

USE OF AN EXISTING SAMPLING FRAME TO COLLECT BROAD-BASED HEALTH AND HEALTH-RELATED DATA AT THE STATE AND LOCAL LEVEL

Trena M. Ezzati-Rice, Marcie Cynamon, Stephen J. Blumberg, and Jennifer H. Madans
National Center for Health Statistics

Over 1.6 million telephone numbers are called annually as part of the National Immunization Survey (NIS) to identify about 34,000 children 19-35 months of age to produce estimates of vaccination coverage levels at the national, state, and local levels. Because of the large number of households that must be screened to identify young children in the target age group, the NIS offers a cost-effective option for collecting a broad spectrum of health and health-related data for individuals in other age-groups without increasing the size of its screening sample. As health-care markets respond to new incentives and state and local areas gain increasing responsibility for administering health, welfare, and health insurance programs through waivers and legislated reforms, high quality state-level data are recognized as increasingly important to the public health and health policy communities. Existing population based surveys, such as the National Health Interview Survey and the Medical Expenditure Panel Survey provide much relevant information on many important health related issues at the national level. However, currently, none of the major national surveys can provide the data needed to evaluate the performance and impact of various programs at the state or local level. As a cost effective approach to providing needed data at the state level, The National Center for Health Statistics has developed a new population-based, multipurpose, flexible survey as an expansion of the existing NIS. This new survey is the State and Local Area Integrated Telephone Survey or SLAITS. This paper provides an overview of the key features of SLAITS including its flexibility for oversampling subdomains of the population and the specific study designs for two pilot studies along with response rates and selected results.

Key Words: Telephone survey; state-level data

1. Background

High quality health data at the state level are recognized as increasingly important to the public health and health policy communities especially with the recent changes in the health care market and the increasing responsibilities gained by states for administering various health, welfare, and health insurance programs. While considerable data are available at the national level to track and monitor our nations' health, data at the state level are much more limited. The National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC), operates a broad-based program of vital and health statistics data collection systems designed to obtain information on a wide range of health and health related topics at the national level (National Center for Health Statistics, 1997). This includes the collection of information on vital events such as births and deaths for each state and the collection of a broad range of national health and health-related data either from population-based household interview surveys such as the National Health Interview Survey (NHIS) or through direct physical examinations such as the National Health and Nutrition Examination Survey. In addition, NCHS conducts a family of record-based surveys designed to supply information about the use of health services provided by medical care providers such as office-based physicians, hospitals, and long-term care facilities. However, few of these surveys can produce statistically reliable data for more than just a handful of states. In recognition of the increasing need for state-level data, NCHS has developed a new integrated survey mechanism to produce state and local data. A primary objective of this new survey is to monitor the impact of changes in the health care and

welfare systems at the state level and to respond to the need for health policy data at the sub-national level. This newly established survey mechanism is the State and Local Area Integrated Telephone Survey or SLAITS.

The purpose of this paper is to provide an overview of key features of the SLAITS survey mechanism, to describe the study design for two SLAITS pilot studies along with selected results, and to briefly discuss future study plans.

2. What is SLAITS?

SLAITS is a single standardized survey mechanism that allows for the collection of population-based data at the state and local level to address emerging health and health-related issues. SLAITS was designed to help fill the gap in knowledge about the impact of changes in the health care and welfare systems at the state and local levels. Specifically, it allows for the comparison of data across states and with national data. SLAITS is integrated with two major national surveys — the National Immunization Survey (NIS) and the NHIS. The NIS is an ongoing Random-Digit-Dialing (RDD) survey designed to monitor vaccination coverage levels among children 19-35 months in all 50 states and 28 large urban areas. The design of the NIS has been previously published (Ezzati-Rice *et al.*, 1995). Because the proportion of households with age eligible children in the NIS is small (about 4%), the NIS must screen about 25 randomly-selected households to identify a single household with an age-eligible child. In fact, approximately 1 million households are contacted each year in the NIS. By sharing the NIS sampling frame and using this large number of telephone numbers for its base, SLAITS can economize on the cost of selecting and screening households. All households contacted for the NIS are potentially eligible for SLAITS, regardless of whether or not they are eligible for NIS.

In addition, SLAITS makes use of questions in the NHIS and its data for telephone and nontelephone households to account for the effect of not covering households without telephones in SLAITS. The NHIS is a large, household based survey conducted by NCHS that has been operational continuously since the mid-1950s. The NHIS is designed to obtain information on health status and functioning, health care utilization, health insurance, access and barriers to care, and health behaviors as well as various special topics. Many of the questions included in the SLAITS questionnaire modules are taken from the NHIS so that SLAITS data can be compared with national data and because many of the questions have undergone extensive testing.

