

2022 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 2022, APHL fielded the fourteenth annual All-hazards Laboratory Preparedness Survey, which covered a 12-month period from July 1, 2021 to June 30, 2022, representing Fiscal Year 2021 or Budget Period 3 of the US Centers for Disease Control and Prevention (CDC) Public Health Emergency Preparedness (PHEP) Cooperative Agreement. APHL received a 100% 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 54 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.

This summary data report provides aggregate responses for all survey questions included in the 2022 APHL All-hazards Laboratory Preparedness Survey. APHL will also summarize key data points in an issue brief that will be shared with respondents, collaborators and other public health partners. The summary data report, issue brief and other APHL resources 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, director, Institutional Research at 240.485.2703 or lorelei.kurimski@aphl.org. For questions pertaining to APHL's preparedness and response activities, please contact Jill Sutton, specialist, Emergency Preparedness and Response at 240.485.2742 or jill.sutton@aphl.org.

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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.

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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

DSLRL 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

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 Threat Preparedness

LRN-C..... Laboratory Response Network for Chemical Threat 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, 2021 – June 30, 2022, did your PHL experience any funding cuts to preparedness activities?

Funding cuts to preparedness activities?	%	#
Yes	24%	13
No	76%	41

n=54

- 1a. Please choose the top five impacts of any preparedness funding cuts your PHL experienced from July 1, 2021 – June 30, 2022.

Impacts of preparedness funding cuts	%	#
Increased staff turnover	76.9%	10
Unable to provide or reduced the number of training courses and outreach activities	46.2%	6
Unable to purchase critical equipment (e.g., PCR instrumentation, automated extractors, biosafety cabinets, etc.)	38.5%	5
Unable to purchase reagents and supplies or materials	38.5%	5
Unable to renew service/maintenance contracts	30.8%	4
Unable to expand capabilities for new assays/tests/methods	23.1%	3
Unable to participate in national meetings/conferences/training courses	23.1%	3
Lost position(s)	15.4%	2
Consolidated staff positions	15.4%	2
Increased sample/specimen turnaround time	15.4%	2
Unable to participate in exercises	15.4%	2
Other—please specify	7.7%	1

n=13. Other specified responses on file with APHL.

2. What factors affected your PHL's ability to carry out preparedness activities from July 1, 2021 – June 30, 2022? Please check all that apply.

Barriers to preparedness activities	%	#
COVID-19 Pandemic	72.2%	39
Non-competitive salaries	64.8%	35
Supply shortages	38.9%	21
Insufficient funding	16.7%	9
Hiring freezes	9.3%	5
No difficulties experienced	5.6%	3
Furloughs	1.9%	1

Barriers to preparedness activities	%	#
Position(s) eliminated	1.9%	1
Lay-offs	0%	0
Other—please specify	48.1%	26

n=54. Other specified responses include prioritization of mpox response activities, facility issues, procurement challenges, travel restrictions, lack of training opportunities and staffing shortages due to difficulty with recruitment and retention of qualified personnel.

2a. What are your laboratory's preparedness and response needs? Please check all that apply.

Preparedness and response needs	%	#
Personnel	81.5%	44
Training	64.8%	35
Funding	48.1%	26
Equipment/Supplies	46.3%	25
Other—please specify	25.9%	14
None	0.0%	0

n=54. 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.

3. From July 1, 2021 – June 30, 2022, how much preparedness funding did your PHL receive? Please enter "0" if none.

Funding Source	Biological Preparedness	Chemical Preparedness	Radiological Preparedness
CDC: PHEP Cooperative Agreement	\$51,841,446	\$30,873,469	\$275,063
CDC: DSLR Crisis Response Notice of Funding Opportunity	\$24,222,229	-	-
CDC: ELC Strengthening Public Health Laboratory Preparedness	\$84,771,705	-	-
ASPR: HPP Cooperative Agreement	\$207,289	-	-
DHS/FEMA Preparedness Grants (e.g., UASI, State Homeland Security Grant)	-	-	\$148,500
DHS/BioWatch Funding	\$4,458,169	-	-
EPA: ERLN	-	-	-
EPA: Water Lab Alliance	-	-	-
FDA: FERN	\$2,010,695	\$2,181,215	\$1,398,543
USDA (FSIS): FERN	\$591,105	\$365,617	\$155,430
State	\$9,911,455	\$1,004,522	\$27,217
Other	\$10,224,704	\$223,437	\$1,051,792

n=54. Individual responses for other sources of funding are on file with APHL.

