HEALTH IMPACT ASSESSMENT OF A REGIONAL FAIR AND AFFORDABLE HOUSING PLAN IN MID-MICHIGAN

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The report is the result of a team effort developed at the Ingham County Health Department by the Community Health Assessment and Improvement Team. The Land Use and Health Resource Team members involved include: Tri-County Regional Planning Commission, Michigan State University, Greater Lansing Housing Coalition, Ingham County Land Bank, and others listed on page 3.

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EXECUTIVE SUMMARY

BACKGROUND (SCREENING)

Housing plays an important role in individual and community health. It provides shelter, enables food storage and preparation, affects access to clean air and water and it impacts household budgets, family dynamics and access to healthy food, transportation, schools, jobs and services such as healthcare.

Good, stable neighborhoods that meet these basic needs improve community wellbeing. In this study, we examined the planning process and recommendations that resulted from a regional housing plan development. We undertook a systematic process to determine the health impacts of a proposed plan for housing in the tri-county region.

To ensure that future land use planning in this region includes fair, affordable and sustainable housing development, the Tri-County Regional Planning Commission (TCRPC) contracted with the Greater Lansing Housing Coalition (GLHC), to develop a regional housing plan. GLHC named the plan as the Innovative, Collaborative, Empowering Fair and Affordable Housing Initiatives: The Next Five Years for Ingham, Clinton and Eaton counties (thereon referred to in this study as *ICE Housing Plan*) (1). The GLHC adopted the finished plan in late 2014 and has oriented their organization to implement it. The *ICE Housing Plan* is a 5-year, comprehensive strategy for improving housing access and quality of life. It analyzes the housing conditions; identifies current regional needs and desires; and recommends actions that will lead to more housing options that are both fair and affordable.

ICE Housing Plan is based on findings from the Regional Affordable Housing Study (RAH study) (2). Aside from demographic, housing and economic analysis, the RAH study used community input from 18 focus groups in the region, over 750 surveys, and several expert interviews with lenders, developers, property managers, and realtors to highlight major housing concerns and suggests actions to be taken by municipalities and other stakeholders. The study provides important background information about current demographics, housing affordability, and housing quality conditions in this region. With a population of 464,036 persons, this region has experienced a mix of declining populations in urban centers, and growth in suburbs and some traditionally small, rural towns. The study produced was recognized as the Region's Fair Housing Equity Assessment (FHEA) by HUD, meeting federal requirements to have a FHEA in place for this region. The study concludes that there are significant affordability concerns in this region for the low-moderate income households. The study also found that the senior population will greatly increase in the near future requiring a variety of more affordable and accessible rental units. Most of the housing quality concerns are in the urban core resulting from inconsistencies in code compliance for proper maintenance of old housing structures. Discriminatory practices related to fair housing may be underreported in the region due to the community's lack of capacity to educate citizens and address complaints related to fair housing, both of which could be resolved with the presence of a local fair housing center.

The Healthy! Capital Counties (H!CC) (3), a regional health assessment project conducted in 2013 in partnership with major hospitals and health departments in Mid-Michigan, provided significant information regarding key health indicators and measures. The assessment concluded that: 1) Child poverty is not equally distributed in the region; 2) On average racial segregation in this region is higher than it is for the State of Michigan as a whole, with Clinton and Eaton counties experiencing higher segregation levels than Ingham County; 3) Urban centers have the highest proportions of children living below poverty compared to suburban and rural areas; 4) Food deserts are particularly concentrated in low income urban areas; 5) The tri-county region fares better than Michigan in obesity, with 25% of adults obese compared to 31.5% statewide. Obesity is a health behavior that potentially leads to chronic diseases such as diabetes; and 6) The region fares worse in preventable childhood asthma hospitalizations (21%) compared to the state (14%).

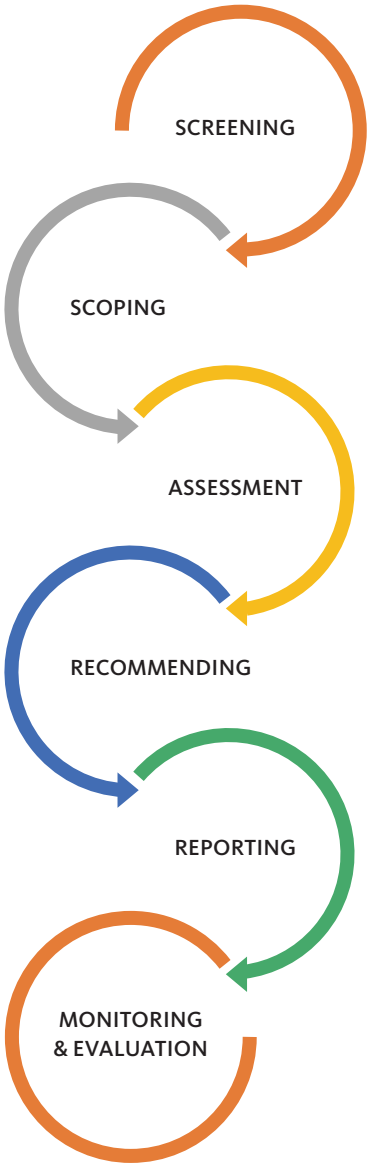
To intentionally and systematically understand health benefits and opportunities associated with the *ICE Housing Plan*, a workgroup led by the Ingham County Health Department (ICHD) and the Land Use and Health Resource Team (LUHRT) was formed early in 2013 to conduct a Health Impact Assessment (HIA). A health impact assessment is "a systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects." (4) There are several steps involved in an HIA process. These are identified and described in Figure 1.

THE GOALS OF THIS HIA WERE TO:

- Elevate health considerations in relation to housing issues among stakeholders participating in the *ICE Housing Plan*.
- Engage diverse stakeholders in discussions focused on health issues related to housing, including marginalized groups. The HIA workgroup reached out to senior center residents, a homeless coalition advocacy group, refugee support agencies, an advocacy group for persons with disability, in addition to other for profit and non profit organizations.
- Research literature and current status of local data, to maximize potential health benefits and mitigate identified risks of four proposed recommendations in the I*CE Housing Plan* and,
- Inform the *ICE Housing Plan* regarding health and housing concerns during its development phase in the RAH and in the writing of the ICE Plan recommendations.

FIGURE 1.

STEPS IN AN HIA PROCESS



- Determine whether an HIA is needed or likely to be
- Determine main HIA investigators and major partners
- Summarize information in a project background description section

- In consultation with stakeholders, develop a plan for the HIA and assess the potential impacts of the decision
- Develop pathways diagrams, research questions and methods

- Describe the baseline health of affected communities and potential impacts of the decision
- Use local data as well as literature to demonstrate evidence

- Develop practical solutions that can be implemented within the political, economic and technical limitations of the project or plan or policy being assessed

- Disseminate the findings to decision makers, affected communities and other stakeholders

- Monitor the changes in the level of dialogues between sectors, in this case health and housing planners
- Monitor the implementation of recommendations
- Monitor changes in health outcomes or health risk factors over time

SCOPING

In the Development of the Ice Housing Plan and the RAH Study, groups most likely to experience housing concerns were engaged.

At the initiation of the screening phase of this HIA, a similar demographic was engaged with special effort made to include groups more likely to experience health issues related to housing.

The meetings with stakeholders highlighted major concerns residents have about their housing situation and how they felt their health could be affected. Anecdotal information was compiled and condensed to develop an online scoping survey. Affordable housing, housing maintenance, fair housing, access to community services, and the need for a variety of housing options were the top five priority housing issues in the scoping survey.

Qualitative anecdotal summary of statements from scoping phase meetings and focus groups:

- There is not enough affordable housing. Multiple generations living in the same house creates stress to the host and other dwellers. The scarcity of affordable housing results in families "doubling up" or "couch-surfing" which also causes stress to the owner/tenant of the dwelling.
- Although most landlords are aware of allergen causing agents that can be found in homes, local housing regulations do not adequately incentivize some landlords to maintain their property as much as they could.
- There is a need to educate tenants about pet care as it relates to indoor environmental quality and healthy home maintenance.
- Inspection frequency and fees are inconsistent between the various communities in the tri-county region, leading to the disproportional distribution of rental housing.
- There is a lack of adequate resources for seniors or residents with disabilities who want to age in place, but cannot renovate or maintain their property as needed.
- There is a data gap regarding the depth of housing quality issues in this region. Insufficient resources are allocated in local communities to do housing inspections of all the stocks in each community.
- While building codes exist for rental property maintenance, some tenants such as seniors may not have the ability to properly maintain the rental units at times. Concurrently the fear of displacing tenants limits enforcement of housing code.
- When asked if they had ever heard of fair housing, groups needed more explanation as to what fair housing means. This implies a lack of understanding in the community about the concept of fair housing and its implications.

Stakeholders' engagement meetings and survey prioritized major housing factors and related health indicators; these are summarized in Table 1. The table lists the major housing factors identified during HIA scoping phase and some of the *ICE Housing Plan* recommendations, as well as related health conditions that the HIA would focus on.

1. For a list of the stakeholders involved in the process, please refer to page ii of the full HIA report and pages

TABLE 1 SCOPING SUMMARY TABLE

ICE Housing Plan Recommendations	Health Outcomes related to the ICE Housing Plan Recommendations (based on scoping engagement sessions and survey)
Invest in affordable housing for all • Maintain and increase funding for multi-family housing subsidies and Section 8 Housing Choice Vouchers. • Seek and support additional low income housing tax credits	• Chronic diseases: Diabetes, disability • Child health (Lead exposure) • Respiratory conditions (Asthma) • Mental health (Poor mental health days) • Health behaviors: Smoking, obesity and consumption of fruits and vegetables • Social determinants of health (Other social and economic conditions affecting health outcomes) such as food and transit access
Improve rental housing quantity and quality • Continue rigorous enforcement of rental codes in urban neighborhoods • Develop simple rental codes in rural communities • Actively address rental home contaminants such as lead, mold, tobacco smoke. • Develop and implement a "Preferred tenant/model manager" program to encourage rental best practices.	• Indoor air quality complaints • Child health (Lead exposure) • Respiratory conditions (Asthma) • Mental health (Poor mental health days) • Health behaviors (Smoking, obesity and consumption of fruits and vegetables • Social determinants of health (Other social and economic conditions affecting health outcomes) such as access to food and transit. • Chronic diseases: Diabetes, disability
Improve housing law compliance • Develop a local Fair Housing Center • Provide education about fair housing. • Offer fair housing rights training program specific to senior tenants. • Establish a Fair Housing Advocates training program	• Chronic diseases: Diabetes, disability • Child health (Lead exposure) • Respiratory conditions (Asthma) • Mental health (Poor mental health days) • Health behaviors: Smoking, obesity and consumption of fruits and vegetables • Housing related health disparities • Residential segregation • Determinants of health (Food access)

KEY FINDINGS
Housing Conditions

KEY HOUSING CONDITIONS FINDINGS

- According to the definition of housing affordability from the Department of Housing and Urban Development (HUD) "Families who pay more than 30 percent of their income for housing are considered cost burdened and may have difficulty affording necessities such as food, clothing, transportation and medical care." More than half of the tri-county region households suffer from a housing cost burden; with an aging population there will be an increased need for a variety of affordable housing options; renters, low income residents, younger adults and students are the most likely to cut back on health care needs in order to set aside money for housing costs.
- More attention should be given to Clinton and Eaton counties in planning for affordable housing for more proportional allocation of affordable housing compared to population size.
- In Ingham County addressing housing foreclosure rates should remain a priority to maintain safe and viable neighborhoods.
- Balancing the need for affordable housing while maintaining older properties is a major struggle for this region, particularly in the City of Lansing and surrounding small older farm area cities. This would prevent health conditions leading to lead poisoning and asthma.
- Deteriorated housing quality leading to poor health is a complex problem that involves multiple factors and solutions would require the cooperation of a myriad of stakeholders. There is a need for a coordinating regional organization to encourage continuous communication among stakeholders, and to address the factors leading to poor housing quality.
- About two thirds of the residents surveyed in this region answered that they were not informed about the fair housing concept. While the perception remains that fair housing is not an issue, the aging population may soon start to experience the limited housing maintenance resources for aging in place and that might result in increasing fair housing issues for this target group.

KEY FINDINGS

Health Conditions

- In this tri-county region, based on the "2012 Annual Data Report on Blood Lead Levels" from the Michigan Department of Health and Human Services, most of the high blood lead level (BLL) concentration happens to be at the intersections where the three counties meet (the northwest corner of Ingham County, the northeast corner of Eaton County, and the southern portion of Clinton County). Local efforts to protect children from lead exposure through blood lead testing and remediation and abatement activities of homes with lead paint are important to ensuring healthy brain development of children in our communities.

According to the 2013 Capital Area Behavior Risk Factor and Social Capital Survey (5), the following is a list of health conditions possibly linked to housing:

- In this region, a higher proportion of tri-county adults reported a mental health status that was "not good" as compared to Michigan adults.
- Ingham has diabetes rates higher than both Clinton and Eaton Counties.
- About a fifth (19.9%) of the adult population in the tri-county region suffers from being limited in their activities because of physical, mental or emotional disabilities.
- Asthma prevalence is higher among children compared to adults, females compared to males, and Blacks compared to Whites in this region. Black residents were three times more likely to be hospitalized for asthma than White residents in 2010. Addressing home air quality could alleviate these health concerns.
- In 2012 about a fifth of adults reported smoking in Ingham County and Eaton County while only 13% smoked in Clinton County. The good news with regard to smoking is that over half (55.8%) of the adults living in the tri-county region reported they have never smoked. Aside from second hand smoking concerns, smoking in homes affects housing quality and maintenance costs.
- Across the tri-county region, about one in every three adults is considered obese (29%). Obesity increases risks for poor health outcomes, disabilities, and potentially increases the need for special accessible housing.
- Over 81% of residents in the tri-county region responded that they consumed less than five servings of fruits and vegetables per day. Among the reasons for low consumptions are transportation and proximity concerns to access food outlets.

KEY FINDINGS

Health Impacts[2]

- The evidence for the direct effect of lead poisoning on child health is strong and based upon numerous studies; and the likelihood of positive health impacts resulting from addressing housing quality concerns through lead abatement is also well substantiated by the literature.
- Evidence linking unaffordable housing to high stress and poor mental health is strong based on multiple supportive literatures; and the likelihood of positive change in mental health resulting from addressing housing affordability concerns is also well substantiated by the literature. Similarly, the likely positive impacts that improved housing quality and neighborhood safety have on mental health are substantial.
- Evidence linking affordable housing directly to diabetes is mixed. Evidence supports a direct link between lifestyle changes such as physical activity and physical health. Indirectly, physical health is linked to healthy and safe neighborhoods that facilitate physical activity. A more direct link can be found between the availability of affordable housing and diabetes management. The impact of changes in affordable housing on diabetes prevention is likely but not strong.
- The impact of housing quality on respiratory health such as asthma is direct and strongly supported by the literature. The impact of addressing housing air quality triggers on asthma conditions is positive and well substantiated.
- Evidence strongly supports smoke-free housing policies as having positive impact on smoking behavior.
- Literature evidence supports programs that address obesity by increasing access to resources such as healthy food; literature also supports social networks that encourage health promoting behaviors to decrease obesity. The health impact is positive, strong and well substantiated by literature.

2. Refer to the full report for details and complete list of citations.

HIA RECOMMENDATIONS

Implementing the following recommendations will improve the health impact of housing in the Tri-County Area

HOUSING AND CHILDREN'S HEALTH (LEAD POISONING)

- Local health departments that don't already do so can provide information to housing organizations, residents, property owners and managers about the dangers of lead paint and how to prevent childhood lead poisoning. Activities include testing, interim controls and/or abatement of lead in homes, increasing awareness of lead-safe repair, renovation and lead-safe cleaning.
- Local health departments can start or continue utilizing the statewide lead result reporting database to identify children with elevated blood lead levels (EBLLs) and provide information and assistance to parents to reduce their child's blood lead level.
- Local health departments should continue to partner with the Michigan Alliance for Lead Safe Housing, which provides technical assistance for EBLL investigation and lead clearance in rental property occupied by children with an EBLL at or above 5 mg/DL.

HOUSING AFFORDABILITY AND REDUCE STRESS LEADING TO POOR MENTAL HEALTH

- Local community partnerships for fair and affordable housing should work on identifying and addressing policy and practice concerns in the assignment and use of housing assistance programs in this region, such as rental voucher, that provide families with a stable source of funding for rent, thus alleviating financial stress or poor mental health related to potentially being displaced.

IMPROVE HOUSING QUALITY AND REDUCE STRESS LEADING TO POOR MENTAL HEALTH

- The LUHRT could discuss, strategize and possibly collaborate with other community partners to advocate for rental inspection reporting through local governments' websites. Public reporting can provide details on the number of rental units inspected in each area, the number of complaint-based inspections, average timeframe for response to complaints, number of violations found and corrected, number of rental properties registered, transferred to new ownership and other metrics.
- Local governments could consider offering an incentive/reduction in rental property registration fees for landlords who participate in educational sessions and demonstrate exemplary compliance with state, local and federal laws.
- Local health departments can start or continue providing outreach and education on health-related housing issues and when necessary, connecting residents to housing counseling organizations, legal advocacy organizations and/or environmental health specialists.
- The City of Lansing and local health departments can explore ways to provide better education and information to residents and landlords about preventing and treating bedbugs.

HOUSING AND CHRONIC DISEASE PREVENTION SUCH AS DIABETES

- Local public health officials can invest in neighborhood organizations or programs that encourage safe access to services by walking, biking or transit.

HOUSING AND ASTHMA

- Local health departments could explore potential models for partnerships between health plans and healthcare providers to offer targeted case management for higher-risk asthma patients.
- Local health departments could explore partnerships with coalitions such as the Green and Healthy Homes Initiative in Lansing (GHHI) to educate residents on removing home-based asthma triggers and implement a home-based environmental interventions program.
- Local governments can request technical assistance from the National Center for Healthy Housing (NHCC) to learn how to integrate components of the National Healthy Housing Standards into their Housing Code sections.
- Local non-profit organizations and/or public health departments can hire or train Healthy Homes Specialist credentialed staff to offer healthy homes assessments.
- Public health leadership could explore developing collaborations between local legal-aid organizations and healthcare providers. Hundreds of health care, law school, legal aid and other partners across the U.S. have created formal partnerships called "Medical-Legal Partnerships" that feature a screening process whereby doctors, nurses and other clinicians assess potential "health-harming legal needs" of their patients as part of routine medical treatment, and connect patients with free legal information and assistance as needed.
- Financial empowerment, housing counseling, legal advocacy, and healthy homes partners can offer a regular renter resource fair to help address asthma issues in high renter-occupied neighborhoods; the logistics and content of the event would reflect the expertise of partners involved.

HOUSING AND OBESITY

- The LUHRT can continue to advocate for the full implementation of the Design Lansing master plan which promotes the development of neighborhoods with non-motorized accessibility and mixed use to promote physical activity leading to reductions in obesity levels.
- The LUHRT or the county's human service collaborative can work collaboratively with other partners such as the Community Economic Development Network to find resources that could help implement the Design Lansing master plan which gives special attention to mixed use development, a proven land use strategy to promote more physical activity thus curbing obesity.
- The LUHRT can continue to support TCRPC's efforts to expand the regional partnership around Complete Streets ordinances adoption and implementation as a way to promote physical activity and reduce obesity.

HOUSING AND ACCESS TO HEALTHY FOODS

- The City of Lansing can continue to support rental assistance and voucher programs to help families maintain stable, affordable, healthy housing and buffer the effects of food insecurity.
- Other communities should explore the feasibility of offering rental assistance and voucher programs located near major grocers.

- ICHD staff work collaboratively with the Food Systems Workgroup food policy action team to find resources that could help implement the Design Lansing master plan, which gives special attention to mixed use development that may bring local food sources closer to housing units.

HOUSING QUALITY AND HEALTH INDICATORS RELATED DIRECTLY TO POOR INDOOR AIR QUALITY SUCH AS ASTHMA AND LEAD POISONING (ALSO INDIRECTLY RELATED TO STRESS AND MENTAL HEALTH) AND BEHAVIORS SUCH AS SMOKING AND OBESITY.

- Local health officials can help nurture local partnerships that will help develop a common agenda to address landlords/tenant housing related issues by reaching out to stakeholders such as Public Housing authorities and non-profit housing organizations such as GLHC, landlords associations, home owners' associations and County Board of Commissioners.
- Local governments in the tri-county region can utilize technical assistance from the National Center for Healthy Housing to explore integrating provisions of the National Healthy Housing Standards into existing local housing code regulations.
- The LUHRT and county human service collaborative can promote collaboration among government agencies, community organizations and other stakeholders to support *ICE Housing Plan* recommendations.
- Landlords can be encouraged by local advocacy groups to establish discounts for renters who complete a "Rent Well" course.
- Local governments can encourage uniform rental housing registration and inspection frequencies in communities already offering pro-active rental inspection.
- Public health officials and staff from the National Center for Healthy Housing could provide technical assistance to local policy boards regarding options to establish the International Property Maintenance Code with National Healthy Housing Standard provisions as the county building code.
- Policy makers could create a framework that would allow local health department staff to respond to complaints by renters in rental housing in unincorporated areas of the county and inspect the inside and outside of the property for code compliance.

CONCLUSIONS AND NEXT STEPS

The proposed *ICE Housing Plan* recommendations listed for this study can have significant positive effects on health, particularly for low-income families, children, seniors and persons with disabilities. The HIA has facilitated the initiation of health impact discussions between organizations that have not traditionally worked together in the planning process. Future steps will use successful regional collaboration, capacity and political will to prioritize recommendations from *ICE Housing Plan* and HIA for implementation. Initial monitoring and evaluation plans of this HIA project are included in the full HIA report.

