COVID-19
nelle
RSA

Una prima valutazione di che cosa è accaduto e azioni di miglioramento

Age, multimorbidity and frailty in COVID-19 patients

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CONFLICT OF INTEREST DISCLOSURE

I have no potential conflict of interest to report

Agenda

- Risk factors for older adults
  - Age
  - Chronic diseases/multimorbidity
  - Frailty/disability
  - Dementia
  - Obesity
- Symptoms presentation in older adults
- What has changed in the last 2 months in the NH setting?

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Chi sono i residenti in RSA? Studio SHELTER

	Campione totale = 4156 (%)
Età, anni (media ± SD)	**83.4 ± 9.4**
Donne	3035 (73)
Disabilità nelle ADL	
Richiede assistenza	**1723 (41.5)**
Completamente dipendente	**1653 (39.8)**
Stato cognitivo	
Deficit lieve/moderato	**1563 (37.6)**
deficit severo	**1265 (30.4)**
Sintomi comportamentali	1142 (27.5)
Cadute	774 (18.6)
Ulcere da pressione	432 (10.4)
Dolore	1496 (36.0)
N di malattie	**3.9 ± 2.4**

Onder G et al. BMC Health Serv Res 2012

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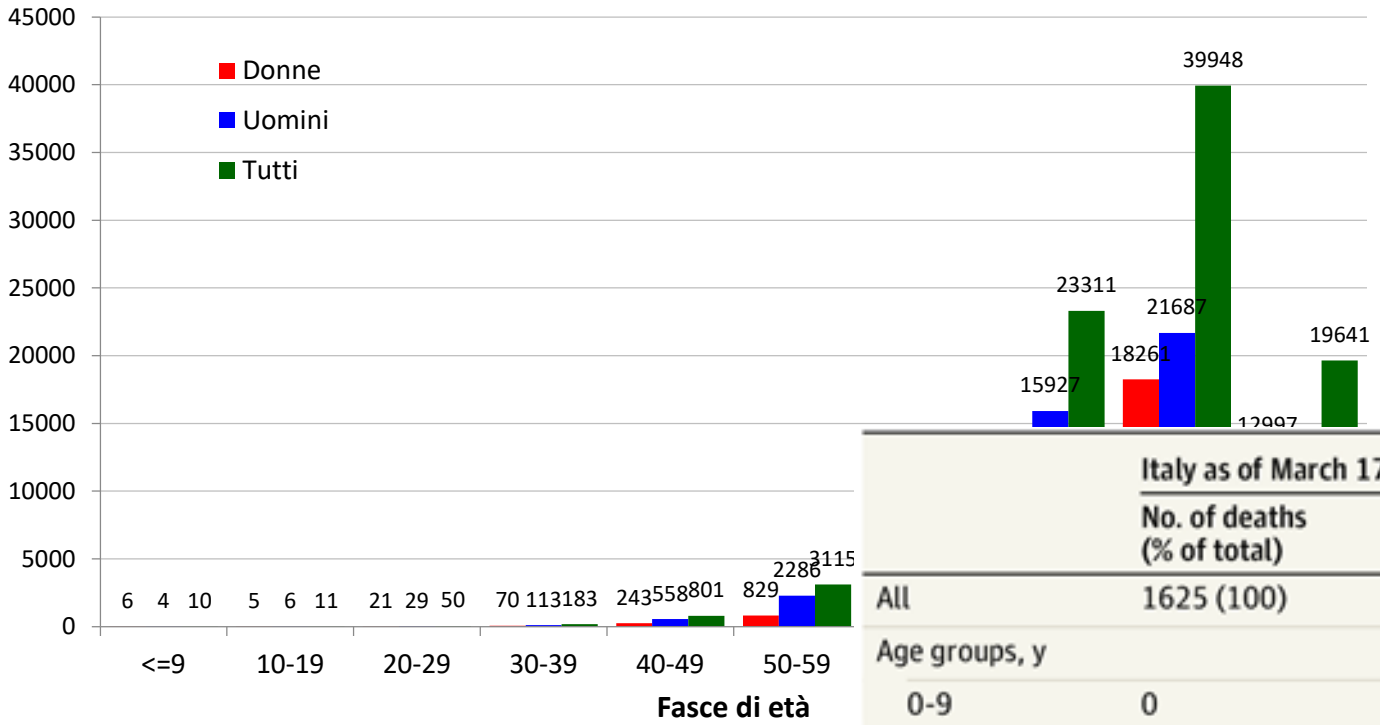
Age and COVID-19 related mortality



Absolute number of death by age group in Italy
https://www.epicentro.iss.it/en/coronavirus/bollettino/

