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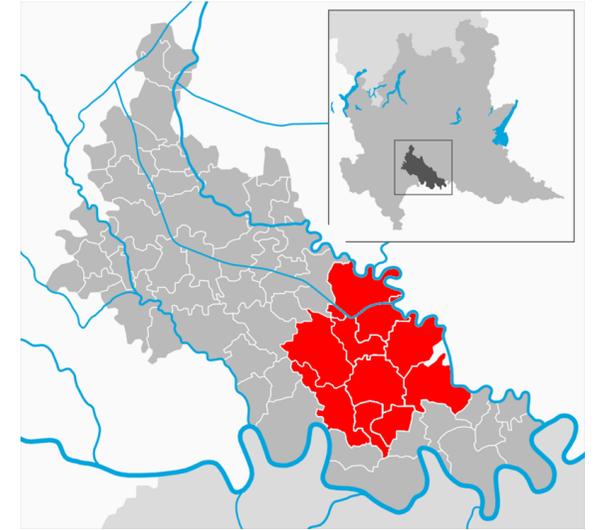
# COVID-19 cluster in northern Italy: Lombardy

The Lombardy outbreak came to light when a 38-year-old Italian tested positive in Codogno, not far from Milan on the 19<sup>th</sup> of February. Initially there was no suspicion of COVID-19, so no additional precautionary measures were taken.

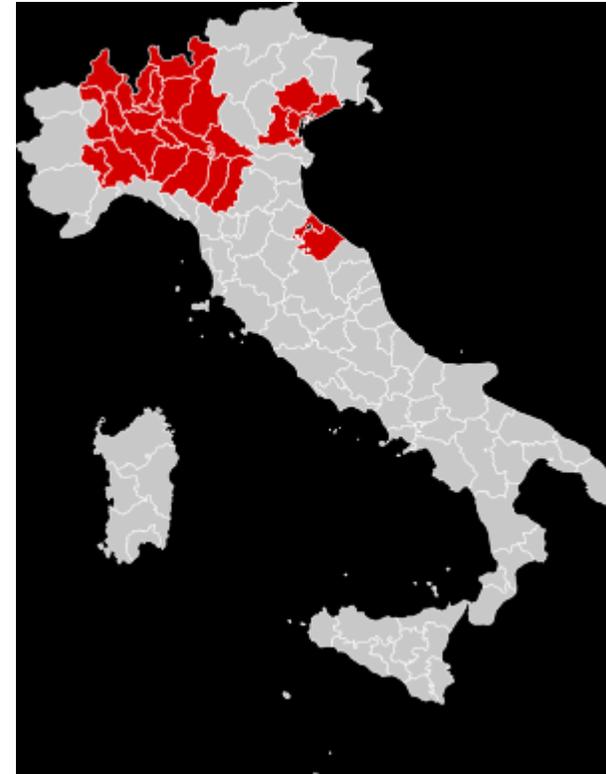
The infection rapidly spread and on 21<sup>st</sup> of February 16 more cases were confirmed (14 in Lombardy and 2 in Veneto) The day after of the 76 newly discovered cases, 54 were found in Lombardy but the virus started to spread in the nearest regions (Emilia-Romagna, Veneto, Piedmont).

# Lockdown areas

On 22 February, the government established a lockdown for eleven municipalities in Lombardy and Veneto (a total population of 53,785).



On 7 March, the restriction were extended to all the provinces of Lombardy, plus fourteen others in Veneto (3), Emilia-Romagna (5), Marche (1) and Piemonte (5), affecting roughly a quarter of Italy's total population.



On 9 March, Prime Minister Conte announced that the lockdown would be extended to the entire country.

# Ospedale S. Giuseppe, Milano (1)

Due to the increasing necessity of respiratory intensive care units, the Lung Unit ward of the hospital was converted in a COVID-19 dedicated Intensive respiratory care unit since the 9<sup>th</sup> of March.

For each bed a helmet CPAP was available, and 6 places were equipped for intubated patients requiring intensive cares.

Pneumologist and Intensivist shared competences and strength, allowing a prompt intervention when required

A regional network collected availability from all the hospitals, supporting emergency care departments.

# Ospedale S. Giuseppe, Milano (2)

One week later another COVID-19 ward was opened in order to receive patients improved from the respiratory intensive care unit as well as patient not requiring intensive cares.

Doctors with different specialties were involved to work together, supported by pneumologists and resuscitators.

