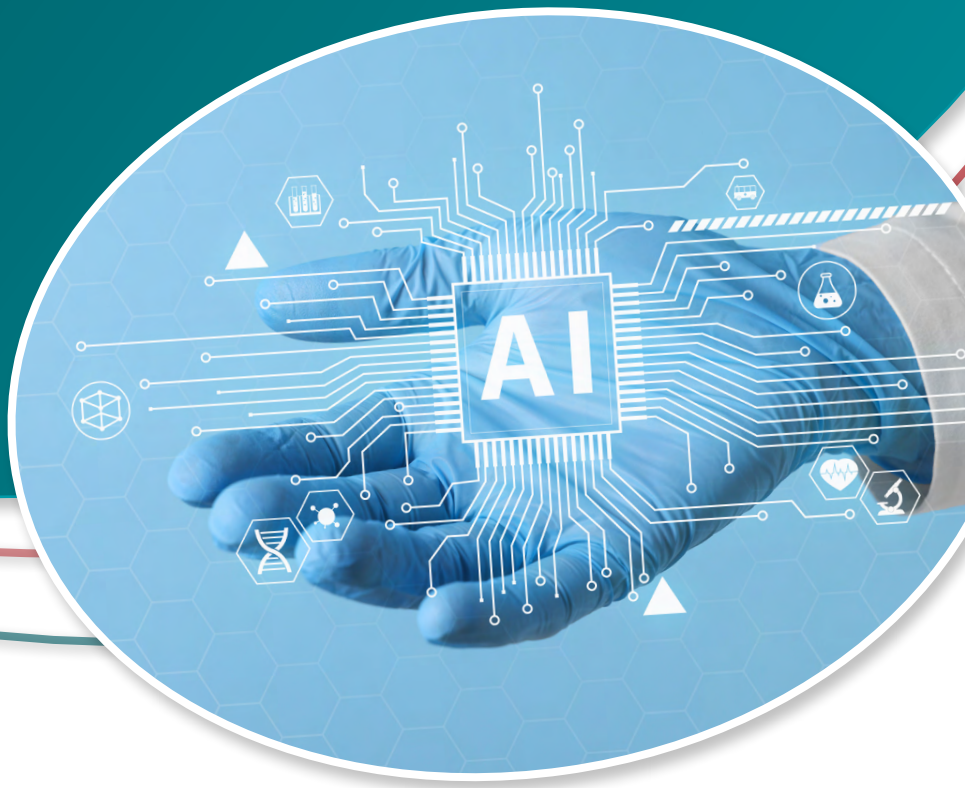
2025 APHL Survey Report

Understanding Artificial Intelligence in Public Health Laboratories



APHL ASSOCIATION OF PUBLIC HEALTH LABORATORIES®

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Executive Summary

The survey findings highlight that while exposure to artificial intelligence (AI) is growing across the public health laboratory workforce, it remains uneven across contexts, roles and generations. The personal adoption of AI tools is significantly higher than the adoption in public health laboratory workplaces, with the majority of respondents using AI occasionally in their personal lives, but more than half reporting no AI use at work. Knowledge levels also vary, with most respondents self-identifying at the basic to moderate understanding level and only a very small proportion reporting expert-level knowledge. Younger generations, particularly Gen Z and Millennials, demonstrate greater confidence and a stronger understanding of AI compared to older generations.

When it comes to the public health laboratory workforce's comfort with AI tools, respondents are split. A majority fell into the somewhat comfortable range, while over one-third expressed discomfort. Across roles, IT and student groups show the highest confidence, whereas clinical partners and emergency preparedness staff show the most hesitation. Concerns about AI primarily focus on trust, reliability and security, including the accuracy of outputs, the risk of misinformation, data privacy and security risks.

Respondents expressed a strong interest in practical and responsible applications of AI. The top learning priorities were how to utilize AI in the workplace, data privacy and ethical considerations. Preferences for training formats strongly lean toward online and virtual delivery, emphasizing accessibility and flexibility over traditional in-person methods.

Overall, the results suggest that while AI adoption and familiarity are advancing, particularly in personal contexts and among younger generations, there remain clear gaps in workplace integration, confidence and leadership communication across public health laboratories. Addressing these areas through targeted training, transparent guidance from leadership, and a focus on trust and security will be critical to advancing effective and responsible use of AI across public health laboratories.

About the Survey

Objectives

The goal of the Artificial Intelligence in Public Health Laboratories survey was to understand the landscape of AI in public health laboratories and assess training needs. Specifically, the we aim to:

- Assess APHL members' understanding and exposure to AI
- Identify challenges and concerns
- Gauge organizational readiness
- Define training and support needs
- Create a volunteer directory of members who are willing to share workplace AI use cases, implementation and operationalize policies.