4. From July 1, 2021 – June 30, 2022, how much of the CDC PHEP Cooperative Agreement funds were allocated to the following activities?

CDC PHEP Funded Activities	Biological Preparedness	Chemical Preparedness	Radiological Preparedness
Distributed to other laboratories – please specify	\$2,463,336	\$183,819	-
Salaries and fringe	\$28,375,400	\$14,824,729	-
Equipment purchases	\$1,166,570	\$2,119,755	\$5,374
Equipment maintenance	\$5,517,008	\$5,941,023	-
Supplies	\$3,112,035	\$3,433,712	\$3,290
Training and travel	\$621,589	\$294,556	-
General overhead	\$3,236,798	\$3,115,262	\$329
Renovations	\$1,000	-	-
Unobligated/Unspent	\$2,722,127	\$312,609	-
Other	\$4,625,583	\$648,003	\$266,070

n=54. Specified responses for funding distributed to other laboratories and other funded activities are on file with APHL.

- 4a. Do you have any recommendations for improving the CDC PHEP Cooperative Agreement?

Individual responses are on file with APHL.

5. 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	42.6%	23
No	57.4%	31

n=54

6. 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	37.0%	20
No	38.9%	21
Planning in future	24.1%	13

n=54

- 6a. How often are meetings held?

	%	#
Semi-annually	25.0%	5
Quarterly	25.0%	5
Monthly	15.0%	3
Annually	5.0%	1
Other—please specify	30.0%	6

n=20. Other specified responses include meeting as needed or on a bi-weekly basis. Individual responses are on file with APHL.

7. What resources or tools are needed to support your laboratory with outreach to clinical laboratories? Please check all that apply.

Clinical laboratory outreach needs	%	#
Dedicated Staff	68.5%	37
Funding	61.1%	33
Guidance Materials	55.6%	30
Other—please specify	24.1%	13

n=54. Other specified responses include laboratory space dedicated to training, guidance specific to hosting trainings in-person and virtually with resources for facilitators, training for designated outreach personnel, travel support and tools to measure the impact of outreach to sentinel clinical laboratories.

Section 3: Planning & Response

8. (NHSPH & 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	98.1%	53
No	1.9%	1

n=54

9. What are the triggers for activation of your surge capacity plan?

n=53. Specific responses include public health emergency declarations, activation of state emergency operation center, significant increases in testing volume that exceed normal thresholds, when unable to meet established turnaround times using existing staff within normal hours of operation, when the capacity needed requires movement of cross-trained staff, sudden reduction in available personnel, facility disruptions, instrument failures, unanticipated events/conditions that may impact operations and when assisting other public health laboratories with testing. Individual responses are on file with APHL.

10. Please select the elements which are included in your surge capacity plan. Please check all that apply.

Surge capacity plan elements	%	#
Prioritization of testing based upon sample type	90.0%	45
Procedures for triage and management of surge testing, which may include referral of samples to other LRN reference and national laboratories within or outside the jurisdiction	84.0%	42
Prioritization of testing based upon risk or threat assessment	78.0%	39
Procedures to secure and deploy surge personnel, equipment, and facility resources for short-term (days) and long-term (weeks to months) response efforts	72.0%	36
Procedures for referral to commercial laboratories	50.0%	25
Procedures for referral to LRN sentinel clinical laboratories	32.0%	16

n=53

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

Formal agreement with another laboratory	%	#
Yes, agreement with other public health laboratory (ies) outside of the state	61.1%	33
Yes, agreement with commercial laboratory (ies) for biological agents	29.6%	16
Yes, agreement with commercial laboratory (ies) for other agents	20.4%	11
Yes, agreement with other state laboratory (e.g. agricultural lab) within state	16.7%	9
Yes, agreement with local public health laboratory (ies) within the state	13.0%	7
Yes, agreement with other state public health laboratory within the state	7.4%	4
Other—please specify	33.3%	18
No	13.0%	7

n=54. Other specified responses include agreements with clinical laboratories, academic laboratories and veterinary laboratories as well as informal agreements with civil support teams (CSTs) and other public health laboratories within the US Regional Consortia. Individual responses are on file with APHL.

12. What are the barriers to entering into formal agreements with other entities? Please check all that apply.

Barriers to entering formal agreements	%	#
Contracting requirements	50.9%	27
Reimbursement mechanisms	28.3%	15
Licensure requirements	22.2%	12
Other—please specify	52.8%	28
No barriers identified	13.2%	7

n=54. Other specified responses include state-specific legal requirements that limit inter-state agreements, extensive contracting processes and legal procedures, liability concerns, compatibility of laboratory infrastructure and funding for specimen transport. Individual responses are on file with APHL.