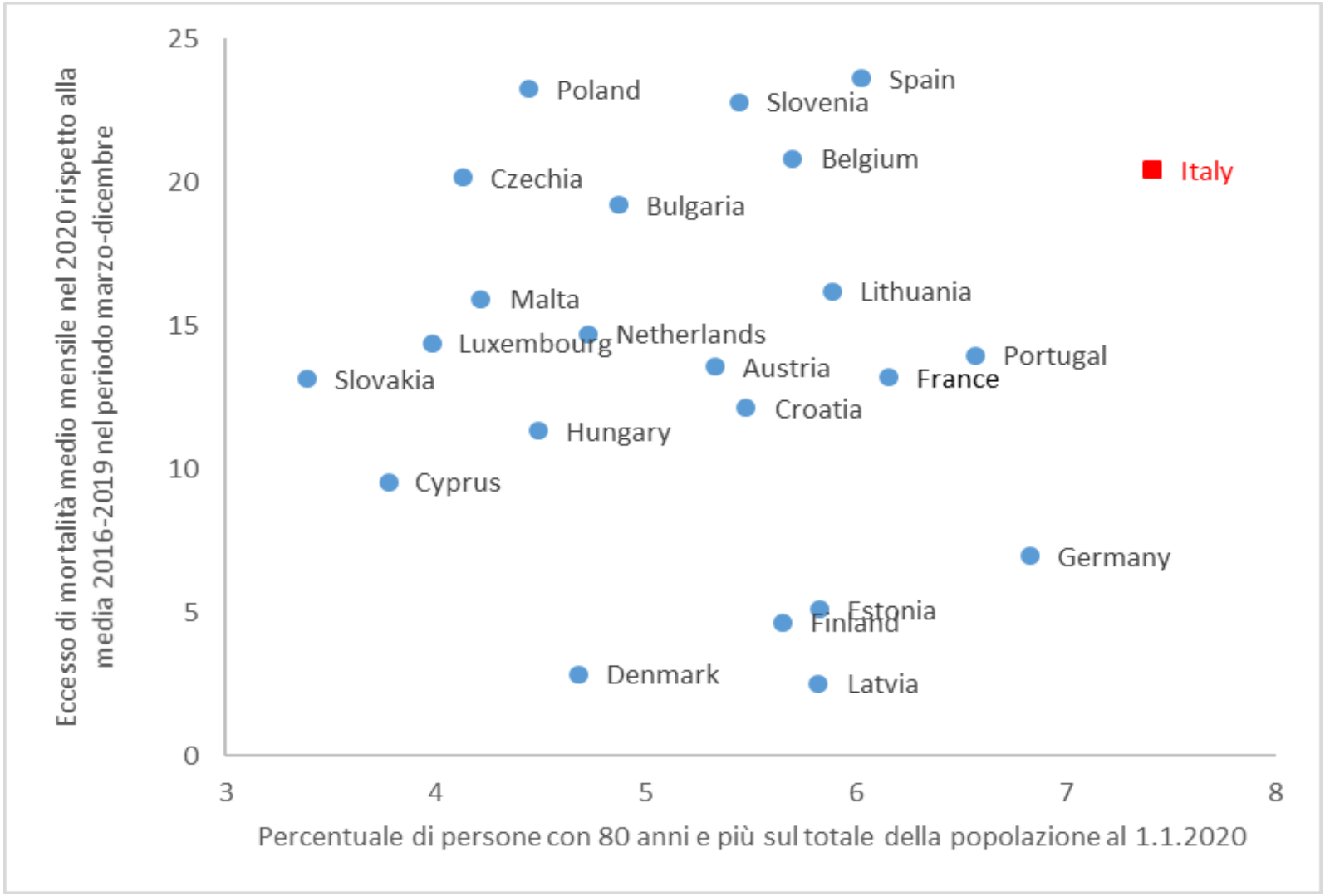
	Italy as of March 17, 2020		China as of February 11, 2020	
	No. of deaths (% of total)	Case-fatality rate, %[b]	No. of deaths (% of total)	Case-fatality rate, %[b]
All	1625 (100)	7.2	1023 (100)	2.3
Age groups, y				
0-9	0	0	0	0
10-19	0	0	1 (0.1)	0.2
20-29	0	0	7 (0.7)	0.2
30-39	4 (0.3)	0.3	18 (1.8)	0.2
40-49	10 (0.6)	0.4	38 (3.7)	0.4
50-59	43 (2.7)	1.0	130 (12.7)	1.3
60-69	139 (8.6)	3.5	309 (30.2)	3.6
70-79	578 (35.6)	12.8	312 (30.5)	8.0
≥80	850 (52.3)	20.2	208 (20.3)	14.8

Case-fatality rate by age group in Italy and China
Onder G et al. JAMA 2020

Eccesso di mortalità nel 2020

Classe di età	Maschi				Femmine				Totale			
	gennaio-febbraio	marzo-maggio	ottobre-dicembre	anno 2020	gennaio-febbraio	marzo-maggio	ottobre-dicembre	anno 2020	gennaio-febbraio	marzo-maggio	ottobre-dicembre	anno 2020
Nord												
0-49	-11,1	2,9	0,6	-6,0	-8,5	-5,3	-9,3	-7,9	-10,2	-0,2	-3,1	-6,7
50-64	-5,4	48,0	26,4	17,0	-1,6	23,6	14,0	8,9	-4,0	38,9	21,8	14,0
65-79	-9,6	67,6	38,3	23,6	-10,4	45,2	25,0	14,3	-9,9	58,7	33,0	19,9
80+	-2,6	74,3	52,9	33,6	-7,0	62,4	42,0	26,0	-5,3	67,1	46,4	29,0
Centro												
0-49	-7,2	-15,1	-9,0	-12,0	-16,5	-4,6	-9,2	-11,3	-10,9	-11,1	-9,1	-11,7
50-64	-9,5	7,6	24,9	5,7	-13,5	0,8	12,6	1,0	-11,0	5,0	20,1	3,9
65-79	-9,2	8,2	23,7	5,4	-9,1	1,7	13,4	2,6	-9,1	5,6	19,5	4,3
80+	-3,3	14,2	31,8	12,7	-7,5	7,6	25,0	8,1	-5,8	10,3	27,9	10,0
Mezzogiorno												
0-49	-3,7	-11,0	1,5	-8,3	-15,4	-11,3	-1,5	-10,1	-8,0	-11,1	0,4	-9,0
50-64	0,5	4,3	28,7	10,1	-1,3	3,4	24,2	8,1	-0,2	4,0	27,1	9,3
65-79	-3,9	4,8	34,6	9,0	-11,6	0,5	22,8	2,9	-7,0	3,0	29,8	6,5
80+	-3,0	7,7	29,7	10,7	-5,8	6,8	22,9	7,7	-4,6	7,2	25,8	8,9
Italia												
0-49	-7,5	-5,9	-0,8	-8,0	-12,8	-7,4	-6,3	-9,4	-9,5	-6,5	-2,9	-8,5
50-64	-3,9	23,9	27,0	12,2	-3,8	11,6	17,5	7,1	-3,9	19,3	23,4	10,3
65-79	-7,5	34,3	34,2	15,0	-10,6	20,9	21,9	8,0	-8,7	28,9	29,3	12,2
80+	-2,9	39,8	41,2	21,8	-6,7	33,7	32,8	16,6	-5,2	36,2	36,2	18,7

Eccesso di mortalità nel 2020 ed età della popolazione



Dati Eurostat

Agenda

- Risk factors for older adults
  - Age
  - Chronic diseases/multimorbidity
  - Frailty/disability
  - Dementia
  - Obesity
- Symptoms presentation in older adults
- What has changed in the last 2 months in the NH setting?

