OSAC
Organization of Scientific Area Committees for Forensic Science

OSAC REGISTRY

OSAC Registry Implementation Survey: 2022 Report

March 2023

NIST NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
U.S. DEPARTMENT OF COMMERCE

About OSAC

The Organization of Scientific Area Committees (OSAC) for Forensic Science is administered by the National Institute of Standards and Technology (NIST), a non-regulatory agency of the U.S. Department of Commerce, with the goal of strengthening the nation's use of forensic science by facilitating the development of technically sound standards and guidelines and encouraging their use throughout the forensic science community. OSAC's 800-plus members and affiliates work in forensic laboratories and other institutions around the country and have expertise in 22 forensic disciplines, as well as scientific research, measurement science, statistics, law, and policy. OSAC drafts and evaluates forensic science standards via a transparent, consensus-based process that allows for participation by all stakeholders.

For more information about OSAC, see www.nist.gov/osac.

For questions or comments about this report, email forensics@nist.gov.

This report was prepared by the OSAC Program Office at NIST:

- John Paul Jones II, OSAC Program Manager
- Allison Getz
- Donna Sirk
- Mark Stolorow

https://doi.org/10.29325/OSAC.risr002

Disclaimer

Contents

Executive Summary

The OSAC Registry is a repository of high-quality standards for forensic science. As more standard developing organization (SDO)-published and OSAC Proposed Standards are added to the Registry, OSAC wants to better understand how these standards are being used, the challenges around standards implementation, and how it can be improved. The OSAC Registry Implementation Survey is an instrument OSAC uses to assess the state of implementation of the standards on the OSAC Registry on an annual basis. This report details the results of OSAC's second Registry Implementation Survey which evaluated the implementation status of 95 standards on the OSAC Registry through June 2022.

OSAC used, following verification, 177 responses to this survey with 128 forensic science service providers (FSSPs) reporting that their organization has fully or partially implemented standards on the OSAC Registry. Of the 95 standards included in this survey, 79 were published and 16 were OSAC Proposed Standards. All 79 SDO-published standards have been implemented, either fully or partially. All but one OSAC Proposed Standard has been implemented, either fully or partially.

As expected, survey data show the standard that has been implemented the most is ISO/IEC 17025:2017 *General Requirements for the Competence of Testing and Calibration Laboratories*, a key standard used in accreditation. Survey data also show that disciplines that are more mature and commonly found in traditional crime laboratories are implementing standards at a higher rate. However, it is anticipated that more FSSPs will adopt standards focusing on those disciplines practiced outside of the traditional crime laboratory as they are added to the OSAC Registry.

Although FSSPs consider standards implementation a high priority and the number of FSSPs implementing standards on the Registry is increasing, the survey data shows that challenges to implementation still exist. OSAC is addressing these challenges by working with collaborators to develop standards training opportunities, implementation checklists, and the sharing of lessons learned from FSSPs that have implemented standards successfully. OSAC continues to engage with relevant stakeholder groups such as FSSPs, SDOs, proficiency test providers, accrediting bodies, certification bodies, and forensic science professional organizations to learn more about their specific needs and open communication pathways to facilitate future collaborations.

The OSAC Registry Implementation Survey has been a valuable tool to better understand the current state of implementation; however, OSAC recognizes that a different approach may be needed in the future. With more than 120 FSSPs self-declaring implementation as of this report, it is expected that "self-declarers" may soon surpass the number of future survey respondents. Additionally, standards implementation takes time and OSAC acknowledges that FSSPs may not experience much change from one year to the next. OSAC will continue to assess the state of Registry implementation and is considering a different approach to collecting this important implementation data in the future.

About the Survey

Background

OSAC works to ensure the highest-quality standards are available to the forensic science community and encourages forensic science service providers (FSSPs) to implement the standards on the OSAC Registry. The OSAC Registry is a repository of high-quality, technically sound standards for forensic science and includes two types of standards:

- **Published standards.** These are fully developed standards that have been published by a standards developing organization (SDO).
- **OSAC Proposed Standards.** These are standards that have been drafted by OSAC and sent to an SDO to be further developed and published.

For standards to make an impact and improve the forensic science field, they must be used. As more published and OSAC Proposed Standards are added to the Registry, OSAC wants to better understand how they are being used, the challenges encountered in their implementation, and what support is needed to improve the implementation process. The OSAC Registry Implementation Survey is a tool OSAC has used to assess the state of Registry implementation on an annual basis.

OSAC released the first Registry Implementation Survey in 2021. The survey, which opened June 10 and closed August 31, 2021, provided an assessment of 46 standards that were posted on the OSAC Registry as of March 2021. OSAC received more than 155 responses to this survey. Of those, 138 FSSPs reported that their organization had fully or partially implemented standards on the OSAC Registry. OSAC published a report in February 2022 which provided a detailed look at the respondents and implementation status of those 46 standards represented in the 2021 survey.

OSAC released its second Registry Implementation Survey in 2022. This survey was open from June 10 through August 31, 2022, and it assessed the state of implementation of 95 standards that were posted on the OSAC Registry through June 2022.

In addition to the survey, FSSPs have an opportunity to inform OSAC directly about their implementation efforts and "self-declare" that their laboratory has implemented specific standards by submitting an OSAC Registry Implementation Form. As of September 30, 2022, OSAC has received 96 self-declaration forms from FSSPs in 23 states and two foreign countries. A question was included in the 2022 survey that asked participants if OSAC should acknowledge their survey responses as their organization's self-declaration. As a result, and after verifying the form with the participating organizations, OSAC was able to include 27 additional self-declarations.

Recruitment of Survey Participants

The OSAC Program Office distributed advertisements through various venues to solicit survey responses. The monthly OSAC Standards Bulletin, the OSAC website, OSAC's LinkedIn page, and the OSAC *In Brief* (internal communication for OSAC members and affiliates) provided invitations for participation. Additionally, the survey was distributed to over 30 forensic science professional organizations (**Appendix A**). The intended participants for this survey included FSSPs from across the United States. A series of questions, shown in the Respondent Demographics section below, were provided to the participants to capture their demographics.

Data Analysis

The OSAC Program Office (OPO) received a total of 181 survey responses. Twenty-five responses from non-FSSPs and foreign organizations were not included in the data analysis.

The survey requested one response be submitted per location. For example, a state or Federal laboratory with multiple laboratories was asked to provide one response for each laboratory system's city, region, or district. The OPO reviewed any uncertain replies to determine if responses were intended for one or multiple locations.

Additionally, OPO also reviewed responses from those who indicated their organization had not implemented any standards on the OSAC Registry to determine if any were operational laboratories that were accredited. OPO validated that 17 of these 18 self-identified "non-implementers" are accredited, meaning they have implemented either ISO 17025 or ISO 17020 which are standards on the OSAC Registry. ISO 17025:2017 is the *General Requirements for the Competence of Testing and Calibration Laboratories* and ISO 17020: 2012 is *Conformity Assessment—Requirements for the Operation of Various Types of Bodies Performing Inspection*.

After reviewing and verifying any uncertain replies with the survey participants, OPO was able to include 21 back into the survey, resulting in a total of 177 responses that were included in the data analysis.

Respondents' demographic information was evaluated to allow the results to be combined and sorted by organization. Data analyses were used to help visualize trends among the selections made by FSSPs, such as the number of standards implemented, level and priority of implementation efforts, and the key challenges encountered in implementation.

About this Report

This report provides a detailed look at the implementation status of 95 standards that were posted on the OSAC Registry through June 2022 (**Appendix B**). It also provides a comparison of the 2022 survey data with some of the findings from the 2021 OSAC Registry Implementation Survey.

This report is divided into six sections including:

- Respondent demographics
- OSAC Registry awareness
- Priority for implementation
- Key challenges to implementation
- Organizations participating in full and partial standards implementation
- Implementation summaries for each of the disciplines where standards were available on the OSAC Registry

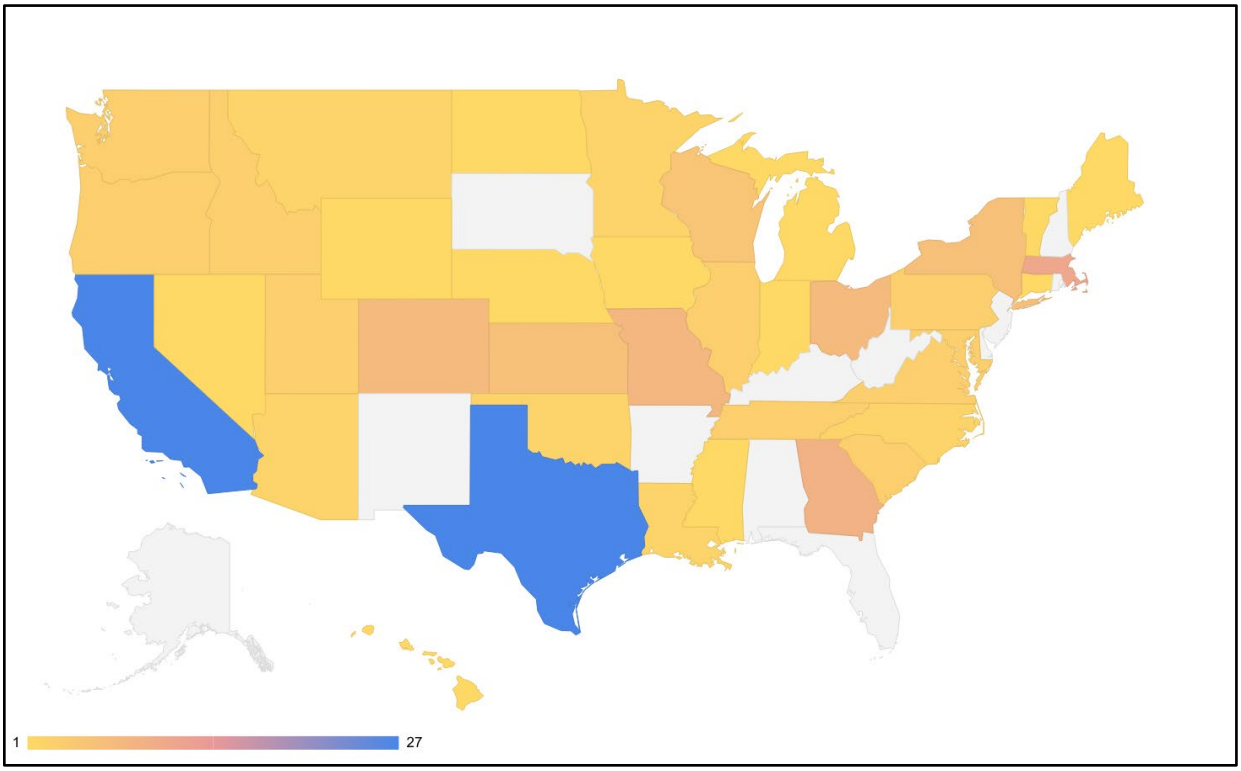
Respondent Demographics

Geographic Regions

2022 Survey

The 177 respondents represented 40 states in the U.S. and the territory of Puerto Rico. Geographic region groups were used as defined by the U.S. census[1]. The Southern region of the U.S., which includes the South Atlantic, East South Central and West South Central divisions, was most heavily represented in the 2022 survey. The Western region, consisting of the Mountain and Pacific divisions, was the second most common region represented **(Figure 1)**.

Figure 1. *Respondent Heat Map*



[1] https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf

Geographic Regions: 2021 & 2022 Comparison

Thirty-eight states were represented in the 2021 survey. FSSPs represented 40 states in the 2022 survey including new representation from CT, VT, IA, NE, ND, MS, TN, MT and PR.

The Southern and Western regions were the most represented areas in both the 2021 and 2022 surveys **(Table 1)**.

Table 1: *Comparison of regions and number of respondents in the 2021 and 2022 OSAC Registry Implementation Surveys*

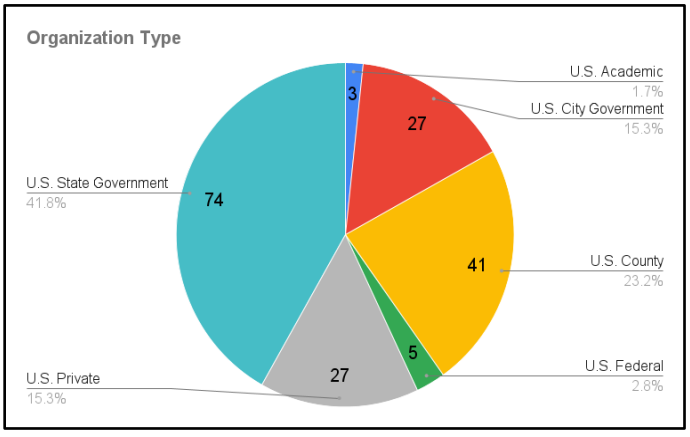
Region	Number of Respondents: 2022	Number of Respondents: 2021
Northeast	**23**	**23**
New England (CT, ME, MA, NH, RI, VT)	14	4
Mid-Atlantic (NJ, NY, PA)	9	19
Midwest	**36**	**35**
East North Central (IL, IN, MI, OH, WI)	17	19
West North Central (IA, KS, MN, MO, NE, ND, SD)	19	16
South	**64**	**57**
South Atlantic (DE, FL, GA, MD, NC, SC, VA, DC, WV)	29	34
East South Central (AL, KY, MS, TN)	4	6
West South Central (AR, LA, OK, TX)	31	17
West	**53**	**40**
Mountain (AZ, CO, ID, MT, NV, NM, UT, WY)	19	19
Pacific (AK, CA, HI, OR, WA)	34	21
Territory of Puerto Rico (PR)	**1**	**0**
Total Respondents	**177**	**155**

Organization Types

2022 Survey

Of the 177 respondents, most were from U.S. state government organizations (41.8%) with the U.S. county government (23.2%) organization type being the second most common. Other U.S. organization types represented included U.S. city government (15.3%), private (15.3%), federal (2.8%), and academic (1.7%) organizations **(Figure 2)**.

Figure 2: *Organization types represented in the 2022 OSAC Registry Implementation Survey*



Organization Types: 2021 & 2022 Comparison

The U.S. state government was the most represented organization type in both the 2021 and 2022 surveys. See **Table 2** for a comparison of organization types represented in the 2021 and 2022 surveys.

Table 2: *Comparison of the organizational types represented in the 2021 and 2022 OSAC Registry Implementation Surveys*

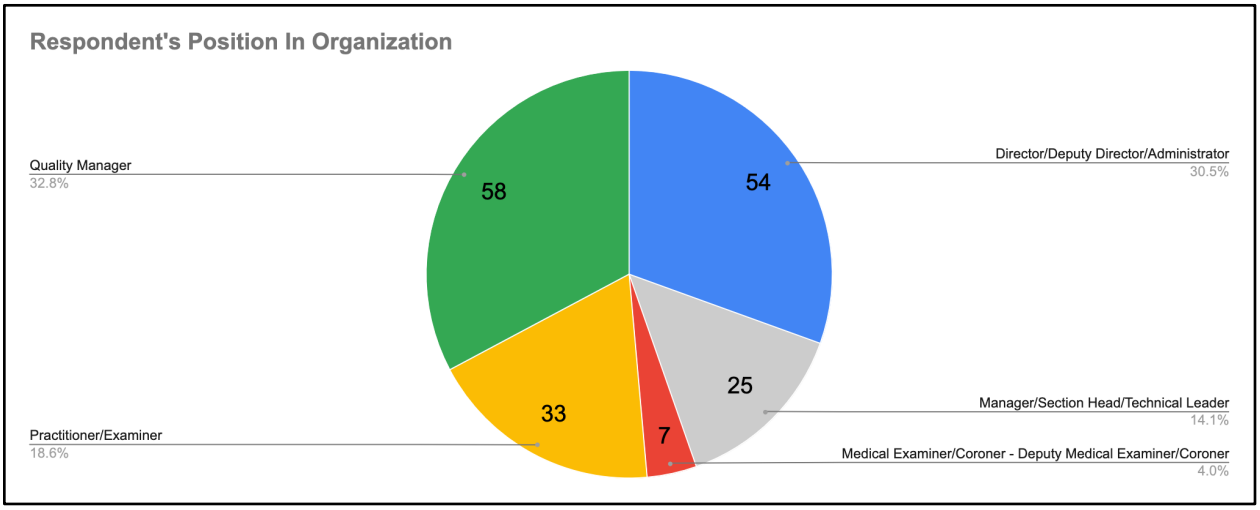
Organization Types	2022 (177 respondents)	2021 (155 respondents)
U.S. State Government	41.8%	47.1%
U.S County Government	23.2%	18.7%
U.S. City Government	15.3%	15.5%
Private	27%	12.9%
Federal	2.8%	5.2%
Academia	1.7%	0.6%

Respondent Roles

2022 Survey

Of the 177 respondents, 32.8% were working as quality managers, followed by 30.5% working in a director or deputy director role. Other positions represented included practitioners/examiners (18.6%), managers/section leaders (14.1%), and medical examiners/coroners - deputy medical examiners/coroners (4.0%) **(Figure 3)**.

Figure 3: *Respondent roles represented in the 2022 OSAC Registry Implementation Survey*



Respondent Roles: 2021 & 2022 Survey Comparison

Quality Managers were the most represented role in both the 2021 and 2022 surveys. See **Table 3** for a comparison of the roles represented in the 2021 and 2022 surveys.

Table 3: *Comparison of respondent roles represented in the 2021 and 2022 OSAC Registry Implementation Surveys*

Respondent Roles	2022 (177 respondents)	2021 (155 respondents)
Director/Deputy Director	30.5%	37.4%
Quality Manager	32.8%	40.6%
Manager/Section Leader	14.1%	11%
Practitioner/Examiner	18.6%	9.7%
Medical Examiner/Coroner	4%	N/A
Organization Owners	N/A	1.3%

OSAC Registry Awareness

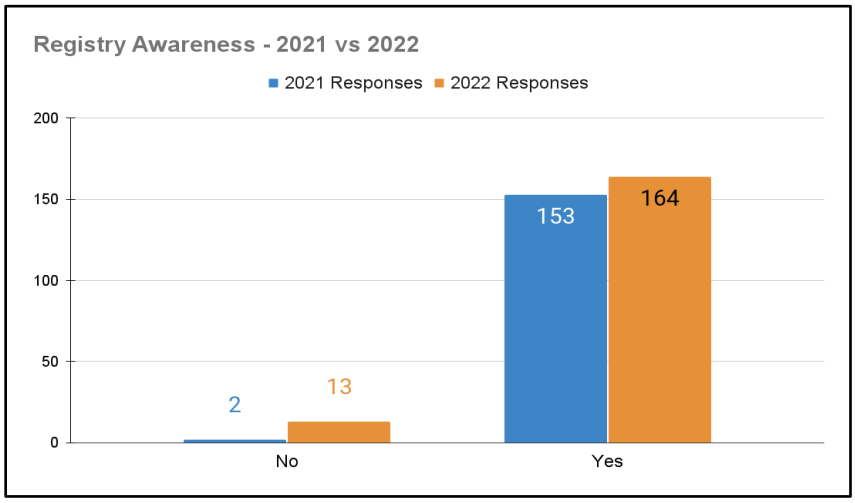
2022 Survey

Survey participants were asked whether individuals in their organization were aware of the OSAC Registry. Most respondents, 164 out of 177 (93%), acknowledged that individuals in their organization were knowledgeable of the standards on the OSAC Registry.

