



# National Biomonitoring Network

## The National Biomonitoring Network:

Its Structure, Current Developments  
and

Reasons Your Laboratory Biomonitoring Program Should Become Involved

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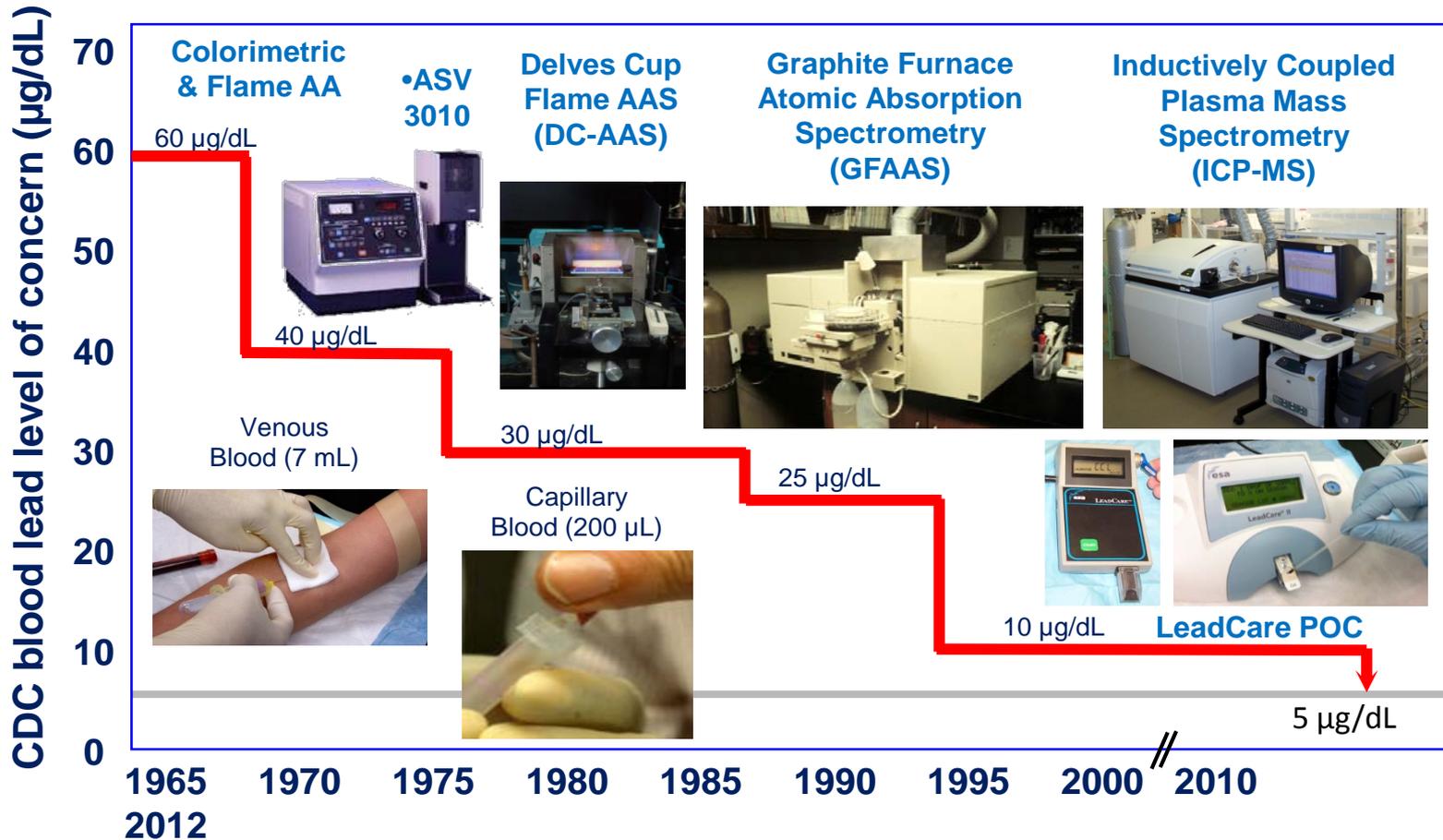
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# Time now for a NBN?



- Greater public awareness of personal exposure to environmental chemicals
- Increases in the number of chemicals introduced into commerce
- Improvements in laboratory infrastructure for testing environmental and biological samples.
- Ensure comparability of biomonitoring data for health assessments and setup data storage and sample archive.

