

FRAMING, STIGMA, AND POLICY APPROACHES TO ADDRESSING  
PRESCRIPTION OPIOID ADDICTION

by  
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## **Abstract**

**Background:** In the last 15 years, rates of prescription opioid addiction and overdose have risen rapidly, leading the CDC to label prescription drug overdose a national epidemic. Social stigma toward persons with opioid addiction is an important barrier to the advancement of public health-oriented solutions to this problem. Particular sub-populations, such as pregnant women, may face added stigma due in part to perceptions of risk associated with prenatal drug exposure and the way in which the problem has been framed in the public discourse. The Affordable Care Act (ACA) includes components to expand access to substance use treatment and integrate primary care and behavioral health services through reforms to the delivery system, such as the Medicaid health home. Maryland is one of only three states to implement health homes in opioid treatment programs (OTPs).

**Methods:** To assess stigma toward persons with prescription opioid addiction, I analyzed data from a nationally representative public opinion survey fielded in early 2014 (N=1,111). To examine how narratives framing prescription opioid addiction during pregnancy affect public attitudes, I designed and conducted a randomized experiment with participants drawn from a nationally representative web-based panel (N=1,620). To assess the implementation of health homes in Maryland OTPs, I conducted in-depth interviews with OTP leadership staff and state officials.

**Results:** Stigma toward persons with prescription opioid addiction is associated with internal causal attributions and with greater support for punitive policy and lower support for public health-oriented policy. The degree to which narratives portraying a woman addicted to prescription opioids during pregnancy affect public attitudes depends on the socioeconomic status of the woman portrayed and whether she engages in addiction treatment. To date, few Maryland

OTPs have adopted Medicaid health homes. Among those OTPs that have, interpersonal relationships and patient engagement are factors critical to successful implementation.

Conclusions: Social stigma toward persons with prescription opioid addiction has important policy implications. Re-framing the issue may reduce stigma and increase support for public health-oriented approaches to addressing opioid addiction. OTPs offer a unique opportunity to implement health homes because many have established relationships with a vulnerable patient population.

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## **Dissertation Introduction**

Prescription opioids are narcotic analgesics (i.e., pain relievers) that include such medications as hydrocodone (e.g., Vicodin), oxycodone (e.g., OxyContin, Percocet), morphine, and codeine.<sup>1</sup> These drugs are chemically similar to heroin.<sup>2</sup> Since the 1990s, prescription opioid misuse, addiction and overdose rates have risen dramatically, with the Centers for Disease Control and Prevention (CDC) labeling this problem one of the worst drug overdose epidemics in U.S. history.<sup>3,4</sup> Prescription opioid overdose mortality rates have increased nearly four-fold from 1.4 per 100,000 population in 1999 to a peak of 5.4 per 100,000 population in 2011, when there were 16,917 deaths attributed to these medications.<sup>5</sup> In 2008, drug poisoning deaths surpassed motor vehicle accidents as the leading injury-related cause of death in the U.S., and prescription opioid overdoses have been the main contributor to this increase.<sup>6,7</sup>

### **Emergence of the problem**

Research published in the 1980s and 1990s challenged the prevailing reluctance among physicians to prescribe opioid medications for non-cancer pain.<sup>3</sup> Although the studies had small sample sizes and other methodological limitations, their conclusions advanced the argument that prolonged use of these medications was unlikely to cause addiction in patients with no history of substance use.<sup>3,8-10</sup> During the 1990s, the American Academy of Pain Medicine, American Pain Society, Joint Commission, and Veterans Health Administration urged medical professionals to devote greater attention to pain, which they promoted as the fifth vital sign.<sup>3,11,12</sup> Meanwhile, the pharmaceutical industry sought to fill the niche for pain treatment.<sup>13</sup> In 1996, Purdue Pharma introduced the medication OxyContin, a sustained-released oxycodone medication. Through an aggressive marketing and promotional campaign targeting primary care physicians with no

training in pain management, Purdue Pharma increased sales of OxyContin from \$48 million to \$1.1 billion in four years.<sup>14</sup> OxyContin became heavily misused, initially in rural areas of the U.S. such as the Appalachian states of West Virginia, southwest Virginia and Kentucky.<sup>14</sup> In 2007, Purdue Pharma was ordered to pay over \$600 million, one of the largest settlements at that time for a pharmaceutical company, for misbranding and minimizing OxyContin's addictive potential.<sup>15</sup> Although Purdue Pharma released a tamper-resistant product in 2010,<sup>16</sup> OxyContin remains perhaps the most notorious example of the addictive risks of these medications.<sup>17</sup>

Overall prescribing of opioid medications has exceeded growth in the U.S. population.<sup>2,18</sup> Between 1999 and 2013, the amount of dispensed prescription opioids in the U.S. quadrupled.<sup>4</sup> Worldwide, the U.S. consumes the vast majority of these products, close to 100 percent of hydrocodone and 80 percent of oxycodone.<sup>2</sup> Substantial prescribing and supply increases have been linked to the rising rates of addiction and overdose in the U.S.<sup>2,19-21</sup> Yet recent evidence suggests a possible turning point in the epidemic. Since 2010, rates of opioid prescribing have stabilized,<sup>18</sup> and from 2011 to 2012, mortality from prescription opioid overdose declined (by 5 percent) for the first time in over a decade.<sup>5</sup> Yet during that same two-year period, rates of overdose deaths from heroin increased by 35 percent.<sup>5</sup> Research has shown that a portion of individuals with prescription opioid addiction have begun transitioning to heroin due to cost and availability.<sup>16,22,23</sup> Four in five persons with new addictions to heroin reported first having regularly used prescription opioids.<sup>24</sup>

Socio-demographic characteristics associated with higher risk of overdose from prescription opioids include: male sex, middle-aged, non-Hispanic white, lower income, co-occurring mental health disorder, and residence in a non-urban community.<sup>3,19,25</sup> Although absolute overdose rates have been higher among men, women experienced a more rapid increase between 1999-2010.<sup>26</sup> Increases in prescription opioid use among women of reproductive age and during pregnancy have raised concern given implications for maternal health and birth outcomes.<sup>27-30</sup> Data on the emerging problem of heroin have shown similar patterns in which new

treatment admissions for heroin addiction and deaths from heroin overdose are more prevalent among people who are white, live in non-urban areas, and are older at the age of first use (compared with previous generations of heroin users).<sup>23,24</sup>

### **Policy strategies**

Efforts to reduce prescription opioid misuse and addiction have included: mass educational campaigns, strengthening regulation of pain clinics, revising clinical guidelines for pain treatment, altering insurance and pharmacy benefits, encouraging safe storage and disposal, developing tamper-resistant opioid medications, and requiring clinicians to use prescription drug monitoring programs (PDMPs).<sup>16,31,32</sup> Given the huge increases in rates of opioid addiction, secondary and tertiary prevention strategies are strongly needed as well.<sup>3,33</sup> These involve improvements in access to evidence-based treatments for opioid addiction including medication assisted treatment (MAT), which includes maintenance treatment with methadone or buprenorphine (i.e., Suboxone, Subutex) in combination with counseling and behavioral therapies.<sup>33</sup>

A large body of literature has established methadone as an effective treatment for opioid addiction that is associated with improved health outcomes, decreased criminal activity, and lower overdose mortality, although most of this research has focused on treatment for heroin addiction.<sup>34,35</sup> Methadone maintenance therapy (MMT) is delivered within opioid treatment programs (OTPs), which require most patients to make daily visits to obtain their methadone doses. In 2002, the Food and Drug Administration (FDA) approved buprenorphine for treatment of opioid dependence; buprenorphine can be delivered in an office-based setting by certified physicians.<sup>36</sup> Despite the evidence base, MAT is underused in treatment of opioid addiction. Of the more than 2.5 million Americans reporting opioid use disorders in the 2012 National Survey on Drug Use and Health, less than 1 million were receiving MAT.<sup>33</sup>

A more tertiary method of addressing prescription opioid addiction is with harm reduction strategies, such as broader distribution of naloxone (brand name Narcan).<sup>31</sup> Naloxone is a medication that reverses the effects of an opioid overdose and can be administered through injection or intranasal methods. Other harm reduction strategies have included implementation of immunity laws, which protect persons experiencing an opioid overdose from drug-related prosecution if they or someone accompanying them are seeking medical assistance.<sup>31</sup>

### **Barriers to implementing public health-oriented policy**

Barriers to advancing more public health-oriented solutions to opioid addiction (as opposed to more punitive approaches) include social stigma toward persons with substance use disorders, stigma surrounding MAT, and the historic segregation of behavioral and non-behavioral health care (often referred to as somatic medical care) in the U.S. health care infrastructure. It is possible that the U.S. public feels lower levels of stigma toward persons with prescription opioid addiction because these are legal medications and there is an iatrogenic pathway to addiction among a portion of users. These factors may reduce internal attributions<sup>37-39</sup> for the causes of prescription opioid addiction. However, no study of which we are aware has examined the extent to which the American public holds stigmatizing attitudes toward this population and whether stigma affects the types of policies that the public supports.

Subpopulations, such as pregnant women who use substances, are particularly vulnerable to social stigma, which has implications for their access to and use of evidence-based treatment.<sup>40-42</sup> Twenty five years ago, the public outcry over “crack babies” elicited a moral panic that framed women affected by cocaine addiction as immoral, negligent mothers and their children as irrevocably damaged.<sup>43</sup> Subsequent research on outcomes among cocaine-exposed children found many of these claims to be exaggerated and untrue.<sup>44</sup> Rapidly rising rates of opioid withdrawal in newborn infants has drawn attention to the prevalence of prescription opioid use during pregnancy.<sup>27,29,30,45</sup> In 2014, responding to increasing rates of opioid withdrawal in infants,

Tennessee passed one of the most punitive laws in the U.S. targeting pregnant women; it enables the prosecution of women who use narcotics during pregnancy on criminal child abuse charges.<sup>46</sup> As the “crack baby” episode taught us, the framing of substance use during pregnancy by the news media and in public dialogue affects how the public views the causes of public health and social problems and potential solutions.

In addition to social stigma and its implications for policy support, the U.S. faces another significant barrier to meeting the needs of the growing population with opioid use disorder: fragmentation in our health care infrastructure. The historic segregation between behavioral and non-behavioral health services is related in part to the high level of stigma toward persons suffering from substance use and mental health disorders, which often have been viewed as matters of individual character or morality rather than treatable medical conditions.<sup>47-49</sup> Policy changes including the 2008 Mental Health Parity and Addiction Equity Act and the 2010 Affordable Care Act (ACA) have mandated equitable insurance benefits for substance use disorders, first steps toward greater integration.<sup>50</sup> Yet minimal communication and coordination exists between behavioral health and other medical providers regarding patients with substance use disorders and other health conditions.<sup>51</sup> The ACA enables state Medicaid programs to test new approaches to integrating behavioral and primary health care, including the Medicaid health home. States can apply to implement a health home program in which the federal government will provide 90% matching rate (for the first two years) for health home services provided to Medicaid enrollees with chronic illnesses, which includes opioid addiction.<sup>51</sup> At the time of this research, Maryland was one of only three states implementing health homes among opioid treatment programs.<sup>52</sup> Little is known about the facilitators and barriers to implementation of health homes in this setting.<sup>53</sup>

## **Dissertation aims**

This dissertation aims to address some of the aforementioned research gaps in order to advance public health-oriented solutions to prescription opioid addiction. Paper 1 examines the prevalence of social stigma toward persons with prescription opioid addiction by analyzing data from a nationally representative survey fielded in early 2014. This study examines the extent to which internal and external attributions for prescription opioid addiction affect negative attitudes toward this population. In addition, it explores how stigma is associated with the types of policies the public supports to reduce prescription opioid misuse and addiction.

Paper 2 tests whether narratives framing prescription opioid addiction during pregnancy affect public attitudes and policy support. In this study, we conducted a randomized experiment in which participants are exposed to different versions of a narrative describing a woman who becomes addicted to prescription opioids after a car accident and then becomes pregnant. We assess how attitudes vary in response to exposure to a narrative portraying the woman as: low or high socioeconomic status; facing barriers to addiction treatment access; and successfully engaging in treatment for her opioid addiction.

Finally, Paper 3 describes a qualitative study assessing the implementation of Medicaid health homes in Maryland opioid treatment programs. Through in-depth interviews with opioid treatment program leadership staff and state officials, we identify facilitators and challenges to health home implementation in the opioid treatment program setting. In addition, we examine the barriers to adoption among non-participating opioid treatment programs.

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# **Paper 1: Stigma toward persons with prescription opioid addiction and public support for punitive and public health-oriented policies**

## **Introduction**

In 2008, drug poisonings in the U.S. surpassed motor-vehicle crashes as the leading injury-related cause of death nationwide, a shift driven in large part by increasing rates of overdose from prescription opioids (i.e., narcotic analgesic medications like OxyContin).<sup>1,2</sup> The problem of prescription opioid misuse and addiction has elicited concern from policymakers, with the Centers for Disease Control and Prevention (CDC) labeling prescription drug overdoses a national epidemic.<sup>3-5</sup> However, given that this public health challenge has emerged mainly within the last ten years, public attitudes and stigma toward persons with addiction to these medications have not been well-studied.<sup>6</sup> Stigma has important implications for the health and wellbeing of affected groups.<sup>7,8</sup> Research has shown public stigma toward persons with substance use disorders (SUD) to be persistently high, exceeding stigma toward those with mental illness or physical disability across multiple countries and cultural contexts.<sup>9-12</sup> The lack of research on stigma toward persons with prescription opioid addiction is a noteworthy gap given the substantial burden of morbidity and mortality associated with this addiction.<sup>2,13-15</sup>

Goffman's seminal work defined stigma as an "attribute that is deeply discrediting" that reduces a stigmatized person from "a whole and usual person to a tainted, discounted one."<sup>16,17</sup> Link and Phelan's sociological conceptualization of stigma includes the interrelated components of: labeling the difference that defines the stigmatized group as 'others' separated from mainstream society; stereotyping or connecting the labeled difference with other negative attributes; separating *them*, the stigmatized persons, from *us*, mainstream members of society and loss of status for the stigmatized group in the social hierarchy as well as discrimination within inter-personal relationships and institutional structures.<sup>7,18</sup> In addition, Link and Phelan have

noted that stigma depends on the exercise of power, a qualification that distinguishes powerful people who may be viewed negatively from those who are stigmatized.<sup>9,18</sup>

Recent U.S. drug epidemics (e.g., heroin in the 1970s and crack cocaine in the 1980s and early 1990s) have been characterized as affecting predominantly low-income racial minority populations living in urban settings.<sup>15,19-22</sup> Linking substance use with populations that already experience discrimination may demarcate further those who use substances, an example of the “othering” process inherent in stigmatization.<sup>18,23,24</sup> The current prescription opioid (and related heroin) epidemic – in contrast - has disproportionately affected rural and suburban white populations,<sup>13,15,25</sup> a pattern that may have implications for stigma. In addition, the fact that prescription opioids are legal medications may affect stigma by reducing associations with criminality.<sup>26</sup> As a target population in the policy-making context, persons with addiction traditionally have been socially constructed as deviants because they lack political influence, and are viewed unsympathetically by the public.<sup>27</sup> Policymakers often have pursued punitive action toward this group, with minimal objection from other constituencies.<sup>27</sup>

Another framework through which to examine stigma toward particular groups is attribution theory.<sup>12,28-30</sup> This theory differentiates between causal attributions for a condition that emphasize an individual’s disposition or character and attributions that focus on social or structural factors.<sup>12</sup> Research suggests that factors influencing whether persons with a condition are stigmatized include the degree to which a condition is perceived as controllable by the individual and whether it is viewed as permanent.<sup>12</sup> Applying attribution theory, we might hypothesize that stigma toward persons with prescription opioid addiction might be lower than stigma toward persons with other drug addictions because the initial route of exposure to prescription opioids can be through an interaction with the health care system for pain treatment after an accident or operation,<sup>31</sup> potentially lowering perceptions that the individual was able to control the circumstances under which his or her addiction began.

The body of literature on stigma toward persons with addiction is more limited than the research on stigma toward persons with other mental health conditions.<sup>32</sup> To address research gaps in our knowledge of how the public perceives persons addicted to prescription opioids, we conducted a national public opinion survey to measure public attitudes toward this population. First, we assessed whether the public associates addiction to these medications with particular socio-demographic population groups. Second, we tested the associations between causal attributions for prescription opioid misuse and measures of stigma. Third, we examined the associations between attributions of responsibility for addressing the problem and measures of stigma. Finally, we examined how public stigma toward persons addicted to prescription opioids is associated with support for punitive versus public health-oriented policies aimed at reducing the epidemic. Building on prior research,<sup>10,28,29</sup> we hypothesized that internal causal attributions and attributions of responsibility to individuals with addiction would be associated with higher levels of stigma. In addition, we hypothesized that stigma would be associated with greater public support for punitive policy and lower public support for public health-oriented policies that provide support to persons with prescription opioid addiction.<sup>11</sup>

## **Methods**

### **Data**

We fielded a survey on public attitudes surrounding the issue of prescription opioid abuse to a nationally representative web-based panel from January 31 through February 28, 2014. The survey sample was drawn from GfK's KnowledgeNetworks'® online panel of 50,000 U.S. residents, who are recruited through an address-based sampling frame that encompasses 97 percent of U.S. households.<sup>33</sup> The recruitment rate for the overall GfK panel was 16.6 percent. The completion rate for this survey (the proportion of panelists sampled to participate who

completed the survey) was 75 percent. Among the respondents completing the survey (N=1,203), we excluded those with survey duration times that exceeded two standard deviations above the mean survey duration time of 13 minutes (N=65) and respondents with duration times of 5 minutes or less (N=27). The final analytic sample was 1,111.

Survey questions asked about: (1) attitudes toward people who are addicted to prescription opioids; (2) associations of prescription opioid addiction with particular population groups; (3) beliefs about the causes of prescription opioid abuse; (4) beliefs about who is responsible for addressing the problem of prescription opioid abuse; and (5) support for various punitive and public health-oriented policies to address prescription opioid abuse. Both the order of the categories of questions and the order of questions within each category were randomized in order to prevent earlier questions influencing responses to later questions in the survey. All survey questions used the terminology “prescription pain medication” rather than prescription opioid to ensure ease of comprehension. Respondents also read a definition of prescription pain medication at the beginning of the survey and had the opportunity to view a list of examples of opioid analgesics.

## **Measures**

Respondent socio-demographic characteristics are collected routinely by GfK for all panelists and were provided with the survey data. These socio-demographic data included information on respondents’ age, gender, race (white, black, or other race), educational attainment (less than high school education, high school or equivalent degree, some college, or Bachelor’s degree or higher), household income (less than \$10,000, \$10,000-24,999, \$25,000-49,999, \$50,000-74,999, and \$75,000 or greater), residence in a metropolitan statistical area (MSA), and political ideology (conservative, moderate, or liberal). The latter three-category measure of political ideology was created by collapsing a 7-point Likert scale measure of political ideology into three categories. Respondents identifying themselves as slightly conservative,

moderate, or slightly liberal (3, 4, and 5 on the Likert scale) were coded as moderate whereas respondents placing themselves on the two ends of the ideology scale were coded either as conservative (6 or 7 on the Likert scale) or liberal (1 or 2 on the Likert scale). In addition, we asked respondents if they themselves had ever had a problem with prescription opioid abuse and whether they had a family member or close friend who had ever had a problem with prescription opioid abuse. We identified those respondents who answered yes to either of these questions as having personal experience with prescription opioid abuse.

To measure stigma, we assessed respondents' desire for social distance, perceptions about the dangerousness of people addicted to prescription opioids, and beliefs about the acceptability of discrimination, using items adapted from other surveys.<sup>11,34-36</sup> Desire for social distance was measured using two items asking respondents to assess their level of willingness to work closely with a person addicted to prescription opioids or to have a person addicted to prescription opioids marry into their family. To assess perceived dangerousness, respondents were asked to indicate the extent to which they agreed that people addicted to prescription opioids are more dangerous than the general population. Beliefs about the acceptability of discrimination were measured via two questions that asked respondents the extent to which they agreed that employers should be allowed to deny a job, or landlords should be allowed to deny housing, to persons addicted to prescription opioids. All items were measured on 7-point Likert scales. We also dichotomized responses to generate descriptive statistics and to conduct sensitivity analyses (see analytic approach). Responses of 5 through 7 on the Likert scale were coded as one, and responses 1 through 4 were coded zero. In addition, we conducted an exploratory factor analysis of the five stigma measures to determine whether the stigma items (measured on the 7-point Likert scales) could be scaled together. A stigma scale was constructed by averaging together the five individual stigma measures. Given that the five items scaled together had good internal consistency (Cronbach's alpha = 0.79), we used this stigma scale in analyses as well.

To measure associations of this addiction with particular sub-populations, we asked respondents to indicate whether they thought that people who are addicted to prescription opioids are more likely to be: poor; middle class; wealthy; or if the problem affects people of all income groups equally. We also asked about racial and ethnic groups (White/Caucasian, Black/African American, Latino/Hispanic, problem affects all groups equally) and geographic residence (rural areas, urban areas, suburban areas, problem affects people living in all areas equally).

To assess causal attributions, we asked respondents to indicate, on 7-point Likert scales (from strongly disagree to strongly agree), whether they agreed with statements about the reasons people abuse prescription opioids. These items included internal causal attributions, including lack of self-discipline and lack of understanding of how easy it is to become addicted to these medications, and family history that increases susceptibility to prescription opioid abuse. The latter causal attribution does not fall cleanly within the “internal causal attribution” category because family history is not a dispositional characteristic nor is it controllable by the individual. We also asked about external causal attributions, including: inadequate research on the safety and effectiveness of prescription opioids; inadequate explanation of addiction risks by pharmaceutical companies; pharmaceutical companies’ promotion of these medications with inadequate knowledge of their safety and effectiveness; and health insurance companies’ more generous coverage of prescription opioids in comparison to other pain treatments like physical therapy or acupuncture. We dichotomized these measures so that responses of 5-7 on the Likert scale indicated agreement with the causal statement, and responses of 1-4 indicated lack of agreement with the statement. The potential causes of prescription opioid abuse included in the survey were identified through a news media content analysis of this topic during the period 1998-2012.<sup>37</sup>

To measure attributions of responsibility, we asked respondents to indicate, on 7-point Likert scales (hardly any to a great deal), how much responsibility the following groups have for addressing the problem of prescription opioid abuse in the U.S.: individuals who have become addicted to prescription opioids; individuals who illegally sell prescription opioids; pharmacies

and pharmacists; pharmaceutical companies; the government; doctors; health insurance companies; and law enforcement. Responses to these questions also were dichotomized so that responses of 5-7 on the Likert scale indicated that the group held responsibility for addressing the problem while responses of 1-4 indicated that the group held little responsibility.

To assess policy attitudes, we asked respondents to indicate, on 7-point Likert scales (strongly oppose to strongly favor), their support for potential solutions to address prescription opioid abuse in the U.S. Policy solutions were gathered from relevant reports produced by the Centers for Disease Control and Prevention (CDC),<sup>3</sup> Trust for America's Health,<sup>4</sup> the American Medical Association,<sup>38</sup> and the Office of National Drug Control Policy.<sup>39</sup> Policy solutions examined in this study included one punitive response, arresting and prosecuting people who obtain multiple prescriptions for opioid medications at the same time from different doctors (known as "doctor-shopping"), in addition to four public health-oriented policies that provide support to people addicted to prescription opioids. The latter policies included: expanding Medicaid insurance benefits to cover treatment for prescription opioid addiction; passing laws to protect people from criminal charges for drug crimes if they are seeking medical help for someone experiencing a prescription opioid overdose (i.e., immunity laws); providing naloxone, a medication to reverse opioid overdose, to friends and family members of persons addicted to prescription opioids; and increasing government spending to improve treatment of substance use disorders, including prescription opioid addiction.

### **Analytic Approach**

We calculated simple descriptive statistics to describe the socio-demographic characteristics of the sample. In addition, using the dichotomized measures, we calculated the proportion of respondents who expressed stigmatizing attitudes toward persons addicted to prescription opioids, including desire for social distance, the perception that they are more dangerous than the general population, and support for the acceptability of discrimination. To

examine whether the public associates prescription opioid addiction as predominately affecting particular sub-populations, we calculated the proportion of respondents who indicated that they thought that particular groups (income class, race/ethnicity, area of residence) were more likely to be affected by prescription opioid addiction. All analyses incorporated survey weights to account for potential sampling bias and non-response. Data was analyzed in Stata 12®.<sup>40</sup>

To test whether causal attributions and responsibility attributions were associated with stigma, we estimated ordered logit regression models. Each binary attribution measure was included as the primary independent variable in separate ordered logit regression models in which the ordinal stigma measures (on 7-point Likert scales) were the dependent variables. In addition, we estimated the associations between each binary attribution measure and the continuous stigma scale in ordinary least squares (OLS) linear regression models. To assess the association between stigma and support for different types of policies, ordered logit regression models were estimated for each policy measure. In these analyses, the ordinal measures of policy support were the outcome variables and the independent variable was the continuous stigma scale.

