The Hispanic Health and Nutrition Examination Survey (HHANES)
1982-1984
Pesticide Exposure Data Release
Persons 12-74 years

The Hispanic Health and Nutrition Examination Survey (HHANES) was conducted from July 1982 through December 1984. The data in this file are from all three portions of the survey:

Mexican Americans
: Residing in selected counties of Texas, Colorado, New Mexico, Arizona, and California Surveyed from July 1982 through November 1983. 9,894 persons sampled; 8,554 interviewed; 7,462 examined

Cuban Americans
: Residing in Dade County (Miami), Florida Surveyed from January 1984 through April 1984. 2,244 persons sampled; 1,766 interviewed; 1,357 examined

Puerto Ricans
: Residing in the New York City area, including parts of New Jersey and Connecticut Surveyed from May 1984 through December 1984. 3,786 persons sampled; 3,369 interviewed; 2,834 examined

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README

CAUTION BEFORE USING THIS DATA FILE,
PLEASE READ THIS PAGE

Read the accompanying description of the survey, "The Plan and Operation of the Hispanic Health and Nutrition Examination Survey", DHHS Publication No. (PHS) 85-1321 before conducting analyses of the data in this file.

Two aspects of HHANES, especially, should be taken into account when conducting any analyses: the sample weights and the complex survey design. See information on use of weights in description of the pesiticide data set.

Analyses should not be conducted on data combined from the three portions of the survey (Mexican-American, Cuban-American, Puerto Rican).

HHANES is a survey of Hispanic households and some of the sample persons included in this file are not of Hispanic origin. A detailed description of the data codes dealing with national origin or ancestry appears in the NOTES section of this document.

Examine the range and frequency of values of a variable before conducting an analysis of data. The range may include unusual or unexpected values. The frequency counts may be useful to determine which analyses may be worthwhile.

Language of Interview, which may appear several places in this file, can vary depending on the questionnaire (several used in the survey) and on whether the response was provided by the sample person or by a proxy.

For some data items, reference is made to a note. The notes

(in a separate section of this document) may be very important in data analyses. Attention to them is strongly urged.

For some data items, the number of sample persons with a positive response is very small. In these instances, it is not possible to produce a reliable population estimate.

The Public Use Data File has been edited very carefully. Numerous consistency and other checks were performed. Nevertheless, due especially to the large number of data items, some errors may have gone undetected.

Please bring to the attention of NCHS any errors in the data or the documentation.

In publications, please acknowledge NCHS as the original data source. The acknowledgment should include a disclaimer crediting the authors for analyses, interpretations, and conclusions; NCHS should be cited as being responsible for only the collection and processing of the data. In addition, NCHS requests that the acronym HHANES be placed in the abstracts of journal articles and other publications based on data from this survey in order to facilitate the retrieval of such materials through automated bibliographic searches. Please send reprints of journal articles and other publications that include data from this release to NCHS.

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DOCUMENTATION

Introduction and Hispanic Health and Nutrition Examination Survey Description

The National Center for Health Statistics (NCHS) collects, analyzes, and disseminates data on the health status of Americans. The results of surveys, analyses, and studies are made known primarily through publications and the release of data on the internet. This document contains details required to guide programmers, statistical analysts, and research scientists in the use of this publicly released data file.

From 1960 through 1980 NCHS conducted five population-based, national health examination surveys. Each survey involved collecting data by direct physical examination, the taking of a medical history, and laboratory and clinical tests and measurements. Questionnaires and examination components have been designed to obtain and support analyses of data on certain targeted conditions such as diabetes, hypertension, and anemia. Beginning with the first National Health and Nutrition Examination Survey (NHANES I) a nutrition component was added to obtain information on nutritional status and dietary practices. The numbers of Hispanics in these samples were, however, insufficient to enable adequate estimation of their health conditions. From 1982 through 1984 a Hispanic Health and Nutrition Examination Survey (HHANES) was conducted to obtain data on the health and nutritional status of three Hispanic groups: Mexican Americans from Texas, Colorado, New Mexico, Arizona, and California; Cuban Americans from Dade County, Florida; and Puerto Ricans from the New York City area, including parts of New Jersey and Connecticut.

The general structure of the HHANES sample design was similar to that of the previous National Health and Nutrition Examination Surveys. All of these studies have used complex, multistage, stratified, clustered samples of defined populations. The major difference between HHANES and the previous surveys is that HHANES was a survey of three special subgroups of the population in selected areas of the United States rather than a national probability sample. A detailed presentation of the design specifications is found in Chapter 5 of "Plan and Operation of the Hispanic Health and Nutrition Examination Survey, 1982-84" (Ref. No. 1).

Data collection began with a household interview. Several questionnaires were administered:

- A Household Screener Questionnaire (HSQ), administered at each selected address, for determining household eligibility and for selecting sample persons.

- A Family Questionnaire (FQ), administered once for each family containing sample persons, which included sections on family relationships, basic demographic information for sample persons and head of family, Medicare and health insurance coverage, participation in income assistance programs, and housing characteristics.

- An Adult Sample Person Questionnaire (ASPQ), for persons 12 through 74 years which, depending on age, included sections on health status measures, health services utilization, smoking (20 through 74 years), meal program participation, and acculturation. Information on the use of medicines and vitamins in the past two weeks was also obtained.

