

## Coronavirus Outbreak

# Similarity in Case Fatality Rates (CFR) of COVID-19/SARS-COV-2 in Italy and China

Rossella Porcheddu<sup>1</sup>, Caterina Serra<sup>2</sup>, David Kelvin<sup>3</sup>, Nikki Kelvin<sup>4</sup>, Salvatore Rubino<sup>2</sup>

<sup>1</sup> Freelance Journalist, JIDC Italy

<sup>2</sup> Dipartimento di Scienze Biomediche, Università degli Studi di Sassari, Sassari, Italy

<sup>3</sup> JIDC Canada; Department of Microbiology and Immunology, Canadian Center for Vaccinology, Dalhousie University, Halifax, NS, Canada. International Institute of Infection and Immunity, Shantou, China

<sup>4</sup> JIDC Canada, Department of Microbiology and Immunology, Dalhousie University, Halifax, NS, Canada

### Abstract

As of 28 February 2020, Italy had 888 cases of SARS-CoV-2 infections, with most cases in Northern Italy in the Lombardia and Veneto regions. Travel-related cases were the main source of COVID-19 cases during the early stages of the current epidemic in Italy. The month of February, however, has been dominated by two large clusters of outbreaks in Northern Italy, south of Milan, with mainly local transmission the source of infections. Contact tracing has failed to identify patient zero in one of the outbreaks. As of 28 February 2020, twenty-one cases of COVID-19 have died. Comparison between case fatality rates in China and Italy are identical at 2.3. Additionally, deaths are similar in both countries with fatalities in mostly the elderly with known comorbidities. It will be important to develop point-of-care devices to aid clinicians in stratifying elderly patients as early as possible to determine the potential level of care they will require to improve their chances of survival from COVID-19 disease.

**Key words:** Novel coronavirus COVID-19; outbreak; Italy; Case Fatality Rates SARS-CoV-19.

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### Introduction

In December 2019, reports emerged from China of a new flu-like virus affecting many people in the city of Wuhan. The virus spread quickly and efficiently, with confirmed cases dramatically increasing within a few weeks. Despite efforts to contain the virus within the city, it quickly spread to other regions of China, and soon to other countries in Asia. In January 2020, the World Health Organization renamed the virus as SARS-CoV-2 and designated the disease COVID-2019 [1].

As of 29 February 2020, there are over 85,700 identified cases of COVID-19 worldwide in 62 countries and territories according to Worldometer [2], a reference website that provides real-time world statistics

(<https://www.worldometers.info/coronavirus/>).

Currently SARS-CoV-2 has now spread to all continents excluding Antarctica. Of these 62 countries, Italy now has the largest outbreak of COVID-19 outside Asia [3].

### The first travel-related cases in Italy

#### *Italian citizens in Wuhan*

On 3 February 2020, fifty-six Italian citizens who were in Wuhan, China, were repatriated to Italy, where they were quarantined in an Italian military base in the city of Cecchignola, near Rome, for 14 days. One 17-year-old male student was not allowed on the flight because he had a fever. A 29-year-old male researcher, who was one of the 56 Italians who returned from Wuhan, developed symptoms of COVID-19 and was transported to the Spallanzani Institute in Rome on 6 February. He was placed in isolation and later discharged on 22 February 2020. The 17-year-old student was also brought home to Italy and hospitalized at the Spallanzani Institute in Rome on 15 February. He recently tested negative for COVID-19 and has concluded his period of observation [4].

#### *The Diamond Princess*

The cruise ship, *Diamond Princess*, was quarantined 3 February 2020, when a passenger who disembarked in Hong Kong tested positive for COVID-19. Of the 3700 people on board the *Diamond Princess*,

35 were Italian, 25 of whom were crew members, including the ship’s captain, Captain Gennaro Arma. On 15 February, the Italian government announced that it would bring the Italian passengers back to Italy, and they were flown home on 22 February, where they were placed under quarantine for another 14 days in Cecchignola. One Italian passenger tested positive for the virus [5].

**Cases in Italy**

Since the identification of COVID-19 travel-related cases in northern Italy, the number of people confirmed to be infected in Italy increased rapidly. Within a couple of days of the first reported patient, over 821 cases were identified, and currently (29 February 2020), 21 patients have died [6]. Figure 1 shows the Italian regions affected by the epidemic. The country is now facing its greatest health crisis in recent history. The outbreak illustrates how rapidly and easily a new virus can spread through local transmission in a naive population.