Drawing from prior research on stigma toward persons with mental illness or a SUD,<sup>28,29,32</sup> all regression models included covariates to adjust for respondent age, gender, race, educational attainment, income, MSA residence, and political ideology. In addition, we controlled for personal experience with prescription opioid abuse given research indicating that exposure to persons with mental illness or addiction may affect stigma.<sup>32,41</sup> As a sensitivity analysis, we re-estimated all models using logistic regression replacing the ordinal outcomes with dichotomized measures.

Finally, to determine the extent to which stigma versus socio-demographic characteristics and political ideology explained variation among respondents in policy support, we tested incremental regression models and compared the R-squared values across these models.<sup>42</sup> These R-squared values provide a measure of how much of the variation in the policy support measures are explained by the independent variables in the regression model. In order to obtain these

values, we estimated linear regression models in which the dependent variables were the ordinal measures of policy support, treated as continuous in the OLS regression models in order to generate R-squared values. In the first model, we included socio-demographic characteristics of respondents: age, gender, race, educational attainment, household income, residence in a MSA, and personal experience with prescription opioid abuse. Then, we added a categorical measure of a respondent's political ideology (conservative, moderate, and liberal). Finally, we added the stigma scale measure. We compared R-squared values across these three models.

## Results

Table 1 displays the socio-demographic characteristics of the sample. About half of respondents were female (52%). Forty-two percent had a high school education or less, 29.3 percent reported having some college education, and 28.7 percent had a Bachelor's or more advanced degree. The majority of the sample (67%) self-identified as white and about 12 percent as African American. Eighteen percent of respondents had household incomes below \$25,000 annually while the largest proportion of respondents had annual household incomes that were \$75,000 or higher (40.2%). Most (84%) lived in a MSA, which encompasses urban and suburban settings. The socio-demographic characteristics of the sample indicate that it is similar to national rates based on 2013 Current Population Survey data on observable characteristics (Appendix 1.1). In terms of political ideology, 18% of respondents were liberal, 57.6% were moderate, and 24.7% were conservative, about the same as rates from the 2012 American National Election Survey (ANES). About a third (30%) reported having personal experience with prescription opioid abuse either oneself or through a close friend or family member.

Figure 1 displays the proportion of respondents who expressed negative attitudes toward persons addicted to prescription opioids. In terms of desire for social distance, 57.7 percent (95% CI: 54.2, 61.2) indicated that they would be unwilling to have a person with an addiction to prescription opioids start working closely with them on the job and 67.7 percent (95% CI: 64.3,

70.9) were unwilling to have someone with this addiction marry into their family. About 56.1 percent (95% Confidence Interval [CI]: 52.6, 59.6) of respondents thought that people addicted to prescription opioids are more dangerous than the general population. Regarding the acceptability of discrimination, 55.6 percent (95% CI: 52.1, 59.1) thought that employers should be allowed to deny employment, and 39.1 percent (95% CI: 35.6, 42.6) felt that landlords should be allowed to deny housing, to a person addicted to prescription opioids.

Table 2 displays the extent to which the public associates prescription opioid addiction with specific population groups. Generally, the public felt that the problem of prescription opioid addiction was likely to affect all income groups equally (76.8%), all racial or ethnic groups equally (79.8%), and all geographic area of residence groups equally (79.6%). Among the minority of respondents (<25%) who associated addiction to prescription opioids with particular groups, the largest proportions of respondents associated this addiction with people who are middle class (14.6%), white (17.2%), and live in suburban areas (10.0%).

Table 3 displays results from the ordered logit regression models testing the associations between causal attributions for prescription opioid abuse and stigma, adjusting for respondent socio-demographic characteristics. Attributing the cause of prescription opioid abuse to individual lack of self-discipline was significantly associated with several of the measures of stigma. Specifically, respondents attributing the cause of prescription opioid misuse to poor self-discipline were significantly more likely to: be unwilling to have a person with a prescription opioid addiction marry into the family (Coeff: 0.46, 95% CI: 0.16, 0.76), perceive people with this addiction as more dangerous than the general population (Coeff: 0.75, 95% CI: 0.43, 1.04), and to agree that employers should be allowed to deny employment to a person with this addiction (Coeff: 0.40, 95% CI: 0.12, 0.68). Consistent with these findings, the belief that prescription opioid abuse was due to a lack of self-discipline was significantly and positively associated with the stigma scale measure (Coeff: 0.30, 95% CI: 0.10, 0.51). Support for all of the causal attributions also was significantly associated with greater likelihood of perceiving people

addicted to prescription opioids as dangerous. Attributing the cause of prescription opioid abuse to pharmaceutical companies' promotion of these medications with inadequate knowledge of their safety and effectiveness was also significantly and positively associated with the employer discrimination measure as well as the stigma scale.

Attributing responsibility for addressing the problem of prescription opioid abuse to the individuals who are addicted to opioid medications was significantly and positively associated with all of the individual measures of stigma and the stigma scale (Table 4). Nearly all responsibility attributions (except attributing responsibility to pharmaceutical companies) were significantly associated with a greater tendency to view persons with this addiction as more dangerous than the general population. In addition, attributing responsibility for addressing the problem to doctors and to law enforcement was positively associated with several of the individual measures of stigma and the stigma scale.

Table 5 displays findings from the ordered logit regression models testing the associations between the stigma scale and support for punitive and public-health oriented policies adjusting for respondent socio-demographic characteristics. Respondents expressing greater stigma were more likely to support the punitive policy, arresting and prosecuting doctor-shoppers (Coeff: 0.53, 95% CI: 0.39, 0.67). In addition, stigma was negatively associated with support for several of the public health-oriented policies, including expanding Medicaid insurance benefits to cover treatment for prescription opioid addiction (Coeff: -0.15, 95% CI: -0.27, -0.02), passing immunity laws to protect persons from drug crime charges if seeking medical assistance for an opioid overdose (Coeff: -0.15, 95% CI: -0.26, -0.03), and increasing government spending to improve treatment for prescription opioid addiction (Coeff: -0.16, 95% CI: -0.28, -0.03). The latter relationships between stigma and support for public health-oriented policies were not significant (although they were in the same negative direction) in sensitivity analyses in which logistic regression models were estimated using binary measures of policy support as outcomes (see Appendix 1.4).

As indicated in Table 5, several of the covariates also were significantly associated with policy attitudes, after controlling for stigma and other respondent socio-demographic characteristics. For instance, although respondent political ideology was not associated with support for the punitive policy, it was significantly associated with attitudes toward all of the public health-oriented policies, with self-reported conservatives generally significantly less likely than liberals to support these policies. In addition, personal experience (through oneself or a family or close friend) was positively associated with support for naloxone distribution (Coeff: 0.45, 95% CI: 0.16, 0.75).

When examining the R-squared values in the incremental OLS regression models (Appendix 1.5), we found that including the stigma scale substantially improved the models' ability to explain variation in support for the punitive policy, arresting and prosecuting doctor-shoppers. The R-squared in the models predicting support for this policy was substantially larger in the model including stigma (0.136) than in the models with only socio-demographic characteristics (0.038) or socio-demographic characteristics and political ideology (0.041). However, in the models estimating support for the public health-oriented policies, the largest changes in the R-squared values occurred when political ideology was added to the models. Adding stigma also increased the R-squared values for these models predicting support for public health-oriented policy, but only slightly so.

## **Discussion**

In this nationally representative public opinion survey, we found that persons addicted to prescription opioids are highly stigmatized by the public. In the context of other research that has used similar measures to assess stigma toward persons with mental illnesses and persons with drug addiction,<sup>11</sup> negative attitudes toward persons with prescription opioid addiction appear to be higher than stigma toward persons with mental illness. Prevalence of stigma toward persons with

prescription opioid addiction was fairly similar to measures of stigma toward persons with drug addiction, although somewhat lower for the measures of the acceptability of discrimination.<sup>11,28</sup>

Our findings were somewhat surprising for several reasons. First, respondents generally did not associate persons who are addicted to prescription opioids with particular income classes, racial and ethnic groups, or areas of residence. Among the minority (less than 25%) who did, most viewed those more likely to have this addiction to be middle-class, white, and living in a suburban area. In other words, while the public generally did not connect prescription opioid addiction with populations that have experienced marginalization,<sup>23,24</sup> a small proportion viewed this addiction as affecting more privileged segments of the population. Secondly, because prescription opioids are legal medications, we hypothesized that the public would be less likely to associate this type of addiction with criminality, reducing stigma. However, we found that attributing responsibility to law enforcement was significantly associated with higher levels of stigma, which suggests that respondents expressing stigma also may view persons with prescription opioid addiction to be criminals or to be engaged in criminal behavior. Third, we expected persons with prescription opioid addiction to be less stigmatized than those with drug addiction more broadly in part because one of the pathways to this addiction is iatrogenic.<sup>31,43</sup> Research indicates that individuals are viewed as more culpable when a situation is foreseeable and the action on the part of the individual is intentional.<sup>44</sup> In fact, we did find that attributing the cause of prescription opioid abuse to ignorance about the potentially addictive nature of these medications, suggesting less foreseeability, was not significantly associated with higher stigma.

Our findings generally aligned with other research that has applied attribution theory to understand stigma,<sup>10,12,28,29</sup> indicating that attribution theory is a useful framework through which to examine the stigmatization of those with prescription opioid addiction. 71% of respondents perceived lack of self-discipline as an important cause of the problem of prescription opioid misuse in the U.S. and our study found that this perception was significantly associated with heightened social stigma. In contrast, attributing the cause to immutable aspects of the

individual,<sup>12</sup> such as a family history that heightens risk of addiction, was not significantly associated with stigma. One finding we struggled to explain was the significant association between pharmaceutical companies' inappropriate promotion of these medications and stigma. According to attribution theory, we would have expected this relationship to be negative or non-significant as causal attributions to external factors are not hypothesized to have a positive relationship with stigma.

Our finding that attributions of responsibility to individuals with addiction was associated with increased stigma suggests that respondents who view this addiction as controllable feel greater stigma toward persons with addiction, a pattern consistent with other research on addiction and stigma.<sup>12,29</sup> Changing these internal attributions of responsibility has the potential to reduce stigma toward persons with prescription opioid addiction. Experimental studies have demonstrated that reframing problems can alter the degree to which the public attributes responsibility to individuals (versus community or governmental actors) for conditions such as obesity and poverty.<sup>45-47</sup> Interestingly, attributions of responsibility to doctors and law enforcement were also significantly associated with greater stigma. As noted previously, the relationship between attributing responsibility to law enforcement and stigma may be related to respondents' associations of prescription opioid addiction with criminality. However, it is unclear why respondents who view doctors as having responsibility to address the problem would hold greater stigmatizing attitudes toward persons with this addiction, particularly given efforts over the last two decades to reduce stigma toward addiction in part by categorizing it as a chronic disease that can be treated by clinicians like other medical conditions.<sup>35,36</sup>

We found stigma to be a significant factor explaining variation in support for punitive policy, even more so than political ideology, which was not a significant predictor. This suggests that reducing public stigma toward persons with prescription opioid addiction might be an effective way to discourage enactment of punitive policy. In addition, we found significant associations between stigma and support for public health-oriented policies that benefit persons

with addiction to prescription opioids. These findings were consistent with other research on stigma and policy attitudes,<sup>11</sup> and indicate that lowering stigma toward persons with addiction to prescription opioids may result in increased support for expanded drug treatment access and immunity laws to protect persons seeking assistance for drug overdoses.

### **Limitations**

This study was subject to a number of limitations. Low recruitment rates for online survey panels raise concern about external validity of the study findings. However, respondents' socio-demographic characteristics in this study sample were similar to rates nationally; thus, at least on observable characteristics, we found no differences between this study sample and the national population. Another potential limitation was the use of the term prescription opioid *abuse* in survey questions about causal attributions and responsibility attributions, which may have affected responses. Research indicates that referring to a person with a substance use disorder as a substance abuser increases stigmatizing attitudes among clinicians,<sup>48</sup> although it is unknown the extent to which this word choice affects attitudes among the public at large. However, it is possible that using this terminology may have heightened internal attributions for the causes of prescription opioid abuse. This survey assessed public stigma toward persons with prescription opioid addiction. Future research could add to our understanding of stigma with respect to this population by assessing perceived stigma and self-stigma<sup>32</sup> and the extent to which perceptions of stigma affect this population's own health and wellbeing, particularly engagement with addiction treatment services. Finally, this was a cross-sectional survey so we are unable to assess causality or examine mediators of these relationships between attributions and stigma, and stigma and policy attitudes.

### **Conclusions**

Among persons with SUDs, perceiving stigma from others and experiencing discrimination is associated with riskier behavior, lower psychological well-being, worse physical health, and less willingness to disclose substance use to clinicians and engage with addiction treatment.<sup>8,32</sup> Negative attitudes among health care professionals toward persons with SUDs also are associated with worse treatment outcomes.<sup>41</sup> This study is the first of which we are aware to assess public stigma toward persons with prescription opioid addiction. We found that stigma toward persons with addiction to prescription opioids is high, due at least in part to the public attributing the causes to controllable individual factors, such as poor self-discipline, and identifying the individuals themselves, as well as doctors and law enforcement to a degree, as responsible for addressing the problem. Efforts to reduce stigma are necessary in order to discourage public support for punitive responses to the individuals affected by prescription opioid addiction, as well as to encourage support for expanding treatment opportunities and harm reduction strategies that could benefit this population. Given research indicating a transition from prescription opioid use to heroin among a portion of those with opioid addiction,<sup>14,15</sup> expanding treatment and secondary and tertiary preventive measures is critical.

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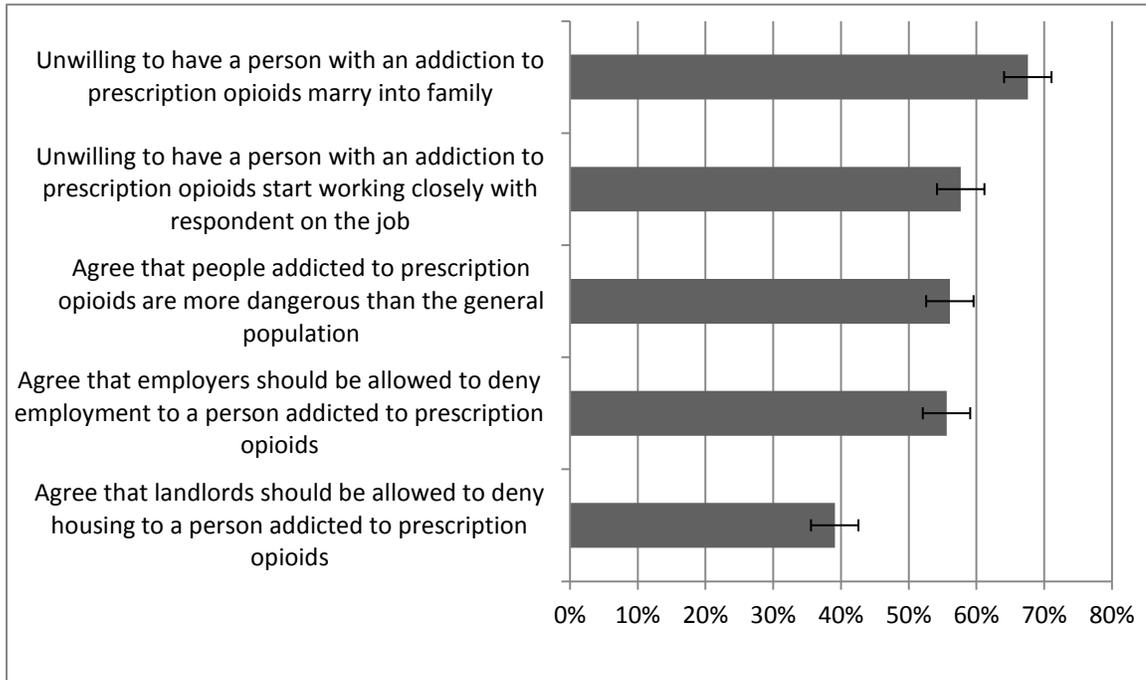
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**Table 1. Socio-demographic characteristics of respondents**

	<b>Proportion</b>	<b>95% CI</b>
Age category		
18-29 years	20.2	(17.0, 23.4)
30-44 years	25.8	(22.6, 29.0)
45-59 years	27.5	(24.5, 30.5)
60 years and older	26.6	(23.7, 29.4)
Gender (% female)	52.4	(48.9, 55.9)
Educational attainment		
Less than HS	12.2	(9.8, 14.6)
High school	29.8	(26.6, 33.0)
Some college	29.3	(26.1, 32.5)
Bachelor's degree or higher	28.7	(25.6, 31.9)
Race		
White	66.9	(63.4, 70.5)
Black	11.8	(9.4, 14.2)
Other	21.3	(18.0, 24.5)
Income category		
Under \$10,000	6.1	(4.3, 7.9)
\$10,000-24,999	12.4	(10.1, 14.8)
\$25,000-49,999	22.5	(19.6, 25.4)
\$50,000-74,999	18.7	(15.9, 21.5)
\$75,000 or higher	40.2	(36.7, 43.6)
Lives in MSA	84.1	(81.5, 86.6)
Political ideology		
Liberal	17.7	(15.0, 20.4)
Moderate	57.6	(54.1, 61.1)
Conservative	24.7	(21.6, 27.7)
Personal experience with prescription opioid abuse	29.9	(26.6, 33.1)

Note: Estimates incorporate survey weights to reflect characteristics of nationally representative population

**Figure 1. Negative attitudes toward people addicted to prescription opioids**



Note: Proportions are estimated using survey weights to reflect attitudes that are nationally representative. The 7-point Likert scale measures were dichotomized so that responses 5-7 indicate support for the statement and responses 1-4 indicate lack of support for the statement.

**Table 2. Public perceptions about who is affected by prescription opioid addiction**

<i>People who are addicted to prescription pain medication are more likely to be:</i>	<b>Proportion</b>	<b>95% CI</b>
<b>Income group</b>		
Poor	4.9	(3.4, 6.3)
Middle class	14.6	(12.0, 17.2)
Wealthy	3.8	(2.2, 5.3)
This problem affects all income groups equally	76.8	(73.7, 79.9)
<b>Racial or ethnic group</b>		
White/Caucasian	17.2	(14.5, 20.0)
Black/African American	2.2	(1.2, 3.2)
Latino/Hispanic	0.7	(0.1, 1.4)
This problem affects all racial and ethnic groups equally	79.8	(76.9, 82.8)
<b>Area of residence group</b>		
Rural areas	1.9	(0.8, 2.9)
Urban areas	8.5	(6.4, 10.5)
Suburban areas	10.0	(7.8, 12.3)
This problem affects all areas groups equally	79.6	(76.7, 82.6)

Note: Proportions are estimated using survey weights to reflect attitudes that are nationally representative.

**Table 3. Associations between causal attributions for prescription opioid misuse and measures of stigma toward persons with prescription opioid addiction**

	Ordered logit regression coefficients <sup>a</sup> [95% CI]					OLS regression coefficients <sup>b</sup> [95% CI]
	Unwilling to work closely on the job with a person with an addiction to prescription opioids	Unwilling to have a person with an addiction to prescription opioids marry into family	People addicted to prescription opioids are more dangerous than the general population	Employers should be allowed to deny employment to a person addicted to prescription opioids	Landlords should be allowed to deny housing to a person addicted to prescription opioids	Stigma scale
<i>Agree with statement about cause of prescription opioid misuse</i>						
Some people lack the self-discipline to use prescription pain medication without becoming addicted	0.129 [-0.158 - 0.417]	0.461** [0.163 - 0.759]	0.733** [0.428 - 1.038]	0.404** [0.124 - 0.683]	0.239 [-0.041 - 0.518]	0.300** [0.096 - 0.505]
Some people do not understand how easy it is to become addicted to prescription pain medication	0.057 [-0.280 - 0.394]	0.212 [-0.128 - 0.552]	0.479** [0.159 - 0.799]	0.232 [-0.117 - 0.581]	-0.185 [-0.530 - 0.160]	0.133 [-0.108 - 0.374]
Some people have a family history that makes them more likely to abuse prescription pain medications	-0.069 [-0.342 - 0.204]	-0.176 [-0.452 - 0.099]	0.602** [0.317 - 0.887]	0.181 [-0.092 - 0.455]	0.141 [-0.131 - 0.414]	0.130 [-0.056 - 0.317]
There has been inadequate research on the safety and	-0.033	-0.098	0.480**	-0.029	0.106	0.037

effectiveness of prescription pain medications	[-0.311 - 0.244]	[-0.378 - 0.182]	[0.214 - 0.747]	[-0.293 - 0.235]	[-0.162 - 0.374]	[-0.152 - 0.227]
Pharmaceutical companies do not adequately explain the risks of addiction on labels of prescription pain medications	0.032 [-0.232 - 0.296]	-0.050 [-0.327 - 0.228]	0.395** [0.120 - 0.669]	0.185 [-0.087 - 0.457]	0.023 [-0.249 - 0.296]	0.077 [-0.110 - 0.265]
Pharmaceutical companies promote prescription pain medications without adequate knowledge of their safety and effectiveness	-0.015 [-0.279 - 0.249]	0.044 [-0.222 - 0.309]	0.686** [0.429 - 0.944]	0.280* [0.0200 - 0.540]	0.211 [-0.050 - 0.472]	0.226* [0.046 - 0.407]
Health insurance companies are more likely to pay for prescription pain medication than other pain treatments like physical therapy or acupuncture	-0.036 [-0.303 - 0.231]	0.066 [-0.223 - 0.354]	0.431** [0.156 - 0.706]	0.187 [-0.089 - 0.463]	-0.038 [-0.313 - 0.238]	0.095 [-0.099 - 0.290]

<sup>a</sup> Ordered logit regression coefficients estimate the proportional log odds of being in a higher level of the 7-point Likert scale measuring the stigma attitude among those who agree with the causal attribution statement vs. respondents who do not support the causal attribution statement.

<sup>b</sup> OLS regression coefficients estimate the change in the continuous stigma scale (1-7, non-discrete values) among those who agree with the causal attribution statement vs. respondents who do not support the causal attribution statement.

Ordered logit and OLS regression coefficient estimates all adjust for age, gender, educational attainment, race, household income, MSA residence, political ideology, and personal experience with prescription opioids, and incorporate survey weights to account for complex sampling design.

\*\* p<0.01, \* p<0.05

**Table 4. Responsibility attributions for prescription opioid misuse and addiction and measures of stigma toward persons with prescription opioid addiction**

	Ordered logit regression coefficients <sup>a</sup> [95% CI]					OLS regression coefficients <sup>b</sup> [95% CI]
<i>Attribute responsibility to the group for addressing the problem of prescription opioid abuse</i>	Unwilling to work closely on the job with a person with an addiction to prescription opioids	Unwilling to have a person with an addiction to prescription opioids marry into family	People addicted to prescription opioids are more dangerous than the general population	Employers should be allowed to deny employment to a person addicted to prescription opioids	Landlords should be allowed to deny housing to a person addicted to prescription opioids	Stigma scale
Individuals addicted to prescription opioids	0.392* [0.033 - 0.751]	0.814** [0.435 - 1.192]	0.772** [0.386 - 1.159]	0.687** [0.334 - 1.039]	0.418* [0.091 - 0.746]	0.547** [0.285, 0.808]
Individuals who illegally sell prescription opioids	0.065 [-0.257 - 0.387]	0.387* [0.032 - 0.741]	0.428* [0.087 - 0.769]	0.268 [-0.081 - 0.617]	0.124 [-0.205 - 0.453]	0.206 [-0.051, 0.463]
Pharmacies and pharmacists	0.022 [-0.257 - 0.300]	0.081 [-0.201 - 0.363]	0.414** [0.129 - 0.700]	0.211 [-0.071 - 0.492]	-0.097 [-0.379 - 0.184]	0.084 [-0.116, 0.283]
Pharmaceutical companies	-0.074 [-0.356 - 0.208]	0.155 [-0.128 - 0.438]	0.273 [-0.008 - 0.553]	0.092 [-0.184 - 0.367]	-0.058 [-0.347 - 0.232]	0.039 [-0.160, 0.239]
Government	-0.067 [-0.331 - 0.197]	0.103 [-0.168 - 0.374]	0.345* [0.076 - 0.614]	0.004 [-0.266 - 0.273]	-0.016 [-0.278 - 0.247]	0.016 [-0.172, 0.204]
Doctors	0.220 [-0.089 - 0.530]	0.496** [0.152 - 0.840]	0.487** [0.168 - 0.805]	0.327* [0.009 - 0.645]	0.083 [-0.246 - 0.413]	0.251* [0.016, 0.486]
Health insurance companies	-0.162 [-0.429 - 0.106]	-0.002 [-0.272 - 0.269]	0.469** [0.201 - 0.736]	0.100 [-0.161 - 0.362]	0.056 [-0.216 - 0.328]	0.041 [-0.147, 0.229]
Law enforcement	0.070 [-0.188 - 0.329]	0.142 [-0.124 - 0.408]	0.588** [0.322 - 0.854]	0.417** [0.153 - 0.681]	0.294* [0.025 - 0.563]	0.241** [0.060, 0.423]

<sup>a</sup> Ordered logit regression coefficients estimate the proportional log odds of being in a higher level of the 7-point Likert scale measuring each stigma attitude among those who view the group as responsible for addressing the problem of prescription opioid misuse vs. respondents who do not view the group as responsible.

