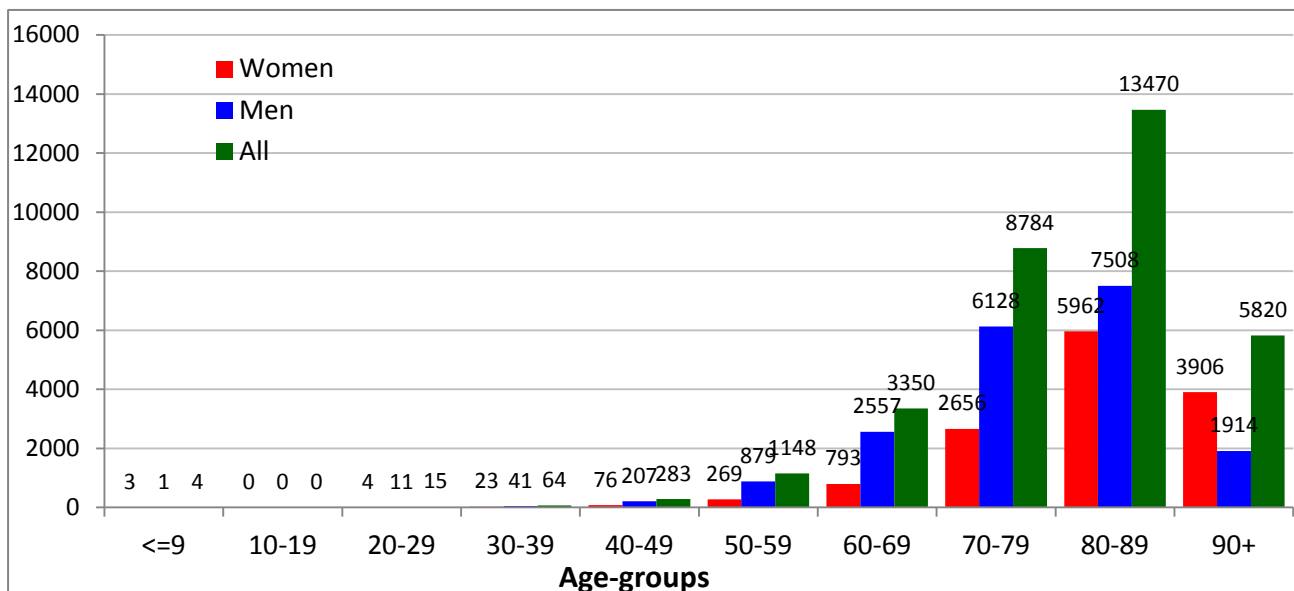*Figure 1.* *Median age of patients with SARS-CoV-2 infection and SARS-CoV-2 positive deceased patients*

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 3,438 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, 4.2% of the sample presented with a no comorbidities, 14.7% 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	%
Ischemic heart disease	957	27.8
Atrial Fibrillation	758	22.0
Heart failure	539	15.7
Stroke	349	10.2
Hypertension	2305	67.0
Type 2-Diabetes	1040	30.3
Dementia	562	16.3
COPD (Chronic Obstructive Pulmonary Disease)	576	16.8
Active cancer in the past 5 years	551	16.0
Chronic liver disease	148	4.3
Chronic renal failure	688	20.0
Dialysis	67	1.9
Respiratory failure	180	5.2
HIV Infection	7	0.2
Autoimmune diseases	137	4.0
Obesity	377	11.0
Number of comorbidities		
0 comorbidities	144	4.2
1 comorbidity	505	14.7
2 comorbidities	738	21.5
3 comorbidities and over	2051	59.7

