



New York State Department of Health
Center for Environmental Health

Health Consultation
PUBLIC COMMENT DRAFT

**Thyroid Condition Follow-Up Report,
Hickory Woods Subdivision,
City of Buffalo, Erie County, New York**

April 2004

Prepared under a Cooperative Agreement with
U.S. Department of Health & Human Services
Public Health Service
Agency for Toxic Substances and Disease Registry

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BACKGROUND AND STATEMENT OF ISSUES

In response to concerns about potential exposures and health problems in the Hickory Woods Development in Buffalo, New York, in December of 1999, the New York State Department of Health (NYS DOH) proposed conducting an exposure survey in the community. The primary purpose of the survey was to gather information about the people living at each residence, whether they had noticed or come in contact with chemical substances or unusual materials in the subdivision, and whether they had health concerns related to potential environmental exposures. This information would be helpful for planning an appropriate health study, if the environmental sampling results indicated that such a study was warranted. Although the primary purpose of the exposure survey conducted in Hickory Woods in 2000 was to collect information on potential exposures, the survey also provided residents with an opportunity to report health problems that might suggest unusual patterns of illness in the neighborhood, if such patterns existed.

Staff of the NYS DOH developed the draft survey and worked with representatives of the Hickory Woods Concerned Homeowners' Association, Citizen's Environmental Coalition and Environment and Society Institute of the University at Buffalo to revise the survey, draft a cover letter about the purpose of the survey, and develop a plan for administering the survey. NYS DOH sent copies of the survey to residents prior to contacting each household by telephone. The survey was conducted beginning in June 2000, and the results were reported in an Appendix to the Health Consultation titled, "Evaluation of Environmental Data Collected in 2000, Abby Street/Hickory Woods Subdivision," dated April 30, 2001. (See Attachment 1 for a copy of this 2001 report, "Summary of Hickory Woods Subdivision Exposure Survey Responses.")

As described in the 2001 Report (Attachment 1), NYS DOH researchers evaluated the pattern of frequently reported health conditions and symptoms by comparing them to national data from the National Health Interview Survey, which collects information about reported health conditions from a random sample of United States households (1). This process of comparison was used to evaluate whether there were any obviously unusual patterns of health problems. The results of the evaluation suggested that there might be more thyroid conditions, described as hypothyroidism or underactive thyroid, among the Hickory Woods residents participating in the survey than among the general population.

In response, the 2001 Health Consultation recommended that additional information be gathered about thyroid problems reported in the Exposure Survey. The public health action plan included in the Health Consultation stated that NYS DOH would follow up on the thyroid conditions reported among the people who responded to the survey and that findings would be shared with residents when follow-up activities were concluded.

DISCUSSION

A. Additional Information about the Exposure Survey conducted in 2000

For the Exposure Survey conducted in the summer of 2000, questionnaires were sent to 78 households in the Hickory Woods sub-division. Survey responses were collected from a total of 55 of these 78 households (71%). Forty-one households (53%) were contacted and interviewed by telephone, 14 (18%) filled out and returned the survey themselves, and 23 (29%) could not be reached after repeated attempts via telephone and a second mailing of the survey.

The neighborhood is a mix of older and newer homes. The older homes were built from 1810 to 1930, while the newer homes were built since 1989. Among the responding households, 40% of the completed surveys were from homes built prior to 1989, while 60% were from homes built in 1989 or later. Of the non-responding households, 43% lived in homes built prior to 1989, and 57% lived in homes built in 1989 or later.

Information was collected for 201 residents, including 96 (48%) males and 105 (52%) females. The age distribution of the residents was as follows: 45 (22%) were 0-12 years, 19 (9%) were 13-19 years, 54 (27%) were 20-39 years, 52 (26%) were 40-59 years, 26 (13%) were 60+ years, and 5 (2%) were age unknown. The average length of residence was 10.1 years. The range was from 1 month to 85 years. In homes built before 1989, the average length of residence was 16.0 years with a range from 1 month to 85 years. In homes built in 1989 or later, the average length of residence was 5.5 years with a range from 2 months to 11 years.

The survey's primary purpose was to collect information on potential exposures. Therefore, the survey did not gather comprehensive information on health conditions and risk factors for disease as would be done for a health study. The survey asked open-ended questions about recurring symptoms, chronic conditions, and serious conditions. The survey did not collect information about occupational history, tobacco or alcohol use, or other risk factors for disease, such as family medical history, that would be evaluated in a comprehensive health study. The exposure survey was not designed to show whether there was evidence for a link between potential exposures and health problems in the community. Based on the limitations of the survey's methods, the results could not show whether or not particular health problems are known to be elevated in the Hickory Woods community.

The original Exposure Survey Summary pointed out that it was important to note differences in methods and circumstances between the NHIS Survey and the Hickory Woods Exposure Survey that could affect the validity of this comparison. For example, the NHIS Survey results were based on a random sample of U.S. households. Among the households targeted to be interviewed, 94% were eventually reached and agreed to be interviewed. The Hickory Woods Survey was conducted in a community with heightened awareness and concern about environmental health issues, and a response rate of 66% of the targeted households was achieved. With a lower response rate there is the possibility that the households who chose to respond to the Exposure Survey may not be representative of the community as a whole. A particular concern was that those responding could be households with more health problems or with particular types of health problems.

Another limitation was that people in Hickory Woods, because of knowledge about environmental issues, might have better recall about household members' health conditions than the general population responding to the National Health Interview Survey. Both the Hickory Woods Exposure Survey and the National Health Interview Survey asked people to report on chronic conditions they have. Neither survey limited responses to conditions diagnosed by health providers. But the National Health Interview Survey listed specific conditions and asks respondents to reply yes or no for each type of condition. The Hickory Woods Exposure Survey asked people an open-ended question, with no lists of conditions.