<sup>b</sup> OLS regression coefficients estimate the change in the continuous stigma scale (1-7, non-discrete values) among those who agree with the causal attribution statement vs. respondents who do not support the causal attribution statement.

Ordered logit and OLS regression coefficient estimates all adjust for age, gender, educational attainment, race, household income, MSA residence, political ideology, and personal experience with prescription opioids, and incorporate survey weights to account for complex sampling design.

\*\* p<0.01, \* p<0.05

**Table 5. Association between measures of stigma toward persons with prescription opioid addiction and policy support**

	<i>Punitive policy</i>	<i>Public health-oriented policies</i>			
	Arresting and prosecuting people who obtain multiple prescriptions for pain medication at the same time from different doctors	Expanding Medicaid insurance benefits to require coverage for treatment of substance abuse problems, including addiction to prescription opioids	Passing laws to protect people from criminal charges for drug crimes if they seek medical help for themselves or others experiencing a prescription opioid overdose	Providing naloxone to friends and family members of people using prescription opioids	Increasing government spending to improve treatment of substance abuse problems, including addiction to prescription opioids
<b>Stigma scale</b>	<b>0.530**</b> [0.386 - 0.673]	<b>-0.145*</b> [-0.272 - -0.018]	<b>-0.148*</b> [-0.263 - -0.034]	<b>-0.076</b> [-0.210 - 0.058]	<b>-0.155*</b> [-0.280 - -0.029]
Political ideology (Reference: Liberal)					
<i>Moderate</i>	-0.242 [-0.644 - 0.160]	-0.521** [-0.867 - -0.176]	-0.278 [-0.620 - 0.0633]	-0.331 [-0.697 - 0.0351]	-0.552** [-0.865 - -0.240]
<i>Conservative</i>	-0.118 [-0.592 - 0.356]	-1.441** [-1.881 - -1.001]	-0.523* [-0.953 - -0.0931]	-0.744** [-1.178 - -0.310]	-1.638** [-2.080 - -1.197]
Age (years)	0.006 [-0.003 - 0.014]	0.006 [-0.002 - 0.014]	0.004 [-0.003 - 0.0124]	0.003 [-0.005 - 0.011]	0.008 [-0.000 - 0.016]
Female gender	0.088 [-0.178 - 0.354]	0.340** [0.087 - 0.593]	0.010 [-0.255 - 0.275]	0.022 [-0.246 - 0.290]	0.185 [-0.074 - 0.443]
Educational attainment (Reference: high school education)					
<i>Less than high school</i>	-0.070	-0.399	-0.110	0.050	-0.236

<i>Some college</i>	-0.122 [-0.571 - 0.431]	-0.098 [-0.891 - 0.094]	0.036 [-0.580 - 0.359]	-0.347 [-0.468 - 0.568]	-0.080 [-0.686 - 0.215]
<i>Bachelor's or higher</i>	-0.325 [-0.471 - 0.227]	0.291 [-0.436 - 0.241]	0.386* [-0.298 - 0.370]	-0.376* [-0.697 - 0.003]	-0.162 [-0.420 - 0.261]
Race (Reference: White)					
<i>Black/African American</i>	0.020 [-0.433 - 0.474]	-0.085 [-0.505 - 0.335]	0.021 [-0.392 - 0.435]	-0.033 [-0.484 - 0.418]	0.241 [-0.175 - 0.657]
<i>Other race</i>	0.397* [0.002 - 0.791]	0.151 [-0.208 - 0.510]	0.256 [-0.109 - 0.622]	0.200 [-0.166 - 0.566]	0.267 [-0.097 - 0.631]
Household income category (Reference: >\$75,000)					
<i>&lt;\$10,000</i>	-0.750* [-1.576 - 0.076]	0.267 [-0.335 - 0.869]	-0.153 [-0.827 - 0.521]	0.298 [-0.361 - 0.957]	-0.085 [-0.719 - 0.550]
<i>\$10,000-24,999</i>	-0.218 [-0.705 - 0.268]	0.207 [-0.222 - 0.637]	-0.052 [-0.511 - 0.407]	0.349 [-0.126 - 0.824]	0.016 [-0.431 - 0.464]
<i>\$25,000-49,999</i>	-0.143 [-0.481 - 0.195]	0.183 [-0.187 - 0.553]	0.009 [-0.365 - 0.382]	0.230 [-0.133 - 0.593]	0.194 [-0.164 - 0.553]
<i>\$50,000-74,999</i>	0.160 [-0.200 - 0.520]	-0.015 [-0.374 - 0.343]	-0.044 [-0.383 - 0.295]	0.141 [-0.213 - 0.495]	-0.027 [-0.359 - 0.306]
MSA residence	-0.221 [-0.553 - 0.110]	0.200 [-0.124 - 0.523]	0.086 [-0.309 - 0.481]	0.256 [-0.110 - 0.623]	0.320 [-0.0510 - 0.691]
Personal experience with prescription opioids	0.228 [-0.0679 - 0.524]	0.229 [-0.0608 - 0.520]	-0.079 [-0.370 - 0.211]	0.454** [0.161 - 0.747]	-0.007 [-0.293 - 0.279]
Observations	1073	1069	1071	1070	1072

\*\* p<0.01, \* p<0.05

<sup>a</sup> Ordered logit regression coefficients estimate the proportional log odds of being in a higher level of the 7-point Likert scale measuring each policy attitude with each one unit change in level of stigma (1-7 scale). Coefficient estimates incorporate survey weights to account for complex sampling design.

## **Paper 2: Effects of competing narratives on public perceptions of prescription opioid addiction during pregnancy**

### **Introduction**

#### **Prescription opioid use during pregnancy**

The misuse of prescription opioid pain relievers has emerged as a significant public health concern for women over the last decade as rates of addiction and overdose have risen rapidly.<sup>1,2</sup> Prescription opioid use among women has become relatively common. Recent estimates show that more than a third of female Medicaid enrollees of reproductive age and over a quarter of privately insured women filled at least one prescription for opioid pain relievers within the last year.<sup>3</sup> While these estimates do not distinguish misuse or capture illicit use of prescription opioids, they raise concerns about the widespread consumption of these medications among women who could become pregnant, given that half of births in the U.S. are unplanned<sup>4</sup> and use of these medications during pregnancy is associated with health risks<sup>3</sup>. A widely-cited study published in 2012 also found a significant increase between 2000-2009 in the rate of women using opioids near the time of birth;<sup>5</sup> however, this study also did not distinguish between women who were using prescription opioids under the supervision of a clinician and women misusing these medications.

The consensus among medical experts is that pregnant women with an addiction to prescription opioids or heroin should receive comprehensive addiction treatment that includes opioid maintenance therapy, a type of medication-assisted treatment (MAT).<sup>6,7</sup> Opioid maintenance therapy's benefits include: reducing fluctuations in opioid levels, protecting the developing fetus from experiencing repeated episodes of withdrawal in utero; lowering the risk of

relapse; decreasing harmful exposures related to drug addiction; and facilitating greater use of prenatal care.<sup>8</sup> Emerging evidence indicates that infants' withdrawal symptoms may be less severe when women are treated with buprenorphine.<sup>9-12</sup> However, the standard of care remains methadone maintenance given the larger body of research on methadone treatment during pregnancy and possibly better treatment retention among those maintained on methadone versus buprenorphine.<sup>8,13</sup> Despite evidence of the benefits of MAT for pregnant women with opioid addiction, a minority of these women receive treatment.<sup>14,15</sup> State Medicaid programs vary widely in the extent to which they cover opioid maintenance therapies.<sup>16</sup> In addition, there is resistance to MAT in some states and communities with significant opioid addiction and overdose problems.<sup>17,18</sup>

Newborns prenatally exposed to prescription opioids, including methadone or buprenorphine within the context of addiction treatment, may experience neonatal abstinence syndrome (NAS), a condition that describes the collection of symptoms associated with opioid withdrawal. NAS is characterized by signs of nervous system irritability, gastrointestinal problems, respiratory distress, and other symptoms.<sup>19</sup> Nationwide, rates of NAS have risen three-fold since 2000,<sup>5</sup> but there is significant geographic variability. For instance, Tennessee has experienced nearly a ten-fold increase in the incidence of NAS since 1999.<sup>20</sup> Although it is a treatable condition, many of the newborns diagnosed with NAS require longer hospital stays and temporary pharmacologic treatment.<sup>21</sup> Estimates of the proportion of infants exposed to opioids prenatally who are diagnosed with NAS range widely.<sup>21</sup> The level of NAS severity depends on factors such as poly-substance exposure, prenatal care, premature delivery, and secondary preventive measures such as swaddling, breastfeeding and keeping the newborn in close physical contact with the mother.<sup>21</sup>

## **Public health-oriented and punitive approaches by states to reduce opioid misuse during pregnancy**

States have undertaken both public health-oriented and punitive measures to attempt to reduce NAS and prescription opioid and other substance use during pregnancy.<sup>14,22,23</sup> Public health-oriented strategies have included: educational initiatives (e.g., public service announcements), encouraging voluntary prenatal substance use screening and treatment, laws that allow immunity from prosecution for drug-related offenses if engaged in drug treatment or prenatal care, and prioritizing publicly-funded treatment services for pregnant women. According to the Guttmacher Institute, as of 2015, 19 states had targeted drug treatment programs for pregnant women, 11 states provided priority access to drug treatment programs for pregnant women and 4 states prohibited publicly funded drug treatment programs from discriminating against pregnant women, e.g. by refusing them treatment.<sup>22</sup>

More punitive state actions have included requiring health care providers to report mothers of infants diagnosed with NAS to child protective services and categorizing substance use during pregnancy as child abuse or as criminal assault.<sup>22,23</sup> As of 2015, 18 states defined substance abuse during pregnancy as child abuse and 15 states required health care providers to report pregnant women misusing substances to child protective services,<sup>22</sup> numbers that have increased since 2000.<sup>23</sup> Tennessee enacted a law in 2014 that allows a woman to be prosecuted for aggravated assault if her newborn experiences NAS or if she misuses narcotics (a category that includes prescription opioids) while pregnant.<sup>24,25</sup> Critics of these punitive strategies worry about the potentially negative effects on women's engagement with prenatal care and substance use treatment,<sup>26-28</sup> which improve birth outcomes.<sup>29,30</sup> Research also indicates that requiring health care providers to report drug-using pregnant women to child protective services can have disproportionate impacts by race and class.<sup>23,31-33</sup>

### **Framing the issue of prescription opioid addiction during pregnancy**

The types of solutions that the public perceives as appropriate for addressing NAS and prescription opioid addiction during pregnancy may be informed by the way that the causes and

consequences of this problem are framed in public discourse. In communication research, Entman has defined message framing as “to select some aspects of a perceived reality and make them more salient in a communication text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation.”<sup>34</sup> In the context of prescription opioid misuse during pregnancy, although risks are associated with pregnant women’s health as well <sup>35</sup>, much of the news media coverage of the issue has focused on NAS. Sensationalized news stories have described an epidemic of “oxytots” and “drug-addicted babies,”<sup>36-41</sup> descriptors that medical experts and health researchers have objected to as inaccurate and stigmatizing.<sup>42</sup>

In addition to the news media framing the issue mainly in terms of its implications for the infant, the enactment of punitive policies targeting mothers in states such as Tennessee<sup>22,43</sup> have led some critics to label this reaction a “moral panic.”<sup>44,45</sup> Moral panics are situations in which segments of the public exaggerate and become sensitized to a perceived threat, with the news media often escalating fear and outrage. Blame is attributed to specific segments of the population, social deviants who are referred to as “folk devils” by the sociologists who have conducted some of the seminal studies of this phenomenon.<sup>46,47</sup> In the case of prescription opioid misuse during pregnancy, the panic surrounds newborns experiencing withdrawal and blame is directed toward the mothers. Despite a growing consensus that addiction is a treatable disease with behavioral, genetic, and socio-environmental determinants,<sup>48</sup> these women are often perceived as deviants who harm their children intentionally.<sup>44,49</sup> Attitudes toward pregnant drug-using women reflect high levels of stigma toward the broader population of people with substance use disorders.<sup>50,51</sup> Much of the American public associates addiction with moral failure rather than with a chronic disease that is responsive to treatment.<sup>50,52,53</sup>

The moral tenor underlying public discourse on substance use is related in part to perceptions of people using drugs as “others” who pose a threat to the more virtuous (according to mainstream values) members of society.<sup>54</sup> Attitudes toward drug use historically have been

influenced by assumptions and fears about disenfranchised groups, including racial and ethnic minorities as well as the poor.<sup>54,55</sup> Early restrictions on opium were linked to suspicions about Chinese immigrants and mandatory federal sentencing for crack cocaine possession was related to more negative attitudes toward African American cocaine users compared to white cocaine users.<sup>54</sup> Negative representations of the poor in the media often have included depictions of drug use.<sup>55,56</sup>

It is not clear that perceptions about race or social class have played the same role in shaping how the public understands prescription opioid misuse and the related upsurge in heroin use. Prescription opioid overdose rates are higher among whites than any other racial and ethnic group in the U.S. apart from Native Americans.<sup>57-59</sup> Public opinion data also suggest that the majority of Americans do not perceive the problem of prescription opioid addiction as affecting particular racial or ethnic groups or income classes disproportionately.<sup>60</sup> However, when OxyContin initially became popular in Appalachian states, it was dubbed “hillbilly heroin,”<sup>61</sup> with clear social class connotations. In addition, Medicaid, the public health insurance program for low-income individuals, is the primary payer of NAS-related treatment<sup>5</sup> and prescription opioid use is higher among Medicaid-enrolled women than among privately insured women,<sup>3,62</sup> patterns that theoretically could influence public perceptions. However, it is unknown how possible preconceptions about who is affected by this problem might change in response to exposure to messages frames. One of the few message framing experiments exploring the effects of social class cues on public attitudes found that depicting an individual as part of the working class versus middle class was associated with reduced perceptions of individual blame for the health condition (in this study, diabetes) and increased support for governmental assistance.<sup>63</sup>

In addition to the public generally associating substance use with particular population groups, addiction can also be examined through the lens of attribution theory. Attribution theory posits that people understand causes of phenomena in terms of: 1) internality and externality, 2) stability and mutability, and 3) controllability.<sup>64,65</sup> Internal causes are related to the dispositional

characteristics of an individual whereas external causes comprise social and structural forces.<sup>64</sup> In the context of addiction, internal (or dispositional) attributions might include: risk-seeking behavior, irresponsibility, and immorality or bad character. In contrast, external (or situational) attributions might include: exposure to trauma, iatrogenic factors, and insufficient or inaccessible substance use treatment. Internal and external attributions, and the degree to which a condition is perceived as stable and controllable, shape how people view potential policy solutions.<sup>66-68</sup> In the context of substance use, even minor differences in labeling a person a substance abuser versus someone with a substance use disorder affects perceptions of personal culpability and support for punitive policies.<sup>65</sup>

The discourse in Tennessee during the debates surrounding passage of a law enabling criminal prosecution of a woman for assault if she used narcotics during pregnancy (a response to increasing rates of NAS in the state) provides one example of how causal attributions in message frames can point to particular policy responses. One of the bill's sponsors, Representative Terri Lynn Weaver stated that "[t]hese ladies are not those who would consider going to prenatal care. These are ladies who are strung out on heroin and cocaine and their only next decision is how to get their next fix. These ladies are the worst of the worst. Again, I want to emphasize what they are thinking about, and that is just money for the next high." Weaver also observed "I don't know what to say about [how] some [women] have insurance and some do not. It's a terrible thing but I don't want to get into that because that's another subject."<sup>43</sup> In promoting legislation offering a punitive solution to substance use among pregnant women, Weaver framed addiction during pregnancy as attributable to internal causes, primarily immoral and irresponsible dispositions, and dismissed an external factor, lack of health insurance (and by extension, treatment), as a possible contributor to the problem. She also framed the issue within the context of illegal drug use even though NAS has been linked to rising rates of prescription opioid misuse and addiction.

In this study, we tested how various narrative depictions of a pregnant woman addicted to prescription opioids affected public attitudes. Narratives, or stories about individuals, are often

used by the media, by policymakers, and in educational campaigns to frame social and public health issues. Narratives can engage audiences by transporting them into another person's story and can elicit emotional reactions, both features that may enhance receptivity to the narrative's persuasive message.<sup>66,69,70</sup> Although one study showed that the social class of the person depicted in a narrative may affect perceptions of blame for a health condition,<sup>63</sup> there has been minimal research examining the effects of portraying individuals of differing social classes. Research has shown that narratives have the potential to increase perceptions that structural determinants contribute to the development of stigmatized health conditions, such as obesity, when the narrative illustrates external forces influencing an individual.<sup>70,71</sup> However, the effects of narratives portraying barriers to treatment access, which frames untreated addiction as partly attributable to external causes, has not been tested. Prior research involving depictions of opioid addiction in vignettes (i.e., short narratives) found that portraying addiction as a treatable condition significantly decreased stigma and negative attitudes toward persons with substance use disorders, but did not increase support for policies benefitting this population.<sup>52</sup>

To build on prior research, we conducted a randomized experiment to study the effects of exposure to three different narrative features: 1) portrayal of the pregnant woman as high or low socioeconomic status (SES), 2) portrayal of the barriers to addiction treatment access during pregnancy; and 3) portrayal of a successfully treated pregnant woman. We examined how these narratives affected study participants' beliefs about persons with prescription opioid addiction, perceptions of addiction treatment effectiveness, support for public policies to address prescription opioid misuse and addiction during pregnancy, and emotional reactions. Emotions may be important mechanisms linking message frames more broadly with changes in attitudes because these message frames operate through both cognitive and affective channels.<sup>72-75</sup> Therefore, we also tested whether emotional responses mediated the relationship between exposure to the narratives and public attitudes.

## Methods

### Data

A six-group, randomized web-based experiment was fielded to assess the effects of exposure to narratives describing a pregnant woman addicted to prescription opioids on beliefs about people addicted to prescription opioids, perceptions of treatment effectiveness, policy attitudes, and emotional responses. The experiment was fielded September 18 through October 6, 2014. The sample was drawn from GfK's KnowledgePanel®, a probability based web panel designed to be representative of the U.S. adult population. GfK forms its panel using address-based sampling from a frame that includes 97 percent of all U.S. households.<sup>76</sup> When selected households lack internet access or a computer, GfK provides these resources so that these individuals are not under-represented in the panel. KnowledgePanel® panelists typically take around 2 surveys each month and GfK encourages participation by offering cash awards and other incentives.<sup>76</sup> Academic researchers in a number of disciplines, including sociology, political science, public health and medicine, have used GfK to field surveys or experimental studies.<sup>77-80</sup>

Of the KnowledgeNetworks® panelists sampled to participate in the study, 72.8 percent completed the experiment. The overall recruitment rate in the KnowledgeNetworks® panel was 16.6 percent at the time of the study. We dropped 7 participants because their survey completion times were potentially too short to ensure adequate time to read the narrative and answer the outcome questions. These were participants randomized to read the shorter narratives who took less than 2 minutes and participants randomized to read the longer narratives (portraying barriers to treatment or treated addiction) who took less than 2.5 minutes to respond. In addition, we dropped 36 participants who took more than 4 hours to complete the experiment due to concern that these participants did not have sufficiently recent exposure to the narrative prior to answering the outcome questions. The final analytic sample included 1,620 participants. On average,

participants took about 13 minutes to complete the experiment. The Johns Hopkins School of Public Health Institutional Review Board determined this study to be exempt.

### **Study Design**

Participants were randomized to one of six groups: a no-exposure control group or one of five versions of a narrative about a woman who becomes addicted to prescription opioids after suffering injuries from a car accident and becomes pregnant. (Full narratives are presented in Appendix 2.1.) Two of the narratives – referred to as the base narratives - examined the effect of describing the woman as low versus high socioeconomic status (SES). The low SES base narrative read:

Michelle is a woman in her early twenties who began working at a fast food restaurant after she dropped out of high school. She lives in a government-subsidized apartment. Two months ago, Michelle learned that she was pregnant.

Last year, Michelle was hit by a car. The accident left her with back, hip, and knee injuries and she had to have surgery. After the surgery, she still had severe pain in her back and hips so her doctor prescribed OxyContin, a narcotic pain medication. Three months after her back surgery, she was still feeling a lot of pain so her doctor prescribed her a higher dose of OxyContin. Michelle began taking more pills to try to control the pain and sometimes ran out before her next refill. When she ran out, she felt anxious, became sweaty and nauseous, and had trouble sleeping. These symptoms lasted until she was able to get more pills. Her doctor refused to give her more pills before her next scheduled refill, so Michelle sometimes took the bus to other parts of town to get more pills from other doctors. Her family and friends noticed that Michelle's behavior had changed, and that she was borrowing money that she didn't repay. When Michelle's family found out that she was pregnant, they told her that they were worried about the pills she was taking and urged her to get help.

The high SES base narrative was identical to the low SES base narrative with the exception of the following characteristics. The woman depicted in the high SES base narrative: (1) was in her early thirties (and therefore, older at the age of her first pregnancy); (2) worked as the regional manager of a restaurant chain (a higher-paying job with greater prestige); (3) had a Master's degree in Business Administration (higher educational attainment); (3) lived in a new house (an indicator of wealth); (4) was married when she becomes pregnant; and (5) drove in a car as her means of transportation (rather than using public transportation).

The narrative with barriers to treatment added the following text to the low SES base narrative described above:

Michelle took the concerns of her family to heart. She was worried that her inability to stop taking OxyContin might cause problems during her pregnancy. Michelle's doctor recommended that she begin taking methadone, a medical treatment for addiction, on a daily basis. He explained to Michelle that abruptly stopping the OxyContin would cause withdrawal symptoms that might put her health and the baby's wellbeing at risk.

However, when Michelle called a nearby methadone treatment center, they told her that there was a long waiting list. Michelle desperately wanted to begin treatment as soon as possible. She found another treatment center two hours away that had a spot for her. However, Michelle had trouble getting to the treatment center because she didn't have a car. She felt embarrassed asking friends for help because she didn't want them to know about the problems she was dealing with while pregnant. She was grateful to family members who helped out occasionally, but no one could take her every day. Taking a taxi was too much money and there was no bus line between the two towns. The nurse at the methadone center told her that she needed to be there every day for the treatment to be effective. Traveling four hours round-trip on the days she was able to find a ride became exhausting and began to create problems for Michelle at work. Her manager became angry when she was repeatedly late for shifts and threatened to let her go. Michelle missed days of treatments and began using OxyContin again. She felt guilty and ashamed.

We only tested a low SES version of the barriers to treatment narrative (and not a high SES version) because many of the barriers included in the text are more relevant to a person with limited financial resources, social support, and job flexibility. In order to test the effects of portraying successfully treated addiction, we added the following paragraphs to the original low and high SES base narratives:

Michelle took the concerns of her family to heart. She was worried that her inability to stop taking OxyContin might cause problems during her pregnancy. Michelle's doctor recommended that she begin taking methadone, a medical treatment for addiction, on a daily basis. He explained to Michelle that abruptly stopping OxyContin would cause withdrawal symptoms that might put her health and the baby's wellbeing at risk. Michelle was able to enroll in a methadone program near her home. With the help of this program and working with a counselor, Michelle had a healthy pregnancy. Her treatment has continued successfully and she hasn't used OxyContin or other narcotic prescription pain medications in over two years.

The face validity of the narrative text and survey instrument was assessed by examining how current news media coverage has described pregnant women with prescription opioid addiction and by obtaining feedback from experts in prescription opioid misuse and addiction treatment.

## **Measures**

The independent variable was exposure to one of the five narrative messages or no exposure (the control group). We examined how exposure to narratives affected four categories of outcome measures: (1) beliefs about people addicted to prescription opioids; (2) perceptions of the effectiveness of treatment for addiction to prescription opioids; (3) attitudes about policies to address prescription opioid misuse and addiction; and (4) emotional responses. Participants randomized to the control group proceeded directly from the introductory screen to questions about the extent to which they currently felt four types of emotions. Participants randomized to one of the other five groups proceeded from the introductory screen to their randomly assigned narrative text before answering questions about their emotions. To assess emotional responses to the narratives, we used questions adapted from the validated Positive and Negative Affect Scale (PANAS).<sup>81</sup> Participants indicated, on a 5-point Likert scale, to what extent they felt the emotion at that moment. We measured anger, disgust, sympathy and pity.

Following the questions about emotional responses, all participants read a definition of prescription opioids, which were referred to using the less technical term “prescription pain medication” throughout the survey; participants also were able to view a list of examples of these medications (Appendix 2.2). Then, all participants answered questions about their beliefs about people addicted to prescription opioids, perceptions of treatment effectiveness, and support for or opposition to potential policy solutions to address prescription opioid misuse and addiction. We randomized the order of all question modules as well as the order of questions within each module to minimize the potential for bias related to priming, in which responses are influenced by exposure to earlier questions in the survey.

