

Background

Blood Sample Rejection Rate (BSRR) allows for identifying and minimizing preanalytical errors. Blood collection can be performed using open systems consisting of hypodermic or winged needles attached to a syringe; or closed systems based on vacuum for drawing blood directly to collection tubes, reducing risk to blood exposure and allowing multiple sample collections from a single venipuncture.

Objective

The aim of this study is to analyze the influence of the Percentage of Use of Closed Blood Collection Systems (%UCBCS) on BSRR in different clinical units of Clínica Dávila.

Method

Sampling data from Medysyn™ informatics system were collected during the first semester of 2015, from nine clinical units (adult and pediatric) including: ambulatory patients units (APU), general hospitalized patients units (GHPU), Emergency Room (ER), and Intensive Critical Units (ICUs). Correlation between BSRR due to collection errors (hemolyzed specimens, underfilled tubes and clogged samples) and %UCBCS per clinical unit was statistically analyzed by using Prism™ 6.0 software.

Results

During the study period, a total of 264.712 blood samples were analyzed from which 3.144 samples were rejected. A total of 29.193 open system devices and 86.046 closed system devices were used during this period. APU, where the highest %UCBCS is evidenced (92.6%), showed lower BSRR compared to GHPU (0.5 versus 2.3). When comparing BSRR and %UCBCS between adult and pediatric ICUs, similar results were obtained (Fig. 5: Pediatric ICU: 40,8 %UCBCS; 3,5 BSRR; Adult UCI: 79,5 %UCBCS; 1,0 BSRR) . A strong negative correlation was observed between %UCBCS and BSRR, when including the nine Clinical Units for the analysis (Pearson $r = -0,8396$, P value = 0,0046).

