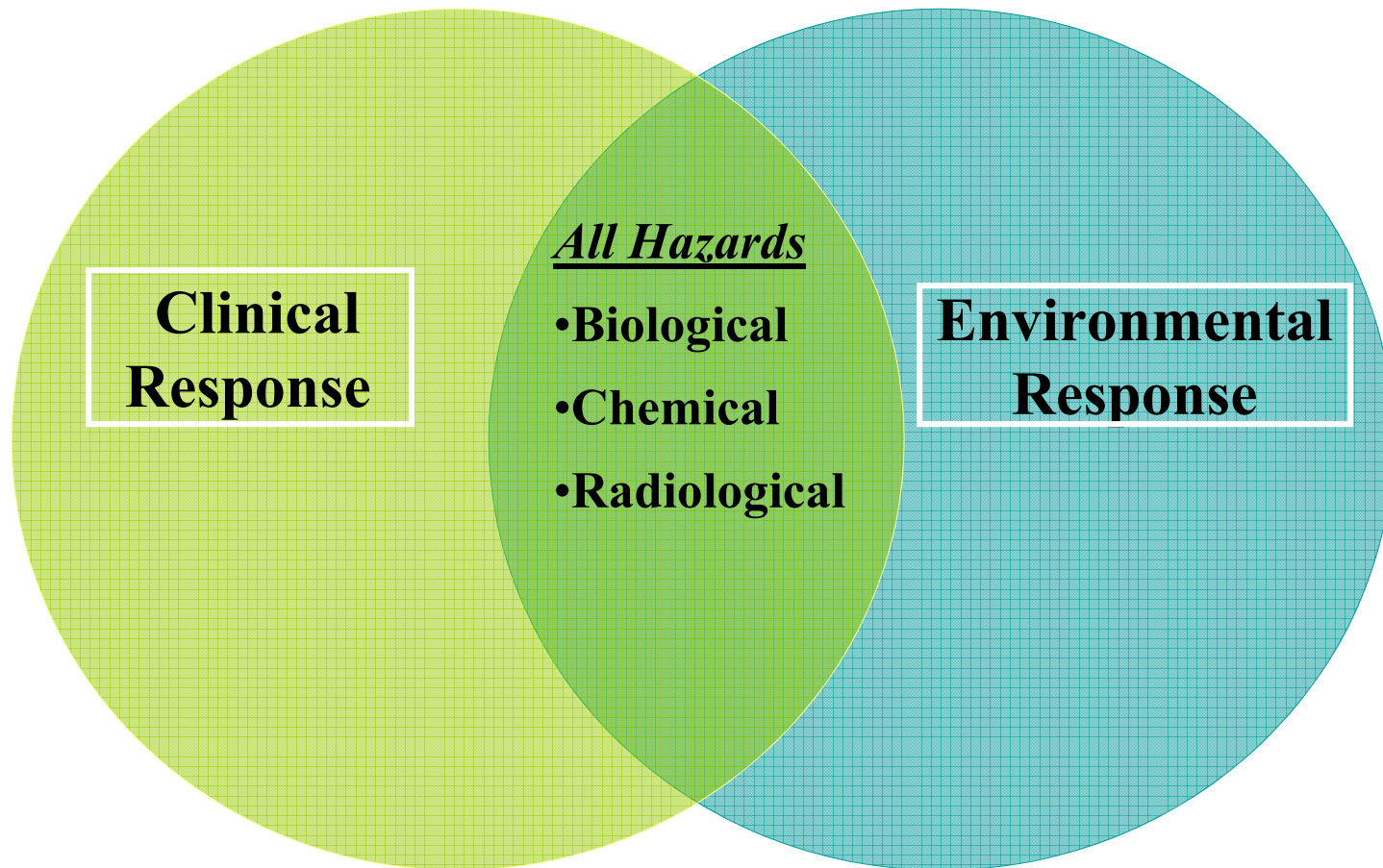


WSLH Emergency Laboratory Response

"All Hazards" Analytical Capabilities



The WSLH and Emergency Response

- **Capability**

- Sustain and likely update uniform diagnostic capability
 - Changes in technology
- Maintain expertise

- **Capacity**

- Maintain(?) adequate **staff**
- Maintain **equipment** → expensive
- Ensure adequate **space**

