

ONLINE-ONLY SUPPLEMENTARY MATERIALS

These supplemental materials have been provided by the authors to give the readers additional information about the study.

Risk factors for severe outcomes in people with diabetes hospitalized for COVID-19: A cross-sectional “Covid Data Save Lives” database study

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TABLE OF CONTENTS		
		PAGE
Supplementary Table 1	Basal vital signs and laboratory measurements of patients admitted for coronavirus according to the presence of diabetes mellitus	2
Supplementary Figure 1.	Proportion of events (%) during hospitalization according to the presence of diabetes and age group (A) and sex (B).	4
Supplementary Table 2.	Number of events in patients with pre-existing diabetes and stress hyperglycaemia/unknown diabetes.	5
Supplementary Table 3.	Clinical characteristics at baseline as predictors of death vs death or invasive mechanical ventilation according to the model with all potential independent variables included.	6
Supplementary Table 4.	Mortality model evaluating diabetes and interactions with other clinical comorbid conditions regarding the outcome of death.	7
Supplementary Table 5.	Clinical characteristics at baseline associated with in-hospital death stratified for diabetes status (model 3, namely the model with all demographic and clinical variables included).	8
Supplementary Table 6.	Clinical characteristics at baseline associated to in-hospital death or mechanical ventilation stratified for diabetes status (model 3, namely the model with all demographic and clinical variables included).	9
Supplementary Table 7.	Multivariate model of the association between predictors and the odds of death and death or invasive mechanical ventilation based on the nonlinear glucose curve.	10
Supplementary text	Database description.	11

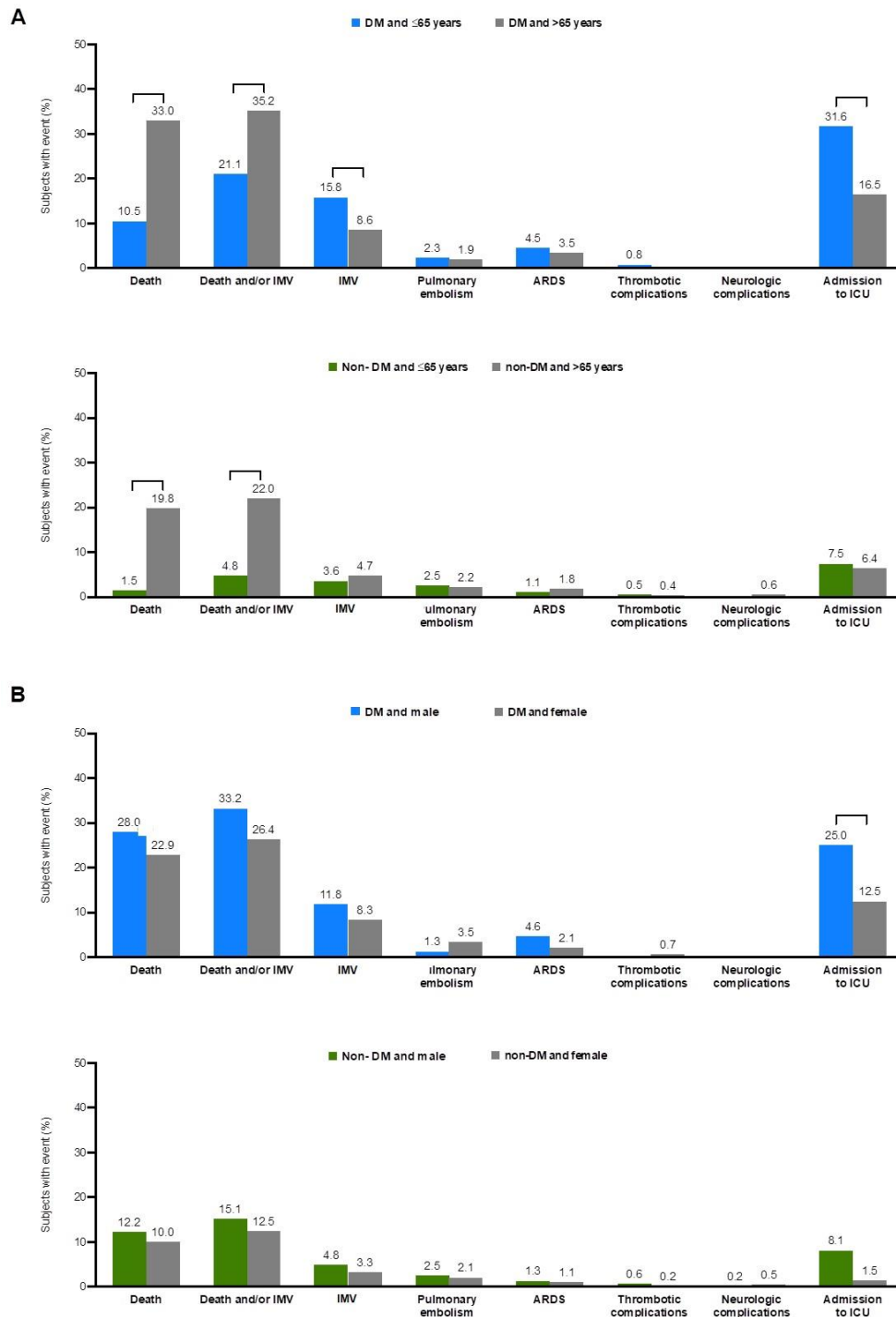
Supplementary Table 1. Basal vital signs and laboratory measurements of patients admitted for coronavirus according to the presence of diabetes mellitus

