Implementing Michigan’s 2016–2020 Comprehensive Cancer Control Plan

Estimated Costs for Select Objectives

October 2016

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SMOKING

Objective: Reduce the proportion of adults and adolescents who currently smoke from 21.2 percent (adults) and 11.8 percent* (adolescents) to 19.3 percent (adults) and 3.6 percent (adolescents) by 2020.

Strategies

Comprehensive Tobacco Control Programs

Coordinated efforts to implement population-level interventions to reduce tobacco use among youth and adults, which are typically organized and funded at the state level.

Mass-reach Health Communications

Targeting large audiences through a variety of media formats to change knowledge, attitudes, and behaviors affecting tobacco use.

Community Mobilization and Additional Interventions to Reduce Youth Access

Community-wide interventions aimed at focusing public attention on the issue of youth access to tobacco products along with efforts to reduce that access.

Worksite-based Incentives and Competitions with Cessation Support

Offering rewards to workers as a motivation to participate in a cessation program or effort.

* This percentage is inconsistent with the figure reported in the Cancer Plan for Michigan: 2016–2020 due to an error that was discovered after the plan was published.

Estimated costs for implementation in Michigan

- $77.6 to $111.6 million
- $8.0 to $11.5 million
- $28.5 to $35.7 million
- $11.3 to $71.2 million

* This percentage is inconsistent with the figure reported in the Cancer Plan for Michigan: 2016–2020 due to an error that was discovered after the plan was published.
**HPV VACCINATIONS**

**Objective:** Increase the proportion of females and males aged 13 to 17 years who have received at least three doses of HPV vaccine from 35.0 percent (females) and 22.4 percent (males) to 80 percent (females and males) by 2020.

**Strategies**

**Community-based Interventions in Combination**

Interventions implemented in communities, including one or more interventions to increase community demand for vaccinations and one or more interventions to enhance access to vaccination services. Potential interventions include client reminder and recall systems, community-wide education, and expanded access to vaccinations in health care settings, among others.

**Health Care System-based Interventions in Combination**

Interventions implemented in health care settings, including at least one intervention designed to increase client demand for vaccinations and at least one intervention to enhance access to vaccinations. Potential interventions include offering client incentives, expanded access in health care settings, and provider reminders, among others.

**Provider Assessment and Feedback**

The use of data to evaluate provider performance in delivering one or more interventions to a specified client population and present providers with information about their performance. The strategy can include offering providers incentives for achieving goals or benchmarking their performance in public reports.

**Estimated costs for implementation in Michigan**

- $10.3 to $157.6 million
- $619,000 to $9.6 million
- $94,000 to $2.9 million

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**LUNG CANCER MORTALITY**

**Objective:** Reduce lung cancer mortality rates from 47.9 to 43.1 deaths per 100,000 population by 2020.

**Strategies**

**Lung Cancer Screening Programs**

Efforts to refer and screen adults who have specified risk factors for lung cancer using low-dose computed tomography (LDCT).

**Tobacco Cessation Interventions**

Efforts to refer and connect adults who smoke to behavioral interventions to help them quit. Quit lines, recommended by the Community Preventive Services Task Force, use telephone-based behavioral counseling to help tobacco users who want to quit.

**Estimated costs for implementation in Michigan**

- $36,000 to $130,000 annually per health system
- $45.8 to $122.7 million
BREAST CANCER SCREENINGS

**Objective:** Increase the proportion of females aged 50 to 74 who received a breast cancer screening (mammogram) in the past two years from 81.9 percent to 89.1 percent by 2020.

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<thead>
<tr>
<th>Strategies</th>
<th>Estimated costs for implementation in Michigan</th>
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<tbody>
<tr>
<td>Client Reminder Systems</td>
<td>$110,000 to $131.0 million</td>
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<tr>
<td>Written or telephone messages advising people that they are due for screening. Strategies often paired with client reminders to increase their effectiveness include follow-up printed or telephone reminders, providing client education about breast cancer screenings, or assistance in scheduling appointments.</td>
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<tr>
<td>Utilize One-on-One, Small Group, and Small-media Client Education</td>
<td>$420,000 to $43.9 million</td>
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<tr>
<td>Providing individualized educational information through one-on-one education with a health care worker and using videos or printed materials to share information about the importance of specific health care procedures.</td>
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<tr>
<td>Reduce Structural Barriers</td>
<td>$4.9 to $5.9 million</td>
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<tr>
<td>Interventions designed to reduce structural barriers include reducing time or distance between service delivery settings and target populations, modifying or increasing the hours of service to meet client needs, and simplifying administrative procedures, among others.</td>
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<tr>
<td>Provider Reminder and Recall Systems</td>
<td>$996,000 to $10.2 million</td>
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<tr>
<td>Processes and systems to inform health care providers when it is time for a client's cancer screening test or if a client is overdue for screening. Reminders can be provided in different ways, such as through client charts, by email, or in electronic medical records.</td>
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<tr>
<td>Provider Assessment and Feedback</td>
<td>$5.0 to $5.9 million</td>
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<tr>
<td>The use of data to evaluate provider performance in delivering one or more interventions to a specified client population and present providers with information about their performance. The strategy can include offering providers incentives for achieving goals or benchmarking their performance in public reports.</td>
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CERVICAL CANCER SCREENING

**Objective:** Increase the proportion of females aged 21 to 65 who have received a cervical cancer screening (Pap test) in the past three years from 83.7 percent to 94.8 percent by 2020.

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<thead>
<tr>
<th>Strategies</th>
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<tr>
<td>Client Reminder Systems</td>
<td>$6.9 to $91.5 million</td>
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<tr>
<td>Written or telephone messages advising people that they are due for screening. Strategies often paired with client reminders to increase their effectiveness include follow-up printed or telephone reminders, providing client education about cervical cancer screenings, or assistance in scheduling appointments.</td>
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<tr>
<td>Utilize One-on-one and Small-media Patient Education</td>
<td>$2.2 to $182.9 million</td>
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<tr>
<td>Providing individualized educational information through one-on-one education with a health care worker and using videos or printed materials to share information about the importance of specific health care procedures.</td>
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<tr>
<td>Provider Reminder and Recall Systems</td>
<td>$1.4 to $4.3 million</td>
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<tr>
<td>Processes and systems to inform health care providers when it is time for a client's cancer screening test or if a client is overdue for screening. Reminders can be provided in different ways, such as through client charts, by email, or in electronic medical records.</td>
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<tr>
<td>Provider Assessment and Feedback</td>
<td>$6.9 to $8.3 million</td>
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<tr>
<td>The use of data to evaluate provider performance in delivering one or more interventions to a specified client population and present providers with information about their performance. The strategy can include offering providers incentives for achieving goals or benchmarking their performance in public reports.</td>
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COLORECTAL CANCER SCREENINGS

Objective: Increase the proportion of adults aged 50 to 75 years who are up to date on appropriate colorectal cancer screening from 70.9 percent to 80 percent by 2020.

**Strategies**

**Client Reminder Systems**
Written or telephone messages advising people that they are due for screening. Strategies often paired with client reminders to increase their effectiveness include follow-up printed or telephone reminders, providing client education about colorectal screenings, or assistance in scheduling appointments.

- Estimated costs for implementation in Michigan
  - $2.4 to $274.3 million

**Utilize One-on-one and Small-media Patient Education**
Providing individualized educational information through one-on-one education with a health care worker and using videos or printed materials to share information about the importance of specific health care procedures.

- $7.2 to $274.3 million

**Reduce Structural Barriers**
Interventions designed to reduce these structural barriers include reducing time or distance between service delivery settings and target populations, modifying or increasing the hours of service to meet client needs, and simplifying administrative procedures, among others.

- $1.8 to $44.5 million

**Provider Reminder and Recall Systems**
Processes and systems to inform health care providers when it is time for a client’s cancer screening test or if a client is overdue for screening. Reminders can be provided in different ways such as through client charts, by e-mail, or in electronic medical records.

- $3.3 to $21.1 million

**Provider Assessment and Feedback**
The use of data to evaluate provider performance in delivering one or more interventions to a specified client population and present providers with information about their performance. The strategy can include offering providers incentives for achieving goals or benchmarking their performance in public reports.

- $15.7 to $18.8 million

CANCER CLINICAL TRIALS

Objective: Increase the percentage of Michigan adults participating in cancer treatment clinical trials from 4.4 percent to 4.8 percent by 2020.

**Strategies**

**Educate Health Care Providers**
Strategies include researchers meeting face-to-face with providers to explain studies and address concerns; giving providers a list of available trials; and having providers sign letters that are sent to patients to make them aware of studies.

- $100,000

**Educate People Diagnosed with Cancer**
One-on-one discussions with a member of the research team, decision aids, and tailored video content have been shown to be effective in increasing patient knowledge and understanding of clinical trials.

- $321,000 to $26.3 million

**Utilize Patient Navigators**
Using patient advocates, peer mentors, representatives of minority groups, and patient navigators to identify people who are willing to participate in clinical trials. The primary goals of these programs have been to increase awareness and access and to reduce barriers to participation in clinical trials.

- $80,000 to $519,000 per health system

**Promote Policy and System Changes to Assess and Address Barriers**
Making changes that address barriers to participation beyond awareness and lack of understanding of clinical trials. These issues might include such things as prior authorization requirements for participation in clinical trials, trial development time, trial eligibility criteria, and finding more effective ways to match eligible patients with appropriate trials.

- $12,000
PALLIATIVE CARE SERVICES

Objective: Increase the number of hospital-based palliative care services in Michigan from 76 to 84 by 2020.

Strategies

Educate the Health Care Team

Strategies include developing and disseminating educational recommendations, training materials, and training requirements for health care professionals in training, and developing continuing education modules for providers already in practice.

Support Michigan Providers in Meeting National Standards

The National Comprehensive Cancer Network recommends a recurring cycle of screening and assessment of palliative care needs, and delivery of appropriate interventions to meet the needs of patients and their families and caregivers.

Promote Policy and System Changes

Making changes that address barriers to participation beyond awareness of and lack of understanding of palliative care services and programs. Barriers might include lack of feasible service delivery models, lack of integration of palliative care services, inadequate reimbursement for services, and limited availability of palliative care specialists.

Survivorship Care Plans

Objective: Increase the percentage of Michigan adults diagnosed with cancer who report they received instructions about where to return or who to see for routine cancer check-ups after completing treatment from 67 percent to 69 percent by 2020.

Strategies

Educate Providers and Patients on Evidence-based Follow-up Care

Strategies may include establishing regional educational programs to increase awareness of survivorship issues, using webinars to distribute resources and information, advocating for the development of survivorship programs, and supporting the use of electronic medical records and patient portals to share treatment summary and care plan documents.

Promote and Support the Efforts of Providers to Meet National Standards

Commission on Cancer accreditation requires health systems to develop a process to disseminate a comprehensive care summary and follow-up plan to patients with cancer who are completing cancer treatment. States and cancer coalitions can promote and support the efforts of providers to meet these standards through funding that can be used to establish such processes.

Physical Activity

Objective: Increase the number of Michigan adults who have ever been diagnosed with cancer who meet the objectives for aerobic physical activity and for muscle-strengthening activity from 17.1 percent to 18.8 percent by 2020.

Strategies

Encourage Physical Activity

Interventions designed to support people with chronic conditions in engaging in and maintaining physical activity based on their needs and abilities.

Educate Providers on Guidelines and Behavioral Support Interventions

Providing online and other opportunities for health care providers to learn about behavioral support interventions designed to help patients with cancer engage in physical activity.
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An estimated 56,530 new cancer cases will occur in Michigan in 2016, and an estimated 21,100 Michigan residents will die from the disease.\(^1\) Cancer is the leading cause of death among Michigan residents under the age of 80. In 2010, the cost of cancer care and treatment in the United States was estimated at $124.6 billion, and is expected to reach $173 billion by 2020.\(^2\) Medical Expenditure Panel Survey data show that the cost of cancer care in Michigan was approximately $5.5 billion in 2010 and will reach $9.1 billion by 2020.\(^3\) These cost estimates do not capture the extraordinary physical and psychological tolls that often accompany cancer diagnosis and treatment.

The Michigan Cancer Consortium (MCC) is Michigan’s statewide cancer coalition. The Michigan Department of Health and Human Services (MDHHS) Cancer Prevention and Control Section is a key partner of the MCC and provides staff support for the consortium. The MDHHS Cancer Section, along with the MCC, has developed a plan—*The Cancer Plan for Michigan: 2016-2020*—for reducing the number of new cases of cancer (cancer incidence) and cancer deaths in the state, including 35 objectives to be achieved over the next five years (by 2020). These objectives focus on prevention; early detection; diagnosis and treatment; and ensuring quality of life for those who are currently living with or have previously experienced cancer. For each objective, the plan includes a set of strategies to be promoted by the MDHHS Cancer Section and its partners for implementation across the state.

As recommended by the Centers for Disease Control and Prevention (CDC),\(^4\) the MDHHS Cancer Section is working to estimate the costs associated with implementing the identified strategies. To begin this work, the Cancer Section asked Public Sector Consultants (PSC) to estimate the cost of implementing the strategies associated with 10 select objectives. These objectives are listed in the table on the following page. Please note that the starting percentage for each objective may differ from the percentage listed in the cancer control plan due to inclusion of updated information that was available at the time this report was written. For example, the Cancer Plan for Michigan states a goal of increasing breast cancer screenings from 81.0 percent (based on 2013 data) to 89.0 percent, but as of 2014 the percentage of women who had been screened had increased from 81.0 percent to 81.9 percent.
## Select Objectives from the Cancer Plan for Michigan: 2016–2020

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*This percentage is inconsistent with the figure reported in the Cancer Plan for Michigan: 2016–2020 due to an error that was discovered after the plan was published.*

* Indicates that the objective has been identified as a priority by the Michigan Cancer Consortium for 2016 to 2018.


PSC identified costs for these strategies using the following four approaches, depending on the type of information available for each strategy:

- Using economic evidence provided in The Community Guide from the Community Preventive Services Task Force (Task Force) for those strategies that are based on Task Force–recommended interventions. The Task Force makes its recommendations based on replicable systematic reviews of scientific literature, wherein each review is conducted by a team whose members specialize in systematic review methods as well as by subject matter experts. The Community Guide is supported and administered by the CDC.
- Independently researching peer-reviewed studies that include the cost of implementing the recommended strategies when limited or no economic evidence is available from the Task Force. PSC’s economic review included only peer-reviewed articles of studies based in the U.S. and published in 1990 or later, in journals accessible through PubMed.
- Calculating the cost of hiring an external consultant to implement the identified strategies. This would involve suggesting an approach for the work and estimating the number of hours required to complete the work.
Identifying the amount the state currently spends on implementing strategies to reduce cancer deaths in the state. This includes current requests for proposal (RFPs), funds spent to promote health care provider education opportunities, and grants given to organizations that aim to reduce cancer incidence and mortality.

Whether PSC reviewed economic evidence provided in The Community Guide or conducted its own economic review, it applied the January to July 2016 inflation rate to costs provided in studies and reports whenever appropriate. Thus, the figures found in this report often do not match precisely those that would be found by someone carrying out an independent review of the same studies and reports. Applying this inflation rate allows PSC to provide estimates in current dollars.

