

Environmental Exposures Measures for PhenX Toolkit

	Measure	Description of Measurement Protocol
1	Air Contaminants in the Home Environment	Questions about interior home/apartment improvements—such as professional cleaning, major renovations, new carpeting, and painting—in the last year. Short-term exposure questions are also asked about personal activities in and around the home in the last 48 hours.
2	Characteristics of Current Residence	Questions asked about the type of home, age, time lived in the residence, garage, pets in the home, and water damage.
3	Current Environmental Tobacco Smoke Exposure	Questions include smoking at the respondent's home and at work. If smoking occurs at the home, a household roster is utilized to document which person smokes and the number of cigarettes smoked per day. If smoking occurs at work, the respondent is asked the number of hours per day the smoke is present.
4	Day Care/Preschool Attendance	Respondent's mother is asked if the child attended day care and/or preschool. If the child attended either, the parent is asked the dates attended and the number of hours per week.
5	Dust Collection - Vacuum Bag	Respondents are mailed instructions and a sealable plastic bag to collect dust from their vacuum cleaner. The respondent mails the contents to the laboratory. The laboratory sieves, weighs, and analyzes the sample for environmental contaminants
6	Exposure at Work and in Daily Life	Respondent completes a table of questions about exposures at work or during daily life. If respondent answers "yes" to any of the exposures, the number of years exposed to the substance is also requested.
7	Exposures from Hobbies	Questions about specific hobbies the respondent participated in for 6 months or longer. If the respondent has participated in one or more of the hobbies, he or she is asked additional questions about when the hobby started, how long it lasted, the overall time period, and the number of hours per week or month.
8	History of Being Breast Fed	Question asking respondent whether or not his or her mother breastfed him or her.
9	Occupation/Occupational History	Questions about the respondent's current job and his or her longest-held job.
	Occupation/Occupational History Alternative Measure	Respondent is asked specific details about every job he or she has had for 6 months or longer since he or she was 16 years old.
10	Plastic Exposures at Work and Home	Questions about recent home renovations and the types of flooring and walls in the residence.
11	Residential History	Captures information about every residence the respondent has lived in for 3 months or longer. It includes questions concerning topics such as the dates lived, exact address and/or landmarks near the residence, whether the residence was located on or near a farm or near fields or orchards, the type of water supply, and whether it was located in the center or margin of town. Also included is a method to determine the geocoordinates of each residence.
12	Sibship/Birth Order	Questions about the respondent's siblings, including the number of full brothers and sisters, if he or she has twin siblings, and a more detailed description of the birth order of all siblings, including name and vital status.
13	Ultraviolet Light Exposure	Interviewer-administered questions about sunburn, use of tanning booths and sunlamps, and time spent outdoors in the midday sun.

NOTE: Complete protocols and links to common data elements are available through the PhenX Survey at <https://www.phenxtoolkit.org>.

What Is PhenX?

PhenX is a collaborative, consensus project between RTI International, the National Human Genome Research Institute (NHGRI) of the National Institutes of Health, and the larger research community. The objective of PhenX is to recommend measures with specified measurement protocols that have a high priority for inclusion in genome-wide association studies (GWAS). The consistent use of some measurement protocols across studies will facilitate cross-study comparisons. High-priority measures are, therefore, those measures that are broadly relevant to multiple health outcomes or assessments of health outcomes, although the measures are not focused on differential diagnosis.

Research Domains

The PhenX Steering Committee (SC) chose 21 research domains. A research domain is a field of research with a unifying theme and easily enumerated quantitative and qualitative measures. Working Groups (WGs) of experts in a specific domain were constituted, and they:

- Evaluated the scope of the domain and the broad elements of that scope, and then
- Recommended potential high-priority measures with specific measurement protocols.

These measures were vetted with the larger research community, and final recommendations from the WGs were reviewed by the SC. The primary goal of the project is to collect these recommendations in a Toolkit that will enable scientists to select measures and implement those measures in studies.

For more information on the PhenX project, please visit the project's website at <https://www.phenx.org/>.

Research Area (Domain)	Status	WG Chair(s)	SC Liaison
Alcohol, Tobacco and Other Substances	In Toolkit	Deborah S Hasin	Erin M Ramos
Anthropometrics	In Toolkit	Michele Forman	Michelle Williams
Cancer	In Toolkit	Neil Caporaso and Christine B Ambrosone	Margaret R Spitz
Cardiovascular	In Toolkit	Thomas A Pearson	William R Harlan
Demographics	In Toolkit	Myles Cockburn	Peter Kraft
Diabetes	In Toolkit	Craig L Hanis	William R Harlan
Environmental Exposures	In Toolkit	Lynn R Goldman	Diane Wagener
Gastrointestinal	In Toolkit	David Whitcomb	William R Harlan
Infectious Diseases and Immunity	In Toolkit	Richard Kaslow	Jonathan Haines
Neurology	In Toolkit	Jeffery M Vance	Lindsay A Farrer
Nutrition and Dietary Supplements	In Toolkit	Patrick J Stover	Jose M Ordovas
Ocular	In Toolkit	Janey L Wiggs	Jonathan Haines
Oral Health	In Toolkit	James Beck and Bryan Michalowicz	Mary L Marazita
Physical Activity and Physical Fitness	In Toolkit	Bill Haskell and Rick Troiano	Jose M Ordovas
Psychiatric	In Toolkit	Jordan Smoller and Kenneth Kendler	Carlos N Pato
Psychosocial	In Toolkit	Bernice Pescosolido	Carlos N Pato
Reproductive Health	In Toolkit	Carol Hogue	Michelle Williams
Respiratory	In Toolkit	Edwin K Silverman	Terri H Beaty
Skin, Bone, Muscle and Joint	In Toolkit	Douglas P Kiel	Lindsay A Farrer
Social Environments	In Toolkit	Barbara Entwisle	Peter Kraft
Speech and Hearing	In Toolkit	Cynthia Morton and Mabel Rice	Mary L Marazita