	Diabetes N=448	No diabetes N=1621	p-value
Vital signs			
Systolic blood arterial pressure, mean (SD), mmHg	128 (19.7)	123 (19.3)	0.037
Diastolic blood arterial pressure, mean (SD), mmHg	72.0 (12.1)	71.1 (12.5)	0.501
Heart rate, mean (SD), bpm	80.2 (14.7)	79.4 (14.9)	0.641
Temperature, mean (SD), °C	36.5 (0.823)	36.5 (0.805)	0.086
Basal laboratory measurements			
Renal function			
Glomerular filtration (CKD-EPI), mean (SD), mL/min/1.73 m ²	73.5 (26.5)	81.2 (23.9)	<0.001
Creatinine, mean (SD), mg/dL	1.09 (0.716)	0.943 (0.510)	<0.001
Inflammation markers			
Procalcitonin, mean (SD), ng/mL	0.661 (1.30)	0.387 (1.30)	<0.001
C-reactive protein, mean (SD), mg/L	97.1 (107)	75.9 (82.5)	<0.001
Other biochemical markers			
D-dimer, mean (SD), ng/mL	3990 (10800)	2340 (6720)	<0.001
Liver function			
Alkaline phosphatase, mean (SD), U/L	78.3 (39.1)	78.6 (62.3)	0.984
Lactate dehydrogenase, mean (SD), U/L	644 (399)	575 (311)	<0.001
Gamma-glutamyl transferase, mean (SD), U/L	93.8 (135)	88.4 (123)	0.804
Aspartate aminotransferase, mean (SD), U/L	49.6 (165)	42.7 (57.8)	0.022
Alanine aminotransferase, mean (SD), U/L	51.7 (136)	45.1 (60.6)	0.354
Haematology parameters			
Haemoglobin, mean, (SD), g/dL	13.1 (2.09)	13.6 (1.84)	0.433
Leucocytes, mean (SD), x10 ³ /μL	8.91 (6.52)	7.47 (4.17)	<0.001
Platelets, mean (SD), x10 ³ /μL	247 (112)	250 (116)	0.705

Monocytes, mean (SD), %	7.21 (5.29)	8.19 (3.91)	<0.001
Lymphocytes, mean (SD), %	15.6 (10.0)	19.0 (10.9)	<0.001
Neutrophils, mean (SD), %	76.1 (13.5)	71.8 (13.5)	<0.001
Prothrombin time, mean (SD), s	15.6 (15.6)	14.8 (10.5)	0.076
Electrolytes			
Phosphorus, mean (SD), mg/dL	3.39 (0.971)	3.15 (0.731)	0.026
Sodium, mean (SD), mg/dL	138 (6.41)	138 (4.35)	0.537
Calcium, mean (SD), mg/dL	8.31 (0.648)	8.39 (0.574)	0.102
Blood gases			
CO ₂ pressure, mean (SD), mmHg	37.8 (9.95)	35.8 (7.42)	0.007
O ₂ pressure, mean (SD), mmHg	73.4 (35.4)	67.5 (30.9)	0.216
O ₂ saturation, mean (SD), %	90.3 (11.4)	89.1 (13.6)	0.694

CKD-EPI, Glomerular filtration rate estimate based on the CKD-EPI (Chronic Kidney Disease Epidemiology Collaboration) equation.

Supplementary Figure 1. Proportion of events (%) during hospitalization according to the presence of diabetes and age group (A) and sex (B).