As a result of this difference in survey methods, the Hickory Woods residents reported the conditions that were most important to them or that they thought might be related to environmental problems. As a result, the responses did not comprehensively list every health condition or symptom among household members. In addition, the Exposure Survey responses included various terms and non-specific terms for particular health conditions, in some cases making it difficult to compare to the precise terminology of the National Health Interview Survey. Despite such differences, a qualitative comparison could help to identify any unusual patterns of health problems from the Exposure Survey that may require further consideration.

Table 1 of Attachment 1 lists selected chronic conditions among the 18 most frequently reported by the general U.S. population in the NHIS survey. (The five conditions left off this listing were not reported by Hickory Woods residents, and include such things as bursitis and ingrown nails). Many of the conditions reported by Hickory Woods residents (Table 2 of Attachment 1) such as chronic sinusitis, hay fever, asthma, bronchitis, migraine headaches and diabetes are among the most frequently reported chronic conditions in the U.S. population. Comparison between the rank ordering and frequency of occurrence of conditions on the two lists suggested that there may be more skin rashes and thyroid conditions among the Hickory Woods group than among the general population.

Acknowledging the limitations of the data and differences between the two sets of data, some Hickory Woods residents' reports of skin rashes may not be equivalent in severity to the "dermatitis" category, but may fall into the "trouble with dry itching skin" category, also reported in the National Health Interview Survey. The reported thyroid conditions, however, appear to be appropriate for comparison with the NHIS category, "goiter or other disorders of the thyroid."

According to the information provided by residents for the survey, these thyroid conditions were reported among residents who lived in Hickory Woods for a minimum of five years, maximum of 22 years, and on average, ten years. Almost all of these reported cases were described as hypothyroidism or underactive thyroid, which is the most frequently diagnosed thyroid condition in the general population. Among the ten Hickory Woods residents reporting thyroid problems, seven were female, and six were under age 45. Thyroid problems are diagnosed approximately five times more frequently among females than males, and the risk for hypothyroid problems increases with age, particularly after age 40. Among the four residents with thyroid problems who were 45 years of age or older, only one was over age 65.

Because of the limitations, described above, associated with the Exposure Survey methods, the results can not show whether or not thyroid or other health problems were elevated in the

community. The report concluded that the results suggested that there might be more thyroid conditions, described as hypothyroidism or underactive thyroid, among the Hickory Woods residents participating in the survey than among the general population. In response to this finding, the 2001 Health Consultation recommended that additional information be gathered about the reported thyroid conditions.

B. Thyroid Condition Follow-up Plan

In response to the finding suggesting a possible elevation of thyroid conditions among Hickory Woods residents, NYS DOH stated in the Exposure Survey Summary that NYS DOH staff would re-contact households where thyroid problems were reported, seek additional information about health history, residential history, and occupational history, and request permission to seek medical records from health care providers. By gathering additional information from households reporting thyroid conditions, the researchers could seek potential explanations for the thyroid problems. In addition, the information would provide more complete descriptions of the thyroid conditions, so that the researchers could understand if the residents appeared to have similar thyroid problems, whether the types diagnosed are relatively common or rare, and whether there were other health problems associated with or predisposing the person to the thyroid condition, such as diabetes. Unusual factors in common among the people with the thyroid conditions might become evident, and might suggest whether there was a need for further study.

The attached survey was written to be conducted by telephone in order to assess the diagnosed thyroid condition, medical history, family medical history, residential and occupational history from an endocrinologist. We also sought each person's consent for us to request medical records from their physician. (See attachments 2-7.)

C. Additional Information about Thyroid Disease Risk Factors

In the general U.S. population, thyroid problems are diagnosed approximately five times more frequently among women than men, and rates per population of thyroid disease increase with age, particularly after age 40. The primary cause for hypothyroidism in the U.S. is Hashimoto's Disease, an autoimmune condition that occurs when the body's immune system attacks the cells in the thyroid gland, preventing it from producing enough thyroid hormone. While iodine-deficiency is a cause of thyroid disease in other areas of the world where iodine is not naturally occurring and not available in food sources, iodine-deficiency is not expected in the U.S. population.

Factors that indicate increased risk for Hashimoto's Disease and hypothyroidism include a family history of thyroid disease or a personal or family history of autoimmune, pituitary, or endocrine disease. Examples of such diseases or conditions are diabetes, systemic lupus erythematosus (lupus), rheumatoid arthritis, and vitiligo (loss of skin pigment). Additional risk factors for hypothyroid disease include having given birth within the last six months, having high cholesterol, clinical depression, trisomy 21 (Down Syndrome), having been treated for hyperthyroidism, having treatment for cancer with x-rays of the neck or head, and taking lithium (used to treat manic depression and depression) or amiodarone (used to treat life-threatening abnormal heart rhythms). (2,3)

D. Follow-Up Results

NYS DOH staff attempted to contact the ten residents who had reported thyroid problems in order to seek their participation in the follow-up. Two individuals did not wish to participate. Additional information was gathered by telephone interviews for eight remaining individuals.

Information Corrections

Additional information gathered in the telephone interviews led to corrections for information in the original survey. The 2000 Exposure Survey Summary reported that all the thyroid conditions were reported to have occurred after moving to Hickory Woods. For one individual, the dates of thyroid diagnosis and moving to Hickory Woods were misinterpreted or misreported in the survey. The telephone interview revealed that this person had the thyroid diagnosis before moving to Hickory Woods. Since the diagnosis preceded moving to Hickory Woods, additional information from medical records was not sought for this person.

For a second person, additional information from a family member revealed that this person was actually deceased five years prior to the Exposure Survey. Since the evaluation of thyroid disease in the neighborhood was meant to address disease burden in the current population, if we had known that this person was deceased, he/she would not have been included in the count of ten people reporting thyroid conditions in the Hickory Woods neighborhood. Information reported to us by the family of this person indicated that this individual had pre-existing conditions, prior to moving into Hickory Woods, that are known to contribute to the risk for thyroid disease. Medical records for this individual were no longer available, so this person's diagnosis was not confirmed by medical records.