Methods

- **Survey sponsor:** APHL Knowledge Management Committee
- **Audience:** APHL members across roles (Total Response: 393)
- **Distribution:** Direct email communication
- **Timing:** July–August 2025
- **Survey structure:** 15 questions (mix of demographics, closed-ended and open-text)
- **Confidentiality:** Anonymous, optional questions

Key Findings

Respondent Demographics

Role Distribution

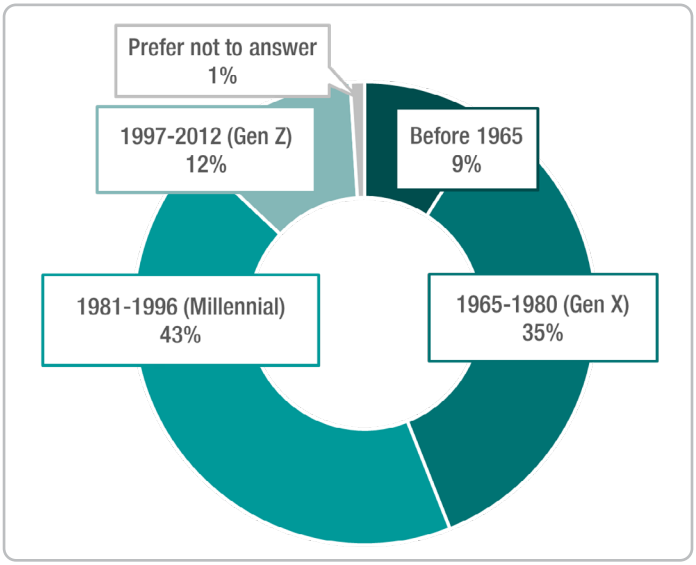
Figure 1. Current Role of Respondents

Current Role	#	%
Laboratory and Scientific Staff, including Bench Scientist	148	38%
Laboratory Management	65	17%
Executive Level: Laboratory Director, Deputy Director, Assistant, Technical Director	55	14%
Quality, Safety, Biosafety and Biosecurity	30	8%
Information Technology, Informatics and Bioinformatics	29	7%
Administration, Operations, and Support Services	20	5%
Other (please describe)	14	4%
Training and Outreach	11	3%
Fellows, Interns, Students	8	2%
Emergency Preparedness	6	2%
NBS Follow-up Program Staff	3	1%
No Response	3	1%
Grand Total	**393**	**100%**

Generational Breakdown

The generational breakdown of respondents shows that the largest group was Millennials (1981–1996), representing 43%, followed by Gen X (1965–1980) at 35%. Gen Z (1997–2012) accounted for 12%, while 9% were born before 1965. A very small proportion (1%) preferred not to disclose their age. This distribution indicates that survey insights are primarily shaped by Millennials and Gen X, who together make up nearly four out of five respondents.

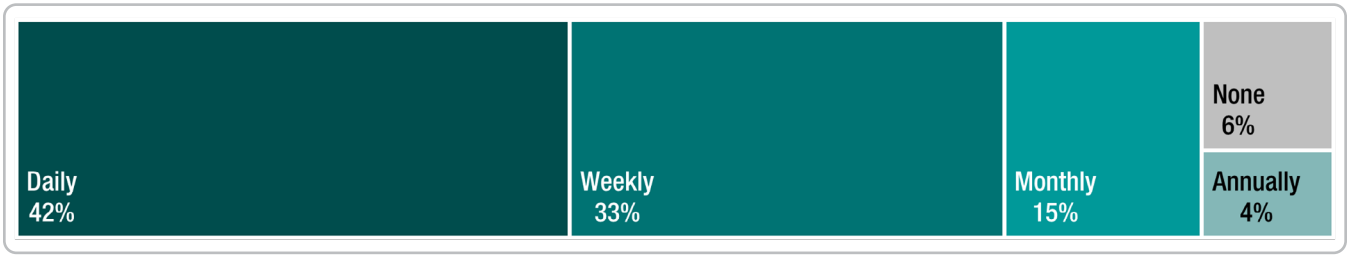
Figure 2. Generational Breakdown of Respondents



Frequency of Data Analysis in Current Roles

A large proportion of respondents reported that they frequently work with data analysis in their roles, with 42% engaging in it daily and 33% on a weekly basis. Less frequent engagement was reported by 15% on a monthly basis and 4% annually, while 6% indicated they do not perform data analysis at all. These findings suggest that data analysis is a core activity for most respondents, though a small subset of roles remain less directly involved in this type of work.

Figure 3. Frequency of Working with Data Analysis in Current Role



Current Use, Understanding and Exposure

Current Uses of AI

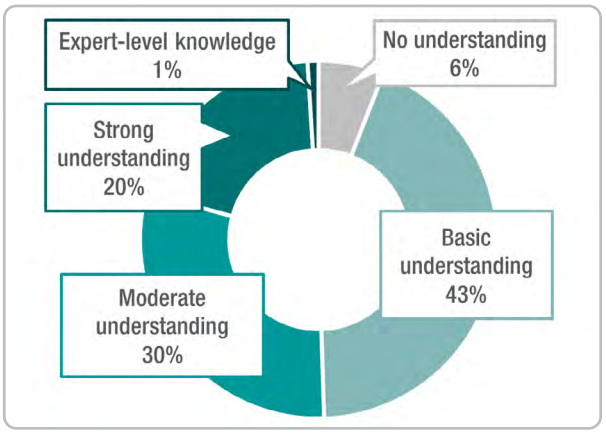
Nearly half of respondents (46%) reported using AI in their personal lives, while only 34% indicated using AI at work. At the same time, 42% stated that they are not currently using AI at all. This finding highlights that personal adoption of AI is outpacing workplace integration, with a significant proportion of individuals still not engaging with AI technologies in any capacity.