SLAITS is designed to allow flexible sample selection and questionnaire modules to address geographical and/or topical requirements. It was created in conjunction with the Department of Health and Human Services' plan for the integration of existing surveys (Ezzati-Rice *et al.*, 1998). By using the NIS sampling frame and questions from multiple existing surveys, such as the NHIS, the Survey of Income and Program Participation (SIPP), the Current Population Survey (CPS), and other surveys, SLAITS has increased analytic capabilities at decreased costs. Since SLAITS is a telephone survey, it has additional cost efficiencies with all interviews conducted from one central location using Computer Assisted Telephone Interviewing or CATI. This allows for rapid implementation, rapid data collection, and timely data release — desirable characteristics of any survey.

Due to the fact that certain sociodemographic groups (for example, those with low family income) are more likely to not have telephones, potential nontelephone coverage bias is an issue in this survey, just as it is for all telephone surveys. Therefore, direct adjustments are made for noncoverage of nontelephone households. Two different methods have been investigated including the use of information from telephone and nontelephone households in the NHIS for selected key variables included in both surveys. More recently, information on interruption in telephone service has been examined as an enhanced method to adjust for nontelephone coverage bias (Frankel *et al.*, 1998).

3. Key Features of SLAITS

SLAITS has been designed as a population-based survey mechanism with topical questionnaire modules, oversampling options, quick turn-around of data, and flexibility. In brief, selected key features of SLAITS include:

- C A centrally administered state-based telephone survey linked to the NHIS, effectively creating state-level health interview surveys;
- C Use of standardized questions, survey methodology, and mode of administration to provide data that are comparable across states and with national data;
- C Use of questions from the NHIS and other existing national household surveys that are administered in person to allow for statistical adjustments for households without telephone coverage and to allow for eventual dual-frame surveys using both area frame and RDD surveys;
- C Efficient use of the sampling frame for the existing NIS, an ongoing telephone survey designed to produce state and selected urban area estimates of vaccination coverage levels among young children;
- C Flexible sampling frame to allow states to sponsor the collection of data at the county level;
- C Flexibility to target policy-relevant subgroups of the population and to customize questionnaires to meet state-specific needs for data. (For example, states can sponsor the inclusion of questions to ascertain respondents' knowledge of program availability and requirements or to assess utilization of specific state-based services or programs.);
- C Rapid implementation and quick turn-around of data; and
- C Demonstrated high response rates.

4. Overview of the Study Designs for SLAITS Pilot Studies and Selected Results

Prior to large scale implementation of SLAITS, pilot studies of two different questionnaire modules and study designs were undertaken. The primary objectives of these pilot studies were to evaluate the integration of the NIS and SLAITS sample design, to test a general health module that would provide NHIS data at the state level for an abbreviated set of variables, to test a mechanism for collecting data for all members of the household, to test a child well being and welfare module including special oversampling design features, to test an alternative statistical adjustment procedure to the one in use by the NIS to adjust for nontelephone coverage bias, and finally to evaluate survey participation rates. At the present time, three separate questionnaire modules have been developed for use with the SLAITS mechanism: a Health Module, a Child Well-Being and Welfare (CWBW) Module, and a Children's Health Insurance and Health Care Module. The sections below provide details of two SLAITS modules pilot-tested as of mid-1999 — the Health and CWBW Modules.

4.1 Health Module Study Design

The SLAITS Health Module closely approximates a state-based NHIS. Questions from the NHIS have been supplemented by items from the SIPP. This module focuses on access and barriers to care, health insurance coverage, health status and limitations of activity, health care utilization, demographic characteristics, family income, and family structure. This module is designed to collect information on all members of the household.

A pilot test of this module was conducted in two states, Iowa and Washington, in summer 1997. The sample of households selected for SLAITS was essentially a subsample of households screened for the NIS in the states of Iowa and Washington. In selecting the sample of households for SLAITS, the NIS sampling frame (a representative sample of telephone households) was used as a second phase sampling frame in the two pilot study states. The goal for the pilot study was 1,000 completed household interviews in each state. For those households that were eligible for NIS (approximately 50 of the 1,000), the SLAITS questions were simply appended to the regular NIS immunization interview. For those households that were only eligible for SLAITS (approximately 950 of the 1,000), the Health Module questions followed the NIS screening questions. As in the NIS, an advance letter was sent to those households with a directory-listed telephone number in order to increase survey participation. The interview was completed with a household member age 18 or older. The interviews averaged 20.2 minutes in length among NIS-ineligible households and 34.0 minutes (including the NIS immunization interview) for NIS-eligible households. Response rates and selected survey results from the Health Module are highlighted in the next section.

