

*Results from the Assessment of  
Trace Evidence Questionnaire*

Sandy Parent and Sandy Koch

# *Goal of Assessment*

To assess the current state of affairs of trace evidence.

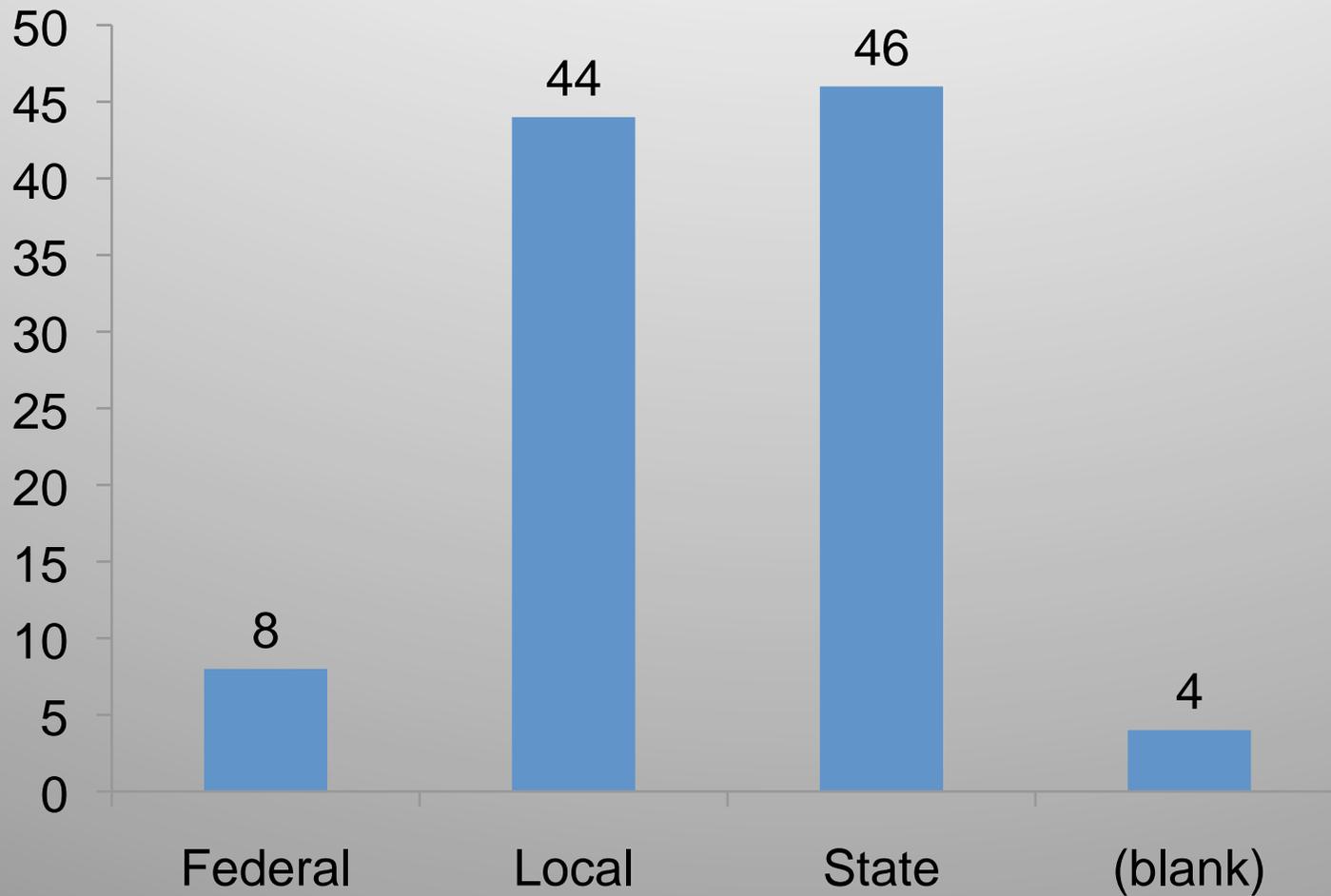
- How are we perceived within the trace community and from other disciplines?
- What sub-disciplines are being analyzed and what methods are being used?
- What are the significant issues facing Trace Evidence?
- What is the impact of the NAS report on Trace Evidence?

## Questionnaire was distributed to ...

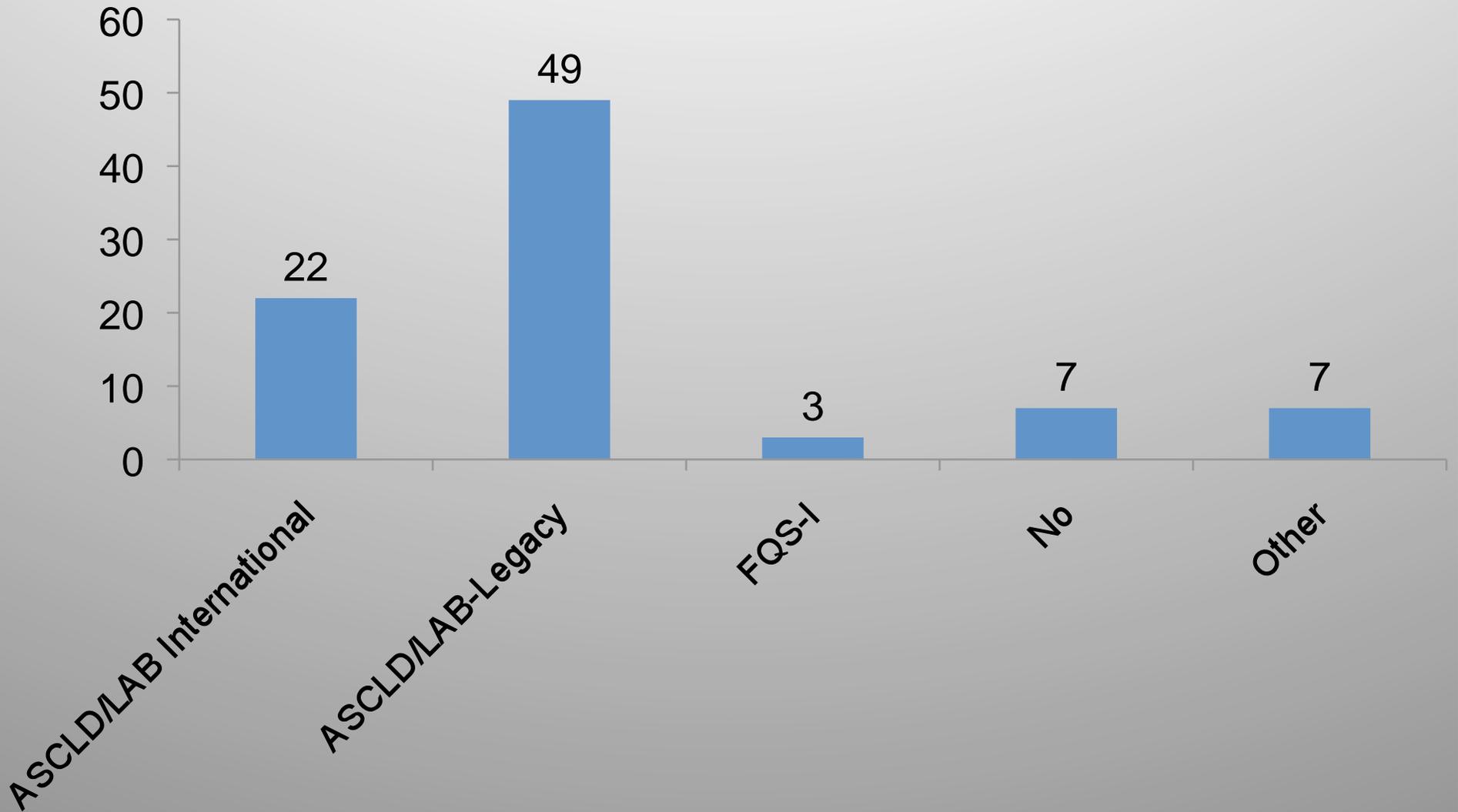
- ASCLD/LAB Delegates
- FBI Management Symposium attendees
- Regional Organizations
- Trace Evidence Symposium Attendees
- Posted on AFQAM
- Posted on the Trace Yahoo Group

- 149 responses representing at least 102 laboratories.
- For data analysis each participating laboratory was included once, except for larger lab systems with multiple trace labs. 121 responses were included in the data analysis portion of this presentation.
- 104 of the 121 responses currently have a unit dedicated to Trace Evidence Analysis.
- The remaining 17 labs did not have a unit dedicated to Trace Evidence Analysis.