INTRODUCTION

The mid-Michigan or tri-county region comprises Ingham, Clinton and Eaton counties in Michigan (figure 1). With a population of 464,036 persons, this region has experienced a mix of declining populations in urban centers, and growth in suburbs and some traditionally small, rural towns (5).

The region of Clinton, Eaton and Ingham counties, once mostly agricultural, transformed in last century into a General Motors manufacturing center and is now the headquarters for Michigan's insurance industry as well as State of Michigan and Michigan State University.

Currently six area universities and colleges offer advanced degrees and certificates of excellence to students from across the globe. The region also supports 430 non-profit organizations, 146 public schools, 35 private schools, and several specialty training centers. The state government also continues to be a strong factor, along with numerous lobbying and special interest groups. (6)

Growth in this region has followed a pattern typical of older cities—declining population and investment in the core cities, accompanied by strong suburban and exurban growth along transportation arterials. Ingham County, with the state capital and Michigan State University (MSU) is heavily urban in the northwest, with agriculture and forest to the southeast. Eaton County, while having some agriculture, is a growing manufacturing hub, with a relatively new General Motors plant that produces the GMC Acadia, Buick Enclave and Chevrolet Traverse models. Eaton County is wooded, and suburban growth is prevalent. Of the three counties, Clinton still retains the most agricultural land, being a strong center for bean, corn and dairy production.

Lansing, in Ingham County, is the state capital of Michigan and is the region's central and most populous city. Adjacent to Lansing, East Lansing is home of Michigan State University, the second largest university in the state. Other incorporated cities in the region include Mason and Williamston in Ingham County, St. Johns in Clinton County, and Charlotte, Grand Ledge, and Potterville in Eaton County. The most populous townships include Meridian Charter Township, Lansing Charter Township, and Delhi Charter Township in Ingham; Delta Charter Township in Eaton County; and DeWitt. In all, the region has 60 incorporated communities, including all 48 townships. A regional growth policy map for the tri-county region is in Appendix 1. A detailed description of the demographic, housing, and economic characteristics of the tri-county region was compiled in the RAH study.

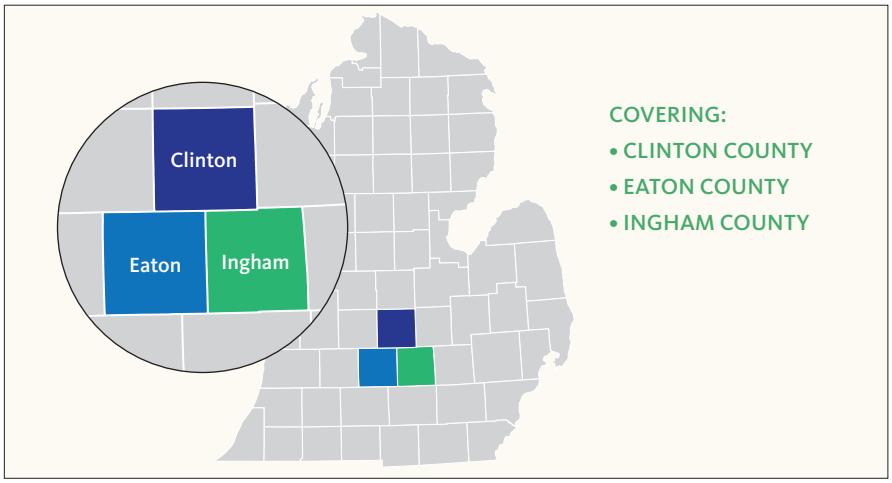


Figure I-1. Mid-Michigan Region (TCRPC, 2014)

Tri-County Regional Planning Commission

Michigan is a home rule state, where the majority of land-use decisions are made at the local level. The Tri-County Regional Planning Commission (TCRPC) (5) assists local planning boards and supports the region by coordinating possible intergovernmental solutions to growth-related problems. TCRPC provides technical assistance to local governments to address the needs of communities across the region. TCRPC serves Clinton, Eaton, and Ingham Counties and a small part of Shiawassee County that is included in the greater Lansing Michigan urbanized area. TCRPC is the designated Metropolitan Planning Organization and the region's Economic Development District (U.S. Dept. Commerce). Additionally, they maintain a regional data center that includes a U.S. Census repository, geographic information systems, and current aerial photography for the region.

Mid-Michigan Program for Greater Sustainability

Along with a local consortium of businesses and organizations from Mid-Michigan's Clinton, Eaton, and Ingham counties, TCRPC applied for and received a $3 million grant from the United States Department of Housing and Urban Development (HUD) to create the Mid-Michigan Program for Greater Sustainability (MMPGS) (7) through the Sustainable Communities Partnership between HUD, the US Department of Transportation (DOT), and the US Environmental Protection Agency (EPA).The overarching goal of MMPGS is to create a healthy, safe, and walkable community for years to come. The MMPGS program has nine project components, all of which, directly or indirectly address housing:

REGIONAL AFFORDABLE HOUSING STUDY

REGIONAL AFFORDABLE HOUSING PLAN (ICE)

COMMUNITY REINVESTMENT FUND

REGIONAL ENERGY STUDY

BUILD CAPACITY FOR REGIONAL URBAN SERVICE AREA

GREENING MID-MICHIGAN- A PRIORITIZED GREEN INFRASTRUCTURE SYSTEM

SUSTAINABLE DESIGN PORTFOLIO FOR MICHIGAN AVENUE CORRIDOR

BUILD CAPACITY FOR COMPLETE STREETS PLANNING AND IMPLEMENTATION

CREATE AN ONLINE PORTAL (INCLUDES AND HIA ONLINE TOOL)

GLHC's Ingham, Clinton, and Eaton Fair and Affordable Housing Plan

The topic of this HIA is the GLHC Ingham, Clinton, and Eaton (ICE) Fair and Affordable Housing Plan (*ICE Housing Plan*). (1) (7). As described in the MMPGS project, the *ICE Housing Plan* is a 5-year strategy that if implemented, will help improve access to housing which could translate to better health and quality of life. It analyzes the housing conditions; identifies current regional needs and desires; and recommends actions to increase housing options that are both fair and affordable (7).

The *ICE Housing Plan* analyzes the performance and capacity to affirmatively protect and promote every resident's right to fair housing in this region. Fair housing is a right, protected by local, state, and federal laws that guarantee that all US citizens may freely choose where they live and may not be denied housing based on their race, color, religion, sex, national origin, because they have children, or are a person with disabilities (7).

The *ICE Housing Plan* adopted the HUD definition for affordable housing, that is housing that costs no more than 30% of a household's monthly income (housing costs include rent or mortgages, utilities, taxes and other housing related costs). Low-income households that lack affordable housing face significant hardship in meeting their other basic needs, such as food, transportation, and healthcare, or saving for their future (7). To encourage the development of housing that is abundant, affordable, fair, and sustainable, the *ICE Housing Plan* made 23 recommendations in 5 categories (Table 2).

TABLE 2.
ICE HOUSING PLAN RECOMMENDATIONS

Local Fair and Affordable Housing Capacity	Identify an appropriate organization or office to monitor fair and affordable housing initiatives and responsibilities for the region
Invest in Affordable Housing in All Communities	Seek and support additional Low Income Housing Tax Credit Maintain and increase funding for multi-family housing subsidies and Section 8 housing choice vouchers Evaluate the need for more supportive housing facilities Simplify and streamline development procedures Investigate development of a regional non-profit real estate investment trust Develop a regional housing trust fund
Create More Variety and Choice in Housing Options in All Communities	Enact inclusionary zoning policies in all communities Support rehabilitation to improve owner-occupied housing Develop new housing in close-in neighborhoods Provide opportunities for seniors to downsize in their neighborhoods Encourage affordable rental housing for families in areas with good schools and services Plan housing with transit access in mind Move toward form-based zoning to encourage mixed uses and complete neighborhoods reduce the costs of housing development where feasible Encourage the state of Michigan to study and address heavy reliance on property taxes to fund schools and community services
Improve Rental Housing Quantity and Quality	Continue rigorous enforcement of rental codes in urban neighborhoods Develop simple rental codes for rural communities Actively address rental home contaminants such as lead, mold, and tobacco smoke Develop and implement “Preferred Tenant/Model Manager” programs to encourage rental best practices
Improve Fair Housing Law Compliance	Develop a local fair housing center Education about fair housing Fair housing rights training program specific to senior tenants Establishing a Fair Housing Advocates Training Program

Greater Lansing Housing Coalition

The *ICE Housing Plan* development and Regional Affordable Housing study were overseen by the Greater Lansing Housing Coalition (GLHC). GLHC is a private non-profit organization that is committed to helping the tri-county region community prosper by providing housing assistance to everyone, revitalizing neighborhoods and empowering residents through education and counseling programs. Founded in 1989, GLHC has helped more than 185 families move into a new or rehabilitated home and has provided safe, affordable housing in 235 GLHC-owned rental units throughout the region (8). GLHC also provides a full curriculum of homebuyer education programs and partners with volunteers to operate a "Tuesday Toolmen" program that keeps seniors and persons with disabilities in their homes longer by making minor home repairs and modifications. GLHC also provides HUD- and MSHDA-certified counselors to offer no-cost assistance to residents who are aiming to improve their credit ratings so that they qualify to purchase a home in the Lansing area. GLHC is the only provider of supportive housing in Lansing and owns and manages 235 units of affordable housing in the tri-county region.

Health Impact Assessments

(This section uses a direct description from source) (9)

Conditions in the places where we live, work and play have a tremendous impact on Americans' health. It is much easier to stay healthy when we can easily and safely walk, run or bike; when we have clean air, healthy food and access to affordable housing; and when we are safe from things like violent crime, fires and lead poisoning. Every day, policy makers in many sectors have opportunities to make choices that—if they took health into account—could help stem the growth of pressing health problems like obesity, injury, asthma and diabetes that have such a huge impact on our nation's health care costs and on people's quality of life.

Health impact assessment (HIA) is a fast-growing field that helps policy makers take advantage of these opportunities by bringing together scientific data, health expertise and public input to identify the potential—and often overlooked—health effects of proposed new laws, regulations, projects and programs. It offers practical recommendations for ways to minimize risks and capitalize on opportunities to improve health. HIA gives federal, tribal, state and local legislators, public agencies and other decision makers the information they need to advance smarter policies today to help build safe, thriving communities tomorrow.

The authoring committee of the National Research Council of the National Academies,Improving Health in the United States: The Role of Health Impact Assessment defined HIA the following way:

"HIA is a systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects".

Health impact assessments are designed to:

LOOK AT HEALTH FROM A BROAD PERSPECTIVE THAT CONSIDERS SOCIAL, ECONOMIC AND ENVIRONMENTAL INFLUENCES;

BRING COMMUNITY MEMBERS, BUSINESS INTERESTS AND OTHER STAKEHOLDERS TOGETHER, WHICH CAN HELP BUILD CONSENSUS;

ACKNOWLEDGE THE TRADE-OFFS OF CHOICES UNDER CONSIDERATION AND OFFER DECISION MAKERS COMPREHENSIVE INFORMATION AND PRACTICAL RECOMMENDATIONS TO MAXIMIZE HEALTH GAINS AND MINIMIZE ADVERSE EFFECTS;

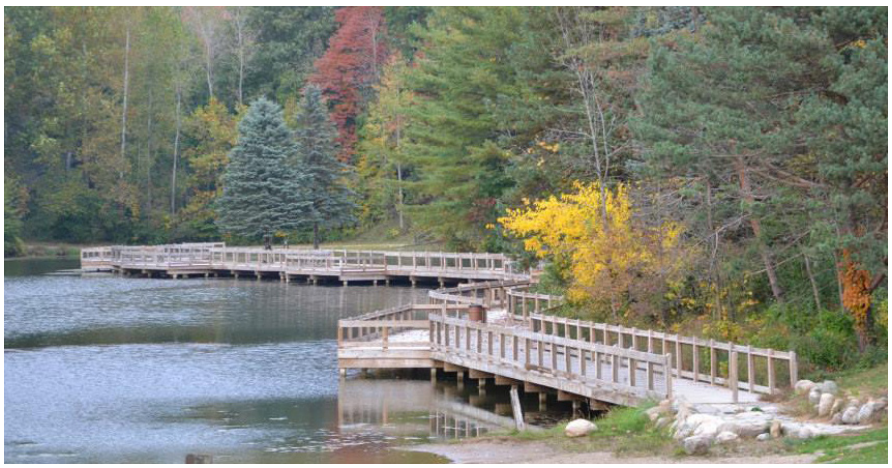
PUT HEALTH CONCERNS IN THE CONTEXT OF OTHER IMPORTANT FACTORS WHEN MAKING A DECISION; AND

CONSIDER WHETHER CERTAIN IMPACTS MAY AFFECT VULNERABLE GROUPS OF PEOPLE IN DIFFERENT WAYS

Land Use and Health Resource Team

The tri-county area has a long history of conducting HIAs. Housed within the Power of We Consortium (10), the Land Use and Health Resource Team (LUHRT) was established as a regional partnership between the three local health departments in Ingham, Eaton and Clinton Counties, the Tri-County Regional Planning Commission (TCRPC), Michigan State University (MSU), MSU Extension, the Capital Area Health Alliance (CAHA), Capital Area Transit Authority (CATA), local jurisdictions, neighborhood associations, NGOs, and many other public and private-sector organizations. LUHRT has the mission to "promote community health through education and engagement on land use and its relationship to health."

The LUHRT leads health impact discussions critical to the development of local master plans, ordinances, policies and practices, drawing on a broad range of local expertise and experience in environmental health, community health, and regional planning. These collaborations established mid-Michigan as a model for integrating health in local decision making, supporting intergovernmental cooperation, and establishing health impact assessment tools as an important step to building healthier communities (11).



COMPONENTS OF THIS REPORT

Recently, as a part of the funding provided by the Health Impact Project, collaboration between the Robert Wood Johnson Foundation, the Pew Charitable Trusts, and the Tri-County Regional Planning Commission for this project, the LUHRT developed an online health impact decision support tool for this region with GIS interface to allow local planners and developer consultants to zoom into a project and answer health impacts questions that can be addressed in the development process. Available at MMPGS site: www.midmichigansustainability.org

The intent of this report is to highlight opportunities to improve community health as the *ICE Housing Plan* is implemented in mid-Michigan. This report is divided into six sections that follow the HIA process:

SCREENING:

This section of the report determines the feasibility of an HIA for a particular project or plan, its timeliness and its usefulness in incorporating health in the RAH study and plan that will guide future decisions.

HIA SCOPE AND METHODS:

In this section, we describe the methods used to develop the HIA, including the ways in which resident stakeholders and the LUHRT contributed to the goals and narrowed down the scope of the assessment using a short prioritizing survey. It reviews the research questions considered and their relation to the determinants of health (social, environmental, economic). It also includes the sources of the data that will be used to investigate questions about the potential impact of a new *ICE Housing Plan* on mid-Michigan communities and includes causal diagrams ('pathways') which illustrate the ways in which *ICE Housing Plan* recommendations can affect health.

CURRENT CONDITIONS:

This section reviews current status and needs for housing and health conditions, which incorporate both qualitative and quantitative local county-level and regional data.

HEALTH IMPACTS SUMMARY AND RECOMMENDATIONS:

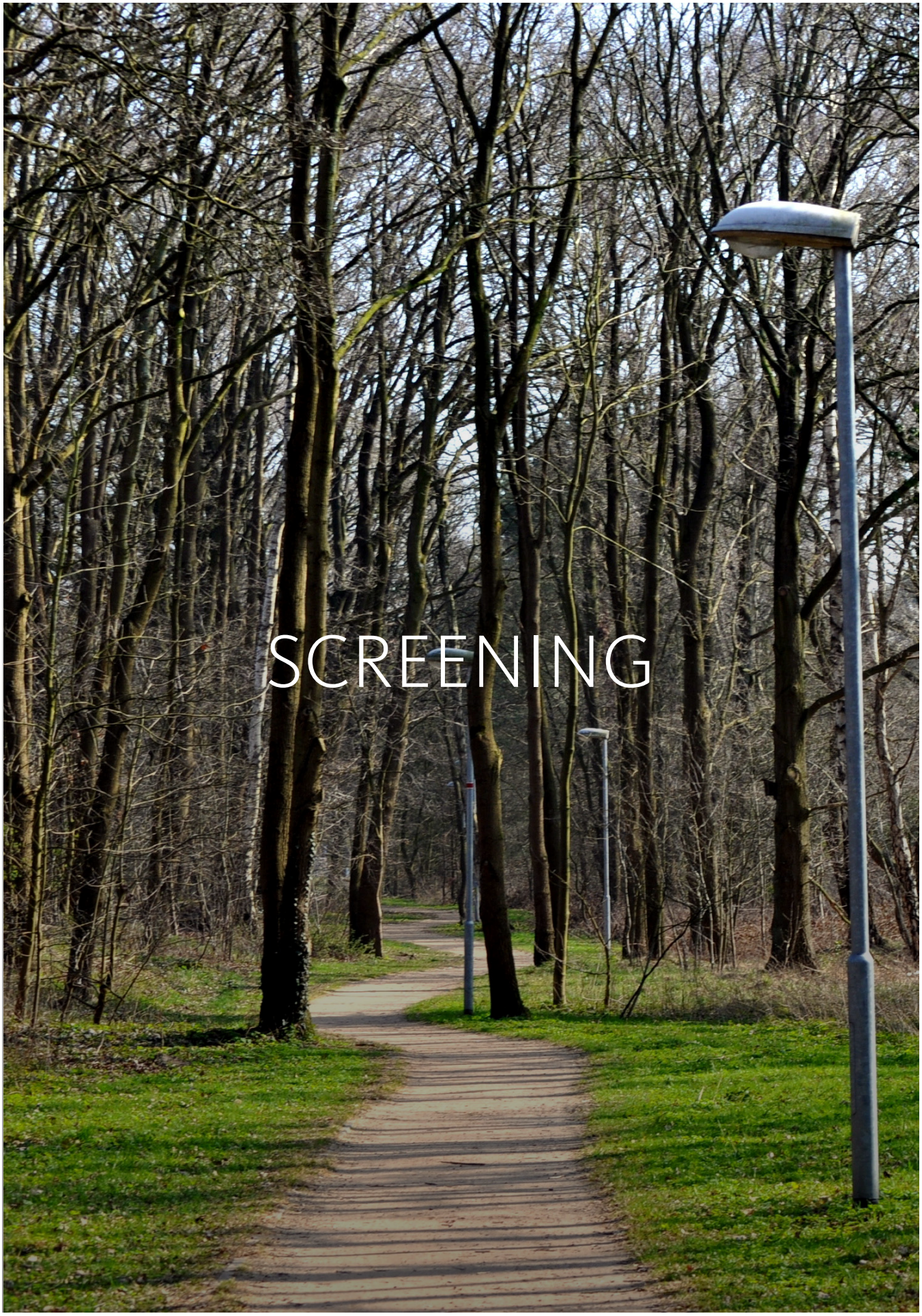
The heart of the report, this section lays out our research based impacts summary, and proposes recommendations for encouraging the positive health impacts of the *ICE Housing Plan*, and addresses areas of concern where our findings suggest that unintended consequences of housing policy changes might negatively impact the health of local communities.

MONITORING AND EVALUATION PLANS:

An outline of project implementation monitoring goals and questions to consider in evaluating the HIA study.

CONCLUSIONS AND NEXT STEPS:

A critical component following the HIA process, the LUHRT will continue to evaluate, monitor and collaborate with partners to sustain the implementation of the *ICE Housing Plan* and HIA recommendations.



SCREENING

Social Determinants of Health

It is increasingly recognized by health professionals that many programs and policies once considered tangential to (or even separate from) health can have profound health consequences for local populations (9). These include community development (land use and housing) and transportation. Their health impacts go far beyond the basic safety concerns associated with each. Determinants of health and health disparities are defined by Healthy People 2020 as "biological, social, economic and environmental factors- and their interrelationships that influence the ability of individuals and communities to make progress on health outcome indicators" (12). Therefore, addressing these determinants is important to improving population health, eliminating health disparities, and meeting the overarching goals of Healthy People 2020.

The magnitude social and physical factors, also known as "social determinants of health," have on health are being quantified and used for policy making. A good example is the conceptual framework for the RWJF's County Health Rankings (13). In this framework, developed by researchers at the University of Wisconsin Population Health Institute, social and economic factors contribute more (40%) to health status than health behaviors (30%) or even clinical care (20%) (9). In light of these findings, it seemed appropriate to include and analyze the effects of recommended practices and policies generated in a housing plan on social determinants of health. During the screening phase, potential stakeholders were contacted and the results of those interactions are presented in two documents, Appendix 2 and Appendix 3.

HIA on Housing Decision-making

The National Center for Healthy Housing developed a concept paper in 2012 (14) to set the basis for a dialogue that could help ensure that housing policy and neighborhood design would contribute to improving the health of children, older adults and other community members. The paper identified some of the important attributes of housing that have direct or indirect impacts on health: 1) Housing Quality (e.g. lead, radon, mold, extremes in temperatures, inadequate light, noise, falls, fires) has direct impacts on a person's physiological, mental and physical health; 2) Unaffordable housing often has indirect impacts by affecting the disposable income available for other important expenses that contribute to better health; 3) Neighborhood attributes and social or governmental policies can also have indirect impacts by affecting access to transit and healthy food options and segregation by race or income. Yet, "despite the many connections between health and housing, the two policy sectors mostly operate on parallel tracks without sufficient interconnection and collaboration" (8). The cited concept paper states that there is a need for an interdisciplinary dialogue between the two fields.