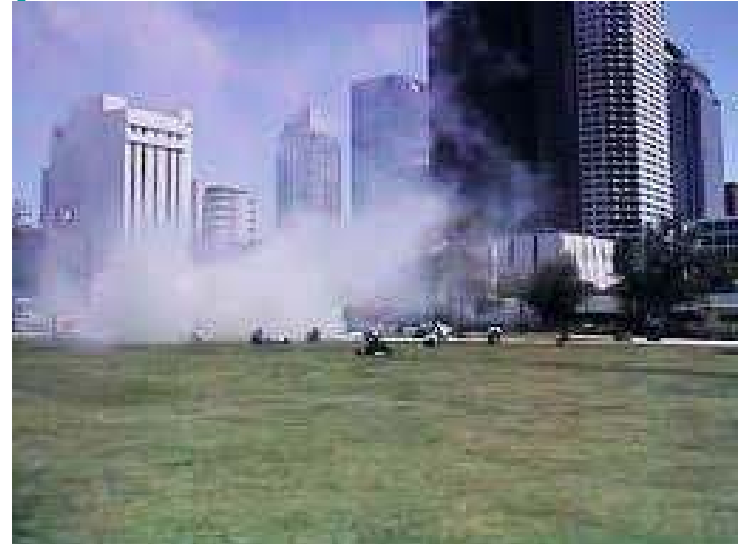
- **Response readiness**

- Continued planning, exercising
- Maintain partnerships, communication, networks

- **Funding** → **THE WEAK LINK**

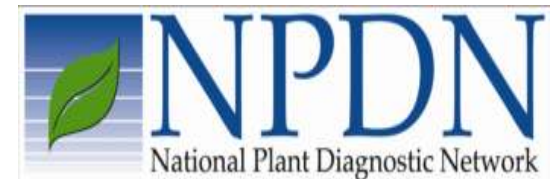
Chem Laboratory Role in PHP/PHER

- Analytical & technical support for WI responders
 - Hazmat, 54th CST
 - FBI, USPIS
 - State & Local health
- Human Exposure testing
 - WMD & other identified threat agents
- Environmental sample testing
 - Frequently integrated into normal lab activities



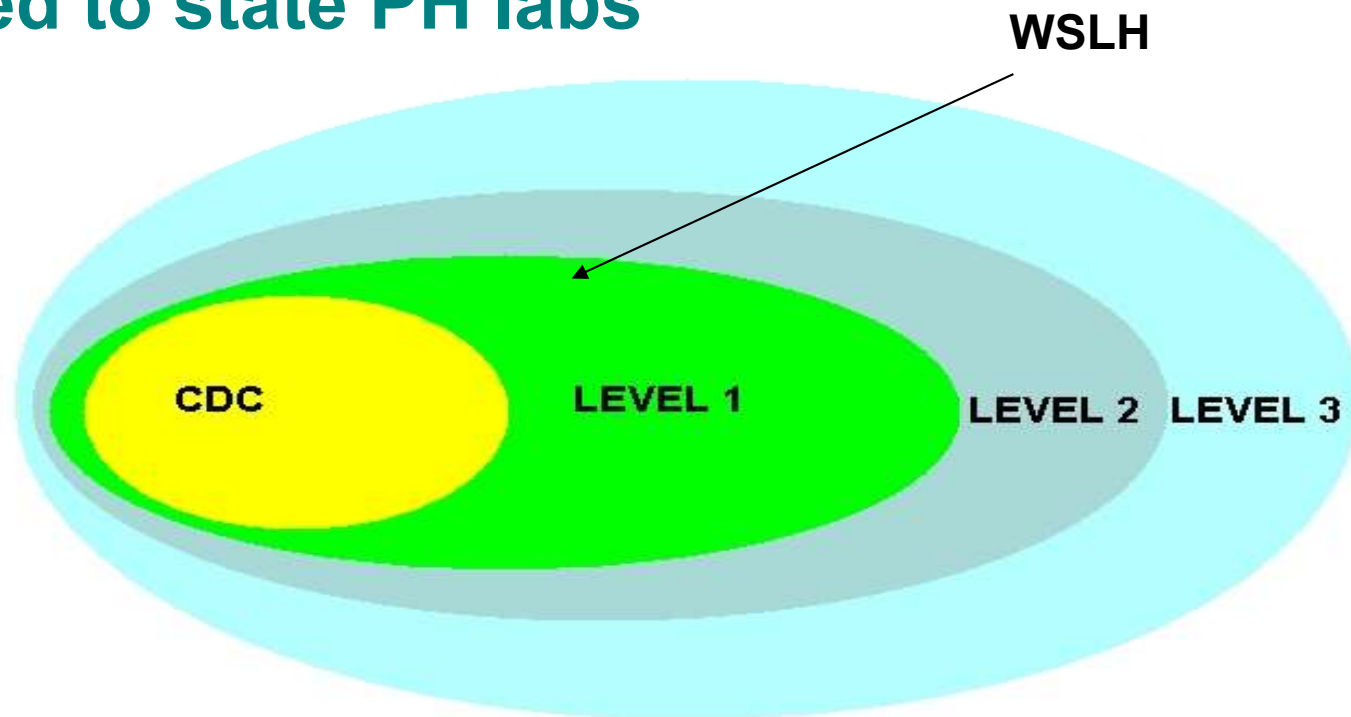
Integrated Consortium of Laboratory Networks (ICLN)