To measure beliefs about people addicted to prescription opioids, participants indicated, on a 7-point Likert scale, the extent to which they saw people as completely to blame (or not at all to blame) for their drug addiction, as irresponsible (or responsible), and whether or not they would be willing to work closely with a person addicted to prescription pain medication, a measure of social distance preferences.<sup>50-52</sup> To assess beliefs about the acceptability of

discrimination, we asked participants whether employers should be allowed to deny employment, and whether landlords should be allowed to deny housing, to persons addicted to prescription opioids.<sup>50-52</sup> To examine perceptions of treatment effectiveness, participants indicated the extent to which they agreed that most people addicted to prescription opioids can, with treatment, get well and return to productive lives, and whether they agreed that effective treatment options are available to help people who are addicted to prescription opioids.<sup>50-52</sup>

To test how the narratives affected policy attitudes, we asked participants to indicate, on a 7-point Likert scale, whether they opposed or favored 6 potential solutions to prescription opioid misuse and addiction broadly as well as actions targeting pregnant women specifically. We identified policy proposals related to the more general problem of prescription drug abuse from the 2013 Trust for America's Health report on curbing prescription drug abuse.<sup>82</sup> In addition, we identified existing state policies specific to substance use during pregnancy from reports produced by the Guttmacher Institute<sup>22,23</sup> and Florida's Task Force on Prescription Drug Abuse and Newborns.<sup>83</sup>

We divided these policies into punitive policies, which include actions that punish pregnant women for their addiction, and public health oriented policies, which focus on prevention or increased supportive services for this population. Punitive policies included defining prescription opioid abuse during pregnancy as criminal child abuse and requiring health care providers to report pregnant women abusing prescription opioids to state authorities. Public health oriented policies included improving treatment access by prioritizing services for pregnant women with addiction, expanding insurance benefits, and passing immunity laws to protect pregnant women abusing prescription opioids from being charged with drug crimes if they seek treatment. We also tested support for Medicaid lock-in programs in which enrollees suspected of misusing prescription opioids are required to use one physician prescriber and/or one pharmacy. The latter policy did not fit clearly into the public health oriented or punitive policy category because while it makes it more difficult for patients at risk of developing an addiction to access

these medication (a public health argument in favor of this policy), this inconvenience may be an added burden and viewed as punitive toward patients with pain management needs.

Given research indicating that emotion may be one of the mechanisms through which message frames influence perceptions of societal problems and support for policies to address these issues,<sup>72,74,75</sup> we also assessed the emotional response measures as potential mediators.

## **Analysis**

To assess the representativeness of the sample in comparison to the national population, we compared socio-demographic characteristics of the sample participants to data from the Current Population Survey (CPS). Weighted socio-demographic characteristics of the analytic sample were similar to these national figures (Appendix 2.3). We used chi-square tests to compare participants in the six groups on measured socio-demographic characteristics to assess randomization. These randomization checks showed no significant differences in characteristics across the study groups (Appendix 2.4). Although all outcomes were measured on Likert scales, for descriptive purposes, we also collapsed these scales into dichotomized measures (Table 1). All analyses were conducted in Stata 12<sup>84</sup> and included survey weights generated by GfK in order to correct for potential biases in sampling and non-response.

We estimated ordered logistic regression models to assess the effects of the narrative exposures on outcomes. Tests of the proportional odds assumption supported the use of ordered logistic regression models.<sup>85</sup> Given that participants were randomly assigned to the narrative groups, no covariates were included in the regression models.<sup>86</sup> In order to test the effects of portraying a high or a low SES woman in the narratives, our independent variable in the regression models was a categorical measure of exposure to a narrative portraying a low SES woman, a narrative portraying a high SES woman, or no exposure. The no exposure control group served as the reference category. Wald post-estimation tests were used to assess whether the changes in attitudes associated with the narrative exposure, compared to the control group, were

significantly different for participants randomized to read the low SES narrative from those randomized to read the high SES narrative.

Next, to estimate the effects of portraying barriers to treatment, we created binary variables in which exposure to the base narrative that did not mention treatment was coded zero (the reference category) and exposure to the narrative describing barriers to treatment access was coded one. The regression models tested the association between exposure to the narrative describing barriers to treatment and the outcomes. We followed the same process to estimate the effects of exposure to narratives portraying successfully treated addiction to prescription opioids. In these latter analyses, exposure to the high or low SES narrative describing successful treatment for addiction was compared to the corresponding high or low SES base narrative that did not mention treatment.

In order to test whether the four emotional responses measured in this survey experiment mediated the relationship between the narrative exposure and the other outcomes, we conducted a mediation analysis using the Preacher and Hayes approach.<sup>87</sup> This method enables the testing of multiple mediators simultaneously, which was appropriate for our purposes given that participants theoretically could have felt more than one emotion at the same time. To produce non-symmetric 95% confidence intervals (CIs) around the estimate of the indirect effect through the mediator, we used bootstrap resampling.<sup>87</sup> We identified emotional responses as consistent mediators if the indirect effect through the emotion was the same sign (positive or negative) as the direct effect estimate. Emotions were deemed inconsistent mediators if the directionality of the indirect effect through the mediator differed from that of the direct estimate, which indicated that the emotion had a suppressing influence on the relationship between the narrative and the outcome.

## **Results**

Table 1 displays the proportion of participants in the control group (N=264) that supported each statement or policy in order to provide a sense of public attitudes at baseline. In the control group, slightly more than half of participants thought that people addicted to prescription opioids are to blame for their drug addiction (54.4%). A large minority (46.6%) felt that employers should be allowed to deny employment to a person addicted to prescription opioids and a quarter (26.1%) thought that landlords should be allowed to deny housing. A large majority of participants in the control group believed that people addicted to prescription opioids could get well with treatment (71.6%), and a majority (67.0%) also felt that effective treatment options were available for addiction. In terms of support for punitive policies, close to a third of participants in the control group (31.0%) supported prosecuting pregnant women addicted to prescription opioids on criminal child abuse charges, and a majority (57.9%) supported requiring health care providers to report these women to state authorities, such as child protection services. With respect to more public health oriented policies, about half of participants in the control group supported immunity laws protecting pregnant women from drug charges if they were seeking treatment for their prescription opioid addiction (49.2%) and requiring government-funded addiction treatment programs to provide priority access for pregnant women (55.1%). Among the policies presented in this study, the most popular, with 64.0% support among control group participants, was the concept of a lock-in program in which Medicaid enrollees suspected of abusing prescription opioids are required to use a single physician prescriber and pharmacy.

### **Effects of socioeconomic status (SES) in narrative messages on public attitudes**

Table 2 indicates that participants reading the high SES base narrative (N=269) were significantly less likely (Coeff: -0.38, 95% CI: -0.70, -0.07) to view people addicted to prescription opioids as to blame for their addiction compared to the no-exposure control group, whereas there was no difference between the low SES base narrative (N=285) and control group participants in beliefs about individual blame. We found no differences between the control group

and these narratives in measures of desire for social distance from persons with prescription opioid addiction or measures gauging the acceptability of discriminating against this group. We did find significant differences in beliefs about people addicted to prescription opioids among participants randomized to the low SES versus the high SES narrative. Results of Wald tests showed significant differences in the high and low SES narrative group coefficients measuring less agreement with the statement that people addicted to prescription opioids are irresponsible (p-value=0.04) and less desire for social distance measured as unwillingness to work closely with people addicted to prescription opioids (p-value=0.01) among those reading the high SES narrative compared to those reading the low SES narrative. The same patterns emerged for the measures of acceptability of discrimination, in which participants randomized to the high SES narrative expressed less agreement with the acceptability of discrimination than those reading the low SES narratives.

We found that those randomized to the high SES base narrative were significantly less likely (Coeff: -0.36, 95% CI: -0.69, -0.03) to believe that effective treatment options were available to help those addicted to prescription opioids compared to the no-exposure control group, whereas those reading the low SES base narrative displayed no difference from the control group in their perceptions of treatment effectiveness. Wald tests showed no significant differences between the low and high SES narrative groups in perceptions of treatment effectiveness.

Compared to the control group, participants reading the high SES base narrative were significantly less likely to support punitive policies but did not demonstrate greater support for public health oriented policies. Participants reading the narrative portraying the high SES woman had significantly lower levels of support for prosecuting pregnant women addicted to prescription opioids on criminal child abuse charges (Coeff: -0.36, 95% CI: -0.69, -0.03) and requiring health care providers to report pregnant women who abused prescription opioids to state authorities (Coeff: -0.43, 95% CI: -0.74, -0.12) compared to the no-exposure control group. Participants

reading the narrative portraying the low SES woman did not differ significantly from the control group in their levels of support for these policies. Wald test results showed significantly lower support among the high SES narrative participants in comparison to the low SES narrative participants for requiring health care providers to report pregnant women to state authorities ( $p$ -value $<0.01$ ). Participants in both narrative groups were significantly more likely than the control group to support lock-in programs requiring Medicaid enrollees suspected of abusing prescription opioids to use a single physician prescriber and pharmacy. The Wald tests found no significant differences between the low and high SES narrative group coefficients in levels of support for other public health oriented policies.

Table 2 indicates that participants exposed to both the high and low SES narratives were significantly more likely to report stronger emotions than participants in the no-exposure control group. The effect of the narrative on the negative emotions – anger and disgust - was stronger among participants randomized to the low SES narrative (anger coefficient: 1.26, 95% CI: 0.91, 1.62; disgust coefficient: 1.36, 95% CI: 1.01, 1.71) than among those randomized to the high SES narrative (anger coefficient: 0.83, 95% CI: 0.47, 1.19; disgust coefficient: 0.83, 95% CI: 0.48, 1.17) (see Table 2).

### **Effects of portraying barriers to treatment on attitudes**

Table 3 compares attitudes among participants randomized to read the narrative portraying a low SES woman facing barriers to treatment (N=268) to those reading the base narrative about a low SES woman in which no barriers to treatment were described. Participants reading the barriers to treatment version of the low SES narrative were significantly less likely to agree that employers should be allowed to deny employment to persons addicted to prescription opioids (Coeff: -0.39, 95% CI: -0.70, -0.07) in comparison to participants reading the low SES base narrative.

In terms of policy attitudes (see Table 3), compared to those reading the low SES base narrative, participants reading the version describing barriers to treatment were significantly less likely to support requiring health care providers to report women who have abused prescription opioids during pregnancy to state authorities (Coeff: -0.42, 95% CI: -0.74, -0.10), and significantly more likely to support expanding Medicaid health insurance benefits to cover treatment for prescription opioid addiction (Coeff: 0.31, 95% CI: 0.00, 0.62). Finally, with respect to emotional responses, participants reading the low SES narrative depicting barriers to treatment reported significantly higher levels of sympathy and pity relative to the low SES base narrative (sympathy coefficient: 0.78, 95% CI: 0.46, 1.11; pity coefficient: 0.42, 95% CI: 0.10, 0.74).

#### **Effects of high SES and low SES narratives describing successful treatment on public attitudes**

As indicated in Table 4, compared to those randomized to the high and low SES narratives with no mention of treatment, participants reading the narratives depicting successful treatment for addiction did not express significantly different beliefs about people addicted to prescription opioids. However, the successful treatment narrative did significantly increase the belief that most people addicted to prescription opioids can, with treatment, get well and return to productive lives, but only among those randomized to read the high SES version (N=274) of this narrative (Coeff: 0.37, 95%: 0.04, 0.70).

In terms of policy attitudes, portraying successfully treated addiction lowered support for punitive policies among those randomized to the low SES version of the narrative (N=260). Compared to participants reading the low SES base narrative that did not mention treatment, participants exposed to the narrative describing successful treatment displayed significantly lower levels of support for requiring health care providers to report women who have abused prescription opioids during pregnancy to state authorities (Coeff: -0.45, 95% CI: -0.77, -0.12). In addition, participants reading the narrative portraying a low SES woman successfully treated for

her addiction expressed significantly lower levels of support for Medicaid lock-in programs (Coeff: -0.45, 95% CI: -0.78, -0.12) compared to the low SES base narrative.

Participants randomized to read the low SES version of the narrative portraying successful treatment reported significantly lower levels of anger and disgust compared to those reading the low SES base narrative without treatment (anger coefficient: -0.70, 95% CI: -1.04, -0.35; disgust coefficient: -0.69, 95% CI: -1.03, -0.034). Similarly, participants reading the high SES narrative portraying successful treatment reported significantly less anger and disgust compared to those reading the high SES base narrative (anger coefficient: -0.45, 95% CI: -0.80, -0.10; disgust coefficient: -0.52, 95% CI: -0.86, -0.17).

### **Emotional responses as mediators of the relationship between narrative exposure and attitudes**

We found that emotional responses to the narratives partially mediated many of the relationships with public attitudes. The mediation analysis demonstrated that by eliciting sympathy, the high SES base narrative reduced the extent to which participants perceive individuals as to blame for their addiction, compared to the control group. Sympathy was a consistent mediator because the indirect effect of the high SES base narrative on participants' attributions of blame to the individuals addicted to prescription opioids was negative, as was the direct effect of the narrative on perceptions of blame. However, the high SES base narrative's positive effect on disgust also increased attributions of blame for addiction to individuals. Therefore, disgust was an inconsistent mediator because its indirect positive effect blunted some of the total negative direct effect of the narrative exposure on beliefs about blame. In other words, by generating disgust, the total negative impact of the narrative on perceptions that individuals are to blame for their drug addiction was reduced.

We found that pity mediated the relationship between exposure to the high SES base narrative and support for prosecuting pregnant women addicted to prescription opioids on

criminal child abuse charges, compared to the control group. By increasing pity, this narrative reduced support for this policy. In contrast, anger was an inconsistent mediator of the relationship between the high SES base narrative and another punitive policy, requiring health care providers to report women abusing prescription opioids to state authorities. Although the total effect of the narrative on this outcome was negative (suggesting that the narrative was associated with reduced support for the policy), the indirect effect through anger was positive, indicating that anger suppressed some of the high SES narrative's overall negative effect on support for the punitive policy.

Rarely were multiple emotional responses simultaneously consistent mediators of the relationship between a narrative exposure and public attitudes. One exception was the low SES narrative portraying barriers to treatment, which, in comparison to the low SES base narrative, had a positive effect on support for expanding Medicaid benefits to cover treatment for prescription opioid addiction. This relationship was partly mediated by increases in both sympathy and pity. Anger and disgust were also simultaneous consistent mediators in one case. Compared to the low SES base narrative, the narrative describing successful treatment of a low SES woman reduced support for requiring health care providers to report women abusing prescription opioids to state authorities partly by lowering participants' anger and disgust. However, lower levels of pity (a significant inconsistent mediator) somewhat blunted the total negative effect of the narrative exposure on this outcome.

## **Discussion**

In this framing experiment involving narratives about a woman struggling with opioid addiction in the context of a pregnancy, we found particular aspects of narratives to be important in shaping public attitudes: (1) the SES of the woman depicted; (2) the portrayal of barriers to treatment access; and (3) the portrayal of successfully treated addiction. These findings provide insight into the factors that influence public attitudes surrounding prescription opioid addiction

during pregnancy and can inform the development of communication strategies to reduce stigma and support for punitive policy, and increase support for more public health oriented approaches to addressing this problem.

Our finding that only the narrative depicting a high SES woman reduced the perception that individuals are to blame for their addiction somewhat contradicts the findings of Gollust and Lynch,<sup>63</sup> who found that a portrayal of a working class individual elicited less individual blame for an illness (in this case, diabetes) than the portrayal of a middle class individual. However, given stereotyping about the poor and drug use,<sup>56,88</sup> it is possible that the effectiveness of the narrative portraying a high SES woman in changing attitudes was due more to its contradiction with study participants' preconceptions about who uses substances during pregnancy rather than beliefs about the degree to which members of particular social classes deserve individual blame for their health conditions. This interpretation is supported by our finding that portraying a low SES woman did not significantly increase negative beliefs about individuals with prescription opioid addiction or increase support for punitive policy. Rather, the idea that a woman with a good job and high educational attainment, living in a nice house, may nevertheless suffer from addiction appears to have caused study participants to reconsider their blame for addiction and support for punitive policy targeting this population. In addition to breaking stereotypes, our finding that the effectiveness of this narrative in changing perceptions was due in part to its elicitation of sympathy and pity contributes to the developing research on the significance of emotions in persuasion.<sup>72,73</sup> Messages that contradict negative stereotypes and engage sympathy and pity may be promising communication strategies for reducing stigma and lowering support for policies that punish vulnerable populations.

Our findings suggest that narrative messages portraying a low SES woman placed within the broader social context –by describing the challenges she faces while attempting to access treatment - may increase support for public health oriented policy. Although Iyengar's message framing experiments demonstrated that episodic frames highlighting individual factors

contributing to a social condition like poverty reduce perceptions that collective actors, like the government, should play a role in addressing the problem,<sup>89,90</sup> recent studies have shown that narrative portrayals are not intrinsically episodic.<sup>66,70</sup> Our study adds to this area of research by demonstrating that a narrative portraying the structural barriers faced by an individual attempting to access treatment can increase support for policies targeting these external factors.

Portraying successfully treated addiction reduced support for punitive policy and increased the perception that treatment can be effective, although these effects varied depending on the SES of the woman portrayed in the narrative. Advocates for less punitive drug policy have hoped that reframing addiction as a chronic disease, a concept supported by neurological research, will reduce public perceptions of addiction as a moral failure, lowering stigma and increasing support for more medically-oriented solutions.<sup>91</sup> There has been disagreement about the success of the disease paradigm in reducing stigma.<sup>51,92</sup> One explanation for why the disease paradigm has not resonated more with the public is that people do not believe that the medical and public health approaches based on this paradigm have been effective in reducing drug abuse and addiction.<sup>91</sup> However, in our study, the majority of the control group believed that treatment options for prescription opioid addiction are available and can be effective. Adding to emerging research,<sup>52</sup> our findings provide additional evidence that individualized depictions of people successfully treated for addiction may be one promising avenue for generating greater public confidence in available treatments. Public confidence in treatment for addiction is important as insurance coverage expansions under the Affordable Care Act reduce some of the financial barriers to accessing these treatments.<sup>93</sup>

## **Limitations**

This study had several limitations. While online survey panels are subject to concerns related to external validity, GfK's address-based sampling approach and the application of survey weights in the statistical analyses reduced potential bias. Despite a low recruitment rate,

comparing the socio-demographic characteristics of our sample to Current Population Survey data, we found no difference on observable characteristics (Appendix 2.3), suggesting that findings from this study appear to be generalizable to the U.S. public more broadly. The public obtains information and news about health and social issues in a number of formats, including but not limited to narratives. Nevertheless, individualized narrative depictions are a common way of conveying information in news and entertainment media and are employed frequently by policymakers attempting to persuade the public to support particular policy proposals. Examining the role of narratives can help us to determine whether particular aspects of individualized portrayals influence public attitudes surrounding controversial issues.

Although we intentionally used language to neutralize assumptions about race (e.g., giving the pregnant woman a name that is not associated with any specific racial or ethnic group), study participants may have inferred race from the indicators of socioeconomic status. Despite efforts to limit racial indicators, we cannot definitively state that the differences between participant responses among those in the low versus high SES narrative groups were limited to perceptions about socioeconomic status only. Another limitation of the content of these narratives was the lack of mention of buprenorphine, a medication alternative to methadone increasingly used to treat opioid addiction during pregnancy. Stigma associated with methadone may have influenced participant responses to the narratives describing treatment. However, we featured methadone as the medication treatment in the narrative because although evidence is emerging that buprenorphine may reduce the risk of NAS, the standard of care for opioid addiction treatment during pregnancy is still methadone.<sup>8</sup> Future research examining the effects of messages framing opioid addiction during pregnancy might explore whether the method of treatment, and its reputation, affects public responses.

### **Implications for policy and politics**

In a seminal article on moral panics, Goode and Ben-Yehuda note that “the periodic drug panics that have washed over American society for a century continue to deposit institutional sediment in their wake.”<sup>47</sup> Concern over withdrawal in infants, without consideration for the health and wellbeing of mothers, may contribute to the enactment of punitive policies,<sup>94</sup> which may further reduce this vulnerable population’s already low engagement with the health care system.<sup>26,95</sup> Anecdotal reports in Tennessee suggest that since the state defined narcotic abuse during pregnancy as a form of criminal assault in 2014, women with substance use disorders have been crossing state lines in order to obtain health services.<sup>96</sup> However, there has been no empirical research yet on the effects of this law. While some of the narratives in this study were associated with lower support for punitive policies, the barriers to treatment narrative was the only narrative associated with increased support for a public health oriented policy: expanded access to addiction treatment for Medicaid enrollees. Pregnancy offers an opportunity to intervene and provide services to a population that may be more motivated to engage with addiction treatment at this critical point.<sup>97</sup> Given that a substantial proportion of child protective service cases involve problems related to parental substance use,<sup>98</sup> treatment during pregnancy can be an early preventive measure that increases the odds of future health and wellbeing for families coping with addiction.<sup>94</sup> Efforts to increase support for expanded substance use treatment access for this population may consider using narratives to illuminate the barriers to care that pregnant women encounter.

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**Table 1: Public attitudes among control group participants (N=264), 2014**

	Percent (95% CI)
<b><u>Attitudes toward people addicted to prescription pain medication</u></b>	
People who are addicted to prescription pain medication are to blame for their drug addiction	54.4 (48.0, 60.8)
People who are addicted to prescription pain medication are irresponsible	46.1 (39.8, 52.5)
Unwilling to work closely with a person with an addiction to prescription pain medication	45.2 (38.9, 51.5)
Employers should be allowed to deny employment to a person addicted to prescription pain medication	46.6 (40.3, 53.0)
Landlords should be allowed to deny housing to a person addicted to prescription pain medication	26.1 (20.4, 31.7)
<b><u>Perceptions of treatment effectiveness</u></b>	
Most people addicted to prescription pain medication can, with treatment, get well and return to productive lives	71.6 (65.8, 77.4)
Effective treatment options are available to help people who are addicted to prescription pain medication	67.0 (60.9, 73.1)
<b><u>Policy attitudes</u></b>	
<b><i>Punitive policies</i></b>	
Prosecute pregnant women who are addicted to prescription pain medication on criminal child abuse charges	31.0 (25.1, 36.9)
Require health care providers to report women who have abused prescription pain medication during pregnancy to state authorities, such as child welfare agencies	57.9 (51.5, 64.2)
<b><i>Public health oriented policies</i></b>	
Pass immunity laws to protect pregnant women addicted to prescription pain medication from being charged with drug crimes if they seek treatment for their addiction.	49.2 (42.8, 55.6)
Require government-funded addiction treatment programs to provide priority access for pregnant women.	55.1 (48.8, 61.5)
Expand Medicaid health insurance benefits for low income families to cover treatment for prescription pain medication addiction.	50.9 (44.5, 57.3)
Require individuals enrolled in Medicaid health insurance that are suspected of abusing prescription pain medication to use a single physician prescriber and single pharmacy.	64.0 (57.7, 70.2)

Table displays the percent (%) of respondents who strongly or somewhat endorse statement among no-exposure control group. 7-point Likert scale responses were dichotomized so that this table displays the percent of responses that were 5, 6 or 7 on the 7-point Likert scale assessing agreement with statement or support for policy.

Percentages are weighted to adjust for the survey sampling design in order to generate estimates that are representative of the U.S. population.

**Table 2: Effects of socioeconomic status (SES) in portrayals of a pregnant woman on attitudes, compared to the control group (N=818), 2014**

	Coefficient (95% CI)		Wald test <i>p</i> -value <sup>a</sup>
	<i>Low SES base narrative vs. control group</i>	<i>High SES base narrative vs. control group</i>	
<b><u>Attitudes toward people addicted to prescription pain medication</u></b>			
Agree that people who are addicted to prescription pain medication are to blame for their drug addiction	-0.08 (-0.37, 0.22)	-0.38* (-0.70, -0.07)	0.05
Agree that people who are addicted to prescription pain medication are irresponsible	0.16 (-0.17, 0.48)	-0.19 (-0.53, 0.15)	0.04
Unwilling to work closely with a person with an addiction to prescription pain medication	0.31 (-0.01, 0.62)	-0.11 (-0.43, 0.22)	0.01
Agree that employers should be allowed to deny employment to persons addicted to prescription pain medication	0.26 (-0.07, 0.58)	-0.27 (-0.59, 0.05)	<0.01
Agree that landlords should be allowed to deny housing to persons addicted to prescription pain medication	0.29 (-0.03, 0.61)	-0.07 (-0.39, 0.26)	0.03
<b><u>Perceptions of treatment effectiveness</u></b>			
Most people addicted to prescription pain medication can, with treatment, get well and return to productive lives	0.12 (-0.21, 0.46)	0.01 (-0.30, 0.32)	0.49
Effective treatment options are available to help people who are addicted to prescription pain medication	-0.09 (-0.41, 0.22)	-0.36* (-0.69, -0.03)	0.10
<b><u>Policy support</u></b>			
<b><i>Punitive policies</i></b>			
Prosecute pregnant women who are addicted to prescription pain medication on criminal child abuse charges	-0.09 (-0.41, 0.22)	-0.36* (-0.69, -0.03)	0.10
Require health care providers to report women who have abused prescription pain medication during pregnancy to state authorities, such as child welfare agencies	0.17 (-0.14, 0.48)	-0.43** (-0.74, -0.12)	<0.01
<b><i>Public health oriented policies</i></b>			
Pass immunity laws to protect pregnant women addicted to prescription pain medication from being charged with drug crimes if they seek treatment for their addiction	0.04 (-0.26, 0.34)	0.27 (-0.06, 0.59)	0.17
Require government-funded addiction treatment programs to provide priority access for pregnant women	0.16 (-0.17, 0.49)	-0.02 (-0.35, 0.30)	0.26

Expand Medicaid health insurance benefits for low income families to cover treatment for prescription pain medication addiction	-0.28 (-0.60, 0.05)	-0.02 (-0.34, 0.30)	0.12
Require individuals enrolled in Medicaid health insurance that are suspected of abusing prescription pain medication to use a single physician prescriber and single pharmacy	0.32* (0.00, 0.64)	0.40* (0.08, 0.71)	0.65
<b><u>Emotions</u></b>			
Anger	1.26** (0.91, 1.62)	0.83** (0.47, 1.19)	0.01
Disgust	1.36** (1.01, 1.71)	0.83** (0.48, 1.17)	<0.01
Sympathy	1.05** (0.74, 1.37)	1.28** (0.94, 1.62)	0.16
Pity	1.79** (1.46, 2.13)	1.73** (1.35, 2.10)	0.71

Asterisks(\*p-value<0.05 \*\*p-value<0.01) indicate statistically significant coefficients, comparing the experimental group to the control group, which is the reference category.