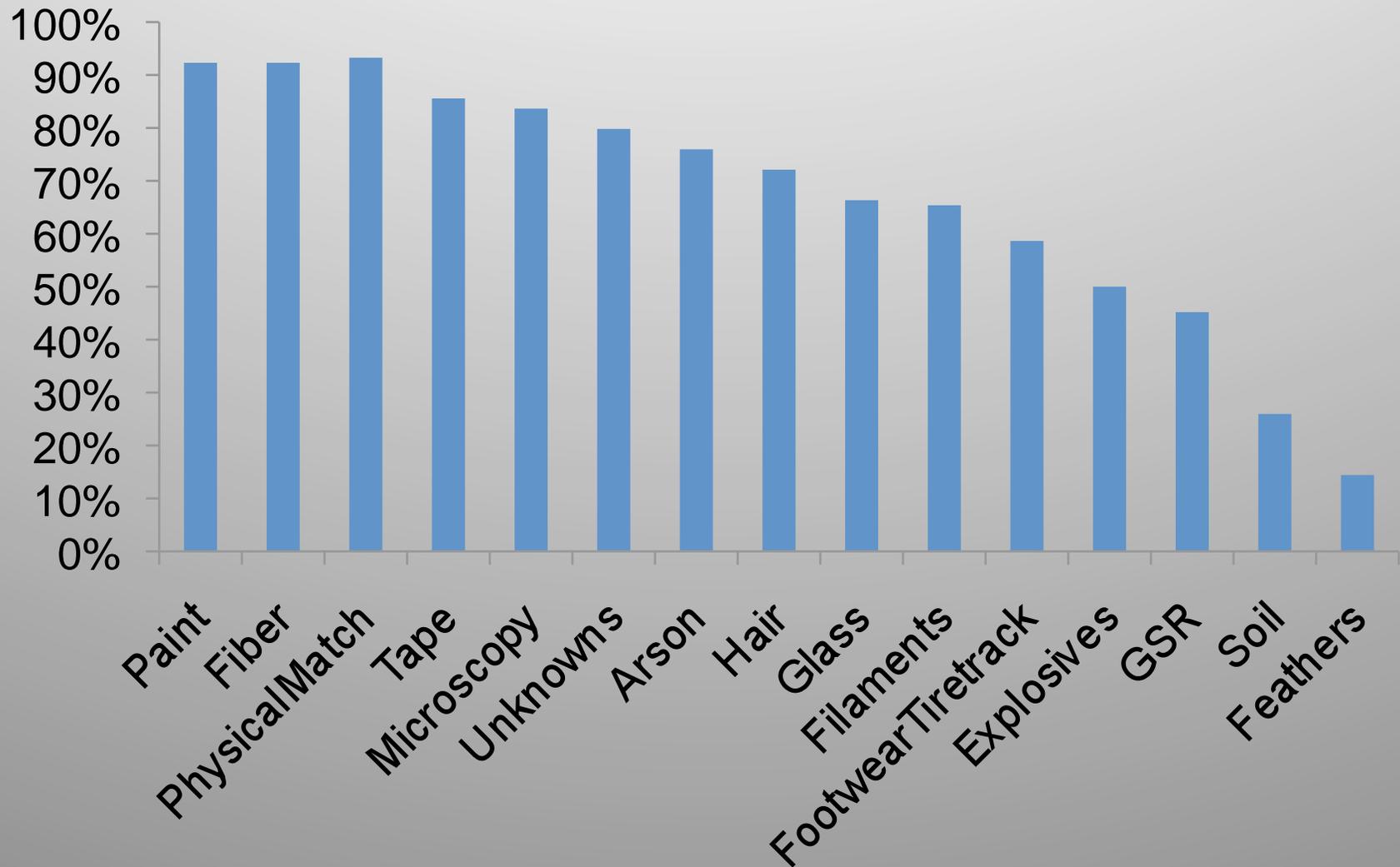
# 102 Labs Represented



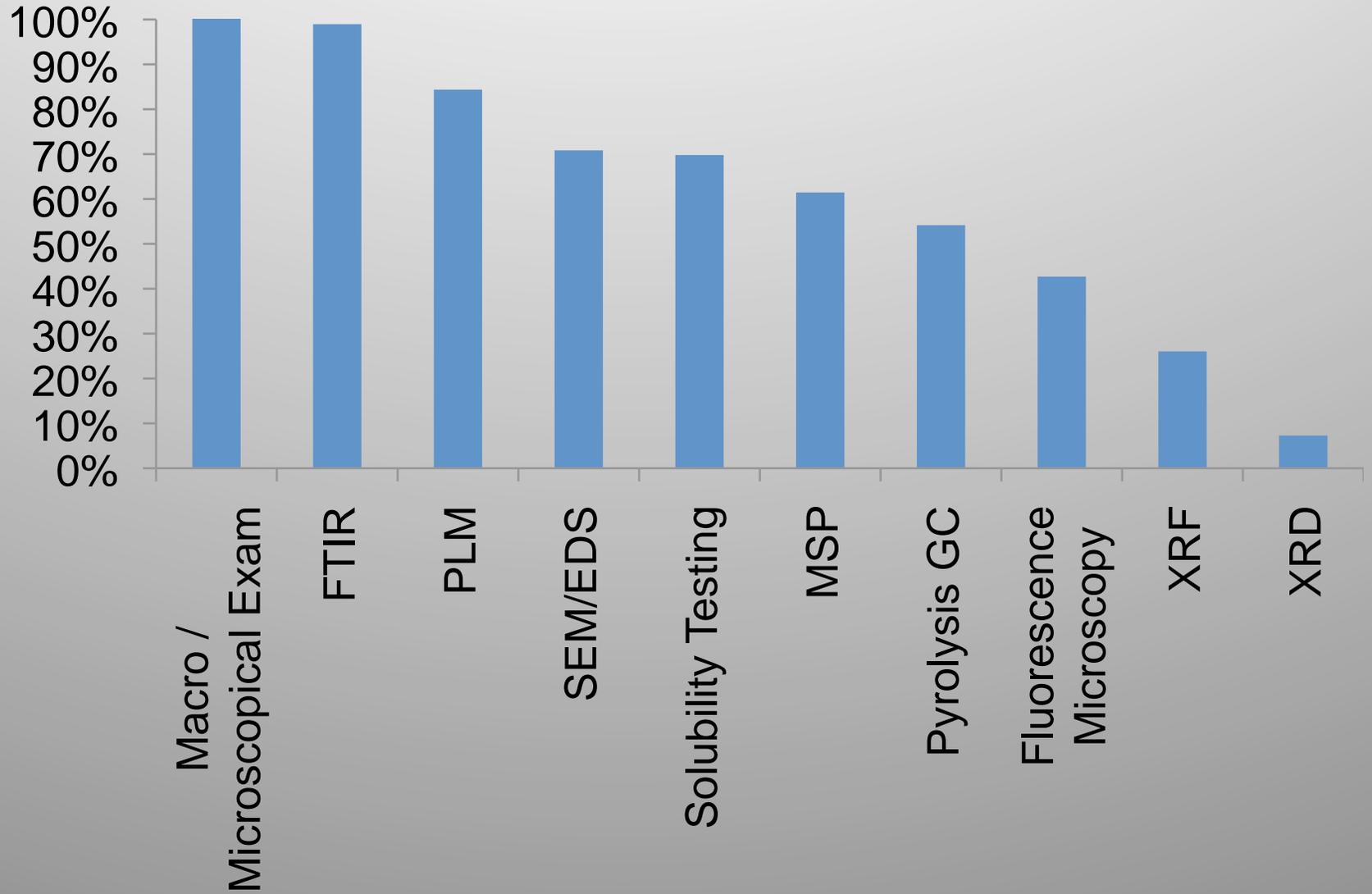
# Accrediting Body for Trace Laboratories