The following report provides a thorough review of the estimated costs and effectiveness of each strategy recommended for achieving the select objectives. It provides an overview of the challenge each objective is intended to address, a description of the strategies recommended in the Cancer Plan for Michigan to achieve the objective, and an estimated cost—or a range of expected costs—that would be incurred to implement each strategy at a statewide level. It is important to emphasize that the costs cited in this report are estimates. In many cases, the costs represent expenditures that were found in other states and/or several years ago. While costs in these instances have been updated to reflect the January to July 2016 inflation rate, it is possible that new advances in technology or changes in the way services are delivered would affect expenditures in Michigan in 2016. There are other instances where the cost estimates provided reflect current expenditures in Michigan, which may not (and in some clear cases are unlikely to) cover the cost of implementing the specified intervention. In the absence of more concrete figures, it was deemed appropriate and useful to provide estimates that would, at the very least, move the state forward in implementing an intervention.
Tobacco use is the leading preventable cause of disease, disability, and death in the United States. Smoking increases the risk for all-cause mortality and has been found to increase risk for various types of cancer, respiratory diseases, cardiovascular disease, and diabetes. Cigarette smoking accounts for more than 480,000 deaths in the U.S. each year. Smoking-related illness in the United States costs more than $300 billion each year, including nearly $170 billion for direct medical care and more than $156 billion in lost productivity. Nearly $4.6 billion in medical costs are incurred in Michigan annually due to smoking. An estimated 21.2 percent of adults and 4.3 percent of adolescents in Michigan are current smokers; among adults, smoking is more prevalent among men, people with lower incomes, and the uninsured.

Adults who have never smoked still may suffer the health consequences of smoking. Secondhand smoke exposure causes an estimated 34,000 deaths from heart disease and 7,300 deaths from lung cancer each year in the United States. An estimated 24.9 percent of Michigan adults (including 11.5 percent with children living in their households) report being exposed to secondhand smoke in their home in the past seven days. Secondhand smoke exposure is more prevalent among black non-Hispanic and Hispanic adults than among white non-Hispanic adults. It is also far more prevalent among those who are uninsured than among those who have insurance.

**STRATEGIES AND COSTS**

Four key strategies aimed at reducing smoking among adults and adolescents appear in the Cancer Plan for Michigan and are endorsed by the Community Preventive Services Task Force (Task Force):

- Comprehensive tobacco control programs with coordinated efforts to implement population-level interventions
- Mass-reach health communication interventions to change knowledge, beliefs, attitudes, and behaviors affecting tobacco use
- Community-wide interventions aimed at reducing youth access to tobacco products
- Targeted worksite-based incentives and competitions combined with individual cessation support

The Michigan Cancer Consortium has established targets for reducing smoking prevalence among adults and adolescents from 21.2 percent and 11.8 percent, respectively, to 19.3 percent and 3.6 percent, respectively.

**Comprehensive Tobacco Control Programs**

The Task Force recommends comprehensive tobacco control programs based on strong evidence of effectiveness in reducing tobacco use and secondhand smoke exposure. Comprehensive tobacco control programs are coordinated efforts to implement population-level interventions to reduce appeal and acceptability of tobacco use, increase tobacco use cessation, reduce secondhand smoke exposure, and prevent initiation of tobacco use among young people. These programs are typically organized and funded at the state level and include the following components:

- State and community interventions
- Mass-reach health communication interventions
- Cessation interventions

**Intervention at a Glance**

**Comprehensive Tobacco Control Programs**

- Coordinated efforts to implement population-level interventions to reduce tobacco use among youth and adults; typically organized and funded at the state level.
- Estimated cost for implementation in Michigan: $77.6 to $111.6 million.
In its report on Best Practices for Comprehensive Tobacco Control Programs, the Centers for Disease Control and Prevention (CDC) established both minimum and recommended funding levels for these programs by state. These funding levels represent the total that a state should spend on state and community interventions; mass-reach health communication interventions; cessation interventions; surveillance and evaluation; and infrastructure, administration, and management. For Michigan, the established minimum and recommended funding levels are $77.6 million and $111.6 million, respectively, when adjusted for inflation.

**Intervention Effectiveness**

In its systematic review of studies of comprehensive tobacco control programs, the Task Force found a median decrease of 2.8 percentage points in prevalence of tobacco use among adults. The programs were implemented for a median of nine years. It also found that states and localities with comprehensive tobacco control programs saw increases in cessation rates over baseline rates and greater increases in cessation rates when compared to the rest of the country or localities without such programs. States with comprehensive tobacco control programs saw decreases in the prevalence of tobacco use among young people (a median decrease of 4.5 percentage points) and reductions in initiation of smoking among adolescents. States with these programs also saw reductions in adults’ exposure to secondhand smoke at home or work, and increased numbers of households that adopted smoke-free rules.

**Mass-reach Health Communications**

The Community Preventive Services Task Force recommends mass-reach health communication interventions based on strong evidence of effectiveness in decreasing the prevalence of tobacco use, increasing cessation and use of available services such as quit lines, and decreasing initiation of tobacco use among young people. Mass-reach health communication interventions target large audiences through television and radio broadcasts, print media (e.g., newspaper), out-of-home placements (e.g., billboards, movie theaters, point-of-sale), and digital media to change knowledge, beliefs, attitudes, and behaviors affecting tobacco use.

**Economic Review**

In its report on Best Practices for Comprehensive Tobacco Control Programs, the CDC established minimum and recommended funding levels for mass-reach health communications by state, as a component of the cost of a comprehensive tobacco control program. These funding levels represent the total that a state should spend to effectively carry out mass-reach health communication interventions. For Michigan, the established minimum and recommended funding levels are $8.0 million and $11.5 million, respectively, when adjusted for inflation.

**Intervention Effectiveness**

The Task Force’s review of the evidence of the effectiveness of mass-reach health communication interventions focused primarily on studies in which television was the primary media channel. Their review found a median decrease of 5 percentage points in the prevalence of tobacco use among adults and a median decrease of 3.4 percentage points in tobacco use among young people. The Task Force also found a median
increase of 132 percent in the number of calls to quit lines and a median increase in tobacco use cessation of 3.5 percentage points.

**Community Mobilization and Additional Interventions to Reduce Youth Access**

The Task Force describes community mobilization with additional interventions to restrict minors’ access to tobacco products as “community-wide interventions aimed at focusing public attention on the issue of youth access to tobacco products and mobilizing community support for additional efforts to reduce that access.” Additional interventions typically include stronger local laws directed at retailers, active enforcement of retailer sales laws, and retailer education with reinforcement.

**Economic Review**

The Task Force identifies lack of cost information on these interventions as a gap in the research and therefore has not conducted an economic evaluation. The CDC, however, recommends the mobilization of the community to restrict minors’ access to tobacco products along with additional interventions as a strategy that could be encompassed in the state and community interventions component of a comprehensive tobacco control program. While state and community interventions can include a broader set of strategies than this single intervention, the CDC’s recommendations are informative as a place to begin identifying an appropriate level of spending. For Michigan, the established minimum and recommended funding levels for state and community interventions are $28.5 million and $35.7 million, respectively, when adjusted for inflation.

**Intervention Effectiveness**

The Task Force included nine studies in its systematic review of the effectiveness of community mobilization with additional interventions to restrict minors’ access to tobacco products. Across these studies, the Task Force found a median decrease of 5.8 percentage points in self-reported tobacco use among youths over follow-up periods of 24 to 48 months. They also found a median decrease of 33.5 percentage points in retail tobacco sales to youth.

**Worksite-based Incentives and Competitions with Cessation Support**

The Task Force recommends worksite-based incentives and competitions when combined with additional interventions to support individual cessation efforts based on strong evidence of effectiveness in reducing tobacco use among workers. This intervention includes offering rewards to individual workers and teams as a motivation to participate in a cessation program or effort. Rewards—which include financial payments, lottery chances for monetary or other prizes, and return of self-imposed payroll withholdings—are provided for participation, for success in achieving behavior change, or for both. A number of interventions typically accompany incentives and competitions: client education, smoking cessation groups, self-help cessation materials, telephone cessation support, workplace smoke-free policies, and social support networks.
Economic Review
Although the Task Force conducted an economic review, inconsistencies in study designs prevented it from reaching conclusions about cost savings. PSC identified three studies representing five study arms that included information about either the cost of employee incentives for tobacco cessation (three study arms) or the cost of incentives plus the cost of additional interventions (two study arms). Across all three studies, inflation-adjusted incentives ranged from $274 to $835 per employee who stopped smoking and remained cigarette-free after either 6 or 12 months.\textsuperscript{24, 25, 26} In the study that also included information about the cost of additional interventions, which included the provision of self-help materials (intervention group 1) or self-help materials and group meetings (intervention group 2), the cost per quitter ranged from $392 to $1,238, when adjusted for inflation.\textsuperscript{27}

Intervention Effectiveness
The Task Force included 12 studies in its systematic review of the effectiveness of worksite-based incentives and competitions in combination with additional interviews.\textsuperscript{28} Across 11 of the studies, the Task Force found a median increase in tobacco quit rates of 4.3 percentage points. The median quit rate achieved by program participants was 15 percent. In a subset of five studies that included a similar combination of interventions (an incentive, a worksite-based tobacco cessation group, and educational materials or activities), tobacco quit rates increased by a median of 10 percentage points. The median quit rate achieved by program participants in these interventions was 21 percent.

ESTIMATED COST FOR IMPLEMENTATION IN MICHIGAN
The table below provides the estimated cost for implementing any of the above strategies in Michigan. For the worksite-based interventions, PSC estimated the number of people targeted by identifying the number of employed adults in state’s labor force in June 2016 (4,616,400)\textsuperscript{29} and multiplying that by the percentage of adults who are current smokers (21.2 percent) to arrive at 978,677 people. In its systematic review of worksite-based incentives and competitions to reduce tobacco use, the Community Preventive Services Task Force found a median cessation program participation rate of 28 percent among eligible tobacco users.\textsuperscript{30} With median quit rates ranging from 15 to 21 percent based on the intensity of the intervention, the estimated the number of quitters would range from 41,104 to 57,546.
Estimated Cost for Reducing Smoking by Adults and Adolescents, by Strategy

**Objective 1:** Reduce the proportion of adults and adolescents who currently smoke from 21.2 percent (adults) and 11.8 percent (adolescents) to 19.3 percent and 3.6 percent, respectively.

<table>
<thead>
<tr>
<th>Suggested Strategy</th>
<th>Expected costs per person targeted*</th>
<th>Estimated cost for implementation in Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive tobacco control programs</td>
<td>N/A</td>
<td>$77.6 to $111.6 million</td>
</tr>
<tr>
<td>Mass-reach health communication interventions</td>
<td>N/A</td>
<td>$8.0 to $11.5 million</td>
</tr>
<tr>
<td>Community mobilization and additional interventions to reduce youth access</td>
<td>N/A</td>
<td>$28.5 to $35.7 million</td>
</tr>
<tr>
<td>Worksite-based incentives and competitions with individual cessation support</td>
<td>$274–$1,238</td>
<td>$11.3 to $71.2 million</td>
</tr>
</tbody>
</table>

* The cost estimates in this table reflect the January to July 2016 inflation rate.
Human Papillomavirus (HPV)

The human papillomavirus (HPV) is a common virus affecting nearly 80 million people in the U.S., with approximately 14 million new infections each year. Although many HPV infections resolve on their own, when they persist, they can lead to genital warts and different types of cancers. Every year in the U.S., approximately 17,600 women and 9,300 men are affected by cancers caused by HPV. Cervical cancer is the most common HPV-associated cancer among women, and oropharyngeal (tonsil) cancers are the most common among men. HPV vaccination could prevent many of these diagnoses.

Since 2006, the CDC has recommended an HPV vaccine for preteen boys and girls 11 to 12 years of age. It is also recommended to men and women up to age 26 if they had not already received the complete vaccine dose. The HPV vaccine—given in a series of three doses over 6 months—protects against many of the types of HPV that can lead to genital warts and cancer. It is proven to be both safe and very effective. In fact, four years after its recommendation in 2006, infections in teen girls decreased by 56 percent. Unfortunately, the HPV vaccine is underutilized in the U.S. and especially in Michigan. As of March 31, 2016, only 35 percent of females and 22.4 percent of males ages 13 through 17 in Michigan had received all three doses of the HPV vaccine. The Cancer Plan for Michigan includes an objective to increase the proportion of females and males aged 13 to 17 years who have received all three doses of HPV vaccine from its current level to 80 percent for both females and males, by the year 2020.

STRATEGIES AND COSTS

There are three key strategies aimed at increasing the percentage of adolescents vaccinated against HPV in Michigan’s cancer control plan, which are also endorsed by the Task Force:

- Community-based interventions implemented in combination
- Health care system-based interventions implemented in combination
- Provider assessment and feedback

Community-based Interventions Implemented in Combination

According to the Task Force, community-based interventions implemented in combination involves the use of two or more coordinated interventions to increase vaccination rates within a targeted population. The approach requires community organizations, local government, and vaccination providers to work together to implement and coordinate one or more interventions to increase community demand as well as one or more interventions to enhance access to vaccination services.

Interventions that aim to increase community demand include strategies such as client reminder and recall systems, manual outreach and tracking, client or community-wide education, client incentives, client-held paper immunization records, and case management. Interventions that aim to enhance access to vaccination services include expanded access to vaccinations in health care settings, home visits to support or provide vaccinations, and reduced out-of-pocket costs for clients. Although not required, the approach can also include interventions directed at vaccination providers, such as provider assessment and feedback, provider

**Intervention at a Glance**

Community-based Interventions in Combination

- Interventions implemented in communities, including one or more interventions to increase community demand for vaccinations and one or more interventions to enhance access to vaccination services. Potential interventions include client reminder and recall systems, community-wide education, and expanded access to vaccinations in health care settings, among others.
- Estimated cost for implementation in Michigan: $10.3 to $157.6 million.
education, and provider reminder systems. The number of interventions used in combination and the level of intensity of each of the selected interventions can significantly affect the total cost of implementing community-based interventions in combination.

**Economic Review**

The Task Force provides economic cost data for implementing community-based interventions in combination. PSC estimates that the median cost per person targeted per year would be $56.16, when adjusting for inflation. The cost, however, can vary significantly based on the combination of interventions used. At the lower end of the range of estimated costs, the state could expect to spend $14.56 per person targeted using interventions that are less intensive (e.g., mail and telephone reminders). At the higher end of the range, the state could spend $222.56 per person using more intensive interventions (e.g., home visits).

**Intervention Effectiveness**

In its review of effectiveness of the strategy, the Task Force found a median increase of 14 percentage points in vaccination rates when community-based interventions were implemented in combination. The improvements in vaccination rates in the studies used in the review ranged from seven to 24 percentage points. However, this increase must be viewed cautiously and may not be representative of its effect in Michigan. The Task Force does not identify community-based interventions implemented in combination as a proven, effective approach for adolescent populations or for those in rural settings. While this does not mean that the strategy will not work for these populations, it does suggest further research is needed to determine if the strategy is effective for those groups. Additionally, client reminders and recall efforts are often employed as part of this strategy. This is an approach that Michigan has been promoting and which may already be in use in many areas across the state.

