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Subject: STRmix™ MCMC Uncertainty Disclosure

On June 30, 2020, the developers of the STRmix™ probabilistic genotyping software sent out a notice regarding some recent testing that was performed. The notice discussed one method within the software, the highest posterior density (HPD), that is applied in the calculation of a likelihood ratio (LR). One aspect of the HPD method applies a lower bound to the variation induced by the Monte Carlo effect in a LR calculation. Their recent testing showed that this portion of the HPD method is not always as conservative as desired.

Although this particular aspect of the HPD approach is not always as conservative as desired, this method is just one of many layers of conservatism built into the STRmix™ software to account for the different areas of uncertainty within the LR calculation. The LR value reported is an estimate that accounts for possible co-ancestry between individuals within racial sub-populations, sampling uncertainty of allele frequency databases, and variability within the STRmix™ deconvolution process. The other layers of conservatism remain unaffected by this notice.

At the OCME, an extensive validation was done before putting the STRmix™ software online for general casework use. The validation showed that the output from the software is performing as expected with respect to the calculated LRs for both true and non-contributors to a given sample, and that the software can be used as a tool to support a trained analyst's overall interpretation of DNA results. This continues to hold true. To address the observation noted by the STRmix™ developers, OCME has updated the case report appendix and laboratory protocols that discuss the lower bound of the HPD method. The reported numerical LR within the case reports will remain unchanged and all LR calculations can still be found within the case file.

Given the many layers of conservatism that are in place for the calculation and reporting of the final LR estimate, we are confident that the results reported by OCME are and will continue to be reliable.