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I. Executive Summary:

The Michigan Department of Community Health’s (MDCH) vision is to “protect, preserve, and promote the health and safety of the people of Michigan with particular attention to providing for the needs of vulnerable and under-served populations” (“About the Michigan Department of Community Health,” 2012). The MDCH established the Healthy Homes and Lead Poisoning Prevention Program (HHLPP) to assist in carrying out this vision. The Program seeks to “improve the health and safety of Michigan citizens by changing home environments through education, prevention, intervention, and collaboration among housing and health professionals at state and local levels,” (“MDCH HHLPP Advisory Group,” 2012). To better frame its activities moving forward, HHLPP applied for a Centers for Disease Control and Prevention (CDC) grant to develop and implement a Statewide Healthy Homes Strategic Plan. The Program received the grant and formed an Advisory Group to assist in carrying out the anticipated grant activities. By developing a carefully focused strategy, identifying assets and resources across Michigan, and collaboratively constructing plans, strategies, and tactics, the Advisory Group intends to help MDCH and local agencies create healthier homes throughout Michigan.

This strategic plan outlines home health hazards and their impact on the health of Michigan residents. The plan presents specific goals, objectives, and strategies to obtain and maintain healthy home environments in Michigan. The plan will also provide an overview of the State’s transition from lead poisoning prevention to a more comprehensive healthy homes model, and considers the roles of various government and non-government agencies in these emerging healthy homes programs.

This document also presents a historical outline of healthy homes challenges and efforts in order to provide context for future health outcomes. To accurately identify future health outcomes, the plan will research how health hazards are identified, tracked, prevented, and addressed. This plan will also identify current and future partners that can help sustain healthy homes efforts in Michigan. The Strategic Plan provides details on how to create safe and healthy environments for Michigan families through surveillance, prevention, training, policy, resource mapping, strategic partnerships, and sustainability. Proposed activities are tailored to and presented for multiple geographic areas including statewide, rural areas and small communities, and large and medium-sized communities. This plan is intended to provide a roadmap for implementing a comprehensive healthy homes strategy in Michigan. It will help indicate how to reach the following goals:

- Prevent or reduce illness, injury and death related to environmental risk factors; and

- Improve environmental health capacity by building and enhancing effective partnerships

The Healthy Homes and Lead Poisoning Prevention Advisory Group (Advisory Group) and several related work groups were formed in 2012 to assist in developing the strategic plan. The Advisory Group and its associated work groups were comprised of representatives from state, county and city departments, nonprofits, universities, hospitals, community coalitions, and faith-based organizations.
Through the efforts of the Advisory Group and work groups, priorities were identified and detailed work plans were produced. These can be summarized in the following strategic directions:

1. **Information gathering and public information/public choice**: The true extent, nature, and costs of housing hazards and related health outcomes are just beginning to be understood and documented. The work groups took note of this, and across the board they called for more information gathering. As the scale of the problems and characteristics of the affected are identified, several efforts are possible.
   a. First, strategies can be developed to educate the affected populations about risks and prevention so they can make informed choices about how to protect themselves and their families. For example, families that understand the risks of lead hazards can use the Lead Safe Housing Registry to identify lead-free housing to which they might relocate. While this system needs on-going enhancements, the lead poisoning surveillance, public information provision and registry represents an example of what might be done to facilitate public choice in other areas.
   b. Second, the information about risks from home health hazards needs to be analyzed and presented to affect policy and funding. To bring about these changes, key populations, along with elected officials and other decision-makers, must understand the scale of mortality and morbidity and their associated costs.

2. **Regulations Requiring Risk Reduction**: A key aspect of the current housing market is an oversupply of units, particularly older, single family units. The use of code enforcement and regulatory tools is unlikely to lead to large increases in rents. Regulation, which involves limited outlays from local and state government, then represents a way to reduce hazards when new supplies are unlikely to be built. However, this is only possible if the first step (above: public information and support) has been developed. In Michigan and other states, efforts to increase regulation are often successful, but there are regular challenges from property owners. Ordinances survive only where the problems can be demonstrated and defended.

3. **Engagement of groups and statewide collaboration**:
   a. **Building Local Coalitions**: Parents, churches, schools, community development corporations, foundations, and medical care providers have a deep interest in children and citizens leading safe and healthy lives. The problem in moving this interest forward, though, is lack of engagement. We have seen various models designed to involve these partners, and we now need to expand broad coalitions such as the Green & Healthy Homes Initiatives (GHHI), currently in Detroit and Flint, to other communities.
   b. **Expanding State Coalitions and Programs**: Both the Asset Map (Appendix D) and the reality of the coming budget year suggest many
of the most effective and well-resourced healthy homes programs and coalitions are at the local level—Grand Rapids, Detroit, Flint, Lansing, and Saginaw. It is the time to tie these and others coalitions together into an effective state-wide healthy homes coalition that educates residents and advocates for policies and programs to protect children and older adults - even in an environment of fiscal austerity. While some of this work has been done for asthma or lead poisoning, we need to first bring these and other groups together and then identify champions for the full package of healthy home improvements that will save lives and reduce injuries and illness. Only in this way are we likely to see expansion of funding or programs at either the state or local levels.

c. **Beginning and Continuing Research:** A large share of data collection and research activities proposed by the workgroups will require substantial resources. Many of these resources are currently absent at the state level. However, a number of local communities have access to additional resources. Through careful and strategic collaboration, these local efforts can move state efforts forward toward data collection. This would facilitate the data collection related to the identification and characterization of healthy homes issues while preparing a way to fund a larger effort.

4. **Resource Development:** Much of the actual program delivery surrounding Healthy Homes is currently supported through HUD grants, foundation funds, and local general funds. Some of these funding sources are not sustainable. The goal is to support comprehensive healthy homes assessment and intervention activities using sustainable funding sources. The State can pursue several avenues for resource development. One avenue is mobilizing the healthy homes coalitions to pursue State funding by demonstrating the extent and depth of the problem. This is likely to be effective as local coalitions identify local policy makers who are willing to champion these issues in state-level forums. Second, the State should pursue all opportunities for federal funding and assist local partners in doing so as well. This may involve pursuing nontraditional funding sources such as FEMA and the Michigan State Housing Development Authority. Third, it is important to involve health care providers in discussions about healthy homes, as their systems will be major beneficiaries as healthy homes lead to better personal health outcomes. The use of community benefit agreements to pay for healthy homes interventions is currently occurring with asthma, and could become a major mechanism for creating sustainability for healthy homes interventions. Fourth, the state must identify existing funding to cover surveillance, primary prevention, case management and other intervention activities. This may be possible through supplementing existing programs such as WIC or Medicaid case management. For example, community groups could be provided with incentives to participate in community education efforts, while other partners could fund intervention efforts by providing training to the private contracting community. Foundations are particularly interested and willing to fund innovative, front of the field efforts. When a state, city, or county seeks to
implement an innovative healthy home activity, the foundation community should be engaged. Finally, the healthy homes community needs to engage key players in the housing industry to help them understand how their future market will involve retrofitting existing housing in ways that will make them safer and healthier for families. If contractors view this as a profitable venture, the healthy homes community will have major allies in pursuing improved regulations and financing.

5. **Service Delivery:** In the healthy homes community, we have a large set of workable interventions, including smoking cessation programs, railing installation on stairs and in baths, asthma case management, and lead hazard abatement. We know that installing carbon monoxide and smoke detectors saves lives, and we believe (though this needs to be thoroughly demonstrated) it is far more cost effective to implement these strategies simultaneously in a home after a visual assessment identifies the highest risk problems. We have several local programs that are testing healthy homes models and several collaboratives providing support. The major challenge is to expand and disseminate these working models to additional areas in major cities and rural areas that do not currently have them. In the medium term it will be important to test healthy homes models in places where these approaches have not been tested and add elements that have not been thoroughly integrated in Michigan. Two places where a healthy homes model needs to be tested include rural communities and Northern Michigan, including the Upper Peninsula. A major element that needs to be thoroughly integrated is weatherization, which has not yet been effectively tied to a comprehensive program in Michigan. Incorporating weatherization into healthy homes will require the cooperation of major utility companies. The expansion of service delivery discussed here is highly dependent on finding sustainable funding.

II. Introduction:

A. **Statement of Purpose:**

The basic premise of healthy homes is that we can improve the health of Michigan’s citizens, particularly its children, by improving housing, especially by removing key hazards. The most important hazards include second hand smoke, poisons, fire risks, radon, fall hazards, mold, insects, pests and lead. By reducing or removing these hazards, we can save many lives, avoid injuries and illness, and increase health and human capacities. By removing these hazards simultaneously, we can save money and increase our health impact.

In recent decades, Michigan’s housing has aged, and many of these health hazards have become more prevalent. These hazards are leading to serious health outcomes including asthma, allergies, lead poisoning, unintentional injuries, cancer, and chemical exposure. The Healthy Homes and Lead Poisoning Prevention Program (HHLPP) and the Healthy Homes Section of the Michigan Department of Community Health (MDCH) were created to address these outcomes.
The purpose of this Strategic Plan is to clearly outline a specific and sustainable set of goals, objectives, and activities to eliminate housing-based hazards to health and to create healthy homes for Michigan families.

B. Mission:

The mission of this plan is to “improve the health and safety of Michigan citizens by changing home environments through education, prevention, and collaboration among housing and health professionals at state and local levels,” (“MDCH HHLPP Advisory Group,” 2012). This mission directly reflects the MDCH’s Healthy Homes principles. These principles, which were adapted from the U.S. Department of Housing and Urban Development (HUD), are:

1. Keeping a dry home to prevent water damage hazards caused by outside and inside leaks and condensation;

2. Keeping the home clean by preventing the presence of pests, allergens and contaminants;

3. Keeping a properly ventilated home by allowing fresh air to easily enter the home while reducing the concentration of allergens, smoke, mold, and dangerous gases;

4. Keeping a home free of pests such as mice, cockroaches, and bed-bugs so the diseases they bring into a home and the often dangerous chemicals needed to rid them can be avoided;

5. Keeping a home safe by creating an environment where injuries caused by fires, falls, choking, drowning, and firearms are not possible;

6. Keeping a home where chemicals—such as contaminants, sprays, and pesticides—are not easily obtainable, especially to children, or even present since “green” products do not pose the health hazards common household chemicals can;

7. Keeping a well maintained home because, no matter how clean or “healthy” a home may initially be, problems will inevitable arise over time. Regular inspection and maintenance will prevent problems from becoming hazardous to individuals’ health. (“The Principles of a Healthy Home,” 2012)

This Healthy Homes Strategic Plan provides a means to help Michigan families live in accordance with these principles. The intent is to assist residents in avoiding the adverse health outcomes associated with lead hazards, dampness, mold, pests, and second-hand smoke, among other hazards. The strategies to implement these principles have been identified through the examination of historical practices, statistical analysis of the presence of certain hazards, fiscal and resource mapping, and an analysis of current programs and policies. Using this information, the HHLPP Advisory Group and work groups have identified and prioritized key activities for advancing healthy housing in Michigan.
III. Health Outcomes:

A. Overview:

The purpose of this plan is to improve health outcomes by reducing housing-related risks of death, injury and illness. The key hazardous health outcomes that this strategic plan seeks to address are lung cancer, unintentional injuries, asthma and allergies, and lead poisoning. It is remarkably difficult to determine the exact scale of these health outcomes as many have not been tracked precisely. As a result, the estimates reported here may be subject to considerable refinement. They are presented to give a sense of the scale of the challenges we face with Michigan’s housing, as well as to help considerably focus the priorities for action. One of those actions, as explained below, is to get far better data on which to make the case for healthy homes. In a time and a place where finances are short and funding difficult, only clear-cut priorities supported by strong advocates with good data are likely to gain support.

Table 1 (below) presents the estimates for death and illness/injury. In terms of mortality and morbidity rates\(^1\), lung cancer is the most deadly of the health effects related to home environments with a mortality rate (lung and bronchus cancer) of more than 54.1 and a morbidity rate of nearly 68.5 per 100,000 (CDC United States Cancer Statistics (USCS), 2012). However, it is important to consider the degree to which lung cancer and associated deaths are attributed to environmental factors such as second-hand smoke (ETS), radon, and asbestos, in comparison to lung cancer and deaths attributed to tobacco use or non-housing environmental factors. Only a partial estimate of mortality attributable to second hand smoke, radon and other housing related hazards is feasible. The best data indicates that there were nearly 2330 lung cancer deaths attributed to exposure to second hand smoke and radon in 2008/2009 (Alberg & Sammit, 2003). See Table 1 (below) for a full explanation of how this number was calculated.

The next most deadly home health outcome is unintentional injury, which accounted for 2,357 deaths in Michigan in 2009 (CDC’s Web-based Injury Statistics Query and Reporting System (WISQARS), 2012). State-level data was not available for morbidity related to unintentional injuries. As a result, this data was interpolated by population from national CDC data, with an estimated 333,448 unintentional injuries related to the home environment in Michigan in 2010 (CDC WISQARS). The above data represents only unintentional injuries due to fire/flame, poisoning, fall, residential fire/flame (for mortality only), and suffocation. Another component of unintentional injury and death is chemical exposure that results in poisoning. There were 1,091 deaths in 2009 attributed to poisoning in Michigan (CDC WISQARS).

The total asthma deaths in Michigan in 2006 were 121 at a mortality rate of 1.18 per 100,000 (MDCH Diabetes and Other Chronic Diseases Section, 2006). The negative health effects of asthma are more visible in an examination of morbidity data, with 11.1% of all children (estimated 260,000) and 10.5% of all adults (estimated 791,800) in Michigan suffering from asthma in 2010 (MDCH Diabetes and Other Chronic Diseases Section, 2010). Asthma is clearly a less deadly condition, but may have the largest impact of all home health outcomes, negatively affecting more than 1 million Michigan residents in 2010 (MDCH). Only a partial estimate of mortality and morbidity attributable to
housing-related factors such as mold, moisture and pests is feasible. While the scientific community has identified a percentage of asthma cases as having genetic origins, the World Health Organization (WHO) estimates that 44% of the asthma burden worldwide is due to the environment (WHO, 2012). Given this proportion, we estimate that 420,720 asthma cases in 2010 and slightly more than 48 deaths in Michigan in 2006 were attributed to environmental factors.

Lead poisoning produces no known deaths in Michigan but considerable morbidity. The most recently available data on lead poisoning in Michigan (from 2011) found that 950, or 0.6%, of Michigan children suffered from lead poisoning (confirmed blood lead levels >=10 µg/dL) as a result of lead hazard exposure (“MDCH 2011 Data Report on Blood Lead Testing and Elevated Levels”). In addition, 6,338, or 4.2%, of Michigan children suffered from blood lead levels of 5-9 µg/dL as a result of lead hazard exposure (MDCH, 2011). The negative health effects of lead poisoning include decreased cognitive abilities, and increased behavioral disorders and criminal activity. Lead poisoning’s effects are generally permanent, so while the number of lead-poisoned children in Michigan has declined, there are tens of thousands of children who have been lead poisoned in the past and who carry damage from that experience.
<table>
<thead>
<tr>
<th>Table 1: Healthy Homes Health Outcome Estimates</th>
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<tr>
<td><strong>Lung &amp; Bronchus Cancer</strong></td>
<td>Unintentional Injuries</td>
</tr>
<tr>
<td><strong>Lung Cancer</strong></td>
<td>Estimated deaths due to ETS &amp; radon</td>
</tr>
<tr>
<td><strong>Mortality Rate</strong></td>
<td>N/A</td>
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<tr>
<td><strong>Morbidity #/%</strong></td>
<td>N/A</td>
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<td><strong># of deaths</strong></td>
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<td><strong># of deaths</strong></td>
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B. Underlying factors:

The key hazardous health outcomes that this strategic plan seeks to address are lead poisoning, asthma and allergies, unintentional injuries, and lung cancer. These health outcomes, caused by hazards such as deteriorated lead-based paint, mold, and structural defects, are often found in similar environments throughout the state and country. While some of these risks may be present in homes of any age and value, they are most often found in older, poorly maintained properties.

In addition to the age of housing, geographic location and the age of residents are also factors that determine vulnerability to housing-related illness or injury (see figure 1 in the Needs Assessment). For example, since children are still developing both physically and mentally, they are more vulnerable to exposure to certain environmental hazards such as lead. This vulnerability increases for children living in older, substandard homes where hazards are more likely to be present. The elderly are particularly at an increased risk to injuries and falls in the home. Geography and climate can also dictate what hazards are present in a particular area. For example, dampness and mold growth may be more common in areas characterized by high levels of humidity. Also, those living in substandard housing, which HUD defines as homes with severe or moderate problems, do not have access to the economic means to substantially improve their housing quality. The combination of these underlying factors such as geography, age, and economic status increases the likelihood of hazards in the home as well as a population’s vulnerability to associated conditions such as asthma, unintentional injuries, lead poisoning and certain cancers.

For example, analyses of asthma data from MDCH show that African American children in Michigan have asthma rates that are 2.7 times higher than white children, and that those living in rural and urban areas are affected by asthma 2.2 times more often than those living in suburban areas (Michigan Department of Community Health HHLPP Proposal, Figure 1, Appendix A, 2012). In addition, the MDCH “Public Health for Michigan for You” report states that the death rate for African-American children in Michigan due to fires was nearly four times the rate for white children during the period 1999-2005. Data from a 2011 MDCH lead poisoning report demonstrates the role of economic status in vulnerability to housing related health outcomes. This report indicated that the rate of lead poisoning for children insured by Medicaid in the state was 0.8 percent, (“Michigan Department of Community Health Childhood Lead Poisoning Prevention Program”, 2011), substantially higher than the percentage all other children, which was 0.2. A closer look at specific geographic locations in the state (the 14 Target Communities) showed the rate of children on Medicaid who have lead poisoning to be 1.8 percent (in 2011). This rate is three times higher than the percentage for all children in the state affected by lead poisoning (0.6%). These Target Communities include cities such as Detroit, Flint, and Grand Rapids, where housing tends to be older and populations are often subject to more adverse economic conditions than other communities in the state, (“Michigan Department of Community Health Childhood Lead Poisoning Prevention Program,” 2011).
C. Overview of Key Health Outcomes:

a. Cancer:

The CDC attributed an estimated 5,898 deaths in Michigan in 2008 to lung cancer (CDC USCS, 2012). The organization also reported that 7,478 new lung cancer cases were identified in 2008 (CDC USCS). Figure 1 below shows the lung cancer mortality rates by Michigan County for the years 1999-2008. Environmental tobacco smoke (ETS) is a significant health hazard, with exposure occurring from both primary use and second-hand smoke. The MDCH reports that 1,740 lung cancer deaths in 2009 were attributable to second hand smoke exposure (“Second Hand Smoke Facts,” 2012).

Figure 1: Lung Cancer Mortality Rates by County, 1999-2008

Among non-smokers, the leading cause of lung cancer is exposure to environmental radon gas. Radon is a naturally occurring odorless, radioactive gas formed by the breakdown of uranium in soil and rocks beneath and around building foundations (EPA “Radon,” 2008). Because radon is a gas, it can leak into home environments (typically basements and/or crawlspace) through cracks in floors and walls, floor drains, well water, and other routes. To a lesser extent, groundwater wells and some building materials can also be sources of radon. The level at which the EPA recommends steps be
taken to reduce radon levels is 4 picocuries per liter of air. Approximately 12 percent of homes in Michigan have radon levels above this threshold, according to a 1987-1988 survey (“Radon Potential in Michigan,” 2012). In addition, the EPA estimates radon is responsible for as many as 21,000 cancer deaths in the U.S. each year (“Health Risks,” 2012). While there is no systematic data on radon specific to Michigan, Alberg and Sammit (2003) estimate that 90% of lung cancer cases are due to active smoking, 10% are due to radon exposure, 9-15% are due to occupational carcinogen exposure, and 1-2% of cases are due to exposure to outdoor air pollution (Epidemiology of Lung Cancer Chest, 2003). As a result, estimates indicate that almost 590 people in Michigan died from lung cancer related to radon in 2008.

Other environmental hazards associated with lung cancer include asbestos and arsenic. Asbestos was used in many building materials prior to 1970, including insulation, tiles, and siding. Inhalation of asbestos fibers is associated with lung cancer, as well as other lung diseases (National Center for Healthy Housing-Asbestos, 2008). Building materials containing the chemical arsenic have also been linked to the development of lung cancer. For example, chromated copper arsenate (CCA), a pesticide and preservative used to prevent rotting in lumber, has been associated with lung cancer development (National Center for Healthy Housing-Resources-Asbestos, 2008).

b. Unintentional Injuries:

1. Overview:

More than half of all serious injuries occur in or around the home (CDC, 2010). Among the more frequent unintentional injuries around the home are falls, burns, chemical exposure, and poisonings. Electrical hazards, uneven walkways or stairways, substandard plumbing, and other structural problems play a role in these injuries. Unintentional injuries, along with violence, are regarded as the leading causes of death, hospitalization, and disability for children between the ages of 1 and 18 in the United States (“Children’s Safety Network,” 2012).

The Michigan Vital Records and the Michigan 2010 Health Indicators indicate that the leading causes of deaths by unintentional injury related to the home between 2002 and 2007 were poisoning, falls, suffocation, burns/fire, and drowning. Estimates from CDC data indicate that there were approximately 2,357 deaths due to fire/burn, poisoning, fall, suffocation, and residential fire/flame in Michigan in 2009 (CDC WISQARS, 2012). Non-fatal injuries are of course also a significant problem. Estimates from CDC data indicate that there were approximately 333,448 unintentional injuries due to suffocation, poisoning, fall, and fire/burn in Michigan in 2010 (CDC WISQARS). According to 2007 Michigan injury hospitalization rates from the MDCH, 619 per 100,000 residents were hospitalized in 2007 for injuries (“State of Michigan Hospitalization Report,” 2007). Such hospitalizations made up 4.7 percent of the 1,329,121 Michigan residents admitted to the hospital for any condition that year. See Figure 2 for a comparison of age adjusted unintentional injury death rates for Michigan and U.S. residents.
2. Poisoning:

According to the CDC, there were 1091 deaths (10.89 per 100,000) due to poisoning in Michigan in 2009 (CDC WISQARS, 2012). There were more than 26,600 nonfatal poisonings in the same year at a rate of 8.56 per 100,000. The MDCH reports that carbon monoxide is the leading cause of deaths related to unintentional poisoning (“Annual Report on Carbon Monoxide Poisoning,” 2009). 1,239 Michigan residents had carbon monoxide poisoning in 2009, with 39 cases resulting in death (“Annual Report,” 2009). The majority of these poisonings occurred in the home environment.

3. Other:

Burns were among the top three causes of children’s death in Michigan between 1999 and 2006 for unintentional injuries (MDCH “Public Health for Michigan for You,” 2009). Fire and burns accounted for 212 child-related deaths, according to the MDCH’s 2009 “Public Health for Michigan for You,” critical indicators list (MDCH, 2009).

c. Asthma and Allergies:

Asthma, a chronic disease characterized by the swelling and narrowing of the airways to the lungs, can be triggered by pests, mold, and dampness in the home. Those who have asthma often experience wheezing, breathlessness, chest tightness, and coughing. Some asthma patients experience symptoms only when their breathing is irritated by some type of trigger, and for others the condition constantly makes breathing difficult. Asthma symptoms can be associated with housing conditions such as dampness, mold, and the presence of pests, as well as environmental factors such as pollution and tobacco smoke. As with asthma, there are several conditions in the home environment that may trigger allergy symptoms such as hives, itching, the swelling of the breathing tubes, and high
blood pressure. Many allergy triggers, which are referred to as allergens, are similar to those impacting individuals with asthma. Similar triggers include mold, pests and pest droppings, volatile organic compounds, and second-hand smoke.

Michigan health agencies and organizations have targeted asthma for many years, but substantial recognition of the disease as a public health problem began in the 1990s (Asthma Initiative of Michigan, 2012). With this recognition, the Asthma Initiative of Michigan (AIM) was formed in 2000. As a result, asthma has been designated as one of the top three program priorities by the American Lung Association of Michigan.

According to recent data, 11.1 percent (estimated 260,000) of all children in Michigan were diagnosed with asthma in 2010 (MDCH Diabetes and Other Chronic Diseases Section, 2012). In addition, 11,304 (20.8 per 10,000) children ages 1 to 14 were hospitalized for asthma between 2006 and 2008 in Michigan (MDCH). Some counties, notably Wayne and Ingham, have asthma hospitalization rates of nearly 3 percent (CDC RFP, Figure 1, Appendix A). The number of asthma related deaths among Michigan residents is between 3.7 and 4.9 deaths per million people, higher than current federal targets ("Asthma in Michigan: A Blueprint for Action," 2011). Michigan also has a higher number of asthma related hospitalizations and a higher mean number of school or work days missed because of asthma compared to the federal targets. When considering asthma case management, Michigan agencies have not met federal expectations for providing education and action plans to people with asthma, managing medication regimes, follow ups, and direct assistance regarding identification and reduction of asthma triggers ("Asthma in Michigan," 2010). The asthma burden is particularly high in larger, urban areas. The table below compares various asthma indicators for children (under age 18) in Detroit and Michigan who are enrolled in Michigan Medicaid programs.

**Table 2: Childhood Asthma Indicators – Michigan vs. Detroit, 2010**

<table>
<thead>
<tr>
<th>2010 Measures</th>
<th>Michigan</th>
<th>City of Detroit</th>
</tr>
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<tbody>
<tr>
<td>Persistent Asthma (%)</td>
<td>5.5</td>
<td>6.0</td>
</tr>
<tr>
<td>Emergency Department Rate (Per 10,000)</td>
<td>202.3</td>
<td>405.8</td>
</tr>
<tr>
<td>Asthma Hospitalization Rate (Per 10,000)</td>
<td>22.9</td>
<td>48.0</td>
</tr>
<tr>
<td>1+ Emergency Department Visits (%)</td>
<td>27.8</td>
<td>47.8</td>
</tr>
<tr>
<td>2+ Emergency Department Visits (%)</td>
<td>6.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Emergency Department Reliance for Primary Care (%)</td>
<td>28.7</td>
<td>45.4</td>
</tr>
<tr>
<td>1+ Hospitalizations (%)</td>
<td>3.6</td>
<td>6.7</td>
</tr>
</tbody>
</table>


d. **Lead Poisoning:**

Conditions that produce lead poisoning include deteriorated lead paint in homes, specifically for those homes built before 1978. Other lead hazards include lead that has filtered into soils from structures, and airborne lead that has been deposited near old industrial sites or around freeways and major roads (given that lead once was in
gasoline). Lead is particularly damaging to children under age 6 who are still developing their physical and mental capacities. Children are exposed to lead primarily through putting their hands or other objects covered with lead dust in their mouths, eating paint chips or soil that contain lead, or breathing in lead dust.

Exposure to lead hazards is directly linked to numerous severe and irreversible health effects, including learning disabilities, behavioral problems, seizures, death, and other outcomes. Until very recently, the CDC defined lead poisoning as having a blood lead level of 10 micrograms per deciliter (µg/dL) or higher (“What Do Parents Need to Know to Protect Their Children,” 2012). In May 2012, the CDC named a new “reference value” of 5 µg/dL, although they stopped short of calling that level “lead poisoning.”

The first year that complete reporting on lead poisoning was mandated by the State of Michigan was 1998. At that time, 9.7 percent of children under the age of 6, or 7,144 children in Michigan had confirmed blood lead levels greater than or equal to 10 µg/dL (“MDCH 2011 Data Report on Blood Lead Testing and Elevated Levels”). By 2011, that percentage had dropped to 0.6, or 950 children (MDCH). In the same year, 4.2 percent of children under the age of 6 had blood levels between 5 and 9 µg/dL (MDCH). See figure 3 for a more detailed overview of lead poisoning levels (≥10, ≥15, and ≥20 µg/dL) in Michigan from 1998 to 2011.

**Figure 3:**

While there has been some success in reducing lead poisoning in Michigan, there are still several cities in the state where lead poisoning occurs in over 1 percent of children. These areas include Benton Harbor, Detroit, Grand Rapids, Hamtramck, Highland Park, Jackson and Muskegon. Collectively, in the 14 Target Communities designated as “high-risk,” 1.4% of children were found to be lead poisoned in 2011 (MDCH).
Lead exposure has become a concern for health and safety officials and advocates at the national, state, and local levels. Recent progress in Michigan has been due to the combined efforts of the CDC, HUD, EPA, MDCH, local health departments, non-profits such as CLEARCorps/Detroit and the Healthy Homes Coalition of West Michigan, and community coalitions across the state. Despite the significant decrease, the CDC still considers the number of children with lead poisoning to be a national problem. Lead remains a leading environmental health hazard for young children.

IV. Background and Goals:

A. Healthy Homes History and Recent Activities:

a. Federal Efforts:

The concept of healthy homes has existed for nearly a century, dating back to the recognition of connections between housing conditions and disease. As this connection was uncovered, policies and programs were implemented to remediate hazardous housing conditions in order to prevent their associated negative health outcomes (Brown, 2010).

The Environmental Protection Agency (EPA) defines environmental justice as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies,” (“Environmental Justice,” 2012). This concept of environmental justice has drawn attention to the idea of healthy homes by focusing on the impact that home environments have on human health. Through the combined efforts of federal agencies, states, and local organizations, the goal of creating healthier home environments is being pursued across the country.

On February 11, 1994, President Clinton signed an executive order focused on health conditions of minority and low-income populations. This order, titled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” encouraged the government to find ways to review and reduce the number of hazardous exposures while considering how federally-funded programs designed to reduce such exposures could support minority and low-income populations. This effort would include a review of the home and occupational environment in culturally diverse areas. The directive required that data be analyzed based on differences in environmental and health risks. Demographic variable such as race, ethnicity, and income were also suggested to be considered. The order also required that minority and low-income populations have access to public information and participate in environmental and health-related programs.

1. United States Centers for Disease Control and Prevention (CDC):

Throughout the last two decades, the CDC has placed an emphasis on funding lead poisoning prevention programs, including surveillance, at the state and local levels. These funding streams have supported much of Michigan’s state and local infrastructure for identification and case management of lead poisoned children, as well as primary prevention activities. These programs are in jeopardy as the CDC reduces funding during a period of fiscal austerity in the state. The CDC took on the Healthy People 2010 initiative to eliminate elevated blood lead levels by 2010. While this did not happen by
2010, great strides have been made through programmatic activities at various levels, many of which have been funded by the CDC.

In 1999, the CDC created the National Asthma Control Program. The CDC set the goal of reducing the number of deaths, hospitalizations, emergency room visits and missed work and school days attributed to asthma. The National Asthma Control Program provides funding to states, municipalities, schools, and various organizations for asthma education, training, and surveillance.

