Health Consultation

Report of a Household Health Survey Groundwater Contamination Area

Pompton Lakes, New Jersey

March 21, 2014

New Jersey Department of Health

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Report of a Household Health Survey
Groundwater Contamination Area, Pompton Lakes, New Jersey

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Summary

Introduction

The New Jersey Department of Health (NJDOH) and the federal Agency for Toxic Substances and Disease Registry (ATSDR) have been working with the community in Pompton Lakes, Passaic County, New Jersey to understand and respond to public health concerns related to environmental contamination. The former DuPont Pompton Lakes Works plant in Pompton Lakes contaminated groundwater, both on and off the plant's site, with chlorinated volatile organic chemicals. The New Jersey Department of Environmental Protection (NJDEP) and the U.S. Environmental Protection Agency (USEPA) are overseeing investigations to characterize the contamination and are responsible for ensuring that remedial actions are taken to protect public health and the environment.

NJDOH and ATSDR established a Community Advisory Group for Health (Health CAG) to serve as a forum to discuss community health concerns and to provide advice to the health agencies. The Health CAG identified a need to understand whether there are health outcomes that are occurring more frequently in the Pompton Lakes population than would be expected, particularly in the population living above the groundwater contamination area.

In response, NJDOH and ATSDR conducted a Household Health Survey to gather information on the occurrence of chronic diseases among current and former members of current households in the community. The survey was based on questions asked in the National Health Interview Survey (NHIS).

The Household Health Survey, together with a Community Health Profile based on analyses of existing health data sets, are being used by NJDOH and ATSDR to assess health burden in the community and guide decision-making about the need for further health investigations in relation to environmental and other factors.

NJDOH and ATSDR have reached the following conclusions based on the information presented in this Household Health Survey report:

Conclusion 1

The percentages of certain chronic health conditions in the Pompton Lakes survey area were higher than in comparable national surveys.

Basis for Conclusion

There were apparently higher percentages of kidney disease, chronic bronchitis (especially among males), and any type of cancer among the surveyed population, as compared to the NHIS values. There was also an indication of elevated percentages of those reporting kidney

cancer and lymphoma. Among children, there was an indication of higher percentages who ever had asthma and still had asthma.

Conclusion 2	*There was no indication that longer duration of residence was associated with increased occurrence of chronic health conditions.*

Basis for Conclusion

Percentages of kidney disease, chronic bronchitis and any cancer type were looked at by years of residence. The findings did not indicate an increase in risk with increasing duration of residence. However, since these estimates were based on small numbers of individuals, the findings were limited.

Conclusion 3

The percentages of several chronic health conditions in the surveyed Pompton Lakes population were similar to or lower than percentages from comparable national surveys.

Basis for Conclusion

Percentages of coronary heart disease, liver disease, breast cancer, and prostate cancer among the survey population were similar and consistent with the NHIS. There were apparently lower percentages of diabetes, asthma, and stroke in the survey population, in comparison to the NHIS. Among children, the percentage of developmental delay (not including mental retardation) appeared consistent with the national values.

Next Steps

In consultation with the Health CAG, NJDOH and ATSDR will consider the results of the Pompton Lakes Household Survey and the Community Health Profile to determine the need for further health investigations in relation to environmental and other factors in the community.

For More Information

Copies of this Household Health Survey report for the area of Pompton Lakes above the groundwater contamination plume will be provided to interested residents through the borough library, the local information repository related to the DuPont Pompton Lakes Works site, and the NJDOH web site. NJDOH will notify area residents that this report is available.

Questions about this Household Health Survey report should be directed to the Environmental and Occupational Health Surveillance Program, New Jersey Department of Health, (609) 826-4984.

1.   Statement of Purpose

The New Jersey Department of Health (NJDOH) was asked by members of the Pompton Lakes community—who have been concerned that their community is experiencing a disproportionate number of health problems—to perform a household health survey to determine whether adverse health outcomes are occurring or have occurred in the community more frequently than would be expected.

The NJDOH has been working with members of the community since March 2010, when a Community Advisory Group for Health (Health CAG) was first convened. The Health CAG serves as an open forum with the Pompton Lakes community to discuss and address their health concerns. This survey is a complement to a Pompton Lakes Community Health Profile based on existing health and demographic data sets, which NJDOH has also developed in consultation with the Health CAG and with the federal Agency for Toxic Substances and Disease Registry (ATSDR) (ATSDR and NJDOH, 2012).

2.   Background

Operations of the former DuPont Pompton Lakes Works plant in Pompton Lakes (Passaic County), New Jersey resulted in environmental contamination of soils, sediments and groundwater, both on and off the plant's site. Contaminants include heavy metals in soils and sediments, and chlorinated solvents in groundwater. The New Jersey Department of Environmental Protection (NJDEP) and the U.S. Environmental Protection Agency (USEPA) are overseeing investigations to characterize the extent and magnitude of contamination and are responsible for ensuring that remedial actions are taken to protect public health and the environment.

Volatile organic compounds present in the groundwater contamination plume beneath residences can enter indoor air via a process known as vapor intrusion. With oversight from NJDEP, DuPont began installing vapor intrusion mitigation systems at residences above the groundwater plume, and collected sub-slab and indoor air data. In a health consultation report released in December 2009, NJDOH and ATSDR evaluated indoor air data collected by DuPont in 337 residences in the latter half of 2008 [ATSDR and NJDHSS[1], 2009a]. The NJDOH and ATSDR concluded that current and future exposures to plume-related contaminants in indoor air at residences where mitigation systems have <u>not</u> been installed may harm people's health. Where properly functioning mitigation systems have been installed, the NJDOH and ATSDR concluded that exposure to plume-related contaminants will not occur, and therefore will not harm people's health. The agencies recommended that residences impacted by the groundwater plume should get the mitigation system installed, and that, to the extent feasible, the groundwater plume should be remediated to eliminate vapor intrusion.

At the request of the Mayor of Pompton Lakes and members of the community, NJDOH and ATSDR compared cancer rates in the portion of Pompton Lakes above the groundwater

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[1] NJDHSS = New Jersey Department of Health and Senior Services. The agency name of NJDHSS was changed to the New Jersey Department of Health (NJDOH) in July 2012.

plume to cancer rates in New Jersey, for the period 1979 through 2006. Rates of all cancer types combined or eleven other types of cancers were not elevated in the Pompton Lakes groundwater plume area as compared to state rates [ATSDR and NJDHSS, 2009b]. However, kidney cancer incidence was higher than expected in females (but not in males), and non-Hodgkin lymphoma (NHL) was higher in males (but not in females), during the more recent part of the period (1994-2006) in comparison to the state rates.

Discussions with the Health CAG revealed the need to provide the community with an understanding of whether there are health outcomes that are occurring more frequently in the Pompton Lakes population (and in particular those living above the groundwater contamination plume) than would be expected. In response, state and federal health agencies have pursued two complementary approaches: 1) development by NJDOH and ATSDR of a Community Health Profile based on existing public health and demographic data sets, including births, deaths, hospitalizations and emergency department usage, cancer registry, birth defects registry, and childhood lead exposure; and 2) development by NJDOH of a Household Health Survey of current and former residents of current households above the groundwater plume.

The Household Health Survey gathered information concerning chronic diseases, demographic factors, and length of residence for each member (past and present) of current households in the plume area. The Household Health Survey and the Community Health Profile are being used by NJDOH and ATSDR to assess health burden in the community and guide decision-making about the need for further health investigations in relation to environmental and other factors.