This HIA

A LUHRT HIA workgroup was formed in 2013 to apply for a Health Impact Project HIA program grant. The workgroup screened the nine MMPGS projects for an appropriate HIA topic, and ultimately decided to move forward with an HIA on the *ICE Housing Plan* because of the influence it has on overall health.

HIA GOALS

- ELEVATE HEALTH CONSIDERATIONS IN RELATION TO HOUSING ISSUES AMONG STAKEHOLDERS PARTICIPATING IN THE ICE 5-YEAR FAIR AND AFFORDABLE HOUSING PLANNING PROCESS.
- ENGAGE DIVERSE STAKEHOLDERS IN DISCUSSIONS FOCUSED ON HEALTH ISSUES RELATED TO HOUSING, INCLUDING MARGINALIZED GROUPS REPRESENTED BY A SENIOR CENTER, A HOMELESS COALITION, A REFUGEE RESETTLEMENT AGENCY AND AN ADVOCACY GROUP FOR PERSONS WITH DISABILITIES, IN ADDITION TO INCLUDING FOR-PROFIT AND NON-PROFIT ORGANIZATIONS.
- RESEARCH LITERATURE AND CURRENT STATUS LOCAL DATA TO MAXIMIZE POTENTIAL HEALTH BENEFITS AND MITIGATE IDENTIFIED RISKS OF FOUR PROPOSED RECOMMENDATIONS IN THE ICE HOUSING PLAN AND,
- INFORM THE *ICE HOUSING PLAN* REGARDING HEALTH AND HOUSING CONCERNS DURING ITS DEVELOPMENT PHASE IN THE RAH STUDY AND IN THE WRITING OF THE ICE PLAN RECOMMENDATIONS

HIA SCOPE AND METHODS

The scoping phase in an HIA is important for developing the assessment team and methods; it is also a time to identify vulnerable groups and engage them to help narrow down the research priority issues and questions, and identify indicators and health outcomes that are relevant to the selected housing priority issues.

While there are numerous health and housing issues that might have been brought up during discussions in the screening process, this report focused only on the RAH study and plan for a health impact assessment. For example, issues such as mobile housing or issues related to heating and energy costs and potential health concerns are

relevant and were initially included in early discussions and assessment drafts; however, the scope of this study and writing was revised when the *ICE Housing Plan* became available to have the assessment findings and impacts closely tied to the *ICE Housing Plan*, which did not address mobile homes and energy costs in

Stakeholder Engagement

Discussions from the screening and scoping phases from expert interviews and meetings were compiled in a table and summarized (Appendix 4). Scoping was initiated with nine community engagement sessions throughout the tri-county region in rural and urban areas, targeting various for profit and nonprofit stakeholders. Four of the nine sessions were planned around focus groups already set up by the ICE research team: 1) One in Eaton County, two in Clinton County and one in Williamston, a rural area of Ingham County. GLHC allowed the HIA workgroup members to participate and discuss briefly HIA during stakeholders' engagement meetings organized for the *ICE Housing Plan* process. The decision made by the HIA workgroup to join GLHC staff in their stakeholders' engagement sessions in these specific communities was to avoid duplication and to facilitate better reach of the HIA workgroup to the more rural parts of the tri-county region. A special time (about 10 minutes) was allowed at the end of the ICE discussions to introduce the HIA and have a brief discussion around health issues they need to see addressed in an HIA and in the *ICE Housing Plan*. The remaining five sessions were focused on marginalized or vulnerable groups particularly sensitive to housing related health conditions, including senior homes, homeless coalitions, and refugees. Below are several ways stakeholders were engaged in the process:

- Through a group exercise to identify top personal and community health issues and how they are related to housing conditions and potentially to political and economic decisions that are decided at higher levels of government.
- Through meetings with public and private sector representatives, landlords were asked to describe the main drivers of increasing housing costs, and any connections to and resulting health effects. They were asked to identify key health issues of their residents resulting from poorly maintained homes. Lastly, they were asked to provide recommended ways to address the issues via private and public partnerships.
- Through a community-wide survey to define the scope, results from 513 participants were later summarized in a 2-page brochure and widely distributed online and in hard copies to raise the level of engagement in the HIA (Appendix 5).
- Using information from the community-wide survey and focus groups, the workgroup summarized feedback and prioritized three areas of focus for the HIA: 1) availability of affordable housing, 2) housing quality or maintenance to avoid deterioration and 3) fair housing. Details of all the meetings and the summary brochure to stakeholders are in Appendix 4 and Appendix 5
- All stakeholders engaged in this project were added to the LUHRT email listserv to receive continued communications and project updates.

Housing Affordability and Health

Housing is considered affordable if the costs of the rent or mortgage, insurance, utilities, taxes and repairs are 30% or less of a household's income (15). Michigan State Housing Development Authority (MSHDA) uses a 28%-35% standard based on debt to income ratio. Following stakeholders' engagement sessions, the workgroup started with the assumption that living in unaffordable housing not only strains an individual's or family's finances, but puts considerable strain on their health based on the policy brief from the Center for Housing Policy (16). Because direct housing costs are inflexible, individuals and families would cut back on other important expenses, such as reducing their food and clothing expenditures, not refilling prescriptions, etc... A reduction in work hours or other financial setback (such as a health-related emergency) can result in getting behind on rent and housing instability. This would often add to both immediate health risks and long-term stress and unsafe living conditions.

Housing Quality and Health

Probably the strongest link between housing and individual health is via housing quality. Housing quality is influenced by a constellation of factors, some within the sphere of influence of tenants and others under the control of the property owner. Housing quality that abides by HUD Housing Quality Standards is decent, safe and sanitary. Substandard housing is associated with outcomes such as injury, respiratory infections, heavy metal poisoning, such as lead, and asthma (17). Maintenance and renovation of existing affordable housing units leads to improved housing quality and consequently improved health.

Fair Housing and Health[18]

The Fair and Federal Housing Act refers to Title VIII of the U.S. Civil Rights Act of 1968. This federal law was amended in 1974 and 1988; it serves as a protection of each individual's right to equal housing opportunity without discrimination based on race, color, religion, national origin, sex, disability, and/or familial status (the presence of children).

In Michigan, the Elliott-Larsen Civil Rights Act (1976) and the Persons with Disabilities Civil Rights Act includes all federal protections as well as age, marital status, height and weight. Local ordinances provide added protection against discrimination based on additional criteria. Examples of added protection for different communities include: Ann Arbor condition of pregnancy, source of income, family responsibilities, educational association, sexual orientation, gender identity or HIV status are added protection criteria; Ypsilanti sexual orientation, educational association, or source of income; Lansing, student status, veteran status, political affiliation or belief, sexual orientation, gender identity, gender expression, or source of income; East Lansing, sexual orientation, student status, use of adaptive devices or aids or legal source of income and in Jackson, source of income.

Scoping Pathways

The workgroup drafted three diagrams (pathways) to summarize the earlier discussions and scoping survey results and begin to show the connections between these three aspects of housing and health. The diagrams provide a visual representation to guide development of research questions, literature review and assessment.

The HIA workgroup agreed on three leading general research questions:

IN WHAT WAYS AND TO WHAT EXTENT DO HOUSING COSTS INFLUENCE HEALTH?

IN WHAT WAYS AND TO WHAT EXTENT DOES HOUSING QUALITY INFLUENCE HEALTH?

IN WHAT WAYS AND TO WHAT EXTENT DOES FAIR HOUSING ACCESS INFLUENCE HEALTH?

To chart a more specific work plan, the workgroup developed a scoping worksheet that included specific research framing questions on existing conditions and impacts, the indicators, the data sources, methods and priority-levels based on input from LUHRT stakeholders (Tables 3;4;5). Pathway diagrams were later revised when the ICE became available and specific recommendations for each of the three focus areas were provided as the "options" column in the pathway. Screenshots of the pathway diagrams and scoping sheets are inserted in the following sections.

FIGURE 2.

POTENTIAL HEALTH IMPACT FOR AFFORDABLE HOUSING PATHWAYS (1)

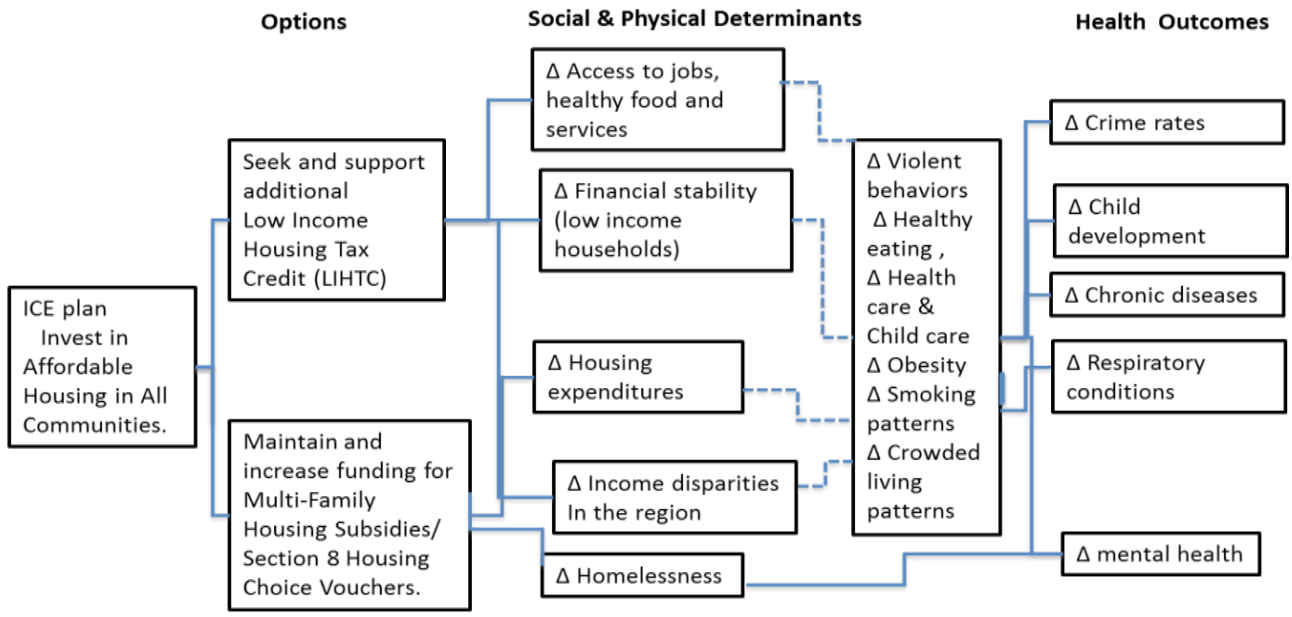


TABLE 3
LEADING INITIAL QUESTION: IN WHAT WAYS AND TO WHAT EXTENT DO HOUSING COSTS INFLUENCE HEALTH?

Existing Conditions Research Questions	Impact Research Questions	Indicators	Data Sources	Methods
What are the major demographic, socio-economic and other determinants linked to housing?	How will investing in affordable housing in all communities affect vulnerable groups?	Population, unemployment, poverty, age, ability, minority status, family type. Determinants include: Income inequality, housing affordability, access to healthy food and violent crime rates	-American Community Survey -ICE Housing Plan study -HCC Literature	-Secondary data analysis -Literature review
What is the current distribution of housing needs compared to availability?	How will maintaining and increasing subsidies for rental units satisfy the existing needs?	Housing availability and needs data	ICE Housing Plan RAH study	-Focus groups--Meeting notes -Secondary data analysis -Literature rev
What are the major affordable housing concerns that may affect health behavior?	What impact do changes in housing affordability have on certain health determinants or behavior such as spending on healthy eating and reduced stress levels?	Housing costs and spending patterns	ICE Housing Plan RAH study Literature review	-Focus groups -Meetings notes -Secondary data analysis -Literature review
How is poor nutrition linked to obesity and diabetes as chronic diseases?	How will a change in affordable housing lead to a change in chronic disease outcomes?	Obesity status Diabetes level	Healthy! Capital Counties; (HCC)	-Secondary data analysis -Literature review
To what extent do housing costs influence stress levels?	How will a change in affordable housing lead to a change in mental health/ quality of life?	Mental health data	HCC	-Literature review

FIGURE 3

POTENTIAL HEALTH IMPACT FOR HOUSING QUALITY PATHWAYS (2)

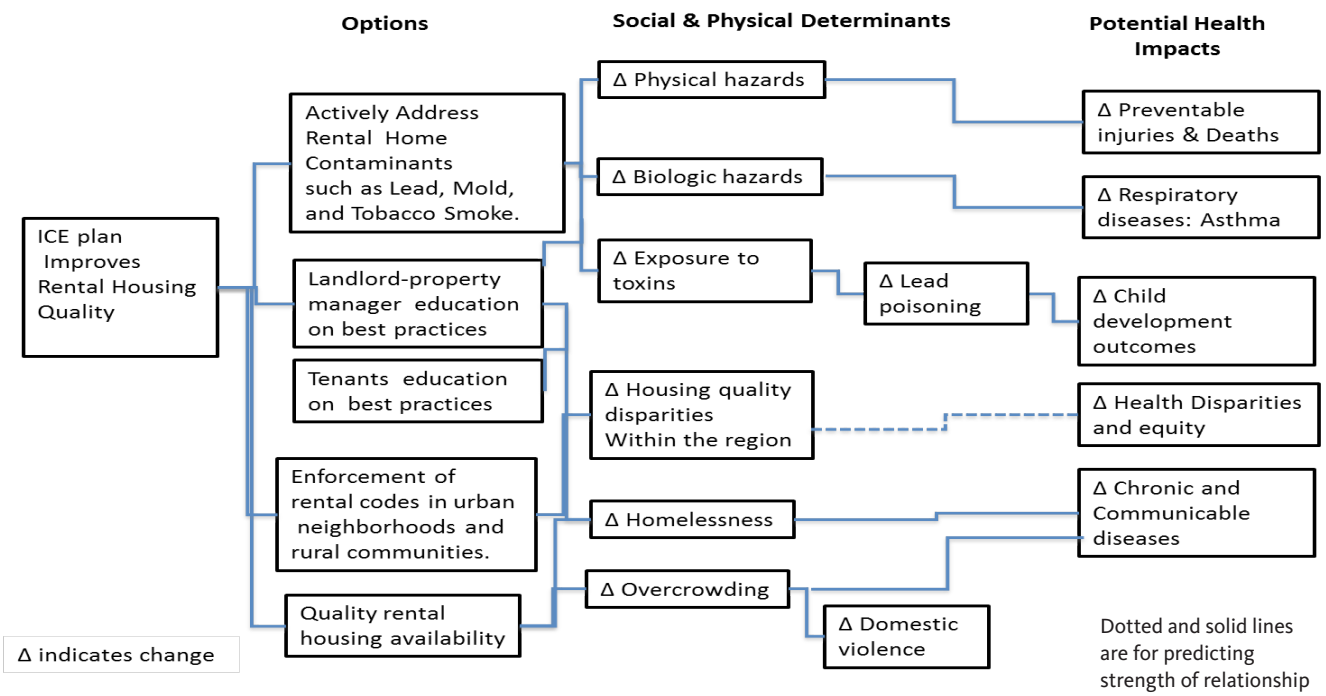


TABLE 4.
LEADING INITIAL QUESTION: IN WHAT WAYS AND TO WHAT EXTENT DOES HOUSING QUALITY INFLUENCE HEALTH?

Existing Conditions Research Questions	Impact Research Questions	Indicators	Data Sources	Methods
What segments of the populations are more affected by low quality (poorly maintained) housing in Mid-Michigan?	How will investing in improvement to owner occupied housing communities affect vulnerable groups?	Population, unemployment poverty, age, ability, minority, family type	-American Community Survey -ICE Housing Plan study -H!CC Literature	-Secondary data analysis -Literature review
What is the policy and enforcement status of monitoring housing quality in Mid-Michigan?	How will addressing housing quality in the ICE Housing Plan change the policy formulation/ enforcement at the local level?	Housing availability and needs data	ICE Housing Plan RAH study	-Focus groups -Meetings note -Secondary data analysis -Literature review
What are the health indicators in the tri-county region that would be associated to housing quality directly or indirectly?	How will addressing housing quality in the ICE Housing Plan change the health of vulnerable groups?	Lead poisoning, mental health, asthma, obesity, diabetes	RAH study Literature review	-Focus groups -Meetings notes -Secondary data analysis -Literature review
How does currently reported local health status compare to housing quality indicators (lead, mold, smoke	How will addressing housing quality concerns change some of the indicators leading to poor health?	Lead, mold, smoke	Primary data: (ICHD complaints analysis) and secondary data (ICE Housing Plan survey results of HIA specific questions)	-Secondary data analysis -Literature review -GIS mapping
How does poorly maintained housing affect neighborhood destabilization?	How will addressing housing quality contribute to neighborhood stability?	Level of crime and age of housing	Secondary data	-Secondary data analysis -Literature review

FIGURE 4

POTENTIAL HEALTH IMPACT OF ADDRESSING FAIR HOUSING PATHWAYS (3)

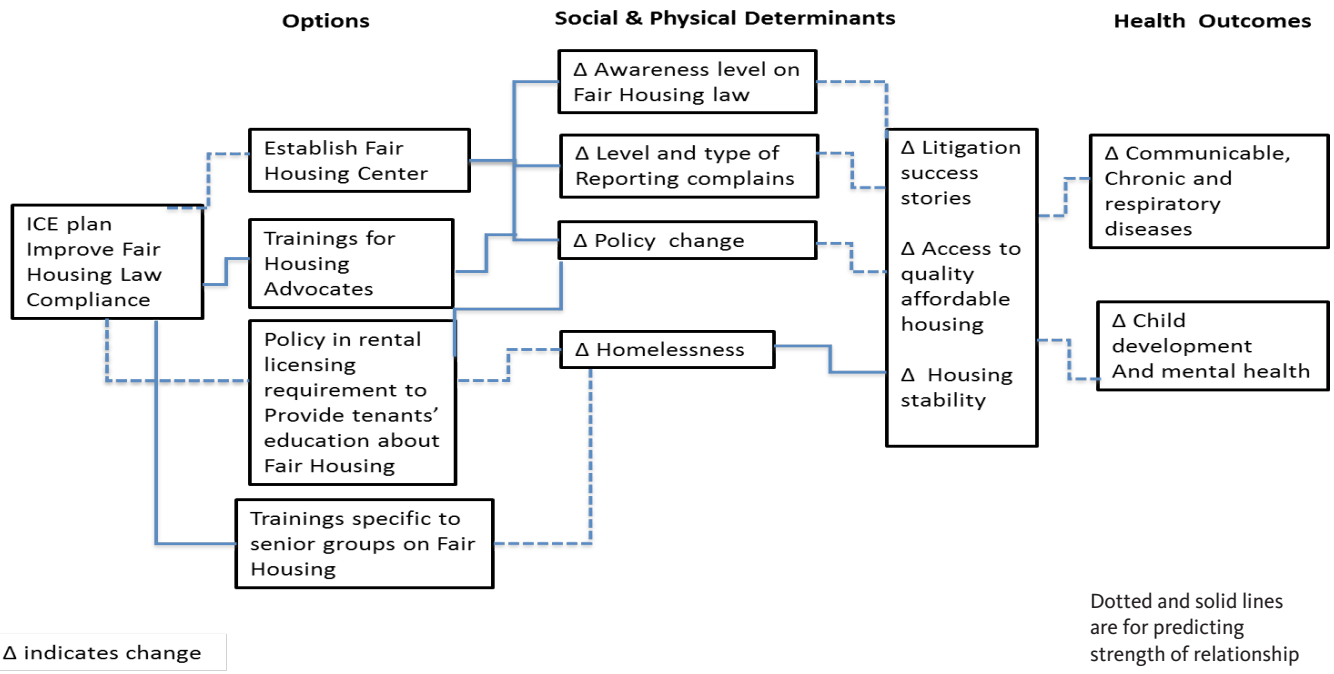


TABLE 5.
LEADING INITIAL QUESTION: IN WHAT WAYS AND TO WHAT EXTENT DOES ACCESS TO FAIR HOUSING INFLUENCE HEALTH?

Existing Conditions Research Questions	Impact Research Questions	Indicators	Data Sources	Methods
What is the current housing and income segregation distribution in Mid-Michigan?	Would addressing affordable housing issues change the income and housing segregation status?	Income and housing segregation index	-American Community Survey -H!CC	-Secondary data analysis -Literature review
How are Fair Housing complaints reported?	Would establishing a Fair Housing center change the level and type of reporting?	Number and type of concerns reported	ICE Housing Plan RAH study	-Focus groups -Meetings notes -Secondary data analysis -Literature review
What is the status on variety of housing availability vs need for the vulnerable (seniors and persons with disability)?	Would addressing the need for variety of housing type change perception on fair housing practices?	Status of housing options	ICE Housing Plan RAH study Literature review	-Focus groups -Meetings note -Secondary data analysis -Literature review
How is housing discrimination linked to health outcomes?	Would programs that promote access to better neighborhoods and lifestyle opportunities address any identified health determinants, behaviors or outcomes?	Physical and mental health linked to poor neighborhood and housing instability	Literature review	-Secondary data analysis -Literature review

Defining Health Indicators, Measures and Data Source

We used the Healthy! Capital Healthy Capital Counties report to further define selected indicators, measures, and data sources. Because counties are usually not homogeneous in their geographic and socio-economic distributions, it was important to acknowledge the differences within each of the counties. The Healthy! Capital Counties (HCC) report provides a good framework and a set of health assessment data to refer to for this purpose. In the HCC report, the Tri-County region was divided into five geographic and socio-economic groups. The urban area was grouped into three subgroups based on home value (urban low price, urban mid-price and urban upscale), while urban and suburban areas were divided into four subgroups based on home value and density (farms and fields, country-side suburbs, small cities and inner suburbs). For example, housing segregation is higher in mid-price urban areas than it is in either low-price or high-price urban areas. The percent of people living in food deserts is over 3 times higher in urban low-price neighborhoods (26%) than in urban-mid price (8%). Just like the *ICE Housing Plan* study provides good background data on housing conditions in this region, the HCC provides good assessment background information for the health conditions needed for an HIA because it is the most recent compilation of health data in the region.

