

Accepted Manuscript

Title: Contributors are a nuisance (parameter) for DNA mixture evidence evaluation

Author: Klaas Slooten Amke Caliebe

PII: S1872-4973(17)30304-6

DOI: <https://doi.org/doi:10.1016/j.fsigen.2018.05.004>

Reference: FSIGEN 1893

To appear in: *Forensic Science International: Genetics*

Received date: 21-12-2017

Revised date: 7-5-2018

Accepted date: 11-5-2018



Please cite this article as: Klaas Slooten, Amke Caliebe, Contributors are a nuisance (parameter) for DNA mixture evidence evaluation, *Forensic Science International: Genetics* (2018), <https://doi.org/10.1016/j.fsigen.2018.05.004>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Title: Contributors are a nuisance (parameter) for DNA mixture evidence evaluation**Authors: prof. dr. K. Slooten (corr. author), dr. A. Caliebe**

Affiliation:

- K. Slooten: VU University Amsterdam, Netherlands Forensic Institute (NFI)
- A. Caliebe: Institut für Medizinische Informatik und Statistik, Christian-Albrechts-Universität zu Kiel

Email: k.slooten@nfi.minvenj.nl, caliebe@medinfo.uni-kiel.de

Abstract: Recently, a debate has arisen around the number of contributors postulated in hypotheses for the purpose of weight of evidence calculations on DNA mixture profiles. Specifically the issue at stake is whether or not one should have the same number of contributors under both hypotheses for which a likelihood ratio is calculated. In this paper we aim to clarify this issue. We take the general approach of considering the number of contributors as a nuisance parameter. Two central assumptions then determine the form of the overall likelihood ratio: whether the prior distributions of the nuisance parameter are equivalent given both hypotheses and whether they depend on the hypotheses. Examples are given for both scenarios where we have either independence or strong dependence between the prior distributions of the number of contributors and the hypotheses. Moreover, examples for different kinship scenarios are presented. In conclusion, the overall likelihood ratio does not only depend on likelihood ratios for fixed values of the nuisance parameter but may also vary considerably with different prior distributions.

Keywords: DNA mixtures, Number of Contributors, Weight of evidence, Nuisance parameters

Download English Version:

<https://daneshyari.com/en/article/11000144>

Download Persian Version:

<https://daneshyari.com/article/11000144>

[Daneshyari.com](https://daneshyari.com)