4.2 Response Rates and Selected Health Module Results

The sample sizes and response rates for the SLAITS Health Module Pilot Test are shown in Table 1. The combined total number of households interviewed in Iowa and Washington was 2,089. These interviews provided data for 5,541 persons of all ages (2,675 in IA, 2,866 in WA) and 1,543 children under 18 (738 in IA, 805 in WA). The interview completion rates among households were 76% in Iowa and 75% in Washington State.

Taking into account the resolution rate and enumeration rate as well as the interview completion rate, the final CASRO (1982) response rates were calculated as 68% in Iowa and 66% in Washington. Unfortunately, due to resource limitations and schedule considerations, the data collection period for some replicates was stopped before all cases could be completely worked. If the resources had been available to extend the field data collection period, higher response rates could have been achieved.

For producing population-based estimates of totals and percentages, a survey weight was attached to each sample person. This weight combined the base sampling weight (reflecting the probability of selection of an individual in the sample) with an adjustment for households that have multiple telephone numbers, an adjustment to compensate for unit nonresponse, a poststratification adjustment to a set of known population totals, and finally an adjustment to account for noncoverage of nontelephone households using information from the NHIS. Weighted estimates and estimates of standard errors shown in Tables 2 and 3 were obtained using SUDAAN (Shah *et al.*, 1997).

Table 1. Sample Sizes and Response Rates for the SLAITS Health Module Pilot Test, 1997

	Iowa	Washington
	Sample Sizes	
Households	1,021	1,068
Persons of all ages	2,675	2,866
Children <18 years	738	805
	Response Rates	
Interview Completion Rate	76%	75%
CASRO*	68%	66%

*Resolution rate x enumeration rate x interview completion rate.

Table 2. Percent of the Population With and Without Health Insurance in Iowa and Washington, 1997*

	Iowa				
	Total % (se)	<18 years % (se)	18-44 years % (se)	45-64 years % (se)	65+ years % (se)
Insured	93.3 (0.74)	95.9 (1.02)	88.7 (1.40)	94.8 (1.09)	98.4 (0.80)
Uninsured	6.5 (0.73)	4.2 (1.02)	10.9 (1.39)	5.1 (1.08)	1.6 (0.80)
	Washington				
Insured	89.4 (1.15)	93.9 (1.65)	82.1 (1.82)	92.1 (2.62)	99.7 (0.31)
Uninsured	9.9 (1.12)	5.7 (1.62)	16.7 (1.75)	7.7 (2.62)	0.3 (0.31)

*Columns may not sum to 100% due to rounding and to missing data.

As shown in Table 2, the uninsured rate in Iowa (6.5%) was lower than in Washington (9.9%). In both states, the uninsured rate for children under 18 (4.2% in IA, 5.7% in WA) was lower than the uninsured rate for adults aged 18-44 years (10.9% in IA, 16.7% in WA). Table 3 shows selected health status, access, and utilization characteristics for those with and without health insurance. As expected, uninsured and insured respondents reported different health status and health care experiences. Nearly twice as many uninsured persons reported fair or poor health status as compared to the insured. In addition, the uninsured were less likely to have visited a doctor in the past year and were 6-7 times more likely than the insured to report a problem getting medical care.

Table 3. Health Status, Access, and Utilization By Insurance Coverage Among Adults (18-64 years) in Iowa and Washington, 1997

	IOWA		WASHINGTON	
	Uninsured % (se)	Insured % (se)	Uninsured % (se)	Insured % (se)
Fair/Poor Health Status	22 (4.67)	12 (1.09)	21 (4.67)	12 (1.13)
Disability that Limits Work Activities	18 (4.36)	10 (0.93)	24 (7.16)	12 (1.24)
Problem Getting Medical Care (Couldn't Afford)	36 (5.91)	5 (0.80)	45 (6.51)	7 (0.97)
Have Usual Source of Care	86 (3.20)	95 (0.73)	57 (5.78)	93 (0.95)
1 or More Doctor Visits in Past 12 Months	64 (5.41)	81 (1.07)	55 (5.04)	80 (1.32)

4.3 Child Well Being and Welfare Module Study Design

The SLAITS Child Well-Being and Welfare (CWBW) Module is designed to provide state-level estimates of measures related to the transition from welfare to work. The impact of this transition on children in poor families is of particular interest. Therefore, the questionnaire is targeted to families below 200% of the Federal Poverty Level and covers aspects of child well-being such as family structure, stability and turbulence, psycho-social characteristics of parents, neighborhood characteristics, academic and school behavior, and child care arrangements. This module also includes economic indicators of well-being such as welfare program participation, income and earnings, health insurance coverage, and education and employment of adults in the household. The measures used were drawn from numerous national surveys including the NHIS, SIPP, the National Household Education Survey, the Survey of Program Dynamics, and the National Survey of America's Families (conducted by the Urban Institute). This module was recently tested with a random sample of 1,265 households in Texas.