Figure 4. Current Use of AI

Self-rated Understanding of AI

Most respondents rated themselves as having a basic understanding of AI (44%), while nearly one-third reported a moderate understanding (30%). A smaller group indicated a strong understanding (20%), and only 1% identified as having expert-level knowledge. Meanwhile, 6% of respondents reported having no understanding of AI. These findings suggest that while many have at least some familiarity with AI, advanced expertise remains limited.

Figure 5. Self-assessed Understanding of AI



Personal vs Workplace Exposure to AI

The majority of respondents (64%) reported that they have occasionally used AI tools in their personal lives, while 24% indicated that they have heard of AI but never used it. A smaller proportion, 12%, stated that they use AI tools on a regular basis. This finding suggests that while casual exposure to AI is common, sustained or frequent personal use remains relatively limited (**Figure 6**).

Yet, more than half of respondents (55%) reported that they never use AI tools at work, while 32% indicated they occasionally use AI tools in their workplace. A smaller share, 11%, stated that they use AI tools regularly at work, and only 1% reported developing or working directly with AI technologies. These results suggest that while some exposure exists, the majority of respondents have limited or no engagement with AI in their professional roles (**Figure 7**).

When comparing personal and workplace exposure to AI, a clear difference emerges. In personal contexts, most respondents (64%) reported using AI tools occasionally, with an additional 12% using them regularly, showing that many individuals have at least some hands-on experience with AI in their daily lives. In contrast, workplace adoption appears lower: 55% of respondents reported never using AI at work, and only 11% said they use it regularly, with just 1% directly developing or working with AI technologies. This comparison highlights that while casual and exploratory use of AI is common in personal life, integration into professional settings remains limited, with most workplace engagement occurring at an occasional rather than routine level.

Figure 6. Personal Exposure to AI

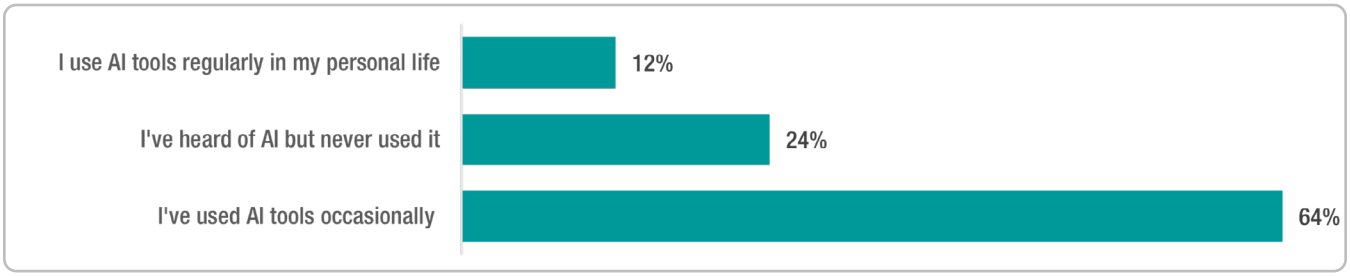
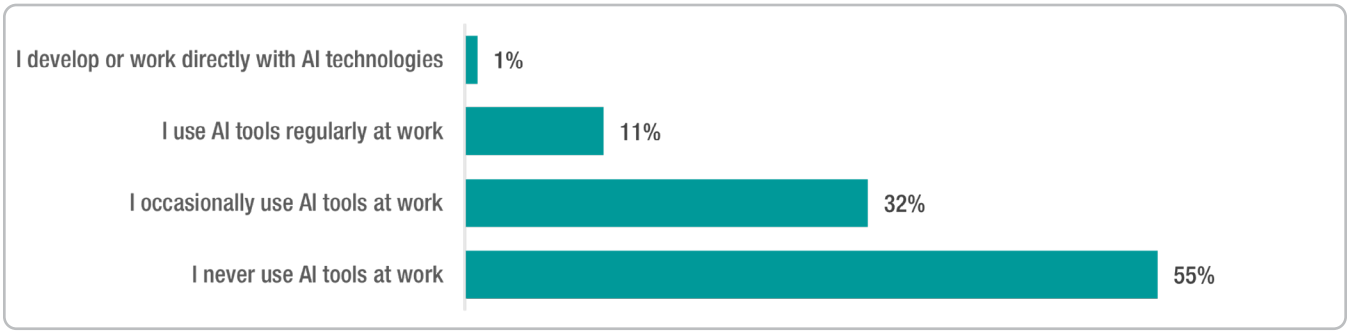


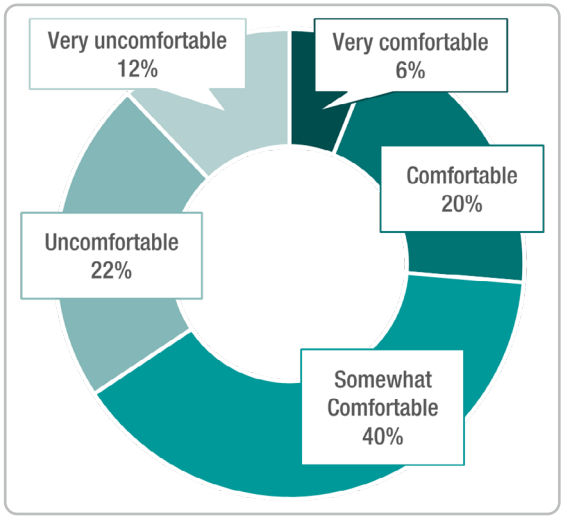
Figure 7. Workplace Exposure to AI



Comfort Levels

The majority of respondents expressed a middle-ground stance toward AI, with 39% reporting they are somewhat comfortable using AI tools. A combined 32% indicated positive comfort levels, with 20% reporting comfort and 6% reporting very comfortable. On the other hand, 34% reported discomfort, including 22% who were uncomfortable and 12% who were very uncomfortable. These results suggest that while many respondents are open to engaging with AI, a significant portion still experience hesitation or unease, highlighting the need for training and support to build confidence.