- A Child Sample Person Questionnaire (CSPQ), for sample persons 6 months through 11 years which included sections on a number of health status issues, health care utilization, infant feeding practices, participation in meal programs, school attendance, and language use. Information on the use of medicines and vitamins in the past two weeks was also obtained.

At the Mobile Examination Center two questionnaires were administered and an examination performed:

- An Adult Sample Person Supplement (ASPS), for sample persons 12 through 74 years, which included sections on alcohol consumption, drug abuse, depression, smoking (12 through 19 years), pesticide exposure, and reproductive history.

- A Dietary Questionnaire (DQ), for persons 6 months through 74 years, by which trained dietary interviewers collected information about "usual" consumption habits and dietary practices, and recorded

foods consumed 24 hours prior to midnight of the interview.

- An examination which included a variety of tests and procedures. Age at interview and other factors determined which procedures were administered to which examinees. A dentist performed a dental examination and a vision test. Technicians took blood and urine specimens and administered a glucose tolerance test, X-rays, electrocardiograms, and ultrasonographs of the gallbladder. Technicians also performed hearing tests and took a variety of body measurements. A physician performed a medical examination focusing especially on the cardiovascular, gastrointestinal, neurological, and musculoskeletal systems. The physician's impression of overall health, nutritional and weight status, and health care needs were also recorded. Some blood and urine specimen analyses were performed by technicians in the examination center; others were conducted under contract at various laboratories.

Because the HHANES sample is not a simple random one, it is necessary to incorporate sample weights for proper analysis of the data. These sample weights are a composite of individual selection probabilities, adjustments for noncoverage and nonresponse, and poststratification adjustments. The HHANES sample weights, which are necessary for the calculation of point estimates, are located on all previously released data files in positions 184-213. Because of the complex sample design and the ratio adjustments used to produce the sample weights, commonly used methods of point and variance estimation and hypothesis testing which assume simple random sampling may give misleading results. In order to provide users with the capability of estimating the complex sample variances in the HHANES data, Strata and Pseudo Primary Sampling Unit (PSU) codes have been provided on all previously released data files in positions 214-217. These variables define a two-PSU per stratum classification and various estimation methods (BRR, Jackknife, and Taylor series) and survey-specific software procedures (for example, STATA, SAS, WESVAR, and SUDAAN) (references 2-5) can be used to compute sampling errors.

***See Analytic and Reporting Guidelines for the Third National Health and Nutrition and Examination Survey, (NHANES III) 1988-1994 at http://www.cdc.gov/nchs/data/nhanes/nhanes3/nh3gui.pdf

for further discussion on variance estimation procedures for complex sample designs.***

Even though the total number of examined persons in this survey is quite large, subclass analyses can lead to estimates that are unstable, particularly estimates of variances. Consequently, analyses of subclasses require that the user pay particular attention to the number of sample persons in the subclass and the number of PSU's that contain at least one sample person in the subclass. Small sample sizes, or a small number of PSU's used in the variance calculations, may produce unstable estimates of the variances.

A more complete discussion of these issues and possible analytic strategies for examining various hypotheses is presented in Chapter 11 of "Plan and Operation of the Hispanic Health and Nutrition Examination Survey, 1982-84" (Ref. No. 1) and in an earlier NCHS methodology (Series 2) publication (Ref. No. 6).

Pesticide Data Collection

The pesticide component of the Hispanic Health and Nutrition Examination Survey (HHANES) is comprised of questionnaire and laboratory data. Farm work histories and pesticide exposure data were collected in the Adult Sample Person Questionnaire (ASPQ) administered in the household. Additional information on pesticide exposure was collected as part of the Adult Sample Person Supplement (ASPS) administered in the mobile examination center. At the examination, urine and blood specimens were obtained from a half-sample of persons aged 12-19 years, and a group of 20-74 year olds who were not scheduled for the glucose tolerance test. While laboratory analysis was performed on all blood serum specimens, analysis of the urine specimens was restricted only to the Mexican American sample. Data from questions L1 - L10 of the ASPQ on farm work history were previously released. The documentation are available at http://www.cdc.gov/nchs/data/nhanes/hhanes/6521.pdf and the data can be accessed at http://www.cdc.gov/nchs/about/major/nhanes/hhanes.htm#datafile. Data from questions L11 - L30 of the ASPQ, from questions A1 - A4 of the ASPS, and laboratory results are released for the first time in this release. Users will need to merge this data set with the previously released data to get the previously released farm work history information, demographic variables, and sample weights.

Pesticide laboratory data should be analyzed using the pesticide sample. The interview final weights should be used for analyses of the questionnaire data from the ASPQ and examination weights should be used for analysis of the questions from ASPS.

The collection of the HHANES pesticide laboratory data was a collaborative effort by the U.S. Environmental Protection Agency (EPA), in collaboration with the National Center for Health Statistics (NCHS). Urine and blood specimens from a subsample of examined persons were analyzed for pesticides and their metabolites. A list of the pesticides analyzed is presented in Table 1. One blood and one urine specimen for each sample person was sent from the collection site to the Environmental Chemistry Laboratory Toxicant Analysis Center (ECL/TAC), an EPA laboratory in Bay St. Louis, Mississippi, where they were stored frozen until analysis. A summary of the laboratory methods and quality assurance procedures is found in the Appendix.

