

2020 APHL ALL-HAZARDS LABORATORY PREPAREDNESS SURVEY

Summary Data Report

NOVEMBER 2021



APHL ASSOCIATION OF
PUBLIC HEALTH LABORATORIES®

ABOUT THE ALL-HAZARDS LABORATORY PREPAREDNESS SURVEY

APHL fielded the twelfth annual All-Hazards Laboratory Preparedness Survey to assess public health laboratories' capability and capacity to respond to biological, chemical, radiological and other threats, such as pandemic influenza. Administered in the fall of 2020, the survey covered a 12-month period from July 1, 2019 to June 30, 2020 representing the US Centers for Disease Control and Prevention (CDC) Public Health Emergency Preparedness (PHEP) Cooperative Agreement Fiscal Year 2019, also known as Budget Period 1. APHL received a 98% (53/54 public health laboratories) response rate from public health laboratories in 50 states, Puerto Rico, the District of Columbia, Los Angeles and New York City.

This Summary Data Report provides aggregate responses for all questions included on the 2020 APHL All-Hazards Laboratory Preparedness Survey. The Summary Data Report and additional APHL resources serve as educational tools that can assist in educating policy makers, public health partners and the public on the important role laboratories play in public health preparedness and response.

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ACRONYM GLOSSARY

APHL	Association of Public Health Laboratories	ICP-MS	Inductively Coupled Plasma-Mass Spectrometry
ASM	American Society for Microbiology	ISO	International Organization for Standardization
ASPR	Assistant Secretary for Preparedness and Response	LC-MS/MS.	Liquid Chromatography-Tandem Mass Spectrometry
BT	Bioterrorism or Biological Threat	LIMS.....	Laboratory Information Management System
CAP	College of American Pathologists	LPX.....	Laboratory Preparedness Exercise
CDC.....	US Centers for Disease Control and Prevention	LRN	Laboratory Response Network
CLIA	Clinical Laboratory Improvement Amendments	LRN-B.....	Laboratory Response Network for Biological Threat Preparedness
COOP.....	Continuity of Operations Plan	LRN-C.....	Laboratory Response Network for Chemical Threat Preparedness
CST	Civil Support Team	NAHLN.....	National Animal Health Laboratory Network
CT	Chemical Terrorism or Chemical Threat	NHSPI.....	National Health Security Preparedness Index
DHS.....	US Department of Homeland Security	PCR	Polymerase Chain Reaction
EPA.....	US Environmental Protection Agency	PHEP	Public Health Emergency Preparedness
FBI.....	US Federal Bureau of Investigation	PHL	Public Health Laboratory
FEMA.....	US Federal Emergency Management Agency	P&S	Packaging and Shipping
FERN	Food Emergency Response Network	RT.....	Radiological Terrorism or Radiological Threat
FTIR.....	Fourier-Transform Infrared Spectroscopy	SPHL	State Public Health Laboratory
GC-MS.....	Gas Chromatography-Mass Spectrometry	TFAH.....	Trust for America's Health
HHS.....	US Department of Health and Human Services	UASI	Urban Areas Security Initiative
HPP	Hospital Preparedness Program	USPS	US Postal Service

SECTION 1: DEMOGRAPHICS

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

Individual laboratory contact information can be found in the data file.

SECTION 2: FUNDING & WORKFORCE

1. From July 1, 2019—June 30, 2020, did your PHL experience any funding cuts to preparedness activities?

?	%	Count
Yes	34.0%	18
No	66.0%	35

n=53

- 1a. Please choose the top five impacts of any preparedness funding cuts your PHL experienced from July 1, 2019—June 30, 2020.

Impacts of preparedness funding cuts	%	Count
Unable to hire staff due to lack of funds	12.5%	9
Unable to provide or reduced the number of training courses and outreach activities	12.5%	9
Unable to purchase critical equipment (e.g., PCR instrumentation, automated extractors, biosafety cabinets, etc.)	9.7%	7
Unable to purchase reagents and supplies or materials	9.7%	7
Consolidated staff positions	8.3%	6
Unable to renew service/maintenance contracts	8.3%	6
Unable to expand capabilities for new assays/tests/methods	8.3%	6
Lost full-time position(s)	5.6%	4
Unable to participate in national meetings/conferences/training courses	5.6%	4
Unable to purchase and/or upgrade Laboratory Information Management System (LIMS)	4.2%	3
Increased staff turnover	2.8%	2
Reduced state courier services	2.8%	2
Lost part-time position(s)	1.4%	1
Unable to participate in exercises	1.4%	1
Increased sample/specimen turnaround time	0.0%	0
Reduced 24/7 capability	0.0%	0
Unable to respond to an event	0.0%	0
Experienced no change in laboratory operations	0.0%	0
Other—please specify	6.9%	5

n= 18. Other specified responses are on file with APHL.

1b. What factors affected your PHL’s ability to carry out preparedness activities from July 1, 2019—June 30, 2020? Please check all that apply.