Confirmation of Diagnoses

Another person with reported thyroid disease at the time of the exposure survey died prior to the conduct of the follow-up survey. Medical records for the thyroid disease diagnosis and cause of death were not available for this individual. Review of this person's other reported health conditions, reported in the Exposure Survey, revealed the existence of medical conditions, not known to be related to thyroid disease, but likely to be related to cause of death. This person reported having resided in Hickory Woods for two years prior to these diagnoses.

Consent for participation and for requesting medical records was granted for the five remaining participants. NYS DOH requested and received medical records from these participants' health care providers. Medical records confirmed the diagnoses of hypothyroid conditions for all. The original group of ten persons reporting thyroid conditions included 7 females and 3 males. In the group of five for whom the diagnoses were confirmed, there were also more females than males. As in the original survey, the participants were relatively young. The five remaining participants were all under age 50 at the time of the original 2000 survey and almost all had been diagnosed with thyroid problems in their 30's and 40's. There were no details related to the specific thyroid diagnoses that appeared to be unusual. All of these individuals were diagnosed with low thyroid function, or hypothyroidism, which is the most frequently diagnosed thyroid condition in the population.

Residential and Occupational History

Additional information provided by the remaining participants indicated that about half lived in homes that were built prior to 1920 and had lived in these homes for at least 15 years (15 - 27 year range) prior to diagnosis of hypothyroidism. The other half of the residents lived in homes that were built since 1992 and had lived in these homes less than 5 years (1-4 year range) prior to the diagnosis of hypothyroidism. There were no occupations in common among the people with thyroid disorders. No unusual occupational exposures were reported.

Family and Personal Medical History

Medical records for the five remaining respondents showed that almost all had pre-existing risk factors for thyroid disease. The majority had family histories of thyroid disease or family histories of autoimmune disease including lupus and diabetes. Almost all of the individuals also had personal medical histories that included risk factors for hypothyroidism. These factors included diabetes, lupus, non-specified autoimmune disease, and a specific genetic condition known to increase risk for thyroid disease.

Summary of Results

This follow-up evaluation gathered additional information to help us see if any unusual patterns were evident among the people reporting thyroid conditions in the 2000 Exposure Survey. Review of all available additional information about eight of the ten individuals, including review of specific thyroid diagnostic information for five individuals, showed no unusual factors in common among them.

Excluding the individual who was deceased seven years prior to the Exposure Survey, residential and diagnostic information for seven individuals living in Hickory Woods in 2000 showed that six of these individuals received diagnoses of thyroid disease after living in Hickory Woods for a length of time ranging from one to 27 years. One of these six people was deceased prior to the follow-up, so medical records were not available for confirming the thyroid diagnosis. Medical records for five individuals showed that most of these individuals had family histories of thyroid or autoimmune disease and almost all had one or more other medical conditions that contribute to the risk for thyroid disease. A variety of these pre-disposing conditions were present, including conditions such as diabetes and lupus.

CONCLUSIONS

1. Neither the original survey nor this follow-up can show whether or not particular health problems are known to be elevated in the Hickory Woods community.
2. While the Exposure Survey results suggested in 2001 that there might be more thyroid conditions among the Hickory Woods residents participating in the survey than among the general population, this review of additional information provided by people who consented to participate in follow-up has not indicated any unusual factors in common among the group.
3. This follow-up showed a variety of predisposing conditions for almost all of the participants in the follow-up with thyroid conditions, and therefore suggests that further investigation, seeking alternative explanations for these diagnoses, is not warranted.

RECOMMENDATION

No additional epidemiological investigations are recommended at this time.

REFERENCES

1. Current Estimates from the National Health Interview Survey, 1996, Vital and Health Statistics, from the Centers for Disease Control and Prevention/National Center for Health Statistics, Series 10, No. 200, Table 57: Number of selected reported chronic conditions per 1,000 persons, by age; United States, 1996.
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Attachment 1:

**SUMMARY OF HICKORY WOODS SUBDIVISION
EXPOSURE SURVEY RESPONSES**

PREPARED BY

**New York State Department of Health
Center for Environmental Health**

APPENDIX C

of the Health Consultation:

**Evaluation of Environmental Data Collected in 2000
Abby Street/Hickory Woods Subdivision
City of Buffalo, Erie County, New York
April 30, 2001**

**Prepared under a Cooperative Agreement with
U.S. Department of Health & Human Services
Public Health Service
Agency for Toxic Substances and Disease Registry**

Summary of the Hickory Woods Subdivision Exposure Survey Responses

Background

In response to concerns about potential exposures and health problems in the Hickory Woods Development in Buffalo, New York, in December of 1999, the New York State Department of Health (NYS DOH) proposed conducting an exposure survey in the community. The primary purpose of the survey was to gather information about the people living at each residence, whether they had noticed or come in contact with chemical substances or unusual materials in the subdivision, and whether they had any health concerns related to potential environmental exposures. Staff of the Bureau of Environmental and Occupational Epidemiology of the Center for Environmental Health developed the draft survey and worked with representatives of the Hickory Woods Concerned Homeowners' Association, Citizen's Environmental Coalition and Environment and Society Institute of the University at Buffalo to revise the survey, draft a cover letter about the purpose of the survey, and develop a plan for administering the survey. NYS DOH sent copies of the survey to residents prior to contacting each household by telephone. (See Attachments for the exposure survey questionnaire and cover letter.)

The list of names and addresses for mailing the survey was developed from lists compiled by NYS DOH and the United States Environmental Protection Agency (EPA). Using a map showing the boundaries for the area where EPA was planning to conduct residential soil sampling and aerial photographs to help locate buildings, addresses were identified for eighty-two households in the study area. In addition to information from existing lists, property ownership information files and telephone directories were used to find names and telephone numbers associated with each address. Additional telephone numbers were provided by the Homeowner's Association.

On June 22, 2000, the telephone survey questionnaire and cover letter explaining the survey process were mailed to residents of the Hickory Woods Subdivision. On June 28, 2000, representatives from the Bureau of Environmental and Occupational Epidemiology of NYS DOH began conducting the telephone survey. On August 31, 2000, a second mailing of the telephone survey was sent to residents who had not yet completed the survey.

