# HOW ACCURATE ARE PROXY REPORTS: RESULTS OF A VERIFICATION STUDY

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## Abstract

Information from proxy respondents is known to be less accurate than information obtained directly from sampled persons. However, less is known about the degree of proxy reporting inaccuracies and whether particular types of proxy respondents (spouses, parents, or others) are more likely to provide accurate information about the sampled person. This paper describes a proxy-report verification study implemented as part of the State and Local Area Integrated Telephone Survey (SLAITS) National Asthma Survey (NAS), sponsored by the National Center for Environmental Health (NCEH), Centers for Disease Control and Prevention (CDC) and conducted by the National Center for Health Statistics (NCHS), CDC.

The NAS, conducted between February 2003 and February 2004, was designed to measure covariates that relate to asthma control, estimate an asthma prevalence rate at the national level, and characterize the content of care and experiences of persons with asthma. The NAS measured error in proxy reporting of adult asthma-positive status – that is, reporting that other adult household members had asthma. In the verification study, households in which a proxy respondent indicated that another sampled household member did not have asthma (asthma-negative) were re-contacted. At callback, the individuals were asked to verify their own asthma status.

This paper reports the results of the verification study, based on 758 completed callback interviews.

## Background

Asthma, an inflammatory condition of the airway, is an important common chronic disease. According to two surveys sponsored by the CDC, the National Health Interview Survey and the Behavioral Risk Factor Surveillance System, approximately 11% of persons 18 years of age and over self-report having lifetime asthma, defined as ever having been told by a doctor or other health professional that they had asthma, and 7% report currently having asthma (1-2).

The CDC's NCEH sponsored the NAS to examine the health, socioeconomic, behavioral, and environmental predictors of better control of asthma; characterize the extent of health care use of persons with asthma; and provide detailed information about asthma treatment and control. The NAS used the SLAITS mechanism (3).

## Methods

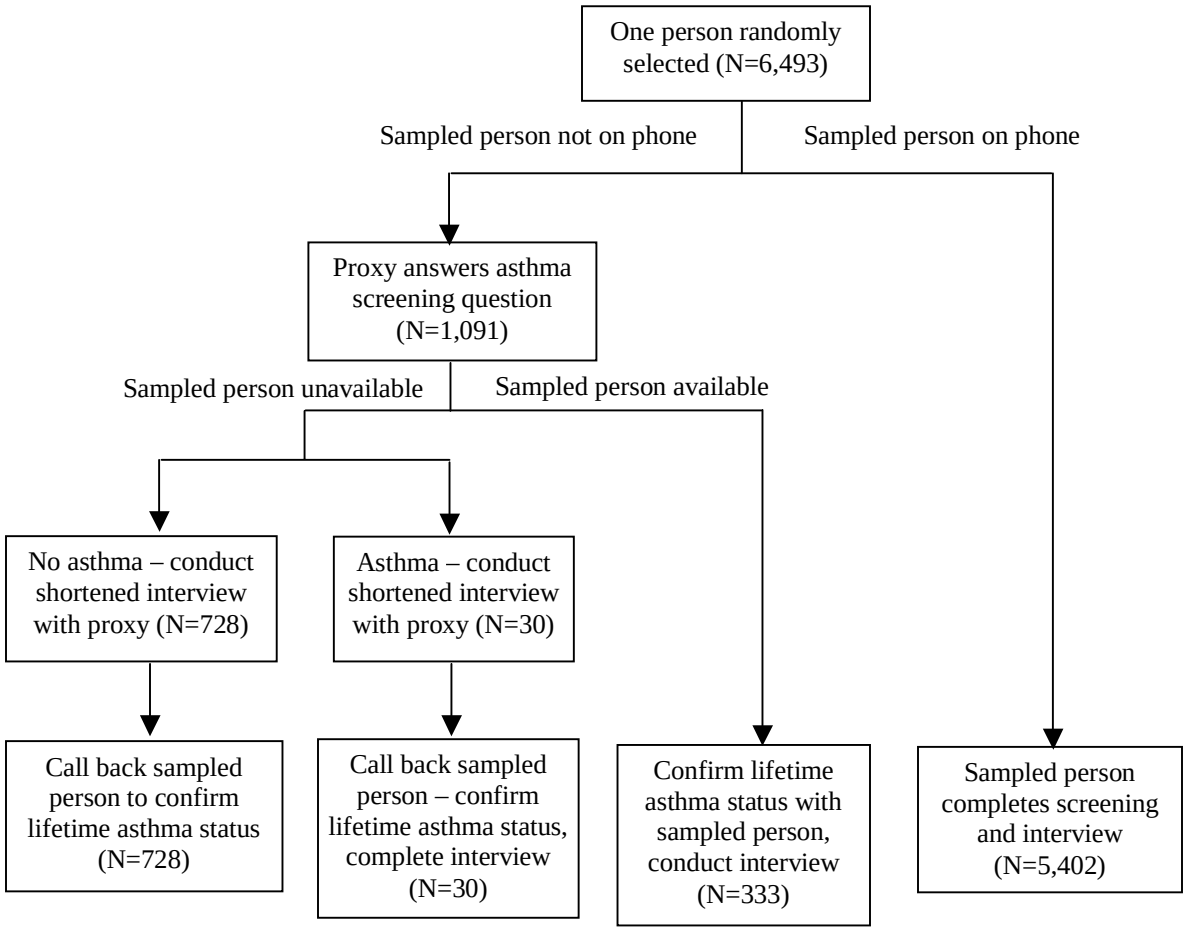
The NAS, an RDD survey, randomly sampled one person per household and determined that person's lifetime asthma status from the adult in the household who initially answered the telephone screening. In over 16% of cases, this respondent was not the sampled household member. In such cases, after asthma screening was completed, the interviewer asked to speak to the sampled household member (adults only), with three possible results:

- The sampled household member was available and an interview was conducted with him/her.
- The sampled household member was not available and was reported to have asthma: the proxy adult completed the household environment and demographic questions and a callback was set to complete the detailed asthma interview with the sampled household member. Asthma status was confirmed with the sampled respondent on the callback.
- The sampled household member was not available and was reported not to have asthma: the proxy adult completed the household environment and demographic questions and the sampled household member was later called back as part of an NAS Verification Study to confirm the asthma status as provided by the proxy adult.

Only cases where the sampled person was an adult and confirmed his/her asthma status are included in this study. Figure 1 diagrams the possible questionnaire paths.

Survey topics were concentrated in several domains: health care utilization and medical behaviors of persons with asthma; knowledge and use of asthma medications; impact of asthma on daily routine; household environment characteristics; demographics; other risk factors for asthma; and family history of asthma. Sampled respondents with current asthma received all sections. Sampled respondents with lifetime, but not current asthma, only received questions on household environment characteristics, demographics, and family history of asthma.

**Figure 1. National Asthma Survey Questionnaire Paths**




**Results**

As can be seen in Table 1, proxies incorrectly reported 37.3% of lifetime asthma cases. However, proxies correctly identified 99.3% of asthma-negative cases. The overall proxy reporting error rate was 4.7%, computed by dividing the false reports by all reports. Percentages in all tables are based on weighted data and chi-square significance testing was performed using SUDAAN® software.

Table 1. Proxy Reporting Error Rates

| **Self-Reported Lifetime Asthma Status ("True State")** | **Proxy-Reported Lifetime Asthma Status** | |
|---|---|---|
| | **Asthma Positive** | **Asthma Negative** |
| Asthma Positive | 72 (62.7%) | 50 (37.3%) |
| Asthma Negative | 7 (0.7%) | 955 (99.3%) |

* $p<0.001$

The proxy error reporting rate of lifetime asthma status for current asthma cases is lower than the proxy error reporting rate of lifetime asthma status for former asthma cases (see Table 2). Proxies correctly identified the lifetime asthma status of 71.5% of the current asthma cases, while correctly identifying the lifetime status of only 61.7% of the former asthma cases. Although this difference is not statistically significant, it does suggest that proxies are more likely to correctly identify lifetime status if the asthma is currently active.