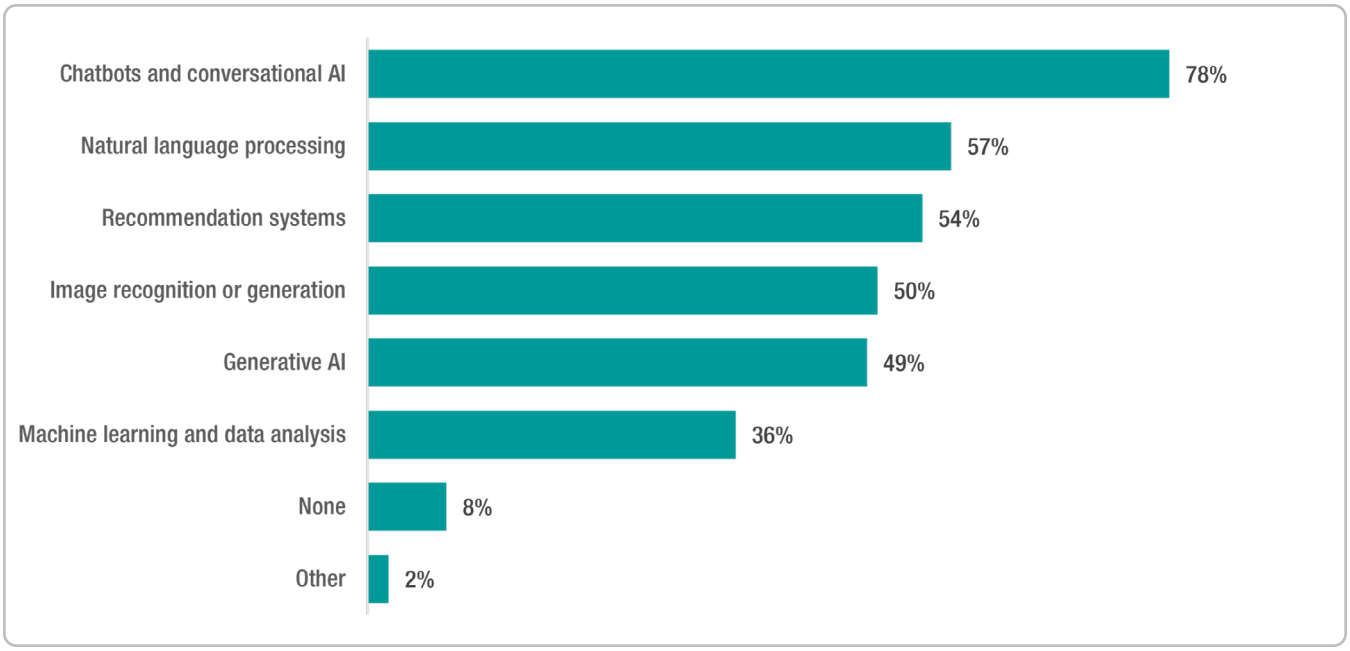
Figure 8. Comfort Level Using AI Tools



Familiarity With AI Areas

Respondents reported the highest familiarity with chatbots and conversational AI (78%), followed by natural language processing (57%) and recommendation systems (54%).

