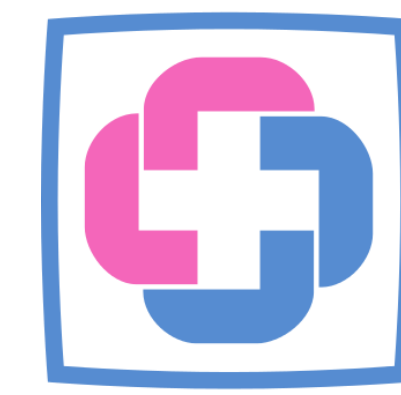




Singapore Healthcare
Management 2015

Erythrocytes Sedimentation Rate (ESR) Stat Plus – A Children's Hospital Experience



KK Women's and
Children's Hospital
SingHealth

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Background:

ESR method, originally proposed by Westergren, is a simple nonspecific test procedure used to assess elevation of acute phase protein in response to inflammation. It measures the sedimentation rate of aggregated red cells in plasma. To perform the test, anticoagulated blood was traditionally placed in an upright tube, known as a Westergren tube, and the rate at which the red blood cells fall was measured and reported in mm/h. The Westergren method, the golden standard for measuring ESR, requires about 1 ml of blood with a testing period of 1 hour. Since the introduction of automated analysers into the clinical laboratory, the ESR test has been automatically performed. One such example is the ESR STAT™ PLUS analyser developed by HemaTechnologies. (see figure 1). It is a second generation automated analyser that measures the ESR of a sample using infrared optic/ kinetics principle. It is able to analyse up to three patient samples simultaneously within 5 minutes using a much smaller volume of blood sample (25µl). In this study we would like to assess the benefits of using ESR STAT™ PLUS analyser over the Microvette CB200 (see figure 2) in our clinical laboratory.

Method:



Figure 1: ESR STAT™ Plus

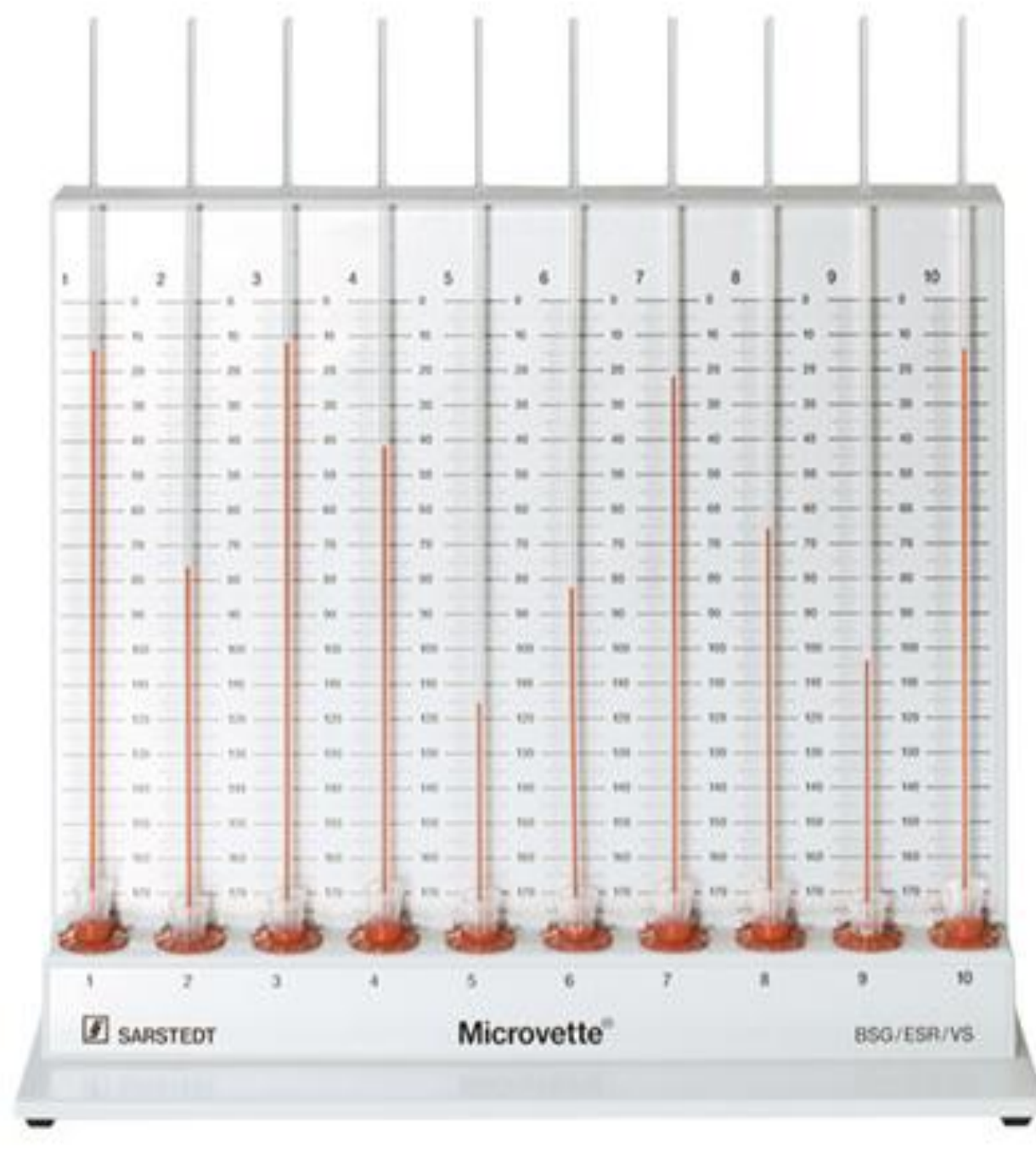
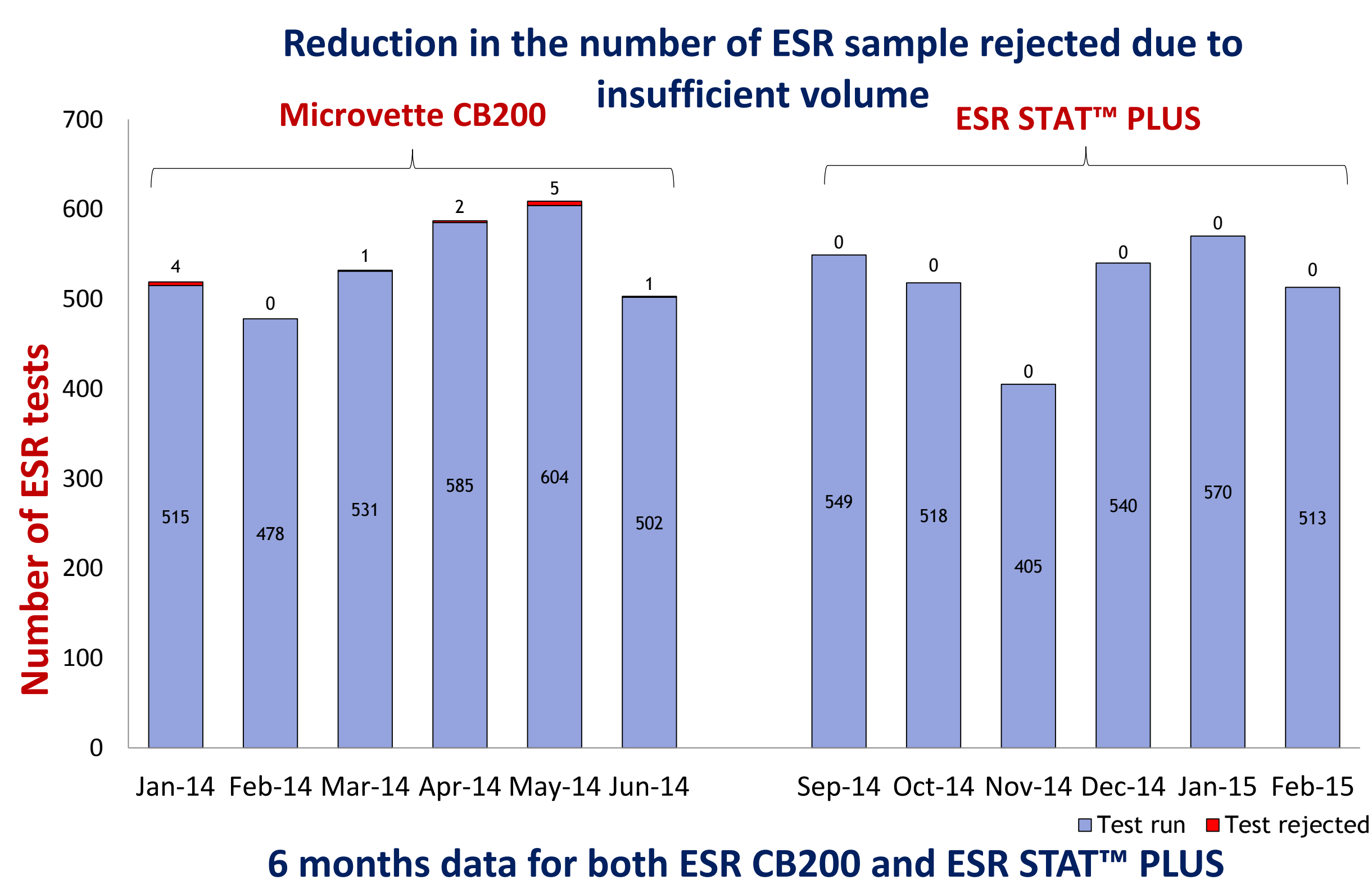