TABLE 6.
INDICATORS, MEASURES AND MAIN DATA SOURCES

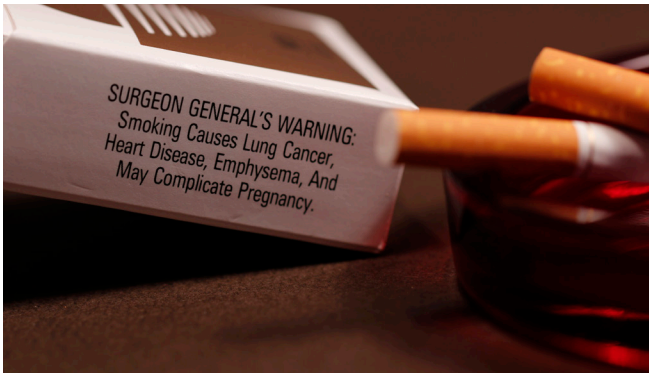
Indicator	Measure	Data Source
Child Health	Prevalence of children 6 yrs.' old and under with elevated blood lead levels (BLL >= 5µg/µg/dL)	STELLAR, CDC- For more than 20 years, STELLAR has been the data source used by many state and local childhood lead poisoning prevention programs (CLPPPs) for blood lead surveillance, collection of environmental samples, and individual and environmental case management.
Mental Health	Poor Mental Health (defined as having fourteen or more days of 'not good' mental health in the past thirty days)	2008-2010 Capital Area Behavioral Risk Factor Survey (19)
Chronic Disease	Diabetes Prevalence Disability Prevalence	2011-2013 Capital Area Behavioral Risk Factor Survey
Respiratory Conditions	Preventable Asthma Hospitalization Rate	Michigan Health and Hospitalization Associate (MHHA) Hospital Discharge data via MDCH
Health Behavior	Current Smoking in Adults Adult Weight, Overweight and Obesity	2011-2013 Capital Area Behavioral Risk Factor Survey (20) 2011-2013 Capital Area Behavioral Risk Factor Survey (20)
Social Determinants of Health	Food Access: Percentage of households with no car and low access to a grocery store	County Food Systems Profile compiled data by the Food Systems Workgroup (21); USDA Food Environment Atlas (22) 2013-2014 American Community Survey (23)

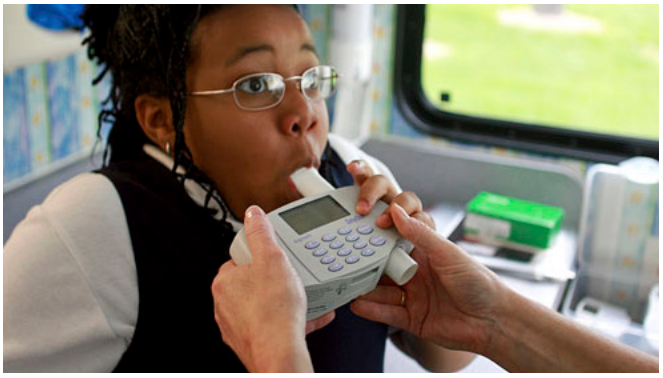
Assessment Process

In the assessment phase of the HIA, the workgroup engaged stakeholders and the advisory team (through LUHRT), in order to focus assessment efforts and fine tune the research questions initially proposed. The researcher from the RAH study was invited to present the expert interview results from her study and collect more insights from the LUHRT partners. In addition, HIA project staff conducted follow-up expert interviews with representatives from Capital Area Community Services, the Center for Financial Health, City of Lansing Planning and Neighborhood Development division, Delta Township administration officials, Habitat for Humanity Michigan AmeriCorps volunteers, Housing Services for Eaton County, and St. Vincent Catholic Charities Refugee Services.

During this process (October–December 2013), the HIA project team continued to seek out both research and policy publications and local area data from groups providing housing and health-related services in the tri-county region which could assist in assessing current needs and projecting future impacts from a regional *ICE Housing Plan*. In January 2014, project staff met with the research and planning team from the GLHC who were then drafting the regional *ICE Housing Plan* to share preliminary findings and potential recommendations. The project staff received an update on research findings and progress to date. Preliminary recommendations from the *ICE Housing Plan* and the RAH study summary were made available in June 2014, and were used to refine the initial HIA framing questions and pathways.

CURRENT CONDITIONS





Community Demographics

New American Community Survey (ACS) (23) data, with five year estimates (2008-2012) for smaller areas within the tri-county region was used in this section, along with data from the Healthy! Capital Counties (HCC) report compiled in 2012 (3). The city of Lansing, in Ingham is the population center in the region. Ingham County is more racial/ethnically diverse than the other counties, with twice as many Hispanic residents compared to Clinton and Eaton counties. Ingham County also has five times more Black residents than Clinton County. A large student low income population resides mostly near Michigan State University in the City of East Lansing, mostly in rental properties.

Table 7 shows that Ingham County has a higher level of income inequality measured by the Gini coefficient than the two other counties, meaning that the available income is concentrated in a smaller percent of the population. Housing segregation, however, is lower in Ingham than in the other two counties, which means that it is more likely for a minority headed household to live nearby white-headed households than in the other two counties.

Table 7 summarizes the data across each of the county in the region, using major demographic, economic and vulnerable group indicators for this study such as population size, family type, poverty rates and percent seniors, and percent persons with disability.

TABLE 7.
SOCIAL DETERMINANTS OF HEALTH

Social Determinants Characteristic/Indicator	Clinton County	Eaton County	Ingham County	Tri-County
Opportunity Measures				
Income Inequality (Gini coefficient (22): 0 is total equality 1.0 is total inequality i.e. 1 person has all the income)	.41	.37	.46	.43
Housing Segregation (23) (0 is total integration of races, 100 is total segregation)	.35	.48	.3	.42
Housing related social factors				
Affordable housing (30% household income or less goes to pay for housing costs)	29.1%	29%	37%	34%
Access Healthy Food (Percent of population living in a food desert)	12.3%	11%	13%	12%
Violent crime rate/1000	60	160	439	320

TABLE 8.
DEMOGRAPHIC, SOCIO-ECONOMIC AND VULNERABLE GROUPS BY COUNTY

Characteristic/Indicator	Clinton County Totals and % of population	Eaton County Totals and % of population	Ingham County Totals and % of population
Total Population 16yrs +	59,200	86,094	229,751
Percent unemployed	7.6%	10.0%	10.1%
Percent Below Poverty	11.2%	9.9%	21.5%
Family type: 2 + Adults (husband and wife) with children (under 18 years old)	6,751 23.5%	8,208 18.9%	17,599 15.8%
1 Adult (female or male) with children (under 18 years old)	2,145 7.5%	3,990 9.2%	10,801 9.7%
People with Disability	5,742 9.7%	13,284 12.4%	33,135 11.9%
Seniors 65 +	9,962 13.2%	15,205 14.1%	29,631 10.5%
Racial Minority (Black and Hispanic)	Black: 1,532 (2.0%) Hispanic: 2,944 (3.9%)	Black: 6,262 (5.8%) Hispanic: 5,139 (4.8%)	Black: 31,215 (11.1%) Hispanic: 20,463 (7.3%)

"More than half of the tri-county region households suffer from a housing cost burden; with aging population there will be an increased need for a variety of affordable housing options; renters, low income residents, younger adults and students are the most likely to cut back on health care needs in order to set aside money for housing costs."

Current Housing Conditions

HOUSING AFFORDABILITY

In 'The State of the Nation's Housing 2014' (24), researchers at Harvard's Joint Center for Housing Studies concluded that families with children who face severe housing cost burdens spend approximately one-fifth as much on healthcare as similar families whose housing is affordable. Similarly, they found that seniors who spend more than half their income on housing spend an average of $150 less per month than their counterparts on other expenses. Unaffordable housing is problematic, because in a household budget, rent or mortgage cost, often take precedence over other items cost (i.e. groceries, utilities, medical copays, or repairs). Since many of the cost associated with health and a healthier lifestyle are considered discretionary, they are allocated a small fraction of the household budget, if they are allocated anything at all.. The following information is derived from an interactive map of the United States that compiles data from the Lansing-East Lansing metro region (24).

The RAH study provided information about the current regional housing affordability situation in the mid-Michigan. The data provided in this section is a very brief summary from the RAH study. For an in depth analysis of current status, please refer to the study.

Demographic, socio-economic and geographic factors: Families with income below the federal poverty level (25) and the elderly are the two major groups suffering from lack of affordable housing. Lack of affordable single-family units housing was a concern throughout the region and for seniors in particular for Clinton and Eaton respondents of the RAH study. In the Lansing area urban core, the housing index indicates that housing prices are lower than they are in the suburbs.

In contrast to homeowners, renters in the urban core of the Lansing area face much lower affordability. The average renter household in the tri-county region spends over 38% of household income on housing costs; this is mostly among those making less than $35,000 annually. While the rent in Lansing is less expensive than in suburban areas, household incomes in Lansing also tend to be lower than in the suburbs. Lower quality housing accounts for higher costs. Older or poorly-built houses can have high energy costs and contain lead and asbestos hazards. Often times, landlords' fail to address concerns, which can burden renters with repair costs and/or frequent relocation. Lack of available, affordable rental units such as subsidized housing, was a major concern in Eaton and Clinton Counties; this can sometimes affect the ability of low-income City of Lansing residents to access jobs in Eaton County. Coordination of transportation plans with housing plans is essential to address this situation.

Major concerns regarding housing affordability according to the RAH study findings:

- On average, owner-occupied housing is affordable in the mid-Michigan tri-county area.
- Rental housing is not affordable for over 90% of extremely low-income households.
- Subsidized housing for low and very-low income households is very scarce relative to the need.
- The Boomer population (46-65 yrs.) will begin to downsize in the near future which may lead to a glut of larger homes.
- Boomers and millennials, due to age and familial status, may compete for smaller housing units within walking/transit distance to attractions and services.
- Affordable senior housing and assisted living will be in even greater demand.
- Rising transportation costs will impact suburbanization.

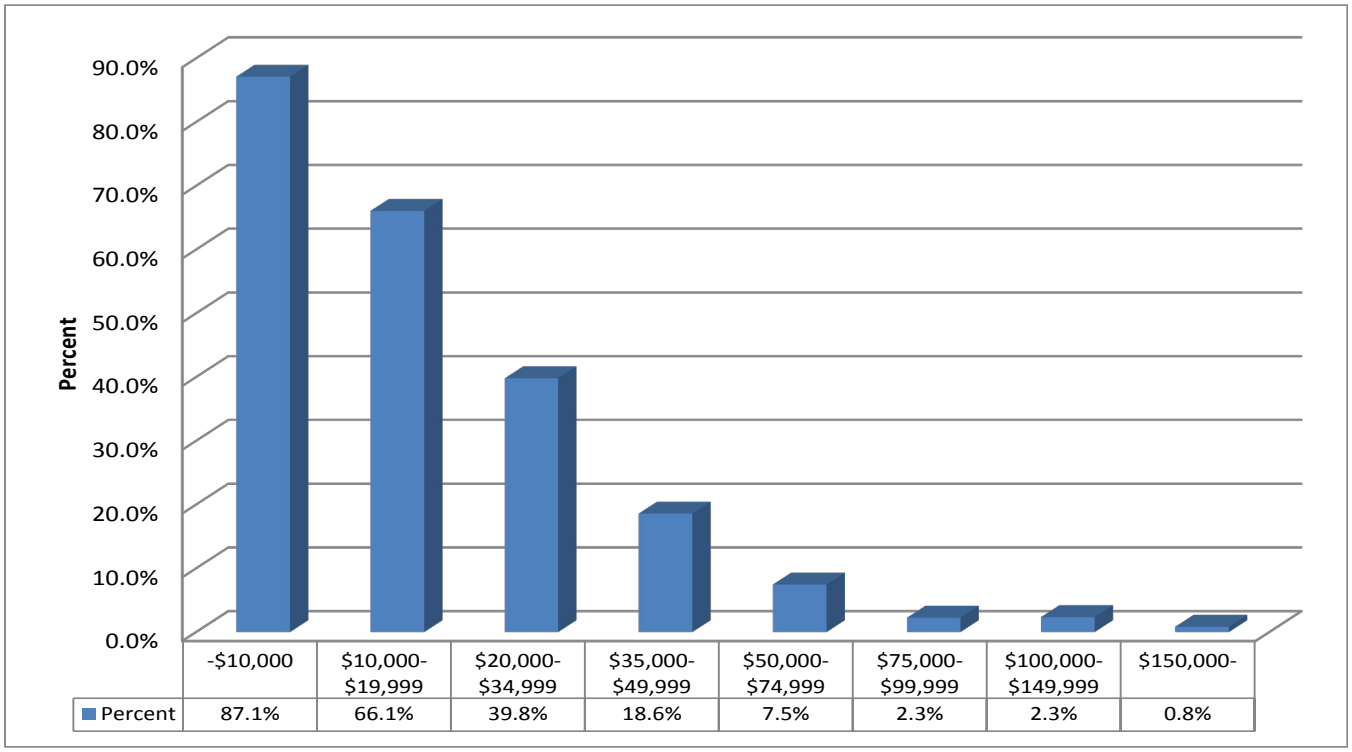
TABLE 9.
HOUSING BURDEN DISTRIBUTION IN THE MID-MICHIGAN TRI-COUNTY REGION (2)

Share of households with cost burdens* (%)	34.7
Share of households with severe cost burdens** (%)	18.5
Household cost burden rank among metros or micros	136 (of 381)
Households with cost burdens	62,930
Household median income ($)	49,000
Household median monthly housing costs ($)	853

*Cost burden is defined as paying more than 30% of income on housing costs,
**Severe cost burden is defined as paying more than 50% of income on housing costs.

FIGURE 6.

PERCENT OF HOMEOWNERS WHO SPEND OVER 30% OF THEIR INCOME ON HOUSING—2012 AMERICAN COMMUNITY SURVEY 1-YEAR ESTIMATES



"More attention should be given to Clinton and Eaton counties in planning for affordable housing for more proportional allocation of affordable housing compared to population size. In Ingham County addressing housing foreclosure rates should remain a priority to maintain safe and viable neighborhoods."

Vulnerable groups mostly affected by high housing costs:

The original RAH study was designed using a template provided by HUD, and after additional conversation between HIA workgroup and RAH study partners, GLHC investigators included a couple questions related to health to the original survey given to area residents. The questions addressed housing affordability and quality in relation to health and the analysis lead to identifying vulnerable groups mostly affected by costs and quality of housing.

"Since moving into your current residence, have you had to use money that was meant to be used for healthcare (for example, visiting a doctor or dentist) and use it for housing expense instead?"

- Owner vs. Renter: 17.9% (51 out of 286) vs. 19.8% (40 out of 202)
- Low-income vs. others: 34.7% (42 out of 121) vs. 13.8% (54 out of 391)
- Seniors vs. Younger Residents: 10.1% (13 out of 129) vs. 22.3% (83 out of 372)
- Students vs. Others: 25.3% (46 out of 182) vs. 18.8% (96 out of 512)

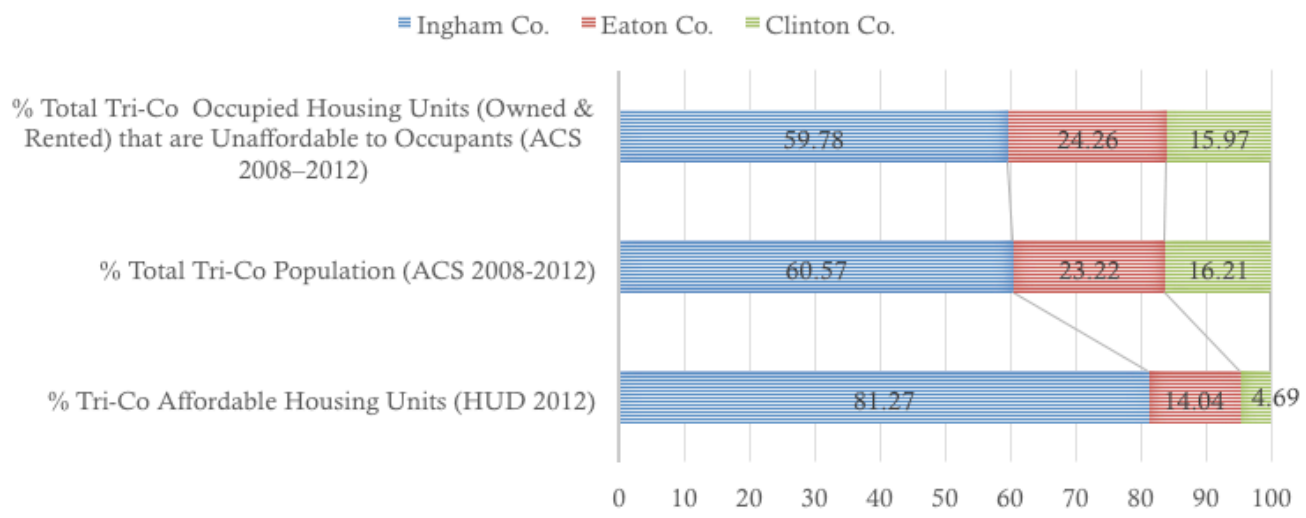
These findings from the RAH study will be used in addition to other demographic data to guide the HIA workgroup to develop recommendations that address specific segments of the population such as renters, low-income and young student populations, and seniors groups.

Affordable housing needs compared to availability: The HIA workgroup investigator was interested in assessing the need for affordable housing compared to the availability in each of the counties, using data from the American Community Survey. The following figure is a summary of data for this comparison. Ingham County has the largest share 81%, of affordable housing units in the tri-county region, more than its proportion of population in the region, which is 60%. Clinton County has less than 5% of affordable housing units while having 16% of the total population. Similarly, Eaton only has 14% of the regional allocation for affordable housing units, while it has almost a quarter 23% of the region's population.

Neighborhood concerns: Owner-occupied homes that become unaffordable contribute to property owners defaulting on mortgage or on tax payments, which subject the property to foreclosure and increases the vacancy rate in the neighborhood. Poorly maintained, vacant housing stocks in a neighborhood can contribute to neighborhood blight and decreases in surrounding property values, making a neighborhood less attractive to new residents or businesses. High property vacancy rates can lead to higher crime in a neighborhood, particularly property and drug crimes, such as "stripping" empty houses of copper and other valuable materials, squatting, and using empty houses for a variety of other illegal activities. The ripple effect of a lower tax base translates into lower government revenues for services to address safety and maintain quality neighborhoods. According to data from the Ingham County Register of Deeds Office, presented in summer 2014 (26), the annual number of foreclosures in Ingham County increased four times from an average of 600 per year in 2004 to a peak of 1800 in 2008 during the recession peak time and is now slowly decreasing. It was back to 800 in 2014. The tax base decreased nearly 8% during the same time period.

FIGURE 7.

NEED AND AVAILABILITY OF AFFORDABLE HOUSING UNITS PER COUNTY AS PROPORTION OF THE TRI-COUNTY REGION



Data Source: American Community Survey and HUD Data (23)

HOUSING QUALITY (MAINTENANCE)

Improving housing quality through federal programs or in the open market would reduce negative health impacts from inadequate or unhealthy housing. In a Minnesota program, low-income housing that was rehabilitated with improved ventilation and use of sustainable building products was combined with "Healthy Homes" training. The outcome was a significant improvement in overall health, including asthma and non-asthma respiratory problems (27). Coordinated remediation efforts based in local laws and housing codes would yield multiple health benefits, and this holistic approach is the basis for the Green and Healthy Homes Initiative, which is also becoming part of the health and housing efforts being made in the Lansing area (28).

Maintaining the quality of housing stocks not only protects the property from decreasing housing values and the neighborhood from destabilization, it also has an effect on the health of current or potential residents, particularly factors related to heating, lead and asthma-causing conditions that are of concern for this HIA. In Ingham County lead abatement such as "Lead Safe Lansing" and "lead Safe Program" are offered (Appendix 6). Individuals who are more likely to be sensitive to indoor air quality such as seniors, families with young children, and persons with respiratory conditions are especially vulnerable to poor housing quality. Housing quality "current conditions" for this HIA rely on age of housing stock (pre-1980), median rental cost data from the American Community Survey (ACS), complaint data compiled by partners, and a review of rental housing policies.

Most of the areas with the highest percentage of pre-1980s housing (as much as 90%) are located in Lansing. There is also a high proportion (three-fifths or more) of older homes in some Clinton County areas (St. Johns, Eagle) and in rural (Farms & Fields (defined as townships with a population density of< 419 persons/ square mile and a median home value of < $167,000)) areas. Older housing stock is more likely to expose residents to environmental health risks including lead and asbestos hazards. Poorly maintained housing can lead to health-harming dampness, mold, pest infestations, CO poisoning, fire hazards and trip-and-fall hazards.

The three zip code areas with the highest percentage of pre-1980 housing (Lansing 48906, 48910, and 48912) have the lowest median home values. Conversely, those zip code areas with the highest median home value have some of the lowest percentages of pre-1980 housing. Less than 50% of housing in the Bath and Meridian townships were built pre-1980; these two communities have experienced more student housing and single family homes build up in recent years.