Figure 9. Areas of AI Familiarity

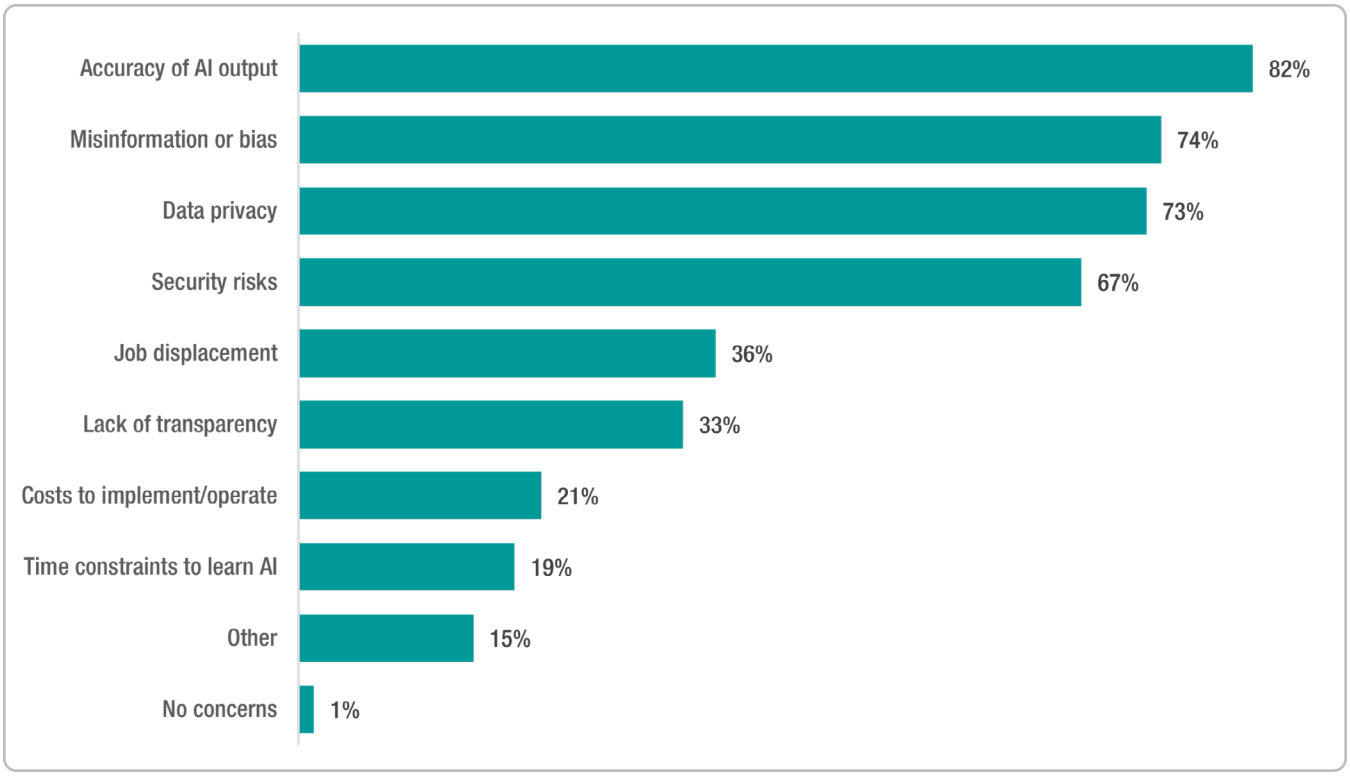


Concerns and Challenges

Concerns About AI

The leading concerns about AI among respondents centered on the accuracy of AI output (82%), misinformation or bias (74%), data privacy (73%) and security risks (67%). Fewer respondents expressed concern about job displacement (36%), lack of transparency (33%) or the costs of implementing and operating AI (21%). Only 19% cited time constraints to learn AI or selected other concerns. These results highlight that trust, reliability and safety are the most pressing issues for respondents, outweighing cost or time-related barriers.

Figure 10. Concerns Related to AI



Barriers to Use

At least a quarter of respondents mentioned ethical concerns (34%), a lack of skills/training (29%) and issues with accuracy/reliability (25%) as barriers to their AI use. See **Figure 11** for a list of top barriers.

Additional but smaller clusters of barriers include:

- Cost/access to tools and APIs
- Trust/verification burden (extra time to QA outputs)
- Lack of guidance/approved tools/guardrails (want an “approved tools library”)
- Leadership culture/resistance to change
- Time to learn
- Limited applicability to manual/wet-lab tasks
- Job displacement & workforce impacts

Figure 11. Barriers to AI Use, Ranked by Frequency of Mentions

Barrier Theme	#	%
Ethical Concerns (bias, fairness, copyright/IP, loss of human role, "cheating")	95	~34%
Lack of Skills / Training / How-to	80	~29%
Accuracy / Reliability Issues (hallucinations, fabrications, QC burden)	70	~25%
Workplace Restrictions / IT Policy Blocks	65	~23%
Unclear Benefits / Use Cases	55	~20%
Privacy & Security Concerns (PHI/HIPAA, data security)	50	~18%
Environmental & Sustainability Concerns	25	~9%
Job Displacement / Workforce Impacts	20	~7%
Leadership / Cultural Resistance	15	~5%
Other (cost, access to APIs, lack of guidance, time to learn)	15–20	~6–7%

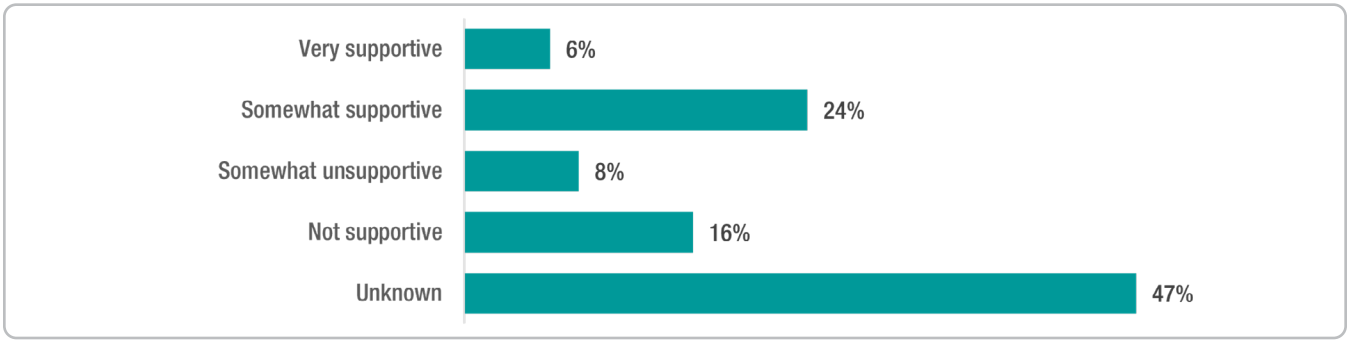
Concerns and Challenges: Key Insights for Reporting

- **Ethics and skills** dominate: Together, they account for over **60% of all mentions**.
- **Accuracy/reliability** and **restrictions** form the next tier (~25% each), showing a t**rust and policy gap**.
- **Privacy/security** is close behind, confirming the sensitivity of public health laboratory data contexts.
- **Environment and job displacement** are smaller but still visible concerns—highlight them for long-term planning.

