

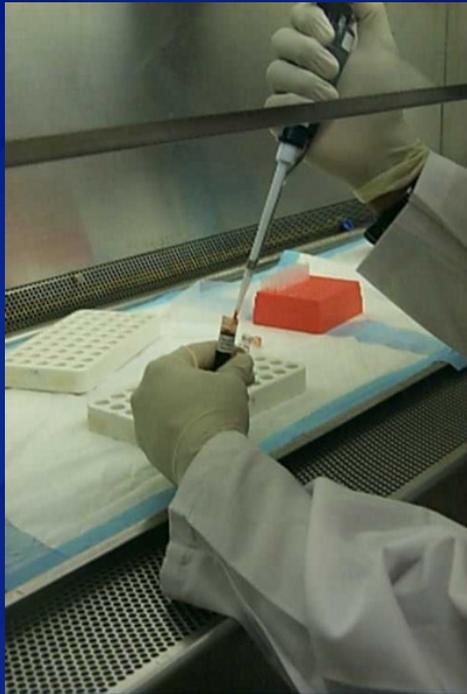
CDC's National Biomonitoring Program and NHANES: 2015 Update

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National Biomonitoring Program: Goal

To provide laboratory science that improves the diagnosis, detection, treatment, and prevention of disease resulting from exposure to environmental chemicals



National Biomonitoring Program: Objectives

- ❑ To assess the exposure of the U.S. population to priority environmental chemicals every two years.
- ❑ Provide biomonitoring measurements for studies of exposure of vulnerable population groups and for studies investigating the relationship between human biomonitoring levels and adverse health effects.
- ❑ Develop new and improved biomonitoring methods for priority environmental chemicals.
- ❑ To provide effective laboratory support for CDC emergency responses that involve known or potential exposure to environmental chemicals.
- ❑ Provide analytical support, training and technology transfer to state and local laboratories to support investigations of known and potentially unsafe exposures.



NHANES: How we assess exposure of the U.S. population to priority environmental chemicals

□ National Health and Nutrition Examination Survey

- Began in 1971
- Continuous survey since 1999 (survey cycle = 2 years)
- Stratified, multistate national probability sample
- About 10,000 participants in 30 locations every 2 years

□ Methods

- Face-to-face and computer-assisted interviews:
 - Demographics
 - Socioeconomic
 - Dietary
 - Health-related topics
- Physical examination
- Biological specimen collection



More at : http://www.cdc.gov/nchs/nhanes/about_nhanes.htm

National Health and Nutrition Examination Survey (NHANES) Mobile Examination Centers



Adding New Chemical Measurements to the *National Reports*

- ❑ Formal process for nominations announced in 2002
<https://www.federalregister.gov/articles/2002/10/07/02-25374/final-selection-criteria-and-solicitation-of-nominations-for-chemicals-or-categories-of>
- ❑ Criteria for consideration include:
 - Evidence that US population exposure may be changing
 - Seriousness of known or suspect health effects
 - Exposure of a proportion of US population
 - Need to evaluate effectiveness of interventions
 - Analytical method available and feasible
 - *Analytical cost (preference for adding to existing methods)

*Costs include NHANES specimen collection and method development

Adding New Chemical Measurements to NHANES

- ❑ Justification (e.g., request, potential widespread exposure)
- ❑ Analyte and Matrix selection
- ❑ Method Development or Modification (availability of reference standard)
- ❑ Feasibility study (e.g., NHANES surplus sample study)
 - Submit proposal to NHANES for surplus blood/serum/urine
 - Must have validated analytical method
- ❑ Submit Letter of Intent (LOI) to NHANES to measure chemical(s) as part of ongoing NHANES
- ❑ LOI deadline is ~2 years before start of NHANES cycle when measurement is planned (e.g., by mid-2015 for measurements in NH 2017-18)