The CDC also leads the National Center for Injury Prevention and Control, which aims to make injury and violence prevention a top public health priority (“Saving Lives and Protecting People from Injuries and Violence,” 2012). While the National Research Council and Institute of Medicine identified the agency as the best federal institution to lead the National Center in 1985, a later recommendation sought a broader scope. In 1997, the Institute of Medicine’s Committee on Injury Prevention and Control encouraged collaboration between several agencies with expertise in injury prevention and awareness.

The CDC currently funds seven different programs and activities focused on injury and violence prevention and control. Among these are the Residential Fire-Related Injury Prevention Program (for which Michigan has received funding) and the Older Adult Fall Prevention Program. The CDC has also funded radon mitigation and integrated pest management programs. Those, along with the asthma and injury prevention programs, are seen as natural outgrowths of lead poisoning programs, particularly those focused on children (Brown, 2010).

2. United States Department of Housing and Urban Development (HUD):

President Clinton’s 1994 health conditions directive increased attention on health outcomes produced by environmental hazards both within and outside of the home. For example, the HUD Office of Lead Hazard Control expanded its focus to include housing-related health hazards in 1999. This expansion made HUD the first federal agency to establish a healthy homes program. HUD efforts are currently focused on lead hazard remediation, healthy homes technical studies, healthy homes production (as funding is available), and demonstration programs. Through these programs, HUD funds various agencies and organizations, some of which are located in Michigan.

3. Environmental Protection Agency (EPA):

Similar to the CDC and HUD, the EPA has funded programs directed at reducing childhood lead poisoning. The agency has also funded programs to improve air and water quality and to reduce the number of pest-related problems in homes. Relevant divisions of the EPA include the Office of Children’s Health Protection, the Office of Pesticide Programs, and the Indoor Environments Division, which has recently begun collaborating with ENERGY STAR on a healthy homes related program. Together, these offices fund intervention, education, and outreach programs directed at pest management, radon, asthma, and indoor air quality. More recently, programs have expanded to include exposures to mold, volatile organic compounds, pests, combustion pollutants, and other asthma triggers.
4. The Surgeon General:

Along with the three aforementioned federal agencies, other actors have been engaged to create healthier homes for American families. In 2009, Acting Surgeon General Steven K. Galson issued a “Call to Action to Promote Healthy Homes.” Galson encouraged parents, homebuilders, and politicians to create healthy home environments through a holistic approach. According to the “Call to Action,” steps to create healthy home environments include: checking heating and cooling appliances (furnaces, air filters, chimneys, etc.); protecting children from drowning, suffocation, strangulation and lead poisoning (among other hazards); improving air quality in the home through the use of radon test kits and carbon monoxide detectors; eliminating exposures related to smoking; controlling allergens related to asthma; and learning to maintain and protect wells.

One of the great challenges for Michigan with respect to federal programs is to ensure that, in a time of reduced capacity for grant writing, neither the State nor its localities leaves any federal dollars lying on the table.

b. State Efforts:

1. CDC Programs:

In the fiscal year 2011, the CDC provided the State of Michigan, through grants and cooperative agreements, $1,422,500 for childhood lead poisoning, asthma, and unintentional injury prevention and control (“Centers For Disease Control and Prevention Fiscal Year 2010 Grants Summary Profile for Michigan,” 2010). An additional $2,295,644 in CDC funds were provided for tobacco related programs, and $13,689,835 was provided for cancer prevention and control (CDC, 2010).

Since 2000, the CDC has also distributed funding for Michigan’s Asthma Prevention and Control Program. Over the last 12 years, the Asthma Prevention and Control Program has worked to reduce the burden of asthma throughout Michigan by identifying and eliminating asthma disparities; assessing the asthma burden and response; supporting awareness of and partnerships to address asthma; improving systems of care; reducing barriers to self-management; and reducing exposures to environmental factors that cause and exacerbate asthma. From 1994 through 2011, the CDC funded the MDCH Childhood Lead Poisoning Prevention Program, and the Healthy Homes and Lead Poisoning Prevention Program in 2012. The CDC has indicated that in FY 2013 it will not be providing funds to Michigan (or other states) for lead poisoning prevention or comprehensive healthy homes programs because of large internal cuts in the CDC budget.

CDC funding to address injuries has included the Smoke Alarm Installation and Fire Safety Education Program (“Preventing Fire Deaths and Injuries: CDC Activities,” 2010). This program has been funded through the CDC since 1998. In 2006, there were 17 different local programs funded across the country. Children’s Hospital of Michigan is the only Michigan agency to receive funding since the program began. Their program focused on education, home assessments, and smoke detector installation in the Detroit area. Housing units without a functioning smoke detector on every floor were their target population.
2. HUD Programs:

HUD currently funds the Healthy Homes Technical Studies, Demonstration, and Production Program grants through the Office of Healthy Homes and Lead Hazard Control. These grants are offered to non-profit and for-profit firms, state and local governments, federally recognized Indian Tribes, and colleges and universities located across the country (“Grant Programs at OHHLHC,” 2008).

The MDCH Healthy Homes Section was the first state agency in Michigan to receive a healthy homes grant from HUD. Their HUD Healthy Homes Demonstration Grant was awarded for 3 years beginning in 2005 and was renewed in 2008. The State of Michigan and several local communities have received millions in HUD Lead Hazard Control and other lead-related grants. In addition, other HUD grants such as Community Development Block Grants and various home improvement grants have provided resources for major healthy homes improvements in communities across the state.

3. EPA Programs:

The EPA has provided funds to state agencies, local health departments, and non-government organizations throughout the state to promote healthy homes. EPA healthy homes focus areas include childhood lead poisoning prevention, indoor air and water quality, asthma, and pest management.

The MDCH Healthy Homes Section has received EPA funding since 1997 to administer their EPA authorized program that certifies and assures compliance of lead abatement contractors, workers, inspectors, risk assessors, project designers, and trainers involved in lead-based paint abatement and removal. This program assures that the removal of lead-based paint is done in a manner that is safe for children, families and workers. Through a Special Certification and Training Projects Grant, the MDCH received funds to develop and implement a training program that targeted health department staff members and moderate-income individuals. This program, which was stipend-based and ended in 2003, focused on training and education for lead abatement and surveillance of housing units with lead poisoned children.

c. Local Efforts

At the local level, there are several efforts taking place to help promote healthy homes. Some of the programs have received direct federal assistance from agencies such as HUD, while others have received grants in cooperation with the State or local foundations. The major communities in which healthy homes programs have taken place are: Detroit, Flint, Grand Rapids, Kalamazoo, Lansing, Saginaw, Muskegon, and Berrien County.

1. Detroit:

In 2011, HUD administered $999,995 to CLEARCorps/Detroit to eliminate health and safety hazards in 180 Detroit homes. CLEARCorps/Detroit was awarded these funds on behalf of 23 other public, private, and non-profit entities, which helped contribute another $1.3 million in resources and in-kind services for the Healthy Homes Detroit project. The ultimate goals of this project are to make 180 Detroit homes safe and healthy, create
community awareness and implement action plans around healthy home issues, create an interactive healthy homes database to share information, and to create a sustainable system dedicated to co-locating services in Healthy Homes Detroit and beyond, according to The Healthy Homes Detroit proposal to HUD.

In addition, HUD has an ongoing grant to Michigan, the City of Detroit and Wayne County for lead hazard remediation. Together these grants are enabling hundreds of homes to be remediated.

In Detroit, the EPA has funded a grant through 2013 to assist with bed bug prevention and control. The funds from this grant are to be used to create bed bug task forces at the governmental and community levels, provide educational outreach, and to increase surveillance through electronic means. EPA is also funding WSU’s Center for Urban Studies to educate residents in the North End and Midtown neighborhoods about lead poisoning and asthma.

Other grants administered to promote healthy home environments in Detroit are: HUD Lead Outreach Grant (2008); MDCH Lead Hazard Reduction Grant (2006); EPA Primary Prevention “Lead Safe Babies” Program (2007); and the HUD Operation LEAP Grant (2003).

2. Flint:

Most of Flint’s healthy homes efforts are a part of the larger Green & Healthy Homes Initiative (GHHI). The GHHI is a national public-private partnership involving the federal government, national and local philanthropy, the National Coalition to End Childhood Lead Poisoning, and local partners in 15 project sites, including Flint. Initially convened by the Flint Area Reinvestment Office, the Flint GHHI has established over forty collaborative partnerships in the area to date, with a focus on seeking partnerships and grant dollars to make local housing greener, healthier, safer, and more energy-efficient. The collaborative also seeks to create more green jobs in the community. Since the effort began in November 2009, the Flint GHHI has secured substantial funding for weatherization and lead hazard reduction efforts in the community. In the last year alone, key partners received $199,000 (Mott Community College) from Open Society Foundations to develop a workforce trained to perform GHHI-related tasks, and $2 million (Genesee County Health Department) from HUD to reduce or eliminate lead-based paint in homes. The collaborative includes organizations such as the Genesee County Health Department, the Genesee County Community Action Resource Department, the Flint Housing Commission and other area nonprofits. Priority Children, a nonprofit child advocacy organization in Genesee County, currently hosts the local GHHI program.

Ten homes in Flint were also targeted as part of a HUD Healthy Homes Demonstration Program grant the MDCH received in 2008. This grant allowed the agency to focus on Ingham County, three ZIP codes in Eaton and Clinton counties, and 10 homes throughout Flint. Together, there were 25 homes that received assistance and the City of Flint was designated as a pilot city. This program focused on the same type of homes as the first HUD funded program except that homes with asthmatic children less than 4 years of age were given top priority (as opposed to the year 6 age mark in the previous grant).
Flint was also designated as a pilot city for the HUD Technical Studies grant the MDCH received in 2011. This project is expected to run through 2014. Genesee County received a HUD Lead Hazard Control grant to remediate homes in 2009.

3. Grand Rapids:

The Healthy Homes Coalition of West Michigan is a non-profit organization seeking to eliminate housing-based hazards to children’s health. The Coalition was created in 2006 as an outgrowth of the Get the Lead Out! Campaign, a collaborative effort to address childhood lead poisoning in West Michigan from 2001 to 2005. The Get the Lead Out! Campaign was facilitated as a pilot project of the Community Leadership Institute at Aquinas College. In 2006, the U.S. Environmental Protection Agency (EPA) recognized the campaign with a Children's Environmental Health Excellence Award. The need to apply this sort of synchronized approach to other environmental health issues became clear as the project neared its end in 2005. As a result, the Healthy Homes Coalition of West Michigan was launched and incorporated as a non-profit organization in August 2006. The Healthy Homes Coalition deploys three key strategies for addressing children’s environmental health related to substandard housing: 1) community outreach and education (training and classes, public presentations, media, printed and online materials and more), 2) direct, one-on-one services for families with young children (comprehensive home assessment, followup report, education, support and referral), and 3) advocacy for policy change at all levels of government and within partner organizations. Issues of primary concern include childhood lead poisoning and asthma triggers; however, the Healthy Homes Coalition employs a holistic, coordinated approach that also looks at carbon monoxide hazards, fire safety, radon, accidental injury, and other potential health hazards for children. Funding support for the Healthy Homes Coalition comes from a mix of government grants and contracts, foundations, fee-for-service, and individual and corporate donors.

The City of Grand Rapids Community Development Department has taken a leadership role in addressing environmental controls for lead since 2004, securing $16.5 million in HUD funding to abate lead hazards in the homes of low-income children. To date, more than 1,100 housing units have been made lead safe. During the next three years, the City of Grand Rapids will be partnering with the Healthy Homes Coalition to integrate use of the Healthy Homes Rating System (HHRS) into the existing lead hazard control program, addressing a wider range of home health hazards in 45 homes. The City of Grand Rapids has also historically integrated green and energy efficiency improvements with lead hazard control activities.

The Asthma Network of West Michigan is the regional leadership organization for providing asthma education and case management in the Grand Rapids metropolitan area. The Asthma Network has been providing in-home case management for more than fifteen years. The Asthma Network encourages families to address environmental asthma triggers. In recent years, the Asthma Network has partnered with the Children’s Health Care Access Project to reach additional families insured by Priority Health.

4. Kalamazoo:

The Kalamazoo County Health and Environmental Services Department obtained funding from the Environmental Protection Agency’s Office of Pollution Prevention and
Toxics in the form of the Targeted Lead Grant Program in 2007 to assist in funding the Healthy Homes of Kalamazoo organization. This grant, which was also administered to the Healthy Home Coalition of West Michigan, funded projects in areas with populations vulnerable to lead poisoning, particularly areas where children were found to have elevated blood-lead levels. Through this grant, the EPA hoped to eliminate childhood lead poisoning as a major public health concern by 2010.

5. Lansing:

The City of Lansing, through funding from HUD and assistance from the Office of Code Compliance and community partners, has a "Lead Safe Lansing" program to assist with lead hazard remediation. The program offers each eligible unit a loan of up to $8,000 for lead paint remediation. Both owner-occupied and rental housing units are eligible. The money is forgiven after three years if the property is maintained, taxes are current, rental certification is current, and the owner is the same. This $8,000 is awarded to each unit, meaning that a three-unit building could potentially receive $24,000 for repairs/abatement.

6. Saginaw:

The community in Saginaw has been implementing childhood lead poisoning programs since the early 1990s. However, efforts specific to healthy homes are a relatively recent development in the area. In December 2008, the Saginaw County Department of Public Health (SCDPH), with the University of Michigan, received a HUD Healthy Homes Demonstration grant for almost $900,000 over three years. The goal of the program was to "reduce the burden of asthma, lead poisoning and other housing-related morbidities among children in the City of Saginaw." The program included screening for housing-based hazards to health as well as the provision of basic intervention products to reduce housing-related illnesses and safety hazards. The program received additional HUD funding in March 2011 when it secured a 3-year $3.1 million HUD Lead Hazard Control Grant, with a $100,000 healthy homes component. According to HUD, these funds will be used to produce at least 240 units of lead-safe housing within the City of Saginaw, integrating healthy home, weatherization, energy efficiency and general rehab interventions. Saginaw County will evaluate 300 homes for lead and healthy homes hazards, conduct outreach and education to at least 5,063 individuals and provide training to 125 individuals. The county is collaborating with a diverse range of partners to advance this effort. These partners include First Ward Community Center (FWCC), the Michigan State University Extension (MSUE), and other county and local governmental agencies, parent groups, grassroots organizations, faith-based initiatives, community development corporations, minority small business owners and for-profit corporations.

7. Muskegon:

In another effort to continue working toward the elimination of lead poisoning concerns, the County of Muskegon Public Health Department was awarded $1,000,000 in HUD Lead Based Paint Hazard Control Grant Program funds in 2011. $100,000 in additional HUD funds to promote healthy homes initiatives was also provided. The program will evaluate 120 homes for lead hazards and eliminate identified hazards in 75 homes. The goal is to reach at least 1000 community members. Muskegon County is also promoting other healthy homes initiatives, such as providing training for 20 low-income individuals.
in lead-safe work practices through partnerships with the Department of Employment and Training as well as other community organizations. The county is also partnering with the City of Muskegon's HUD Lead Grant.

8. Berrien County:

The Berrien County Health Department is in the third year of a three-year HUD lead remediation grant. Over 100 Berrien County residences are now lead-safe because of the grant and over 120 will be complete by the end of the grant cycle in December 2012. The majority of the homes were single family residences within Benton Harbor. Grant funding was not renewed for the next funding cycle for FY 2013.

V. Statement of Needs Relative to Healthy Homes:

A. Overview:

Michigan is facing substantial challenges in maintaining healthy homes, and therefore it must become a major priority of the state. The first challenge is that the state’s housing stock is getting older, and with age, more maintenance will be necessary. The second challenge is that the income of Michigan residents has declined over the last decade, and residents have less money to devote to housing maintenance. The third challenge is that Michigan’s climate is such that it imposes a relatively high maintenance demand on property owners because of dampness, cold, and freeze-and-thaw cycles. Together, these challenges imply increasing problems with housing-related health issues in Michigan and a need for a broader and renewed focus on solving these problems.

The MDCH, recognizing this overall need, contracted with Michigan State University’s Institute for Health Care Studies to conduct a needs assessment with respect to healthy homes concerns. That needs assessment revealed clearly that we have only a general understanding of the extent of home health hazards in the state. This implies that we can produce only a limited approximation of the scope of healthy homes issues in Michigan. The next several paragraphs present, in brief, both that portrait and an accounting of the state’s major data gaps.

We will look at these findings from the perspective of health conditions produced by unhealthy housing. For each health condition, we will examine the scale, associated risks, and identified data gaps.

B. Gap Analysis:

a. Lung Cancer:

Data on tobacco smoking and secondhand smoke is tracked by U.S. Surgeon General’s Office in relation to both financial costs and health. At the state and county level, smoking rates are available from the 2010 Michigan Behavioral Risk Factor Surveillance Survey (BRFSS) and the MDCH Tobacco Section.

The U.S. Surgeon General (2009) reports that radon is the leading cause of lung cancer among non-smokers, contributing to between 15,400 and 21,800 deaths per year in the U.S.
In sum, the major gaps identified are:

Data

- A tool to capture radon test results; and
- Secondhand smoke exposure data beyond the relevant question on the BRFSS.

Action

- Additional programs addressing smoking and involuntary tobacco exposure.
- Reinstate funding for the radon program.

b. Unintentional injuries:

Data on outcomes from unintentional injuries in the home are available from a variety of sources, including Vital Records, the MDCH Injury & Violence Prevention Section, the MDCH Bureau of Epidemiology, Michigan Health Indicators reports, the Michigan Hospital Association, and possibly 9-1-1/EMS records. Much harder to find, however, is solid data on the hazards and structural deficiencies in the home that facilitate injury events.

In sum, the major needs for unintentional injuries are:

1. Poisonings:

Data

- Thorough data on non-occupational pesticide deficiency measurements;
- A surveillance tool so data on VOCs can be collected at the national, state, or county level.
- A systematic process at the state and county level to capture radon risk data beyond the limited test kits that are distributed and submitted to one laboratory; and
- County level data on carbon monoxide poisoning.

2. Other Unintentional Injuries:

Data

- County and state level systematic data for fires, electrical hazards, lack of weatherization, and lack of home safety devices;

Action

- Create a systematic data capturing system on structural deficiencies (fires, electrical hazards, weatherization, and home safety devices) that will allow reliable and consistent state and county data to be collected and made available.
- Reinstatement of weatherization funding to assist with home insulation, installation of high efficiency furnaces, water heaters, and similar repairs.
c. Asthma and allergies:

Asthma is not a stand-alone condition, but is related to environmental quality, housing conditions, and other comorbid conditions. Asthma triggers include mold, smoking and second-hand smoke exposure, volatile organic compounds (VOCs), dust mites, bed bugs, and other pests. Pesticides have also been suggested as a link to increased asthma risk, according to the Michigan Network for Children’s Environmental Health (2010).

While the Department of Environmental Quality oversees remedial activities required for contaminated groundwater sites, including drinking water wells, updated data on groundwater and its organic compound levels have not been tracked since 2003. Michigan used the groundwater database Wellogic to create Geographical Information System maps in 2003 to show specific sample results over a 1 square mile radius. However, no type of data has been tracked or compiled subsequently.

Smoking and second-hand tobacco exposure have been tracked by the U.S. Surgeon General’s Office in relation to both the public health aspect and its financial costs. However, at the state and county levels, the only smoking data available is the smoking rates published in the 2010 Michigan Behavioral Risk Factor Surveillance Survey (BRFSS) and those that are made available from local health department estimates. Data is not currently available at the state and county level to track other asthma triggers such as mold, dust mites, bed bugs, cockroaches, and others.

For asthma and its related triggers, the needs identified include:

Data

- Systematic way to track mold data at the state and county level;
- Surveillance system to collect data and measure the impact of pests, such as dust mites, bed bugs, cockroaches, and others;
- A surveillance tool to collect data on VOCs at the national, state, or county level;
- Updated data on groundwater and organic compound levels; and

Action

- Allocate resources for personnel to update groundwater data collected by Wellogic;
- Create stronger collaborations with existing chronic disease programs so families in crisis because of their home environment can be identified;
- Develop health-based VOC standards at the state level; and
- Seek funding for radon abatement.

e. Lead poisoning:

Michigan has had comprehensive surveillance of blood lead testing since 1998. A major gap still exists, however, in data on lead hazards in Michigan housing.
In sum, the major needs identified relative to eliminating lead poisoning are:

**Data**

- Systematic data at the state, county and address level on homes in need of lead remediation. The actual collection and analysis of this data is jeopardized by the proposed cuts in CDC funding, though the true extent of this problem will depend on MDCH decisions.

**Action**

- Funding for lead abatement

**VI. Strategic Planning Process:**

**A. Phase I: January-August 2012**

**a. Production Timeline:** The internal timeline for the development of the strategic plan is provided below:

<table>
<thead>
<tr>
<th>TASK</th>
<th>DATE</th>
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</thead>
<tbody>
<tr>
<td>1. Wayne State University’s Center for Urban Studies (WSU-CUS) supports the operation of the three work groups. Michigan State University conducts the needs assessment.</td>
<td>March-May 2012</td>
</tr>
<tr>
<td>2. The Advisory Group meets to discuss findings submitted by the work groups</td>
<td>March-May 2012</td>
</tr>
<tr>
<td>3. WSU-CUS submit first draft of strategic plan to MDCH staff</td>
<td>June 15, 2012</td>
</tr>
<tr>
<td>4. WSU-CUS submits second draft of strategic plan to Advisory Group</td>
<td>July 11, 2012</td>
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<tr>
<td>5. WSU-CUS finalizes feedback from Advisory Group and submits third draft of strategic plan to MDCH</td>
<td>July 25, 2012</td>
</tr>
<tr>
<td>6. WSU-CUS submits final version of strategic plan to MDCH for final approval</td>
<td>August 15, 2012</td>
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<tr>
<td>7. MDCH submits strategic plan to the CDC.</td>
<td>August 30, 2012</td>
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**b. Advisory Group Makeup:**

Initial planning for this Strategic Plan began in January 2012 when the MDCH formed an Advisory Group to help facilitate and oversee the planning process and to ensure the
mission of the Strategic Plan was clearly identified and implemented. Two co-
chairpersons of the Advisory Group, Dr. Kanta Bhambhani and Paul Haan, were
identified. The full list of Advisory Group members is provided below:

**Advisory Group**

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<thead>
<tr>
<th>Category</th>
<th>Name</th>
<th>Agency</th>
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<tbody>
<tr>
<td>Local Health Departments</td>
<td>Jane Nickert, RN, Director of Environmental Health</td>
<td>Detroit Department of Health and Wellness</td>
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<td>Stephen R. Tackitt, Health Officer</td>
<td>Barry-Eaton District Health Department</td>
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<td>Non-profits</td>
<td>Paul Haan, Executive Director</td>
<td>Healthy Homes Coalition of West Michigan</td>
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<td>Mary Sue Schottenfels, Executive Director</td>
<td>CLEARCorps/Detroit</td>
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<td>Weatherization Provider</td>
<td>Chere Coleman, Strategic Development Director</td>
<td>Michigan Community Action Agency Association</td>
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<tr>
<td>Physician</td>
<td>Dr. Kanta Bhambhani</td>
<td>Children’s Hospital of Michigan Hematology/Oncology Department</td>
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<tr>
<td>Major University</td>
<td>Lyke Thompson, Ph. D., Director</td>
<td>Wayne State University’s Center for Urban Studies</td>
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<td>Faith-Based</td>
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<td>The Ezekiel Project</td>
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<tr>
<td>Volunteer</td>
<td>Jim Brooks, Co-President</td>
<td>Rebuilding Together</td>
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<td>Organization</td>
<td>Dave Vincent, President</td>
<td>Michigan Association of Housing Officials</td>
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<td>Regulatory</td>
<td>Cheryl Bupp, Medicaid Policy</td>
<td>Michigan Association of Health Plans</td>
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<td>Agency</td>
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<td>Health Plans</td>
<td>John Dowling, Programmatic</td>
<td>Michigan Department of Community Health</td>
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<tr>
<td>Asthma</td>
<td>Specialist</td>
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<tr>
<td>Lay Person</td>
<td>Catrina Bady-Adams</td>
<td>Parent, graduate of Healthy Homes University II</td>
</tr>
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</table>

**c. Strategic Plan Draft Development:**

Three work groups were formed to study and identify major tasks that might be part of the strategic plan. The work groups included:

- Surveillance
- Primary prevention, case coordination, and training
- Strategic partnerships & policy

As noted earlier, Michigan State University’s Institute for Health Care Studies was contracted to conduct a needs assessment and report on its findings. Wayne State University’s Center for Urban Studies was contracted to facilitate and support the operation of the workgroups. The Center also agreed to draft the strategic plan with the assistance of key MDCH staff.

Work groups presented their suggested activities to the Advisory Group on May 9 in order to identify priorities and begin the development of the work plans. The Center then developed a survey for the Advisory and work group members to prioritize activities identified by the work groups and needs assessment. The survey linked the work groups’ proposed activities to their appropriate scope (statewide, metropolitan, and rural) and period of resource availability (year 2 (2012-2013), year 3 (2013-2014), and beyond 2014). For example, survey respondents were asked to determine in what order metropolitan (large city) activities should be prioritized using resources available during the 2013-2014 fiscal year. Responses to this survey were analyzed and translated to the
strategic plan, a rough draft of which was provided to MDCH on June 25. Subsequently a draft was supplied to the Advisory Group and workgroup members for review before the July 11 Advisory Group meeting, after which a third draft was submitted to MDCH. Final feedback on the third draft was provided by the Advisory Group on July 25. The final version of the Strategic Plan was then submitted to the MDCH for approval on August 15 to meet the August 31 deadline for submission to the CDC.

VII. Work Group Findings--Surveillance

A. Overview:

The surveillance workgroup was asked to plan an active system that collects, organizes, and tracks data related to home hazards and health outcomes. The MDCH, in conjunction with the Michigan Department of Technology, Management, and Budget and the CDC, performed STELLAR data migration to allow for a smooth transition to the newly installed Healthy Homes Lead Poisoning and Surveillance System (HHLPSS). Data that cannot be tracked through HHLPSS will be managed through alternative data systems.

B. Proposed Activities:

In order to obtain data related to healthy homes hazards and outcomes, the surveillance workgroup suggested that HHLPSS be implemented at the state level in Year 2 of this process. Data on asthma, unintentional injuries, and lung cancer would be obtained through efforts of the state, working with hospitals and state agency databases. Detroit will serve as a pilot city, with injury data collection at the metropolitan level in Year 2 from a collaboration with local EMS partners. In addition, a healthy homes survey will be created for use at the metropolitan (both urban and suburban) and rural levels. Once this information is obtained, a healthy homes data report on lead, asthma, and injuries will be created. The data from this report will be evaluated to determine the effectiveness of the healthy homes program.

Going forward, data would continue to be collected through the same avenues as Year 2, only with lead data being reported through an HL7 messaging system. In year 3, the survey developed as an assessment tool would be implemented in both metropolitan and rural areas, allowing hazard data to be collected and used in the annual healthy homes report. It is suggested that data collection and use of an assessment tool continue as a means to obtain healthy homes related information. The only change would be expanding the collection to include EMS data for rural communities as well.

VIII. Primary Prevention, Case Coordination, and Training:

A. Overview:

The primary prevention, case coordination, and training workgroup was formed to expand capacity for primary prevention of housing-based hazards, assure effective case management, and identify appropriate training at the local level. Group members focused on the identification of a healthy homes screening tool, and the identification of appropriate case management protocols for lead poisoning and asthma. It was determined that primary prevention would require the use of home health and condition assessments completed during home visits. Results of these assessments could be sent to
local healthy agencies for review and appropriate case management in conjunction with the other healthy homes activities. Through the efforts of this group, related healthy homes work funded through other initiatives in the state was aligned with the healthy homes strategies and activities outlined in this strategic plan.

**B. Proposed Activities:**

The primary prevention, case coordination, and training workgroup identified three major activities that should take place at the state and local levels. First, it was determined that the state would need to find funding to test the validity and reliability of their proposed healthy homes screening tool in volunteer communities acting as test sites for implementation. Once test sites and funding are secured, volunteers would be sought to participate in the initial healthy homes screening tool pilot study. It was suggested that potential volunteers could be identified through referrals from local asset maps. Once volunteers were identified, data on hazards and outcomes would be collected and analyzed. This analysis would measure the validity of the proposed healthy homes screening tool. In year three, the healthy homes screening tool would be revised according to results of the analysis. Following revision of the tool, it would be further tested for reliability and validity at the state, metropolitan, and rural levels. After testing at all three levels, an annual assessment report for utilization of the tool would be prepared.

**IX. Strategic Partnerships & Policy:**

**A. Overview:**

The strategic partnerships and policy workgroup was organized to discuss ways to strengthen state and local regulatory policy and enforcement related to healthy homes, and to identify and establish partnerships at state and local levels to develop the infrastructure needed to improve environmental health capacity. To complete this task, the policy work group mapped out existing policies and enforcement strategies related to healthy homes. This activity helped identify regulatory authorities and potential gaps in policy at the state and local level.

The strategic partnerships and policy workgroup also identified national and state partners, as well as local coalitions and collaboratives related to healthy homes, all of whom would likely be key stakeholders in shaping future healthy homes agendas. Partner agencies and organizations with a link to the MDCH mission of creating healthy home environments are a diverse group, including health departments, regulatory bodies, faith-based and/or volunteer organizations, universities, hospitals, non-profit organizations, healthcare agencies, and enforcement groups. These organizations vary in size and funding availability, but they share a common aim to create healthy home environments in Michigan.

HHLPP staff identified and formed partnerships with a number of strategic State agencies who shared data, information, and publications used in this Strategic Plan. The primary focus was on advancing collaboration and linking healthy home agendas between State divisions, bureaus, and sections. Individuals were met in person and discussion surrounded education on the HHLPP Strategic Plan and data needed to formulate a needs assessment. Strategic working partnerships were formed to share the mission of each
department in the strategic plan, to use the data collected, and to evaluate gaps in data needed to be collected at the State level.

**B. Proposed Activities:**

Partnerships will be expanded through initiatives from stakeholders that include management and administrative staff from health, housing, chronic disease, and epidemiology departments. These partnerships will increase education opportunities related to healthy homes concepts and allow resource mapping to be more comprehensive, as a variety of groups related to healthy homes are identified, contacted, and included.