ARDS, acute respiratory distress syndrome; DM, diabetes mellitus; ICU, intensive care unit; IMV, invasive mechanical ventilation. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Supplementary table 2. Number of events in patients with pre-existing diabetes and stress hyperglycaemia/unknown diabetes

	Pre-existing diabetes (DM codes and/or HbA1c \geq 6.5% and/or antidiabetic treatment N=302	Stress hyperglycaemia/unknown diabetes glucose \geq 200 mg/dl or insulin use in the first 24 hours of admission N=146
Death	69 (22.8%)	49 (33.6%)
Death and or invasive mechanical ventilation	79 (26.2%)	60 (41.1%)
Invasive mechanical ventilation	22 (7.28%)	26 (17.8%)
Pulmonary embolism	5 (1.66%)	4 (2.74%)
Acute respiratory distress syndrome (ARDS)	7 (2.32%)	10 (6.85%)
Thrombotic complications	1 (0.33%)	0 (0.00%)
Neurologic complications	0 (0.00%)	0 (0.00%)
Admission to intensive care unit	23 (7.62%)	71 (48.6%)

Supplementary Table 3. Clinical characteristics at baseline as predictors of death vs death or invasive mechanical ventilation according to the model with all potential independent variables included

Predictors	Death			Death or invasive mechanical ventilation		
	Odds Ratios	95% CI	p-value	Odds Ratios	95% CI	p-value
Diabetes (yes)	2.325 ***	1.719–3.144	<0.001	2.107 ***	1.608–2.761	<0.001
Sex (male)	1.977 ***	1.463–2.670	<0.001	1.663 ***	1.276–2.167	<0.001
Age (years)	1.102 ***	1.087–1.117	<0.001	1.063 ***	1.052–1.075	<0.001
Obesity (yes)	1.297	0.694–2.424	0.414	1.978 **	1.198–3.267	0.008
Hypertension (yes)	1.188	0.874–1.613	0.271	1.188	0.902–1.565	0.221
Hyperlipidaemia (yes)	1.289	0.919–1.808	0.141	1.158	0.853–1.572	0.346
Cardiovascular diseases (yes)	1.721	0.999–2.966	0.051	1.403	0.830–2.370	0.206
Heart failure (yes)	0.964	0.504–1.842	0.911	1.082	0.578–2.023	0.806
Chronic renal insufficiency (yes)	2.135 **	1.246–3.659	0.006	2.096 **	1.255–3.498	0.005
COPD (yes)	1.721 *	1.066–2.779	0.026	2.310 ***	1.498–.564	<0.001
Observations	2069			2069		
R2 Tjur	0.208			0.157		
Hosmer–Lemeshow test	0.26			0.94		

p<0.05 ** p<0.01 *** p<0.001

Supplementary Table 4. Mortality model evaluating diabetes and interactions with other clinical comorbid conditions regarding the outcome of death.

Predictors	Death		
	Odds Ratios	95% CI	p-value
Diabetes * Obesity	0.720	0.214–2.425	0.596
Diabetes * Hyperlipidaemia	0.766	0.407–1.442	0.408
Diabetes * Heart failure	1.406	0.373–5.298	0.614
Diabetes * Chronic kidney disease	0.805	0.273–2.371	0.693
Diabetes * COPD	0.631	0.235–1.696	0.361

Supplementary Table 5. Clinical characteristics at baseline associated with in-hospital death stratified for diabetes status (model 3, namely the model with all demographic and clinical variables included).

Predictors	Without diabetes			Diabetes		
	Odds Ratios	95% CI	p-value	Odds Ratios	95% CI	p-value
Sex (male)	2.107 ***	1.516–2.929	<0.001	2.125 *	1.014–4.451	0.046
Age	1.096 ***	1.081–1.112	<0.001	1.124 ***	1.081–1.170	<0.001
Obesity	1.984	0.938–4.198	0.073	0.826	0.272–2.511	0.736
Hypertension	1.333	0.947–1.876	0.099	0.823	0.400–1.697	0.598
Hyperlipidaemia	1.173	0.780–1.765	0.443	1.729	0.899–3.326	0.101
Cardiovascular diseases	1.943 *	1.033–3.654	0.039	1.368	0.445–4.208	0.584
Heart failure	0.926	0.442–1.944	0.840	1.330	0.323–5.484	0.693
Chronic kidney disease	2.143 *	1.137–4.038	0.018	2.839 *	1.000–8.060	0.050
COPD	1.712	0.984–2.979	0.057	1.404	0.529–3.729	0.495
Observations	1795			274		
R2 Tjur	0.178			0.240		

p<0.05 ** p<0.01 *** p<0.001

Supplementary Table 6. Clinical characteristics at baseline associated to in-hospital death or mechanical ventilation stratified for diabetes status (model 3, namely the model with all demographic and clinical variables included).