- CDC LRN – B
- CDC LRN – C
- FDA FERN
- EPA ERLN (WLA)
- USDA NAHLN
- USDA NPDN
- LRN - R?



Laboratory Response Network for Chemical Events (LRN-C)

- Clinical exposure testing
- WMD and threat agents
- Limited to state PH labs



WSLH Level 1 Lab Requirements

- Maintain infrastructure to test 1000 specimens
 - For all LRN tests
- Initiation of testing & 24/7 operation
 - Within 24 hour notification window
- Required to stay “qualified” for all LRN tests
 - Overt PT: 3 events/year, 10 specimens/event
 - Typically two unannounced PT exercises, 20-25 specs.
 - Typically 1-2 surge exercises-500 specimens



WSLH Level 1 Lab Activities

- Meeting all Level 2 & 3 lab requirements
 - Shipment & packaging supplies, exercises
 - Analytical capability & resources
 - Technical support & consultation with partners
 - HAZMAT
 - CST
 - Poison Center
 - DHS, DNR, many others



LRN-C Lab Considerations

- # labs restricted, fed decision
- Scarcity of materials
 - Single source-expensive & complex
 - Metabolites tested in many cases
 - Isotopically-labeled ISTD for most
- Instrumentation & expertise demands
 - Three basic platforms: ICPMS, LCMS/MS, GCMS
 - Instrument maintenance & analytical expertise levels high
 - Also requires robotic SPE & sample handlers
- Limited impact on medical treatment
 - Results downstream of symptoms, limited tox data
 - Value in reassuring worried well, epi



WSLH Level 1 Lab Capabilities

- Cyanide, whole blood
 - Occasional testing for Forensic Tox
- Trace Elements panel of 7 in urine, 3 in blood
 - Urine Be, As, Cd, Ba, Pb, Tl, ^{238}U , blood Cd, Hg, Pb
 - Also employed for biomonitoring studies
- Vesicant Sulfur Mustard metabolite
 - MA exposure
- Vesicant Nitrogen Mustard metabolite panel
 - Panel of 2
- Lewisite metabolite (CVAA) panel



WSLH Level 1 Lab Capabilities

- Organophosphorus Nerve Agent metabolite panel
 - Sarin, Soman, VX, Russian VX, cyclohexylsarin
 - Precedent: Tokyo subway attack
- Volatile Organic Compounds (panel of 10)
 - Can qualitatively identify ~50 others
- Metabolic Toxin panel
 - Monofluoro and monochloroacetate
- Abrine and Ricinine
 - Plant-derived toxins, rosary pea and castor beans
 - Abrin toxicity 75X ricin , LD50 0.1-1.0 $\mu\text{g}/\text{kg}$



Amanita Exercise 2012

- *Amanita phalloides*
 - Deadly mushroom genus, incl. death cap, avenging angel
 - Toxin is amanitin
 - 3 forms, α , β , γ , α most prominent
 - Asymptomatic 6-15 hours, then GI symptoms that resolve, liver & kidney failure 4-7 days post-ingestion
 - Excreted intact in urine
- Exercise scenario
 - Mass illness in Little Rock, Arkansas
 - Initial screens inconclusive
 - Ultimately 10,000 affected, thousands dead
 - Identified as α amanitin April 6

