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Lung Cancer Screening Provider Survey

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Lung Cancer Screening Provider Survey

MPH Capstone

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Project Description
The purpose of this capstone project is to evaluate provider knowledge, attitudes, and behaviors around lung cancer screening in Maine. To evaluate these elements, a survey will be developed and administered to primary care physicians in Maine through three physician specialty societies. The survey will be developed keeping existing literature and previous studies of a similar nature in mind. This survey is being developed in collaboration with the Center for Outcomes Research and Evaluation (CORE), a branch of Maine Medical Center Research Institute. The Evidence-Based Public Health Framework will be used to outline and ground this capstone project.

Background
Lung cancer is a significant problem in the United States, where it represents the second most common cancer and most common cause of cancer death (Weiss et al., 2016). As of 2014, Maine, specifically, had the sixth highest lung cancer incidence rate in the nation, with 72.1 out of every 100,000 people developing lung cancer (Centers for Disease Control and Prevention, 2017). Compared with most other states, Maine citizens are at a greater risk for developing lung cancer and this emphasizes the need for early detection and treatment.

Low-dose CT (LDCT) scans are a relatively new lung cancer screening test that lower the risk of mortality for patients at high risk of developing lung cancer. The risk of mortality is lowered because LDCT detects potentially cancerous nodules earlier than other screening methods. An important event in lung cancer screening history was the National Lung Screening Trial (NLST) which released its findings in 2011 (National Cancer Institute, 2014). This study compared chest x-ray and LDCT screening methods among current smokers, and former heavy smokers (greater
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than or equal to 30 pack years). This study found that those receiving LDCT screening had a 15 to 20 percent lower chance of dying from lung cancer. Since the findings of this study were released LDCT screening has been an evidence-based recommendation by the United States Preventive Services Task Force (USPSTF) and is considered a covered service by the Centers for Medicare and Medicaid Services (CMS) (Duong et al., 2017).

To determine which Maine residents get screened, it is important to understand providers’ screening behaviors and gauge their level of knowledge and beliefs regarding the existing screening guidelines.

CORE is leading the Maine Lung Cancer Coalition (MLCC), a statewide, multi-institution initiative aimed at promoting prevention and early detection of lung cancer, and ultimately reducing morbidity and mortality from this disease in Maine. MLCC works to educate all Maine people, including patients and healthcare professionals alike, about evidence-based lung cancer prevention and screening practices as well as developing and getting involved with programs to increase access to evidence-based lung cancer prevention, screening, and treatment services. To inform future efforts in promoting LDCT screening, the MLCC decided to develop and administer a survey to understand primary care physicians’ knowledge, attitudes, and practices regarding lung cancer screening in Maine. This survey aims to collect data on how much screening is currently being performed and what the barriers to screening may be for some providers. These barriers could include personal bias, access to equipment, lack of personnel to perform screening, or even lack of knowledge about how to conduct lung cancer screening, among others.
A survey was selected as the appropriate method of measurement because it allows assessment of a larger number of providers and enables quantitative analyses of the frequencies of various knowledge, attitudes, and practices, and of the factors associated with these outcomes. A survey also allows sampling of providers from the entire state of Maine to participate.

**Project Framework**

The framework used to outline and ground this project is the evidence-based public health framework. This is a commonly used and well recognized framework. It is composed of seven cycling steps including community assessment, quantifying the issue, developing a concise statement of the issue, determining what it known using scientific literature, developing and prioritizing program and policy options, developing an action plan and implementing interventions, and evaluating the program or policy (Association of State and Territorial Health Officials, 2018). This project will specifically involve assessing the community by reaching out to providers with our survey. This survey will help to quantify the issue and develop a concise statement of the issue, specifically in Maine. This survey will be developed considering existing research that has been done around lung cancer and lung cancer screening. Ultimately, development of program and policy options, as well as development of an action plan and intervention implementation will occur after analysis of the survey findings is complete.

**Literature Review**

There are various guidelines around lung cancer screening and not all providers follow the same guidelines (American Academy of Family Physicians, 2016; American Cancer Society, 2013;
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American College of Radiology, 2015; Centers for Medicare & Medicaid Services, 2015; National Comprehensive Cancer Network, 2014; U.S. Preventive Services Task Force, 2013; Wiener, 2015) For this reason, literature surrounding lung cancer screening is not comprehensive and there are some gaps. Providers represent a wealth of knowledge, and understanding their views and behaviors about lung cancer screening may better help the medical field to more effectively address the problem of lung cancer deaths. Consistent themes in the literature include limitations in provider knowledge of screening guidelines, varying attitudes and behaviors around lung cancer screening, and limitations in the feasibility of implementing LDCT lung cancer screening.