3.   Household Health Survey Methods

Overview of Survey Design

The Household Health Survey was conducted in the part of Pompton Lakes above a groundwater contamination plume, where potential exposures to volatile organic chemicals via vapor intrusion may have occurred.

The survey was a population-based, cross-sectional design in which data is collected from current households by a structured, telephone-administered questionnaire. Following the methods of the National Health Interview Survey (NHIS), the Pompton Lakes Household Health survey used a 'one-adult-per-household rule' which is structured to obtain a set of core data for all household members by interviewing only one household representative (CDC, 2012). The household representative was an adult self-identified as the person who knows the most about the health of the household members. [2]

The survey gathered information on demographic characteristics and health conditions (selected chronic diseases) for each current and former member of current households. Age-adjusted percentages of each health condition were compared to national age-adjusted percentages from the NHIS and when available to New Jersey Behavioral Risk Factor Surveillance System (BRFSS).

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[2] Residential home units were considered household units by NJDOH; members of the household were determined by the household representative.

The protocol for the Household Health Survey received a 'Not Human Subjects Research' determination from the NJDOH Institutional Review Board (NJDOH IRB ID#0378). The NJDOH IRB provided advice to the project team regarding consent language and procedures to protect confidentiality.

Survey Population

The Household Health Survey targeted an area of Pompton Lakes located above the groundwater contamination plume associated with the DuPont Pompton Lakes Works site. According to information provided by NJDEP, 479 households were identified as being located above the plume area. Exclusions were made due to invalid address, vacancy or a location being a business and not a family household which resulted in 455 eligible households. The population of the plume area makes up approximately one-sixth of the residents of Pompton Lakes as a whole. Figure 1 is a map prepared by NJDEP (dated December 2010) of the Pompton Lakes plume area. Identification of individual households for the survey inclusion was based on NJDEP information as of May 2011.

All current and former residents of current (eligible) households in the identified plume area of Pompton Lakes, New Jersey were considered eligible to participate in the Household Health Survey, excluding those whose length of residency was less than one year. A flowchart of household member identification with inclusion and exclusion criteria is presented in Figure 2.

Participant Recruitment

A postcard introducing the household health survey and requesting the cooperation of household representatives was mailed initially to each eligible current household. Within two weeks, a follow-up introduction letter explaining the purpose of the survey and inviting participation—with informed consent language and instructions for participation—was mailed to each address. Household recruitment activities are outlined in Figure 3.

Using publicly available telephone numbers, trained interviewers made phone calls during weekday evening hours and weekends to households who were sent the recruitment materials. Accurate phone numbers were not available for all residences. When a working number was available, interviewers made five call attempts staggered over different times and days in order to reach the household. After all available phone numbers were attempted, a follow-up mailing was sent to those households which did not have a telephone number, had a wrong number, or were unable to be reached after multiple attempts. The follow-up mailing, with an enclosed postage paid envelope, allowed residents to clearly mark refusal or interest in participation. When interested, residents included a telephone to best reach them as well as best available times to be reached.

Recruitment letters included language specifying that participation in the survey was voluntary; eligible households were provided with sufficient time to review the risks and benefits in order to determine whether they would like to participate. Household were provided with NJDOH contact information and encouraged to contact NJDOH with any questions.

Survey and Interview Procedures

The survey was designed and formatted to be administered by trained interviewers. Specific training on administration of this survey was provided; training also emphasized procedural adherence, data integrity, voluntary participation of household representatives, and confidentiality. All interviewers were trained and certified through the Collaborative Institutional Training Initiative (CITI) for ethical conduct of research. The survey and associated interviewer scripts were pre-tested among the interviewers and refined as needed prior to data collection, to ensure clarity of the questions and proper flow of the interview. Survey questions regarding household member identification and questions related to health conditions were modeled after the National Health Interview Survey (NHIS).

Introductory recruitment materials and the interviewer script described to the participants the role of household representatives and how they are identified. Health survey questions included chronic health conditions about which there were community concerns, and for which national comparison rates are available from NHIS. Three of the selected health conditions are asked on BRFSS, therefore both national and state rate comparisons can be made for these three health conditions.

The household representative provided their own length of residence at the current address, gender, and date of birth, and also provided these same demographic variables for all current and former members of their household. The household representative then provided chronic disease information for her- or himself and for each of the identified household members.

Names and date of birth were collected for each household member to facilitate completion of the survey, and for later use in removing any duplicate entries for individuals who may have been a part of multiple households in the area. Names and dates of birth were eliminated before release of this report.

Confidentiality

All data collected for this survey are used for statistical purposes only. Data are reported only in summary statistics form and no names or other personal health identifiers are disclosed. Data collected from this survey will be handled, as all identifiable data at NJDOH, with the strictest understanding of nondisclosure and confidentiality.

Data Analysis

The survey obtains percentages of specific chronic health conditions that may be comparable to data collected through the national NHIS and state BRFSS surveys for the year 2010. For each chronic health condition surveyed, both crude and age-adjusted percentages were calculated. Age-adjusted percentages were also calculated by sex. Additionally, crude and age-adjusted percentages were calculated among three household member status categories: all current plus former members (excluding deceased); current only; and former only (excluding deceased).

Percentages of household members responding "yes" to questions about specific chronic health conditions were calculated, excluding unknown or missing values [i.e., (yes /(yes+

no))*100]. Age-adjusted percentages were standardized to the year 2000 U.S. population, using the same population values used to age-adjust rates reported by the NHIS.

Statistical significance was assessed by comparing the national value and its 95% confidence interval to the 95% confidence interval calculated around each of the percentages calculated for Pompton Lakes household members. Following NHIS methodology, a relative standard error (RSE) [where RSE= (SE/Est)*100] was calculated for each estimate to determine the reliability and stability of the estimates. Estimates with a RSE greater than 30% but less than or equal to 50% are preceded with an asterisk (*) in the data tables, and should be used with caution. Estimates with a RSE greater than 50% were replaced with a dagger (†) in the tables and are not shown.

Selected health conditions with percentages greater than the national average were stratified by categories of duration of residence at the current household address (less than 10 years, 10 to 19 years, and 20 years or greater of residence) in order to examine whether age-adjusted percentages differed by duration of residence in the survey area.

A select number of survey questions were applicable to deceased survey members. Although not directly comparable, unadjusted percentages were compared to leading causes of death reported by National Vital Statistics Report for 2009 (Kochanek et al., 2011).

4.   Results of the Household Health Survey

Household Response

Of the 455 eligible households, 173 households (38%) participated and completed the survey, while 70 households (15%) refused to participate (Figure 4).[3] A total of 212 households (47%) were unable to be reached. These households consist of those without a listed telephone number, a disconnected telephone number, a wrong phone number or a number with five unanswered call attempts. Every household that was unreachable as of April 19, 2012 was sent the third mailing with a form for households to indicate refusal and return using an enclosed postage paid envelope.

Survey Response

The first interview was conducted on February 23, 2012 and the last interview was conducted on May 29, 2012. The 173 participating households resulted in 693 completed household member surveys, an average of 4.0 household members per household. One individual was found to have been reported from two households; for this individual, the record from the household in which the person currently resides was chosen since the survey responses regarding health conditions were identical. The duration of residence for this individual reflects a combined value from both locations.

