



Health District of Northern Larimer County
Larimer County 2016 Triennial Community Health
Survey

Methods Report

June 2017



LeCroy & Milligan
ASSOCIATES, INC.

Health District of Northern Larimer County 2016 Triennial Community Health Survey – Methods Report

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About LeCroy & Milligan Associates:

Founded in 1991, LeCroy & Milligan Associates, Inc. is a consulting firm specializing in social services and education program evaluation and training that is comprehensive, research-driven and useful. Our goal is to provide effective program evaluation and training that enables stakeholders to document outcomes, provide accountability, and engage in continuous program improvement. With central offices located in Tucson, Arizona, LeCroy & Milligan Associates has worked at the local, state and national level with a broad spectrum of social services, criminal justice, education and behavioral health programs.

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Introduction

The Health District of Northern Larimer County was established in 1960 as a public tax-funded special district organized under the laws of the State of Colorado. The Health District is comprised of the northern two-thirds of Larimer County, an area of approximately 1,800 square miles. The largest population center of the Health District (and Larimer County as a whole) is Ft. Collins, which according to 2011-2015 American Community Survey 5-Year Estimates had a population of 153,292 (U.S. Census Bureau n.d.). The remainder of the population of the Health District lives in geographically dispersed small towns and unincorporated areas. The population of the Health District as a whole was estimated to be 220,303 in 2015 (U.S. Census Bureau n.d.).

Since 1995, every three years the Health District has surveyed community members who reside within its boundaries about their health needs and health status using a written survey sent to a scientific sample of addresses. Residents in the southern third of Larimer County have also been surveyed in all years except 1998. While in its earliest iterations the survey's administrators recruited respondents by phone, in 2007 the survey moved to mail-only recruitment methods, using the USPS Delivery Sequence File (DSF) as the sampling frame. The 2013 administration of the survey added a web-based option for survey completion.

The Health District contracted with LeCroy & Milligan Associates of Tucson, Arizona to conduct its 2016 Community Health Survey. Residents of both the Health District and southern Larimer County were surveyed, resulting in data for all of Larimer County. The survey used a four-wave design: a pre-notice letter, first mailing of the survey, reminder postcard, and second mailing of the survey. The survey was officially launched with mailing of the prenotice letter on September 22, 2016. The last completed survey was received on January 18, 2017 on SurveyMonkey.

Methods

Questionnaire Development

For the 2016 administration of the survey the Health District made extensive revisions to the questionnaire used in 2013, deleting many items, revising the wording of others (or their response choices), and adding new items. The order of thematic sections and items was also greatly modified. The LeCroy & Milligan Associates project team collaborated in the development of this revised survey, providing feedback for wording of an introductory



section, items, directions related to items, response choices, item and thematic section order, and formatting for both the paper and web-based versions of the survey.

The resulting paper survey consisted of 65 numbered questions but including sub-questions there was a total of 148 items. Some questions were specific to respondents with certain demographics or characteristics (e.g., gender, those who do not have health insurance) – respondents to whom a question did not apply would skip it. The survey was printed on three sheets of 11 by 17 inch paper in landscape orientation, and the three sheets were folded in half and stapled in the center crease, producing a 12-page questionnaire booklet. A Spanish language version of the survey booklet was also available upon request.

The web-based version of the survey had 149 items, the difference in number from the paper version of the survey resulting from a need to format some questions in the web-based version differently due to limitations of the SurveyMonkey platform. The only real difference between the paper and web-based versions of the surveys was a question about seat belt usage that the Health District decided to add late in the process and after printing preparations had already begun. The web-based version of the survey included this question.

LeCroy & Milligan Associates also participated in piloting the web-based version of the survey. In addition, the LeCroy & Milligan Associates project team collaborated in translating both the paper- and web-based versions of the survey into Spanish. LeCroy & Milligan Associates posted both the English and Spanish versions of the survey on the SurveyMonkey website and collaborated with the Health District's IT department in establishing active links to the surveys posted on SurveyMonkey and a validation system to ensure only members of the sample could access the survey.