Collaboration and availability to learn new skill has allowed this new ward to work

# Patients characteristics

## HSG 3<sup>rd</sup> March 2020 to 29<sup>th</sup> April 2020

	Patients (N=260)
Gender	
Male (%)	147 (56.5)
Female (%)	113 (43.5)
Age	
Years (standart deviation)	72 (15.4)
Median	75
Range (min-max)	27-97

121 (55.3 %) patients were discharged at home, 28 (12.8 %) were admitted in other hospitals for a rehab program and 70 died (32%)

# Intensive respiratory care on 84 patients: a more detailed analysis

	Patients (N=84)	Not severe (N=28)	Severe <sup>#</sup> (N=56)
Age, years ( $\pm$ SD)	66,8 ( $\pm$ 13,5)	69,4 ( $\pm$ 13,6)	65,6 ( $\pm$ 13,5)
Gender Male/Female n <sup>o</sup>	56/28	8 (28,6%)	20 (35%)
Smoking history- n <sup>o</sup> (%)			
Never smoked	36 (42,9%)	10 (35,7%)	26 (46,4%)
Ex-smoker	33 (39,3%)	12 (42,9%)	21 (37,5%)
Smoker	15 (17,9%)	6 (21,4%)	9 (16,1%)
Days from symptoms onset- admission to the hospital, days ( $\pm$ SD)	8,6 ( $\pm$ 5,0)	7,1 ( $\pm$ 3,9)	9,5 ( $\pm$ 5,3)*
Days in the Intensive respiratory care Unit, days ( $\pm$ SD)	15,9 ( $\pm$ 10,8)	11,9 ( $\pm$ 6,0)	18,7 ( $\pm$ 12,6) *

# according the ATS/ERS community acquired pneumonia guide lines (2019)

\* p < 0.05

# Main Comorbidities

Disease	Patients (N=84)	Not severe (N=28)	Severe <sup>#</sup> (N=56)
Systemic Hypertension - n° (%)	36 (42,9%)	14 (50%)	22 (39,3%)
Ischemic cardiopathy - n° (%)	6 (7,1%)	4 (14,3%)	2 (3,6%)
Cardiac failure - n° (%)	1 (1,2%)	0 (0%)	1 (1,8%)
Aritmic disorders - n° (%)	5 (6%)	3 (10,7%)	2 (3,6%)
Asthma - n° (%)	2 (2,4%)	2 (7,1%)	0 (0%)
COPD - n° (%)	8 (9,5%)	1 (3,6%)	7 (12,5%)
Chronic renal failure- n° (%)	2 (2,4%)	1 (3,6%)	1 (1,8%)
Diabetes type 2- n° (%)	13 (15,5%)	6 (21,4%)	7 (12,5%)
Obesity - n° (%)	8 (9,5%)	2 (7,1%)	6 (10,7%)
Malignancies- n° (%)	5 (6%)	1 (3,6%)	4 (7,1%)
Malignancies in remission (> 5aa) - n° (%)	7 (8,3%)	4 (14,3%)	3 (5,4%)
Autoimmune diseases- n° (%)	2 (2,4%)	0 (0%)	2 (3,6%)
Co-pathologies ≥ 1 - n° (%)	52 (61,9%)	19 (67,9%)	33 (58,9%)
Co-pahtologies ≥ 2 - n° (%)	24 (28,6%)	11 (39,3%)	13 (23,2%)
Co-pathologies ≥ 3 - n° (%)	11 (13,1%)	5 (17,9%)	6 (10,7%)