<sup>a</sup> Wald post-estimation tests were conducted to test whether the coefficient for the low SES base narrative group was significantly different from the coefficient for the high SES base narrative group.

Ordered logistic regression models were used to produce the coefficients, which are proportional log odds ratios. Models are weighted to adjust for the survey sampling design; the weights enable estimates that are representative of the U.S. population.

**Table 3: Effects of narratives portraying a low SES pregnant woman facing barriers to treatment on public attitudes, compared to the low SES base narrative with no depiction of barriers to treatment (N=553), 2014**

	Coefficient (95% CI) <i>Low SES narrative with barriers to treatment vs. low SES base narrative</i>
<b><u>Attitudes toward population</u></b>	
People who are addicted to prescription pain medication are to blame for their drug addiction.	-0.07 (-0.38, 0.25)
People who are addicted to prescription pain medication are irresponsible.	-0.15 (-0.48, 0.18)
Unwilling to work closely with a person with an addiction to prescription pain medication closely on the job.	-0.25 (-0.56, 0.07)
Employers should be allowed to deny employment to persons addicted to prescription pain medication.	-0.39* (-0.70, -0.07)
Landlords should be allowed to deny housing to persons addicted to prescription pain medication.	-0.17 (-0.49, 0.16)
<b><u>Perceptions of treatment effectiveness</u></b>	
Most people addicted to prescription pain medication can, with treatment, get well and return to productive lives.	-0.13 (-0.45, 0.20)
Effective treatment options are available to help people who are addicted to prescription pain medication.	-0.19 (-0.51, 0.14)
<b><u>Policy support</u></b>	
<b><i>Punitive policies</i></b>	
Prosecute pregnant women who are addicted to prescription pain medication on criminal child abuse charges.	-0.19 (-0.51, 0.14)
Require health care providers to report women who have abused prescription pain medication during pregnancy to state authorities, such as child welfare agencies.	-0.42* (-0.74, -0.10)
<b><i>Public health oriented policies</i></b>	
Pass immunity laws to protect pregnant women addicted to prescription pain medication from being charged with drug crimes if they seek treatment for their addiction.	-0.02 (-0.34, 0.29)
Require government-funded addiction treatment programs to provide priority access for pregnant women.	-0.04 (-0.36, 0.27)
Expand Medicaid health insurance benefits for low income families to cover treatment for prescription	0.31*

pain medication addiction.	(0.00, 0.62)
Require individuals enrolled in Medicaid health insurance that are suspected of abusing prescription pain medication to use a single physician prescriber and single pharmacy.	-0.01 (-0.33, 0.31)
<b><u>Emotions</u></b>	
Anger	0.06 (-0.26, 0.39)
Disgust	-0.23 (-0.55, 0.09)
Sympathy	0.78** (0.46, 1.11)
Pity	0.42** (0.10, 0.74)

Asterisks(\*p-value<0.05 \*\*p-value<0.01) indicate statistically significant coefficients, comparing participants exposed to the narrative portraying barriers to treatment to participants exposed to the low SES base narrative that does not mention treatment (reference category). Ordered logistic regression models were used to produce the coefficients, which are proportional log odds ratios. Models are weighted to adjust for the survey sampling design; the weights enable estimates that are representative of the U.S. population.

**Table 4: Effects of narratives portraying a high SES and low SES pregnant woman with successful treatment on public attitudes, compared to the high and low SES base narratives with no mention of treatment, 2014**

	Coefficient (95% CI)	
	<i>Low SES narrative with successful treatment vs. low SES base narrative</i> N=545	<i>High SES narrative with successful treatment vs. high SES base narrative</i> N=543
<b><u>Attitudes toward people addicted to prescription pain medication</u></b>		
People who are addicted to prescription pain medication are to blame for their drug addiction.	0.12 (-0.20, 0.45)	-0.04 (-0.37, 0.28)
People who are addicted to prescription pain medication are irresponsible.	-0.29 (-0.64, 0.05)	0.25 (-0.08, 0.59)
Unwilling to work closely with a person with an addiction to prescription pain medication closely on the job.	-0.14 (-0.46, 0.18)	0.09 (-0.23, 0.42)
Employers should be allowed to deny employment to persons addicted to prescription pain medication.	-0.05 (-0.37, 0.27)	0.18 (-0.14, 0.49)
Landlords should be allowed to deny housing to persons addicted to prescription pain medication.	-0.11 (-0.43, 0.21)	0.03 (-0.30, 0.35)
<b><u>Perceptions of treatment effectiveness</u></b>		
Most people addicted to prescription pain medication can, with treatment, get well and return to productive lives.	-0.01 (-0.34, 0.32)	0.37* (0.04, 0.70)
Effective treatment options are available to help people who are addicted to prescription pain medication.	-0.10 (-0.42, 0.22)	0.18 (-0.14, 0.51)
<b><u>Policy support</u></b>		
<b><i>Punitive policies</i></b>		
Prosecute pregnant women who are addicted to prescription pain medication on criminal child abuse charges.	-0.10 (-0.42, 0.22)	0.18 (-0.14, 0.51)
Require health care providers to report women who have abused prescription pain medication during pregnancy to state authorities, such as child welfare agencies.	-0.45** (-0.77, -0.12)	0.21 (-0.12, 0.53)
<b><i>Public health oriented policies</i></b>		
Pass immunity laws to protect pregnant women addicted to prescription pain medication from being charged with drug crimes if they seek treatment for their addiction.	-0.02 (-0.34, 0.30)	-0.22 (-0.55, 0.10)

Require government-funded addiction treatment programs to provide priority access for pregnant women.	-0.32 (-0.64, 0.00)	-0.13 (-0.45, 0.19)
Expand Medicaid health insurance benefits for low income families to cover treatment for prescription pain medication addiction.	0.01 (-0.30, 0.33)	-0.01 (-0.33, 0.31)
Require individuals enrolled in Medicaid health insurance that are suspected of abusing prescription pain medication to use a single physician prescriber and single pharmacy.	-0.45** (-0.78, -0.12)	-0.06 (-0.39, 0.27)
<b><u>Emotions</u></b>		
Anger	-0.70** (-1.04, -0.35)	-0.45* (-0.80, -0.10)
Disgust	-0.69** (-1.03, -0.34)	-0.52** (-0.86, -0.17)
Sympathy	-0.02 (-0.34, 0.30)	-0.11 (-0.44, 0.21)
Pity	-0.43* (-0.76, -0.09)	-0.30 (-0.63, 0.03)

Asterisks(\*p-value<0.05 \*\*p-value<0.01) indicate statistically significant coefficients, comparing the successful treatment narrative groups to the background narrative groups, which are the reference categories. For instance, the high SES successful treatment group is compared to the high SES base narrative group (reference category) while the low SES successful treatment group is compared to the low SES base narrative group (reference category). Ordered logistic regression models were used to produce the coefficients, which are proportional log odds ratios. Models are weighted to adjust for the survey sampling design; the weights enable estimates that are representative of the U.S. population.

## **Paper 3: Implementation of health homes in Maryland opioid treatment programs**

### **Introduction**

Persons with addiction to opioids (i.e., heroin and opioid analgesic medications) and other substances experience significantly higher rates of physical and mental health disorders than the general population.<sup>1-3</sup> In addition to increased susceptibility to communicable diseases such as HIV/AIDS and hepatitis C, those with substance use disorders are at elevated risk of lung disease, cardiovascular disease, liver cirrhosis, cancer, and serious mental illness (SMI).<sup>3,4</sup> Premature mortality in this population often results from complications related to somatic conditions rather than drug overdose.<sup>5-7</sup> Compared to those with just a chronic physical condition, Medicaid enrollees who also have co-occurring substance use and mental health disorders accrue health care costs that are two-three times higher.<sup>8</sup>

Research suggests that integrating somatic and behavioral health care services for this population can improve patient outcomes and reduce emergency department utilization.<sup>9-13</sup> Yet the financing and healthcare delivery infrastructure for substance use, mental illness, and somatic conditions have long been segregated.<sup>14</sup> Historically, this separation was due in part to lack of parity in health insurance coverage of behavioral health services. Recent policy changes including the 2008 Mental Health Parity and Addiction Equity Act and the 2010 Affordable Care Act (ACA) have required equitable insurance benefits for addiction treatment.<sup>15</sup> In addition, the ACA has established new mechanisms to promote the integration of behavioral and somatic health care, including the Medicaid health home state option.<sup>16</sup>

Under Section 2703 of the ACA, states can design and implement health homes to improve quality of care for Medicaid beneficiaries with chronic health conditions.<sup>17</sup> States receive

90% federal matching for the first eight quarters that a patient is enrolled in a health home.<sup>17</sup> By the end of 2014, 17 states had obtained approval from the Centers for Medicare and Medicaid Services (CMS) to establish health homes for targeted groups of Medicaid enrollees.<sup>18</sup> The Medicaid health home option provides states with considerable flexibility in defining eligibility criteria for patients and providers.<sup>19</sup> As of April 2015, Maryland, Rhode Island, and Vermont were the only states implementing health homes focusing on Medicaid enrollees with opioid dependence.<sup>20</sup>

Maryland's health home program became effective in October 2013.<sup>20</sup> It targets enrollees with a diagnosed opioid use disorder engaged in medication-assisted treatment (MAT) at licensed opioid treatment programs (OTPs) and enrollees with serious mental illnesses (SMI) or serious emotional disturbances (SED) receiving services at psychiatric rehabilitation programs (PRPs) or through mobile treatment services (MTS) providers. To be eligible for health home participation, opioid dependent patients also must be at risk of developing another chronic condition based on prior or current use of tobacco, alcohol or other substances.<sup>19</sup> Given that co-occurring substance use is widespread among this population (for example, estimates suggest that between 73-94 percent of methadone maintained patients use tobacco products<sup>21</sup>), this eligibility criteria encompasses most OTP patients.

Preliminary research on the Medicaid health homes has included descriptive studies of state variation in structuring their health home demonstrations, as well as evaluations of early effects on quality of care, clinical outcomes, hospitalizations, and costs.<sup>16,19,20,22,23</sup> Qualitative research on Medicaid health homes is limited and minimal research has examined the implementation of health homes in OTPs.<sup>20</sup>

At the time of this study, there were 69 OTP provider sites in Maryland,<sup>24</sup> all of which were eligible to become health homes. OTPs provide methadone treatment (dispensing on-site daily doses and take-home doses for more stable patients), medical examinations, counseling and behavioral therapies, and routine drug screening tests.<sup>25,26</sup> Many OTPs also provide additional

services including: mental health services, testing for hepatitis C and HIV, recovery groups, and on-site or referral to educational and employment resources.<sup>26</sup> According to data from the National Survey of Substance Abuse Treatment Services (NSSATS), 15,437 Maryland patients were receiving methadone maintenance therapy (MMT) in 2011.<sup>27</sup> Although buprenorphine, another medication used to treat opioid addiction, is primarily offered in office-based settings, OTPs are increasingly providing this medication as well.<sup>28</sup> Among the over 2,400 Maryland patients maintained on buprenorphine in 2011, 468 were receiving treatment in OTPs.<sup>29</sup>

In order to become a health home in Maryland, OTPs must first complete an application and obtain approval from Maryland's Department of Health and Mental Hygiene's (DHMH) Medicaid and Behavioral Health Administration (BHA) agencies. Health homes have to maintain certain staffing levels for the following positions: health home director, nurse care manager, and medical consultant (see Appendix 3.1 for additional information).<sup>30</sup> In addition, health homes are required to obtain health home accreditation from the Commission on Accreditation of Rehabilitation Facilities (CARF) or the Joint Commission within 18 months of obtaining state approval. Maryland health homes use an electronic reporting system, eMedicaid, to verify patient eligibility and to submit monthly reports on the health home services they have provided. Providers receive an initial intake reimbursement of \$98.87 for each new enrollee as well as a per member per month (PMPM) rate of \$98.87 for providing at least 2 health home services monthly for each patient. Health home services fall into the following categories: comprehensive care management; care coordination; health promotion; comprehensive transitional care; individual and family support; and referral to community and social support services.

Adoption of the health home among OTPs has been low. As of April 2015, over 90 percent of the 75 health homes approved to-date were in PRPs. Virtually all of the PRPs with sufficiently large patient populations are implementing health homes. In contrast, of the 69 OTPs in the state, less than 10 OTPs had applied to become health homes, and of these, only five in Maryland had obtained health home approval from DHMH at the time of the study (<10% of all

Maryland OTP sites). As of February 2015, two of the approved health homes had discontinued their programs, leaving three OTPs actively providing health home services.

Health services interventions that researchers find to be effective in one context often fail to translate to other settings.<sup>31,32</sup> Factors that can impede translation of interventions include differences in provider setting and patient population. OTPs serve a vulnerable patient population with unique health and social services needs. Implementing new models of care within this setting may involve atypical challenges and solutions. Implementation science involves examining the processes related to dissemination of research findings and their adoption and implementation in a variety of contexts.<sup>33</sup> This study examined the adoption and implementation of Medicaid health homes in Maryland OTPs through qualitative analysis of data collected through in-depth interviews with leaders in OTPs in Maryland and state officials. Specifically, this research sought to identify and explain: the facilitators of successful implementation among OTP health homes; challenges faced by OTP health homes during the implementation process; and factors contributing to low adoption of the health home among OTPs in Maryland.

## **Methods**

### **Data collection**

We conducted semi-structured interviews with key informants at: (1) OTP health homes; (2) OTPs not implementing health homes; and (3) in Maryland state government agencies charged with overseeing OTP health home implementation. An initial list of potential interviewees was developed using SAMHSA's online OTP directory<sup>24</sup> and Maryland state government resources on the health home demonstration. We purposefully selected key informants at OTP health homes based on their leadership role and level of involvement with the health home. We used stratified purposive sampling to identify directors at non-participating OTPs from diverse geographic settings (rural, urban, and suburban) and with varied operational structures (non-profit, public/government-run, and for-profit) to be interviewed. Through contacts

with Maryland state government officials, we identified key informants at Maryland's Medicaid and Behavioral Health Agencies who had been involved in the planning, implementation or evaluation of the health home demonstration. Study participants were recruited by email and by telephone. Interview recruitment continued until data saturation had been reached at 17 interviews.

Separate, semi-structured interview guides were developed for the three types of interviewees – OTP health home providers, non-participating OTPs, and state agency officials (see Appendix 3.2). Interviews with OTP health home providers included questions about their motivation to become a health home, the implementation process, including its facilitators, challenges, and lessons learned, and perceived effects on their organization to-date. Interviews with OTP providers that had not implemented a health home focused on what they knew about the health home, whether they had considered adopting, perceived barriers to adoption, future plans, and general attitudes toward the health home demonstration. Interviews with government officials concentrated on the design of the health home demonstration, its roll-out and implementation, the evaluation of the health home, and concurrent policy changes related to OTPs and the state's recent integration of its substance use and mental health administrative agencies.

Interviews were conducted between February and April 2015 and took place mainly in-person, with two conducted by phone. With participant consent, all interviews were audio-recorded and transcribed. This study was determined to be not human subjects research by the Johns Hopkins School of Public Health Institutional Review Board.

## **Analysis**

We used a hybrid deductive and inductive coding approach to analyze the interview data. Based on prior literature on the implementation of medical homes<sup>34,35</sup> and an initial reading of the interview transcripts, we created a preliminary list of deductive codes. During the process of

coding, new inductive codes were developed and applied as part of an iterative coding process. NVivo® qualitative data analysis software was used to code all transcripts. Transcripts from interviews with the three sets of participants (health home provider; OTP not implementing a health home; and state government official) were coded together. The codes generated for each concept emerging from the data were then collapsed into a smaller number of more broadly-defined groups in order to identify the major themes.

## **Results**

In total, 17 in-depth interviews were conducted with 19 participants. These included: 6 interviews with OTP health home leadership staff; 8 interviews with non-participating OTP administrators who oversaw 15 OTPs in the state; and 3 interviews with Maryland officials from the Department of Health and Mental Hygiene (DHMH). Interviews ranged in length from 38 minutes to 1 hour and 39 minutes (mean interview duration = 55 minutes).

### **Health homes**

Among the three active OTP health homes, two were early adopters and had been in operation since late 2013. At the time of interviews, the third OTP had just opened and begun rolling out its health home simultaneously with its other services; it also was in the process of establishing on-site primary care and behavioral health services. Given that this OTP was at the beginning of its implementation process, this section focuses mainly on the experiences of the two OTP health homes that had been in operation for over a year at the time of the interviews.

#### *Motivation to implement a health home*

Although they did conduct internal analyses to determine financial feasibility, the OTPs implementing health homes generally described their decisions as “no-brainers” because the health home fit within their organizational culture and overall approach to patient care. Two of

the three health homes had ongoing or future plans to offer primary care services on-site. Thus, the health home aligned with their organizational goals. The two more established OTPs felt that they were providing some of the health home services already, such as referrals and care coordination with other medical providers. They perceived the health home as a way to formalize and build upon these services, and obtain compensation for work their staff were already doing. As non-profit organizations, the OTPs noted that they operated on limited budgets, so the added PMPM reimbursements for health home patients enabled them to continue improving their services while removing some of the burden on existing staff who were stretched thin. One of the interviewees observed that, given changes in the health care system such as the Medicaid expansion, implementing a health home offered the opportunity to help a vulnerable population navigate these changes more easily.

#### *Facilitators to successful health home implementation*

Table 1 displays illustrative quotations from the interviews that exemplify themes that emerged from the interviews related to facilitators of the implementation. The major themes included: health home staff interpersonal skills; gaining patient trust and respect; obtaining buy-in from the clinical director and counselors; engaging health home patients; making the health home space accessible and inviting to patients; and collaborating and sharing information with the other OTP health homes.

#### Interpersonal skills of health home staff

While the OTPs identified their health home staff as critical to the smooth implementation of the health home, they took different approaches to filling these positions. One of the OTPs hired a new nurse to fill the health home director and nurse care manager positions simultaneously during the initial stage of implementation and later hired a FTE nurse care manager as enrollment grew. At this OTP, the leadership cited these nurses' attitudes as critical to

the success of the implementation, speculating that “I think we would’ve struggled more with it really” without finding the “right person” to fill the health home director and nurse care manager positions. In contrast, the other OTP was able to rely on existing nurses on-staff to fill the health home positions. This OTP acknowledged that their organization already offers a number of supplementary services so their existing staffing structure might be unique among OTPs. At this OTP, interviewees cited the nurses’ existing familiarity with patients, such as the fact that the nurses knew most patients already on a first-name basis, as a facilitator. “We weren’t a mystery to people. People were comfortable with us already...I think that was a plus for us--we weren’t starting from scratch.”

In addition, the staff took different approaches to care coordination and comprehensive care management. At one of the OTP health homes, the nurse care manager frequently called providers on behalf of patients to help them set up appointments and occasionally joined patients at their appointments with medical providers. In contrast, the other OTP expressed a different philosophy in which they wanted to “empower patients to become autonomous,” and did not accompany patients on visits to other clinicians. Similarly, one health home scheduled internal appointments with its patients whereas the other health home typically did not, instead asking patients to check in with them and tracking down those who had not interacted with the health home that month. In terms of other staffing decisions, OTPs had to use existing staff to support administrative efforts, such as scanning medical records collected from other providers into the OTPs’ health IT systems.

### Gaining patient trust

The health homes identified the development of patient trust as critical to their implementation success. The OTPs noted that trust is particularly important for this patient population due to long-standing and widespread mistrust of medical professionals. Regarding medication adherence, one interviewee observed “[I] can’t tell you how many times I’ve heard

patients say like ‘I’m not going to take that [medication], because they’re [the doctor] experimenting on me.’ And especially I’ve noticed this with patients with hypertension.” In order to fulfill the objective of the health home, which is to integrate behavioral health and somatic care, health home nurses had to earn patients’ trust as well as address their mistrust of other medical professionals. Health home nurses leveraged counselors’ long-standing relationships with patients to encourage use of prescribed medication, for instance. In addition, one of the OTPs undertook informal and formal efforts to educate other medical professionals about opioid addiction and methadone treatment and reduce stigma. Informal efforts included conversations with their patients’ medical providers. More formal efforts included bringing in medical and nursing students from local universities to do rotations at the OTP.

#### Patient engagement

In order to generate sufficient revenue to support the health home, the OTP needed to bill for as many of its enrollees as possible each month; this required providing at least two services a month to receive PMPM for each enrollee. Critical to this objective was engaging patients. While fostering trust in patients was somewhat intangible, often described by the interviewees as part of their organizational culture and approach to patient care, the interviewees thought that their philosophies were transferrable to other OTP settings. More tangible were efforts to engage patients in the health home. One OTP set up a “fast track” system in which patients seeing a nurse for a health home visit could move to the front of the methadone dosing line. The health home nurse thought that this perk made the patients feel special. Another OTP prepared newsletters on particular health topics, which contained quizzes about its content. Patients who completed the quiz were entered in raffles to win gift cards to a nearby grocery store. They also occasionally provided transportation assistance (e.g., tokens) to patients when they had external medical appointments.

### Accessible and inviting physical space

One perceived key to engaging patients was the location of the health home within the OTP. Both OTPs emphasized the importance of the health home being an accessible and inviting space for patients. One OTP strategically located the health home on the first floor “where the traffic is heaviest to...capture as many people as we can for their monthly services.” This OTP noted that the first-floor space was valuable real estate within the organization. Similarly, the other health home operated within a newly remodeled space that they thought the patients found to be attractive and that was convenient to the counseling offices, intensive outpatient group areas, and other important components of the organization.

### Buy-in from clinical directors and counselors

Given that the health home is intended to be a part of the OTP, rather than a supplement, health home staff noted that achieving the buy-in of the clinical directors and counseling staff was critical. Involving counseling staff in the health home was important not only to ensure that the health home was a part of the broader OTP but also to address the logistical difficulty in providing two health home services per month per patient for over one hundred patients. Counselors at these OTPs also helped to recruit new health home enrollees. The OTPs experimented with different approaches to involving the counselors in providing health home services and documenting qualifying services they had already been providing prior to the implementation. Both established health homes tried to have counselors deliver some of the health promotion services and provided counselors with materials (i.e., documents summarizing information on particular health home topics, videos on smoking cessation) to discuss with their patients.

### Collaboration between the OTP health homes and with the state

The health homes worked collegially with one another, sharing policies and procedures they had developed and exchanging ideas as they began to prepare for the CARF accreditation process. The several OTPs originally approved to become health homes, including the two that discontinued their health homes, initially met regularly and formed a health home learning collaborative for OTPs. However, when two of the OTPs discontinued their health homes, the learning collaborative disbanded. The OTP health homes have shared their experiences at the Maryland Association for the Treatment of Opioid Dependence (MATOD) meetings, and been in contact with other OTPs interested in pursuing a health home.

As the health home demonstration rolled out, both the OTPs and state officials indicated that they were able to resolve issues of confusion collaboratively. The state adjusted policies that lacked clarity or did not work well in practice. One state interviewee noted that “it’s not like [the health home demonstration] launched and then it’s been a static program...the providers that have enrolled and been active have had really good feedback” that the state has applied to improve the program.

### *Challenges*

The OTPs faced several challenges during the implementation process, some of which they had already addressed at the time of the interviews. These included: their pioneer status as early adopters; staffing; incorporating the health home into the OTP; balancing time devoted to high-need versus healthier patients; health IT issues; billing; dealing with non-eligible patients; and the delivery of particular categories of health home services. Table 1 displays illustrative quotations from the interviews that provide examples of these challenges.