Predictors	Without diabetes			Diabetes		
	Odds Ratios	95% CI	p-value	Odds Ratios	95% CI	p-value
Sex (male)	1.710 ***	1.282–2.280	<0.001	2.138 *	1.081–4.226	0.029
Age	1.061 ***	1.050–1.073	<0.001	1.082 ***	1.047–1.118	<0.001
Obesity	2.958 ***	1.651–5.298	<0.001	1.090	0.420–2.827	0.860
Hypertension	1.297	0.955–1.762	0.096	0.920	0.473–1.789	0.806
Hyperlipidaemia	1.165	0.811–1.675	0.408	1.326	0.728–2.415	0.356
Cardiovascular diseases	1.525	0.827–2.814	0.177	1.217	0.426–3.477	0.714
Heart failure	0.923	0.447–1.906	0.829	2.219	0.549–8.971	0.264
Chronic kidney disease	1.993 *	1.084–3.662	0.026	3.140 *	1.163–8.474	0.024
COPD	2.298 **	1.396–3.781	0.001	1.976	0.800–4.885	0.140
Observations	1795			274		
R2 Tjur	0.129			0.190		

p<0.05 ** p<0.01 *** p<0.001

Supplementary Table 7. Multivariate model of the association between predictors and the odds of death and death or invasive mechanical ventilation based on the nonlinear glucose curve.

Predictors	Death			Death or Invasive mechanical ventilation		
	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI	p-value
Sex (male)	1.911 ***	1.375–2.655	<0.001	1.540 **	1.159–2.047	0.003
Age	1.108 ***	1.090–1.125	<0.001	1.062 ***	1.049–1.074	<0.001
Obesity	1.079	0.527–2.206	0.836	1.814 *	1.057–3.112	0.031
Hypertension	1.109	0.800–1.537	0.534	1.134	0.849–1.515	0.394
Hyperlipidaemia	1.330	0.928–1.906	0.120	1.152	0.837–1.585	0.386
Cardiovascular diseases	1.686	0.958–2.967	0.070	1.356	0.792–2.325	0.267
Heart failure	0.768	0.388–1.520	0.448	0.911	0.472–1.757	0.781
Chronic kidney disease	2.251 **	1.268–3.996	0.006	2.151 **	1.250–3.701	0.006
COPD	1.666 *	1.006–2.760	0.047	2.253 ***	1.436–3.536	<0.001
Observations	1877			1877		
R2	0.241			0.188		

p<0.05 ** p<0.01 *** p<0.001

Covid Data Save Lives

HM Hospitales makes an anonymous dataset freely available to the international medical and scientific community with all the available clinical information on patients treated in our hospital centers for the SARS-CoV-2 virus

Compared to most of the existing **databases on COVID-19**, focused on demographic data, this clinical dataset collects the different interactions in the **COVID-19 treatment process, including detailed information on diagnoses, treatments, admissions, ICU admissions, diagnostic imaging tests, laboratory results, discharge or death, among many other records.**

With the opening of this dataset, we intend to take the first step and serve as an example for other institutions to be encouraged to share their information and thus, together, be able to offer the medical and scientific community clinical data with which to obtain predictive models of evolution, epidemiological models, information on the response to the various treatments applied, **knowledge of virus for the creation of a vaccine, and sociodemographic data on the impact on the population of the virus.**

Dataset “Covid Data Save lives”

The information in this data set comes from the HM Hospitales EHR system. It contains the anonymized records of 2,310 patients, admitted with a diagnosis of COVID POSITIVE or COVID PENDING, since the beginning of the epidemic to date. The information is organized in tables according to their content, all of them linked by a unique admission identifier. This identifier is the de-anonymization key, explicitly created for this purpose, and has nothing to do with the actual identifier of each admission.

- The main table includes data on the admission and the patient (age and sex), data on the previous emergency if there has been one (2,226 records), data on their stay in the ICU if there has been one and records of the first and last set of emergency constants.
- The medication table shows all the medication administered to each patient during admission (more than 60,000 records), with the dates

corresponding to the first and last administration of each drug, identified by their brand name and classification in the ATC5/ATC7.

- In the table of vital signs, there are all the basic records of constants (54,000 records so far) collected during admission with their date and time of registration.
- The laboratory table contains the results of the determinations (398,884 records) of all the requests made to each patient during admission and in the previous emergency, if any.
- And finally, the ICD10 coding tables show the records of diagnostic and procedural information coded according to the international ICD10 classification in its latest distributed version (does not include COVID), for the patients referred, both for episodes of hospital admission (more than 1,600) and for the emergency (more than 1,900) prior to those episodes, if any.

Web page: <https://www.hmhospitales.com/coronavirus/covid-data-save-lives/english-version>