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**Health Care System–based Interventions Implemented in Combination**

According to the Task Force, health care system-based interventions implemented in combination involve the use of two or more interventions to increase vaccination rates within a targeted client population. The interventions are implemented primarily in health care settings, although efforts may include additional activities within the community. This strategy must include at least one intervention to increase client demand for vaccinations, such as using client reminder and recall systems, conducting manual outreach and tracking, providing client or community-wide education, offering client incentives, and giving client-held paper immunization records. It must also include at least one intervention that addresses either enhanced access to vaccinations—through expanded access in health care settings, reduced client out-of-pocket costs, or providing home-visits—or interventions directed at vaccination providers or systems, such as provider assessment and feedback, provider reminders, and the use of standing orders.

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**Prepared by Public Sector Consultants Inc.**

October 2016
**Intervention Effectiveness**

The Task Force reports that health care system-based interventions implemented in combination result in a median increase in vaccinations of nine percentage points, and range from four to 21 points. The level of increase varies based on the combination of interventions used and current vaccination rates. Based on the studies in the Task Force’s review, areas with lower starting rates saw a greater percentage increase over areas that started with higher vaccination rates. The health care system-based interventions implemented in combination were applied in a variety of settings and different client populations in the studies included in the review. The Task Force, however, identifies adolescents and rural settings as an evidence gap, meaning that there was not enough evidence to recommend the approach for these populations. While this approach may be effective, more research is needed to determine its effectiveness for these populations.

**Provider Assessment and Feedback**

Provider assessment and feedback interventions evaluate provider performance in delivering one or more vaccinations to a client population (assessment) and then present providers with information about their performance (feedback). The feedback may describe the performance of a group of providers, such as the average performance for a practice, or it may be given to an individual provider. This strategy can include offering providers incentives to improve their vaccination performance or benchmarking their performance against that of other providers. The CDC’s assessment and feedback system—assessment, feedback, incentives, and exchange (AFIX)—is used in every state, implemented through state and local health departments, to help providers improve their vaccination rates. The AFIX system supports assessment of provider vaccination coverage levels, feedback on results along with recommended strategies for improvement, incentives to recognize and reward performance, and exchange of health care information and resources to facilitate improvement. This system is available in all states, including Michigan, although not all health care providers participate in the system.

**Economic Review**

The Task Force includes only three studies in its economic review of provider assessment and feedback, none of which included adolescent populations. Through a search of peer-reviewed journals, PSC found a study that described the successful use of assessment and feedback to increase vaccinations for patients 11 to 18 years of age, at an inflation-adjusted cost of $153.31 per provider. Across all four studies (those from the Task Force and the one from PSC’s economic review), costs range from $0.13 per patient targeted per year to $4.10 per patient targeted per year, when adjusted for inflation. The cost per patient is determined by dividing the cost of providing assessment and feedback to physicians by the number of patients in the target population, so these estimated costs are highly dependent on the number of eligible patients seen by the physicians targeted with the intervention. For example, it could cost $5,000 to train a provider group, who collectively see 1,000 adolescent patients—a cost of $5.00 per patient. It could also cost $5,000 to train a provider group that sees 100 eligible patients—a cost of $50 per patient. It is also important to note that the costs provided in the studies represent the costs for training and educating providers on an assessment and feedback system, and do not include the costs to the practices implementing a provider assessment and feedback strategy.
**Intervention Effectiveness**

The studies included in the Task Force’s review of provider assessment and feedback had a median increase of nine percentage points in vaccinations, with a range of three to 14 percentage points. Although only the study found by PSC focused on adolescents, the Task Force identifies this intervention as effective for all potentially targeted populations.

**ESTIMATED COST FOR IMPLEMENTATION IN MICHIGAN**

The U.S. Census Bureau estimates there were approximately 661,451 children ages 13 to 17 in Michigan, in 2015. After accounting for those who have received all three doses of the HPV vaccine (35 percent of females and 22.4 percent of males), approximately 472,543 children in this age group remain without the full vaccine. In 2015, there were approximately 251,836 children ages 11 and 12 in Michigan, of whom 6.4 percent had received the full vaccine series. This leaves approximately 235,718 children in this age group who have not received the full vaccine. These children should be included in the target population for the state’s efforts to increase HPV vaccination rates to 80 percent of 13- to 17-year-olds. The table below provides the expected range of costs per person targeted, and the total expected cost for reaching an estimated 708,261 children aged 11 to 17 years old in Michigan using the recommended strategies.

**Table: Estimated Cost for Increasing HPV Vaccinations, by Strategy**

<table>
<thead>
<tr>
<th>Suggested Strategy</th>
<th>Expected costs per person targeted*</th>
<th>Estimated cost for implementation in Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community-based interventions implemented in combination</td>
<td>$14.56–$222.56</td>
<td>$10.3 to $157.6 million</td>
</tr>
<tr>
<td>Health care system-based interventions implemented in combination</td>
<td>$0.87–$13.52</td>
<td>$619,000 to $9.6 million</td>
</tr>
<tr>
<td>Provider assessment and feedback, alone</td>
<td>$0.13–$4.10</td>
<td>$94,000 to $2.9 million</td>
</tr>
</tbody>
</table>

*The cost estimates in this table reflect the January to July 2016 inflation rate.
Lung Cancer

Lung cancer is the second most commonly diagnosed cancer in men and women, and is the leading cause of cancer death for both men and women in the U.S. In 2013, 212,584 people in the United States were diagnosed with lung cancer, including 111,907 men and 100,677 women.\(^{51}\) In the same year 156,176 people in the U.S., including 5,761 people in Michigan, died from the disease. The American Cancer Society estimates that in 2016, 8,440 people will be diagnosed and 6,030 will die from lung cancer in Michigan.\(^{54}\) The risk of lung cancer increases with age, and current cigarette smokers have higher rates of new lung cancer cases than people who never smoked or who quit smoking. The risk of being diagnosed with lung cancer drops by 50 percent ten years after a person quits smoking.\(^{55}\) The rates of lung cancer incidence and mortality have been decreasing over the past three decades,\(^{56}\) due primarily to declining rates of smoking prevalence. The Michigan Cancer Consortium has established an objective to reduce lung cancer mortality rates from 47.9 to 43.1 deaths per 100,000 population.

**STRATEGIES AND COSTS**

The Cancer Plan for Michigan identifies the following three strategies for reducing lung cancer mortality:

- Increase appropriate referrals for lung cancer screening.
- Increase referrals for tobacco cessation.
- Prevent tobacco use among youth and young adults.

Only the first two of these are discussed below because prevention of tobacco use among youth and young adults is included in the strategies for Objective 1.

**Lung Cancer Screening Programs**

The U.S. Preventive Services Task Force (USPSTF) recommends annual lung cancer screening using low-dose computed tomography (LDCT) for adults between the ages of 55 and 80 who have a history of heavy smoking (30 pack-years; an average of one pack per day for 30 years) and currently smoke or have quit within the past 15 years. The USPSTF recommends that screenings be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.\(^{57}\) Use of LDCT has been shown to reduce lung cancer mortality by 20 percent compared to standard chest x-ray among those adults for whom this screening is recommended.\(^{58}\)

Effective lung cancer screening programs lead to earlier detection of cancer, which increases the effectiveness of treatment and improves the chances for survival. They also increase opportunities for tobacco cessation when effective counseling and other behavioral interventions are used as part of the screening program.

While it has been well-established that smoking is the leading cause of lung cancer, routine screening for lung cancer is a relatively recent development. The USPSTF recommendation was finalized in December 2013, and MDHHS began promoting LDCT in 2015 as a new tool for lung cancer screening with the development of a toolkit to help increase awareness of lung cancer screening.\(^{59}\) Other states have also been working in recent years to educate primary care providers and encourage them to refer appropriate patients for lung cancer screening.\(^{60}\)
Economic Review

Because lung cancer screening is so recent, state and local efforts are targeted at building awareness of lung cancer screening programs among primary care providers and patients who are eligible for screening based on age and smoking history. The hope is that these education efforts will encourage patients to ask their physicians about screening and lead physicians to refer patients for screening. The CDC described efforts of states, including South Carolina, Delaware, Kentucky, Kansas, and Vermont, to build awareness of and referrals for lung cancer screening through media campaigns, surveys to assess awareness of lung cancer screening, and development of shared decision-making tools for providers to use with patients. Data on the cost of these activities are not readily available, however; nor is there information on the effectiveness of the approaches. In Michigan, the MDHHS offers grants to health systems to support lung cancer screening referrals and tobacco dependence treatment. The scope of work carried out with this funding varies by health system. The most common activities are:

- Assessing tobacco dependence and lung cancer screening policies and practices, EMR capabilities, quality measures, and provider and staff knowledge, attitudes, and behaviors
- Developing or enhancing processes for tobacco dependence treatment and lung cancer screening referrals
- Modifying EMRs to allow documentation of referrals and identification of patients who are eligible for screening
- Educating providers about lung cancer screening

These grants range from $36,250 to $130,000 per health system per year. It is difficult to know whether these amounts are adequate to support the development or implementation of lung cancer screening programs.

Referrals for Tobacco Cessation

Michigan’s comprehensive cancer control plan calls for an increase in referrals for tobacco cessation services. Tobacco cessation quit line interventions are a commonly employed strategy for helping people quit smoking and are recommended by the Community Preventive Services Task Force (Task Force) and the USPSTF based on sufficient evidence of effectiveness. Quit lines use the telephone to provide evidence-based behavioral counseling and support to help tobacco users who want to quit. Counseling is provided by trained cessation specialists who follow standardized protocols that may include several sessions delivered over one or more months. Referrals from health care systems and providers are among the interventions the Task Force says are effective at increasing the use of quit lines. Due to the availability of evidence of effectiveness and cost estimates, referrals to quit lines are the focus of this section of the report.

Referrals for Tobacco Cessation

- Efforts to refer and connect adults who smoke to behavioral interventions to help them quit. Quit lines, recommended by the Community Preventive Services Task Force, use telephone-based behavioral counseling to help tobacco users who want to quit.
- Estimated cost for implementation in Michigan: $45.8 to $122.7 million.

Economic Review

Public Sector Consultants found three studies of efforts to increase clinician referrals to tobacco cessation quit lines that included information about the cost of the interventions. Working with information from physician practices, researchers in one Michigan study developed and shared quarterly comparative feedback reports with individual physicians in participating practices. The reports allowed the physicians to see how their own performance and that of their practice compared to benchmarks set by the study authors. Benchmarks were based on the mean number of referrals per quarter for the top 10 percent of clinicians. Using a group-randomized trial, the study authors compared this intervention with providing
general reminders regarding the availability of quit line services. In another study, researchers conducted a randomized trial of a pay-for-performance program to increase clinician referrals to a state tobacco quit line.\textsuperscript{62} A third study included training of health care providers and staff in a single health system on motivational counseling techniques, information on appropriate pharmacotherapy, and encouragement to refer patients to a statewide quit line.\textsuperscript{63} Adjustments were made to practice EMRs to allow them to document patient tobacco use status, provider advice to quit, patient readiness to quit, and referral to the quit line (either by fax or brochure). Across the three studies, the inflation-adjusted cost per referral ranged from $28 to $75.

\textit{Intervention Effectiveness}

In its review of the effectiveness of quit line interventions, the Task Force found successful tobacco cessation was 3.1 percentage points greater among people who received counseling through a quit line than it was among those in control groups. It also found that tobacco cessation rates for tobacco users referred to a quit line by a health care provider were 2.4 percentage points greater than for non-referred tobacco users. The Task Force also found the intervention saved $2,358 per quality-adjusted life year.

In the studies used in PSC’s economic review, study authors found that providers who received an intervention designed to increase the number of referrals they made to quit lines were significantly more likely to do so than providers in the usual care or randomized control groups. In the Michigan-based study, intervention practices referred 484 patients over 18 months while control practices referred only 220. In the study of the pay-for-performance intervention, pay-for-performance clinics referred 11.4 percent of smokers compared with 4.2 percent for usual care clinics. The intervention was especially effective in increasing referral rates among practices that did not have a history of being engaged with quality improvement activities.

\textbf{ESTIMATED COST FOR IMPLEMENTATION IN MICHIGAN}

There are approximately 1,635,638 adult smokers in Michigan.\textsuperscript{64} These adults should be targeted for referrals to tobacco cessation quit lines. The table below shows the estimated cost per person referred to a quit line and the total expected costs to reach adult smokers in the state. The estimates are high, given that not all of these adults are likely to be interested in or ready to quit smoking. The table also shows the estimated cost for increasing referrals for lung cancer screening among adults who meet age and smoking history criteria.

\begin{table}[h]
\centering
\begin{tabular}{|l|l|l|}
\hline
\textbf{Objective 14: Reduce lung cancer mortality rates from 47.9 to 43.1 deaths per 100,000 population.} & & \\
\hline
\textbf{Suggested Strategy} & \textbf{Intervention cost per person targeted\textsuperscript{*}} & \textbf{Estimated cost for implementation in Michigan} \\
\hline
Increase appropriate referrals for lung cancer screening. & N/A & $36,000 to $130,000 per health system per year \\
\hline
Increase referrals for tobacco cessation\textsuperscript{65, 66, 67} & $28.00–$75.00 & $45.8 to $122.7 million \\
\hline
\end{tabular}
\caption{Estimated Cost for Reducing Lung Cancer Mortality, by Strategy}
\end{table}

\textsuperscript{*} The cost estimates in this table reflect the January to July 2016 inflation rate.
Breast Cancer

Breast cancer affects thousands of individuals and their families in Michigan every year. In 2016 alone, an estimated 8,150 new breast cancer cases—predominantly among women—will be diagnosed and an estimated 1,410 Michigan residents will die from breast cancer.68

As of 2009, the Community Preventive Services Task Force recommends that women aged 50 to 74 receive biennial mammograms. This recommendation pertains only to those who do not have preexisting breast cancer, have not had breast cancer previously, or are not at a high risk of breast cancer that is likely to be caused by an underlying genetic mutation.69 (Screening for women who do not fall under this recommendation may occur more frequently and/or beginning at a younger age, as directed by a physician who is familiar with the patient’s health history and level of risk.) In 2014, 81.9 percent of women aged 50 to 74 reported having a mammogram in the past two years.70 The Cancer Plan for Michigan includes an objective to increase the proportion of women aged 50 to 74 who have received a mammogram in the past two years to 89.1 percent by the year 2020.

STRATEGIES AND COSTS

Five key strategies aimed at increasing the percentage of women who have received a mammogram in the past two years appear in the Cancer Plan for Michigan and are also endorsed by the Task Force:

- Client reminder systems
- One-on-one, small group, and small-media patient education
- Reducing structural barriers
- Provider reminder and recall systems
- Provider assessment and feedback

While the Task Force recommends the use of these strategies based on its review of their effectiveness, it provided very limited information related to the costs of implementing these strategies. PSC conducted a review of the literature to identify and calculate the cost estimates provided below.