*The first cases in Rome*

The first patients reported in Rome were Chinese tourists from Wuhan who had travelled in the northern region of Italy. After arriving in Milan on 23 January 2020, they travelled around the area for several days, visiting Milan, Parma, and Verona before going to Rome [5]. The 65-year-old woman and 66-year-old man were hospitalized at the Istituto Nazionale Malattie Infettive Lazzaro Spallanzani in Rome on 30 January, where they were confirmed as SARS-CoV-2 positive on 31 January 2020 and placed in isolation [7]. The couple is now reported to be in stable condition [8].

After the identification of these individuals from Wuhan, 12 other tourists from the Wuhan area were also found to have symptoms of the virus and hospitalized at the Istituto Nazionale Malattie Infettive Lazzaro Spallanzani. Additionally, 20 asymptomatic Chinese tourists, who were in contact with the original couple, were placed under observation at the same hospital and released on 13 February 2020 at the end of the normal period of observation and active surveillance [9].

*Patient Zero and Patient One*

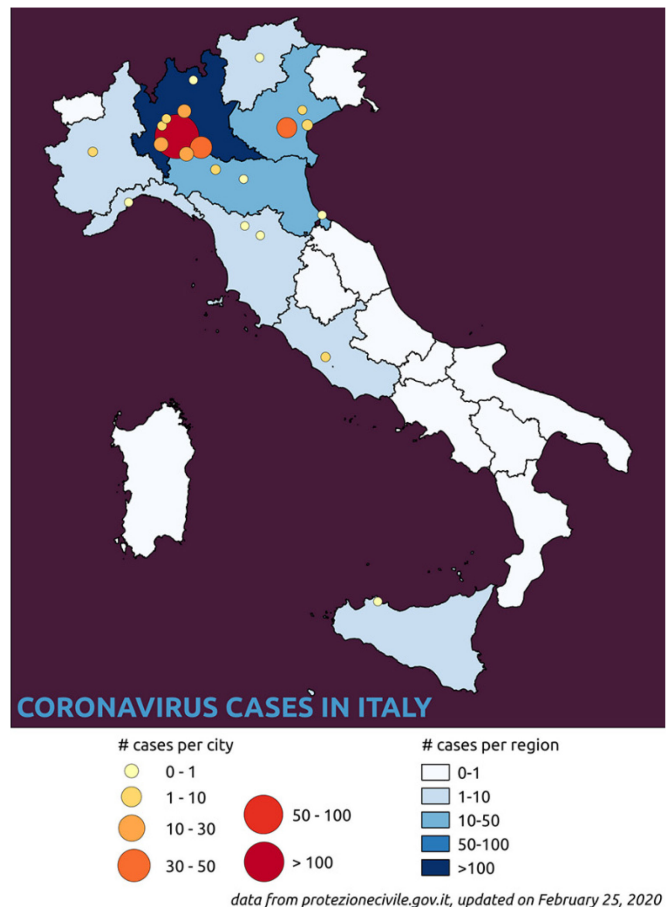
Patient Zero is the term given to the individual identified to be the first person, and therefore carrier, infected with a new virus or bacterial disease in an outbreak. It is important to identify Patient Zero in an outbreak because knowing where that person has been and with whom they have had contact will help doctors

and researchers better understand, track, and control the infection. At present, health authorities have been unable to accurately identify Patient Zero in the Northern Italian outbreak.

The region of Lombardy has the highest number of cases of coronavirus in Italy and appears to be the epicentre of the Italian outbreak. It has been suggested that a 38-year-old man from the city of Codogno, who presented at the hospital on 20 February 2020 with a serious respiratory infection, could be the first local human-to-human transmission case in the region, as he had dined with a friend who had been in China. However, his friend tested negative for the virus, and it was further determined that the interval of time between the dinner meeting and the onset of the man’s symptoms was longer than expected for the incubation period [10].

After the report of the case in Codogno, testing of other people in Lombardy with flu-like symptoms revealed many other individuals positive for COVID-19, including medical staff and patients at the hospital where the first case was treated. More than a dozen cities in the region have closed schools, bars, and other public places.

