

# Straight to the Source: Blood Culture Contamination in the Emergency Department

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## Introduction

Blood cultures are an important tool for the identification of bloodstream infections. Contamination rates should be regularly tracked, with a national benchmark rate of <3% contamination.<sup>1</sup> At a community hospital with 2 campuses, a 6-month baseline average of 81% of total contaminated blood cultures were drawn in the ED. It was recognized that blood cultures were not always being drawn in accordance with institutional policy; our intervention was targeted at reducing contamination rates by increasing policy compliance.

## Objective

To assess if solution-targeted education during a staff meeting can decrease the rate of blood culture contamination in the emergency department by at least 20%, from 2.9% to 2.5%.

## Methods

This quality improvement project was conducted at a 540-bed community teaching hospital in southern NJ with 2 campuses, each with their own ED. A baseline questionnaire with 13 items was distributed to all emergency department nurses at both hospital campuses to evaluate blood culture draw technique. Items included self-assessed adherence to best practice and hospital protocols when drawing blood cultures. Baseline contamination rates in the ED were measured for 16 months prior to distribution of the questionnaire. After a 6-month washout period, the solution-targeted education intervention was administered at staff meetings for both campuses; the results of this questionnaire were presented as an educational lecture.

Each question detailed overall staff adherence to protocol along with tailored solutions. For example, 20% of respondents reported placing supplies on the bed while drawing blood cultures. Solutions for this measure included increasing the availability/accessibility of bedside tables in the ED. After the intervention, contamination rates were remeasured for 6 months to assess adherence.

## Results

From April 2021 to February 2023, there were 38,856 blood cultures drawn at both campuses. There were 520 (1.34%) contaminated cultures from campus 1 and 403 (1.03%) from campus 2. Average contamination rates were 2.58% prior to issuing the questionnaire to staff, 2.8% at the time of the targeted staff education intervention, and 1.7% one-month post-intervention. The average contamination rate over the 6 months post-intervention was 2.6% (p=0.46).