Through the strategic partnerships and policy workgroup, it was decided that efforts in Year 2 should be focused on implementing the recommendations put forth by the CDC at the state level. Ways to implement CDC recommendations include educating stakeholders (political figures, state and local agency staff, non-profit representatives) and the public, developing and implementing assessment tools and policies, and forging new collaborations. The education-related activities (presentations, training sessions, Green and Healthy Homes models based on those in Detroit and Flint) would be introduced after further research on healthy homes hazards and outcomes is conducted and disseminated. The gathering of this information will allow additional healthy homes policy to be created. Year 2 policy suggestions include mandating all healthy homes information derived the assessment tools be reported to the MDCH surveillance team, who would organize information into a data system. While policy, assessment tools, and educational interventions are being developed at the state level in Year 2, it was also suggested that education, collaboration, and advocacy take place at the metropolitan and rural levels. Following the development and integration of these activities, additional property codes, particularly those related to maintenance and inspection, should be reviewed and adopted. Development and adoption of International Property Maintenance Code (IPMC) standards would need to take place at the state level. However, in order for IPMC standards to be effective, local ordinances would need to be updated. This would take place in Year 3, if funding is available.

**X: Needs Assessment:**

**A. Proposed Activities:**

The needs assessment workgroup identified the need for a healthy homes screening tool to be identified and endorsed by the Healthy Homes and Lead Poisoning Prevention program in Year 2 using currently available resources. Data on health conditions, injuries, and home hazards could be collected at the state level using this proposed assessment tool. This assessment tool would focus on individual housing units and collect information on race/ethnicity, Medicaid status, and presence of home health hazards. Methods to assess for health hazards and outcomes not typically tracked as closely as lead, asthma, or injuries need to be identified in Year 2. A suggested method to collect data on these hazards and outcomes was collaboration with organizations and agencies that complete home visits focused on healthy homes.

The needs assessment workgroup concluded that information on certain health hazards, such as radon and volatile organic compounds (VOCs) will be hard to obtain because of
the lack of surveillance. Therefore, it was suggested that policies be created related to data surveillance and the effects and exposure risks of these home health hazards. Knowing that financial resources are likely to be limited, it was suggested that health-based standards for VOCs be created in Year 2 through the assistance of state agencies while policies seeking to improve radon data collection be developed in Year 3. In addition, the workgroup suggested that additional funds should be sought in Year 2 to complete lead and radon abatements and weatherization interventions.

XI. Asset and Scenario Mapping:

A. Asset Map:

a. Overview:

The Healthy Homes Asset Map (see Appendix D) was developed to facilitate the identification of resources included in this strategic plan. For participating organizations, this map outlines current and future financial resources available for healthy homes activities in Michigan.

The Healthy Homes Asset Map includes two tabs. Column A of both tabs includes a list of healthy homes activities, including production, education, information systems, legal enforcement, and others. Tab 1 is a chart that includes current funding sources for healthy homes in Michigan. Partner organizations were asked to list their current funding sources and amounts for each healthy homes activity listed in Column A. Tab 2 is a chart that includes possible future funding sources. Partner organizations were asked to list any possible future funding sources (not included in tab 1) and the projected amount (if available) for each healthy homes activity listed in Column A. Both charts include columns that detail funding sources for each partner organization participating in the HHLPP Advisory and Work Groups. On each chart, respondents were asked to select the category they deemed most appropriate for a particular funding source (such as General Funding Sources, Funding Sources Specific to Addressing Health Outcomes/Conditions, or a particular hazard or health outcome listed in column A). For example, funding to address asthma could be inserted into the one of the following sections: funding sources specific to addressing health outcomes/conditions, asthma management, asthma triggers, pests, dampness and mold growth, etc.

Organizations that did not initially complete the asset map were contacted and reminded to do so. Following a second round of submissions, key actors contacted organizations that had not participated in the fiscal mapping process. A final round of follow up (through email) was targeted at remaining organizations that had not yet participated. A total of 16 organizations completed their section of the asset map. There are multiple instances where resources are available for projects focused on data collection, hazard identification and remediation, and legal enforcement.

b. Partners’ Funding Sources and Activities:

Through completion of the Asset Map, information regarding funding sources, data systems, regulatory efforts, and delivery of programs in Michigan was collected. While not all partners provided information, the map does show how certain funds and efforts are distributed throughout the state. For example, state and local health departments
received a majority of their funding from federal agencies. Their grants typically came from CDC, HUD, and the EPA, and were directed at specific health outcomes such as lead poisoning and asthma. CLEARCorps/Detroit was the only non-profit organization to record its general funding source as a federal agency, HUD. The other participating non-profit organizations indicated that their main funding sources were local. These local sources included donations and grants from community foundations. Foundations and large non-profit organizations such as the Kresge Foundation and the United Way also provide funds for healthy homes programs and activities.

While funding sources were largely addressed in the Asset Map, additional resources related to creating healthy home environments were also included. Participants were asked to list specific funding sources related to health outcomes, regulation, educational activities, data system development and management, policy development, and other healthy homes areas. These sections did not contain as much information as the general funding categories, but there was a broader range of funding sources represented. For example, the Asset Map showed that the Healthy Homes Coalition of West Michigan received federal dollars directed at specific healthy home outcomes, such as maintaining lead, pest, and carbon monoxide free environments. However, state agencies and local health departments received a majority of the federal funding in Michigan. Additional funding sources for specific healthy homes areas came from non-profit organizations, the MDCH, or a specific county/community. Only a few organizations provided information related to possible future funding and other categories not addressed in the Asset Map. However, the few respondents detailed a shift from expected federal funding from CDC, HUD, and EPA to other federal agencies and more state focused funding avenues. For example, the MDCH listed the Federal Emergency Management Agency (FEMA) as a possible future funding source.

Overall, responses on the Asset Map showed that a majority of funding for healthy homes efforts is currently provided at the federal level. There are additional funding outlets, but they tend to be focused on and provide funds to more locally oriented organizations and projects. The Asset Map showed there are several future funding opportunities for institutions and organizations beyond the traditional federal government agencies (CDC, HUD, EPA). However, these funding sources appear to be heavily focused on lead and asthma prevention and remediation, with funds specific to other healthy homes risks or outcomes lacking.

1. Resources:

While there were multiple avenues of funding, such as federal and state grants, community foundations, and community general fund accounts, there were some partners who consistently appeared as resource providers. These resource providing agencies include CDC, HUD, EPA, and MDCH. Key local organizations with financial resources included the United Way and the Kresge Foundation.

2. Data:

The Wayne State University Center for Urban Studies was the only partner that provided a response related to healthy homes data efforts in Michigan. According to the response, The Center has been provided funding over a three-year period from the Kresge Foundation to create and maintain a Healthy Homes Data and Information System and
Case Management System, both in Michigan and other states. The Center also has HUD Healthy Homes Technical Studies funding to assess the performance and reliability of the HUD-endorsed Healthy Homes Rating System (HHRS).

3. Regulation:

Only a few respondents noted the availability of funding in the enforcement column or other sections that applied to regulation, such as data systems development or management and policy. The Healthy Homes Coalition of West Michigan reported that they received $15,000 from a county-wide settlement to apply toward enforcement through policy implementation. The Healthy Homes Coalition of West Michigan is based out of Grand Rapids, which is located in Kent County. The Kent County Health Department reported using $300 annually on enforcement. It is clear that other localities have resources devoted to regulation, including both the City of Detroit and Wayne County, but these were not detailed.

4. Program Delivery:

This category had a wide range of funded agencies and organizations. Programs listed include healthy homes production, educational interventions, and case management. The Genesee County Health Department implements an education and outreach program using $34,381 through the Michigan Department of Community Health Childhood Lead Poisoning Prevention Program. The Wayne State University Center for Urban Studies and the Ezekiel Project provide educational interventions. The Center for Urban Studies has been granted funding by the EPA for an 18-month health education program, and the Ezekiel Project offers education on asthma and allergy prevention methods. The Asthma and Allergy Foundation of America—Michigan Chapter funds their asthma management and prevention program, which is based around home visits, through $2,000 from the CDC.

C. Scenario Mapping

a. Methodology:

In order to identify and prioritize activities based on different possible future funding scenarios, an activity prioritization template was developed and distributed to each of the four workgroups. The workgroups were asked to complete the chart, organizing their proposed activities on a timeline, including Year 2, Year 3, and Beyond Year 3. Within each timeline category, the groups were then asked to rank activities according to their geographical scope, such as statewide, metropolitan/large urban area, or small city/rural. Each workgroup prioritization chart can be found in Appendix C.

Following completion of the initial prioritizations charts, workgroup members were encouraged to provide feedback. Feedback was very limited, though some additional activities were suggested and background context to a proposed activity was provided. The chart review process began on May 21st and ended June 1. On that date the Center distributed a survey to give each workgroup member and advisory committee member an opportunity to rank the priority of each activity proposed by the workgroups. Each activity was assigned a weighted rank based on survey responses.
b. Scenarios:

Results were organized based on time period (Year 2, Year 3, and/or Beyond Year 3) and geographical level (statewide, metropolitan/large urban, or small city/rural). First, survey participants were asked to rank activities proposed by each of the work groups that could be implemented across the entire State of Michigan using all federal, state, and local resources available now through the 2012-2013 grant cycle. Following a list of the activities related to each work group, survey participants were asked to list any additional activities. In ranking activities for Year 3, which will use resources from the 2013-2014 grant cycle, all work group activities were included together, with each work group assigned a number for identification. For example, the two activities listed as top priorities for Year 3 were related to the Surveillance Work Group, with the third submitted by the Primary Prevention Work Group. As with the Year 2 scenarios, survey participants were asked to list any activities not included in the list that they believed should be supported across the entire State of Michigan using resources projected to be available beyond 2014. This same approach was taken for the Beyond Year 3 time period, which includes potential funding resources beyond 2014.

Results from this survey indicated that financial resources in Year 2 should be directed at policy development and surveillance system implementation. Improved surveillance will allow additional data to be collected and can shape recommendations related to future healthy homes policy.

Overall the priorities were used to sequence and prioritize the activities suggested for inclusion in the strategic plan, which is presented below. In addition to the survey, feedback from MDCH leadership, stakeholders and staff helped shape the activities suggested below.

XII. Strategic Plan

Michigan has been enduring nearly a decade of economic stagnation and downturns, broken only recently by a moderate recovery. The nation-wide recession that began in 2008 only deepened Michigan’s downturn, which has become one of the deepest and longest the state has experienced since the Great Depression. Housing has been especially hard hit. Housing production dropped to very low levels and has not yet recovered. Figure 3 shows the steady and rapid decline in the number of building permits authorized from 2004-2009 in Michigan. At the same time, Michigan’s population has been either steady or declining through this period, thus removing a source for demand for new housing. And the massive loss in housing value reduces substantially the incentive to invest in either new housing or in major renovations in existing housing.
Altogether these factors and trends mean the traditional engine for housing renewal in the state—the introduction of new housing—is no longer functional. More specifically, new housing production once facilitated a process of upward filtering as better off and newly-forming households invested in new housing, leaving behind high-quality older housing that other households then occupied. Through a process of chaining, each income strata filtered into slightly higher quality housing over time, leaving behind the worst housing to be, in many cases, demolished. While not a perfect process, this gave many households a chance to move up the economic ladder.

Now that this process has slowed substantially, more and more homeowners will remain in homes that are only getting older. These homes will be accumulating defects from age—leaking roofs, insect infestations, pests, aging wiring, fire risks and plumbing problems. At the same time, lack of affordable, quality housing remains a critical challenge. The National Low Income Housing Coalition reports that over 6.5 million low income families spend more than 50% of their incomes on housing and utility costs. Many people are left to occupy homes with major shortcomings that are the artifacts of when they were built—lead paint, basements that leak radon, asbestos and design features that increase trip and fall hazards.

Figure 4 shows the age of housing from data provided by both the 2000 and 2010 censuses. When comparing the age of housing from the 2000 and the 2010 data it can be seen that more new homes were built from 1991 to 2000 than from 2001 to 2010. The data also shows that in 2010 the number of homes 50 years and older was much higher,
by 576,531, in the year 2010 than 2000. This has huge implications for housing maintenance costs in the state at a time of declining incomes.

**Figure 4: Age of Michigan housing: 2000, 2010**

![Age of Michigan housing: 2000, 2010](image)

Source: U.S. Census data, 2000 and 2010

Without a doubt, the stalling of the housing production process, together with the aging of occupied housing, means there will be an increase in housing hazards. Whether this leads to an increase in negative health outcomes, we cannot yet know, but it will not lead to a decline, except in certain circumstances. This process of aging probably has been abetted by a decline in home improvements over the last decade produced by lower income, tight credit and a loss of faith in the housing market. There is some recent evidence of a counter trend as householders returning to the job market make investments in their homes, but these indications are still preliminary.

At the same time, governmental investment in housing is declining as fiscal austerity measures have led to reductions in federal and state investments, especially as counter-cyclical investments have ended and budget cuts hit major programs like Community Development Block Grants and HUD’s Healthy Homes grants.

Therefore, in the short run, it is unlikely that voluntary public or private housing investment will overcome major healthy homes problems in Michigan. We must look elsewhere to make a difference in these problems. The avenues we take must not be expected to require major financial investments or must identify realistic sources of funds for those investments.

Scanning through the many ideas and approaches that surfaced through the work groups, three major strategies can be identified. These are mutually reinforcing strategies that might have some probability of success in this resource constrained environment. They include:
1. Information gathering and public information/public choice: The true extent, nature, and costs of housing hazards and related health outcomes are just beginning to be understood and documented. The work groups took note of this, and across the board they called for more information gathering. As the scale of the problems and characteristics of the affected are identified, several efforts are possible.

   a. First, strategies can be developed to educate the affected populations about risks and prevention so they can make informed choices about how to protect themselves and their families. For example, families that understand the risks of lead hazards can use the Lead Safe Housing Registry to identify lead-free housing to which they might relocate. While this system needs on-going enhancements, the lead poisoning surveillance, public information provision and registry represents an example of what might be done to facilitate public choice in other areas.

   b. Second, the information about risks from home health hazards needs to be analyzed and presented to affect policy and funding. To bring about these changes, key populations, along with elected officials and other decision-makers, must understand the scale of mortality and morbidity and their associated costs.

2. Regulations Requiring Risk Reduction: A key aspect of the current housing market is an oversupply of units, particularly older, single family units. The use of code enforcement and regulatory tools is unlikely to lead to large increases in rents. Regulation, which involves limited outlays from local and state government, then represents a way to reduce hazards when new supplies are unlikely to be built. However, this is only possible if the first step (above: public information and support) has been developed. In Michigan and other states, efforts to increase regulation are often successful, but there are regular challenges from property owners. Ordinances survive only where the problems can be demonstrated and defended.

3. Engagement of groups and statewide collaboration:
   
a. Building Local Coalitions: Parents, churches, schools, community development corporations, foundations, and medical care providers have a deep interest in children and citizens leading safe and healthy lives. The problem in moving this interest forward, though, is lack of engagement. We have seen various models designed to involve these partners, and we now need to expand broad coalitions such as the Green & Healthy Homes Initiatives (GHHI), currently in Detroit and Flint, to other communities.

   b. Expanding State Coalitions and Programs: Both the Asset Map (Appendix D) and the reality of the coming budget year suggest many of the most effective and well-resourced healthy homes programs and coalitions are at the local level—Grand Rapids, Detroit, Flint, Lansing, and Saginaw. It is the time to tie these and others coalitions together into an effective state-wide healthy homes coalition that educates residents and advocates for policies and programs to protect children.
and older adults - even in an environment of fiscal austerity. While some of this work has been done for asthma or lead poisoning, we need to first bring these and other groups together and then identify champions for the full package of healthy home improvements that will save lives and reduce injuries and illness. Only in this way are we likely to see expansion of funding or programs at either the state or local levels.

c. **Beginning and Continuing Research:** A large share of data collection and research activities proposed by the workgroups will require substantial resources. Many of these resources are currently absent at the state level. However, a number of local communities have access to additional resources. Through careful and strategic collaboration, these local efforts can move state efforts forward toward data collection. This would facilitate the data collection related to the identification and characterization of healthy homes issues while preparing a way to fund a larger effort.

4. **Resource Development:** Much of the actual program delivery surrounding Healthy Homes is currently supported through HUD grants, foundation funds, and local general funds. Some of these funding sources are not sustainable. The goal is to support comprehensive healthy homes assessment and intervention activities using sustainable funding sources. The State can pursue several avenues for resource development. One avenue is mobilizing the healthy homes coalitions to pursue State funding by demonstrating the extent and depth of the problem. This is likely to be effective as local coalitions identify local policy makers who are willing to champion these issues in state-level forums. Second, the State should pursue all opportunities for federal funding and assist local partners in doing so as well. This may involve pursuing nontraditional funding sources such as FEMA and the Michigan State Housing Development Authority. Third, it is important to involve health care providers in discussions about healthy homes, as their systems will be major beneficiaries as healthy homes lead to better personal health outcomes. The use of community benefit agreements to pay for healthy homes interventions is currently occurring with asthma, and could become a major mechanism for creating sustainability for healthy homes interventions. Fourth, the state must identify existing funding to cover surveillance, primary prevention, case management and other intervention activities. This may be possible through supplementing existing programs such as WIC or Medicaid case management. For example, community groups could be provided with incentives to participate in community education efforts, while other partners could fund intervention efforts by providing training to the private contracting community. Foundations are particularly interested and willing to fund innovative, front of the field efforts. When a state, city, or county seeks to implement an innovative healthy home activity, the foundation community should be engaged. Finally, the healthy homes community needs to engage key players in the housing industry to help them understand how their future market will involve retrofitting existing housing in ways that will make them safer and healthier for families. If contractors view this as a profitable venture,
the healthy homes community will have major allies in pursuing improved regulations and financing.

5. **Service Delivery:** In the healthy homes community, we have a large set of workable interventions, including smoking cessation programs, railing installation on stairs and in baths, asthma case management, and lead hazard abatement. We know that installing carbon monoxide and smoke detectors saves lives, and we believe (though this needs to be thoroughly demonstrated) it is far more cost effective to implement these strategies simultaneously in a home after a visual assessment identifies the highest risk problems. We have several local programs that are testing healthy homes models and several collaboratives providing support. The major challenge is to expand and disseminate these working models to additional areas in major cities and rural areas that do not currently have them. In the medium term it will be important to test healthy homes models in places where these approaches have not been tested and add elements that have not been thoroughly integrated in Michigan. Two places where a healthy homes model needs to be tested include rural communities and Northern Michigan, including the Upper Peninsula. A major element that needs to be thoroughly integrated is weatherization, which has not yet been effectively tied to a comprehensive program in Michigan. Incorporating weatherization into healthy homes will require the cooperation of major utility companies. The expansion of service delivery discussed here is highly dependent on finding sustainable funding.
Statewide Strategic Plan for Healthy Homes

Work Plan

The work plan below presents specific goals, objectives, and strategies to obtain and maintain healthy home environments in Michigan. These activities are organized into five major strategic directions: (1) Information gathering and public information/public choice; (2) Regulations Requiring Risk Reduction; (3) Engagement of groups and statewide collaboration; (4) Resource Development; (5) Service Delivery. This plan is intended to provide a roadmap for implementing a comprehensive healthy homes strategy in Michigan.
I. Information Gathering and Public Information—Public Choice

GOAL: Gather, compile, and analyze information to facilitate public information campaigns and public choice.

<table>
<thead>
<tr>
<th>Healthy Housing &amp; Lead Poisoning Surveillance System (HHLPPSS)</th>
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<tbody>
<tr>
<td>Finish implementation of HHLPPSS</td>
<td>2012-2013</td>
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<tr>
<td>Train local health dept. staff on HHLPPSS</td>
<td>2012-2013</td>
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<tr>
<td>Continue collection, storage &amp; distribution of legally-required lead data</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Maintain HHLPPSS and work with labs on direct HL7 imports</td>
<td>2013-2014</td>
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<tr>
<td>Expand training to other users</td>
<td>2013-2014</td>
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<tr>
<td>Continue use of HHLPPSS</td>
<td>Beyond 2014</td>
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<table>
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<tr>
<th>Healthy Homes Screening Tool (HHST)</th>
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<tr>
<td>Identify funds for Pilot Study to assess reliability and validity of HHST</td>
<td>2012-2013</td>
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<tr>
<td>Identify Pilot Communities and train users</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Complete Pilot Study</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Analyze Data</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Identify additional sites/programs and train users</td>
<td>2012-2013</td>
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<tr>
<td>Deploy the screening tool through service provision agencies, such as Federally Qualified Health Centers (FQHCs)</td>
<td>2013-2014</td>
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<tr>
<td>Implement use in all sites</td>
<td>2013-2014</td>
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<tr>
<td>Incorporate HHST into code inspections</td>
<td>2013-2014</td>
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<tr>
<td>Revise HHST as needed</td>
<td>2013-2014</td>
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<tr>
<td>Test Reliability and Validity (follow-up)</td>
<td>2013-2014</td>
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<tr>
<td>Evaluate annually</td>
<td>Beyond 2014</td>
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Obtaining New Sources of Data

<p>| Identify sources of data on homes needing remediation, pesticide use in homes, radon, dust mites, bedbugs, other pests, mold, unsafe drinking water, structural deficiencies, fires, electrical hazards, homes needing weatherization, and homes lacking safety devices. | 2012-2013 |
| Collect ER data (asthma, injuries)                                                                                        | 2012-2013 |
| Work with BRFSS staff to include new questions regarding home health hazards                                                | 2012-2013 |
| Expand 911 EMS data beyond Detroit                                                                                       | 2013-2014 |</p>
<table>
<thead>
<tr>
<th><strong>Consolidate &amp; Link Existing Data Sources</strong></th>
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</thead>
<tbody>
<tr>
<td>Collect results of all healthy homes screens and assessments</td>
<td>2012-2013</td>
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<tr>
<td>Use MDCH Data Warehouse (asthma, injuries, lung cancer)</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Use Michigan Inpatient Database (asthma, injuries, lung cancer)</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Use 911 EMS data in Detroit (injuries)</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Work with DEQ to analyze existing groundwater database to generate updated maps</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Continue to use MDCH Data Warehouse, Michigan Inpatient Database &amp; ER data</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Improve policy regarding radon data collection</td>
<td>2013-2014</td>
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**Data Use and Dissemination**

| Use existing data to guide distribution of funding and resources | 2012-2013 |
| Use surveillance data to evaluate programs | 2012-2013 |
| Identify racial/ethnic disparities in home environments | 2012-2013 |
| Create and distribute Annual Healthy Homes Data Report | 2012-2013 |
| Include special emphasis on children with BLLs 5-9 and their distribution across Michigan | 2012-2013 |
| Expand/Promote the Healthy Homes website | 2012-2013 |
| Continue use of surveillance data to evaluate programs | 2013-2014 |
| Produce a series of materials (handouts, PowerPoints, executive summaries, videos, press releases) that could be provided to state and local officials to help them understand the scale of the problem. | 2013-2014 |
| Develop legislative presentations and receptions to educate legislators about the scale of the problem | 2013-2014 |

**Research**

| Research ways to implement primary prevention strategies | 2012-2013 |
| Examine MEAP/SAT scores and hospital records associated with healthy homes-related conditions | 2012-2013 |
| Examine research linking early childhood growth and development and the built environment | 2012-2013 |
| Evaluate the effectiveness of training modules to assure evidence of effectiveness | 2012-2013 |
| Research healthy homes hazards that are specific to residents with disabilities | 2012-2013 |
Public Information

| Incorporate social justice and health disparity message into education and advocacy. | 2012-2013 |
| Promote having code enforcement officers provide informational handouts to residents | 2012-2013 |
| Help families identify safe and healthy housing through websites and checklists such as the HHST | 2012-2013 |
| Develop education materials for parents regarding how to select a day care with a high environmental health standard | 2012-2013 |

II. Regulation to Require Risks to be Reduced

GOAL: Expand and fully implement regulation of healthy homes hazards in Michigan, concentrating on implementation through property maintenance codes in the short run.

| Develop an overall strategy for expanding regulatory authority | 2012-2013 |
| Develop health-based standards for VOCs | 2012-2013 |
| Advocate that International Property Maintenance Code (IPMC) be amended to include healthy homes concepts | 2012-2013 |
| Promote State, County and local adoption of IPMC | 2012-2013 |
| Encourage local communities to implement proactive rather than complaint-based code enforcement | 2012-2014 |
| Re-evaluate the State’s Landlord Tenant Law and amend as necessary. | 2012-2013 |
| Advocate for 90% of public housing commissions with smoke-free policies | 2012-2013 |
| Identify best healthy homes elements of existing local housing codes, for adoption by other communities | 2012-2013 |
| Recommend that HHST be used at certification of day cares and pre-schools | 2012-2013 |
| Analyze the day care structure and put forth suggestions for how it could be strengthened in relation to healthy homes | 2012-2013 |
| Investigate options for implementing licensing of foster homes based on healthy housing criteria. | 2012-2013 |
| Track legislative bills that would have an effect on housing, housing hazards, lead poisoning and HHLPP priorities | 2012-2014 |
| Develop a new enforcement strategy with input from prosecutors and code enforcement officials | 2013-2014 |
III. Engagement of Groups and Statewide Collaboration

a. Building Local Coalitions

**GOAL:** Replicate existing successful local coalition in a broad range of mid and small sized Michigan communities

<table>
<thead>
<tr>
<th>Task</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document and participate in local collaboratives</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Seek federal, state, and private foundation funding to expand local community collaboratives</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Increase the range of participation in local collaboratives—churches, community development corporations, day cares, parents, schools, foundations, medical care providers, and contractors</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Include local early childhood coalitions in healthy homes collaboratives</td>
<td>2012-2013</td>
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<tr>
<td>Train communities on how to braid resources</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Conduct local asset mapping for healthy homes referrals</td>
<td>2012-2013</td>
</tr>
</tbody>
</table>

b. Expanding State Coalitions and Programs

**GOAL:** Expand state coalitions and programs to incorporate the spectrum of healthy homes hazards and outcomes.

<table>
<thead>
<tr>
<th>Task</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider creating a statewide coalition for healthy homes</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Emphasize participation of local collaboratives in the Alliance</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Extend Advisory Group and expand partners to advise, collaborate and educate new legislation, initiatives and policy changes</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Work with other state programs to advise on healthy homes issues</td>
<td>2012-2013</td>
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<tr>
<td>Reach out to the State level early childhood interagency group for two way engagement</td>
<td>2012-2013</td>
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<tr>
<td>Promote use of 211 to address home hazard inquiries</td>
<td>2012-2013</td>
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<tr>
<td>Work with MDCH staff to add lead and healthy homes messages/links to the <strong>MI healthy baby</strong> mobile website</td>
<td>2012-2013</td>
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<tr>
<td>Seek physician advocates for healthy homes</td>
<td>2012-2013</td>
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<tr>
<td>Revise asset map to develop collaborative relationships</td>
<td>2013-2014</td>
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</tbody>
</table>
IV. Resource Development

**GOAL:** Identify resources to support the overall development of the healthy homes function in the State of Michigan.

<table>
<thead>
<tr>
<th>Description</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seek funding for asthma, lead abatement, radon abatement, and weatherization</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Advocate that Medicaid and insurance providers pay for home assessments for at-risk children</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Identify sources of products and funding for home safety and repair</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Explore alternative means of reimbursement for case management that reflect actual costs of services</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Seek on-going State funding for lead surveillance case management and education/outreach</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Identify additional sources of funding for WIC to support healthy homes education</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Explore how MSHDA can support healthy housing renovations</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Expand the use of insurance payments and community benefit agreements where cost effectiveness demonstrates savings for the healthcare community</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Pursue FEMA and other nontraditional federal funding streams to support healthy homes</td>
<td>2012-2013</td>
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<tr>
<td>Identify healthy homes champions among policymakers</td>
<td>2012-2013</td>
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<tr>
<td>Build an association of healthy homes contractors, home inspectors, and other private sector housing partners</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Engage weatherization programs in discussions about funding healthy homes endeavors.</td>
<td>2012-2013</td>
</tr>
</tbody>
</table>

V. Service Delivery

**GOAL:** Increase and develop service delivery across a range of healthy homes sites and projects.

<table>
<thead>
<tr>
<th>Description</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving existing service delivery models</td>
<td></td>
</tr>
<tr>
<td>Provide referrals based on HHST</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Integrate behaviour change models into education, training, and home visits</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Use existing case management protocols for EBLL nursing, EBL investigations, lead remediation and asthma</td>
<td>2012-2013</td>
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<tr>
<td>Update protocols and provider guidelines as necessary</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Educate clinicians on new CDC recommendations, esp. regarding education of families and home assessments</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Offer NCHH Healthy Homes Specialist trainings to local staff in health, code compliance and related fields</td>
<td>2012-2013</td>
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<tr>
<td>-----------------------------------------------</td>
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</tr>
<tr>
<td>Incorporate 7 principles of healthy housing in educational presentations</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Provide lead and healthy homes educational material to MDCH staff working with Child &amp; Adolescent Health Centers statewide</td>
<td>2012-2012</td>
</tr>
<tr>
<td>Collaborate with MDCH staff working on Patient-Centered Medical Home pilot sites, to assure that healthy homes concepts are folded into the model.</td>
<td>2012-2013</td>
</tr>
<tr>
<td><strong>Disseminate Comprehensive Healthy Homes Model</strong></td>
<td></td>
</tr>
<tr>
<td>Identify successful local models</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Evaluate current and adapt existing training modules on &quot;How to Implement a Healthy Homes Program in Your Community&quot;</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Identify cities and rural areas to target next sites</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Build new local collaboratives</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Support new collaboratives</td>
<td>2013-2014</td>
</tr>
</tbody>
</table>

**Work Plan Implementation:**

Following adoption of the plan, the Advisory Group anticipates convening again in the Fall of 2012 to set its top five priorities. The group will then identify and pursue champions who will be responsible for driving those particular activities forward.

**Summary: Year 2 (2012-2013) Work Plan**

Under the five strategies into which Year 2 (2012-2013) activities were broken, implementation of specific programs systems and tools as well as policy development and data collection were identified as top priorities under the first strategy. The first strategy, which aims to gather information and inform the public through a set of specific goals, had several activities fall under the Healthy Homes Screening Tool and the Obtaining New Sources of Data sub-sections. Within these, activities such as developing policies and procedures for the collection of Michigan healthy home assessments and obtaining funding to test the reliability and validity of the HHST were noted as the top priorities. Throughout the sub-sections of this strategy though, seeking volunteers, obtaining stronger surveillance, and finding additional ways to share and report data at the state, metropolitan, and rural areas were also noted. While a majority of the activities listed by the work groups fell under this first strategy, there were also several within the third strategy.