Barriers to preparedness activities	%	Count
Non-competitive salaries	30.0%	12
Insufficient funding	20.0%	8
Hiring freezes	15.0%	6
Lay-offs	2.5%	1
Furloughs	2.5%	1
No difficulties experienced	2.5%	1
Position eliminated	0.0%	0
Other—please specify	27.5%	11

n= 18. Other specified responses include reorganizing staff duties to support COVID-19 and challenges with procurement of materials. Individual responses are on file with APHL.

2. From July 1, 2019—June 30, 2020, 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	\$48,858,675	\$37,737,683	-
CDC: DSLR Crisis Response Notice of Funding Opportunity	\$18,228,600	\$283,309	-
ASPR: HPP Cooperative Agreement	\$383,616	-	-
DHS/FEMA Preparedness Grants (e.g., UASI, State Homeland Security Grant)	-	-	-
DHS/BioWatch Funding	\$4,031,548	-	-
EPA: ERLN	-	-	-
EPA: Water Lab Alliance	-	-	-
FDA: FERN	\$1,613,923	\$2,471,783	\$1,334,912
USDA (FSIS): FERN	\$965,652	\$720,623	\$102,945
State	\$1,368,356	\$947,383	\$294,958
Other	\$512,317	\$130,000	\$804,554.00

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

3. From July 1, 2019—June 30, 2020, how much from each funding source was allocated to the following activities? Please note that the total for each column must equal the amount of money you indicated for PHEP in Question 2. Do not include funds received for carryover from previous years. Please enter “0” if none.

Funded Activities	CDC PHEP Funds for:		
	Biological Preparedness	Chemical Preparedness	Radiological Preparedness
Distributed to other laboratories—please specify which labs	\$1,937,936	-	-
Salaries and fringe	\$28,438,946	\$15,579,134	-
Equipment purchase	\$532,678	\$6,505,633	-
Equipment maintenance	\$4,211,646	\$5,146,851	-

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Funded Activities	CDC PHEP Funds for:		
	Biological Preparedness	Chemical Preparedness	Radiological Preparedness
Supplies	\$3,162,727	\$3,635,069	-
Training and travel	\$515,896	\$258,510	-
General overhead	\$3,872,437	\$3,105,831	-
Renovations	-	-	-
Unobligated/unspent	\$1,103,126	\$620,725	-
Other	\$4,079,583	\$1,731,183	-

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

4. In addition to your BT coordinator, CT coordinator and BSO, do you have a position responsible for outreach to clinical laboratories?

Position responsible for clinical lab outreach?	%	Count
Yes	62.3%	33
No	37.7%	20

n=53

5. 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?	%	Count
Yes	41.5%	22
No	39.6%	21
Planning in future	18.9%	10

n=53

- 5a. How often are meetings held?

Advisory meeting regularity	%	Count
Quarterly	36.4%	8
Semi-annually	22.7%	5
Annually	4.5%	1
Other—please specify	36.4%	8

n=22. Other specified responses include meeting monthly and as needed. Individual responses are on file with APHL.

- 5b. What topics are discussed? Please check all that apply.

Discussion topics	%	Count
New lab tests or technologies	29.0%	20
How to improve collaboration and communication	26.1%	18
Laboratory system improvement	21.7%	15
Other—please specify	23.2%	16

n=22. Other specified topics include biosafety, outbreak investigations and emergency preparedness exercises. Individual responses are on file with APHL.

SECTION 3: PLANNING & RESPONSE

6. (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?	%	Count
Yes	100.0%	53
No	0.0%	0

n=53

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

n=52. Specific responses include activation of state emergency operations center, significant increases in testing volume and unanticipated weather events. Individual responses are on file with APHL.

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

Surge capacity plan elements	%	Count
Prioritization of testing based upon sample type	21.1%	46
Procedures to secure and deploy surge personnel, equipment and facility resources for short-term (days) and long-term (weeks to months) response efforts	20.6%	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	19.7%	43
Prioritization of testing based upon risk or threat assessment	19.3%	42
Procedures for referral to commercial laboratories	11.5%	25
Procedures for referral to LRN sentinel clinical laboratories	7.8%	17

n=53

9. 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?	%	Count
Yes, agreement with other public health laboratory(ies) outside of the state	30.9%	30
Yes, agreement with commercial laboratory(ies) for other agents	11.3%	11
Yes, agreement with other state laboratory (e.g., agricultural lab) within state	11.3%	11
Yes, agreement with local public health laboratory(ies) within the state	9.3%	9
Yes, agreement with commercial laboratory(ies) for biological agents	7.2%	7
Yes, agreement with other state public health laboratory within the state	4.1%	4
Other—please specify	18.6%	18
No	7.2%	7

n=53. Other specified responses include informal agreements with other regional public health and academic laboratories. Individual responses are on file with APHL.

10. What are the barriers to entering into formal agreements with other entities for surge capacity testing needs?

Specified responses include challenges receiving approval of agreements by state legal departments and state laws preventing entering agreements with external laboratories. Individual responses are on file with APHL.