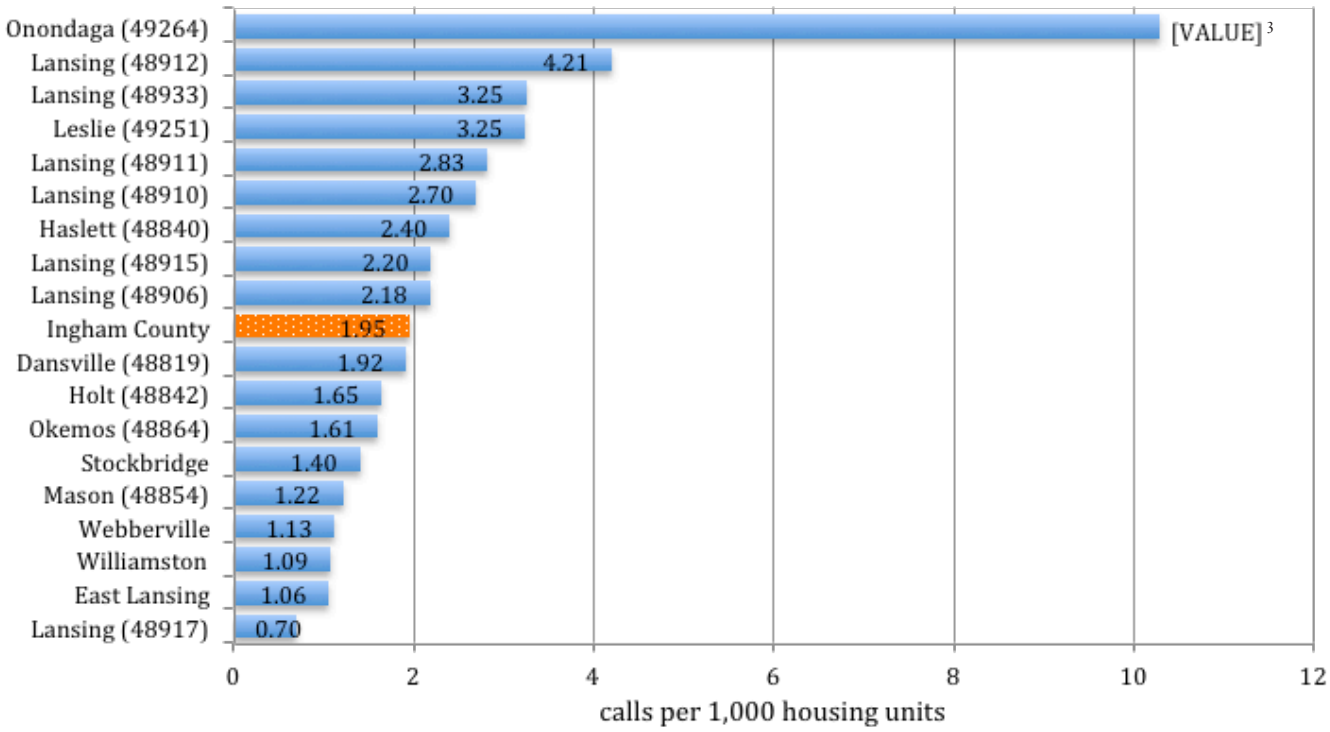
ACS cross-tables linking housing age and median rents reveal that often the more affordable rental housing in an area (units with the lowest median rent, lower than the average for the area as a whole) is housing dating from the 1940s–1970s (29), housing units old enough to be of particular concern for the presence of lead, the effort and cost required for general maintenance, and lack of weatherization. In the tri-county region with the exception of the university-centered 48823 zip code, very little rental housing has been built in representative urban areas (48910, 48911, and 48912) since the year 2000. In the 48912 area, very little rental housing has been built in the past thirty years.

Aside from age of housing stocks as a predictor of housing quality, the HIA relied on: data compiled from the *ICE Housing Plan* survey, complaints received by the ICHD Environmental Health Bureau, and qualitative data collected during the series of HIA community engagement sessions and from focus group summaries in the *ICE Housing Plan* report.

The timing of the HIA allowed the HIA workgroup to influence the RAH study survey by adding an important question (below) that demonstrates the relationship between housing quality and health.

FIGURE 5.

AIR QUALITY ASSISTANCE REQUEST CALLS PER 1000 HOUSING UNITS



Data Source: Logs of Complaints (1/2011-8/2013), Ingham County [3]

3. Note: Onondaga has no code enforcement so all indoor air calls are directed to the Ingham County Health Department. All other small areas in Ingham County have part time enforcement. Also of all the zip codes 49264 has the smallest number of housing units 778, so while there were the same number of calls for Leslie and Onondaga in the same period, it resulted in big variations in calls/units because Leslie has 3 times as many housing units as Onondaga.

"Since moving into your current residence, have you had any injuries or other health problem that you think might be linked to poor housing conditions, such as poor indoor air quality, mold, pests, inadequate heating or air conditioning system?"

The results of the survey showed disparities in the proportion of persons responding "Yes" to the aforementioned question. Air quality related health concerns resulting from mold, pests and inadequate heating or air conditioning systems were more likely to be prominent to low-income residents, renters, and younger student populations.

- Owner vs. Renter: 8.7% (25 out of 286) vs. 20.3% (41 out of 202)
- Low-income vs. others: 27.3% (33 out of 121) vs. 9.2% (36 out of 391)
- Seniors vs. Younger Residents: 9.3% (12 out of 129) vs. 14.2% (53 out of 373)
- Students vs. Others: 21.3% (39 out of 183) vs. 13.5% (69 out of 512)

Aside from these survey results, calls to the ICHD Environmental Health Division for mold assistance were compiled for this HIA. Although local area data is only available for Ingham County, calls to the ICHD Environmental Health Division suggest an overall pattern of concern, with higher proportions of calls often coming from areas with older housing and a higher proportion of rental units. This supports the above stated finding about renters more than owners having concerns about air quality issues.

The HIA researcher analyzed the sources of calls based on individual communities in the region to identify clusters of concerned residents and older housing stock. The highest proportion of calls (a cluster) came from Onondaga3, a small rural zip code area (less than 800 houses mostly with damp Michigan basements, high agriculture use of land that can cause erosion, a high water table and poor drainage); most of the other high-call areas are in Lansing, where there are substantial proportions of both renters and home owners. Another high-call city-township area, Leslie, one of the representative Farms & Fields communities, fits the profile with a high proportion of older housing stock (over 60%) and a higher percentage of renters than other Farms & Fields communities. Although similar IAQ call data is not available from Eaton County, Denise Dunn (Housing Services of Eaton County) notes in an interview (11/18/13) that "mold is a problem," and that the lack of codes for rental properties means that tenants can find themselves in unhealthy situations. Dunn states this is more problematic for independently owned rental properties rather than those owned by larger companies.

Balancing the need for affordable housing while maintaining older properties to prevent negative health conditions such as lead poisoning and asthma, is a major struggle for this region, particularly in the City of Lansing and surrounding small older farm area cities.

QUALITATIVE ANECDOTAL EVIDENCE ON HOUSING QUALITY FROM STAKEHOLDERS' ENGAGEMENT MEETINGS:

HIA stakeholders' meetings highlighted several housing quality concerns that they felt the *ICE Housing Plan* needs to address. The following is a list of the meetings and a summary for each. All of these statements have been reviewed and approved by stakeholders involved.

MEETING WITH INGHAM COUNTY TREASURER ERIC SCHERTZING, APRIL 2013

The Ingham County Land Bank recognizes two important housing quality issues and tries to address them: a) Some landlords are uninformed about allergen causing agents in homes; b) Energy inefficient homes are more costly in the long run and will lead tenants to save on energy costs by seeking government assistance or by limiting the heat in the house which leads to poor health concerns.

ICE HOUSING PLAN FOCUS GROUP MEETING ON HOUSING QUALITY AND HEALTH IN CHARLOTTE (EATON COUNTY), APRIL 2013

There is a lack of adequate resources for seniors or residents with disability who want to stay home but can't maintain their property as needed.

Drug addiction leading youth to homelessness was linked to mental health issues and the methamphetamine labs that are increasingly a problem in rural areas, damaging homes and youths.

MEETING WITH TENANTS AND TRANSIENT PERSONS/RECENTLY EVICTED RESIDENTS WHO LIVE AROUND CHARLOTTE AND SEEK SERVICES AT THE EATON COUNTY HEALTH DEPARTMENT AND EATON COUNTY HOMELESS COALITION, MAY 2013.

There are issues that act as barriers to home maintenance by landlords sometimes. Even when landlords are willing to fix a housing maintenance problem, family conditions and finances are an issue. For example, to fix a cockroach infestation, a family of six is asked to move out of the house for a week. Who will pay for a hotel/motel for a week? This creates a barrier to fixing the problem. If the law is enforced by the city or township, then sometimes that would mean temporarily placing the family in a shelter.

There is not enough data about the depth of housing quality issues in this region and likely insufficient resources in local communities to do housing inspections of all the stocks in each community. There is a housing quality data gap.

There is a lack of financial literacy and home maintenance skills/knowledge training in the education system. High school graduates eligible to rent or own are sometimes unprepared to maintain a house.

There are legal barriers, and scope of work limits the extent of what local health departments in this region can do on behalf of renters. For example, while there is authority in the public health code to address imminent dangers, such as a mercury spill or meth lab, more gradual dangers (like mold, bugs) are not so well defined; thus, often time advocacy on such issues is mostly limited to providing education materials to tenants and landlords, and organizing for policy changes, but no legal authority to condemn in court.

MEETING WITH LANDLORDS OF MID-MICHIGAN ASSOCIATION BOARD MEMBERS, MAY 2013.

Animal ownership, code inspection policies were the main issues that rose at the meeting.[4] There is a perception that "low-income people who are struggling to make their monthly rents and living expenses are more likely to own pets to help them go by their daily emotional struggles than others". Pets may carry home allergens and damage property if not properly maintained.

Code compliance is not enforced in owner-occupied properties as it is in rental properties. When it comes to animals, negligence leads to poor home hygiene which in turn leads to related health issues. Home owners can be negligent with pets and not pay penalties. That unfairly targets rental property owners, who end up paying more fees and fines to keep up with code compliance. That added cost is transferred to the tenants in the monthly rent. Tenants should be required to have added rental insurance if they own pets and be offered a pet care and healthy home maintenance education class by the county health department.

The major home maintenance quality issue landlords face aside from aging housing stocks is related to feeling unfairly targeted by the burden of code compliance fees compared to home owners. "If triggers of unhealthy home conditions are affecting the public health of mid-Michigan residents then the inspection rules should apply to all property owners not just rental properties".

4. Reviewer note- Sometimes landlords have an inherent bias in the reporting by rental property owners; it is sometimes easier to shift responsibility onto renters and alleged pet ownership skills than accept some negligence on their part.

"Deteriorated housing quality leading to poor health is a complex problem that involves multiple layers of stakeholders and factors. There is a need for a coordinating regional organization to encourage continuous communication among stakeholders and to address the factors leading to poor housing quality."

BATH TOWNSHIP AND CITY OF ST. JOHNS STAKEHOLDERS' MEETING, MAY 2014

In Clinton County the main concerns raised in the HIA meeting attended along with *ICE Housing Plan* focus groups were access to services and lack of diverse housing options for seniors. The comments related to housing maintenance or quality, were as follows:

While building codes exist for rental property maintenance, people do not have resources to maintain the rental units so we cannot really enforce the code for fear of displacing them.

Multiple generations living in the same house creates stress to the host and the couch surfers or other dwellers, causing more housing maintenance care problems.

In the farmland areas, there are several hundred Spanish-speaking people who live in substandard housing but family farms cannot operate without them. Most are homeless; if they can navigate into cities they can access better resources, but most are ineligible for most services because they are not counted.

Some communities have limited enforcement capacity and no local rental association advocating to enforce existing codes in the law and control abusive slum lords

RENTAL POLICIES RELATED TO HOUSING QUALITY ASSESSMENT BY ENVIRONMENTAL EQUITY SPECIALIST AT ICHD AND CITY OF LANSING COUNCIL MEMBER JESSICA YORKO (AUGUST 2014).

In Lansing, East Lansing and Meridian Township, owners of residential rental property are required to register the property and allow scheduled and complaint-driven inspections for compliance with the International Property Maintenance Code. Delta and Delhi Township require rental registration and inspection, but neither the frequency nor fees are clear. Other communities in the region do not appear to have residential rental registration or inspection programs.

For the three jurisdictions that operate rental registration and inspection programs, there is great variability in fees and inspection frequencies. East Lansing and Meridian Township charge higher registration and inspection fees than Lansing and inspect more frequently. The greatest difference in inspection frequency is for dwellings with 1-2 units, which are inspected annually in East Lansing and Meridian Township, but only every three years in Lansing. Also, both Meridian Township and East Lansing charge a "Safety Complaint Inspection Fee", whereas Lansing does not, which could hamper the ability of code officials in Lansing to be able to respond to code-related housing complaints. Code enforcement inspections in communities that have them are usually underfunded and limited in staff which would make it even more challenging if the current policy was to be expanded to include owner occupied homes. A comparison chart of inspection frequency and fees between the various communities in the tri-county region is included in the Appendix 7.

FAIR HOUSING SEGREGATION

Neighborhoods and community environments play an important role in health. There is an increase in empirical evidence that while the Civil Rights act of 1968 made it illegal to discriminate on the basis of race for owning or renting a residence, subtle and explicit discrimination still persist. Residential segregation leads to a concentration of poverty which is the root cause of several others factors of poor health (30).Such factors can include reduced access to educational and employment opportunities and to other resources that encourage healthy habits, including healthier food options and walkable neighborhoods. Segregation of this kind can also increase exposures to potentially hazardous materials. Racial residential segregation has also been found to be associated with increases in very preterm births in minorities (31).

Historically (1934-1968), housing segregation was enforced through policies such as "redlining," which literally meant that red lines were drawn on maps to indicate where persons of color could rent or purchase homes. While this practice became

illegal nationally in 1968 with the Fair Housing Act, previous decades of legal segregation are still apparent today (32).Over the past 40 years, demographers have noted an increase in Whites residing in areas outside the urban core. Just as communities with greater diversity in income can offer more opportunities for the poor to achieve well-being, more-integrated communities can offer increased opportunities for social interaction and mutual benefit. The 2010 census segregation (or dissimilarity) index shows that the Tri-County area is moderately segregated with index .48. An index of 60 or more is considered by demographers as highly segregated where Blacks live in exclusively or mostly Black neighborhoods and Whites live in exclusively or mostly White neighborhoods; an index level of 39-59 would be considered moderately segregated and an index level below 39 is less segregated." A zero index means each neighborhood has the same proportions of Black and White residents as the metro area as a whole". (33). Eaton County (index .48) is more segregated than Clinton County (.36) and Ingham County(.30). When asked in RAH study if they feel that our region is segregated 55% of respondents to the RAH study didn't think it was and those who did attributed that to poor English skills, followed by race and income according to the *ICE Housing Plan* report.

FAIR HOUSING COMPLAINTS:

The HIA scoping survey (Appendix 5) ranked fair housing as the third top issue for over 500 respondents; disability and limited English language issues in seeking good affordable housing were mentioned in HIA stakeholders' engagement discussions as fair housing concerns. The HIA workgroup decided to include fair housing because while housing discriminatory practices might exist, they are often under reported for various reasons including lack of knowledge about fair housing laws, and this HIA might unveil issues and their potential impact on health. The literature linking fair housing practices to health is not extensive, and the relationship may be confounded with other factors.

When asked "What are the main barriers to fair housing?" 20% of the 1,773 respondents to the RAH study survey said lack of high quality affordable housing, followed by 18% who said lack of affordable housing and 12% who said insufficient public transportation; none of these responses are officially recognized as fair housing issues. When asked if they ever heard of fair housing, 66% answered they were not informed about it. This shows a need for more information and possibly a fair housing center to raise awareness and address fair housing needs.

Based on a discussion with GLHC staff in May 2014 regarding complaints to the MSU Housing Law Clinic received in the last five years, most of the complaints in the tri-county area were based on not being allowed to rent at the market rate because of low-income, and thus were not considered an actual "fair housing" complaint using existing approved categories. Other fair housing complaints based on disability were resolved through educating landlords on how to best address the need of the potential renter and only one complaint ended up with a settlement. These complains, however do not reflect the extent of fair housing violations in the area. The reasons for this are:

The MSU Housing Law Clinic is a consumer advocacy and research clinic that offers free legal advice and assistance to consumers with housing problems in the tri-county area. It is not responsible for assuring fair housing protection in the general housing market, nor the civil rights protections in the policies and programs of HUD.

The fair housing center that covers this region is the Fair Housing Center of Southeastern Michigan located in Ann Arbor. Its distance from this area, hampers its efforts to educate, investigate, and advocate for residents in the tri-county area.

"About two third of the residents surveyed in this region answered that they were not informed about the fair housing concept. While the perception remains that fair housing is not an issue, the aging population may soon start to experience the limited housing maintenance resources for aging in place and that might result in fair housing issues."

LACK OF HOUSING OPTIONS

Lack of housing options indirectly leads to unfair housing opportunities, affecting some segments of the populations such as seniors and people with disability. A fifth of adults surveyed in the 2010 Behavioral Risk Factors Survey in this region suffer from some limitations due to physical, mental or emotional problems. According to the *ICE Housing Plan* report, in 2020 it is expected that the senior population will grow at a rate 11 times more than the rest of the population in this region. Projections of senior population trends found in the *ICE Housing Plan* report for this region require special consideration for adding options to the existing pool of housing styles. Some of the housing styles that would need to be added include assisted living, senior living communities, co-housing, shared housing, multi-generation housing, accessory dwelling units, grannies flat and smaller housing units. Increasing the rental housing stock will also help the aging population with housing options.

A 2012 Michigan State Housing Development Authority (MSHDA) Senior Housing Market Study concluded, "There is a huge mismatch between the demand for both affordable senior housing and for housing blended with supportive services compared to the housing supply." (34) Across Michigan, seniors preferred aging in place to other options, with more low income seniors (often renters) moving into senior apartment units. One of the most frequently answered reason for moving was "no longer being able to maintain residence".

The 2012 MSHDA Senior Housing Market Study also found that rural areas and urban centers, which have some of the least wealthy seniors, also have fewer complexes which provide housing and access to services seniors require for healthy living. Among the features which were surveyed, in-unit laundry facilities were equally important to lower- and higher-income seniors (over 90% of each), while accessibility features were more important to older seniors (over age 75) and recreation and fitness options for younger seniors. Access to grocery stores, pharmacies, hospitals, and libraries were emphasized by residents in urban and exurban (suburban) areas. For the purposes of this survey Lansing was characterized as an Urban hub, with much of Ingham marked as exurban and much of Clinton and Eaton as rural.

In this region, a question about need for housing modifications to allow for seniors aging in place was asked in a survey conducted in 2013 in the City of East Lansing (35). The question was worded as: "Does your current residence need any major repairs, modifications or changes to enable you to stay there as you age (e.g., ramp, wider doors)?"

The total number of respondents was 2,401, and nearly a quarter of respondents, 23.4% answered "yes" and another 15.8% answered "not sure," stating that they might need these changes at a later point in their life. Given that East Lansing's population tends to be relatively well-educated and financially secure, with correspondingly better health, when compared with other communities in the tri-county area (56% of respondents gave their monthly household gross income as over $5,000), the proportion of seniors who may require similar assistance with housing modifications is likely to be even higher in less affluent areas. When asked what services they would be most interested in if moving to a retirement community, "home maintenance services" were the service most often selected as "highly" rather than "moderately" or "less preferred." (35)

Current Health Conditions

The link between housing and health has been well established since 2002 in a peer reviewed article by Krieger and Higgins. (17) The following section will use this source as a basic framework for the HIA and will highlight health factors that are of particular interest in this region and, where possible, will include local relevant data about these. Each section relates to the HCC measures identified as major health issues in the area.

CHILD HEALTH MEASURE: LEAD EXPOSURE LEADING TO POOR CHILD DEVELOPMENT

Conditions within our homes can affect our physical health especially during the important developmental years during childhood. Lead poisoning in children has been associated with a number of health effects including impaired intellectual development, impaired hearing, reduced physical stature, anemia, and learning and behavior problems (17)((36) (37) (38) (39). Progress has been made in reducing exposure to lead throughout the United States including the state of Michigan. The primary cause of childhood lead exposure is the presence of lead paint in homes built before 1978 (39).

According to the Michigan Department of Community Health (40), the number of children with confirmed blood lead levels (BLLs) of ≥ 10 µg/µg/dL has decreased consistently since the state began tracking lead levels in children as directed in Public Act 434 of 2004. Recently in 2012, the CDC changed the standard for blood lead poisoning level from ≥ 10 µg/µg/dL to ≥ 5 µg/µg/dL based on the growing number of scientific studies that have shown that even low blood lead levels can cause lifelong health effects such as lower intelligence, behavioral issues, reduced physical statue, and learning problems (41) (42) (43). Under this new standard, no blood lead level is considered safe and no level is called "negative" (41). In Michigan, 4.5% of the children tested in 2012 had BLLs of ≥ 5 µg/dL compared with 0.5% of children with BLLs ≥ 10 µg/dL (40). In this tri-county region, most of the high BLL concentration happens to be at the intersections where the three counties meet (northwest corner of Ingham County, northeast corner of Eaton County, and the southern portion of Clinton County) (40). Local efforts to protect children from lead exposure through blood lead testing and remediation and abatement activities of homes with lead paint are important to ensuring the healthy brain development of children in our communities.

MENTAL HEALTH MEASURE: POOR MENTAL HEALTH DAYS

Mental health is defined as, "a state of successful performance of mental function, resulting in productive activities, fulfilling relationships with other people, and the ability to adapt to change and to cope with adversity" (44). Culture, gender, physiology and societal norms all influence mental health. Consequently, no assessment of health can be considered comprehensive without assessing mental health as well as physical health. Krieger and Higgins (17) state that the link between substandard housing and mental health is tentative; some of the factors associated with mental health in this study include: excessive indoor temperatures leading to irritability; cold, moldy and damp housing conditions may be associated with housing and depression; concerns about substandard housing and fear of homelessness can also lead to poor mental health.

