

# Forensic Evidence Analysis: Reasons for Incompetency in Reporting: A Short Article

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## Abstract

The field of forensic science deals with the analysis of a large number of evidence (namely biological, chemical physical and other materials respectively) via application of various methods ranging from preliminary to confirmatory testing. The use of these methods may sometimes poses serious challenges in front of forensic scientists while analyzing these evidence in the laboratory which leads to non-detectability of the desired substance and thereby incompetency in reporting the results.

The present article is a short review highlighted the common reasons responsible for incompetency in reporting of such cases along with some suggestive measures.

**Keywords:** Analysis; Evidence; Incompetency of Results; Challenges; Analytical Methods.

## INTRODUCTION

Forensic Science being a diversified field involves examination of a large number of evidence recovered (in form of samples) from the scene of crime. These evidence can be in the form of any physical material, or bodily secretions, or any chemical substances. These evidence when subjected to varied analysis during the testing process sometimes may not indicate the presence

of the actual analyte or the target compound. This non-detectability of the desired substance or the compound of interest is the leading cause of incompetent reporting.

The time starting from the recovery of the sample as exhibit at the crime scene till its examination and reporting requires crucial handling at each and every step.

### Reasons for Incompetency in Reporting

The incompetency in reporting arise due to a large number of significant factors some of which are discussed below:

**Improper sample collection:** This is considered to be the first and foremost factor contributing to incompetent analysis. The exhibits are usually collected from the crime scene along with a reference standard in order to establish a conclusive match between the two regarding their source or origin. There are reported incidences from the past

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showing a reckless attitude regarding collection practices leading to improper collection (standards are not collected along with sample) or act of contamination while taking the exhibits.

**Lack of well-equipped facilities and Infrastructure:** Inadequate infrastructure of laboratory or lacking the facility of state of art equipments for the analysis of sample evidence collected.<sup>2</sup>

**Improper Laboratory Resource allocation:** Improper management of resources and non-management of funds for the procurement of costly, high standards state of art equipments namely Gas Chromatography coupled with Mass Spectrometry (GC-MS)/Liquid Chromatography coupled with Mass Spectrometry (LC-MS/MS) High Performance Thin Layer Chromatography coupled with Mass Spectrometry (HPTLC MS)/Fourier Transform Infrared Spectroscopy coupled with Attenuated Total Reflectance (FTIR-ATR)/Inductively Coupled Plasma coupled with Mass Spectrometry (ICP-MS) and many others employed for the sample identification and characterization.<sup>2</sup>

**Preliminary Screening leads to false Positive Results:** The preliminary examination deals with the protocols applied for preliminary testing of various forensic evidence mainly drugs of abuse, controlled substances, serological evidence namely blood, semen, saliva, urine etc. and other significant materials like glass, soil, fiber etc. in order to narrow down the investigation process. These tests are performed to for the detection of the presence or absence of any particular evidence in the sample collected. The sample is collected and tested for the positive presence but there are chances that these tests being preliminary in nature may give false positive results which leads to incompetency in further analysis.

**Lack of Appropriate Reference Standards for Comparison:** The forensic analysis of exhibit always require a standard material of known specifications, purity, quantity to be employed simultaneously with the sample so as to make out a comparison between the two for determination of the origin, or source or to check its authenticity. Majority of laboratories are nowadays lacking these standards to carry out the comparison which leads to incompetency in results.

**Lack of field Experts and Professionals:** The field of forensic science is facing the challenge in the analysis of evidence material due to engagement of non-subject personnel's. These individuals being from non-forensic educational background does

not possess knowledge of the basic concepts and methods of analysis opted for material examination and thereby resulting in incompetency. Also, those individuals who are qualified enough in forensic domain well aware with the concepts and protocols to work as forensic professional in the field does not get the opportunity to work in these forensic laboratories and enhance their experience over those non-forensic professionals. This situation created a chaos in the profession and therefore affects the efficiency of reporting.<sup>1</sup>

**Lack of Proper Protocols for Analysis of Certain Samples:** The forensic analysis of various samples belonging to different domains of forensic science lack any standard operating procedure for sampling and analysis. For example forensic laboratories lack the proper procedures for sampling and analysis of petroleum products adulteration, detection of various food toxins, animal toxins which leads to incompetent results.

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## CONCLUSION

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Forensic field being a multidisciplinary area require proper sampling and analysis of the evidence recovered from the scene of crime. Lack of available facilities, skilled professionals, sophisticated equipments and instruments, inappropriate measures opted for sample collection, inadequate protocols for analysis, non-availability of funds or improper allocation of funds are certain contributing factors for incompetent results and reporting.

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### *Suggestive Measures*

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Measures must be taken to overcome these problems by

- Improving the infrastructure and equipment facilities
- Raising of funds
- Hiring of skilled staff
- Provide adequate training to the already working staff time to time regarding the usage of modern day instruments, working methodology opted for analysis of evidence which aids in eliminating the chances of incompetency in reporting.

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### *List of Abbreviations*

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Gas Chromatography coupled with Mass Spectrometry (GC-MS).

Liquid Chromatography coupled with Mass Spectrometry (LC-MS/MS).

High Performance Thin Layer Chromatography coupled with Mass Spectrometry (HPTLC MS).

Fourier Transform Infrared Spectroscopy coupled with Attenuated Total Reflectance (FTIR-ATR).

Inductively Coupled Plasma coupled with Mass Spectrometry (ICP-MS).

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