Survey Response Summary

Response Rates and Demographic Characteristics

Survey questionnaires were sent to 78 households. Survey responses were collected from a total of 55 of these 78 households (71%). Forty-one households (53%) were contacted and interviewed by telephone, 14 (18%) filled out and returned the survey themselves, and 23 (29%) could not be reached after repeated attempts via telephone and a second mailing of the survey. One former resident of a household address already included in the EPA's sampling study area requested a survey, and one resident whose residence, on the east side of Germania Street, was originally outside the study area, but later added to the list for sampling, requested and completed a survey. The two additional households were interviewed by telephone and included in the study for a total of 57 households, representing 56 unique addresses.

The neighborhood is a mix of older and newer homes. The older homes were built from 1810 to 1930, while the newer homes were built since 1989. For the 57 responding households, 23 (40%) completed surveys were from homes built prior to 1989, while 34 (60%) were from

homes built in 1989 or later. Of the 23 non-responding households, 10 (43%) were homes built prior to 1989, and 13 (57%) were homes built in 1989 or later.

Information was collected for 201 residents, including 96 (48%) males and 105 (52%) females. The age distribution of the residents was as follows: 45 (22%) were 0-12 years, 19 (9%) were 13-19 years, 54 (27%) were 20-39 years, 52 (26%) were 40-59 years, 26 (13%) were 60+ years, and 5 (2%) were age unknown. The average length of residence was 10.1 years. The range was from 1 month to 85 years. In homes built before 1989, the average length of residence was 16.0 years with a range from 1 month to 85 years. In homes built in 1989 or later, the average length of residence was 5.5 years with a range from 2 months to 11 years.

Potential Environmental Exposures

Fifty-six (98%) households reported having a basement. Thirty-three households reported that the basement becomes wet at times. Forty of the houses with basements have a sump pump, and 22 of these sump pumps are described as running at least daily. Nineteen households reported using the basement as part of the living space.

Thirty-four (60%) households reported that children regularly spend time in the yard. The activities included playing, sports, picnics and cook outs, using child pools and sprinklers, and helping adults with yard and construction work. Sixteen (28%) of the homes have a swing set or play area in the yard with 12 (21%) reporting exposed soil in these areas. Thirty-two (56%) households reported exposed soil in other areas of the property. Twenty-three (40%) reported children playing on vacant lots in the neighborhood.

Forty-one (72%) households reported that family members regularly spend time outdoors in the subdivision, and 45 (79%) reported spending time outdoors in the past. Activities included walking, bike riding, dog walking, playing at the playground, delivering papers, and sledding.

Thirty-one (55%) have a fruit or vegetable garden on the property, 10 (18%) have a fruit or vegetable garden elsewhere in Hickory Woods, and 34 (61%) eat fruits or vegetables from a garden anywhere in Hickory Woods. Forty-three (77%) of homes have a flower garden, 54 (96%) work on their lawns, 40 (71%) do other landscaping work, and 32 (57%) do construction work on the property. The landscaping and construction activities included installing fences, decks, sheds, additions, swing sets, pools, patios, walkways, and planting shrubs and trees. Other activities that involved digging below the soil surface ranged from a depth of 5 inches to 4 feet.

Thirty-five (61%) reported having pets that track in dirt or other substances from the outside. The pets play or get walked in the yard, berm, streets, and vacant lots. Twenty-eight (49%) have pets that often dig holes or have other habits or characteristics that contribute to bringing dirt or other substances into the home.

Thirty-three (58%) households reported noticing chemical substances, unusual materials, or discolored soil on the property, and 16 (28%) reported that children play in the area. There were 22 (39%) reports of dark, black or cindery soil, 16 (28%) reports of debris in soil, 8(14%) reports of ash-like substances in soil, and 7 (13%) reports of orange "goo" near sump pumps or sewers. The debris included coal-like substances, steel, pipe, bricks, asphalt, building materials, glass, and tires. Twenty-four (71%) of the homes built in 1989 or later reported noticing chemical substances on their property versus 9 (39%) of the homes built prior to 1989. The most commonly reported substance in both newer and older homes was the dark, black or cindery soil.

Thirty-three (58%) households reported noticing chemical substances, unusual materials, or discolored soil elsewhere in Hickory Woods, and 21 (37%) have seen children playing in the area. Eighteen (32%) households described the standing water with strange colors and odors near the berm, nine (16%) reported similar puddles of standing water elsewhere in Hickory Woods, three (5%) reported coke-like debris, two (4%) reported an odor like mothballs, one reported orange-colored, standing water in a new basement, and one reported a yellow and green, thick substance where the gas line entered a newly constructed home.

Twenty-seven (47%) households reported at least one family member coming in contact with these chemical substances. Fifteen (26%) homes reported family members being exposed when gardening or doing yard work, seven (12%) while walking or walking the dog in the subdivision, five (9%) while playing in the area, four (7%) while installing a fence or performing home improvements, and one when the basement flooded. Sixty-seven (33%) residents were listed as coming into contact with the substances. In homes built prior to 1989, 10 (43%) of households reported a member coming in contact with unusual chemical substances. In newer homes, 17 (50%) of households reported a family member coming in contact with the unusual substances.

Twelve (21%) households reported that the vehicle traffic on the street is very light, 35 (63%) reported average traffic for a residential area, and nine (16%) reported constant heavy traffic. Twelve (21%) reported living near businesses where cars are often parked, and two (4%) reported cars left idling for long periods. Thirty-one (54%) reported living near businesses where trucks are often parked, and 23 (40%) reported trucks left idling for long periods.

Forty-seven (83%) have noticed unusual types or amounts of dust in the outdoor air near the residence currently or in the past. Thirty-three (58%) said the dust varies with the season, 24 (42%) said the dust varied with temperature, and 37 (65%) said the dust varied with wind conditions. Thirty-two (56%) reported noticing dust currently. The most frequently mentioned time periods that unusual amounts of dust were noticed were during the construction of new homes, when trucks drove by, when street was unpaved, during remediation of lots, and during hot or windy days. The dust was usually described as black.