The third strategy, which focuses on group engagement of statewide collaborations, ranks creating coalitions along with research development, particularly in relation to seeking funding at the statewide and metropolitan levels, as high ranking activities. Specific activities, such as documenting and participating in all major local healthy homes coalitions and educating state programs, local health departments, and community organizations on new CDC recommendations, were also among the top ranking activities. However, other recommended activities ranged from developing and advancing other educational programs to developing state platforms on various health outcomes.
The fourth strategy, which is focused on resource development, and the fifth, which is focused on service delivery, also had higher-ranking activities. Many of the resource development activities focused around seeking funding for abatement techniques, education, and training. The service delivery strategy also focused on training, but through specific protocols and case management techniques. The third strategy, which seeks regulation to reduce risks had the least amount of activities listed, the highest of which was ranked as an “8” by the Advisory and work group members. This activity seeks the development of health based standards for VOCs at the state level.

While there were a range of activities listed for the Year 2 work plan, many of the expected resource providers remained the same. The most common resource providers listed were the Michigan Department of Community Health and the MDCH Healthy Homes Lead Poisoning Prevention Program. Both were recommended as resource providers for activities at all levels—statewide, metropolitan, and rural. However, there were additional resource providers listed, such as local health departments and non-profits to not only help with the more locally-scoped projects, but also those to be implemented at the state level.

**Summary: Year 3 (2013-2014) Work Plan**

As with Year 2, Year 3 (2013-2014) was broken down into five major strategies of activities. Most of these activities also fell under the first strategy of information gathering. However, unlike Year 2, there were fewer activities listed under the other four strategies. The work plan included activities such as implementing a survey of housing hazards, and creating an annual healthy homes statewide data report on such hazards. Revising and maintaining screening tools, testing the reliability and validity of such tools, and continuing educational efforts were also recommended activities within the first strategy. Other recommended activities in the Year 3 work plan include adopting an International Property Maintenance Code, strengthening enforcement through legal input and inspections, and developing collaborative partnerships.

**Summary: Beyond 2014:**

Among the statewide activities listed, most were focused on maintaining and expanding healthy homes data. Exploring ways to expand the healthy homes concept and the creation of an annual healthy homes data report were identified as top priorities. Additional activities related to healthy homes data surveillance were also included, such as the continued use of HHLPSS, the addition of the Michigan Inpatient Database, evaluation data, and results from the Healthy Homes Screening Tool (HHST).
XIII. References:


Appendix A: Healthy Homes Literature Review

a. Lung Cancer

Lung cancer, which is uncontrolled and abnormal cell growth in the lung tissue, is the leading cause of cancer death in the United States according to the Centers for Disease Control and Prevention. Lung cancer begins in the lung tissue but can spread to the lymph nodes then to other organs. Cigarette smoking is the leading cause of lung cancer in the United States. However, lung cancer can also be caused by exposure to environmental tobacco smoke and substances such as asbestos and radon in the home environment.

Lung Cancer Risks:

A direct and causal correlation between the development of lung cancer and exposure to the following carcinogens has been found:

- Tobacco Smoke (Through smoking and second-hand smoke)
- Radon Gas
- Asbestos

In addition to the causal factors listed above, recent scientific research has identified the following risk factors:

- Family history of lung cancer
- Past exposure to radiation therapy

While treatment options available for individuals with lung cancer are improving, there is currently no cure. The CDC recommends several prevention methods that can reduce the risk of developing the disease. These prevention methods include reducing and eliminating tobacco use, reducing and eliminating exposure to secondhand smoke, and utilizing home environment tests that detect radon and asbestos.

Contributing Factors:

Certain genetic and occupational characteristics are linked to an increased likelihood of lung cancer. These characteristics include:

Genetic factors:

- Research conducted by Bonner et al. (2006) and Wenzlaff et al. (2005) found that non-smokers carrying the \( GSTM1 \) null genotype had two to four times the risk of lung cancer if exposed to secondhand smoke. They also found that the risk of lung cancer due to relatively low levels of radon exposure was greater in \( GSTM1 \) null individuals than it was in \( GSTM1 \) carriers.

Occupation:

- An increased risk of lung cancer has been consistently shown among workers exposed to asbestos, arsenic, and silica (Samet et al., 2009).
According to Samet et al. (2009) the following are lung cancer risks associated with certain occupations:

- Use of coal for cooking and heating was associated with increased lung cancer in women.
- Exposure to smoke from wood combustion is associated with an increased risk of lung cancer, but the results on exposure duration and intensity are difficult to interpret.
- An increased risk of lung cancer has been consistently show among women who have never smoked but who have been exposed to fumes from various methods of cooking with oil at high temperatures.

**Lung Cancer Prevention:**

Preventing and eliminating exposure to known carcinogens is the best way to reduce personal risk of developing lung cancer. Specifically, the best way to reduce lung cancer risk is to quit smoking. Mendez, Warner & Courant (1998) found that quitting smoking alone reduced the risk of radon-related lung cancer more than remediating the home’s radon problem alone, even at high (10 pCi/L) levels. The greatest gains, as expected, came from both quitting smoking and radon mitigation, where 60-70% reductions in lung cancer risk were found.

If asbestos is found in the home, the EPA reports that material in good condition will not release asbestos fibers, and the best thing may be to leave the material alone. If signs of damage, such as tears, abrasions, and water damage, are found, the EPA recommends limiting access to the area or removal by a professional.

In houses with radon levels higher than 4 pCi/L, the EPA recommends remediation. For homes with basements, active sub-slab suction is the most common and reliable radon reduction method. This entails one or more suction pipes being inserted through the floor slab into the rock/soil underneath, and using a fan and vent pipes to draw and vent radon outdoors above the roof and away from windows. For homes with crawlspaces, sub-membrane suction is recommended and involves covering the earth floor with a high-density plastic sheet and using a vent pipe and a fan to draw and vent the radon to the outdoors. Gray, Read, McGale, & Darby’s (2009) cost-benefit analysis found that policies requiring basic preventive measures against radon in all new homes throughout the United Kingdom would be cost effective, a conclusion that the authors believe would apply to most developed countries (including the United States).

**Further Reading:**


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8 From EPA’s Consumer Guide to Radon Reduction (http://www.epa.gov/radon/pubs/consguid.html) and the California Department of Public Health (http://www.cdph.ca.gov/HealthInfo/environhealth/Pages/RadonFix.aspx)


## b. Unintentional Injury

As defined by the U.S. Department of Health and Human Services, injuries are “unintentional or intentional damage to the body resulting from acute exposure to thermal, mechanical, electrical, or chemical energy or from the absence of such essentials as heat or oxygen.” In short, unintentional injuries are accidental in nature. There are many hazards in and around the home environment that can increase the chances of experiencing an event such as a fall, fire, collision, entrapment, poisoning, or drowning. To remove or limit hazards conducive to injury, there are basic precautions that can be taken in the home. According to the CDC, injuries can be prevented through changes in environment, behavior, social norms, legislation, and policy.

### Home Injury Hazards:

Hazards conducive to injury and death in the home and surrounding environment can be organized by the type of injury events, and include:

- **Slips and falls in and around the home environment**
  - Structural deficiencies in stairs, floors, and roofs
  - Quality and condition and of doors and windows
- **Home fires**
  - Smoking in the home
  - Quality and condition of electrical wiring and devices
- **Burns and Scalds**
  - Water temperature settings (Hot Water Heater)
  - Hot surfaces (stoves, ovens, toasters, etc.)
- **Animal and/or pest bites/stings**
  - Pet Safety/Training
  - Pest Management
- **Inhalation of hazardous substances**
- **Choking/Suffocation**
  - Small items, plastic bags, etc.
- **Poisoning**
  - Carbon Monoxide
  - Pesticides
  - Radon
  - Mercury
- **Drowning**
  - Improper use of security measures around pools
  - Water safety/training
• Being struck by a falling object
  o Shelf/Cabinet organization and safety

**Contributing Factors:**

Certain characteristics are linked to an increased likelihood of being injured and/or killed in the home environment as a result of an unintentional injury or poisoning. These characteristics include:

*Age:*

According to Mack et al. (2002), children and the elderly are more susceptible to unintentional injuries and death in their home environments. Children are more prone to injuries because they typically lack the formal knowledge surrounding home safety, including fire and water safety. According to this study, the elderly are more susceptible to unintentional injuries if their homes are not adapted to fit their changing safety needs, including brighter lights, handrails, and grab bars. Also, the elderly are more likely to have additional health complications that contribute to home injuries, including hearing, vision, and mobility problems. Such factors make it easier for injuries to occur because typical indicators of danger may not be noticed.

*Mobility:*

- According to Lord et al. (2006), it was found that level of physical ability or functioning is an important factor in determining vulnerability to environmental stressors.

*Housing conditions and location:*

- Shenassa et al. (2004) conducted a bivariate analyses of housing at the zip code-level and found that owner occupied housing had some protective effect on the rate of home injury, while older housing had a higher injury risk.
  - For every 10% increase in the proportion of owner-occupied units, the risk for falling decreased by 16% and the risk of burn decreased 27%. A 10% increase in the proportion of housing built before 1950 was associated with a 17% fall risk increase and a 34% burn risk increase.

**Preventing Unintentional Injury and Death:**

One way in which unintentional injuries in the home and surrounding environment can be prevented is through simple home modifications. Having installed and functional smoke alarms, pool fencing, and preset hot water heaters are effective and easily implemented ways to prevent fire, accidental drowning, and burns (DiGuiseppi et al., 2010).

To reduce injuries among children, Katcher et al. (2006) consulted the opinions of 34 experts, and found the top 10 recommended safety behaviors to be:

1. Install smoke alarms;
2. Set water temperature at <48.9 degrees Celsius (120 degrees F);
3. Use child resistant packaging;
4. Install pool fencing;
5. Install window guards;
6. Remove firearms form the home;
7. Store and lock firearms and ammunition separately;
8. Use bicycle helmets;
9. Use fire-resistant sleepwear; and
10. Create a safe play area.

Recent research also suggests that formal swimming lessons can reduce the risk of drowning in children 4 years and under, according to an evidence-based review completed by Mack & Liller (2010). The researchers determined that interventions to increase stair gate use and reduce baby walker use have also been effective in reducing home injuries.

For adults, the leading cause of residential fire deaths is smoking (Mack & Liller, 2010). Home safety education has been effective in increasing the proportion of families with functional smoke alarms, although Jackson et al. (2010) recommended sustained programs should consider revisiting high-risk homes after 10 years to replace older alarms with new ones, as they found only a third of alarms were still functional after ten years.

To prevent injuries among the elderly, Mack & Liller (2010) found evidence that structural modifications, such as the installation of hand rails, grab bars, and improved lighting, are promising interventions for reducing the risk of falls in older adults. They also recommend installing smoke alarms with flashing lights and vibrating alerts, as hearing decreases with age; and placing an easy-to-read thermometer in an indoor location where it is frequently seen, as the ability to feel a change in temperature decreases with age as well.

Further reading:


c. Chemical Exposure:

According to the Michigan Department of Community Health, a chemical exposure occurs when an individual touches, eats, drinks, or breathes in chemicals. Such exposure can cause various adverse health effects, including organ failure, skin disease, brain and nervous system disorders, tissue damage, and death.

**Chemical Exposure Risks:**

Chemical exposures in the home environment are caused by an almost infinite number of sources, but predominantly come from products designed for:

- Pest Control
- Gardening and Yard Work
- Cleaning and Disinfecting
- Cosmetics and Hair
- Home Repair and Construction
- Health (including medicine)
Common locations for hazardous chemicals in the home environment are:

- Medicine Cabinets
- Kitchen and Bathroom Cabinets (specifically under sinks)
- Basements
- Garages

The risks associated with chemical exposure increase as a result of accidental spills or leaks, improper use or storage, and home repair or construction. Chemicals present in many homes that are difficult to detect include the family of Volatile Organic Compounds, or VOCs. These can be produced either directly or through the use of paint, varnish, wax, air fresheners, hair products, and other items packaged in aerosol cans.

**Contributing Factors:**

Certain demographic characteristics are linked to exposure to chemicals in the home environment, including age, employment, and education. These characteristics can be related to an increased likelihood of chemical exposure for certain individuals. Some demographic factors include:

**Age:**

- Children are especially vulnerable to chemical exposures, especially pesticides. This is due to age-related biological factors that enable absorption of chemicals but limit the body’s ability to detoxify or eliminate them (Mir, Finkelstein & Tulipano, 2010). The same principle is related to an increased risk of lead poisoning in children.

**Cognitive Ability:**

- According to Graff et al. (2006), children with intellectual and developmental disabilities may be at higher risk of chemical exposure because of their behaviors that continue beyond their developmentally appropriate age. These behaviors include hand-to-mouth activity (which can lead to the accidental consumption of toxins and increase risk of chemical exposure), delayed motor skills, and poor communication, which inhibits proper diagnosis. Physicians may incorrectly attribute the child’s symptoms of chemical exposure to their disabilities, without further investigating the cause.

**Job Activities (Agriculture):**

- Agricultural workers are at a higher risk of being exposed to pesticides. As such, the EPA has established worker protection standards for farm workers and pesticide handlers. Bouchard et al. (2011) found higher organophosphate levels in pregnant women living in an agricultural area of California, and children that had lower IQs at 7 years old. Likewise, Rauh et al. (2011) found that prenatal exposure to a common agricultural pesticide, Chlorpyrifos, was associated with lower scores for working memory and full-scale IQ in seven year olds.
Hobbies:

- According to the CDC, many hobbies involve the use of chemicals (such as paints, solvents, thinners, finishes, and fertilizers). These hobbies include, but are not limited to, woodworking, pottery, gardening, auto repair, and painting. Individuals that use materials associated with these hobbies may be exposing themselves and their families to toxic and hazardous chemicals.

Preventing Chemical Exposure:

To reduce chemical exposure related to pest control in the home environment, integrated pest management (IPM) practices should be encouraged. IPM includes the use of traps, elimination of pest food sources, and repair of cracks and crevices that allow pests entry. IPM has been found to be equally, if not more effective, than conventional pest extermination methods using hazardous chemicals. Nalyanya, Gore, et al. (2009) compared schools using IPM to those using conventional cockroach control and found that IPM-treated schools had significantly less infestation and allergens than conventionally treated schools, all without the toxic chemicals in pesticides. Sandel et al. (2010) also confirms IPM as an intervention with sufficient evidence for effectiveness to reduce pesticide chemical exposure.

To reduce chemical exposure related to cleaning products in the home, the CDC recommends using natural cleaning products whenever possible. Some examples of natural cleaning products include vinegar to remove mildew and grease, baking soda mixed with water as an all-purpose cleaner, olive oil as a furniture polish, and lemon juice to act as a stain remover, glass cleaner, and deodorizer.

When working with outdoor chemicals, the CDC recommends using masks, gloves, and other appropriate clothing, such as long pants and protective eyewear. For agricultural workers exposed to pesticides, Bradman et al. (2009) conducted an intervention in which workers were given removable coveralls, gloves, education, and were encouraged to frequently wash their hands. Following intervention, the levels of Malathion and MDA (common agricultural chemicals) on hands was lower among workers who wore gloves than those who did not. These findings suggest that wearing gloves can reduce pesticide exposure. In addition, removing work gloves and clothes before returning home reduces the transport of pesticides to the home environment. The CDC also recommends wearing gloves, changing clothes, and washing hands for all individuals involved in jobs or hobbies that involve the use of hazardous chemicals.

Further reading:


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All CDC recommendations in this section come from: [http://www.atsdr.cdc.gov/emes/public/docs/How%20to%20Reduce%20Your%20Exposure%20to%20chemicals%20at%20home%20work%20and%20play%20fs.pdf](http://www.atsdr.cdc.gov/emes/public/docs/How%20to%20Reduce%20Your%20Exposure%20to%20chemicals%20at%20home%20work%20and%20play%20fs.pdf)
reduce pesticide exposure to farmworkers and potential take-home exposure to their families. *Journal of Exposure Science and Environmental Epidemiology*, 19: 79-89.


Rauh, V. et al. (2011). 7-year neurodevelopmental scores and prenatal exposure to Clorpyrifos, a common agricultural pesticide. *Environmental Health Perspectives*.


d. Asthma

According to the Michigan Department of Community Health, asthma is a chronic inflammatory disease of the airways. The condition is constant, even if the individual does not always experience symptoms, which include wheezing, breathlessness, chest tightness, and coughing. In many cases, the exact cause of asthma is not known, though researchers have identified a wide range of environmental, behavioral, and genetic risk factors. Many environmental factors trigger asthma attacks, and can also impact the severity of symptoms associated with asthma. Though asthma cannot be cured, it can be managed through the avoidance of asthma triggers and proper treatment, including the use of medications.

**In-Home Asthma Triggers:**

Asthma attacks can be triggered by several factors, many of which are typically found in the home. These include:10

- Smoke from tobacco, wood, and candles
- Dust mites
- Cockroach skin and waste
- Dander (skin particles) from dogs, cats, birds, and rodents
- Mold spores
- Humidity and damp housing conditions
- Fungi
- Scented products such as hair spray and air fresheners
- Cosmetic products

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10 Information provided by:

- MDCH Asthma website: [http://www.michigan.gov/mdch/0,1607,7-132--13055--,00.html](http://www.michigan.gov/mdch/0,1607,7-132--13055--,00.html)
Contributing Factors:

Certain demographic characteristics are linked to the quality of health care and individual receives, including access to healthy environments and education. These characteristics can disproportionately expose certain individuals to asthma triggers. Some demographic factors include:

Education:

- According to the 2009 article, "Socioeconomic Factors and Home Allergen Exposure in Children with Asthma," by Ungar, et al., factors related to a mother’s education are associated with important differences in asthma risk reduction behaviors, especially in the case of environmental tobacco smoke exposure. Children whose mothers had not finished post-secondary school had a 140% higher probability of ETS exposure.

Income:

- According to Bryant-Stephens (2009), there are higher asthma rates in homes with a lower socio-economic status. Low-income, inner-city environments are characterized by overcrowding, high housing density, and increased crime. These factors are associated with the presence of allergens and asthma triggers such as old carpeting, ventilation issues, moisture, cockroaches, and others. In addition, living in an area with a higher crime rate inhibits transportation to pharmacies, office visits, and emergency departments to help treat and control asthma.
- Bloomberg et al. (2005) found that the stressors associated with poverty, family dysfunction, and neighborhood conditions (such as exposure to violence) were associated with an increase in pediatric asthma symptoms.

Geographic Location:

- According to Horner (2006), homes in rural and urban areas experience similar challenges related to asthma. However, Horner found that it was often more difficult for residents of rural areas to obtain the resources needed to manage asthma because of their remote location.
- According to Bryant-Stephens (2009) and Etzel (2003), those living in urban settings are more likely to have of asthma and require attention to help treat and prevent asthma attacks. Children living in the older or dilapidated houses found in some urban areas are more likely to be exposed to multiple allergens and respiratory irritants. Additionally, many inner-city parents have limited family support due to economic and social stressors, creating difficulties for accessing the treatment their children need. Finally, urban areas are usually characterized by higher air pollution – whether from smog, traffic, factories, or incinerators– that can exacerbate asthma.

Race/Ethnicity:

- Asthma prevalence, mortality, and morbidity rates are higher among African American and Latino children than White children, according to Bryant-Stephens (2009). The
Asthma Trigger Remediation:

There are several approaches to reducing and eliminating asthma triggers in the home environment. In particular, the academic literature outlines specific strategies for addressing asthma triggers in the home environment so that a person with asthma can sustain their normal activities.

In a 2009 American Journal of Public Health article by Bryant-Stephens, Kurian, Guo & Zhao, a multi-faceted form of asthma management, involving both quality care and asthma trigger avoidance (including education and mitigation), is described as the best form of asthma management.

Quality care includes the proper use preventative medications, as well as the strategic use of medications for specific allergies related to the onset of asthma symptoms. Those with a higher risk of asthma often face significant barriers to treatment, especially medication use. Williams et al (1998) found that illiteracy rates among low-income individuals impacts their ability to treat and prevent asthma attacks. Cost is also a significant barrier, as some asthma medications cost up to $74 out-of-pocket, based on the insurance tier they fall under (Asthma Regional Council of New England, 2010). High cost sharing levels affect patient use of asthma medication, as the Asthma Regional Council found that 14 percent of asthmatics in New England reported not filling their prescriptions because of cost.

In such instances where quality care becomes difficult to maintain, Horner (2006) and Carter et al (2001) suggest home visits by health care professionals to low-income families affected by asthma. Researchers have found home visits have a positive influence on the asthma management process and encourages families to follow through with remediation steps after the study is over in order to reduce the number of asthma symptoms experienced. In an evaluation of a household intervention aimed at children residing in the East and Southwest areas of Detroit, Parker et al. (2007) found participants had improved lung function and fewer symptoms of persistent cough. The study also discovered a reduction in unscheduled health care utilization and a reduction in under-treatment for active symptoms for children who should be on a controller but are not.

In addition to improving health care utilization and medication use, home-based interventions by health care professionals have also been used to improve asthma symptom mitigation. Asthma symptom mitigation includes the reduction or elimination of asthma triggers in the home; however, this is not easy for families to achieve on their own. As a result, a number of home-based asthma intervention strategies have been evaluated. Eggleston et al. (2005) conducted a randomized controlled trial, in which the treatment group received home-based education, cockroach and rodent extermination, mattress and pillow casings, and a high-efficiency particulate air cleaner (the control group was not treated until the end of the one year trial). The authors found significant reductions in particulate matter and the proportion of children with daytime asthma symptoms, and non-significant reductions in cockroach allergen levels. Similarly, Kercsmar et al. (2006) reported significant reductions in symptom days and emergency room visits following an intervention that combined education and individualized problem solving with household repairs and mold removal. Both are consistent with Krieger et al.’s (2010) review,
which found multifaceted, tailored asthma interventions, integrated pest management, and elimination of mold and moisture sources had the highest evidence of effectiveness.

Further reading:


**e. Lead Poisoning**

According to the Michigan Department of Community Health and the U.S. Department of Housing and Urban Development, lead poisoning is a medical condition caused by increased
levels of lead, a toxic heavy metal, in the body. Lead is a soft, malleable metal used in many materials and consumer products because of its conductive and insulating characteristics and low cost. Lead poisoning results from exposure to a variety of hazards in and around the home environment, including lead-based paints, contaminated water and soil, cosmetics, pottery, ammunition, and other sources. If absorbed into the body at high enough levels, lead can damage the central nervous system, vital organs, and blood cells. Lead exposure can also lower IQ (Jusko et al., 2008) and lead to negative cognitive outcomes such as learning disabilities (Miranda, 2010). The damage caused by lead poisoning is permanent and irreversible, though high levels of lead can be treated through certain forms of medical intervention. Lead poisoning can often be prevented by thoroughly inspecting the home and surrounding environment for lead hazards. Identified hazards can be encapsulated or removed, and home cleaning and maintenance strategies can also be performed to prevent the emergence of lead hazards.

**Lead Hazards:**
Lead poisoning results from exposure to lead hazards that often exist in and around the home environment. Common lead hazards include:

- Dust in older homes. The lead in this dust comes from a variety of sources including:
  - Deteriorated lead-based paint on walls, windows, cupboards, doors, porches, or outdoor surfaces in poorly maintained housing.
  - Painting and remodeling projects that disrupt old painted surfaces without proper safeguards.
- Soil in and around homes. This includes soil in lots where homes that were demolished once stood.
- Drinking water, which may become contaminated with lead from corrosion of older fixtures or from the solder that connects pipes.
- Various items typically found in foreign cultures. These include, but are not limited to, traditional medicines, cosmetics, pottery, and toys.
- Certain antiques and collectibles, including stained glass, automobiles, military weapons and munitions, and fishing weights and hooks.

**Contributing Factors:**
Certain demographic characteristics are linked to exposure to lead hazards in the home environment, including race, geographic location, income, and housing. These characteristics can be related to an increased likelihood of lead poisoning for certain individuals. Some demographic factors include:

**Geographic Location:**
- According to Kemper et al. (2005), children diagnosed with lead poisoning are most likely to live in urban areas. Soils in these urban areas can also be contaminated with lead hazards (Howard & Oszewska, 2011).

**Housing stock:**
- According to the MDCH, homes built before 1978 are more likely to contain lead hazards (specifically from lead-based paints) and contribute to lead poisoning.
- According to a 2005 Meyer et al. study, homes built before 1950 valued at less than $50,000 were considered high risk properties for lead hazards. However, homes built after 1950 valued at more than $50,000 were considered low risk for lead poisoning.

**Income:**
- According to Miranda et al. (2002), higher income families and individuals had lower blood lead levels. Percentages for renter-occupied units, persons/children in poverty, one-parent homes, African Americans, and information related to housing stock were also analyzed in this study. These underlying factors were measured based on previous literature related to risk factors for lead exposure and poisoning.
• According to Miranda (2010), children enrolled in free and/or reduced lunch programs in North Carolina had higher mean blood lead levels.

Race:
• According to Miranda (2010), African American children had higher mean blood lead levels.
• In a previous study, Miranda et al. (2009) concluded that lead exposure among African American students explains part of the achievement gap experienced in that racial group. According to Kemper et al. (2005), it was found that the majority of Michigan Medicaid-enrolled children 6 years old or younger with lead poisoning were Hispanic or Non-White

Lead Hazard Remediation and Lead Poisoning Prevention:
Numerous intervention trials have been conducted to determine the best ways to prevent and eliminate lead hazard exposure and poisoning. Early screening for lead exposure is a key part of prevention. Berg et al. (2012) evaluated a lead hazard screening and remediation program targeting the homes of pregnant women in a high-risk population. This intervention resulted in an average blood lead level (BLL) of 2.70 µg/dL among participating individuals, while the average control (non-intervention) subject BLL was 3.63 µg/dL. In addition, the program was effective in reducing the number of children that exceeded the CDC level of concern for lead poisoning (10 µg/dL).

There are multiple options for lead remediation in the home, including interim control and abatement of lead hazards. Interim control strategies, such as repairing and covering chipped and peeling paint, can be conducted at a lower cost but reductions are typically not sustained over time. Tohn, Dixon, Wilson, Galke & Clark (2003) found a one-time, professional, low-cost cleaning intervention can substantially reduce dust lead levels immediately following work, but results were not sustained at the six-month and one-year follow-ups. This is consistent with Dixon, Jacobs, Wilson, Akoto, Nevin & Clark’s (2012) finding that complete window removal and replacement was more effective over time. In addition, homes with all or some of the windows replaced were found to have lower dust lead levels than homes that just received window repair.

Full abatement of lead hazard entails removing all lead sources in the home. While complete abatement of lead hazards is the most effective approach, it can be cost prohibitive in some circumstances (Taha et al., 1999). As a result, most interventions use a combination of abatement and interim control strategies. Taha, Kanarek, Schultz & Murphy (1999) found a combination of interim controls and abatement (namely, wet-scraping and repainting deteriorated surfaces and wrapping window wells with aluminum or vinyl) was an effective short-term intervention for lowering child blood lead levels, and could be completed at a cost-effective price. Wilson et al. (2006) found that across all grantees and treatment intensities (low or medium treatment levels), lead hazard control treatments effectively reduced environmental lead levels on floors, window sills, and window troughs and maintained lowered levels over the following six years.

Further Reading:


f. Integrated Approaches to Healthy Homes

Based on the literature, an integrated approach to home remediation can be effective in reducing a number of hazards, including asthma triggers, lead, and safety hazards. Dixon et al. (2008) combined asthma trigger reduction with housing structural repairs, device disbursement, and education as an integrated approach to such remediation. On average, 8 injury hazards and 3.3 respiratory hazards were observed in the home at the baseline of this study; these were reduced to 2.2 and 0.9, respectively, four months later. Furthermore, 97 percent of parents reported their homes were safer and 96 percent said the respiratory health of their asthmatic children had improved post-intervention. Likewise, Klitzman et al. (2005) evaluated a pilot home remediation that addressed multiple home hazards, including lead, pests, mold, and safety hazards. This led to statistically significant reductions in the number of dwellings containing lead dust, significant reductions in safety hazards, and declines in evidence of cockroaches and rodents. Also, the proportion of dwellings with multiple hazards declined significantly. At the baseline, 75 percent had three or more types of hazards, while at follow up showed only 22 percent had three or more. The authors concluded a comprehensive approach to hazard remediation can be both highly effective and cost efficient.

Further Reading:


APPENDIX B. HEALTHY HOMES & LEAD POISONING PREVENTION PROGRAM (HHLPP) NEEDS ASSESSMENT

Introduction
The Michigan Department of Community Health (MDCH) Healthy Homes and Lead Poisoning Prevention Program (HHLPP) received funding from the Centers for Disease Control and
Prevention (CDC) to increase the availability of healthy, safe, affordable, accessible and environmentally friendly homes throughout the state. Specific HHLPP goals are to prevent or reduce illness, injury and death related to environmental risk factors and to improve environmental health capacity by building and enhancing effective partnerships.

Using this grant, MDCH is transitioning to a more comprehensive approach to addressing home environment quality and related health outcomes. Project objectives are to develop a comprehensive strategic plan; expand primary prevention capacity and effectiveness at the community level; assure that effective care coordination and a plan of care are in place when specific health and/or housing related hazards are identified; establish strategic partnerships at state and local levels to develop the infrastructure needed to improve environmental health capacity; develop a surveillance system to collect, compile and track data related to health and housing-related health hazards; strengthen state and local regulatory policy and enforcement; and use a data-driven evaluation plan to understand and improve program effectiveness on an ongoing basis.

A needs assessment was conducted as an essential component of the strategic planning process. The focus of the needs assessment was on gathering available information at state and county levels, identifying gaps in data availability, analyzing available data, and identifying potential priority areas for intervention.

**HHLPP Needs Assessment Process**

MDCH identified the following categories of data that would contribute to the development of the HHLPP needs assessment:

- Population demographics
- Economics and housing
- Environmental hazards
- Health conditions and injuries

A literature search was completed to obtain background on appropriate measures for each area of importance, followed by an environmental scan to identify and obtain state and/or county level data for these measures. Potential data sources were identified for each indicator. MDCH used internal and external data sources (e.g., MDCH data warehouse, vital records, American Community Survey, Behavioral Risk Factor Surveillance System, census) as primary data sources. External entities were contacted as possible sources of additional data (e.g., local public health departments, poison control). After compiling measures, data sources, and available data in a spreadsheet, data were categorized by availability and current MDCH use to identify gaps in data availability:

- Available at the state and county levels and routinely obtained and used by MDCH to inform programs and/or policy
- Available at the state and county levels but not routinely obtained by MDCH
- Limited availability (e.g., data not available at both state and county levels, lack of consistency in defining indicators, limitations in data collection and reporting, etc.)
- Data not available
Available data were grouped and analyzed according to potential contribution to HHLPP project goals and objectives, resulting in recommendations for the systematic collection of priority data elements to facilitate project success.