Household members who resided in the survey target area for less than one year were not eligible to participate. Five residents for whom survey responses were collected were removed

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[3] Using the formulation developed by the CDC for use in BRFSS, the Overall Response Rate for the Household Health Survey is 38.5%. [(Completed Interviews/ (0.98 * All Likely Households)) * 100] (CDC, 2010).

from the analysis. Following exclusions due to duplicate survey members and length of residence less than one year, a total of 687 household member surveys were included in the analysis.

The household representative was asked, *"Are you confident that you have accurate knowledge about the household member in question?"* Among the 687 completed household member surveys, a total of 19 surveys (2.8%) were coded as "No." Responses from these surveys were not included in analyses of health conditions.

Descriptive Analysis

Household Member Status   Among the 687 household member surveys completed, 469 (68.3%) were current household members, 164 (23.9%) were former household members and 54 (7.9%) were deceased.

Age and Sex   Age was calculated from the date of birth to the time of interview for current and former members, or to date of death for the deceased. Of the completed surveys, 599 (87%) were for adults (18 years of age or older); the average age of adult participants was 50.7 years. The other 88 surveys (13%) were completed for children.

Surveys were completed for 287 adult males (47.9%), 309 adult females (51.6%) and 3 adults (0.5%) for whom gender was missing. Adult males had an average age of 50.6 years and adult females had an average age of 50.9 years. Among surveyed children, there were 44 boys (50%), 43 girls (49%) and 1 (1.1%) with missing gender (Table 1).

Duration of Residency   Duration of residency was calculated from the start date of residency to the interview date for current residents, to the end date of residency for former residents, and to the date of death for the deceased. When month was missing, the midpoint month (June) was selected. Duration of residency was calculated for adults only.

Duration of residency at a surveyed household address ranged from 1 to 95 years. The average duration of residency reported by survey participants was 22.6 years. Half (50%) of survey participants had resided for 20 or more years, 24% resided for 10 to 19 years, 14% for 5 to 9 years, 7% for less than five years.

Survey Results for Chronic Health Conditions among Adults

This discussion of survey findings focuses on age-adjusted percentages, since these values account for differences in age distribution between the NHIS survey population and the participating Pompton Lakes Household Health Survey population.

Diabetes   The age-adjusted percentages of diabetes among adult survey participants (current and former combined = 6.4%; current only = 6.3%; and former = 5.2%) are smaller than the age-adjusted percentages of diabetes among adults reported from the NHIS for the year 2010 (8.8%) and for BRFSS (9.2%).

The differences between the the Pompton Lakes survey data compared to NHIS and BRFSS were not statistically significant. The findings were similar for both males and females (Tables 2 and 16).

Kidney Disease   The age-adjusted percentage of kidney disease nationally (1.7%) was smaller than for survey participants (current and former combined = 2.4%; current only = 2.8%; former = 3.4%), but the differences were not statistically significant. This finding was similar for both males and females. For male former residents, the percentage of kidney disease (9.5%, 95% CI 2.4, 16.6) was statistically significantly higher compared to males in the NHIS (1.6%, 95% CI 1.4, 1.8). It should be noted, however, that this difference is based on a small number of cases, resulting in a high RSE, indicating that the estimate should be used with caution (Table 3).

Percentage estimates for kidney disease were stratified by duration of residence. Due to small numbers of "yes" respondents, most of the estimates were suppressed (RSE > 50%), so whether there is a change in percentage with increasing duration of residence cannot be determined.

Liver Disease   National age-adjusted percentages of liver disease (1.4%) were similar to values of liver disease among the survey participants (current and former combined = 1.9%; current only = 1.4%); differences were not statistically significant (Table 4).

Chronic Bronchitis   Age-adjusted percentages of chronic bronchitis among survey members were larger (current and former combined = 5.6%; current only = 6.8%) than the national value (4.2%), but these differences were not statistically significant. Among male current and former members combined (7.4%, 95% CI 4.0, 10.8), and among male current members alone (9.7%, 95% CI 5.2, 14.2), participants had statistically significantly larger age-adjusted percentages than the national value for males (3.0%, 95% CI 2.6, 3.4) (Table 5).

Percentage estimates of chronic bronchitis were stratified by duration of residence. Current survey members with duration of residence 10 to 19 years (11.8%, 95% CI 5.0, 18.6) had a statistically larger age-adjusted percentage of chronic bronchitis compared to the national value (4.2%, 95% CI 3.9, 4.5). There did not appear to be a consistent increase in age-adjusted percentage with increasing duration of residence (Table 6).

Asthma   Age-adjusted percentages of ever having had asthma among current and former members (11.1%) and current members only (11.3%) were similar to the national NHIS value (12.7%); the differences were not statistically significant. Similarly, age-adjusted percentages of still having asthma were smaller among survey members (6.3% for current and former combined and 7.0% for current members only) in comparison to the national value (8.2%), but the differences were not statistically significant. The patterns were similar for males and females (Table 7).

The age-adjusted percentage of reporting ever having had asthma was smaller in the Pompton Lakes survey member population as compared to the New Jersey BRFSS population, but was not statistically significant. The age-adjusted percentage of still having asthma (6.3%, 95% CI 4.2, 8.4) was not statistically significantly smaller than the state BRFSS value (8.7%, 9.5% CI 8.0, 9.5) (Table 15).

Heart Disease   For comparison to NHIS percentages, a participant was considered to be a "yes" for heart disease if any of the following conditions were reported: coronary heart disease, angina pectoris, or heart attack. Although the age-adjusted percentage for heart disease among

survey members was smaller among current and former members combined (5.4%) than the national value (6.4%), the difference is not statistically significant. There were no statistically significant differences in the age-adjusted percentages of heart disease among males or females (Table 8).

Reported "angina or coronary heart disease" and "heart attack" were examined separately against the percentages reported from BRFSS. Heart attacks among the current and former combined survey member population (1.4%, 95% CI 0.7, 2.8) was statistically smaller than the BRFSS state percentage (3.8%, 95% CI 3.3, 4.2). The percentage of reported angina or coronary heart disease among both the survey population and the BRFSS state population were identical (3.9%) (Table 15).

Stroke   Although age-adjusted percentages for stroke among survey members were smaller (1.5% among current and former members combined) than the national value (2.6%), this difference is not statistically significantly different. There were no statistically significant differences in the age-adjusted percentages of stroke among males or females (Table 9).

Similarly, the age-adjusted percentage of reported stroke among the survey members (1.5%) was smaller than the New Jersey BRFSS value for stroke (2.4%) , but was not statistically significantly smaller (Table 15).

Any Cancer   Age-adjusted percentages for any cancer among current and former members combined (10.4%) was larger than the national value (8.2%), but the difference was not statistically significant. Findings were similar for both males and females (Table 10).

Age-adjusted percentages of reporting any cancer were stratified by duration of residence. For all duration categories, age-adjusted percentages of cancer were larger than the national value, but none were statistically significantly larger. There did not appear to be a consistent increase in age-adjusted percentage with increasing duration of residence (Table 11).

Breast Cancer   Age-adjusted percentages of breast cancer among the current and former member survey participants (1.1%) were similar to percentages calculated nationally (1.3%). Among females only, percentages were similar and no statistically significant differences were found (Table 12).

Prostate Cancer   Age-adjusted percentages of prostate cancer among the male current and former member survey participants (2.9%) were similar to percentages calculated among males nationally (2.4%) (Table 13).