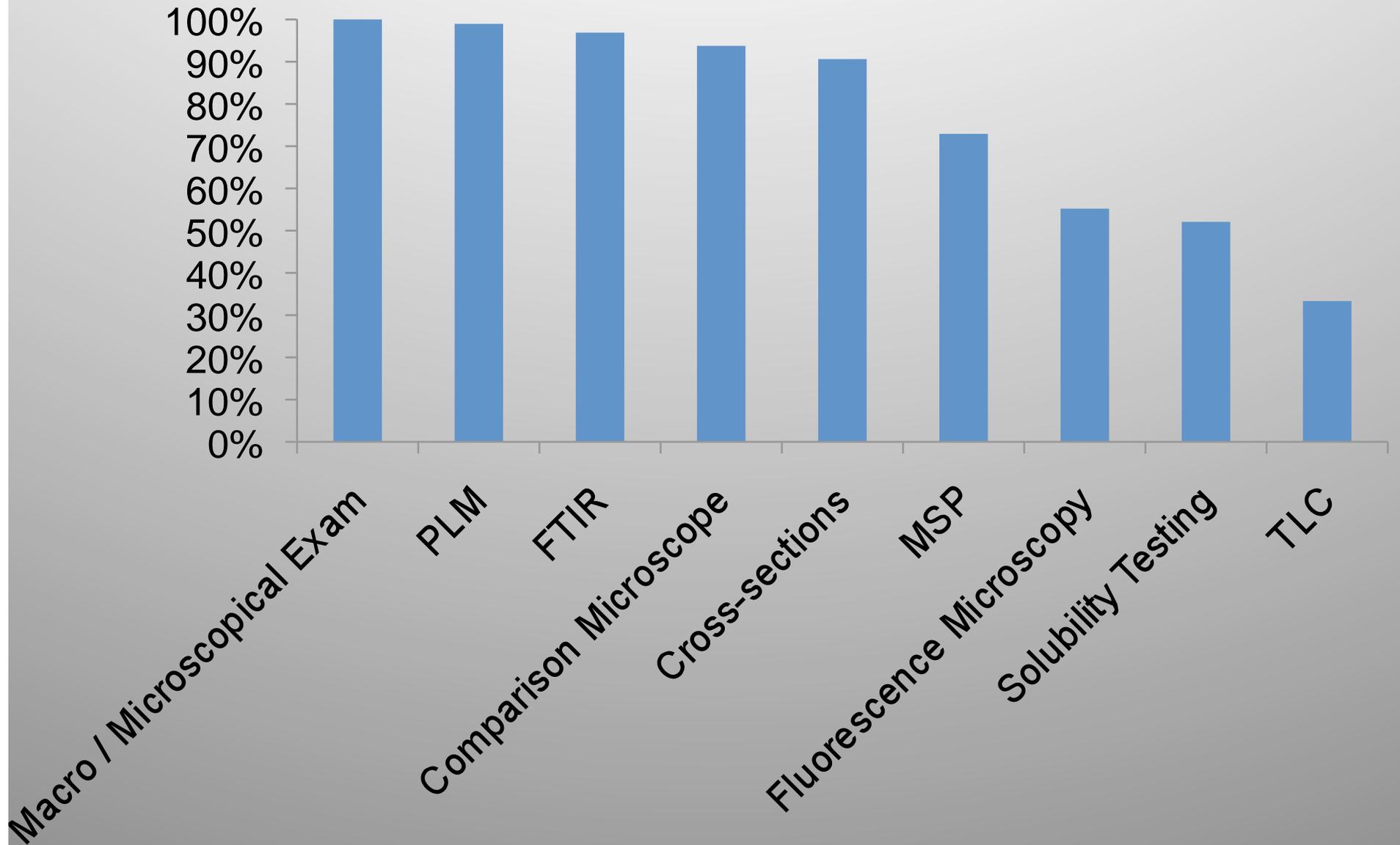
# Sub-disciplines analyzed



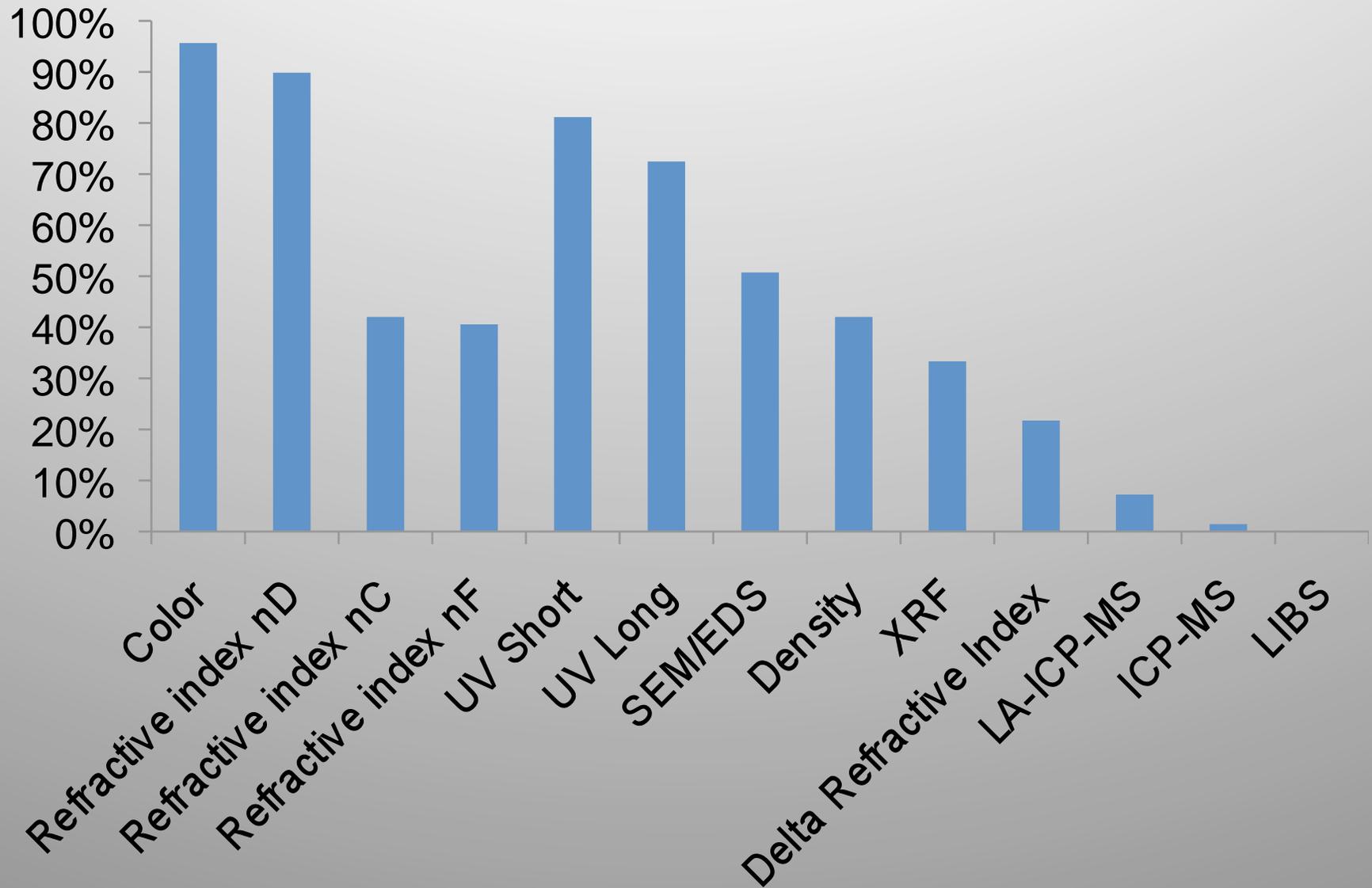
# Paint - 96 Laboratories



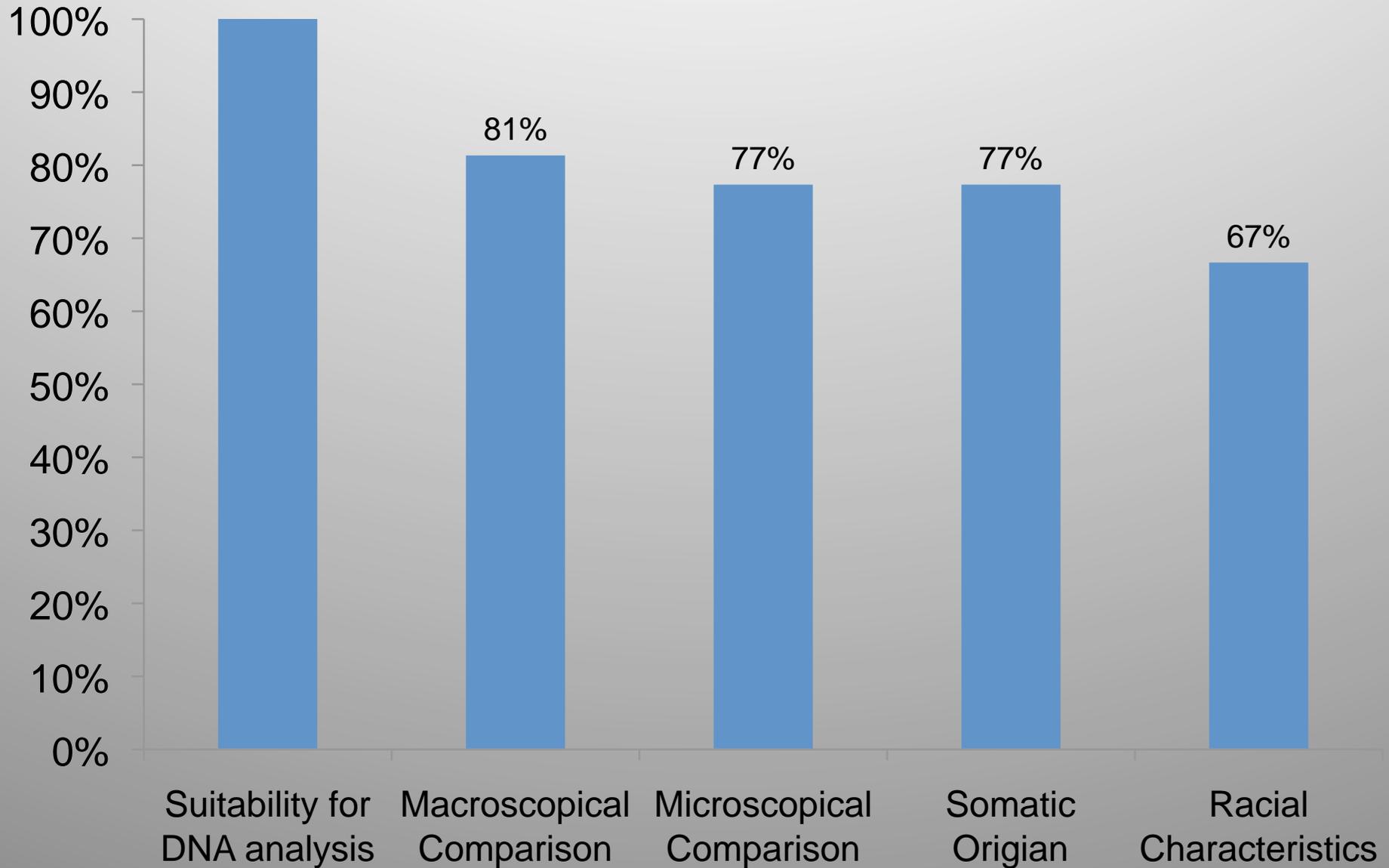