COVID-19 deaths by Multimorbidity

	All (n = 3,032)	Younger Adults <65 y (n = 368)	Older Adults ≥ 65 y (n = 2,664)	
	n (%)	n (%)	n (%)	p-Value[a]
Comorbidities				
Ischemic heart disease	856 (28.2)	42 (11.4)	814 (30.6)	<.001
Atrial fibrillation	681 (22.5)	18 (4.9)	663 (24.9)	<.001
Heart failure	490 (16.2)	31 (8.1)	459 (16.9)	<.001
Stroke	310 (10.2)	16 (4.3)	294 (11.0)	<.001
Hypertension	2,071 (68.3)	188 (51.1)	1,883 (70.7)	<.001
Type 2 diabetes	914 (30.1)	106 (28.8)	808 (30.3)	.586
Dementia	480 (15.8)	12 (3.3)	468 (17.6)	<.001
Diarrhea	175 (5.8)	34 (9.3)	141 (5.4)	.004
Hemoptysis	17 (0.6)	3 (0.8)	14 (0.5)	.453
Complications during hospitalization				
Acute Respiratory Distress Syndrome	2,856 (96.9)	353 (97.2)	2,503 (96.9)	.871
Acute renal failure	641 (21.8)	109 (30.0)	532 (20.6)	<.001
Acute cardiac injury	314 (10.7)	49 (13.5)	265 (10.3)	.069
Superinfection	364 (12.4)	112 (30.9)	252 (9.8)	<.001
Treatments				
Antibiotics	2,390 (85.4)	338 (90.6)	2,216 (84.9)	.003
Antivirals	1,760 (59.0)	268 (71.8)	1,492 (57.2)	<.001
Steroids	1,115 (37.4)	178 (47.7)	937 (35.9)	<.001

	All (n=3,032)	**< 65 years (n=368)**	**≥ 65 years (n=2,664)**
0 diseases	124 (4.1%)	40 (10.9%)	84 (3.2%)
1 disease	454 (15.0%)	85 (23.1%)	369 (13.9%)
2 diseases	648 (21.4%)	82 (22.3%)	566 (21.2%)
3 or more diseases	1,806 (59.6%)	161 (43.8%)	1,545 (61.7%)

Multimorbidity in persons dying with COVID-19

Clinical chart review

Patients had a high number of comorbidities (mean number 3.2 ± 1.9). Hypertension, diabetes, and ischemic heart disease were the most common pre-existing comorbidities.

Palmieri L, et al. J Gerontol A Biol Sci Med Sci. 2020

COVID-19 deaths and complications

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Dementia	480 (15.8)	12 (3.3)	468 (17.6)	<.001
COPD	498 (16.4)	41 (11.1)	457 (17.2)	.003
Active cancer	480 (15.8)	56 (15.2)	424 (15.9)	.761
Chronic liver disease	120 (4.0)	24 (6.5)	96 (3.6)	.010
Chronic renal failure	618 (20.4)	42 (11.4)	576 (21.6)	<.001
Dialysis	55 (1.8)	9 (2.4)	46 (1.7)	.301
HIV	6 (0.2)	4 (1.1)	2 (0.1)	.003
Autoimmune diseases	115 (3.8)	15 (4.1)	100 (3.8)	.770
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Acute cardiac injury	314 (10.7%)	49 (13.5%)	265 (10.3%)
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Complications in persons dying with COVID-19

Clinical chart review

Palmieri L, et al. J Gerontol A Biol Sci Med Sci. 2020

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Complications in persons dying with COVID-19