Cancer Type Distribution   Among those who reported any type of cancer, Table 15 compares the percentage of cancer types reported in the Pompton Lakes survey to those reported in the NHIS, for cancer types whose frequency was more than 1% in the NHIS. The top three cancers types reported in NHIS are skin (non-melanoma), breast and prostate, while the top three reported types in the survey are skin (don't know the kind), breast, and "other," followed by prostate and skin (non-melanoma). Lymphoma comprised 5.6% of the survey distribution and only 2.6% of the national distribution; kidney cancer also comprised 5.6% of the survey distribution and only 1.4% of the national distribution (Table 14).

Survey Results for Chronic Health Conditions among Children

Since there were very few children (under age 18 years) who were considered "former" members of current households, the discussion of findings for children is limited to "current plus former" members. However, values for current residents only are presented in the Tables when not suppressed.

Asthma   The age-adjusted percentage of ever having had asthma among survey members under 18 years of age (current and former members = 20.3%) was larger than the national value (13.7%), but the difference were not statistically significant. The age-adjusted percentage of still having asthma (17.5%) was also larger among survey members less than 18 years compared to national values (9.5%), but this difference was also not statistically significant. Patterns were similar for males and females (Table 16).

The crude (not age-adjusted) percentage among current and former child survey response (20.0%, 95% CI 11.2, 28.8) was statistically significantly larger than the national crude percentage (9.4%, 95% CI 8.8, 10.0) (Table 17).

Percentages for Other Surveyed Health Conditions   Crude (not age-adjusted) percentages for other chronic health conditions among children under 18 years of age— diabetes, congenital heart disease, any other heart condition, and autism/autism spectrum disorder—among survey participants were suppressed due to instability of the estimates (RSE $\geq$ 50%), with the exception of asthma, as discussed above (Table 17).

Crude percentages for other chronic health conditions among children between the ages of 3 and 17 years of age—attention deficit hyperactivity disorder (ADHD) or attention deficit disorder (ADD), mental retardation, and seizures—were suppressed due to instability of the estimates (RSE $\geq$ 50%). The percentage of "any other developmental delay" among the survey population (5.5%) was not statistically significantly different from the national percentage (4.6%) (Table 18).

Survey Results for Chronic Health Conditions among Deceased Household Members

The Pompton Lakes Household Health Survey collected information on health conditions experienced by all former residents of current households, including those who are now deceased. Percentages of health conditions experienced during life among those now deceased were calculated; however, there are no comparable statistics for these percentages, which cannot be interpreted as, or compared directly to, statistics on causes of death. Nonetheless, according to the National Vital Statistics Report for 2009 (Kochanek et al., 2011), the top two leading causes of death are diseases of the heart and cancer; these are also the two most prevalent diseases among the deceased household members. No further comparisons were performed.

5.   Discussion

The Pompton Lakes Household Health Survey captured the percentage of selected, NHIS- and BRFSS-comparable chronic health conditions among current and former members of current households located above a contaminated groundwater plume. The surveyed community is a relatively stable population in which the average duration of residency reported by survey participants was 22.6 years, with half of the participating population residing in the area for 20 years or longer. Findings were consistent among the household member status categories of "current + former" members and current only. The relatively small number of former residents limits our ability to interpret the impacts of disease on this household member category.

Overall survey findings were consistent with NHIS and BRFSS. Percentages of liver disease, coronary heart disease, breast cancer, and prostate cancer among the adult survey population were similar and consistent with NHIS. Percentages of kidney disease, chronic bronchitis (especially among males), and any type of cancer were elevated among the adult survey population, with an indication of higher percentages of kidney cancer and lymphoma as well. Diabetes, ever having had asthma and still having asthma and stroke all appear lower in the adult survey population as compared to NHIS. Among children, a limited number of comparisons could be made: ever having had asthma, and still having asthma appeared to be elevated compared to national values.

Kidney disease, chronic bronchitis and cancer were stratified by duration of residence. Unfortunately, suppression due to instability of estimates limited our view of the impact that duration of residence may have on the rates of disease; however, the findings did not indicate an increase in risk with increased duration of residence.

Strengths and Limitations

NJDOH employed evidence-based methods to increase phone survey response rates, including advance letter mailing (Smith et al., 2005), interviewer training, established researcher credentials, increasing call attempts and targeted call times (O'Toole et al., 2008). Due to the reliance on publicly available resources to compile phone numbers for contacting households, the ability of interviewers to personally call each household was limited due to missing and inaccurate telephone number listings.

The Pompton Lakes Household Health Survey resulted in an Overall Response Rate of 38.5% which compares favorably to the New Jersey BRFSS telephone interview survey Overall Response Rate of 29.5% (CDC, 2010). This response rate is an indicator of potential bias (i.e., inaccuracy) in the survey results; however it does not measure bias. Bias is introduced through a variety of different modes.

Bias may be introduced if the survey population has different distributions of important factors such as: age, gender, race, ethnicity and socioeconomic status from the national population which is used for comparison. Since these factors are related to the way in which populations experience disease, if distributions are different, comparisons may not be accurate. For this analysis we performed age-adjustment and stratification of sex in order to control for some of these biases. Unfortunately, unmeasured factors such as race, ethnicity, socioeconomic

status, personal behaviors or other risk factors may differ and may or may not affect the comparison of estimates.

Another source of potential inaccuracy in survey results is recall bias, in which survey participants do not properly recall the response to the survey questions. Since this survey used one representative per household to provide responses, recall bias may be particularly impactful; errors could be made such that percentages could be inflated or deflated. Also, participants may have under or over-reported certain disease outcomes leading to a response bias. Interviewer bias, whereby interviewers introduce their own opinions which affects the recorded outcomes, is likely to pose little to no problem due to proper interviewer training and no apparent prejudice among the interviewers. Selection bias is of particular import, where respondents differ from non-respondents. The higher the response rate the more confidently survey coordinators believe respondents and non-respondents have similar disease profiles. Therefore if respondents and non-respondents have similar health outcomes, little bias will have been introduced.

In general, the consistency of findings with the NHIS leads us to believe that the introduction of bias did not impact the ability for the survey to collect comparable percentages of disease among adults.

With the exception of asthma, estimates for children were unreliable since the number of completed surveys for children was small and the outcomes surveyed are relatively uncommon. This survey would have required a larger population or higher response rate in order to more confidently capture the percentage of chronic health conditions among the population under 18 years of age.

Since the Pompton Lakes Household Health Survey did not collect information on cause of death specifically, comparability of data on deceased household members is limited. However, the Community Health Profile contains data on mortality for the entire population of Pompton Lakes in comparison to the State and surrounding municipalities.

6. Conclusions and Next Steps

The Household Health Survey was successful in estimating percentages of chronic health conditions among the survey participants. The general comparability between percentages of chronic health conditions in the Household Health Survey relative to national data sources indicates that there was no systematic bias in the survey; therefore, this survey is able to provide additional insight into the chronic health conditions experienced within the surveyed population. Though the response rate compared favorably to BRFSS, a higher response rate would have increased the power of comparisons to detect differences between the surveyed and national populations.

Based on the findings of the Pompton Lakes Household Health Survey, the New Jersey Department of Health has reached the following conclusions:

The percentages of certain chronic health conditions in the Pompton Lakes survey area were higher than in comparable national surveys. There were apparently higher percentages of

kidney disease, chronic bronchitis (especially among males), and any type of cancer among the surveyed population, as compared to NHIS values. There was also an indication of elevated percentages of those reporting kidney cancer and lymphoma. Among children, there was an indication of higher percentages who ever had asthma and still had asthma.