# according the ATS/ERS community acquired pneumonia guide lines (2019)

\* p < 0.05

# Clinical characteristics

	Patients (N=84)	Not severe (N=28)	Severe <sup>#</sup> (N=56)
pO <sub>2</sub> /fiO <sub>2</sub>	211,1 (± 65,5)	261,4 (± 43,0)	181,3 (± 51,3) *
WBC - ×10 <sup>3</sup> /μL	8,85 (± 5,48)	7,84 (± 3,02)	9,35 (± 6,33)
Lymphocytes %	10,78 (± 6,6)	13,9 (± 8,01)	9,22 (± 5,17)*
Lymphocytes×10 <sup>3</sup> /μL	0,8 (± 0,48)	0,95 (± 0,41)	0,72 (± 0,5)*
Proteina C reattiva (PCR) - mg/dL	13,62 (± 9,87)	11,65 (± 8,76)	14,61 (± 10,31)
Procalcitonina - ng/mL	1,28 (± 3,9)	0,34 (± 0,5)	1,75 (± 4,7)
Lattato deidrogenasi (LDH) - U/L	413,36 (± 149,03)	392,36 (± 132,22)	424,05 (± 156,97)
Aspartato aminotrasferasi (AST) - U/L	48,7 (± 34,43)	45,29 (± 19,56)	50,41 (± 39,9)
Alanina aminotrasferasi (ALT) - U/L	55,93 (± 57,01)	53,43 (± 42,04)	57,18 (± 63,5)
Creatinina - mg/dL	0,94 (± 0,6)	0,95 (± 0,44)	0,93 (± 0,66)
D-dimero - ng/mL	5036,4 (± 9365,83)	2305,44 (± 2768,91)	6324,58 (± 11003,44)
Interleuchina-6 (IL-6) - pg/mL	76,95 (± 159,31)	62,56 (± 69,98)	82,7 (± 184,13)

# according the ATS/ERS community acquired pneumonia guide lines (2019)

\* p < 0.05

# Treatment approach

	Patients (N=84)	Not severe (N=28)	Severe <sup>#</sup> (N=56)
Ventilatory support - n° (%)			
CPAP	57 (67,9%)	13 (46,4%)	44 (78,6%)*
Intubation	28 (33,3%)	0	28 (50,0%)*
Tracheostomy	10 (11,9%)	0	10 (17,9%)*
Pharmacologic treatment- n° (%)			
Lopinavir/ritonavir	32 (38,1%)	9 (32,1%)	23 (41,1%)
Remdesivir	9 (10,7%)	0	9 (16,1%)*
Hydroxichloroquine	36 (42,9%)	9 (32,1%)	27 (48,2%)
Tocilizumab	14 (16,7%)	6 (21,4%)	8 (14,3%)
Anakinra	2 (2,4%)	1 (3,6%)	1 (1,8%)
Corticosteroids	40 (47,6%)	7 (25,0%)	33 (58,9%)*

# according the ATS/ERS community acquired pneumonia guide lines (2019)

\* p < 0.05

# Differences between the first and second month

	Pts 1st month (N=71)	Pts 2nd month (N=13)
Age, years ( $\pm$ SD)	64,7( $\pm$ 13,2)	78,5( $\pm$ 9,0)*
Gender Male/Female n°	22 (31,0%)	6 (46,2%)
Smoking history- n° (%)		
Never smoked	32 (45,1%)	4 (30,8%)
Ex-smoker	28 (39,4%)	5 (38,5%)
Smoker	11 (15,5%)	4 (30,8%)
Days from symptoms onset- admission to the hospital, days ( $\pm$ SD)	8,9 ( $\pm$ 4,9)	7,6 ( $\pm$ 5,3)*
Days in the Intensive respiratory care Unit, days ( $\pm$ SD)	15,8 ( $\pm$ 11,5)	16,5 ( $\pm$ 7,5)

# 1<sup>st</sup> vs 2<sup>nd</sup> month: treatment approach

	Pts 1st month (N=71)	Pts 2nd month (N=13)
Ventilatory support - n° (%)		
CPAP	51 (71,8%)	6 (46,2%)
Intubation	28 (39,4%)	0
Tracheostomy	10 (14,1%)	0
Pharmacologic treatment- n° (%)		
Lopinavir/ritonavir	32 (45,1%)	0*
Remdesivir	9 (12,7%)	0
Hydroxichloroquine	36 (50,7%)	0*
Tocilizumab	12 (16,9%)	2 (15,4%)
Anakinra	1 (1,4%)	1 (7,7%)
Corticosteroids	29 (40,8%)	11 (84,6%)*

\* p < 0.05

# CONCLUSIONS

- ✓ Among patients referred to our hospital a wide range of age has been observed with a prevalence of males.
- ✓ Comorbidities did not affect the severity of the disease, although we have reported a high prevalence of systemic hypertension.
- ✓ The majority of the patient were admitted to our Intensive Respiratory Care Unit during the first month of the pandemic.
- ✓ Pts admitted during the first month were younger and presented less comorbidities compared to the others. Furthermore, they showed a more inflammatory pattern, as suggested by increased CPR, LDH, IL-6 and lymphopenia which were related to a worst prognosis.
- ✓ Treatment was wide, only during the first month we used ritonavir/lopinavir associated to hydroxicloroquine. Steroids were used since the end of the first month and seemed to be effective in reducing the cytokine storm in these patients and improving survival.