13. From January 2020 – June 2022, how much funding did your laboratory receive for COVID-19 pandemic response?

COVID-19 funding	Amount
Received	\$3,732,233,351
Spent	\$1,538,836,757
Obligated	\$473,990,201
Unspent	\$1,719,406,393

n=54

14. How have the COVID-19 funds been used to strengthen laboratory preparedness? Please select all that apply.

Use of COVID-19 funds	%	#
Enhancements to informatics/LIMS capabilities	98.1%	53
Procurement of additional testing equipment, reagents and/or PPE	96.3%	52
Implementation of new diagnostic methods	94.4%	51
Hired temporary staff	88.9%	48

Use of COVID-19 funds	%	#
Hired permanent staff	64.8%	35
Renovated laboratory facilities	59.3%	32
Conducted additional outreach or training to clinical laboratories and other partners	55.6%	30
Other—please specify	24.1%	13
Constructed new laboratory	13.0%	7

n=54. Other specified responses include establishment of a clinical laboratory consortium and clinical sequencing group, establishment of a courier system, development of patient portal, conducting laboratory space assessments and resourcing website updates.

15. (NHSPH) 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	42.6%	23
Yes, a state agency or department-wide COOP that includes the laboratory	48.1%	26
No, but the laboratory or state is developing a COOP	9.3%	5
No	0.0%	0

n=54

15a. Does your laboratory review and update COOP?

COOP review and updates?	%	#
Yes, annually	68.5%	37
Yes, biennially	7.4%	4
No	5.6%	3
Other—please specify	18.5%	10

n=54. Other specified responses include COOP review and updates on an as needed basis. Individual responses are on file with APHL.

15b. 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? Please check all that apply.

Laboratory-critical tests	%	#
LRN Biological Testing	94.4%	51
Infectious diseases (e.g., reference and specialized testing)—please specify	92.6%	50
LRN Chemical Testing	74.1%	40
Environmental health (e.g., water testing, lead testing)	59.3%	32
Newborn screening	57.4%	31
Food safety	42.6%	23
Other—please specify	31.5%	17
No critical tests identified	0.0%	0

n=54. Other specified responses include BioWatch testing. Individual responses are on file with APHL.

15c. From July 1, 2021 – June 30, 2022, did your PHL evaluate the functionality of your COOP via a real event or an exercise?

COOP evaluated?	%	#
Yes	62.3%	33
No	37.7%	20

n=53

15d. From July 1, 2021 – June 30, 2022, did you activate your laboratory COOP?

COOP activated?	%	#
Yes – please provide any additional information on the steps and outcomes	39.6%	21
No	60.4%	32

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

16. (TFAH) Has your PHL implemented a Laboratory Information Management System (LIMS) to receive and report laboratory information electronically (e.g., electronic test order and report with hospitals and clinical labs, surveillance data from public health laboratory to epidemiology)?

LIMS implementation status and functionality	%	#
Yes, bidirectional capability to receive and report	79.6%	43
Report only	18.5%	10
No electronic messaging capability at this time	1.9%	1
Receive only	0.0%	0

n=54

16a. Do you have dedicated IT support for your LIMS?

Dedicated IT support for LIMS	%	#
Yes, the laboratory has personnel dedicated to LIMS	71.7%	38
No, the laboratory relies on external contractors (e.g., LIMS vendor)	5.7%	3
No, the laboratory receives IT personnel support from the state/local government for LIMS	9.4%	5
Other—please specify	9.4%	5
No	3.8%	2

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

17. (NHSPi) Please indicate the number of preparedness exercises your PHL conducted or participated in from July 1, 2021 – June 30, 2022.

Preparedness exercises	Tabletop Exercises	Drills	Functional Exercises	Full-Scale Exercises
Biological Threats (BT)	34	51	32	13
Chemical Threats (CT)	22	12	33	11
Radiological Threats (RT)	5	5	4	4
Multi-Hazards e.g., any combo of BT, CT and RT	4	6	0	6
Pandemic Influenza	1	1	0	0
COOP	10	12	0	5
Other	12	30	5	2
Total	88	117	74	41

n=54

18. From July 1, 2021 – June 30, 2022, please enter the total number of samples and specimens you accepted and tested in your preparedness and response system (e.g., using Laboratory Response Network methods).