Data availability for indicators in each of these areas is discussed below, followed by an assessment of overall priority to HHLPP and potential strategies to obtain data that are currently unavailable.

**POPULATION DEMOGRAPHICS**

Factors influencing health and safety in homes include structural and safety aspects, physical characteristics, presence of safety devices, indoor air and water quality, chemicals, resident behavior, and the home’s immediate surroundings. Although many hazards impact all populations regardless of socioeconomic status, certain populations are disproportionately affected by health and housing issues, creating disparities in the availability in healthy home environments. Minority populations and those with disabilities or low income are less likely to have access to safe and healthy homes.11 For example, low income renters are more likely to live in homes with severe or moderate physical problems, such as water leaks that can cause mold growth, triggering asthma.

It is essential to understand the characteristics of the population to develop a meaningful and actionable strategic plan. A primary component of the needs assessment process was identifying appropriate demographic measures and examining the availability of statewide and county level data. MDCH examined the availability of data on age, race/ethnicity, and socioeconomic status.

**AGE**

Age data for Michigan’s population is critical for understanding the impact of healthy homes on at risk populations such as young children and the elderly. Priority age categories for this needs assessment are children ages zero through five and residents ages 65 and older. Population age data for all age categories are readily available at state and county levels from the U.S. Census 2010.12 These data are routinely obtained by MDCH for efforts addressing population health. Distribution of program recipients for Department of Human Services (DHS), Family Independence Program, State Disability Assistance, Food Assistance Program, Medicaid, State Emergency Relief, and Child Development and Care programs are available from the Michigan Department of Human Services.13

According to the 2010 U.S. Census, children ages zero through five and residents ages 65 and older comprised 7.3 and 13.8 percent of Michigan’s total population, respectively.

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12 U.S. Census Bureau 2012 Data Book.
RACE/ETHNICITY

According to the U.S. Surgeon General and the National Center for Healthy Housing, minority populations are more likely to reside in substandard housing. Understanding the impact of race/ethnicity on healthy homes in Michigan is necessary for the needs assessment and to the development of the statewide state strategic plan. Data sources for state and county level race/ethnicity include the 2010 U.S. Census and the American Community Survey (ACS).

According to the 2010 ACS, the ethnicity of children ages zero through five years as a percent of the total population in this age category were 0.6 percent American Indian/Alaskan Native, 16.8 percent African American/Black, and 8.4 percent Latino.

Adults aged 65 years or greater as a percent of the total population in this age category were 0.3 percent American Indian/Alaskan Native, 9.4 percent African American/Black, and 1.3 percent Latino.

ECONOMICS AND HOUSING

Socioeconomic Status

Income, unemployment, and Medicaid enrollment are generally accepted indicators for socioeconomic status (SES). Because low SES is associated with unhealthy housing status, it is critically important to incorporate SES in Michigan’s healthy homes needs assessment. SES is also an essential component of community prioritization for healthy homes interventions.

Michigan identified multiple state and county level data sources for SES. Unemployment data are available from the U.S. Department of Labor, Bureau of Labor Statistics, and median income data are available from the ACS. Data showing distribution of children receiving FIP, SDA, FAP, CDC, and Medicaid are available from the Michigan Department of Human Services.

Medicaid eligibility and enrollment data are available from the Michigan Department of Community Heath (MDCH) Data Warehouse. Based on a report generated from the Data Warehouse, 59.4 percent of Michigan children ages zero through five were enrolled in Medicaid in 2009.

HOUSING DEFICIENCIES

According to the Surgeon General’s report (2009), approximately 2 million people in the United States lived in severely inadequate homes (without heat, hot water, or electricity, or housing with significant upkeep problems and structural defects). While these conditions are not limited to pre-1950 housing, older homes are more likely to have housing deficiencies.

14 http://www.waptac.org/data/files/events/hhiregionalconferences/sandiego/5amymcleansalls.pdf
Michigan examined sources of data sources for housing indicators for the healthy homes needs assessment. State and county level data are available from the ACS for pre-1950s housing, percent of occupied rental housing, and all houses lacking plumbing and kitchens.

ENVIRONMENTAL HAZARDS

LEAD

Childhood lead exposure is linked to developmental and neurological problems and is the leading environmental health hazard for young children. In 2010, over 1,223 Michigan children were diagnosed with lead poisoning, with another 8,223 children having elevated blood lead levels (5 to 9 ug/dL). A report from the Michigan Network for Children’s Environmental Health (2010) estimated the present value of loss of future lifetime earnings due to pediatric lead poisoning in Michigan (2009 cohort) at $4.85 billion. The medical, social, and economic impact of lead poisoning cannot be understated. Although there are other sources of lead exposure, seventy percent of Michigan’s housing was built prior to 1978, and homes that contain lead-based paint pose a continuous hazard to children.

For purposes of the healthy homes needs assessment, Michigan lead data are reliable and readily available at all geographic levels. Since lead has been at the forefront of Michigan’s public health and legislative efforts for more than a decade, data have been widely analyzed, mapped, and disseminated. Interventions have included public health campaigns, inclusion of lead testing in the Michigan Care Improvement Registry (MCIR), and mapping and spatial analyses to identify geographic areas of risk, elevated blood lead remains a significant public health concern.

A systematic process to gather data at the state and county levels for the number of homes needing lead remediation does not exist, and Michigan lacks sufficient funds for lead abatement.

PESTICIDE-RELATED ILLNESSES AND INJURIES

Chemicals in and around homes contribute to poisonings and other adverse health effects. Studies suggest links between chronic pesticide exposure and neuropsychological deficits and increased asthma risk. Michigan initiated surveillance of non-occupational pesticide exposures in 2006. In 2009, there were 508 reported non-occupational pesticide exposure cases; of these, 249 were confirmed according to NIOSH criteria. Thirty eight percent of the confirmed cases occurred in Wayne (36), Oakland (23), Kent (18), and Macomb (17) counties.

MDCH Epidemiology has only partial state occurrence data on pesticide exposures in the home, and county level data are unreliable due to small numbers. This is consistent with findings in the Surgeon General’s report, which indicate there are no national available estimates of home pesticide exposure prevalence.

For purposes of the healthy homes assessment, meaningful data on pesticide-related illnesses or injuries occurring in the home are not readily available.

**SMOKING AND SECOND-HAND SMOKE EXPOSURE**

The U.S. Surgeon General’s reports on smoking and second-hand tobacco exposure (2006, 2010)\(^{19,20}\) outline the public health and financial costs associated with tobacco use. In 2009, 12,700 (14.7%) of Michigan deaths were linked directly to tobacco use. Tobacco use remains the single most preventable cause of disease, disability and death in Michigan,\(^{21}\) and direct health care costs attributed to smoking (2009) were $3.4 billion.

Interventions addressing smoking and involuntary tobacco exposure in homes are essential elements of Michigan’s healthy homes needs assessment. Smoking rates are available at the state and county levels from the 2010 Michigan Behavioral Risk Factor Surveillance Survey (BRFSS) and local health department estimates. Michigan also added questions addressing secondhand smoke exposure to the Michigan BRFSS in 2007-2009.

Additional data on secondhand exposure are unavailable.

**RADON**

According to the U.S. Surgeon General (2009), radon is the leading cause of lung cancer among nonsmokers, causing approximately 15,400-21,800 lung cancer deaths in the United States each year. Nearly one in 15 homes in the U.S. has radon levels above 4 picocuries per liter, the level at which the U.S. Environmental Protection Agency (EPA) recommends taking specific steps to reduce radon exposure. Healthy People 2020 radon includes two objectives for reducing radon risk: having an operating radon mitigating system in 3.1 million (30 percent) of the estimated 9.2 million homes with an elevated radon level, and increasing to 100 the percentage of new single family homes constructed with radon-reducing features in high-radon potential areas.\(^{22}\) Many low- and middle-income Americans either cannot or will not pay for radon mitigation possibly due to a lack of education and community awareness regarding radon risk.

Governor Snyder declared October 16-22, 2011 Michigan Radon Action Week, noting that radon is a significant environmental health threat in this state, with some Michigan counties having more than 45 percent of homes with elevated radon levels.

The U.S. Environmental Protection Agency has produced radon maps since the late 1980s. These maps depict areas of radon risk at the county level using color-coded zones (zone one with the greatest risk, predicted average indoor radon screening levels greater than 4pCi/L; zone two with moderate risk (predicted average 2-4 pCi/L; zone three with low risk (less than 2). Zone maps are available for Michigan but are imprecise, because radon levels may vary within geographic locations.

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21 Tobacco Facts for State of Michigan

Michigan conducted a series of indoor radon surveys in the late 1980s and early 1990s to inform radon risk identification and intervention in the state. The Michigan Department of Environmental Quality funds distribution of radon test kits to local public health departments, and results for these completed kits are available. However, test kits are also available at many locations such as home improvement stores, and results of tests from these sources are not available.

For the purposes of the healthy homes needs assessment, there is no systematic data source to capture radon test results.

**VOLATILE ORGANIC COMPOUNDS (VOCS)**

Volatile Organic Compounds (VOCs) are comprised of carbon-based chemicals that evaporate at room temperature. VOCS may or may not have an odor and are found in common chemicals used in homes (e.g., acetone), building materials (e.g., upholstery fabrics, carpets, solvents), personal care products, paint, wood burning stoves, and others.

VOC risk is determined by exposure; breathing low levels over a long period of time may increase health problems, particularly those with respiratory conditions, such as asthma. Short-term exposure to high levels of VOCs may result in eye, nose and throat irritation, headaches, nausea/vomiting, dizziness, and worsening of asthma symptoms. Limiting exposure to VOCs is the most effective health protection measure, particularly for young children, the elderly, and persons with heightened sensitivity to chemicals.\(^{23}\)

There are no state or federal health-based standards for VOCs as a group, and Michigan does not capture data for VOCs at the state or county levels.

**DUST MITES, BED BUGS, AND OTHER PESTS**

Dust mites, bed bugs, cockroaches, and other pests are commonly found in homes, where environments support their life cycles. Although Michigan laws broadly authorize the government to protect the public against vermin, rodents, insects, or nuisances or conditions detrimental to human health, there are no specific surveillance systems to collect data and measure their impact.\(^{24}\) During the process of gathering information for the healthy homes needs assessment, MDCH created a web-based survey to determine whether local public health departments collect data and report occurrence rates for specific risk factors. The survey was sent to Michigan’s 45 local public health departments, and seven responses were received (response rate 16%). Of those responding, none could provide data or occurrence rates for dust mites, bed bugs, or other pests.

Michigan does not systematically capture data at the state or county level on dust mites, bed bugs, or other pests.

**MOLD**

Indoor exposure to mold is associated with upper respiratory tract symptoms, exacerbation of pre-existing asthma, hypersensitivity pneumonitis in susceptible persons, and fungal colonization or opportunistic infections in immune-compromised persons. Thresholds have not been established for “safe” or “dangerous” levels of mold, nor does Michigan have specific laws pertaining to mold.

\(^{23}\) [http://www.health.state.mn.us/divs/eh/indoorair/voc/](http://www.health.state.mn.us/divs/eh/indoorair/voc/)

Systematic state and county level mold surveillance systems have not been established, and data are not available.²⁵,²⁶

**UNSAFE DRINKING WATER (WELLS)**

According to the Michigan Department of Environmental Quality (DEQ), 45 percent of Michigan citizens are served by groundwater. Michigan has 1.25 million private household wells serving 2.6 million Michigan citizens (more than any other state). The total groundwater Michigan has established stringent standards for industry professionals in the state well code. DEQ investigates drinking water well contamination and oversees remedial activities at sites of groundwater contamination affecting drinking water wells.²⁷

Michigan has a groundwater database, Wellogic, which captures data on water well records, plugging, arsenic and nitrate levels. These data were used to generate GIS maps in 2003, which provided specific sample results over 1 square mile areas. Due to limited resources at the state level, the groundwater database has not been used to update these maps since 2003.

**Structural deficiencies**

Structural integrity is necessary and integral to well-being. A home’s design, construction, and maintenance influence injuries, illnesses, and mental health. The Surgeon General’s report (2009) estimates 18,000 injury deaths occur each year in residential settings, with an additional 12 million non-fatal residential injuries annually. Children younger than 15 years and adults over age 70 are the most vulnerable to residential injuries. Fire is among the leading causes of home injury deaths, along with choking/suffocation, drowning/submersion, firearms, and poisoning.

For purposes of this needs assessment, Michigan categorized fire, electrical hazards, lack of weatherization, and lack of home safety devices as structural deficiencies. No systematic state or county level data are collected for these deficiencies. Michigan previously received limited funding from the Department of Energy (DOE) to assist residents with home weatherization. However, weatherization funding has been severely reduced and delayed. Reinstatement of these funds would be valuable for Michigan families to assist with home insulation, installation of high efficiency furnaces, water heaters, and similar repairs and upgrades.

**HEALTH CONDITIONS AND INJURIES**

**Asthma**

Asthma has long been a targeted area of focus for Michigan community health activities. MDCH has dedicated epidemiologists addressing asthma burden, and Michigan has a comprehensive asthma action plan developed by the Asthma Initiative of Michigan (AIM). AIM was formed in 2000 to enhance asthma activities throughout the state and has achieved success in reducing Michigan’s burden of asthma over the last ten years. The purpose of Michigan’s asthma action plan is to provide strategic, focused direction and guide decisions and actions for the greatest areas of priority around asthma mortality and morbidity. The state asthma action plan uses a data-driven approach to measure various indicators and Healthy People 2010 targets.

²⁵ [http://www.michigan.gov/mdch/0,1607,7-132-54783_54784_54984_55925---,00.html](http://www.michigan.gov/mdch/0,1607,7-132-54783_54784_54984_55925---,00.html)


²⁷ [http://www.michigan.gov/deq/0,4561,7-135-3313_3675---,00.html](http://www.michigan.gov/deq/0,4561,7-135-3313_3675---,00.html)
Michigan’s asthma strategic plan notes that asthma is not a “stand-alone” condition but is related to environmental quality and housing conditions, as well as other comorbid conditions. Areas of highest asthma burden in Michigan are in populations with lower socioeconomic and education status and poorer home and work environmental conditions.\textsuperscript{28}

Asthma indicators include hospitalization rates, emergency department visit rates, inhaled corticosteroid use rates. Asthma data are available for all Michigan hospitalizations; however, the most recent (2010) data available for this needs assessment are limited to the Medicaid population. Medicaid asthma data are derived from the MDCH Data Warehouse (Medicaid claims and encounters) and are available at the state and county levels. For purposes of the needs assessment data analysis, asthma emergency department visit rates were used; hospitalization rates were not used due to missing data at the county level.

Michigan counties with rates of asthma hospitalization significantly higher than the state as a whole were Baraga, Bay, Genesee, Ingham, Saginaw, and Wayne.\textsuperscript{18} Michigan’s asthma strategic plan has established a goal to integrate asthma activities into at least two state level programs. A strategy associated with this goal is to partner with the Michigan Department of Environmental Quality (DEQ) to increase awareness of the effect of air quality on asthma among the public and stakeholders and utilize health homes principles.

\section*{Unintentional Injuries}

Unintentional injuries and violence are the leading causes of death, hospitalization, and disability for children ages 1-18. The Michigan Department of Community Health Injury Mortality in Michigan 2002-2006 report (2008) contains data by county for unintentional injury deaths due to poisoning, falls, fire/smoke, and strangulation. The primary source of data for these deaths was Michigan Vital Records (death certificates). Data analyses on age, sex, race, and county of residence assist with identifying segments of the Michigan population at highest risk for injury; however, data analysis by county is not included in this report. Vital Records also reports state level data on leading causes of non-fatal injury hospitalizations for ages 0-19.

The leading causes of injury deaths in Michigan from 2002-2007\textsuperscript{29} were transportation, unintentional poisoning, unintentional falls, suicides and homicides (firearms), suffocation, poisoning, burns/fire, and drowning. In 2007, unintentional poisoning was the second leading cause of fatal injury in Michigan (all age, both gender). Unintentional suffocation and fire were the eighth and ninth leading causes of injury death.

Injuries without death are also a major problem in Michigan. In 2007, there were 62,376 Michigan resident hospitalizations for which the principle diagnosis was injury (corresponding to an injury hospitalization rate of 619 per 100,000 residents). Injury hospitalizations comprised 4.7% of the 1,329,121 hospitalizations for any condition among Michigan residents in 2007.\textsuperscript{30}

For the purpose of this needs assessment, county level data are available for the following injury measures:

\begin{itemize}
  \item Average annual unintentional injury and poisoning death rates per 100,000
\end{itemize}


\textsuperscript{29} Michigan 2010 Critical Health Indicators.

- Age-adjusted rate of hospitalizations for all injury types per 100,000
- Michigan Poison Control System human patient cases per 1000 population
- Average annual unintentional fall injury death rates per 100,000
- Average annual unintentional fire/flame/smoke injury death rates per 100,000
- Average annual unintentional poisoning death rates per 100,000
- Average annual unintentional suffocation/strangulation death rates per 100,000
- Age-adjusted rate of hospitalizations for all injury types per 100,000

Michigan county level data are not available for carbon monoxide (CO) poisoning. CO poisoning is the leading cause of unintentional poisoning deaths in the United States, with most poisonings occurring in the home. In 2009, 1,239 Michigan residents were unintentionally poisoned by carbon monoxide, resulting in 39 deaths. Michigan initiated CO surveillance in 2009 as a result of regulations promulgated by MDCH in 2007 to address the health hazards of CO exposure, which also include mandatory reporting by health care facilities and professionals. The 2011 Michigan report recommended ongoing public education about potential sources of CO exposure, common symptoms of exposure, and the importance of CO detectors.

**Gap Analysis**

This review process identified gaps around data availability (collection and/or reporting) and program resources. These categories are not mutually exclusive; for example, data may not be reported due to lack of staff resources to generate and analyze reports. Refer to Table 1, Data Availability for HHLPP Measures.

**GAPS IN DATA AVAILABILITY**

**DEMOGRAPHIC MEASURES**

No gaps in data availability exist at the state or county levels for demographic measures identified by MDCH (age, race/ethnicity).

**SOCIOECONOMIC MEASURES**

No gaps in data availability at the state or county levels exist for the socioeconomic measures identified by MDCH (median income, unemployment rate, percent of children on Medicaid).

**HOUSING DEFICIENCIES MEASURES**

No gaps in data availability exist at the state or county levels for housing deficiencies measures identified by MDCH (percent of housing units pre-1950, percent of occupied rental units, percent of housing units lacking plumbing, percent of housing units lacking kitchen facilities).

**ENVIRONMENTAL HAZARDS MEASURES**

The following data gaps exist for environmental hazards measures identified by MDCH (lead, pesticides, smoking, radon, VOCs, dust mites/bed bugs/other pests, mold, unsafe drinking water – private wells):

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– Lack of systematic state or county level data on homes requiring lead remediation
– Meaningful data on pesticide-related illnesses or injuries occurring in the home are not readily available
– Data on secondhand smoke exposure are limited to the Michigan BRFSS (2007-09)
– Michigan does not have a systematic process to capture radon risk data at state or county levels; radon data collection is limited to test kits distributed by local public health departments, which are completed and submitted to one laboratory
– Michigan does not capture data on VOCs at state or county levels
– Michigan does not capture data on dust mites, bed bugs, or other pests
– Michigan does not have a systematic process to capture state or county level mold data

**STRUCTURAL DEFICIENCIES MEASURES**

No state or county level data are collected for the structural deficiencies measures identified by MDCH (fires, electrical hazards, lack of weatherization, lack of home safety devices).

**HEALTH CONDITIONS AND INJURIES MEASURES**

For health conditions and injuries measures identified by MDCH (asthma emergency department visits, unintentional injuries due to falls, fire/smoke, suffocation/strangulation, poisoning, carbon monoxide), the only data gap is for carbon monoxide at the county level. Michigan initiated CO surveillance in 2007; however, county level data will not be available in the near future.

**GAPS IN RESOURCE AVAILABILITY**

The following gaps were identified around resources (funding, staffing, infrastructure, policy) for the following:

**ENVIRONMENTAL HAZARDS**

– Lack of funds for lead abatement
– No state or federal health-based standards for VOCs
– Michigan has the capability to analyze data on water wells using Wellogic, the state’s groundwater database. However, personnel have been unavailable to generate these reports since 2003.

**STRUCTURAL DEFICIENCIES**

– Michigan’s DOE funding to assist residents with home weatherization has been severely reduced and delayed.

**Analysis of existing data**

As previously discussed, MDCH has state and county level data available for the following measures:

**Housing:**
– Percent of housing units built before 1950;
– Percent of occupied housing units that are rental;
– Percent of housing units lacking complete plumbing facilities;
– Percent of housing units lacking complete kitchen facilities.
**Environmental:**
- Percent of children tested who were identified with lead poisoning (2011).

**Health conditions and injuries:**
- Asthma: Medicaid emergency department visit rates per 10,000
- Average annual unintentional injury and poisoning death rates per 100,000
- Age-adjusted rate of hospitalizations for all injury types per 100,000
- Michigan Poison Control System human patient cases per 1000 population
- Average annual unintentional fall injury death rates per 100,000
- Average annual unintentional fire/flame/smoke injury death rates per 100,000
- Average annual unintentional poisoning death rates per 100,000
- Average annual unintentional suffocation/strangulation death rates per 100,000
- Age-adjusted rate of hospitalizations for all injury types per 100,000

In an effort to analyze disparate types of data for HHLPP measures, a process was used to categorize and rank county level data:
- For each measure, counties were sorted in descending order by rate/percent, producing a ranked list of counties.
- Each ranked list was divided into four groups (quartiles).
- For each category of measures, the number of times a county appeared in a quartile was summed, producing a ranked list of counties showing frequency by quartile.
- The above steps were performed for all three measurement categories, producing three ranked lists of counties by quartile.
- The lists were combined, ranked, summed, and sorted into quartiles, resulting in an overall list of county rankings for all measurement categories. Refer to Figures 4-9.

**RESULTS BY MEASURES CATEGORY: HOUSING**

**Housing quartile 1:** (Refer to Figure 1)

The following were the top counties* in quartile 1:
- Baraga, Gogebic, Houghton, and Wayne, Chippewa, Delta, Dickinson, Iron, Keweenaw, Menominee, and Ontonagon
Housing quartile 2:
The following were the top counties* in quartile 2:

- Manistee, Alger, Alpena, Clare, Marquette, Oceana, Saginaw

Note: there was no overlap of counties most frequently occurring in quartile 1 and quartile 2.

Housing quartile 3:
The following were the top counties* in quartile 3:

- Allegan, Benzie, Eaton, Lapeer, Oceana, Van Buren

Housing quartile 4:
The following were the top counties* in quartile 4:

- Leelanau, Livingston, Midland, Ottawa, Washtenaw, Isabella

*counties with 3 or 4 housing measures in the quartile

RESULTS BY MEASURES CATEGORY: ENVIRONMENTAL

Environmental quartile 1: (Refer to Figure 2)
The following were in quartile 1 for lead, which was the only measure in the “Environmental” category with county level data:

- Schoolcraft, Wayne, Lake, Berrien, Muskegon, Manistee, Mackinac, Ionia, Kent, Bay, Newaygo, Delta, Van Buren, Calhoun, Hillsdale, Grand Traverse, Ingham, Jackson, Cheboygan, Monroe, and Genesee

RESULTS BY MEASURES CATEGORIES: HEALTH CONDITIONS/INJURIES

For this group of measures:

The unintentional fall injury death rate measure had only 81 counties with data (i.e., only 3 counties in quartile 4).

This category included nine measures: Medicaid asthma emergency department visit rates, unintentional injury and poisoning death rates, injury hospitalization rates, Poison Control System cases, unintentional fall injury death rates, unintentional fire/flame/smoke injury death rates, unintentional poisoning death rates, unintentional suffocation/strangulation death rates, and hospitalizations for all injury types. Three measures were eliminated due to insufficient data (poison control, fire/flame/smoke deaths, and suffocation/strangulation deaths), leaving 6 measures.
Health conditions/injuries quartile 1: (Refer to Figure 3)

The following were the top counties* in quartile 1:

- Clare, Dickinson, Iron, Baraga, Barry, Crawford, Ogemaw, Vanburen, Wayne, Calhoun, Emmet, Genesee, Gogebic, Ingham, Iosco, Kalkaska, Manistee, Mason, Monroe, Presque Isle, Saginaw

Health conditions/injuries quartile 2:

The following were the top counties* in quartile 2:

- Oceana, Hillsdale, Charlevoix, Cheboygan, Huron, Kalamazoo, Kent, Newaygo, Schoolcraft, Shiawassee, St. Joseph, Arenac, Berrien, Calhoun, Emmet, Gratiot, Isabella, Luce, Mackinac, Macomb, Montcalm, Oakland, St. Clair

Note: two counties, Calhoun and Emmet, were included in both quartile 1 and quartile 2.

Health conditions/injuries quartile 3:

The following were the top counties* in quartile 3:

- Sanilac, Allegan, Antrim, Benzie, Berrien, Chippewa, Ionia, Jackson, Lenawee, Midland, Tuscola, Branch, Cass, Clinton, Gladwin, Grand Traverse, Lapeer, Livingston, Manistee, Menominee, Montmorency, Newaygo, Osceola

Health conditions/injuries quartile 4:

The following were the top counties* in quartile 4:

- Leelanau, Alcona, Isabella, Keweenaw, Lake, Livingston, Midland, Oscoda, Otsego, Ottawa, Washtenaw, Wexford

*counties with 5, 4, or 3 health conditions/injuries measures in the quartile

DISCUSSION BY MEASURES CATEGORY

HOUSING

Nine of the eleven top counties (those with 3 or 4 housing measures in quartile 1) are located in the western Upper Peninsula. However, of these nine counties, only two are present (in the fourth or lowest quartile) when combined with the environmental and health conditions/injuries categories.

ENVIRONMENTAL

Due to lack of available county level data, only lead poisoning was included in the environmental category. These data should be reviewed against existing Michigan testing data trends.
HEALTH CONDITIONS AND INJURIES

For this category of measures, four of the top counties are located in the western Upper Peninsula. It is interesting to note that these counties are also included in the top housing category. In addition, five of the six counties with asthma hospitalization rates significantly higher than the state as a whole (Baraga, Genesee, Ingham, Saginaw, and Wayne) are included in the highest Health Conditions and Injuries quartile. Further analysis may be useful in determining characteristics of the western Upper Peninsula relative to healthy home environments.

As expected, multiple counties with larger urban populations (e.g., Wayne, Ingham, Saginaw, Genesee) are in the highest quartile. However, other counties (e.g., Kent, Berrien, Muskegon, Marquette) were not in this group. This may be a function of data and the method used for grouping; however, further analyses relative to chronic disease burden would be useful.

Recommendations

Based on the data and information available for review, the following needs are identified for Michigan’s HHLPP Program:

− Clearly define those measures that will be included in future HHLPP assessments and evaluations.

− Eliminate gaps in data availability by creating systematic mechanisms to capture reliable, consistent state and county level data. It is of particular concern that there is no mechanism to identify issues associated with structural deficiencies, a key component of healthy homes.

− Examine potential efficiencies in data collection or warehousing to enable timely and accurate analyses.

− Allocate resources/personnel to perform timely and complete data analyses where such capability exists (e.g., Wellogic).

− Use demographic/race/ethnicity to identify disparities in healthy home environments.

− Identify mechanisms to capture data on environmental hazards such as mold, bed bugs, and other pests by leveraging resources from other home visiting programs (e.g., Maternal Infant Health Program).

− Collaborate more closely with existing chronic disease programs to identify families in crisis due to home environment issues (e.g., Asthma in Michigan).

− Consider policy improvements in the area of radon, enabling Michigan to capture and map all radon testing results.
– Continue to seek funds to support lead abatement, radon abatement, and home weatherization.

– Consider the development of state health-based standards for VOCs

– Evaluate how to use data to guide distribution of funding and resources

– Consider expanding healthy homes concept to address the need for safe and supportive physical, chemical, and built environments
Red represents the top counties in Housing Quartile 1

Housing measures:

- Percent of housing units built before 1950
- Percent of occupied housing units that are rental
- Percent of housing units lacking complete plumbing facilities
- Percent of housing units lacking complete kitchen facilities

(FIGURE 1)
Red represents the top counties in Environmental (Lead Poisoning) Quartile 1

Environmental measure:

- Percent of children tested who were identified with lead poisoning

(FIGURE 2)
Red represents the top counties in Health Conditions and Injuries Quartile 1

Health Conditions and Injuries measures:

- Medicaid asthma emergency department visits
- Unintentional injury and poisoning death rates
- Injury hospitalization rates
- Poison Control system cases
- Unintentional poisoning death rates
- Unintentional suffocation/strangulation death rates
- Hospitalizations all injury types

(FIGURE 3)
Red represents counties falling within the 1st (highest) quartile for ALL THREE CATEGORIES* of measures combined.

*Categories of measures:

Housing Deficiencies

Environmental Hazards

Health Conditions and Injuries

(FIGURE 4)
Yellow represents counties falling within the 2nd quartile (2nd highest) for ALL THREE CATEGORIES* of measures combined.

*Categories of measures:

- Housing Deficiencies
- Environmental Hazards
- Health Conditions and Injuries

(FIGURE 5)
Green represents counties falling within the 3rd quartile for ALL THREE CATEGORIES* of measures combined.

*Categories of measures:

Housing Deficiencies

Environmental Hazards

Health Conditions and Injuries

(FIGURE 6)
Blue represents counties falling within the 4\textsuperscript{th} quartile (lowest) for ALL THREE CATEGORIES\(^\star\) of measures combined.

\(^\star\)Categories of measures:

- Housing Deficiencies
- Environmental Hazards
- Health Conditions and Injuries

(\textit{FIGURE 7})
Red represents counties falling within the 1st quartile for ALL THREE CATEGORIES* of measures combined. Yellow represents counties falling within the 2nd quartile for ALL THREE CATEGORIES of measures.