The SLAITS CWBW Module in Texas collected information on the health and well-being of children under 19 years along with information on welfare program participation of households with the targeted sample children. Because the focus of this study was on child well-being from the perspective of program participation, it was important to get a larger sample of low income households than would be obtained from a simple random sample of households. Therefore, this pilot study targeted a sample of 660 households with children whose screened household income was below 200% of the Federal Poverty Level and a sample of 588 households with children under 19 years and income above 200% of poverty. To accomplish this, a general income screening question was added early in the interview. A household respondent 18 years of age or older was asked about the number of household members, the number of children under age 18, and the standard NIS eligibility questions. Respondents in NIS-ineligible households were then asked whether the household income in the last calendar year was above or below a dollar amount determined to be

200% of poverty based on the household's size. Respondents in NIS-eligible households first completed the NIS interview and then were asked this income question. All households with children that reported income below 200% of poverty were included in the sample. Initially, households that reported income above 200% of poverty were subsampled at the rate of 1 in 1.8. This subsampling rate was later adjusted because the actual number of households reporting income below 200% of poverty was greater than anticipated from 1997 CPS data. Using 1997 CPS data, the target sample size, an assumed response rate of 85% to the screening interview, and an assumed 85% interview response rate, the screening sample size was determined to be 5,742 households.

For this study, rather than collecting data for the child well-being questions for every child in the household (which could make for a very long interview), a maximum of two children were randomly selected from each sample household. Children in each household were stratified into two age groups: All children from 0 to 5 years were in the first stratum and children between 6 and 17 years were in the second stratum. If children were present in both age groups, then one child was selected at random from each age group. If there were children only in one age group, then no more than two children were selected at random from that household. In single child households, the child was included in the sample.

The CWBW interviews (including the SLAITS portion of the screener) averaged 30.3 minutes in length among NIS-ineligible households and 45.1 minutes (including the NIS portion) for NIS-eligible households. Among the NIS-ineligible households, the interview ranged from a mean of 26.9 minutes for a one child household to 32.5 minutes for a household with 2 children. Spanish-speaking respondents were interviewed by a bilingual interviewer using a Spanish translation of the questionnaire.

Response rates and selected survey results from the CWBW Module are highlighted in the next section.

4.4 Response Rates and Selected Child Well Being and Welfare Module Results

The total number of households interviewed in Texas was 1,265. These interviewed households yielded completed interviews for 686 children 0-5 and 1,323 children 6-17 years. The interview completion rate among households was 88%. The American Association for Public Opinion Research recommends that final response rates for surveys that involve screening take into account the resolution rate, the screener completion rate, and the interview completion rate. The final response rate was calculated as 70% in Texas — slightly higher than the rates for the health module.

For producing population-based estimates of totals and percentages, a survey weight was attached to each sample person using the same weighting process as for the health module. Likewise, weighted estimates and estimates of standard errors were obtained using SUDAAN (Shah *et al.*, 1997). Table 4 compares children living in lower-income families with children living in higher-income families. For example, compared to children in higher-income households, children in lower-income families were more likely to be living with only one parent (16.6% versus 37.6%). Income levels were also related to important measures of child well-being. For example, nearly twice as many children in lower-income families lived with aggravated parents (11.5%), as compared to children in

higher-income families (6.0%). This difference is particularly important because high stress and aggravation in parents are associated with poor cognitive, social, and emotional development in children. Finally, as might be expected, the proportion of children without any type of health insurance coverage was substantially higher for those children living in lower-income households (36.4%) compared to those residing in higher-income households (5.0%).