# Biomonitoring Methods for Blood Lead



Graphics – Patrick Parsons

# The Need for Biomonitoring Capacity in States

- Biomonitoring provides unique and valuable information on human exposure to environmental compounds by measuring chemicals or their breakdown products in people's blood or urine.
- CDC applies biomonitoring to conduct an ongoing assessment of the U.S. population's exposure to more than 300 environmental chemicals.
- CDC's data provide nationally representative reference ranges, but do not provide exposure information by **specific state or locality**.



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# State Public Health Labs

## Goals for Biomonitoring

### **State Biomonitoring Program**

- Determine which environmental chemicals actually get into people
- Measure how much exposure a person has received
- Assess exposure for health studies of certain groups of people such as children or women of childbearing age.
- Determine which population groups, minorities, people with low incomes, the elderly, are at high risk for exposure and adverse health effects.
- Assess the effectiveness of public health interventions.
- Monitor trends in exposure levels over time.
- Prepared to respond to exposure incidents.
- Work with federal agencies and obtain additional funding.



# The Evolution of the National Biomonitoring Network

## National Biomonitoring Plan

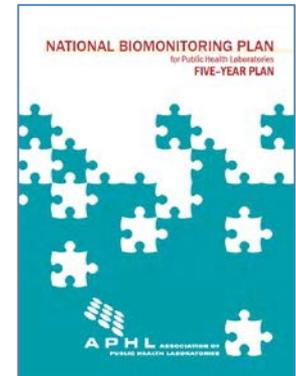
- APHL developed consecutive five-year National Biomonitoring Plans to guide a nation-wide, state-based system approach for biomonitoring.

### 2009 Plan Goals

- Foster collaboration among environmental public health programs
- Advance biomonitoring science
- Develop a **biomonitoring network**
- Disseminate biomonitoring information to guide policy and practice
- Enhance biomonitoring workforce and infrastructure

### 2015 Plan Goals

- Formalize a national biomonitoring network structure**
- Harmonize biomonitoring measurements**
- Fully incorporate biomonitoring into routine public health surveillance**



## The National Biomonitoring Network

Vision: A formal, national network of regional, state and local laboratories conducting high quality human biomonitoring science for use in public health practice and in response to environmental emergencies

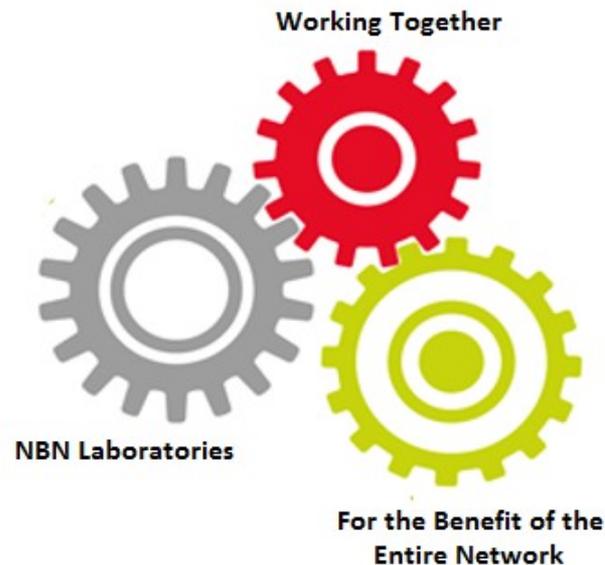
Mission: To advance science by ensuring the quality and consistency of biomonitoring measurements nationally



## What does it mean to have a Network?

A **Network** is a group or system of interconnected people or things

- Component Network Biomonitoring Program Members
- Working together
- For the benefit of the entire system



Components:

Environmental Health,  
Epidemiologists, Toxicologists,  
Communications,  
Field staff, Laboratory staff,  
Data/IT



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# State Biomonitoring Cooperative Agreement

CDC launched the State Biomonitoring Program in 2001 to help states use biomonitoring to assess chemical exposures of concern in their communities.

## 2014-2019 Cooperative Agreement Awards

Six awardees receive a total of \$5 million annually for five years.