OSAC Registry Awareness: 2021 & 2022 Comparison

When asked this question in the 2021 survey, 153 out of 155 respondents (98%) were aware of the standards on the OSAC Registry **(Figure 4)**.

Figure 4: *Comparison of OSAC Registry awareness identified in the 2021 and 2022 OSAC Registry Implementation Survey*

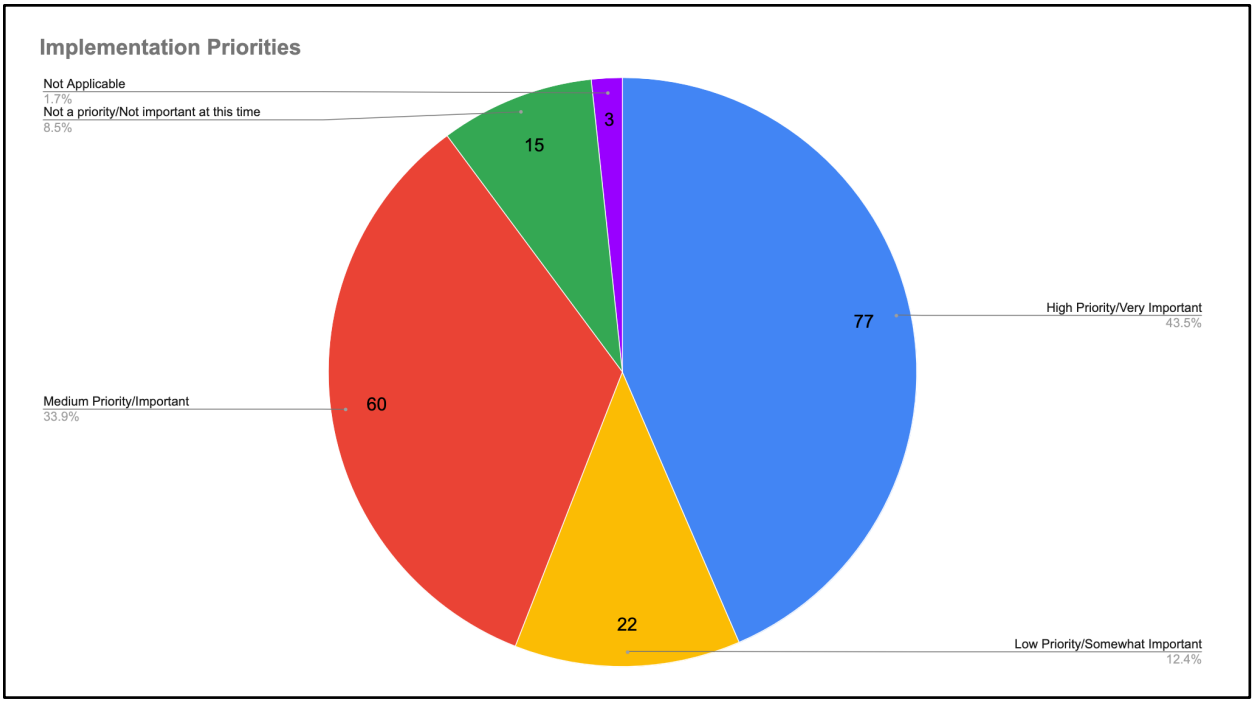


Priority for Standards Implementation

2022 Survey

When asked what priority survey participants considered standards implementation for their organization, 43.5% said it was a high priority (very important) and 33.9% said it was a medium priority (important). Of the 177 respondents, 37 (20.9%) indicated that implementation was a low priority or not a priority at this time and three (1.7%) said implementation was not applicable for their organization **(Figure 5)**.

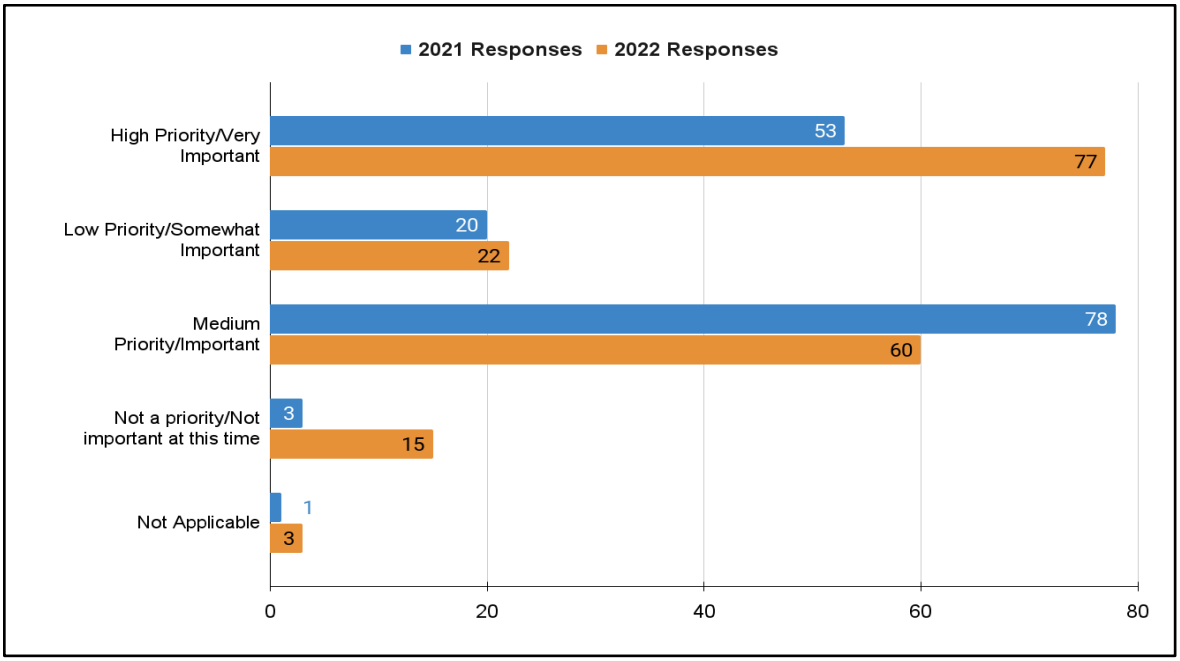
Figure 5: *Priority for standards implementation identified in the 2022 OSAC Registry Implementation Survey*



Priority for Standards Implementation: 2021 & 2022 Comparison

According to the 177 respondents to the 2022 survey, implementation was seen as a higher priority compared to the 155 respondents in the 2021 survey **(Figure 6)**.

Figure 6: *Priority for standards implementation: Comparison between the 2021 and 2022 OSAC Registry Implementation Surveys*



Key Challenges to Implementation

OSAC wanted to learn more about the challenges organizations faced when implementing standards on the OSAC Registry. Survey participants were asked to select up to five key challenges from a list of 14 options. From a total of 434 responses to this question, 70 indicated there were no key challenges and their organization supports implementation policies. See **Table 4** for the complete list of key challenges and number of responses.

Table 4: *Key challenges to standards implementation identified in the 2022 OSAC Registry Implementation Survey*

Key Challenges	Responses
My organization supports implementation policies. No key challenges	70
My organization does not have the available personnel to allocate to this task.	63
My organization does not have the available instruments and/or facility to support implementation.	47
My organization supports implementation policies but can't implement them at this time.	41
My organization has not completed validation required by these standards.	40
My organization does not have the training to support implementation.	32
My organization is not required to implement standards on the OSAC Registry.	39
My organization does not have the funding to support implementation.	34
My organization does not know how to update our standard operating procedures/quality manual to incorporate OSAC Registry standards.	15
My organization currently uses other guidance documents that are not on the OSAC Registry.	21
My organization does not feel the standards on the OSAC Registry will add value over what is already implemented.	12
My organization does not understand the need for standards on the OSAC Registry.	11
The OSAC Registry does not have any applicable standards for my organization.	5
My organization does not agree with standards on the OSAC Registry.	4
Grand Total	***434***

Organizations Participating in Full and Partial Standards Implementation

This survey assessed the state of implementation, either full or partial, of 95 standards that were posted on the Registry through June 2022. Of these 95, 79 were SDO published and 16 were OSAC Proposed Standards.

Of the 177 survey respondents, 49 indicated that they have not implemented, either fully or partially, any of the standards on the OSAC Registry. The remaining 128 respondents (referred to as "implementers" in the rest of this report) have either partially or fully implemented at least one standard on the OSAC Registry.

All 79 SDO published standards have been implemented, either fully or partially by a FSSP. Only one OSAC Proposed standard, OSAC 2021-N-0009, *Standard Practice for the Collection and Preservation of Organic Gunshot Residue Analysis,* has not yet been implemented in organizations represented by the survey respondents.

Full or Partial Implementation: Published Standards

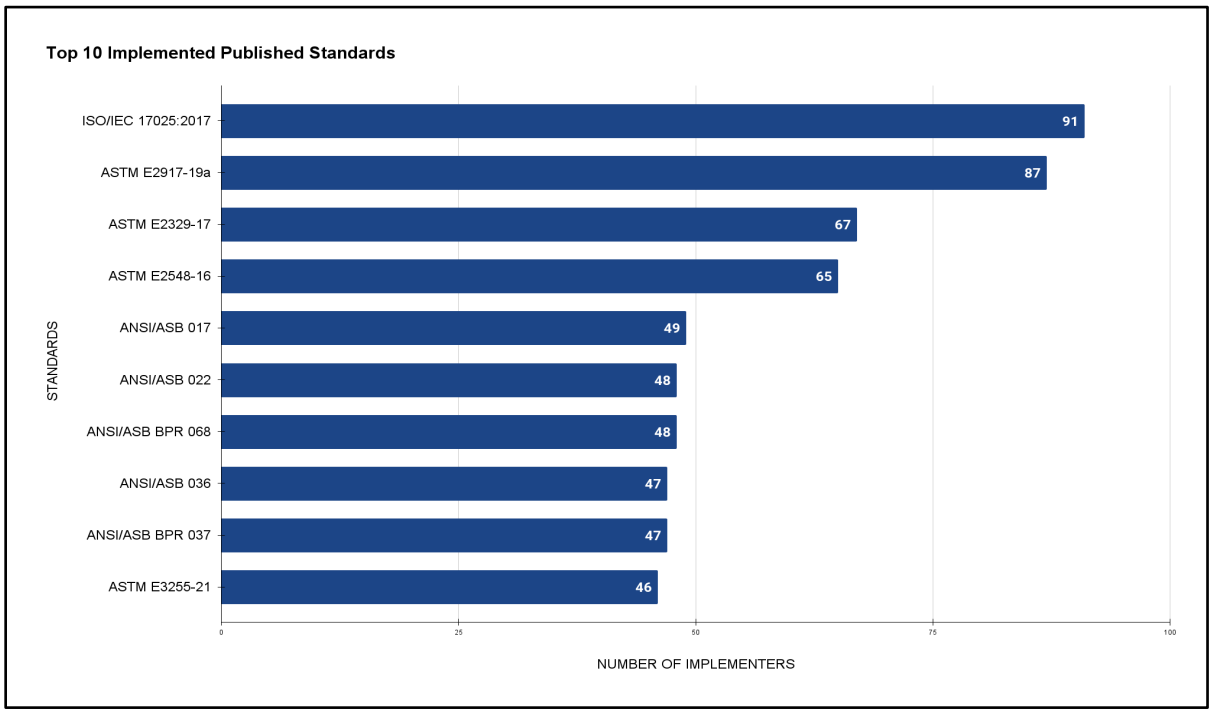
As mentioned above, all 79 SDO published standards represented in this survey have been implemented (either fully or partially) (**Appendix B**). The SDO published standard that has been implemented the most by organizations is ISO/IEC 17025:2017 *General Requirements for the Competence of Testing and Calibration Laboratories*. This standard specifies the general requirements for the competence, impartiality, and consistent operation of laboratories and is a key standard used to accredit forensic laboratories. Of the 128 implementers, 91 have implemented ISO 17025:2017, either fully or partially.

After ISO 17025:2017, the standard that was implemented the most was ASTM E2917-19a, *Standard Practice for Forensic Science Practitioner Training, Continuing Education, and Professional Development*. This standard provides foundational requirements for the training, continuing education, and professional development of forensic science practitioners to include training criteria toward competency, documentation, implementation of training, and continuous professional development. Of the 128 implementers, 87 have implemented ASTM E2917-19a, either fully or partially.

The discipline-specific standards that have been implemented the most are in the seized drugs discipline and include ASTM E2329-17 *Standard Practice for Identification of Seized Drugs* and ASTM E2548-16 *Standard Guide for Sampling Seized Drugs for Qualitative and Quantitative Analysis.* Of the 128 implementers identified in this survey, 67 have implemented ASTM E2329-17 and 65 have implemented ASTM E2548-16, either fully or partially.

See **Figure 6** for the top 10 implemented SDO published standards in this survey and **Appendix B** for the full list of SDO published standards and the number of implementers for each.

Figure 6: *The top 10 implemented published standards from the 2022 OSAC Registry Implementation Survey*



Full or Partial Implementation: OSAC Proposed Standards

Of the 16 OSAC Proposed Standards represented in this survey, only OSAC 2021-N-0009, *Standard Practice for the Collection and Preservation of Organic Gunshot Residue Analysis*, has not yet been implemented in organizations which responded to the 2022 survey.

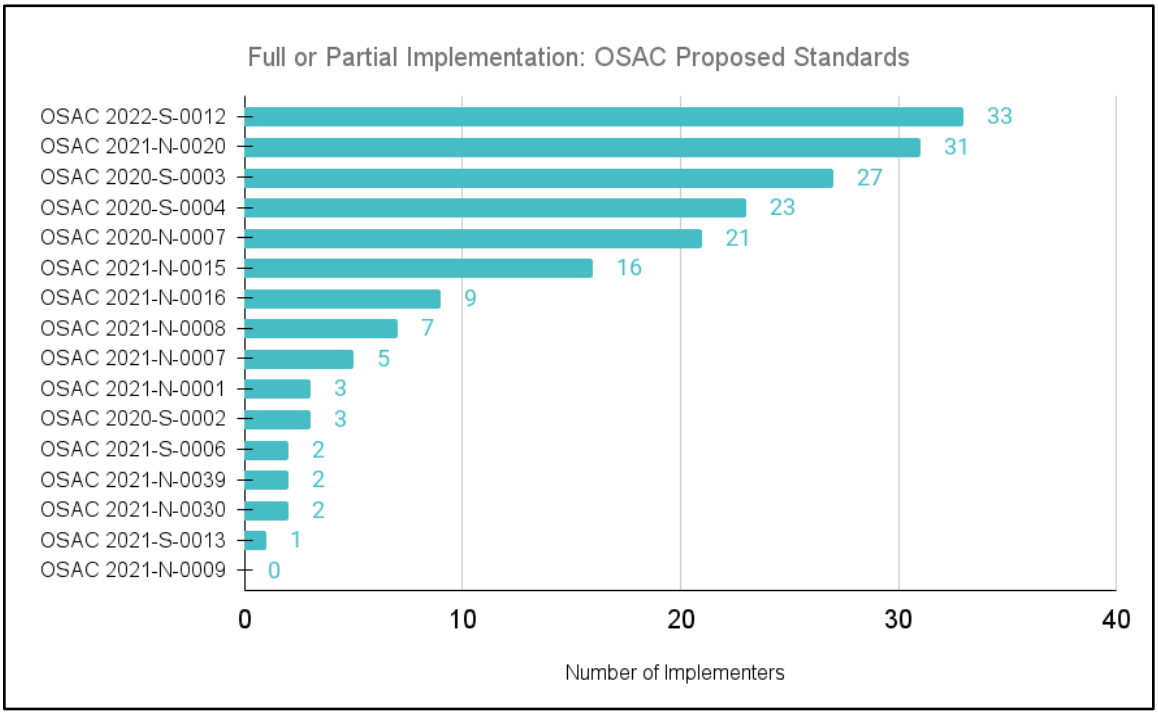
Of the OSAC Proposed Standards on the Registry, two friction ridge standards have been implemented the most. The first, OSAC 2022-S-0012, *Standard for Proficiency Testing in Friction Ridge Examination* describes the minimum requirements for the selection, development, validation, administration, evaluation, and documentation of proficiency tests to assess the performance of personnel and the overall quality system of a forensic service provider related to friction ridge examination. Of the 128 implementers, 33 have implemented this standard, either fully or partially.

The second most implemented OSAC Proposed Standard, OSAC 2021-N-0020, *Best Practice Recommendations for Limited Friction Ridge Examinations*, describes what limited examinations are and provides the best practice recommendations on how limited examinations should be conducted. Of the 128 implementers, 31 have implemented this OSAC standard, either fully or partially.

There were no SDO published standards available for the friction ridge discipline at the time of this survey. Perhaps this is the reason that the survey results support the observation that these friction ridge OSAC Proposed Standards were the most implemented.

See **Figure 7** for the number of respondents that have indicated full or partial implementation of the 16 OSAC Proposed Standards in this survey. The full title of each standard can also be found in **Appendix B**.

Figure 7: *Number of implementers (out of 128) that have indicated full or partial implementation of the 16 OSAC Proposed Standards in the 2022 OSAC Registry Implementation Survey*



Discipline-Specific Implementation Summaries

The next section of this report provides data on the specific disciplines where standards on the OSAC Registry were available as of June 2022. Each of the following discipline-specific sections begins with a list of the applicable standards, followed by a graph showing the implementation status for each standard, and finally a summary of the data.

