October 2024

2023 All-hazards Laboratory Preparedness Survey

Summary Data Report

Via its annual All-hazards Laboratory Preparedness Survey, the Association of Public Health Laboratories (APHL) surveys state and large local public health laboratories to collect information on their ability to prepare for and respond to biological, chemical, radiological and other emerging public health threats.

In the fall of 2023, APHL fielded the fifteenth annual All-Hazards Laboratory Preparedness Survey, which covered a 12-month period from July 1, 2022 to June 30, 2023, representing Fiscal Year 2022 or Budget Period 4 of the US Centers for Disease Control and Prevention (CDC) Public Health Emergency Preparedness (PHEP) Cooperative Agreement. APHL received a 98% response rate from public health laboratories in 50 states, Puerto Rico, the District of Columbia, Los Angeles County and New York City. The total of 53 respondents was used as the basis for analysis of the aggregate survey data; however, the analysis for several data points is based on a smaller sample size, as a result of specific responses to questions or because some participants only submitted partial data.

Contents

This summary data report provides aggregate responses for all survey questions included in the 2023 APHL All-Hazards Laboratory Preparedness Survey. APHL will also summarize key data points in publications which will be shared with respondents, collaborators and other public health partners as well as posted on the APHL website. The summary data report and publications serve as educational tools that can assist in educating policy makers, public health partners and the public on the importance of public health laboratories in preparedness and response.

For questions on the data or survey methodologies, please contact Lorelei Kurimski, senior director, Quality Systems and Analytics at lorelei.kurimski@aphl.org. For questions pertaining to APHL's preparedness and response activities, please contact Jill Sutton, specialist, Emergency Preparedness and Response at jill.sutton@aphl.org.

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 diverse health threats.

7700 Wisconsin Avenue, Suite 1000, Bethesda, MD 20814 | 240.485.2745 | www.aphl.org

This publication was supported by Cooperative Agreement #NU60OE000104 funded by the US Centers for Disease Control and Prevention (CDC). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of CDC or the US Department of Health and Human Services.

Acronym Glossary

APHL..... Association of Public Health Laboratories

ASM ..... American Society for Microbiology

ASPR ..... US Administration for Strategic Preparedness and Response

BT..... Bioterrorism or Biological Threat

BSO..... Biological Safety Officer

BSL..... Biological Safety Level

CAP ..... College of American Pathologists

CDC..... US Centers for Disease Control and Prevention

CLIA ..... Clinical Laboratory Improvement Amendments

COOP ..... Continuity of Operations Plan

CST..... Civil Support Team

CT..... Chemical Terrorism or Chemical Threat

DEA ..... US Drug Enforcement Administration

DHS..... US Department of Homeland Security

DoD ..... US Department of Defense

DoT..... US Department of Transportation

DSLR ..... Division of State and Local Readiness

ELC..... Epidemiology and Laboratory Capacity for Prevention and Control of Emerging Infectious Diseases

EPA ..... US Environmental Protection Agency

ERLN..... Environmental Response Laboratory Network

FBI ..... Federal Bureau of Investigation

FDA ..... US Food and Drug Administration

FEMA ..... Federal Emergency Management Agency

FERN..... Food Emergency Response Network

FSIS..... Food Safety and Inspection Service

HAN..... Health Alert Network

HAZMAT .. Hazardous Materials

HHS..... US Department of Health and Human Services

HPP..... Hospital Preparedness Program

ISO ..... International Organization for Standardization

LFFM..... Laboratory Flexible Funding Model

LIMS..... Laboratory Information Management System

LPX..... Laboratory Preparedness Exercise

LPHL ..... Local Public Health Laboratory

LRN ..... Laboratory Response Network

LRN-B..... Laboratory Response Network for Biological Threats Preparedness

LRN-C..... Laboratory Response Network for Chemical Threats Preparedness

NCEH ..... National Center for Environmental Health

NIMS..... National Incident Management System

NHSPI ..... National Health Security Preparedness Index

PCR..... Polymerase Chain Reaction

PHEP..... Public Health Emergency Preparedness

PHL ..... Public Health Laboratory

P&S..... Packaging and Shipping

RT..... Radiological Terrorism or Radiological Threat

SPHL..... State Public Health Laboratory

TFAH ..... Trust for America's Health

UASI ..... Urban Areas Security Initiative

USDA..... US Department of Agriculture

WLA ..... Water Laboratory Alliance

WSLHPT .. Wisconsin State Laboratory of Hygiene Proficiency Testing

Section 1: Demographics

Please provide the following information for your laboratory's contacts.

Individual laboratory contact information is on file with APHL.

Section 2: Funding & Workforce

1. From July 1, 2022 – June 30, 2023, did your PHL experience any funding cuts and/or level funding that impacted preparedness activities?