Pesticide measurements are based on minimum detectable levels (MDL) as determined by the sensitivity of the laboratory method (see Table 1). Although chemical analysis was performed for a total of 31 pesticide residues or metabolites, many pesticides were not measured at or above the MDL. In the data file, a series of zeros have been entered to identify these observations. For other pesticides, positive concentrations were measured in only a small number of specimens. In these instances, it will not be possible to produce reliable age/sex specific population estimates. Table 1 provides the percent of positive specimens for each pesticide.

Similarly, the number of sample persons with positive responses to many of the questions on pesticide exposure and farm work are small, and should therefore be analyzed with caution. Data may be too sparse to calculate age-sex specific estimates, variances of those estimates, and average design effects.

For the laboratory and questionnaire data, there are two codes for missing information: 8's and blanks. A code "8" labeled as "blank but applicable," is used to indicate that a sample person should have a data value but for various reason that value is unavailable. Blanks were used to follow skip patterns, i.e., when a question was not supposed to be asked or was not applicable. The "don't know" codes (9, 99, 999) were used only when given as a printed response on the original questionnaire.

Table 1

Pesticide Target Compounds
Minimum Detectable Levels (MDL) and Percent Identified Positive

Pesticide	**MDL** (ppb)	**Percent at or above MDL**		
		M	**C**	**PR**
Urine Malathion		(n=2022)		
Monocarboxylic Acid	10.0	6.2%		
Dicarboxylic Acid	10.0	2.2%		
Urine Multiphenol		(n=2008)		
3,5,6-Trichloro-2-pyridinol	3.0	18.4%		
Dicamba	3.0	1.0%		
2,4,6-Trichlorophenol	2.0	5.5%		
2,2,4-D	10.0	1.0%		
Pentachlorophenol	2.0	29.7%		
Para-Nitrophenol	10.0	1.1%		
2,4,5-T	5.0	0.0%		
Silvex	5.0	0.0%		
2,4,5 Trichlorophenol	5.0	1.1%		
Serum		(n=2034)	(n=399)	(n=671)
Hexachlorobenzene	1.0	4.8%	6.3%	0.0%
trans-Nonachlor	1.0	8.3%	1.1%	1.0%
pp'-DDT	2.0	15.2%	7.3%	1.9%
op'-DDT	2.0	0.0%	0.0%	0.0%
pp'-DDE	1.0	99.7%	97.0%	90.5%
op'-DDE	1.0	0.0%	0.0%	0.0%
pp'-DDD	2.0	0.0%	0.0%	0.0%
op'-DDD	2.0	0.0%	0.0%	0.0%
alpha-BHC	1.0	0.0%	1.0%	0.0%
beta-BHC	1.0	19.0%	21.0%	4.2%
gamma-BHC	1.0	0.0%	0.0%	0.0%
delta-BHC	1.0	0.0%	0.0%	0.0%
Aldrin	1.0	0.0%	0.0%	0.0%
Dieldrin	1.0	3.5%	1.5%	1.0%
Endrin	2.0	0.0%	0.0%	0.0%
Heptachlor	1.0	0.0%	0.0%	0.0%
Heptachlor epoxide	1.0	1.0%	1.0%	0.0%
Polychlorinated biphenyl	15.0	1.0%	0.0%	0.0%
Oxychlodane	1.0	4.4%	5.5%	1.0%
Mirex	2.0	0.0%	0.0%	0.0%

Refferences

1. National Center for Health Statistics: Maurer, K. R. and others: Plan and Operation of the Hispanic Health and Nutrition Examination Survey, 1982-84. Vital and Health Statistics. Series 1, No. 19. DHHS Pub. No. (PHS) 85-1321. Public Health Service. Washington. U.S. Government Printing Office. Sept., 1985.

2. STATA (1996) Statistical Software Release 5.0, College Station, TX. Stata Corporation. www.stata.com (Date last referenced: July 30, 2003)

3. SAS Institute Inc (1989) SAS/STAT Users Guide, Version 6, Fourth Edition, SAS Institute, Cary, NC. http://support.sas.com/ (Date last referenced: July 30, 2003)

4. WESVAR 4.0 Users Guide (2000). Westat, Inc, Rockville, MD. http://www.westat.com/wesvar/ (Date last referenced: July 30, 2003)

5. Shah BV, Barnwell BG, Bieler GS (1995). SUDAAN User's Manual: Software for the Statistical Analysis of Correlated Data. Research Triangle Park, NC. Research Triangle Institute http://www.rti.org/sudaan/ (Date last referenced: July 30, 2003)

6. National Center for Health Statistics: Landis, J. R., Lepkowski, J. M., Eklund, S. A., and Stehouwer, S.A. A Statistical Methodology for Analyzing Data from a Complex Survey: The First National Health and Nutrition Examination Survey. Vital and Health Statistics. Series 2, No. 92. DHHS Pub. No. (PHS) 82-1366.Public Health Service. Washington. U.S. Government Printing Office. Sept., 1982.

