RESULTS

In the present study, data were collected from any hospital in Qaliobya plus Abbasia fever hospital and Abbasia chest disease hospital that were referral centers for the care of patients with influenza.

According to data registered in Qaliobya Ministry of Health at the period of study, the number of propable cases was 728, males were 398 (54.6%) and females were 330 (45.4%). The number of confirmed cases in Qaliobya was 348, males were 177 (50.8%) and females were 171 (49.2%).The died cases in Qaliobya were 15 (4.3%), they were 9 males (60%) and 6 females (40%).

During the study period, the total number of confirmed cases were 500, (348 cases in Qaliobya hospitals and 152 cases in Abbasia fever hospital plus Abbasia chest disease hospital); they were assessed and admitted to study hospitals. Survivors were 466 (93.2%), 211(45.28%) were females and 255 (54.72%) were males .

Non survivors were 34 (6.8%), 21 (9%) were females and 13 (4.8%) were males. From the total sample, 84 (16.8%) patients were admitted to ICU unit in Abassia Chest Diseases Hospital and 34 patients of them were died, they represents (40.4%).

The number of patients with age group 0 – 17 years were 184 (36.8%) cases and death rate in this age group was 2/184 (1.08%), which represents (0.4%) 2/500 of the total study sample, age group 18 - 64 years were 313 (62.6%) cases and death rate in this age group was 31/313 (9.9%), which represents (6.2%) 31/500 of the total study sample, age group >65 years were 3 (0.6%) cases and death rate in this age group was 1/3 (33.3%), which represents (0.2%) 1/500 of the total study sample.

The total comorbidities were 105 (21%), 16 (3.2%) cases had D.M and death rate in this group was 4 (25%), 23 (4.6%) cases were pregnant females and death rate in this group was 6 (26%), 20 (4%) cases had cardiac problems and death rate in this group was 9 (45%), 33 (6.6%) cases had chest problems and death rate in this group was 2 (6.06%), 13 (2.6%) cases had other comorbidities and death rate in this group was 7 (53.8%).

Table (2): Case fatality rate of H1N1 cases.

	N	**%**
Survivors	466	93.20
Non survivors	34	6.80
Total	500	100.00

-There were 466 (93.20%) survivors and 34 (6.80%) non survivors.

Figure (2): Mortality chart
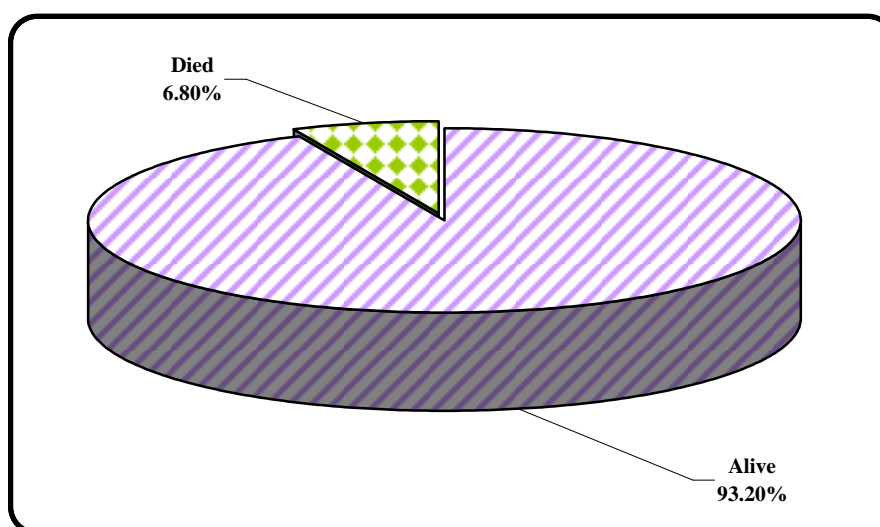
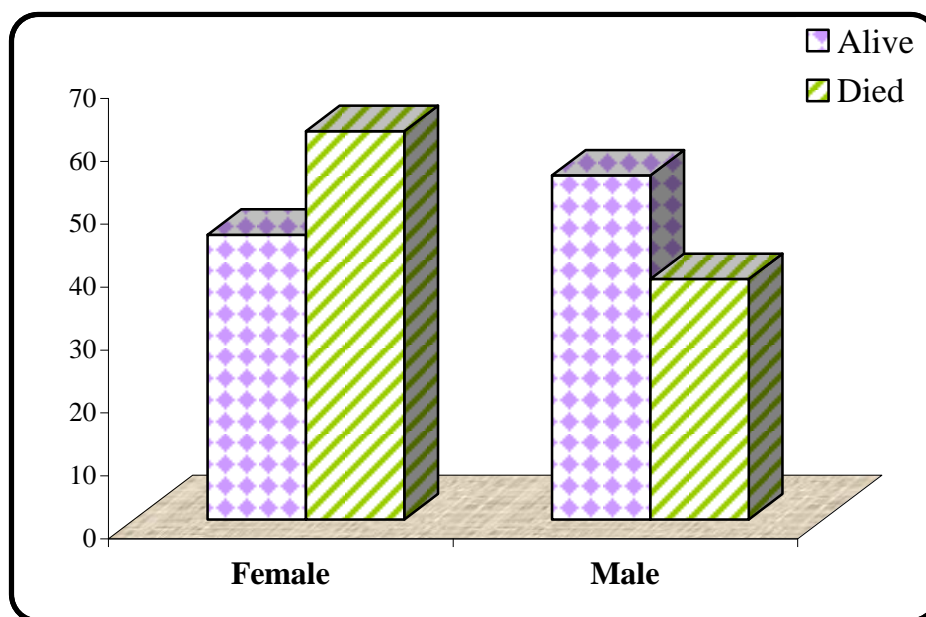**Table (3):** Study of gender difference in association with mortality.