Table 3 presents the most common pre-existing chronic pathologies in patients who died, separately in men (n = 2,301 and women (n = 1,137). 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*

| Diseases	**Women** N	%	**Men** N	%
Ischemic heart disease	236	20.8	721	31.3
Atrial Fibrillation	260	22.9	498	21.6
Heart Failure	209	17.8	330	14.1
Stroke	118	10.4	231	10.0
Hypertension	774	68.1	1531	66.5
Type 2-Diabetes	322	28.3	718	31.2
Dementia	266	23.4	296	12.9
COPD (Chronic Obstructive Pulmonary Disease)	143	12.6	433	18.8
Active cancer in the past 5 years	185	16.3	366	15.9
Chronic liver disease	37	3.3	111	4.8
Chronic renal failure	200	17.6	488	21.2
Dialysis	19	1.7	48	2.1
Respiratory failure	61	5.4	119	5.2
HIV Infection	0	0.0	7	0.3
Autoimmune diseases	67	5.9	70	3.0
Obesity	127	11.2	250	10.9
Number of comorbidities				
0 comorbidities	33	2.9	111	4.8
1 comorbidity	161	14.2	344	15.0
2 comorbidities	250	22.0	488	21.2
3 comorbidities and over	693	60.9	1358	59.0

4. *Diagnosis of hospitalization*

In 92.4% of hospitalizations, conditions (e.g. pneumonia, respiratory failure) or symptoms (e.g. fever, dyspnoea, cough) compatible with SARS-CoV-2 were mentioned. In 241 cases (7.6% of cases) the diagnosis of hospitalization was not related to the infection. In 38 cases the diagnosis of hospitalization concerned exclusively neoplastic pathologies, in 88 cases cardiovascular pathologies (for example Acute Myocardial Infarction-AMI, heart failure, stroke), in 31 cases gastrointestinal pathologies (for example cholecystitis, perforation of the intestine, intestinal obstruction, cirrhosis), in 84 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*
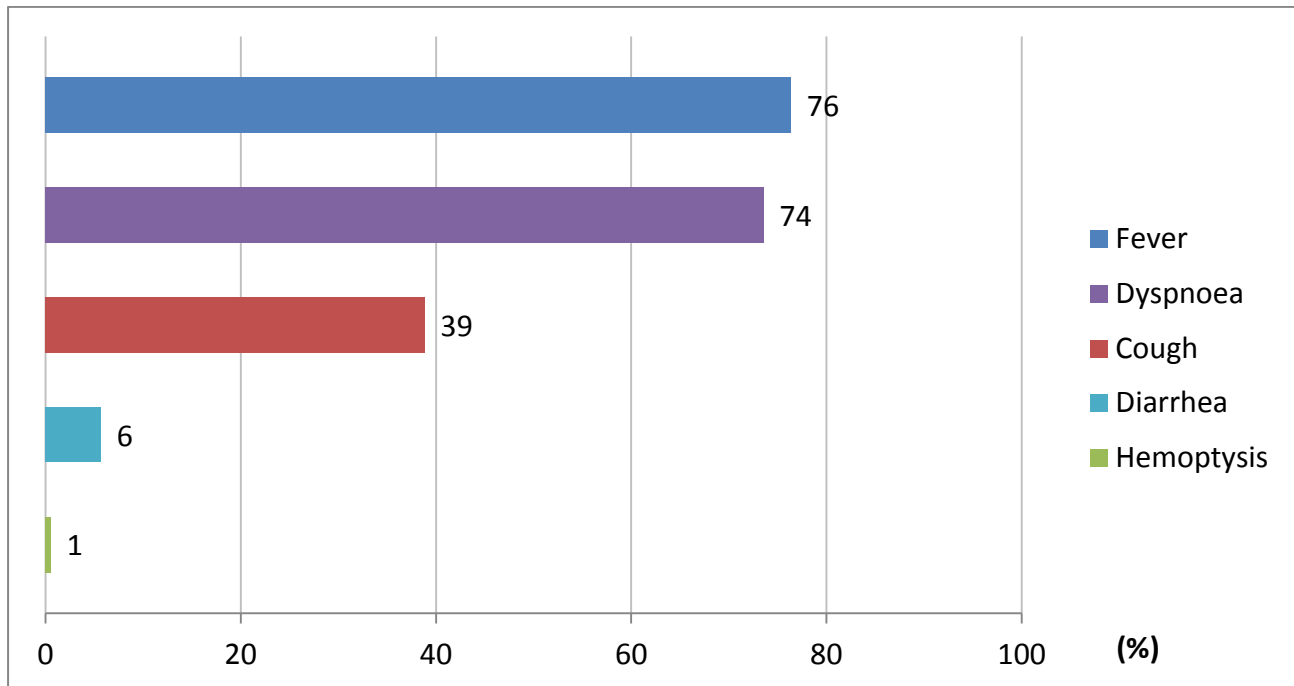
6. Acute conditions