Funding cuts to preparedness activities?	%	#
No	68%	36
Yes	32%	17

n=53

1a. From the list below, please select the top five preparedness activities impacted by funding cuts or level funding:

Impacts of preparedness funding cuts or level funding	%	#
Increased staff turnover	70.6%	12
Unable to expand capabilities for new assays/tests/methods	52.9%	9
Unable to provide or reduced the number of training courses and outreach activities	47.1%	8
Consolidated staff positions	41.2%	7
Unable to purchase critical equipment e.g., PCR instrumentation, automated extractors, BSCs, etc.	35.3%	6
Unable to purchase and/or upgrade LIMS	17.6%	4
Unable to purchase reagents and supplies or materials	17.6%	4
Unable to renew service/maintenance contracts	23.5%	4
Lost position(s)	23.5%	3
Unable to participate in national meetings/conferences/training courses	23.5%	3
Increased sample/specimen turnaround time	17.6%	3
Reduced state courier services	11.8%	2
Unable to participate in exercises	11.8%	2
Reduced 24/7 capability	5.9%	1
Other–please specify	0%	0

n=17

2. Other than funding, what factors affected your PHL's ability to carry out preparedness activities? Please check all that apply.

Barriers to preparedness activities	%	#
Non-competitive salaries	79.2%	42
Recruitment and/or retention of qualified personnel	73.6%	39
Response activities (e.g., COVID-19, mpox, flooding, fires, etc.)	39.6%	21
Lack of training opportunities	34.0%	18

Barriers to preparedness activities	%	#
Supply chain shortages	26.4%	14
Hiring freezes	11.3%	6
Hiring caps	11.3%	6
Position(s) eliminated	5.7%	3
No difficulties experienced	1.9%	1
Other–please specify	11.3%	6

n=53. Rank of urgency for gaps were calculated using the weighted average of ranked responses.

3. Please rank the following gaps in preparedness and response for your laboratory (1 being the most urgent).

Laboratory preparedness and response gaps	Rank
Availability of qualified personnel i.e., limited recruitment pipeline	1
Funding	2
Limited number of positions i.e., personnel cap	3
Training	4
Equipment	5
Supplies	6

n=53. Other specified responses include additional laboratory space, service/maintenance agreements for new and existing instrumentation, validation of new instrumentation, streamlined procurement processes, faster implementation of modernized data exchange infrastructure and support for biosurveillance projects.

4. From July 1, 2022 – June 30, 2023, how much funding did your PHL receive? Enter "0" if none.

Funding Source	Biological Preparedness	Chemical Preparedness	Radiological Preparedness	Received at the end of FY2022
CDC: PHEP Cooperative Agreement	$57,080,355	$36,864,964	-	$11,367,257
CDC: DSLR Crisis Response Cooperative Agreement	$13,442,023	$1,200,548	-	$5,454,991
CDC: ELC Strengthening Public Health Laboratory Preparedness	$26,432,619	-	-	$3,318,461
ASPR: HPP Cooperative Agreement	$130,488	$283,000	-	-
DHS: FEMA Preparedness Grants e.g., UASI, State Homeland Security Grant	$4,408	-	-	-
DHS: BioWatch Funding	$4,440,700	-	-	$974,758
EPA: ERLN	-	-	-	-
EPA: Water Lab Alliance	-	-	-	-
FDA: LFFM e.g., FERN	$4,082,439	$3,725,396	$2,388,378	$1,420,614
State	$11,562,088	$1,705,117	$179,172	$708,955
USDA (FSIS): FERN	$924,522	$287,591	$99,459	-
Other	$2,087,132	$550,000	$607,748	$275,952

n=53. Specified responses for other funding sources are on file with APHL.

5. From July 1, 2022 – June 30, 2023, how much of the CDC PHEP Cooperative Agreement funds were allocated to the following activities? Enter "0" if none.

CDC PHEP Funded Activities	Biological Preparedness	Chemical Preparedness	Radiological Preparedness
Salaries and fringe	$34,176,204	$16,940,680	-
Equipment maintenance and service agreements	$6,497,370	$6,262,874	-
Distributed to other laboratories – please specify	$3,958,394	-	-
General overhead	$3,706,953	$3,474,876	-
Supplies	$2,875,195	$4,313,080	-
Equipment purchases	$1,208,330	$3,900,934	-
Unobligated/Unspent	$884,442	$561,360	-
Training and travel	$566,532	$330,717	-
Renovations	-	-	-
Other	$3,206,935	$1,080,442	-

n=53. Specified responses for funding distributed to other laboratories and other funded activities are on file with APHL.

6. From January 2020 – June 2023, how much funding did your laboratory receive for COVID-19 pandemic response?

COVID-19 funding	Amount
Received	$4,316,240,262
Spent	$2,371,150,020
Obligated	$594,027,881
Unspent	$1,351,062,361

n=53

7. How have your PHL's COVID-19 funds been used to strengthen laboratory preparedness? Select all that apply.

Use of COVID-19 funds	%	#
Procurement of additional testing equipment, reagents and/or PPE	100.0%	53
Procurement of maintenance contracts and/or service contracts	92.5%	49
Enhancements to informatics/LIMS capabilities	92.5%	49
Implementation of new diagnostic methods	83.0%	44
Hired temporary staff	81.1%	43
Renovated laboratory facilities	60.4%	32
Hired permanent staff	60.4%	32
Conducted additional outreach or training to clinical laboratories and other partners	47.2%	25
Constructed new laboratory	18.9%	10
Other–please specify	5.7%	3

n=53. Other specified responses include contracts with academic medical centers for surge testing, a state courier system and implementation of a laboratory inventory system. Individual responses are on file with APHL.