Survey respondents were asked to categorize their organization's implementation efforts for each of the 95 standards on the Registry using the selections identified below:

- Implementation Full
- Implementation Partial
- Not Yet Implemented/Undecided
- Not Applicable
- Will Not Implement

BIOLOGY/DNA

Standards on the OSAC Registry and Included in the Survey (13):

- ANSI/ASB Standard 018, *Standard for Validation of Probabilistic Genotyping Systems*, First Edition, 2020.
- ANSI/ASB Standard 020, *Standard for Validation Studies of DNA Mixtures, and Development and Verification of a Laboratory's Mixture Interpretation Protocol*, First Edition, 2018.
- ANSI/ASB Standard 022, *Standard for Forensic DNA Analysis Training Programs*, First Edition, 2019.
- ANSI/ASB Standard 023, *Standard for Training in Forensic DNA Isolation and Purification Methods*, First Edition, 2020.
- ANSI/ASB Standard 040, *Standard for Forensic DNA Interpretation and Comparison Protocols*, First Edition, 2019.
- ANSI/ASB Standard 110, *Standards for Training in Forensic Serological Methods*, First Edition, 2020.
- ANSI/ASB Standard 115, *Standard for Training in Forensic Short Tandem Repeat Typing Methods using Amplification, DNA Separation, and Allele Detection*, First Edition, 2020.
- ANSI/ASB Standard 116, *Standard for Training in Forensic DNA Quantification Methods*, First Edition, 2020.
- ANSI/ASB Standard 130, *Standard for Training in Forensic DNA Amplification Methods for Subsequent Capillary Electrophoresis Sequencing*, First Edition, 2021.
- ANSI/ASB Standard 131, *Standard for Training in Forensic DNA Sequencing Using Capillary Electrophoresis*, First Edition, 2021.
- ANSI/ASB Standard 140, *Standard for Training in Forensic Human Mitochondrial DNA Analysis, Interpretation, Comparison, Statistical Evaluation, and Reporting*, First Edition, 2021.
- OSAC 2020-N-0007, *Best Practice Recommendations for the Management and Use of Quality Assurance DNA Elimination Databases in Forensic DNA Analysis.*
- OSAC 2020-S-0004, *Standard for Interpreting, Comparing and Reporting DNA Test Results Associated with Failed Controls and Contamination Events.*

Implementation Status by Standard:

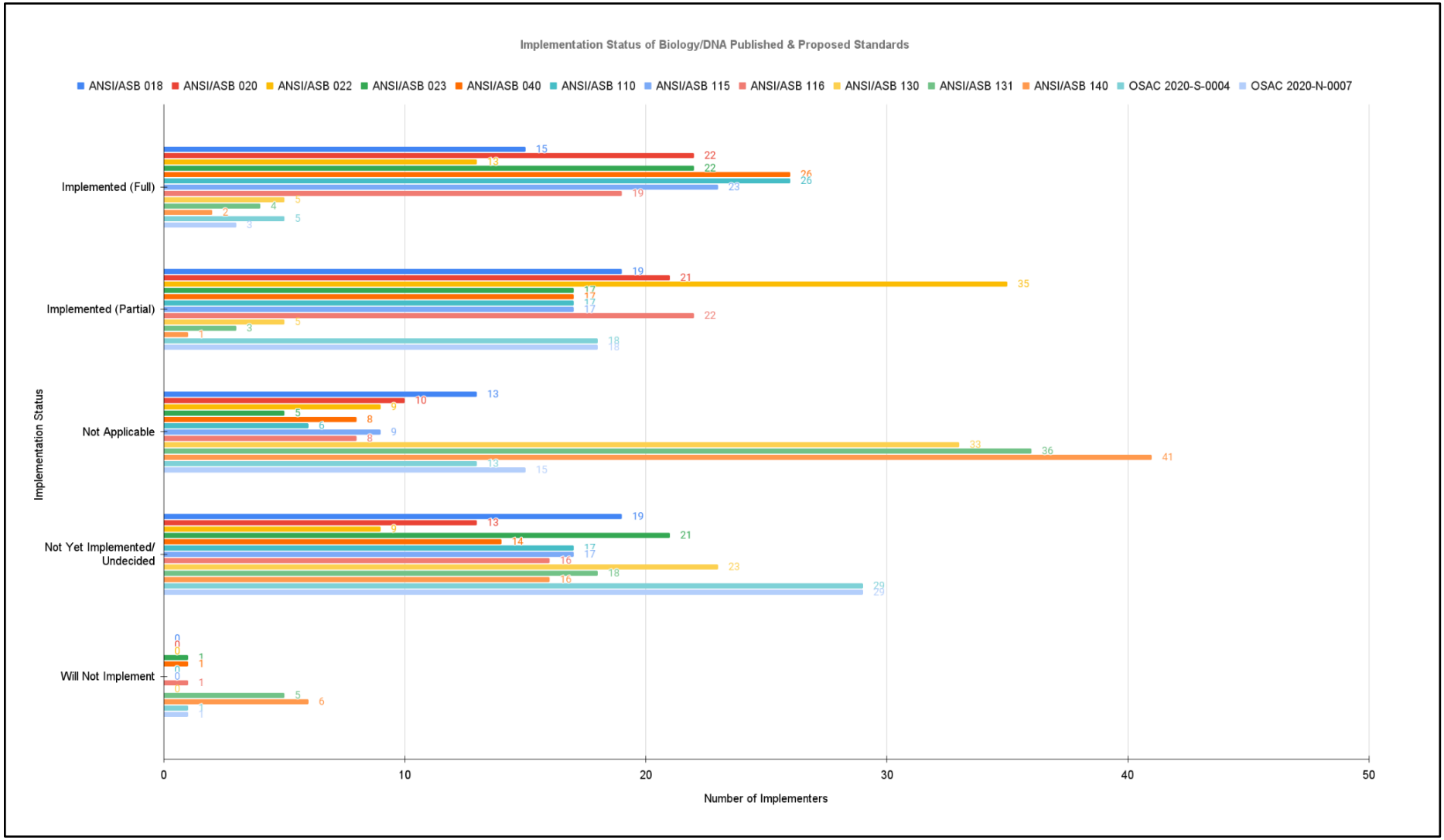


Figure 8: *SDO published and OSAC Proposed Standards implemented by 66 Biology/DNA service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 respondents who indicated their organization has implemented standards on the OSAC Registry **(Figure 8)**:
    - 66 organizations (51.6%) perform services in biology/DNA.
    - 62 organizations (48.4%) do not perform services in biology/DNA.
- Of the 66 organizations that perform services in biology/DNA:
    - 34 indicated that their organization has either fully or partially implemented ANSI/ASB 018, while 19 have not yet implemented this standard.
    - 43 indicated that their organization has either fully or partially implemented ANSI/ASB 020, while 13 have not yet implemented this standard.
    - 48 indicated that their organization has either fully or partially implemented ANSI/ASB 022, while 9 have not yet implemented this standard.
    - 39 indicated that their organization has either fully or partially implemented ANSI/ASB 023, while 21 have not yet implemented this standard.
    - 43 indicated that their organization has either fully or partially implemented ANSI/ASB 040, while 14 have not yet implemented this standard.
    - 43 indicated that their organization has either fully or partially implemented ANSI/ASB 110, while 17 have not yet implemented this standard.
    - 40 indicated that their organization has either fully or partially implemented ANSI/ASB 115, while 17 have not yet implemented this standard.
    - 41 indicated that their organization has either fully or partially implemented ANSI/ASB 116, while 16 have not yet implemented this standard.
    - 10 indicated that their organization has either fully or partially implemented ANSI/ASB 130, while 23 have not yet implemented this standard.
    - 7 indicated that their organization has either fully or partially implemented ANSI/ASB 131, while 18 have not yet implemented this standard.
    - 3 indicated that their organization has either fully or partially implemented ANSI/ASB 140, while 16 have not yet implemented this standard.
    - 23 indicated that their organization has either fully or partially implemented OSAC 2020-S-0004, while 29 have not yet implemented this standard.
    - 21 indicated that their organization has either fully or partially implemented OSAC 2020-N-0007 while 29 have not yet implemented this standard.

BLOODSTAIN PATTERN ANALYSIS

Standards on the OSAC Registry and Included in the Survey (2):

- ASB Technical Report 033, *Terms and Definitions in Bloodstain Pattern Analysis*, First Edition, 2017.
- OSAC 2021-N-0039, *Standard for a Mentorship Program in Bloodstain Pattern Analysis.*

Implementation Status by Standard:

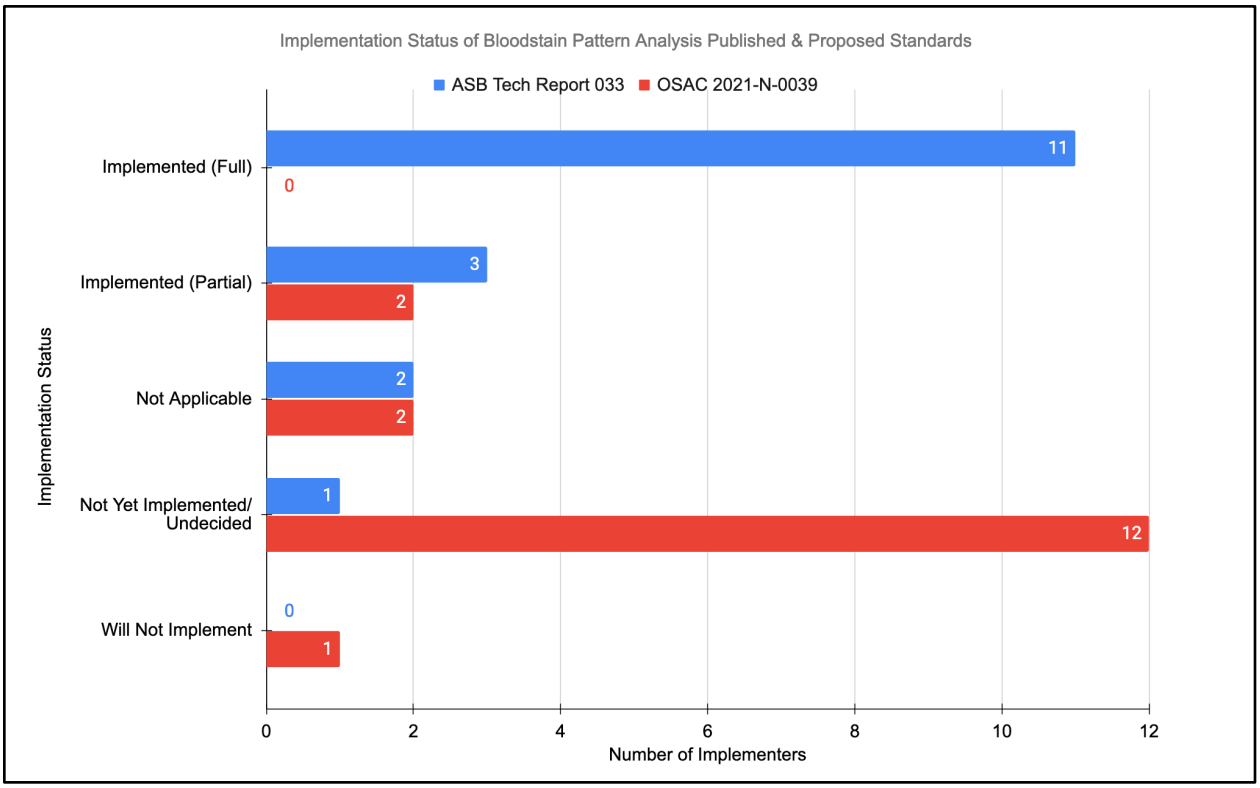


Figure 9: *SDO published and OSAC Proposed Standards implemented by 17 bloodstain pattern analysis service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 9)**:
  - 17 organizations (13.3%) perform services in bloodstain pattern analysis.
  - 111 organizations (86.7%) do not perform services in bloodstain pattern analysis.
- Of the 17 organizations that perform services in bloodstain pattern analysis:
  - 14 have either fully or partially implemented ASB 033, while 1 has not yet implemented this standard.
  - 2 have partially implemented OSAC 2021-N-0039, while 12 have not yet implemented this standard.

CRIME SCENE INVESTIGATION/RECONSTRUCTION

Standards on the OSAC Registry and Included in the Survey (2):

- OSAC 2021-N-0015, *Guiding Principles for Scene Investigation and Reconstruction*.
- OSAC 2021-N-0016, *Standard for Initial Response at Scenes by Law Enforcement*.

Implementation Status by Standard:

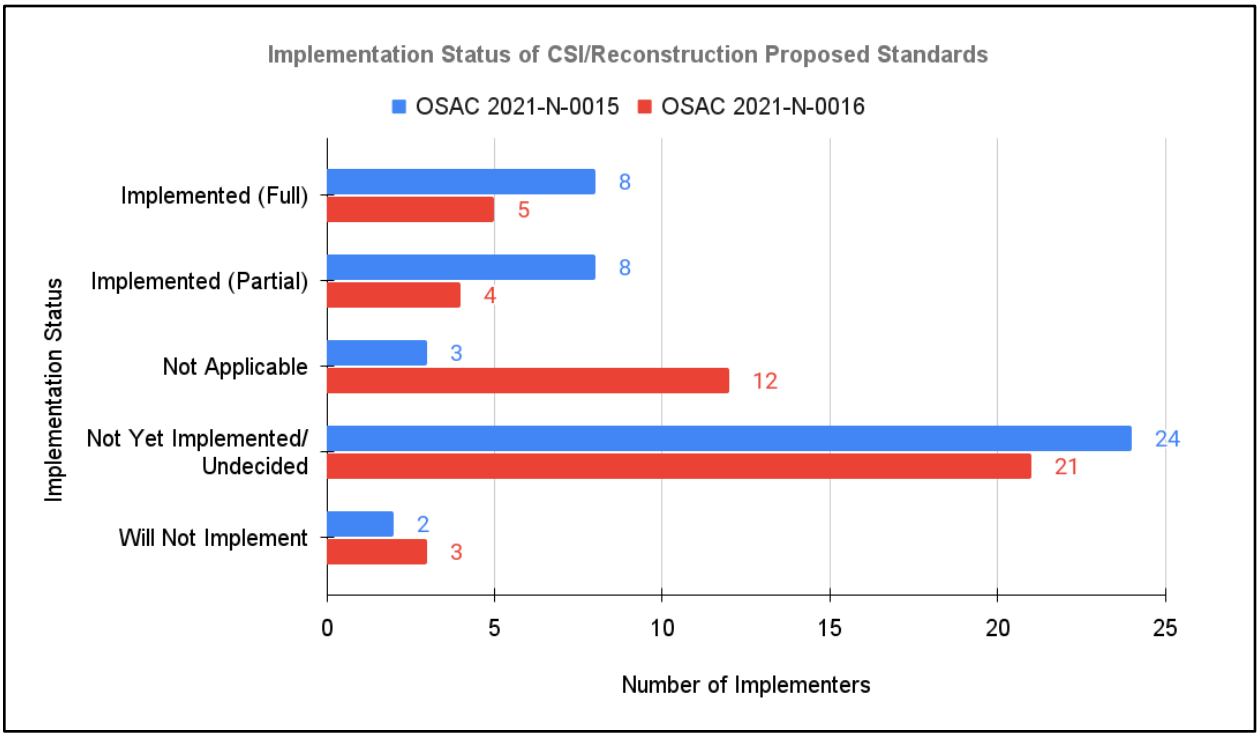


Figure 10: *OSAC Proposed Standards implemented by 45 crime scene investigation/reconstruction service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 10)**:
  - 45 organizations (35.2%) perform services in crime scene investigation/reconstruction.
  - 83 organizations (64.8%) do not perform services in crime scene investigation/reconstruction.
- Of the 45 organizations that perform services in crime scene investigation/reconstruction:
  - 16 have either fully or partially implemented OSAC 2021-N-0015, while 24 have not yet implemented this standard.
  - 9 have either fully or partially implemented OSAC 2021-N-0016, while 21 have not yet implemented this standard.

DIGITAL EVIDENCE

Standards on the OSAC Registry and Included in the Survey (3):

- ASTM E2916-19e1, *Standard Terminology for Digital and Multimedia Evidence Examination*.
- ASTM E3017-19, *Standard Practice for Examining Magnetic Card Readers*.
- ASTM E3150-18, *Standard Guide for Forensic Audio Lab Setup and Maintenance*.

Implementation Status by Standard:

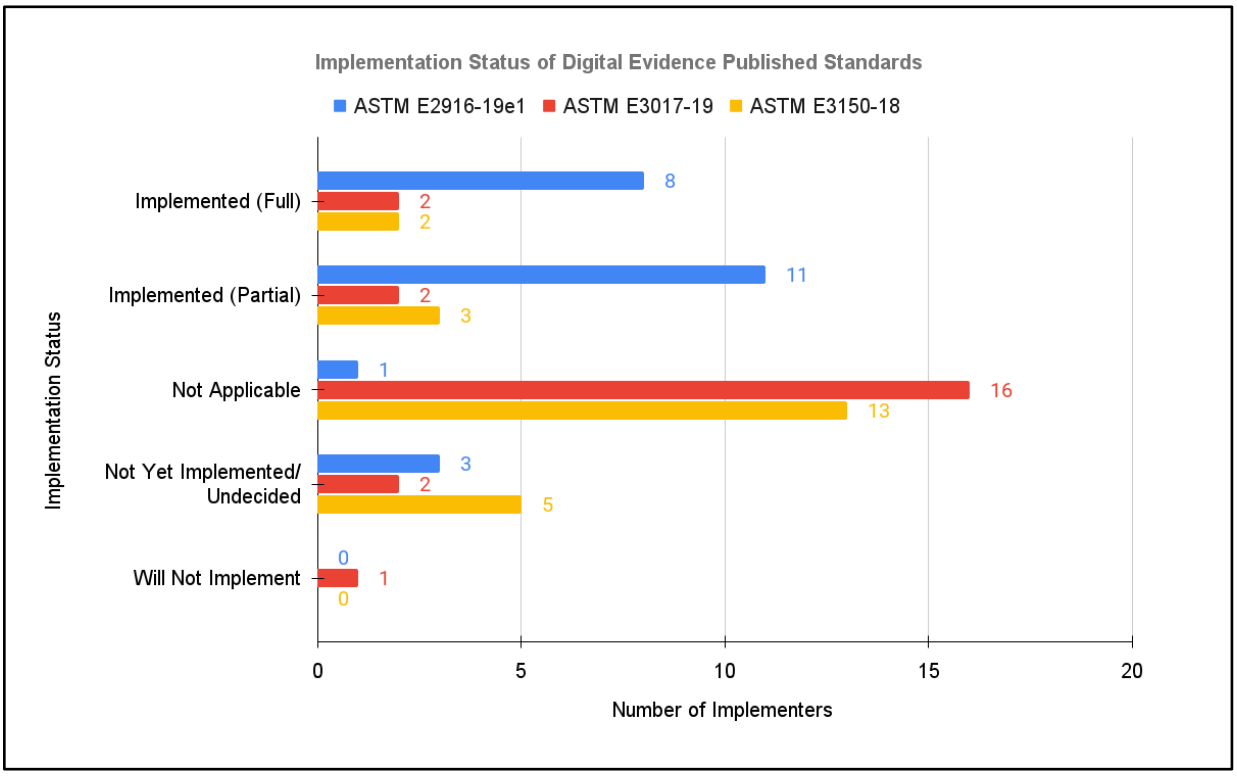


Figure 11: *SDO published standards implemented by 23 digital evidence service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 11)**:
  - 23 organizations (18%) perform services in digital evidence.
  - 105 organizations (82%) do not perform services in digital evidence.
- Of the 23 organizations that perform services in digital evidence:
  - 19 have either fully or partially implemented ASTM E2916-19e1, while 3 have not yet implemented this standard.
  - 4 have either fully or partially implemented ASTM E3017-19, while 2 have not yet implemented this standard.
  - 5 have either fully or partially implemented ASTM E3150-18, while 5 have not yet implemented this standard.