Reported Health Concerns

When household respondents were asked about health concerns, 48 (84%) reported a variety of health problems among family members. These health problems were reported for 130 (65%) residents. The open-ended health concern question asked people to report health problems they thought were important. Residents were asked to report about long-term or chronic health problems, continuing symptoms that concerned them although they may not have reported them to a physician, and serious health problems, such as a diagnosis of cancer.

Respiratory tract and ear/nose/throat symptoms and conditions, including asthma, bronchitis, sinusitis, bloody noses, persistent earaches, frequent cough and other cold symptoms were reported by 70 (35%) residents. 37 (18%) residents reported symptoms in a broad category of "general" symptoms including joint and muscle aches, headaches, migraines, fatigue, weakness, anorexia. Table 1 lists twelve specific chronic conditions reported by residents and shows the number of residents who reported each condition. Chronic sinus problems led the list with 23 residents reporting sinus conditions, including chronic sinus infections. Asthma, skin rashes, and hay fever or other allergies, thyroid problems and heart disease were the next five most frequently reported conditions and symptoms. Ten residents reported having been diagnosed with thyroid problems, and almost all described the condition as underactive thyroid

or hypothyroidism. Some respondents reported links between symptoms and specific activities, such as rashes that developed in household members directly after handling soil in the yard. Some respondents also reported that members of their families began experiencing many more health problems after moving to Hickory Woods.

Some reports of health conditions gave descriptions using terms such as tumor, polyp, or growth. These conditions were not counted as reports of cancer. If the term “cancer” was used, or if the reported condition is a type of cancer (melanoma or multiple myeloma, for example), the condition was classified as cancer for this evaluation. (New York State maintains a Cancer Registry, and NYS law mandates that all cancers, excluding non-invasive skin cancers, must be reported by health care providers, hospitals, and clinics to the Registry. However, for this evaluation, the Registry was not used for confirming the reported cancers or gathering additional information on specific type of cancer.) Eleven cases of cancer were reported among residents responding to the survey. For one reported case of cancer, type of cancer was not reported and the age at diagnosis and length of residence of the person, now deceased, was not reported. For one other reported case of cancer, the age at diagnosis of the person was not reported. Among the nine other reported cases of cancer, six were among people age 60 or older and three were among people in the age group, 30 through 59. Length of residence in Hickory Woods among ten of the 11 reported cancer cases ranged from less than one year to 76 years, with four people reporting length of residence of ten years or more and six reporting fewer than ten years’ residence. The ten reported types of cancer included nine different types of cancer.

Each household was given the opportunity to make comments about the environmental issues in the neighborhood. A specific question asked, “Would you like to comment on what you would like to see done about the contamination issues in the neighborhood?” Five households did not comment, and five of the comments recorded could not be classified in the following categories. Respondents from 14 households stated they wanted to be relocated and have their homes bought out. Seven wanted to be relocated if the sampling showed ongoing health risks. Thirteen households wanted the neighborhood environmental problems to be cleaned up. Eleven households stated that the situation was overblown, and two stated they were waiting for the sampling results before forming an opinion about what needed to be done.

Some residents expressed the opinion that people should be relocated temporarily during clean-up. A frequent concern in these comments was that clean-up activities could lead to additional exposures to PAHs. Most residents’ comments emphasized their primary concern with protecting their families’ health. Additional concerns included property values, getting accurate information, and the actions of public agencies and officials.

Residents brought up concerns about the LTV inactive hazardous waste site, bordering Hickory Woods on Abby Street. Residents also mentioned concerns about potential exposures from operating facilities such as Buffalo Color, Buffalo China and Bethlehem Steel’s coke furnace. Some residents reported odors they believe came from Buffalo Color. Some long-term residents reported that levels of dust and ash used to be much more noticeable when the LTV facility, formerly Republic Steel, and Donner-Hanna Coke were in operation. Many owners of older homes described the black dust that had accumulated within the walls during the years that these plants were operating.

Discussion and Conclusions

Potential Environmental Exposures

One goal of the exposure survey was to gather information related to possible routes of exposure to environmental contaminants. By participating in the survey, residents had an opportunity to inform NYS DOH researchers about the range of activities that may have led to exposure to chemicals, particularly in soil. The survey results show that about 75% of Hickory Woods households reported having a fruit or vegetable garden, about 75% reported having flower gardens, and almost 75% reported they did landscaping work. Members of more than 50% of the households reported having done construction work on their property. Approximately 50% of the households reported that family members had come in contact with unusual chemical substances. More than 60% of households reported having pets that track in dirt or other substances from the outside. The Exposure Survey respondents reported having many more gardens than were reported to EPA and NYS DOH field staff. The reason for the difference may be that residents, in responses to the Exposure Survey, reported gardens they had currently or in the past, while for the EPA and NYS DOH field staff, residents only reported currently active gardens. Most responses to the Exposure Survey did not include a timeframe for the garden. Of the ten questionnaire responses that included a timeframe, three reported gardens continuing in the year 2000, three reported gardens only through 1999, and the others reported gardening that ended in earlier years.

Reported Health Problems

Another goal of the exposure survey was to provide residents with an opportunity to report problems that might suggest unusual patterns of illness in the neighborhood, if such patterns existed. This information would be helpful for planning an appropriate health study, if the sampling results indicated that such a study was warranted. The survey asked open-ended questions about recurring symptoms, chronic conditions, and serious conditions. The survey did not collect information about occupational history, tobacco or alcohol use, or other risk factors for disease, such as family medical history, that would be evaluated in a comprehensive health study.