*Categories of measures:

- Housing Deficiencies
- Environmental Hazards
- Health Conditions and Injuries

(FIGURE 8)
Red represents counties falling within the 1st (highest) quartile for ALL THREE CATEGORIES* of measures combined. Yellow represents counties falling within the 2nd quartile for all three categories of measures. Green represents counties falling within the 3rd quartile for all three categories of measures. Blue represents counties falling within the 4th (lowest) quartile for all three categories of measures. White represents counties that did not fall consistently within any single quartile for all categories of measures.

*Categories of measures:
- Housing Deficiencies
- Environmental Hazards
- Health Conditions and Injuries

(FIGURE 9)
<table>
<thead>
<tr>
<th>Measure</th>
<th>Data readily available (state and county); routinely obtained</th>
<th>Data available (state and county) but not routinely obtained</th>
<th>Limited data availability (GAP)</th>
<th>Data not available (GAP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POPULATION DEMOGRAPHICS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population &lt; 6 years of age</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population ≥65 years of age (total and percent)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian/Alaska Native, African American/Black, Latino</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td><strong>SOCIOECONOMIC STATUS</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Median income</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children on Medicaid (total and percent)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HOUSING DEFICIENCIES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing units pre-1950</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of rental</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lacking plumbing</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lacking kitchen</td>
<td>✓</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>ENVIRONMENTAL HAZARDS</strong></td>
<td></td>
<td></td>
<td>(no data on homes needing remediation)</td>
<td></td>
</tr>
<tr>
<td>Lead</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pesticide-related illness/injuries</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking and secondhand smoke exposure</td>
<td>✓</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Radon</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Volatile organic compounds (VOCs)</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Dust mites, bed bugs, other pests</td>
<td>✓</td>
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<tr>
<td>Mold</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Unsafe drinking water (wells)</td>
<td>✓</td>
<td></td>
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</tr>
<tr>
<td><strong>STRUCTURAL DEFICIENCIES</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Fires</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical hazards</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of weatherization</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of home safety devices</td>
<td>✓</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>HEALTH CONDITIONS AND INJURIES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unintentional injuries and poisoning death rates</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unintentional injuries: falls</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unintentional injuries: fire/smoke</td>
<td>✓</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Unintentional injuries: suffocation/strangulation</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unintentional injuries: poisoning</td>
<td>✓</td>
<td></td>
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</tr>
</tbody>
</table>
### Appendix C. Work Group Prioritization Charts

#### a. Surveillance Work Group

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Statewide Activities</th>
<th>Metropolitan (Large City) Activities</th>
<th>Rural (Small City) Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S2</td>
<td>M2</td>
<td>R2</td>
</tr>
<tr>
<td><strong>Year 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activities</td>
<td>Implement HHLPPS (Lead plus HH hazards)</td>
<td>Develop ongoing access to 9-1-1 data (Injuries) in Detroit</td>
<td>Develop survey of housing hazards</td>
</tr>
<tr>
<td></td>
<td>Use MDCH Data Warehouse (Asthma, Injuries)</td>
<td>Develop survey of housing hazards</td>
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</tr>
<tr>
<td></td>
<td>Gain access to Michigan Inpatient (Asthma, Injuries)</td>
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<tr>
<td></td>
<td>Explore lung cancer data related to 2nd-hand smoke and radon</td>
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<tr>
<td></td>
<td>Create annual Healthy Homes data report</td>
<td></td>
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<tr>
<td></td>
<td>Use surveillance data to evaluate program per evaluation plan</td>
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<tr>
<td><strong>Year 3</strong></td>
<td>S3</td>
<td>M3</td>
<td>R3</td>
</tr>
<tr>
<td>Activities</td>
<td>HHLPPS (Lead plus HH hazards) work with labs on next stage</td>
<td>Expand 9-1-1 data project to other metro areas</td>
<td>Implement survey of housing hazards, collect data.</td>
</tr>
<tr>
<td></td>
<td>MDCH Data Warehouse (Asthma, Injuries)</td>
<td></td>
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<tr>
<td></td>
<td>Michigan Inpatient Database (Asthma, Injuries)</td>
<td></td>
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<tr>
<td></td>
<td>Lung cancer data related to 2nd-hand smoke and radon</td>
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<tr>
<td></td>
<td>Annual Healthy Homes data report</td>
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<td></td>
<td>Use surveillance data to evaluate program per evaluation plan</td>
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</tr>
<tr>
<td>Beyond Activities</td>
<td>SB</td>
<td>MB</td>
<td>RB</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td>• HHLPPS (Lead plus HH hazards)</td>
<td></td>
<td>• Expand 9-1-1 data project to small cities and rural areas</td>
</tr>
<tr>
<td></td>
<td>• MDCH Data Warehouse (Asthma, Injuries)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Michigan Inpatient Database(Asthma, Injuries)</td>
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<tr>
<td></td>
<td>• Lung cancer data related to 2nd-hand smoke and radon</td>
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<tr>
<td></td>
<td>• Annual Healthy Homes data report</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Use surveillance data to evaluate program per evaluation plan</td>
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</tr>
</tbody>
</table>
### b. Primary Prevention, Case Coordination & Training Work Group

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Statewide Activities</th>
<th>Metropolitan (Large City) Activities</th>
<th>Rural (Small City) Activities</th>
</tr>
</thead>
</table>
| Year 2 Activities | S2  
- Solicit volunteer communities  
- Seek funding to test reliability & validity of healthy homes screening tool (HHST)  
  - Assess HHST  
  - Local public health collects data  
  Analyze the data  
- Annual assessment of HHST utilization | M2  
- Volunteer participation in HHST  
- Local asset mapping for referrals  
- Provide referrals based on scores & identified needs | R2  
- Volunteer participation in HHST  
- Local asset mapping for referrals  
- Provide referrals based on scores & identified needs |
| Year 3 Activities | S3  
- Revise tool as needed  
- Test reliability and validity of tool  
- Annual assessment of HHST utilization | M3  
- Revise tool as needed  
- Test reliability and validity of tool  
- Revise asset map—developing collaborative relationships | R3  
- Revise tool as needed  
- Test reliability and validity of tool  
- Revise asset map—developing collaborative relationships |
| Beyond | SB  
- Annual assessment of HHST utilization | MB | RB |
### c. Strategic Partnerships and Policy Work Group

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Statewide Activities</th>
<th>Metropolitan (Large City) Activities</th>
<th>Rural (Small City) Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ye ar 2 A ct iviti es</td>
<td>S2 Using lead surveillance, determine the number of children at the CDC recommended Blood Lead level reference value of 5 micrograms per deciliter in children younger than 6 years of age for distribution to state per county and target areas in State of Michigan. MDCH respond to new CDC recommendations with protocols for care of children with 5 micrograms/deciliter and above blood levels. Integrate into State MDCH program materials new CDC recommendations regarding new EBL reference value. MDCH HHLPP conducting educational programs to state programs, local health departments, and community organizations on new CDC guidelines. Educate clinicians on new CDC recommendations, helping them to take the primary role in educating families about primary prevention of lead exposure, promoting use of Healthy Homes assessment tool for pregnant women and children living in at risk home environments under age of 6 with priority children 0-2, having blood lead test of all children tested twice prior to age of 2.</td>
<td>M2 Join and continue membership with both Detroit and Flint Green and Healthy Homes Initiative, using their program as a model and assisting with expansion of similar programs to other large cities in Michigan. Assist, train, advocate for CHW to develop community Healthy Homes Coalitions following the model of safe kids and asthma Coalitions in State of Michigan. Develop training module using power point presentations, Talking points, social media to share “How To implement a Healthy Homes program in your community” through successful implementation of healthy Homes demonstration Grants, technical studies, green and healthy Homes Initiatives in State of Michigan and nationally. Assist, train, advocate for CHW to develop community Healthy Homes Coalitions following the model of safe kids and asthma Coalitions in State of Michigan.</td>
<td>Assist, train, advocate for CHW to develop community Healthy Homes Coalitions following the model of safe kids and asthma Coalitions in State of Michigan. Develop training module using power point presentations, Talking points, social media to share “How To implement a Healthy Homes program in your community” through successful implementation of healthy Homes demonstration Grants, technical studies, green and healthy Homes Initiatives in State of Michigan and nationally. Collaborate with Safe Kids Coalitions, MCA weatherization programs, Lead safe coalitions, asthma coalitions, faith based organizations. Seek funding, grants and sustainability to</td>
</tr>
<tr>
<td>Develop State recommended policy and policy to identify pregnant mothers and new born children who live in at-risk home to have lead, healthy home assessment to determine lead exposures, asthma triggers, environmental tobacco smoke, radon, and other health hazards.</td>
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<tr>
<td>Expand opportunities for cross training lead inspector/assessors, code compliance officers, renovation contractors, and other Home inspectors with National Center for Healthy Homes training program for Healthy Homes Specialist certification.</td>
<td></td>
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</tr>
<tr>
<td>Develop State platform on health outcomes including lead poisoning, asthma, unintentional injuries, cancer, other health issues due to home hazards.</td>
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<tr>
<td>Provide approved Healthy Homes Assessment tool to home visiting programs, and home inspection programs.</td>
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<tr>
<td>Recommend approved Healthy Homes Assessment tool to be completed as day care, preschool and school enrollment form.</td>
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<tr>
<td>Develop MDCH Policy that all Healthy Home assessments be reported to State Surveillance Program and input into State HHLPS Surveillance data system.</td>
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<tr>
<td>Integrate into program materials new CDC recommendations regarding EBL reference value and educate state, county, local partners.</td>
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</tr>
<tr>
<td>assistance with multiple home hazard remediation and family’s needs including social, Homelessness, health, home visiting programs, etc.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Advocate for home visit programs to advance HHLPP education by using the HHLPP survey, incorporating into current survey &amp;/or leaving a HHLPP self-assessment for family to complete and return to home visitor to report to state surveillance program.</td>
<td></td>
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</tr>
<tr>
<td>Collaborate with Safe Kids Coalitions, MCA weatherization programs, lead safe coalitions, asthma coalitions, faith based organizations, community coalitions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop protocol and talking points to promote, educate medical community, WIC, school based health centers, physicians, Medicaid, health plans regarding children to be tested twice between 0-2.</td>
<td></td>
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</tr>
<tr>
<td>Seek funding, grants and sustainability to fund local county health departments, city and community grants to continue and expand lead case management, asthma case management, lead and environmental assessments, radon testing, tobacco smoke cessation and other Healthy home services community coalitions.</td>
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<tr>
<td>Support and advocate for International Property Maintenance Code to be amended with Appendix B adding healthy homes concepts and promotes state, county and local community acceptance of IPMC.</td>
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<tr>
<td>Research, and model strongest community groups promoting braiding of resources and lead and healthy home advocacy that can be shared with other communities.</td>
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<tr>
<td>Goal to have one Community Health worker trained in communities across Michigan.</td>
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<tr>
<td>Document existing community collaborative and advance the initiation of other community</td>
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<tr>
<td>Expand HHLPP message to include pregnant women, newborns, children 0-18, adults and senior citizens.</td>
<td>fund local county health departments, city and community grants to continue and expand lead case management, asthma case management, lead and environmental assessments, radon testing, tobacco smoke cessation and other Healthy home services.</td>
<td>collaborative in the state sharing partners, accomplishments to forward braiding resources in rural areas. Example using Barry-Eaton Community Collaborative that meets monthly with partners including DHS, 211, housing, transportation, meals on wheels, community hospital, united way, health department, ISD, county administrator, health and human services as model to promote to other communities.</td>
<td></td>
</tr>
<tr>
<td>Promote use of 211 as central phone contact to address home hazard inquiries from citizens of Michigan and to receive referrals to resources and services in state, local and community.</td>
<td>Expand collaboration on other grant funded programs to advise on HHLPP issues.</td>
<td>Seek and advocate for federal, state funding to expand local community collaborative.</td>
<td></td>
</tr>
<tr>
<td>Continue to advocate and educate state legislators on lead and Healthy homes messages, seek funding by state of Michigan for HHLPP program.</td>
<td>Offer NCHH Healthy Homes Specialist and one day Healthy Homes training to community health workers, code compliance, weatherization, radon and other Healthy Homes advocates &amp; professions.</td>
<td>Identify children in rural areas that have tested at 5 micrograms/deciliter, family, follow up on further services for appropriate care and safe housing.</td>
<td></td>
</tr>
<tr>
<td>Expand collaboration on other grant funded programs to advise on HHLPP issues.</td>
<td>Assist, train, advocate for Community Health Workers trained in Healthy Homes principles to develop community Healthy Homes Coalitions following the model of safe kids, asthma Coalitions, and model local coalitions in State of Michigan.</td>
<td>Connecting electronic medical records from local, rural areas to state data collection system.</td>
<td></td>
</tr>
<tr>
<td>Offer NCHH Healthy Homes Specialist and one day Healthy Homes training to community health workers, code compliance, weatherization, radon and other Healthy Homes advocates &amp; professions.</td>
<td>Assist, train, advocate for Community Health Workers trained in Healthy Homes principles to develop community Healthy Homes Coalitions following the model of safe kids, asthma Coalitions, and model local coalitions in State of Michigan.</td>
<td>Reassess and share HHLPP Needs Assessment with local,</td>
<td></td>
</tr>
<tr>
<td>Develop power point presentation on healthy homes training modules “How To implement a Healthy Homes program in your Community” by sharing “ideas, successful strategies &amp; lessons learned” from Healthy Homes</td>
<td>Work with local Medical Societies (pediatricians) in testing children AND report back the findings Determine partners who can assist (both private and public) via MOUs</td>
<td>Reassess and share HHLPP Needs Assessment with local,</td>
<td></td>
</tr>
<tr>
<td>demonstration grants, HH technical studies, Green and Healthy Homes Initiatives in Michigan and nationally.</td>
<td>rural areas of need for home Lead, asthma, home hazard education and home assessment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop model following success of Green and Healthy Homes initiatives in Detroit and Flint as educational tool to train communities “how to braid resources, services through state, county, community partners to advance healthy homes collaboration and to linking families to multiple home hazard education and remediation opportunities.</td>
<td>Document elevated EBLs and renovations that have taken place.</td>
<td></td>
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</tr>
<tr>
<td>Advocate for children with asthma, lead poisoning, unintentional Injuries, disabilities, on WIC, Childrens Special Health Care, enrolled in Maternal Infant programs, and/or living in “high risk” home or area to have healthy homes assessment to be Recommended and paid for by Medicaid and insurance providers.</td>
<td>Determine areas of community that may have children needing BL testing.</td>
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<tr>
<td>Promote HHLPP Principles at State health conferences.</td>
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</tr>
<tr>
<td>Educate and advocate HHLPP Program to programs at State level who have home visiting programs to advance Healthy Homes concepts and use of Healthy Homes assessment tools.</td>
<td></td>
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</tr>
<tr>
<td>Research ways to change focus to primary prevention of lead, asthma, unintentional injuries and home hazard risk reduction and recommend systems for implementation.</td>
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</tr>
<tr>
<td>Continue the HHLPP Advisory Group of stakeholders and expand partners to</td>
<td></td>
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</tr>
</tbody>
</table>
advise, collaborate, educate on new legislation, initiatives, programs, and policy changes regarding each program, braiding state departments and reducing silo programing and implementation to include messages and advocacy of all programs.

Collaborate with Safe Kids Coalitions, MCA weatherization programs, Lead safe coalitions, asthma coalitions, faith based organizations, Community coalitions.

Promote educational tools for landlords, tenants and citizens to Address and educate on legal rights and resources.

Support and advocate for International Property Maintenance Code to be amended with Appendix B adding healthy homes concepts and promote State, county, and local community acceptance of IPMC.

Seek physician advocates for healthy home programs who have referred families and seen results of Healthy Homes programs in Michigan.

Advocate sharing of data between WIC, MICR, Lead Surveillance, Asthma, Weatherization, Radon, Social justice, disparity, MSHDA, DEQ water quality, DHS services, Medicaid data, Disability, Injury, Maternal Infant data, and other Healthy Homes issues with HHLPS system.

Train state and local programs on HHLPS Surveillance system.

Seek funding, grants and sustainability
to fund local county health
departments, city and community
grants to continue and expand lead &
asthma case management, lead and
environment assessments, radon
testing, tobacco smoke cessation and
other Healthy home services.

Continue to expand and promote
Healthy Homes Website at
Michigan.gov

Incorporate HUD Healthy Housing 7
principles, Healthy Housing Rating
Tool, State HHLPP Assessment into
HHLPP education and materials
developed.

Offer training to each local health
department with goal of having one
person as minimum trained as Healthy
Homes Specialist.

Healthy Homes trained individual or
staff to educate, train,

and promote Healthy Homes training
and to research, gather
current legislative changes, new
grants, programs and resources
available for healthy homes hazard
services and to update 211.

Maintain membership in Michigan
Alliance for Lead Safe Housing and
educate Legislative advocates on
Healthy Housing platform and legal
advocacy.

Seek to enact and enforce health based
housing standards.

Expand and target resources for
housing maintenance, repair, rehab
and retrofit.
Research and promote local housing models in State of Michigan (Grand Rapids, Lansing, Detroit,) and adoption of International Property Maintenance code.

Learn and integrate Behavior change models into training, education, Healthy Home site visits, and advocacy.

Work to demand protective national, state and local policy that a healthy home is a right for all citizens of Michigan.

Promote one application to apply for multiple programs connected by home hazard remediation, DHS services, and case management for health issues.

Incorporate social justice, disparity data, message into all materials, education, power points, social media, and programs delivered.

Assist, promote and advocate objectives and goals of healthy housing partners.

Advocate for MDCH Tobacco Section goal of 90% m housing to be non-smoking.

Work on legislation to enforce EPA’s Renovate Right Rule

Include “environmental insults” into the legislation

Begin implementation of Strategic plan

Develop incentives for communities to work together (regionalization)
<table>
<thead>
<tr>
<th>Year 3 Activities</th>
<th>S3</th>
<th>M3</th>
<th>R3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>State legislature adopt Int’l Property Maintenance Code</td>
<td>Review and update local codes consistent with IPMC</td>
<td>Partner with larger community to provide services if needed</td>
</tr>
<tr>
<td></td>
<td>Fund enforcement via local CVT Inspections</td>
<td>Report EBL/investigation/renovation information back to the public</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop a new enforcement strategy with court/prosecutor input</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Beyond</th>
<th>SB</th>
<th>MB</th>
<th>RB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
## d. Needs Assessment

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Statewide Activities</th>
<th>Metropolitan (Large City) Activities</th>
<th>Rural (Small City) Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 2 Activities</strong></td>
<td>S2</td>
<td>M2</td>
<td>R2</td>
</tr>
</tbody>
</table>
| | • Develop policy and procedure for collecting results of all healthy homes assessments performed in Michigan.  
• Tie race/ethnicity information health condition and hazard data to identify disparities in home environments.  
• Identify mechanisms to capture data on environmental hazards such as mold, bed bugs, and other pests.  
• Identify mechanisms to capture data on structural deficiencies.  
• Seek funding for lead abatement, radon abatement, and weatherization.  
• Identify sources for products and funding for home safety/home repair.  
• Work with the appropriate State agency to develop health-based standards for VOCs.  
• Evaluate how to use existing data to guide distribution of funding and resources, when available. | | |
<p>| <strong>Year 3 Activities</strong> | S3 | M3 | R3 |
| | • Improve policy regarding radon data collection. | | • Work with DEQ to analyze existing data in Wellogic, the State’s groundwater database, to generate updated GIS maps. |</p>
<table>
<thead>
<tr>
<th>Beyond Activities</th>
<th>SB</th>
<th>MB</th>
<th>RB</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Explore ways to expand the healthy homes concept to address need for safe and supportive physical, chemical and built environments.</td>
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</tr>
</tbody>
</table>
Appendix D. Asset Map

a. Current Funding

<table>
<thead>
<tr>
<th>Category</th>
<th>Source</th>
<th>Description</th>
<th>Department</th>
<th>Program</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>HHS</td>
<td>Medicaid</td>
<td>State</td>
<td>$100,000</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Federal</td>
<td>$200,000</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>DOE</td>
<td>Elementary</td>
<td>$300,000</td>
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<tr>
<td></td>
<td></td>
<td>Secondary</td>
<td>$400,000</td>
<td></td>
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</tr>
<tr>
<td>Infrastructure</td>
<td>DOT</td>
<td>Roadway</td>
<td>$500,000</td>
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<tr>
<td></td>
<td></td>
<td>Bridge</td>
<td>$600,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
b. Possible Additional Future Funding (Tab 2)

<table>
<thead>
<tr>
<th>Category: General Funding Sources (sources not specific to a particular hazard or health outcome, ie. State General Fund, HUD Healthy Homes Production)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General Funding Source 1</td>
</tr>
<tr>
<td>2. General Funding Source 2</td>
</tr>
<tr>
<td>3. General Funding Source 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category: Funding Specific to a Particular Health Outcome/Condition (ie. funding to decrease lead poisoning)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Funding Source 1</td>
</tr>
<tr>
<td>2. Funding Source 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category: Contaminant Free</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Lead-based paint</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category: Pest Free, Maintained</th>
</tr>
</thead>
<tbody>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Category: Safe</th>
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</table>

<table>
<thead>
<tr>
<th>Additional Topics:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Studies/Research</td>
</tr>
<tr>
<td>Nursing Case Management (managing the coordination of services)</td>
</tr>
</tbody>
</table>
Appendix E. Current & Potential Future Partners

Federal Government

Centers for Disease Control & Prevention (CDC)
Department of Housing and Urban Development (HUD)
Environmental Protection Agency (EPA)

National Organizations:

American Cancer Society
American Lung Association
Coalition to End Childhood Lead Poisoning
Habitat for Humanity
National Center for Healthy Housing

State Government

Children's Special Health Care Services (CSHCS)
Michigan Department of Community Health (MDCH)
  Asthma Prevention and Control Program
  Bureau of Epidemiology
  Health Disparities Reduction and Minority Health Section
  Healthy Homes & Lead Poisoning Prevention Program
  Healthy Homes Section
  Home Visitation Program
  Injury and Violence Prevention Section
  Maternal Infant Health Program
  Medical Services Administration (Medicaid)
  Office of Services to the Aging
  Tobacco Control Program
  Trace Metals Laboratory
  WIC
Michigan Department of Education (DOE)
Michigan Department of Environmental Quality (DEQ)
Michigan Department of Human Services (DHS)
  Weatherization Assistance Program
Michigan State Housing Development Authority (MSHDA)

State Organizations

The Asthma and Allergy Foundation of America - Michigan Chapter (AAFA-MI)
Michigan Environmental Council (MEC)
Michigan Public Health Institute (MPHI)

City Institutions

Detroit, City of
Detroit Department of Health and Wellness Promotion
Grand Rapids, City of
Grand Rapids Housing Commission
Lansing, City of
Lansing Housing Commission
Lansing Office of Code Compliance

County Institutions

Barry-Eaton District Health Department
Berrien County Health Department
Genesee County Health Department
Ingham County Health Department
Kalamazoo County Health & Community Services Department
Kent County Health Department
Oakland County Health Division
Saginaw County Department of Public Health
Wayne County Health Department

Philanthropic

The Kresge Foundation
The Skillman Foundation

Cultural Institutions

Black Child and Family Institute (Lansing)
Greater Lansing African American Health Institute
Hmong American Community Inc. (Lansing)
Islamic Center of East Lansing
Jewish Federations of North America: (Greater Lansing, Detroit and other cities)
Lansing Latino Health Alliance (LLHA)
Lutheran Child and Family Services of Michigan (statewide)
MSU Office of International Students and Scholars
Native American and Indian Affairs Commission (national)
St. Vincent Catholic Charities Refugee Services Program (Lansing area)
Non Profit Organizations and Coalitions

Asthma Network of West Michigan
Capitol Area Partners for Smoking Cessation
ClearCorps/Detroit
Community Rebuilders (Grand Rapids)
Data Driven Detroit
Detroit Lead Safe Partnership
Detroiter Working for Environmental Justice
Ezekiel Project of Saginaw
First Steps: Children’s Healthcare Access Program (Kent County)
Focus: HOPE (Detroit)
Genesee County Asthma Network (affiliated with Hurley Medical Center)
Greater Lansing Housing Coalition
Green and Healthy Homes Initiative (Detroit and Flint)
Green Door Initiative (Detroit)
Healthy Homes Coalition of West Michigan (Grand Rapids)
Home Repair Services of Kent County
Kent County Renters’ Alliance
Lansing Area Safety Council
LINC Community Revitalization, Inc. (Grand Rapids)
Michigan 2-1-1 – MI Association of United Ways
Michigan Community Action Agency Association
Michigan Energy Options (East Lansing and Marquette)
Michigan League for Human Services – Kids Count
Michigan Minority Health Coalition
Michigan Works
Mid-Michigan Asthma Coalition
Rebuilding Together (Ingham County)
Safe Kids Michigan
Salvation Army (statewide)
SouthEast Michigan Regional Energy Office
Telamon Corporation (Lansing)
Tri-County Office on Aging (Clinton, Eaton and Ingham Counties)
Volunteers of America (Lansing and Southfield)
WARM Training Center (Detroit)
Wayne Metro Community Action Agency
Young Detroit Builders

Hospitals/Clinics

Asthma and Allergy Center, Ingham County
Carefree Medical Clinic, Ingham County
Children’s Hospital of Michigan (Detroit)
Community Mental Health, Ingham County
DeVos Children’s Hospital (Grand Rapids)
Spectrum Health (Grand Rapids)
McLaren - Greater Lansing (formerly Ingham Regional Medical Center)
Michigan State University, Department of Pediatric Pulmonology
Okemos Allergy Center
Pulmonary and Critical care Consultants (Lansing)
Sparrow Hospital (Lansing)
Spectrum Health (Grand Rapids)

Health Plans

Blue Cross Complete of Michigan
Care Source
CoventryCares of Michigan
HealthPlus Partners, Inc.
Ingham Health Plan
McClaren Health Plan
Medical Access Program.
Meridian Health Plan of Michigan
Michigan Association of Health Plans
Midwest Health Plan
Molina Healthcare of Michigan
PHP – Family Care
Priority Health Government Programs, Inc.
ProCare Health Plan
Total Health Care
United Healthcare Community Plan
Upper Peninsula Health Plan

Universities

Grand Valley State University, Johnson Center for Philanthropy
Michigan State University, College of Nursing
Michigan State University, Institute for Health Care Studies
Michigan State University, Integrated Pest Management Resources
MSU Extension – Building Strong Families
Wayne State University, Center for Urban Studies
Wayne State University, Institute for Environmental Health Sciences

Regulatory

Michigan Association of Code Enforcement Officers
Michigan Association of Housing Officials

Legal

115
The Smoke-Free Environments Law Project (statewide)
Wayne County Prosecutor’s Office

Property Owners

Rental Property Owners Association of Kent County

Childcare/Early Learning

Early On® Michigan
Michigan Head Start Association
Michigan 4C (Community Coordinated Child Care) Association

Neighborhood Groups & Community Centers

Allen Neighborhood Center, Lansing
Baker Donora Center, Lansing
Baxter Community Center, Grand Rapids
Central Woodward/North End Collaborative, Detroit
Creston Neighborhood Association, Grand Rapids
Cristo Rey Community Center, Lansing
Detroit Local Initiatives Support Corporation
Garfield Park Neighborhoods Association, Grand Rapids
Heritage Hill Association, Grand Rapids
Lansing Neighborhood Council
North West Initiative, Lansing
Roosevelt Park Neighborhood Association, Grand Rapids
South Side Community Coalition, Lansing
South West Area Neighbors (SWAN), Grand Rapids
West Grand Neighborhood Organization, Grand Rapids

Energy Companies

Consumers Energy
DTE Energy
Inspired Green
Appendix F. Figures

Figure 1: Blood Lead Testing in Michigan, Children < Age 6

Figure 2: Blood Lead Testing in Michigan, Children 1 & 2 Years of Age

Blood Lead Testing in Michigan, 1998 - 2011
Children One & Two Years of Age


February 20, 2012   Source: MDCH Data Warehouse

Figure 3: Blood Lead Testing by Michigan County

Figure 4: Asthma Deaths by Michigan County

Deaths Due to Asthma by County
Michigan, 2010

Source: 2010 Death File
Vital Records and Health Statistics Section,
Michigan Department of Community Health
Figure 5: Asthma Prevalence by Zip Code in Detroit, 2010

Figure 6: Unintentional Fall Injury Death Rates in Michigan

Age-adjusted Unintentional Fall Injury Death Rates
By Year of Death, Michigan and U.S. Residents, 1990-2006

Change to ICD-10 coding

Figure 7: Unintentional Fire/Flame/Smoke Injury Death Rates in Michigan

Age-adjusted Unintentional Fire/Flame/Smoke Injury Death Rates
By Year of Death, Michigan and U.S. Residents, 1990-2006

Figure 8: Unintentional Poisoning Death Rates in Michigan

Age-adjusted Unintentional Poisoning Death Rates
By Year of Death, Michigan and U.S. Residents, 1990-2006

Rates are the number of deaths per 100,000 population.
1990-1998 data based on ICD-9 codes: E850 – E859
1999-2006 data based on ICD-10 codes: X40 – X49
Sources: Division for Vital Records and Health Statistics, MDCH
Web-based Injury Statistics Query and Reporting System, U.S. Centers for Disease Control and Prevention
Population Estimates released by the National Center for Health Statistics, CDC

Figure 9: Unintentional Suffocation/Strangulation Death Rates in Michigan

Age-adjusted Unintentional Suffocation/Strangulation Death Rates
By Year of Death, Michigan and U.S. Residents, 1990-2006

Figure 10: Unintentional Poisoning: Age–Adjusted Death Rates in Michigan

2000-2006, Michigan
Age-adjusted Death Rates per 100,000 Population
Poisoning, Unintentional, All Races, All Ethnicities, Both Sexes, All Ages
Annualized Age-adjusted Rate for Michigan: 5.07

Produced by: Office of Statistics & Programming, National Center for Injury Prevention & Control, CDC
Data Sources: NCES National Vital Statistics System for numbers of deaths; US Census Bureau for population estimates.

Reports for All Ages include those of unknown age.
* Rates based on 20 or fewer deaths may be unstable. These rates are suppressed for counties (see legend above); such rates in the title have an asterisk.
The standard population for age-adjustment represents the year 2000, all races, both sexes.
Figure 11: Unintentional Residential Fire/Flame: Age–Adjusted Death Rates in Michigan

2000–2006, Michigan
Death Rates per 100,000 Population
Residential Fire/Flame, Unintentional, All Races, All Ethnicities, Both Sexes, All Ages
Annualized Crude Rate for Michigan: 1.15

Produced by: Office of Statistics & Programming, National Center for Injury Prevention & Control, CDC
Data Sources: NCES National Vital Statistics System for numbers of deaths; US Census Bureau for population estimates.