Figure 2: Microvette CB200

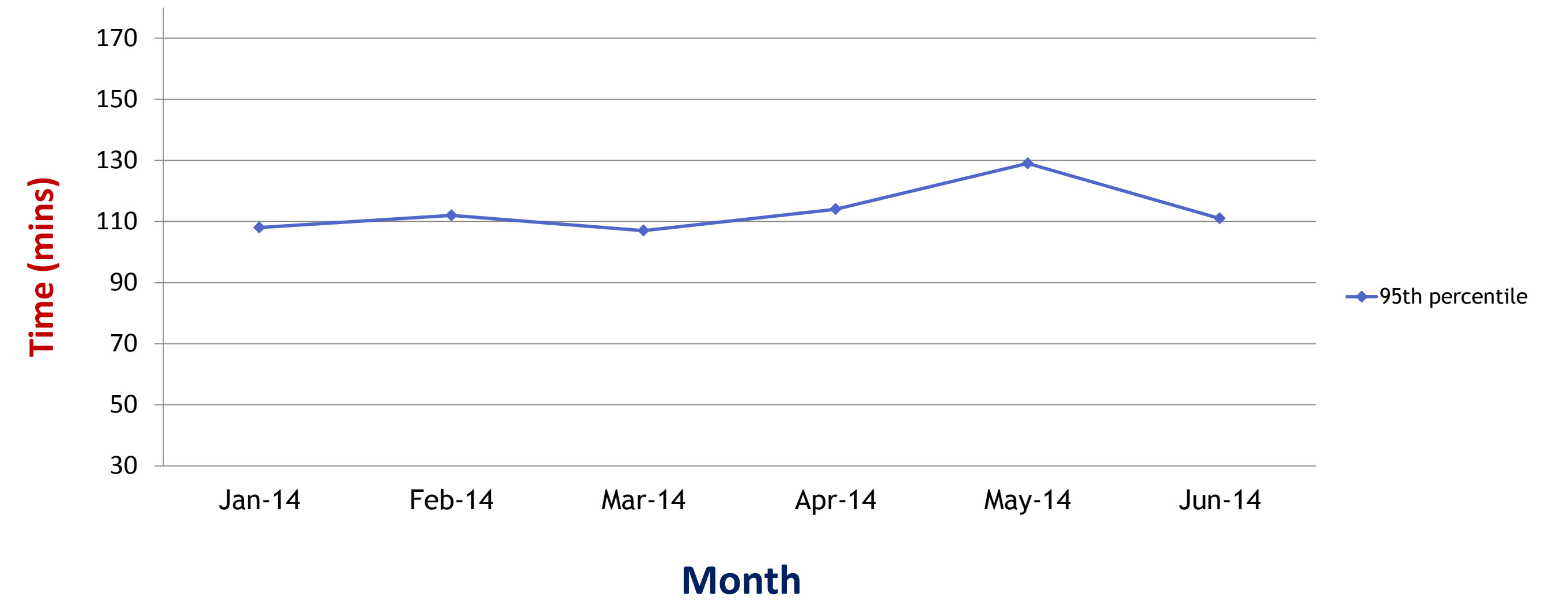
Results:

There were improvements in the TAT and the rejection rate of specimens due to insufficient volume. (see graph 1, 2 and 3). The ESR Stat Plus has stronger peer group, which will enable our laboratory to confidently monitor the accuracy of ESR performance. All our EQA results from CAP have been satisfactory. (see figure 3).



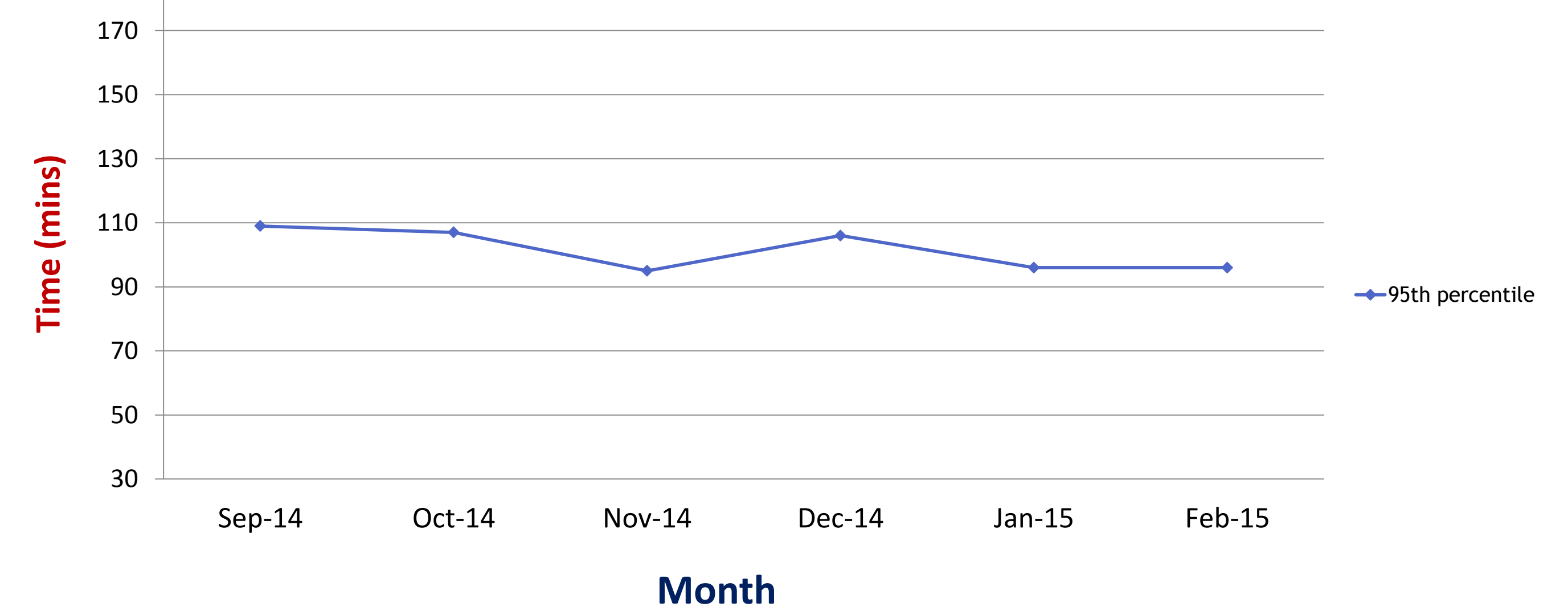
Graph 1: The overall specimen rejection rate due to insufficient volume is 0.43% (14/3263) with Microvette CB200 while there were no rejections of specimen out of 3200 workload with ESR Stat Plus.