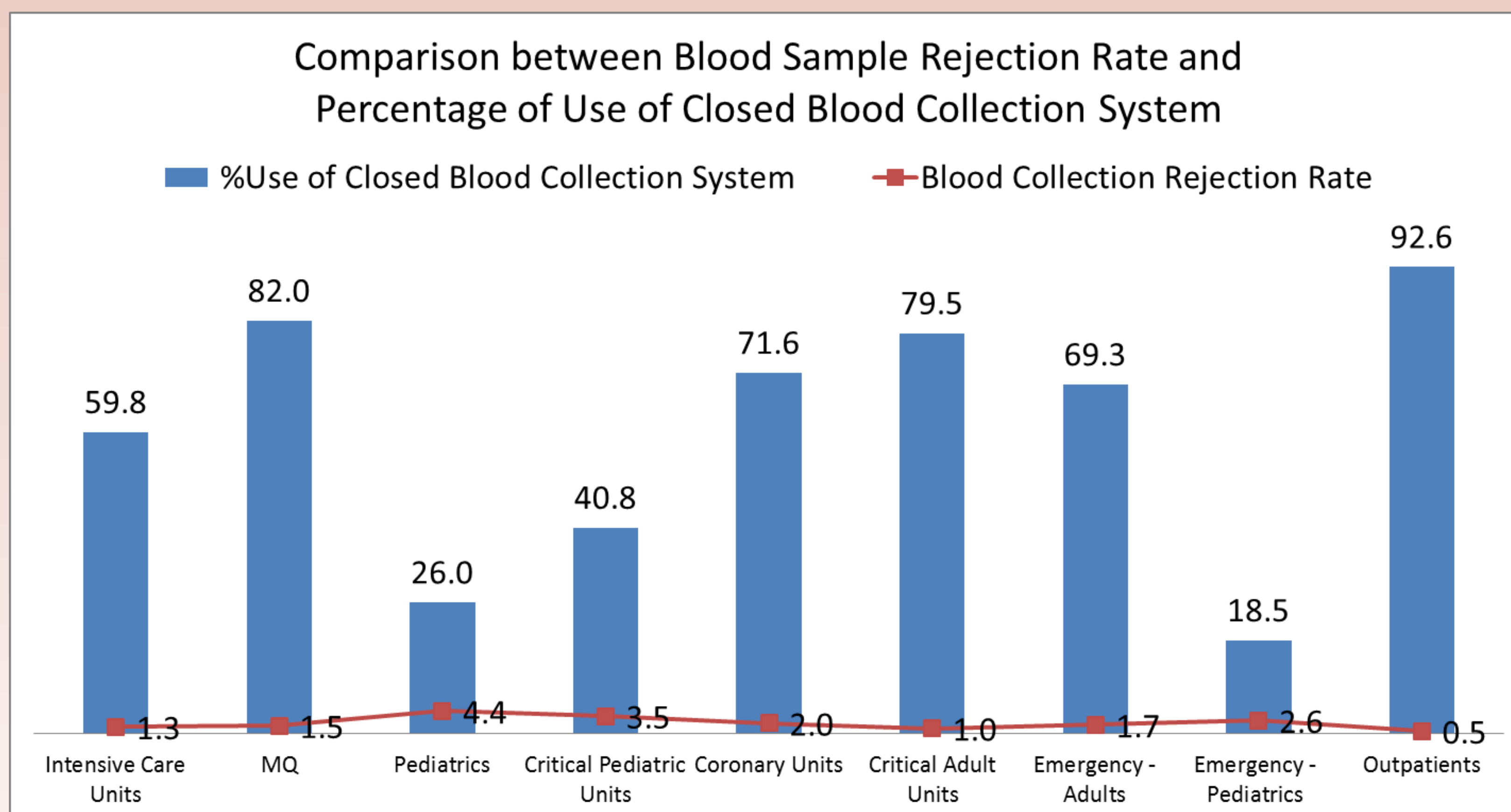


Figure 1: Comparison between Blood Sample Rejection Rate and Percentage of Use of Closed Blood Collection Systems