Client Reminder Systems

Client reminders are written (letter, postcard, email) or telephone messages (including automated messages) advising people in a target population that they are due for screening. Client reminders are often paired with other interventions, which may increase their effectiveness. These include follow-up printed or telephone reminders, client education about breast cancer screenings, or assistance in scheduling appointments. Client reminders can be generalized to the entire target population or tailored to reach specific individuals.71

Economic Review

In its economic review, PSC found ten studies that involved client reminders. Six of those studies implemented client reminders alone and four studies implemented client reminders in combination with one or more other strategies. All ten studies had at least one study arm that sent out initial reminder letters, and three had at least one study arm that included an initial telephone reminder. Most of the studies (seven of ten) included a follow-up letter or telephone call after the
initial reminder. Of the four studies that used client reminders in combination with other strategies, all included patient education and two reduced structural barriers by providing support for scheduling appointments.

Many of the studies’ target populations differed from the current screening recommendation of those aged 50 to 74. Those targeted with interventions ranged from 40 years of age to 85 years of age, and some studies had a beginning target age but no end range (e.g., 40 years or older).

The cost of implementing these strategies varies significantly depending on whether the strategy was implemented on its own or in combination with a costlier intervention such as tailored messaging or one-on-one patient education. Five of the six studies that implemented client reminders alone reported costs under $9 per person targeted, when adjusted for inflation; one of these used an automated telephone reminder and had inflation-adjusted costs as low as $0.39 per person targeted. In comparison, a study that implemented client reminders with one-on-one patient education reported costs of $232.43 per person targeted, when adjusted for inflation.

**Intervention Effectiveness**

In its review of effectiveness, the Task Force found that implementing client reminders was associated with a median increase of 14 percentage points in breast cancer screenings, with a range of 2 to 24 percentage points. It also found that using telephone reminders had a greater effect (median increase of 15.5 percentage points) than using written reminders (median increase of 4.5 percentage points) on increasing the percentage of women who are up to date on breast cancer screenings. The Task Force states that client reminders are likely to be effective across a wide range of settings and populations.

The Task Force recommends conducting additional research on client reminders to determine (1) whether its effectiveness varies based on newer methods of communication (e.g., email, text messages) or by the source of the reminder (e.g., clinic or practice versus a screening registry or outside program) and (2) the level of effectiveness of the intervention for specific populations, such as those who are overdue for a screening or those who have never been screened.72

**Utilize One-on-one, Small Group, and Small-media Patient Education**

One-on-one, small group, and small-media patient education provides information to individuals about the importance of cancer screenings and encourages patients to seek them out. The information presented may be tailored to individuals based on their health record or perceived barriers, or it can be generalized to a larger population. One-on-one patient education can be delivered over the telephone or in person, usually by a health care worker or volunteer.73 Small group education is done in person, usually by a health care worker or trained lay educator. The instructor can use a lecture or interactive format that incorporates a variety of styles to present the information including lectures and interactive role-play sessions.74 Small-media-based education includes videos and printed materials, such as a pamphlet or brochure.75 One-on-one and small group patient education is usually accompanied by small-media education.

**Economic Review**

PSC found 13 studies of interventions that used small-media, group education, or one-on-one patient education and included cost information. Nine of the 13 studies used small-media education in combination
with either one-on-one patient education or group education. Six of the 13 studies included one or more other strategies (i.e., client reminders, provider reminders, and reducing structural barriers) as a part of the intervention to increase breast cancer screenings, and seven included only patient education strategies.

Many of the studies’ target populations were outside of the recommended age range for breast cancer screening (50 to 74 years), targeting women from as young as 18 to as old as 85. Some studies had a beginning target age but no end range (e.g., 40 years or older).

The cost of implementing the patient education strategies in these studies varied significantly due to factors including the type and intensity of the education, the provider or staff person presenting the information, and whether the education messages were tailored to a specific population. For example, two studies of small-media education being used alone reported costs under $6 per person targeted. Studies with one-on-one education had costs ranging from $11.86 to $464.74, when adjusted for inflation. At the lower end, phone-based education was provided by a graduate nurse researcher ($11.86) or a trained lay educator ($41.95). The higher end included more intensive interventions: a nurse educator providing one-on-one education and follow-up care ($357.08) and a seven-week education program that included information about cancer and how to reduce your risk of cancer, as well as cancer screenings provided by a lay educator ($464.74). Two studies that included group education reported costs ranging from $14.32 to $122.52 per person, when adjusted for inflation.

**Intervention Effectiveness**

The Task Force provides expected effectiveness information for using one-on-one, small group, and small-media patient education separately. The Task Force found a median increase in breast cancer screenings of 9.7 percentage points through the use of tailored one-on-one education, 6.3 percentage points for untailed one-on-one education, 11.5 percentage points for group education, and 7.0 percentage points through the use of small-media education. Not all studies that used small-media patient education showed a positive effect, however, and some studies that used tailored messaging showed a negative effect. The Task Force finds that all of these patient education interventions are likely to be applicable across a wide range of settings and populations, and they can be adapted to meet the needs of a specific population.

**Reduce Structural Barriers**

Structural barriers are system challenges that make it difficult for people to receive recommended cancer screenings, regardless of their ability to pay. As described in The Community Guide, there are several ways to reduce these barriers, including:76

- Reducing time or distance between service delivery settings and target populations
- Modifying or increasing the hours of service to meet client needs
- Offering services in alternative or nonclinical settings (e.g., mobile clinic vans at worksites or in residential communities)
- Eliminating or simplifying administrative procedures and other obstacles (e.g., scheduling assistance, patient navigators, transportation assistance, dependent care, translation services, and limiting the number of clinic visits).

Strategies to reduce structural barriers are often accompanied by other interventions, such as the use of client reminders, patient education, or interventions that reduce the economic burden of the screening for the client.77
In its economic review, PSC identified six studies of interventions that aimed to reduce structural barriers for women needing mammograms. Four of these studies included the use of mobile mammography clinics and two included scheduling assistance. The mobile mammography vans all utilized radiology technicians, and one used a nurse practitioner as well. The two studies that included scheduling assistance also included client reminders and client education to increase breast cancer screening adherence. The studies that included mobile mammography did not appear to include other strategies to increase breast cancer screening.

The ages of the target populations in many of these studies were outside of the recommended age range for breast cancer screening (50 to 74 years). Those targeted with interventions in these studies ranged from 40 to 79 years of age, and some studies had a beginning target age but no end range (e.g., 40 years or older).

Of the studies that included mobile mammography clinics, the inflation-adjusted cost per woman screened ranged from $68.40 to $155.88 per woman. Three of the studies, however, had costs above $100 per person. The costs vary in part due to the average number of women screened per day in each study, which ranged from an average of 14.4 to 40. The studies also note that start-up costs (e.g., purchase of van and equipment) would be higher in the first year than in subsequent years, although the studies used a 5-year amortization schedule for the van in their cost assessments.

The two studies that included scheduling assistance reported costs between $17.41 and $65.91 per woman targeted (adjusted for inflation), but both studies also included client reminders and client education and did not separate the cost of the scheduling assistance from these other strategies. It is difficult to determine how much of this cost should be attributed to scheduling assistance versus the other strategies.

### Intervention Effectiveness

In a 2002 review of the effectiveness of reducing structural barriers to increase breast cancer screenings, the Task Force found a median increase in breast cancer screenings of 17.7 percentage points with a range of 11.5 to 30.5 percentage points. In 2008, the Task Force conducted an updated review, which included one additional study that reported an increase in mammography screenings of 18 percentage points. The Task Force states that strategies to reduce structural barriers can be effective across a range of populations and settings.

### Provider Reminder and Recall Systems

Provider reminder and recall systems inform health care providers when it is time for a client’s cancer screening test or if a client is overdue for screening. Reminders can be provided in different ways, such as through client charts, by email, or in electronic medical records. Increasingly, the use of electronic medical records allows provider reminders and recalls to occur easily and without a lot of additional cost.

### Intervention at a Glance

**Provider Reminder and Recall Systems**

- Processes and systems to inform health care providers when it is time for a client’s cancer screening test or if a client is overdue for screening. Reminders can be provided in different ways, such as through client charts, by email, or in electronic medical records.
- Estimated cost for implementation in Michigan: $996,000 to $10.2 million

In its economic review, PSC identified three studies of provider reminder and recall systems being used to increase breast cancer screening rates. Of those, two studies included cost information on provider reminder and recall systems as an isolated strategy, and one provided costs for the use of provider reminder and recall systems in combination with provider or patient education. Two of
the three studies used electronic reminders for providers and one used colored stickers in patient charts to inform physicians that screenings were due.

Across the three studies, the inflation-adjusted cost of implementing provider reminder and recall systems ranged from $3.54 to $36.36 per patient targeted. The study that included provider education in addition to reminder and recall systems also offered $150 incentives to each provider that attended a training session. It is important to note that the cost per patient is determined by dividing the cost of implementing the provider reminder and recall system by the number of patients in the target population, so these estimated costs are highly dependent on the number of eligible patients seen by the physicians using the intervention.

**Intervention Effectiveness**

The Task Force’s review of effectiveness found that implementing provider reminder and recall systems led to a median increase of 12 percentage points in breast cancer screenings. Provider reminders are effective across a broad range of clinical settings and populations, including clients who are infrequently or have never been previously screened for cancer.

**Provider Assessment and Feedback**

In addition to promoting its use for increasing vaccinations, the Task Force recommends the use of provider assessment and feedback to increase breast cancer screenings. Provider assessment and feedback interventions evaluate provider performance in delivering or offering recommended cancer screenings to a client population (assessment) and then present providers with information about their performance (feedback). The feedback may describe the performance of a group of providers, such as the average performance for a practice, or it may be given to an individual provider. This strategy can include offering providers incentives to improve their screening performance or benchmarking their performance against that of other providers.

**Economic Review**

It its economic review, PSC found one study that implemented provider assessment and feedback for any cancer screening and one additional study that used provider assessment and feedback to increase colorectal cancer screenings, which should be applicable to other types of cancer screenings. The two studies reported similar costs, ranging from $17.59 to $20.99 per person targeted, when adjusted for inflation. The cost per patient is determined by dividing the cost of providing assessment and feedback to physicians by the number of patients in the target population, so these estimated costs are highly dependent on the number of eligible patients seen by the physicians targeted with the intervention. It is also important to note that the costs provided in the studies represent the costs for training and educating providers on an assessment and feedback system, and do not include the costs incurred by the practices in implementing a provider assessment and feedback strategy.

**Intervention Effectiveness**

The studies included in the Task Force’s review of provider assessment and feedback showed a median increase of 13 percentage points for cancer screening in general (i.e., breast, cervical, or colorectal cancer), with a range of 3.4 to 20.6 percentage points for breast cancer screening alone. The Task Force determined that assessment and feedback is effective across a broad range of settings and populations.
ESTIMATED COST FOR IMPLEMENTATION IN MICHIGAN

The U.S. Census Bureau estimates there were approximately 1,556,863 women aged 50 to 74 in Michigan, in 2015. In 2014, 81.9 percent of women in Michigan aged 50 to 74 years had received a recommended breast cancer screening. Based on this, there are about 281,792 women not up to date with this recommendation. The strategies identified in the Cancer Plan for Michigan to increase breast cancer screening should be targeted at this population of women to reach the target screening rate of 89.1 percent. The table below shows the expected range of costs per woman targeted, and the total expected cost of using the suggested strategies to reach women aged 50 to 74 in Michigan who have not received breast cancer screening in the last two years.

### Estimated Cost for Increasing Breast Cancer Screenings, by Strategy

| Objective 15: Increase the proportion of females aged 50 to 74 who received a breast cancer screening (mammogram) in the past two years from 81.9 percent to 89.1 percent. |
|--------------------------------------------------|---------------------------------|
| Suggested Strategy                              | Expected costs per person targeted | Estimated cost for implementation in Michigan |
| Client reminder systems, alone<sup>85, 86, 87, 88, 89, 90</sup> | $0.39–$77.65 | $110,000 to $21.9 million |
| Client reminders, in combination<sup>91, 92, 93, 94</sup> | $11.86–$232.43 | $3.3 to $65.5 million |
| Client education: small media, alone<sup>95, 96</sup> | $1.49–$5.68 | $420,000 to $1.6 million |
| Client education: group education with small media<sup>97, 98</sup> | $14.32–$122.52 | $4.0 to $34.5 million |
| Client education: one-on-one education with small media<sup>99, 100, 101, 102, 103, 104, 105, 106</sup> | $11.86–$464.74 | $3.3 to $131.0 million |
| Reduce structural barriers: mobile mammography, alone<sup>107, 108, 109, 110</sup> | $68.40–$155.88 | $19.3 to $43.9 million |
| Reduce structural barriers: scheduling assistance, in combination<sup>111, 112</sup> | $17.41–$65.91 | $4.9 to $18.6 million |
| Provider reminder and recall systems, alone or in combination<sup>113, 114, 115</sup> | $3.54–$36.36 | $996,000 to $10.2 million |
| Provider assessment and feedback, alone<sup>116, 117</sup> | $17.59–$20.99 | $5.0 to $5.9 million |

* The authors of the studies included in the review did not take a uniform approach to determining the cost of the interventions. Some included indirect and overhead expenses and/or staff costs, while others did not.

† The cost estimates in this table reflect the January to July 2016 inflation rate. When study authors provided the year in which the cost data was presented, PSC used that year as the basis for the inflation adjustment. When that information was not provided, the year in which the study was published was used as the basis for applying inflation.
Cervical Cancer

Cervical cancer is estimated to affect over 12,000 individuals and their families in the U.S. in 2016. In Michigan, an estimated 380 women will be diagnosed with cervical cancer and an estimated 110 women will die of the disease in 2016.

Cervical cancer is most commonly caused by the Human papillomavirus (HPV), and is largely preventable through HPV vaccination and cervical cancer screenings (Pap test), which can identify abnormal cells before they become cancerous. The Task Force recommends screening for cervical cancer in women aged 21 to 65 with a Pap test every three years. In 2014, 83.7 percent of women aged 21 to 65 in Michigan reported having a Pap test within the last three years. The Cancer Plan for Michigan includes an objective to increase the proportion of women aged 21 to 65 years who have received this screening in the past three years to 94.8 percent, by the year 2020.

STRATEGIES AND COSTS

The Cancer Plan for Michigan recommends using the following evidence-based strategies from The Community Guide to reach its goal of almost 95 percent of women aged 21 to 65 receiving a cervical cancer screening test within the last three years:

- Client reminder systems
- One-on-one and small-media patient education
- Provider reminder and recall systems
- Provider assessment and feedback

While the Community Preventive Services Task Force recommends the use of these strategies based on its review of their effectiveness, the Task Force provided very limited information related to the costs of implementing these strategies. PSC conducted a review of the literature to identify and calculate the cost estimates provided below.

**Client Reminder Systems**

Client reminders described in the breast cancer section are recommended by the Task Force to increase cervical cancer screenings.

**Economic Review**

In its economic review, PSC found three studies, with four study arms, that provided cost information on using client reminders to increase cervical cancer screenings. All three studies included a follow-up letter or telephone call after the initial reminder and described the use of client reminders in combination with at least one patient education strategy. Two of them also included scheduling support. The women targeted with the interventions ranged from 18 to 79 years of age.