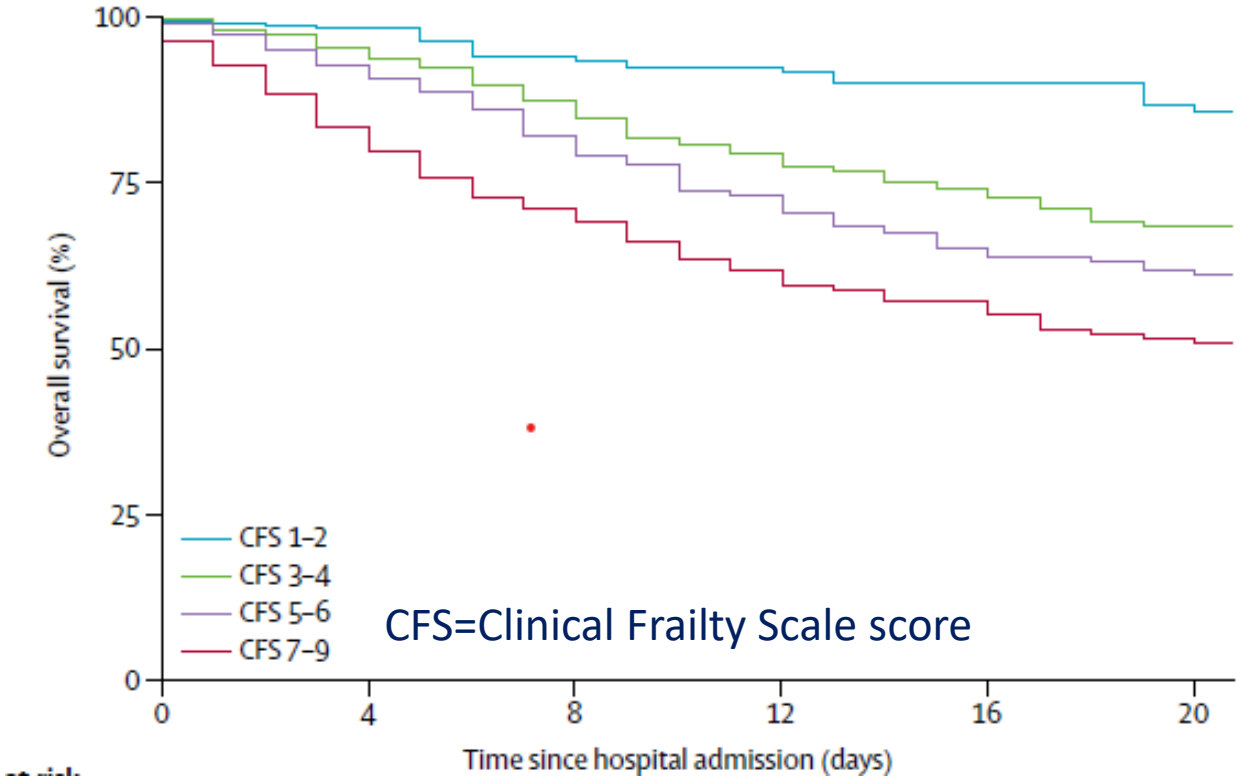
Clinical chart review

Older adults → vulnerability for pre-existing conditions

Younger adults → die when non-respiratory complications occurr

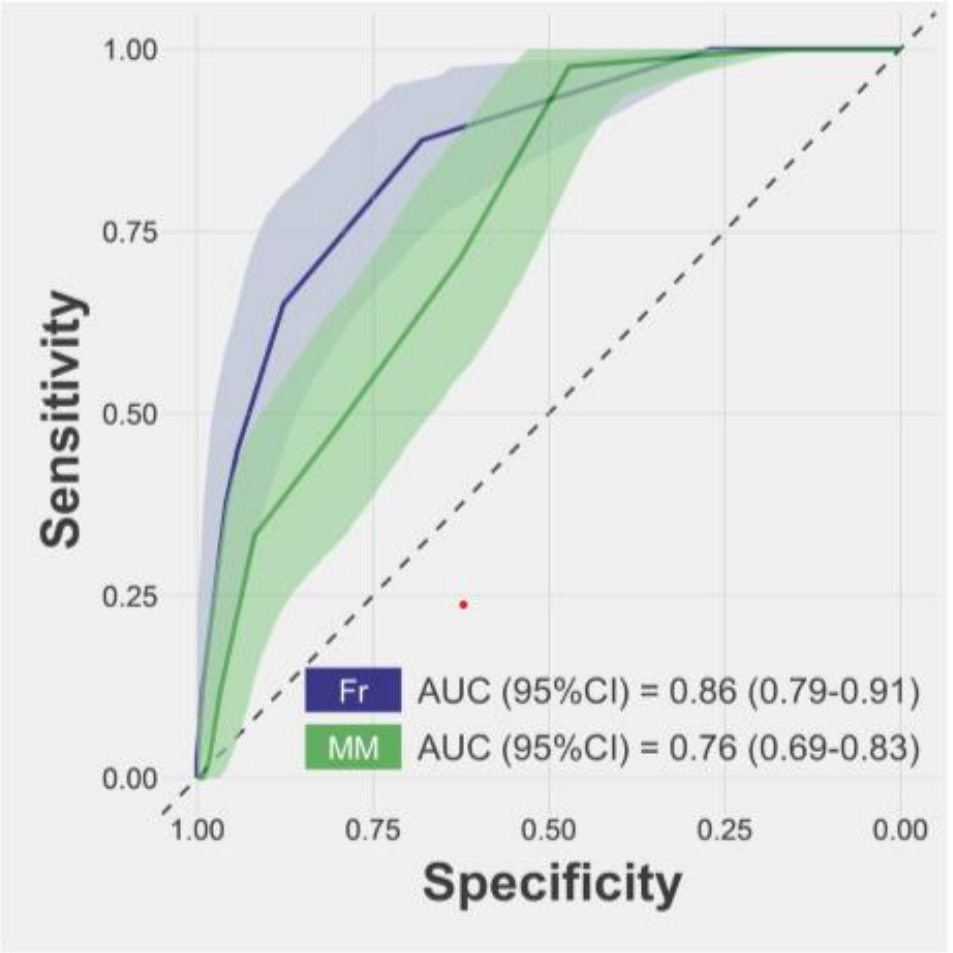
Palmieri L, et al. J Gerontol A Biol Sci Med Sci. 2020

COVID-19, frailty and multimorbidity



Survival by Clinical Frailty Scale score

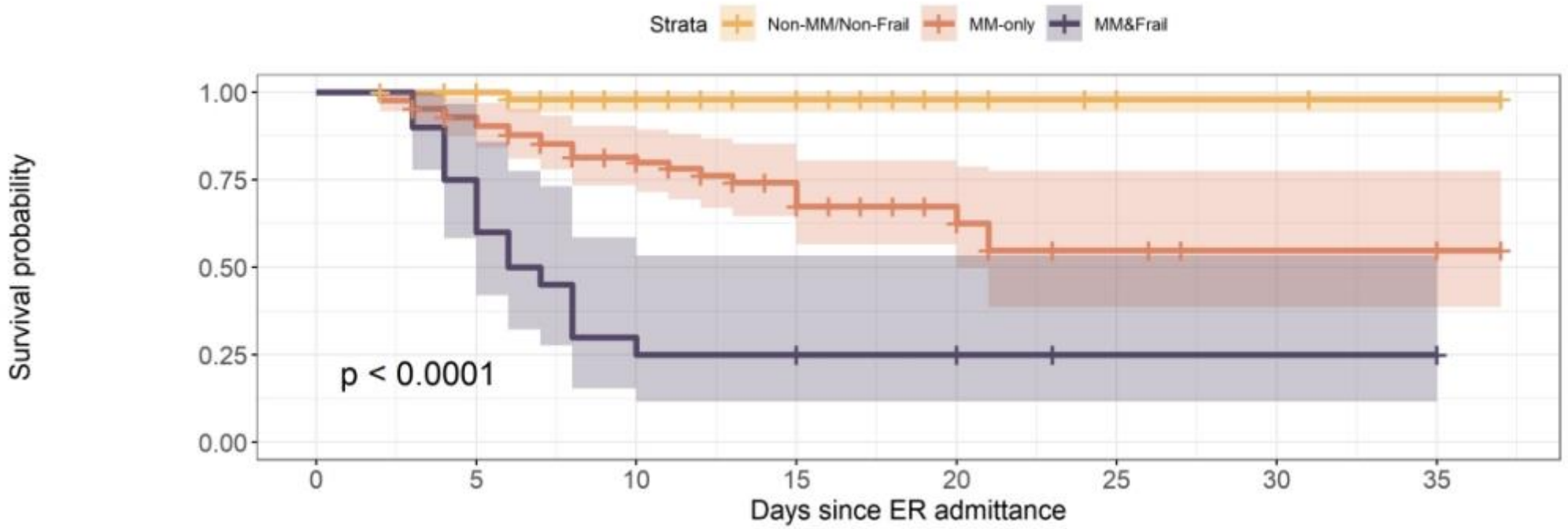
Hewitt J et al. Lancet Public Health 2020



ROC curves for Clinical Frailty Scale (Fr) score and mulimorbidity (MM) in the prediction of mortality.