11. Does your laboratory conduct and/or participate in surge capacity exercises?

Surge capacity exercises?	%	Count
Yes, annually	49.1%	26
Yes, biennially	13.2%	7
No	37.7%	20

n=53

12. Did your PHL receive funding from any of the following sources for COVID-19 response? Please select all that apply.

Funding for COVID-19 response?	%	Count
Coronavirus Preparedness and Response Supplemental Appropriations Act (ELC Cooperative Agreement)	75.5%	40
Paycheck Protection Program and Health Care Enhancement Act (ELC Cooperative Agreement)	71.7%	38
Coronavirus Preparedness and Response Supplemental Appropriations Act (Crisis Response Cooperative Agreement)	71.7%	38
Redirection of internal CDC Funds (ELC Cooperative Agreement)	26.4%	14
State/Local	26.4%	14
Redirection of internal CDC Funds (Crisis Response Cooperative Agreement)	18.9%	10
Other—please specify	17.0%	9
None	0.0%	0

n=53. Other responses include funding from state government and the CDC PHEP Cooperative Agreement. Individual responses are on file with APHL.

12a. How have new COVID-19 funds been used to strengthen laboratory preparedness? Please select all that apply.

Use of funds	%	Count
Procurement of additional testing equipment, reagents and/or personal protective equipment (PPE)	96.2%	51
Implementation of new diagnostic methods	94.3%	50
New staffing positions filled	92.5%	49
Enhancements to informatics/LIMS capabilities	86.8%	46
Conducted additional outreach or training to clinical laboratories and other partners	50.9%	27
Other—please specify	26.4%	14
None	1.9%	1

n=52. Specific responses include renovations to laboratory spaces, new mobile laboratory facilities, supporting field testing operations and hiring temporary staff. Individual responses are on file with APHL.

12b. How have your laboratory operations been impacted as a result of COVID-19? Please select all that apply.

Impacts to lab operations	%	Count
Staff cross-trained or shifted to other areas	100%	53
Staff required to work additional days/hours	98.1%	52
Equipment from other sections utilized for COVID-19 testing	81.1%	43
Challenges with data reporting requirements	75.5%	40

Impacts to lab operations	%	Count
Reduced laboratory space	67.9%	36
Slower testing turnaround time for routine testing	54.7%	29
Non-COVID testing put on hold	50.9%	27
Other—please specify	47.2%	25
None	0.0%	0

n=53. Other specified responses include inspecting new laboratories to ensure compliance with CMS/CLIA and state regulations, changing staff shifts to maintain social distancing and staffing challenges due to illness and school closures. Individual responses are on file with APHL.

12c. How have your laboratory surge capacity plans been utilized to respond to COVID-19 and other response efforts lasting greater than 8 weeks? Please select all that apply.

Utilization of surge capacity plans during responses lasting greater than eight (8) weeks	%	Count
Established new partnerships with state/local, clinical or commercial laboratories	94.3%	50
Implemented operational changes and duties (e.g., distributing COVID testing materials to partners)	86.8%	46
Additional engagement with other preparedness partners (e.g., Hospital Preparedness Program, preparedness director)	66.0%	35
Revised plans to accommodate for longer response times	37.7%	20
Unable to effectively utilize surge capacity plans	5.7%	3
Other—please specify	11.3%	6
None	0.0%	0

n=53. Other specified responses include utilizing personnel from other agencies to support response efforts. Individual responses are on file with APHL.

12d. Please share any major successes and challenges your laboratory encountered regarding implementing surge capacity during the response to COVID-19. APHL staff may contact you to follow-up on these stories and to solicit photos. Stories may be featured in issue briefs or other APHL publications, such as *Lab Matters*, eUpdate or the APHL blog.

Individual responses are on file with APHL.

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

PHL COOP in place?	%	Count
Yes, a state agency or department-wide COOP that includes the laboratory	58.5%	31
Yes, a laboratory-specific COOP	37.7%	20
No, but the laboratory or state is developing a COOP	3.8%	2
No	0.0%	0

n=53

13a. Does your laboratory review and update COOP?

COOP review and updates?	%	Count
Yes, annually	62.30%	33
Yes, biennially	9.40%	5
Other—please specify	26.40%	14
No	1.90%	1

n=53. Other specified responses include updating COOP as needed and currently developing a new COOP. Individual responses are on file with APHL.

13b. 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	%	Count
Infectious diseases (e.g., reference and specialized testing)—please specify	94.3%	50
LRN Biological Testing	94.3%	50
LRN Chemical Testing	73.6%	39
Environmental health (e.g., water testing, lead testing)	60.4%	32
Newborn screening	58.5%	31
Food safety	39.6%	21
Other—please specify	30.2%	16
No critical tests identified	0.0%	0

n=53. Other specified responses include emerging pathogens, BioWatch and radiochemistry testing. Individual responses are on file with APHL.

13c. From July 1, 2019—June 30, 2020, did your PHL evaluate the functionality of your COOP via a real event or an exercise?