The researchers evaluated the pattern of frequently reported health conditions and symptoms by comparing the pattern of frequently reported conditions to national data from the National Health Interview Survey, which collects information about reported health conditions from a random sample of United States households. This process of comparison was used to evaluate whether there were any obviously unusual patterns of health problems. It is important to note beforehand, however, differences in methods and circumstances between the NHIS Survey and the Hickory Woods Exposure Survey that may affect the validity of this comparison.

For example, the NHIS Survey results are based on a random sample of U.S. households. Among the households targeted to be interviewed, 94% were eventually reached and agreed to be interviewed. The Hickory Woods Survey was conducted in a community with heightened awareness and concern about environmental health issues, and a response rate of 66% of the targeted households was achieved. With a lower response rate there is the possibility that the households who chose to respond to the Exposure Survey may not be representative of the community as a whole. A particular concern is that those responding may be households with more health problems or with particular types of health problems. Another limitation is that people in Hickory Woods, because of knowledge about environmental issues, may have better recall about household members' health conditions than the general population responding to the

National Health Interview Survey. The exposure survey was not designed for conclusively identifying whether there were excesses of symptoms or disease in the study area.

Both the Hickory Woods Exposure Survey and the National Health Interview Survey asked people to report on chronic conditions they have. Neither survey limited responses to conditions diagnosed by health providers. But the National Health Interview Survey listed specific conditions and asks respondents to reply yes or no for each type of condition. The Hickory Woods Exposure Survey asked people an open-ended question, with no lists of conditions. As a result of this difference in survey methods, the Hickory Woods residents reported the conditions that were most important to them or that they thought might be related to environmental problems. As a result, the responses did not comprehensively list every health condition or symptom among household members. In addition, the Exposure Survey responses included various terms and non-specific terms for particular health conditions, in some cases making it difficult to compare to the precise terminology of the National Health Interview Survey. Despite such differences, a qualitative comparison may help to identify any unusual patterns of health problems from the Exposure Survey that may require further consideration.

Table 2 lists selected chronic conditions among the 18 most frequently reported by the general U.S. population in the NHIS survey. (The five conditions left off this listing were not reported by Hickory Woods residents, and include such things as bursitis and ingrown nails). Many of the conditions reported by Hickory Woods residents such as chronic sinusitis, hay fever, asthma, bronchitis, and migraine headaches and diabetes are among the most frequently reported chronic conditions in the U.S. population. Comparison between the rank ordering and frequency of occurrence of conditions on the two lists, suggests that there may be more skin rashes and thyroid conditions among the Hickory Woods group than among the general population. Acknowledging the limitations of the data and differences between the two sets of data, some Hickory Woods residents' reports of skin rashes may not be equivalent in severity to the "dermatitis" category, but may fall into the "trouble with dry itching skin" category, also reported in the National Health Interview Survey. The reported thyroid conditions, however, appear to be appropriate for comparison with the NHIS category, "goiter or other disorders of the thyroid."

Thyroid Conditions: In the general U.S. population, thyroid problems are diagnosed three to four times more frequently among women than men, and rates per population of thyroid disease increase with age. Among the ten Hickory Woods residents reporting thyroid problems, seven were female, and six were under age 45. Among the four residents with thyroid problems who were 45 years of age or older, only one was over age 65. These thyroid conditions were reported among residents who lived in Hickory Woods for a minimum of five years, maximum of 22 years, and on average, ten years. Almost all of these reported cases were described as hypothyroidism or underactive thyroid.

Cancer: This evaluation of the reported cancers is based on the approach used by NYS DOH to review cancer cases in small geographic areas. Characteristics of the cases, such as type of cancer diagnosed, age at diagnosis and year of diagnosis are examined to look for any unusual patterns. These patterns include: (1) several cases of the same type of cancer; (2) two or more cases of a rare cancer type; (3) several cases in an unusual or unexpected age group; (4) a clustering of the same cancer type by year of diagnosis; and (5) adequate latency period (time between first potential exposure to an environmental hazard in the community or workplace and development of cancer). The finding of any of these patterns suggests the possibility that cases may share a common cause and, therefore, may provide a basis for further investigation.

The distribution of types of cancer among Hickory Woods residents reporting cases of cancer did not point to an unusual pattern of cancer incidence. The ten reported types of cancer (one report did not specify type) for residents of Hickory Woods involved nine different types of cancer. The age distribution of the cases did not appear unusual. Most cases were over age 60 at diagnosis. Because community surveys may miss diagnoses of cancer among people in the community, the reported cases cannot be assumed to represent all the cancer cases diagnosed in recent years in the area.

More information about cancer incidence in the Hickory Woods area will soon be available in a ZIP code screening evaluation being conducted by the NYS Cancer Surveillance Program. As part of an evaluation of cancer incidence in the area near Bethlehem Steel in Lackawanna, cancer incidence is being evaluated for ZIP code 14220 where Hickory Woods is located. Although Hickory Woods comprises a very small part of this ZIP code, the results of this evaluation will be checked to see if they are consistent with the interpretation of self-reported cancers presented above.

A few families in the study area have experienced particularly severe and difficult health problems, not specifically described here to protect individual privacy. While it may not be possible for a health study of this relatively small community to draw conclusions about whether environmental exposures are linked to relatively rare health problems, individual health problems are still important. To date, our review of the scientific research literature on some of these specific health problems reported by Hickory Woods residents has not provided evidence for direct links to environmental exposures. Continued attention to the literature, as well as to any additional information that residents wish to provide, may be useful for developing suggestions for additional research.

Overall Conclusion

The exposure survey has identified a variety of pathways for potential exposure to residential soils at various depths and suggested a variety of health problems that are of particular concern to this community. The exposure survey was not designed to show whether there was evidence for a link between potential exposures and health problems in the community. Based on the limitations of the survey's methods, the results cannot show conclusively whether or not particular health problems are known to be elevated in the Hickory Woods community.