# Fibers – 96 Laboratories



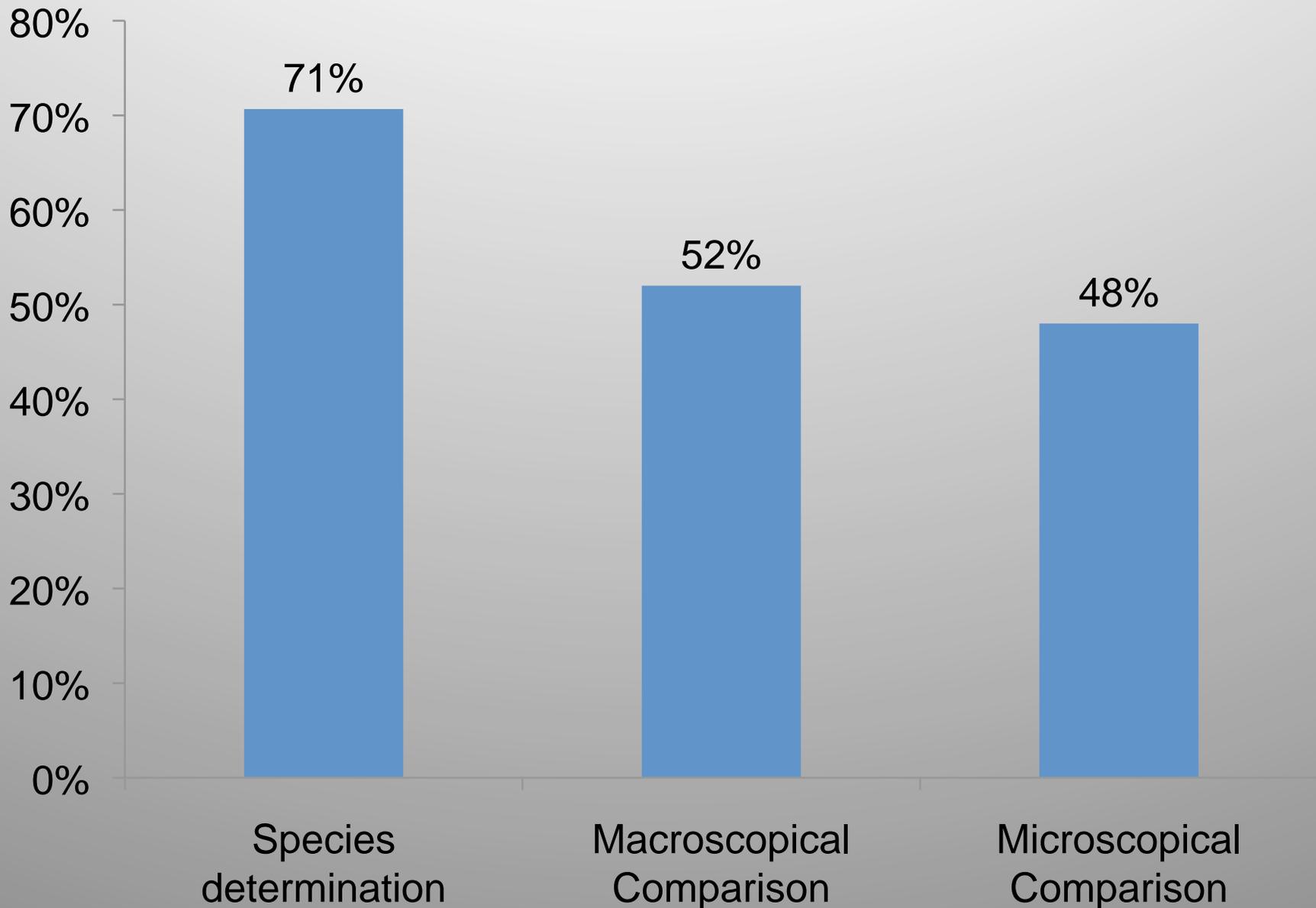
# Glass – 69 Laboratories



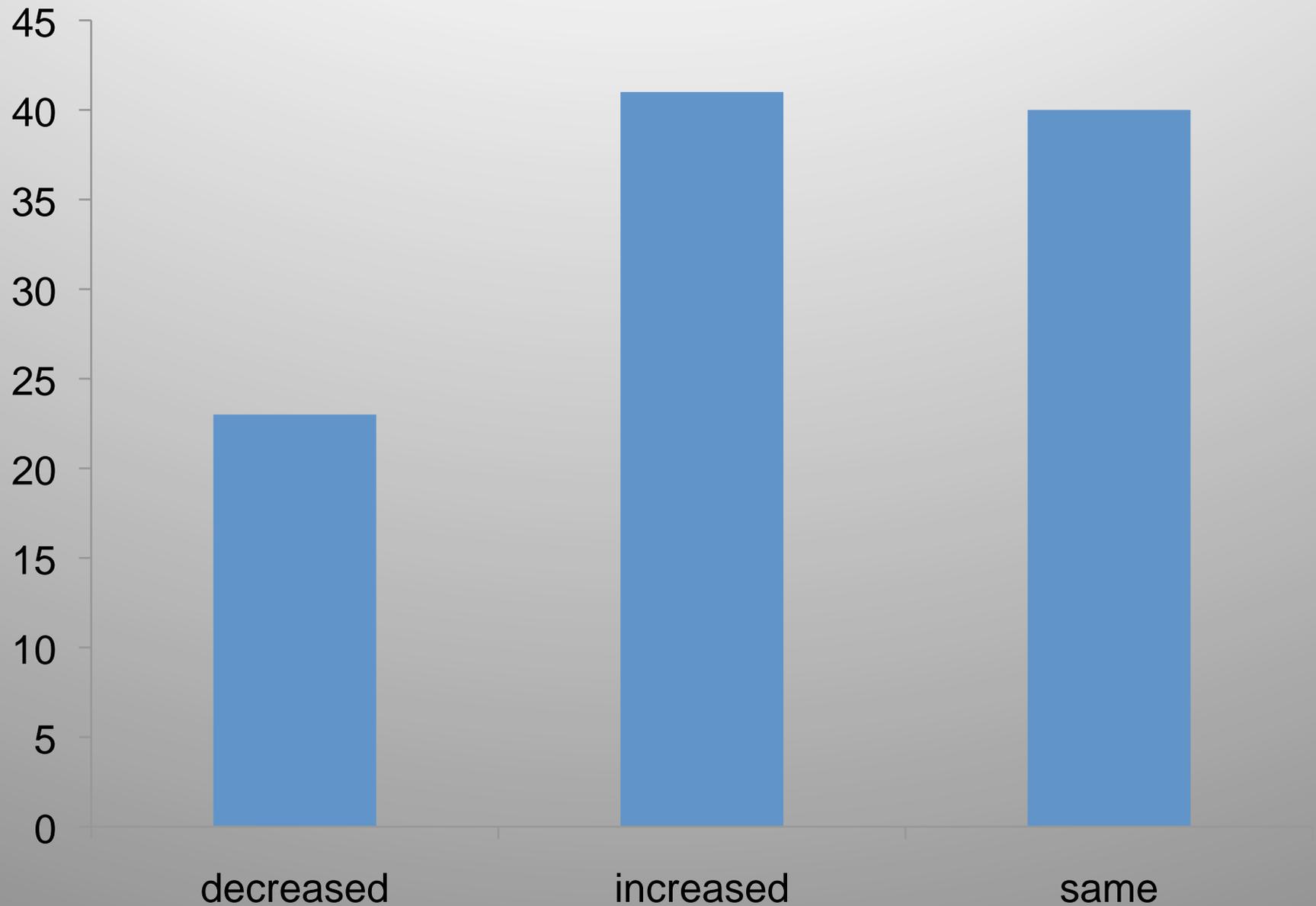