8. In addition to your BT Coordinator, CT Coordinator and BSO who may have outreach duties, do you have a position dedicated to outreach to clinical laboratories?

Position dedicated for clinical lab outreach	%	#
Yes	52.8%	28
No	47.2%	25

n=53

9. Do you have a Laboratory Advisory Council or similar group where members of the clinical laboratory community are involved in communicating with or advising the PHL?

Laboratory advisory group	%	#
Yes	35.8%	19
No	34.0%	18
Planning in future	30.2%	16

n=53

9a. How often are meetings held?

	%	#
Quarterly	33.3%	6
Semi-annually	27.8%	5
Monthly	16.7%	3
Annually	11.1%	2
Biweekly	5.6%	1
Other–Please specify	5.6%	1

n=18. One laboratory indicated meetings are held on an as needed basis.

10. What resources or tools are needed to support your laboratory with outreach to clinical laboratories? Check all that apply.

Clinical laboratory outreach needs	%	#
Dedicated staff	26.9%	42
Funding	25.6%	40
Training resources e.g., facilitator guides, guidance for in-person vs. virtual training, etc.	25.0%	39
Guidance materials e.g., SOPs	20.5%	32
Other–please specify	1.9%	3

n=53. Other specified responses include resources to promote value of outreach activities and encourage clinical laboratory participation, opportunities to learn how other PHLs are conducting outreach activities and support for travel. Individual responses are on file with APHL.

11. Does your PHL have a sufficient number of staff to sustain routine testing services during a sudden surge of samples?

Sufficient staff to sustain routine testing during surge?	%	#
Yes	62.3%	33
No	37.7%	20

n=53

12. What percentage of staff are cross-trained at your PHL?

The survey revealed that on average, 52% of PHL staff are cross-trained and have the skills and training to perform multiple roles or tasks within the PHL.

Percentage of cross-trained staff	%	#
0–25%	35.8%	19
26–50%	13.2%	7
51–75%	26.4%	14
76–100%	24.5%	13

n=53

Section 3: Planning & Response

13. (NHSPI & TFAH) Does your PHL have a plan to handle a significant surge in testing over a six- to eight-week period in response to an outbreak or other public health event?

Surge testing plan in place?	%	#
Yes	92.5%	49
No	7.5%	4

n=53

13a. If no, what is your PHL's timeline for developing one?

Timeline for development of surge testing plan	%	#
< 6 months	0%	0
6-12 months	0%	0
> 1 year	100%	4

n=4

14. Identify the elements included in your surge capacity plan. Select all that apply.

Surge capacity plan elements	%	#
Procedures for sample triage and prioritization of testing e.g., criteria for acceptable specimen types, risk or threat assessments, guidance for packaging and shipping, etc.	85.7%	42
Procedures for referral to external laboratories–specify the types of laboratories e.g., LRN-B National, LRN-B Reference, LRN-B Sentinel, LRN-C Level 1, LRN-C Level 2, LRN-C Level 3, other private clinical, commercial, academic, etc.	71.4%	35
Procedures to secure, deploy and train additional personnel for short-term (days) and long-term (weeks to months) response efforts	69.4%	34
Updating of contact information lists for all laboratory partners e.g., sentinel clinical laboratories, epidemiology, CDC, APHL, relevant commercial laboratories, etc.	65.3%	32
Procedures to secure and deploy additional equipment and/or supplies for short-term (days) and long-term (weeks to months) response efforts	63.3%	31
Procedures for performing risk assessment(s) on assays and following standard BSL protocols	63.3%	31
Designation of information technology (IT) personnel to provide LIMS support and assist with any IT related issues during a surge event	55.1%	27
Requirements for data management and results reporting	53.1%	26
Procedures to secure and deploy facility resources for short-term (days) and long-term (weeks to months) response efforts e.g., repurposing of or securing additional laboratory space for surge testing	53.1%	26
Procedures for development of a quality assurance (QA) plan to meet new/updated requirements for testing and reporting	44.9%	22
An incident response manual that includes resources for vaccinations (if available) and prophylaxis treatments	36.7%	18
Other–please specify	11.3%	6

n=49. Other specified responses include employee call down, information related to the state's response plan, lists of partner agencies, criteria for standing up surge and demobilization, staff ICS roles and procedures for transport staff and samples to/from the lab in hazardous weather. Individual responses are on file with APHL.

15. Between July 1, 2022 – June 30, 2023, did your PHL test your surge plan via a real-life event or exercise?

Surge plan tested?	%	#
Yes	59.2%	29
No	40.8%	20

n=49

15a. What elements of your PHL's surge plan were exercised and how?