DOGS & SENSORS

Standards on the OSAC Registry and Included in the Survey (3):

- ANSI/ASB 025, *Crime Scene/Death Investigation Dogs and Sensors Terms and Definitions,* First Edition, 2017.
- ANSI/ASB 085, *Standard for Detection Canine Selection, Kenneling, and Healthcare*, First Edition, 2021.
- ANSI/ASB 088, *General Guidelines for Training, Certification, and Documentation of Canine Detection Disciplines*, First Edition, 2020.

Implementation Status by Standard:

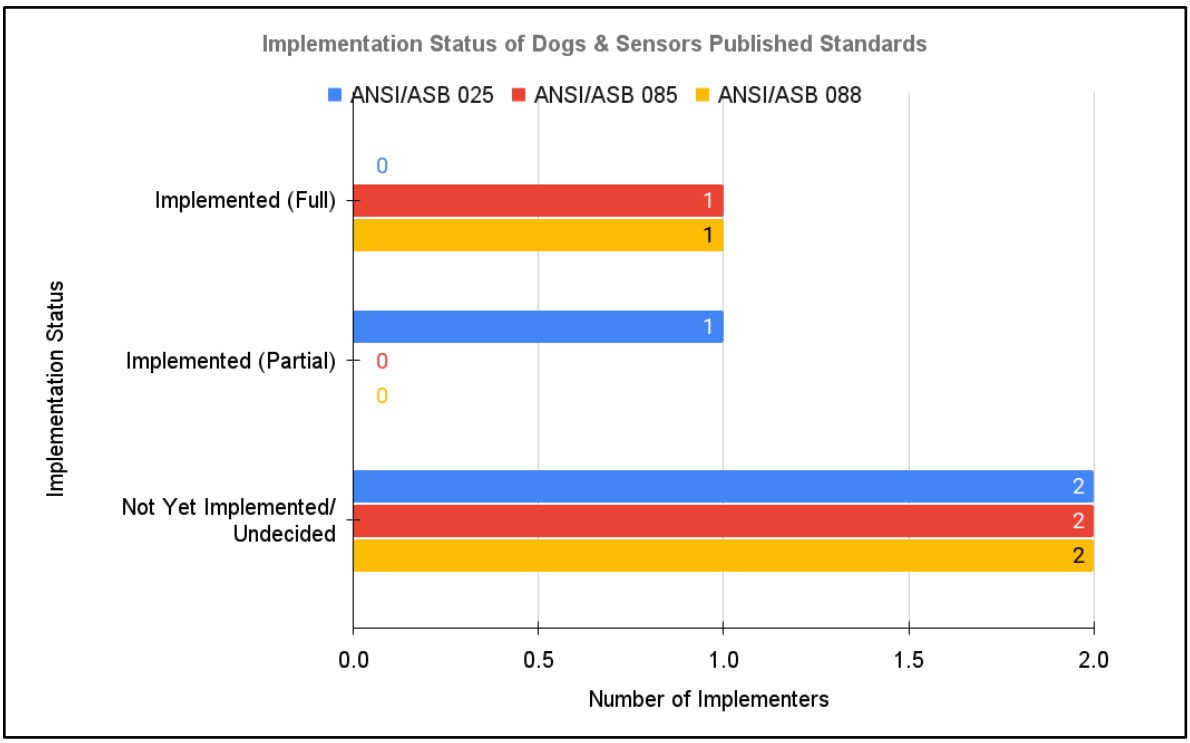


Figure 12: *SDO published Standards implemented by 3 dogs & sensors service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 12)**:
  - 3 organizations (2.3%) perform services related to dogs and sensors.
  - 125 organizations (97.7%) do not perform services related to dogs and sensors.
- Of the 3 organizations that perform services related to dogs and sensors:
  - 1 has partially implemented ANSI/ASB 025, while 2 have not yet implemented this standard.
  - 1 has fully implemented ANSI/ASB 085, while 2 have not yet implemented this standard.
  - 1 has fully implemented ANSI/ASB 088, while 2 have not yet implemented this standard.

FACIAL IDENTIFICATION

Standards on the OSAC Registry and Included in the Survey (5):

- ASTM E2916-19e1, *Standard Terminology for Digital and Multimedia Evidence Examination*.
- ASTM E3115-17, *Standard Guide for Capturing Facial Images for Use with Facial Recognition Systems.*
- ASTM E3148-18, *Standard Guide for Postmortem Facial Image Capture*.
- ASTM E3149-18, *Standard Guide for Facial Image Comparison Feature List for Morphological Analysis.*
- OSAC 2020-S-0002, *Physical Stability of Facial Features of Adults.*

Implementation Status by Standard:

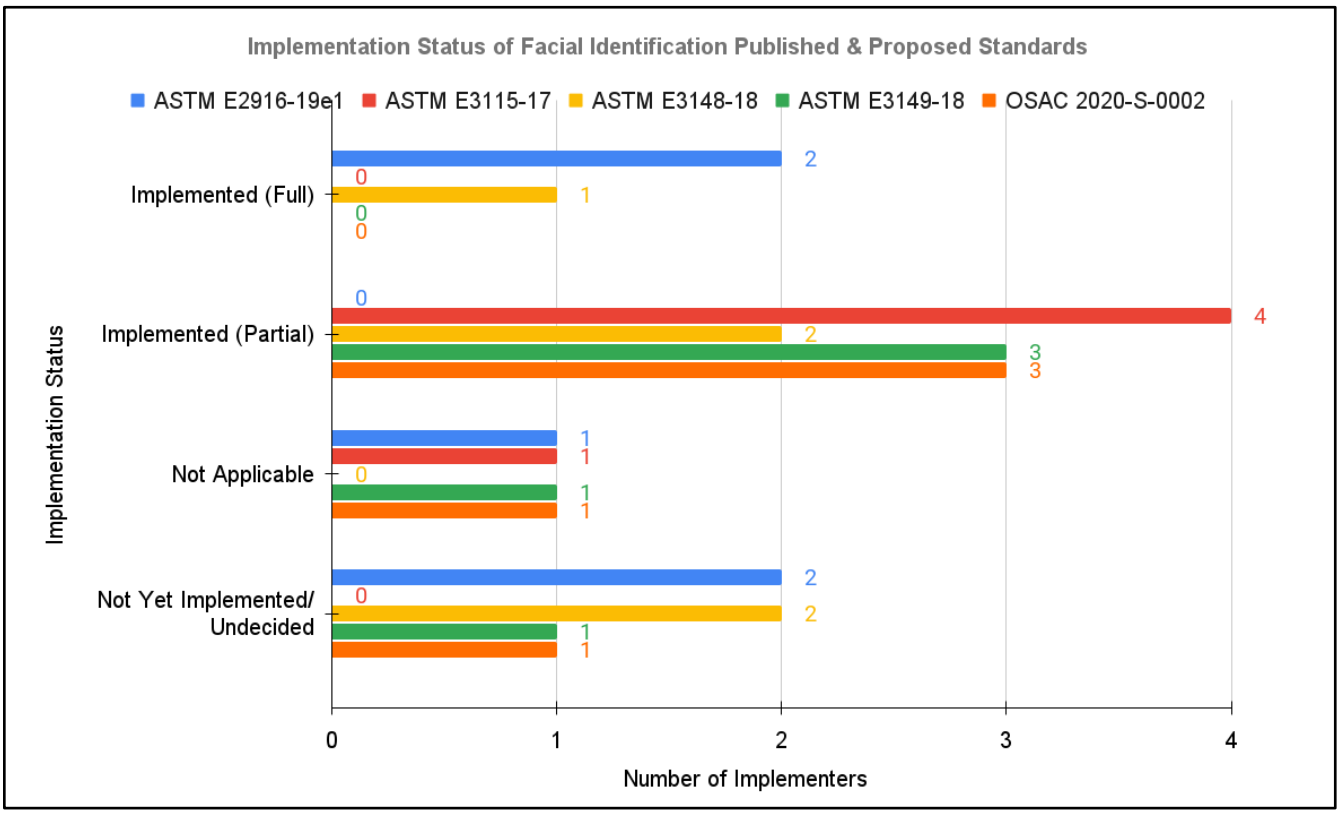


Figure 13: *SDO published and OSAC Proposed Standards implemented by 5 facial identification service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 13)**:
    - 5 organizations (3.9%) perform services in facial identification.
    - 123 organizations (96.1%) do not perform services in facial identification.
- Of the 5 organizations that perform services in facial identification:
    - 2 have fully implemented ASTM E2916-91e1, while 2 have not yet implemented this standard.
    - 4 have partially implemented ASTM E3115-17.
    - 3 have either fully or partially implemented ASTM E3148-18, while 2 have not yet implemented this standard.
    - 3 have partially implemented ASTM E3149-18, while 1 has not yet implemented this standard.
    - 3 have partially implemented OSAC 2020-S-0002, while 1 has not yet implemented this standard.

FIRE & EXPLOSION INVESTIGATION

Standards on the OSAC Registry and Included in the Survey (2):

- NFPA 921:2017, *Guide for Fire and Explosion Investigations*.
- NFPA 1033:2014, *Standard for Professional Qualifications for Fire Investigator*.

Implementation Status by Standard:

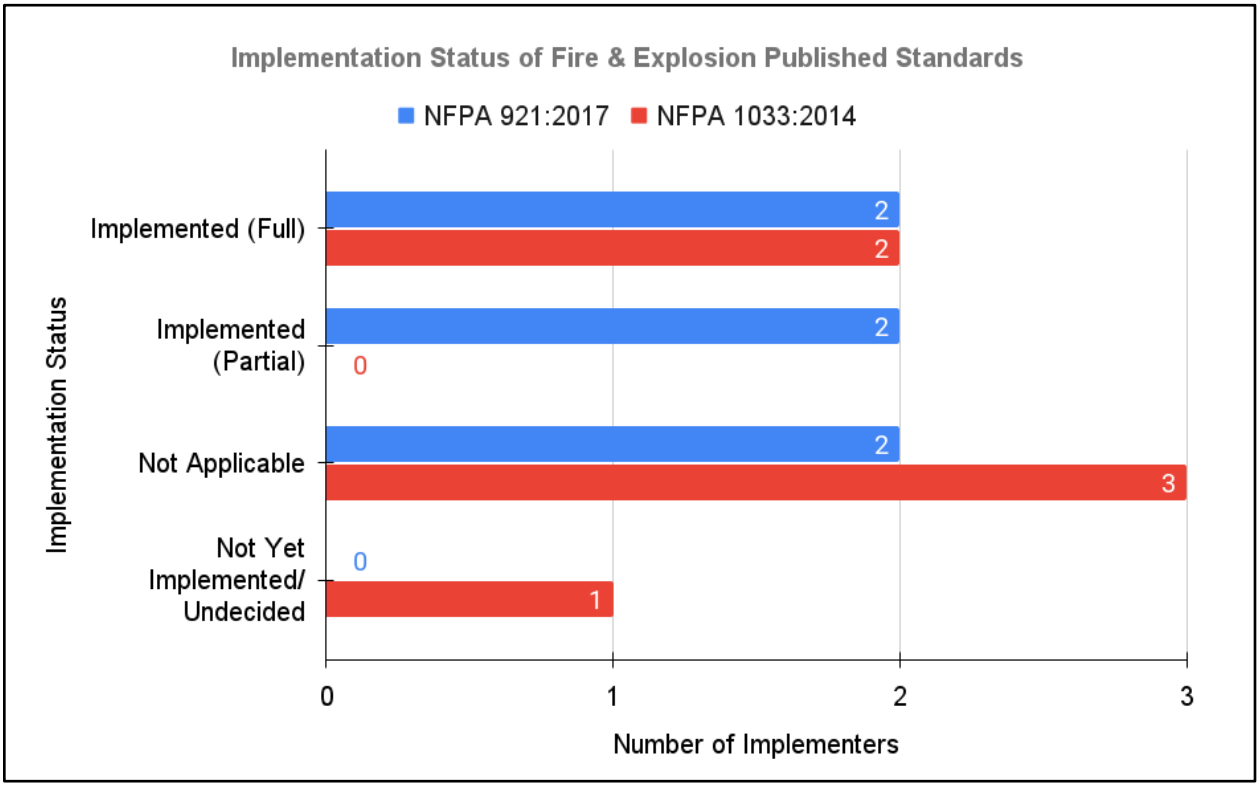


Figure 14: *SDO published standards implemented by 6 fire & explosion investigation service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 14)**:
  - 6 organizations (4.7%) perform services in fire and explosion investigation.
  - 122 organizations (95.3%) do not perform services in fire and explosion investigation.
- Of the 6 organizations that perform services in fire and explosion investigation:
  - 4 have either fully or partially implemented NFPA 921:2017, while 2 have said it is not applicable to their organization.
  - 2 have fully implemented NFPA 1033:2014, while 1 has not yet implemented this standard.

FIRE DEBRIS

Standards on the OSAC Registry and Included in the Survey (7):

- ASTM E1388-17, *Standard Practice for Static Headspace Sampling of Vapors from Fire Debris Samples.*
- ASTM E1412-19, *Standard Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Passive Headspace Concentration with Activated Charcoal*.
- ASTM E1413-19, *Standard Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Dynamic Headspace Concentration onto an Adsorbent Tube*.
- ASTM E2451-21, *Standard Practice for Preserving Ignitable Liquids and Ignitable Liquid Residue Extracts from Fire Debris Samples.*
- ASTM E3189-19, *Standard Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Static Headspace Concentration onto an Adsorbent Tube*.
- ASTM E3197-20, *Standard Terminology Relating to Examination of Fire Debris*.
- ASTM E3245-20e1, *Standard Guide for Systematic Approach to the Extraction, Analysis, and Classification of Ignitable Liquids and Ignitable Liquid Residues in Fire Debris Samples*.

Implementation Status by Standard:

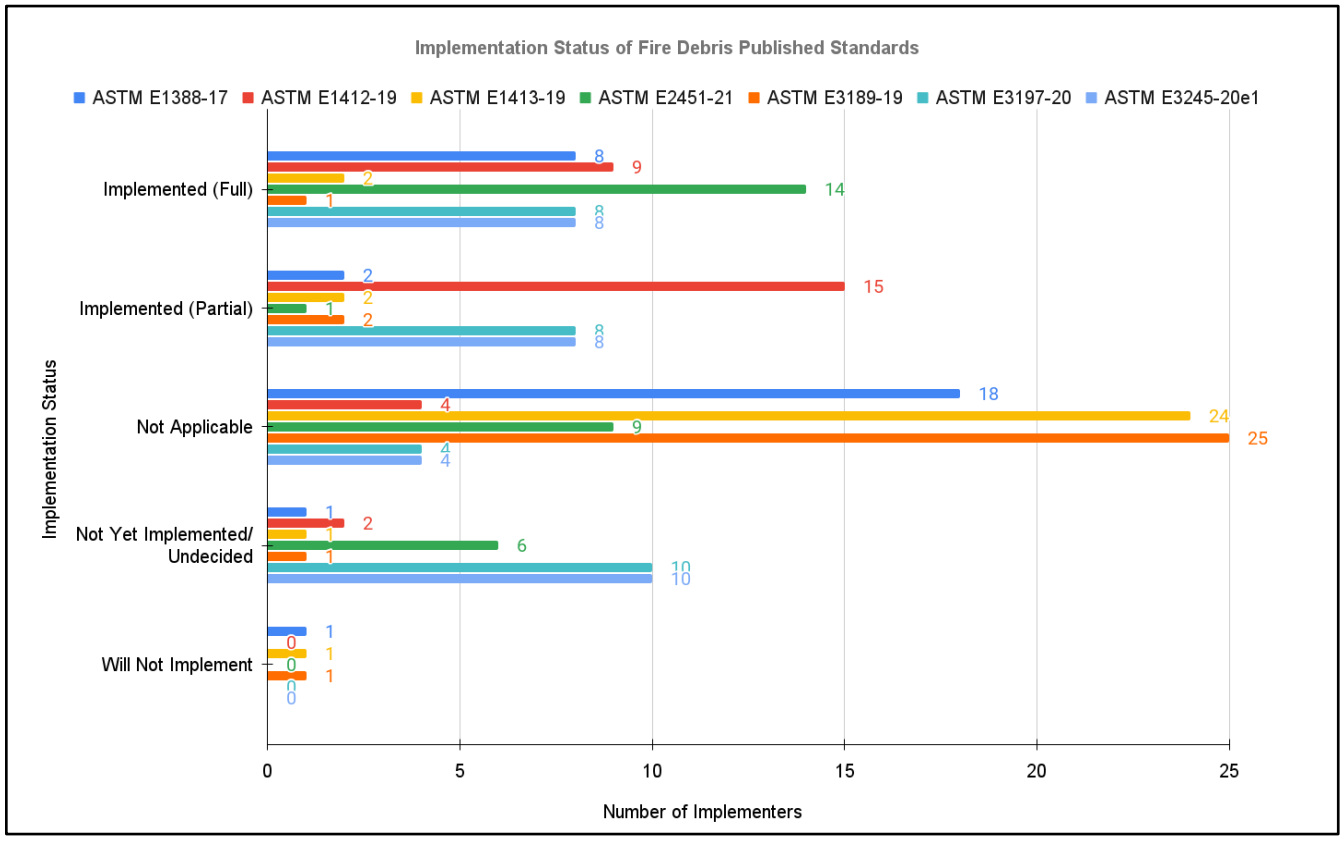


Figure 15: *SDO published standards implemented by 30 fire debris service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 15)**:
    - 30 organizations (23.4%) perform services related to fire debris.
    - 98 organizations (76.6%) do not perform services related to fire debris.
- Of the 30 organizations that perform services related to fire debris:
    - 10 have either fully or partially implemented ASTM E1388-17, while 1 has not yet implemented this standard.
    - 24 have either fully or partially implemented ASTM E1412-19, while 2 have not yet implemented this standard.
    - 4 have either fully or partially implemented ASTM E1413-19, while 1 has not yet implemented this standard.
    - 15 have either fully or partially implemented ASTM E2451-21, while 6 have not yet implemented this standard.
    - 3 have either fully or partially implemented ASTM E3189-19, while 1 has not yet implemented this standard.
    - 16 have either fully or partially implemented ASTM E3197-20, while 8 have not yet implemented this standard.
    - 16 have either fully or partially implemented ASTM E3245-20e1, while 10 have not yet implemented this standard.