There was no indication that longer duration of residence was associated with increased occurrence of chronic health conditions. Percentages of kidney disease, chronic bronchitis and any cancer type were looked at by years of residence. The findings did not indicate an increase in risk with increasing duration of residence. However, since these estimates were based on small numbers of individuals the findings were limited.

The percentages of several chronic health conditions in the surveyed Pompton Lakes population were similar to or lower than percentages from comparable national surveys. Percentages of coronary heart disease, liver disease, breast cancer, and prostate cancer among the survey population were similar and consistent with the NHIS. There were apparently lower percentages of diabetes, asthma, and stroke in the survey population, in comparison to the NHIS. Among children, the percentage of developmental delay (not including mental retardation) appeared consistent with the national values.

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In consultation with the Health CAG, NJDOH and ATSDR will consider the results of the Pompton Lakes Household Survey and the Community Health Profile to determine the need for further health investigations in relation to environmental and other factors in the community.

References

[ATSDR and NJDHSS] Agency for Toxic Substances and Disease Registry, and New Jersey Department of Health and Senior Services, 2009a. Health Consultation, DuPont Pompton Lakes Works Site: Analysis of the Vapor Intrusion Pathway in the Pompton Lakes Neighborhood Impacted by the DuPont Groundwater Contamination. Atlanta: U.S. Department of Health and Human Services.

[ATSDR and NJDHSS] Agency for Toxic Substances and Disease Registry, and New Jersey Department of Health and Senior Services, 2009b. Health Consultation, DuPont Pompton Lakes Works Site: Analysis of Cancer Incidence in the Pompton Lakes Neighborhood Impacted by the DuPont Groundwater Contamination. Atlanta: U.S. Department of Health and Human Services.

[ATSDR and NJDOH] Agency for Toxic Substances and Disease Registry, and New Jersey Department of Health, 2012. Health Consultation, Community Health Profile, Pompton Lakes, New Jersey. Atlanta: U.S. Department of Health and Human Services.

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Report Preparation

This Health Consultation, "Household Health Survey, Groundwater Contamination Area, Pompton Lakes, New Jersey" was prepared by the New Jersey Department of Health.

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The NJDOH would like to thank ATSDR for reviewing and providing comments on a draft of this Health Consultation.

Tables and Figures

Household Member Status	Surveys Completed (687 /100%)						Total
	Adult >= 18 Years of Age (599/87.2%)			Child <18 Years of age (88/12.8%)			
	Male (287/47.9%)	Female (309/51.6%)	Missing (3/0.5%)	Boy (44/50%)	Girl (43/48.9%)	Missing (1/1.1%)	
Current	174	207	1	44	42	1	469 (68.3%)
Former*	81	80	2	0	1	0	164 (23.9%)
Deceased	32	22	0	0	0	0	54 (7.9%)

Table 1. Current, former and deceased household members by gender and age category

*Excluding deceased

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Table 2. Age-adjusted percentages of diabetes among persons aged 18 years and over, by household member status and sex[1]				
Household Member Status	Total (crude) % (95% CI)	Total % (95% CI)	Male % (95% CI)	Female % (95% CI)
National Values[2]	9.3 (8.9, 9.7)	8.8 (8.4, 9.2)	9.8 (9.2, 10.4)	8.0 (7.5, 8.5)
Current + Former[3]	6.8 (4.6, 9.0)	6.4 (4.3, 8.6)	6.3 (3.0, 9.6)	6.4 (3.5, 9.3)
Current	8.0 (5.3, 10.8)	6.3 (3.8, 8.8)	*6.2 (2.5, 9.9)	6.0 (2.7, 9.4)
Former[3]	*3.6‡ (0.5, 6.6)	*5.2 (1.5, 9.0)	*9.4 (2.3, 16.4)	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]Based on the question, "Have you ever been told by a doctor or other health professional that you had diabetes?"

[2]Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(252). 2012.

[3]Excluding deceased

Table 3. Age-adjusted percentages of kidney disease among persons aged 18 years and over, by household member status and sex[1]				
Household Member Status	Total (crude) % (95% CI)	Total % (95% CI)	Male % (95% CI)	Female % (95% CI)
National Values[2]	1.7 (1.5, 1.9)	1.7 (1.5, 1.9)	1.6 (1.4, 1.8)	1.7 (1.5, 1.9)
Current + Former[3]	2.3 (1.0, 3.6)	2.4 (1.1, 3.8)	*3.0 (0.8, 5.2)	*1.8 (0.2, 3.4)
Current	*2.7 (1.0, 4.3)	*2.8 (1.1, 4.4)	*2.6 (0.2, 5.0)	*2.6 (0.4, 4.9)
Former[3]	†	*3.4 (0.4, 6.5)	*9.5‡ (2.4, 16.6)	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.
†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.
‡Statistically significant difference

[1]Based on the question, "Have you been told in the past 12 months by a doctor or other health professional that you had weak or failing kidneys (excluding kidney stones, bladder infections, or incontinence)?"
[2]Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(252). 2012.
[3]Excluding deceased

Table 4. Age-adjusted percentages of liver disease among persons aged 18 years and over, by household member status and sex[1]				
Household Member Status	Total (crude) % (95% CI)	Total % (95% CI)	Male % (95% CI)	Female % (95% CI)
National Values[2]	1.4 (1.2, 1.6)	1.4 (1.2, 1.6)	1.5 (1.2, 1.8)	1.2 (1.0, 1.4)
Current + Former[3]	2.1 (0.9, 3.4)	*1.9 (0.7, 3.1)	*2.3 (0.4, 4.2)	*2.0 (0.3, 3.6)
Current	*1.9 (0.5, 3.2)	*1.4 (0.2, 2.7)	†	†
Former[3]	†	†	†	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]Based on the question, "Have you been told in the past 12 months by a doctor or other health professional that you had any kind of liver condition?"

[2]Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(252). 2012.

[3]Excluding deceased

Table 5. Age-adjusted percentages of chronic bronchitis among persons aged 18 years and over, by household member status and sex[1]				
Household Member Status	Total (crude) % (95% CI)	Total % (95% CI)	Male % (95% CI)	Female % (95% CI)
National Values[2]	4.3 (4.0, 4.6)	4.2 (3.9, 4.5)	3.0 (2.6, 3.4)	5.3 (4.8, 5.8)
Current + Former[3]	5.3 (3.3, 7.2)	5.6 (3.6, 7.7)	7.4‡ (4.0, 10.8)	4.1 (1.7, 6.4)
Current	6.4 (3.9, 8.9)	6.8 (4.2, 9.4)	9.7‡ (5.2, 14.2)	*4.4 (1.5, 7.2)
Former[3]	†	†	†	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]Based on the question, "Have you been told in the past 12 months by a doctor or other health professional that you bronchitis?"

[2]Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(252). 2012.