Individual responses are on file with APHL.

16. Does your laboratory have a formal agreement (e.g., contract, memorandum of agreement) in place with other laboratories to handle surge capacity? Check all that apply.

Formal agreement with another laboratory	%	#
Yes, agreement with other public health laboratory(ies) outside of the state	33.3%	33
Yes, agreement with commercial laboratory(ies) for biological agents	12.1%	12
Yes, agreement with commercial laboratory(ies) for other agents	8.1%	8
Yes, agreement with other state laboratory within state e.g., agricultural lab	8.1%	8
Yes, agreement with local public health laboratory(ies) within the state	6.1%	6
Yes, agreement with other state public health laboratory within the state	6.1%	6
Yes, agreement with clinical laboratory(ies) within the state	6.1%	6
Other–please specify	11.1%	11
No	9.1%	9

n=53. Other specified responses include agreements with private laboratories, academic medical center laboratories, university laboratories and CDC as well as informal agreements with other public health laboratories within the US Regional Consortia and LRN. Individual responses are on file with APHL.

16.a What are the barriers to entering into formal agreements with other entities? Check all that apply.

Barriers to entering formal agreements	%	#
Legal requirements	25.9%	7
Reimbursement mechanisms	22.2%	6
Contracting requirements and procedures	18.5%	5
Compatibility of laboratory infrastructure for results reporting	14.8%	4
Licensure requirements	7.4%	2
Funding	3.7%	1
No barriers identified	3.7%	1
Other–please specify	3.7%	1

n=9. One laboratory specified lack of responsiveness from an entity in another state as a barrier to entering formal agreements.

17. (NHSPI) Does your PHL have a Continuity of Operations Plan (COOP) consistent with National Incident Management System (NIMS) guidelines?

PHL COOP in place?	%	#
Yes, a laboratory specific COOP	47.2%	25
Yes, a state agency or department-wide COOP that includes the laboratory	45.3%	24
No, but the laboratory or state is developing a COOP	5.7%	3
No	1.9%	1

n=53

17a. Does your laboratory review and update COOP?

COOP review and updates?	%	#
Yes, annually	63.3%	31
Yes, biennially	10.0%	5
Yes, semi-annually	6.1%	3
No	6.1%	3
Other–please specify	14.3%	7

n=49. Other specified responses include COOP review and updates on a quarterly basis, as needed and upon completion of an after action report following an event. Individual responses are on file with APHL.

17b. If your PHL shuts down and only a portion of staff were available to work, in terms of COOP, which test(s) are critical for your laboratory? Check all that apply.

Laboratory-critical tests	%	#
LRN Biological Testing	21.9%	46
Infectious diseases–please specify e.g., reference and specialized testing	20.5%	43
LRN Chemical Testing	16.7%	35
Newborn screening	13.8%	29
Environmental health e.g., water testing, lead testing	12.4%	26
Food safety	11.0%	23
Other–Please specify:	3.8%	8
No critical tests identified	0%	0

n=49. Other specified responses include testing for BioWatch, blood alcohol testing, urine drug testing and testing to support outbreak investigations. Individual responses are on file with APHL

17c. From July 1, 2022 – June 30, 2023, did your PHL evaluate the functionality of your COOP via a real event or an exercise?

COOP evaluated?	%	#
Yes	54.2%	26
No	45.8%	23

n=49

17d. From July 1, 2022 – June 30, 2023, did you activate your laboratory COOP?

COOP activated?	%	#
No	64.6%	31
Yes–please provide any additional information on the steps and outcomes below.	35.4%	17

n=53. Individual responses are on file with APHL.

18. (TFAH) Has your PHL implemented a Laboratory Information Management System (LIMS) to receive and report laboratory information electronically?

LIMS implementation status and functionality	%	#
Yes, bidirectional capability to receive and report	81.1%	43
Report only	18.9%	10
Receive only	0%	0
No electronic messaging capability at this time	0%	0

n=53

18a. Do you have dedicated IT support for your LIMS?

Dedicated IT support for LIMS	%	#
Yes, the laboratory has personnel dedicated to LIMS	67.9%	36
No, the laboratory receives IT personnel support from the state/local government for LIMS	5.8%	3
No, the laboratory relies on external contractors e.g., LIMS vendor	5.8%	3
Other–please specify	21.2%	11
No	0%	0

n=53. Other specified responses include a combination of IT support from external contractors and state/local government. Individual responses are on file with APHL.

19. (NHSPI) Please indicate the number of preparedness exercises your PHL conducted or participated in from July 1, 2022 – June 30, 2023.

Preparedness exercises	Tabletop Exercises	Drills	Functional Exercises	Full-scale Exercises
Biological Threats (BT)	30	46	9	51
Chemical Threats (CT)	22	9	15	50
Radiological Threats (RT)	1	5	5	6
Multi-Hazards e.g., any combo of BT, CT and RT	5	5	2	8
Pandemic Influenza	1	0	0	3
COOP	10	4	2	2
Other	6	20	0	2
Total	**75**	**89**	**33**	**122**

n=53

20. From July 1, 2022 – June 30, 2023, please enter the total number of samples and specimens you accepted and tested in your preparedness and response system (e.g., using LRN methods).

