

# Factors Associated with Early and Late COVID-19-related Deaths in Riyadh City, Saudi Arabia: A Prospective Cohort Study

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## Background

Coronavirus disease (COVID-19) can cause severe acute respiratory distress syndrome (ARDS), which can progress to respiratory failure and death.

## Objective

To compare risk factors associated with early and late deaths in COVID-19 patients admitted to the intensive care unit (ICU).

## Methods

We prospectively followed up all critically ill patients with a confirmed diagnosis of COVID-19 who died in the adult ICU tertiary hospital in Riyadh, from January to December 2020. We analysed demographic characteristics, presenting symptoms, clinical complications, comorbidities, use of mechanical ventilation. Patients were divided into two groups according to the admission to death duration, Group 1 < 14 days (n = 71) and group 2 > 14 days (n = 89).

## Results

A total of 160 deaths underwent detailed analysis. Their median age was 60.4 years, and the majority of patients (123/160, 77.5%) were male. Patients aged 60-69 years there were significantly more likely to die later. Persistent dry cough and prolonged ARDS were associated with a significantly increased risk of a late death (adjusted odds ratio [95% CI], 6.91 [1.9–25.3] and 2.5 [1.3–5.0] respectively).

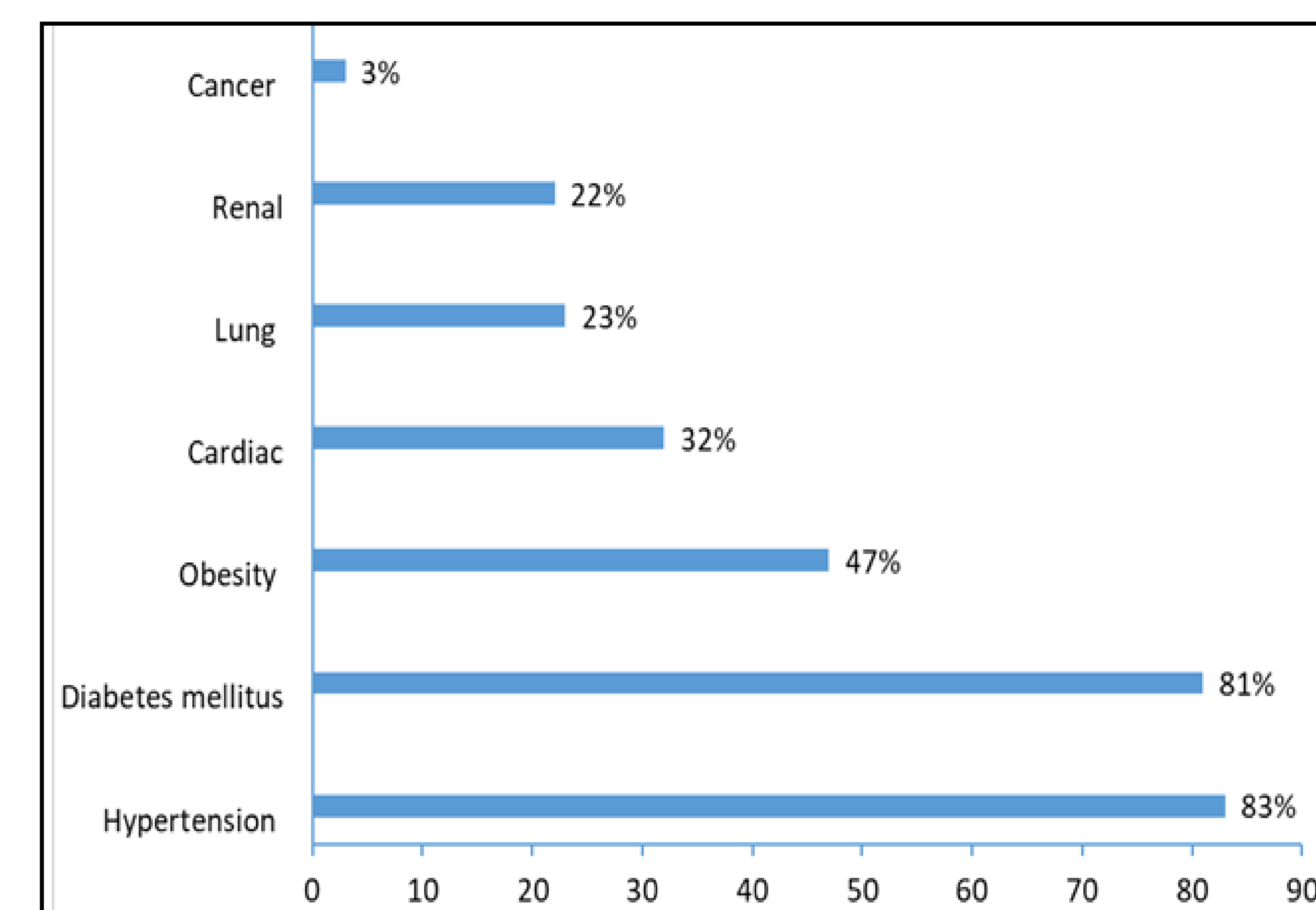
Table 1: Baseline characteristics for studied population according to admission to death duration.

Characteristics		Group1: <14 days N = 71 (44.4%)	Group2: >14 days N = 89 (55.6%)	P value
Gender	Male	54 (76.1)	69 (77.5)	0.8
	Female	17 (23.9)	20 (22.5)	
Age (y)	mean	61.5 ± 16.4	59.6 ± 12.1	0.4
Age (y) group	30-39 y	8 (11.3%)	5 (5.6%)	0.2
	40-49 y	11 (15.5%)	15 (16.9%)	0.8
	50-59 y	16 (22.5%)	20 (22.5%)	0.9
	60-69 y	14 (19.7%)	30 (33.7%)	0.04*
	70-79 y	8 (11.3%)	14 (15.7)	0.4
	≥80 y	14 (19.7%)	5 (5.6%)	0.006*
BMI		28.6 ± 7.7	28.7 ± 5.7	0.9
Smoking	No	59 (83.1)	77 (86.5)	0.5
	Yes	12 (16.9)	12 (13.5)	
Nationality	Saudi	23 (32.4)	21 (23.6)	0.2
	Non-Saudi	48 (67.6)	68 (76.4)	
Mechanical ventilator used		59 (83)	89 (100)	< 0.001

Table 2: Multivariable logistic regression analysis showing the independent risk factors for late death (>14 days after admission).

Risk factor	B	S.E.	P-value	OR	95% C.I.	
					Lower	Upper
ARDS	.933	.348	.007	2.542	1.286	5.026
Cough	1.933	.663	.004	6.910	1.884	25.340

Figure 1. Associated comorbidities of studied population.



## Conclusion

Preexisting lung disease in men aged 60-69 years was strongly associated with COVID-19-related deaths. A persistent dry cough and prolonged ARDS were associated with late death.