[3]Excluding deceased

Table 6. Age-adjusted percentages (95% CI) of chronic bronchitis among persons aged 18 years and over, by household member status and duration of residence			
National Values[1]	4.2 (3.9, 4.5)		
	Duration of Residence		
Household Member Status	<10 Years	10 to 19 Years	≥ 20 Years
Current + Former[2]	†	8.9 (3.9, 14.0)	5.2 (2.5, 8.0)
Current	†	11.8‡ (5.0, 18.6)	6.5 (2.9, 10.0)
Former[2]	†	†	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat

[2]Excluding deceased

Table 7. Age-adjusted percentages of asthma among persons aged 18 years and over, by household member status and sex

Household Member Status	Total (crude) % (95% CI)		Total % (95% CI)		Male % (95% CI)		Female % (95% CI)	
	Ever had[1]	Still has[2]	Ever had	Still has	Ever had	Still has	Ever had	Still has
National Values[3]	12.7 (12.2, 13.2)	8.2 (7.8, 8.6)	12.7 (12.2, 13.2)	8.2 (7.8, 8.6)	10.8 (10.1, 11.5)	5.8 (5.3, 6.3)	14.5 (13.8, 15.2)	10.3 (9.7, 10.9)
Current + Former[4]	9.9 (7.3, 12.5)	5.8 (3.8, 7.8)	11.1 (8.3, 13.8)	6.3 (4.2, 8.4)	11.0 (7.0, 15.0)	4.4 (1.8, 7.0)	11.6 (7.7, 15.4)	8.0 (4.8, 11.3)
Current	9.6 (6.6, 12.5)	6.0 (3.6, 8.4)	11.3 (8.1, 14.6)	7.0 (4.4, 9.6)	10.9 (6.1, 15.7)	*5.3 (1.9, 8.7)	12.0 (7.4, 16.5)	8.4 (4.6, 12.3)
Former[4]	10.9 (5.7, 16.1)	*5.3 (1.7, 8.9)	10.0 (4.9, 15.1)	*4.9 (1.5, 8.4)	*10.4 (3.0, 17.8)	†	*9.9 (2.8, 17.1)	*7.3 (1.4, 13.2)

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]Based on the question, "Have you ever been told by a doctor or other health professional that they had asthma?"

[2]Based on the question, "Do you still have asthma?"

[3]Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(252). 2012.

[4]Excluding deceased

Table 8. Age-adjusted percentages of coronary heart disease among persons aged 18 years and over, by household member status and sex[1]				
Household Member Status	Total (crude) % (95% CI)	Total % (95% CI)	Male % (95% CI)	Female % (95% CI)
National Values[2]	6.7 (6.3, 7.1)	6.4 (6.1, 6.7)	8.2 (7.7, 8.7)	5.0 (4.6, 5.4)
Current + Former[3]	5.7 (3.8, 7.7)	5.4 (3.4, 7.4)	6.6 (3.4, 9.8)	*3.8 (1.5, 6.1)
Current	6.9 (4.3, 9.4)	5.3 (3.0, 7.6)	6.5 (2.7, 10.2)	*3.7 (1.1, 6.4)
Former[3]	*2.8‡ (0.1, 5.5)	*4.4 (1.0, 7.8)	†	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]In separate questions, respondents were asked if they had ever been told by a doctor or other health professional that they had: coronary heart disease, angina pectoris, or heart attack.

[2]Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(252). 2012.

[3]Excluding deceased

Household Member Status	Total (crude) % (95% CI)	Total % (95% CI)	Male % (95% CI)	Female % (95% CI)
Table 9. Age-adjusted percentages of stroke among persons aged 18 years and over, by household member status and sex[1]				
National Values[2]	2.7 (2.5, 2.9)	2.6 (2.4, 2.8)	2.8 (2.5, 3.1)	2.5 (2.2, 2.8)
Current + Former[3]	*1.7 (0.6, 2.9)	*1.5 (0.5, 2.6)	†	*1.8 (0.2, 3.4)
Current	*1.6 (0.3, 2.9)	*1.4 (0.2, 2.6)	†	†
Former[3]	†	†	†	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]Based on the question, "Has a doctor, nurse or other health professional ever told you that you had a stroke?"

[2]Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(252). 2012.

[3]Excluding deceased

Table 10. Age-adjusted percentages of any cancer among persons aged 18 years and over, by household member status and sex[1]				
Household Member Status	Total (crude) % (95% CI)	Total % (95% CI)	Male % (95% CI)	Female % (95% CI)
National Values[2]	8.5 (8.1, 8.9)	8.2 (7.8, 8.6)	7.9 (7.4, 8.4)	8.6 (8.1, 9.1)
Current + Former[3]	11.9‡ (9.1, 14.6)	10.4 (7.7, 13.0)	10.9 (6.9, 14.9)	9.8 (6.3, 13.4)
Current	14.8‡ (11.2, 18.3)	11.2 (8.0, 14.4)	11.6 (6.8, 16.5)	10.7 (6.4, 15.1)
Former[3]	*4.2‡ (0.9, 7.4)	*7.1 (2.8, 11.4)	*7.7 (1.4, 13.9)	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.
†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.
‡Statistically significant difference

[1]Based on the question, "Has a doctor, nurse or other health professional ever told you that you had cancer or a malignancy of any kind?"
[2]Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(252). 2012.
[3]Excluding deceased

Table 11. Age-adjusted percentages (95% CI) of any cancer among persons aged 18 years and over, by household member status and duration of residence			
National Values[1]	8.2 (7.8, 8.6)		
	Duration of Residence		
Household Member Status	<10 Years	10 to 19 Years	≥ 20 Years
Current + Former[2]	*8.7 (3.4, 14.0)	11.2 (5.7, 16.7)	9.6 (6.0, 19.1)
Current	*9.6 (3.3, 15.9)	12.2 (5.4, 19.1)	9.7 (5.5, 13.9)
Former[2]	†	*10.6 (0.8, 20.3)	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.
†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.
‡Statistically significant difference

[1]Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat
[2]Excluding deceased

Table 12. Age-adjusted percentages of breast cancer among persons aged 18 years and over, by household member status and sex[1]				
Household Member Status	Total (crude) % (95% CI)	Total % (95% CI)	Male % (95% CI)	Female % (95% CI)
National Values[2]	1.4 (1.2, 1.6)	1.3 (1.2, 1.4)	*0.0 (0.0, 0.0)	2.4 (2.1, 2.7)
Current + Former[3]	*1.5 (0.5, 2.6)	*1.1 (0.2, 2.0)	†	*2.1 (0.4, 3.8)
Current	*1.8 (0.5, 3.2)	*1.2 (0.1, 2.3)	†	*2.3 (0.2, 4.3)
Former[3]	†	†	†	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.
†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.
‡Statistically significant difference

[1] Based on the question, "Has a doctor, nurse or other health professional ever told you that you had cancer or a malignancy of any kind? If yes, what kind?"
[2] Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(252). 2012.
[3] Excluding deceased

Table 13. Age-adjusted percentages of prostate cancer among persons aged 18 years and over, by household member status and sex[1,2]				
Household Member Status	Total (crude) % (95% CI)	Total[5] % (95% CI)	Male % (95% CI)	Female % (95% CI)
National Values[3]	2.4 (1.9, 2.5)	2.4 (2.1, 2.7)	2.4 (2.1, 2.7)	–
Current + Former[4]	*2.9 (0.8, 5.0)	*2.9 (0.8, 5.0)	*2.9 (0.8, 5.0)	–
Current	*2.9 (0.4, 5.4)	*2.6 (0.2, 5.0)	*2.6 (0.2, 5.0)	–
Former[4]	†	†	†	–

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]Based on the question, "Has a doctor, nurse or other health professional ever told you that you had cancer or a malignancy of any kind? If yes, what kind?"

[2]Calculated among men only

[3]Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(252). 2012.