Sample/Specimen type	Total Accepted	BT Agents Tested	CT Agents Tested	RT Agents Tested
Clinical	21,583	21,444	2,077	-
Environmental e.g., food, water, unknown substance	739	692	209	375
BioWatch	132,493	199,182	-	-
Total	**154,815**	**221,318**	**2,286**	**375**

n=53.

21. (NHSPI) Does your PHL assure the timely transportation (pick-up and delivery) of specimens/samples 24/7/365 days to the appropriate public health LRN Reference Laboratory?

Timely sample/specimen transport to LRN Reference Laboratory?	%	#
Yes	96.2%	51
No	3.8%	2

n=53

22. (NHSPI) Does your PHL have a plan to receive samples from a sentinel laboratory during non-business hours?

Timely sample/specimen transport to LRN Reference Laboratory?	%	#
Yes	98.1%	52
No	1.9%	1

n=53

23. Does your PHL provide field screening collection kits to first responders?

Timely sample/specimen transport to LRN Reference Laboratory?	%	#
No	67.8%	36
Yes–please describe what each kit includes	32.1%	17

n=53. Descriptions of materials included in field screening collection kits on file with APHL.

Section 4: Safety

24. Does your laboratory have a biosafety officer?

Biosafety officer	%	#
Yes, full-time staff designated to biosafety	67.9%	36
Yes, part-time staff	28.3%	15
No–please explain why there is no staff	3.8%	2

n=53. Two laboratories indicated not having a BSO due to the position being vacant.

25. What types of laboratory safety trainings are currently needed for your staff?

n=53. Specified responses include trainings needed for laboratory security, conducting risk assessments, packaging and shipping of infectious substances, BSL-2 and BSL-3 standard and special practices, biological and chemical spill response and prevention, PPE donning and doffing, waste management and HAZWOPER, decontamination, chemical hygiene, radiation safety, biological safety cabinets, chemical fume hoods, gas cylinders, glove boxes, respirators, autoclaves, handling compressed gas, fire extinguishers, first aid CPR and AED, Narcan training, bloodborne pathogens and agent-specific training, emergency management and incident response, decontamination, select agent regulations, quality improvement, development of new safety protocols, and safety and security training for moving laboratory facilities. Individual responses are on file with APHL.

Section 5: Biological Threats

26. Does your PHL maintain a database of active sentinel clinical laboratories with the required elements (e.g., CLIA number, address, primary contact, 24/7 emergency contact) listed in the current Sentinel Clinical Laboratories Definition?

Database of active sentinel clinical laboratories	%	#
Yes, for the entire state	96.2%	51
Yes, for my jurisdiction only (may not be the entire state)	3.8%	2
No	0%	0

n=53

26a. How many active sentinel clinical laboratories are in your database?

	Minimum Reported	Maximum Reported	Average Reported	Total Reported
Number of active sentinel clinical laboratories in PHL databases	3	571	65.7	3,481

n=53

26b. Does your PHL utilize a commercial software to manage your database of sentinel clinical laboratories?

Commercial software manages database of sentinel clinical laboratories?	%	#
No	60.4%	32
Yes, please specify	39.6%	21

n=53. Specified responses for commercial software utilized are on file with APHL.

27. How does your PHL identify sentinel clinical laboratories?

Definition of sentinel clinical laboratories	%	#
Use Sentinel Clinical Laboratories Definition	86.8%	46
Use other definition – please specify	13.0%	7
We do not identify sentinel clinical laboratories	0%	0

n=53. Other specified responses include jurisdictions that have their own definition. Individual responses are on file with APHL.

28. From July 1, 2022 – June 30, 2023, did your PHL award a certificate of recognition to sentinel clinical laboratories in your state? Check all that apply.

Recognition given to sentinel clinical laboratory	%	#
No	88.9%	48
Yes, awarded the LRN Joint Leadership Committee approved certificate	5.6%	3
Yes, awarded a state developed certificate	5.6%	3

n=53. One laboratory uses both types of certificates for recognition.

28a. How many sentinel clinical laboratories received a certificate? Enter "0" if none.

Five PHLs responded, indicating 84 total sentinel clinical laboratories received certificates.

29. Which of the following do you use to assess the competency of sentinel clinical laboratories to rule-out and refer BT agents? Check all that apply.

Competency assessment of sentinel clinical laboratories	%	#
College of American Pathologists (CAP) Laboratory Preparedness Exercise (LPX)	88.7%	47
State-developed	11.3%	6
Wisconsin State Laboratory of Hygiene Proficiency Testing (WSLHPT)/Challenge Set for Sentinel Laboratories	7.5%	4
Other–please specify	7.5%	4
None of the above	3%	2

n=53. Other specified responses include CDC, Gram stain challenge sets, communications drills and compliance with the ASM Rule-Out and Refer procedures.