### Pioneer status

As early adopters, these health homes felt that their pioneer status posed a challenge, as well as the fact that they were among only three OTPs implementing the health home. Although

Maryland identified Missouri as its model for the health home demonstration, Missouri did not implement health homes in OTPs. In addition, the pilot health home in Maryland was implemented in a psychiatric rehabilitation program and targeted Medicaid enrollees with SMI. While the OTP health homes felt that they benefitted from the knowledge and experiences of the pilot site, given the differences in patient population, types of services provided, and OTP staffing ratios (1 counselor for every 50 patients at OTPs versus 1 staff person for every 10 patients at PRPs), much of that experience did not translate to the OTP setting. The current health homes will be the first OTPs in Maryland to go through the CARF health home accreditation process. CARF accreditation was a source of anxiety among the health home interviewees because they felt that there were so many unknowns and no models from which to learn.

### Staffing

While citing the interpersonal and professional skills of the staff as facilitators of the implementation, the health homes also reported some minor challenges related to staffing decisions. The new health home nurses had to develop relationships with patients from scratch while the OTP that used existing staff felt that these patient relationships were well-established. However, the OTP that used existing staff had to make a concerted effort to protect the time of the health home nurses, who were occasionally recruited for other tasks, such as assisting with methadone dosing when the line became too long. In addition, the health homes felt that the staffing ratios in the health home regulations were unrealistic. As a result, they have had to rely more than originally anticipated on assistance from counselors in delivering two health home services monthly.

### Incorporating the health home into the OTP

Changing the organizational culture so that the OTP staff view the health home as part of the overall OTP rather than a supplementary program was described as partially addressed but

still a work-in-progress. One of the health homes felt that while they have largely obtained sufficient buy-in, they are still struggling to get the counselors to document the health home services that they provide. In addition, they are trying to broaden the idea of behavior change as not just substance use related but applicable to somatic conditions with behavioral components, such as diabetes, hypertension, and asthma. One of the health homes suggested that their counselors might play larger roles in assisting patients with chronic illnesses by using some of the same behavior change techniques they apply to patients' substance use to helping patients make adjustments to their diet, exercise habits and other aspects of their lifestyle relevant to somatic conditions.

One way to involve counseling staff and further incorporate the health home into the OTP was through the development of integrated treatment plans that include patients' substance use treatment and somatic health goals. The health homes were at different stages in terms of implementing integrated treatment plans. One of the health homes added the patients' health goals to the existing substance use treatment plans with the goal to promote shared responsibility (with the counselors) for the patients achieving their health goals. The other health home has had regular meetings for health home patients in which the health home nurses, medical director, clinical director, and other key staff discussed enrollees' treatment plans together to ensure a more collaborative approach to addressing these patients' needs.

#### Balancing time devoted to high-need and healthier patients

Balancing the time the health homes devote to high-need patients with serious medical, psychiatric, and psychosocial problems versus healthier patients has been an ongoing challenge. The difficulties have been exacerbated by the need to bill for enough patients each month to support the health home. The frequency with which patients see health home nurses varies. In addition, both health homes are in OTPs that have patient populations that are aging and have somatic conditions of increasing complexity.

## Health information technology

OTPs face unique challenges with respect to health IT due to requirements specific to the methadone treatment setting. The health homes felt that their internal health IT software lacks the features that would be needed if they were to integrate primary care services on-site in the future. In addition, the health homes' experience with eMedicaid has been mixed. The providers like the eligibility verification feature, noting that they generally have had few payment denials because they are able to confirm eligibility at intake. Reimbursement turnaround has been timely, which is hugely important to organizations operating on tight budgets. The reporting features in eMedicaid were not perceived as supporting the type of population health management the state encourages, although it is not clear that the eMedicaid system was intended to be used this way. Many of the PRPs use ProAct, an IT system adopted initially by Missouri health homes, which has more sophisticated population health management capabilities. However, the OTPs have not adopted this system due in part to limited funding and the unique health IT needs of OTPs. Interviewees noted that the existing software platforms suitable for OTPs (i.e., include a methadone dosing system and fulfill DEA requirements for inventory and accounting) do not have electronic health record (EHR) capabilities that would support meaningful use.

The health homes have customized templates in their existing software programs to create "health home notes" to document provision of services. Health home staff, as well as other OTP staff like counselors, have access to and contribute to these health home notes. At the end of each month, at one of the OTPs, the health home nurses have been running reports on all health home notes entered in the health IT system and entering this information into the eMedicaid system for billing purposes. The other OTP has asked counselors to email the health home director whenever they provide a health home service but are transitioning to greater reliance on the electronic health home notes. The health homes also have used their health IT system to remind other OTP staff to provide patients with reminders about visiting the health home nurse or

reminders for an appointment with an external provider. However, the software these OTPs currently use, while appropriate for the OTP setting, would be insufficient in a facility in which primary or somatic health services are provided on-site. Thus, as OTP health homes expand the types of services they provide, a significant challenge will be the lack of health IT options available to them that offer the necessary features for delivering methadone maintenance therapy and medical services.

### Billing

One of the challenges the OTPs faced early on the implementation process was figuring out how to bill for services that the counselors had already been providing. OTPs receive a bundled rate for providing standard OTP services such as daily methadone dosing, monthly counseling sessions, and drug screenings. However, prior to the health home implementation, counselors at both OTPs had often provided additional services and contacted local doctors or social services agencies on behalf of patients. After discussing with state officials, the OTPs received guidance to bill for a qualifying health home service even if it was provided by a counselor during a counseling session as long as the service was not directly related to substance use treatment. While the logistics are still being addressed internally by the health homes, clarification from the state has helped to reduce confusion.

### Ineligible patients

The inability to enroll non-qualifying OTP patients also has been a source of frustration for the health homes because they feel that these patients would benefit tremendously, particularly non-qualifying Medicare patients. There was no consensus among interviewees about whether the health home affected patients who were not enrolled positively or negatively. The OTPs have chosen not to restrict access to group health home activities, such as nutrition classes and tobacco recovery support groups.

### Delivery of particular types of health home services

The health homes have struggled to deliver particular types of health home services, particularly the provision of family support. For the OTPs, involving family members has always been a challenge due to several factors: (1) patients' relationships may have been damaged with family members due to their substance use; (2) patients' family members may be actively using substances; and (3) family members may be skeptical about methadone treatment.

### Perceived effects of the health home on the OTP and its patients

Overall, these OTPs were positive about the health home and felt that it had benefitted both OTP staff and the patients. One of the OTPs felt that the implementation of the health home had increased job satisfaction, particularly among the clinical staff. One of the interviewees said "I really can't imagine working here without it...I see it in the patients here. I see it in the morale of our whole clinical team." In addition, both health homes felt that it has had a beneficial effect on the quality of services they are providing and on patient health. Interviewees were skeptical about the extent to which the state would be able to detect a measurable impact on costs to-date, noting that some patients were using more care as they received services related to health issues that previously had been neglected. For instance, one interviewee noted "I'm sure our people are maybe dusting off their cards and getting health care for the first time." At both of the established health homes, there was a sense that health home enrollees were experiencing improvements in the severity of their substance use disorders (typically, non-opioid substances like cocaine, marijuana or other prescription drugs). Both health homes hypothesized a similar pathway through which persons who were not stable in their addiction at the start of the health home have begun to pay greater attention to their overall health and wellbeing, which has then led to reductions in other substance use. Finally, both OTPs felt that the health home has established itself as a valuable presence within their organizations. The health homes were particularly proud

of specific success stories in which patients made important gains, or had serious medical issues addressed (e.g., attainment of prosthetics and dentures) due to health home intervention.

### *Future plans*

The health homes shared a number of future plans to improve upon the services they are offering. These included: organizing monthly in-service trainings for counselors on specific health topics to strengthen their ability to provide health promotion and education services; identifying medical provider partners more systematically and providing information on opioid dependence and MAT; engaging health professional students from local universities as a means of reducing stigma among clinicians; and refining unified treatment plans for clients. In addition, two of the three OTPs had future plans to provide primary care services on-site.

### **Barriers to adoption among OTPs that have not implemented health homes**

State officials identified adoption among the OTPs as one of the main challenges with respect to the Medicaid health home demonstration. If findings from an ongoing intra-state evaluation<sup>1</sup> indicate that the health homes are having a positive impact on quality, patient health or hospitalizations, the state will ramp up efforts to increase participation among OTPs. All of the OTP directors interviewed for this study felt that the OTP was an appropriate setting for a health home and that, in concept, the health home was a good idea. Table 2 displays the key themes identified through interviews with directors at OTPs that were not adopting the health home. These included: hesitancy to adopt a new program in the midst of other state policy changes; financial risk; staffing requirements; too few eligible patients; insufficient physical space in the OTP; the requirement of a separate health home accreditation; confusion about billing

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<sup>1</sup> Preliminary findings should be released in mid-2015.

procedures, the logistics of integrating somatic care, or the application; organizational culture and leadership; and uncertainty about the permanency of the health home program.

*Simultaneous changes in the regulatory and financing environment*

At the time that the health home demonstration rolled out in Maryland in 2013, OTPs were facing other major changes in the regulatory and financing environment. Some OTPs in Maryland had been receiving grant funding under the Substance Abuse Prevention and Treatment (SAPT) block grant administered by state and local governmental entities for uninsured patients. However, with the expansion of insurance under the ACA, particularly through Medicaid, funding for OTP services has been shifted as more OTP patients obtain insurance coverage. One OTP director felt that this was, in some respects, a budget cut because the staff required for billing purposes is an added strain on OTPs' tight operating budgets. Numerous OTPs expressed that, in this time of change, they have been operating in "survival mode." As Maryland's previous Medicaid expansion, Primary Adult Care (PAC), wound down and the ACA Medicaid expansion ramped up, OTPs reported that they had felt a sense of instability that reduced their willingness to undergo organizational changes. In addition, in 2014, the state announced that a new administrative services organization (ASO), ValueOptions, would handle Medicaid billing for mental health and substance use treatment services. Previously, OTPs submitted claims to the various MCOs in the state. The transition to the ASO occurred in early 2015. At the time of the interviews, most, albeit not all, providers were fairly positive about the Value Options transition. However, the lead-up nevertheless was described as another source of uncertainty. Finally, in addition to these changes in the financing environment, both the state and Baltimore City integrated administratively their mental health and substance use agencies.

*Financial risk, staffing requirements and size*

Financial risk and interrelated concerns about staffing requirements and having sufficient numbers of eligible patients also were mentioned by a number of the OTP directors as factors contributing to their decision not to apply to become health homes. There was uncertainty about whether the health home reimbursement rates would make up for initial investments (i.e., start-up costs), such as hiring a RN to fill the health home director and nurse care manager roles. OTPs with smaller patient populations (<125 patients) did not feel that it was financially viable to hire an additional nurse. In addition, while no interviewees indicated that their organization did not implement a health home due to concerns about profitability, several OTPs suggested that some of the for-profit OTPs already offer limited services and might be disinclined to adopt a health home due to uncertain return on investment (ROI). In addition, some OTPs in the state are owned by out-of-state companies that operate clinics in multiple states. The extent to which ROI calculations played a role in these companies' decision-making surrounding the health home is unknown. In addition to issues related to financial viability and staffing requirements, some OTPs also did not feel that they had the physical space to house a nurse's office and/or exam room to support health home activities. One OTP director noted: "every corner of my building is filled with a human being."

#### *Separate accreditation requirement*

A number of OTPs identified the requirement of a separate accreditation as a health home as a significant barrier to adoption. Obtaining health home accreditation is expensive (e.g., CARF health home accreditation is \$7,000), particularly for small OTPs. In addition, the time and energy required to prepare for the accreditation process is substantial. For OTPs that had just been re-accredited for a three-year period, the idea of going through the process again to obtain the separate health home accreditation was daunting.

#### *Confusion about billing and logistics of integration*

There were several conceptual areas of confusion for the OTPs surrounding billing and the practical matter of integrating the health home into the OTP. Several OTPs expressed confusion about how to differentiate services they already provide (i.e., referrals to other medical providers) from health home services. Some interviewees expressed discomfort about the possibility of accidental duplicative billing and Medicaid fraud. However, as noted in the previous section, the state and existing health homes have addressed this concern already by specifying that as long as the service is not directly related to substance use treatment, OTPs can still bill for the service even if delivered within the confines of a counseling session. Therefore, OTPs may benefit from the learning experience of the early adopters. Similar to the billing issue was a lack of understanding from several of the OTPs about how this integration of the health home and OTP would take place in practice. The OTPs that have not adopted the health home realized that this type of change would transform their organizations. However, undergoing a practice transformation felt overwhelming to some OTP directors. One of the OTPs felt that the application to obtain health home approval from the state was confusing, particularly the standards section, but this barrier was not mentioned by other OTPs perhaps because few other organizations had considered applying.

#### *Organizational culture and leadership*

Interviewees cited variability among OTPs in terms of organizational culture. OTPs vary in the quality and scope of services that they provide, therapeutic approach to care, and willingness to try new approaches. Interviewees distinguished between OTPs that provide the minimal services and meet the minimum staffing levels required by law and OTPs that offer additional services and view themselves as having a patient-centered approach. Several interviewees identified for-profit OTPs as less likely to fit in the latter category. However, among the for-profit OTPs we interviewed, none explicitly indicated that they were less inclined to

provide additional services due to profit motivations. In fact, the few for-profit OTPs we interviewed were providing more extensive services than required.

Many of the OTPs expressed interest in and enthusiasm for the health home. Given that a number of the major state-level changes have been implemented at this point, several OTPs indicated that they were now considering applying to become health homes. One OTP was discontinuing an existing program and was considering the reinvestment of those resources in a health home.

## **Discussion**

Many of the facilitators and challenges related to the health home implementation among Maryland OTPs corresponded with findings in other research on implementations of new models to integrate primary care and behavioral health; these included the importance of staff and physical space, developing integrated treatment plans and protocols, and issues related to billing procedures.<sup>34–36</sup> A number of the facilitators of the health home implementation fell within the category of “soft practices,” defined by Hoff as “relational in nature” and deriving “from existing practice social structure and everyday interactions with staff and patients.”<sup>35</sup> While the ways in which these soft practices developed at the two established health homes were distinct, the importance of the relationships health home staff built with their patients and with the OTP counselors were viewed as critically important to the success of the health home implementation.

Several aspects of the implementation process might be unique to the OTP setting, particularly the relationships that health home staff had to develop with their patients and other medical providers in order for the health home to function well. All interviewees noted high levels of patient mistrust of medical professionals and institutions. Mistrust is associated with lower utilization of health care services.<sup>37</sup> OTPs may be uniquely positioned to help patients improve their relationships with medical providers because of the frequency with which they see

their patients (nearly every day) and the length of these relationships (often over the course of many years). Health homes also are well-positioned to play an informal role in educating other medical professionals about opioid use disorder and methadone treatment,<sup>38</sup> a role that might reduce stigma as well as improve patients' trust in and comfort with other clinicians.

One theme that emerged from these interviews was that the OTP patient population is aging (although there may be a future influx, given rising rates of prescription opioid and heroin addiction<sup>39</sup>). Research has documented increased rates of SMI, somatic chronic illness, and poor physical functioning among aging methadone-maintained patients.<sup>1,2,40</sup> The OTP health homes have observed an increase in the complexity of medical problems among their OTP patients as the health home has been implemented, likely due to increased detection. If the state decides to extend the health home program depending on the evaluation findings, efforts to expand adoption among non-participating OTPs will be important, given the role these providers play in serving an aging population with serious chronic medical conditions.

The two established OTPs implementing health homes were considered, both by the state and by other OTPs, to be leaders in the OTP Maryland community. According to theory on the dissemination of innovations, these providers might be categorized either as “innovators” or “early adopters.”<sup>41</sup> However, there are a number of other OTPs in Maryland that display similar organizational philosophies and levels of willingness to provide new services in order to improve quality of care and patient experiences. Many of the barriers to adoption identified by OTPs were related to feelings of instability and uncertainty about recent policy changes that have now been implemented, as well as unresolved questions about the billing process and how integration would function in practice. Many of these issues have been resolved. For instance, concern about duplicative billing should no longer hold providers back from participating given clarification from the state. The positive experiences of the early adopters of the health home also may encourage other providers to participate. Once the health homes have gone through the CARF accreditation process, sharing their experiences may alleviate concerns on this front as well.

The degree to which the for-profit status of an OTP affects health home adoption is uncertain. Interviewees frequently cited this as a potential hindrance to adoption for *other* OTPs but not for their own organization. A subset of OTPs are owned by out-of-state companies; this may complicate state efforts to promote the health home, given that decisions about service expansions are made by company executives located in other states rather than the local OTP directors. If the state hopes to achieve broad participation among OTPs, it may need to rethink how it targets recruitment given that current promotional efforts may not reach these key decision-makers. However, given that the majority of OTPs are locally owned, out-of-state ownership may not pose a significant barrier to recruitment. Research suggests that OTP ownership has implications for service expansion.<sup>42</sup> An analysis of NSSATS data indicates that for-profit OTPs are significantly less likely than non-profit and public (i.e., government-run) OTPs to provide additional services beyond those required by law.<sup>42</sup> However, the third OTP health home that just recently opened is for-profit. This OTP's implementation experience will be especially informative to other for-profit OTPs considering adoption.

### **Limitations**

Given the use of stratified purposive sampling, participants in this study may not be representative of the views of leadership of all OTPs in Maryland. The findings may be somewhat limited in their transferability to other Maryland OTPs and to other states considering the implementation of health homes among OTPs. Although Maryland is currently experiencing an opioid overdose epidemic that includes rural and suburban residents, nearly half of the state's OTPs are in Baltimore City. However, it is also true nationwide that OTPs are concentrated in urban areas.<sup>43</sup> It is possible that Baltimore is unique in the extent to which OTPs have formed collegial relationships in which information-sharing is welcomed and encouraged. This environment may facilitate a smoother implementation of the health homes if other OTPs choose to adopt. Finally, this study did not include interviews with counseling staff at health homes.

Future research should examine the way in which the implementation is perceived by substance use treatment staff that has little to no prior experience with medical models of care.

### **Conclusion**

Only three OTPs are implementing health homes in Maryland. Two have been in operation for over a year and cite the importance of staffing and interpersonal relationships, trust and patient engagement, and physical space as important facilitators. Poor rates of adoption among OTPs may have been related in part to the timing of the roll-out of the health home demonstration in the midst of other state policy changes. Although the existing OTP health homes have been eager to share their experiences at professional association meetings, the state may be able to leverage these leaders further to promote more widespread adoption of the health home in the OTP setting. Despite the challenges faced in Maryland, OTPs present a unique opportunity for health home implementation due to their ability to successfully engage with this vulnerable population.

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**Table 1. Facilitators of implementation among OTP health homes**

<b>Facilitators</b>
<p><b><i>Staff inter-personal skills</i></b></p> <p>“I think if [finding and hiring the health home director] had not happened, I think we would have struggled more because it was so clear that X*...even just from the very get-go it was like, you know...X had the right-just the right everything, the right demeanor, the right attitude, the right kind of can get it done, the right patient advocate.”</p> <p>“They’ve really formed these relationships with the patients and the patients are happy to go to the clinic and the patients are happy to see [the nurses]. The patients are happy to talk to them about their health care or about their sex lives, about their you name it. And there’s, like, some of the conversations that I’ve overheard as I’m walking up, ‘Ahh.’”</p>
<p><b><i>Patient trust and mutual respect</i></b></p> <p>“So I think that the whole like concept of trust is so--it is at the core of what the health home is really about...I think the philosophy is absolutely transferrable [to other OTPs considering becoming health homes]. It’s not going to be the same people, right, but...you do have to show people that you...care about them, and that you trust them, and that they can trust you. That is absolutely transferrable [to other settings].”</p> <p>“I think [this story] really speaks to just the whole underlying feel of what our health home is about really...so [the nurse] went to an appointment with [a patient], they went to see a psychiatrist, a new psychiatrist, and...I guess X kind of walked in with this individual, and the psychiatrist was like, ‘Oh, well, why is [this person] here? Why is X here?’ or, ‘Who is this?’ And so the patient was like, ‘Oh, well, this is X. This is my nurse.’ And the psychiatrist was like, ‘Oh, okay, well, why is X here?’ And the patient was like, ‘Well, because I asked X to come. X is my support.’ So X’s just kind of sitting there like, and then the psychiatrist goes, ‘Well, I don’t know if I feel comfortable having here, especially for like every visit.’ So the patient leans forward and goes well, ‘Well, when I trust you the same way that I trust X, then X won’t need to come with me anymore.’”</p>
<p><b><i>Buy-in from clinical director(s) and counselors</i></b></p> <p>“Having the buy-in of the clinical directors...has been really helpful, because I’m not in charge of the counselors. I’m not their boss. I can’t tell them what to do. They’re the ones who oversee the counseling staff. So they’re the ones, like their buy-in is really important. Because they’re the ones who are going to make sure various [health home] activities are getting done and documentation is happening and it’s being done appropriately.”</p> <p>“I think the medical and counseling departments...work together, play nicely together.”</p>
<p><b><i>Patient engagement</i></b></p> <p>“We do a ‘Fast Track’ health pass system. So if somebody is in the health home and they want to come in for a health home service, we actually allow them to kind of have a fast track for medication. So they can receive their dose of methadone in a faster way to make it as conveniently accessible for them as</p>

possible...it's a perk to be in the health home because I get my fast track pass, I can get my medication five minutes sooner, you know. So then you feel special."

"Another way we try to really encourage patients to actually read [the health home newsletter] and interact is we do a quiz...so we collect all the quizzes, and we put them in a raffle, and then whoever gets picked gets a \$25 gift card for a food store right over here."

"We budgeted for tokens for patients to get back and forth, not every day for every appointment, but sometimes if someone isn't going to go to a doctor's appointment because they can't get there, we give them tokens and say 'here, use these for the appointment.'" We budgeted things in like that."

#### ***Accessible and inviting physical space***

"One of the bigger things that we did here that we found has been really helpful is that we utilized space...where the traffic is heaviest to kind of, you know, capture as many people as we can for their monthly services, and things like that. So there were adjustments that we made in order to prioritize the health home being on that first floor, which is, you know, valuable real estate in this agency."

"Because I think to be successful, especially in the OTP setting, it's about having--being accessible and I think we are -- that's what we are here. We generally are 90+ percent on getting our contacts done for the month, and I think that's because we're here. We've very visible."

"So I think the fact that it's voluntary and that it really is kind of, yes, we're here, but [the nurses] make it kind of inviting to come, and so then people want to come back, and then when the word spreads, and like people just kind of want to come, and I think probably because the space is nice and it doesn't look like a rundown building."

#### ***Collaboration between the OTP health homes***

"We've definitely had, I think, a lot of success with maintaining our relationship with them and just in general what's working for you, what isn't working, what can we improve even just working on things like policies and procedures for the programs like the questionnaire, what do you have, what are your thoughts. And then, I would say they usually meet in person like once every couple of weeks, but a lot of phone and email communication as well."

"Sometimes there are long period of time when we won't talk but for the most part, we talk and we share information and we kind of support each other, because we're the only ones."

### **Challenges**

#### ***Pioneer status***

"We have benefitted from kind of the knowledge and the experience that the other, that kind of the [PRP] pilot program did, had or offered. It hasn't necessarily translated. Everything hasn't really translated to us in an OTP. So I don't want to say like it hasn't been helpful at all, but you know, it just, you know, not as helpful as we would have hoped."

“We were really kind of like the pioneers of this, I mean, OTPs in particular. So there were issues that we ran into that probably weren’t anticipated.”

“I think that’s probably the one thing that is the mystery, is the CARF thing...it’s just like a mystery...I think we’re all nervous...we feel like we’re really out on a limb here.”

### ***Staffing***

Among OTP using existing staff: “The downside of all of that is..that there are so many things that X and I are both trained and know how to do, whether it’s dispensing...or whatever...plus, being [another role at OTP], I could be pulled in at a moment’s notice into some kind of emergency or we need to have a huddle about something, so I think that’s the one thing. I don’t just sit in my office and just use tunnel vision and just do health home.”

“I think the [staffing] ratio that was put out by the state was not realistic in terms of the number...If I had a team of case managers with a ratio of 15 to 1. I’m just throwing out what I think the ratio for PRPs are. Could be a little bit different. But if I had the team on the ground that was taking the people to the appointments and everything and then just concentrating on really acute situations and a population study, sure...but the reality is in an [OPT] is that it’s going to probably be more the nurse doing more of the services and I don’t have a way. I haven’t come up with a solution on how it wouldn’t be.”

“But that’s really kind of not manageable, you know. Like for me, like I think I had 125 patients at one point, and to serve 125 patients in a month is really hard. Especially like our patients who have a lot going on physically and socially. You know, and I felt like me personally, like I couldn’t provide the kind of care or services that I wanted to with it just being me.”

### ***Integration within OTP***

“I have to say that in the beginning sometimes I felt like the counselors were kind of dumping on the nurse managers, “Oh, well now I don’t have to deal with the patient with this,” and as soon as the patient brought up anything related to their health, which when we didn’t have the health home the counselors were dealing this and talking with them, helping them get appointments, and so it became like, ‘Hey, you guys can do a health home service as well,’ and they can, as long as it’s documented and so we created in our, we have an electronic record so we created a health home note and so they can do that as well and just getting them to realize all of the health home interactions that they were doing and that they weren’t documenting.”