[4]Excluding deceased

Table 14. Distribution of cancer types, aged 18 years or older[1]				
Cancer Types[2]	NHIS	NHIS Ranking	Survey[3]	Survey Ranking
Skin (non-melanoma)	18.2%	1	9.7%	4
Breast	16.4%	2	11.1%	2
Prostate	10.3%	3	9.7%	4
Skin (Don't Know Kind)	6.9%	4	12.5%	1
Cervix	6.5%	5	†	-
Melanoma	6.0%	6	†	-
Colon	5.6%	7	6.9%	6
Uterus	4.7%	8	†	-
Other	4.2%	9	11.1%	2
Lymphoma	2.6%	10	5.6%	7
Thyroid	2.6%	10	†	-
Lung	2.5%	12	†	-
Ovary	2.0%	13	†	-
Bladder	1.8%	14	†	-
Kidney	1.4%	15	5.6%	7
Leukemia	1.3%	16	†	-

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown

[1]National Center for Health Statistics. National Health Interview Survey, 2010. Public-use data file and documentation. http://www.cdc.gov/nchs/nhis/nhis_2010_data_release.htm/. 2012.

[2]Cancer types presented here only include those with an NHIS distribution greater than 1.0% .

[3]Pompton Lakes Household Health Survey, current and former residents, excluding deceased

Table 15. Comparison of age-adjusted percentages (95% CI) for selected health conditions		
Health Condition	BRFSS[1]	Health Survey Current + Former
Diabetes	9.2 (8.5, 9.8)	6.4 (4.3,8.6)
Heart Attack	3.8 (3.3, 4.2)	[*]1.4 (0.7, 2.8) ‡
Angina or coronary heart disease	3.9 (3.5, 4.3)	3.9 (2.3, 5.7)
Stroke	2.4 (2.0, 2.7)	[*]1.5 (0.5, 2.6)
Asthma – Ever	13.3 (12.4, 14.3)	11.1 (8.3, 13.8)
Asthma – Still	8.7 (8.0, 9.5)	6.3 (4.2-8.4)

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2010.

Household Member Status	Total % (95% CI)		Male % (95% CI)		Female % (95% CI)	
Table 16. Age-adjusted percentages of ever having asthma and still having asthma for children under 18 years, by household member status and sex[1,2]						
	Ever had	Still has	Ever had	Still has	Ever had	Still has
National Values[3]	13.7 (12.9, 14.4)	9.5 (8.9, 10.1)	15.3 (14.2, 16.4)	10.5 (9.6, 11.4)	11.8 (10.8, 12.8)	8.2 (7.4, 9.0)
Current + Former[4]	20.3 (11.5, 29.2)	17.5 (9.1, 25.9)	*20.1 (7.3, 32.9)	*16.8 (5.4, 28.3)	*18.3 (6.0, 30.5)	*16.0 (4.4, 27.7)
Current	20.3 (11.5, 29.1)	17.5 (9.1, 25.9)	*20.1 (8.0, 32.2)	*16.8 (5.4, 28.3)	*18.3 (6.0, 30.5)	*16.0 (4.4, 27.7)

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]Based on the question, "Have you ever been told by a doctor or other health professional that [insert child's name] had asthma?"

[2]Based on the question, "Does [insert child's name] still have asthma?"

[3]Bloom B, Cohen RA, Freeman G. Summary health statistics for U.S. children: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(250). 2011.

[4]Excluding deceased

Table 17. Crude percentage with 95% confidence intervals for select disease types for current and former Pompton Lakes Household Health Survey members compared to national values, for children under 18 years of age[1]

Disease Type	National Value[1] Crude (95% C I)	Pompton Lakes Household Health Survey Crude (95% CI) Current + Former
Asthma – Ever Had[1, 3]	13.6 (12.8, 14.4)	21.8 (13.2, 30.5)
Asthma – Still Have[1, 4]	9.4 (8.8, 10.0)	20.0 (11.2, 28.8) ‡
Diabetes[2, 5]	0.2 (0.1, 0.3)	†
Congenital Heart Disease[2, 6]	0.16 (0.1, 0.2)	†
Any other heart condition[2,7]	1.0 (0.8, 1.3)	†
Autism/Autism Spectrum Disorder[2,8]	0.9 (0.7, 1.1)	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]Bloom B, Cohen RA, Freeman G. Summary health statistics for U.S. children: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(250). 2011.

[2]National Center for Health Statistics. National Health Interview Survey, 2010. Public-use data file and documentation. http://www.cdc.gov/nchs/nhis/nhis_2010_data_release.htm/. 2012.

[3]Based on the question, "Have you ever been told by a doctor or other health professional that [insert child's name] had asthma?"

[4]Based on the question, "Does [insert child's name] still have asthma?"

[5]Based on the question, "Has a doctor or other health professional ever told you that [child's name] had diabetes?"

[6]Based on question, "Has a doctor or other health professional ever told you that [child's name] had congenital heart disease?"

[7]Based on question, "Has a doctor or other health professional ever told you that [child's name] had any other heart condition?"

[8]Based on the question, "Has a doctor or other health professional ever told you that [child's name] had autism/autism spectrum disorder?"

Table 18. Crude percentage with 95% confidence intervals for select disease types for current and former Pompton Lakes Household Health Survey members compared to the national value for children, aged 3 to 17 years

Disease Type	National Value[1] Crude (95% CI)	Pompton Lakes Household Health Survey Crude (95% CI) Current + Former
ADD/ADHD[1,3]	8.4 (7.7, 9.1)	†
Mental Retardation[2,4]	0.7 (0.5, 0.9)	†
Any other developmental delay[2,5]	4.6 (4.1, 5.2)	*5.5 (0.3, 10.7)
Seizures[2,6]	1.0 (0.8, 1.2)	†

*Estimates preceded by an asterisk have a relative standard error greater than 30% and less than or equal to 50% and should be used with caution as they do not meet standards of reliability or precision.

†Estimates with a relative standard error greater than 50% are replaced with a dagger and are not shown.

‡Statistically significant difference

[1]Bloom B, Cohen RA, Freeman G. Summary health statistics for U.S. children: National Health Interview Survey, 2010. National Center for Health Statistics. Vital Health Stat 10(250). 2011.

[2]National Center for Health Statistics. National Health Interview Survey, 2010. Public-use data file and documentation. http://www.cdc.gov/nchs/nhis/nhis_2010_data_release.htm/. 2012.

[3]Based on the question, "Has a doctor or other health professional ever told you that [child's name] had attention deficit hyperactivity disorder (ADHD) or attention deficit disorder (ADD)?"

[4]Based on the question, "Has a doctor or other health professional ever told you that [child's name] had mental retardation?"

[5]Based on the question, "Has a doctor or other health professional ever told you that [child's name] had any other developmental delay"

[6]Based on the question, "During the past 12 months, has [child name] had seizures?"

Figure 1. Groundwater investigation area, Pompton Lakes, NJ.