29a. Do these competency assessments impact the renewal status of sentinel clinical laboratories?

Competency assessments impact renewal status of sentinel clinical laboratories?	%	#
No	86.3%	44
Yes	13.7%	7

n=51

29b. How do you utilize the CAP LPX in your state?

Utilization of CAP LPX	%	#
Track which sentinel clinical laboratories contact the LRN Reference PHL	32%	48
Provide training and outreach to the sentinel clinical laboratories that do not provide the intended responses for the LPX organisms	28%	42
Test competency of LRN-B staff at your state PHL e.g., your PHL actively participates in the testing of the LPX organisms	25%	37
Test the ability of sentinel clinical laboratories to package and ship specimens to the LRN Reference PHL	13%	19
Other–please specify	2.0%	1
Do not utilize CAP LPX	0%	0

n=51. One laboratory uses CAP LPX as an opportunity to update their contact list.

29c. Which of the following resources do you utilize for training sentinel clinical laboratories? Check all that apply.

Resources utilized for training sentinel clinical laboratories	%	#
APHL Biothreat Identification Bench Cards and Poster	84.3%	43
Sentinel Level Clinical Laboratory Guidelines for Suspected Agents of Bioterrorism and Emerging Infectious Diseases	68.6%	35
Clinical Laboratory Preparedness and Response Guide	51.0%	26
PHL Specific Training Resources	35.3%	18
Other–please specify	11.8%	6

n=51. Other specified responses included packaging and shipping resources and training modules from APHL, CDC and Saf-T-Pak, transportation resources from the International Air Transport Association (IATA) and Title 49 of the Code of Federal Regulations (eCFR.org), laboratory safety resources from ABSA International, the Biosafety in Microbiological and Biomedical Laboratories (BMBL), the CDC Morbidity and Mortality Weekly Report (MMWR) and resources from the Federal Select Agent Program (FSAP). Individual Responses are on file with APHL.

30. From July 1, 2021 – to June 30, 2022, did your PHL conduct an exercise or utilize a real event to evaluate the time for sentinel clinical laboratories to acknowledge receipt of an urgent message from your laboratory?

Evaluation of sentinel clinical laboratory response time	%	#
Yes	83.0%	44
No	17.0%	9

n=53

31. (NHSPI) For which of the following have you utilized a rapid method of communication (HAN, blast email, or fax) for your sentinel clinical laboratories and other partners? Check all that apply.

Rapid communication event	%	#
Routine updates	84.9%	45
Outbreaks	81.1%	43
Training events, such as providing a training calendar	66.0%	35
Other–Please specify	24.5%	13
Have not used it	1.9%	1

n=53. Other specified responses include communication drills and exercises, CAP LPX updates and results, laboratory moves or relocations, severe weather events, courier issues, changes to testing services, survey and newsletter distribution, disseminating pertinent information for ongoing outbreaks such as guidance for specimen collection and submission as well as packaging and shipping, CDC HAN and LOCS updates and updates from other partners such as FDA, ASM and ASCP. Individual responses are on file with APHL.

32. From July 1, 2022 – June 30, 2023, did your PHL sponsor any sentinel clinical laboratory trainings for BT threat agents?

Lab-sponsored BT sentinel clinical laboratory trainings	%	#
Yes	67.9%	36
No	32.1%	17

n=53

32a. For each category below, Indicate how many trainings were provided, the total number of sentinel clinical laboratory facilities within your jurisdiction that received training and the total number of laboratorians that participated.

Trainings	Rule-out Testing Only	Packaging & Shipping Only	Any Combo of Categories	Biosafety	Other	Total
Number of training classes	31	452	33	23	25	**564**
Number of sentinel clinical laboratory facilities within your jurisdiction that received training	98	617	197	82	5	**4054**
Number of laboratorians that participated in trainings	362	2,602	551	235	304	**999**

n=36

32b. For each training category, specify the format(s) used and provide a short description of the content covered.

Training Format	Rule-out Testing Only	Packaging & Shipping Only	Any Combo of Categories	Biosafety	Other	Total
Online	6	24	5	3	2	**40**
Telephone	2	1	1	0	1	**5**
In-person	10	17	6	12	5	**50**

n=36. Individual responses about training content are on file with APHL.

33. From July 1, 2022 – June 30, 2023, approximately how many sentinel clinical laboratories did your staff visit?

Visit type	# Sites Visited	# of Visits
Physical (On-site)	30	208
Virtual (Phone and/or Video)	25	313

n=36

34. Did your laboratory experience any of the following barriers to providing training to sentinel clinical laboratories? Check all that apply.

Training barriers	%	#
Lack of available staff at the sentinel clinical laboratories	54.7%	31
Lack of training staff at the public health laboratory	58.5%	29
Response to threats (e.g., COVID-19, mpox, etc.)	52.8%	28
Issues with coordination or access to sentinel clinical laboratories	47.2%	25
Travel restrictions	9.4%	8
Information technology compatibility issues e.g., different platforms for web based training	15.1%	8
No funding	14.8%	8
Other–please specify	20.4%	11
No barriers	3.7%	2

n=53. Other specified responses include lack of interest from sentinel clinical laboratories and lack of physical training space. Individual responses are on file with APHL.