The inflation-adjusted cost of implementing these strategies varied between $17.41 and $232.43 per woman targeted. The study that reported the largest cost per person targeted ($232.43 per person) implemented reminder messages with tailored education and outreach, which were more time intensive to prepare and deliver than the other patient education approaches.
Intervention Effectiveness

The Task Force’s review of effectiveness found that implementing client reminders was associated with a median increase of 10.2 percentage points for cervical cancer screening, with a range of 6.3 to 17.9 percentage points. It also found that telephone reminders following up on written reminders were more effective than written reminders alone, with a median 15.5 percentage point increase in screenings compared to a 9.8 percentage point increase for use of only a written reminder.

Utilize One-on-One and Small-media Patient Education

One-on-one and small-media patient education, as described in the breast cancer section, are patient education interventions recommended by the Task Force.

Economic Review

In its economic review, PSC found seven studies that included patient education. Three studies included at least one study arm that focused on small-media education only, and six studies included study arms that utilized one-on-one education in addition to small-media education strategies. In three of the study arms that included one-on-one education, the education was provided over the telephone; in the other three studies, the education was provided in person. Three of the studies that included one-on-one education also included additional strategies (client reminders and/or scheduling support). The women targeted with the interventions ranged primarily from 18 to 79 years of age, but some studies did not specify a maximum age (e.g., 21 and older).

The six study arms that implemented both one-on-one education and small media, regardless of any additional strategies, reported costs ranging from $17.41 to $464.74 per person targeted (when adjusted for inflation), with four of these reporting costs greater than $150 per person targeted. The study that had the most expensive intervention included very intensive one-on-one educational sessions that reviewed information about cancer, cancer risks, and cancer screening. The studies that implemented small media alone reported costs ranging from $5.68 to $73.31 per person targeted, when adjusted for inflation; the more expensive study used tailored messages to reach a specific population.

Intervention Effectiveness

The Task Force does not provide expected effectiveness information for using one-on-one and small-media patient education together, but provides it for each of these interventions separately. The Task Force found a median increase in cervical cancer screenings of 8.1 percentage points through the use of one-on-one education and a median increase of 4.5 percentage points in these screenings through the use of small-media education. The Task Force finds that tailored messages are either less or no more effective than untailored interventions. One-on-one and small-media patient education is likely to be applicable to a broad range of settings and populations.125, 126

Provider Reminder and Recall Systems

Provider reminder and recall systems, described in the breast cancer screening section above, are also recommended as an intervention to increase cervical cancer screenings.127
Economic Review

In its economic review, PSC identified two studies that included provider reminder and recall systems to increase cancer screenings in general and one that used the intervention to increase screenings for breast cancer alone, but all three should be applicable to increasing cervical cancer screenings. Two of the studies used provider reminders as an isolated strategy and the other included both provider education and provider reminders. Two of the studies identified patients with scheduled appointments who were due or overdue for a cancer screening so that the physician would prompt the patient during the visit to get the recommended screening. In the third study, providers received quarterly updates on which of their patients were overdue for a cancer screening.

Across the three studies, the inflation-adjusted cost of implementing provider reminder and recall systems ranged from approximately $3.54 to $36.36 per patient targeted. The cost per patient is determined by dividing the cost of implementing the provider reminder and recall system by the number of patients in the target population, so these estimated costs are highly dependent on the number of eligible patients seen by the physicians using the intervention.

Intervention Effectiveness

The Task Force’s review of effectiveness found that implementing provider reminder and recall systems led to a median increase of 4.7 percentage points in cervical cancer screenings. Provider reminder and recall systems are effective across a broad range of clinical settings and populations, including clients who are infrequently or have not been previously screened for cancer.

Provider Assessment and Feedback

The Task Force also recommends the use of provider assessment and feedback as described in the breast cancer section to increase cervical cancer screenings.

Economic Review

In its economic review of this intervention for cervical cancer screenings, PSC applied costs from the same studies of provider assessment and feedback that are described in the breast cancer section. One of these studies implemented assessment and feedback for cancer screenings in general and the other used provider assessment and feedback as an intervention to increase colorectal cancer screenings, which should be applicable to other types of cancer screenings. The two studies reported similar costs, ranging from $17.59 to $20.99 per person targeted, when adjusted for inflation. The cost per patient is determined by dividing the cost of providing assessment and feedback to physicians by the number of patients in the target population, so these estimated costs are highly dependent on the number of eligible patients seen by the physicians targeted with the intervention. The costs provided in the studies represent the costs for training and educating providers on an assessment and feedback system, and do not include the costs incurred by the practices in implementing a provider assessment and feedback strategy.
**Intervention Effectiveness**

The studies included in the Task Force’s review of provider assessment and feedback had a median increase of 13 percentage points for cancer screening in general (i.e., breast, cervical, or colorectal cancer), and a range of 4.0 to 29.5 percentage points for cervical cancer screening alone. The Task Force determined that assessment and feedback is effective across a broad range of settings and populations. 131

**ESTIMATED COST FOR IMPLEMENTATION IN MICHIGAN**

The U.S. Census Bureau estimates there were approximately 2,951,688 women aged 21 to 65 in Michigan in 2015132. Approximately 18.2 percent133 of these women have had a hysterectomy and would, therefore, not need to be screened for cervical cancer. This means there are approximately 2,414,481 women aged 21 to 65 in Michigan who should receive a Pap test at least once every three years. In 2014, 83.7 percent of women in Michigan aged 21 to 65 years of these women had received an appropriately timed Pap test, meaning approximately 393,560 women are not up to date with this recommendation. The strategies identified in the Cancer Plan for Michigan to increase cervical cancer screening should be targeted at this population of women. The table below shows the estimated cost per woman targeted and the total expected costs of using the suggested strategies to reach the 393,560 women in Michigan aged 21 to 65 who have not had a hysterectomy and have not been screened for cervical cancer in the last three years.

<table>
<thead>
<tr>
<th>Suggested Strategy</th>
<th>Intervention cost per person targeted**</th>
<th>Estimated cost for implementation in Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client reminder systems, alone or in combination134, 135, 136</td>
<td>$17.41–$232.43</td>
<td>$6.9 to $91.5 million</td>
</tr>
<tr>
<td>One-on-one and small-media patient education137, 138, 139, 140, 141, 142</td>
<td>$5.68–$464.74</td>
<td>$2.2 to $182.9 million</td>
</tr>
<tr>
<td>Provider reminder and recall systems, alone or in combination143, 144, 145</td>
<td>$3.54–$36.36</td>
<td>$1.4 to $14.3 million</td>
</tr>
<tr>
<td>Provider assessment and feedback, alone146, 147</td>
<td>$17.59–$20.99</td>
<td>$6.9 to $8.3 million</td>
</tr>
</tbody>
</table>

* The authors of the studies included in the review did not take a uniform approach to determining the cost of the interventions. Some included indirect and overhead expenses and/or staff costs, while others did not.

** The cost estimates in this table reflect the January to July 2016 inflation rate. When study authors provided the year in which the cost data was presented, PSC used that year as the basis for the inflation adjustment. When that information was not provided, the year in which the study was published was used as the basis for applying inflation.
Colorectal cancer is the third most common cancer in men and women, and is the second leading cause of cancer death for both men and women in the U.S. In 2012, 134,784 people in the U.S., including 4,547 in Michigan, were diagnosed with colorectal cancer. In the same year, 51,516 people in the U.S., and 1,721 people in Michigan, died from the disease. The American Cancer Society estimates that in 2016, 4,570 people will be diagnosed and 1,640 will die from colorectal cancer in Michigan.

Colorectal cancer is treatable and curable if found early. The rates of colorectal cancer incidence and mortality have been decreasing since 2002, in part due to an increase in screening for the disease. Screening identifies precancerous polyps so they can be removed before they become cancerous. Screening can also detect cancer when it is still at an early stage. Colorectal cancer screening is recommended for all adults between the ages of 50 and 75, and for adults under age 50 who are determined to be at high risk. Three different types of screening mechanisms can be used to detect colorectal cancer or precancerous polyps, and each is recommended for use on a different schedule: screening by colonoscopy can be conducted every 10 years, a flexible sigmoidoscopy every five years, or a stool test (either a high-sensitivity fecal occult blood test [FOBT] or a fecal immunochemical test [FIT]) every year. A colonoscopy is recommended if the results of the flexible sigmoidoscopy, FOBT, or FIT find anything unusual. In 2014, only 66.3 percent of U.S. adults and 70.9 percent of Michigan adults aged 50 to 75 reported having received an appropriately timed colorectal cancer screening.

STRATEGIES AND COSTS

Michigan’s cancer control plan recommends using the following evidence-based strategies from The Community Guide to reach its goal of 80 percent of adults aged 50 to 75 receiving an appropriately timed colorectal cancer screening:

- Client reminder systems
- One-on-one and small-media patient education
- Reduce structural barriers
- Provider reminder and recall systems
- Provider assessment and feedback

While the Community Services Preventive Task Force recommends the use of these strategies based on its review of their effectiveness, the Task Force provided very limited information related to the costs of implementing these strategies. PSC conducted a review of the literature to identify and calculate the cost estimates provided below.

**Client Reminder Systems**

Client reminders, as described under breast cancer screening section above, are also recommended to increase cervical cancer screenings.

**Economic Review**

In its economic review, PSC found 12 studies that involved client reminders. Nine of those 12 studies focus on increasing the rate of screening by an FOBT or a fecal immunochemical test (FIT). Two of the 12 focus on increasing the rate of screening through a

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**Intervention at a Glance**

**Client Reminder Systems**

- Written or telephone messages advising people that they are due for screening. Strategies often paired with client reminders to increase their effectiveness include follow-up printed or telephone reminders, providing client education about colorectal screenings, or assistance in scheduling appointments.

- Estimated cost for implementation in Michigan: $2.4 to $274.3 million.
colonoscopy, and one focuses on increasing use of either a FOBT or a colonoscopy. All 12 studies included mailing an initial reminder, usually with educational materials, and eight studies included mailing an FOBT kit to patients. In seven of the studies, an additional reminder (usually delivered by phone, but sometimes by mail) was used after the initial mailing.

The inflation-adjusted cost of implementing these strategies varies significantly depending on the combination of client reminder strategies used. Six of the studies reported costs under $10 per person targeted. One study found that the use of client reminders along with intensive patient education costs more than $300 per person targeted. The only study included in the review that did not use any intervention other than client reminders reported a cost of $4.66 per person targeted.

**Intervention Effectiveness**

The Task Force’s review of effectiveness found that implementing client reminders was associated with a median increase of 10.9 percentage points in colorectal cancer screening, with a range of six to 13.5 percentage points. The Task Force recommends the use of client reminders to increase colorectal cancer screening with FOBT, but the evidence is insufficient to determine effectiveness of client reminders in increasing colorectal cancer screening with either colonoscopy or flexible sigmoidoscopy. This does not mean that these strategies are not effective for increasing screening rates using these procedures, but that additional research is needed. The Task Force found that client reminder interventions are effective across a range of settings and populations, provided they are adapted to the target population and delivery context. The Task Force recommends conducting additional research to determine (1) whether the effectiveness of client reminders varies based on the method of communication and (2) the level of effectiveness of the intervention for specific populations, such as those who are overdue for a screening or those who have never been screened.

**Utilize One-on-one and Small-media Patient Education**

One-on-one and small-media patient education, as described in the breast cancer section, are interventions recommended by the Task Force to also increase colorectal cancer screenings.

**Economic Review**

Six studies were found through PSC’s economic review that included both one-on-one patient education and small-media education. All but one of these studies also included client reminders and half of the studies reduced structural barriers by mailing FOBT kits and placing follow-up phone calls to patients. One of the studies used one-on-one patient education, but only as a last attempt to get the patient to return the FOBT, so most participants in the study did not receive one-on-one education.

Only one of the six studies used one-on-one and small-media patient education without any other interventions at an inflation-adjusted cost of $8.00 per person targeted. The remaining five studies used one-on-one and small-media patient education in combination with other strategies and cost between $18.45 and $306.79 per person targeted, when adjusted for inflation.

**Intervention Effectiveness**

The Task Force does not provide expected effectiveness information for using one-on-one and small-media patient education together, but provides it for each of the interventions separately. The Task Force found a median increase in colorectal cancer screenings by FOBT of 19.1 percentage points through the use of one-
on-one education and a median increase of 12.7 percentage points in these screenings through the use of small-media education. Not all studies that used small-media patient education showed a positive effect, however. The Task Force recommends the use of one-on-one patient education and the use of small-media education to increase colorectal cancer screening by FOBT only. The Task Force does not have sufficient evidence to recommend one-on-one patient education and small-media patient education to increase screenings by colonoscopy and flexible sigmoidoscopy because of the limited number of studies available.

**Reduce Structural Barriers**

The Task Force also recommends reducing structural barriers, as described under breast cancer screening, to increase colorectal cancer screenings.155

**Economic Review**

In its economic review, PSC found seven studies of interventions that reduce structural barriers to increase colorectal cancer screenings. All of these studies reduce barriers by mailing an FOBT or FIT kit to people due or overdue for a colorectal cancer screening, thus allowing the patient to avoid making a screening appointment or going to pick up an FOBT or FIT test. Six of these studies reported providing return envelopes for the FOBT or FIT test to make it as easy as possible for the patient to return the test. Six of the studies also included the use of client reminders and patient education, and one of these included the use of provider reminders. Only one study did not include the use of any additional interventions.

The cost of implementing these strategies varied depending on how much staff time was dedicated to following up with patients or providing education about the screening. Inflation-adjusted costs per person targeted ranged from $2.00 per person for simply mailing the kit with postage paid to $6.35 per person when simple client reminders and patient education are included, to $49.75 per person targeted when client reminders and intensive education are included.

**Intervention Effectiveness**

The Task Force review of the effectiveness of reducing structural barriers found an average increase of 36.9 percentage points in colorectal screening, with a range between 16.3 and 41.1 percentage points. The Task Force recommends these interventions as an effective way to increase screening for colorectal cancer by FOBT. The evidence is insufficient to determine whether reducing structural barriers is effective in increasing colorectal cancer screening by flexible sigmoidoscopy or colonoscopy due to a limited number of available studies. The Task Force recommends that more research be done to determine if this approach would be effective in increasing these types of screenings.

**Provider Reminder and Recall Systems**

Provider reminder and recall systems are recommended by the Task Force to increase colorectal cancer screenings. This intervention is described in detail under the breast cancer screening section above.

**Economic Review**

PSC identified three studies in its economic review that used provider reminder and recall systems to increase screening rates. Of those three, only two studies used provider reminder and recall systems as an isolated strategy, and the other study used provider reminder and recall systems in combination with client reminders and the reduction of structural barriers. Two of the studies used electronic reminders for

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**Intervention at a Glance**

**Reduce Structural Barriers**

- Interventions designed to reduce structural barriers include reducing time or distance between service delivery settings and target populations, modifying or increasing the hours of service to meet client needs, and simplifying administrative procedures, among others.
- Estimated cost for implementation in Michigan: $1.8 to $44.5 million.