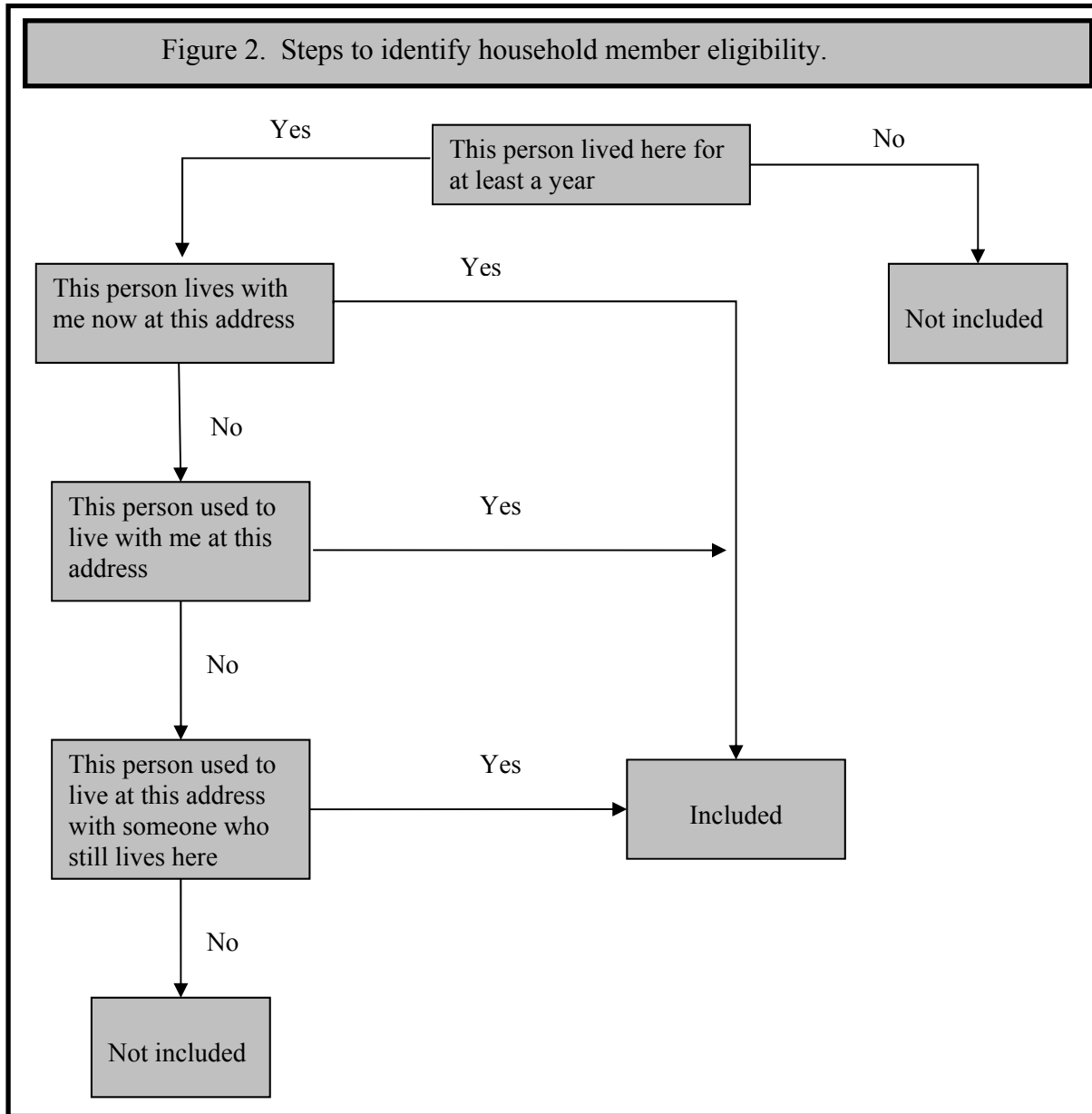Figure 2. Steps to identify household member eligibility.

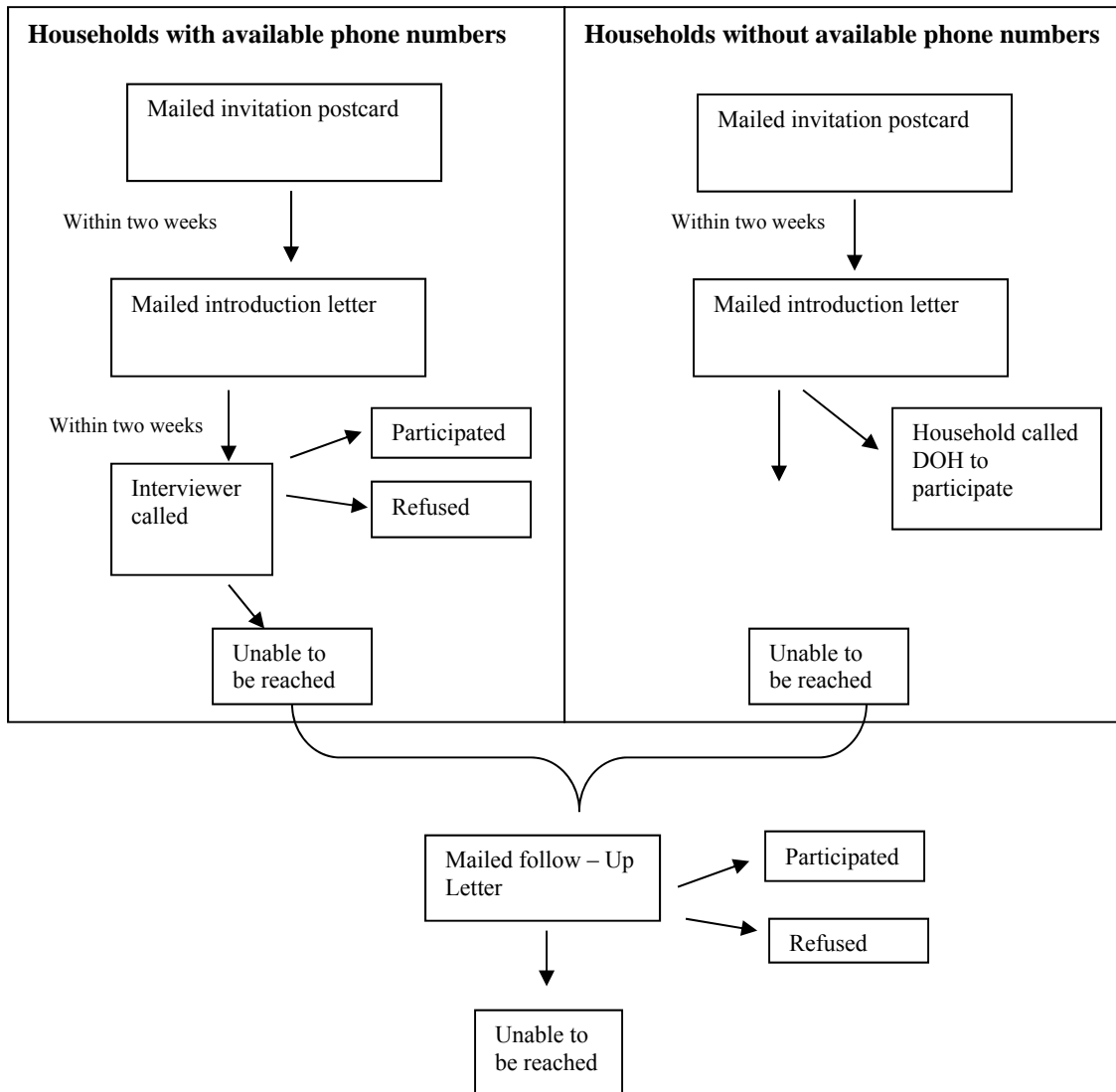Figure 3. Steps in outreach and recruitment of households for the Pompton Lakes Household Health Survey.

Figure 4. Numbers and percentages of those households completing interviews, those that refused, and those unable to be reached.