“What has been a little more of a challenge is really and...X has worked to implement this kind of much more--is the whole idea of integrating the health home [with the rest of the OTP] as opposed to kinda having it as an add-on ‘cause it has been challenging, right, and really getting the whole team to see that.”

“When we first started the health home, one of the ideas was to really have one single unified treatment plan and that was really hard and that there was not buy-in for ‘cause the clinical supervisors were like ‘oh it’s gonna be too hard. What does that mean?’...I think that there’s no more buy-in for that than there had been kind of in the beginning. So that’s definitely--and I don’t think we’re there yet--but that definitely is a change that and an evaluation that we’ve seen.”

***Balancing time for high-need patients and healthier patients***

“I know that some of the challenges that-- I mean, some of the patients are overall relatively healthier than some others and so maybe they’re not quite as engaged and they’re just not here as often as some others.”

“We have some people who are really, really sick, like medically really sick, and just then over all kind of medically, psychiatrically, psychosocially, kind of substance use disordered...and they take a lot of time.”

***Health information technology***

“It [the health IT system] doesn’t meet all our needs and we’re hoping that we’ll be getting more like, something even better but frankly, we’ve looked at lots of different things and they either don’t have a dosing system and then we’d have to pay for a separate health record and then a separate dosing system, so it’s been difficult to really find something.”

“I mean it [current health IT system] works okay, but it’s not going to work for primary care, and that’s kind of a big expensive and undertaking it just in and of itself.”

***Billing***

“There were issues that we ran into that probably weren’t anticipated. Like for example, Medicaid pays OTPs a bundle rate. So there're very specific services that come with that rate. And we needed to make sure that weren't going to be double-dipping by having the counselors who are included in that bundled rate bill for services-- do services that Medicaid-- how do I say this? So Medicaid-- within the bundled rate, that the counselors worked, that Medicaid didn't see that counselor's work as being not just counseling patients on kind of their substance use disorder, but also on like contacting their primary care doctors, or helping them make appointments. We wanted to make sure that all of that wasn't included under the bundled rate. And so we had to get some guidance from DHMH and they got back to us and eventually said, ‘As long as it's not-- the service that's performed is not specifically relate to the substance use treatment, it can be considered a Health Home service and the counselors can bill for it. Even if they do the service at the same time they're doing their counseling session.’”

“So the counselors were already basically doing services. They were calling doctors, they were setting up appointments. They were coordinating care. They were helping patients with their transportation needs, and housing and education, everything. I mean, those are all Health Home services. So kind of the next challenge was how do we get the counselors to now document those as Health Home services. And we're kind of still in that phase right now.”

***Serving non-eligible patients***

“I will say, one of the other things that just kills me is that we can’t involve people who are not Medicaid.”

“There’s folks that would like to be in the health home that don’t meet the requirements. We try and help them or give some resources to counselors to help them. I don’t restrict our groups if--they’re open to anybody. I’ll just say it’s a health home-sponsored group but you’re welcome to come. I haven’t felt like there’s too many--there’s room in the group so why should I restrict people from coming? So that’s been our rule of thumb. I don’t feel comfortable saying I can’t give you this information.”

***Specific health home services***

“What we see here is a lot family members are completely written off, so they’ve completely given up on them, or family members who are really involved but just don’t want to come to the program or don’t trust methadone...it’s very rare that we find family members that are that engaged.” (referring to provision of family support)

“We’re really good at delivering individual services...bringing those population [-level services] is probably the thing that we’re really trying to bring it home with a little bit more.” (referring to population health management)

**Lessons learned**

- Developing patient trust and mutual respect is important, particularly for a vulnerable population with long-standing mistrust of medical professionals.
- Health homes in OTPs can play a critical role in educating other medical professionals about opioid addiction and medication assisted treatment.
- Integrating other OTP staff, particularly counselors, is critical to ensuring that the health home can provide two services monthly to its patients. Also, staff can leverage the relationships with counselors and their patients, which are often long-standing.
- Locating the health home in an attractive, high-traffic part of the OTP can promote patient engagement.
- Health homes customize templates within their existing health IT systems to create “health home notes” that health home and counseling staff all can access. Staff use these “notes” to document the health home services that they provide and then the health home director enters this information into eMedicaid at the end of the month for billing purposes.
- More developed electronic health records that meet the needs of OTPs are limited and pose a challenge to efforts to integrate behavioral and somatic care.
- Health homes perceive the services they provide as potentially improving patients’ substance use disorders, not just somatic health conditions.

\*X is used to replace specific names.

**Table 2. Barriers to adoption of the health home among non-participating OTPs**

Theme	Sub-themes
Concurrent changes to financial and regulatory environment	<ul style="list-style-type: none"> <li>• Changes in the funding mechanisms for OTP services (cuts to grant-based funding and shift to reliance on Medicaid)</li> <li>• Recent health systems-level changes as Maryland’s Primary Adult Care (PAC) has been phased down and Medicaid expansion rolled out</li> <li>• Transition from Medicaid managed care organizations (MCOs) to a new administrative services organization (ASO)</li> <li>• Integration of mental health and substance use agencies at state and city (Baltimore) levels</li> </ul>
Financial risk	<ul style="list-style-type: none"> <li>• Uncertainty about whether the health home reimbursements would be timely enough for OTPs to cover payroll and services</li> <li>• Unclear that health home would have a sufficient return on investment to justify adoption and start-up costs</li> <li>• Local OTPs owned by out-of-state companies have less influence over how these entities’ leadership makes decisions surrounding service expansion and costs</li> <li>• Hospital-based OTPs already reimbursed at a higher rate due to Hospital Services Cost Review Commission (HSCRC) regulations</li> </ul>
Staffing requirements	<ul style="list-style-type: none"> <li>• Risk of hiring new nursing staff if health home reimbursements end up being insufficient to cover costs</li> <li>• For smaller OTPs, would have to staff at a higher rate than makes sense fiscally</li> <li>• For hospital-based OTPs, added barrier of requiring higher-level hospital approval for new hiring</li> <li>• Not enough existing staff to support in the provision of health home services</li> </ul>
Size of eligible patient population and OTP physical space	<ul style="list-style-type: none"> <li>• OTPs with small patient base (&lt;125 patients) would also need to provide 2 health home services/month/patient for as many patients as possible, raising concerns about financial viability of hiring additional staff</li> <li>• If OTP is in a more rural setting, there is more limited provider network for referrals</li> <li>• Some small OTPs expressed disinclination to partner with other OTPs as part of a consortium for delivering health home services due to desire to partner only with OTPs that have similar treatment philosophy</li> <li>• No free physical space for health home to operate within OTP facility (i.e., space for exam room and nurse’s office)</li> </ul>
Separate accreditation	<ul style="list-style-type: none"> <li>• Cost of separate accreditation for health home (i.e., \$7,000 for CARF health home accreditation)</li> <li>• Time and energy required to prepare for separate accreditation process</li> <li>• Some OTPs had just gone through accreditation process and earned 3-year CARF accreditation, and felt disinclined to go through another accreditation process</li> <li>• No example or model to follow</li> </ul>
Confusion about the health home	<p>Billing</p> <ul style="list-style-type: none"> <li>• Differentiating existing services provided from new health home services and preventing duplicative billing</li> <li>• Billing for specific services in order to get PMPM reimbursements for health home services is unfamiliar to OTPs, which are paid a bundled rate by Medicaid for their standard services</li> </ul> <p>Integration of health home into existing OTP infrastructure</p> <ul style="list-style-type: none"> <li>• Confusion about what the integration of the OTP and health home actually means in practice</li> <li>• OTP has to become health home, not just add a new program to the OTP; that</li> </ul>

	<p>sort of transformational change perceived by some as a big undertaking</p> <p>Application</p> <ul style="list-style-type: none"> <li>• Misunderstanding about the standards section of the application</li> <li>• Perception of lack of guidance for completing the application</li> </ul>
Organizational culture and leadership	<ul style="list-style-type: none"> <li>• Variability among OTPs in: therapeutic approach to care; quality of services provided; scope of services provided; and willingness to adopt new programs</li> <li>• For-profit OTPs may be less inclined to provide additional services beyond what is required by law</li> </ul>
Uncertainty about permanency	<ul style="list-style-type: none"> <li>• Some reluctance to invest in major organizational change if the health home program is not going to be sustained by state</li> </ul>

## **Dissertation Conclusion**

This dissertation examined: (1) public stigma toward persons with prescription opioid addiction and implications for policy; (2) the effects of narratives framing prescription opioid addiction during pregnancy on public attitudes and policy support; and (3) facilitators and challenges associated with the implementation of health homes among Maryland opioid treatment programs (OTPs). In a nationally representative sample of Americans, we found social stigma toward persons with prescription opioid addiction to be high. Internal attributions for prescription opioid addiction were associated with greater stigma, suggesting that highlighting external contributors to untreated prescription opioid addiction may reduce stigma. Stigma toward this population was associated with greater public support for punitive approaches to the problem, such as the arrest and incarceration of doctor-shoppers, and lower support for public health-oriented policies. Reducing stigma may increase public support for expanding treatment access and harm reduction strategies.

In the second study, we found that reframing the experience of prescription opioid addiction during pregnancy through the use of narratives can reduce individual blame, increase perceptions of treatment effectiveness, and reduce support for punitive policy. However, the effects of the narratives depended on the socioeconomic status of the woman depicted in the narrative and whether or not she accessed treatment. Depicting the barriers to treatment access faced by a pregnant woman may be one strategy for increasing support for expanded insurance coverage for prescription opioid addiction treatment.

Efforts to integrate substance use treatment services into the broader health care infrastructure face significant challenges. The third study in this dissertation highlighted the importance of addressing patient mistrust of medical providers and educating other clinicians with minimal experience working with this population about opioid addiction and medication assisted treatment (MAT). Opioid treatment programs present a unique opportunity for health

home implementation due to their experience in successfully engaging with this vulnerable population.

Social stigma toward this population likely varies geographically. Future research should explore whether stigma across communities is associated with availability of medication assisted treatment; findings may provide insight into how best to target efforts to reduce stigma. In addition, stigma on the part of health care providers toward patients with opioid use disorders is problematic because it reduces patients' willingness to disclose substance use and to engage with the medical system. Message framing experiments targeting clinicians specifically could help to identify the communication strategies that might be most effective in reducing stigma among health care providers. Finally, the Maryland opioid treatment programs implementing health homes hypothesized that their health homes were positively impacting enrollees' non-opioid substance use in addition to their physical health. Evaluations of the health homes' impact on patients with opioid addiction should examine the degree to which this intervention has affected all aspects of health, not just physical conditions.

## Appendices

**Appendix 1.1: Socio-demographic characteristics of survey respondents in comparison to Current Population Survey (2013) data**

	<b>Un-weighted</b>	<b>Weighted</b>	<b>National Comparison</b>
Female (%)	50.9	52.4	51.9
Age (%)			
Ages 18-24	7.7	9.5	12.7
Ages 25-34	15.1	20.1	17.5
Ages 35-44	13.9	16.4	16.8
Ages 45-54	19.1	17.4	18.4
Ages 55-64	22.1	18.9	16.3
Age 65 +	22.1	17.8	18.3
Race (%)			
White only	71.6	66.9	66.0
Black only	9.7	11.8	11.6
Other	18.7	21.3	22.5
Hispanic ethnicity (%)			
Hispanic	11.1	14.5	15.0
Non-Hispanic	88.9	85.5	85.0
Education (%)			
Less than high school degree	10.5	12.2	12.6
High school degree	30.0	29.8	29.6
Some college	29.7	29.3	28.9
Bachelor's degree or higher	29.8	28.7	28.9
Household income (%)			
Under \$10,000	4.9	6.1	5.2
\$10,000-24,999	12.2	12.5	13.3
\$25,000-49,999	24.2	22.5	22.7
\$50,000-74,999	18.2	18.7	18.4
\$75,000 or higher	40.6	40.2	40.5
Employment status (%)			
Employed	57.2	59.1	59.9
Unemployed	8.2	9.8	4.9
Retired	20.1	15.6	17.2
Other (e.g., disabled, homemaker, other)	14.6	15.5	18.1
Region (%)			
Northeast	18.2	17.6	18.2
Midwest	23.6	21.5	21.4
South	35.3	37.9	37.1
West	23.0	23.0	23.4

**Appendix 1.2: Sensitivity analysis testing associations between causal attributions for prescription opioid misuse and binary measures of stigma using logistic regression models**

	<b>Adjusted Odds Ratios (AORs)<sup>a</sup></b>				
	<b>[95% CI]</b>				
	<b>Unwilling to work closely on the job with a person with an addiction to prescription opioids</b>	<b>Unwilling to have a person with an addiction to prescription opioids marry into family</b>	<b>People addicted to prescription opioids are more dangerous than the general population</b>	<b>Employers should be allowed to deny employment to a person addicted to prescription opioids</b>	<b>Landlords should be allowed to deny housing to a person addicted to prescription opioids</b>
Some people lack the self-discipline to use prescription pain medication without becoming addicted	1.382 [0.992 - 1.924]	1.932** [1.366 - 2.733]	2.413** [1.719 - 3.387]	1.862** [1.335 - 2.596]	1.599* [1.118 - 2.288]
Some people do not understand how easy it is to become addicted to prescription pain medication	1.335 [0.904 - 1.972]	1.335 [0.889 - 2.003]	2.020** [1.372 - 2.974]	1.610* [1.095 - 2.366]	1.005 [0.678 - 1.488]
Some people have a family history that makes them more likely to abuse prescription pain medications	1.158 [0.852 - 1.573]	0.977 [0.707 - 1.350]	2.115** [1.555 - 2.877]	1.426* [1.053 - 1.933]	1.273 [0.926 - 1.750]
There has been inadequate research on the safety and effectiveness of prescription pain medications	1.066 [0.786 - 1.447]	1.004 [0.719 - 1.402]	1.887** [1.390 - 2.563]	1.078 [0.796 - 1.460]	1.460* [1.068 - 1.995]
Pharmaceutical companies do not adequately explain the risks of addiction on labels of prescription pain medications	1.339* [0.989 - 1.811]	1.192 [0.863 - 1.645]	1.719** [1.272 - 2.323]	1.510** [1.118 - 2.039]	1.274 [0.931 - 1.743]
Pharmaceutical companies promote prescription pain medications without adequate knowledge of their safety and effectiveness	1.128 [0.839 - 1.518]	1.119 [0.817 - 1.532]	1.844** [1.365 - 2.491]	1.347* [1.001 - 1.813]	1.415* [1.039 - 1.927]

Health insurance companies are more likely to pay for prescription pain medication than other pain treatments like physical therapy or acupuncture	1.113 [0.813 - 1.525]	1.393 [1.000 - 1.942]	1.757** [1.285 - 2.401]	1.489* [1.087 - 2.038]	1.219 [0.880 - 1.690]
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<sup>a</sup> Odds ratios adjust for age, gender, educational attainment, race, household income, MSA residence, political ideology, and personal experience with prescription opioids. Estimates incorporate survey weights to account for complex sampling design.

\*\* p<0.01, \* p<0.05

**Appendix 1.3: Sensitivity analysis testing associations between causal attributions for prescription opioid misuse and addiction and binary measures of stigma using logistic regression models**

	Adjusted Odds Ratios (AORs) <sup>a</sup> [95% CI]				
	Unwilling to work closely on the job with a person with an addiction to prescription opioids	Unwilling to have a person with an addiction to prescription opioids marry into family	People addicted to prescription opioids are more dangerous than the general population	Employers should be allowed to deny employment to a person addicted to prescription opioids	Landlords should be allowed to deny housing to a person addicted to prescription opioids
Individuals addicted to prescription opioids	1.775** [1.166 - 2.703]	2.856** [1.863 - 4.380]	2.480** [1.626 - 3.780]	2.549** [1.648 - 3.943]	2.475** [1.499 - 4.086]
Individuals who illegally sell prescription opioids	1.315 [0.875 - 1.977]	2.156** [1.419 - 3.275]	1.860** [1.232 - 2.808]	1.637* [1.075 - 2.493]	1.624* [1.044 - 2.526]
Pharmacies and pharmacists	1.158 [0.838 - 1.599]	1.317 [0.944 - 1.839]	1.756** [1.277 - 2.414]	1.324 [0.964 - 1.819]	0.95 [0.683 - 1.322]
Pharmaceutical companies	1.052 [0.763 - 1.450]	1.341 [0.963 - 1.868]	1.392* [1.017 - 1.905]	1.192 [0.871 - 1.632]	1.105 [0.795 - 1.534]
Government	0.956 [0.707 - 1.294]	1.157 [0.840 - 1.595]	1.583** [1.167 - 2.147]	0.981 [0.725 - 1.327]	1.162 [0.852 - 1.586]
Doctors	1.443 [0.984 - 2.117]	2.350** [1.593 - 3.466]	1.892** [1.305 - 2.743]	1.403 [0.961 - 2.046]	1.206 [0.815 - 1.785]
Health insurance companies	1.049 [0.775 - 1.419]	1.119 [0.812 - 1.542]	1.757** [1.298 - 2.378]	1.212 [0.899 - 1.635]	1.251 [0.918 - 1.705]
Law enforcement	1.188 [0.880 - 1.604]	1.316 [0.960 - 1.805]	1.823** [1.343 - 2.473]	1.607** [1.191 - 2.169]	1.504* [1.102 - 2.053]

<sup>a</sup> Odds ratios adjust for age, gender, educational attainment, race, household income, MSA residence, political ideology, and personal experience with prescription opioids. Estimates incorporate survey weights to account for complex sampling design.

\*\* p<0.01, \* p<0.05

**Appendix 1.4: Sensitivity analysis estimating association between stigma and policy support in logistic regression models**

<i>Punitive policy</i>		<i>Public health-oriented policies</i>			
<b>Adjusted Odds Ratios<sup>a</sup> [95% CI]</b>	<b>Arresting and prosecuting people who obtain multiple prescriptions for pain medication at the same time from different doctors</b>	<b>Expanding Medicaid insurance benefits to require coverage for treatment of substance abuse problems, including addiction to prescription opioids</b>	<b>Passing laws to protect people from criminal charges for drug crimes if they seek medical help for themselves or others experiencing a prescription opioid overdose</b>	<b>Providing naloxone to friends and family members of people using prescription opioids</b>	<b>Increasing government spending to improve treatment of substance abuse problems, including addiction to prescription opioids</b>
<b>Stigma scale</b>	<b>1.564** [1.350 - 1.812]</b>	<b>0.888 [0.784 - 1.006]</b>	<b>0.913 [0.812 - 1.025]</b>	<b>0.981 [0.867 - 1.110]</b>	<b>0.981 [0.866 - 1.112]</b>
Age (years)	1.014** [1.004 - 1.024]	1.006 [0.996 - 1.015]	1.005 [0.996 - 1.014]	0.997 [0.988 - 1.006]	1.011* [1.001 - 1.021]
Female gender	0.978 [0.704 - 1.357]	1.248 [0.918 - 1.697]	0.92 [0.685 - 1.235]	1.019 [0.753 - 1.379]	1.178 [0.869 - 1.598]
Educational attainment (reference: High school education)					
<i>Less than HS</i>	0.826 [0.471 - 1.451]	0.599 [0.339 - 1.057]	0.817 [0.478 - 1.397]	1.043 [0.619 - 1.759]	0.714 [0.405 - 1.261]
<i>Some college</i>	0.99 [0.634 - 1.546]	1.184 [0.802 - 1.747]	1.102 [0.754 - 1.609]	0.655* [0.441 - 0.973]	1.085 [0.729 - 1.614]
<i>Bachelor's degree +</i>	0.668 [0.424 - 1.052]	1.531 [0.998 - 2.347]	1.245 [0.834 - 1.858]	0.703 [0.463 - 1.068]	0.988 [0.647 - 1.508]
Race (reference: white)					
<i>Black</i>	0.637	0.823	0.751	0.730	1.081

<i>Other race</i>	[0.379 - 1.072] 1.374 [0.864 - 2.185]	[0.495 - 1.368] 1.26 [0.807 - 1.966]	[0.456 - 1.237] 1.303 [0.857 - 1.982]	[0.435 - 1.226] 1.184 [0.776 - 1.806]	[0.643 - 1.815] 1.412 [0.911 - 2.188]
Income category (reference: \$75,000 or higher)					
<i>Under \$10,000</i>	0.288** [0.124 - 0.667]	0.984 [0.462 - 2.095]	0.575 [0.276 - 1.196]	1.112 [0.529 - 2.337]	0.659 [0.297 - 1.464]
<i>\$10,000-24,999</i>	0.696 [0.404 - 1.199]	0.91 [0.554 - 1.495]	0.824 [0.501 - 1.355]	1.630 [0.964 - 2.755]	1.01 [0.604 - 1.688]
<i>\$25,000-49,999</i>	0.749 [0.487 - 1.151]	1.050 [0.685 - 1.609]	0.841 [0.562 - 1.256]	1.200 [0.793 - 1.816]	1.264 [0.827 - 1.930]
<i>\$50,000-74,999</i>	1.394 [0.860 - 2.260]	0.998 [0.646 - 1.544]	0.872 [0.576 - 1.320]	1.222 [0.800 - 1.867]	1.15 [0.762 - 1.734]
Lives in MSA	0.624* [0.397 - 0.981]	1.083 [0.720 - 1.630]	0.903 [0.604 - 1.351]	1.570* [1.025 - 2.404]	1.595* [1.049 - 2.425]
Political ideology (reference: liberal)					
<i>Moderate</i>	0.839 [0.530 - 1.329]	0.540** [0.348 - 0.836]	0.662* [0.440 - 0.996]	0.692* [0.460 - 1.042]	0.450** [0.299 - 0.677]
<i>Conservative</i>	0.761 [0.447 - 1.296]	0.234** [0.141 - 0.388]	0.566* [0.353 - 0.909]	0.491** [0.304 - 0.792]	0.185** [0.112 - 0.306]
Personal experience with prescription opioid abuse	1.376 [0.958 - 1.976]	1.464* [1.043 - 2.054]	1.008 [0.730 - 1.392]	1.733** [1.254 - 2.395]	1.086 [0.777 - 1.519]
Constant	0.280* [0.101 - 0.770]	2.039 [0.754 - 5.515]	2.119 [0.837 - 5.367]	0.734 [0.289 - 1.863]	0.703 [0.267 - 1.853]
Observations	1,073	1,069	1,071	1,070	1,072

<sup>a</sup> Odds ratios adjust for age, gender, educational attainment, race, household income, MSA residence, political ideology, and personal experience with prescription opioids. Estimates incorporate survey weights to account for complex sampling design.