### How Do States Use Funding?

- Purchase laboratory equipment and supplies
- Hire and train specialized staff
- Conduct fieldwork and data analysis

### CDC Programmatic Support

- Site visits
- Technical support
- Analytical method transfer
- Training at the CDC
- Grantee meetings
- Quality assurance programs

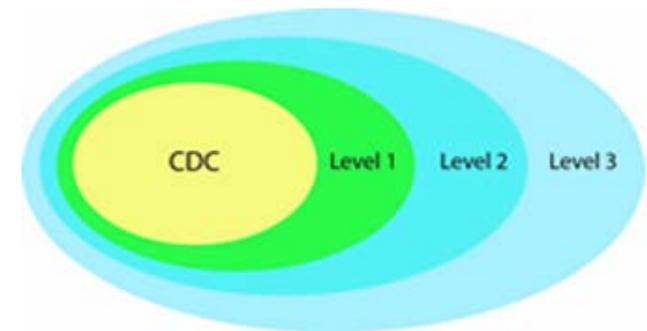
### Potential NBN Labs



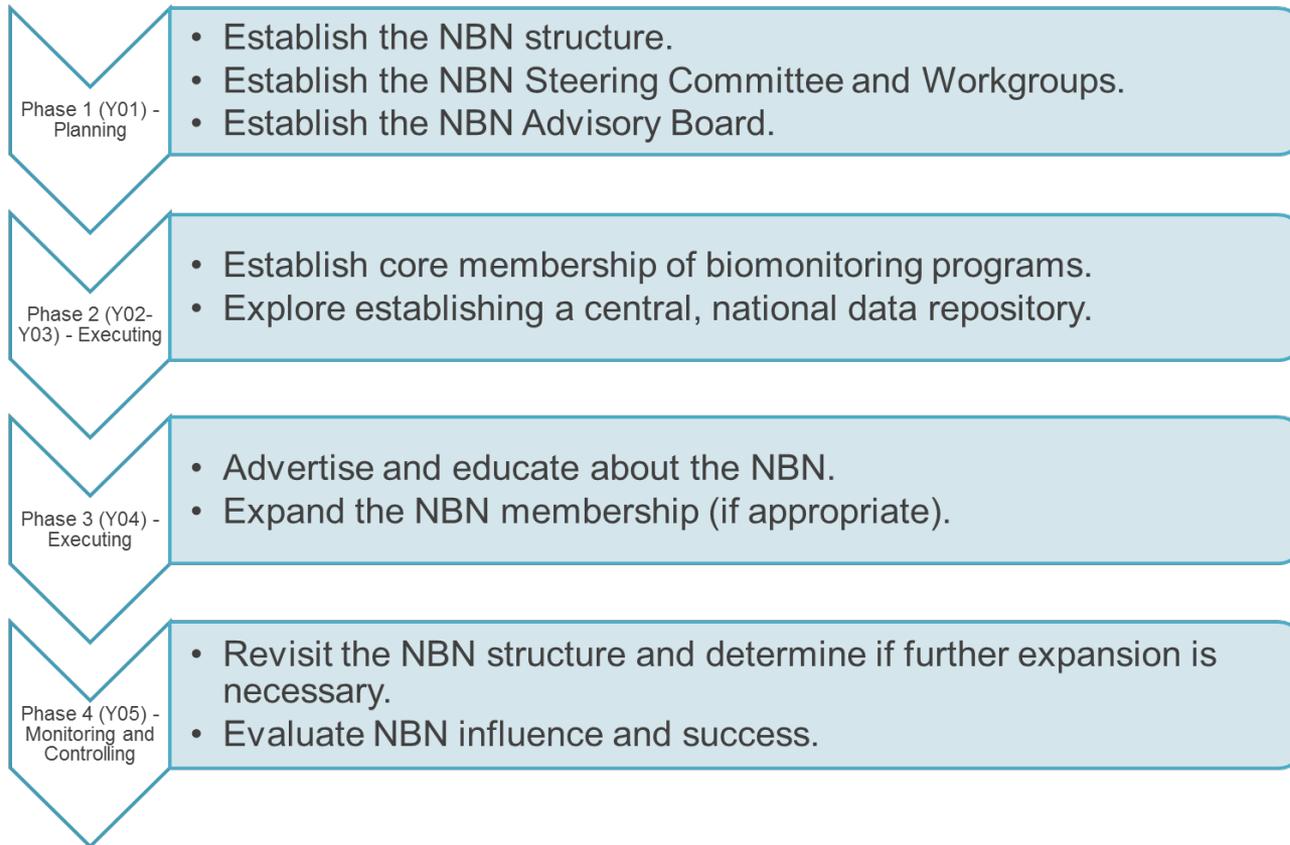
# Laboratory Response Network (LRN-C)