# Human Hair – 75 Laboratories



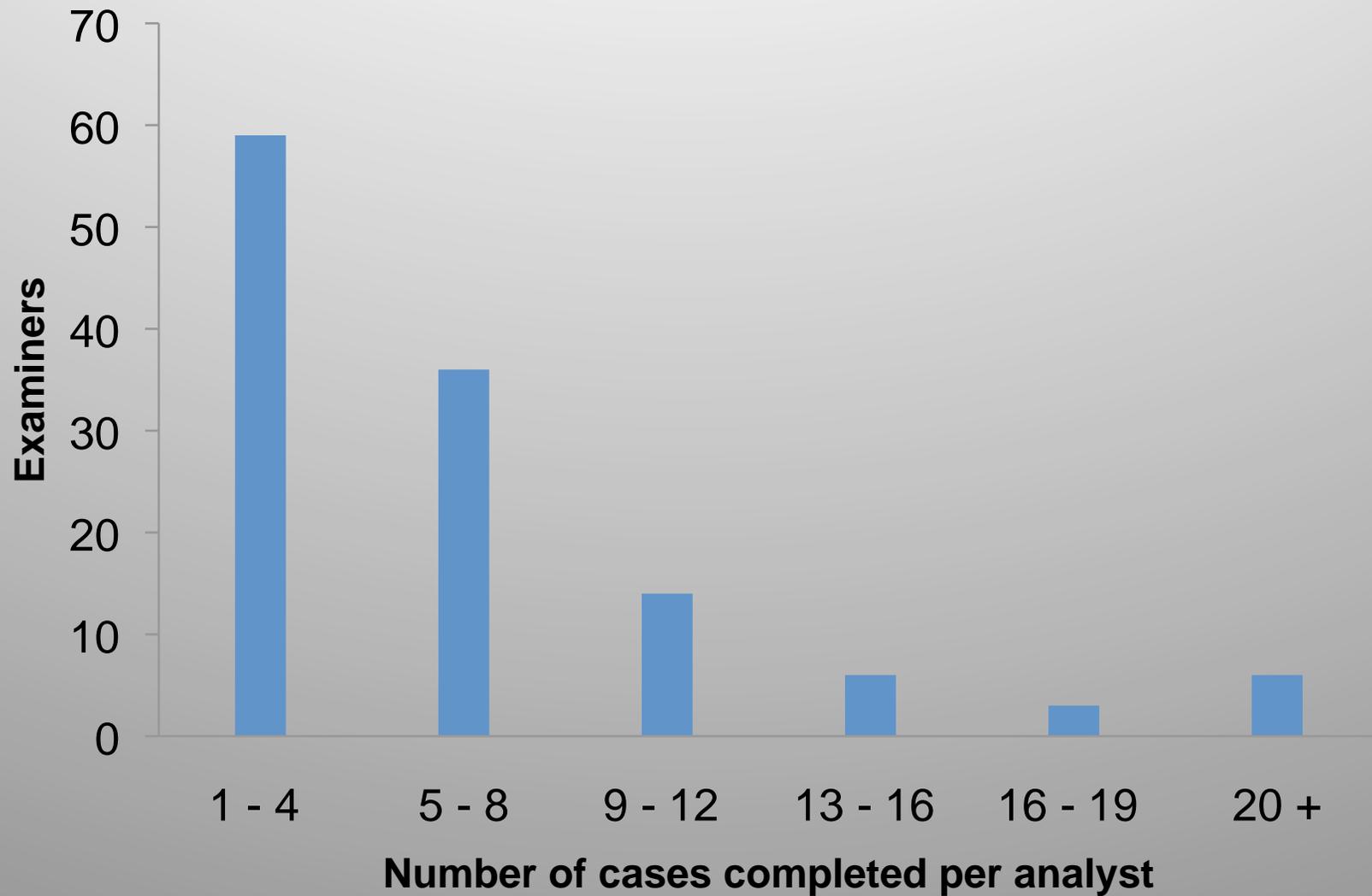
# Animal Hair – 75 Laboratories



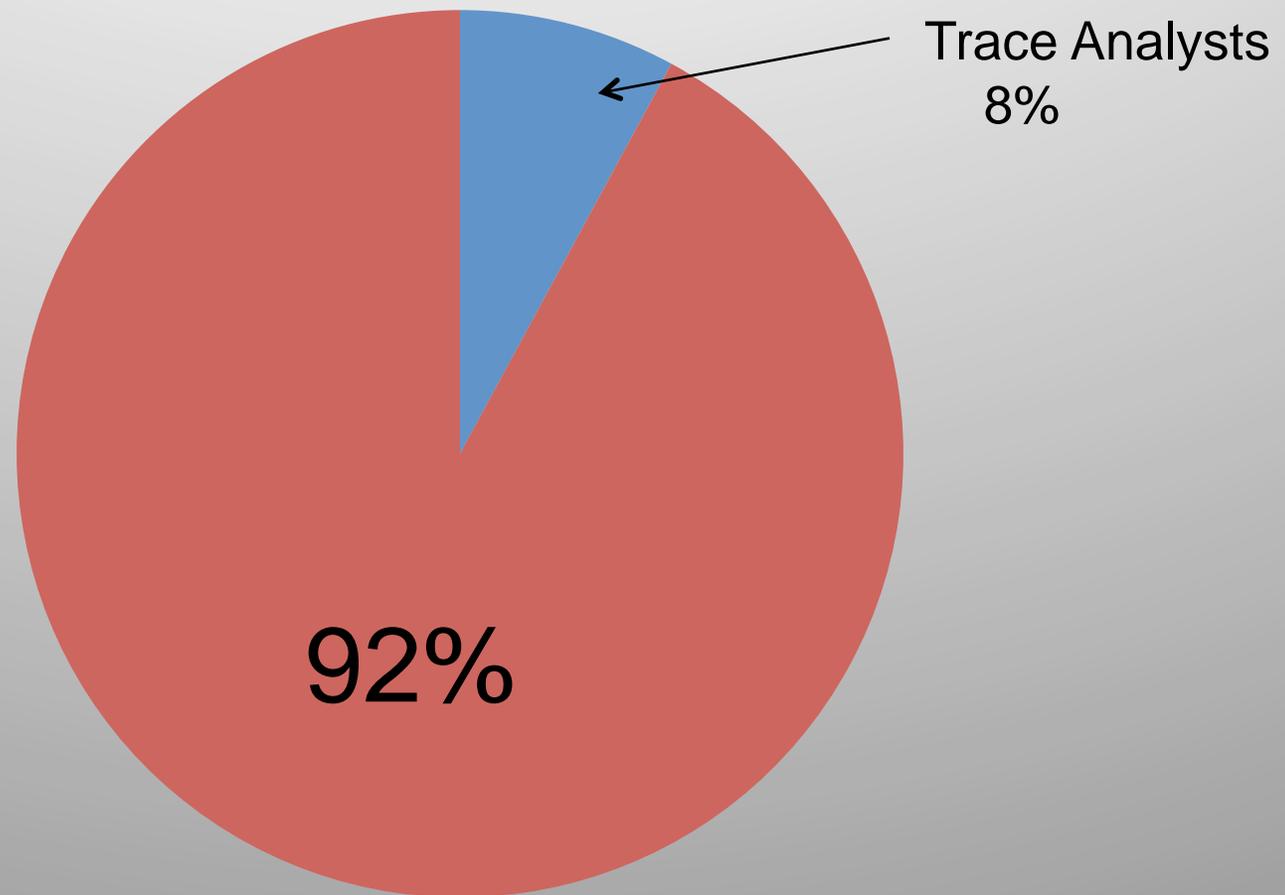
# Case Load for the past 5 years