FIREARMS & TOOLMARKS

Standards on the OSAC Registry and Included in the Survey (3):

- ANSI/ASB Standard 061, *Firearms and Toolmarks 3D Measurement Systems and Measurement Quality Control*, First Edition, 2021.
- ANSI/ASB Best Practice Recommendation 068, *Safe Handling of Firearms and Ammunition*, First Edition, 2020.
- ANSI/ASB Standard 093, *Standard Test Method for the Forensic Examination and Testing of Firearms*, First Edition, 2020.

Implementation Status by Standard:

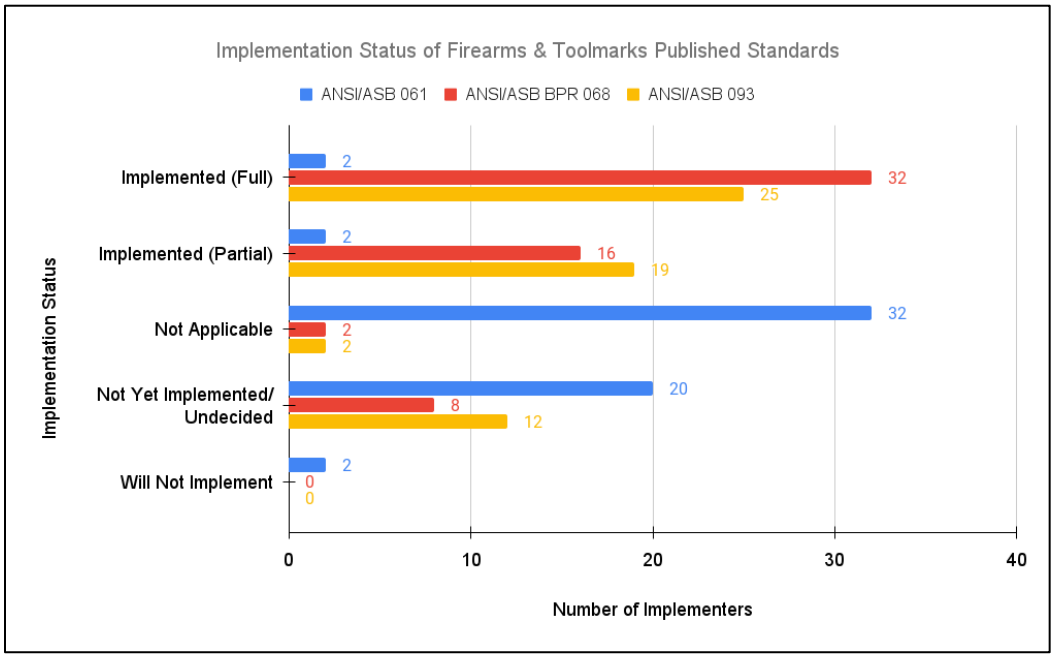


Figure 16: *SDO published standards implemented by 58 firearms & toolmarks service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 16)**:
  - 58 organizations (45.3%) perform services in firearms and toolmarks.
  - 70 organizations (54.7%) do not perform services in firearms and toolmarks.
- Of the 58 organizations that perform services in firearms and toolmarks:
  - 4 have either fully or partially implemented ANSI/ASB 061, while 20 have not yet implemented this standard.
  - 48 have either fully or partially implemented ANSI/ASB 068, while 8 have not yet implemented this standard.
  - 44 have either fully or partially implemented ANSI/ASB 093, while 12 have not yet implemented this standard.

FOOTWEAR & TIRE

Standards on the OSAC Registry and Included in the Survey (2):

- ANSI/ASB Best Practice Recommendation 021, *Best Practices for the Preparation of Test Impressions from Footwear and Tires*, First Edition, 2019.
- ANSI/ASB Best Practice Recommendation 049, *Best Practice Recommendation for Lifting of Footwear and Tire Impressions*, First Edition, 2020.

Implementation Status by Standard:

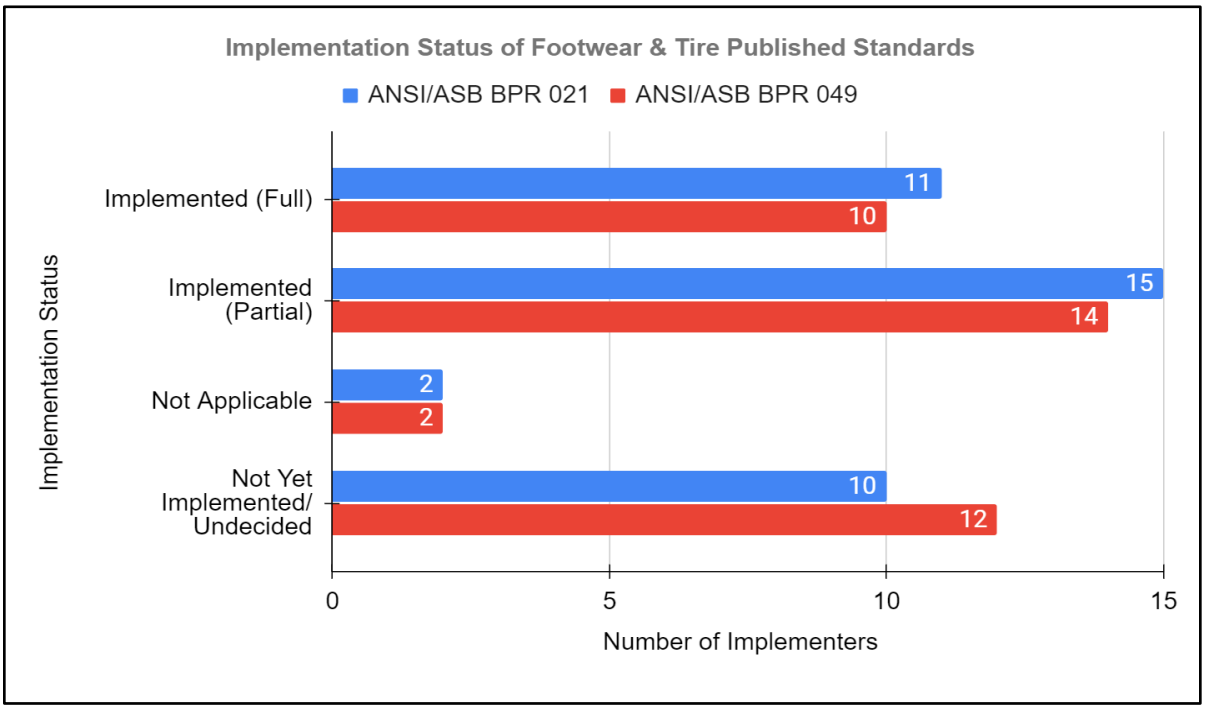


Figure 17: *SDO published standards implemented by 38 footwear & tire service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 17)**:
  - 38 organizations (29.7%) perform services in footwear and tire.
  - 90 organizations (70.3%) do not perform services in footwear and tire.
- Of the 38 organizations that perform services in footwear and tire:
  - 26 have either fully or partially implemented ANSI/ASB 021, while 10 have not yet implemented this standard.
  - 24 have either fully or partially implemented ANSI/ASB 049, while 12 have not yet implemented this standard.

FRICTION RIDGE

Standards on the OSAC Registry and Included in the Survey (2):

- OSAC 2021-N-0020, *Best Practice Recommendations for Limited Examinations*.
- OSAC 2022-S-0012, *Standard for Proficiency Testing in Friction Ridge Examination*.

Implementation Status by Standard:

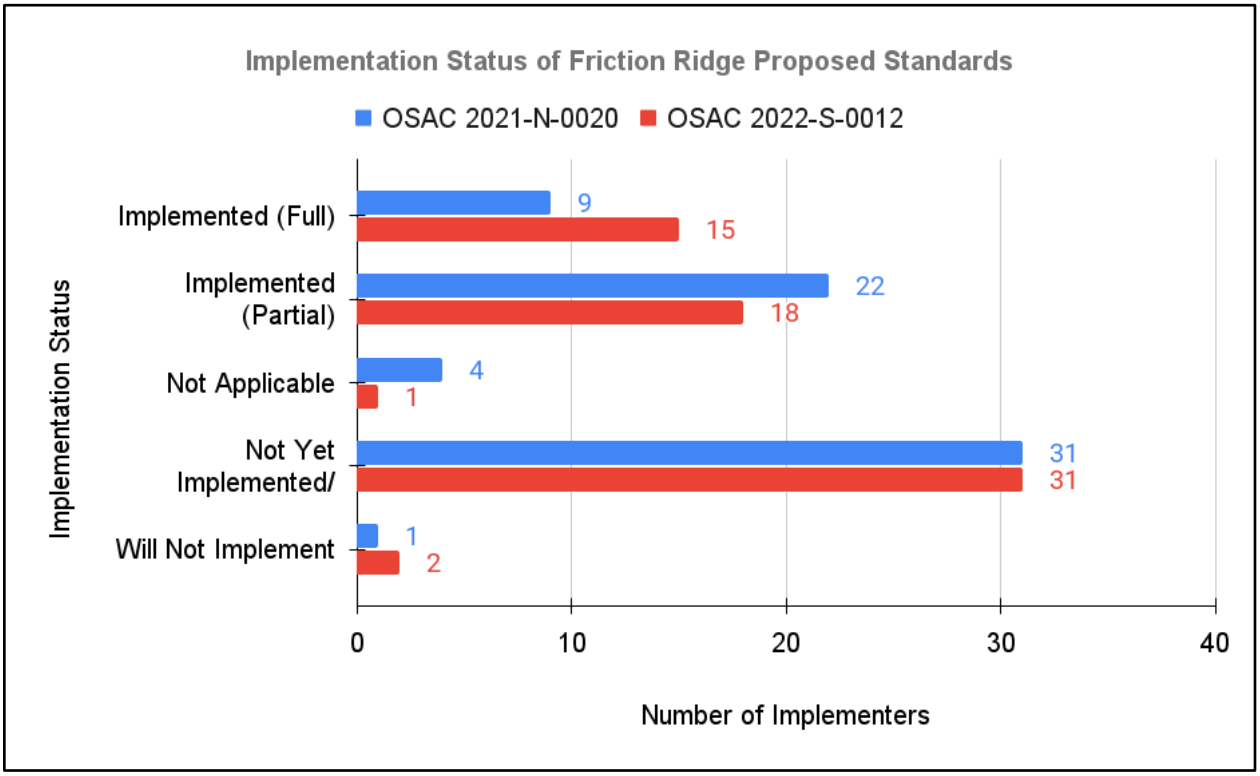


Figure 18: *OSAC Proposed Standards implemented by 67 friction ridge service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 18)**:
  - 67 organizations (52.3%) perform services in friction ridge.
  - 61 organizations (47.7%) do not perform services in friction ridge.
- Of the 67 organizations that perform services in friction ridge:
  - 31 have either fully or partially implemented OSAC 2021-N-0020, while 31 have not yet implemented this standard.
  - 33 have either fully or partially implemented OSAC 2022-S-0012, while 31 have not yet implemented this standard.

GUNSHOT RESIDUE

Standards on the OSAC Registry and Included in the Survey (2):

- ASTM E1588-20, *Standard Practice for Gunshot Residue Analysis by Scanning Electron Microscopy/Energy Dispersive X-Ray Spectrometry*.
- OSAC 2021-N-0009, *Standard Practice for the Collection and Preservation of Organic Gunshot Residue.*

Implementation Status by Standard:

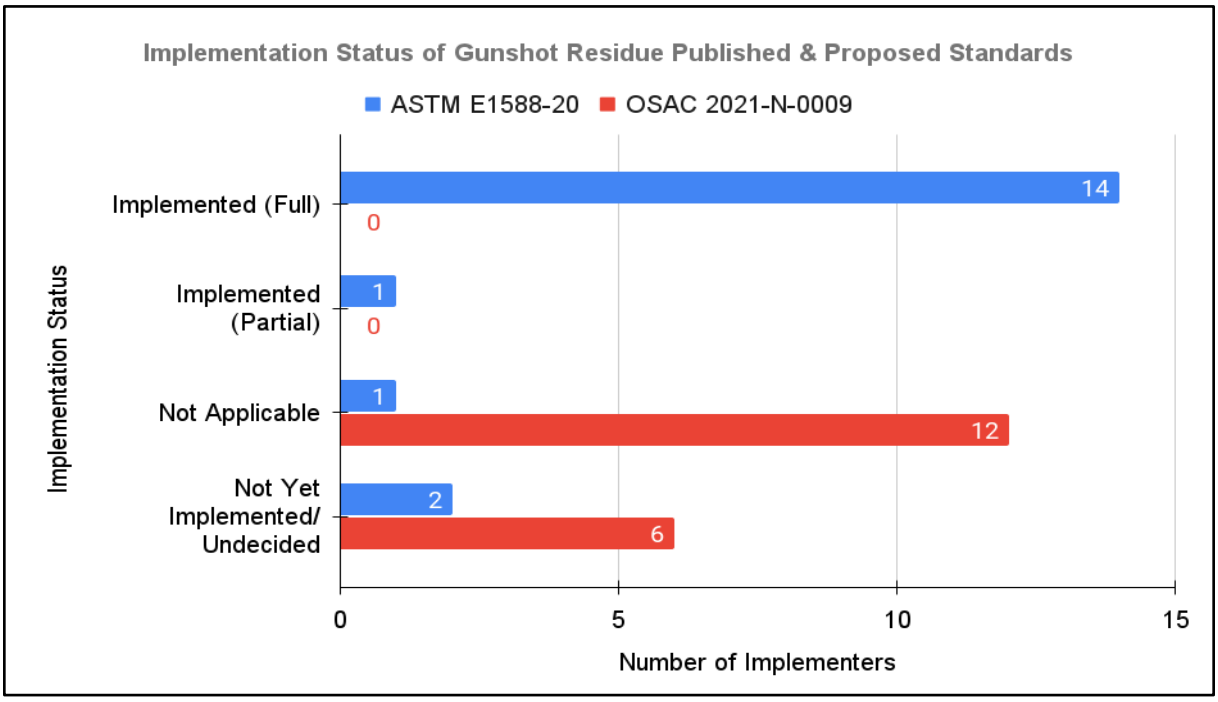


Figure 19: *SDO published and OSAC Proposed Standards implemented by 18 gunshot residue service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 19)**:
  - 18 organizations (14.1%) perform services in gunshot residue.
  - 110 organizations (85.9%) do not perform services in gunshot residue.
- Of the 18 organizations that perform services in gunshot residue:
  - 15 have either fully or partially implemented ASTM E1588-20, while 2 have not yet implemented this standard.
  - No organizations have implemented OSAC 2021-N-0009.

MEDICOLEGAL DEATH INVESTIGATION

Standards on the OSAC Registry and Included in the Survey (7):

- ANSI/ASB *Best Practice Recommendation 007, Postmortem Impression Submission Strategy for Comprehensive Searches of Essential Automated Fingerprint Identification System Databases*, First Edition, 2018.
- ANSI/ASB Best Practice Recommendation 008, *Mass Fatality Scene Processing: Best Practice Recommendations for the Medicolegal Authority*, First Edition, 2021.
- ANSI/ASB Best Practice Recommendation 009, *Best Practice Recommendations for the Examination of Human Remains by Forensic Pathologists in the Disaster Victim Identification Context*, First Edition, 2019.
- ANSI/ASB Best Practice Recommendation 010, *Forensic Anthropology in Disaster Victim Identification: Best Practice Recommendations for the Medicolegal Authority*, First Edition, 2018.
- ANSI/ASB Best Practice Recommendation 094, *Postmortem Impression Recovery: Guidance and Best Practices for Disaster Victim Identification*, First Edition, 2021.
- OSAC 2021-N-0007, *Media Communications Following a Mass Fatality Incident: Best Practice Recommendations for the Medicolegal Authority*.
- OSAC 2021-N-0008, *Victim Accounting: Best Practice Recommendations for Medicolegal Authorities in Mass Fatality Management.*

Implementation Status by Standard:

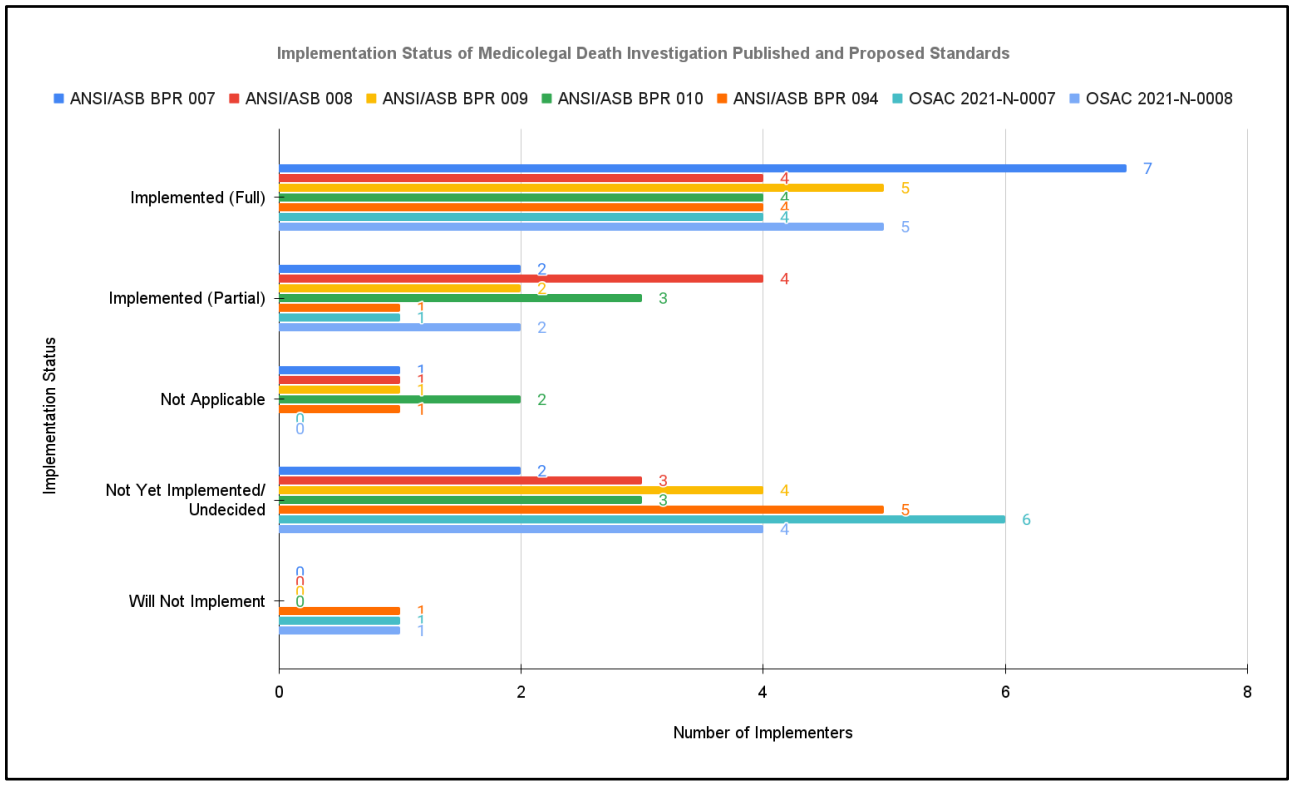


Figure 20: *SDO published and OSAC Proposed Standards implemented by 12 medicolegal death investigation service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 20)**:
    - 12 organizations (9.4%) perform services in medicolegal death investigation.
    - 116 organizations (90.6%) do not perform services in medicolegal death investigation.
- Of the 12 organizations that perform services in medicolegal death investigation:
    - 9 have either fully or partially implemented ANSI/ASB 007, while 2 have not yet implemented this standard.
    - 8 have either fully or partially implemented ANSI/ASB 008, while 3 have not yet implemented this standard.
    - 7 have either fully or partially implemented ANSI/ASB 009, while 4 have not yet implemented this standard.
    - 7 have either fully or partially implemented ANSI/ASB 010, while 3 have not yet implemented this standard.
    - 5 have either fully or partially implemented ANSI/ASB 094, while 5 have not yet implemented this standard.
    - 5 have either fully or partially implemented OSAC 2021-N-0007, while 6 have not yet implemented this standard.
    - 7 have either fully or partially implemented OSAC 2021-N-0008, while 4 have not yet implemented this standard.