Gender		Survivors	Non survivors	Total
Female	N	211	21	232
	%	45.28	61.76	46.40
Male	N	255	13	268
	%	54.72	38.24	53.60
Total	N	466	34	500
	%	100.00	100.00	100.00
Chi-square	X2	3.463		
	P-value	0.063		

1-Survivors were 466, 211(45.28%) were females and 255 (54.72%) were males.

2-Non survivors were 34, 21 (9%) were females and 13 (4.8%) were males.

3-There was no significant difference as P-value 0.063.

Figure (3): Difference between gender and mortality.

Table (4): Study of age difference in association with mortality.

	Survivors				Non survivors				Mann-Whitney Test	
	Mean	**±**	**SD**	**Mean rank**	**Mean**	**±**	**SD**	**Mean rank**	**Z**	**P-value**
Age	24.7	±	17.0	243.96	34.9	±	14.4	340.2	-3.750	<0.001*

- There was significant difference between survivors and non survivors for age as P-value < 0.001.

Table (5): Comparison of the clinical criteria for survivors versus non survivors among H1N1 cases.

Character	Survivors 466(100%) +ve (no. %)	Non survivors 34(100%) +ve (no. %)	Total 500(100%) +ve (no. %)	P value
Fever	461(98.93%)	33(97.06%)	494(98.8%)	0.334
Headache	313(67.17%)	8(23.53%)	161(32.2%)	0.262
Bodyache	228(48.93%)	17(50%)	245(49%)	0.904
Sore throat	321(68.88%)	12(35.29%)	333(66.6%)	0.001*
Cough	372(80%)	33(97.06%)	405(81%)	0.014*
Expectoration	115(24.68%)	33(97.06%)	148(29.6%)	0.001*
Dyspnea	138(29.61%)	23(67.65%)	161(32.2%)	0.001*
Vomiting	54(11.59%)	2(5.88%)	56(11.2%)	0.308
Diarrhea	40(8.58%)	6(17.65%)	46(9.2%)	0.078
Running nose	162(34.76%)	8(23.53%)	170(34%)	0.182

As regard the comparison of the clinical criteria for survivors and non survivors among H1N1 cases;

There was significant difference for:

1-Sore throat was positive in 321 cases (68.88%) for survivors versus 12 cases (35.29%) for non survivors, with significant difference as P-value 0.001.

2-Cough was positive in 372 cases (80%) for survivors versus 33 cases (97.06%) for non survivors, with significant difference as P-value 0.014.

3-Expectoration was positive in 115 cases (24.68.93%) for survivors versus 33 cases (97.06%) for non survivors, with significant difference as P-value 0.001.

4-Dyspnea was positive in 138 cases (29.61%) for survivors versus 23 cases (67.65%) for non survivors, with significant difference as P-value 0.001.

There was non significant difference for:

1- Fever was positive in 461 cases (98.93%) for survivors versus 33 cases (97.06%) for non survivors, with no significant difference as P-value 0.334.