NHANES Update

- ❑ Racial/ethnic groups
 - All Hispanic
 - Asian
 - non-Hispanic white
 - non-Hispanic Black
 - Mexican American
- ❑ Urine collection age lowered to 3 years (starting 2015)—full sample planned

NHANES Update (continued 2)

- ❑ DEET and metabolites (new method) starting 2007; data release pending
- ❑ Personal Care and Consumer Product Chemicals and Metabolites (2013-14)
 - Bisphenol F, Bisphenol S, Triclocarban (new)
 - BPA, Benzophenone-3, Triclosan, 2,4- and 2,5-Dichlorophenol, Parabens (all previously measured)
- ❑ Blood cobalt, chromium ages 40+ years (2015-16)
- ❑ New phthalate-alternative metabolite (2015-16; possibly 2013-14)
 - Carboxy-MHNCH (in addition to the DINCH metabolite, MHNCH)
- ❑ 2 additional DBP metabolites (2015-16; possibly 2013-14)
 - Mono-2-hydroxy-isobutyl phthalate (2OH-MHiBP)
 - Mono-2-hydroxy-n-butyl phthalate (2-OH-MHBP)

NHANES Update (continued 3)

- ❑ Specific PFOA, PFOS isomers (2015-16; possibly 2013-14)
 - n-PFOA, branched PFOA isomers (Σ b-PFOA)
 - n-PFOS, branched PFOS isomers mixture 1 (Σ m-PFOS), branched PFOS isomers mixture 2 (Σ m2-PFOS)
- ❑ Blood metals ages 12 + years sample reduced to ½ (rather than full (2013-14))
- ❑ Urine and serum tobacco biomarkers (2013-14)
 - VOC metabolites (2011-12)
 - Serum aldehydes
 - Tobacco-specific n-nitrosamines (TSNAs)
 - Volatile nitrosamines
 - Heterocyclic amines
 - Aromatic amines
 - Cotinine and nicotine analogs

Dropping Chemical Measurements from the *National Reports*

- ❑ Formal process to remove chemicals announced in 2008: <http://www.gpo.gov/fdsys/granule/FR-2008-03-28/E8-6350>
- ❑ Criteria include:
 - Replacement chemical is a better measure (e.g., metabolite)
 - Detection rate for 3 cycles is <5% (all chemicals in a group)
 - Chemical concentrations for 3 cycles are unchanged or falling, unless the chemical has established biomonitoring threshold (e.g., blood lead) or health concern (e.g., blood mercury)

NHANES Update (continued 4)

Analytes no longer reported after 2010:

- ❑ Beryllium, platinum
- ❑ Phytoestrogens and metabolites
- ❑ 2,4,5- and 2,4,6-Trichlorophenol
- ❑ Phthalate metabolites: mono-n-octyl phthalate (MOP) and mono-cyclohexyl phthalate (MCHP)
- ❑ 4-*tert*-Octylphenol
- ❑ *ortho*-Phenylphenol

Future Directions for the *National Reports*

- ❑ Considering a *Fifth Report* (electronic only)
- ❑ Considerations for ease of use:
 - Separate volumes for:
 - US population
 - Adult smoker/nonsmoker biomarkers
 - Pooled samples (PDBEs, POPs)
 - Chemicals no longer measured (?)
 - To present all cycles of available data for a given chemical and accommodate new categories, tables are split; data up to NH 2009-2010 and data starting with NH 2011-012 are in separate tables.

Where to Look for the Latest Information:



NEW [Updated Tables, February 2015](#) [PDF - 67,343 KB]

Revised February 2015

This *Updated Tables, February 2015*, provides nationally representative biomonitoring data that became available since the publication of the *Fourth National Report on Human Exposure to Environmental Chemicals, 2009*. This report includes data made available from NHANES survey periods 2005-2006, 2007-2008, 2009-2010, 2011-2012, and pooled samples using corrected NHANES sampling weights. It also includes previous updates to the tables and provides new data for some metals, phthalates, and volatile organic compounds (VOCs).

Thank You!

Questions?

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