Provider Knowledge

Knowledge of lung cancer screening and the screening guidelines is mentioned numerous times in the literature. Most primary care providers need more education regarding guidelines for LDCT screening, including insurance coverage, cost, and the frequency of false positive test results (Lewis et al., 2015). Triplette et al. (2018) found that decision aids are helpful knowledge facilitators for providers. A study done in the Stanford Health Care system found that education for providers around LDCT screening can increase the accuracy and efficacy of screening (Duong et al., 2017). They also found that four out of five providers were interested in learning more about LDCT screening (Duong et al., 2017). In a study by Rajupet et al. (2017) primary care physician (PCP) and specialist attitudes about LDCT were compared. They found that PCP’s are less comfortable with LDCT screening than specialists and more education around lung cancer screening may help to improve PCP’s comfort regarding screening (Rajupet et al., 2017). Kanodra et al. (2016) determined in their study that providers are receptive to learning
about LDCT screening, and that more effort is needed to improve knowledge of guidelines, especially regarding patient eligibility criteria.

**Informed/Shared Decision-Making Skills**

Education around how to have shared decision-making conversations with patients is another key piece in the screening process (Lewis et al., 2015). Hoffman et al. (2017) noted that providers were not aware of NLST findings or existing guideline recommendations. They also mentioned that lung cancer screening programs need to educate providers to support informed decision-making and ensure high-quality screening (Hoffman et al., 2017).

**Provider Attitudes**

Findings regarding provider attitudes towards lung cancer screening vary in the existing literature. Most notably, the 95 percent false-positive rate was a concern for providers once they were made familiar with NLST findings (Hoffman et al., 2017). Additional studies are needed to identify the benefits and challenges of using shared decision-making tools when counseling about LDCT screening, and to determine the effect of these interventions on provider behavior and ordering of lung cancer screening (Rajupet et al., 2017). How provider attitudes impact the way they practice medicine in general is a theme that frequently comes up in the literature as a future direction for research. Triplette et al. (2017) noted that attitudes and barriers by specialty should be looked into to determine optimal screening implementation across provider types. Rajupet et al. (2017) also mentioned that as implementation of lung cancer screening programs become more common, more research around provider attitudes and barriers to screening would bring to light any limitations of the NLST trial on which lung cancer screening recommendations
are largely based.

**Stigma**

There is scant existing research regarding provider stigma regarding lung cancer patients and screening. This gap is an important problem for future research given that many other clinical practices have been shown to be affected by personal bias, even if this bias is not recognized. According to Latner et al., a prejudice against overweight people is not widely recognized by society as those outside of this group do not question their bias and those in the group feel that the bias is justified, and internalize these beliefs as truths. This leads one to question if lung cancer beliefs are similar, meaning that the population agrees that lung cancer is their fault, thus justifying these beliefs. Survey measures to assess stigma have been utilized in obesity and HIV research. Latner et al. (2008) published a study “Weighing obesity stigma: the relative strength of different forms of bias.” They included the Universal Measure of Bias – Fat Scale, which includes items that determine the bias their study participants felt toward obese people. The Universal Measure of Bias items are used to measure bias around weight, sexuality, and religion. Items specifically addressing bias need to be included in lung cancer screening surveys to understand attitudes toward smokers and those with lung cancer.

Another study performed by Christian S. Crandall (1994), “Prejudice Against Fat People: Ideology and Self-Interest,” included the development of the Anti-Fat Attitudes questionnaire to test explicit weight stigma. These items were similar to those included in the Universal Measure of Bias survey and probe providers’ personal beliefs. Interestingly, Crandall found that people felt more comfortable expressing a bias toward obesity than a racial bias. This finding suggests
some biases may be more acceptable in society than others.

Access

Research written by Lewis et al., (2015) documented some of the differences between use of LDCT and chest x-ray screening. Frequently providers reported using chest x-ray instead of LDCT because of lack of insurance coverage and the financial burden of LDCT for patients (Lewis et al., 2015). The authors found most patients do not want to pay out of pocket for lung cancer screening (Lewis et al., 2015).

Available resources in a given community may also be a barrier for some providers when it comes to LDCT screening and smoking cessation services (Richards, White, & Caraballo, 2014). Providers report a lack of time and resources to address lung cancer screening in their clinical practice (Triplette et al., 2017). Similarly, lack of time and resources are issues that providers in Kanodra et al.’s (2016) study mentioned as barriers to implementing more shared decision-making and smoking cessation services.