Table 2. Comparison of Accuracy of Proxy Reporting for Current and Former Asthma Status

| Current Asthma | | | Former Asthma* | | |
|---|---|---|---|---|---|
| **False Negatives** | **True Positives** | **Total** | **False Negatives** | **True Positives** | **Total** |
| 22 (28.5%) | 48 (71.5%) | **70 (100%)** | 16 (38.3%) | 23 (61.7%) | **39 (100%)** |

* "Former" asthma cases are sampled persons who respond yes to the "lifetime" question and no to the "current" question.
* Chi-square significance test revealed no statistically significant differences in proxy reporting error rates between respondents with current and former asthma.

The accuracy of proxy reports varied by the relationship of the proxy to the sampled person (Table 3). Although the differences in reporting error rates are not statistically significant, mothers do appear to commit fewer errors when reporting lifetime asthma status than do other household members. Reporting error rates were computed overall and for two subgroups of sampled adults: adults 18 to 44 years of age and adults aged 45 or older. Relationship data were collected only in cases where the proxy reported that the sampled person did not have asthma and the sampled person was unavailable at the time of the initial call. Percentages in Table 3 do not reflect overall proxy reporting error rates but are only for the cases where relationship data exist.

Table 3. Proxy Reporting Error Rate for Negative Reports of Asthma by Relationship of Proxy to Sampled Adult

| Relationship of proxy to sampled adult | Proxy reporting error rate* | | |
|---|---|---|---|
| | **Overall** | **Sampled adults 18-44 years of age** | **Sampled adults Aged 45 or older** |
| Sibling | 12.5% (n=18) | 7.5% (n=14) | 39.1% (n=4) |
| Other Non-Relative | 10.4% (n=35) | 4.5% (n=23) | 24.4% (n=12) |
| Unmarried Partner, Boyfriend/Girlfriend | 8.9% (n=31) | 7.8% (n=24) | 14.1% (n=7) |
| Child | 8.1% (n=53) | 6.6% (n=15) | 8.8% (n=38) |
| Father | 5.8% (n=32) | 5.0% (n=28) | 13.8% (n=4) |
| Spouse of Female Sampled Respondent | 5.4% (n=177) | 3.7% (n=82) | 7.4% (n=95) |
| Spouse of Male Sampled Respondent | 4.5% (n=364) | 4.7% (n=120) | 4.3% (n=244) |
| Other Relative | 4.2% (n=15) | 9.8% (n=6) | 0.0% (n=9) |
| Mother | 1.0% (n=81) | 1.2% (n=65) | 0.0% (n=16) |

* Reporting error rates were computed by dividing the number of false reports by the total number of reports.
* Chi-square significance test revealed no statistically significant differences in proxy reporting error rates by the relationship of the proxy.

## Discussion

The NAS examined the accuracy of proxy reporting of lifetime asthma status, finding that proxies missed 37.3% of lifetime asthma cases. The overall proxy reporting error rate was 4.7%. False negative cases appear less likely to have current asthma than respondents correctly identified by proxies. The relationship of the proxy to the sampled person was also related to the accuracy of reporting, with mothers committing the fewest reporting errors.

These findings from the NAS suggest that caution should be used when dealing with proxy reports of health conditions. Factors such as whether the disease is currently active and the relationship of the proxy to the sampled person can impact the accuracy of the data collected. People that do not currently have the condition are more likely to be missed when using proxy reports. This suggests that using proxies to screen for current asthma instead of lifetime asthma might be more appropriate. Proxy information regarding current and lifetime asthma status should be confirmed whenever possible.

## References

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