

Health Consultation

ABBY STREET/HICKORY WOODS SUBDIVISION

BUFFALO, ERIE COUNTY, NEW YORK

EPA FACILITY ID: NYSFN024229

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

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Division of Health Assessment and Consultation

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HEALTH CONSULTATION

ABBY STREET/HICKORY WOODS SUBDIVISION

BUFFALO, ERIE COUNTY, NEW YORK

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Prepared by:

New York State Department of Public Health
Under a Cooperative Agreement with the
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 entitled, "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 (NHIS), 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 any obviously unusual patterns of health problems existed. The results of the evaluation suggested that the Hickory Woods residents participating in the survey might have more thyroid conditions (described as hypothyroidism or underactive thyroid) than 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 the findings would be shared with residents when follow-up activities were concluded.

The follow-up report was completed and distributed to the residents for public comment on May 25, 2004. The public comment period ended on June 30, 2004. The NYS DOH received no comments. Therefore, no changes have been made to this report.

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 subdivision. 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 by telephone and by mail (a second mailing of the survey was sent).

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 in 1989 or later. 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 an unknown age. 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 evidence existed 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 differences in methods and circumstances between the NHIS and the Hickory Woods Exposure Survey could affect the validity of this comparison. For example, the NHIS results were based on a random sample of U.S. households. Among the households targeted to be interviewed, 94% of the households 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, the possibility exists 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 nonspecific terms for particular health conditions, making it sometimes difficult to compare with 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. (The five conditions left off this listing were not reported by Hickory Woods residents, and included 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 5 years, a maximum of 22 years, and on average, 10 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 10 Hickory Woods residents reporting thyroid problems, seven were female, and six were younger than age 45. Thyroid problems are diagnosed approximately 5 times more frequently among females than males, and the risk for hypothyroid problems increases with age, particularly after 40 years. Among the 4 residents with thyroid problems who were 45 years of age or older, only 1 resident was older than 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 more thyroid conditions, described as hypothyroidism or underactive thyroid, might exist 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 recontact 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. Then, the researchers could understand if the residents appeared to have similar thyroid problems, whether the types diagnosed are relatively common or rare, and whether other health problems existed that were 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 a further study was needed.

The attached survey was written to be conducted by telephone in order to assess the diagnosed thyroid condition, medical history, family medical history, and residential and occupational history. 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 5 times more frequently among women than men, and rates per population of thyroid disease increase with age, particularly after the age of 40 years. 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 giving birth within the last 6 months; having high cholesterol, clinical depression, trisomy 21 (Down Syndrome); receiving treatment for hyperthyroidism or 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 10 residents who had reported thyroid problems in order to seek their participation in the follow-up. 2 individuals did not wish to participate. Additional information was gathered by telephone interviews for 8 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 1 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 5 years prior to the Exposure Survey. 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 10 persons 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 that are known to contribute to the risk for thyroid disease, prior to moving into Hickory Woods. 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 2 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 10 persons reporting thyroid conditions included 7 females and 3 males. More females than males were in the group of five for whom the diagnoses were confirmed. As in the original survey, the participants were relatively young. The 5 remaining participants were all younger than age 50 at the time of the original 2000 survey, and almost all had been diagnosed with thyroid problems in their 30s and 40s. No details related to the specific thyroid diagnoses 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 of the residents 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 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 7 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 1 to 27 years. 1 of these 6 persons was deceased prior to the follow-up, so medical records were not available for confirming the thyroid diagnosis. Medical records for 5 individuals showed that most of these individuals had family histories of thyroid or autoimmune disease and almost all had 1 or more other medical conditions that contribute to the risk for thyroid disease. A variety of these predisposing 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 the 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

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CERTIFICATION

This health consultation was prepared by the New York Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated.



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The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this Health Consultation and concurs with its findings.



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