35. Please share any major successes and challenges your laboratory encountered regarding biological threats preparedness (e.g., response to an event, development of new tests, etc.) during the time period of July 1, 2022 to June 30, 2023.

Individual responses are on file with APHL.

Section 6: Chemical Threats

36. From July 1, 2022 – June 30, 2023, did your LRN-C capability (testing capabilities to specific test agents or analytes) increase, decrease, or was it maintained?

LRN-C capability	%	#
Maintained	73.6%	39
Increased	18.9%	10
Decreased	7.5%	4

n=53

36a. How did your capability increase? Check all that apply.

Increased LRN-C capabilities	%	#
Added CT personnel	50.0%	6
Added CT equipment	25.0%	3
Added two LRN-C methods	16.7%	2
Added one LRN-C method	8.3%	1
Added more than two LRN-C methods	0%	0
Increased CT level	0%	0
Other–Please Specify	0%	0

n=10

36b. How did your capability decrease? Please check all that apply.

Decreased LRN-C capabilities	%	#
Decrease in CT personnel	40.0%	2
Decrease in CT equipment	20.0%	1
Unable to maintain service agreement(s) on current equipment	20.0%	1
Unable to purchase new equipment required to add methods	0%	0
Dropped a CT Level	0%	0
Reduced support from the broader system	0%	0
Lack of connection to those responding i.e., first responders, communities, epidemiologists, etc.	0%	0
Other–Please specify:	20.0%	1

n=4. Other specified responses include redistribution of LRN-C staff to conduct driving under the influence of drugs testing.

37. From July 1, 2022 – June 30, 2023, did your PHL utilize your CT capabilities to respond to any of the following? Please check all that apply.

CT capabilities utilized	%	#
Chemical threat – non-clinical sample	15.9%	13
Biosurveillance e.g., drugs of misuse such as Opioids	13.4%	11
Biomonitoring investigations	9.8%	8
Community concern – non-clinical sample e.g., exposure to a potentially toxic chemical	8.5%	7
Community concern – clinical specimen e.g., exposure to a potentially toxic chemical	6.1%	5
Chemical threat – clinical specimen	6.1%	5
Chemical spill or other emergency incident – non-clinical sample	3.7%	3
Chemical spill or other emergency incident – clinical specimen	2.4%	2
Other–please specify	7.4%	6
None	25.6%	21

n=53. Other specified responses include poison control testing for toxic alcohol ingestions, urine drug testing, testing for food adulteration and unknown substances, state lead exposure programs, opioid epidemic response efforts and to perform proficiency testing. Individual responses are on file with APHL.

37a. Which LRN-C resources are you utilizing for your laboratory's biomonitoring efforts? Check all that apply.

LRN-C resources utilized for biomonitoring	%	#
Personnel	100.0%	8
Instruments/equipment	87.5%	7
Technical training	75.0%	6
Relationships with clinical community, other relationships	50.0%	4

n=8

37b. What other funding sources are you utilizing for biomonitoring? Check all that apply.

Biomonitoring funding sources	%	#
Other federal–please explain	50.0%	4
State–please explain	50.0%	4
Other–please explain	50.0%	4

n=8. Specified responses for other sources of federal funding include the CDC Biomonitoring grant, the CDC Overdose Data to Action (OD2A) grant, the CDC PHEP grant, the CDC National Center for Environmental Health/Agency for Toxic Substances and Disease Registry (NCEH/ATSDR) program, the US Department of Transportation (DOT) and the National Institute of Environmental Health Sciences (NIEHS) Human Health Exposure Analysis Resource (HHEAR) grant. Specified responses for other non-federal funding sources include insurance reimbursement, a small privately funded grant and a contract with academic institutions for analysis of biosurveillance research samples. Individual responses are on file with APHL.

38. (NHSPI) Please provide the certification/accreditation status of your LRN-C laboratory. Check all that apply.

Certification or Accreditation	Currently certified/ accredited		Planning for certification/ accreditation next year		Neither	
	%	#	%	#	%	#
CLIA (toxicology subspeciality)	69.8%	37	9.4%	5	26.4%	14
CAP	15.1%	8	0%	0	84.9%	45
ISO	13.2%	7	3.8	2	83.0%	44
Other–please specify	9.4%	5	0%	0	91.7%	48

n=53. Other specified responses include certification/accreditation with the EPA, FDA, DEA, DEP, the NELAC Institute (TNI) and state-based certification/accreditation programs. Three PHLs indicated currently having CLIA (toxicology subspecialty) certification/accreditation and are also planning for certification/accreditation next year. Individual responses are on file with APHL.