ODONTOLOGY

Standards on the OSAC Registry and Included in the Survey (3):

- ANSI/ADA 1058-2010D, *Forensic Dental Data Set*.
- ADA 1077-2020, *Human Age Assessment by Dental Analysis*.
- ADA 1088-2017D, *Human Identification by Comparative Dental Analysis.*

Implementation Status by Standard:

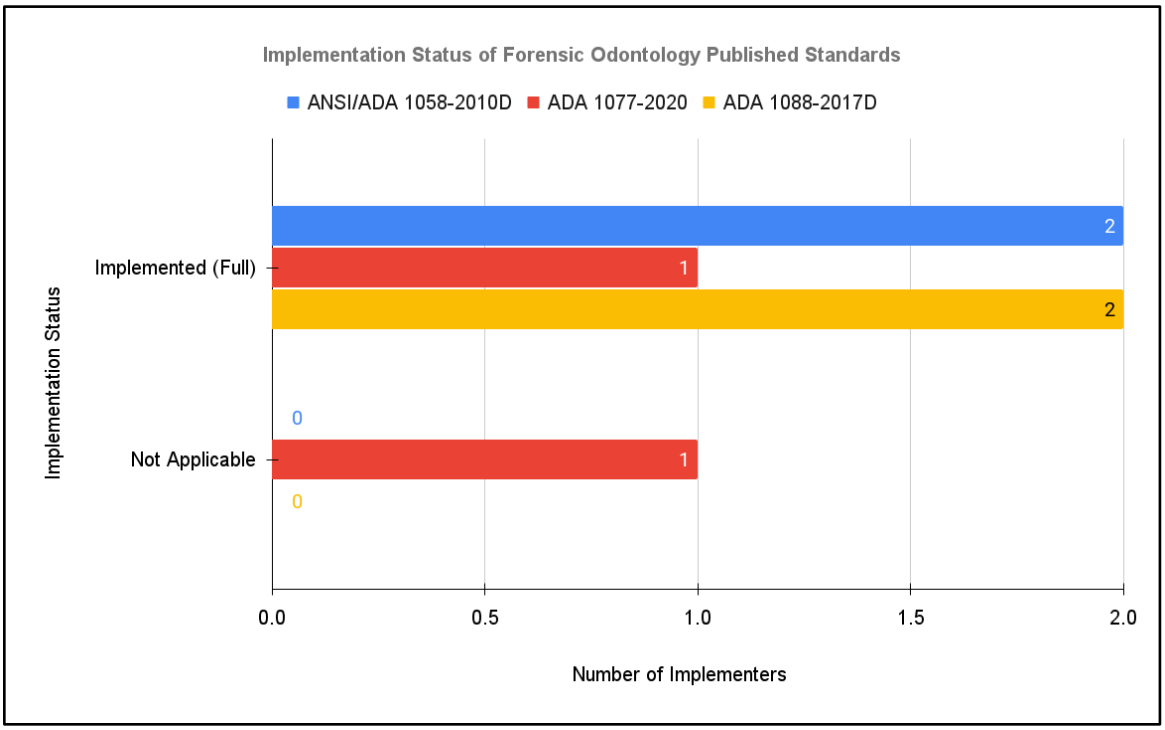


Figure 21: *SDO published standards implemented by 2 forensic odontology service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 21)**:
  - 2 organizations (1.6%) perform services in forensic odontology.
  - 126 organizations (98.4%) do not perform services in forensic odontology.
- Of the 2 organizations that perform services in forensic odontology:
  - Both have fully implemented ANSI/ADA 1058-2010D.
  - 1 has fully implemented ANSI/ADA 1077-2020.
  - Both have fully implemented ANSI/ADA 1088-2017D.

SEIZED DRUGS

Standards on the OSAC Registry and Included in the Survey (7):

- ASTM E1968-19, *Standard Practice for Microcrystal Testing in Forensic Analysis of Cocaine*.
- ASTM E1969-19, *Standard Practice for Microcrystal Testing in Forensic Analysis for Methamphetamine and Amphetamine*.
- ASTM E2125-19, *Standard Practice for Microcrystal Testing in Forensic Analysis for Phencyclidine and its Analogues.*
- ASTM E2329-17, *Standard Practice for Identification of Seized Drugs*.
- ASTM E2548-16, *Standard Guide for Sampling Seized Drugs for Qualitative and Quantitative Analysis.*
- ASTM E2882-19, *Standard Guide for Analysis of Clandestine Drug Laboratory Evidence*.
- ASTM E3255-21, *Standard Practice for Quality Assurance of Forensic Science Service Providers Performing Forensic Chemical Analysis.*

Implementation Status by Standard:

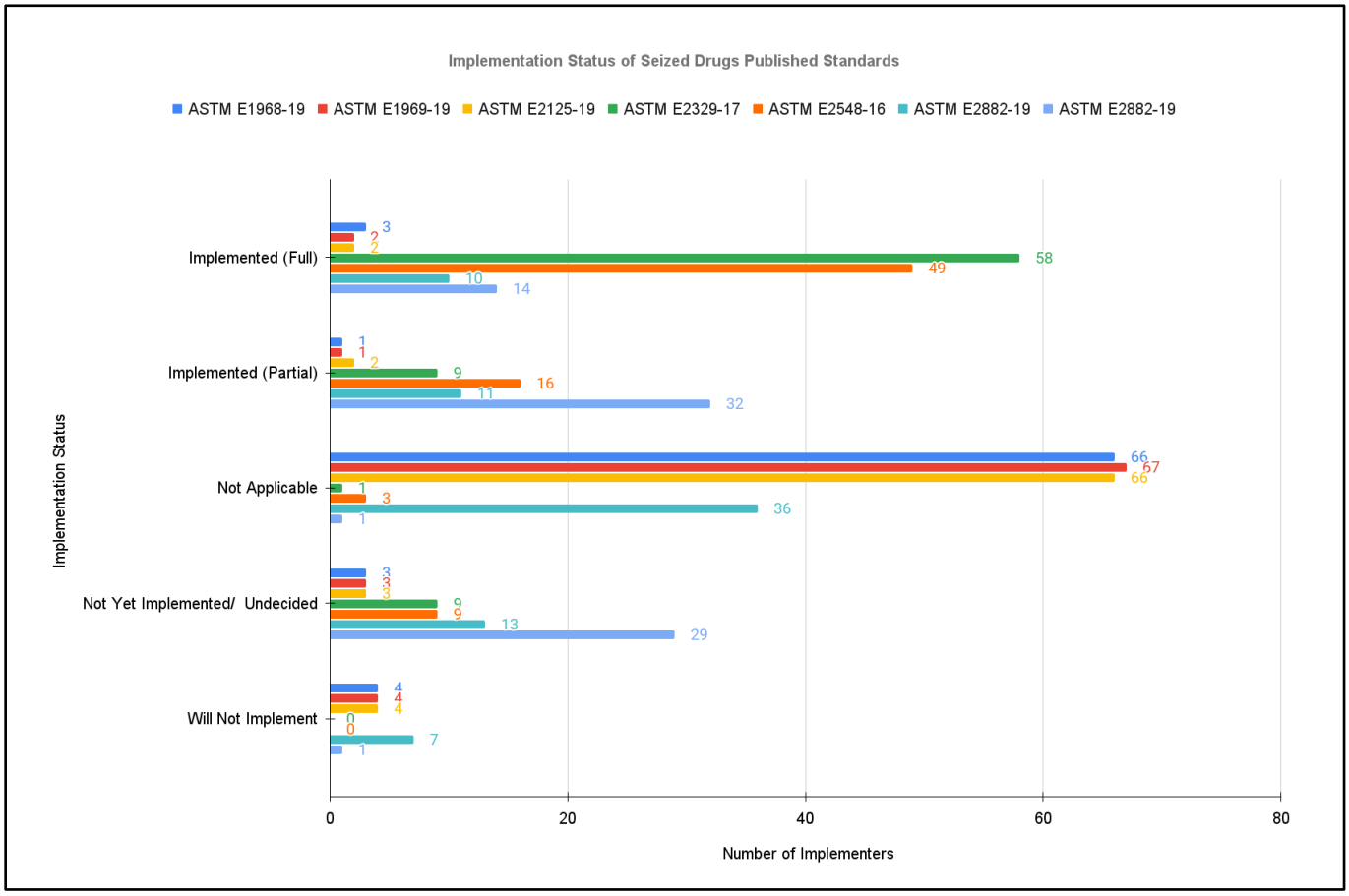


Figure 22: *SDO published standards implemented by 77 seized drugs service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 22)**:
    - 77 organizations (60.2%) perform services in seized drugs.
    - 51 organizations (39.8%) do not perform services in seized drugs.
- Of the 77 organizations that perform services in seized drugs:
    - 4 have either fully or partially implemented ASTM E1968-19, while 3 have not yet implemented this standard.
    - 3 have either fully or partially implemented ASTM E1969-19, while 3 have not yet implemented this standard.
    - 4 have either fully or partially implemented ASTM E2125-19, while 3 have not yet implemented this standard.
    - 67 have either fully or partially implemented ASTM E2329-17, while 9 have not yet implemented this standard.
    - 65 have either fully or partially implemented ASTM E2548-16, while 9 have not yet implemented this standard.
    - 21 have either fully or partially implemented ASTM E2882-19, while 13 have not yet implemented this standard.
    - 46 have either fully or partially implemented ASTM E3255-21, while 29 have not yet implemented this standard.

TOXICOLOGY

Standards on the OSAC Registry and Included in the Survey (6):

- ANSI/ASB Standard 017, *Standard Practices for Measurement Traceability in Forensic Toxicology,* First Edition, 2018.
- ANSI/ASB Standard 036, *Standard Practices for Method Validation in Forensic Toxicology,* First Edition, 2019.
- ANSI/ASB Best Practice Recommendation 037, *Guidelines for Opinions and Testimony in Forensic Toxicology*, First Edition, 2019.
- ANSI/ASB Standard 053, *Standard for Report Content in Forensic Toxicology*, First Edition, 2020.
- ANSI/ASB Standard 121, *Standard for the Analytical Scope and Sensitivity of Forensic Toxicological Testing of Urine in Drug-Facilitated Crime Investigations*, First Edition, 2021.
- OSAC 2020-S-0003, *Guidelines for Performing Alcohol Calculations in Forensic Toxicology*.

Implementation Status by Standard:

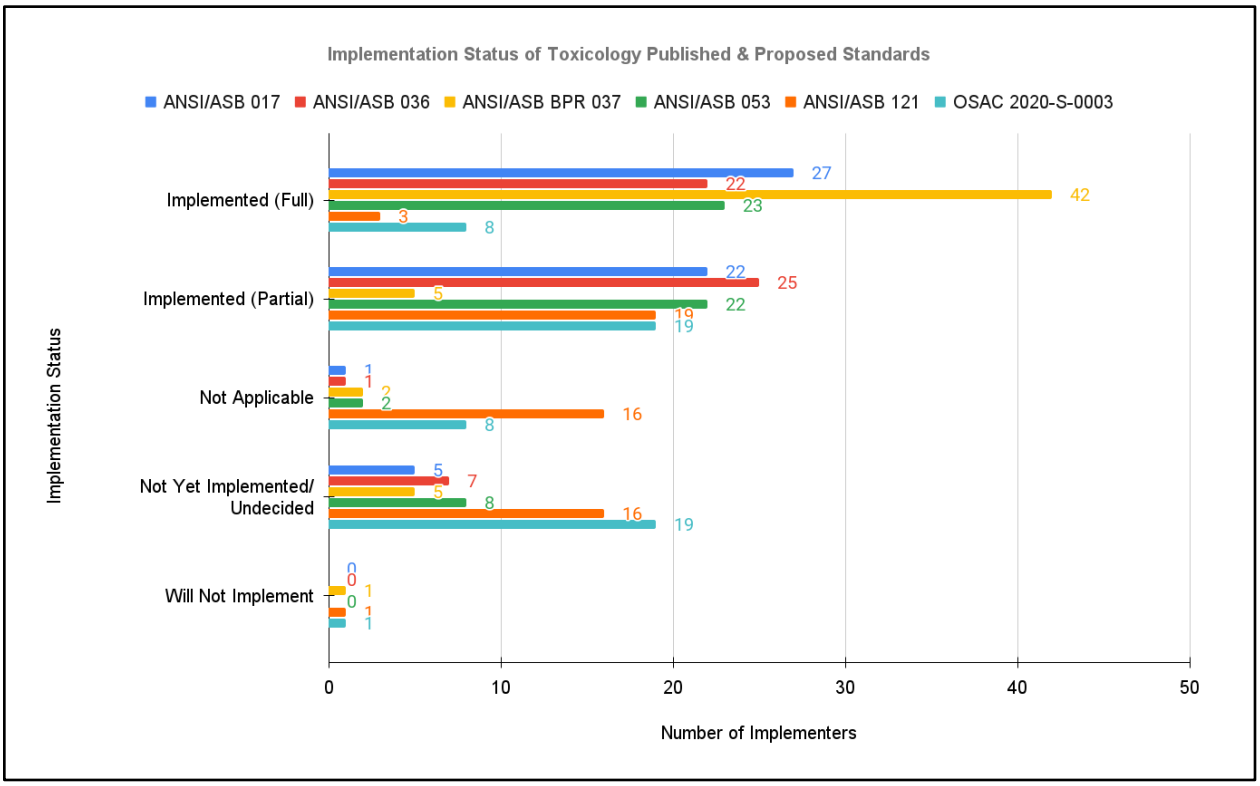


Figure 23: *SDO published and OSAC Proposed Standards implemented by 55 forensic toxicology service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 23)**:
    - 55 organizations (43%) perform services in forensic toxicology.
    - 73 organizations (57%) do not perform services in forensic toxicology.
- Of the 55 organizations that perform services in forensic toxicology:
    - 49 have either fully or partially implemented ANSI/ASB 017, while 5 have not yet implemented this standard.
    - 47 have either fully or partially implemented ANSI/ASB 036, while 7 have not yet implemented this standard.
    - 47 have either fully or partially implemented ANSI/ASB 037, while 5 have not yet implemented this standard.
    - 45 have either fully or partially implemented ANSI/ASB 053, while 8 have not yet implemented this standard.
    - 22 have either fully or partially implemented ANSI/ASB 121, while 16 have not yet implemented this standard.
    - 27 have either fully or partially implemented OSAC 2020-S-0003, while 19 have not yet implemented this standard.