Sample Design

LeCroy & Milligan Associates collaborated with the Health District in designing the parameters of the sampling frame that would include addresses in both the Health District and southern Larimer County. The Health District and LeCroy & Milligan Associates conferred with county staff from a neighboring county (Weld County) that was conducting a similar health survey about what the sampling frame's parameters should be. At the suggestion of the Health District, LeCroy & Milligan Associates contacted Marketing Systems Group of Horsham, Pennsylvania, one of the leading national vendors specializing in the generation of scientific samples, to obtain an address list. LeCroy & Milligan Associates worked with the list vendor to further identify parameters that would best capture the population of the county. It was determined that the list should include certain address types:



- City Style – addresses with a typical city street number (e.g., 501 Oak St.);
- Highway Contract – non-city style address where mail is delivered via highway by private firm contacted by the USPS;
- Rural Route – non- city style address (e.g., Rural Route Box 12);
- Throwbacks - address is a street address, but actual delivery is made to a customer’s P.O. Box; and
- Post Office Boxes – OWTGM (Only Way To Get Mail) – the residence has no choice but to get mail via their post office box.

Excluded from the sample were addresses that are traditional post office boxes, seasonal, educational, drops (mail is left at central place for distribution to multiple residents), and vacant residences

At the request of the Health District, addresses in Jelm (an area with residents in both Larimer County, Colorado and Albany County, Wyoming) were also included in the sampling frame. The 2010 U.S. Census put the population of Jelm at 97.

The sampling design was based on a representative sample of Larimer County based on the number of households within census tracts. Two census tracts were excluded from the sample: census tract 6 which covers the university dormitory and student housing areas, and census tract 28.03 which is a national park. In addition, in order to improve the response rate of households with low household income and higher Hispanic populations, three census tracts were oversampled. Census tracts 13.04 and 13.06 had low response rates in the 2013 survey and more than 30% of its households living below the poverty level and of Hispanic ethnicity. Census tract 5.03 had more than 50% of its households living below the poverty level. These three census tracts were oversampled at a 2 to 1 ratio.

Based on the described parameters, we obtained a probability sample of 9,084 mailable addresses for the county based on the census tract distribution. Whenever possible, addresses had names attached to allow personalization of mailing envelopes and other survey-related material. Random selection within household was also utilized during data collection, with the pre-notice letter including instruction to the household that the questionnaire should be filled out by the adult (ages 18 years or older) in the household who will have the next birthday. LeCroy & Milligan Associates randomly assigned each household in the sample an identification code from a list developed by the Health District. This code was printed on the pre-notice letter and subsequently mailed survey-related materials (i.e., the initial survey, reminder post-card, and replacement survey). Individuals were asked to go to the Health District website and enter their



code if they chose to complete the survey online. Once this was entered, the individual was directed to a linked SurveyMonkey survey to ensure that people did not complete the survey more than once online.

Survey Administration

LeCroy & Milligan Associates mailed a pre-notification letter authored by the Health District to every household in the sample on September 22, 2016. This letter, written in both English and Spanish, informed recipients of the proximate arrival of a paper survey, and included a link and login code allowing respondents to complete the survey online. On September 29, 2016 we sent a paper questionnaire to all sample addresses that had not responded with completed web surveys. Accompanying the questionnaire was a cover letter in both English and Spanish that requested participation and a postage paid business reply mail envelope for returning the completed survey. Additionally, the mailing included a \$2 bill as an incentive and appreciation for completing the survey.

Notable proportions of the pre-notification letters and the first mailing of the survey packets were returned as undeliverable for a variety of reasons (e.g., the addressee no longer resided at the address, the address did not exist). Therefore, in the last week of October 2016 the Health District re-sent 1,340 of the surveys, replacing addressees' names with Valued Community Member (see table below). On October 31, 2017, LeCroy & Milligan Associates sent a reminder postcard to addresses for which a survey had not yet been completed.

On November 14, 2017, LeCroy & Milligan Associates sent the second mailing of the survey packet to 7,082 households. Survey packets were not sent to households that had already completed a paper or online survey, or addresses identified as invalid by the United States Postal Service on returned mail. The second survey packet included a cover letter, survey booklet, and return envelope but not a \$2 bill. LeCroy & Milligan Associates replaced addresses names with Current Resident on 848 of the survey envelopes to increase the chances of delivery to households that had not received a first mailing of the survey due to addressee name problems. However, a check of returned mail from the second mailing of the survey identified a relatively small number of surveys (545) had still been addressed to a person who no longer resided at the address. To compensate, LeCroy & Milligan Associates did a supplementary mailing of 296 surveys to such addresses with Current Resident replacing addressees' names. The following table provides information about mailings of the survey and related materials.



