UK NEQAS
Haematology and Transfusion

An investigation of feto-maternal haemorrhage (FMH) flow cytometry (FC) referral rates when the bleed volume is below the BSH recommended cut off

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Background

In recent years, FMH testing by FC has become increasingly accessible, resulting in a decrease in hospital laboratories performing FMH quantification by acid elution (AE), and instead screening by AE with follow-up FC quantification (FCQ) performed on the samples identified using screening criteria.

An FMH EQA exercise was designed to investigate referral and follow-up practices where the bleed volume (BV) is below the BSH recommended referral level of ≥2.0mL when based on a semi-quantitative screen[1].

Methods

In March 2018, an EQA sample simulating a bleed volume of 1mL was sent to 304 participants in 16 countries. Results for technique and registration type were analysed separately. The FCQ median BV was taken as the 'true' result.

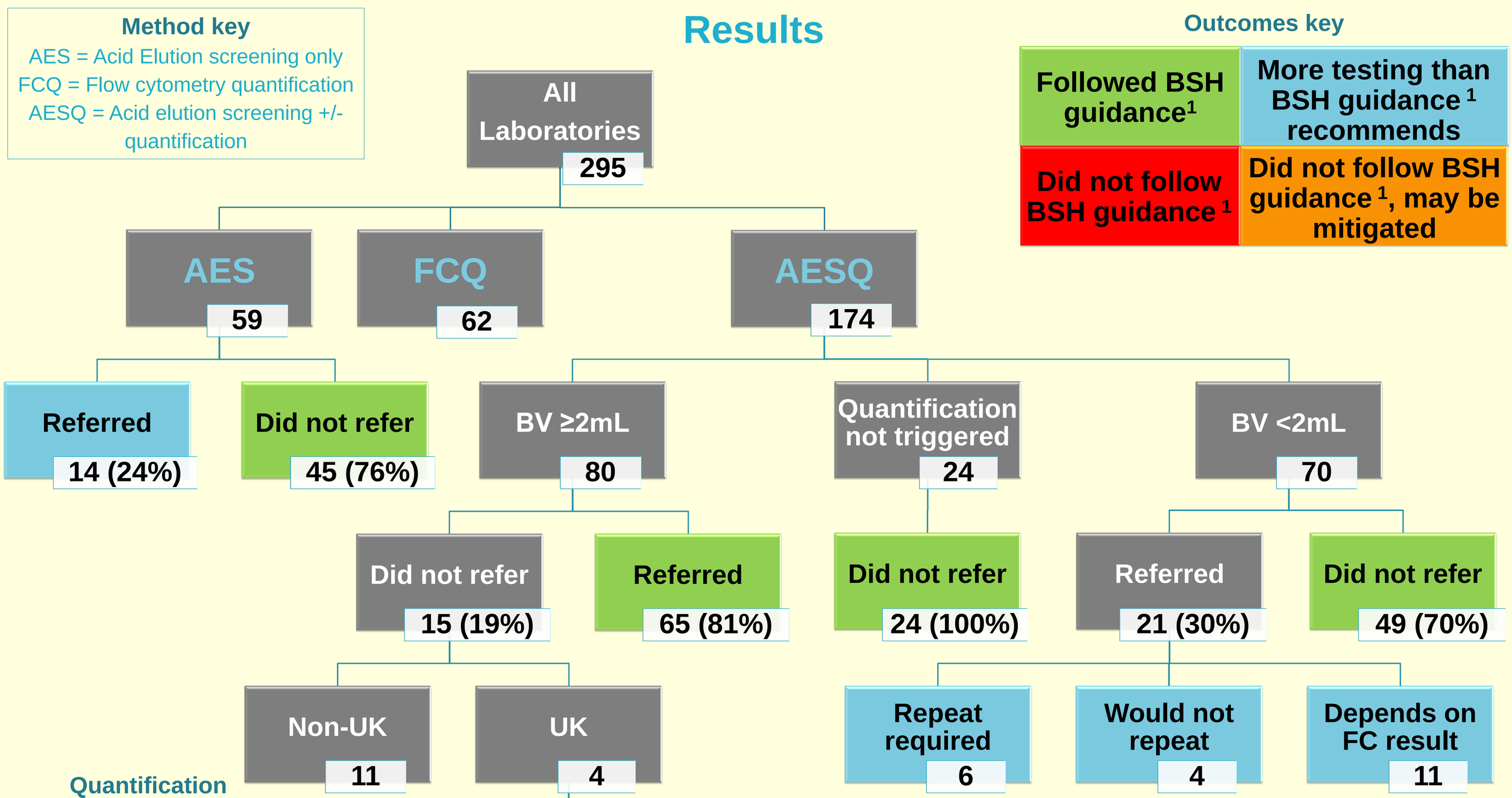
For laboratories only undertaking AE screening, the decision to trigger quantification was analysed. For laboratories registered for AE quantification, BV, decision to trigger quantification, decision to refer for FCQ, and the recommended dose of anti-D Immunoglobulin (Ig) were analysed.