Reports for All Ages include those of unknown age.
* Rates based on 20 or fewer deaths may be unstable. These rates are suppressed for counties (see legend above), such rates in the title have an asterisk.

Figure 12: Unintentional Suffocation: Age–Adjusted Death Rates in Michigan

Produced by: Office of Statistics & Programming, National Center for Injury Prevention & Control, CDC
Data Sources: NCES National Vital Statistics System for numbers of deaths; US Census Bureau for population estimates.
Figure 13: Unintentional Fall: Age–Adjusted Death Rates in Michigan

2000-2006, Michigan
Age-adjusted Death Rates per 100,000 Population
Fall, Unintentional, All Races, All Ethnicities, Both Sexes, All Ages
Annualized Age-adjusted Rate for Michigan: 6.61

Reports for All Ages include those of unknown age.
* Rates based on 20 or fewer deaths may be unstable. These rates are suppressed for counties (see legend above); such rates in the title have an asterisk.
The standard population for age-adjustment represents the year 2000, all races, both sexes.

Produced by: Office of Statistics & Programming, National Center for Injury Prevention & Control, CDC
Data Sources: NCES National Vital Statistics System for numbers of deaths; US Census Bureau for population estimates.
No map available from CDC for hot objects/substances. Data for all counties is suppressed/undefined.
Figure 14: Lung & Bronchus Cancer in Michigan

Lung and Bronchus Cancer: 2008
Age-adjusted incidence rate
All ages, races, sexes

Michigan Rate: 68.5 per 100,000
Michigan ranked 30th out of 51 states/territories

Source: http://apps.nccd.cdc.gov/DCPC_INCA/DCPC_INCA.aspx

Notes:
Confidence interval (CI): Range of values for a rate that will include the true value of the rate a given percentage of the time. Example: 95% CI includes the true value of the rate 95% of the time.
Urinary bladder cases include invasive and in situ.
ONS – Other Nervous System; NOS – Not Otherwise Specified; IBD – Intrahepatic Bile Duct.

Footnotes:
* Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. standard population (19 age groups – Census P25–1130).
** Louisiana data presented on this Website differs from data presented by the Louisiana Tumor Registry and the SEER Program. See Technical Notes.
† Data are from selected statewide and metropolitan area cancer registries that meet the data quality criteria for all invasive cancer sites combined. See registry-specific data quality information. Rates cover approximately 100% of the U.S. population.
‡ Invasive cancers only
Figure 15: Lung Cancer Incidence Rates by County, 1998-2007
Figure 16: Lung Cancer Mortality Rates by County, 1999-2008

Age-adjusted Lung Cancer Mortality Rates (per 100,000) by County, Michigan 1999-2008


Michael D. Carr
Chronic Disease and Injury Control Division GIS Team
July 2012
Figure 17: Regional Estimates of Adults with Disability in Michigan, 2008-2010

Regional Estimates of Adults with Disability
Michigan, 2008-2010

Disability is defined as "the proportion of adults who reported being limited in any activities because of physical, mental, or emotional problems, or reported that they required use of special equipment (such as a cane, a wheelchair, a special bed, or a special telephone) due to a health problem."

Region and Total Percent

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region 1</td>
<td>23.0%</td>
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<tr>
<td>Region 2</td>
<td>27.9%</td>
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<tr>
<td>Region 3</td>
<td>24.6%</td>
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<td>Region 11</td>
<td>26.9%</td>
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<tr>
<td>Region 12</td>
<td>25.3%</td>
</tr>
</tbody>
</table>

Source: Michigan Department of Community Health
Table 7, Michigan Behavioral Risk Factor Survey, 2008 - 2010 Combined

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Wayne State University
A. L. Campos
Appendix G. Work Plan Fully Annotated

I. Information Gathering and Public Information—Public Choice

GOAL: Gather, compile, and analyze information to facilitate public information campaigns and public choice.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Work Group</th>
<th>Rank</th>
<th>Scope</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy Housing &amp; Lead Poisoning Surveillance System (HHLPSS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finish implementation of HHLPSS</td>
<td>Surveillance</td>
<td>1</td>
<td>Statewide</td>
<td>HHLPP</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Train local health dept. staff on HHLPSS</td>
<td>Surveillance</td>
<td>2</td>
<td>Statewide</td>
<td>HHLPP</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Continue collection, storage &amp; distribution of legally-required lead data</td>
<td>Surveillance</td>
<td>N/A</td>
<td>Statewide</td>
<td>HHLPP</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Maintain HHLPSS and work with labs on direct HL7 imports</td>
<td>Surveillance</td>
<td>N/A</td>
<td>Statewide</td>
<td>HHLPP</td>
<td>Beyond 2014</td>
</tr>
<tr>
<td>Expand training to other users</td>
<td>Surveillance</td>
<td>N/A</td>
<td>Statewide</td>
<td>HHLPP</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Continue use of HHLPSS</td>
<td>Surveillance</td>
<td>N/A</td>
<td>Statewide</td>
<td>HHLPP</td>
<td>Beyond 2014</td>
</tr>
<tr>
<td>Healthy Homes Screening Tool (HHST)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify funds for Pilot Study to assess reliability and validity of HHST</td>
<td>PPCCT</td>
<td>1</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Identify Pilot Communities and train users</td>
<td>PPCCT</td>
<td>2</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Complete Pilot Study</td>
<td>PPCCT</td>
<td>4</td>
<td>Metro Rural</td>
<td>Local Health Departments</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Analyze Data</td>
<td>PPCCT</td>
<td>5</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2012-</td>
</tr>
</tbody>
</table>

32 The language for some of the Year 2 activities included in this work plan is slightly different than the language included in the survey.

33 For statewide (see “scope” column), activities are ranked according to their priority relative to other activities proposed by the same work group (see “work group” column). For metropolitan and rural respectively, activities are ranked according to their priority relative to the activities proposed by all work groups for the same area.
<table>
<thead>
<tr>
<th>Activity Description</th>
<th>Method</th>
<th>Sites</th>
<th>Agency</th>
<th>Year(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify additional sites/programs and train users</td>
<td>N/A</td>
<td>N/A</td>
<td>Statewide</td>
<td>MDCH</td>
</tr>
<tr>
<td>Implementation use in all sites</td>
<td>Surveillance</td>
<td>1</td>
<td>Metro</td>
<td>MDCH / Universities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>Rural</td>
<td></td>
</tr>
<tr>
<td>Incorporate HHST into code inspections</td>
<td>N/A</td>
<td>N/A</td>
<td>Statewide</td>
<td>Code Enforcement Officials</td>
</tr>
<tr>
<td>Revise HHST as needed</td>
<td>PPCCT</td>
<td>4</td>
<td>Metro</td>
<td>MDCH / Universities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>Rural</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test Reliability and Validity (Follow-Up)</td>
<td>PPCCT</td>
<td>8</td>
<td>Metro</td>
<td>MDCH / Universities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
<td>Rural</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluate annually</td>
<td>PPCCT</td>
<td>10</td>
<td>Statewide</td>
<td>MDCH / Universities</td>
</tr>
<tr>
<td>Obtain new sources of data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collect results of all healthy homes screens and assessments</td>
<td>Needs</td>
<td>1</td>
<td>Statewide</td>
<td>MDCH</td>
</tr>
<tr>
<td></td>
<td>Assessment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use MDCH Data Warehouse (asthma, injuries, lung cancer)</td>
<td>Surveillance</td>
<td>2</td>
<td>Statewide</td>
<td>HHLPP</td>
</tr>
<tr>
<td>Use Michigan Inpatient Database (Asthma, Injuries)</td>
<td>Surveillance</td>
<td>4</td>
<td>Statewide</td>
<td>MDCH / Hospitals</td>
</tr>
<tr>
<td>Use 911 EMS data (In Detroit)</td>
<td>Surveillance</td>
<td>8</td>
<td>Metro</td>
<td>MDCH / DHWP / DFD</td>
</tr>
<tr>
<td>Collect ER data</td>
<td>Surveillance</td>
<td>N/A</td>
<td>Statewide</td>
<td></td>
</tr>
<tr>
<td>Project Description</td>
<td>Phase</td>
<td>Region</td>
<td>Responsible Parties</td>
<td>Time Frame</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------</td>
<td>--------</td>
<td>---------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Explore other data sources for environmental hazards (mold, pests, radon, ETS, poisons, structural deficiencies)</td>
<td>Needs Assessment</td>
<td>3</td>
<td>Statewide</td>
<td>MDCH / Local Health Departments</td>
</tr>
<tr>
<td>Expand 911 EMS Data Beyond Detroit</td>
<td>Surveillance</td>
<td>5</td>
<td>Metro</td>
<td>MDCH / Local EMS</td>
</tr>
<tr>
<td>Work with DEQ to analyze existing groundwater database to generate updated maps</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Continue to use Michigan Inpatient Database (Asthma, Injuries)</td>
<td>Surveillance</td>
<td>4</td>
<td>Statewide</td>
<td>MDCH / Hospitals</td>
</tr>
<tr>
<td>Improve policy regarding radon data collection</td>
<td>Surveillance</td>
<td>N/A</td>
<td>Statewide</td>
<td>MDEQ</td>
</tr>
</tbody>
</table>

### Data Use and Dissemination

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Phase</th>
<th>Region</th>
<th>Responsible Parties</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use existing data to guide distribution of funding and resources</td>
<td>Needs Assessment</td>
<td>4</td>
<td>Statewide</td>
<td>MDCH</td>
</tr>
<tr>
<td>Use surveillance data to evaluate programs</td>
<td>Surveillance</td>
<td>5</td>
<td>Statewide</td>
<td>MDCH</td>
</tr>
<tr>
<td>Identify racial/ethnic disparities in home environments</td>
<td>Needs Assessment</td>
<td>6</td>
<td>Statewide</td>
<td>MDCH</td>
</tr>
<tr>
<td>Create Annual Healthy Homes Data Report</td>
<td>Surveillance</td>
<td>3</td>
<td>Statewide</td>
<td>HHLPP</td>
</tr>
<tr>
<td>Include special emphasis on children with BLLs 5-9 and their distribution across Michigan</td>
<td>SP&amp;P</td>
<td>1</td>
<td>Statewide</td>
<td>HHLPP</td>
</tr>
<tr>
<td>Expand/Promote the Healthy Homes Website</td>
<td>SP&amp;P</td>
<td>38</td>
<td>Statewide</td>
<td>MDCH</td>
</tr>
<tr>
<td>Continue use of surveillance data to evaluate programs</td>
<td>Surveillance</td>
<td>5</td>
<td>Statewide</td>
<td>MDCH</td>
</tr>
<tr>
<td>Produce a series of materials (handouts, PowerPoints, executive summaries, videos, press releases)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
that could be provided to state and local officials to help them understand the scale of the problem.

Develop legislative presentations and receptions to educate legislators about the scale of the problem

<table>
<thead>
<tr>
<th>Research</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop ways to implement primary prevention strategies</td>
<td>SP&amp;P</td>
<td>23</td>
<td>Statewide</td>
</tr>
<tr>
<td>Examine MEAP/SAT scores and hospital records associated with healthy homes related conditions</td>
<td>General Comments</td>
<td>N/A</td>
<td>Rural</td>
</tr>
</tbody>
</table>

Public Information

| Incorporate social justice and health disparity message into education and advocacy | SP&P | 34 | Statewide | 2012-2013 |
| Promote having code enforcement officers provide informational handouts to residents | General Comments | N/A | Statewide | Local Building Officials | 2012-2013 |
| Help families identify safe and healthy housing through websites and checklists such as the HHST | N/A | N/A | N/A | N/A | 2012-2013 |

II. Regulation to require risks to be reduced

GOAL: Expand and fully implement regulation of healthy homes hazards in Michigan, concentrating on implementation through property maintenance codes in the short run.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Work Group</th>
<th>Rank</th>
<th>Scope</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop an overall strategy for expanding regulatory authority</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Develop health-based standards</td>
<td>Needs</td>
<td>8</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
<tr>
<td>for VOCs</td>
<td>Assessment</td>
<td>Rank</td>
<td>Scope</td>
<td>Resources</td>
<td>Year</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------------</td>
<td>------</td>
<td>---------------</td>
<td>------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Advocate that International Property Maintenance Code (IPMC) be amended to include healthy homes concepts</td>
<td>SP&amp;P</td>
<td>31</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Promote State, County, and local adoption of IPMCs</td>
<td>SP&amp;P</td>
<td>31</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Advocate for 90% of public housing commissions with smoke-free policy</td>
<td>SP&amp;P</td>
<td>40</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Identify best healthy homes elements of existing local housing codes, for adoption by other communities</td>
<td>SP&amp;P</td>
<td>41</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Recommend that HHST be used at certification of day cares and pre-schools</td>
<td>SP&amp;P</td>
<td>45</td>
<td>Statewide</td>
<td>MDCH / Local Health Departments</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Develop a new enforcement strategy with input from prosecutors and code enforcement officials</td>
<td>SP&amp;P</td>
<td>11</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2013-2014</td>
</tr>
</tbody>
</table>

III. Engagement of groups and statewide collaboration

a. Building Local Coalitions

GOAL: Replicate existing successful local coalitions in a broad range of mid and small sized Michigan communities.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Work Group</th>
<th>Rank</th>
<th>Scope</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document and participate in local collaboratives</td>
<td>SP&amp;P</td>
<td>2</td>
<td>Metro</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Seek federal and state funding to expand local community collaboratives</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2012-2013</td>
</tr>
</tbody>
</table>
### Increase the range of participation in local collaboratives--churches, community development corporations, parents, schools, foundations, medical care providers, and contractors

<table>
<thead>
<tr>
<th>Activity</th>
<th>Work Group</th>
<th>Rank</th>
<th>Scope</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2012-2013</td>
</tr>
</tbody>
</table>

### Train communities on how to braid resources

<table>
<thead>
<tr>
<th>Activity</th>
<th>Work Group</th>
<th>Rank</th>
<th>Scope</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SP&amp;P</td>
<td>2</td>
<td>Metro</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
</tbody>
</table>

### Conduct local asset mapping for referrals

<table>
<thead>
<tr>
<th>Activity</th>
<th>Work Group</th>
<th>Rank</th>
<th>Scope</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PPCCT</td>
<td>7</td>
<td>Metro</td>
<td>Local Collaboratives</td>
<td>2012-2013</td>
</tr>
</tbody>
</table>

### b. Expanding State Coalitions and Programs

**GOAL:** Expand state coalitions and programs to incorporate the spectrum of healthy homes hazards and outcomes.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Work Group</th>
<th>Rank</th>
<th>Scope</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider transforming the Michigan Alliance for Lead Safe Housing (MIALSH) into the Michigan Alliance for Healthy Housing</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Emphasize participation of local collaboratives in the Alliance</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Extend Advisory Group and expand partners to advise, collaborate and educate new legislation, initiatives and policy changes</td>
<td>SP&amp;P</td>
<td>10</td>
<td>Statewide</td>
<td>HHLPP</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Work with other state programs to advise on healthy housing issues</td>
<td>SP&amp;P</td>
<td>12</td>
<td>Statewide</td>
<td>HHLPP</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Promote use of 211 to address home hazard inquiries</td>
<td>SP&amp;P</td>
<td>16</td>
<td>Statewide</td>
<td></td>
<td>2012-2013</td>
</tr>
<tr>
<td>Seek physician advocates for</td>
<td>SP&amp;P</td>
<td>36</td>
<td>Statewide</td>
<td></td>
<td>2012-2013</td>
</tr>
</tbody>
</table>
**IV. Resource Development**

**GOAL:** To identify resources to support the overall development of the healthy homes function in the State of Michigan.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Work Group</th>
<th>Rank</th>
<th>Scope</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seek funding for lead abatement, radon abatement, and weatherization</td>
<td>Needs Assessment</td>
<td>2</td>
<td>Statewide</td>
<td>Local Health Departments</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Advocate that Medicaid and insurance providers pay for home assessments for at-risk children</td>
<td>SP&amp;P</td>
<td>5</td>
<td>Statewide</td>
<td></td>
<td>2012-2013</td>
</tr>
<tr>
<td>Identify sources of products and funding for home safety and repair</td>
<td>Needs Assessment</td>
<td>5</td>
<td>Statewide</td>
<td>Local Health Departments/ Nonprofits</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Explore alternative means of reimbursement for case management that reflect actual costs of services</td>
<td>PPCCT</td>
<td>N/A</td>
<td>Statewide</td>
<td></td>
<td>2012-2013</td>
</tr>
<tr>
<td>Seek on-going State funding for lead surveillance case management and education/outreach</td>
<td>MDCH leadership</td>
<td>N/A</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Identify additional sources of funding for WIC to support healthy homes education</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Explore how MSHDA can support healthy housing renovations</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Expand the use of insurance payments and community benefit agreements where cost effectiveness demonstrates savings for the healthcare</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2012-2013</td>
</tr>
<tr>
<td>community</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2012-2013</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----------</td>
</tr>
<tr>
<td>Pursue FEMA and other nontraditional federal funding streams to support healthy homes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

V. Service Delivery

GOAL: To increase and develop service delivery across a range of healthy homes sites and projects.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Work Group</th>
<th>Rank</th>
<th>Scope</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving existing service delivery models</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide referrals based on HHST</td>
<td>PPCCT</td>
<td>5</td>
<td>Metro</td>
<td>Local Health Departments</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Integrate behavior change models into education, training, and home visits</td>
<td>SP&amp;P</td>
<td>44</td>
<td>Statewide</td>
<td>MDCH / Local Health Departments</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Use existing case management protocols for EBLLs, EBL investigations, lead remediation and asthma</td>
<td>MDCH Leadership</td>
<td>N/A</td>
<td>Statewide</td>
<td>MDCH / Local Health Departments</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Update protocols and provider guidelines as necessary</td>
<td>MDCH Leadership</td>
<td>N/A</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Educate clinicians on new CDC recommendations, esp. regarding education of families and home assessments</td>
<td>SP&amp;P</td>
<td>4</td>
<td>Statewide</td>
<td>MDCH / Local Health Departments</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Offer NCHH Healthy Homes Specialist and trainings to local staff in health, code compliance, weatherization and related fields</td>
<td>SP&amp;P</td>
<td>14</td>
<td>Statewide</td>
<td>MDCH</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Incorporate 7 principles of healthy housing in educational presentations</td>
<td>SP&amp;P</td>
<td>39</td>
<td>Statewide</td>
<td>HHLPP</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Disseminate Comprehensive Healthy Homes Model</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>-----------------------------------------------</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Identify successful local models</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2012-2013</td>
</tr>
<tr>
<td><strong>Develop training modules on</strong></td>
<td>SP&amp;P</td>
<td>11</td>
<td>8</td>
<td>Statewide Rural</td>
<td>HHLPP</td>
</tr>
<tr>
<td>&quot;How to Implement a Healthy Homes Program in Your Community&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Identify cities and rural areas to target next sites</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2013-2014</td>
</tr>
<tr>
<td><strong>Build new local collaboratives</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2013-2014</td>
</tr>
<tr>
<td><strong>Support new collaboratives</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix H. HHLPP Strategic Plan Survey Report

Survey: HHLPP Statewide Strategic Plan for Healthy Homes

Instructions:

We have sent this survey to you to facilitate the strategic planning process. This survey is intended to identify proposed activities that can actually be implemented given resources. It is also intended to prioritize those activities.

The activities listed are those that have been proposed by the HHLPP work groups (see activity key included with questions below):

- **Needs Assessment**: activities labeled with a #1
- **Surveillance**: activities labeled with a #2
- **Primary Prevention/Case Coordination/Training**: activities labeled with a #3
- **Strategic Partnerships/Policy**: activities labeled with a #4

The survey is organized by scope into 3 major sections of activity: Statewide, Metropolitan (Large Cities), and Rural (Small Cities). Each major section is divided into 3 subsections of resource availability: Year 2 (2012-2013), Year 3 (2013-2014), and Beyond 2014. For each scope, you will be asked to select and prioritize activities that should be supported for each period of resource availability.

**Statewide Activities**

1) Statewide Activities from the Needs Assessment Group

Year: 2 (2012-2013)

These are activities that were identified by the needs assessment group as possible responses to the needs assessment. Please identify activities from the left column that could be implemented across the entire State of Michigan considering all federal, state and local resources that are available from now through the 2012-2013 grant cycle. Once identified, please rank the activities according to the funding available and the relative importance of the activity. You may rank the activities by dragging and dropping them up or down into the right hand column.

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop policy and procedure for collecting results of all healthy homes assessments performed in Michigan.</td>
<td>183</td>
<td>1</td>
</tr>
</tbody>
</table>
1b) Please list any activities not included on the list above that you believe should be supported across the entire State of Michigan using resources that are available from now through the 2012-2013 grant cycle.

2a) Statewide Activities from the Surveillance Group

Year: 2 (2012-2013)

Please identify the surveillance activities from the left column that could be implemented across the entire State of Michigan considering all federal, state and local resources that are available from now through the 2012-2013 grant cycle. Once identified, please rank the activities according to the funding available and the relative importance of the activity. You may rank the activities by dragging and dropping them up or down into the right hand column.

Total Respondents:

1 Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.
2b) Please list any surveillance activities not included on the list above that you believe should be supported across the entire State of Michigan using resources that are available from now through the 2012-2013 grant cycle.

<table>
<thead>
<tr>
<th>Count</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assure the ongoing availability of the state's surveillance system. Highest priority.</td>
</tr>
<tr>
<td>1</td>
<td>Continue to collect lead data</td>
</tr>
<tr>
<td>1</td>
<td>Gain access to ER visit data.</td>
</tr>
<tr>
<td>1</td>
<td>Radon testing data</td>
</tr>
<tr>
<td>1</td>
<td>Use MICIR to chart immunization records.</td>
</tr>
<tr>
<td></td>
<td>Train local health departments, physician offices, healthy home programs, code compliance, home visiting programs, asthma visiting programs, lead remediation, weatherization, to use HHLPSS data base to enter home hazards.</td>
</tr>
<tr>
<td>1</td>
<td>I don't think there are enough analytic resources or data available that are home based v. person-based.</td>
</tr>
<tr>
<td>1</td>
<td>Communicate finding on EBL investigations to other Public Health Nurses. Case notes, all lead results past and present - Blood Lead Levels</td>
</tr>
</tbody>
</table>

3a) Statewide Activities from the Primary Prevention/Case Coordination/Training Group

Year: 2 (2012-2013)

Please identify the primary prevention, case coordination and training activities from the left column that could be implemented across the entire State of Michigan considering all federal, state and local resources that are available from now through the 2012-2013 grant cycle. Once identified, please rank the activities according to the funding available and the relative importance of the activity. You may rank the activities by dragging and dropping them up or down into the right hand column.

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seek funding to test reliability &amp; validity of Healthy Homes Screening Tool (HHST)</td>
<td>138</td>
<td>1</td>
</tr>
<tr>
<td>Solicit volunteer communities</td>
<td>109</td>
<td>2</td>
</tr>
<tr>
<td>Local public health collects data from HHSTs</td>
<td>91</td>
<td>3</td>
</tr>
</tbody>
</table>
### Item Breakdown

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess HHST</td>
<td>86</td>
<td>4</td>
</tr>
<tr>
<td>Analyze the HHST data</td>
<td>70</td>
<td>5</td>
</tr>
<tr>
<td>Annual assessment of HHST utilization</td>
<td>46</td>
<td>6</td>
</tr>
</tbody>
</table>

**Total Respondents:**

1 Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

---

3b) Please list any primary prevention, case coordination, and training activities not included on the list above that you believe should be supported across the entire State of Michigan using resources that are available from now through the 2012-2013 grant cycle.

<table>
<thead>
<tr>
<th>Count</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Implement Case Management (nursing) protocols from new CDC recomendations</td>
</tr>
<tr>
<td>1</td>
<td>More training of the HHST</td>
</tr>
<tr>
<td>1</td>
<td>Test entry.</td>
</tr>
<tr>
<td>1</td>
<td>The HHST was not created to be a validated data collection tool, just for screening only.</td>
</tr>
<tr>
<td>1</td>
<td>Work to get more aggressive stance on addressing environmental controls for asthma coalitions, AIM.</td>
</tr>
<tr>
<td>1</td>
<td>Compile list of key stakeholders, initiate and maintain regular communication. Coming together events?</td>
</tr>
<tr>
<td>1</td>
<td>Explore alternate means to compensate for case coordination that better reflects actual costs to provide the service. Ties for being the highest priority.</td>
</tr>
<tr>
<td>1</td>
<td>Use existing case management protocols for EBLls, EBL investigations, lead remediation and asthma. Update protocols and provider guidelines as necessary.</td>
</tr>
<tr>
<td>1</td>
<td>Send Statement from State HHLPP Program to Health Departments, Partners, Lead Advocates regarding State Response to CDC Recommendations. Incorporate new CDC recommendations into Case Management for Lead Blood Test Results and Train, educate on lead protocols.</td>
</tr>
</tbody>
</table>

---

4a) Statewide Activities from the Strategic Partnerships & Policy Group

Year: 2 (2012-2013)

Please identify activities from the left column that could be implemented across the entire State of Michigan considering all federal, state and local resources that are available from now through the 2012-2013 grant cycle. Once identified, please rank the activities according to the funding available and the relative importance of the activity. You may rank the activities by dragging and dropping them up or down into the right hand column.
<table>
<thead>
<tr>
<th>Item</th>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine the number of children younger than 6 and with blood lead levels at or above 5 (\mu g/dL), and their distribution within the state and targeted areas.</td>
<td>1062</td>
<td>1</td>
</tr>
<tr>
<td>MDCH respond to new CDC recommendations with protocols for care of children with blood levels at or above 5 (\mu g/dL).</td>
<td>1017</td>
<td>2</td>
</tr>
<tr>
<td>Integrate new CDC recommendations (regarding the new EBL reference value change) into State MDCH program materials.</td>
<td>951</td>
<td>3</td>
</tr>
<tr>
<td>Educate clinicians on new CDC recommendations and help them to take the primary role in educating families about: primary prevention of lead exposure, promoting use of Healthy Homes assessment tool for pregnant women and children living in at risk home environments under age of 6 with priority children 0-2, having blood lead test of all children tested twice prior to age of 2.</td>
<td>807</td>
<td>4</td>
</tr>
<tr>
<td>Advocate that Medicaid and insurance providers recommend and pay for high-risk children's healthy home assessments.</td>
<td>673</td>
<td>5</td>
</tr>
<tr>
<td>Continue to advocate and educate state legislators on lead and Healthy Homes messages, and seek funding by state of Michigan for HHLPP program.</td>
<td>659</td>
<td>6</td>
</tr>
<tr>
<td>Seek sustainable funding to continue and expand lead &amp; asthma case management, lead and environment assessments, radon testing, tobacco smoke cessation and other Healthy home services.</td>
<td>650</td>
<td>7</td>
</tr>
<tr>
<td>MDCH HHLPP educating state programs, local health departments, and community organizations on new CDC guidelines.</td>
<td>640</td>
<td>8</td>
</tr>
<tr>
<td>Integrate new CDC recommendations regarding EBL reference value into program materials and educate state, county, local partners.</td>
<td>596</td>
<td>9</td>
</tr>
<tr>
<td>Continue the HHLPP Advisory Group of stakeholders and expand partners to advise, collaborate, and educate on new legislation, initiatives, programs, and policy changes, thus braiding state departments.</td>
<td>593</td>
<td>10</td>
</tr>
<tr>
<td>Develop power point presentation on healthy homes training modules &quot;How To implement a Healthy Homes program in your Community.&quot;.</td>
<td>529</td>
<td>11</td>
</tr>
<tr>
<td>Expand collaboration on other grant funded programs to advise on HHLPP issues.</td>
<td>513</td>
<td>12</td>
</tr>
<tr>
<td>Develop MDCH policy that all Healthy Home assessments be reported to State Surveillance Program and input into State HHLPS Surveillance data system.</td>
<td>512</td>
<td>13</td>
</tr>
<tr>
<td>Offer NCHH Healthy Homes Specialist and one day Healthy Homes training to community health workers, code compliance, weatherization, radon and other Healthy Homes advocates &amp; professionals.</td>
<td>465</td>
<td>14</td>
</tr>
<tr>
<td>Educate and advocate HHLPP Program to programs at State level who have home visiting programs to advance Healthy Homes concepts and use of Healthy Homes assessment tools.</td>
<td>436</td>
<td>15</td>
</tr>
<tr>
<td>Promote use of 211 as central phone contact to address home hazard inquiries from citizens of Michigan and to receive referrals to resources and services in state, local and community.</td>
<td>422</td>
<td>16</td>
</tr>
<tr>
<td>Train state and local programs on HHLPS Surveillance system.</td>
<td>410</td>
<td>17</td>
</tr>
<tr>
<td>Develop State recommended policy to identify pregnant mothers and new born children who live</td>
<td>407</td>
<td>18</td>
</tr>
<tr>
<td>Item</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
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</tr>
<tr>
<td>in at-risk homes to have lead and healthy home assessment</td>
<td></td>
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</tr>
<tr>
<td>Collaborate with Safe Kids Coalitions, MCA weatherization programs,</td>
<td></td>
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</tr>
<tr>
<td>Lead safe coalitions, asthma coalitions, faith based organizations,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and community coalitions.</td>
<td></td>
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<tr>
<td>Promote educational tools for landlords, tenants and citizens to</td>
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</tr>
<tr>
<td>address and educate on legal rights and resources.</td>
<td></td>
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</tr>
<tr>
<td>Develop State platform on health outcomes including lead poisoning,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>asthma, unintentional injuries, cancer, other health issues due to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>home hazards.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expand opportunities for cross training lead inspector/assessors,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>code compliance officers, renovation contractors, and other home</td>
<td></td>
<td></td>
</tr>
<tr>
<td>inspectors.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research ways to change focus to primary prevention of lead, asthma,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unintentional injuries and home hazard risk reduction and recommend</td>
<td></td>
<td></td>
</tr>
<tr>
<td>systems for implementation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advocate sharing of data between State agencies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assist, train, and advocate for Community Health Workers trained in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthy Homes principles to develop community Healthy Homes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coalitions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offer training to each local health department with goal of having</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a minimum of one person trained as a Healthy Homes specialist.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seek to enact and enforce health based housing standards.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthy Homes trained individual or staff to educate, train, and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>promote Healthy Homes training and to research, gather current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>legislative changes, new grants, programs and resources available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for healthy homes hazard services and to update 211.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expand HHLPP message to include pregnant women, newborns, children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-18, adults and senior citizens.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promote HHLPP principles at State health conferences.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support and advocate for International Property Maintenance Code to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>be amended with Appendix B adding healthy homes concepts and promote</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State, COUNTY, and local community acceptance of IPMC.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop model following success of Green and Healthy Homes initiatives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in Detroit and Flint as educational tool to train communities how to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>braid resources and services through state, and to link families to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>education and remediation opportunities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintain membership in Michigan Alliance for Lead Safe Housing and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>educate legislative advocates on Healthy Housing platform and legal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>advocacy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorporate social justice message and disparity data into all</td>
<td></td>
<td></td>
</tr>
<tr>
<td>materials, education, power points, social media, and programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>delivered.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work to demand protective national, state and local policy that a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>healthy home is a right for all citizens of Michigan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seek physician advocates for healthy home programs who have referred</td>
<td></td>
<td></td>
</tr>
<tr>
<td>families and seen results of Healthy Homes programs in Michigan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assist, promote and advocate objectives and goals of healthy housing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>partners.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>402</td>
<td>19</td>
</tr>
<tr>
<td>400</td>
<td>20</td>
</tr>
<tr>
<td>398</td>
<td>21</td>
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<td>393</td>
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<td>379</td>
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<td>293</td>
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<td>286</td>
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<td>283</td>
<td>36</td>
</tr>
<tr>
<td>281</td>
<td>37</td>
</tr>
</tbody>
</table>
### Item

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continue to expand and promote Healthy Homes Website at Michigan.gov</td>
<td>278</td>
<td>38</td>
</tr>
<tr>
<td>Incorporate HUD Healthy Housing 7 principles, Healthy Housing Rating Tool, State HHLPP Assessment into HHLPP education and materials developed.</td>
<td>276</td>
<td>39</td>
</tr>
<tr>
<td>Advocate for MDCH Tobacco Section goal of 90% of public housing commissions to have a smoke-free policy, including individual living units</td>
<td>268</td>
<td>40</td>
</tr>
<tr>
<td>Research and promote local housing models in State of Michigan (Grand Rapids, Lansing, Detroit,) and adoption of International Property Maintenance code.</td>
<td>260</td>
<td>41</td>
</tr>
<tr>
<td>Promote one application to apply for multiple programs connected by home hazard remediation, DHS services, and case management for health issues.</td>
<td>254</td>
<td>42</td>
</tr>
<tr>
<td>Expand and target resources for housing maintenance, repair, rehab and retrofit.</td>
<td>250</td>
<td>43</td>
</tr>
<tr>
<td>Learn and integrate behavior change models into training, education, Healthy Homes site visits, and advocacy.</td>
<td>233</td>
<td>44</td>
</tr>
<tr>
<td>Recommend approved Healthy Homes Assessment tool to be completed with day care, preschool and school enrollment form.</td>
<td>0</td>
<td>45</td>
</tr>
<tr>
<td>Provide approved Healthy Homes Assessment tool to home visiting programs and home inspection programs.</td>
<td>0</td>
<td>46</td>
</tr>
</tbody>
</table>

**Total Respondents:**

1. Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

4b) Please list any strategic partnerships and policy activities not included on the list above that you believe should be supported across the entire State of Michigan using resources that are available from now through the 2012-2013 grant cycle.