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October 2016
providers and the other, which was more expensive per person targeted, used color-coded reminders in medical charts and dedicated personnel resources for following up with patients. Across the three studies, the inflation-adjusted cost of implementing provider reminder and recall systems ranged from $3.74 to $23.62 per patient targeted. The cost per patient is determined by dividing the cost of implementing the provider reminder and recall system by the number of patients in the target population, so these estimated costs are highly dependent on the number of eligible patients seen by the physicians using the intervention.

**Intervention Effectiveness**

The Task Force review of effectiveness found that implementing provider reminder and recall systems led to a median increase of 17.6 percentage points in colorectal cancer screenings. The Task Force specifically recommends using provider reminder and recall systems as a way to increase colorectal cancer screening by FOBT and flexible sigmoidoscopy, but not colonoscopy. This does not mean that this intervention will not work to increase colonoscopies, but that the Task Force does not have enough evidence to make that recommendation. The Task Force recommends more research be done to determine if provider reminders are effective for increasing colonoscopies.156

**Provider Assessment and Feedback**

The Task Force also recommends the use of provider assessment and feedback as described in the HPV vaccination section.157

**Economic Review**

In its economic review, PSC found two studies that included the use of provider assessment and feedback as an intervention to increase cancer screenings. The inflation-adjusted costs range from $355 per provider to $825 per provider, or $17.59 to $20.99 per patient targeted for colorectal cancer screening. The study with higher costs was conducted prior to implementation of electronic health records (EHRs). Use of EHRs may dramatically decrease the personnel costs associated with gathering information needed for provider assessments. Costs per patient depend on the number of eligible patients in a provider’s practice, as with other provider-based interventions.

**Intervention Effectiveness**

The Task Force found that provider assessment and feedback increased colorectal cancer screening via FOBT by a range of 12.3 to 23.0 percentage points. The Task Force recommends using provider assessment and feedback to increase colorectal cancer screenings by FOBT, specifically, but finds that there is not enough evidence to recommend it for increasing screening by flexible sigmoidoscopy or colonoscopy. The Task Force recommends this strategy for all populations and settings.
ESTIMATED COST FOR IMPLEMENTATION IN MICHIGAN

The U.S. Census Bureau estimates there were approximately 3,072,454 people aged 50 to 75 in Michigan in 2015. In 2014, 70.9 percent of adults aged 50 to 75 had received recommended colorectal cancer screenings based on the recommended schedule. Based on this data, there are about 894,084 adults not up to date with the recommended screening. The strategies identified in Michigan’s cancer control plan to increase colorectal cancer screening should be targeted at this population of adults to reach the target screening rate of 80 percent. The table below shows the estimated cost per person targeted and the total expected costs to reach people aged 50 to 75 in Michigan who have not received an appropriately timed screening using the suggested strategies.

### Estimated Cost for Increasing Colorectal Cancer Screenings, by Strategy

<table>
<thead>
<tr>
<th>Suggested Strategy</th>
<th>Intervention cost per person targeted††</th>
<th>Estimated cost for implementation in Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client reminder systems, alone or in combination</td>
<td>$2.64–$306.79</td>
<td>$2.4 to $274.3 million</td>
</tr>
<tr>
<td>One-on-one and small-media patient education</td>
<td>$8.00–$306.79</td>
<td>$7.2 to $274.3 million</td>
</tr>
<tr>
<td>Reduce structural barriers, alone or in combination</td>
<td>$2.00–$49.75</td>
<td>$1.8 to $44.5 million</td>
</tr>
<tr>
<td>Provider reminder and recall systems, in combination or alone</td>
<td>$3.74–$23.62</td>
<td>$3.3 to $21.1 million</td>
</tr>
<tr>
<td>Provider assessment and feedback, alone</td>
<td>$17.59–$20.99</td>
<td>$15.7 to $18.8 million</td>
</tr>
</tbody>
</table>

* The authors of the studies included in the review did not take a uniform approach to determining the cost of the interventions. Some included indirect and overhead expenses and/or staff costs, while others did not.

†† The cost estimates in this table reflect the January to July 2016 inflation rate. When study authors provided the year in which the cost data was presented, PSC used that year as the basis for the inflation adjustment. When that information was not provided, the year in which the study was published was used as the basis for applying inflation.
Cancer Clinical Trials

Cancer clinical trials are research studies designed to test new ways to prevent, detect, and treat cancer. Most cancer clinical trials are treatment studies used to determine whether new treatments are safe and effective and whether they work better than current treatments. While clinical trials have the potential to improve the lives of those who participate as well as those who benefit from the research findings, only an estimated 3 percent of adult patients with cancer in the U.S. participate in them. Participation rates among minorities are particularly low. Currently, African Americans make up only 5 percent of clinical trial participants and Hispanics only 1 percent. To ensure that trial results are generalizable across the entire population, representative samples of minority populations should participate in clinical trials.

Many potential barriers to patient participation in clinical trials have been identified. These include lack of awareness of clinical trials, fear of receiving a placebo, inconvenience of trial participation, and difficulty with eligibility criteria. Studies have shown that patients are more likely to participate in clinical trials when their physicians are aware of the trials and encourage them to participate.

The Cancer Plan for Michigan includes a target of increasing the percentage of Michigan adults who have had cancer that report participating in cancer treatment clinical trials from 4.4 percent in 2011 to 4.8 percent by 2020.

STRATEGIES AND COSTS

The Cancer Plan for Michigan includes the following recommended strategies to increase participation in cancer clinical trials:

- Educate health care providers and people diagnosed with cancer on the availability, purpose, and benefits of clinical trials.
- Utilize patient advocates, peer mentors, patient navigators and representatives of target minority groups to enhance recruitment and retention in clinical trials.
- Promote policy and system changes to assess and address barriers to clinical trials.
- Encourage the multidisciplinary discussion of clinical trials, for example in tumor board meetings.

Potential approaches to carrying out these strategies are described below along with the estimated costs of doing so. The education of health care providers and patients are handled as separate strategies because the approaches used for each population are different and have different sets of associated costs. Multidisciplinary discussion of clinical trials is considered an approach that would be used as component of health care provider education, and it is not described as a separate strategy below.

**Educate Health Care Providers**

Recognizing that providers can offer a critical link to patients who are eligible for clinical trials, much has been written about potential strategies for educating health care providers about the trials and to engage them in recruitment efforts. Such strategies include researchers meeting face to face with providers to explain studies and address concerns, giving providers a list of available trials, and having providers sign letters that are sent to patients to make them aware of the studies. Literature reviews have found that multidisciplinary discussion of a trial, especially during tumor boards and past physician attendance at educational sessions on cancer treatment trials are linked to higher patient accrual.
**Economic Review**

The cost of implementing most of these interventions is difficult to estimate and is not provided in the studies describing them. The MDHHS, however, has dedicated resources toward physician education efforts. In late 2014, the department (then the Michigan Department of Community Health) in partnership with the Blue Cross Blue Shield of Michigan (BCBSM) Foundation solicited proposals from Michigan medical schools for the development, implementation, and evaluation of a continuing medical education (CME) module for primary care providers. This particular effort was directed toward prostate cancer survivorship care, but a similar effort could be applied to clinical trial accrual.

The RFP was designed to support the development of the CME module based on best practices in physician education and the topic of prostate cancer survivorship care, to publicize and deliver the module, and to evaluate the course. The RFP required that the course be evaluated on its effectiveness in reaching providers, facilitating incorporation of recommendations into office visits, and facilitating distribution of appropriate information to patients and families. The cost of this work was estimated by MDHHS and the BCBSM Foundation at $100,000. The funds to support development of the CME module came from the Prostate Cancer Research Fund, which was financed by a tax check-off option that is no longer available.

**Educate People Diagnosed with Cancer**

Strategies to increase general awareness of clinical trials have not proven particularly effective in improving accrual. The best strategies for educating cancer patients about clinical trials appear to be those that are presented one-on-one and/or tailored to a specific trial or type of patient. Patient accrual in clinical trials is boosted when physicians discuss the trial with them, explain potential adverse effects and consequences, and address patient concerns.\(^{196}\) One-on-one discussions with a member of the research team, decision aids, and tailored video content have been shown to be effective in increasing patient knowledge and understanding of clinical trials.\(^{197}\)

**Intervention at a Glance**

**Educate Health Care Providers**

- Strategies include researchers meeting face-to-face with providers to explain studies and address concerns; giving providers a list of available trials; and having providers sign letters that are sent to patients to make them aware of studies.
- Estimated cost for implementation in Michigan: $100,000.

**Educate People Diagnosed with Cancer**

- One-on-one discussions with a member of the research team, decision aids, and tailored video content have been shown to be effective in increasing patient knowledge and understanding of clinical trials.
- Estimated cost for implementation in Michigan: $321,000 to $26.3 million.

**Economic Review**

As with the strategies for educating providers, the estimated cost of implementing strategies for educating cancer patients about cancer clinical trials is not readily available in the literature. However, costs may be estimated by reviewing approaches described elsewhere in this report. Used as a strategy for increasing cancer screenings, it appears that one-on-one and small-media patient education would be similarly effective in improving clinical trial accrual among Michigan residents diagnosed with cancer each year (an estimated 56,530 in 2016). The intervention would be carried out to deliver information to patients about the availability of clinical trials, the benefits of participation, and ways to overcome barriers to participation with the goal of informing, encouraging, and motivating them to participate. These messages would likely be delivered in person by physicians, clinical trial researchers, other health professionals involved in the patient’s treatment, or patient navigators. The one-on-one conversations may be accompanied by supporting material about a specific clinical trial or clinical trials in general. Based on the cost of implementing this type of intervention for breast, cervical, and colorectal cancer screenings, when
adjusted for inflation, the state could expect to spend $5.68–$464.75 per person targeted with this intervention to increase clinical trial participation.

**Utilize Patient Navigators**

One commonly recommended strategy for improving patient recruitment and retention in clinical trials is the involvement of patient advocates, peer mentors, representatives of minority groups, and patient navigators. Patient navigation programs have been especially effective in identifying people from underrepresented populations who are willing to participate in clinical trials. Patient navigation programs vary in size and complexity and target populations. The primary goals of these programs have been to increase awareness of and access to clinical trials and to reduce barriers to participation. A literature review of patient navigation in clinical trials identified three essential characteristics of successful patient navigation programs: community engagement, cultural competency, and integration within the cancer care team.

**Economic Review**

PSC found two studies of patient navigation programs that provided information about the cost of implementation, and each program took a different approach to program development and staffing. One program was based in a National Cancer Institute-designated comprehensive cancer center that sought to improve recruitment of black patients to breast cancer clinical trials. This program hired an oncology nurse navigator (an oncology research nurse who has completed training in patient navigation) to inform patients about and enroll eligible patients in clinical trials. The nurse navigator also provided personalized patient support to help patients navigate the health care system. Access to these patients was gained by developing partnerships with community physicians in areas where the target population received health care services. The nurse navigator kept physicians informed of available trials, coordinated referrals to clinical investigators, and reduced community physician trial-related workload by providing in-office assistance with patient screening, treatment, follow-up, and symptom management. When adjusted for inflation, the two-year cost of this patient navigation program, which included salaries for the oncology nurse navigator and a data manager, as well as overhead costs, such as transportation, office supplies, and publications/printing, was $392,468. This equated to $7,676 per patient enrolled in a clinical trial, which the study authors said represents a significant savings over the cost per patient for treating patients on clinical trials at an academic or cancer center.

The other patient navigation program took the approach of hiring and training more than two dozen part-time lay navigators, with a concerted effort to hire those who had survived cancer and were representative of the diverse patient population. The program was designed to help minority cancer patients navigate the health care system and, when appropriate, support enrollment in clinical trials. A clinical research coordinator served as a resource to the navigators and others to provide support and materials related to clinical trials. In addition to a larger number of navigators, this patient navigation program included a community health educator who recruited, selected, trained, and supervised navigators, and an administrative assistant coordinated the administrative function of navigator training, patient/navigator assignments, and program record keeping. When adjusted for inflation, the cost of this program is approximately $519,000 per year, which equates to $6,921 per person who participated in navigation services.
The MDHHS is currently providing funding to health care providers to implement a variety of interventions designed to help achieve objectives in the state’s cancer control plan. In an RFP released in May 2015, the department invited interested parties to submit applications to implement any number of strategies, including providing patient navigation services. Successful applicants were eligible to receive up to $40,000 per year for two years (up to $80,000 total). While this amount is far less than what would be necessary to fully implement a patient navigation program, it would allow a health system to create a plan for patient navigation for clinical trials.

**Promote Policy and System Changes**

Increasing participation in clinical trials is likely to require policy and system changes that address barriers to participation beyond lack of awareness and understanding of trials. These barriers might include such things as tightening the timeframe within which insurers provide prior authorization for patients who want to participate in clinical trials, shortening trial development time, addressing stringent eligibility criteria, and finding more effective ways to match eligible patients with appropriate trials. The costs associated with strategies to assess and address barriers are not easily estimated. To do so, PSC has estimated the cost of hiring a consultant to help MDHHS identify policy barriers and potential solutions that could then be carried out in partnership with the MCC.

PSC proposes:

- Conducting a literature review of barriers to participation in clinical trials and recommended policy and system strategies for addressing barriers
- Surveying oncology providers in Michigan to identify the barriers and strategies that they believe are most relevant to their experience and the Michigan policy and system landscape
- Facilitating two meetings of a diverse set of stakeholders, including providers, insurers, researchers, and patient advocates to examine the literature review and survey findings, identify select issues and strategies, and develop an action plan for implementing the strategies

The estimated cost of this work, based on a billing rate of $100 per hour and 120 hours of work, is $12,000. This estimate does not include the cost of strategy implementation, which may be led and facilitated by the MCC and its staff.

**ESTIMATED COST FOR IMPLEMENTATION IN MICHIGAN**

The following table provides the estimated costs for implementing each of the strategies described above based on the information PSC found in its economic review and its estimated costs for hiring a consultant to help MDHHS identify policy barriers and potential solutions to increase participation in cancer clinical trials.
## Estimated Cost for Increasing Cancer Clinical Trial Participation, by Strategy

### Objective 21: By 2020, increase the percentage of Michigan adults participating in cancer treatment clinical trials from 4.4 percent to 4.8 percent.

<table>
<thead>
<tr>
<th>Suggested Strategy</th>
<th>Cost per person targeted</th>
<th>Estimated cost for implementation in Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educate health care providers on the availability, purpose, and benefits of clinical trials.</td>
<td>N/A</td>
<td>$100,000</td>
</tr>
<tr>
<td>Educate people diagnosed with cancer on the availability, purpose, and benefits of clinical trials.</td>
<td>$5.68–$464.74*</td>
<td>$321,000 to $26.3 million†</td>
</tr>
<tr>
<td>Utilize patient advocates, peer mentors, patient navigators, and representatives of target minority groups.</td>
<td>N/A</td>
<td>$80,000–$519,000 per health system*</td>
</tr>
<tr>
<td>Promote policy and system changes to assess and address barriers (where possible) to clinical trial participation.</td>
<td>N/A</td>
<td>$12,000</td>
</tr>
</tbody>
</table>

* These costs reflect the January to July 2016 inflation rate.