COOP evaluated?	%	Count
Yes	69.8%	37
No	30.2%	16

n=53

13d. From July 1, 2019—June 30, 2020, did you activate your laboratory COOP?

COOP activated this year?	%	Count
Yes—please provide any additional information on the steps and outcomes	58.5%	31
No	41.5%	22

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

13e. Please specify state, local and/or other jurisdictional requirements that may impact a response. For example, some states have licensure requirements and laboratorians without a license are not permitted to work in that state. Please enter N/A for none.

33 respondents replied with "N/A." Other responses include both federal and state clinical licensure requirements. Individual responses are on file with APHL.

14. Does your state have any legal and/or jurisdictional requirements that could complicate testing being performed by another state or prevent additional staff from coming on-site to perform testing (e.g. state licensure requirements)?

Legal/jurisdictional requirements	%	Count
Yes, requirements prevent additional staff from coming on-site—please specify	24.5%	13
Yes, requirements prevent another state from assisting with testing—please specify	9.4%	5
No	66.0%	35

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

15. (TFAH) Has your PHL implemented a laboratory 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	%	Count
Yes, bidirectional capability to receive and report	71.7%	38
Receive only	26.4%	14
Report only	1.9%	1
No electronic messaging capability at this time	0.0%	0

n=53

- 15a. Do you have dedicated IT support for your LIMS?

Dedicated IT LIMS support?	%	Count
Yes, the laboratory has personnel dedicated to LIMS	58.5%	31
No, the laboratory receives IT personnel support from the state/local government for LIMS	13.2%	7
No, the laboratory relies on external contractors (e.g., LIMS vendor)	9.4%	5
Other—please specify	18.9%	10
No	0.0%	0

n=53. Other specified responses include laboratory personnel who manage LIMS as a secondary duty, and a combination of state personnel supported with LIMS vendor assistance. Individual responses are on file with APHL.

16. (NHSPi) Please indicate the number of preparedness exercises your PHL conducted or participated in from July 1, 2019—June 30, 2020. Do not include your responses to real events and proficiency tests. Enter “0” if none.

	Tabletop Exercises	Drills	Functional Exercises	Full-Scale Exercises
Biological threats	35	69	25	11
Chemical threats	21	11	41	2
Radiological threats	7	5	6	5
Multi-hazards (Please avoid double counting)	10	14	6	3
Pandemic influenza	7	1	1	2
COOP	4	9	3	0
Other	1	21	6	5
Total	85	130	88	28

n=53. Other specified response were not captured.

17. From July 1, 2019—June 30, 2020, please enter the total number of samples and specimens you accepted and tested in your preparedness and response system. Do not include proficiency tests or exercises as part of your preparedness and response system. Please enter “0” if none.

	Total Number Accepted	BT Agents Tested	CT Agents Tested	RT Agents Tested	Other Analyses
Clinical	8,113	3,165	261	0	662
Environmental (e.g., food, water, unknown substances)	2,575	1,337	1,291	1,898	763
BioWatch	142,704	129,460	0	0	0

n=53. Some samples were tested for multiple agents. Counts do not include specimens tested for COVID-19.

18. (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? (This system can encompass a state-operated courier, FedEx, contract courier service, etc.)

Timely sample/specimen transport to LRN Reference Laboratory?	%	Count
Yes	92.5%	49
No	7.5%	4

n=53

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

After-hours sample receipt plan?	%	Count
Yes	100.0%	53
No	0.0%	0

n=53

20. From July 1, 2019—June 30, 2020, did your LRN-C capability increase, decrease or was it maintained?

LRN-C capability changes	%	Count
Increased	37.7%	20
Decreased	3.8%	2
Maintained	58.5%	31

n=53

20a. How did your capability increase? Please check all that apply.

Factors for LRN-C capability increase	%	Count
Added one LRN-C method	60.0%	12
Added CT equipment	30.0%	6
Other—please specify	20.0%	4
Added CT personnel	15.0%	3
Added two LRN-C methods	3.8%	2
Added more than two LRN-C methods	0.0%	0
Increased CT level	0.0%	0

n=20. Other specified responses include employing a new test in response to an exposure outbreak.

20b. How did your capability decrease? Please check all that apply.

Factors for LRN-C capability decrease	%	Count
Lost CT personnel	100.0%	2
Lack of connection to those responding (i.e., first responders, communities, epidemiologists, etc.)—please specify the barrier	50.0%	1
Other—please specify	50.0%	1
Lost CT equipment	0%	0
Unable to purchase new equipment required to add methods	0%	0
Unable to maintain service agreement(s) on current equipment	0%	0
Dropped a CT level	0%	0
Reduced support from the broader system	0%	0

n=2. Other specified responses include loss of staff due to retirement.

21. Does your laboratory have a biosafety officer?

Biosafety officer?	%	Count
Yes, full-time staff designated to biosafety	60.4%	32
Yes, part-time staff	30.2%	16
No—please explain why there is no staff	9.4%	5

n= 53. Specified responses include a lack of funding and having a current vacancy for the position. Individual responses are on file with APHL.