Measuring the number of days when people report that their mental health is not good (i.e., poor mental health days) represents an important facet of health-related quality of life. In this region, mental health status was measured by an indicator that represents the percentage of adults who reported 14 or more days of poor mental health in the past 30 days (19). In the tri-county region, 11.7% of residents reported at least 14 days of poor mental health in the past month; the figure was slightly higher in Ingham County, 12.1%. Adults who report this frequency of poor mental health days are categorized as having a mental health status that is "not

FIGURE 6.
PRE-1978 HOUSING AND BLOOD LEAD LEVELS (BLL) FOR CHILDREN UNDER 6 YEARS (40)

	Clinton	Eaton	Ingham
% Pre-1978 houses in 2013	52.8	56.4	68.2
Number of children tested BLL in 2012	613	1,168	4750
% of children tested BLL in 2012	11.2	15.9	24.5
Number of tested children BLL 5µg/dL	10	29	156
% of tested children with BLL>5µg/dL	1.6	2.5	3.3
Number of tested children BLL>10µg/dL	0	0	8
% of children tested with BLL>10µg/dL	0	0	.2

FIGURE 7.

INGHAM COUNTY LEAD TESTING DATA 2008-2012

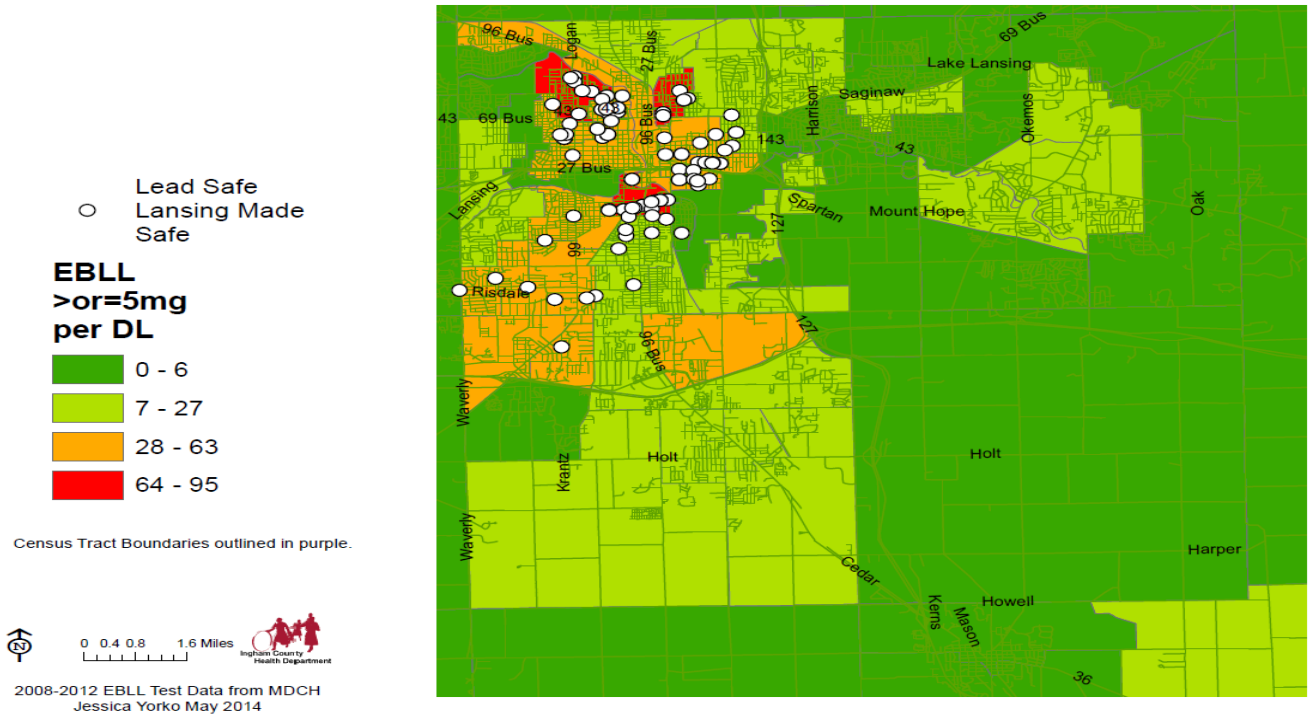


TABLE 12.
NUMBER AND PERCENTAGE OF PRE-1980S HOUSING UNITS IN REPRESENTATIVE MID-MICHIGAN AREAS BY ZIP CODE. SOURCE: ACS 5–YEAR ESTIMATES 2008-2012

Type and Zip Code	Name	# Housing Units (Total)	Margin of Error +/-	# Pre-1980 Housing Units1	Margin of Error +/-	% of Housing Stock Pre-1980	Margin of Error +/-
URBAN							
48823	East Lansing	22,504	531	13,435	625	59.7%	1.5
48910	Lansing	17,503	338	14,699	706	84.0%	3.0
48911	Lansing	17,966	335	12,773	538	71.1%	2.1
48912	Lansing	8,695	264	7,832	502	90.1%	2.2
INNER SUBURBS							
48842	Holt	8,610	285	4,189	414	48.7%	4.0
48906	Lansing	11,783	282	9,566	502	81.2%	2.8
48917	Lansing	15,666	372	9,531	538	60.8%	2.5
SMALL CITIES							
48827	Eaton Rapids	6,474	303	3,780	361	58.4%	3.3
48864	Okemos	8,603	239	4,244	354	49.3%	3.4
48879	Saint Johns	7,386	270	4,983	360	67.5%	2.7
COUNTRYSIDE SUBURBS							
48821	Dimondale	2,480	187	1,413	220	57.0%	5.4
48822	Eagle	1,116	108	734	129	65.8%	5.0
48854	Mason	7461	311	4291	365	57.5%	2.9
48895	Williamston	4636	201	2657	266	57.3%	4.0
FARMS & FIELDS							
48808	Bath	2416	181	920	168	38.1%	5.1
48892	Webberville	1826	151	907	127	49.7%	1.6

good." The term mental health in this context includes, but is not limited to, stress, depression, and problems with emotions. The survey found a higher proportion of tri-county adults who reported a mental health status that was "not good" as compared to Michigan adults. The proportion of adults whose mental health was not good varied between counties within the region, most notably Clinton County (6.8%) and Eaton County (14.5%). Clinton County was the only county in the tri-county region to fare better than Michigan for mental health. The survey also reported the rate of adults who reported their mental health as 'not good' varies by racial group. The African-American or Black population had higher rates in both the Ingham County and tri-county region of poor mental health in the past 30 days when compared to Whites. Whites in Eaton County are 3 times more likely to have worse mental health then are Whites in Clinton County, and Whites in Ingham County are two times more likely to have worse mental health than Whites in Clinton County. The HIA study did not find local studies directly linking housing conditions to mental health status. The relationship is likely to be more indirect.

CHRONIC DISEASE MEASURE: DIABETES PREVALENCE

Diabetes is becoming increasingly pervasive in the United States and can cause disability, if left untreated. It is a condition in which the body can no longer use blood sugar effectively. It is most often observed in three forms: Type 1, Type 2, and gestational diabetes (45). Type 1 diabetes is an autoimmune disorder in which the body is incapable of producing sufficient insulin (a hormone regulating blood sugar). In type 2 diabetes, the body becomes gradually resistant to the insulin it produces. To compensate, the body produces more insulin until it can no longer keep up with the increasing demand. Gestational diabetes is a temporary form of insulin resistance that occurs during pregnancy and usually resolves itself after delivery. Diabetes is a leading cause of death, disability and multiple long-term complications, including: stroke, kidney failure, nerve damage, blindness, and lower limb amputations.

In the tri-county region, 9.8% of adults reported that they have been told by a health provider that they had diabetes (20). One way to assess the health of a community is to examine the age-specific ambulatory care sensitive hospitalization (hospitalization that would not have occurred if the underlying condition was managed properly) rate per 10,000 persons related to diabetes among adults. In 2012 in the tri-county region, the number of preventable hospitalizations per 10,000 persons due to diabetes was almost the same for Ingham (14.3) as for the state of Michigan (14.6). This rate per 10,000 was 8.0 for Clinton County and 12.0 for Eaton County. Ingham has diabetes rates higher than both Clinton and Eaton Counties: 14.3. While there is not enough local evidence linking housing to diabetes, a number of studies describe an indirect association and are presented in the Summary of Impacts section of this report.

CHRONIC DISEASE MEASURE: DISABILITY PREVALENCE

Disability can take many forms and affects anyone at any age. Disability includes impairment of vision, hearing, movement and physical activity, cognition, communication, and other social and mental symptoms. Persons with disability are less likely to be able to access adequate healthcare and more likely to be victim of unfair housing, which translate into more homelessness. According to the most recent data (20), over a fifth (19.9%) of the adult population in the tri-county region suffers from being limited in their activities because of physical, mental or emotional disabilities. Disability prevalence is important because disabilities, particularly physical disabilities, may require home accessible rental housing, which is scarce, or expensive home modifications, which the householder may not be able to afford.

RESPIRATORY CONDITIONS MEASURE: ASTHMA

Air quality is very important for overall health, especially the health of children, and of those whose respiratory systems have been compromised by disease (chronic or infectious) or by injury. Asthma is a disease that affects the lungs causing wheezing, breathlessness, chest tightness and coughing especially at night and early mornings. One of the most important ways to control the symptoms of asthma is to control its environmental triggers, such as poor indoor air quality which includes mold and some health behaviors, such as smoking. In the past decade, asthma prevalence (the percentage of people who have ever been diagnosed with asthma and still have asthma) increased from 7.3% in 2001 to 8.4% in 2010 (46). Asthma trends in this region are monitored by the Mid-Michigan Asthma Coalition as summarized in the chart below. Asthma prevalence is higher among children compared to adults, female compared to males, and Blacks compared to Whites. Black residents were three times more likely to be hospitalized from asthma than White residents of the tri-county region in 2010. In the description of housing conditions section, local data was used to link indoor air quality complaints and housing age (Figure 8). Addressing those factors could alleviate asthma attacks for affected population groups.

HEALTH BEHAVIOR MEASURE: SMOKING

Each year approximately 443,000 premature deaths occur in the United States primarily due to smoking (47). Cigarette smoking is identified as a cause in multiple diseases including various cancers, cardiovascular disease, respiratory conditions, low birth weight, and other adverse health outcomes. Measuring the prevalence of tobacco use in the population can alert communities to potential adverse health outcomes and can be valuable for assessing the need for cessation programs or the effectiveness of existing programs. In 2012 adult smoking rates were 20.5% in Ingham County and 20.8% in Eaton County, both slightly higher than the self-reported adult smoking prevalence than the state of Michigan (19.3%). Within the tri-county region, adult smoking rates vary considerably from a 13.9% low for Clinton County to 20.8% for Eaton County (18). In Ingham County alone, one in three adults between the ages of 25–34 years old (29.4%) and 45–54 years old (17.4%) are current smokers. White adults (20.8%) and Black adults (21.3%) had similar proportions of current smokers. The good news with regard to smoking in the tri-county region is that over half (55.8%) of the adults living in the tri-county region reported they have never smoked. (19) In mid-Michigan there is no 'no smoking' policies for privately owned rental properties. Because instituting and enforcing a no smoking policy in single family housing would be very difficult, efforts to institute such policies have concentrated on multi-unit housing. In Ingham County there has been a 10-year effort to increase the number of multi-unit housing that adopt a smoke-free policy on the inside of the property. Two of the largest community housing agencies

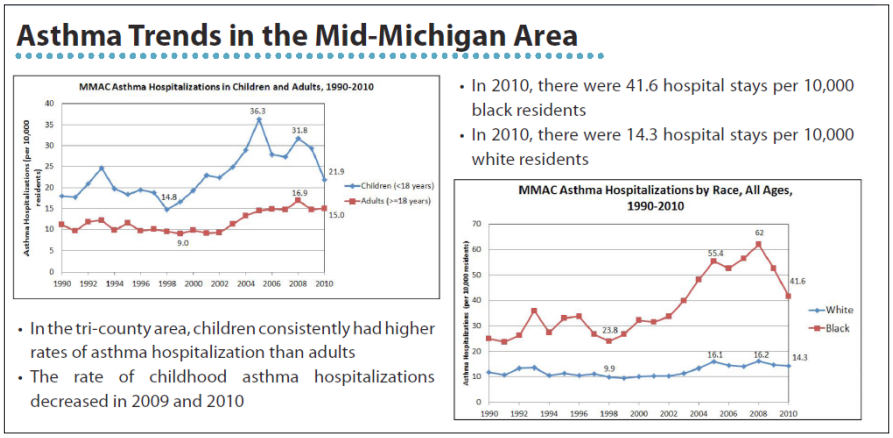


Figure 8 Childhood Asthma Hospitalization Rate Data-Mid Michigan Asthma Coalition (MMAC)

in our community are leaders in this progressive policy. Lansing Housing Commission, with over 800 units, and Greater Lansing Housing Coalition, with over 200 units, made all of these units smoke-free. The Surgeon General Report on Passive Smoke Exposure asserts that there is no safe level of passive smoke exposure, and that over 60% of children are exposed to passive smoke in their family dwellings (48). This report also asserts that there is no safe way to separate smoke from seeping into other areas of a building even through the use of barriers or separate ventilation. The danger of smoke exposure in a multi-unit dwelling is that passive smoke exacerbates asthma, causes asthma and is the cause of hospitalization for asthma cases even when there is no smoking in the immediate family apartment. At this time based on quarterly assessment reports of area rental properties to the Tobacco Division of the Michigan Department of Community Health (MDCH), only 12% of Ingham County rental housing stock is smoke-free and only 7% of the subsidized housing stock in Ingham County is smoke-free. Homes and multi-unit housing with a smoke-free policy have reduced cleaning costs, reduced liability and improved tenant retention. Ingham County also boasts that over 60 worksites have created smoke-free property policies and the numbers are growing.

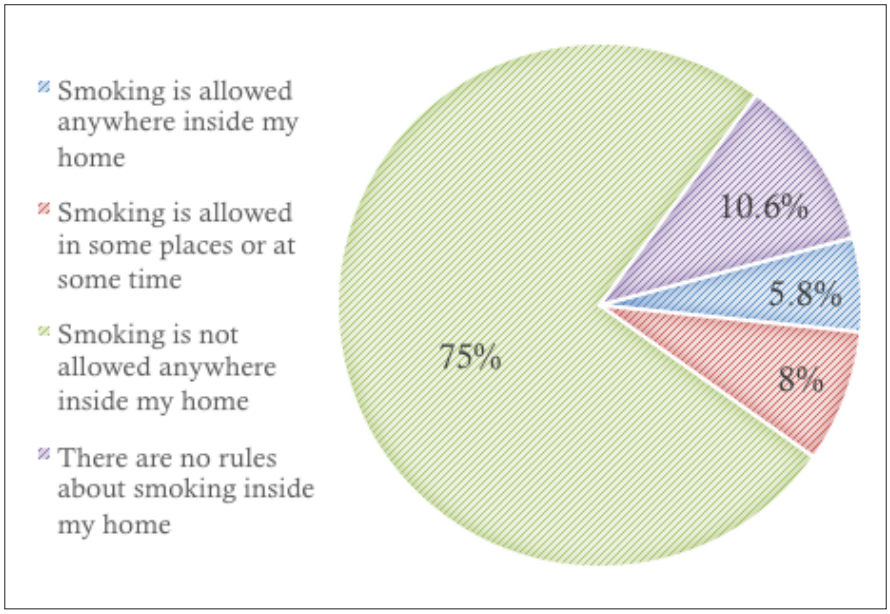


Figure 9 Tobacco smoke in the home among residents in the Tri-County Region. Data Source: (17)

HEALTH BEHAVIOR MEASURE: OBESITY AND CONSUMPTION OF FRUITS AND VEGETABLES

Obesity is one of six measures for chronic diseases and was selected as the indicator to focus on in this study. Body weight is determined by energy (measured in calories) consumed in food and energy expenditures. If a person takes in more energy than is spent, this results in weight gain. If a person expends more energy than is consumed (by being more physically active, for example), weight is lost. Carrying excess weight, known as overweight and obesity, is associated with an increased risk of developing a number of public health concerns and potentially leads to disabilities and death resulting from chronic disease conditions (49). Adult obesity prevalence represents the percentage of the adult population (age 18 and older) with a body mass index (BMI) greater than or equal to 30 kg/m2. BMI is calculated from the individual's self-reported height and weight. Across the tri-county region, according to the latest 2012 statistics (20) about one in every three adults are considered obese (29%) slightly less than the state of Michigan rate of 31.3%. Obesity increases risks for poor health outcomes, disabilities, and potentially increases the need for special accessible housing. Specifically, 30.8% of adults reported obese in Clinton County, 33.9% in Eaton County and 27.0% in Ingham County (20). Adequate intake

of fruits and vegetables contributes to lowering the obesity risk, and therefore it is a measure observed regularly in this region. Over 81% of residents in the tri-county region responded that they consumed less than five servings of fruits and vegetables per day (19). Among the reasons for low consumptions is the proximity of the house to food outlets. This is discussed in the next section.

SOCIAL DETERMINANTS OF HEALTH MEASURE: FOOD ACCESS

The justification for using the food access indicator as a social determinant for health is well described at the North Central Region County Food System Profile Portal (50). "Availability of food outlets, such as grocery stores, convenience stores/ gas stations, fast-food and full-service restaurants, or farmers markets can influence consumer purchasing and dietary behavior." Additionally, disparities in relative access to 'healthy food outlets' exist; low-income neighborhoods and censustracts, and rural communities are more likely to experience limited access to grocery stores (50). Research suggests that grocery stores and supermarkets are generally more likely to stock a variety of healthy food options at lower prices, compared to convenience stores/gas stations. Obesity and diabetes have been associated with limited access to healthy food options, particularly among people of color and individuals with limited income who have easier access to fast food outlets and convenience stores. Federal and state supplemental food programs can assist limited income households, especially if more effort is made in pricing strategies to promote purchasing fruits and vegetables (50). Traditionally, when applying for Low Income Tax Credits (LIHTC) from HUD, access to grocery, transit and the Walk/ Bike Score has been a crucial part of the application process and better scoring (more access) projects get higher priority and resources. Multi-family units are generally built at a vortex of public transit, educational opportunities and access to resources (including food). Over time, market conditions can change the conditions surrounding these units, resulting in a reduction of access to resources including food. With increasing sprawl, demographic and socio-economic shifts and food distribution centers parking space and other requirements to locate a food market, there was a gradual decline in the ability of core cities to attract new grocers and that in turn exacerbated the food access problem.

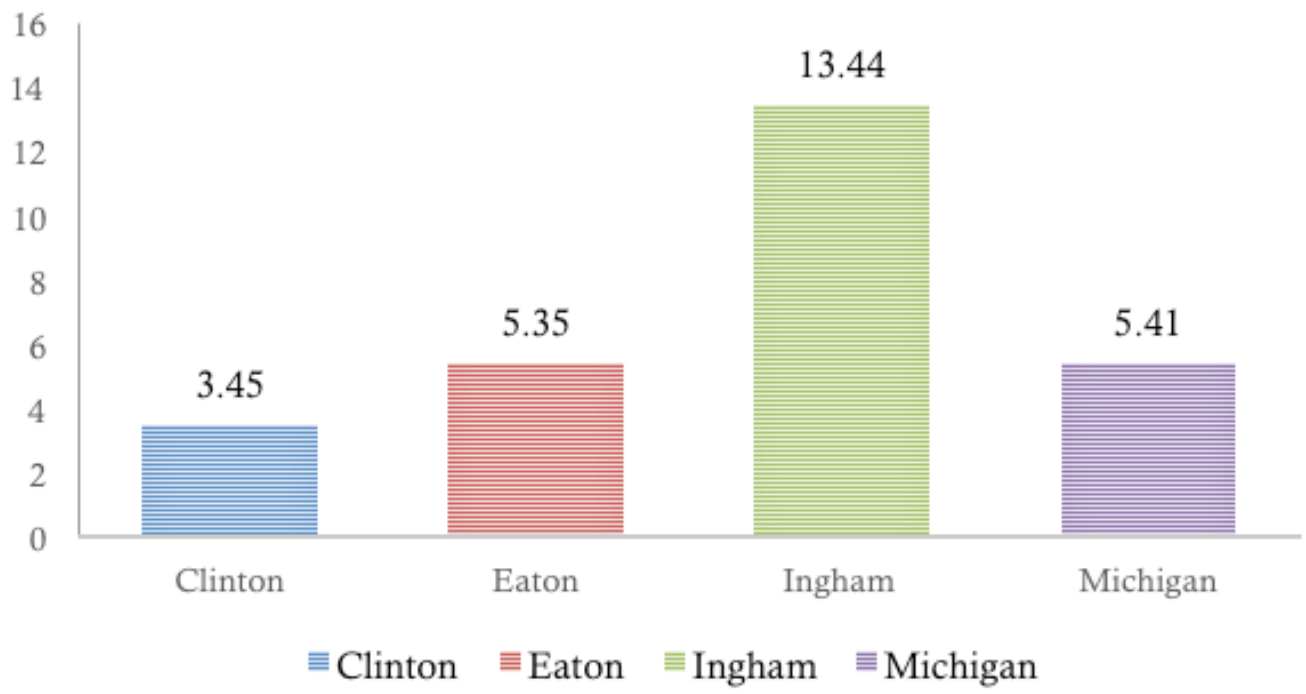
Transportation to a grocery store also plays an important role in understanding how easily families are able to access healthy and affordable foods and services. Families with limited transportation may resort to accessing food at gas stations or convenience stores with limited selections of fresh or healthy food options. Low-income census tracts where a substantial number of residents have low access to a large grocery store are known as 'food deserts.' Food access is then defined as the percent of households with no car and low access to a grocery store. To qualify as a 'low-accesscommunity,' at least 500 people and/or at least 33 percent of the census tract's population must reside more than one mile from a super market or large grocery store (for rural census tracts, the distance is more than 10 miles)". (50)

In 2009, the Food Systems Workgroup organized in the tri-county region as a coalition of partners to study and address concerns about food access through collaboration and community mobilization. Eight food access indicators have been compiled for each of the counties and updated in a "Food Systems Profile" (21). In 2010, Ingham County had the highest percentage of low-income households with low access to a grocery store (13.44%) compared to Clinton (3.45%) and Eaton County (5.35%), which was the closest to the Michigan average (5.41%) Figure 10.