39. What is the source of funding for service contracts for LRN-C instruments? Check all that apply.

Funding sources for LRN-C instrument service contracts	%	#
CDC PHEP cooperative agreement	84.9%	45
State funding	26.4%	14
Local funding	0%	0
Other federal funding–please specify	5.7%	3
Other–please specify	11.3%	6

n=53. Specified responses for other sources of federal funding include the CDC Overdose Data to Action (OD2A) grant, the FDA Laboratory Flexible Funding Model (LFFM) cooperative agreement and the DOT for opioid response. Other specified responses include no funding for instrumentation due to designation as LRN-C Level 3 laboratory. Individual responses are on file with APHL.

40. Does your laboratory have any unmet funding needs for response chemical threats?

Funding needed for response chemical threats	%	#
Yes–please specify	51%	27
No	49%	26

n=53. Specified responses for unmet funding needs for response to chemical threats include replacement of aging and obsolete instrumentation, increase staff capacity, competitive salaries for existing staff, multi-year service agreements and maintenance contracts for new and existing instrumentation and equipment, training staff and conducting drills and exercises for chemical threats, training for method development and staff travel. Individual responses are on file with APHL.

41. Please share any major successes and challenges your laboratory encountered regarding chemical threats preparedness (e.g., response to an event, development of new tests, etc.) during the time period of July 1, 2022 – June 30, 2023.

Individual responses are on file with APHL.

Section 7: Radiological Threats

42. Does your laboratory have responsibility for radiological surveillance and response (e.g., testing environmental, food or clinical samples)?

Responsible for radiological preparedness?	%	#
No–please specify which agency within your jurisdiction has this responsibility.	58.5%	31
Yes–please describe	41.5%	22

n=53. Specified agencies responsible for radiological surveillance and response are on file with APHL.

43. Is your laboratory interested in developing the capability to measure human radiation contamination and become CLIA compliant for radiobioassay in clinical samples?

Interested in developing human radiation test capability?	%	#
No–please specify why not	60.4%	32
Yes	37.7%	20
Already have capability	1.9%	1

n=53. Specified responses include lack of staff and expertise, lack of equipment and building infrastructure, and limited space and funding. Individual responses are on file with APHL.

44. Please provide the current number of college/university or in-house-trained scientists that perform nuclear chemistry and/or radiochemistry measurements in your laboratory as well as the number of additional trained scientists that are needed to meet your laboratory's surveillance and emergency response needs. If no staff, enter "0".

Scientists performing nuclear chemistry and/or radiochemistry procedures	Current number of scientists		Number of additional scientists needed	
	%	#	%	#
0	49.1%	26	62.3%	33
1	1.9%	1	13.2%	7
2	17.0%	9	13.2%	7
3	7.3%	4	5.7%	3
4	11.3%	6	3.8%	2
5	3.8%	2	0%	0
6	1.9%	1	0%	0
7	0%	0	0%	0
8	0%	0	0%	0
9	1.9%	1	0%	0
10	1.9%	1	0%	0
Other–please specify	3.8%	2	1.9%	1

n=53. One laboratory indicated the need for 20 additional scientists and two laboratories indicated having more than 10 current scientists – one indicated 11 and the other indicated 12.

44a. If your laboratory needs additional scientists that perform nuclear chemistry and/or radiochemistry measurements in your laboratory, are your program partners aware of capacity gap?

Awareness of nuclear chemistry and/or radiochemistry capacity gaps	%	#
Yes	49.1%	26
No	17.0%	9
No gap in capacity	34.0%	18

n=53

44b. In how many years are your currently staffed scientists expected to retire?

Number of Staff Retiring Within...	0-2 years		3-5 years		6-10 years		11+ years	
	%	#	%	#	%	#	%	#
0	75.5%	40	83.0%	44	83.0%	44	54.7%	29
1	20.8%	11	11.3%	6	11.3%	6	9.4%	5
2	3.8%	2	3.8%	2	3.8%	2	13.2%	7
3	0%	0	1.9%	1	1.9%	1	5.7%	3
4	0%	0	0%	0	0%	0	9.4%	5
5	0%	0	0%	0	0%	0	1.9%	1
6	0%	0	0%	0	0%	0	3.8%	2
7	0%	0	0%	0	0%	0	1.9%	1

n=53

45. Even if your laboratory currently has no scientists dedicated to nuclear chemistry and/or radiochemistry, what are your training needs to meet your laboratory's surveillance and emergency response needs?

Training needs for radiological threats	%	#
Analysis	58.5%	31
Emergency Response Outreach (specimen collection, packaging and shipping, etc)	52.8%	28
Mentoring	50.9%	27
Safety and Regulatory Requirements	49.1%	26
Waste Management	39.6%	21
Results Reporting	32.1%	17
Other–please specify	20.8%	11

n=53. Other specified responses include instrumentation and equipment training, method development, and training for all of the above to bring on the processes in labs without responsibility. Individual responses are on file with APHL.

46. Please share any major successes and challenges your laboratory encountered regarding radiological threats preparedness (e.g., response to an event, development of new tests, etc.) during the time period of July 1, 2022 – June 30, 2023.

Individual responses are on file with APHL.