TRACE EVIDENCE

Standards on the OSAC Registry and Included in the Survey (12):

- ASTM E1610-18, *Standard Guide for Forensic Paint Analysis and Comparison*.
- ASTM E1967-19, *Standard Test Method for the Automated Determination of Refractive Index of Glass Samples Using the Oil Immersion Method and a Phase Contrast Microscope*.
- ASTM E2330-19, *Standard Test Method for Determination of Concentrations of Elements in Glass Samples Using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) for Forensic Comparisons*.
- ASTM E2808-21a, *Standard Guide for Microspectrophotometry in Forensic Paint Analysis*.
- ASTM E2926-17, *Standard Test Method for Forensic Comparison of Glass Using Micro X-ray Fluorescence Spectrometry*.
- ASTM E2927-16e1, *Standard Test Method for Determination of Trace Elements in Soda Lime Glass Samples Using Laser Ablation Inductively Coupled Plasma Mass Spectrometry for Forensic Comparisons.*
- ASTM E2937-18, *Standard Guide for Using Infrared Spectroscopy in Forensic Paint Examinations.*
- ASTM E3085-17, *Standard Guide for Fourier Transform Infrared Spectroscopy in Forensic Tape Examinations.*
- ASTM E3233-20, *Standard Practice for Forensic Tape Analysis Training Program*.
- ASTM E3234-20, *Standard Practice for Forensic Paint Analysis Training Program.*
- ASTM E3260-21, *Standard Guide for Forensic Examination and Comparison of Pressure Sensitive Tapes.*
- ASTM E3272-21, *Standard Guide for Collection of Soils and Other Geological Evidence for Criminal Forensic Applications.*

Implementation Status by Standard:

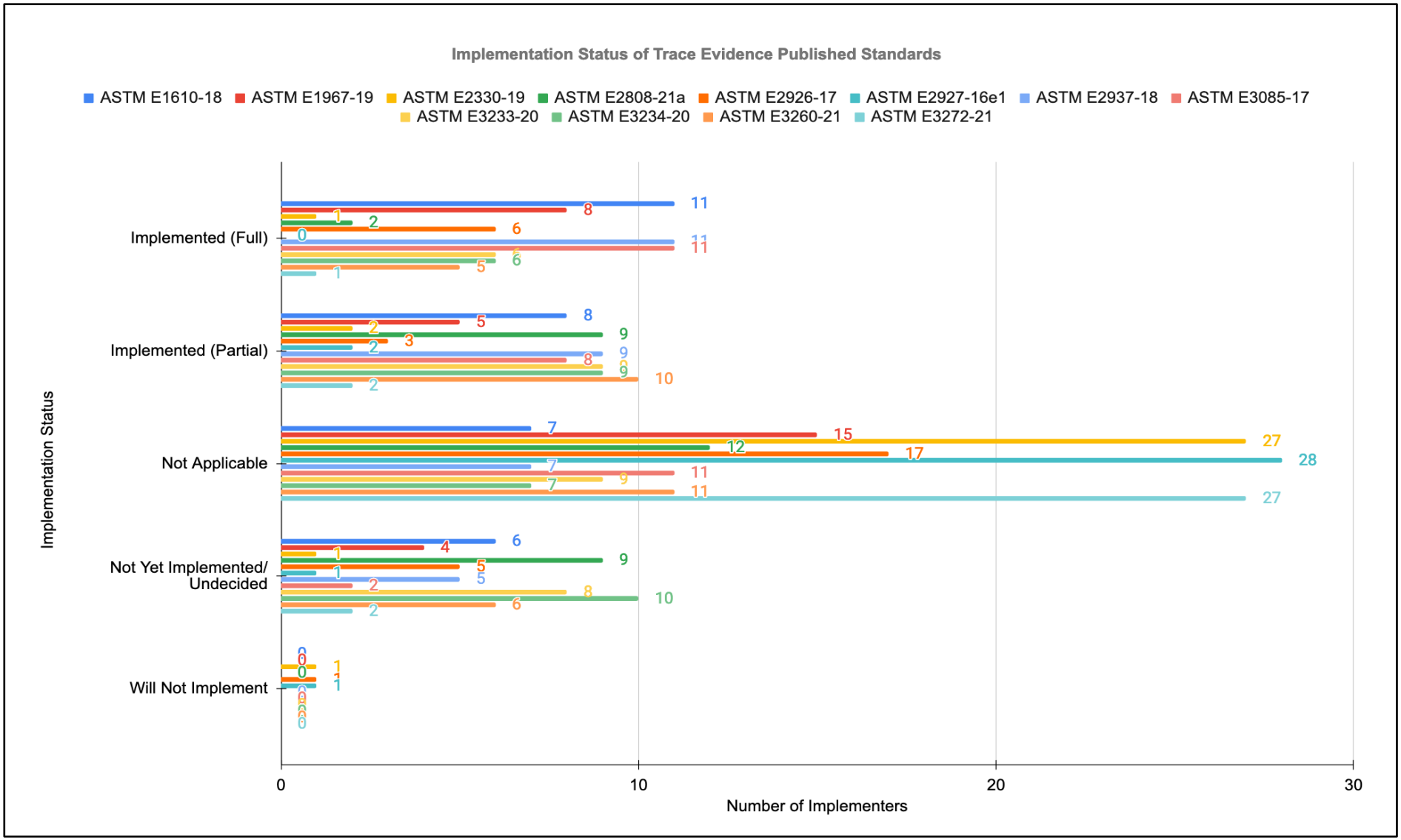


Figure 24: *SDO published standards implemented by 32 trace materials service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 24)**:
    - 32 organizations (25%) perform services in trace materials.
    - 96 organizations (75%) do not perform services in trace materials.
- Of the 32 organizations that perform services in trace materials:
    - 19 have either fully or partially implemented ASTM E1610-18, while 6 have not yet implemented this standard.
    - 13 have either fully or partially implemented ASTM E1967-19, while 4 have not yet implemented this standard.
    - 3 have either fully or partially implemented ASTM E2330-19, while 1 has not yet implemented this standard.
    - 11 have either fully or partially implemented ASTM E2808-21a, while 9 have not yet implemented this standard.
    - 9 have either fully or partially implemented ASTM E2926-17, while 5 have not yet implemented this standard.
    - 2 have partially implemented ASTM E2927-16e1, while 1 has not yet implemented this standard.
    - 20 have either fully or partially implemented ASTM E2937-18, while 5 have not yet implemented this standard.
    - 19 have either fully or partially implemented ASTM E3085-17, while 2 have not yet implemented this standard.
    - 15 have either fully or partially implemented ASTM E3233-20, while 8 have not yet implemented this standard.
    - 15 have either fully or partially implemented ASTM E3234-20, while 10 have not yet implemented this standard.
    - 15 have either fully or partially implemented ASTM E3260-21, while 6 have not yet implemented this standard.
    - 3 have either fully or partially implemented ASTM E3272-21, while 2 have not yet implemented this standard.

VIDEO/IMAGING TECHNOLOGY & ANALYSIS

Standards on the OSAC Registry and Included in the Survey (3):

- ASTM E2916-19e1, *Standard Terminology for Digital and Multimedia Evidence Examination*.
- ASTM E3235-21, *Standard Practice for Latent Print Evidence Imaging Resolution*.
- OSAC 2021-S-0013, *Standard Guide for Post Mortem Examination Photography.*

Implementation Status by Standard:

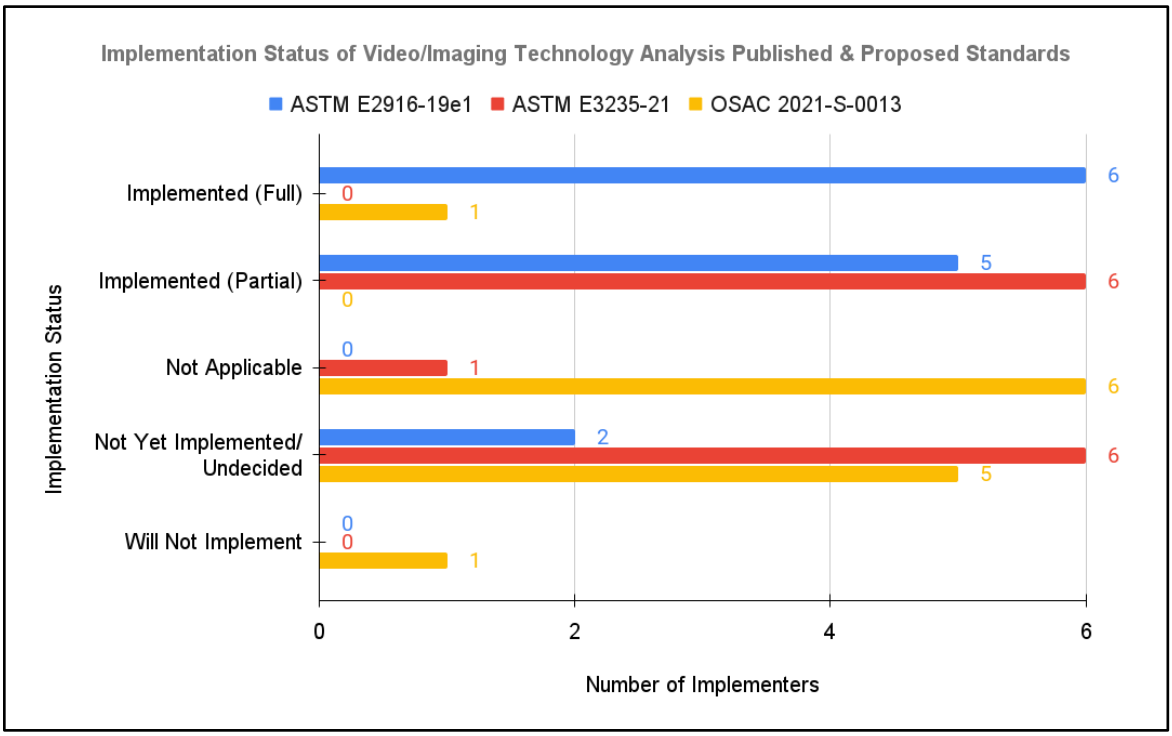


Figure 25: *SDO published and OSAC Proposed Standards implemented by 13 video/imaging technology and analysis service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 25)**:
  - 13 organizations (10.2%) perform services in video/imaging technology and analysis (VITAL).
  - 115 organizations (89.8%) do not perform services in VITAL.
- Of the 13 organizations that perform services in VITAL:
  - 11 have either fully or partially implemented ASTM E2916-19e1, while 2 have not yet implemented this standard.
  - 6 have partially implemented ASTM E3235-21, while 6 have not yet implemented this standard.
  - 1 has fully implemented OSAC 2021-S-0013, while 5 have not yet implemented this standard.

WILDLIFE FORENSICS

Standards on the OSAC Registry and Included in the Survey (6):

- ANSI/ASB Standard 019, *Wildlife Forensics General Standards*, First Edition, 2019.
- ANSI/ASB Standard 028, *Wildlife Forensics Morphology Standards*, First Edition, 2019.
- ANSI/ASB Standard 029, *Report Writing in Wildlife Forensics: Morphology and Genetics*, First Edition, 2019.
- ANSI/ASB Standard 047, *Wildlife Forensics Validation Standard—Validating New Primers for Sequencing*, First Edition, 2019.
- OSAC 2021-N-0001, *Wildlife Forensics Method-Collection of Known DNA Samples from Domestic Mammals*.
- OSAC 2021-S-0006, *Standard for the Use of GenBank for Taxonomic Assignment of Wildlife*.

Implementation Status by Standard:

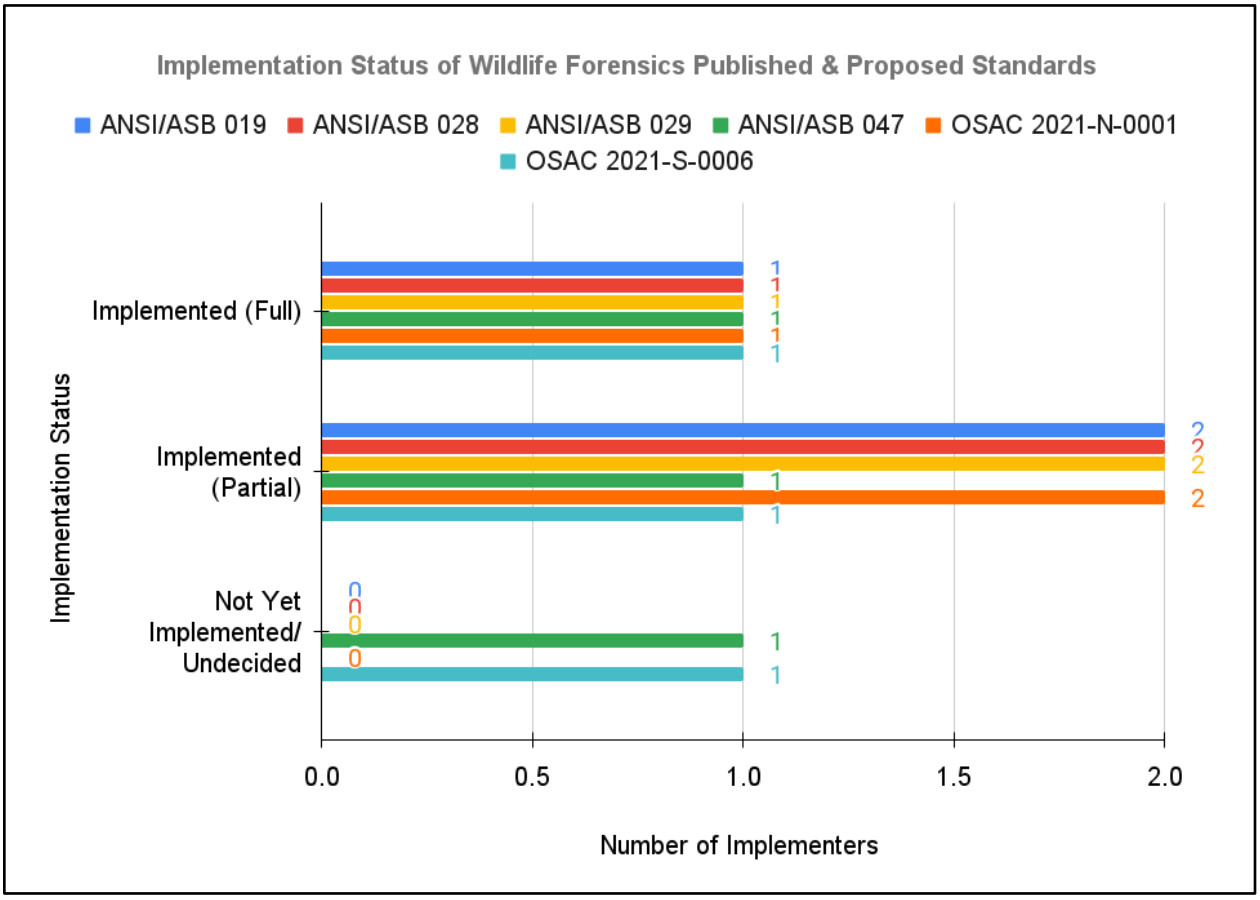


Figure 26: *SDO published and OSAC Proposed Standards implemented by 3 wildlife forensics service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 implementers who indicated their organization has implemented standards on the OSAC Registry **(Figure 26)**:
    - 3 organizations (2.3%) perform services related to wildlife forensics.
    - 125 organizations (97.7%) do not perform services related to wildlife forensics.
- Of the 3 organizations that perform services related to wildlife forensics:
    - All 3 have either fully or partially implemented ANSI/ASB 019.
    - All 3 have either fully or partially implemented ANSI/ASB 028.
    - All 3 have either fully or partially implemented ANSI/ASB 029.
    - 2 have either fully or partially implemented ANSI/ASB 047, while 1 has not yet implemented this standard.
    - All 3 have either fully or partially implemented OSAC 2021-N-0001.
    - 2 have either fully or partially implemented OSAC 2021-S-0006, while 1 has not yet implemented this standard.

INTERDISCIPLINARY

Standards on the OSAC Registry and Included in the Survey (6):

- ANSI/NIST ITL-1: 2011, *Data Format for the Interchange of Fingerprint, Facial & Other Biometric Information.*
- ASTM E2917-19a, *Standard Practice for Forensic Science Practitioner Training, Continuing Education, and Professional Development Programs.*
- ASTM E3255-21, *Standard Practice for Quality Assurance of Forensic Science Service Providers Performing Forensic Chemical Analysis.*
- ISO/IEC 17020:2012, *Conformity Assessment - Requirements for the Operation of Various Types of Bodies Performing Inspection.*
- ISO/IEC 17025:2017, *General Requirements for the Competence of Testing and Calibration Laboratories.*
- ISO 21043-2 Forensic Sciences, Part 2: *Recognition, recording, collecting transport and storage of items.*

Implementation Status by Standard:

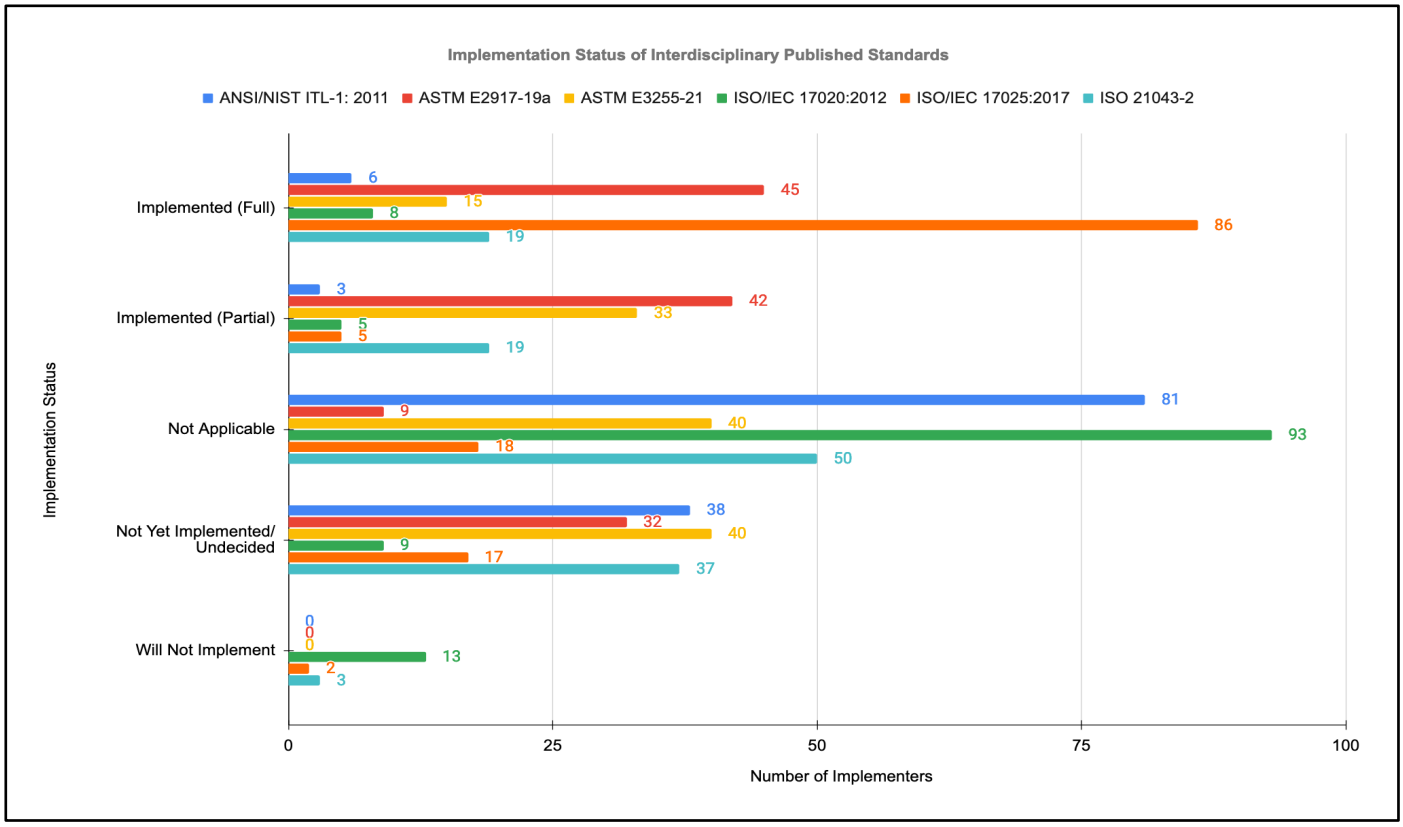


Figure 27: *SDO published standards implemented by forensic service providers out of 128 OSAC Registry implementers.*

Summary:

- Of the 128 registry implementers **(Figure 27)**:
    - 9 have either fully or partially implemented ANSI/NIST ITL-1: 2011, while 38 have not yet implemented this standard.
    - 87 have either fully or partially implemented ASTM E2917-19a, while 32 have not yet implemented this standard.
    - 48 have either fully or partially implemented ASTM E3255-21, while 40 have not yet implemented this standard.
    - 13 have either fully or partially implemented ISO/IEC 17020:2012, while 9 have not yet implemented this standard.
    - 91 have either fully or partially implemented ISO/IEC 17025:2017, while 17 have not yet implemented this standard.
    - 38 have either fully or partially implemented ISO 21043-2 Forensic Sciences, Part 2, while 37 have not yet implemented this standard.