Time taken for ESR test from received to verified (Microvette CB200)




Graph 2: With Microvette CB200, 95% of results were verified at 115 minutes.

Time taken for ESR test from received to verified (ESR Stat™ Plus)



Graph 3: With ESR Stat Plus, 95% of results were verified at 100 minutes.

 College of American Pathologists 325 Waukegan Road, Northfield, Illinois 60093-2750 800-323-4040 • http://www.cap.org <i>Advancing Excellence</i>		CAP Number: 8040562-01 Institution: KK Women's and Children Hospital Attention: Chiew Yin Leong MT City / State: Singapore SN 229899		Kit# 1 Original	Microvette CB200			
EVALUATION ORIGINAL		ESR-B 2013 Erythrocyte Sedin						
Test Unit of Measure Peer Group	Evaluation and Comparative Method Statistics							
	Specimen	Your Result	Mean	S.D.	No. of Labs	Limits of Acceptability		Your Grade
						S.D.I	Lower Upper	
	Erythrocyte Sed Rate	ESR-04	80		9			[20]
	mm/hr	ESR-05	130		9			[20]
OTHER	ESR-06	120		10			[20]	
DILUTED								
Actions Laboratories Should Take when a PT Result is Not Graded								
The College uses Exception Reason Codes that signify the proficiency testing (PT) for an analyte has not been graded. The Exception Reason Code is located on the evaluation report in brackets to the right of the result. Your laboratory must identify all of the analytes with an Exception Reason Code and investigate the acceptability of performance with the same rigor as if it were an unacceptable performance. The actions accredited laboratories should take include but are not limited to:								
Code	Exception Reason Code Description	Action Required						
11	Unable to analyze.	Document why the specimens were not analyzed (eg, instrument not functioning or reagents not available). Perform and document alternative assessment (ie, split samples) for the period that commercial PT was not tested to the same level and extent that would have been tested.						
20	No appropriate target/response; cannot be graded.	Document that the laboratory performed a self-evaluation using the data presented in the Participant Summary and compared its results to a similar method, all method, or all participant statistics if provided. If comparison is not available, perform and document alternative assessment (ie, split samples) for the period that commercial PT was not tested to the same level and extent that would have been tested.						

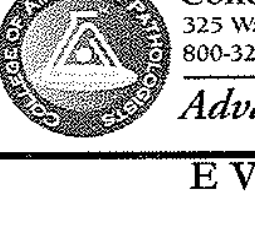

 College of American Pathologists 325 Waukegan Road, Northfield, Illinois 60093-2750 800-323-4040 • http://www.cap.org <i>Advancing Excellence</i>		CAP Number: 8040562-01 Institution: KK Women's and Children Hospital Attention: Chiew Yin Leong MT City / State: Singapore SN 229899		Kit ID: 26413574 Kit Mailed: 5/19/2014 Original Evaluation: 7/24/2014		EST Stat Plus				
EVALUATION ORIGINAL		ESR-A 2014 Erythrocyte Sedimentation Rate								
Test Unit of Measure Peer Group		Evaluation and Comparative Method Statistics						Plot of the Relative Distance of Your Results from Target as Percentages of Allowed Deviation		
		Specimen	Your Result	Mean	S.D.	No. of Labs	S.D.I	Limits of Acceptability Lower Upper	Your Grade	Survey -100-----Mean-----+100
Erythrocyte Sed Rate mm/hr HEMATECH ESR STAT PLUS UNDILUTED		ESR-01	84	68.4	9.1	334	+1.7	41 95	Acceptable	
		ESR-02	14	13.1	2.6	330	+0.3	5 25	Acceptable	
		ESR-03	81	67.7	9.3	329	+1.4	39 95	Acceptable	

Figure 3: CAP EQA for ESR Stat Plus has over 290 participants as compared to 10 participants for CB200.

Conclusion:

Acquiring ESR Stat Plus provides a faster turnaround time and has significantly reduced sample rejection rates due to insufficient sample volume. This makes it ideal for use in a children's hospital facility.

Acknowledgement:

We would like to thank the staff of the Clinical Lab for their contributions and support.