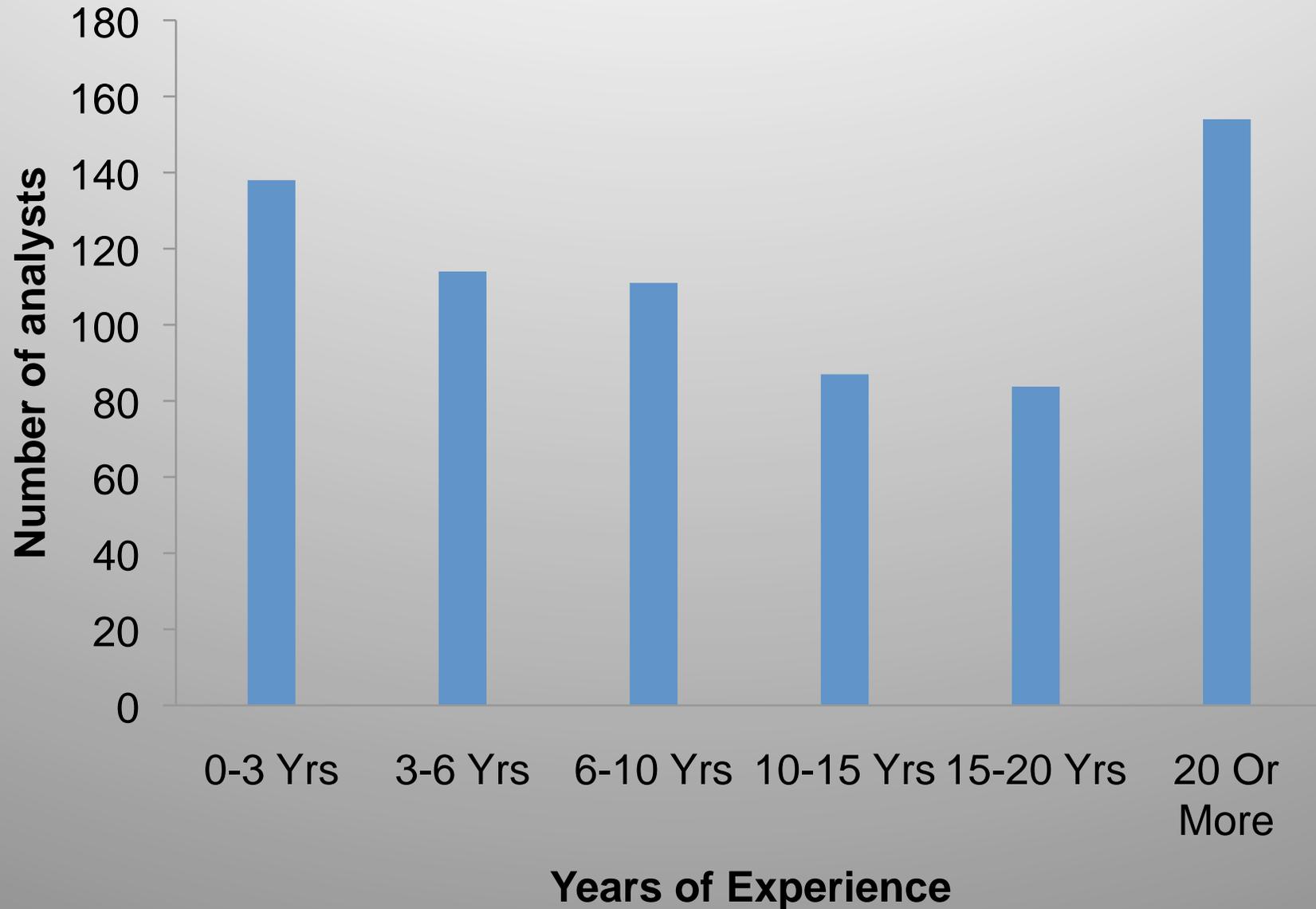
# Monthly case output



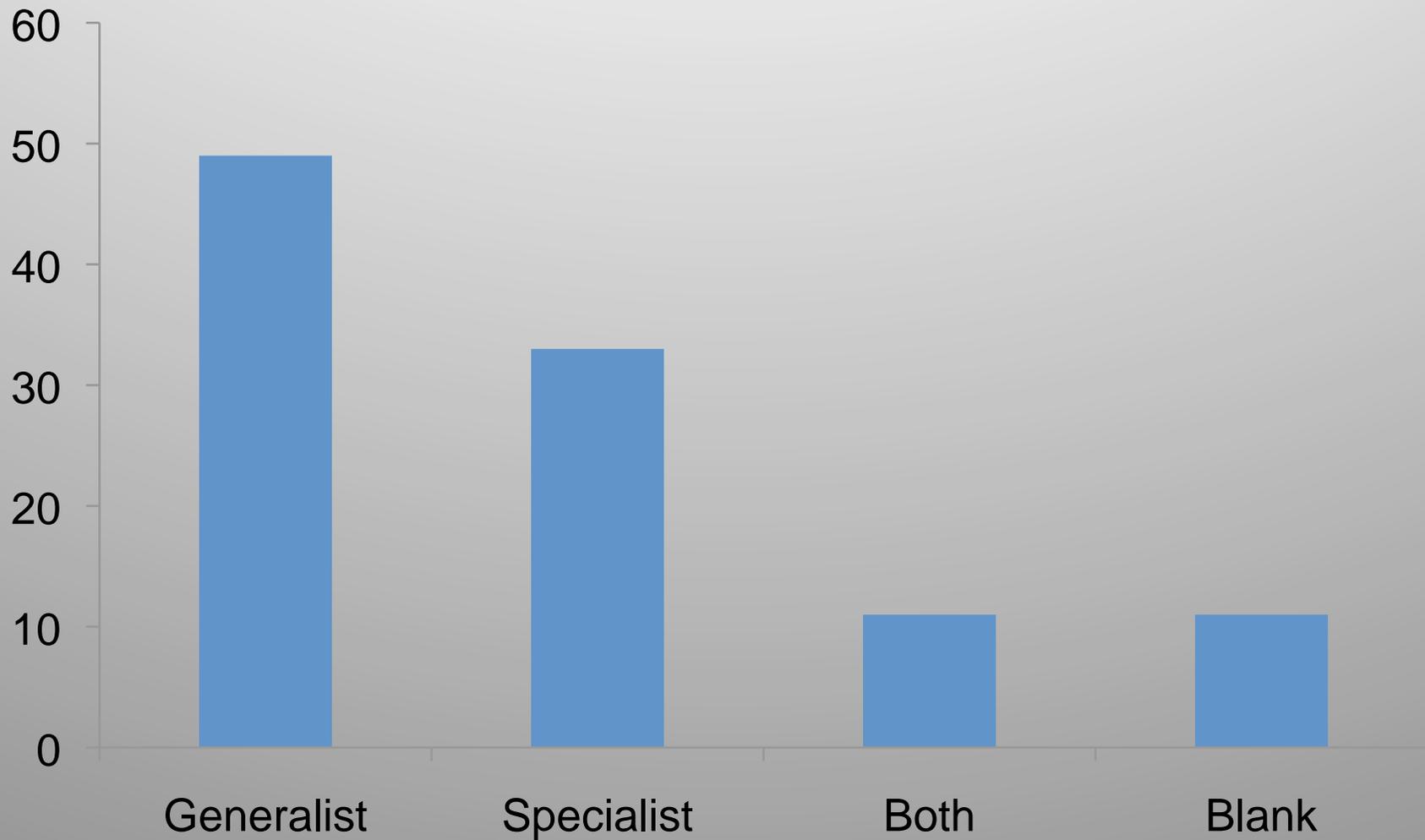
# Number of Trace Analysts vs. Total Population of Analysts



