

## PROVIDER ON-LINE LOCATING FACILITY FOR A TELEPHONE SURVEY OF CHILDHOOD IMMUNIZATION

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### Background

The National Immunization Survey (NIS) provides coverage estimates for children aged 19 to 35 months in each of 78 state and urban areas designated as Immunization Action Plan (IAP) areas by the National Immunization Program in the Centers for Disease Control and Prevention (CDC). Coverage-level estimates for the 78 areas and for the nation as a whole are published in *Morbidity and Mortality Weekly Report (MMWR)*, U. S. Department of Health and Human Services/Public Health Service (Ezzati-Rice *et al.*, 1995).

The NIS uses a list-assisted random-digit-dial (RDD) sample design. Households with eligible children are interviewed by telephone and invited to participate in the survey by providing immunization data about each eligible child in the household. Respondents are encouraged to rely on shot cards given to them by physicians and other immunization providers. Although more than half of the respondents do use these records as they respond to the survey, a significant proportion do not. Even when respondents do refer to shot records during the interview, they may have incomplete records. Parents can lose a copy of the shot card and be given a new one that omits earlier vaccinations, or they may have changed physicians and kept only the shot card from the newer provider.

The NIS Provider Record Check Study was designed to address these shortcomings in the household data by obtaining vaccination records from providers themselves. During the telephone survey with eligible households, interviewers request permission from the respondent to contact immunization providers and obtain mailing addresses for those providers.

Obtaining correct mailing addresses from household respondents is an essential component of contacting providers to request the necessary immunization records. This paper describes an enhancement to the NIS CATI system questionnaire that is designed to increase the accuracy of provider address information; reduce the time required for interviewers to gather address information; and

reduce the time required to edit and locate provider addresses before mailing requests to obtain or complete children's immunization information.

### Provider On-Line Locating Facility

The locating facility consists of three components:

- a database of immunization providers developed from previous quarters of NIS data collection;
- a section of the CATI program allowing interviewers to prompt respondents using listings in the provider database; and,
- an off-line facility that allows access to the database by clerks engaged in locating activities subsequent to the interview and in procedures related to the mailing of requests to providers.

Initially, the database consisted of contact information for about 35,000 providers compiled over five previous quarters of data collection for the NIS Provider Record Check Study. The original source of information about any provider was a household respondent contacted during an NIS telephone interview. Providers' names, addresses and telephone numbers were then located and edited for use in the NIS Provider Record Check survey. As address corrections were received from any source, these corrections were made for additional contacts with that provider during that quarter. In preparation for using this Provider Address Database (PAD) on-line, exact duplicate records, where provider name, address, and telephone number all matched, were identified and consolidated. However, because immunization providers can work from more than one location, providers with multiple addresses have separate records for each address. Currently, the database contains about 51,525 provider records. Additional records are added each quarter as new providers are identified during telephone interviews and verified in subsequent locating efforts.

The provider database is available to interviewers through the provider section of the CATI questionnaire. This section begins with an explanation of the Provider Record Check Study and asks respondents for oral

permission allowing providers to release immunization records to CDC. Respondents are requested to supply the names and addresses of all immunization providers for the NIS-eligible child. To avoid leading respondents to providers already in the database, interviewers are trained to ask for the names and addresses of providers in an open-ended question. However, if the respondent has difficulty recalling the exact name or address of a provider, the interviewer can use records from the database to prompt respondent recall.

Using a geocoding software package,<sup>1</sup> the CATI system searches for all known providers within a variable radius of the respondent's current residence. Based on the postal ZIP codes of the respondent and the providers, the CATI system displays only the corresponding portion of the database. The radius is set by the CATI software between 20 and 50 miles, depending on provider population density in the respondent's local area. Metropolitan areas with higher numbers of providers in a smaller geographic region are usually restricted to a 20 mile radius while rural locations may extend to a 50 mile radius to include providers in the closest urban area. This partitioning of the database was designed to simplify the search and minimize the time necessary to locate the correct provider record.

Once the correct portion of the PAD is displayed, the interviewer can search the list alphabetically by typing the first few letters of either a physician's last name or the first word of an organization name. If the provider named by the respondent is an exact match for a provider listed in the database, a single keystroke allows the interviewer to attach the provider name and address information to the survey data file, further reducing interviewer labor and respondent burden.

If an exact match cannot be found in the PAD for the respondent's provider, the interviewer has two options. The first option involves provider information with only minor variations from an entry in the PAD. The interviewer can choose the provider listing, indicate a need for minor changes, and type in those changes. This record will then be referred for editing and/or locating before it is approved for use in contacting the provider. The PAD stores both previous and current addresses for providers who have relocated, allowing the respondent and interviewer to identify a provider at either address. A trained locator will contact the provider to determine if the respondent supplied information that is more recent than the record in the PAD. In this manner, it is possible to continuously update provider addresses.