Recommendation

To follow-up on the thyroid conditions reported among the people who responded to the survey, NYS DOH staff will re-contact households where thyroid problems were reported, seek additional information about health history, residential history, and occupational history, and request permission to seek medical records from health care providers. By gathering additional information from households reporting thyroid conditions, the researchers can seek potential explanations for the thyroid problems. In addition, the information will provide more complete descriptions of the thyroid conditions, so that the researchers can understand if the residents appear to have similar thyroid problems, whether the types diagnosed are relatively common or rare, and whether there are other health problems associated with or predisposing the person to the thyroid condition, such as diabetes. Factors in common among the people with the thyroid conditions may become evident, and may suggest whether there is a need for further study.

Table 1. Listing of chronic conditions reported in exposure survey in rank order by number of individuals reporting (*Numbers smaller than five not shown.)

<u>Chronic Condition</u>	<u>Number Reported</u>
Chronic Sinus Problems	23
Asthma	18
Skin Rashes	16
Hay Fever or Allergic Rhinitis	15
Goiter or Other Thyroid Disease	10
Heart Disease	8
Diabetes	5
Frequent Indigestion	5
Arthritis	*
Chronic Bronchitis	*
Migraine Headaches	*
High Blood Pressure	*

Table 2. Listing of selected chronic conditions in the general U.S. population in rank order by rate per 1,000 population
rate per 1,000 (all ages)

127.3	Arthritis
125.8	Chronic sinusitis
107.1	High blood pressure
89.8	Hay fever or allergic rhinitis without asthma
78.2	Heart disease
55.2	Asthma
53.5	Chronic bronchitis
43.7	Migraine headaches
31.2	Dermatitis
28.9	Diabetes
25.1	Trouble with Dry Itching Skin
24.3	Frequent indigestion
17.4	Goiter or other thyroid disease

Source: Current Estimates from the National Health Interview Survey, 1996, Vital and Health Statistics, from the Centers for Disease Control and Prevention/National Center for Health Statistics, Series 10, No. 200, Table 57: Number of selected reported chronic conditions per 1,000 persons, by age; United States, 1996.

Attachment 2: Introduction Letter

Name
Address
Date

Dear:

In May of 2001 The New York State Department of Health (NYS DOH) Center for Environmental Health completed its Health Consultation for the Abby Street/Hickory Woods Subdivision, An appendix to the Health Consultation summarized the responses to our survey which consisted of questions about exposures and health. The results of the NYSDOH exposure survey suggest that there may be more thyroid conditions, described as hypothyroidism or under active thyroid, among the Hickory Woods residents who participated in the survey than among the general population. Additional information is needed to help NYSDOH better understand the thyroid conditions that have been reported by the Hickory Woods residents.

We are following up on the thyroid conditions reported among the people who responded to our survey. We are contacting you because you identified yourself or a member of your family as having a thyroid condition in the survey.

As part of this follow up we would like to complete a short telephone interview with you. The interview normally takes only about 10 minutes. During this interview we will gather additional information about health history, residential history, and occupational history. This additional information will provide more complete descriptions of the thyroid conditions, so that the researchers can understand if the residents appear to have similar thyroid problems, whether the types diagnosed are relatively common or rare, and whether there are other health problems associated with or predisposing the person to the thyroid condition, such as diabetes. Factors in common among the people with thyroid conditions may become evident, and may suggest whether there is a need for further study.

Ms Lorraine Benton will be calling you within the next week to discuss your interest in this project. The telephone number that we have listed for you is _____. If this telephone number is incorrect or there is a more convenient time for us to call, please call Lorraine Benton at 1-800-458-1158 extension 27950.

If you have any questions or do not wish to be contacted, please call Lorraine Benton at 1-800-458-1158 extension 27950.

Thank you in advance for your help.

Sincerely,

Dr. Elizabeth Lewis-Michl

Attachment 3: Telephone Protocol

If you get a person:

Hello, this is _____ from the Center for Environmental Health. May I please speak with _____. (if the subject is there continue with this part if not see phone message protocol). Mr./Mrs. _____, I am calling in regards to a letter that I sent to you recently. Do you have a few moments to talk? If no – when is a better time for me to call?

If yes – Thank you. I am calling to see if you might be willing to help us with the continued research that is being done on thyroid conditions in your community. I am calling you because you had responded in our first mail in survey that you or a household member had been diagnosed with thyroid disease. Is that correct? What I would like to do, if you have about 10 minutes, is to complete the short telephone interview part of this project. Would now be a good time to do that? (if no – then when is a better time?).

If you have to leave a message (machine or household member other than subject):

Hello, this message is for Mr. / Mrs. _____. _____ this is _____ from the Center for Environmental Health. I am calling in regards to a letter I sent to you about one week ago and I was hoping to have a moment or two to speak with you. If you could give me a call back at 1-800-458-1158 extension 27950 and just let me know what would be a better time for me to call I would greatly appreciate it. Thank you.

(Note: if you are speaking to a person you can just ask them when would be a better time to try to reach the study subject)

If this is the third message that we have left with no response, we may add a line that they could also call 1-800-458-1158 X 27950 and leave a message that they are not interested in participating in the research project.

At the end of the interview:

Thank you for taking the time to complete this interview with me. The next step in our investigation is to review the medical records of people participating in this project. The reason for doing this is to ensure that we have complete information on the types of thyroid conditions that have been reported in your community. Once we have this information along with the valuable information you have just provided we will be better able to evaluate whether the thyroid conditions in the community are related. In order for us to be able to review the medical records we need you to complete a consent form, that I will send to you, and then return this form to me in a stamped addressed envelope that I will also provide. This consent form needs to be completed for yourself and name of each household member for whom thyroid conditions were reported. I will send you one form for each of your physicians. **How many physicians have helped to diagnose or treat your thyroid condition?** All the information we collect for this project will be kept strictly confidential.

May I send out the consent form for you to review?

Thank you again and please feel free to call me with any questions you may have regarding this project.

Attachment 4: Thank-you letter to participants

Name
Address

Date

Dear:

Thank you for completing the telephone interview with me on *date of interview*. As we discussed at that time, I am sending you the medical release forms. Please complete one form for each physician that has helped diagnose or treat your thyroid condition. Please sign each medical release consent form. Then please return these forms to me in the enclosed self addressed stamped envelope.