Project Objectives

Plans to advance this research include:

- development of the provider survey,
- pilot testing of the survey,
- IRB approval to distribute the survey (both USM and MMCRI approval),
- distribution of the survey to primary care physicians in Maine, and
- reporting findings
This capstone focuses on the first two steps (e.g. developing and pilot testing the survey with providers).

The specific research questions addressed by the survey include:

- What are the lung cancer screening practices of providers in Maine?
- How knowledgeable are providers about lung cancer screening?
- How confident are providers that they can implement lung cancer screening?
- To what extent do providers acknowledge stigmatizing attitudes towards patients who smoke, and do these attitudes relate to providers’ self-reported screening attitudes and behaviors?

Sample Development

Three physicians’ societies in Maine have agreed to allow administration of the provider survey with their members. These three societies are American College of Physicians, Maine Chapter (433 members), American Academy of Family Physicians, Maine chapter (530 members), and Maine Primary Care Association (219 members). Maine Primary Care Association has roughly 110 medical doctors, and many of these members are also members of the other 2 societies, so there is some overlap.

The target audience for this research is primary care physicians, specifically internal medicine and family medicine providers. Ultimately, this survey will help us better understand Maine provider’s knowledge and beliefs around lung cancer screening. In addition, it is our hope that we might be able to understand how a provider’s beliefs might influence their screening
behaviors. Once there is an understanding about how behaviors and beliefs vary, there will be more clarity about how to intervene to encourage providers to effectively use lung cancer screening strategies, and how best to share information regarding screening.

Methods

Survey Development

A team of four including the author and CORE staff worked together to develop the survey targeting members of the participating associations (above). Items used in existing provider surveys about lung cancer screening were considered, as were stigma-related items from HIV and obesity research questionnaires. The team then edited selected items to make the attitudes section of the survey more robust. Several drafts of the survey were edited by the team and interested partners before pilot testing took place. Details regarding development of the questionnaire are reported below under findings.

Development of the survey questionnaire began after review of the literature to understand the lung cancer screening research surveys that had been conducted previously. Once existing surveys had been evaluated, the research team pulled specific items that could elicit responses relevant to the research questions.

Pilot Development

One of the specialty societies required that the survey be approved by their national branch before allowing their members to take it. This was to ensure that the survey was not too long and would not cause any distress to the providers who would be taking it. Each society also had to
approve a pre-written letter for approval or write their own before submitting the project to IRB for review. Another necessary piece before IRB submission was confirming funding from Maine Cancer Foundation (MCF). This raised additional questions as MCF needed clear communication about how exactly the stipend for each society was determined and what each society was using the funding for. To clarify this information the application for funding was delayed by negotiation between CORE and MCF for several months.

**Cognitive Testing**

To assess the comprehensibility of survey items, individual cognitive testing interviews were completed with three medical professionals who are representative of the survey population. The interviews included a medical resident, who would not be receiving this survey, and two Internal Medicine physicians employed at Maine Medical Center, who would also not be receiving this survey through any of the medical societies. Each cognitive interview was conducted using a paper-and-pencil version of the survey rather than the online version that will be used for participants.

**Online Survey Programming**

The survey was loaded into REDCap, a HIPAA-compliant online survey platform widely used in biomedical research. REDCap was selected as the platform due to its ease of inputting items, ease of access for the participants, and personalized links that could be sent directly to each participant email account. Although this was a relatively easy process, the question and response formatting and branching for question skip patterns required for some of the items proved to be
very time consuming. We estimate that the 50-item questionnaire required about 10 hours for entry and editing.

IRB Review of Pilot

Letters of support from each association and approval from their national offices, confirmed external funding, and a completed IRB application were necessary before submitting to the MMC IRB. Because time was limited for this capstone project, the short submission to IRB through the University of Southern Maine was used to determine that pilot testing of the survey was not research and, therefore, did not require a full IRB.

Findings

Survey Development

Upon reflection of the survey items the team selected, the group identified four domains in which to sort items: knowledge, attitudes, practices/behaviors, and provider characteristics. Classifying items in these categories was intended to ensure that only necessary and relevant items would be included in the survey.

One domain that had not been included in previous lung cancer screening surveys was the potential role of stigma in providers’ attitudes towards screening and treating smokers and lung cancer patients. To develop items for this domain, the research team searched the literature for stigma items in HIV and obesity surveys. Some of these items were altered to fit for lung cancer screening survey. The team also developed stigma items of their own to get at unique dimension of stigma that might unintentionally play a role in lung cancer screening practices.
Cognitive Testing

Cognitive testing is a method of identifying problems in survey items that may impede their understandability or reliability. This method uses individual interviews in which respondents provide feedback on survey items, and identify difficulties in understanding. One of our pilot testers was a new doctor, fresh out of residency. He felt that he might have more knowledge about lung cancer screening than most doctors in Maine due to his interest in preventive care. Another doctor specialized in geriatrics and had less knowledge and experience with lung cancer screening but background experience with pilot testing surveys of her own, so provided very thorough feedback. The third doctor was an internal medicine teaching physician who no longer practices clinical medicine.