APPENDIX. ANALYTIC METHODS AND QUALITY CONTROL

I. Urine Malathion Method

1. Principle

Human exposure to the insecticide malathion is documented by the measurement of urinary metabolites – alpha–Monocarboxylic acid (MCA) and dicarboxylic acid (DCA). This method, a modification of the method by Shafik and Bradway (1), is performed in two phases. In the initial screening for malathion, two ml of urine is acidified with hydrochloric acid and extracted with 5.0 ml of ethyl ether. After centrifuging at a setting of 4 for five minutes, 4.0 ml of ether layer is pipetted off. It is then alkylated with 0.5 ml diazo ethane reagent, left to stand for five minutes, and then combined with 1 ml of hexane. The extract is concentrated under a gentle stream of nitrogen to 0.5 ml. In the phase that follows, positive determinations are confirmed by esterification to convert mono and Dicarboxylic acids to methyl–ethyl carboxy ester (MCA) and dimethyl carboxy ester (DCA). The procedures of the first phase are repeated except for using 0.5 ml of diazo methane. Then, using a silica gel clean up, MCA and DCA is eluted from silica gel with 10 ml of benzene, followed by 10 of 10 percent ethyl acetate in benzene. The esters are analyzed on a Tracor 560 gas liquid chromatograph (GLC) with a flame photometric detector. Final concentrations are reported as parts per billion (ppb).

2. Quality Control

The quality control measures include a validation analysis of the malathion screening method, set compositions with three controls, a reagent blank, and two standard procedure reference materials (SPRM), and duplicate specimen analyses.

II. Urine Multiphenol Method

1. Principle

This method is used to analyze human blood for halo– and nitrophenols. It is a multi–residue procedure and a modification of the method by Shafik, Sullivan, and Enos (2). It involves acid hydrolysis of 5 ml of urine followed by extraction with diethyl ether. The extraction is then derivatized with

diazoethane and cleaned up on a silica gel chromatographic column. The 20 percent benzene-in-hexane eluate contains the halogenated phenols, and the 60-80 percent benzene-in- hexane fractions contain the nitrophenols and certain phenoxy acids. The 100 percent benzene fraction elutes 2,2,4-D and any remaining portions of 2,4,5-T and Dicamba. Compounds are detected using gas chromatography. All sample extracts are analyzed on at least two columns, usually SP-2100 and SP-2401; control extracts for fraction are analyzed additionally on the 5 percent SP-2250 column.

In order to establish the true identity of a metabolite identified by gas chromatography, at least one other independent method of confirmation is needed. Confirmation options include selecting 5-15 percent of the positive samples for GC/MS measurement and 15 percent of the samples for confirmation by the Hall detector. Unusual samples and those with high concentrations must be confirmed by GB/MS. Final concentrations of phenol levels are reported as parts per billion (ppb).

2. Quality Control

Samples are run in sets consisting of control samples sufficient to measure the quality of residue data derived from samples in the set independently of any other set. Set control samples consist of a column check, reagent blank, control blank, duplicate control spikes, and a separate control spike for 2,4,6-trichlorophenol recovery. A duplicate or field control is also included in each set. Usually, an additional 19 urine samples, including duplicates or field controls, comprise the set.

Urine samples are reextracted when the quality control set is invalid, when recovery of the surrogate standard is outside the control limits, or when unusual or unusually high concentrations of residues are encountered.

III. Urine Osmolality and Creatinine

A. Osmolality

1. Principle

Osmolality is the indirect measurement of osmotic pressure based on freezing point depression whereby three phenomena occur.

First, the freezing point of a solvent decreases as the quantity of solute increases. Second, the phenomenon of super cooling brings the sample to its freezing point without crystal formation. The third phenomenon is that of heat release when freezing occurs. The Precision Osmette A Automatic Osmometer controls the conditions under which the sample is cooled and frozen. The osmolality of a specimen is expressed as mosm/kg/H_2O.

B. Creatinine

1. Principle

Creatinine is measured by picric acid coloimey method and is based on the reaction of saturated picric acid with creatinine in the presence of an alkali. The absorbance of the saturated solution is measured at 520 nm on the Technicon AutoAnalyzer II continuous flow instrument. The final concentration of creatinine in a specimen is expressed as milligrams per deciliter (mg/dl).

IV. **Blood Serum Analysis**

1. Principle

A general survey method for the determination of chlorinated hydrocarbon pesticide levels in blood, this procedure utilizes the direct solvent extraction of the Dale, et al., (2) method. A 2-ml aliquot of serum is extracted with 6 ml of hexane in a round bottom tube. The extraction is conducted for 2 hours on a slow speed rotating mixer. The formation of emulsion is unlikely, but if it should occur, centrifugation may be used to effect separation of the layers. A 5-ml aliquot of the hexane layer is quantitatively transferred to an evaporative-concentrator tube to which is affixed a modified micro-Synder column. The extract is concentrated in a water or steam bath, and the final volume is adjusted to correspond to the expected concentration of the pesticide residue. A suitable aliquot is analyzed by electron capture gas chromatography. All samples must be analyzed on two columns at a minimum. Possible and apparent residues of interest are calculated by the computer system on two columns and any procedure blank is subtracted to yield a net concentration. Calculation of the lower (lowest) value for a residue must equal or exceed the minimal detectable level (MDL) for that compound.

In order to establish the true identity of any pesticide by gas chromatography, at least one independent method of confirmation is needed. Final concentrations of the chlorinated hydrocarbon pesticide levels are reported as parts per billion (ppb).