The negative impact that food insecurity has on health, particularly for children, is well documented. It has been associated with diabetes, heart disease and other chronic conditions, general ill health, obesity, stress, and depression (51). Among children, developmental delays (physical,

FIGURE 10.

PERCENT LOW-INCOME HOUSEHOLDS WITH LOW ACCESS TO A GROCERY STORE IN 2010



Data Source: Food Systems Profile (19)

neurological, and social) are strongly associated with food insecurity.

In January 2013, an estimated eighteen percent of the Michigan population (1 in 6 people) received Supplemental Nutrition Assistance Program (SNAP) benefits. Sixty-four percent of program participants were in families with children, and forty-eight percent (higher than the national average) were members of working families. Elderly and disabled adults comprised an additional twenty-two percent of recipients (52).

Michigan DHS's Food Assistance Program annual report for fiscal year 2013 provides county-level data on SNAP recipients, which is summarized in Table 10 (below). Over 70,000 mid-Michigan residents used the program in 2013 to supplement their food supplies (53).

Individuals and families seeking food assistance also rely on non-government sources to supplement their nutrition. In their 2013 Report to the Community staff from Greater Lansing Food Bank reported that 38% of the members of households they served were children under the age of 18, and 8% were age 65 and over (54). Drawing on estimates in a 2009 Hunger Study from the Feeding America Network they noted that roughly 12 % of Clinton County residents, 13% in Eaton County, and nearly 18% of the Ingham County population were food insecure. The Greater Lansing Food Bank itself is an example of how a regional approach can work in supplying community needs: In the summer of 2012, the current food bank grew out of a merger of the Mid-Michigan Food Bank and the (earlier) Greater Lansing Food Bank. This allowed them to eliminate duplicate operations and to buy greater amounts of food in bulk.

Looking at smaller segments of the mid-Michigan area, the local nonprofit Williamston Food Bank (zip code 48895, provides food and personal items) notes their service to "families, large and small, single parents, the elderly, the unemployed and underemployed. In the last five years, the Williamston Food Bank has grown from serving 25-30 families each month to over 100" including "families and individuals who are employed but don't earn enough to meet housing, health, transportation and food needs." (55)

American Community Survey estimates for representative zip code areas reveal a wide range in SNAP utilization, from less than two percent of households in Eagle (Countryside Suburbs) to over 25 percent in some Lansing (Urban) areas.

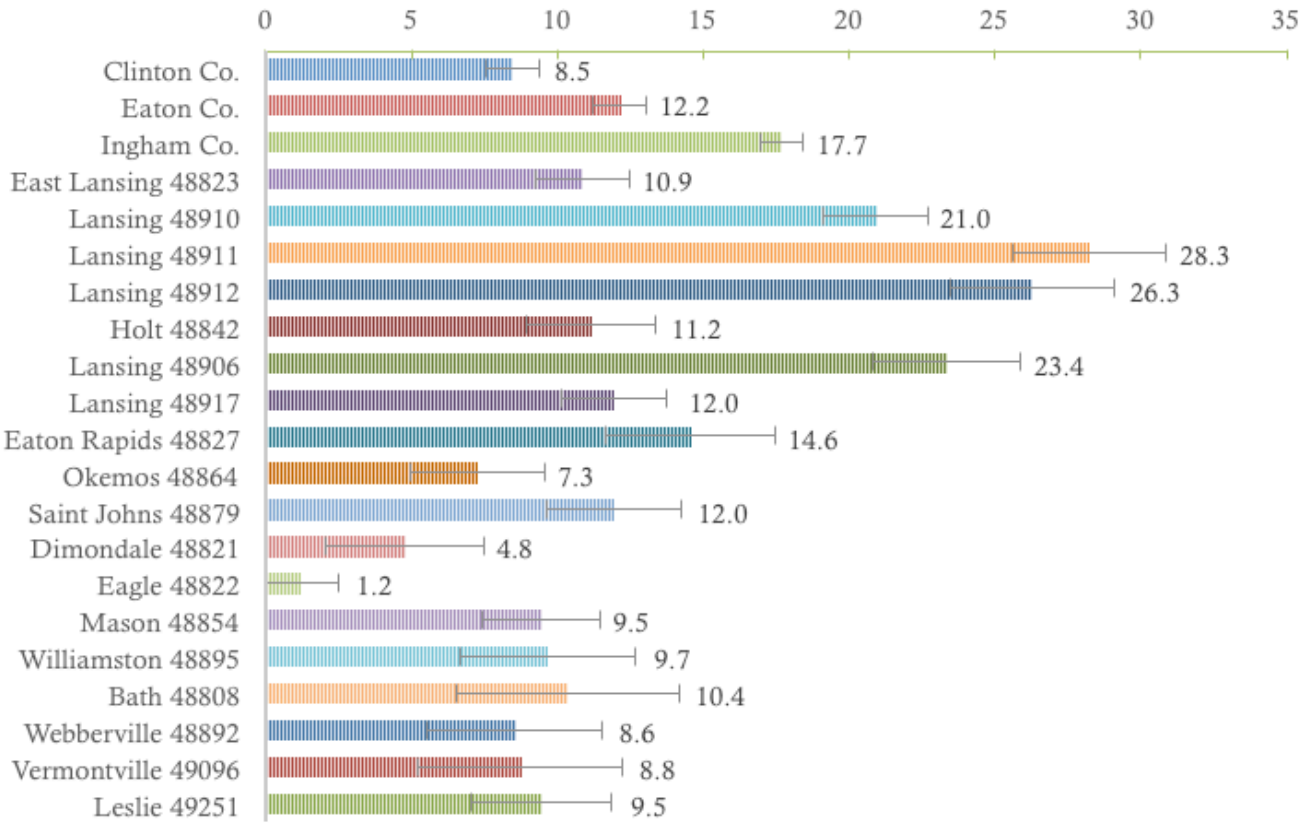
Again, household needs in urban areas outpace other areas (East Lansing remains an MSU-related exception). The differing levels of SNAP usage in representative zip code areas may align with housing costs like GRAPI (Gross Rent as a Percentage of Household Income, seen in Chart 7 alongside median rents). For example, the Holt area has a relatively low percentage, less than 50 percent, of renters paying unaffordable rents while in the Lansing 48906 zip code has a much higher

TABLE 10.
ADULT AND CHILD RECIPIENTS OF SNAP AND AVERAGE AMOUNT PROVIDED PER PERSON IN CLINTON, EATON, AND INGHAM COUNTIES (FY 2013). SOURCE: MICHIGAN DHS

Area	Recipients: Adult	Recipients: Child	Recipients: Total	Amount per Person
Clinton Co.	3,444 (58%)	2,516 (42%)	5,960	$125
Eaton Co.	7,504 (58%)	5,476 (42%)	12,980	$128
Ingham Co.	31,299 (60%)	20,465 (40%)	51,764	$139
Michigan	1,037,387 (58%)	738, 258 (42%)	1,775,646	$136

FIGURE 15.

PERCENTAGE OF HOUSEHOLDS RECEIVING SNAP BENEFITS IN MID-MICHIGAN COUNTIES AND REPRESENTATIVE MID-MICHIGAN AREAS BY ZIP CODE.



proportion of renters whose rent costs are officially unaffordable. This despite the fact that the median rent in 48906 is substantially lower that the median rent in Holt. This may account for the higher percentage of households needing and qualifying for SNAP benefits. Among the Small Cities areas, in the Eaton Rapids zip code over 70 percent of renters are estimated to be paying over 30 percent of their income on rent, while in St. Johns, a relatively high 19 percent of homeowners without mortgages still have unaffordable monthly owner costs (SMOCAPI, seen in Chart 6).[6]

The more detailed ACS data tables regarding SNAP reveal several important characteristics regarding mid-Michigan households receiving benefits. In all three counties the majority of households receiving SNAP had one or more adults who were working, roughly half of SNAP households had children (45 to 55 percent), and they were twice as likely to include a person with a disability as households which did not receive SNAP benefits. The economic distinction between households that did and did not receive benefits was not whether adults in the household worked, but how many adults were working during the previous year, and their median incomes. Between 22 (Clinton) and 32 (Eaton) percent of SNAP households in mid-Michigan had two or more adults in the workforce, with median annual incomes between 17 and 22 thousand dollars, whereas non-SNAP recipients across the three counties revealed a consistently higher percentage (56% to 58%) of multiple-worker households and median household incomes between 53 and 63 thousand dollars. As for racial distribution, households receiving SNAP were predominantly white (ranging from 64 percent in Ingham to 88 percent in Clinton County).

If food prices for healthy staples like poultry, eggs, fish, and fresh vegetables continue to rise as they did in 2013 (when compared with 2012) and if the ongoing drought in California affects fruit, vegetable, and dairy prices in 2014 and beyond, it will be even more difficult for low-income families to supply themselves with nourishing foods on a limited budget. (56) [7] If low-income families' budgets were made more manageable by a reduction in housing costs, some of the negative health impacts related to food insecurity could be alleviated.

An HIA online assessment toolkit has been developed as part of this HIA program, that allows planners to answer some of the important livability and health related questions as they plan or update land use development projects including affordable housing. The toolkit provides free access to environmental and other determinants of health data and a mapping and visualization application. Planners can integrate an assessment of public health impacts in their decision making (7). As an example, the Appendix 8 includes a screen shot of a current affordable housing project and locates the nearby bus lines and bus stops, as well as access to grocery and convenience stores, and the sidewalks around the project.

6. All three of the representative Small Cities zip code areas (Eaton Rapids, Okemos, St. Johns) have roughly equal percentages of home owners with mortgages who's SMOCAPI are above 30 percent. The differences in SNAP utilization are likely to reflect differences in median household income and these other housing-related variables.

7. Although the authors of the report emphasize a relatively low rate of food price increase overall in 2013, this is due to falling prices for sugar and sweets, fats and oils, and other meats, which do not contribute to healthy eating in the same way as fresh fruits and vegetables.

TABLE 11- HIA SUMMARY OF FINDINGS

Determinant Using A Few Recommendations From *ICE Housing Plan*	Health Indicators And Measures	Magnitude Of Impact	Direction Of Impact	Likelihood	Distribution (Populations Most Affected)	Quality Of Evidence
Invest in Affordable Housing in All communities Maintain and increase affordable housing subsidies	Stress leads to: -Poor health/ mental health -Smoking -Food Access -Obesity -Diabetes	High Impact on low income	Alleviate stress -Improve mental health -Reduce smoking -Improve Food Access -Reduce obesity and diabetes	Likely** Possible* Likely Possible	All ages	Good Multiple studies
Improve rental housing Quality/ Maintenance Actively Address rental home contaminants such as lead, mold, tobacco smoke Continue rigorous enforcement of rental codes in urban neighborhoods Develop a simpler rental code for rural communities	Lead poisoning leads to: -poor childhood development -Poor mental health Stress leads to: -Smoking behavior -Poor health/ mental health	High Impact on low income	Reduce high blood lead levels Reduces Asthma levels Reduce smoking Improve mental health	High likelihood High likelihood High likelihood Likely	Young children All ages	Good Multiple studies
Address Fair Housing law compliance: Establishment of Fair Housing center Education / training Modify the housing licensing policies	Stress leads to: -Poor Mental Health -Smoking -Domestic violence	High Impact on Persons with Disability and seniors	Alleviate stress -Improve mental health -Reduce smoking	High Likelihood	All ages	Good Multiple studies

**Likely means the literature evidence supports a direct relationship between financial status or housing quality and stress levels/mental health

*Possible means the literature evidence supports a possible indirect relationship between more dispensable income and health behavior such as smoking cessation and curbing obesity

HEALTH IMPACTS AND RECOMMENDATIONS

This section presents the evidence of social and economic determinants of health to the selected health impact indicators; each of the sections will address the specific research questions that the HIA workgroup had agreed upon during the scoping phase. The questions will be stated in bold following each indicator.

Child Health: Lead Exposure

How will investing in affordable housing in all communities affect child mental health and development?

How will addressing housing quality concerns change some of the indicators leading to poor health such as lead poisoning?

(Health Impact Questions (from scoping worksheet))

There are several issues associated with affordable housing and exposure to lead paint. First, the research literature supports the finding that all children, regardless of social and economic levels, who live in older (pre-1978 dwellings) housing are more likely to be exposed to lead paint (37); (57)); (58). However, children who live at or below the poverty line and live in older housing are at the greatest risk of being exposed to lead paint (37); (57) (59). Second, with regard to affordable housing, older housing can be classified as both affordable and unaffordable depending upon whether the family is considered cost burdened by housing (over 30% of annual income spent as housing based on HUD threshold). It is the older, substandard housing that is poorly maintained that presents health hazards to the families that live in them. Lead paint can often be found on surfaces such as windows and door frames or in the soil surrounding housing. Lead paint that is peeling, chipping, or flaking is dangerous and remediation and abatement of housing with lead paint should be done to prevent exposure to children (60) (36) (38) (39). The evidence for the direct effect of lead poisoning on child health is strong. The likelihood of change in health impact resulting from addressing housing quality concerns is also well substantiated by the literature. All housing, regardless of whether it is classified as affordable or unaffordable, should be free of lead paint hazards.

ICE HOUSING PLAN RECOMMENDATION:

The *ICE Housing Plan* addressed the lead poisoning health issue in recommendation 5.4.3 to have communities in the tri-county region "Actively address rental home contaminants such as lead" by assessing the need for programs such as "Green and Healthy Homes" initiatives that offer contamination and remediation services to area residents.

HIA RECOMMENDATIONS TO ADDRESS HOUSING AND CHILDREN'S HEALTH (LEAD POISONING)

1. Local health departments that don't already do so can provide information to housing organizations, residents and property owners and managers about the dangers of lead paint and how to prevent childhood lead poisoning with testing and interim controls and/or abatement of lead in homes; and by increasing awareness of lead-safe repair and renovation and lead-safe cleaning. This information is currently available on the Ingham County website at (61) http://hd.ingham.org/Home/EnvironmentalHealth/LeadPoisoningPrevention.aspx.
2. Local health departments can start or continue utilizing the statewide lead result reporting database to identity children with elevated blood lead levels (EBLLs) and provide information and assistance to parents to reduce their child's blood lead level. The Michigan Department of Community Health oversees the Childhood Lead Poisoning Prevention Program for screening and testing. More information can be obtained from the website (62) www.michigan.gov/lead
3. Local Health departments should continue to partner with the Michigan Alliance for Lead Safe Housing, which provides technical assistance for EBLL investigation and lead clearance in rental property occupied by children with and EBLL at or above 5 mg/DL. A bill was been introduced on this measure in the Michigan House of Representatives in January 2015 by State Representative Brian Banks. Current state law requires this intervention at the 10 mg/DL threshold, inconsistent with the CDC Level of Concern for lead of 5 mg/DL.

Housing and Mental Health

To what extent do housing costs influence stress levels?

How will a change in affordable housing lead to a change in mental health/ quality of life?

How will addressing housing quality concerns change mental health? How will addressing housing quality contribute to neighborhood stability and mental health?

Housing that is considered unaffordable has been linked to poorer mental health among family members, particularly for mothers according to several literatures. (63) (64) (65) (66) (67). Family members who live in unaffordable housing often report higher levels of stress and depression. This occurs for a number of reasons primarily because the housing is often too expensive based on the income of the family, substandard and poorly maintained, located in high crime areas, and overcrowded due to multiple family members sharing the same housing unit (68) (66) (69) (70). In addition, stress has been associated with working extra hours to pay high rent and depression has been reported among mothers who are unable to pay their bills (63) (71). Rental assistance programs like subsidies and voucher programs have been shown to reduce the stress and anxiety associated with lack of affordable housing (68) (72) (70). For example, vouchers can help decrease the stress associated with crowding, which occurs when too many family members live in the same housing unit. Wood et al (70) found vouchers helped to decrease the incidence of crowding in housing because it allowed family members to find a place of their own to live. Vouchers can also help families move to better housing in better neighborhoods which can alleviate stress and improve mental health. For example, a number of studies have found moving to safer neighborhoods with lower crime and drug use rates and better schools has been shown to have a positive impact on the mental health of girls aged 12 to 19 and mothers as well as adults who reported decreased levels of psychological distress and depressive symptoms (65) (73) (70). The evidence linking unaffordable housing to high stress and poor mental health is strong based on multiple supportive literatures; and the likelihood of change in health impact resulting from addressing housing affordability concerns is also well substantiated by the literature. Similarly, addressing housing quality concerns and neighborhood safety are positively linked to mental health and likelihood to impact mental health is well substantiated by the literature. Housing quality also has its impact on mental health. The effect of bed bug infestation on mental health has been highlighted as one example of housing quality impacts in a number of studies. Bed bug infestation in homes has been linked to sleep deprivation, anxiety and depression (74) (75)

ICE HOUSING PLAN RECOMMENDATIONS:

Sections 5.2 and 5.4 of the *ICE Housing Plan* have several recommendations that can potentially alleviate stress levels caused by unaffordable and low quality housing and therefore, boost mental health.

HIA RECOMMENDATIONS TO ADDRESS HOUSING AFFORDABILITY AND MENTAL HEALTH:

1. The research literature indicates that residential instability has adverse health impacts. Therefore, local Community partnerships for fair and affordable housing should work on changing policies and practices for the assignment and use of housing assistance programs such as rental voucher programs in this region that provide families with a stable source of funding for rent, thus alleviating financial stress related to potentially being displaced.

HIA RECOMMENDATIONS TO IMPROVE HOUSING QUALITY AND REDUCE STRESS:

1. The LUHRT could discuss, strategize and possibly collaborate with other community partners to advocate for rental inspection reporting through local governments' websites to detail the number of rental units inspected in each area, number of complaint-based inspections, average timeframe for response to complaints, number of violations found and corrected, number of rental properties registered, number of rental property registrations transferred to new ownership and other metrics.
2. Local governments could consider offering an incentive/reduction in rental property registration fees for landlords who participate in educational sessions and demonstrate exemplary compliance with state, local and federal laws. This would encourage landlords to voluntarily attend workshops on renters' and landlords' rights and responsibilities, Housing Choice Voucher Program, how to ensure a safe and healthy home, and Fair Housing Laws. The City of Portland, Oregon provides a good example of such trainings, available at (76) www.portlandoregon.gov/bds/31887
3. Local health departments can start or continue providing outreach and education on health-harming housing issues, distributing the Michigan Tenants & Landlords Guide and Tips on Identifying Fair Housing Issues, and where necessary connecting residents to legal advocacy organizations and/or environmental health specialists. This has been happening in Ingham County since 2011, through partnerships between Ingham County Health Department, Michigan Department of Community Health, MSU College of Law, and Legal Aid of South Central Michigan, Michigan Department of Civil Rights.
4. The City of Lansing and Ingham County Health Department can work together to explore how to provide better education and information to residents and landlords about preventing and treating bedbugs.

Chronic diseases: Diabetes

How will a change in affordable housing lead to a change in chronic disease outcomes?

The research literature indicates there is an indirect connection between the built and social environments in which an individual lives and making healthy lifestyle choices. For example, neighborhoods that have lower crime rates and are conducive to physical activity can foster improved physical and mental health in their residents (45) (77) (66) (67) (78) (79). One study found that poor housing may increase the risk of developing diabetes mellitus among middle-aged Black Americans but there was no association between any actual or perceived neighborhood conditions and incidence of diabetes; the study also found that poor housing conditions was an independent contributor to the risk of diabetes in this same group (80).

Furthermore, advocates for affordable housing suggest that affordable housing can help individuals better maintain their treatment for diabetes because they are less likely to defer medical care (81). The Diabetes Prevention Program recommends modest lifestyle changes, such as losing seven percent of body weight and participating in moderate exercise for approximately 150 minutes per week (82). Healthy environments that support an individual's ability and motivation to make lifestyle changes make it easier for the individual to adopt and maintain those changes long term. A healthy lifestyle is a key component of preventing chronic diseases such as diabetes.

In sum, the evidence linking affordable housing directly to diabetes is mixed. Literature evidence supports a direct link between lifestyle changes such as physical activity and physical health; indirectly physical health is linked to healthy and safe neighborhoods that facilitate physical activity. A more direct link can be found between availability of affordable income and diabetes management. The impact of changes in affordable housing on diabetes prevention is likely but not strong.

ICE HOUSING PLAN RECOMMENDATION 5.3.1:

Support inclusionary zoning that recommends "30% low-income housing mandate" along the proposed rapid transit route development along the Michigan Avenue corridor. To implement this recommendation there needs to be a "multilateral effort undertaken equitably in all communities so that all communities have quality affordable housing available." Implementing this recommendation will increase the chances of physical activity among residents using transit on regular basis and will decrease their risk for diabetes.