Our first provider to test the survey completed the 50 items in 11 minutes and found the survey to be mostly easy to answer. However, going through item by item, there was more confusion than he initially indicated. In particular, there were concerns about the language of response options not appropriately matching the question they belong to. For example, strongly disagree through strongly agree might be better as strongly discourage through strongly encourage. Another concern was the need for clarification around some of the language used in the questionnaire. The most significant finding from this provider was that he felt some of the stigma items might have been too strongly worded. This meaning that providers might be reluctant to answer truthfully because their bias regarding lung cancer patients and smokers might become too clear.
The second provider, who had more experience as a doctor but knew less about lung cancer screening, also went through the survey item by item. With her experience in survey research, she was candid about her thoughts on each item which was helpful as we were interested in learning what providers taking this survey would think about it. This pilot tester shared many of the same comments as the first about changing the language of some items and response options. She made several comments about moving items around to better the flow of the survey. This tester was excited about the stigma items, but again was concerned about how honest providers might be when answering them. She presented the idea that instead of asking about the provider specifically, making the subject “many physicians” might encourage providers to answer more freely. This way they are not answering about themselves and their beliefs, but their peers.

The third provider mentioned many of the same concerns as the other two, and also felt that physicians may not be able to provide accurate information on some questions, including the total number of patients referred for screening in the past. She also pointed out how physicians may have difficulty providing reliable answers of what they do for their “average” patients because their patient population is heterogeneous.

Conclusions
Survey development is a complex task and there are many steps and details that need to be considered throughout the process. One of the most essential parts is finding a time to get all members of the survey team in one room at the same time. When working with individuals that have several projects going at once, this can be a challenge, so flexibility is key. Important considerations and concerns when creating the survey include the length and content. Time
matters, especially considering the provider population being asked to complete the lung cancer screening survey. Keeping the items simple and the time commitment to a minimum was something that the survey development team kept in mind throughout the process. Another important thing to keep in mind was that this population has taken numerous surveys and they are intelligent people. They know what the stigma items are getting at and the goal is to make the provider feel comfortable answering honestly, not to alienate them. This is why selecting and creating stigma items was especially challenging.

Pilot testing of this survey was extremely helpful to the survey development process. After having the same four pairs of eyes on the survey for months, having a fresh perspective was happily welcomed. Language that may be understood by the survey development team did not always translate to the providers and could make all the difference in how those surveyed will respond to the item. For this reason, having an outside perspective and understanding of the survey is beneficial. When there are new items that can have an emotional response, like those around stigma, it is important to have someone from the potential study population provide feedback before launching them. The goal of this survey is to receive honest responses that will help understand where providers stand on the issue of lung cancer screening. If the items are too intrusive the findings could be skewed. The pilot testers for this survey were enlightening because they came from difference places in their careers and had different focuses. This allowed the survey development team to see varied perspectives and hone in on the areas that stood out to the testers as needing work.
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This survey will be one the first of its kind because it is getting at a provider’s attitudes around lung cancer screening and the at-risk population. There is hope that if this survey is successful in Maine, a similar survey could be launched in other states with high lung cancer rates. Despite the long process and legwork that it has taken to get this survey developed, it has been a worthwhile learning experience. My knowledge about survey research has increased tremendously and I have a better idea of what it takes to make a successful and meaningful survey. Survey research is a complex process and while maneuvering through it, I discovered several things that may be of help to future students pursuing similar research projects.

Recommendations

1. Timelines are not set in stone. Anticipating completion dates for each piece of the project helps outline where the project is going. That being said, it is important to keep this schedule flexible. Things may come up and slow the project down. These include, but are not limited to, delays submitting and obtaining IRB responses, miscommunication with a project partner or funder, or unexpected, but necessary, approval from partners before distribution of the survey.

2. Expect the unexpected. Despite how well a process has been planned out, barriers will arise. Acknowledge the barrier, assess its significance, and adapt as necessary. Project partners may want to have a larger say in the survey development or need approval from their leadership. These may seem like a roadblock at the time, but the more buy in you can get from your partners, the more successful your survey will be.