2. Quality Control

Samples are run in sets consisting of control samples sufficient to measure the quality of the residue data derived from samples in the set independently of any other set. Elements of quality control include:

a. set controls: A standard procedure reference material (SPRM) is included with each set, and data from this blood serum sample is documented on control charts prepared from method validation data. These controls serve as a measure of the quality of data from a set.

b. surrogate standards: Approximately every other serum sample is spiked with Aldrin, the recovery of which must be within specified limits.

c. duplicates: Internal or external duplicates are included in sample sets to provide an indication of the precision of the analysis.

d. field controls: A blood serum sample spiked with a number of different pesticides is run once or twice per stand, as a field control. These controls are spiked near the time of sampling of the stand, sent to the field, and thereafter stored and handled in the same manner as other samples. Recovery of pesticides from field controls provides an indication of changes that may have occurred in actual samples from the time of sampling to analysis.

e. interlaboratory performance samples: Twice each year, the Environmental Chemistry Laboratory (ECL), in competition with other EPA laboratories, is evaluated, scored, ranked and critiqued on the analysis of various blood serum pesticide samples.

References

1. Bradway DE, Shafik TM. Malathion studies: determination of mono and icarboxylic acids and alkyl phosphates in urine. J Agric Food Chem 2: 1342–44, 1977.

2. Shafik TM, Sullivan EC, Enos ER. Multiresidue procedure for halo- and nitrophenols; measurement of exposure to biodegradable pesticides yielding these compounds as metabolites. J Agric Food Chem 21:2595- 98, 1973.

3. Edgerton TR, Moseman RF. Determination of pentachlorphenol in urine: the importance of hydrolysis. J Agric Food Chem 27:197–99, 1979.

4. Dale WE, Curley A, Cueto C. Hexane extractable chlorinated insecticides in human blood. Life Sciences 5:47–50, 1966.

LIST OF VARIABLE NAMES AND LABELS

Varaible Name	SAS Label
SEQN	Sample person sequence number
HHDM0013	Portion of survey
HHPX0030	Meals near fields?
HHPX0040	Water brought to fields from elsewhere?
HHPX0050	Water from well in field?
HHPX0060	Water from irrigation/standing?
HHPX0070	Water from other source?
HHPX0080	Doesn't wash hands
HHPX0090	Drinking water brought to fields?
HHPX0100	Drinking water from well in field?
HHPX0110	Drinking water from irrigation/standing?
HHPX0120	Drinking water from other source?
HHPX0130	Doesn't drink water
HHPX0140	Pesticides applied while working?
HHPX0150	Times pesticides applied while working?
HHPX0160	Handled pesticides while working?
HHPX0170	Times handled pesticides while working?
HHPX0180	Gloves while handled pesticides?
HHPX0190	Special suit while handled pesticides?
HHPX0200	Mask while handled pesticides?
HHPX0210	Goggles while handled pesticides?
HHPX0220	Rubber boots while handled pesticides?
HHPX0230	Head Covering while handled pesticides?
HHPX0240	Use other item while handled pesticides?
HHPX0250	How often used protective equipment?
HHPX0260	Pesticides spilled on body?
HHPX0270	Times pesticides spilled on body?
HHPX0280	Ill due to pestcides spill?
HHPX0290	See doctors due to pesticides spill?
HHPX0300	Lost work due to pesticides spill?
HHPX0310	Mixed pestcds last year besides farming?
HHPX0320	Handled pesticides last year?
HHPX0330	Used KWELL last 5 yrs?
HHPX0340	Have ever worked in pesticide plant?
HHPX0350	Have ever worked as pesticide sprayer?
HHPX0360	Used weed killers last week?
HHPX0370	Applied insectides last week?
HHPX0380	Pesticides spilled on body last week?
HHPX0390	Worked in pesticide plant last week?
HHPX0400	Worked as pesticide sprayer last week?
HHPX0410	Urine malathion final disposition
HHPX0420	Malathion monocarboxylic acid (ppb)

HHPX0430	Malathion dicarboxylic acid (ppb)
HHPX0440	Urine multiphenol final disposition
HHPX0450	Urine osmolality (milliliters)
HHPX0460	Urine creatinine (milliliters)
HHPX0470	3,5,6-Trichloro-2-pyridinol (ppb)
HHPX0480	Dicamba (ppb)
HHPX0490	2,4,6-Trichlorophenol (ppb)
HHPX0500	2,2,4-D (ppb)
HHPX0510	Pentachlorophenol (ppb)
HHPX0520	para-nitrophenol (ppb)
HHPX0530	2,4,5-T (ppb)
HHPX0540	Silvex (ppb)
HHPX0550	2,4,5 Trichlorophenol (ppb)
HHPX0560	Blood serum final disposition
HHPX0570	Hexchlorobenzene (ppb)
HHPX0580	Trans-Nonachlor (ppb)
HHPX0590	pp'-DDT (ppb)
HHPX0600	op'-DDT (ppb)
HHPX0610	pp'-DDE (ppb)
HHPX0620	op'-DDE (ppb)
HHPX0630	op'-DDD (ppb)
HHPX0640	op'-DDD (ppb)
HHPX0650	alpha-BHC (ppb)
HHPX0660	beta-BHC (ppb)
HHPX0670	gamma-BHC (ppb)
HHPX0680	delta-BHC (ppb)
HHPX0690	Aldrin (ppb)
HHPX0700	Dieldrin (ppb)
HHPX0710	Endrin (ppb)
HHPX0720	Heptachlor (ppb)
HHPX0730	Heptachlor-Epoxide (ppb)
HHPX0740	Polychlorinated biphenyl (ppb)
HHPX0750	Oxychlordane (ppb)
HHPX0760	Mirex (ppb)