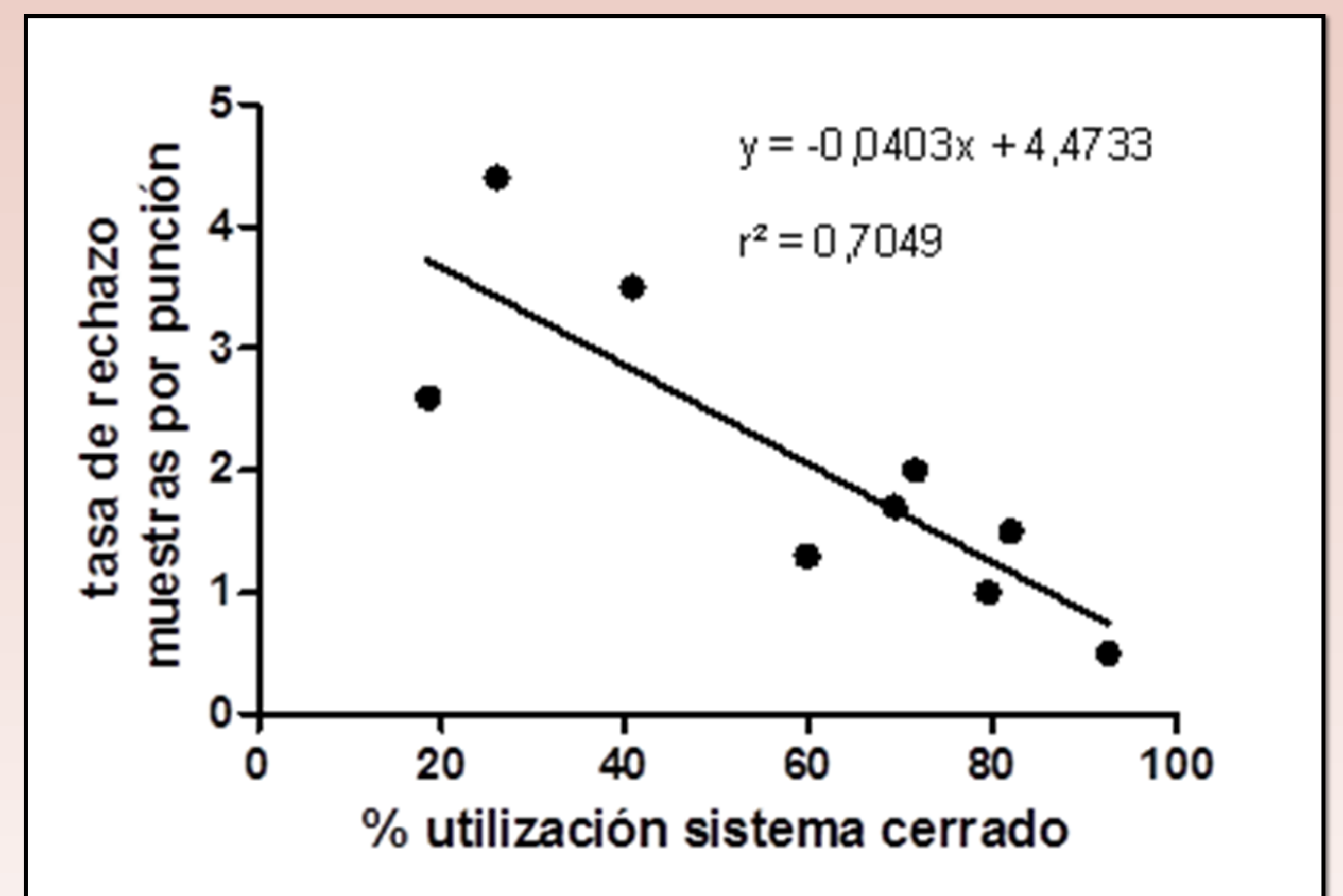


Figure 2: Correlation rate between Blood Sample rejection Rate and % of use of Closed Blood Collection System .

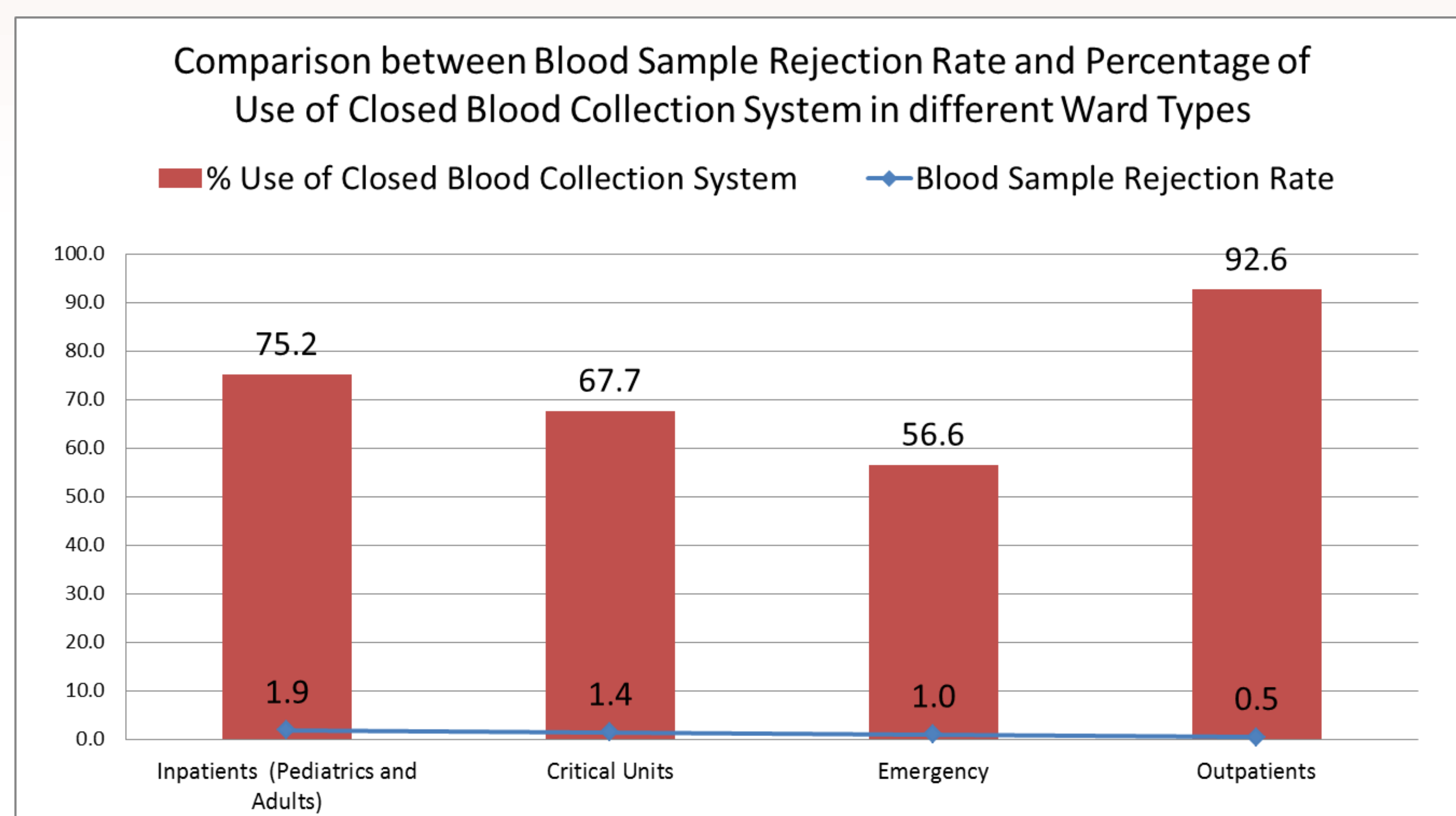


Figure 3: Comparison between Blood Sample Rejection Rate and Percentage of Use of Closed Blood Collection System in different Ward Types