3. Use your resources. Questions will certainly come up throughout the survey research project. Ask your professional counterparts about their experience and how they may
have handled a hurdle that came up in the past. Access the vast literature available at your fingertips.
References


screening at an academic medical center. Retrieved from


#lung_screening
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http://www.jnccn.org/content/10/2/240.full.pdf.html
Cognitive Testing Notes

Page 1
Question 1:
- Change 12 months to 3 or 4 – some providers may have too many patients to estimate the number referred for screening in an entire year

Question 2:
- Have this question come after eligibility questions – this will help to clarify what providers know about screening eligibility before asking their approach with eligible patients
- Give an option for those who might not discuss LDCT screening
- Discuss down sides of LDCT screening (i.e. false-positives) before getting at this question

Question 3:
- Change the response scale – Strongly encourage-discourage, or reword question: I feel I should encourage him/her to get screened…

Page 4
Question 1:
- Clarify multidisciplinary lung cancer treatment services
- Reword “Care processes” to be more clear

Question 5:
- Is this question getting at what we want it to? Do we want to emphasize that this question is intended to mean false-positives?

Page 5
Question 2:
- Change RPM to risk calculator on all RPM questions

Page 6
Question 3:
- Include SDM in “As a tool for clinicians to help patients decide whether to be screened” – there was some confusion about the different between option 1 and 3 in this question
- Maybe reword to say “As a decision tool for clinicians…” – or “As a patient education tool…”

Question 4:
- Is this question fair? It seems that the question is open to interpretation and that might not be what we were meaning to do
- Potentially include the specific NLST overall risk – give some kind of risk for providers to better understand the question and answer to the best of their ability
Page 9
Question 2:
- Needs to be completely redone – in particular clarify who plays each role – does PCP always conduct SDM? If patient navigators are not usually physicians are we going to skew our results by listing them as a model?

Question 3:
- How honest are these physicians going to be? Are some of these items too abrasive?
- Think about changing wording to “Many physicians” instead of “I” to make the questions less personal
- Make this the last question of the survey
- Consider getting rid of “I would feel more sympathetic toward a person who developed lung cancer because of a genetic disposition…” item (found on page 10)

Page 10
Question 1:
- Clarify which patients in these vignettes are currently smoking (likely all to make it easy for providers)
- Move this set of questions to follow RPM questions
Approximately how many patients did you refer for low-dose CT (LDCT) screening in the last 3 months?

How often do you:

<table>
<thead>
<tr>
<th>Offer LDCT screening to patients at high risk for lung cancer?</th>
<th>1 Never</th>
<th>2</th>
<th>3</th>
<th>4 Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive patient inquiries about lung cancer screening</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Discuss the potential benefits of LDCT screening with screening-eligible patients</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Discuss the potential harms of LDCT screening with screening-eligible patients</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Which guidelines, if any, do you follow for LDCT screening? (Please check all that apply)

- [ ] American Academy of Family Physicians
- [ ] U.S. Preventive Services Task Force
- [ ] American Cancer Society
- [ ] National Comprehensive Cancer Network
- [ ] American Thoracic Society
- [ ] Center for Medicare and Medicaid Services
- [ ] American College of Radiology
- [ ] Other

Please indicate the guidelines that you follow that are not listed.

How familiar are you with the USPSTF recommendations for screening for the following cancers?

<table>
<thead>
<tr>
<th></th>
<th>1 Not at all familiar</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 Extremely familiar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast cancer</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Cervical cancer</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Colon cancer</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Prostate cancer</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
### How confident do you feel about your knowledge of the following aspects of lung cancer screening... (Please mark one box in each row)

<table>
<thead>
<tr>
<th>Aspect</th>
<th>1 Not at all confident</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 Extremely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligibility criteria</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential benefits of screening</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential harms of screening</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essential elements of a shared decision making (SDM) consultation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriate follow-up for abnormal LDCT findings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### How confident do you feel about your ability to...

<table>
<thead>
<tr>
<th>Task</th>
<th>1 Not at all confident</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 Extremely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide tobacco treatment/smoking cessation counseling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduct a shared decision making (SDM) consultation for LDCT screening</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Are the following available in your own practice or service area?

<table>
<thead>
<tr>
<th>Service/Process</th>
<th>Yes</th>
<th>No</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDCT screening</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialty pulmonary consultation services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multidisciplinary lung cancer treatment (surgery, radiation therapy, chemotherapy)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical processes to facilitate LDCT screening (e.g. patient or physician reminders, referral protocols)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient navigation for LDCT screening</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please answer the following questions about lung cancer screening based on what you’ve read or heard.

What is the minimum age requirement to begin lung cancer screening with LDCT?

What is the minimum smoking history requirement (in cigarette pack years) for patients?