CODE BOOK ON HHANES PESTICIDE RELEASE DATA SET

SAS name	Item Description and Code	M	C	P	Source/Notes
SEQN	Sample person sequence number				
	1 - 9894 Mexican Americans	5773	-		
	10115-12240 Cuban Americans	-	1454	-	
	13113-16785 Puerto Ricans	-	-	2416	
HHDM0013	Portion of survey				
	1 Mexican-American (M)	5773	-	-	
	2 Cuban American (C)	-	1454	-	
	3 Puerto Rican (P)	-	-	2416	
HHPX0030	When working in farming, do you usually eat any meals in or near the fields during the working day?				ASPQ L-11
	1 Yes	143	11	4	
	2 No	74	5	6	
	Missing	5556	1438	2406	
	When working in farming, where does the water you use for washing your hands come from?				ASPQ L-12
HHPX0040	Brought to the fields from somewhere else				
	1 Yes	64	3	1	
	2 No	69	7	2	
	8 Blank but applicable	1	0	0	
	Missing	5639	1444	2413	
HHPX0050	From a well in the fields				
	1 Yes	43	7	1	
	2 No	90	3	2	
	8 Blank but applicable	1	0	0	
	Missing	5639	1444	2413	
HHPX0060	Irrigation or standing water				
	1 Yes	21	2	0	
	2 No	112	8	3	
	8 Blank but applicable	1	0	0	
	Missing	5639	1444	2413	
HHPX0070	From some other source				
	1 Yes, other not specified	28	0	1	
	2 No	105	10	2	
	8 Blank but applicable	1	0	0	
	Missing	5639	1444	2413	

SAS name	Item Description and Code	M	C	P	Source/Notes
HHPX0080	Doesn't wash hands				
	0 Doesn't wash hands	9	1	1	
	Missing	5764	1453	2415	
	When working in farming, where does your drinking water come from?				ASPQ L-13
HHPX0090	Brought to the fields from somewhere else				
	1 Yes	116	14	5	
	2 No	88	2	5	
	8 Blank but applicable	3	0	0	
	9 Don't know	1	0	0	
	Missing	5565	1438	2406	
HHPX0100	From a well in the fields				
	1 Yes	47	1	2	
	2 No	158	15	8	
	8 Blank but applicable	2	0	0	
	9 Don't know	1	0	0	
	Missing	5565	1438	2406	
HHPX0110	Irrigation or standing water				
	1 Yes	12	0	0	
	2 No	192	16	10	
	8 Blank but applicable	3	0	0	
	9 Don't know	1	0	0	
	Missing	5565	1438	2406	
HHPX0120	From some other source				
	1 Yes, other not specified	48	3	3	
	2 No	158	13	7	
	8 Blank but applicable	1	0	0	
	9 Don't know	1	0	0	
	Missing	5565	1438	2406	
HHPX0130	Doesn't drink water				
	0 Doesn't drink water	9	0	0	
	8 Blank but applicable	2	0	0	
	Missing	5762	1454	2416	
HHPX0140	Have pesticides ever been applied to an area while you were working in it?				ASPQ L-14
	1 Yes	383	83	64	
	2 No	1241	161	153	
	8 Blank but applicable	2	1	2	
	9 Don't know	55	8	7	
	Missing	4092	1201	2190	

SAS name	Item Description and Code	M	C	P	Source/Notes
HHPX0150	How many times				ASPQ L-15
	1 2 times	83	6	12	
	2 3-5 times	78	12	15	
	3 6-10 times	42	3	6	
	4 More than 10 times	156	52	27	
	9 Don't know	24	10	4	
	Missing	5390	1371	2352	
HHPX0160	Have you mixed handled, or applied pesticides while working in farming?				ASPQ L-16
	1 Yes	225	48	30	
	2 No	1453	204	191	
	8 Blank but applicable	1	1	2	
	9 Don't know	2	0	3	
	Missing	4092	1201	2190	
HHPX0170	How many times have you mixed, handled or applied pesticides while working in farming?				ASPQ L-17
	1 Less than once per year	20	7	3	
	2 1-12 times per year	144	20	16	
	3 More than 12 times per year	59	21	11	
	8 Blank but applicable	2	0	0	
	Missing	5548	1406	2386	
	Have you ever used any of the following items of protective equipment while mixing, handling or applying pesticides?				ASPQ L-18
HHPX0180	Gloves				
	1 Yes	113	24	11	
	2 No	111	24	19	
	8 Blank but applicable	1	0	0	
	Missing	5548	1406	2386	
HHPX0190	Special suit over clothes				
	1 Yes	27	9	5	
	2 No	198	39	25	
	Missing	5548	1406	2386	
HHPX0200	Mask				
	1 Yes	82	18	13	
	2 No	142	30	17	
	8 Blank but applicable	1	0	0	
	Missing	5548	1406	2386	