Marengoni A et al. J Gerontol 2020

COVID-19, frailty and multimorbidity



Beyond chronological age: Frailty and multimorbidity predict in-hospital mortality in patients with coronavirus disease 2019

Marengoni A et al. J Gerontol 2020

COVID-19 and deaths in Down Syndrome

In Italy **0.5% of COVID-19 related deaths occurred in persons with DS**
Prevalence of DS in the Italian population is about 0.05%
Mortality in DS is **10 times greater** than the general population

Compared with individuals without DS, those with DS deceased with COVID-19 were **younger (52 vs. 78 years)** and presented a higher incidence of **superinfections (31% vs. 13%)**.
Autoimmune diseases (43% vs. 4%), **obesity** (37% vs. 11%) and **dementia** (38% vs. 16%) were more prevalent in individuals with DS.

Specific strategies in the population with DS are needed.

Villani ER et al. Am J Med Genet A 2020

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Type 2 diabetes	914 (30.1)	106 (28.8)	808 (30.3)	.586
Dementia	480 (15.8)	12 (3.3)	468 (17.6)	<.001
No. of comorbidities				
0	124 (4.1)	40 (10.9)	84 (3.2)	<.001
1	454 (15.0)	85 (23.1)	369 (13.9)	
2	648 (21.4)	82 (22.3)	566 (21.2)	
3 or more	1,806 (59.6)	161 (43.8)	1,645 (61.7)	
COVID-19 Symptoms				
Fever	2,292 (76.4)	283 (77.3)	2,009 (76.3)	.694
Dyspnea	2,211 (73.7)	270 (73.8)	1,941 (73.7)	1.000
Cough	1,162 (38.7)	146 (39.9)	1,016 (38.6)	.647
Diarrhea	175 (5.8)	34 (9.3)	141 (5.4)	.004
Hemoptysis	17 (0.6)	3 (0.8)	14 (0.5)	.453
Complications during hospitalization				
Acute Respiratory Distress Syndrome	2,856 (96.9)	353 (97.2)	2,503 (96.9)	.871
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Dementia in persons dying with COVID-19

Clinical chart review

Clinical Characteristics of Hospitalized Individuals Dying With COVID-19 by Age Group in Italy

Palmieri L, et al. J Gerontol A Biol Sci Med Sci. 2020

COVID-19 related deaths by dementia status

	No dementia (n=2,206)	Dementia (n=415)	p-value
Demographics			
Age	77.0 ± 10.9	84.3 ± 8.1	<0.001
Female sex	654 (29.6)	196 (47.2)	<0.001
Symptoms			
Fever	1,639 (76.3)	300 (77.3)	0.70
Dyspnea	1,597 (74.3)	267 (68.8)	0.03
Cough	865 (40.3)	120 (30.9)	<0.01
Treatments			
Antivirals, hydroxychloroquine, chloroquine	1,291 (60.6)	163 (41.6)	<0.001
Steroids	817 (38.4)	123 (31.4)	<0.01
Clinical course			
Admission to intensive care unit	469 (23.2)	17 (4.5)	<0.001
Time from onset to SARS-CoV-2 testing (days)	5 (3-9)	4 (2-7)	<0.001
Time from onset to hospitalization (days)	4 (2-7)	3 (1-6)	<0.001
Time from onset to death (days)	11 (7-16)	9 (6-13)	<0.001

Canevelli M et al. Alzheimer's & Dementia *2020*

COVID-19 related deaths by dementia status

	No dementia (n=2,206)	Dementia (n=415)	p-value
Demographics			
Age	77.0 ± 10.9	84.3 ± 8.1	<0.001
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Less symptoms

Canevelli M et al. Alzheimer's & Dementia *2020*

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Less symptoms	Dyspnea	1,597 (74.3)	267 (68.8)	0.03
Less symptoms	Cough	865 (40.3)	120 (30.9)	<0.01
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Shorter survival	Time from onset to SARS-CoV-2 testing (days)	5 (3-9)	4 (2-7)	<0.001
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Canevelli M et al. Alzheimer's & Dementia *2020*

