

Healthy Homes University: An Innovative Approach to Indoor Air Quality, Asthma, and Family History in a Community Setting

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Background and objectives: The Michigan Department of Community Health's (MDCH's) Division of Environmental Health determined that there was a need for a more holistic program to address hazards within the home beyond lead-based paint. As a result, in November of 2005, funding from HUD and other sources were secured to create Healthy Homes University (HHU) in 2005. The outcomes for HHU are to reduce the rate and severity of asthma episodes as well as unintentional injury to children under the age of 18 in Ingham County. Eligible applicants include household units where low to moderate income families with children less than 18 years of age with asthma.

To better understand who was affected by this program, the Healthy Homes Section partnered with the MDCH Genomics Unit to integrate family history questions into the baseline survey of homes. The Genomics Unit provides assessment, policy development and assurance related to the use of genomics in public health programs. To our knowledge, this is the first time a state health department has integrated genomics into an environmental health project.

Methods: Throughout a 36-month period, a total of 300 homes of low-moderate income families will receive the Basic Intervention treatment. Each home is visually inspected and an evaluation conducted to identify and address asthma and allergy triggers, along with unintentional injury hazards, in addition to the collection of family health history information regarding asthma. Self-reported family history information is collected on all first and second degree relatives of the index case, as well as information on which of those relatives live in the home. The families enroll for a 6-month period of time, during which staff visits the home on approximately four separate occasions. The first two site visits introduce the program and staff to the families, collect baseline information about the family and house, and provide education and Basic Intervention products. Homes that qualify for the Custom Intervention products and services will be determined at that time. A minimum of 40 of these homes will receive Custom Intervention products and services based on multiple scored criteria including family history of asthma and the number of affected persons within each household. The remaining two site visits provide additional education and collect information about changes in knowledge, attitudes and behaviors of the families.

Results: As of August 2007, 207 families have completed the baseline intervention portion of the project and 116 have graduated from the program. Family history information was analyzed on 162 families that completed the baseline intervention between November, 2005 and May, 2007. 65% of probands had at least one 1st degree relative ever diagnosed with asthma. When expanding the analysis to include second degree relatives, this number rose to 80%. By incorporating genomics, the HHU impact on the family has been demonstrated by the documentation of not only the index case, but also another 150 relatives in 93 households who had ever been diagnosed with asthma. At the baseline interview, with increasing numbers of affected first degree relatives there was a significant trend of an increasing number of days reported with asthma symptoms such as shortness of breath and wheezing. Children with one or more first-degree relatives ever diagnosed with asthma had more days with symptoms, on average, than children without a first-degree family history on all six survey questions regarding asthma symptoms. This difference was significant ($p < .05$) for data from five of the six questions.

Discussion/Conclusion: In public health, it is critical to show a maximum amount of impact with limited resources. By including family history information in the HHU program, we have documented the rate of self-reported asthma in the relatives of children referred as index cases, and provided interventions in the home environment that will potentially benefit 150 additional family members. This extends the number of beneficiaries whose asthma symptoms may be alleviated. In addition, HHU staff report that collecting a family history appears to build trust and communication with families. This has led to referrals of other households within the same extended family. Moreover, among the HHU target population, there may be an association between family history of asthma and severity of asthma symptoms.