Figure S1. Visual predictive check plot. Concentration data is presented in mg/L, shaded area represents 95% confidence interval at each quantile.
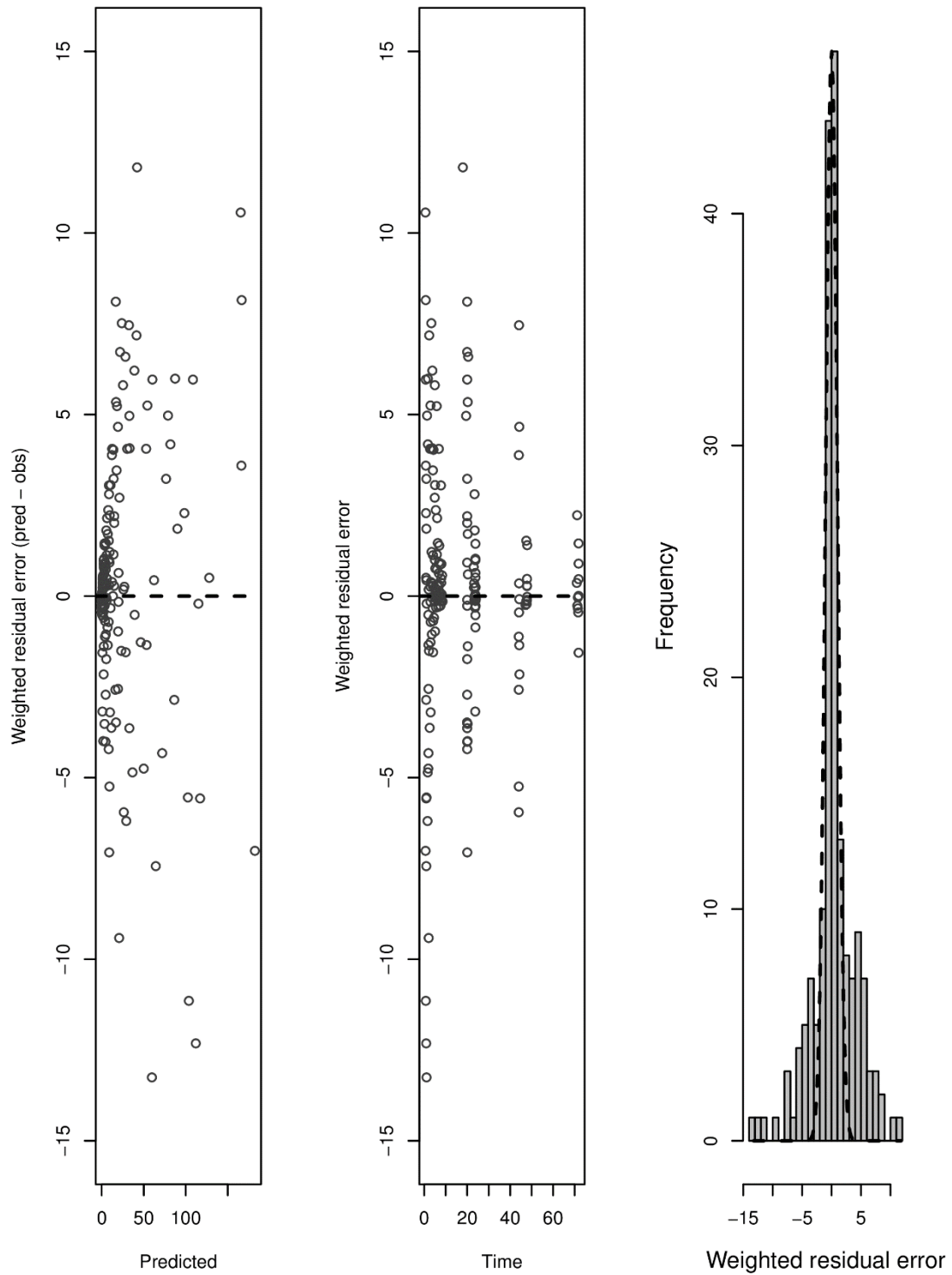
Figure S2. A plot of weighted residual error (population predicted concentrations – observed concentration, mg/L) versus population predictions (left) and time of observation (middle); and frequency distribution of the weighted residual errors (right).
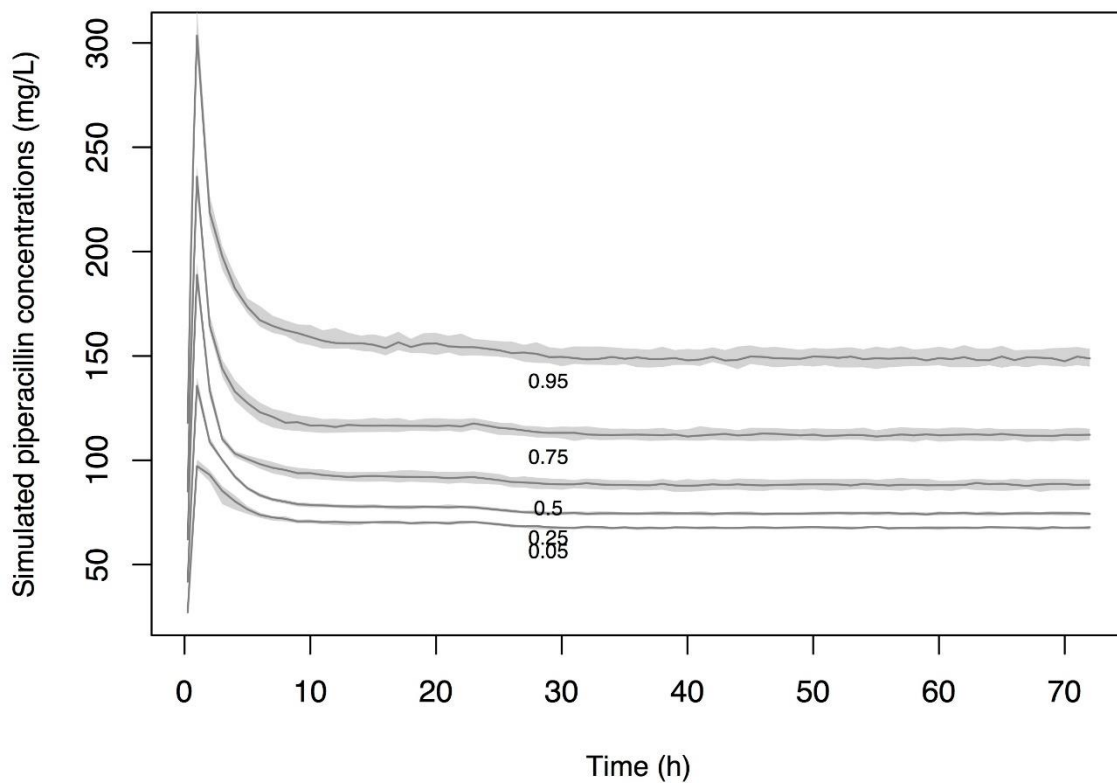
Figure S3. The concentration-time profile of piperacillin for simulated dosing regimen of 4.0 g loading dose plus 16g continuous infusion for a creatinine clearance of 40 mL/min/1.73m^2. 0.95, 95th percentile; 0.75, 75th percentile; 0.5, 50th percentile; 0.25, 25th percentile; 0.5, 5th percentile. Shaded area represents the 95 % confidence interval .