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  - Frailty/disability
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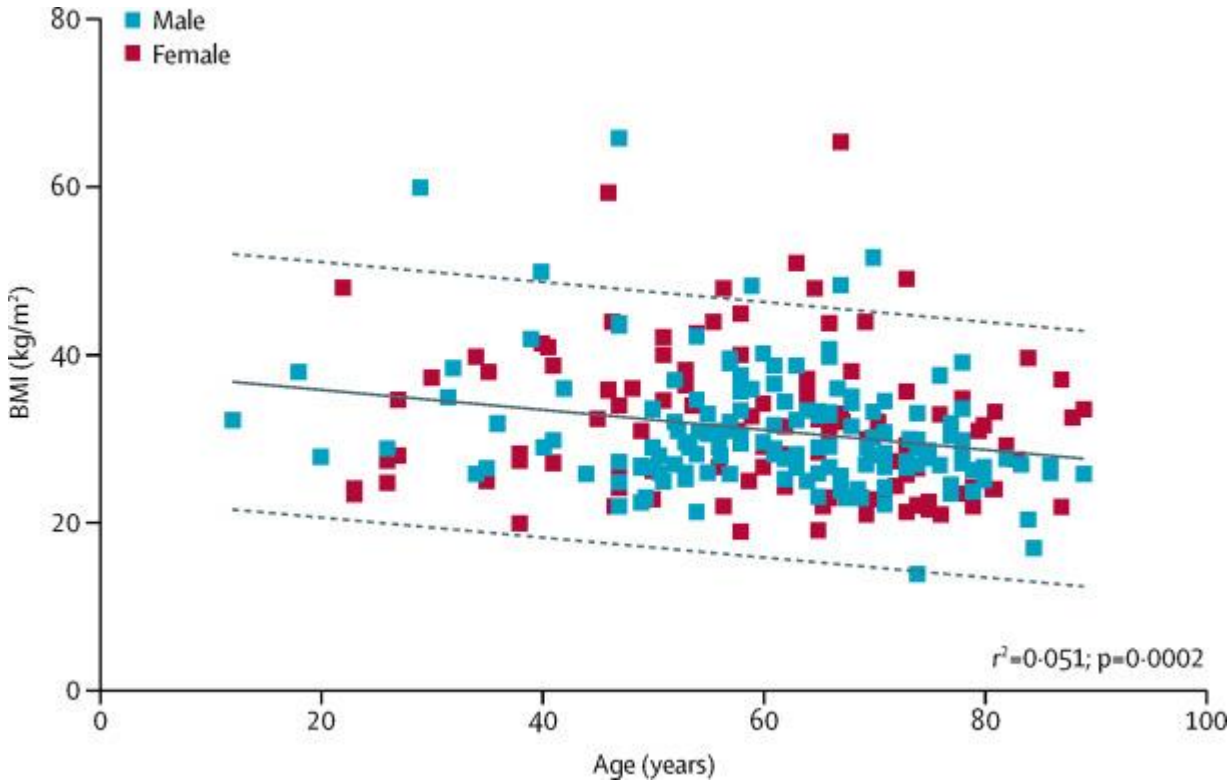
  - Obesity
- Symptoms presentation in older adults
- What has changed in the last 2 months in the NH setting?

Obesity and COVID-19

Obesity is a risk factor for negative outcomes in COVID-19

1. Ventilation restriction
2. Limitation of diaphragm excursion
3. Reduction of immune responses to viral infection
4. Increment in inflammatory response



BMI and age in 265 patients with COVID-19 in intensive care units

Kass DA et al. Lancet 2020

Obesity and COVID-19

Obesity in persons dying with COVID-19

Clinical chart review

	All (*n* = 3,032)	Younger Adults <65 y (*n* = 368)	Older Adults ≥ 65 y (*n* = 2,664)	
	n (%)	*n* (%)	*n* (%)	*p*-Value[a]
Comorbidities				
Ischemic heart disease	856 (28.2)	42 (11.4)	814 (30.6)	<.001
Atrial fibrillation	681 (22.5)	18 (4.9)	663 (24.9)	<.001
Heart failure	490 (16.2)	31 (8.1)	459 (16.9)	<.001
Stroke	310 (10.2)	16 (4.3)	294 (11.0)	<.001
Hypertension	2,071 (68.3)	188 (51.1)	1,883 (70.7)	<.001
Type 2 diabetes	914 (30.1)	106 (28.8)	808 (30.3)	.586
Dementia	480 (15.8)	12 (3.3)	468 (17.6)	<.001
COPD	498 (16.4)	41 (11.1)	457 (17.2)	.003
Active cancer	480 (15.8)	56 (15.2)	424 (15.9)	.761
1	454 (15.0)	85 (23.1)	369 (13.9)	
2	648 (21.4)	82 (22.3)	566 (21.2)	
3 or more	1,806 (59.6)	161 (43.8)	1,645 (61.7)	
COVID-19 Symptoms				
Fever	2,292 (76.4)	283 (77.3)	2,009 (76.3)	.694
Dyspnea	2,211 (73.7)	270 (73.8)	1,941 (73.7)	1.000
Cough	1,162 (38.7)	146 (39.9)	1,016 (38.6)	.647
Diarrhea	175 (5.8)	34 (9.3)	141 (5.4)	.004
Hemoptysis	17 (0.6)	3 (0.8)	14 (0.5)	.453
Complications during hospitalization				
Acute Respiratory Distress Syndrome	2,856 (96.9)	353 (97.2)	2,503 (96.9)	.871
Acute renal failure	641 (21.8)	109 (30.0)	532 (20.6)	<.001
Acute cardiac injury	314 (10.7)	49 (13.5)	265 (10.3)	.069
Superinfection	364 (12.4)	112 (30.9)	252 (9.8)	<.001
Treatments				
Antibiotics	2,390 (85.4)	338 (90.6)	2,216 (84.9)	.003
Antivirals	1,760 (59.0)	268 (71.8)	1,492 (57.2)	<.001
Steroids	1,115 (37.4)	178 (47.7)	937 (35.9)	<.001

	All (n=3,032)	**< 65 years (n=368)**	**≥ 65 years (n=2,664)**
Obesity	335 (11.0%)	108 (29.3%)	227 (8.5%)

Clinical Characteristics of Hospitalized Individuals Dying With COVID-19 by Age Group in Italy

Palmieri L, et al. J Gerontol A Biol Sci Med Sci. 2020

Obesity and non-respiratory complications

	Age < 60 years (n=291)				
	Obesity n=81 n *(%)*	**No obesity n=210 n *(%)***	***p-value***		**Odds Ratio (95% Confidence Interval)***
Myocardial infarction	11 (13.6)	25 (11.9)	0.694		0.86 (0.37-1.96)
Acute renal failure	35 (43.2)	46 (21.9)	<0.001		2.00 (1.09-3.67)
Superinfection	33 (40.7)	64 (30.5)	0.099		1.05 (0.58-1.90)
Shock	52 (64.2)	82 (39.0)	<0.001		2.37 (1.29-4.36)
	Age ≥ 60 years (n=3,403)				
	Obesity n=330 n (%)	**No obesity n=3,073 n (%)**	**p-value**		**Odds Ratio (95% Confidence Interval)***
Myocardial infarction	40 (12.1)	321 (10.4)	0.347		1.00 (0.69-1.45)
Acute renal failure	91 (27.6)	668 (21.7)	0.018		1.20 (0.90-1.60)
Superinfection	65 (19.7)	406 (13.2)	0.002		1.05 (0.76-1.44)
Shock	92 (27.9)	535 (17.4)	<0.001		1.22 (0.91-1.65)