21a. Please indicate the percentage of time breakdown for the BSO duties and include what other assignments they take.

Activities	Average % of Duties
Internal biosafety/biosecurity	52.4%
External clinical lab outreach	14.2%
Other	33.4%

n=48. Other duties not captured.

22. Has your staff received training under the following topics?

Training	Yes		No		Additional Training Needed		Total Labs Responding
	%	Count	%	Count	%	Count	
BSL-2 standard and special practices (fundamentals of biological materials safety practices, excluding blood-borne pathogen training)	100.0%	53	0.0%	0	1.9%	1	53
Biological risk assessment	84.9%	45	9.4%	5	13.2%	7	53
Personal protective equipment	98.1%	52	0.0%	0	1.9%	1	53
Biological safety cabinets (BSCs) and other engineering controls	98.1%	52	0.0%	0	1.9%	1	53
Bloodborne pathogens	94.3%	50	0.0%	0	5.7%	3	53
Chemical fume hoods	90.6%	48	3.8%	2	7.5%	4	53

Training	Yes		No		Additional Training Needed		Total Labs Responding
	%	Count	%	Count	%	Count	
Glove boxes	39.6%	21	56.6%	30	3.8%	2	53
Naloxone	43.4%	23	45.3%	24	11.3%	6	53
Spill prevention, control and response plan	96.2%	51	1.9%	1	5.7%	3	53
Sharps Hazard	94.3%	50	1.9%	1	3.8%	2	53
Safe handling and use of cryogenic liquids	64.2%	34	30.2%	16	5.7%	3	53
Chemical hazards	92.5%	49	3.8%	2	5.7%	3	53
Decontamination	90.6%	48	5.7%	3	7.5%	4	53
Regulated waste management	90.6%	48	5.7%	3	3.8%	2	53
Emergency management and response	83.0%	44	11.3%	6	13.2%	7	53
Certification in packaging and shipping of Division 6.2 infectious substances	98.1%	52	0.0%	0	5.7%	3	53
Biosecurity plan	96.2%	51	1.9%	1	1.9%	1	53
Select Agent regulations	96.2%	51	3.8%	2	0.0%	0	53
BSL-3 standard and special practices	100.0%	53	0.0%	0	1.9%	1	53
Continuous quality improvement (review, improvement and implementation)	90.6%	48	1.9%	1	13.2%	7	53

SECTION 4: 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?	%	Count
Yes, for the entire state	92.5%	49
Yes, for my jurisdiction only (may not be the entire state)	5.7%	3
No	1.9%	1

n=53

23a. How many active sentinel clinical laboratories are in your database?

	Minimum reported	Maximum reported	Average reported	Total
Active sentinel clinical laboratories in PHL databases	6	442	65.5	3,404

n=53

24. How do you identify sentinel clinical laboratories? Please check all that apply.

Definition of sentinel clinical laboratories	%	Count
Use APHL, CDC LRN and ASM definition	78.9%	45
Use other definition—please specify	17.5%	10
We do not identify sentinel clinical laboratories	3.5%	2

n=47. Specified responses include independently maintained databases and databases maintained by other government entities. Individual responses are on file with APHL.

24a. Please provide any additional information on the criteria your laboratory used to identify a sentinel clinical laboratory.

36 respondents replied with “N/A.” Other specified responses include state-based designation and microbiology capabilities of laboratory. Individual responses are on file with APHL.

25. From July 1, 2019—June 30, 2020, 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?	%	Count
Yes, awarded the LRN Joint Leadership Committee (JLC) approved certificate	9.3%	5
Yes, awarded a state developed certificate	13.0%	7
No	77.8%	42

n=53. One laboratory issues both types of certificate of recognition.

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

Eleven PHLs responded, indicating that a total of 294 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	%	Count
College of American Pathologists (CAP) Laboratory Preparedness Exercise (LPX)	92.5%	49
State developed	24.5%	13
Wisconsin State Laboratory of Hygiene Proficiency Testing (WSLHPT)/ Challenge Set for Sentinel Laboratories	5.7%	3
Other—please specify	5.7%	3
None of the above	3.8%	2

n=53. Other specified responses include virtual training for biothreat agents, Gram stain challenge sets, and packaging and shipping exercises. Individual responses are on file with APHL.

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

Competency assessments impact renewal status of sentinel clinical laboratories?	%	Count
Yes	5.9%	3
No	94.1%	48

n=52

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

Utilization of CAP LAX	%	Count
Track which sentinel clinical laboratories contact the LRN Reference PHL	98.0%	48
Provide training and outreach to the sentinel clinical laboratories that do not provide the intended responses for the LPX organisms	81.6%	40
Test competency of LRN-B staff at your state PHL (e.g., your PHL actively participates in the testing of the LPX organisms)	73.5%	36
Test the ability of sentinel clinical laboratories to package and ship specimens to the LRN Reference PHL	35.8%	19
Other—please specify	10.2%	5

n=49. Other specified responses include providing individual feedback to participating laboratories and determining the effectiveness of response notification systems. Individual responses are on file with APHL.