## What constitutes a LRN-C Laboratory?

- LRN-C infrastructure, assets + prepared.
  - Skilled analysts – method validation and method development
  - Analytical instrumentation
  - Biological sample logistics
  - Sample collection and shipping
  - Automated sample processing
  - Surge capacity training
  - External Quality Assessments (PT challenges)
  - Rapid results reporting
  - Outreach



# NBN Timeline





# NBN Structure

## (National Biomonitoring Plan)

- Network Steering Committee

- broad expertise across EH system

- State public health partners (epidemiologists, toxicologists risk communication, CDC, NIST, EPA, NIOSH, EPHT, APHL lab reps.

- Topic specific workgroups

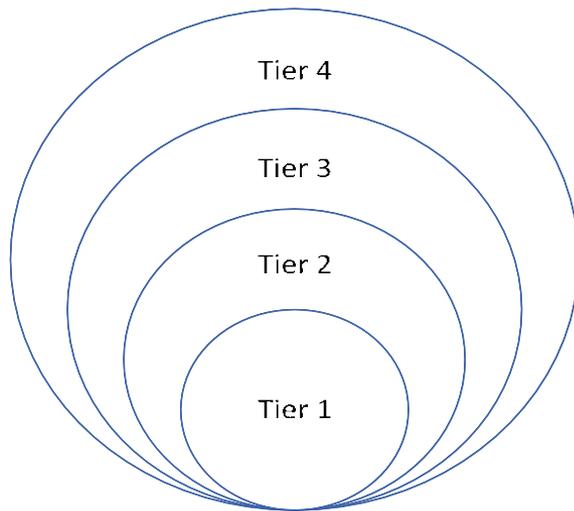
- ✓ study design
  - ✓ laboratory methods
  - ✓ membership
  - data analysis and management
  - Communication
  - Data harmonization



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# National Biomonitoring Member Structure



National  
**Biomonitoring**  
Network

## Tier 1

- Experience with surveillance, targeted emergency response
- Successful participation in a quality assessment program.
- Well established biomonitoring team integrated within the state public health system.

## Tier 2

- Targeted and emergency response biomonitoring.
- Successful participation in a quality assessment program.
- A well established biomonitoring team integrated within the state public health system.

## Tier 3

- Biomonitoring capabilities and infrastructure but not actively conducting biomonitoring.

## Tier 4

- Laboratories considering development of biomonitoring capabilities

Laboratory membership in the NBN is based on programmatic activity, capability/capacity, infrastructure, and participation in quality assessment programs. Tier 1-Tier 3 will be clearly defined public health mission.

# Membership Requirements

- **Comprehensive quality management system consistent with the principles found in APHL Biomonitoring Guidance document**
- **Participation in a relevant proficiency testing program**
- **Certified or accredited for toxicology testing**
- **Use validated methodology**
- **Demonstrated collaboration with environmental public health partners**



# Biomonitoring Resources for State and Local Programs

CDC and APHL work together to promote system-wide networking and collaboration and to provide critical non-financial resources for all state and local programs interested in conducting biomonitoring.

## [Biomonitoring Guidance Document for Public Health Laboratories](#)

Highlights key considerations for conducting a biomonitoring study and outlines infrastructure and expertise needed for laboratory capacity