#### Count

<table>
<thead>
<tr>
<th>Count</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>This section was difficult, many duplicative items.</td>
</tr>
<tr>
<td>1</td>
<td>I believe the above list was too lengthy and we should concentrate on a few initiatives—which includes retrieval of data, combining like activities and grants and education and training.</td>
</tr>
<tr>
<td>1</td>
<td>The above question was too challenging! Could it be presented differently to obtain the info you are looking for??</td>
</tr>
<tr>
<td>1</td>
<td>Join Text for Baby to Inform Pregnant/Mothers of Newborns messages on Lead Poisoning, Asthma and Healthy Homes messages. Using CAMP as Model developed in Kent County, join, research and develop model to promote through State of Michigan Offer lead surveillance, healthy home education and services to grants seeking these services and advance asthma symptom connection to home triggers.</td>
</tr>
<tr>
<td>1</td>
<td>I think a good policy is to promote having building inspectors and code enforcement officers to provide handouts to tenants when inspections take place as I am almost certain most landlord's do not provide information at time of lease.</td>
</tr>
</tbody>
</table>
5a) Statewide Activities

Year: 3 (2013-2014)

Please identify activities from the left column that could be implemented across the entire State of Michigan using federal, state and local resources projected to be available for the 2013-2014 grant cycle. Once identified, please rank the activities according to the funding available and the relative importance of the activity. You may rank the activities by dragging and dropping them up or down into the right hand column. Activity Key: 1=Needs assessment 2=Surveillance work group 3=Primary prevention, case coordination, and training work group 4=Strategic partnerships & policy work group

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Create annual <strong>Healthy Homes</strong> data report on Lead, Asthma and Injuries statewide, plus hazard data from surveys. 2. Maintain HHLPSS (Lead plus HH hazards) work with labs on next stage</td>
<td>250</td>
<td>1</td>
</tr>
<tr>
<td>2. Use Michigan Inpatient Database to obtain ongoing data on hospitalizations (Asthma, Injuries). 3: Revise Healthy Homes Screening Tool (HHST) as needed</td>
<td>209</td>
<td>3</td>
</tr>
<tr>
<td>2. If possible, obtain ongoing data on lung cancer related to 2nd-hand smoke and radon. 4: Fund enforcement via local CVT inspections</td>
<td>89</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total Respondents:</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

5b) Please list any activities not included on the list above that you believe should be supported across the entire State of Michigan using resources projected to be available for the 2013-2014 grant cycle.
Count
Response
Continue training and education of HHLPPSS system and linking of data collected through programs statewide of home hazards and conditions to state HHLPPSS System Seek state departments sharing of data with HHLPPSS system

6a) Statewide Activities

Year(s): Beyond 2014

Please identify activities from the left column that could be implemented across the entire State of Michigan using federal, state and local resources projected to be available beyond 2014. Once identified, please rank the activities according to the funding available and the relative importance of the activity. You may rank the activities by dragging and dropping them up or down into the right hand column.

Activity Key:

1=Needs assessment
2=Surveillance work group
3=Primary prevention, case coordination, and training work group
4=Strategic partnerships & policy work group

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Explore ways to expand the healthy homes concept to address need for safe and supportive physical, chemical and built environments.</td>
<td>147</td>
<td>1</td>
</tr>
<tr>
<td>2: Create annual Healthy Homes data report on Lead, Asthma and Injuries statewide, plus hazard data from surveys.</td>
<td>140</td>
<td>2</td>
</tr>
<tr>
<td>2: Maintain HHLPPSS, with most labs using HL7 messaging to report lead results.</td>
<td>129</td>
<td>3</td>
</tr>
<tr>
<td>2: Use Michigan Inpatient Database to obtain ongoing data on hospitalizations (Asthma, Injuries).</td>
<td>122</td>
<td>4</td>
</tr>
<tr>
<td>2: Use surveillance data to evaluate effectiveness of the program in accordance with evaluation plan developed in collaboration with MSU IHCS.</td>
<td>121</td>
<td>5</td>
</tr>
<tr>
<td>3: Annual assessment of Healthy Homes Screening Tool (HHST) utilization</td>
<td>107</td>
<td>6</td>
</tr>
<tr>
<td>2: Use MDCH Data Warehouse to obtain ongoing data for the Medicaid population (Asthma, Injuries).</td>
<td>98</td>
<td>7</td>
</tr>
<tr>
<td>2: If possible, obtain ongoing data on lung cancer related to 2nd-hand smoke and radon.</td>
<td>52</td>
<td>8</td>
</tr>
</tbody>
</table>

Total Respondents:
Score is a weighted calculation. Items ranked first are valued higher than the
6b) Please list any activities not included on the list above that you believe should be supported across the entire State of Michigan using resources projected to be available beyond 2014.

**Metropolitan (Large City) Activities**

7a) Metropolitan (Large City) Activities

Year: 2 (2012-2013)

Please identify activities from the left column that could be implemented in major urban areas and surrounding areas in Michigan (i.e. Detroit, Lansing, Grand Rapids, etc) using resources that are available from now through the 2012-2013 grant cycle. Once identified, please rank the activities according to the funding available and the relative importance of the activity. You may rank the activities by dragging and dropping them up or down into the right hand column.

**Activity Key:**
- 1=Needs assessment
- 2=Surveillance work group
- 3=Primary prevention, case coordination, and training work group
- 4=Strategic partnerships & policy work group

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>4: Seek sustainable funding to continue and expand lead case management, to conduct lead and environmental assessments, radon testing, tobacco smoke cessation and other Healthy Home services.</td>
<td>190</td>
<td>1</td>
</tr>
<tr>
<td>4: Join and continue membership with both Detroit and Flint Green and Healthy Homes Initiative (GHHI), using their programs as a model, and assist with the expansion of similar programs to other large cities in Michigan.</td>
<td>176</td>
<td>2</td>
</tr>
</tbody>
</table>
| 4: Develop protocol and talking points to promote and educate the medical community, WIC, school based health centers, physicians, Medicaid, and health plans regarding the need for children to be tested twice between 0-2.  
  3: Volunteer participation in Healthy Homes Screening Tool (HHST) | 174 | 3 |
| 3: Provide referrals based on HHST scores & identified needs | 160 | 5 |
| 4: Collaborate with Safe Kids Coalitions, MCA weatherization programs, lead safe coalitions, | 158 | 6 |
7b) Please list any activities not included on the list above that you believe should be supported in major urban areas and surrounding areas in Michigan (i.e. Detroit, Lansing, Grand Rapids, etc) using resources that are available from now through the 2012-2013 grant cycle.

8a) Metropolitan (Large City) Activities

Year: 3 (2013-2014)

Please identify activities from the left column that could be implemented in major urban areas and surrounding areas in Michigan (i.e. Detroit, Lansing, Grand Rapids, etc) using resources projected to be available for the 2013-2014 grant cycle. Once identified, please rank the activities according to the funding available and the relative importance of the activity. You may rank the activities by dragging and dropping them up or down into the right hand column.
Activity Key:

- 1=Needs assessment
- 2=Surveillance work group
- 3=Primary prevention, case coordination, and training work group
- 4=Strategic partnerships & policy work group

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2: Implement survey of housing hazards, collect data.</td>
<td>145</td>
<td>1</td>
</tr>
<tr>
<td>4: Report EBL/investigation/renovation information back to the public</td>
<td>109</td>
<td>2</td>
</tr>
<tr>
<td>3: Revise asset map—developing collaborative relationships</td>
<td>108</td>
<td>3</td>
</tr>
<tr>
<td>3: Revise tool as needed</td>
<td>89</td>
<td>4</td>
</tr>
<tr>
<td>2: Expand 9-1-1 data project to other metro areas</td>
<td>88</td>
<td>5</td>
</tr>
<tr>
<td>4: Review and update local codes consistent with IPMC</td>
<td>82</td>
<td>6</td>
</tr>
<tr>
<td>3: Test reliability and validity of tool</td>
<td>76</td>
<td>7</td>
</tr>
</tbody>
</table>

Total Respondents: 1

Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

8b) Please list any activities not included on the list above that you believe should be supported in major urban areas and surrounding areas in Michigan (i.e. Detroit, Lansing, Grand Rapids, etc) using resources projected to be available for the 2013-2014 grant cycle.

**Rural (Small City) Activities**

9a) Rural (Small City) Activities

Year: 2 (2012-2013)

Please identify activities from the left column that could be implemented in rural areas and small cities in Michigan using resources that are available from now through the 2012-2013 grant cycle. Once identified, please rank the activities according to the funding available and the relative importance of the activity. You may rank the activities by dragging and dropping them up or down into the right hand column.

Activity Key:

- 1=Needs assessment
- 2=Surveillance work group
- 3=Primary prevention, case coordination, and training work group
- 4=Strategic partnerships & policy work group

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>4: Seek sustainable funding for continued local expansion of lead case management, asthma case management, lead and environmental assessments, radon testing, tobacco smoke cessation and other healthy homes services.</td>
<td>332</td>
<td>1</td>
</tr>
<tr>
<td>4: Identify children in rural areas that have tested at 5 µg/dL, follow up on further services for appropriate care and safe housing.</td>
<td>284</td>
<td>2</td>
</tr>
<tr>
<td>2: Develop survey of housing hazards</td>
<td>267</td>
<td>3</td>
</tr>
<tr>
<td>3: Volunteer participation in Healthy Homes Screening Tool (HHST)</td>
<td>230</td>
<td>4</td>
</tr>
<tr>
<td>4: Assist, train, and advocate for CHWs to develop community Healthy Homes coalitions.</td>
<td>227</td>
<td>5</td>
</tr>
<tr>
<td>4: Collaborate with Safe Kids Coalitions, MCA weatherization programs, Lead safe coalitions, asthma coalitions, &amp; faith based organizations.</td>
<td>226</td>
<td>6</td>
</tr>
<tr>
<td>3: Provide referrals based on HHST scores &amp; identified needs</td>
<td>209</td>
<td>7</td>
</tr>
<tr>
<td>4: Using power point presentations, talking points, and social media, develop and share a training module, &quot;How to implement a Healthy Homes program in your community.&quot;</td>
<td>204</td>
<td>8</td>
</tr>
<tr>
<td>4: Document existing community collaboratives and advance the initiation of other collaboratives in the state.</td>
<td>195</td>
<td>9</td>
</tr>
<tr>
<td>3: Local asset mapping for referrals</td>
<td>192</td>
<td>10</td>
</tr>
<tr>
<td>4: Seek and advocate for federal and state funding to expand local community collaboratives.</td>
<td>184</td>
<td>11</td>
</tr>
<tr>
<td>4: Research and model strongest community groups promoting braiding of resources and advocacy around lead and healthy homes.</td>
<td>171</td>
<td>12</td>
</tr>
<tr>
<td>4: Train one community health worker (CHW) in communities across Michigan.</td>
<td>134</td>
<td>13</td>
</tr>
<tr>
<td>4: Advocate for International Property Maintenance Code to be amended with Appendix B, adding healthy homes concepts and promoting acceptance of IPMC.</td>
<td>130</td>
<td>14</td>
</tr>
<tr>
<td>4: Connecting electronic medical records from local, rural areas to state data collection system.</td>
<td>106</td>
<td>15</td>
</tr>
<tr>
<td>4: Reassess and share HHLPP Needs Assessment with local and rural areas needing healthy homes interventions.</td>
<td>100</td>
<td>16</td>
</tr>
</tbody>
</table>

Total Respondents: 1

Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

9b) Please list any activities not included on the list above that you believe should be supported in rural areas and small cities in Michigan using resources that are currently available from now through the 2012-2013 grant cycle.
Possible take M.E.A.P. scores or S.A.T. scores to see if there are areas geographically crossed with hospital records to see if certain conditions are present of known side-affects of lead, mold, radon, etc. so it can be mapped. Could possibly help pinpoint housing/environment areas of concern to target initiatives. (Not sure I even understand what I wrote). I'm getting tired.

<table>
<thead>
<tr>
<th>Count</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Possible take M.E.A.P. scores or S.A.T. scores to see if there are areas geographically crossed with hospital records to see if certain conditions are present of known side-affects of lead, mold, radon, etc. so it can be mapped. Could possibly help pinpoint housing/environment areas of concern to target initiatives. (Not sure I even understand what I wrote). I'm getting tired.</strong></td>
</tr>
</tbody>
</table>

10a) Rural (Small City) Activities

Year: 3 (2013-2014)

Please identify activities from the left column that could be implemented in rural areas and small cities in Michigan using resources projected to be available for the 2013-2014 grant cycle. Once identified, please rank the activities according to the funding available and the relative importance of the activity. You may rank the activities by dragging and dropping them up or down into the right hand column.

Activity Key:

- 1=Needs assessment
- 2=Surveillance work group
- 3=Primary prevention, case coordination, and training work group
- 4=Strategic partnerships & policy work group

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Score</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>4: Partner with larger community to provide services if needed</td>
<td>86</td>
<td>1</td>
</tr>
<tr>
<td>3: Revise asset map of partners and their funding streams—developing collaborative relationships</td>
<td>84</td>
<td>2</td>
</tr>
<tr>
<td>3: Revise Healthy Homes Screening Tool (HHST) as needed</td>
<td>81</td>
<td>3</td>
</tr>
<tr>
<td>3: Test reliability and validity of HHST</td>
<td>67</td>
<td>4</td>
</tr>
<tr>
<td>1: Work with DEQ to analyze existing data in Wellogic, the State's groundwater database, to generate updated GIS maps.</td>
<td>47</td>
<td>5</td>
</tr>
<tr>
<td>2: Implement survey of housing hazards, collect data.</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

Total Respondents: 1

Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

10b) Please list any activities not included on the list above that you believe should be supported in rural areas and small cities in Michigan using resources projected to be available for the 2013-2014 grant cycle.
General

11) Do any of the work groups' proposed activities included here need to be explained more thoroughly?

<table>
<thead>
<tr>
<th>Count</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Analyze the data. Is this data from the HHST?</td>
</tr>
<tr>
<td>1</td>
<td>CRV?</td>
</tr>
<tr>
<td>1</td>
<td>Great Job with them/</td>
</tr>
</tbody>
</table>

The longest list we completed was so complex and full of information it would have been helpful to somehow view the entire list so that you didn't have to remember all the different thoughts at the same time. Could have grouped similar topics together and then go back later and prioritize the items within a similarly related group.

1 I'm not sure what the water mapping is going to tell you about home-based contamination. Well water is tested sporadically, perhaps when the home is sold. How will you make sense of this data?

1 I'm not sure that you'll get very good data on injuries from 9-1-1 (only get information on a subset of injuries and won't be representative of injuries in the population) or Medicaid claims (no cause of injury information).

12) Is there any major activity relative to healthy homes that you think the work groups have missed?

<table>
<thead>
<tr>
<th>Count</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>More focus on HH as an issue of social justice and community development.</td>
</tr>
<tr>
<td>1</td>
<td>No. The groups did a great job.</td>
</tr>
<tr>
<td>1</td>
<td>Test entry</td>
</tr>
</tbody>
</table>

Yes, Case Management. We should expand on current EBL case management, Asthma Match model of case management, Addressing and adding the new CDC guidelines as state of MI recommendation, promote through state to state Agencies, partners, local health departments, advocates for home hazards, health providers, physicians, and community coalitions.

I can't help but thinking if we can incorporate the entire healthy homes concept into the International property maintenance code and maybe even require some type of inspection requirement for any and all rental properties in the State of Michigan we could capture thousands of homes that require some type of healthy home repair or abatement.
13a) Are you a member of the HHLPP Advisory Group, Work Group, or both?

<table>
<thead>
<tr>
<th>Value</th>
<th>Count</th>
<th>Percent %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisory Group</td>
<td>12</td>
<td>42.9%</td>
</tr>
<tr>
<td>Work Group</td>
<td>6</td>
<td>21.4%</td>
</tr>
<tr>
<td>Both</td>
<td>12</td>
<td>42.9%</td>
</tr>
</tbody>
</table>

**Statistics**
- Total Responses: 28
- Skipped: 4

13b) If you are a HHLPP work group member, which work group are you a part of? (please check all that apply)

<table>
<thead>
<tr>
<th>Value</th>
<th>Count</th>
<th>Percent %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needs Assessment</td>
<td>5</td>
<td>23.8%</td>
</tr>
<tr>
<td>Surveillance</td>
<td>5</td>
<td>23.8%</td>
</tr>
<tr>
<td>Primary Prevention, Case Coordination, and Training</td>
<td>9</td>
<td>42.9%</td>
</tr>
<tr>
<td>Strategic Partnerships &amp; Policy</td>
<td>9</td>
<td>42.9%</td>
</tr>
</tbody>
</table>

**Statistics**
- Total Responses: 21
- Skipped: 11
Appendix I: Healthy Homes Screening Tool (HHST)

Note: This version of the Healthy Homes Screening Tool (HHST) is intended for use as a door-to-door survey. We are in the midst of developing a version for professionals to use to observe hazards within the home environment. The tool is not a substitute for hazard rating systems such as the Healthy Homes Rating System (HHRS). Both versions are being adapted based upon our experience implementing them in the field.

Interviewer Name: ____________________

Thank you for participating in Healthy Homes Screening Survey. The survey will take approximately 10-15 minutes of your time.

You will be asked questions about your home and home environment.

There are no risks or benefits to taking part in the study. Any information you provide will be kept completely confidential. Your cooperation is voluntary and you may opt out of the survey at any time.

Section One – General Information

May we have your contact information?*

Name: ________________________________
Address: ___________________________________  City: ____________________ State: _____  Zip: __________

Phone: ____________________  Alternate Phone: ____________________  Email: ____________________

*This information will only be used to assist us in contacting you and will not be shared.

Do you currently own or rent your home / residence?  
☐ Own  ☐ Rent

1. INCLUDING YOURSELF, how many adults 18 and older currently live in your household?
   ☐ One  ☐ Two  ☐ Three  ☐ Four  ☐ Other (Specify):_______

2. How many children or teens, 5 through 17 years of age, currently live in your household, if any?
   ☐ None  ☐ One  ☐ Two  ☐ Three  ☐ Other (Specify):_______

3. How many children under age 5 currently live in your household, if any?
   ☐ None  ☐ One  ☐ Two  ☐ Three  ☐ Other (Specify):_______

4. Do you ever have children under the age of 18 in your home on a regular bases, even if they are not your own?  
   ☐ Yes  ☐ No

5. How often do you have children in your home? Would you say...
   ☐ About once per month  ☐ About once per week  ☐ More often than once per week
   ☐ Yes  ☐ No

6. Is there a pregnant woman living in your home?
   ☐ Yes  ☐ No

---

Section Two - Asthma

In this next section, we would like to ask you about Asthma.

For each question, please FILL IN ONE circle.

1. Have any adults living here been told by a doctor or other medical professional that they have asthma?
   ☐  ☐  ☐
2. Have any children (Under 18) living here been told by a doctor or other medical professional that they have asthma?

   a. If yes, please list the age(s) of the children: _________________________________

3. Do any of the children living here have chronic problems breathing? (occur all or much of the time): shortness of breath, chest tightness, cough or wheeze (whistling in the chest)

4. Would you say [you/your child] limits [your/his/her] usual activities due to asthma?

   □ Not at All   ☑ A Little   ▼ A Moderate Amount   ✔ Alot

5. Does anyone in your home smoke?

   □ No   ☑ Yes

   a. If yes, how many people smoke: __________________________________________

6. Do you have any of the following pets living in your home?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.  Dogs</td>
<td>□</td>
<td>☑</td>
</tr>
<tr>
<td>ii. Cats</td>
<td>□</td>
<td>☑</td>
</tr>
<tr>
<td>iii. Birds</td>
<td>□</td>
<td>☑</td>
</tr>
<tr>
<td>iv. Other (Please Specify): __________________________________________</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Is there visible evidence of the following pests in the home?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.  Cockroaches</td>
<td>□</td>
<td>☑</td>
</tr>
<tr>
<td>ii. Insects</td>
<td>□</td>
<td>☑</td>
</tr>
<tr>
<td>iii. Mice/Rats</td>
<td>□</td>
<td>☑</td>
</tr>
<tr>
<td>iv. Bed Bugs</td>
<td>□</td>
<td>☑</td>
</tr>
</tbody>
</table>

   If yes to any i-iv than ask 7a.

   7a. If yes to any of the above, do you use pesticides to get rid of   □   ☑   ▼
8. Is mold visible and/or smelled in the home?  
   □  □  □

9. Do you use the following cleaning products in your home?  
   Yes  No  Don’t Know
   
   i. Bleach  □  □  □
   ii. Lysol  □  □  □
   iii. Other (Please Specify): ____________________________________________

For each question, please FILL IN ONE circle.

10. Do you use the following air freshener products in your home?  
    Yes  No  Don’t Know
    
    i. Candles  □  □  □
    ii. Plug-Ins  □  □  □
    iii. Incense  □  □  □
    iv. Other (Please Specify): ____________________________________________

Section Three – Moisture/Water Damage

In this next section, we would like to ask you about Moisture/Water Damage.

   Yes  No  Don’t Know
   
   1. Has water leaked into your home from outdoors in the last 12 months?  
      (exclude plumbing or other inside leaks. While household was living here if less than 12 months)  □  □  □
   2. Have there been water leaks in the house from INSIDE the building in the last 12 months? (while household was living here if less than 12 months)  □  □  □
### Section Four– Lead

*In this next section, we would like to ask you about Lead.*

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have your children been tested for lead poisoning?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>a. If yes, what is the lead level number given for each child</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Was your house built before 1978?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>a. What year?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Has your home been checked for lead?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>a. If yes, how?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Has there been renovation or repair of your home or building in the past two years?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. Is chipping or peeling paint visible on the exterior or interior of the home?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Section Five– Injury Prevention:

*In this next section, we would like to ask you about Injury Prevention.*

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. House:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Are there strong proper door and window locks?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>ii. Have you experienced any problems with your utilities (gas, water, or electric) over the past year?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>go to question iia</td>
<td>go to question 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iia. If yes, what utility:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii. Were these problems due to mechanical issues (such as a broken furnace or stove)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>iv. Were these problems due to a utility shut off (due to unpaid bill)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

For each question, please FILL IN ONE circle.
2. **Stairs:**
   
i. Are all stairways lighted? ☐ ☐ ☐
   
ii. Are all stairways in good structural condition? ☐ ☐ ☐
   
iii. Are all stairs free from clutter? ☐ ☐ ☐
   
iv. Are there handrails present at all stairways? ☐ ☐ ☐
   
3. **Bath:**
   
i. Is there a skid-proof surface in bathtub(s)? ☐ ☐ ☐
   
ii. Are grab bars present in bathtub? ☐ ☐ ☐
   
4. **Fire/Electrical**
   
i. Are smoke detectors present on every level and in every sleeping area? ☐ ☐ ☐

   ia. If yes, how many and are they working? ________________________________

   ii. Are exits from the building accessible in event of fire? ☐ ☐ ☐
   
   iii. Is a fire extinguisher present? ☐ ☐ ☐

   iiiia. Is it readily accessible for use? ☐ ☐ ☐
   
   iv. Do you use any appliances other than a heater to provide heat? (wood stove, fireplace, space heater) ☐ ☐ ☐
   
   v. Is a fireplace or wood burning stove used in your home? ☐ ☐ ☐
   
   vi. Are unvented gas logs, an unvented gas fireplace, or an unvented gas stove used in your home? ☐ ☐ ☐
   
   vii. Does your family sleep with the bedroom doors closed? ☐ ☐ ☐
viii. Is all the wiring in the finished areas of your home concealed either in walls or behind metal coverings? (exclude appliance cords, extension cords, chandelier cords, telephone, antenna, or cable TV wires)

5. Carbon Monoxide

i. Do you have a carbon monoxide detector in your home?

ia. If yes, how many:____

Are they working?

Yes  No  Don’t Know

ii. Was your furnace inspected in the past year?

Yes  No  Don’t Know

iii. If so, when do the symptoms start?  Morning  Afternoon  Evening


v. Where in the house are you when you notice your symptoms?

For each question, please FILL IN ONE circle.

vi. Do you have any gas appliances? (dryer, stove, etc.)

If yes, is it vented to the outside?

Yes  No  Don’t Know

vii. Do you (or someone in your household) have frequent headaches or nausea?

6. Poisoning: Other

Are the following items stored out of the reach of children?
7. **Radon**

i. Has your home ever been tested for radon?

   *☐* Yes  *☒* No  *☐* Don’t Know

   go to question iia

   go to demographic questions

ii. If yes, were you told the results were high?

   ☛ Yes  ☒ No

iv. Do you know the number? __________

i. Has any work been done on your home to reduce the level of radon?

   *☐* Yes  *☒* No  *☐* Don’t Know

   go to question iia

ii. If yes, please describe what was done: ____________________________________________

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**Section Six – Demographic:**

*This last set of questions is for statistical purposes only.*

1. Do you have a phone?

   ☛ Yes  ☒ No

   1a. If yes:

      ☐ Landline  ☒ Cell Phone  ☒ Both

      The next set of questions asks about your household’s computer and internet use.

2. Does anyone in your household own a computer?

   ☛ Yes  ☒ No
3. Does anyone in your household have a computer that can access the internet at home?  

- Yes  
- No

4. How did you complete this survey today?

- Face-to-face with interviewer  
- Completed by myself and mailed it in  
- Online  
- By Phone

5. Is there an existing block club on this block? (A block club is an organized group of neighbors on one block who work together towards a common goal, such as public safety.)

- Yes  
- No

6. Would you like to be involved if a block club were formed?  

- Yes  
- No

7. What is your current marital status?

- Now married  
- Separated  
- Never married

- Widowed  
- Divorced  
- Cohabiting with a partner

8. Please indicate your gender.  

- Female  
- Male

9. The next question is about the ethnic identify category that best describes how you identify yourself. Are you Hispanic or Latino?

- Yes, Hispanic/Latino  
- No, Not Hispanic or Latino

10. Which of the following race identify categories best describes yourself? Select all that apply.

- American Indian or Alaska Native  
- Asian  
- Black or African American

- Native Hawaiian / Other Pacific Islander  
- White  
- Other (Specify): ______________________
11. What is the highest degree or accreditation you have received?

☐ None, I did not graduate high school
☐ High school graduate (Diploma or GED)
☐ Apprenticeship certification (Craft/Trade/Professional certif.)

☐ Associate degree in college (Occupational or Vocational program)
☐ Associate degree in college (Academic program)
☐ Bachelor’s degree (BA, AB, BS, etc.)

☐ Master’s degree (MA, MS, MSW, MBA, etc.)
☐ Professional school degree (MD, DDS, JD, etc.)
☐ Doctorate (PhD, ED, etc.)

☐ Other (Specify): ________________

12. Which of the following best describes your CURRENT employment status? Select all that apply

☐ Employed and working full-time
☐ Employed and working part-time
☐ Unemployed

☐ Retired
☐ Student
☐ Homemaker

☐ Temporarily laid-off
☐ Other (Specify): ________________

13. What is the best estimate of your PERSONAL annual earnings before taxes or other deductions for 2011?

☐ Less than $10,000
☐ $10,000 to $14,999
☐ $15,000 to $24,999
☐ $25,000 to $34,999

☐ $35,000 to $49,999
☐ $50,000 to $74,999
☐ $75,000 to $99,999
☐ $100,000 to $149,999

☐ $150,000 to $199,999
☐ $200,000 or more

14. May we contact you again to follow up on our visit today?

☐ Yes
☐ No

15. What would be the best time to reach you? __________