What is the recommended frequency for LDCT screening, assuming a patient has normal screening results?
- Every 6 months
- Every year
- Every 2 years
- Every 3 years

According to the NLST, approximately what percentage of individuals who have an LDCT for lung cancer screening will get a false-positive result?
- 1%
- 5%
- 10%
- 25%
- 35%

Approximately what is the expected reduction in death from lung cancer associated with using LDCT for lung cancer screening?
- 1%
- 10%
- 20%
- 30%
- 40%

What is your usual approach to LDCT screening among eligible patients?
- Do not discuss LDCT screening
- Recommend LDCT screening
- Recommend against LDCT screening
- Let individual patients decide for or against LDCT screening

Risk calculators are statistical models that predict the chance that an individual with a particular set of risk factors will experience a health outcome.

How familiar are you with risk calculators to estimate an individual patient’s risk for the following conditions?

<table>
<thead>
<tr>
<th></th>
<th>1 Not at all familiar</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 Extremely familiar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular disease</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

04/16/2018 5:01pm www.projectredcap.org
LUNG CANCER SCREENING PROVIDER SURVEY

Osteoporotic fractures
Breast cancer
Lung cancer

How often do you use risk calculators in your practice?
1 Never 2 3 4 5 Very frequently

How helpful have risk calculators been in your clinical practice?
1 Not at all helpful 2 3 4 5 Extremely helpful

How helpful do you think a lung cancer risk calculator would be in the care of patients who are considering lung cancer screening?
1 Not at all helpful 2 3 4 5 Extremely helpful

To what extent do you agree with the following uses of risk calculators:

1 Strongly disagree 2 3 4 5 Strongly agree

As a tool for clinicians to help determine LDCT eligibility
As a tool for policy makers to set standards about LDCT eligibility
As a shared decision making tool to help patients decide whether or not to be screened

If individual patients were going to use a risk calculator to obtain information about their own risk of developing or dying from lung cancer:

How much do you think this risk information would influence the following patient outcomes?

1 Not at all 2 3 4 5 A great deal

Interest in lung cancer screening
Understanding of lung cancer
Ability to make informed decisions about screening
Motivation to stop smoking
Some patients will learn that their risks are lower than they thought. How much do you think this information would have the following effects?

<table>
<thead>
<tr>
<th>Decrease interest in lung cancer screening</th>
<th>1 Not at all</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 A great deal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrease motivation to stop smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How confident are you in your ability to explain to patients the meaning of individual risk estimates produced by a lung cancer risk calculator?</td>
<td>1 Not at all confident</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 Extremely confident</td>
</tr>
<tr>
<td>If a patient eligible for LDCT screening initially declines, I feel I should encourage him/her to get screened.</td>
<td>1 Strongly disagree</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 Strongly agree</td>
</tr>
</tbody>
</table>

Please review the following brief patient vignettes, and indicate how strongly you feel that each patient should be offered LDCT screening. Please assume that insurance coverage is not an issue and all patients are current smokers.

**Patient 1:**
- 44 years old
- 35 pack-year smoking history
- Family history of lung cancer in father and paternal uncle
- No other comorbidities

<table>
<thead>
<tr>
<th>How strongly do you feel that this patient should be offered LDCT screening?</th>
<th>1 Not at all strongly</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 Very strongly</th>
</tr>
</thead>
</table>
Patient 2:
- 56 years old
- 40 pack-year smoking history
- No medical comorbidities or symptoms

How strongly do you feel that this patient should be offered LDCT screening?

1 Not at all strongly 2 3 4 5 Very strongly

○ ○ ○ ○ ○

Patient 3:
- 82 years old
- 50 pack-year smoking history
- Well-controlled comorbidities: hypertension, mild Type II DM
- Physically active, completely independent in all activities of daily living

How strongly do you feel that this patient should be offered LDCT screening?

1 Not at all strongly 2 3 4 5 Very strongly

○ ○ ○ ○ ○

Patient 4:
- 57 years old
- 20 pack-year smoking history
- History of occupational asbestos exposure

How strongly do you feel that this patient should be offered LDCT screening?

1 Not at all strongly 2 3 4 5 Very strongly

○ ○ ○ ○ ○
Please answer the following series of questions on a scale of 1 to 5 (least to most).

To what extent do the following factors limit your ability to provide LDCT screening to patients?