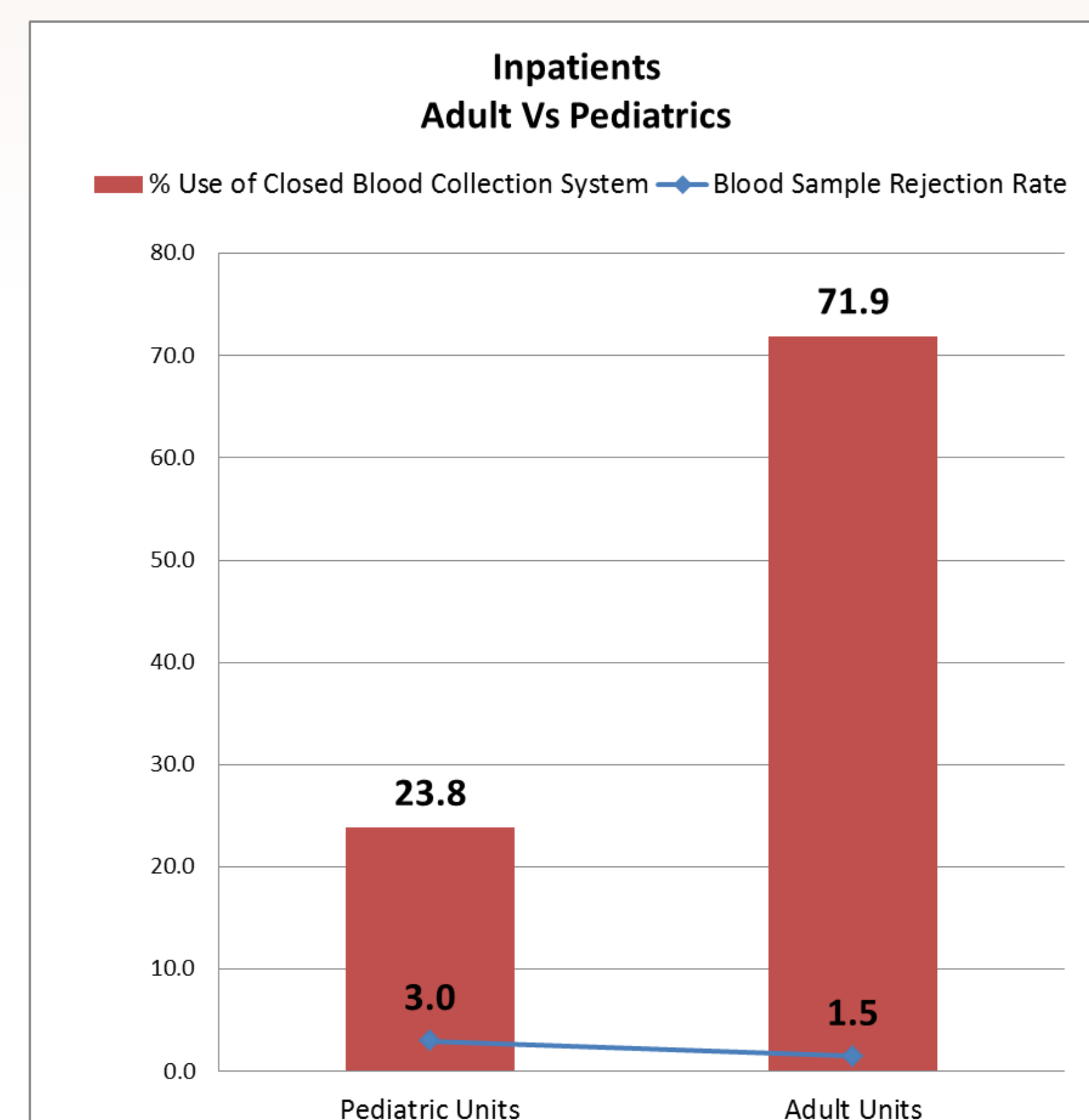


Figure 4: Comparison between Pediatrics and Adult Units

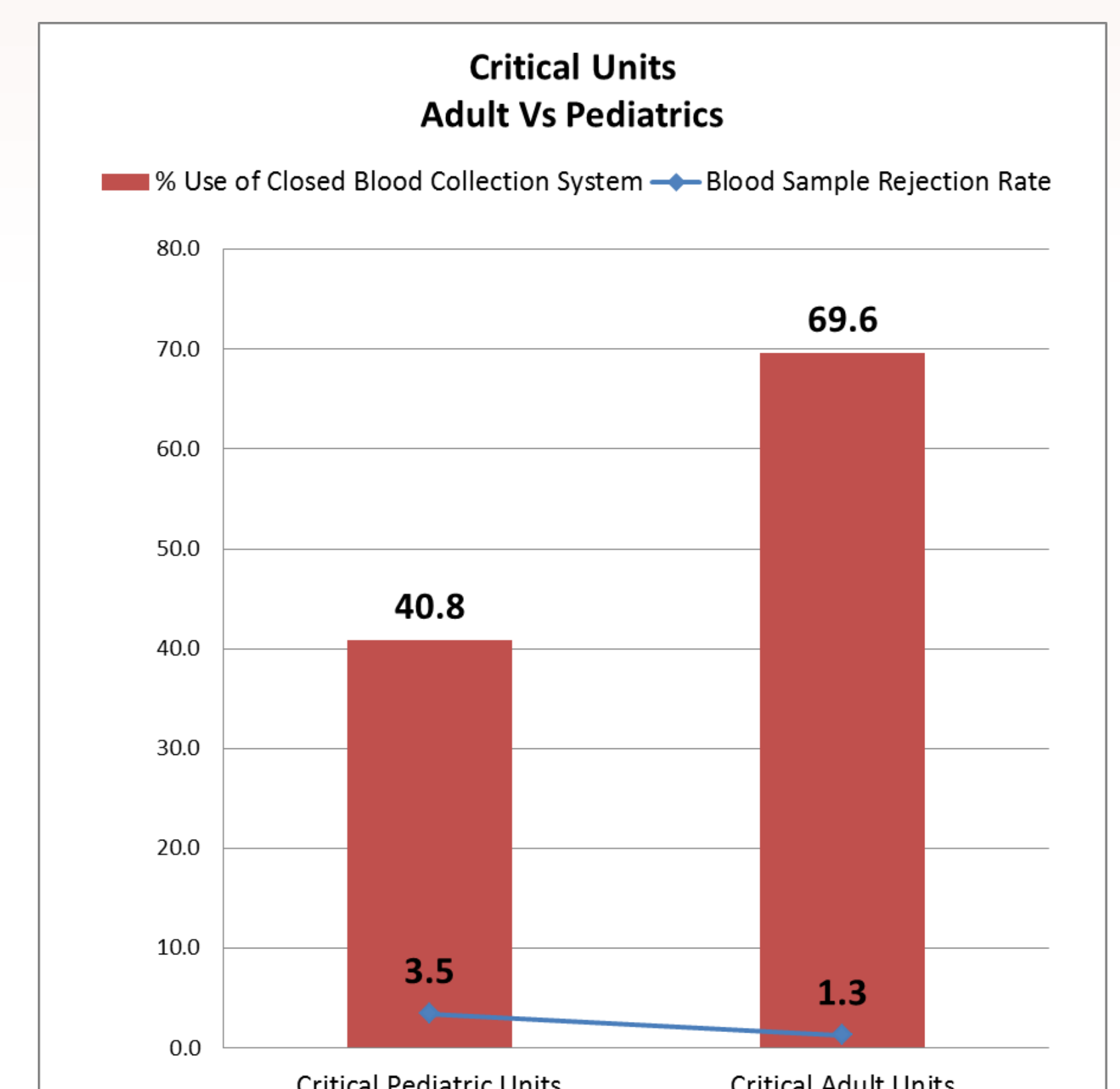


Figure 5: Comparison between Pediatrics and Adult Critical Units

Conclusions

%UCBCS show a statistically significant negative correlation with BSRR, impacting positively in the preanalytical quality. Low adherence to the use of closed blood collection systems in the pediatric ICU should be addressed and counteracted.