B121 Statistical Modeling of the Case Information From Ohio's Sexual Assault Kit (SAK) Testing Initiative

Jaimie E. Kerka*, 31307 Fairwin Drive, Bay Village, OH 44140; D.J. Heckman, BS, BGSU, Math Dept, Bowling Green, OH 43404; James Albert, PhD, BGSU, Math Dept, Bowling Green, OH 43404; Jon E. Sprague, PhD*, Center for the Future of Forensic Sci at BGSU, 39 College Park, Bowling Green State University, Bowling Green, OH 43403; and Lewis O. Maddox, PhD, Ohio BCI&I, 4055 Highlander Parkway, Richfield, OH 44286

After attending this presentation, attendees will be informed concerning: (1) the application of logistic regression model to forensic science; and, (2) lessons learned from the Ohio SAK Initiative.

This presentation will impact the forensic science community by demonstrating that the application of logic regression modeling to SAK processing can be used to provide insight into whether a sample might yield a Combined DNA Index System (CODIS) -eligible DNA profile.

There is limited comprehensive data documenting the progression and results of statewide SAK forensic testing. The state of Ohio has now analyzed SAKs that did not initially undergo DNA testing, and a wealth of information now exists regarding the DNA test results from nearly 14,000 kits processed because of Ohio's SAK Initiative. Case information from a sample of 2,500 completed SAKs was collected in order to investigate a number of relationships regarding SAK data. Data collected from the SAK case files included: (1) pertinent information from the nurse notes taken at the time of the kit collection; (2) whether or not a particular forensic sample was collected; (3) whether or not a sample yielded foreign DNA; (4) whether the sample produced a CODIS-eligible DNA profile; (5) whether the sample resulted in a CODIS hit; and, (6) the total number of samples run in the first round of testing.

The majority of the focus of the study involved analyzing the results of DNA testing by swab or sample location (vaginal, anal, oral, hair, clothing, etc.). A logistic regression model was fit to the data to predict whether or not a kit contained CODIS-eligible DNA profiles. The individual effects of variables identified early in the study on the response were observed. The number of days a victim waited between the date of the sexual assault and SAK collection significantly impacted the probability of obtaining a CODIS-eligible DNA profile. As the wait time increased, the probability of obtaining a CODIS-eligible DNA profile decreased. The probability of obtaining at least one CODIS-eligible sample from a kit varies as a function of victim age and days to kit collection. The impact of years to kit submission to the laboratory for testing is being further investigated. Days to submission were more significant than years until testing. This study demonstrates that application of logic regression modeling to SAK processing can be used to provide some insight into whether a sample might yield a CODIS-eligible DNA profile.

CODIS, SAK, Statistics