<table>
<thead>
<tr>
<th>Factor</th>
<th>1 Not at all</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 To a great extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of patient interest in screening</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lack of insurance coverage for LDCT screening</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lack of time to counsel patients</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Inability of patients to follow up with screening</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

In your opinion, how likely is it that lung cancer screening with LDCT will result in the following outcomes for your patients:

**Benefits:**

- Reduction in lung cancer mortality
- Detection of lung cancer at an earlier stage
- Increased motivation to stop smoking

**Harms:**

- False-positive LDCT screening results
- False-negative LDCT screening results
- Harm from unnecessary diagnostic procedures
- Harm from radiation exposure
- Diagnosis of lung cancers that do not require treatment
- Decreased motivation to stop smoking (for patients with normal LDCT results)
<table>
<thead>
<tr>
<th>Statement</th>
<th>1 Strongly disagree</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The financial costs to the healthcare system of lung cancer screening are too high.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Screening smokers for lung cancer will reduce smoking prevention and cessation efforts.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Lung cancer screening is a low-value intervention.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The evidence supporting LDCT screening is strong.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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</tr>
<tr>
<td>I believe there are conflicting guidelines regarding LDCT screening in eligible patients</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>If experts had conflicting opinions about a medical test or treatment, I would still be willing to try it.</td>
<td>○</td>
<td>○</td>
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<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**Imagine you are a health policy maker and you need to allocate public funds to address the burden of lung cancer. What percent of funds would you allocate to the following? (Your responses should add up to 100%)**

**Tobacco Prevention/Treatment**

- ○ 0%
- ○ 5%
- ○ 10%
- ○ 15%
- ○ 20%
- ○ 25%
- ○ 30%
- ○ 35%
- ○ 40%
- ○ 45%
- ○ 50%
- ○ 55%
- ○ 60%
- ○ 65%
- ○ 70%
- ○ 75%
- ○ 80%
- ○ 85%
- ○ 90%
- ○ 95%
- ○ 100%
<table>
<thead>
<tr>
<th>Environmental Risk Reduction (e.g. radon, other environmental risk factors)</th>
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</thead>
<tbody>
<tr>
<td>0%</td>
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<tr>
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</table>

<table>
<thead>
<tr>
<th>Lung Cancer Screening</th>
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</thead>
<tbody>
<tr>
<td>0%</td>
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</tr>
<tr>
<td>Lung Cancer Treatment</td>
<td>0%</td>
</tr>
<tr>
<td>----------------------</td>
<td>----</td>
</tr>
<tr>
<td>Lung Cancer Survivorship</td>
<td>0%</td>
</tr>
</tbody>
</table>
There are different potential models for providing LDCT screening services to patients (including SDM counseling and follow-up of screening results). Please consider the following models and rank them according to your preference.

<table>
<thead>
<tr>
<th>Model</th>
<th>1 Most preferred</th>
<th>2</th>
<th>3</th>
<th>4 Least preferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Care Physicians conduct SDM counseling and order LDCT screening, as well as provide further follow-up of screening results.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Lung cancer specialists (pulmonologists, thoracic surgeons, radiologists) conduct SDM counseling and order LDCT screening, as well as provide further follow-up of screening results.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Patient Navigators (trained non-physician personnel) conduct SDM counseling and order LDCT screening, as well as provide further follow-up of screening results.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Shared model of care: PCPs and specialists share responsibilities: PCPs conduct SDM counseling and order LDCT screening, while lung cancer specialists provider further follow-up of screening results.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Please indicate your level of empathy in regard to the following questions.

<table>
<thead>
<tr>
<th>Question</th>
<th>1 None</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 A Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much empathy do you have for someone with cancer?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>How much empathy do you have for someone with lung cancer who smoked?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>How much empathy do you have for someone with lung cancer who did not smoke</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Please indicate your level of agreement/disagreement with the following statements.

<table>
<thead>
<tr>
<th></th>
<th>1 Strongly disagree</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The healthcare system treats lung cancer patients with the same compassion and respect as patients with other cancers.</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>I treat lung cancer patients with the same compassion and respect as patients with other cancers.</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>People with lung cancer should receive as much support as people with other cancers.</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>Pharmacologic therapy is more effective for smoking cessation than quitting cold turkey.</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>People who smoke are generally less adherent to medical care than people who do not smoke.</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>It feels more comfortable to help people who do not smoke than people who do.</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>It is easier to feel sympathetic toward people who develop lung cancer because of a genetic predisposition, compared to people who develop lung cancer because of smoking.</td>
<td>○</td>
<td></td>
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<td></td>
<td>○</td>
</tr>
<tr>
<td>Despite physicians' professional training, it is not uncommon to have negative reactions toward people who smoke.</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>There is little physicians can do to help people who smoke.</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>Many people who smoke don't try hard enough to stop.</td>
<td>○</td>
<td></td>
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<td>○</td>
</tr>
<tr>
<td>People who smoke are challenging to take care of.</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
</tbody>
</table>
LUNG CANCER SCREENING PROVIDER SURVEY

It can be difficult to feel compassion for a person who smokes.  ○ ○ ○ ○ ○ ○
Lung cancer is a self-inflicted disease.  ○ ○ ○ ○ ○ ○
People who smoke should pay higher health insurance premiums.  ○ ○ ○ ○ ○ ○

Please answer the following questions about yourself.