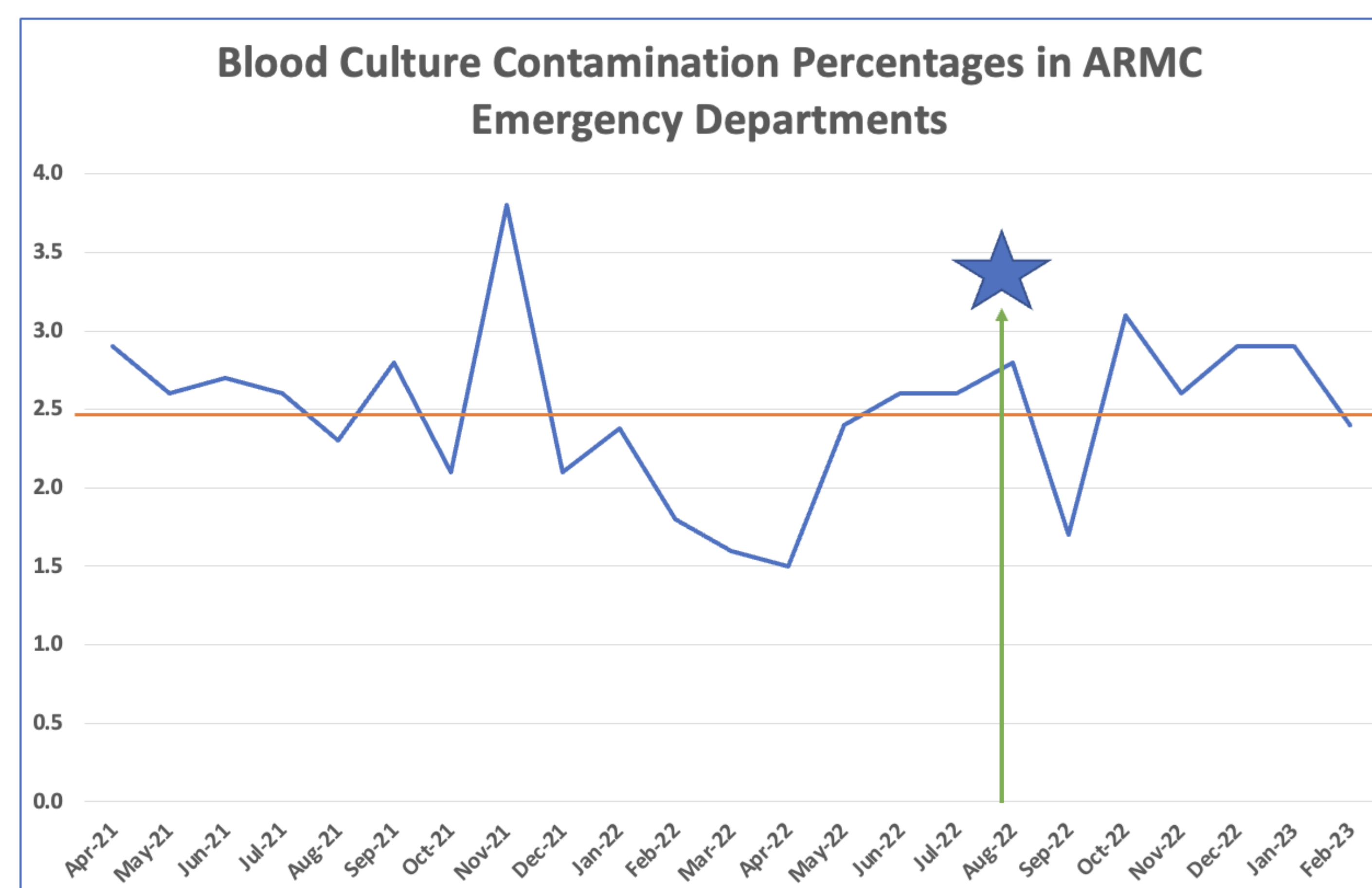


Figure 1. Line Graph demonstrating blood culture contamination rates in the ED from April 2021 to February 2022. The blue star indicates the intervention administration point.

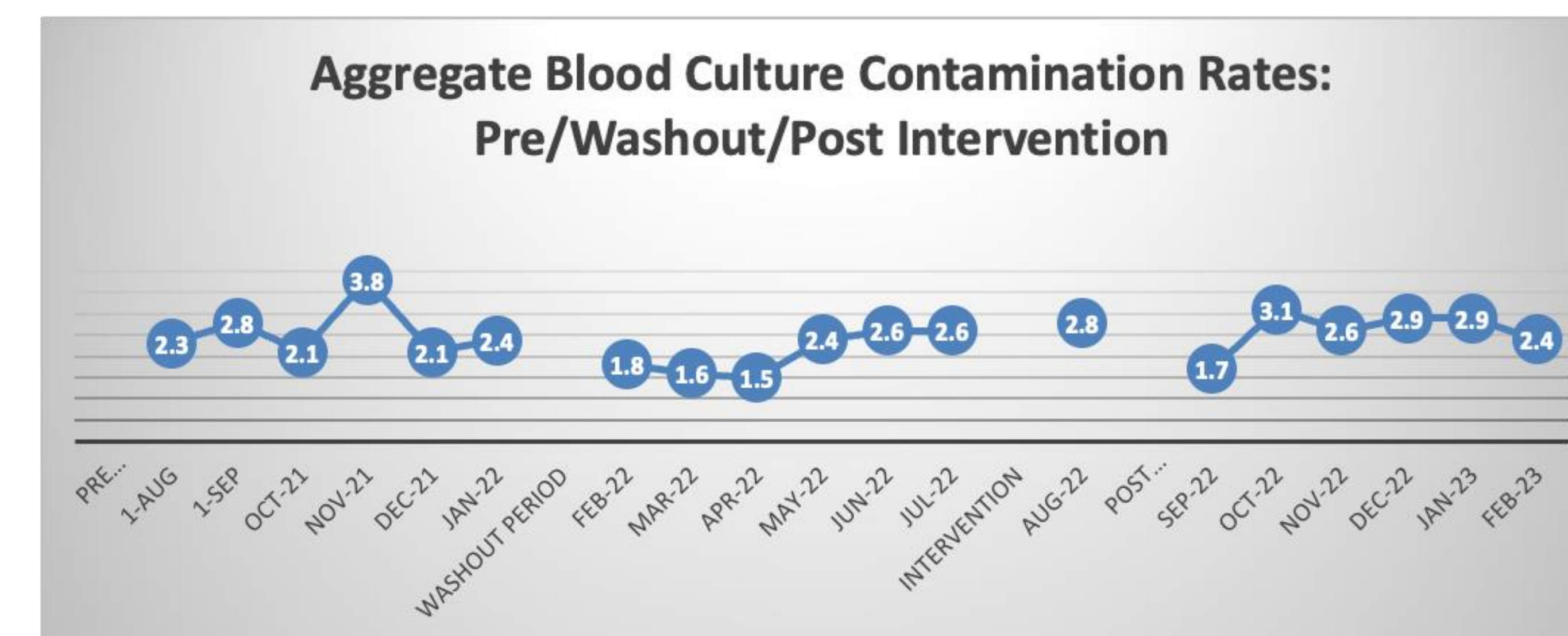


Figure 2. Out of the total blood culture volume - amounting of 38,856 blood cultures drawn from April 2021 to February 2023, 520 samples obtained in MLD Division were determined to be contaminants compared to 403 contaminated samples drawn in City Division

## Conclusions

Although there was not statistically significant difference between pre-intervention and 6-month post-intervention contamination rates, there may be some utility in the survey tool used in this initiative. Interestingly, immediately after dissemination of the introspective questionnaire, there was a sharp reduction in contamination rates at the one-month mark. It is possible that the questionnaire prompted participants to evaluate their own technique. This finding can direct further investigation into the effects of surveys in reducing contamination rates by increasing nursing awareness of best practice.

## References

1. Clinical and Laboratory Standards Institute. 2022. Principles and Procedures for Blood Cultures; 2nd Edition. CLSI Document M47-E2. Clinical and Laboratory Standards Institute.

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