† The total estimated cost for educating people diagnosed with cancer on the availability, purpose, and benefits of clinical trials is based on targeting the intervention to the 56,530 people in Michigan who will be diagnosed with cancer in 2016.
Palliative care is care that is given to improve the quality of life of patients who have a serious or life-threatening disease, such as cancer. The goal of this type of treatment is not to cure the disease, but to prevent or treat the symptoms and side effects of the disease and its treatment and address patients’ psychological, social, and spiritual needs.

A study of the effects of palliative care on quality of life and patient outcomes found significantly higher quality of life, fewer depressive symptoms, and less aggressive end of life care among cancer patients who received palliative care than among patients who did not. It also found that patients who received palliative care lived longer than those who did not receive palliative care. There are cost savings associated with palliative care, too. In one study, Medicaid patients who received palliative care incurred $6,900 less in hospital costs than patients who received usual care. Those who received palliative care also spent less time in intensive care units and were less likely to die there.

Both the American Society of Clinical Oncology (ASCO) and the National Comprehensive Cancer Network (NCCN) recommend palliative care as a part of cancer treatment. ASCO recommends palliative care for patients with cancer that has spread or who have many or severe symptoms from their cancer or its treatment. NCCN recommends palliative care screening for all patients and provides criteria for identifying those in need of referral to a palliative care specialist. Both organizations agree that palliative care should be offered to appropriate patients as soon as a diagnosis is made and should continue through treatment, follow-up care, and the end of life.

To help meet the palliative care needs of cancer patients in Michigan, the cancer control plan includes a target of increasing the number of hospital-based palliative care services in the state from 76 to 84.

STRATEGIES AND COSTS
The following four strategies for increasing the number of hospital-based palliative care services are included in the Cancer Plan for Michigan:

- Educate the health care team about palliative care and how to talk with patients about its role in cancer care.
- Educate patients and families about palliative care.
- Promote and support Michigan providers in meeting national standards on palliative care.
- Promote policy and system changes to encourage the screening of all people diagnosed with cancer.

Educating patients and families about palliative care is not included in the descriptions of strategies and costs below. While a public media campaign might be utilized to inform people with cancer and their families about this type of treatment, most patients will learn about palliative care from their providers, who will offer better information and referrals once they receive relevant information and have policies and systems in place that support the delivery of palliative care services and referrals to those services.
**Educate the Health Care Team**

Primary barriers to patients receiving palliative care services include oncologists being unaware of palliative care programs, what the programs can do, and when to refer patients for palliative care, as well as being unwilling to refer patients due to lack of a full understanding of palliative care. Several private and public organizations have worked to identify core competencies for the provision of palliative care, and have developed and disseminated educational recommendations, training materials, and training requirements at the medical school and residency levels, as well as for nurses and other health professionals. For oncologists already in practice, ASCO has developed three modules related to palliative care, each of which can be used for continuing medical education credits. In 2012, the Quality Oncology Practice Initiative (QOPI) added a number of palliative care–focused questions to the assessment of practice quality indicators. The Center to Advance Palliative Care recommends a systems-based approach that calls for the use of checklists to identify the palliative care needs of patients in combination with educational initiatives tied to the credentialing process.

**Economic Review**

As with strategies for educating providers regarding clinical trials, little cost information is available regarding interventions. The MDHHS does, however, have a few options for which costs can be estimated. The department could identify a way to promote the ASCO-developed maintenance of certification module for limited cost. The MDHHS is currently spending $5,000 to promote a Cancer Survivorship E-Learning Series for Primary Care Providers that was developed by the GW Cancer Institute at The George Washington University. The MDHHS may be able to promote the ASCO modules for a similar cost.

Alternatively, an organization or contractor could be hired to develop, implement, and evaluate an online CME module regarding palliative care (as is described for provider education regarding clinical trials). To ensure appropriate education of patients regarding palliative care, the module should promote strategies for incorporating palliative care screening and referrals into practice and for using culturally competent approaches for communicating the information. As with the CME module for clinical trials, this strategy would cost the state approximately $100,000.

**Support Michigan Providers in Meeting National Standards**

The National Comprehensive Cancer Network guidelines for palliative care include:

- Routine screening for palliative care needs
- Full assessment of identified palliative care needs
- Provision of interventions to meet identified needs
- Ongoing reassessment and treatment modification
- After-death interventions for family and caregivers and the health care team

**Intervention at a Glance**

- Strategies include developing and disseminating educational recommendations, training materials, and training requirements for health care professionals in training, and developing continuing education modules for providers already in practice.
- Estimated cost for implementation in Michigan: $5,000 to $100,000.

- The National Comprehensive Cancer Network recommends a recurring cycle of screening and assessment of palliative care needs, and delivery of appropriate interventions to meet the needs of patients and their families and caregivers.
- Estimated cost for implementation in Michigan: Up to $80,000 per health system.
Health care providers need enabling tools and infrastructure that will support them in achieving these guidelines. ASCO’s Leadership Development Program (LDP) developed a service model for integrating palliative care throughout the continuum of cancer care. The model is designed to be tailored to the level of resources available to a provider or health system, and includes steps for screening, assessment, intervention, referral, and reassessment. It also points to several validated screening tools that are currently in use for identifying palliative care needs. Providers and health systems that do not currently have these processes and tools in place are likely to need support in developing and implementing them.

**Economic Review**

It is difficult to estimate the cost of supporting health systems and providers as they develop and implement palliative care programs that meet the NCCN guidelines. The level of support needed is likely to vary widely depending on the current status of such services within hospitals and across providers. The MDHHS is currently seeking to help Michigan providers and health systems across the state build capacity for a variety of quality improvement and patient care activities. As part of the same RFP described for supporting the use of patient navigation services, the department could offer grants to health systems to support their efforts to put palliative care programs in place. The current funding level for these grants is up to $40,000 per year for two years (up to $80,000 total).

**Promote Policy and System Changes**

Increasing hospital-based palliative care services will likely require policy and system changes that address barriers to delivery and use of palliative care services. According to some, these barriers include lack of feasible service delivery models in inpatient and outpatient settings, lack of integration between palliative care and oncology providers, inadequate reimbursement for palliative care services, and limited availability of palliative care specialists. The costs associated with strategies to assess and address barriers are not easily estimated. Toward that end, PSC has estimated the cost of hiring a consultant to help MDHHS identify policy barriers and potential solutions that could then be carried out in partnership with the MCC.

PSC proposes:

- Conducting a literature review of barriers to implementing hospital-based palliative care services and recommended policy and system strategies for addressing barriers
- Surveying oncology providers in Michigan to identify the barriers and strategies that they believe are most relevant to their experience and to the Michigan policy and system landscape
- Facilitating two meetings of a diverse set of stakeholders, including providers, insurers, researchers, and patient advocates to examine the literature review and survey findings, identify select issues and strategies, and develop an action plan for implementing the strategies

The estimated cost of this work, based on a billing rate of $100 per hour and 120 hours of work, is $12,000. This estimate does not include the cost of strategy implementation, which may be led and facilitated by the MCC and its staff.
ESTIMATED COST FOR IMPLEMENTATION IN MICHIGAN

The following table provides the estimated costs for implementing each of the strategies described above based on the information PSC found in its economic review and its estimated costs for hiring a consultant to help MDHHS identify policy barriers and potential solutions to increase appropriate screening and timely screening for palliative care needs among people diagnosed with cancer.

| Objective 24: Increase the number of hospital-based palliative care services in Michigan from 76 to 84. |
|-------------------------------------------------|-------------------------------------------------|
| Suggested Strategy                              | Estimated cost for implementation in Michigan   |
| Educate health care providers on what palliative care is and how to talk to patients about its role in cancer care and where to find helpful resources. | $5,000 to $100,000                             |
| Promote and support the efforts of Michigan providers to meet national standards on palliative care. | Up to $80,000 per health system                 |
| Promote policy and system changes to encourage the screening of all people diagnosed with cancer. | $12,000                                       |
Survivorship Care

When patients complete cancer treatment, the need for follow-up care and long-term monitoring of their health is often not clearly communicated. Survivorship care entails 1) prevention of new cancers and recurrent cancer, 2) surveillance for cancer recurrence or new primary cancers, 3) interventions for long-term and late effects from cancer and its therapies, and 4) coordination between specialists and primary care providers to ensure that all of the survivor’s needs are met. In 2015, the Commission on Cancer (COC) added an accreditation standard that requires dissemination of survivorship care plans for patients with cancer completing active treatment. The two primary components of a survivorship care plan are a record of care received and important disease characteristics (e.g., diagnostic tests and results, tumor characteristics, dates of treatment and completion) and a written follow-up care plan that incorporates evidence-based standards of care.

Several barriers to adequately addressing cancer patients’ survivorship care needs have been identified—some related to providers and others to patients. While cancer treatment is often led by an oncologist, long-term follow-up care can be a collaborative effort among oncologists, primary care providers, and advanced-practice providers. These providers may not have a well-established process for communication and may not be familiar with the long-term needs of cancer survivors. Similarly, patients may be unaware of the potential long-term effects of treatment and the need for ongoing care. They may also be symptom-free and anxious to leave cancer care and treatment behind them.

The American Cancer Society estimated that there were 543,470 cancer survivors living in Michigan in 2015. The Cancer Plan for Michigan includes a target of increasing the percent of Michigan adults diagnosed with cancer who receive instructions about where to return or who to see for routine cancer check-ups after completing treatment from 67 percent in 2013 to 69 percent in 2020.

STRATEGIES AND COSTS

Michigan’s comprehensive cancer control plan includes the following strategies for increasing the dissemination of survivorship care plans:

- Educate health care providers and patients on evidence-based follow-up care for the short-term and late effects of cancer and its treatment in children and adults.
- Promote the presentation of survivorship information in an appropriate manner to ensure comprehension.
- Promote and support the efforts of providers to meet national standards on the distribution of survivorship care plans.

Potential approaches to carrying out these strategies are described below along with the estimated cost of doing so. The presentation of survivorship information in ways that ensure comprehension (i.e., delivering the information using approaches that reflect cultural competence) is difficult to separate from educating health care providers and supporting their efforts to distribute survivorship care plans according to national standards. Thus, separate costs were not identified for that strategy alone.
Educate Providers and Patients on Evidence-based Follow-up Care

To support providers in the implementation of survivorship programs, the American Society of Clinical Oncology (ASCO) recommends establishing regional educational programs to increase awareness of survivorship issues, using webinars to distribute resources and information, advocating for the development of survivorship programs, and supporting the use of electronic medical records and patient portals to share treatment summaries and care plan documents. ASCO emphasizes the role of providers in helping patients understand the need for long-term follow-up care and the late- or long-term effects they may experience. They say that providers should communicate the plan for follow-up care early in the treatment process and that information should be presented in a way that ensures comprehension.217

Economic Review

As with strategies for educating providers regarding clinical trials and palliative care, little cost information is available regarding interventions. The MDHHS does, however, have a few options for which costs can be estimated. The GW Cancer Institute at The George Washington University has developed a Cancer Survivorship E-Learning Series for Primary Care Providers. The free continuing education program, comprising ten online educational modules, is designed to help clinicians learn about care for adult cancer survivors. The MDHHS is currently spending $5,000 to promote this series to Michigan providers. The MDHHS can continue to promote this series and others that may be developed elsewhere for a similar cost.

Alternatively, an organization or contractor could be hired to develop, implement, and evaluate an online CME module regarding cancer survivorship care (as is recommended for provider education regarding clinical trials). To ensure appropriate education of patients regarding survivorship care, the module should promote strategies for incorporating survivorship care plans into practice and for using culturally competent approaches for communicating the information. As above, this strategy would cost the state approximately $100,000.

Support Michigan Providers in Meeting National Standards

To meet the COC accreditation standard related to survivorship care plans, health systems must develop a process to disseminate a comprehensive care summary and follow-up plan to patients with cancer who are completing cancer treatment. States and cancer coalitions can provide financial support to promote and bolster the efforts of providers to meet these standards.218

States and cancer coalitions can promote and support the efforts of providers to meet these standards through funding that can be used to establish such processes. The funding should also be used to promote the use of culturally competent communication with patients regarding the care plans.
Economic Review

The MDHHS is currently seeking to help Michigan providers achieve the recently added COC accreditation standard through a grant program. As part of the same RFP described for supporting the use of patient navigation services, the department is offering up to $40,000 per year for two years to COC-accredited health systems to support their efforts to implement the required processes and documentation for providing survivorship care plans. As with patient navigation, this likely represents only a portion of the cost that would be necessary to fully implement a process for providing survivorship care plans to cancer patients. The cost of staff time to create survivorship care plans, which may not be reimbursed by patients’ health insurance coverage, would not be covered by this level of funding. Additional estimates for implementing survivorship care planning are unavailable.

ESTIMATED COST FOR IMPLEMENTATION IN MICHIGAN

The following table provides the estimated costs for implementing each of the strategies described above based on PSC’s economic review.

<table>
<thead>
<tr>
<th>Estimated Cost for Increasing Dissemination of Survivorship Care Plans, by Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 30:</strong> By 2020, increase the number of Michigan adults diagnosed with cancer who report they received instructions about where to return or who to see for routine cancer check-ups after completing treatment for cancer from 67 percent to 69 percent.</td>
</tr>
<tr>
<td><strong>Suggested Strategy</strong></td>
</tr>
<tr>
<td>Educate providers and patients on evidence-based follow-up care for the short-term and late effects of cancer and its treatment in both children and adults.</td>
</tr>
<tr>
<td>Promote and support the efforts of Michigan providers to meet national standards on distributing survivorship care plans.</td>
</tr>
<tr>
<td>Promote the presentation of survivorship information in an appropriate manner to ensure comprehension.</td>
</tr>
</tbody>
</table>
Physical Activity

Engaging in regular physical activity can be beneficial for people who are living with cancer and those who are living disease-free following cancer treatment. Regular exercise can help people with cancer prevent muscle loss due to inactivity, make them less dependent on others for help with normal activities of daily living, decrease the risk of anxiety or depression, and improve their quality of life, among many other benefits. The American Cancer Society (ACS) recommends that cancer survivors (those living disease-free or with stable disease) take these actions:

- Take part in regular physical activity.
- Avoid inactivity and return to normal daily activities as soon as possible after diagnosis.
- Aim to exercise at least 150 minutes per week.
- Include strength training exercises at least 2 days per week.

The ACS also recommends that patients going through active treatment for advanced cancer engage in some physical activity, depending on their physical ability. All patients should check with their doctors before engaging in an exercise program. The Cancer Plan for Michigan includes an objective for increasing the percentage of people ever diagnosed with cancer who meet guidelines for physical activity from 17.1 percent to 18.8 percent.

STRATEGIES AND COSTS

Michigan’s cancer control plan identifies the following three strategies for increasing physical activity and muscle-strengthening activity among people who have ever been diagnosed with cancer:

- Encourage physical activity in people who have been diagnosed with cancer.
- Educate providers on physical activity guidelines and encourage referrals to behavioral support interventions.
- Promote the use of patient education materials on the benefits of physical activity.

Only the first two of these are discussed below because use of patient education materials would occur as part of the other two strategies.