Age: _____________________________________________________________

Gender:  ○ Male  ○ Female

Where did you receive your medical training/education?  ○ The United States of America  ○ Other

Please indicate where you received your medical training/education. ______________________________________________________

In which Maine county or counties do you practice? (please list all):

☐ Androscoggin  ☐ Aroostook  ☐ Cumberland  ☐ Franklin  ☐ Hancock  ☐ Kennebec  ☐ Knox  ☐ Lincoln  ☐ Oxford  ☐ Penobscot  ☐ Piscataquis  ☐ Sagadahoc  ☐ Somerset  ☐ Waldo  ☐ Washington  ☐ York

Specialty:  ○ Internal medicine  ○ Family medicine  ○ Nurse practitioner  ○ Physician assistant  ○ Other

Please indicate your specialty. ________________________________________

Practice setting:  ○ Mostly outpatient/ambulatory  ○ Mostly inpatient  ○ Mixed outpatient and inpatient

Your primary hospital affiliation: ______________________________________
During a typical month, approximately what percent of your professional time do you spend on the following activities? (Answers should add up to 100%)

<table>
<thead>
<tr>
<th>Providing patient care</th>
<th>0%</th>
<th>5%</th>
<th>10%</th>
<th>15%</th>
<th>20%</th>
<th>25%</th>
<th>30%</th>
<th>35%</th>
<th>40%</th>
<th>45%</th>
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<th>80%</th>
<th>85%</th>
<th>90%</th>
<th>95%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>0%</td>
<td>5%</td>
<td>10%</td>
<td>15%</td>
<td>20%</td>
<td>25%</td>
<td>30%</td>
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<td>100%</td>
</tr>
</tbody>
</table>
LUNG CANCER SCREENING PROVIDER SURVEY

Other
- 0%
- 5%
- 10%
- 15%
- 20%
- 25%
- 30%
- 35%
- 40%
- 45%
- 50%
- 55%
- 60%
- 65%
- 70%
- 75%
- 80%
- 85%
- 90%
- 95%
- 100%

Please indicate the activities you perform that are not listed:

During a typical week, approximately how many patients do you see:

What is the estimated breakdown of your patient population by insurance coverage? (Answers should add up to 100%)

Medicare
- 0%
- 5%
- 10%
- 15%
- 20%
- 25%
- 30%
- 35%
- 40%
- 45%
- 50%
- 55%
- 60%
- 65%
- 70%
- 75%
- 80%
- 85%
- 90%
- 95%
- 100%
Uninsured

0%  5%  10%  15%  20%  25%  30%  35%  40%  45%  50%  55%  60%  65%  70%  75%  80%  85%  90%  95%  100%

How many years have you practiced as a primary care provider?

What do you consider to be your race? (Select all that apply)

☐ American Indian or Alaska Native  ☐ Asian American  ☐ Black of African American
☐ Native Hawaiian or Pacific Islander  ☐ White  ☐ Other

Please indicate your race if it is not listed.

What do you consider to be your ethnicity? (Select all that apply)

☐ Non-Hispanic  ☐ Hispanic  ☐ Other

Please indicate your ethnicity if it is not listed.

How interested would you be in continuing medical education offerings regarding lung cancer screening?

1 Not at all  2  3  4  5 Extremely

The Maine Lung Cancer Coalition is a consortium of healthcare institutions across Maine dedicated to an innovative, statewide approach to lung cancer education, lung cancer prevention, and screening for Maine residents - especially the most vulnerable and at-risk.

1 Not at all  2  3  4  5 Extremely
How familiar are you with the Maine Lung Cancer Coalition?

○ ○ ○ ○ ○ ○
TIPS FOR SURVEY RESEARCH

Recommendations for first-time survey researchers

TIMELINES ARE NOT SET IN STONE
It is important to keep the survey development and implementation schedule flexible. Things may come up that slow the project down.

EXPECT THE UNEXPECTED
Despite how well a process has been planned out, barriers will arise. Acknowledge the barrier, assess its significance, and adapt as necessary.

USE YOUR RESOURCES
Questions will come up throughout the survey research project. Ask your professional counterparts about their experience and use the literature available at your fingertips.

LINDSAY MCFARREN