Organizational Readiness

Nearly half of respondents (47%) reported being uncertain about their leadership's support for AI technologies, indicating a lack of clear communication or visibility on this issue. Among those with a defined perception, 24% felt leadership was somewhat supportive, while only 6% viewed them as very supportive. On the other hand, 16% believed leadership was not supportive and 8% described leadership as somewhat unsupportive. These findings suggest that, while some level of support exists, the prevailing sentiment is one of uncertainty, highlighting the need for clearer messaging and direction from leadership regarding AI adoption.

Figure 12. Perceived Leadership Support for AI Technologies

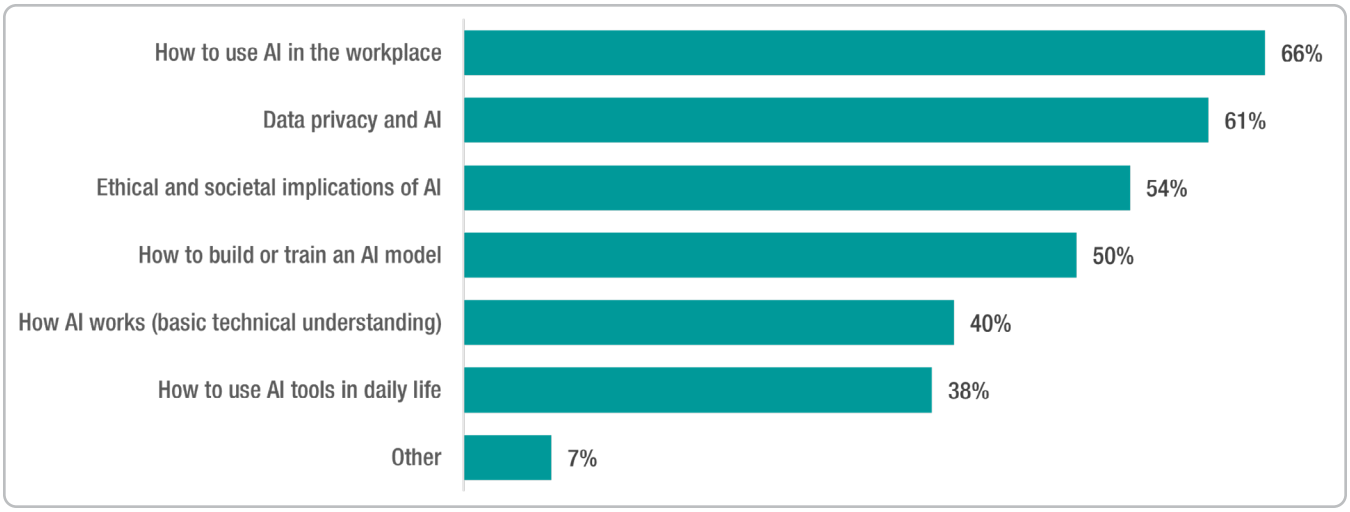


Learning Needs and Preferences

AI Learning Topics

Respondents expressed the greatest interest in learning how to use AI in the workplace (66%), followed by data privacy and AI (61%), and the ethical and societal implications of AI (54%). Interest in more technical areas included building or training an AI model (50%) and gaining a basic technical understanding of how AI works (40%). Fewer respondents prioritized learning how to use AI tools in daily life (38%) and only 7% selected other topics. These results suggest a strong focus on practical workplace applications and responsible use of AI, with secondary interest in technical skills and everyday applications.

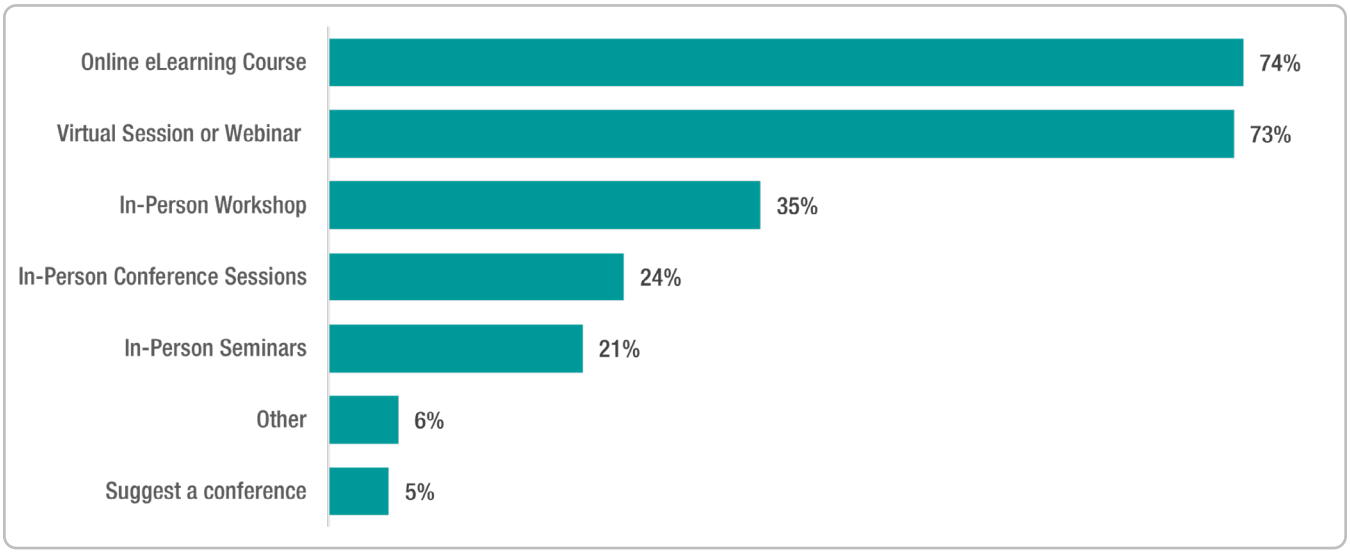
Figure 13. AI Learning Topics of Interest