Key Takeaways from this survey

- Survey responses represent forensic science service providers from 40 states in the U.S. and the territory of Puerto Rico, across a range of organization types, roles, and geographical regions.
- Of the 177 survey respondents:
    - 93% are aware of the standards on the OSAC Registry.
    - 44% of survey respondents consider standards implementation a high priority (or very important).
    - 128 reported that their organization has fully or partially implemented at least one standard on the OSAC Registry.
- Of the 95 standards included in this survey, 94 are being implemented.
    - All 79 SDO published standards have been implemented, either fully or partially.
    - Of the 16 OSAC Proposed Standards, 15 have been implemented, either fully or partially.
- The key standard used in accreditation, IEC/ISO 17025:2017, *General Requirements for the Competence of Testing and Calibration Laboratories,* has been implemented the most.
- The disciplines practiced in traditional crime laboratories are further along in their efforts to implement the standards on the OSAC Registry, with standards related to seized drugs, toxicology, biology/DNA, and firearms being implemented the most.
- Survey respondents identified a lack of resources (personnel, instruments/facility, validation, training) as the top key challenges to implementation.
- The number of standards included in the 2022 survey (95) was more than double the number in the 2021 survey (46). As of the publication of this report (February 2023), the OSAC Registry contains 133 standards, representing over 20 forensic science disciplines and interdisciplinary topics. OSAC recognizes that standards implementation takes time and acknowledges that FSSPs may not experience much change from one year to the next. Additionally, with now over 120 FSSPs self-declaring implementation as of this report, it is expected that "self-declarers" will soon surpass the number of future survey respondents. OSAC will continue to assess the state of Registry implementation on an annual basis, but instead of a survey, is considering a different approach to collecting implementation information.

Appendix A

Organizations invited to participate in the 2022 OSAC Registry Implementation Survey:

- American Academy of Forensic Sciences (AAFS)
- American Board of Forensic Anthropology (ABFA)
- American Board of Forensic Odontology (ABFO)
- American Board of Forensic Toxicology (ABFT)
- American Board of Medicolegal Death Investigators (ABMDI)
- Association of Firearm and Tool Mark Examiners (AFTE)
- Association of Forensic DNA Analysts and Administrators (AFDAA)
- Association of Forensic Quality Assurance Managers (AFQAM)
- Association of State Criminal Investigative Agencies (ASCIA)
- American Society of Crime Laboratory Directors (ASCLD)
- American Society of Forensic Odontology (ASFO)
- American Society of Trace Evidence Examiners (ASTEE)
- California Association of Crime Laboratory Directors (CACLD)
- California Association of Criminalists (CAC)
- Digital Evidence Scientific Working Groups (SWGDE)
- Florida Association of Crime Lab Directors (FACLD)
- International Association of Arson Investigators (IAAI)
- International Association of Bloodstain Pattern Analysts (IABPA)
- International Association of Chiefs of Police (IACP)
- International Association of Coroners & Medical Examiners (IACME)
- International Association for Identification (IA)
- International Symposium on Human Identification (ISHI)
- Mid-Atlantic Association of Forensic Scientists (MAAFS)
- Midwestern Association of Forensic Scientists (MAFS)
- National Association of Fire Investigators (NAFI)
- National Association of Medical Examiners (NAME)
- National Sheriff's Association
- New York State Police Crime Laboratory System (NYCLAC)
- Northeastern Association of Forensic Scientists (NEAFS)
- Scientific Working Group for the Analysis of Seized Drug (SWGDRUG)
- Scientific Working Group on DNA Analysis Methods (SWGDAM)
- Society of Fire Protection Engineers (SFPE)
- Society of Forensic Anthropologists (SOFA)
- Society of Forensic Toxicologists (SOFT)
- Southern Association of Forensic Scientists (SAFS)
- Southwestern Association of Forensic Scientists (SWAFS)
- Texas Association of Crime Lab Directors (TACLD)
- Texas Forensic Science Commission (TXFSC)
- The International Association of Forensic Toxicologists (TIAFT)

Appendix B

Published and OSAC Proposed Standards (including the number of implementers) in the 2022 OSAC Registry Implementation Survey.

Discipline	Standards on the OSAC Registry - as of June 2022	Number of Implementers (out of 128)
Interdisciplinary	ISO/IEC 17025:2017 *General Requirements for the Competence of Testing and Calibration Laboratories*	91
Interdisciplinary	ASTM E2917-19a, *Standard Practice for Forensic Science Practitioner Training, Continuing Education, and Professional Development Programs*	87
Seized Drugs	ASTM E2329-17, *Standard Practice for Identification of Seized Drugs*	67
Seized Drugs	ASTM E2548-16, *Standard Guide for Sampling Seized Drugs for Qualitative and Quantitative Analysis*	65
Toxicology	ANSI/ASB Standard 017, *Standard Practices for Measurement Traceability in Forensic Toxicology*, First Edition, 2018	49
Biology/DNA	ANSI/ASB Standard 022, *Standard for Forensic DNA Analysis Training Programs*, First Edition, 2019	48
Firearms & Toolmarks	ANSI/ASB Best Practice Recommendation 068, *Safe Handling of Firearms and Ammunition*, First Edition, 2020	48
Toxicology	ANSI/ASB Standard 036, *Standard Practices for Method Validation in Forensic Toxicology*, First Edition, 2019	47
Toxicology	ANSI/ASB Best Practice Recommendation 037, *Guidelines for Opinions and Testimony in Forensic Toxicology*, First Edition, 2019	47
Seized Drugs & Interdisciplinary	ASTM E3255-21, Standard Practice for Quality Assurance of Forensic Science Service Providers Performing Forensic Chemical Analysis	46
Toxicology	ANSI/ASB Standard 053, *Standard for Report Content in Forensic Toxicology*, First Edition, 2020	45
Firearms & Toolmarks	ANSI/ASB Standard 093, *Standard Test Method for the Forensic Examination and Testing of Firearms*, First Edition, 2020	44
Biology/DNA	ANSI/ASB Standard 020, *Standard for Validation Studies of DNA Mixtures, and Development and Verification of a Laboratory's Mixture Interpretation Protocol*, First Edition, 2018	43

Biology/DNA	ANSI/ASB Standard 040, *Standard for Forensic DNA Interpretation and Comparison Protocols*, First Edition, 2019	43
Biology/DNA	ANSI/ASB Standard 110, *Standards for Training in Forensic Serological Methods*, First Edition, 2020	43
Biology/DNA	ANSI/ASB Standard 116, *Standard for Training in Forensic DNA Quantification Methods*, First Edition, 2020	41
Biology/DNA	ANSI/ASB Standard 115, *Standard for Training in Forensic Short Tandem Repeat Typing Methods using Amplification, DNA Separation, and Allele Detection*, First Edition, 2020	40
Biology/DNA	ANSI/ASB Standard 023, *Standard for Training in Forensic DNA Isolation and Purification Methods*, First Edition, 2020	39
Interdisciplinary	ISO 21043-2 Forensic Sciences - Part 2: *Recognition, recording, collecting, transport and storage of items*	38
Biology/DNA	ANSI/ASB Standard 018, *Standard for Validation of Probabilistic Genotyping Systems,* First Edition, 2020	34
Friction Ridge	OSAC 2022-S-0012, *Standard for Proficiency Testing in Friction Ridge Examination*	33
Digital Evidence, Facial Identification, Video/Imaging Technology & Analysis	ASTM E2916-19e1, *Standard Terminology for Digital and Multimedia Evidence Examination*	32
Friction Ridge	OSAC 2021-N-0020, *Best Practice Recommendations for Limited Examinations*	31
Toxicology	OSAC 2020-S-0003, *Guidelines for Performing Alcohol Calculations in Forensic Toxicology*	27
Footwear & Tire	ANSI/ASB Best Practice Recommendation 021, *Best Practices for the Preparation of Test Impressions from Footwear and Tires*, First Edition, 2019	26
Footwear & Tire	ANSI/ASB Best Practice Recommendation 049, *Best Practice Recommendation for Lifting of Footwear and Tire Impressions*, First Edition, 2020	24
Fire Debris	ASTM E1412-19, *Standard Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Passive Headspace Concentration with Active Charcoal*	24
BIology/DNA	OSAC 2020-S-0004, *Standard for Interpreting, Comparing and Reporting DNA Test Results Associated with Failed Controls and Contamination Events*	23
Toxicology	ANSI/ASB Standard 121, *Standard for the Analytical Scope and Sensitivity of Forensic Toxicological Testing of Urine in Drug-Facilitated Crime Investigations*, First Edition, 2021	22
Seized Drugs	ASTM E2882-19, *Standard Guide for Analysis of Clandestine Drug Laboratory Evidence*	21

Biology/DNA	OSAC 2020-N-0007, *Best Practice Recommendations for the Management and Use of Quality Assurance DNA Elimination Databases in Forensic DNA Analysis*	21
Trace Evidence	ASTM E2937-18, *Standard Guide for Using Infrared Spectroscopy in Forensic Paint Examinations*	20
Trace Evidence	ASTM E1610-18, *Standard Guide for Forensic Paint Analysis and Comparison*	19
Trace Evidence	ASTM E3085-17, *Standard Guide for Fourier Transform Infrared Spectroscopy in Forensic Tape Examinations*	19
Fire Debris	ASTM E3197-20, *Standard Terminology Relating to Examination of Fire Debris*	16
Fire Debris	ASTM E3245-20e1, *Standard Guide for Systematic Approach to the Extraction, Analysis, and Classification of Ignitable Liquids and Ignitable Liquid Residues in Fire Debris Samples*	16
Crime Scene Investigation/ Reconstruction	OSAC 2021-N-0015, *Best Practice Recommendation for Guiding Principles for Scene Investigation and Reconstruction*	16
Gunshot Residue	ASTM E1588-20, *Standard Practice for Gunshot Residue Analysis by Scanning Electron Microscopy/Energy Dispersive X-Ray Spectrometry*	15
Fire Debris	ASTM E2451-21, *Standard Practice for Preserving Ignitable Liquids and Ignitable Liquid Residue Extracts from Fire Debris Standards*	15
Trace Evidence	ASTM E3233-20, *Standard Practice for Forensic Tape Analysis Training Program*	15
Trace Evidence	ASTM E3234-20, *Standard Practice for Forensic Paint Analysis Training Program*	15
Trace Evidence	ASTM E3260-21, *Standard Guide for Forensic Examination and Comparison of Pressure Sensitive Tapes*	15
Bloodstain Pattern Analysis	ANSI/ASB Technical Report 033, *Terms and Definitions in Bloodstain Pattern Analysis*, First Edition, 2017	14
Trace Evidence	ASTM E1967-19, *Standard Test Method for the Automated Determination of Refractive Index of Glass Samples Using the Oil Immersion Method and a Phase Contrast Microscope*	13
Interdisciplinary	ISO/IEC 17020:2012 *Conformity Assessment - Requirements for the Operation of Various Types of Bodies Performing Inspection*	13
Trace Evidence	ASTM E2808-21a, *Standard Guide for Microspectrophotometry in Forensic Paint Analysis*	11
Biology/DNA	ANSI/ASB 130, *Standard for Training in Forensic DNA Amplification Methods for Subsequent Capillary Electrophoresis Sequencing*, First Edition, 2021	10

Fire Debris	ASTM E1388-17, *Standard Practice for Static Headspace Sampling of Vapors from Fire Debris Samples*	10
Medicolegal Death Investigation	ANSI/ASB Best Practice Recommendation 007, *Postmortem Impression Submission Strategy for Comprehensive Searches of Essential Automated Fingerprint Identification System Databases*, First Edition, 2018	9
Interdisciplinary	ANSI/NIST ITL-1: 2011, *Data Format for the Interchange of Fingerprint, Facial & Other Biometric Information*	9
Trace Evidence	ASTM E2926-17, *Standard Test Method for Forensic Comparison of Glass Using Micro X-ray Fluorescence Spectrometry*	9
Crime Scene Investigation/ Reconstruction	OSAC 2021-N-0016, *Standard for Initial Response at Scenes by Law Enforcement*	9
Medicolegal Death Investigation	ANSI/ASB Standard 008, *Mass Fatality Scene Processing: Best Practice Recommendations for the Medicolegal Authority*	8
Biology/DNA	ANSI/ASB Standard 131, *Standard for Training in Forensic DNA Sequencing Using Capillary Electrophoresis*	7
Medicolegal Death Investigation	ANSI/ASB Best Practice Recommendation 009, *Best Practice Recommendations for the Examination of Human Remains by Forensic Pathologists in the Disaster Victim Identification Context,* First Edition, 2019	7
Medicolegal Death Investigation	ANSI/ASB Best Practice Recommendation 010, *Forensic Anthropology in Disaster Victim Identification: Best Practice Recommendations for the Medicolegal Authority,* First Edition, 2018	7
Medicolegal Death Investigation	OSAC 2021-N-0008, *Victim Accounting: Best Practice Recommendations for Medicolegal Authorities in Mass Fatality Management*	7
Video/Imaging Technology and Analysis	ASTM E3235-21, *Standard Practice for Latent Print Evidence Imaging Resolution*	6
Medicolegal Death Investigation	ANSI/ASB 094, Best Practice Recommendation, *Postmortem Impression Recovery: Guidance and Best Practices for Disaster Victim Identification,* First Edition, 2021	5
Digital Evidence	ASTM E3150-18, *Standard Guide for Forensic Audio Lab Setup and Maintenance*	5
Medicolegal Death Investigation	OSAC 2021-N-0007, *Media Communications Following a Mass Fatality Incident: Best Practice Recommendations for the Medicolegal Authority*	5
Firearms & Toolmarks	ANSI/ASB Standard 061, *Firearms and Toolmarks 3D Measurement Systems and Measurement Quality Control,* First Edition, 2021	4
Fire Debris	ASTM E1413-19, *Standard Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Dynamic Headspace Concentration onto an Adsorbent Tube*	4

Seized Drugs	ASTM E1968-19, *Standard Practice for Microcrystal Testing in Forensic Analysis of Cocaine*	4
Seized Drugs	ASTM E2125-19, *Standard Practice for Microcrystal Testing in Forensic Analysis for Phencyclidine and its Analogues*	4
Digital Evidence	ASTM E3017-19, *Standard Practice for Examining Magnetic Card Readers*	4
Facial Identification	ASTM E3115-17, *Standard Guide for Capturing Facial Images for Use with Facial Recognition Systems*	4
Fire & Explosion Investigation	NFPA 921:2017, *Guide for Fire and Explosion Investigations*	4
Wildlife Forensics	ANSI/ASB Standard 019, *Wildlife Forensics General Standards,* First Edition, 2019	3
Wildlife Forensics	ANSI/ASB Standard 028, *Wildlife Forensics Morphology Standards,* First Edition, 2019	3
Wildlife Forensics	ANSI/ASB Standard 029, *Report Writing in Wildlife Forensics: Morphology and Genetics,*	3
Biology/DNA	ANSI/ASB Standard 140, *Standard for Training in Forensic Human Mitochondrial DNA Analysis, Interpretation, Comparison, Statistical Evaluation, and Reporting,* First Edition, 2021	3
Anthropology	ANSI/ASB Best Practice Recommendation 089, *Best Practice Recommendation for Facial Approximation in Forensic Anthropology*, First Edition, 2020	3
Seized Drugs	ASTM E1969-19, *Standard Practice for Microcrystal Testing in Forensic Analysis for Methamphetamine and Amphetamine*	3
Trace Evidence	ASTM E2330-19, *Standard Test Method for Determination of Concentrations of Elements in Glass Samples Using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) for Forensic Comparisons*	3
Facial Identification	ASTM E3148-18, *Standard Guide for Postmortem Facial Image Capture*	3
Facial Identification	ASTM E3149-18, *Standard Guide for Facial Image Comparison Feature List for Morphological Analysis*	3
Fire Debris	ASTM E3189-19, *Standard Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Static Headspace Concentration onto an Adsorbent Tube*	3
Trace Evidence	ASTM E3272-21, *Standard Guide for Collection of Soils and Other Geological Evidence for Criminal Forensic Applications*	3
Facial Identification	OSAC 2020-S-0002, *Physical Stability of Facial Features of Adults*	3
Wildlife Forensics	OSAC 2021-N-0001, *Wildlife Forensics Method-Collection of Known DNA Samples from Domestic Mammals*	3
Forensic Odontology	ADA 1088-2017D, *Human Identification by Comparative Dental Analysis*	2

Forensic Odontology	ANSI/ADA 1058-2010D, *Forensic Dental Data Set*	2
Wildlife Forensics	ANSI/ASB Standard 047, *Wildlife Forensics Validation Standard - Validating New Primers for Sequencing,* First Edition, 2019	2
Trace Evidence	ASTM E2927-16e1, *Standard Test Method for Determination of Trace Elements in Soda-Lime Glass Samples Using Laser Ablation Inductively Coupled Plasma Mass Spectrometry for Forensic Comparisons*	2
Fire & Explosion Investigation	NFPA 1033:2014, *Standard for Professional Qualifications for Fire Investigator*	2
Forensic Odontology	OSAC 2021-N-0030, *Terminology for A Suspected Pattern of Dental Origin*	2
Bloodstain Pattern Analysis	OSAC 2021-N-0039, *Standard for a Mentorship Program in Bloodstain Pattern Analysis*	2
Wildlife Forensics	OSAC 2021-S-0006, *Standard for the Use of GenBank for Taxonomic Assignment of Wildlife*	2
Forensic Odontology	ADA 1077-2020, *Human Age Assessment by Dental Analysis*	1
Dogs & Sensors	ASB Technical Report 025, *Crime Scene/Death Investigation - Dogs and Sensors - Terms and Definitions,* First Edition, 2017	1
Dogs & Sensors	ANSI/ASB Standard 085, *Standard for Detection Canine Selection, Kenneling, and Healthcare,* First Edition, 2021	1
Dogs & Sensors	ANSI/ASB Standard 088, *General Guidelines for Training, Certification, and Documentation of Canine Detection Disciplines,* First Edition, 2020	1
Video/Imaging Technology and Analysis	OSAC 2021-S-0013, *Standard Guide for Post Mortem Examination Photography*	1
Gunshot Residue	OSAC 2021-N-0009, *Standard Practice for the Collection and Preservation of Organic Gunshot Residue*	0