2-Headache was positive in 313 cases (67.17%) for survivors versus 8 cases (23.53%) for non survivors, with no significant difference as P-value 0.262.

3-Bodyaches was positive in 228 cases (48.93%) for survivors versus 17cases (50%) for non survivors, with no significant difference as P-value 0.904.

4-Vomiting was positive in 54 cases (11.59%) for survivors versus 2 cases (5.88%) for non survivors, with no significant difference as P-value 0.308.

5-Diarrhea was positive in 40 cases (8.58%) for survivors versus 6 cases (17.65%) for non survivors, with no significant difference as P-value 0.078.

6-Running nose was positive in 162 cases (34.76%) for survivors versus 8 cases (23.53%) for non survivors, with no significant difference as P-value 0.182.

Table (6): Comparison of comorbidities for survivors versus non survivors among H1N1 cases

Character	Survivors 466(100%) +ve (no. %)	Non survivors 34(100%) +ve (no. %)	Total 500(100%) +ve (no. %)	P value
D.M	12(2.58%)	4(11.76%)	16(3.2%)	0.003*
Cardiac disease	11(2.36%)	9(26.47%)	20(4%)	0.001*
Chest disease	31(6.65%)	2(5.88%)	33(6.6%)	0.861
Pregnancy	17(3.65%)	6(17.65%)	23(4.6%)	0.001*
Others	6(1.29%)	7(20.59%)	13(2.6%)	0.001*

As regard the comparison of the comorbidities for survivors and non survivors among H1N1 cases:

1- D.M was positive in 12 cases (2.58%) for survivors versus 4 cases (11.76%) for non survivors, with significant difference as P-value 0.003.

2- Cardiac disease was positive in 11 cases (2.36%) for survivors versus 9 cases (26.47%) for non survivors, with significant difference as P-value 0.001.

3- Chest diseases was positive in 31 cases (6.65%) for survivors versus 2 cases (5.88%) for non survivors, with no significant difference as P-value 0.861.

4- Pregnancy was positive in 17 cases (3.65%) for survivors versus 6 cases (17.65%) for non survivors, with significant difference as P-value 0.001.

5- Others as (obesity, cerebral palsy, liver cell failure and i.v drug addict) were positive in 6 cases (1.29%) for survivors versus 7 cases (20.59%) for non survivors, with significant difference as P-value 0.001.

Table (7): Comparison of laboratory data for survivors versus non survivors.

Investigation	Survivors (108) Mean ± SD	Non survivors (34) Mean ± SD	P-value
HB%	12.7 ± 2.5	11.6 ± 2.0	0.049*
TLC	7,868.2 ± 4,992.9	10,754.2 ± 7,037.5	0.082
PLT	234,082.4 ± 89,521.8	179,833.3 ± 103,376.3	0.001*
Blood sugar	126.1 ± 57.0	167.6 ± 99.0	0.216
Urea	31.7 ± 19.7	48.4 ± 41.2	0.013*
Creatinine	1.0 ± 0.6	2.1 ± 3.1	0.001*
AST	61.3 ± 27.3	84.2 ± 48.5	0.089
ALT	38.4 ± 29.1	73.6 ± 55.6	0.001*
PT	16.2 ± 4.8	14.5 ± 2.7	0.792
Bilirubin	1.4 ± 1.9	6.0 ± 1.9	0.001*

As regard the laboratory parameters:

A) There was significant difference for:

1- HB% where, Mean ± SD was 12.7 ± 2.5 in survivors and it was 11.6 ± 2.0 in non survivors, P-value 0.049.

2- PLT count where, Mean ± SD was 234082.4 ± 89521.8 in survivors and it was 179833.3 ± 103376.3 in non survivors, P-value 0.001.

3- Urea where, Mean ± SD was 31.7 ± 19.7 in survivors and it was 48.4 ± 41.2 in non survivors, P-value 0.013.

4- Creatinine where, Mean ± SD was 1.0 ± 0.6 in survivors and it was 2.1 ± 3.1 in non survivors, P-value 0.001.

5- ALT where, Mean ± SD was 38.4 ± 29.1 in survivors and it was 73.6 ± 55.6 in non survivors , P-value 0.001.

6- Bilirubin where, Mean ± SD was 1.4 ± 1.9 in survivors and it was 6.0 ± 1.9 in non survivors, P-value 0.001.