Sample/Specimen type	Total Accepted	BT Agents Tested	CT Agents Tested	RT Agents Tested
Clinical	198,029	48,766	856	-
Environmental e.g., food, water, unknown substance	5,460	583	598	2,119
BioWatch	153,434	173,568	-	-
Total	356,923	222,917	1,454	2,119

n=54. Some samples tested for multiple agents.

19. (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	92.6%	50
No	7.4%	4

n=54

Section 4: Safety

21. Does your laboratory have a biosafety officer?

Biosafety officer	%	#
Yes, full-time staff designated to biosafety	70.4%	38
Yes, part-time staff	27.8%	15
No—please explain why there is no staff	1.9%	1

n=54. One laboratory indicated no BSO due to lack of funding.

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

n=54. Specified responses include training needed for BSL-2 and BSL-3 standard and special practices, biological risk assessments, biological safety cabinets, chemical fume hoods, glove boxes and sharps hazards, personal protective equipment, spill prevention and response, emergency management, waste management, decontamination, packaging and shipping, select agent regulations, waste management and quality improvement.

Section 5: Biological Threats

23. 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	88.9%	48
Yes, for my jurisdiction only (may not be the entire state)	5.6%	3
No	5.6%	3

n=54

23a. 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	7	571	76.9	3,923

n=51

24. How do you identify sentinel clinical laboratories?

Definition of sentinel clinical laboratories in PHL databases	%	#
Use Sentinel Clinical Laboratories Definition	85.2%	46
Use other definition – please specify	13.0%	7
We do not identify sentinel clinical laboratories	1.9%	1

n=54. Other specified responses include jurisdictions that have their own definition. Individual responses are on file with APHL.

25. From July 1, 2021 – June 30, 2022, did your PHL award a certificate of recognition to sentinel clinical laboratories in your state? Please check all that apply.

Recognition given to sentinel clinical laboratory	%	#
No	84.9%	45
Yes, awarded a state developed certificate	9.4%	5
Yes, awarded the LRN Joint Leadership Committee (JLC) approved certificate	5.7%	3

n=53

- 25a. How many sentinel clinical laboratories received a certificate? Please enter “0” if none.

Eight PHLs responded, indicating a total of 350 sentinel clinical laboratories received certificates.

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

Competency assessment of sentinel clinical laboratories	%	#
College of American Pathologists (CAP) Laboratory Preparedness Exercise (LPX)	90.7%	49
State-developed	9.3%	5
Wisconsin State Laboratory of Hygiene Proficiency Testing (WSLHPT)/Challenge Set for Sentinel Laboratories	7.4%	4
Other—please specify	9.3%	5
None of the above	3.7%	2

n=54. Other specified responses include Gram stain challenge sets, packaging and shipping exercises, communications exercises and compliance with the ASM Rule-Out and Refer procedures.

- 26a. Do these competency assessments impact the renewal status of sentinel clinical laboratories?

Competency assessments impact renewal status of sentinel clinical laboratories?	%	#
No	88.5%	46
Yes	11.5%	6

n=52

- 26b. How do you utilize the CAP LPX in your state? Please check all that apply.

Utilization of CAP LPX	%	#
Track which sentinel clinical laboratories contact the LRN Reference PHL	96.2%	47
Provide training and outreach to the sentinel clinical laboratories that do not provide the intended responses for the LPX organisms	73.1%	36
Test competency of LRN-B staff at your state PHL e.g., your PHL actively participates in the testing of the LPX organisms	71.2%	36
Test the ability of sentinel clinical laboratories to package and ship specimens to the LRN Reference PHL	42.3%	22
Other—please specify	0.0%	0

n=49

27. 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	75.9%	41
No	24.1%	13

n=54

28. (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? Please check all that apply.

Rapid communication event	%	#
Outbreaks	87.0%	47
Routine updates	79.6%	43
Training events, such as providing a training calendar	64.8%	35
Other – please specify	38.9%	21
Have not used it	1.9%	1

n=54. Other specified responses include CDC HAN alerts, change of service notices, facility shutdowns, severe weather events, guidance distribution, courier issues, communication drills and exercises, contact information updates and distribution of surveys. Individual responses are on file with APHL.

29. From July 1, 2021 – June 30, 2022, did your PHL sponsor any sentinel clinical laboratory trainings for BT threat agents?

Lab-sponsored BT sentinel clinical laboratory trainings	%	#
Yes	56.6%	30
No	43.4%	23

n=53

- 29a. Please indicate how many classes were provided and how many facilities were trained.