27. From July 1, 2019—June 30, 2020, 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? (You may factor requests to sentinel clinical laboratories to contact you during the CAP LPX in your response.)

Evaluation of sentinel clinical laboratory response time?	%	Count
Yes	75.5%	40
No	24.5%	13

n=53

27a. How is the information gathered from this exercise or event used?

Specified responses include improving communication with sentinel clinical laboratories and ensuring timely contact with all sentinel clinical laboratories. Individual responses are on file with APHL.

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

Rapid communication event	%	Count
Routine updates	88.7%	47
Outbreaks	86.8%	46
Training events, such as providing a training calendar	83.0%	44
Other—please specify	50.9%	27
Have not used it	0.0%	0

n=53. Other specified responses include communication drills and exercises. Individual responses are on file with APHL.

28a. Please provide any additional information on the type of outbreak and the steps and outcomes.

10 respondents replied with “N/A.” Other specified responses include information on COVID-19 testing information and other local disease outbreaks. Individual responses are on file with APHL.

29. From July 1, 2019—June 30, 2020, did your PHL sponsor any sentinel clinical laboratory trainings for biological threat agents?

Lab-sponsored BT sentinel clinical laboratory trainings?	%	Count
Yes	64.2%	34
No	35.8%	19

n=53

29a. Please indicate how many classes were provided and how many facilities were trained. Please enter “0” if none.

	Rule-out testing only	Packaging and shipping (P&S) only	Any combo of categories (Rule-Out, P&S)	Biosafety	Other
Number of classes	30	113	38	39	49
Percentage of facilities in jurisdiction that received training	15.8%	34.2%	11.3%	10.4%	11.0%
Number of laboratorians that received training	268	1,550	248	262	523

n=34. Individual responses about course content are on file with APHL.

30. From July 1, 2019—June 30, 2020, approximately how many sentinel clinical laboratories did your BT coordinator and/or BSO physically visit? Enter 0 for none.

Number of sentinel clinical laboratories visited	%	Count
0	52.8%	28
1	1.9%	1
2	9.4%	5
3	5.7%	3
4	3.8%	2
6	5.7%	3
7	1.9%	1
12	1.9%	1
13	1.9%	1
14	1.9%	1
15	3.8%	2
17	1.9%	1
20	5.7%	3
22	1.9%	1

n=53

31. Did you experience any barriers to providing biosafety training to sentinel clinical laboratories?

Training barriers?	%	Count
Yes	86.8%	46
No - proceed to question 30	13.2%	7

31a. What were the barriers to providing training to sentinel clinical laboratories? Please check all that apply.

Training barriers	%	Count
Lack of interest from the sentinel clinical labs	26.1%	12
Issues with coordination or access to sentinel clinical laboratories	23.9%	11
No funding	23.9%	11
Lack of BSO at the public health laboratory	21.7%	10

Training barriers	%	Count
Information technology compatibility issues (e.g., different platforms for web-based training)	6.5%	3
Other—please specify	71.7%	33

n=46. Other specified responses include travel restrictions due to COVID-19 and BSO workload management challenges. 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, 2019—June 30, 2020. In addition to your stories, we encourage you to share best practices. Please note an APHL staff member will contact you to follow-up on these stories and also to solicit photos of your laboratorians in action responding to public health threats. Stories with pictures will be more likely featured in next year’s All-Hazards Laboratory Preparedness issue briefs or other publications, such as *Lab Matters*, eUpdate or the APHL blog.

Individual responses are on file with APHL.

SECTION 5: CHEMICAL THREATS

33. From July 1, 2019—June 30, 2020, did your PHL utilize your CT capabilities to respond to any of the following? Please check all that apply.

CT capabilities utilized?	%	Count
Community concern (e.g., exposure to a potentially toxic chemical)—non-clinical sample	22.6%	12
Biomonitoring investigations	22.6%	12
Chemical threat—clinical sample	20.8%	11
Chemical threat—non-clinical sample	20.8%	11
Community concern (e.g., exposure to a potentially toxic chemical)—clinical sample	17.0%	9
Chemical spill or other emergency incident—non-clinical sample	9.4%	5
Chemical spill or other emergency incident—clinical sample	7.6%	4
Other—please specify	9.4%	5
No	49.1%	26

n=53. Other specified responses include lead exposure programs and opioid crisis response efforts. Individual responses are on file with APHL.

33a. Which LRN-C resources are you utilizing for your laboratory’s biomonitoring efforts? Please check all that apply.

LRN-C resources utilized for biomonitoring	%	Count
Personnel	91.7%	11
Instruments/equipment	91.7%	11
Relationships with clinical community, other relationships	83.3%	10
Analytical methods	83.3%	10
Technical training	58.3%	7

n=12

33b. What other funding sources are you utilizing for biomonitoring? Please check all that apply.