Acute Respiratory Distress syndrome was observed in the majority of patients (**96.9% of cases**), followed by acute renal failure (22.1%). Superinfection was observed in 13.0% 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 (60%) and corticosteroids (38%). Concomitant use of these 3 treatments was observed in 23.4% 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*
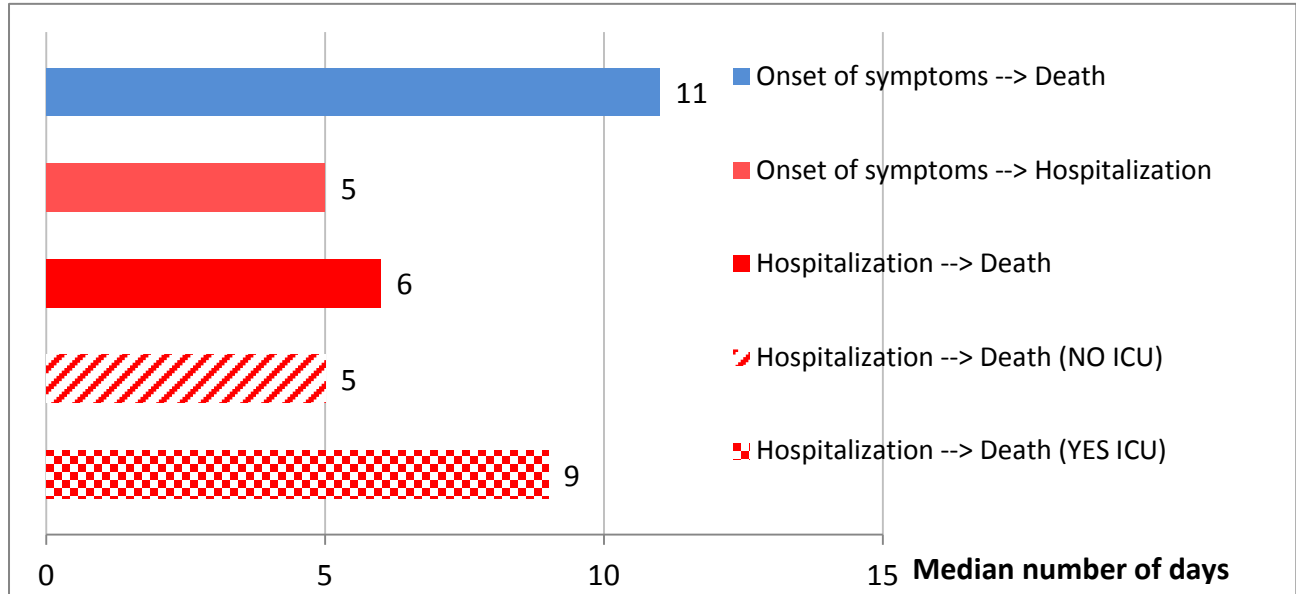
9. Deaths under the age of 50 years

As of June 11th, 366 out of the 32,938 (1.1%) positive SARS-CoV-2 patients under the age of 50 died. In particular, 83 of these were less than 40 years (53 men and 30 women), age range between 0 and 39 years. For 7 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

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