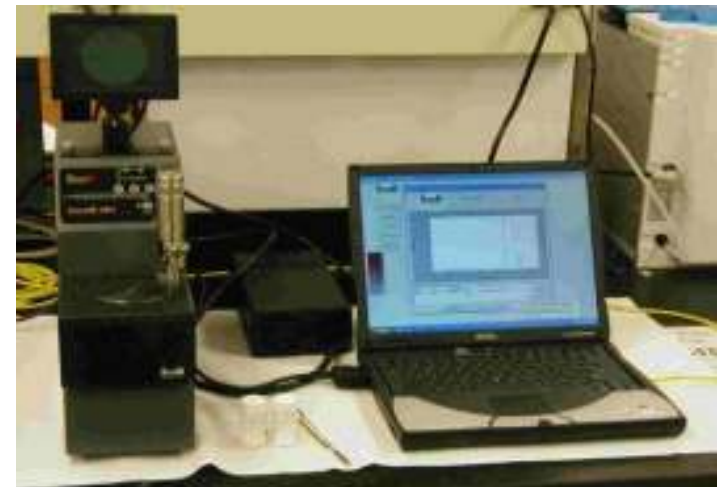


Amanita Exercise, cont'

- Configuration & timeline
 - 4/6: α amanitin identified, “method in development”
 - 4/10: Notification that method was being sent to labs, samples to follow
 - 4/12: 500 urine specimens and characterized materials rec'd
 - Method validation & specimen testing not allowed until 4/16
 - 4/16 2:00 AM method testing begins
 - 2 nominal 12 hr shifts of 3 people, plus others supporting
 - 4/17 10:00 PM method characterization completed
 - 46 analytical runs req'd
 - Sample testing commences immediately
 - 4/19 11:00 PM last sample reported to CDC
- Results
 - No false pos or neg, results near targets, variability consistent with other network labs

Environmental Emergency Response Capabilities

- Powders, larger solids, liquids, gasses
 - Downstream role, not a first responder
 - Employ or adapt existing analytical methods (mostly)
 - May encompass all WSLH analytical capabilities
 - Note: explosives detection capabilities not developed
 - Bio testing precedes any chemical testing
 - Analytical reference lab for HAZMAT, CST
 - FTIR spectral reach-back capability
 - Confirm/augment field data
 - Field instrument limitations
 - Chem & rad, not bio
 - True unknown determination
 - Rare, for good reason



Env. Sample Collection Resources

- Considers all-hazards approach
- Regional Hazmat team sample collection and transport supplies
- Regional Hazmat team 2.7 Liter canisters



Env. Sample Collection Resources. Cont'

- Emergency Response Drinking Water Collection Kit and Reservoir Sampler
- Forensic implications considered
 - Chain of custody
 - Evidentiary packaging



Additional Activities

- Uniform Regional HAZMAT Sampling Protocols
- WSLH/DHS Air Sampling Kit
- WSLH/DHS Equipment Loan Program
 - Field monitors maintained for use by DPH
 - CO, NO₂, H₂S, H₂CO, Hg, NH₃, Cl₂, VOCs, etc.



Environmental Response Lab Network (ERLN and WLA)

- Sponsored by EPA
 - Open to all qualified labs, incl. commercial
 - Provides surge capacity, payment mechanism
 - Few resources, utilizes extant PT, accreditation, etc.
 - WSLH granted membership August 2010
 - Based on existing capabilities
 - Test list maintained on EPA Lab Compendium
 - Also WLA member: Water Lab Alliance, specific to H₂O
 - No network activity to date

Food Emergency Response Network- FERN

- Includes Bio, Chem (DATCP) and Rad (WSLH)
- WSLH is 1 of 5 FERN Radiological labs
 - Gross α , β , γ activity measurement
 - Specific radioisotopes, Po in H₂O ¹³¹I in milk, ²³⁹Pu in tuna
 - Network activated following Fukushima
 - No FERN testing actually performed



LRN-C Staff

At your service

- Staff contributing to the program:
 - Greg Berkseth
 - Bill Krick
 - John Mathew
 - Meshel Mork
 - Susan Percy
 - Matt Roach
 - Martin Shafer
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 - Rachel Wipperfurth