Encourage Physical Activity

There are several programs in Michigan that can be used to help cancer survivors and patients engage in physical activity. Two of them—Personal Action Toward Health (PATH) and Enhance® Fitness—are highlighted here. PATH is Michigan’s name for the Stanford Chronic Disease Self-Management Program. It is an evidence-based self-management education program for people with any type of chronic health problem. Workshops are given for two and a half hours once a week for six weeks in community settings such as senior centers, churches, libraries, and hospitals. In PATH workshops, trained facilitators cover topics such as dealing with symptoms commonly associated with the chronic disease (e.g., pain, fatigue), good nutrition, physical activity, appropriate use of medications, communicating with health professionals, and how to evaluate new treatment options.
EnhanceFitness is an evidence-based group exercise program for older adults (and is also appropriate for people with physical disabilities). Certified instructors lead a one-hour class that incorporates stretching, flexibility, balance, low-impact aerobics, and strength training exercises, all of which can be adapted for a wide range of participant ability. Emphasis is placed on helping participants maintain function so they can remain active and independent.

**Economic Review**

The cost of offering PATH workshops varies by the number of enrolled participants and the resources available to the organization offering the workshops. The average cost per participant, which ranges from $70 to $300, typically includes licensure costs, trained peer personnel, materials, and any space rental costs.

Organizations offering EnhanceFitness can expect higher costs in the first year of the program, with lower costs each subsequent year. Costs in the first year average $4,000, which includes the first-year membership fee, a site license, and program supplies. Costs in subsequent years include a $50 site renewal fee and instructor fees, which are an average of $25 per class.

**Intervention Effectiveness**

Studies show that participants in PATH experience less fatigue, pain, shortness of breath, and depression, and report more energy, improved communication with their health care providers, greater confidence dealing with their condition, increased physical activity, and fewer social role limitations. EnhanceFitness is proven to increase strength, boost activity levels, and elevate mood.

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**Intervention at a Glance**

**Educate Providers on Guidelines and Behavioral Support Interventions**

- Providing online and other opportunities for health care providers to learn about behavioral support interventions designed to help patients with cancer engage in physical activity.
- Estimated cost for implementation in Michigan: $5,000 to $100,000.

**Educate Providers on Guidelines and Behavioral Support Interventions**

Health care providers need to be made aware of the American Cancer Society (ACS) recommendations and programs that are available to support patients with cancer in engaging in routine physical activity. The ACS-sponsored *CA: A Cancer Journal for Clinicians* offers an online opportunity for continuing medical education and continuing nursing education credits or contact hours. Physicians and nurses can read an article titled “Nutrition and Physical Activity Guidelines for Cancer Survivors” and answer questions about the information provided in the article to receive the appropriate number of credits or contact hours.

**Economic Review**

As with strategies for educating providers regarding clinical trials, palliative care, and survivorship care plans, little cost information is available regarding the cost of educating providers on guidelines for increasing physical activity. The MDHHS, however, may be able to spend an amount similar to what it is spending to help clinicians learn about care for adult cancer survivors by promoting the GW Cancer Institute’s online education models. The MDHHS is currently spending $5,000 to promote this series to Michigan providers. The MDHHS may be able to promote the ACS-developed online continuing education activity for a similar cost.

Alternatively, an organization or contractor could be hired to develop, implement, and evaluate an online CME module regarding physical activity and cancer. To ensure that patients are given information about how they can engage in appropriate physical activity, the module should include information about behavioral interventions available for patients (i.e., PATH and EnhanceFitness). As with modules for clinical trials and palliative care, this strategy would cost the state approximately $100,000.
ESTIMATED COST FOR IMPLEMENTATION IN MICHIGAN

The following table provides the estimated costs for implementing each of the strategies described above based on PSC’s economic review. Nearly 12 percent of Michigan adults (873,778 people) have ever been diagnosed with cancer and, as of 2013, about 17 percent of these adults (149,416 people) were achieving recommended levels of physical activity. This means an estimated 724,362 people diagnosed with cancer are not engaging in recommended levels of physical activity. The estimated cost for encouraging physical activity among people diagnosed with cancer is based on these figures.

Estimated Cost for Increasing Physical Activity, by Strategy

| Objective 35: Increase the number of Michigan adults who have ever been diagnosed with cancer who meet the objectives for aerobic physical activity and muscle-strengthening activity from 17.1 percent to 18.8 percent. |  |
|---|---|---|
| Suggested Strategy | Cost per Person Targeted | Estimated cost for implementation in Michigan |
| Encourage physical activity in people who have been diagnosed with cancer at levels tailored to the survivors’ abilities and preferences. | $70 to $300* | $50.7 to $217.3 million |
| Educate providers on current physical activity guidelines for people in cancer treatment and post-treatment survivorship and encourage them to refer survivors to behavioral support interventions to assist them in adopting and maintaining a physically active lifestyle. | N/A | $5,000 to $100,000 |

*The cost per person targeted is based only on the cost of implementing the PATH program.
Conclusion

Employing any of the strategies associated with the select objectives is likely to improve the lives of Michiganders by preventing cancer, identifying it early, improving treatment options, and ensuring that people remain well after recovering from the disease. Several of the recommended strategies build on existing state-funded grant opportunities or have relatively low costs. These should be considered for implementation in the near-term with existing funding or smaller grant funding opportunities. Strategies with the potential for much greater costs (and potentially greater reach) should be considered for larger future funding opportunities, perhaps from the Centers for Disease Control and Prevention or another federal agency.

The MDHHS Cancer Section, along with the MCC, should use the information on effectiveness and costs provided here as the foundation for a plan to achieve the objectives in the state’s cancer control plan. Using their awareness of existing financial and human resources as well as of complementary efforts underway, these partners should identify a set of strategies to implement immediately as well as a set of strategies for which additional funding should be sought to implement in the coming years. Such a plan would position the state well to achieve its objectives related to cancer prevention, detection, and treatment, and for improving the quality of life of Michiganders diagnosed with cancer.
### Estimated Cost per Strategy, by Objective

<table>
<thead>
<tr>
<th>Objective 1: Reduce the proportion of adults and adolescents who currently smoke from 21.2 percent (adults) and 11.8 percent (adolescents) to 19.3 percent and 3.6 percent, respectively.</th>
<th>Expected cost per person targeted</th>
<th>Estimated cost for implementation in Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive tobacco control programs&lt;sup&gt;226&lt;/sup&gt;</td>
<td>N/A</td>
<td>$77.6 to $111.6 million</td>
</tr>
<tr>
<td>Mass-reach health communication interventions&lt;sup&gt;227&lt;/sup&gt;</td>
<td>N/A</td>
<td>$8.0 to $11.5 million</td>
</tr>
<tr>
<td>Community mobilization and additional interventions to reduce youth access&lt;sup&gt;228&lt;/sup&gt;</td>
<td>N/A</td>
<td>$28.5 to $35.7 million</td>
</tr>
<tr>
<td>Worksite-based incentives and competitions with individual cessation support&lt;sup&gt;229,230,231&lt;/sup&gt;</td>
<td>$274–$1,238</td>
<td>$11.3 to $71.2 million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Objective 5: Increase the proportion of females and males aged 13 to 17 years who have received at least three doses of HPV vaccine from 35 percent (females) and 22.4 percent (males) to 80 percent.</th>
<th>Expected cost per person targeted</th>
<th>Estimated cost for implementation in Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community-based interventions implemented in combination</td>
<td>$14.56–$222.56</td>
<td>$10.3 to $157.6 million</td>
</tr>
<tr>
<td>Health care system-based interventions implemented in combination</td>
<td>$.87–$13.52</td>
<td>$619,000 to $9.6 million</td>
</tr>
<tr>
<td>Provider assessment and feedback, alone</td>
<td>$0.13–$4.10</td>
<td>$94,000 to $2.9 million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Objective 14: Reduce lung cancer mortality rates from 47.9 to 43.1 deaths per 100,000.</th>
<th>Expected cost per person targeted</th>
<th>Estimated cost for implementation in Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase appropriate referrals for lung cancer screening.</td>
<td>N/A</td>
<td>$36,000 to $130,000 per health system per year</td>
</tr>
<tr>
<td>Increase referrals for tobacco cessation</td>
<td>$28 to $75</td>
<td>$45.8 to $122.7 million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Objective 15: Increase the proportion of females aged 50-74 who received a breast cancer screening (mammogram) in the past two years from 81.9 percent to 89.1 percent.</th>
<th>Expected cost per person targeted</th>
<th>Estimated cost for implementation in Michigan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client reminder systems, alone</td>
<td>$0.39–$77.65</td>
<td>$110,000 to $21.9 million</td>
</tr>
<tr>
<td>Client reminders, in combination</td>
<td>$11.86–$232.43</td>
<td>$3.3 to $65.5 million</td>
</tr>
<tr>
<td>Client education: small media, alone</td>
<td>$1.49–$5.68</td>
<td>$420,000 to $1.6 million</td>
</tr>
<tr>
<td>Client education: group education with small media</td>
<td>$14.32–$122.52</td>
<td>$4.0 to $34.5 million</td>
</tr>
<tr>
<td>Client education: one-on-one education with small media</td>
<td>$11.86–$464.74</td>
<td>$3.3 to $131.0 million</td>
</tr>
<tr>
<td>Reduce structural barriers: mobile mammography, alone</td>
<td>$68.40–$155.88</td>
<td>$19.3 to $43.9 million</td>
</tr>
<tr>
<td>Objective</td>
<td>Description</td>
<td>Cost Range</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td></td>
<td>Reduce structural barriers: scheduling assistance, in combination</td>
<td>$17.41–$65.91</td>
</tr>
<tr>
<td></td>
<td>Provider reminder and recall systems, alone or in combination</td>
<td>$3.54–$36.36</td>
</tr>
<tr>
<td></td>
<td>Provider assessment and feedback, alone</td>
<td>$17.59–$20.99</td>
</tr>
</tbody>
</table>

**Objective 17:** Increase the proportion of females aged 18-65 who received a cervical cancer screening (Pap test) in the past three years from 83.7 to 94.8 percent.

<table>
<thead>
<tr>
<th>Cost Range</th>
<th>Cost Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client reminder systems, alone or in combination</td>
<td>$17.41–$232.43</td>
</tr>
<tr>
<td>One-on-one and small-media patient education</td>
<td>$5.68–$464.74</td>
</tr>
<tr>
<td>Provider reminder and recall systems, alone and in combination</td>
<td>$3.54–$36.36</td>
</tr>
<tr>
<td>Provider assessment and feedback, alone</td>
<td>$17.59–$20.99</td>
</tr>
</tbody>
</table>

**Objective 19:** Increase the proportion of adults aged 50 to 75 who are up to date on appropriate colorectal cancer screening from 70.9 percent to 80 percent.

<table>
<thead>
<tr>
<th>Cost Range</th>
<th>Cost Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client reminder systems, alone or in combination</td>
<td>$2.64–$306.79</td>
</tr>
<tr>
<td>One-on-one and small-media patient education</td>
<td>$8.00–$306.79</td>
</tr>
<tr>
<td>Reduce structural barriers, alone or in combination</td>
<td>$2.00–$49.75</td>
</tr>
<tr>
<td>Provider reminder and recall systems, alone or in combination</td>
<td>$3.74–$23.62</td>
</tr>
<tr>
<td>Provider assessment and feedback, alone</td>
<td>$17.59–$20.99</td>
</tr>
</tbody>
</table>

**Objective 21:** Increase the percentage of Michigan adults participating in cancer treatment clinical trials from 4.4 percent to 4.8 percent.

<table>
<thead>
<tr>
<th>Cost Range</th>
<th>Cost Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educate health care providers on the availability, purpose, and benefits of clinical trials.</td>
<td>N/A</td>
</tr>
<tr>
<td>Educate people diagnosed with cancer on the availability, purpose, and benefits of clinical trials.</td>
<td>$5.68–$464.74</td>
</tr>
<tr>
<td>Utilize patient advocates, peer mentors, patient navigators, and representatives of target minority groups.</td>
<td>N/A</td>
</tr>
<tr>
<td>Promote policy and system changes to assess and address barriers (where possible) to clinical trial participation.</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Objective 24: Increase the number of hospital-based palliative care services in Michigan from 76 to 84.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educate health care providers on what palliative care is and how to talk to patients about its role in cancer care and where to find helpful resources.</td>
<td>N/A</td>
</tr>
<tr>
<td>Promote and support the efforts of Michigan providers to meet national standards on palliative care.</td>
<td>N/A</td>
</tr>
<tr>
<td>Promote policy and system changes to encourage the screening of all people diagnosed with cancer.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Objective 30: Increase the number of Michigan adults diagnosed with cancer who report they received instructions about where to return or who to see for routine cancer check-ups after completing treatment for cancer from 67 percent to 69 percent.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educate providers and patients on evidence-based follow-up care for the short-term and late effects of cancer and its treatment in both children and adults.</td>
<td>N/A</td>
</tr>
<tr>
<td>Promote and support the efforts of Michigan providers to meet national standards on distributing survivorship care plans.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Objective 35: Increase the number of Michigan adults who have ever been diagnosed with cancer who meet the objectives for aerobic physical activity and muscle-strengthening activity from 17.1 to 18.8 percent.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encourage physical activity in people who have been diagnosed with cancer at levels tailored to the survivors’ abilities and preferences.</td>
<td>$70 to $300</td>
</tr>
<tr>
<td>Educate providers on current physical activity guidelines for people in cancer treatment and post-treatment survivorship and encourage them to refer survivors to behavioral support interventions to assist them in adopting and maintaining a physically active lifestyle.</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Endnotes


7 CPSTF. March 2016. “What is the Task Force?”


22 Ibid.

23 Ibid.


40 Ibid.


45 Ibid.


52 Ibid.


64 1,635,638 is 21.2 percent of the total adult population in Michigan in 2015 (7,715,272). The number of adults aged 18 and older in Michigan was calculated based on the percentages of the population by age found at http://factfinder.census.gov/faces/tables_services/jsf/pages/productview.xhtml?src=bkmk (accessed on 10/31/16)


77 Ibid.

79 Ibid


82 Ibid


Costantza, Mary E., et al. 2000. “Promoting Mammography: Results of a Randomized Trial of Telephone Counseling and Medical Practice Intervention.” doi: http://dx.doi.org/10.1016/S0749-3797(00)00150-1


National Cancer Institute. Quick Profiles: Michigan. Data pulled from MBRFSS.


CPSTF. July 2010. “Increasing Cancer Screening: Client Reminders.”

CPSTF. February 2006. “Increasing Cancer Screening: One-on-One Education for Clients.”


Ibid.


Ibid


Costantza, Mary E., et al. 2000. “Promoting Mammography: Results of a Randomized Trial of Telephone Counseling and Medical Practice Intervention.” doi: http://dx.doi.org/10.1016/S0749-3797(00)00150-1


National Cancer Institute. Quick Profiles: Michigan. Data pulled from MBRFSS.

CPSTF. July 2010. “Increasing Cancer Screening: Client Reminders.”


Ibid.


National Cancer Institute. Quick Profiles: Michigan. Data pulled from MBRFSS.


217 Ibid.


220 Ibid.

221 Ibid.


225 Project Enhance. n.d. “What is Enhance Fitness?”


227 Ibid.

228 Ibid.