B) There was non significant difference for:

1- TLC where, Mean ± SD was 7868.2 ± 4992.9 in survivors and it was 10754.2 ± 7037.5 in non survivors, P-value 0.082.

2- Blood sugar where, Mean ± SD was 126.1 ± 57.0 in survivors and it was 167.6 ± 99.0 in non survivors, P-value 0.216.

3- AST where, Mean ± SD was 61.3 ± 27.3 in survivors and it was 84.2 ± 48.5 in non survivors, P-value 0.089.

4- PT where, Mean ± SD was 16.2 ± 4.8 in survivors and it was 14.5 ± 2.7 in non survivors, P-value 0.792.

Table (8): Blood gases and electrolytes for 142 patients.

Investigation	Survivors (108) Mean ± SD	Non survivors (34) Mean ± SD	P-value
PH	7.4 ± 0.0	7.3 ± 0.1	0.003*
paCO2	36.5 ± 3.6	39.4 ± 3.9	<0.001*
paO2	84.2 ± 18.5	50.4 ± 18.3	<0.001*
HCO3	18.7 ± 2.3	19.1 ± 3.8	0.572
O2 sat. %	95.8 ± 2.4	73.2 ± 16.7	<0.001*
Na	135.4 ± 3.2	134.9 ± 5.8	0.875
K	4.2 ± 0.2	4.1 ± 0.8	0.273

As regard the blood gases and electrolytes:

A) There was significant difference between survivors and non survivors as regard:

1- PH where, Mean ± SD was 7.4 ± 0.0 in survivors and it was 7.3 ± 0.1 in non survivors, P-value   0.003.

2- PaCO2 where, Mean ± SD was 36.5 ± 3.6 in survivors and it was 39.4 ± 13.9 in non survivors, P-value   0.001.

3- PaO2 where, Mean ± SD was 84.2 ± 18.5 in survivors and it was 50.4 ± 18.3   in non survivors, P-value   0.001.

4- O2 sat. % where, Mean ± SD was 95.8 ± 2.4 in survivors and it was 73.2 ± 16.7   in non survivors, P-value   0.001.

B) There was no significant difference between survivors and non survivors as regard:

1- HCO3 where, Mean ± SD was 18.7 ± 2.3 in survivors and it was 19.1 ± 3.8 in non survivors, P-value   0.572.

2- Na+ where, Mean ± SD was 135.4 ± 3.2 in survivors and it was 134.9 ± 5.8   in non survivors, P-value   0.875.

3- K+ where, Mean ± SD was 4.2 ± 0.2 in survivors and it was 4.1 ± 0.8 in non survivors, P-value   0.273.

Table (9): Comparison of the scores for survivors versus non survivors among H1N1 cases.

		Range	Mean	SD	t	P-value
SOFA	**Non survivors**	11 -14	12.971	1.000	60.515	<0.001*
	survivors	0 - 8	0.415	1.106		
APACHE II	**Non survivors**	14 - 29	20.091	4.238	25.850	<0.001*
	survivors	0 - 17	2.266	3.208		

- There was significant difference between survivors and non survivors as regard SOFA score where Mean ± SD was 0.415 ± 1.106 for survivors and it was 12.971± 1.000 for non survivors, P-value <0.001*.

- Also there was significant difference between survivors and non survivors as regard APACHE II score where Mean ± SD was 2.266 ± 3.208 for survivors and it was 20.091 ± 4.238 for non survivors, P-value <0.001*.