Exhibit 1. Survey Mailing Information

Mailing Description	Mailer	Number Sent	Number (%) successfully delivered
Prenotice letter	LeCroy & Milligan Associates	9,084	7,773 (85.57)
First mailing of survey	LeCroy & Milligan Associates	9,084	7,531 (82.90)
Re-mail of returned first surveys	Health District	1,340	1,217 (90.82)
Reminder post card	LeCroy & Milligan Associates	7,330	6,620 (90.31)
Second mailing of survey	LeCroy & Milligan Associates	7,082	6,261 (88.41)
Re-mail of second surveys that had not had addressee changed to Current Resident	LeCroy & Milligan Associates	296	275 (92.9)

Response Rates and Margins of Error

The initial sample consisted of 9,084 household addresses within Larimer County. Multiple mailings were conducted which provided households different opportunities to respond. Overall, there was a total of 842 households that did not receive a survey at any of the time points leaving an overall sample of 8,242. Survey data collection was closed on January 18th, 2017. A total of 2,279 surveys were completed for an overall response rate of 28%. Approximately 71% of the surveys (1,622) were completed by hand on paper, with the remainder of the surveys (657) completed online. Using a 95% confidence level, the margin of error is 2.04 for the sample of 2,279. Given this margin of error, the estimates produced from the survey are considered to be an accurate representation of Larimer County household residents.

Of the completed surveys, 1,378 (61%) were from households within the Health District and 901 (39%) were outside of the Health District boundaries. Within the Health District the margin of error is 2.63, while for households outside the Health District boundaries the margin of error is 3.25. These are also within an acceptable margin of error to generalize to the selected population.

Data Compilation and Analysis

Paper surveys received by LeCroy & Milligan Associates were hand-entered into a separate SurveyMonkey site for ease of matching the variable names and coding. The data entry staff did a 10% quality assurance match on the surveys. This entailed having a different data entry person review a random 10% of a stack of surveys just entered for accuracy. If data entry errors were detected, corrections were made and an additional 10% of surveys were reviewed. This resulted in a total of 205 surveys reviewed for data entry errors with a less than 1% error rate. Additional data cleaning was conducted to determine outliers and other values that did not seem accurate. The data entry staff was able to pull out and review the answers on these surveys. An example of outlier values



is a height of 9 feet 6 inches that one respondent wrote. Although this was what the individual wrote, this value is outside of the current realm of human height and was changed to missing. This and other questions where the responses were considered inaccurate were reset to “missing” for purposes of the analysis. The data from both the online survey and the paper survey were combined with a variable created to denote which type of survey was taken. Overall there were eleven surveys which appeared to be duplicates (same household, same demographics). In each case the earlier survey was chosen, but additional comments were included for 2 surveys where the comments had changed. All data were cleaned and new variables created. Syntax files include all created variables used for analysis.

In order to provide a good representation of the Larimer County population, weights were applied to the data. LeCroy & Milligan Associates and the Health District discussed weighting options and two methodologies were chosen. The first method used post-stratification weights of age and gender distributions for Larimer County based on 2015 U.S. Census Bureau estimates. This is directly comparable to prior years’ surveys. Second, in order to account for the sampling design which included oversampling three census tracts to try to improve the response rates of low income and Hispanic households, the data was weighted back to the sampling proportions by census tract, and then post-stratification weights of age and gender distributions was applied. Post-stratification weights for age and gender came from the 2015 U.S. Census Bureau estimates, as comparable data were not available from State Demography Office of Colorado. Both of these weighting options were then applied to the sample to produce two final weighted samples for use in analysis.

The 2016 Larimer County Survey data file was then used to create a set of custom cross-tabulation tables, referred to as “banner spreadsheets,” for each categorical or created categorical question asked on the survey, with the percent distributions broken down by age, gender, income level, health insurance type, self-rated health status, access to health care, primary health care provider status, days of poor mental health, days of poor physical health, and educational attainment. LeCroy & Milligan Associates created three banner spreadsheets, one each for the Health District service area, the south part of Larimer County, and the full county.

In addition to the 2016 Larimer County Survey data file, a second data file was created that combined the 2016 data with the prior survey data. This required additional recoding as some questions had been coded differently in prior years. This combined data was then used to create another set of custom cross-tabulation tables referred to as “trend banners” for a subset of the categorical or created categorical questions by survey year. Altogether, three “trend banners” were created – one for the Health



District service area, another for the southern part of Larimer County, and a third one for all of Larimer County. Some questions on the “trend banners” have data available for all years back to 1995, while others are only available for the 2013 and 2016 survey years. Single year and trend banner spreadsheets were created using both of the weighting options and provided to the Health District.

Data cleaning was conducted in both Microsoft Access and SPSS, version 22. All data analysis was completed in SPSS, and custom tables were finalized in Microsoft Excel.