Biomonitoring funding sources	%	Count
Other federal—please explain	66.7%	8
State—please explain	50.0%	6
Other—please explain	33.3%	4

N=12. Other specified responses include CDC bio-monitoring funding and National Institute of Environmental Health Sciences funding. Individual responses are on file with APHL.

34. As of June 30, 2020, for which proficiency tests administered by CDC/NCEH did your lab qualify? Please check all that apply.

Laboratory qualified for __ proficiency tests	%	Count
Qualified for sample collection, packing and shipping (SCPaS)	94.3%	50
Cyanide in blood by GC-MS	83.0%	44
Tetramine in urine by GC-MS	81.1%	43
Cd/Hg/Pb in blood by ICP-MS	79.2%	42
Nerve agent metabolites in urine by LC-MS/MS	79.2%	42
Ricinine/Abrine in urine by LC-MS/MS	79.2%	42
VOCs in blood by GC-MS	79.2%	42
Nerve agent metabolites in blood by LC-MS/MS	77.4%	41
Trace metals panel in urine by ICP-MS	77.4%	41
As/Se in urine by ICP-MS	64.2%	34
Tetranitromethane biomarker in urine by LC-MS/MS	43.4%	23
Lewisite metabolite in urine by LC-ICP-MS	34.0%	18
Sulfur mustard metabolite in urine by LC-MS/MS	26.4%	14
Nitrogen mustard metabolite in urine by LC-MS/MS	24.5%	13
Not qualified	3.8%	2

n=53

35. Do you use your LRN-C instrumentation for biosurveillance for drugs of abuse, such as opioids?

Biosurveillance for drugs of abuse?	%	Count
Yes	26.4%	14
No	73.6%	39

n=53

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

Question	Currently certified / accredited		Planning for certification / accreditation next year		Not certified / not planning		Total
	%	Count	%	Count	%	Count	
CLIA (toxicology subspecialty)	58.2%	32	9.1%	5	32.7%	18	55
CAP	13.2%	7	0.0%	0	86.8%	46	53
ISO	15.1%	8	13.2%	7	71.7%	38	53

Question	Currently certified / accredited		Planning for certification / accreditation next year		Not certified / not planning		Total
	%	Count	%	Count	%	Count	
Other—please specify	13.0%	7	3.7%	2	83.3%	45	54

n=53. Other specified responses include EPA Drinking Water certification and state-based accreditation programs. Individual responses are on file with APHL.

37. Does your PHL plan to replace the following LRN-C instruments? Please check all that apply.

LRN-C instrument replacements	%	Count
Equipment already in place; replacements not needed	30.2%	16
LC/MS or LC/MS/MS (used for organo phosphate nerve agents (OPNA), abrin/ricinine, MTP3, other organic chemicals)	26.4%	14
Other (used for solid phase extraction)—please specify	22.6%	12
GC/MS with multi-purpose sampler (MPS) (to test for VOCs, cyanide, other organic chemicals)	20.8%	11
GC/MS (used for tetramine and other organic chemicals)	17.0%	9
ICP/MS (used for metals)	5.7%	3
None of the above	20.8%	11

n=53. Other specified responses include automated extractors and liquid handlers. Individual responses are on file with APHL.

37a. How many of each instrument do you plan to replace?

25 laboratories reported replacing an average of two (2) instruments each, with a maximum of six (6) instruments. Individual responses are on file with APHL.

37b. When do you plan to replace the instrument(s)?

14 laboratories reported planning to replace equipment within one–three (1–3) years, on average. Individual responses are on file with APHL. Individual responses are on file with APHL.

37c. How much would it cost to replace the instrument(s)?

24 laboratories reported costs ranging from \$34,000–500,000 to replace equipment. Individual responses are on file with APHL.

37d. Is the instrument(s) used for programs other than CT?

Question	Yes		No or N/A		Total
	%	Count	%	Count	
ICP/MS (used for metals)	33.3%	1	66.7%	2	3
GC/MS (used for tetramine and other organic chemicals)	33.3%	3	66.7%	6	9
GC/MS with Multi-Purpose Sampler (MPS) (to test for VOCs, cyanide, other organic chemicals)	18.2%	2	81.8%	9	11
LC/MS or LC/MS/MS (used for Organo Phosphate Nerve Agents (OPNA), abrin/ricinine, MTP3, other organic chemicals)	42.9%	6	57.1%	8	14

Question	Yes		No or N/A		Total
	%	Count	%	Count	
Other (used for solid phase extraction)—please specify	33.3%	4	66.7%	8	12
Equipment already in place; replacements not needed	0.0%	0	0.0%	0	0
None of the above	0.0%	0	0.0%	0	0

n=26. Other specified responses include testing for drugs of abuse and biomonitoring. Individual responses are on file with APHL.