## [Laboratory Capabilities List](#)

Searchable database with analytical capabilities of APHL member labs

## [Biomonitoring Toolkit](#)

Houses a discussion board and resources in document libraries

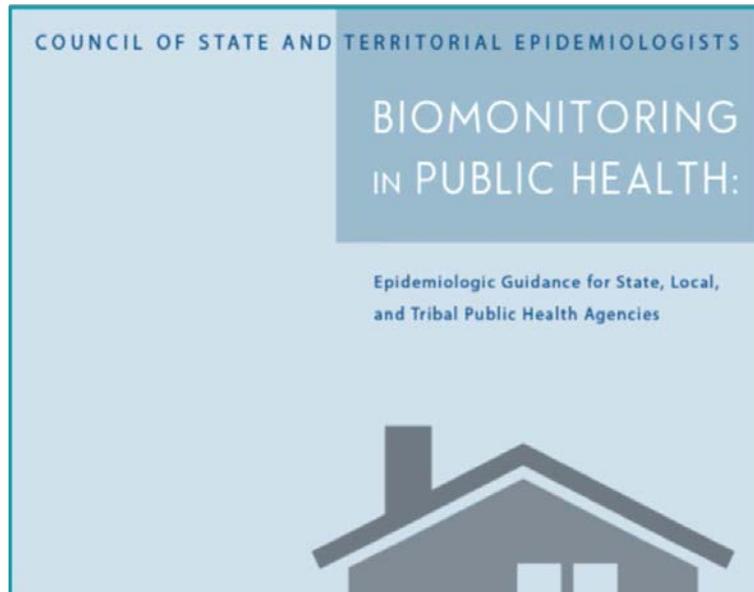


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# Guidance for Laboratories and Epidemiologists

Planning a Successful Biomonitoring Study requires collaboration among many parts of the Network.



Guidance for Laboratory Biomonitoring Programs (Revision due 2018)

# Membership Benefits

- **State of the art biomonitoring science**
  - Best practices, practical tools
  - Referral and reciprocity system
  - Technical assistance
  - Peer mentoring
  - Information exchange
- **Data harmonization**
- **Marketing and communications**
- **A national repository for biomonitoring data**
  - EPHT
  - CHEAR



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## Resources for State and Local Biomonitoring Programs

### Environmental Public Health Fellowships

Places fellows in state laboratories to expand biomonitoring workforce

### Biomonitoring Traineeships

Travel scholarships for laboratory staff to attend biomonitoring trainings or conferences

### National Meetings of State Biomonitoring Programs

CDC and APHL convene environmental public health system stakeholders to engage on scientific and programmatic biomonitoring issues.



# National Biomonitoring Network

The National Biomonitoring Network (NBN) leverages outcomes from the National Biomonitoring Plan and existing laboratory infrastructure from state-funded programs, CDC's State Biomonitoring Program, and the Laboratory Response Network – Chemical.

## Network Goals

- Connect and coordinate laboratories across the country that perform biomonitoring
- Create a central platform for biomonitoring practice
- Ensure the quality and consistency of national biomonitoring measurements
- Expand biomonitoring capacity
- Better incorporate biomonitoring measurements into routine public health surveillance

## Activities To Date

- Formed and convened a steering committee, which includes relevant non-laboratory stakeholders
- Established a network structure and network laboratory member criteria based on programmatic activities, capability/capacity, infrastructure, and participation in quality assessment programs
- Drafted member benefits

# NBN Membership Benefits

- **Marketing, Communication, and Outreach**

- o Discussion Board
- o Toolkit
- Best practices of sample collection
- Sample IRBs
- Sample testing collaborations
  - o Subject recruitment material
  - o Member Spotlight
  - o Storytelling (highlighting impact)
  - o Use of logo & motto

## **Education**

- Workshops
- Targeted conferences/meetings/trainings (webinar)
- Lab to lab mentorship, training, lab resource sharing

- **Harmonization**

- o A community of best practices
- o PT program
- o Method validation comparison
- o Limit of detection guidelines

- **Access to unpublished methods**
- **Access to technical assistance from federal partners**
- **Compendium of suppliers and materials**
- **Official Network membership certificate**



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# Next Steps and Expected Outcomes

## Future Activities

- Develop NBN priorities
- Recruit NBN members and develop a process for application review and member acceptance
- Educate stakeholders about the NBN and biomonitoring broadly
- Explore a central biomonitoring data repository

## What We Hope to Achieve

- Increased use of high quality biomonitoring to track state-specific exposures and reduce harmful chemical exposures
- Improved nationwide biomonitoring capacity and capability
- Greater efficiency and stronger collaborations in conducting biomonitoring
- Increased awareness of the value of biomonitoring among the general population and scientific community
- Improved quality of chemical exposure assessment across the U.S.

## Membership Applications

Member Application can be entered electronically on the APHL website  
Applications are being reviewed quarterly  
Five completed application from first quarter of 2018 are in process of review.

NBN Website at APHL:

[https://www.aphl.org/programs/environmental\\_health/nbn/Pages/default.aspx](https://www.aphl.org/programs/environmental_health/nbn/Pages/default.aspx)

Contact:

Email: [kenneth.aldous@health.ny.gov](mailto:kenneth.aldous@health.ny.gov)

Phone: (518) 474-7161

# Thank You