Table (10): The ROC curve for APACHE II score in relation to mortality

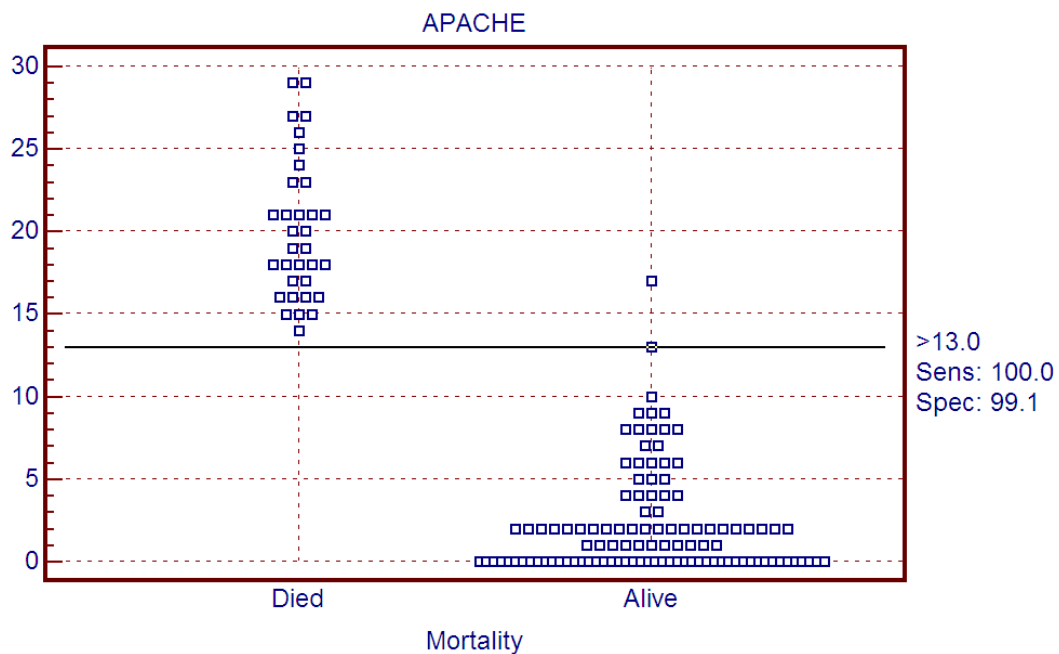| ROC curve for APACHE II score					
Cutoff	**Sens.**	**Spec.**	**PPV**	**NPV**	**Accuracy**
> 13	**100.0**	**99.1**	**97.1**	**100.0**	**0.997**

Cutoff between non survived or survived was >13 with (Sens.100, Spec.99.1, PPV 97.1, NPV100 with Accuracy 99.7%)

Figure (4): ROC curve testing the ability of APACHE II score to predict mortality.
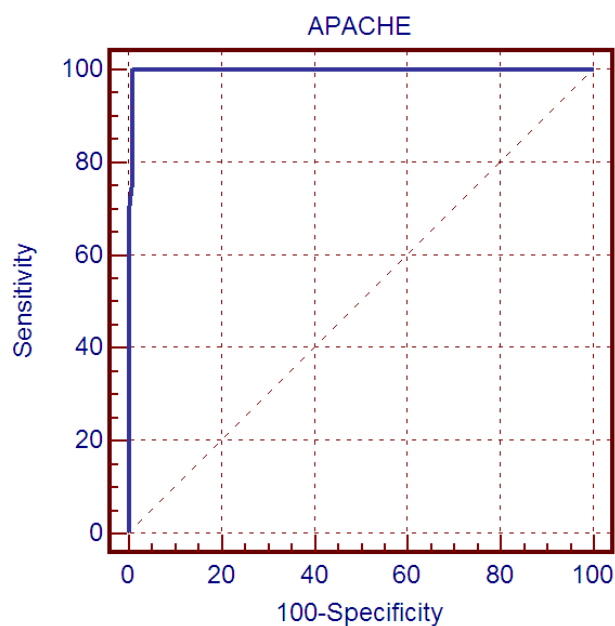
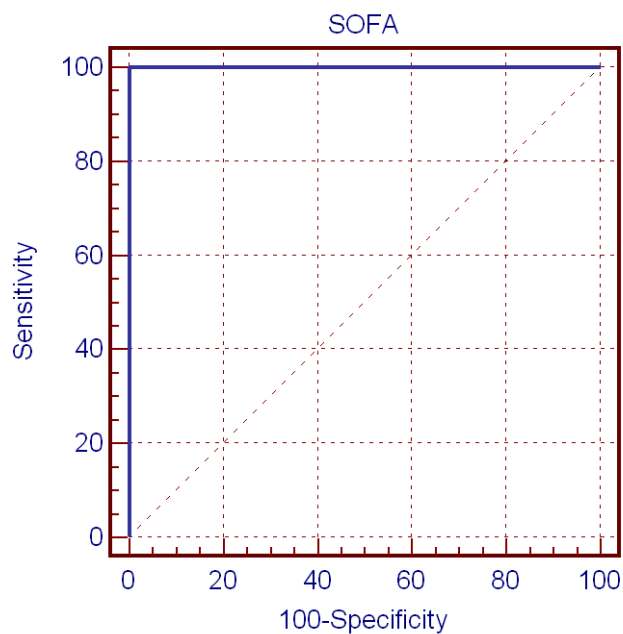**Figure (5):** Relation between APACHE II score and mortality

At Cutoff >13 for APACHE II score, it can differentiate between survivors and non survivors with 100% sensitivity,99.1% specificity,97.1% PPV , 100%NPV and with 99.7% Accuracy.