Preferred Learning Formats

Respondents showed a clear preference for online learning formats, with 74% selecting online eLearning courses and another 73% preferring virtual sessions or webinars. In-person options were less favored, with 35% preferring workshops, 24% opting for conference sessions and 21% selecting seminars. Only a small share suggested other methods (6%) or (5%) recommended a specific conference. These findings suggest that flexibility and accessibility are the most highly valued features for AI training, with digital formats being strongly preferred over traditional in-person settings.

Figure 14. Preferred Format for AI Training



Closing Thoughts

Figure 15. Themes in Closing Thoughts

Theme	Mentions	%
Training, capacity and format needs Included: Desire for workshops, in-person learning, role-based resources	45	~22%
Concrete use cases and success stories Included: SOPs review, troubleshooting, data summarization	35	~17%
Governance, policies and leadership guidance Included: Approved tools, clear guardrails, direction from management	40	~20%
Privacy, PHI/HIPAA and secure enterprise options	28	~14%
Accuracy, reliability and hallucinations	32	~15%
Ethics, bias & environmental sustainability	38	~18%
Human-in-the-loop (tool, not replacement)	20	~10%
Culture, stigma and generational readiness	15	~7%
Pro-AI enthusiasm and productivity benefits	25	~12%
Anti-AI or strong opposition	22	~11%
Distinction between GenAI vs. embedded scientific AI	10	~5%
Workforce and job security concerns	18	~9%
Community of practice and resource sharing	12	~6%

Closing Thoughts: Key Takeaways

- **Training and governance** dominate (40%+ of mentions), showing that members want capacity building and clear guardrails.
- **Ethics, accuracy** and **privacy** together account for ~45%, highlighting **trust and risk management as adoption barriers**
- **Responses are polarized**: a visible minority are **enthusiastic** (12%) while a similar share is **strongly opposed** (11%)
- Some highlight **workforce/job security risks** (9%) and **environmental impacts** (18%), which should be part of long-term APHL guidance.

Cross-cutting Insights

Role × Comfort/Understanding

Across roles, most respondents reported being somewhat comfortable (39%) with using AI tools, while 20% felt comfortable and 6% very comfortable. However, discomfort remains notable, with 22% of respondents reporting discomfort and 12% describing it as very uncomfortable overall.

Fellows, interns and students reported the highest comfort, with 63% indicating they are comfortable. By contrast, clinical partners showed the greatest unease, with 100% reporting they are very uncomfortable. Information technology and bioinformatics staff were among the most confident, with 21% very comfortable and 38% somewhat comfortable, while laboratory staff displayed mixed levels of comfort; nearly half fell into the somewhat comfortable or comfortable categories, but 46% reported discomfort.

These findings indicate that AI comfort varies significantly by role, with students and IT staff showing the greatest readiness, while clinical and emergency preparedness roles remain the most hesitant.

Figure 16. Role vs Comfort

Role	Very comfortable	Comfortable	Somewhat Comfortable	Uncomfortable	Very uncomfortable
Administration, Operations and Support Services	5%	25%	35%	15%	20%
Clinical Partners	0%	0%	0%	0%	100%
Emergency Preparedness	0%	0%	33%	50%	17%
Executive Level Laboratory director, deputy director, assistant, technical director	2%	27%	53%	16%	2%
Fellows, Interns, Students	0%	63%	25%	13%	0%
Information Technology, Informatics and Bioinformatics	21%	17%	38%	10%	14%
Laboratory and Scientific Staff Includes bench scientists	7%	16%	31%	28%	18%
Laboratory Management	8%	17%	49%	18%	8%
NBS Follow-up Program Staff	33%	0%	33%	33%	0%
Other	0%	14%	50%	36%	0%
Quality, Safety, Biosafety and Biosecurity	0%	23%	40%	23%	13%
Training and Outreach	9%	36%	36%	9%	9%
Grand Total	6%	20%	39%	22%	12%

Generation × Comfort

Comfort with AI tools varied by generation. Gen Z (born 1997–2012) reported the highest confidence, with 13% feeling very comfortable and 30% feeling comfortable, while only 15% felt uncomfortable. Millennials (born 1981–1996) also leaned toward comfort, with 24% being comfortable and 8% very comfortable, although nearly one-third still expressed discomfort (32%). Gen X (1965–1980) showed the highest share of somewhat comfortable (47%), but more than a third (37%) reported discomfort. Respondents born before 1965 were less confident, with only 17% comfortable and nearly half (45%) reporting discomfort. These findings suggest younger generations, particularly Gen Z, feel more at ease with AI, while older generations show higher levels of hesitation and unease.