Results

Method key
AES = Acid Elution screening only
FCQ = Flow cytometry quantification
AESQ = Acid elution screening +/- quantification

Outcomes key

Followed BSH guidance[1]	More testing than BSH guidance [1] recommends
Did not follow BSH guidance [1]	Did not follow BSH guidance [1], may be mitigated

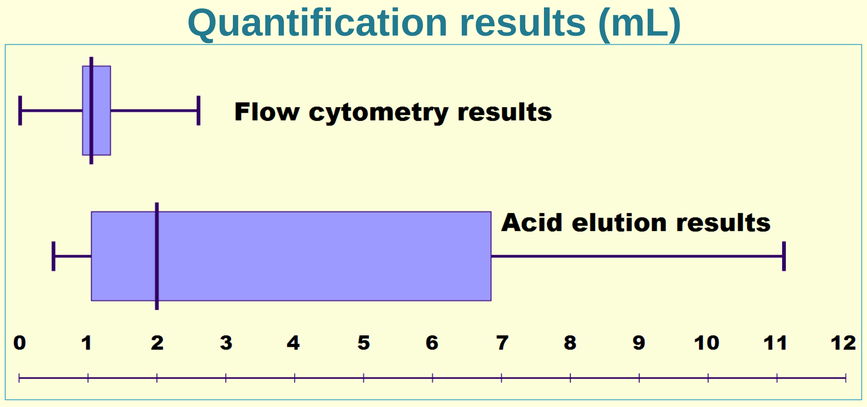


Quantification statistics (mL)

	FCQ	AESQ
n	62	150
Min	0.0	0.5
IQR1	0.9	1.6
Median	1.0	2.0
IQR3	1.3	2.6
Max	2.6	11.1*

*excluding one outlying result

Quantification results (mL)



Summary / Conclusions

- Although no laboratories would have put patients at risk based on the bleed volume in this exercise, it is interesting to note the trends in over-testing and under-testing when compared to current BSH guidance.
- Of the AE screening only laboratories, approximately one quarter would have referred for FCQ, presumably due to a semi-quantitative screen not being used in all cases, and quantification being required where any fetal cells are seen. The referral rate for these laboratories could be reduced with wider use of a semi-quantitative screen. In July 2018, 33/53 (62%) screening laboratories and 132/174 (76%) quantification laboratories reported using BSH semi-quantitative screen.
- Of the AE quantification laboratories, 30% who found the bleed volume to be <2mL referred the sample for quantification by flow cytometry. This additional testing is not indicated by BSH guidance, and may be causing unnecessary testing for the reference laboratories, and for the patient where a repeat sample is requested.
- Four UK laboratories recording acid elution quantification results of >2mL did not refer the sample for quantification by flow cytometry; three of these issued sufficient anti-D Ig to cover a 12mL bleed and requested a repeat sample, and one laboratory issued anti-D Ig to cover a 4mL bleed and did not request a repeat sample. The BSH guideline recommends that bleed volumes estimated at ≥2mL are referred for quantification by flow cytometry due to the confounding factors inherent in acid elution quantification, and the risks of sensitisation when insufficient anti-D Ig is administered.
- The decision to not refer when the in-house BV is ≥2.0mL is outwith current BSH guidance and should be subject to risk assessment.

References ([1]) British Committee for Standards in Haematology (BSH) *Guidelines for the Estimation of Fetomaternal Haemorrhage* (2009): E Austin, S Bates, M de Silva, D Howarth, A Lubenko, M Rowley, M Scott, E Thomas, J White, M Williams. Available from: http://www.b-s-h.org.uk/guidelines/ [Accessed 13/08/2018].

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