Table (11): The ROC curve for SOFA score in relation to mortality

ROC curve for SOFA score					
Cutoff	**Sens.**	**Spec.**	**PPV**	**NPV**	**Accuracy**
>8	100	100	100	100	100

Cutoff between non survived or survived was >8 with (Sens.100, Spec.100, PPV 100, NPV100 with Accuracy 100%)

Figure (6): ROC curve testing the ability of SOFA score to predict mortality.

Figure (7): Relation between SOFA score and mortality
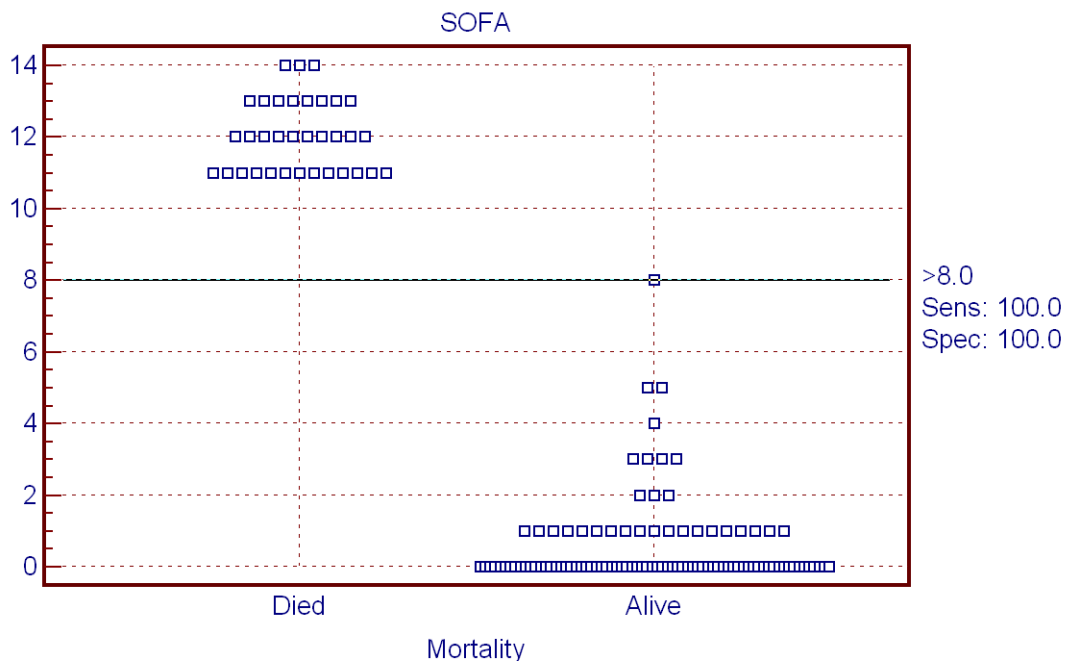
At Cutoff >8 for SOFA score, it can differentiate between survivors and non survivors with 100% for all sensitivity, specificity, PPV and NPV with 100% Accuracy.

Table (12): Multivariate Logistic Regression analysis for mortality.

variables	B	P-value
Sore throat	0.266	0.563
Cough	-0.080	0.964
Expectoration	4.529	0.000*
Dyspnea	1.129	0.013*
D.M	-0.149	0.855
Pregnancy	2.597	0.001*
Cardiac problems	1.833	0.003*
Age	-0.772	1.000
Platelets	0.000	0.999
PH	-248.197	0.998
Pa CO2	-2.506	0.999
Pa O2	-1.219	1.000
O2 saturation	-1.952	1.000
Urea	0.077	1.000
Creatinine	7.287	1.000
ALT	-0.048	1.000
Bilirubin	4.380	1.000
APACHE II score	-2.275	0.006*
SOFA score	10.179	0.000*

This table shows that expectoration, dyspnea, pregnancy, cardiac comorbidities, APACHE II score and SOFA score were independently predictor of mortality.