38. Does your PHL plan to purchase a service contract for the following LRN-C instruments? Please check all that apply.

Plan to purchase service contract for LRN-C instruments?	%	Count
ICP/MS	77.4%	41
GC/MS	62.3%	33
GC/MS (MPS)	71.7%	38
LC/MS	73.6%	39
Other—please specify	54.7%	29
None of the above	15.1%	8

n=53. Other specified responses include solid phase extraction and liquid handler units. Individual responses are on file with APHL.

- 38a. How much would the service contract cost?

43 laboratories reported contracts ranging from \$3,200–200,000 and one–five (1–5) years in length. Individual responses are on file with APHL.

- 38b. What is the source of funding for service contracts for CT instruments? Please check all that apply.

Source funding for CT instrument service contracts	%	Count
CDC PHEP Cooperative Agreement	83.0%	44
State funding	20.8%	11
Local funding	1.9%	1
Other federal—please specify	5.7%	3
Other—please specify	11.3%	6

n=53. Six laboratories reported not having any LRN-C testing equipment due to Level 3 status. Other Federal funding includes Overdose Data to Action. 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, 2019—June 30, 2020. APHL staff will contact you to follow-up on these stories and to solicit photos. Stories may be featured in issue briefs or other APHL publications, such as *Lab Matters*, eUpdate or the APHL blog.

Individual responses are on file with APHL.

SECTION 6: RADIOLOGICAL THREATS

40. Does your laboratory have the ability to perform radiological testing in the following matrices? Please check all that apply.

Question	Yes		No		Total
	%	Count	%	Count	
Environmental samples	41.5%	22	58.5%	31	53
Food samples	39.6%	21	60.4%	32	53
Human clinical (bioassay) samples	7.5%	4	92.5%	49	53

40a. Is your laboratory interested in developing the capability to test for radionuclides to measure human radiation contamination and become CLIA compliant for clinical samples?

Interest in developing human radiation testing capability?	%	Count
Yes	36.7%	18
No—please specify why not	63.3%	31

n=49. Specified responses include lack of infrastructure and lack of staff. Individual responses are on file with APHL.

40b. Does another laboratory in your state perform clinical bioassay testing? If so, please list the laboratory's name and briefly describe their capability (e.g., radionuclides tested and throughput per week).

Another laboratory in state performing clinical bioassay testing?	%	Count
Yes—please specify	10.2%	5
No	89.8%	44

n=49. Individual responses are on file with APHL.

41. Does your laboratory have responsibility for radiological preparedness? (e.g. testing environmental, food or clinical samples)

Responsible for radiological preparedness?	%	Count
Yes—please describe	50.9%	27
No	49.1%	26

n=53. Specified responses include environmental sample testing and supporting FDA FERN laboratory needs. Individual responses are on file with APHL.

42. Does the PHL have trained radiochemists that perform radiochemistry procedures?

Nuclear power plant?	%	Count
Yes	43.4%	23
No	56.6%	30

n=53

42a. Please indicate how many radiochemists in the PHL have college/university-based or in-house training.

Number of radiochemists with college/university education		%	Count
0		22.7%	5
1		27.3%	6
2		18.2%	4
3		13.6%	3
5		9.1%	2
6		9.1%	2

Number of radiochemists with in-house training		%	Count
0		0.0%	0
1		18.2%	4
2		9.1%	2
3		45.5%	10
4		0.0%	0
5		9.1%	2
6		18.2%	4

n=22

42b. In how many years are these radiochemists expected to retire? Please enter a number of radiochemists for each timeframe that applies.

Number Retiring	Retirement Timeframe							
	0–2 years		3–5 years		6–10 years		11+ years	
	%	Count	%	Count	%	Count	%	Count
0	35.3%	6	42.9%	6	40.0%	6	9.5%	2
1	52.9%	9	35.7%	5	20.0%	3	23.8%	5
2	0.0%	0	21.4%	3	33.3%	5	33.3%	7
3	0.0%	0	0.0%	0	6.7%	1	14.3%	3
4	0.0%	0	0.0%	0	0.0%	0	14.3%	3
5	5.9%	1	0.0%	0	0.0%	0	0.0%	0
6	0.0%	0	0.0%	0	0.0%	0	4.8%	1

n=22

42c. What is the number of college/university- or in-house-trained radiochemists that perform radiochemistry procedures that is needed to meet your laboratory's surveillance and emergency response requirements?

Number of radiochemists needed	%	Count
1	4.3%	1
2	8.7%	2
3	30.4%	7
4	17.4%	4
5	4.3%	1
6	8.7%	2
7	4.3%	1
8	8.7%	2
9	0.0%	0
10+	13.0%	3

n=23

42d. What radiochemistry staffing challenges and needs do you foresee that your laboratory will have to meet your surveillance and emergency response requirements (e.g., training, mentoring, emergency response)?

Specified responses include recruitment, training and expansion of testing capabilities. Individual responses are on file with APHL.

43. 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, 2018 to June 30, 2019. APHL staff will contact you to follow-up on these stories and to solicit photos. Stories may be featured in issue briefs or other APHL publications, such as *Lab Matters*, eUpdate, or APHL's blog.

Individual responses are on file with APHL.