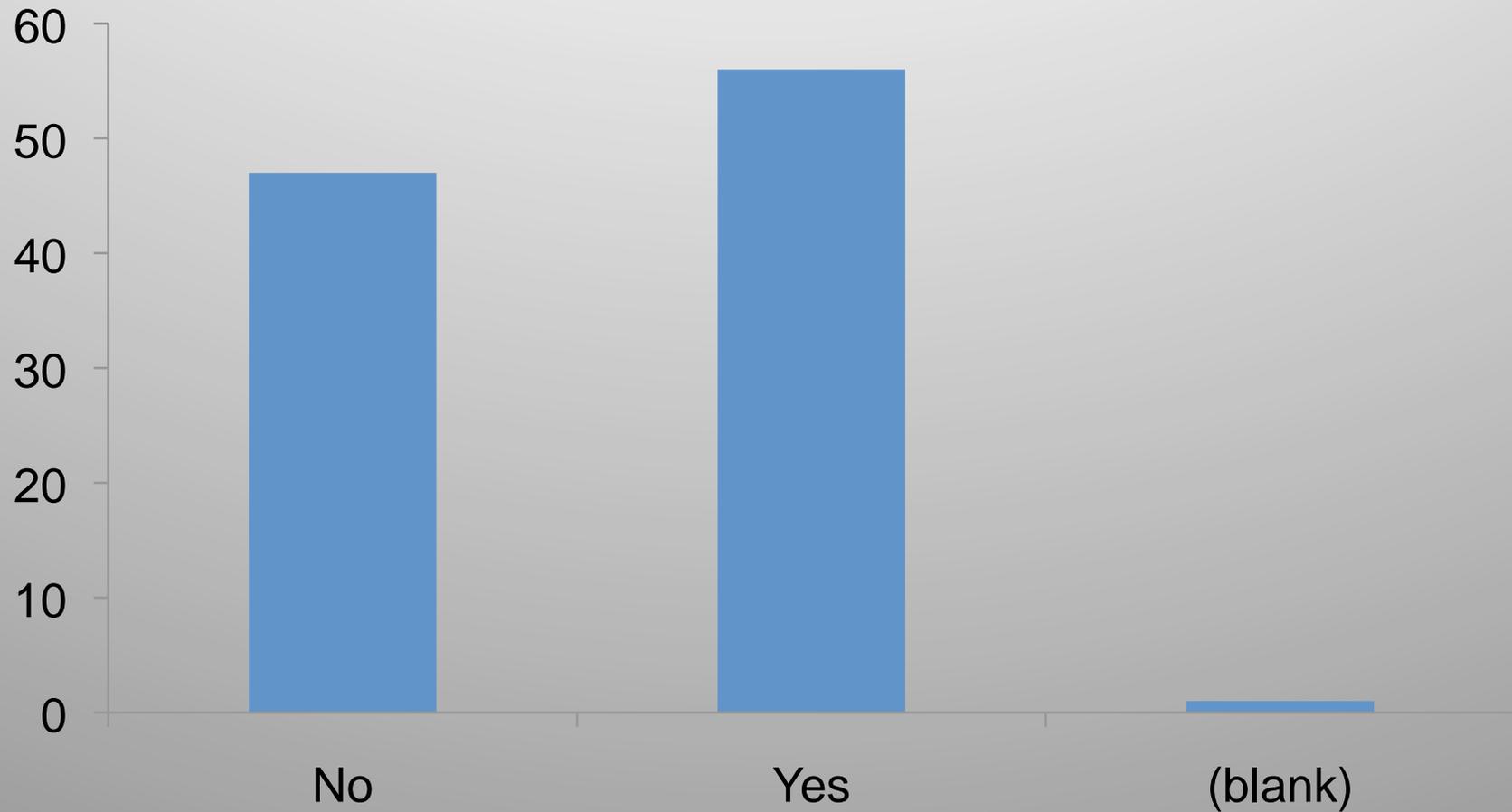
# Years of Experience



# Generalist vs. Specialist



# Analysts processing crime scenes



# 17 Labs without trace evidence...

- 6 labs at one time had trace evidence
- Reasons for elimination of trace evidence included:
  - We are a small state we did not receive many trace cases. It was expensive and difficult to keep an examiner competent.....
  - No 2nd analyst for peer review. Lack of demand due to lack of investigator knowledge of availability.
  - loss of staff and no replacement made
  - lack of casework
  - Hairs, fibers, paint, glass, footwear and tire track were eliminated due to the lack of staffing and state-of-the art equipment. ...
  - Budget and lack of submitted cases
  - Backlogs in Biology/DNA and Firearms forced a reallocation of resources out of trace into those Units.

# NAS report

- It may strengthen the reporting and help to develop consistency in the field.
- Encourage certification of laboratories and individual examiners
- May provide the impetus for more funding, training opportunities and research
- It may impact testimony but hopefully it will encourage individuals to qualify their testimony appropriately

*“I feel that trace evidence is one of the most powerful fields in the forensic sciences”*

We need to remember that trace evidence is not defined the same for all people and all laboratory systems.

# Significant Issues Responses

- access to adequate funding
- assessing and reporting the significance of findings
- database development
- attempts at application of statistics to the trace evidence disciplines
- adequate collection/preservation of trace evidence

Trace evidence sections in general seem to be phased out of many smaller crime labs around the country because those jurisdictions do not feel funding should be given to these types of evidence.

The lack of knowledge of law enforcement personnel and lawyers on what trace evidence is, what should be collected and what is really probative in court. I think forensics is so commercialized to the point where law enforcement grasps at straws in a lot of cases.

A lack of freedom to do analyses outside a narrowly written SOP.

Inability (generally due to laboratory SOP's) to write good comprehensive reports.

A lack of understanding on the part of administration of the difficulties and freedoms and time required for good, thorough trace evidence examination.

# More Significant Issues Responses

Misunderstanding by law enforcement and more especially the legal community (DA's, judges) about the significance and value of trace evidence.

There are people that are moving up into positions of leadership with their central focus being on DNA with "the rest" of the disciplines being marginalized as necessary (or not) but not as important.

## **SOP's**

Our diversity (sub-discipline areas) produces a variety of issues that other sections do not face or face to a lesser degree (i.e. SOP writing, proficiencies, etc.). While this diversity is good, some categories of our testing do not fall under a specific guideline. My concern is that testing will not be done because the documentation to provide the service will outweigh the requests. In other words, we won't be able to perform our work as scientists because there isn't a guideline that covers it. I fear we will lose the ability to think outside the box and will only be allowed to follow a recipe.

# Answers Causing Some Concern

Trace evidence analysis becoming obsolete

I think hair comparisons in the traditional sense may be a thing of the past.

The non-specificity of the results make the expense of operating the unit cost prohibitive. We will not replace our trace examiner when he retires.

Trace is a last resort analysis

Elimination of Trace units in favor of DNA. No one wants investigative information anymore

Local law enforcement seems to be trying to collect and analyze evidence at their police departments more frequently (CSI effect?) and can create contamination problems.

# Significant Issues Responses

The lack of a centralized forum in which we can exchange ideas, and analytical techniques.

The lack of support and funding for further education and social interaction with colleagues from across the nation.

The NAS report and its "findings" and recommendations, such as the association of error rates applied to trace evidence analyses.

How often do you want a trace  
symposium?

# Lack of Funding

money for instrumentation  
and personnel

loss of trained personnel  
with years of experience  
giving way to units with  
uncertified analysts with  
minimal experience

specialized training - free or  
at minimal cost

Availability of quality and affordable training for labs to have competent trace examiners for casework in trace sub-disciplines. Funds needs to be available to labs to support trace examinations.

The lack of sufficient personnel to maintain an adequate turnaround time for cases, providing information in a timely manner for investigations.

Because of the many sub-disciplines in which we are responsible for performing casework, it is often very difficult to become trained and remain proficient in all of them.

# Standardization of the interpretation of data and report wording.

The majority of trace units use SWGMAT guidelines and/or ASTM standards even without mandated standardization.

Interpretation guidelines are coming

Recognition, collection and preservation of trace evidence

Interpretation of results - too many folks say Q matches K and don't see it as our responsibility to interpret the significance of those results.

Testimony may eventually be a problem, due to individuals who testify in an inappropriate manner, which then causes issues for other Analysts who realize and properly state the significance of their evidence.

I think that moving away from "could have" associative statements is pretty much essential for the survival of our discipline.

# Comments Regarding Standardization

Forensic science is becoming so compartmentalized that no one is being taught overall case approach.