HIA RECOMMENDATIONS TO ADDRESS HOUSING AND CHRONIC DISEASE PREVENTION SUCH AS DIABETES

1. The research literature indicates that moving to healthy neighborhoods has a positive impact on the physical health. Thus, housing assistance programs that enable families to move from poverty stricken areas to low-poverty neighborhoods should also be fully supported. Recommendation 5.3.1 in the *ICE Housing Plan* allows such opportunity because the Michigan Avenue corridor extends through several communities from lower to higher income density.
2. Local public health officials can invest in neighborhood organizations or programs that encourage safe access to services by walking, biking or transit. They can also provide information about the physical health benefits of engaging in physical activity to manage obesity and diabetes. The Design Lansing master plan non-motorized transportation section and the tri-county region Green Infrastructure plans have allowed over 73 miles of trails to be installed in this region.

Respiratory Condition: Asthma

How will addressing housing quality in the *ICE Housing Plan* change asthma rates of vulnerable groups?

The housing we live in can play a role in the development of asthma if it contains allergens and irritants that are factors in the development and exacerbation of asthma. Asthma is a chronic inflammation of the airways, and there are both genetic and environmental causes of asthma (83). Some household triggers of asthma can include allergens, such as molds, dampness, dust mites and pests (e.g., mice and cockroaches) and irritants such as strong fumes or odors and environmental tobacco smoke (84). Older household dwellings that are of substandard quality are more likely to expose individuals to household triggers of asthma (81) (37) (81) (60) (28) (85) (17) . Therefore, residential environments that are free of household triggers can reduce both the risk of developing as well as exacerbating asthma (27) (17). The research literature has shown that communities can play an active role in efforts to promote healthy living environments. The impact of improving housing quality on respiratory health such as asthma is direct and strongly supported by literature.

ICE HOUSING PLAN RECOMMENDATION:

The above mentioned recommendation 5.4.3 in the *ICE Housing Plan* earlier for lead applies to asthma as well. The HIA findings support this recommendation.

HIA RECOMMENDATIONS TO ADDRESS HOUSING AND ASTHMA:

1. Local health departments could explore potential models for partnerships between health plans and healthcare providers to offer targeted case management for higher-risk asthma patients. One model could be for the health plan to provide reimbursement to health care providers, such as public health nurses, social workers and community health workers who are Certified Asthma Educators (AE-C), for targeted case management of higher-risk asthma patients. The type of targeted case management typically includes up to six visits with the patient and their caregiver. Most visits occur in the home, which can allow for a precursory visual assessment of possible housing-related health hazards, and a conversation with the patient and caregiver about possible housing-related health hazards and how to mitigate those hazards. Visits can also be held in conjunction with the primary care physician and at the person's workplace and/or school, so that asthma patients are able to manage their condition through behavioral and environmental controls that can be supported by others in their environment. Successful models that may be replicated include that of the Asthma Network of West Michigan, which now works with six different health plans to receive referrals and work with patients through its "MATCH" program, Managing Asthma through Case-management in Homes. Example available at : (86) http://getasthmahelp.org/managing-asthma-match.aspx
2. Local public health departments could explore partnerships to educate residents on removing home-based asthma triggers. For example, the Healthy Homes model has been shown to be effective in reducing trigger exposure and decreasing asthma morbidity. This was done by developing a home environmental action plan to improve the quality and safety of the home environment. Components of the plan included: offering education and social support from community health workers, encouraging changes in lifestyle habits, such as cleaning and tobacco use, using materials to reduce exposure such as bedding

covers, making repairs to the housing to stop water leaks and to prevent pests from entering, and working with landlords to ensure housing issues are addressed. Other home based models have also found similar results with a reduction in asthma symptoms.

3. Implement a home-based environmental interventions program. The Asthma Regional Council's guidance document, "Investing in Best Practices for Asthma: August 2010 Update (87), describes the kinds of home-based environmental interventions that can be recommended to asthma patients along a "spectrum of intensity" categorized by CDC Task Force.

4. Local governments can request technical assistance from the National Center for Healthy Housing (NHCC) to learn how to integrate components of the National Healthy Housing Standards into their Housing Code sections. The NCHH is offering assistance to local governments by conducting side-by-side comparisons of the current provisions in local housing codes and other forms of technical support to local government staff and leadership involved in developing and enforcing local housing codes.

5. Local non-profit organizations and/or public health departments can hire or train Healthy Homes Specialist credentialed staff to offer healthy homes assessments. Healthy Homes Assessments, such as those using HUD's Health Homes Rating System, include a visual assessment, collection of environmental measures related to natural gas, carbon monoxide, moisture and other factors that can impact indoor air quality, a written and verbal report to occupants about priority areas for correction, and assistance in obtaining resources needed to make corrections.

6. Public health leadership could explore developing collaborations between local legal-aid organizations and healthcare providers. Hundreds of health care, law school, legal aid and other partners across the U.S. have created formal partnerships called "Medical-Legal Partnerships" that feature a screening process whereby doctors, nurses and other clinicians assess potential "health-harming legal needs" of their patients as part of routine medical treatment, and connect patients with free legal information and assistance as needed. These partnerships result in patients being able to resolve issues and concerns related to housing, immigration status, and benefits denials that create barriers to patients' ability to attain good health. (88) www.gih.org/usr_doc/Medical-Legal_Partnerships_Kellogg_January_2008.pdf

7. Financial empowerment, housing counseling, legal advocacy, and healthy homes partners should offer a monthly renter resource fair in high renter-occupied neighborhoods, which can provide information and assistance to renters about renters' rights, repairs and maintenance, healthy homes, fair housing and tenant organizing.

Health Behavior: Smoking

Would programs that promote access to better neighborhoods' lifestyle opportunities address any identified health determinants, behaviors or outcomes?

The health consequences of tobacco smoke are well documented (89). With over 7,000 chemicals and 70 carcinogens in cigarette smoke, exposure to tobacco smoke puts individuals at increased risk for cancer, cardiovascular disease and heart disease (90).

Although there is no one reason why people start smoking, there is some evidence to suggest that "place matters in shaping individual health outcomes" (91). For example, research suggests that neighborhood level characteristics can influence whether an individual starts smoking through a variety of mechanisms such as the increased stress of living in a disadvantaged neighborhood, low socioeconomic status, the availability of tobacco products, and the acceptance of smoking in the community (92) (93). Research has shown an association between low socioeconomic status, the increased availability of tobacco products, and living in disadvantaged neighborhoods and a higher incidence of smoking (92) (93) (94) (95). Many of the neighborhood characteristics that influence whether a person starts smoking are present in housing that is considered unaffordable. Individuals of low socioeconomic backgrounds who are living in disadvantaged neighborhoods with high crime in housing that is unaffordable are exposed to high levels of stress which can lead to unhealthy behaviors such as smoking. What is needed is affordable housing that offers smoke-free policies which would encourage health promoting behaviors such as never starting or quitting smoking. In addition, housing units that have smoke-free policies would also protect residents from the dangers of secondhand smoke (37) (96). Smoke-free housing policies have a direct impact on the health of residents in multi-units apartment housing; consistent with HUD guidance on smoke-free policies and implementation, nearly 450 Public Housing Agencies in the US have now implemented smoke-free multi-unit housing (97). Affordable smoke-free housing options can not only reduce the stress associated with unaffordable housing but it can also encourage health promoting healthy behaviors. Smoking bans have been successful in non-residential settings such as work places, restaurants, retail stores, and sports arenas, so there is every reason to believe they can be successful in residential housing units (98). The evidence of strong impact of smoke-free policies in housing on smoking behavior is well substantiated with literature.

ICE HOUSING PLAN RECOMMENDATION:

The above mentioned *ICE Housing Plan* 5.4.3 recommendation also addressed ways to curb smoking behaviors in rental properties. HIA supports this recommendation.

HIA RECOMMENDATIONS TO ADDRESS HOUSING AND SMOKING:

1. Communities in this region should adopt the National Healthy Housing Standard set forth by the National Center for Healthy Housing and the American Public Health Association (2014) (14). This document sets the minimum performance standards for a safe and healthy home by setting the duties and requirements for owners and occupants of housing units.

2. Local public health departments can implement education programs to support residents to take action to improve their housing environment by offering smoking cessation classes and other resources to help family members quit smoking. One component of The Healthy Homes model includes smoking cessation. Smoking cessation counseling has been found to be successful in helping participants quit smoking. Local public health officials can also play a role in ensuring landlords respond to tenant housing issues. For example, local public health departments can provide indoor environmental air quality assessments of homes and inspect for unhealthy living conditions such as contaminants in the air. Local public health plays an important role in creating living environments that support healthy choices that can help prevent the devastating illnesses caused by smoking.

Health Behavior: Obesity

Obesity is a growing public health issue because of its association with other chronic health problems such as heart disease, cancer and diabetes (99). There is research that suggests the built and social environment in which we live and work can influence our physical health status. Substandard housing conditions are associated with a number of poor health conditions because they present barriers to engaging in physical activity, and this can lead to obesity. On the other hand, neighborhoods that are less stressful, have lower crime rates, and that have parks, sidewalks and transit routes encourage physical activity, which can result in improved physical and mental health (66) (78) (45) (67).

To better understand how neighborhood environments impact the lives of low-income families, the U.S. Department of Housing and Urban Development (HUD) initiated a demonstration housing mobility program called Moving to Opportunity (MTO) (HUD, 2011 (100). The final evaluation of MTO occurred 10 to 15 years after baseline and reported positive improvements on some important health outcomes including obesity and diabetes. For example, the experimental adults groups in federally subsidized housing units, also called section 8 housing, had a lower prevalence of extreme obesity and diabetes and fewer self-reported physical limitations (100). The report concluded that moving from high-poverty to lower-poverty neighborhoods can have a positive impact on obesity. In this study, housing vouchers enabled families to move from high-poverty to low-poverty neighborhoods without having to give up their subsidy which reduced their costs associated with changing their neighborhood conditions. Other research has found that even improving upon the built (e.g., walkable neighborhoods, open spaces such as parks, easy walking to stores; access to supermarkets) or social (e.g., using walking groups to encourage walking) environments, is associated with higher physical activity levels, healthier diets and lower obesity levels (101) (102) (103) (58) (66).

Funding programs that encourage families to relocate to affordable, low-poverty neighborhoods can increase access to communities that encourage physical activity in terms of their design and safety features (e.g., availability of sideways, parks, recreation centers, and a sense of safety due to lower crime rate). Also, programs that improve the built environments of public housing residents can increase health promoting behaviors. Therefore, literature evidence supports programs that address obesity by increasing access to health-related resources and social networks that encourage health promoting behaviors. The health impact is positive, strong and well substantiated by literature.

ICE HOUSING PLAN RECOMMENDATIONS:

Section 5.3 of the *ICE Housing Plan* recommendations has a list of specific actions that can be taken to encourage an active living with access to services in the community, such as 5.3.5. "Encourage affordable rental housing for families in areas with good schools and services" or 5.3.6. "Plan with transit access in mind".

HIA RECOMMENDATIONS TO ADDRESS HOUSING AND OBESITY:

1. The research literature indicates that there is a connection between the built and social environments and engaging in physical activity. Stressful living environments are associated with poorer health outcomes such as obesity. Therefore, the LUHRT can advocate for the implementation of the Design Lansing master plan which promotes the development of neighborhoods with non-motorized accessibility and mixed use to promote physical activity leading to reductions in obesity levels.
2. The LUHRT or the county's human service collaborative should work collaboratively with other partners such as the Community Economic Development Network to find resources that could help implement the Design Lansing master plan (94) which gives special attention to mixed use development, a proven land use strategy to promote more physical activity and thus curbing obesity. (104)
3. Complete Streets ordinances are effective policies to promote active living (105). The Tri-County Region has successfully passed Complete Streets ordinances in nine local units of governments. The LUHRT can continue to support the expansion of the regional partnership around Complete Streets ordinances adoption and implementation as a way to promote physical activity and obesity.

Social Determinants of Health: Food Access

What impact does change in housing affordability have on certain health determinants or behavior such as access to healthy eating and reduced stress levels?

Research on housing affordability indicates that the issues of lack of affordable housing and access to food are closely intertwined (64) (67) (71) (72). Families who spend thirty percent or more of their incomes on housing have less to spend on food and other necessities such as clothing, transportation and medical care (15) (17) (72) (68). Unable to stretch their monthly incomes far enough, families often reduce spending on food and other necessities (17) (65) (106). The result is food insecurity which can have a harmful effect on the development of children because of the lack of adequate nutrition. Food insecurity can be reduced through assistance programs such as subsidized housing and rental vouchers (64) (65) (98) (71) (72) (107) (108). Subsidized housing and rental vouchers have been shown to buffer families from food insecurity because they reduce the amount spent each month on housing. This frees up household income so it can be spent on food and other household necessities. The health impact of investing in programs and policies that expand the availability of affordable housing is strong and well substantiated by literature; not only can it help stabilize families in housing they can afford but it can also ensure they have access to food.

ICE HOUSING PLAN RECOMMENDATIONS:

"Encourage form-based zoning to encourage mixed uses and complete neighborhoods" recommendation 5.3.7 in the *ICE Housing Plan* and also 5.3.5 and 5.3.6 mentioned in the section on obesity, all contribute to an increased access to healthy food. Section 5.2 of the *ICE Housing Plan* recommendations has multiple action items that aim to reduce the housing cost burden to release more discretionary spending on food and alleviate stress.

HIA RECOMMENDATIONS TO ADDRESS HOUSING AND ACCESS TO HEALTHY FOODS:

1. The City of Lansing can maintain its support of rental assistance and voucher programs that have been successful in helping families maintain stable, affordable, healthy housing and buffer the effects of food insecurity.
2. Other communities should explore the feasibility of offering rental assistance and voucher programs.
3. ICHD staff work collaboratively with the Food Systems Workgroup food policy action team to find resources that could help implement the Design Lansing master plan, which gives special attention to mixed use development that may bring local food sources closer to housing units. The plan also devotes a special section to enhancing the green infrastructure, including urban gardens and farms, as a way to address food desert concerns, and Complete Streets initiatives that make non-motorized access to services and stores safer.
4. All communities need to be encouraged to use the HIA online tool developed through this grant and available on the MMPGS website http://www.midmichigansustainability.org/, in determining current or potential plans for increasing access to healthy food/grocery stores, especially near affordable housing units. Living close to a grocery store is defined differently in rural and non-rural areas; in rural areas, it means living less than 10 miles from a grocery store whereas in non-rural areas, it means less than 1 mile. (Appendix 8)

Recommendations with Overarching Impacts on Multiple Health Indicators

ICE HOUSING PLAN RECOMMENDATIONS:

Recommendation 5.2: "Invest in affordable housing in all communities" and specifically 5.2.2: "Maintain and increase funding for multi-family housing subsidies and Section 8 Housing Vouchers" have the potential to allow more mixed income living, which in turn allows low-income families greater access to community amenities and services (grocery stores, good schools) that are available to higher income families. Positive Health Impacts of upward mobility on all the above mentioned health indicators is substantiated by multiple studies.

Recommendation 5.3: "Create more variety and choice in housing options in all communities" will contribute to the creation of mixed uses and complete neighborhoods with transit access and that could impact chronic disease-related conditions as well as mental health.

HIA RECOMMENDATIONS TO ADDRESS HOUSING QUALITY AND IMPACT HEALTH INDICATORS RELATED DIRECTLY TO POOR INDOOR AIR QUALITY SUCH AS ASTHMA AND LEAD POISONING (ALSO INDIRECTLY RELATED TO STRESS AND MENTAL HEALTH) AND BEHAVIORS SUCH AS SMOKING AND OBESITY.

1. Local health officials can play a role in reaching out to stakeholders such as Public Housing authorities and non-profit housing organizations such as GLHC, landlord associations, home owners' associations and County Board of Commissioners to nurture a partnership that will help develop a common agenda to address landlords/tenant housing related issues.
2. Local governments in the tri-county region can utilize technical assistance from the National Center for Healthy Housing to explore integrating provisions of the National Healthy Housing Standards into existing local housing code regulations.
3. The LUHRT and county human service collaborative can promote collaboration among government agencies, community organizations and other stakeholders to support *ICE Housing Plan* recommendation 5.1 "Identify an Appropriate organization or office to monitor Fair and Affordable Housing initiatives and responsibilities for the region."
4. The LUHRT members can learn more about the National Healthy Housing Standard provisions from the National Center for Healthy Housing and find ways to encourage and promote the integration of these provisions into existing local housing codes.
5. ICHD staff can work with landlords and other community partners to establish discounts for renters who complete a "Rent Well" course. Such a course could be developed that would be similar to the Multnomah County, Oregon "Rent Well" class, covering renters' and landlords' rights and responsibilities, how to ensure a safe and healthy home, local financial empowerment counseling and programs, and Fair Housing laws.
6. Encourage uniform rental housing registration and inspection frequencies in communities already offering pro-active rental inspection. Renters in mid-Michigan communities have expressed a strong need for a uniform policy where pro-rental inspection exists, in order to reduce the potential health disparities generated from variations in housing quality.
7. Public health officials and staff from the National Center for Healthy Housing could provide technical assistance to County Board of Commissioners regarding options to establish the International Property Maintenance Code with National Healthy Housing Standard provisions as the building code of the county.
8. Policy makers could create a framework that would allow local health department staff to respond to complaints by renters in rental housing in unincorporated areas of the county and inspect the inside and outside of the property for code compliance.

MONITORING AND EVALUATION PLANS

Monitoring the Promotion, Adoption and Implementation Processes

The following table summarizes the main indicators and steps that will ensure promotion and implementation of the HIA, and the main responsible agency that will carry on each step. The selected health indicators for this HIA will continue to be monitored by the LUHRT using the same data sources and measures as the ones listed in the table 6.

TABLE 12

Monitoring Goals	Measure: Steps for adoption and prioritization	Agency responsible for monitoring and time schedule
HIA study promotion and adoption	Microsite and documents printed and distributed to stakeholders, hold presentations to stakeholders	ICHD, 2015
Prioritizing recommendations	ICE HOUSING PLAN and HIA stakeholders will hold a meeting to prioritize recommendations for implementations	GLHC, TCRPC and ICHD and other stakeholders involved in HIA and ICE HOUSING PLAN 2015
HIA Implementation Plan	PWC and LUHRT will have to lay out a 3-year action plan for starting to implement the prioritized HIA recommendations	LUHRT and PWC 2015
Monitoring HIA implementation progress	Health indicators used in this HIA will be revisited periodically and linked where possible to HIA implementation of recommendations.	LUHRT starting in 2018 will use ICHD Community Health Assessment resources to monitor HIA implementation progress and report outcomes to stakeholders and decision makers on the microsite and print for dissemination to vulnerable groups.
Regional Housing Center for long term monitoring	Established and endorsed regional housing data gathering, planning and implementation center Will be the data clearinghouse for regular updates on housing conditions and monitoring of implementation plans.	On-going discussions to determine the agency responsible for tracking data and monitoring implementation of the ICE HOUSING PLAN; hopefully this will be determined by 2016. LUHRT will work with the Regional Housing Center to link ICE HOUSING PLAN and HIA implementation to health impacts.

Evaluation Plans

A separate document will summarize process and impact evaluations of this HIA project.

A. Process evaluation can provide lessons about why and how the HIA worked at each step in the HIA work plan, including:

- How was the HIA undertaken—including details of time, place, geographic area/population group affected by the proposal, what the proposal sought to achieve, and the methods used?
- What resources (financial, human, time) were used, and what was the associated opportunity cost?
- What evidence was used, and how did it inform the development of recommendations?
- How was health inequality assessed?
- How were recommendations formulated and prioritized (what factors influenced this decision-making process)?
- Were the decision makers involved and engaged in the process, if so how and what were their expectations, and were they fulfilled with the limited resources available?
- How and when did decision makers contribute to the recommendations?
- What did those involved in the HIA think about the process used?

B. Impact Evaluation for both HIA1 and HIA2 can consider whether, and how well, the HIA worked, including:

- How and when were the recommendations accepted and implemented by the decision makers—and what factors contributed to this?
- What are the likely reasons why recommendations were rejected?
- Were the aims and objectives of the HIA met?
- What other process impacts were associated with the HIA? – e.g., improved partnership working, or raising the profile of local health needs and putting health on partner agencies' agendas, or organizational development and new ways of working within and across the organizations involved.

CONCLUSION AND NEXT STEPS

The proposed Fair and Affordable Housing Plan will not only reshape the housing landscape, but can have significant effects on health, particularly for low-income families, children, seniors and persons with disabilities. By increasing the availability of more affordable housing and siting projects close to grocery stores and transit access, many of the health concerns raised in this study will be alleviated. The stress of not being able to afford a payment or rent can be reduced, which in turn, will translate positively to improvements in mental health and smoking behavior. Obesity and chronic disease outcomes could improve through better access to healthier food options. Addressing concerns related to poor housing quality in older homes will lower young children's blood lead and asthma levels, aside from other indirect health impacts when housing repair costs are reduced. By establishing a Fair Housing Center and improving the education and training of both tenants and landlords, people with disabilities and seniors, in particular, will find relief in housing security-related stressful conditions, which affect mental health, smoking and poor diet behaviors.

Future steps will focus on LUHRT members disseminating the HIA report and participating in a regional and local adoption and implementation process for the findings and recommendations from both *ICE Housing Plan* and the HIA. This process has started by identifying housing health related issues in this HIA and the *ICE Housing Plan* as important on the common agenda of a local collaborative partnership, the Power of We Consortium "Infrastructure and Transportation" committee. The recommendations will need to be prioritized within the resources and available political will. The current HIA collaborating partners plan to engage stakeholders involved in the HIA and the *ICE Housing Plan* projects to develop and implement a detailed monitoring plan schedule that will hopefully be posted on a microsite created for the Health Impact Assessment project.

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