Trainings	Rule-out Testing Only	Packaging & Shipping (P&S) Only	Any Combo of Categories (Rule-Out, P&S)	Biosafety	Other
Number of classes	21	164	17	49	13
Percentage of facilities	42%	44%	39%	94%	59%
Number of laboratorians that received training	247	2,133	157	1,137	135

n=53. Individual responses about course content and course format are on file with APHL.

30. From July 1, 2021 – June 30, 2022, approximately how many sentinel clinical laboratories did your staff visit? Enter “0” for none.

Visit type	%	#
Physical (On-site)	27.4%	145
Virtual (Phone and/or Video)	72.6%	385

n=53

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

Training barriers	%	#
COVID-19 response activities	70.4%	38
Travel restrictions	46.3%	25
Lack of training staff at the public health laboratory	46.3%	25
Lack of interest from the sentinel clinical labs	42.6%	23
Issues with coordination or access to sentinel clinical laboratories	37.0%	20
Information technology compatibility issues e.g., different platforms for web based training	22.2%	12
No funding	14.8%	8
Other—please specify	20.4%	11
No barriers	3.7%	2

n=53. Other specified responses include competing priorities due to the mpox response, lack of available staff at sentinel clinical laboratories able to participate and lack of training space. Individual responses are on file with APHL.

32. 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, 2021 to June 30, 2022.

Individual responses are on file with APHL.

Section 6: Chemical Threats

33. From July 1, 2021 – June 30, 2022, did your LRN-C capability (testing capabilities to specific test agents or analytes) increase, decrease, or was it maintained?

LRN-C capability	%	#
Maintained	66.7%	36
Decreased	18.5%	10
Increased	14.8%	8

n=54

- 33a. How did your capability increase? Please check all that apply.

Increased LRN-C capabilities	%	#
Added CT equipment	50.0%	4
Added one LRN-C method	37.5%	3
Added CT personnel	25.0%	2
Added more than two LRN-C methods	12.5%	1
Other—please specify	12.5%	1
Increased CT level	0.0%	0
Added two LRN-C methods	0.0%	0

n=8. Other specified responses include the addition of fentanyl analogs testing and blood lead testing.

- 33b. How did your capability decrease? Please check all that apply.

Decreased LRN-C capabilities	%	#
Decrease in CT personnel	90.0%	9
Lack of connection to those responding (i.e., first responders, communities, epidemiologists, etc.)	30.0%	3
Unable to maintain service agreement(s) on current equipment	20.0%	2
Dropped a CT Level	10.0%	1
Reduced support from the broader system	10.0%	1
Other—please specify	0.0%	0

n=10

34. From July 1, 2021 – June 30, 2022, did your PHL utilize your CT capabilities to respond to any of the following? Please check all that apply.

CT capabilities utilized	%	#
Biomonitoring investigations	26.4%	14
Chemical threat – non-clinical sample	26.4%	14
Community concern – non-clinical sample e.g., exposure to a potentially toxic chemical	17.0%	9
Chemical threat – clinical sample	13.2%	7
Community concern – clinical sample e.g., exposure to a potentially toxic chemical	11.3%	6

CT capabilities utilized	%	#
Chemical spill or other emergency incident – non-clinical sample	3.8%	2
Chemical spill or other emergency incident – clinical sample	1.9%	1
Other–please specify	13.2%	7
None	41.5%	22

n=53. Other specified responses include state lead exposure programs, opioid crisis response efforts, method development and trainings.

34a. Which LRN-C resources are you utilizing for your laboratory's biomonitoring efforts? Please check all that apply.

LRN-C resources utilized for biomonitoring	%	#
Personnel	78.6%	11
Instruments/equipment	78.6%	11
Technical training	64.3%	9
Relationships with clinical community, other relationships	57.1%	8

n=14

34b. What other funding sources are you utilizing for biomonitoring? Please check all that apply.

Biomonitoring funding sources	%	#
Other federal–please explain	64.3%	9
State–please explain	35.7%	5
Other–please explain	42.9%	6

n=14. Specified responses for other sources of federal funding include the CDC Biomonitoring grant, the CDC Overdose Data to Action (OD2A) program 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 health insurance reimbursements and a privately funded grant. Individual responses are on file with APHL.