If you have any questions please call me at 1-800-458-1158 extension 27950.

Thank you again for joining us in this project.

Sincerely,

Lorraine Benton

Attachment 5: Consent to release medical information

New York State Department of Health
Center for Environmental Health
Bureau of Environmental & Occupational Epidemiology

CONSENT TO RELEASE INFORMATION

I consent to participate in the follow-up evaluation and agree to the release of my medical records concerning my thyroid diagnosis, treatment and follow-up care, to the project investigators at the New York State Department of Health.

PATIENT SIGNATURE _____

PATIENT'S NAME _____

(please print)

DATE _____

STREET ADDRESS _____

CITY, STATE, ZIP _____

TELEPHONE NUMBER : HOME: _____ (_____)

WORK: *(optional)* _____ (_____)

HEALTH CARE PROVIDER:

NAME _____

First Name

Last Name

PRACTICE NAME _____

STREET ADDRESS _____

CITY, STATE, ZIP _____

TELEPHONE NUMBER (_____) _____

Please return to:

Pat Steen

*NYS Department of Health
Flanigan Square, Room 200
547 River Street
Troy, NY 12180-2216
(518) 402-7950*

Attachment 6: Letter to health care provider

DATE

MD Name
Address
City, State

Dear :

Please find enclosed a consent form for the release of medical information from your patient, **Subject name**. Ms/Mr. **Last Name** is participating in a follow-up investigation that is being conducted by the New York State Department of Health, Bureau of Environmental Health. As part of this investigation we are following up on **Name**'s history of thyroid disease. **Name** indicated that he/she had been diagnosed with **Thyroid Condition** in **Year**.

Please send any information pertaining to **Name**'s diagnosis or treatment of **Thyroid Condition** to:

Pat Steen
NYS Department of Health
Flanigan Square, Room 200
547 River Street
Troy, NY 12180-2216

If you have any questions, please call Lorraine Benton at 518-402-7950.

Thank you in advance for your assistance.

Sincerely,

Elizabeth L. Lewis-Michl, Ph. D., Chief
Community Exposure Research Section
Bureau of Environmental and Occupational Epidemiology

Attachment 7: Participant Interview Questions

Assigned ID:

Sex

Date

Time

Interviewer

First I have a few general questions.

1. What is your age?
2. What is your date of birth?
3. How tall are you?
4. How much do you weigh?
5. When did you move to your current residence (MMYY)
6. How long have you lived at your current residence?
7. Have you ever lived at another residence in hickory woods?
If yes:
 - 7a. How many other residences in hickory woods?
 - 7b. When did you move into the first residence?
 - 7c. What was the address of this residence?
 - 7d. How long did you live in this residence?
 - 7e. When did you move out of this residence?
 - 7f. When did you move into the second residence?
 - 7g. How long did you live in this residence?
 - 7h. What was the address of this residence?
 - 7i. When did you move out of this residence?
 - 7j. When did you move into the third residence?
 - 7k. What was the address of this residence?
 - 7l. How long did you live in this residence?
 - 7m. When did you move out of this residence?
 - 7n. When did you move into the fourth residence?
 - 7o. What was the address of this residence?
 - 7p. How long did you live in this residence?
 - 7q. When did you move out of this residence?
 - 7r. When did you move into the fifth residence?
 - 7s. What was the address of this residence?
 - 7t. How long did you live in this residence?
 - 7u. When did you move out of this residence?
8. Are you currently employed?
If yes:
 - 8a. What is your job?
 - 8b. For what type of business or industry do you work?
 - 8c. How long have you had this job?
9. Have you ever had a job where you were exposed to chemotherapeutic agents?
If yes:
 - 9a. What were you exposed to?
 - 9b. What was your job?
 - 9c. When did you begin this job?(year)
 - 9e. How long did you do this type of work?

10. Have you ever had a job where you were exposed to x-rays, microwaves or some other form of radiation?

If yes: 10a. What were you exposed to?

10b. What was your job?

10c. When did you begin this job? (year)

10d. How long did you do this type of work?

Now I have some questions about cigarette smoking.

11. Have you ever smoked regularly, by that I mean one cigarette a day or seven in a week?

If yes: 11a. Did you smoke in the past month?

11b. How many cigarettes did you smoke?

11c. How old were you when you first began smoking?

11d. During the time you were smoking, how many cigarettes did you usually smoke?

11e. How old were you when you last smoked?

11f. Between the ages of _____ and _____ did you ever stop smoking?

If yes: 11g. How many times did you stop?

11h. Thinking of the first (second, third, ...)time you stopped, how long did you stop?

(Ask for each time stopped) Total Duration:

The next few questions pertain to some medical conditions.

12. How many different doctors do you currently have?

Has a doctor or other healthcare professional ever said you have	Thyroid Disease 13.	Diabetes 14.	Lupus 15.	Rheumatoid Arthritis 16.	Addison's Disease 17.	Vitiligo 18.	Anemia 19.
a. What type of ___ do you have?							
b. What tests were done to diagnose ___?							
c. How old were you when you were first diagnosed?							
d. What year were you first diagnosed?							
e. Do you currently have ___?							
f. Are you currently being treated for ___?							
g. If yes: what medication or treatment							

I have some questions about your family history. These questions are in regards to your immediate family that do NOT currently reside in your house with you.

Has a doctor or other healthcare professional ever said a member of your family had	Thyroid Disease 20.	Diabetes 21.	Lupus 22.	Rheumatoid Arthritis 23.	Addison's Disease 24.	Vitiligo 25.	Anemia 26.
a. What is their relationship to you?							
b. What type of ___ does/did ___ have?							
c. What tests were done to diagnose ___?							
d. How old was ___ when he/she was first diagnosed?							
e. What year was he/she first diagnosed?							
f. Does he/she currently have ___?							
g. Is he/she currently being treated for ___?							
h. If yes: what medication or treatment							