Figure 17. Generation vs Comfort

Birth Year	Expert-level knowledge	Strong understanding	Moderate understanding	Basic understanding	No understanding
Before 1965	0%	3%	25%	**50%**	22%
1965-1980 (Gen X)	1%	13%	26%	**54%**	**6%**
1981-1996 (Millennial)	1%	22%	**36%**	**38%**	4%
1997-2012 (Gen Z)	0%	**48%**	28%	24%	0%
Prefer not to answer	**33%**	0%	0%	67%	0%
Grand Total	**1%**	**20%**	**31%**	**43%**	**6%**

Generation × Exposure

Across generations, most respondents reported occasional use of AI tools in their personal lives (63%; **Figure 18**), with Millennials (69%) and Gen Z (70%) leading in adoption. Regular personal use was less common, with 13% overall, highest among Millennials (16%). Meanwhile, 24% of respondents said they have only heard of AI but never used it, a response most common among those born before 1965 (44%). These results suggest that while personal exposure to AI is widespread, especially among younger generations, it is largely casual rather than regular, and older generations remain more likely to have little to no direct engagement.

Workplace exposure (**Figure 19**) was much lower, with 56% of respondents reporting they never use AI tools at work. Occasional use was reported by 32%, with Gen X (34%) and Millennials (32%) showing the highest levels in this category. Regular workplace use was limited (12% overall), and very few respondents (1%) indicated that they develop or work directly with AI technologies. The generational breakdown reveals that even younger groups, such as Gen Z (67% never use) and Millennials (54% never use), face significant barriers to the workplace integration of AI, despite their higher levels of personal adoption.

While personal use of AI is common and growing across generations, particularly among Millennials and Gen Z, workplace integration remains limited. Most respondents engage with AI in their personal lives—at least occasionally—whereas more than half report no exposure at work. This gap highlights a clear trend: AI adoption is advancing more rapidly in personal contexts than in professional settings, suggesting opportunities to enhance organizational awareness, training and the application of AI tools in the workplace.

Figure 18. Generation vs Personal Life Exposure

Birth Year	I use AI tools regularly	Occasionally	I've heard of AI but never used it
Before 1965	11%	44%	44%
1965-1980 (Gen X)	10%	60%	30%
1981-1996 (Millennial)	16%	69%	16%
1997-2012 (Gen Z)	9%	70%	22%
Prefer not to answer	33%	67%	0%
Grand Total	13%	63%	24%

Figure 19. Generation vs Workplace Exposure

Birth Year	I develop or work directly with AI tools	Regular Use	Occasional Use	Never Use
Before 1965	0%	9%	31%	60%
1965-1980 (Gen X)	1%	12%	34%	53%
1981-1996 (Millennial)	1%	14%	32%	54%
1997-2012 (Gen Z)	2%	4%	26%	67%
Prefer not to answer	33%	0%	0%	67%
Grand Total	1%	12%	32%	56%

Implications

▶ Personal Adoption Outpaces Workplace Integration

While most respondents use AI tools occasionally in their personal lives, more than half reported never using AI at work. This indicates that organizations are lagging behind individual adoption trends. Without formal integration strategies, valuable opportunities to improve efficiency, innovation, and decision-making in the workplace may be missed.

▶ Generational Gaps in AI Familiarity and Comfort

Millennials and Gen Z report a stronger understanding and greater comfort with AI compared to older generations, who are more likely to remain at basic or no understanding levels. This gap suggests that targeted, generation-sensitive training will be necessary to ensure equal competency across the workforce and avoid leaving older employees behind.

▶ Need for Practical, Workplace-Focused Training

Respondents prioritized learning how to use AI in the workplace, with online and virtual training formats strongly preferred. This underscores the need for accessible, role-relevant training that translates directly into daily tasks and organizational contexts, rather than abstract or overly technical instruction. Additionally, more than 70 respondents provided their contact information to share their AI journey at the workplace, which APHL and their associated committees can utilize as a resource to develop and implement training and tools, including case studies and field practices.

▶ Trust and Confidence Barriers to Adoption

Concerns about accuracy, bias, data privacy and security risks emerged as top issues. These findings highlight that successful AI adoption will depend on assuring clear policies, ethical guidelines, and quality assurance practices.

▶ Leadership Communication is Critical

Nearly half of the respondents were unsure of their leadership's stance on AI. This uncertainty represents a major barrier to adoption, as unclear priorities can stall implementation. Organizational adoption will depend on communicating a clear vision and strategy for AI use, supported by policies and investments that demonstrate the organization's commitment.

▶ Data Analysis as a Core Skill Across Roles

With three-quarters of respondents working with data analysis on a daily or weekly basis, analytical skills are already central to many roles. This provides a strong foundation for integrating AI tools, as employees are already accustomed to working with data. However, the small share reporting no involvement in data analysis indicates that implementation strategies should consider varying levels of data literacy.

Association of Public Health Laboratories

The Association of Public Health Laboratories (APHL) works to strengthen laboratory systems serving the public's health in the US and globally. APHL's member laboratories protect the public's health by monitoring and detecting infectious and foodborne diseases, environmental contaminants, terrorist agents, genetic disorders in newborns and other health threats.

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