35. How do you use your LRN-C resources to meet jurisdictional needs? Please check all that apply.

Utilization of LRN-C resources	%	#
Biosurveillance e.g. Drugs of misuse such as opioids	33.3%	18
Biomonitoring	31.5%	17
Other–please specify	24.1%	13
Not applicable	37.0%	20

n=54. Other specified responses include packaging and shipping, training and resources for first responders, environmental monitoring and responding to potential chemical threats such as environmental spills. Individual responses are on file with APHL.

36. (NHSPH) Please provide the certification/accreditation status of your LRN-C laboratory. Please check all that apply.

Certification or Accreditation	Currently certified/ accredited		Planning for certification/ accreditation next year		Neither	
	%	#	%	#	%	#
CLIA (toxicology subspecialty)	66.0%	34	13.2%	7	26.4%	14
CAP	15.1%	8	3.8%	2	79.2%	42
ISO	17.0%	9	0.0%	0	81.1%	43
Other—please specify	13.2%	7	1.9%	1	84.9%	45

n=53. Other specified responses include certifications with EPA, FDA, DEA and state-based accreditation programs. Individual responses are on file with APHL.

37. What is the source of funding for service contracts for LRN-C instruments? Please check all that apply.

Funding sources for LRN-C instrument service contracts	%	#
CDC PHEP cooperative agreement	90.6%	48
State funding	24.5%	13
Local funding	1.9%	1
Other federal funding—please specify	9.4%	5
Other—please specify	9.4%	5

n=53. Specified responses for other sources of federal funding include the CDC Biomonitoring grant, the CDC OD2A program and CDC ELC Enhancing Detection funding.

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

Funding needed for response chemical threats	%	#
Yes—please specify	47.2%	25
No	52.8%	28

n=53. Specified responses include increased staffing, competitive salaries for existing staff, maintenance of multi-year service agreements, instrumentation replacements and new advanced technologies, support for outreach activities and travel to attend trainings. Individual responses are on file with APHL.

39. 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, 2021 to June 30, 2022.

Individual responses are on file with APHL.

Section 7: Radiological Threats

40. 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.	51.9%	28
Yes—please describe	48.1%	26

n=54. Specified agencies responsible for radiological surveillance and response are on file with APHL. Described responsibilities for radiological surveillance and response from PHLs include testing of environmental, food and drinking water samples for monitoring and emergency response. Individual responses are on file with APHL.

41. 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	59.3%	32
Yes	40.7%	22

n=54. Specified responses include lack of staff and equipment, and limited space and funding. Individual responses are on file with APHL.

42. 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, please enter "0".

Scientists performing nuclear chemistry and/or radiochemistry procedures	Current number of scientists		Number of additional scientists needed	
	%	#	%	#
0	46.3%	25	63.0%	34
1	3.7%	2	14.8%	8
2	13.0%	7	13.0%	7
3	13.0%	7	3.7%	2
4	13.0%	7	3.7%	2
5	1.9%	1	0.0%	0
6	1.9%	1	0.0%	0
7	0.0%	1	0.0%	0
8	0.0%	1	0.0%	0
9	1.9%	1	0.0%	0
10	1.9%	1	0.0%	0
Other—please specify	3.7%	2	1.9%	1

n=54. 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.

42a. 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	36.0%	18
No	30.0%	15
No gap in capacity	38.9%	21

n=54

42b. In how many years are your currently staffed scientists expected to retire? Please enter the number of scientists for each timeframe that applies.

Number of Staff Retiring Within...	0-2 years		3-5 years		6-10 years		11+ years	
	%	#	%	#	%	#	%	#
0	77.8%	42	70.4%	38	77.8%	42	57.4%	31
1	20.4%	11	20.4%	11	18.5%	10	5.6%	3
2	1.9%	1	9.3%	5	1.9%	1	13.0%	7
3	0.0%	0	0.0%	0	1.9%	1	11.1%	6
4	0.0%	0	0.0%	0	0.0%	0	3.7%	2
5	0.0%	0	0.0%	0	0.0%	0	0.0%	0
6	0.0%	0	0.0%	0	0.0%	0	3.7%	2
7	0.0%	0	0.0%	0	0.0%	0	3.7%	2

n=54

43. 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	22.6%	12
Emergency Response Outreach (specimen collection, packaging and shipping, etc)	13.2%	7
Safety and Regulatory Requirements	11.3%	6
Mentoring	11.3%	6
Other—please specify	43.4%	23

n=54. Other specified responses include training needed for all of the above, waste management and reporting of results. Individual responses are on file with APHL.

44. 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, 2021 to June 30, 2022.

Individual responses are on file with APHL.