Forensic science is becoming so procedurally oriented (i.e. follow the cookbook perfectly) that I fear significant evidence will be missed because scientists are not training to look outside the box (this seems to be especially true with DNA where the examination of evidence for certain stains is taught, but the appreciation of possible trace evidence does not exist).

# Statistics and Databases

- Need for databases
  - These need to be relevant and constantly updated
- Statistical evaluation of data.
  - Be careful of using statistics as the data may not support the use of statistics just to have numbers!
- Ignitable Liquids
- SICAR
- Treaddesign
- Internal glass and tape databases
- FTIR Libraries
- GC/MS Libraries
- SLICE

# Hair Exams

Issues regarding hair comparisons - if anyone still does that. It seems to be based on opinion founded by examiner experience (and it better be good experience) rather than scientific method.

Hair microscopy comparisons seem to be going by the wayside.

Hairs can provide corroborative information about a possible type of crime which occurred, (forcibly removed, crushed by a heavy object, cut by glass shards, etc) as well as something about an individual – race, hair color, treated or untreated, etc.

Hair should be examined to its full extent and then be sent along to DNA.

# Options

Agencies are begging for trace analysis and we have tried to join up with other states in the Western United States to make it feasible. We do not have the cases or budget to justify a full-time person but we were hoping to train a part-time person in some sub-discipline and then have an MOU with other states. This is troublesome in so many ways. I think regional trace centers should be considered.

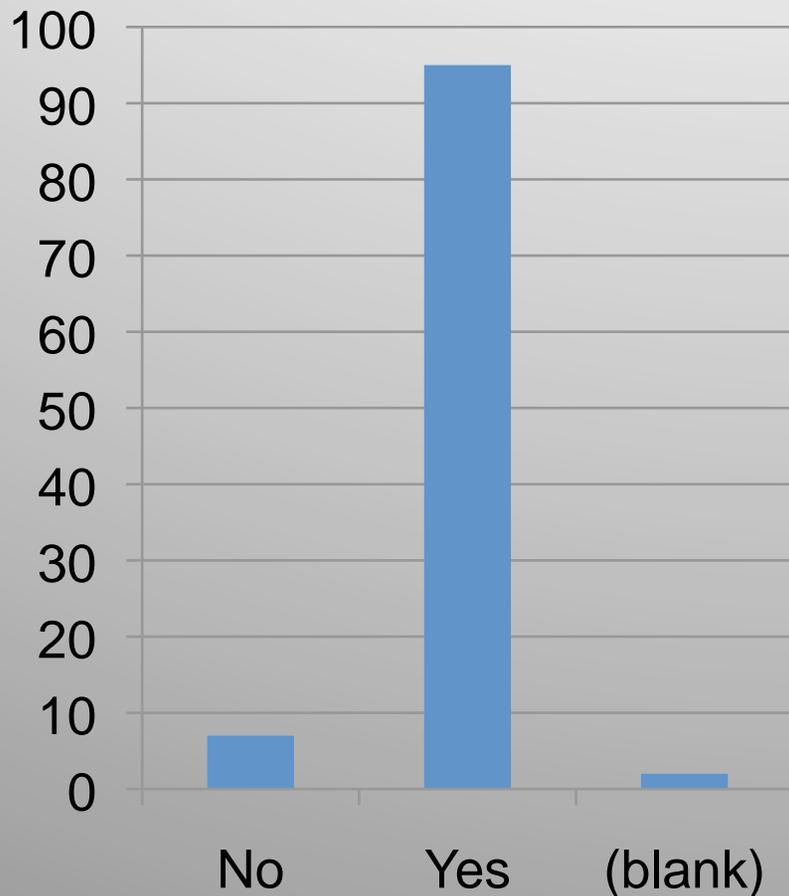
Work with academia and business to come up with better testing processes/procedures.

Staying relevant by being able to provide more investigative leads as well as participating in education and outreach.

# Educating the public

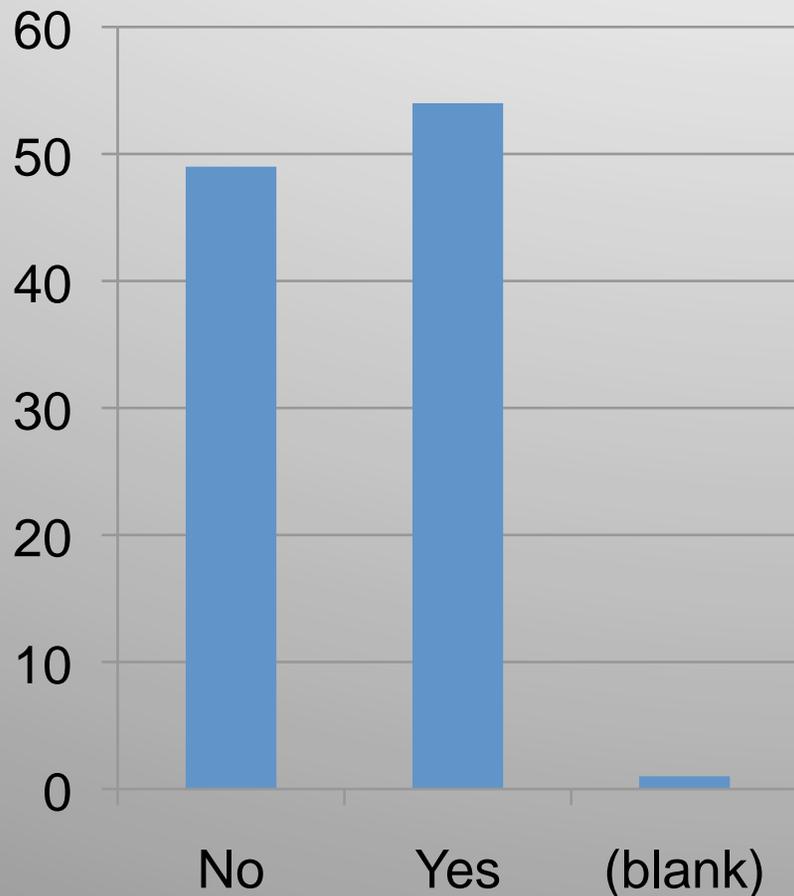
1. The trace field needs to work on a continuous basis to educate detectives, patrol, other investigators, hospital personnel and lawyers on the uses and collection of trace evidence.
2. The University Programs in Forensic Science should work to strengthen their trace programs. These programs could be expanded into many areas (textiles, geology, botany, palnology, etc.) to enhance the trace examiner knowledge base as well as the understanding of those who go into other disciplines in the lab.

# Outreach



- Evidence Technicians
- Attorneys and Judges
- Crime Scene Response Teams
- Detectives
- SANE / SART
- Public
- Medical Examiners
- Professors and Universities
- Fire Marshall's Office
- Post Blast schools
- Anthropologists

# Research



- Majority of labs collaborating with universities through internship programs.
- More potential for greater collaboration between universities and laboratories exists.

# Research Issues

- The lack of ability to accurately assess the significance of findings in time for trial. Meaningful research will be:
  - current
  - updated regularly,
  - accurate, and
  - be about evidence that is actually found in a case
    - Collaboration with working forensic scientists is a necessity!

We need to get more information out on the internal research projects that we do in our laboratory systems. We need to share our information as a community better.

# Significant Issues

“Trace Evidence needs to develop a TE Society to help resolve issues, set standards and certification in each of the sub-disciplines, validate training etc. “

Do we further dilute the attendance at the American Academy meetings, regional associations, SWGMAT, any future symposiums and have the same research presented at those meetings?

American Board of Criminalistics already has a certification test

We can make certification more rigorous and use the SWGMAT guidelines that have become standards through ASTM.

# ASTE

## Proposed

- Disseminate trace specific information through a website
- Online Journal/ newsletter
- Business meeting in conjunction with other forensic conferences
- As a professional organization this group may be able to promote trace evidence more efficiently than individual examiners
- Facilitate training

# What is our future?

- The future of trace evidence appears to be in helping with crime scene reconstruction. There are fewer cases every year where trace evidence is of importance in the prosecution of a suspect. Our lab would benefit by disbanding the trace section, sending any essential trace evidence analysis out to another lab, and using the staffing for our DNA section and CSI unit. The ability to use magnification at the scene to identify a material as a hair, fiber, glass, paint, etc. and describe the basic properties such as color and appearance seems to be more significant than the ability to analyze the material using an increasing variety of increasingly more expensive instruments...

Any comments or ideas to help  
the future of trace evidence?