D30 American Association for the Advancement of Science (AAAS) Forensic Science Assessments: A Quality and Gap Analysis of Fire Investigation

Jose R. Almirall, PhD, Florida International University, Miami, FL 33199*

Learning Overview: After attending this presentation, attendees will be familiar with the July 2017 report published by AAAS on the quality and gap analysis in the field of fire investigation.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing conclusions and recommendations reported by the AAAS fire investigation working group.

The AAAS, the world's largest scientific society, recently commissioned a quality and gap analysis on the topic of fire investigation. The AAAS staff and a working group composed of a fire investigator and academic scientists reviewed the current practice and available scientific literature in the field and reported their findings in July 2017.[1] The working group was asked to identify gaps in the body of knowledge within fire investigation and make recommendations for future research that would fill the gaps and "inspire greater confidence in the criminal justice system." The report was divided into two parts, fire scene investigation and fire debris analysis, and includes conclusions and recommendations related to the different aspects of each of these methodologies. Fire scene investigation covers the topics of origin and cause determination, locating ILRs in fire debris, reliability and validity, cognitive bias and education, certification and experience. The fire debris analysis section of the report covers topics that include potential improvements in locating and analysis of ILRs at the scene using more advanced analytical chemistry tools, applying analytical methods in the laboratory, advances in the standardization of analytical practice, challenges in the analysis of Ignitable Liquid Residues (ILRs), including the interpretation of the analytical data collected from fire debris analysis and, finally, reporting language.

The report is formatted to include specific recommendations for both the fire scene investigation portion and the fire debris analysis portion. The report also includes conclusions drawn from the review of the available literature to aid policy makers and funding agencies in developing a strategy to facilitate research where gaps in knowledge are identified. The fire scene investigation portion of the report includes recommendations in the areas of origin and cause determinations, locating ILRs in fire debris, reliability and validity, cognitive bias and education, certification, and experience.

The recommendations and conclusions drawn from the fire debris analysis portion of the report include improving the identification and, hence, collection of ILRs in the field through the use of portable instrumentation, trained canines, and other means, improving the application of analytical chemistry tools in the laboratory (sampling, extraction and analysis), addressing the current challenges in analyzing ILRs, such as the classification of ILRs in a standardized way, a study on the limitations on the current methods, and the need to know the performance of the current standard methods in use by the fire debris analysis community (global and local error rates).

Reference(s):

1. José Almirall, Hal Arkes, John Lentini, Frederick Mowrer and Janusz Pawliszyn. Fire Investigation. *Forensic Science Assessments: A Quality and Gap Analysis.* 7/11/2017. https://www.aaas.org/report/fire-investigation.

Fire Investigation, Fire Scene Investigation, Fire Debris Analysis