**Figure 1.** Coronavirus cases in Italy.



**Table 1.** Case fatality rates in China and Italy.

Age Group	Confirmed SARS-COV-2 N (%)		Deaths		Case Fatality Rate	
	China	Italy	China	Italy	China	Italy
0–9	416 (0.9)	*	–			
10–19	549 (1.2)	*	1	*		
20–29	3,619 (8.1)	*	7	*	–	
30–39	7,600 (17.0)	*	18	*	0.2	*
40–49	8,571 (19.2)	*	38	*	0.2	*
50–59	10,008 (22.4)	*	130	*	0.2	*
60–69	8,583 (19.2)	*	309	3	0.4	*
70–79	3,918 (8.8)	*	312	6	1.3	*
≥ 80	1,408 (3.2)	*	208	12	3.6	*
Unknown		867				
Total	44,672	888	1,023	21	2.3	2.3

\* Unknown Chinese data was taken from Feng et al. 2020 CCDC Weekly / Vol. 2 / No. 8 pg 113-122.

**Comparison of cases between China and Italy**

Comparison of fatalities between China and the current cases in Italy (Table 1) show that even though there are only 888 cases in Italy, the case fatality rate (CFR) in Italy is 2.3, strikingly close to the CFR of 2.3 reported by Feng et al. for 44,000 SARS-CoV-2 cases in China. Furthermore, case fatalities in Italy appear to be in the elderly age groups 60 and above (Table 1). More than 50% of the fatalities in China are in ages greater than 50. Again, comorbidities appear to be important contributors in deaths in both China [11], and Italy (Table 2), where comorbidities in Italian deaths are present in 10 of 16 patients. In China, very few deaths (1 in 965) occur in ages 19 years or lower [11]. Anecdotally, very few children and adolescents are

infected in Italy as well and no deaths in the young have been reported at this time.

As mortality and severity of illness are correlated to age and comorbidities in both China and Italy, having strategies to ensure these high-risk groups have adequate protection from infections, and early access to medical care when infected, is important for improving chances of survival. Additionally, rigorous medical history taking, and scoring for frailty, may indicate the highest risk groups. The surge in COVID-19 cases during the outbreaks in Wuhan, China, and Northern Italy placed substantial strain on hospitals and intensive care units. It will be important to develop point-of-care devices to aid clinicians in stratifying patients based on potential need in level of care to improve chances of survival from COVID-19 disease.

**Table 2.** COVID-19 Fatalities in Italy.

	Date	Age	Sex	City (province)	Region	Comorbidities
1	21 February	78	M	Vo' Euganeo (Padova)	Veneto	+
2	22 February	75	W	Casalpusterlengo (Treviso)	Veneto	+
3	23 February	68	W	Trescore Cremasco (Cremona)	Lombardia	+
4	24 February	84	M	Villa di Serio (Bergamo)	Lombardia	+
5	24 February	88	M	Codogno (Lodi)	Lombardia	-
6	24 February	62	M	Castiglione d'Adda (Lodi)	Lombardia	+
7	24 February	80	M	Castiglione d'Adda (Lodi)	Lombardia	+
8	25 February	84	M	Nembro (Bergamo)	Lombardia	-
9	25 February	91	M	San Fiorano (Lodi)	Lombardia	-
10	25 February	83	W	Codogno (Lodi)	Lombardia	-
11	26 February	69	M	Lodi	Lombardia	-
12	26 February	70	M	Lodi	Lombardia	-
13	26 February	75/76	W			
14	26 February	77	?			
15	27 February	88	?			
16	27 February	88	?			
17	27 February	82	?			
18	28 February	73	M	Offanengo (Cremona)	Lombardia	+
19	28 February	80	W	Gandino (Bergamo)	Lombardia	+
20	28 February	86	W	Cene (Bergamo)	Lombardia	+
21	28 February	85	M	San Fiorano (Lodi)	Lombardia	+

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## Corresponding author

David J Kelvin  
Department of Microbiology and Immunology, Faculty of Medicine  
Dalhousie University, Halifax, Nova Scotia, Canada  
Tel: 1-647-529-3556  
Email: [dkelvin@jdic.org](mailto:dkelvin@jdic.org)

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