Introduction:
Acid-base disturbances are common in patients with infection admitted to the intensive care unit (ICU). More attention is given to hyperlactatemia in this patient population as a prognostic factor, although other acid-base disturbances may also have an impact on patient outcomes. Our objective is to describe the acid-base profile of this patient population and determine the association between different acid-base abnormalities and ICU mortality.

Methods:
Retrospective cohort of patients admitted with infection to an intensive care unit. Patients were stratified according to pH (< 7.35; 7.35 – 7.45; > 7.45) and, then, according to the standard base excess (SBE) (< -2; -2 – +2; > +2). In each of these strata and the whole population, the proportions of acid-base disturbances were quantified during the first 24 hours of ICU admission. To assess the association between acid-base disturbances and outcome, a logistic regression model was fit, adjusting for age, sex and saps 3 score.

Results:
605 patients were analysed. 304 (50%) patients were acidemic and 244 (40%) presented with a normal pH. Metabolic acidosis (as assessed by SBE) was observed in all subgroups, regardless of pH levels (pH < 7.35: 287/304 [94%]; pH 7.35 – 7.45: 184/244 [75%]; pH > 7.45: 34/57 [60%]). Lactic acidosis was observed in 71% of the whole population; SIG (Strong ion gap) acidosis, in 75%; SID (hyperchloremic) acidosis, in 58%; metabolic alkalosis, in 7%; and respiratory acidosis, in 13% of the patients. In multivariate analysis, lactic acidosis (OR 1.85 [95% CI 1.19 – 2.88]), albumin (OR 0.49 [95% CI 0.34 – 0.69]) and phosphate (OR 1.15 [95% CI 1.05 – 1.26]) were the acid-base variables independently associated with ICU mortality.

Conclusion:
The most common form of acid-base disturbance in patients with infection is SIG acidosis, although only lactic acidosis is independently associated with worse outcomes among strong ions. Weak anions variations are also independently associated with worse outcomes.