SAS name	Item Description and Code	M	C	P	Source/Notes
HHPX0210	Goggles				
	1 Yes	51	13	8	
	2 No	174	35	22	
	Missing	5548	1406	2386	
HHPX0220	Rubber boots				
	1 Yes	53	14	10	
	2 No	172	34	20	
	Missing	5548	1406	2386	
HHPX0230	Head Covering				
	1 Yes	64	15	7	
	2 No	161	33	23	
	Missing	5548	1406	2386	
HHPX0240	Any other item				
	1 Yes, not specified	14	3	2	
	2 No	210	45	28	
	8 Blank but applicable	1	0	0	
	Missing	5548	1406	2386	
HHPX0250	How often have you used protective equipment?				ASPQ L-19
	1 Always	105	18	9	
	2 Sometimes	49	7	6	
	3 Never	1	1	2	
	8 Blank but applicable	0	0	1	
	Missing	5618	1428	2398	
HHPX0260	Have any pesticides ever been spilled or sprayed on any part of your body?				ASPQ L-20
	1 Yes	149	25	19	
	2 No	1515	226	198	
	8 Blank but applicable	0	1	2	
	9 Don't know	17	1	7	
	Missing	4092	1201	2190	
HHPX0270	How many times have pesticides been spilled or sprayed on your body?				ASPQ L-21
	001 - 400	103	19	13	
	888 Blank but applicable	7	0	2	
	999 Don't know	39	6	4	
	Missing	5624	1429	2397	
HHPX0280	Did you ever become ill because pesticides were spilled or sprayed on you?				ASPQ L-22
	1 Yes	36	3	2	
	2 No	112	22	17	
	8 Blank but applicable	1	0	0	
	Missing	5624	1429	2397	

SAS name	Item Description and Code	M	C	P	Source/Notes
HHPX0290	Did you ever see a doctor because pesticides were spilled or sprayed on you?				ASPQ L-23
	1 Yes	19	4	2	
	2 No	130	21	18	
	Missing	5624	1429	2396	
HHPX0300	Did you ever lose any work time as a result of having pesticides spilled or sprayed on you?				ASPQ L-24
	1 Yes	18	3	3	
	2 No	131	22	17	
	Missing	5624	1429	2396	
HHPX0310	Besides while working in farming, have you mixed, applied or handled any pesticides during the past year?				ASPQ L-26
	1 Yes	394	50	27	
	2 No	1286	201	198	
	8 Blank but applicable	1	1	0	
	9 Don't know	0	0	1	
	Missing	4092	1202	2190	
HHPX0320	Pesticides are chemicals used to kill insects, weeds, plant diseases and rodents. Have you mixed, applied or handled pesticides during the past year?				ASPQ L-27
	1 Yes	815	285	277	
	2 No	3265	911	1901	
	8 Blank but applicable	4	4	5	
	9 Don't know	3	1	5	
	Missing	1686	253	228	
HHPX0330	During the past five years have you used the prescription medication KWELL to control body head lice?				ASPQ L-28
	1 Yes	118	35	19	
	2 No	5637	1417	2385	
	8 Blank but applicable	12	2	10	
	Missing	6	0	2	
HHPX0340	Have you ever worked in a pesticide processing plant?				ASPQ L-29
	1 Yes	51	3	15	
	2 No	5708	1448	2387	
	8 Blank but applicable	4	1	9	
	9 Don't know	4	2	3	
	Missing	6	0	2	

SAS name	Item Description and Code	M	C	P	Source/Notes
HHPX0350	Have you ever worked as a pesticide applicator or sprayer?				ASPQ L-30
	1 Yes	126	15	23	
	2 No	5635	1437	2380	
	3 Blank but applicable	3	1	8	
	9 Don't know	3	1	3	
	Missing	6	0	2	
HHPX0360	During the past seven days, have any weed killers been applied to your garden or the area around you house				ASPS A-1
	1 Yes	140	25	32	
	2 No	4729	1081	1934	
	8 Blank but applicable	1	0	0	
	9 Don't know	25	9	9	
	Missing	878	339	441	
HHPX0370	During the past seven days, have any insecticides been applied to your home, garden, yard, pets, or houseplants?				ASPQ A-2
	1 Yes	696	228	403	
	2 No	4176	879	1567	
	8 Blank but applicable	1	0	1	
	9 Don't know	22	8	4	
	Missing	878	339	441	
HHPX0380	During the past seven days, has any pesticide spilled or been sprayed on any part of your body accidently or for any reason?				ASPS A-3
	1 Yes	67	6	14	
	2 No	4825	1109	1961	
	8 Blank but applicable	3	0	0	
	Missing	878	339	441	
	During the past seven days, have you worked in any of the following occupations or businesses?				ASPS A-4
HHPX0390	Pesticide processing plant				
	1 Yes	4	0	1	
	2 No	4884	1115	1974	
	8 Blank but applicable	6	0	0	
	9 Don't know	1	0	0	
	Missing	878	339	441	