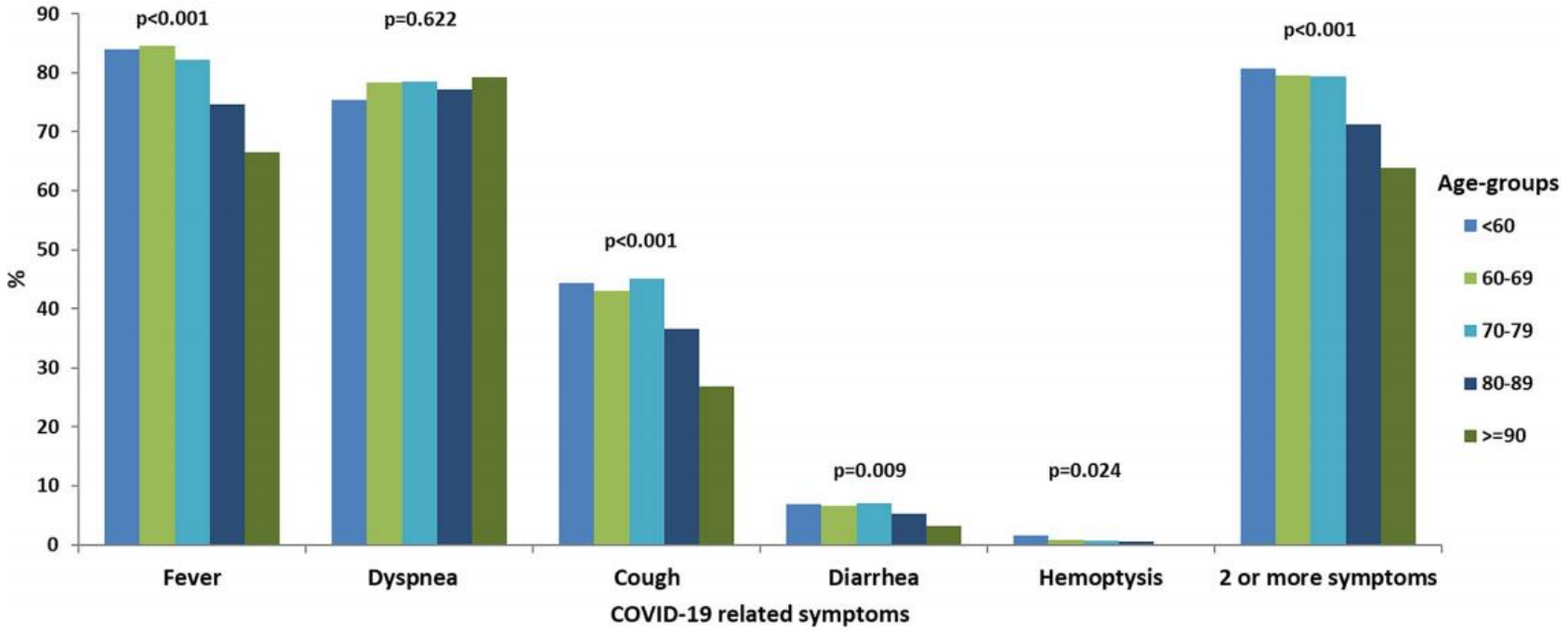
Reverse epidemiology in COVID-19?

Onder G et al. Obesity 2020

Agenda

- Risk factors for older adults
  - Age
  - Chronic diseases/multimorbidity
  - Frailty/disability
  - Dementia
  - Obesity
- Symptoms presentation in older adults
- What has changed in the last 2 months in the NH setting?

Symptoms at hospital admission by age group



Sintomi atipici dell'anziano:

- Delirium
- Cadute
- Apatia
- Confusione
- Disorientamento
- Sonnolenza

Unim B et al. Aging Clin Exp Res 2021

Agenda

- Risk factors for older adults
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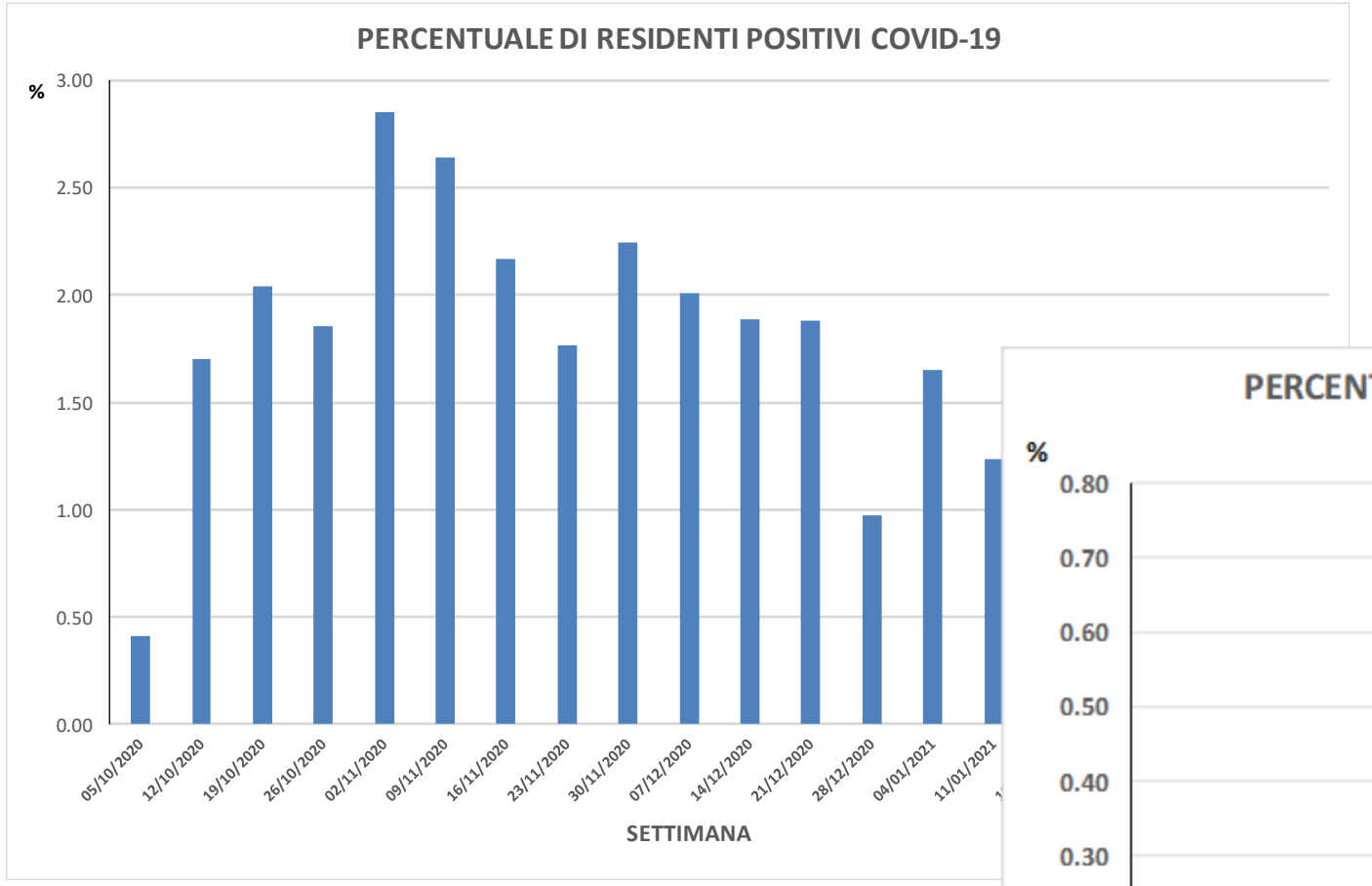
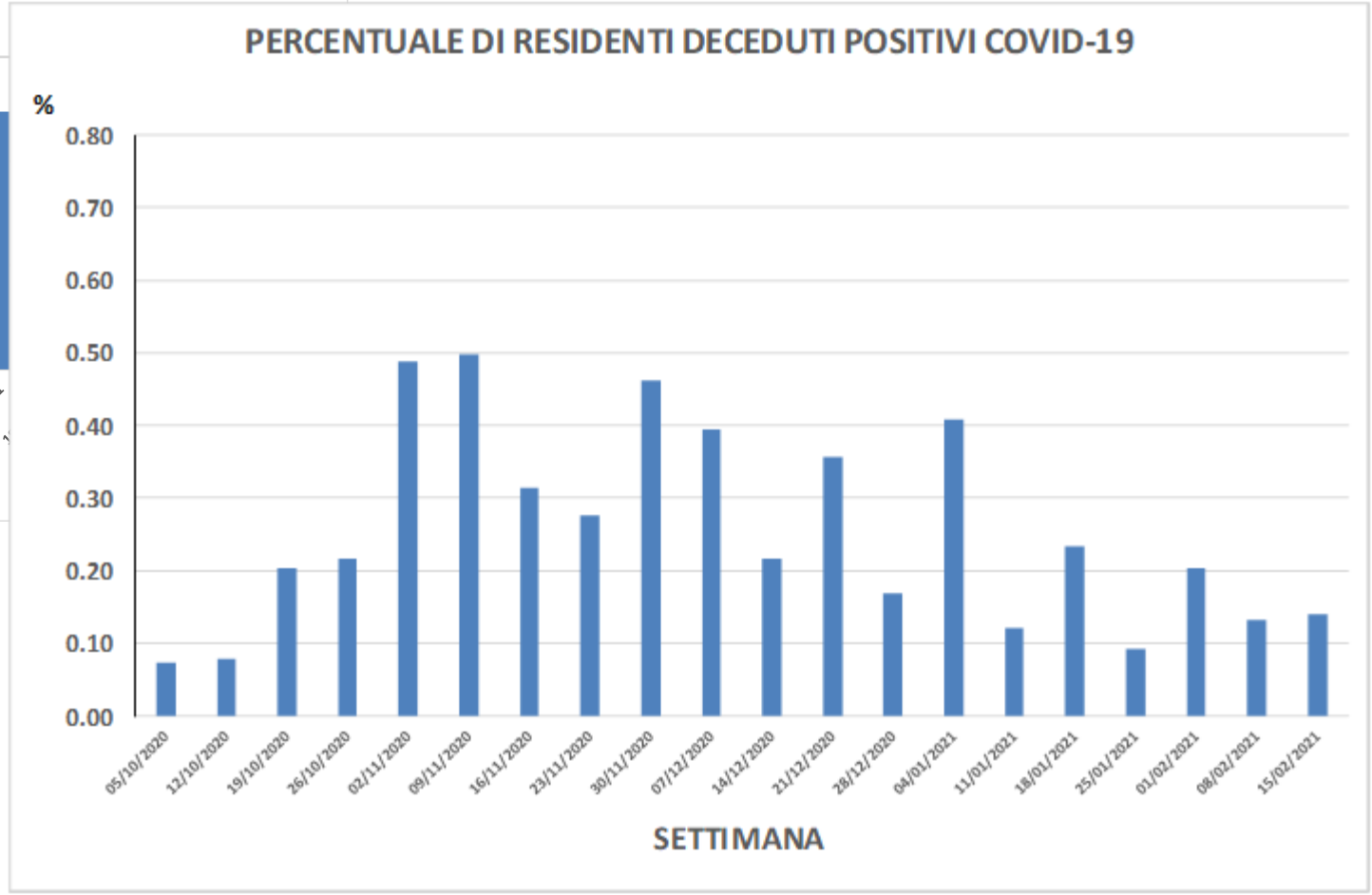
COVID-19 cases and deaths in NH





Conclusions

1. Older adults are at higher risk for negative health outcomes in COVID-19
2. Frailty, multimorbidity and chronic conditions can explain this association
3. Atypical presentation of symptoms is common in older adults
4. Since the beginning of the vaccination campaign number of COVID-19 cases and deaths was reduced in the NH

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