Table 4. Selected Measures of Well-Being and Health Insurance Coverage by Poverty Status in Texas, 1999

	# 200% FPL ¹ % (se)	> 200% FPL ¹ % (se)	All Income Levels % (se)
Family Structure			
Living with no parents ²	3.7 (.76)	2.2 (.58)	2.9 (.47)
Living with one parent ³	37.6 (2.14)	16.6 (1.74)	27.7 (1.39)
Parents never married to each other	24.6 (1.93)	5.6 (.81)	16.0 (1.12)
Child Well-Being			
Read Stories 3+ times per week (age 1-5)	73.8 (2.93)	90.9 (2.75)	80.7 (2.00)
Participated in Extracurricular Activities in last year (age 6-17)	54.4 (2.82)	76.9 (2.38)	64.9 (1.82)
Live with Aggravated Parents	11.5 (1.50)	6.0 (1.04)	9.6 (.95)
Health Insurance⁴			
Private	35.4 (2.22)	88.1 (1.46)	59.5 (1.54)
Public	28.9 (1.93)	8.9 (1.26)	19.6 (1.18)
Other	3.4 (.66)	5.1 (.92)	4.1 (.53)
Uninsured	36.4 (2.15)	5.0 (.99)	22.0 (1.31)

¹FPL = Federal Poverty Level

²Includes biological, foster, step, and adoptive parents, but not other guardians

³One parent families may include unmarried partners

⁴Columns may not sum to 100% because respondents could report more than one type of insurance coverage.

5. Concluding Comments

Testing of the CWBW Module is continuing with a second pilot in Minnesota (scheduled to be completed in late summer 1999), where it is focusing strictly on families with children insured by state-based health coverage (e.g., Medicaid and MinnesotaCare). In addition to providing well-being data for publicly insured children, this survey will also provide information on how accurately respondents report their children's Medicaid coverage. A similar analysis of the accuracy of Medicaid reporting is also being undertaken in Texas by linking the pilot-test data to state-maintained administrative databases (with respondents' permission, of course). Upon completion of analysis of

the two special SLAITS Medicaid evaluation studies, the information can be used to improve the accuracy of estimates of health care coverage and other program participation data from SLAITS through implementation of methods to statistically adjust the estimates for reporting error such as under-reporting. These results will likely be of interest to many health care researchers and the results could be adapted for other studies undertaking surveys of the low income population.

SLAITS is also in the process of developing additional new modules. For example, a Children's Health Insurance and Health Care Module has been developed for use by states to plan programs and monitor progress toward increasing health insurance coverage and improving access to care as required in the recently enacted Children's Health Insurance Initiative (Title XXI of the Social Security Act). The current draft of this module draws on questions from the NHIS, the Consumer Assessment of Health Plans, and the Medical Expenditure Panel Survey. (These latter two surveys are conducted by the Agency for Health Care Policy and Research.) Questions focus on health insurance coverage, access to care, use of preventive health services (e.g., well-child care, dental screening), children's health status, and unmet needs. Additional indicators of health care quality and satisfaction are also included. Pending funding, this module will be tested in one or more states.

Additional SLAITS questionnaire modules under consideration or in the early development phase include an Asthma Module with detailed items on asthma care and treatments, a module on HIV testing and risk behaviors, and a module related to the health and development of young children. This Pediatric Care Module is being planned in collaboration with the American Academy of Pediatrics and the UCLA Center for Healthier Children, Families, and Communities as part of a larger project sponsored by the Gerber Foundation. The overall design is to have companion surveys of pediatricians and parents to provide data on critical contemporary questions surrounding the health and development of children. Some of the topics to be addressed include how pediatricians deal with developmental issues, parents' concerns about developmental issues, the primary stresses and concerns of parenting, how pediatricians address parenting issues, access to and satisfaction with the health system, and how health care services are coordinated. Finally, a special module is being planned to assess health care and health care access for children with special health care needs, to be conducted in collaboration with the Maternal and Child Health Bureau of the Health Resources and Services Administration, DHHS.

In conclusion, SLAITS has the capacity to grow into a broad based ongoing surveillance system at the state and local levels to track and monitor the health and well-being of both adults and children. Until now, information on many of the important topic areas discussed in this paper were available nationally from the NHIS, and were available at the state-level from the Behavioral Risk Factor Surveillance System (BRFSS) or, in some cases, from special state-sponsored surveys. Yet, these surveys often provided little detail on specific topic areas or were restricted to adults only. The SLAITS survey mechanism and questionnaire modules have been designed to complement these existing national and state surveys and systems. A unique feature of this new population-based resource is the ability to collect comprehensive data on specific health and welfare-related topics and for specific at-risk subdomains of the population. This flexibility provides health policy makers with many analytic possibilities to track and monitor specific state health and welfare programs and to evaluate emerging public policy issues at the state and local level.

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