SAS name	Item Description and Code	M	C	P	Source/Notes
HHPX0400	Pesticide application or spraying				
	1 Yes	25	3	2	
	2 No	4863	1111	1973	
	8 Blank but applicable	6	1	0	
	9 Don't know	1	0	0	
	Missing	878	339	441	
HHPX0410	Urine Malathion Method Final Disposition				
	1 Sample analyzed	2022	0	0	
	2 Sample not sent by NCHS	195	0	0	
	3 Sample lost in shipment	0	0	0	
	4 Sample lost in laboratory	1	0	0	
	5 Sample damaged in shipment	98	0	0	
	6 Sample damaged in laboratory	4	0	0	
	7 Interfering substances	8	0	0	
	8 Quantity not sufficient	8	0	0	
	Missing	3437	1454	2416	
HHPX0420	Malathion Monocarboxylic Acid				
	7.07-114.30 ppb	2022	0	0	
	888888.88 Blank but applicable	314	0	0	
	Missing	3437	1454	2416	
HHPX0430	Malathion Dicarboxylic Acid				
	7.07-54.40 ppb	2022	0	0	
	888888.88 Blank but applicable	314	0	0	
	Missing	3437	1454	2416	
HHPX0440	Urine Multiphenol Method Final Disposition				
	1 Sample analyzed	2008	0	0	
	2 Sample not sent by NCES	198	0	0	
	3 Sample lost in shipment	0	0	0	
	4 Sample lost in laboratory	0	0	0	
	5 Sample damaged in shipment	98	0	0	
	6 Sample damaged in laboratory	5	0	0	
	7 Interfering substances	21	0	0	
	8 Quantity not sufficient	9	0	0	
	Missing	3434	1454	2416	
HHPX0450	Urine Osmolality				
	0.58-13.54 mosm/kg/H20	2003	0	0	
	Missing	3770	1454	2416	
HHPX0460	Urine Creatinine				
	0.08-4.53 mg/dl	2003	0	0	
	Missing	3770	1454	2416	

SAS name	Item Description and Code	M	C	P	Source/Notes
HHPX0470	3,5,6-Trichloro-2-pyridinol				
	2.12-136.80 ppb	2008	0	0	
	888888.88 Blank but applicable	331	0	0	
	Missing	3434	1454	2416	
HHPX0480	Dicamba				
	2.12-5.21 ppb	2008	0	0	
	888888.88 Blank but applicable	331	0	0	
	Missing	3434	1454	2416	
HHPX0490	2,4,6-trichlorophenol				
	1.41-79.18 ppb	1797	0	0	
	888888.88 Blank but applicable	542	0	0	
	Missing	3434	1454	2416	
HHPX0500	2,2,4-D				
	7.07-28.56 ppb	2008	0	0	
	888888.88 Blank but applicable	331	0	0	
	Missing	3434	1454	2416	
HHPX0510	Pentachlorophenol (PCP)				
	1.41-94.17 ppb	2008	0	0	
	888888.88 Blank but applicable	331	0	0	
	Missing	3434	1454	2416	
HHPX0520	para-nitrophenol				
	7.07-51.37 ppb	2008	0	0	
	888888.88 Blank but applicable	331	0	0	
	Missing	3434	1454	2416	
HHPX0530	2,4,5-t				
	3.54 ppb	2008	0	0	
	888888.88 Blank but applicable	331	0	0	
	Missing	3434	1454	2416	
HHPX0540	Silvex				
	3.54 ppb	2008	0	0	
	888888.88 Blank but applicable	331	0	0	
	Missing	3434	1454	2416	
HHPX0550	2,4,5 Trichlorophenol				
	3.54-51.58 ppb	2008	0	0	
	888888.88 Blank but applicable	331	0	0	
	Missing	3434	1454	2416	

SAS name	Item Description and Code	M	C	P	Source/Notes
HHPX0560	Blood Serum Method Final Disposition				
	1 Sample Analyzed	2034	399	671	
	2 Sample not sent by NCSS	280	83	71	
	3 Sample lost in shipment	0	8	0	
	4 Sample lost in laboratory	6	0	0	
	5 Sample damaged in shipment	85	43	248	
	6 Sample damaged in laboratory	3	22	4	
	7 Interfering substance	0	3	0	
	8 Quantity not sufficient	3	0	2	
	Missing	3362	896	1420	
HHPX0570	Hexchlorobenzene				
	0.71-5.67 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0580	Trans-Nonachlor				
	0.71-17.60 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0590	pp'-DDT				
	1.41-88.62 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0600	op'-DDT				
	1.41 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0610	pp'—DDE				
	0.71-513.96 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0620	op'-DDE				
	0.71 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0630	pp'-DDD				
	1.41-7.86 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	

SAS name	Item Description and Code	M	C	P	Source/Notes
HHPX0640	op'-DDD				
	1.41 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0650	alpha-BHC				
	0.71-2.16 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0660	beta-BHC				
	0.71-13.68 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0670	gamma-BHC				
	0.71 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0680	delta-BHC				
	0.71 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0690	Aldrin				
	0.71 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0700	Dieldrin				
	0.71-9.00 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0710	Endrin				
	1.41 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0720	Heptachlor				
	0.71 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	

SAS name	Item Description and Code	M	C	P	Source/Notes
HHPX0730	Heptachlor Epoxide				
	0.71–5.90 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0740	Polychlorinated biphenyl (PCB)				
	10.61–33.06 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0750	Oxychlordane				
	0.71–6.60 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	
HHPX0760	Mirex				
	1.41 ppb	2032	396	667	
	888888.88 Blank but applicable	377	159	325	
	Missing	3364	899	1424	