The second option facilitates gathering information

about a provider with no entry in the PAD. The interviewer types all information from the respondent about the provider into the CATI system. This new provider information is referred for editing and locating before it is used to contact the provider. Information for this provider will then be added to the PAD and will be available as a choice for subsequent interviews.

The database is also available to clerks involved in provider locating efforts that follow the interview. Each of the provider names and addresses recorded verbatim during the interview session is edited for completeness and correct spelling. Checking the verbatim addresses against the provider database can improve the efficiency and accuracy of this procedure. Prior to using the PAD during CATI household interviewing, every provider named during an interview was sent through the editing and locating process.

During the first few months that the PAD was available to telephone interviewers, about fifty percent of providers named by respondents during an interview were found in the on-line look-up. These entries needed no additional work from editors or locators and were immediately available for use in mailing requests to providers. Consequently, the amount of time spent in post interviewing processing of provider addresses was substantially reduced.

Finally, the database is used in the preparation of mailings to providers. The database includes an indicator for a preferred mailing address. This is used in situations, such as a multi-site medical practice, where medical records are stored in a site other than the location where the NIS child may have received vaccinations. This feature is particularly helpful for government-sponsored clinics which provide multiple neighborhood sites for immunizations but store all records in a central location.

In addition, the database is updated to reflect the current status of facilities and providers. For example, facilities that have closed or providers who have deceased are noted in the database in order to avoid unnecessary mailings. Similarly, records of health care professionals named incorrectly by respondents as immunization providers (for example, dentists or psychologists) are also noted, again to avoid unnecessary mailings.

## Results

As mentioned above, the three objectives of the on-line locating facility are: (1) improved accuracy of provider address information, (2) reduced interviewing time required for the provider section of the questionnaire, and (3) reduced effort in the tasks of editing and locating provider addresses subsequent to the interview. The following paragraphs present some results related to these objectives. Evaluation of the on-line locating facility is continuing and these results should be considered preliminary.

The on-line locating facility was introduced in the third quarter of 1997 (Q3/1997). Table 1 presents a comparison of two outcome measures from Q2/97 and Q4/97 (the

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<sup>1</sup>The geocoding software is "Pro-Zipcode Deluxe" with "ADD-ON PRODUCTS" available from Professional Computer Consulting, Inc., 13600 Roanoke St., Davie, FL 33325.

quarters just prior and just following the introduction of the facility). A slightly smaller percentage of providers identified in telephone interviews were mailed the initial request (95% in Q2/97 compared with 94% in Q4/97). Investigation determined that the difference was because of a reduction in mailings to facilities that were no longer in practice (the practice had closed or the provider had died) or to practices that were not immunization providers (respondent incorrectly provided the name of a dentist or other health professionals that did not offer vaccinations).

**Table 1**  
**Comparison of Two Outcomes Before and After**  
**Introduction of On-line Locating Facility**

	Q2/97 %	Q4/97 %
Providers Mailed Initial Request	95	94
Participating Providers	91	96

*Source: National Immunization Survey, 1997*

The second row of Table 1 shows that, following the introduction of the on-line locating facility, the percentage of responding providers was higher (96% in Q4/97 compared with 91% in Q2/97). Provider participation in the Provider Record Check Study is the result of several factors and this increase is probably not attributable solely to the on-line locating facility. Nonetheless, this difference can be taken as evidence that the locating facility has had a positive impact on the accuracy of provider addresses.

The second objective is a reduction in interviewing time necessary to collect accurate provider address information. Initial results from Q2 and Q4 suggest that the locating facility has not resulted in a lower average length of interviewing time for the provider section. In each of these quarters, the average time for completing this section is about 8 minutes.

The third objective is a reduction in clerical effort subsequent to the interview. More than half of the providers named during the interview are matched to provider records in the database, either during the interview or during subsequent processing steps. Because these addresses have been edited and approved for mailing labels, the time necessary to edit provider names captured during the interview has also decreased.

### Conclusions

Initial results suggest that the locating facility has achieved two of its three objectives. The accuracy of provider address information appears to have been improved. The

time necessary to complete editing procedures subsequent to the interview has also been reduced. However, interviewing time for the provider section of the NIS questionnaire is the same before and after the introduction of the on-line locating facility. We are continuing to monitor these figures and are seeking means to realize this objective through improvements in interviewer training.

This result notwithstanding, the benefits of the on-line locating facility appear to justify its development and continued use in the NIS data collection procedures.

### References

Ezzati-Rice, T.M., Zell, E.R., Battaglia, M.P., Ching, P.L.Y.H., and Wright, R.A. (1995), "The Design of the National Immunization Survey." *1995 Proceedings of the Section on Survey Research Methods*. Alexandria, VA: American Statistical Association, pp. 668-672.