\*\* p<0.01, \* p<0.05

**Appendix 1.5a: Measures of R-squared values from OLS regression models testing contributions of stigma scale, political ideology, and socio-demographic characteristics in explaining variation in policy support (Part I of III)**

	<i>Arresting and prosecuting people who obtain multiple prescriptions for pain medication at the same time from different doctors</i>			<i>Expanding Medicaid insurance benefits to require coverage for treatment of substance abuse problems, including addiction to prescription opioids</i>		
	<b>Model 1: Socio-demographic</b>	<b>Model 2: Adds ideology</b>	<b>Model 3: Adds stigma</b>	<b>Model 1: Socio-demographic</b>	<b>Model 2: Adds ideology</b>	<b>Model 3: Adds stigma</b>
Stigma scale			0.391** [0.291, 0.491]			-0.127* [-0.230, -0.023]
Political ideology (Re: Liberal)						
<i>Moderate</i>		0.027 [-0.283, 0.337]	-0.111 [-0.430, 0.208]		-0.517** [-0.801, -0.233]	-0.472** [-0.757, -0.188]
<i>Conservative</i>		0.194 [-0.170, 0.559]	-0.065 [-0.434, 0.303]		-1.382** [-1.741, -1.024]	-1.298** [-1.659, -0.937]
Age (years)	0.009** [0.003, 0.016]	0.008* [0.002, 0.015]	0.005 [-0.001, 0.012]	0.001 [-0.007, 0.008]	0.004 [-0.003, 0.011]	0.005 [-0.002, 0.012]
Female gender	0.061 [-0.155, 0.277]	0.046 [-0.174, 0.267]	0.083 [-0.129, 0.295]	0.446** [0.214, 0.679]	0.364** [0.139, 0.588]	0.351** [0.126, 0.575]
Educational attainment (Ref: high school education)						
<i>Less than high school</i>	-0.011 [-0.389, 0.367]	-0.014 [-0.404, 0.377]	-0.019 [-0.404, 0.366]	-0.260 [-0.694, 0.174]	-0.321 [-0.755, 0.113]	-0.318 [-0.748, 0.112]
<i>Some college</i>	-0.165	-0.171	-0.094	0.015	-0.090	-0.115

<i>Bachelor's or higher</i>	[-0.454, 0.124] -0.349*	[-0.464, 0.121] -0.331*	[-0.378, 0.190] -0.273	[-0.290, 0.321] 0.383*	[-0.385, 0.205] 0.257	[-0.409, 0.179] 0.238
Race (Ref: white)	[-0.651, -0.048]	[-0.630, -0.031]	[-0.563, 0.017]	[0.051, 0.714]	[-0.068, 0.583]	[-0.088, 0.564]
<i>Black/African American</i>	-0.076	-0.015	0.000	0.125	0.003	-0.001
	[-0.442, 0.290]	[-0.405, 0.375]	[-0.361, 0.361]	[-0.267, 0.517]	[-0.379, 0.385]	[-0.382, 0.381]
<i>Other race</i>	0.311*	0.318*	0.321*	0.203	0.169	0.166
	[0.011, 0.610]	[0.018, 0.618]	[0.021, 0.622]	[-0.122, 0.528]	[-0.154, 0.491]	[-0.150, 0.482]
Household income category (Ref: >\$75,000)						
<i>&lt;\$10,000</i>	-0.695*	-0.762*	-0.566	0.573*	0.343	0.280
	[-1.255, -0.134]	[-1.356, -0.168]	[-1.170, 0.039]	[0.038, 1.109]	[-0.172, 0.859]	[-0.246, 0.805]
<i>\$10,000-24,999</i>	-0.316	-0.327	-0.219	0.384*	0.247	0.212
	[-0.706, 0.074]	[-0.718, 0.064]	[-0.607, 0.168]	[0.003, 0.765]	[-0.125, 0.620]	[-0.156, 0.579]
<i>\$25,000-49,999</i>	-0.231	-0.218	-0.167	0.184	0.195	0.177
	[-0.528, 0.066]	[-0.518, 0.082]	[-0.446, 0.113]	[-0.140, 0.508]	[-0.122, 0.511]	[-0.141, 0.496]
<i>\$50,000-74,999</i>	0.064	0.056	0.133	0.011	0.005	-0.023
	[-0.229, 0.357]	[-0.240, 0.352]	[-0.155, 0.421]	[-0.332, 0.355]	[-0.321, 0.332]	[-0.343, 0.297]
MSA residence	-0.286*	-0.274	-0.175	0.276	0.184	0.153
	[-0.567, -0.006]	[-0.556, 0.008]	[-0.439, 0.090]	[-0.035, 0.588]	[-0.105, 0.473]	[-0.135, 0.441]
Personal experience with prescription opioids	0.149	0.158	0.147	0.145	0.141	0.144
	[-0.092, 0.390]	[-0.087, 0.403]	[-0.090, 0.384]	[-0.115, 0.404]	[-0.107, 0.389]	[-0.101, 0.390]
Constant	5.223**	5.170**	3.418**	3.911**	4.621**	5.191**
	[4.732, 5.714]	[4.599, 5.742]	[2.708, 4.128]	[3.359, 4.462]	[4.029, 5.213]	[4.439, 5.944]
Observations	1099	1073	1073	1095	1069	1069
<b>R-squared</b>	<b>0.038</b>	<b>0.041</b>	<b>0.136</b>	<b>0.041</b>	<b>0.112</b>	<b>0.121</b>

\*\*\* p<0.01, \*\* p<0.05, \*p<0.1

This table displays coefficients from linear regression models estimating changes in policy support (on a 1-7 scale), adjusting for covariates. Estimates incorporate survey weights to account for complex sampling design.

**Appendix 1.5b: Measures of R-squared values from OLS regression models testing contributions of stigma, political ideology, and socio-demographic characteristics in explaining variation in policy support (Part II of III)**

	<i>Passing laws to protect people from criminal charges for drug crimes if they seek medical help for themselves or others experiencing a prescription opioid overdose</i>			<i>Providing naloxone to friends and family members of people using prescription opioids</i>		
	<b>Model 1: Socio-demographic</b>	<b>Model 2: Adds ideology</b>	<b>Model 3: Adds stigma</b>	<b>Model 1: Socio-demographic</b>	<b>Model 2: Adds ideology</b>	<b>Model 3: Adds stigma</b>
Stigma scale			-0.131* [-0.228, -0.033]			-0.065 [-0.168, 0.039]
Political ideology (Ref: Liberal)						
<i>Moderate</i>		-0.247 [-0.548, 0.054]	-0.202 [-0.497, 0.093]		-0.246 [-0.544, 0.053]	-0.226 [-0.525, 0.074]
<i>Conservative</i>		-0.535* [-0.911, -0.159]	-0.448* [-0.817, -0.079]		-0.721** [-1.079, -0.364]	-0.681** [-1.041, -0.321]
Age (years)	0.002 [-0.005, 0.008]	0.003 [-0.004, 0.009]	0.004 [-0.003, 0.010]	0.001 [-0.006, 0.008]	0.003 [-0.004, 0.010]	0.003 [-0.003, 0.010]
Female gender	0.084 [-0.143, 0.312]	0.083 [-0.147, 0.312]	0.070 [-0.159, 0.299]	0.060 [-0.159, 0.280]	0.018 [-0.202, 0.239]	0.011 [-0.210, 0.232]
Educational attainment (Ref: high school education)						
<i>Less than high school</i>	-0.011 [-0.414, 0.393]	-0.084 [-0.501, 0.334]	-0.081 [-0.498, 0.337]	0.071 [-0.349, 0.491]	0.027 [-0.394, 0.447]	0.028 [-0.390, 0.446]
<i>Some college</i>	0.054 [-0.247, 0.355]	0.037 [-0.260, 0.333]	0.012 [-0.283, 0.306]	-0.231 [-0.522, 0.060]	-0.262 [-0.554, 0.030]	-0.275 [-0.567, 0.017]

<i>Bachelor's or higher</i>	0.424** [0.105, 0.743]	0.386* [0.0659, 0.707]	0.366* [0.045, 0.686]	-0.223 [-0.522, 0.076]	-0.247 [-0.547, 0.054]	-0.255 [-0.557, 0.047]
Race (Reference: white)						
<i>Black/African American</i>	0.163 [-0.196, 0.523]	0.097 [-0.272, 0.465]	0.092 [-0.280, 0.463]	0.016 [-0.340, 0.371]	-0.010 [-0.373, 0.352]	-0.013 [-0.378, 0.352]
<i>Other race</i>	0.207 [-0.122, 0.536]	0.236 [-0.087, 0.560]	0.233 [-0.087, 0.553]	0.170 [-0.143, 0.484]	0.180 [-0.129, 0.489]	0.179 [-0.128, 0.486]
HH income category (Ref: >\$75,000)						
<\$10,000	-0.109 [-0.702, 0.484]	0.018 [-0.558, 0.595]	-0.048 [-0.630, 0.533]	0.425 [-0.099, 0.948]	0.369 [-0.173, 0.912]	0.336 [-0.203, 0.874]
\$10,000-24,999	0.092 [-0.304, 0.488]	0.023 [-0.377, 0.422]	-0.015 [-0.414, 0.383]	0.425* [0.047, 0.803]	0.372 [-0.013, 0.757]	0.353 [-0.033, 0.739]
\$25,000-49,999	0.119 [-0.189, 0.427]	0.115 [-0.199, 0.429]	0.097 [-0.219, 0.413]	0.263 [-0.035, 0.561]	0.261 [-0.039, 0.561]	0.251 [-0.050, 0.552]
\$50,000-74,999	0.072 [-0.233, 0.378]	0.050 [-0.253, 0.353]	0.021 [-0.277, 0.319]	0.163 [-0.149, 0.475]	0.137 [-0.167, 0.441]	0.123 [-0.178, 0.425]
MSA residence	0.217 [-0.140, 0.574]	0.186 [-0.168, 0.540]	0.153 [-0.202, 0.509]	0.197 [-0.123, 0.518]	0.177 [-0.131, 0.484]	0.161 [-0.147, 0.468]
Personal experience with prescription opioids	-0.075 [-0.326, 0.177]	-0.092 [-0.343, 0.159]	-0.088 [-0.336, 0.159]	0.340** [0.095, 0.585]	0.356** [0.114, 0.599]	0.358** [0.117, 0.598]
Constant	4.026** [3.432 - 4.621]	4.325** [3.662 - 4.988]	4.913** [4.085 - 5.741]	3.922** [3.385 - 4.458]	4.229** [3.649 - 4.809]	4.520** [3.742 - 5.297]
Observations	1097	1071	1071	1096	1070	1070
<b>R-squared</b>	<b>0.020</b>	<b>0.033</b>	<b>0.043</b>	<b>0.038</b>	<b>0.063</b>	<b>0.065</b>

\*\*\* p<0.01, \*\* p<0.05, \*p<0.1

This table displays coefficients from linear regression models estimating changes in policy support (on a 1-7 scale), adjusting for covariates. Estimates incorporate survey weights to account for complex sampling design.

**Appendix 1.5c: Measures of R-squared values from OLS regression models testing contributions of scale, political ideology, and socio-demographic characteristics in explaining variation in policy support (Part III of III)**

	<i>Increasing government spending to improve treatment of substance abuse problems, including addiction to prescription opioids</i>		
	<b>Model 1: Socio-demographic</b>	<b>Model 2: Adds ideology</b>	<b>Model 3: Adds stigma</b>
Stigma scale			-0.144** [-0.250, -0.0375]
Political ideology (Ref: Liberal)			
<i>Moderate</i>		-0.556** [-0.832, -0.279]	-0.506** [-0.780, -0.231]
<i>Conservative</i>		-1.580** [-1.950, -1.210]	-1.484** [-1.849, -1.120]
Age (years)	0.002 [-0.005, 0.009]	0.005 [-0.002, 0.012]	0.006 [-0.001, 0.013]
Female gender	0.299* [0.059, 0.539]	0.208 [-0.026, 0.442]	0.195 [-0.038, 0.428]
Educational attainment (Ref: high school education)			
<i>Less than high school</i>	-0.176 [-0.607, 0.256]	-0.255 [-0.671, 0.160]	-0.251 [-0.659, 0.157]
<i>Some college</i>	0.014 [-0.298, 0.326]	-0.068 [-0.372, 0.236]	-0.096 [-0.399, 0.206]
<i>Bachelor's or higher</i>	-0.004 [-0.350, 0.343]	-0.135 [-0.467, 0.197]	-0.160 [-0.495, 0.176]
Race (Reference: White)			
<i>Black/African American</i>	0.465* [0.103, 0.827]	0.299 [-0.071, 0.668]	0.293 [-0.078, 0.665]
<i>Other race</i>	0.272 [-0.073, 0.618]	0.283 [-0.051, 0.618]	0.279 [-0.048, 0.607]
Household income category (Ref: >\$75,000)			
<\$10,000	0.229 [-0.303, 0.760]	0.087 [-0.453, 0.627]	0.014 [-0.539, 0.567]
\$10,000-24,999	0.262 [-0.147, 0.671]	0.097 [-0.301, 0.495]	0.057 [-0.341, 0.455]

\$25,000-49,999	0.183 [-0.147, 0.512]	0.202 [-0.117, 0.521]	0.182 [-0.139, 0.503]
\$50,000-74,999	0.011 [-0.331, 0.352]	-0.018 [-0.333, 0.297]	-0.048 [-0.356, 0.259]
MSA residence	0.430* [0.0549, 0.804]	0.314 [-0.024, 0.652]	0.278 [-0.057, 0.613]
Personal experience with prescription opioids	0.002 [-0.272, 0.275]	-0.009 [-0.263, 0.246]	-0.004 [-0.253, 0.246]
Constant	3.631** [3.040 - 4.222]	4.438** [3.810 - 5.065]	5.084** [4.282 - 5.887]
Observations	1098	1072	1072
<b>R-squared</b>	<b>0.032</b>	<b>0.125</b>	<b>0.135</b>

\*\*\* p<0.01, \*\* p<0.05, \*p<0.1

This table displays coefficients from linear regression models estimating changes in policy support (on a 1-7 scale), adjusting for covariates. Estimates incorporate survey weights to account for complex sampling design.

## Appendix 2.1: Narrative text

<b>Group 1: Control group, N=264</b>
No narrative text
<b>Group 2: Low SES base narrative, N=285</b>
<p>Michelle is a woman in her early twenties who began working at a fast food restaurant after she dropped out of high school. She lives in a government-subsidized apartment. Two months ago, Michelle learned that she was pregnant.</p> <p>Last year, Michelle was hit by a car. The accident left her with back, hip, and knee injuries and she had to have surgery. After the surgery, she still had severe pain in her back and hips so her doctor prescribed OxyContin, a narcotic pain medication. Three months after her back surgery, she was still feeling a lot of pain so her doctor prescribed her a higher dose of OxyContin. Michelle began taking more pills to try to control the pain and sometimes ran out before her next refill. When she ran out, she felt anxious, became sweaty and nauseous, and had trouble sleeping. These symptoms lasted until she was able to get more pills. Her doctor refused to give her more pills before her next scheduled refill, so Michelle sometimes took the bus to other parts of town to get more pills from other doctors. Her family and friends noticed that Michelle's behavior had changed, and that she was borrowing money that she didn't repay. When Michelle's family found out that she was pregnant, they told her that they were worried about the pills she was taking and urged her to get help.</p> <p><i>Word count = 232</i></p>
<b>Group 2: High SES base narrative, N=269</b>
<p>Michelle is a woman in her early thirties who began working as the regional manager of a restaurant chain after getting her Master's degree in Business Administration. She lives in a new house with her husband. Two months ago, Michelle learned that she was pregnant.</p> <p>Last year, Michelle was hit by a car. The accident left her with back, hip, and knee injuries and she had to have surgery. After the surgery, she still had severe pain in her back and hips so her doctor prescribed OxyContin, a narcotic pain medication. Three months after her back surgery, she was still feeling a lot of pain so her doctor prescribed her a higher dose of OxyContin. Michelle began taking more pills to try to control the pain and sometimes ran out before her next refill. When she ran out, she felt anxious, became sweaty and nauseous, and had trouble sleeping. These symptoms lasted until she was able to get more pills. Her doctor refused to give her more pills before her next scheduled refill, so Michelle sometimes drove to other parts of town to get more pills from other doctors. Her family and friends noticed that Michelle's behavior had changed, and her husband noticed money missing from their bank account. When Michelle's family found out that she was pregnant, they told her that they were worried about the pills she was taking and urged her to get help.</p> <p><i>Word count = 237</i></p>
<b>Group 4: Low SES narrative with barriers to treatment, N=268</b>

Michelle is a woman in her early twenties who began working at a fast food restaurant after she dropped out of high school. She lives in a government-subsidized apartment. Two months ago, Michelle learned that she was pregnant.

Last year, Michelle was hit by a car. The accident left her with back, hip, and knee injuries and she had to have surgery. After the surgery, she still had severe pain in her back and hips so her doctor prescribed OxyContin, a narcotic pain medication. Three months after her back surgery, she was still feeling a lot of pain so her doctor prescribed her a higher dose of OxyContin. Michelle began taking more pills to try to control the pain and sometimes ran out before her next refill. When she ran out, she felt anxious, became sweaty and nauseous, and had trouble sleeping. These symptoms lasted until she was able to get more pills. Her doctor refused to give her more pills before her next scheduled refill, so Michelle sometimes took the bus to other parts of town to get more pills from other doctors. Her family and friends noticed that Michelle's behavior had changed, and that she was borrowing money that she didn't repay. When Michelle's family found out that she was pregnant, they told her that they were worried about the pills she was taking and urged her to get help.

Michelle took the concerns of her family to heart. She was worried that her inability to stop taking OxyContin might cause problems during her pregnancy. Michelle's doctor recommended that she begin taking methadone, a medical treatment for addiction, on a daily basis. He explained to Michelle that abruptly stopping the OxyContin would cause withdrawal symptoms that might put her health and the baby's wellbeing at risk.

However, when Michelle called a nearby methadone treatment center, they told her that there was a long waiting list. Michelle desperately wanted to begin treatment as soon as possible. She found another treatment center two hours away that had a spot for her. However, Michelle had trouble getting to the treatment center because she didn't have a car. She felt embarrassed asking friends for help because she didn't want them to know about the problems she was dealing with while pregnant. She was grateful to family members who helped out occasionally, but no one could take her every day. Taking a taxi was too much money and there was no bus line between the two towns. The nurse at the methadone center told her that she needed to be there every day for the treatment to be effective. Traveling four hours round-trip on the days she was able to find a ride became exhausting and began to create problems for Michelle at work. Her manager became angry when she was repeatedly late for shifts and threatened to let her go. Michelle missed days of treatments and began using OxyContin again. She felt guilty and ashamed.

*Word count = 493*

**Group 5: Low SES narrative with successful treatment, N=260**

Michelle is a woman in her early twenties who began working at a fast food restaurant after she dropped out of high school. She lives in a government-subsidized apartment. Two months ago, Michelle learned that she was pregnant.

Last year, Michelle was hit by a car. The accident left her with back, hip, and knee injuries and she had to have surgery. After the surgery, she still had severe pain in her back and hips so her doctor prescribed OxyContin, a narcotic pain medication. Three months after her back surgery, she was still feeling a lot of pain so her doctor prescribed her a higher dose of OxyContin. Michelle began taking more pills to try to control the pain and sometimes ran out before her next refill. When she ran out, she felt anxious, became sweaty and nauseous, and had trouble sleeping. These symptoms lasted until she was able to get more pills. Her doctor refused to give her more pills before her next scheduled refill, so Michelle sometimes took the bus to other parts of town to get more pills from other doctors. Her family and friends noticed that Michelle's behavior had changed, and that she was borrowing money that she didn't repay. When Michelle's family found out that she was pregnant, they told her that they were worried about the pills she was taking and urged her to get help.

Michelle took the concerns of her family to heart. She was worried that her inability to stop taking OxyContin might cause problems during her pregnancy. Michelle's doctor recommended that she begin taking methadone, a medical treatment for addiction, on a daily basis. He explained to Michelle that abruptly stopping OxyContin would cause withdrawal symptoms that might put her health and the baby's wellbeing at risk. Michelle was able to enroll in a methadone program near her home. With the help of this program and working with a counselor, Michelle had a healthy pregnancy. Her treatment has continued successfully and she hasn't used OxyContin or other narcotic prescription pain medications in over two years.

*Word count = 345*

**Group 6: High SES narrative with successful treatment, N=274**

Michelle is a woman in her early thirties who began working as the regional manager of a restaurant chain after getting her Master's degree in Business Administration. She lives in a new house with her husband. Two months ago, Michelle learned that she was pregnant.

Last year, Michelle was hit by a car. The accident left her with back, hip, and knee injuries and she had to have surgery. After the surgery, she still had severe pain in her back and hips so her doctor prescribed OxyContin, a narcotic pain medication. Three months after her back surgery, she was still feeling a lot of pain so her doctor prescribed her a higher dose of OxyContin. Michelle began taking more pills to try to control the pain and sometimes ran out before her next refill. When she ran out, she felt anxious, became sweaty and nauseous, and had trouble sleeping. These symptoms lasted until she was able to get more pills. Her doctor refused to give her more pills before her next scheduled refill, so Michelle sometimes drove to other parts of town to get more pills from other doctors. Her family and friends noticed that Michelle's behavior had changed, and her husband noticed money missing from their bank account. When Michelle's family found out that she was pregnant, they told her that they were worried about the pills she was taking and urged her to get help.

Michelle took the concerns of her family to heart. She was worried that her inability to stop taking OxyContin might cause problems during her pregnancy. Michelle's doctor recommended that she begin taking methadone, a medical treatment for addiction, on a daily

basis. He explained to Michelle that abruptly stopping OxyContin would cause withdrawal symptoms that might put her health and the baby's wellbeing at risk. Michelle was able to enroll in a methadone program near her home. With the help of this program and working with a counselor, Michelle had a healthy pregnancy. Her treatment has continued successfully and she hasn't used OxyContin or other narcotic prescription pain medications in over two years.

*Word count = 350*

## **Appendix 2.2: Introductory text from GfK online survey and list of examples of prescription opioids**

Prescription pain medications are narcotic medications prescribed by a doctor to treat pain. These do not include "over-the-counter" pain relievers such as aspirin, Tylenol, or Advil that can be bought in drug stores or grocery stores without a doctor's prescription. To see examples of prescription pain medications, please [click here](#).

VICODIN®, LORTAB®, NORCO®, OR LORCET®/LORCET PLUS®, PERCOCET®, PERCODAN®, OR TYLOX®, OXYCONTIN®, HYDROCODONE, MORPHINE, KADIAN®, OXYCODONE, TRAMADOL, ULTRAM®, CODEINE, TYLENOL® WITH CODEINE, METHADONE, DILAUDID®, FIORICET®, FIORINAL®, OPANA®, OXYMORPHONE, BUPRENORPHINE, SUBOXONE, SUBUTEX, DARVOCET-N®, DARVON®, OR PROPOXYPHENE, DEMEROL®

Note: This introductory text followed questions about survey participants' emotions.

**Appendix 2.3: Weighted and Un-Weighted Characteristics of Survey Respondents  
Compared with National Rates**

	<b>Un-weighted</b>	<b>Weighted</b>	<b>National Comparison</b>
Female (%)	51.1	51.6	51.9
Age (%)			
Ages 18-24	9.7	12.2	12.7
Ages 25-34	15.9	18.4	17.5
Ages 35-44	15.5	15.9	16.8
Ages 45-54	18.2	16.5	18.4
Ages 55-64	21.8	19.7	16.3
Age 65 +	19.0	17.4	18.3
Race (%)			
White only	73.4	65.4	66.0
Black only	9.6	11.4	11.6
Other	17.0	23.1	22.5
Hispanic ethnicity			
Hispanic	9.8	15.2	15.0
Non-Hispanic	90.2	84.8	85.0
Education (%)			
< High school degree	10.7	12.3	12.6
High school degree	31.5	29.7	29.6
Some college	26.9	28.7	28.9
Bachelor's degree or higher	30.9	29.3	28.9
Household income (%)			
Under \$10,000	5.0	5.2	5.2
\$10,000-24,999	14.1	12.6	13.3
\$25,000-49,999	22.1	22.4	22.7
\$50,000-74,999	19.0	18.8	18.4
\$75,000 or higher	39.9	41.1	40.5
Employment status (%)			
Employed	57.7	59.1	59.9
Unemployed	7.5	8.5	4.9
Retired	19.8	18.0	17.2
Other (e.g., disabled, homemaker, other)	15.1	14.4	18.1
Region (%)			
Northeast	19.3	18.4	18.2
Midwest	23.6	21.4	21.4
South	35.4	36.6	37.1
West	21.7	23.5	23.4
Political Party Affiliation (%)			
Republican	26.8	24.9	23.5
Independent	41.0	41.2	43.3
Democrat	32.2	33.9	32.5

Note: GfK KnowledgeNetworks sample weights used to calculate descriptive statistics. For socio-demographic characteristics, comparison data extracted from the March 2013 Current Population Survey. For political party affiliation, comparison data extracted from the 2012 American National Election Study (NES).

**Appendix 2.4: Socio-demographic characteristics of sample, across study groups**

	<b>Weighted (%)</b>	<b>Test of randomization across 6 groups</b>
Female	51.6	Pearson $X^2 = 0.316$ ; $p=0.998$
Age		Pearson $X^2 = 14.854$ ; $p=0.978$
Ages 18-24	12.2	
Ages 25-34	18.4	
Ages 35-44	15.9	
Ages 45-54	16.5	
Ages 55-64	19.7	
Age 65 +	17.4	
Race		Pearson $X^2 = 0.372$ ; $p=1.000$
White only	65.4	
Black only	11.4	
Other	23.1	
Hispanic ethnicity		Pearson $X^2 = 0.221$ ; $p=0.999$
Hispanic	15.2	
Non-Hispanic	84.8	
Education		Pearson $X^2 = 0.671$ ; $p=1.000$
< High school degree	12.3	
High school degree	29.7	
Some college	28.7	
Bachelor's degree or higher	29.3	
Household income		Pearson $X^2 = 6.876$ ; $p=0.999$
Under \$10,000	5.2	
\$10,000-24,999	12.6	
\$25,000-49,999	22.4	
\$50,000-74,999	18.8	
\$75,000 or higher	41.1	
Employment status		Pearson $X^2 = 15.301$ ; $p=0.586$
Employed	59.1	
Unemployed	8.5	
Retired	18.0	
Other (e.g., disabled, homemaker, other)	14.4	
Region		Pearson $X^2 = 0.390$ ; $p=1.000$
Northeast	18.4	
Midwest	21.4	
South	36.6	
West	23.5	
Political Party Affiliation		Pearson $X^2 = 16.156$ ; $p=0.160$
Republican	24.9	
Independent	41.2	
Democrat	33.9	

Note: Chi square tests were used to test differences across study groups. GfK KnowledgeNetworks sample weights used to calculate descriptive statistics.

### Appendix 3.1: Health home staffing requirements

Position	Time requirements	Qualifications	Responsibilities
Health home director	0.5 FTE / 0-249 enrollees 1.0 FTE / 250-374 enrollees 1.5 FTE / 375-499 enrollees 2 FTE / 500-624 enrollees 2.5 FTE / 625-749 enrollees 3.0 FTE / 750-874 enrollees 3.5 FTE / 875-999 enrollees	i. Bachelor's degree + 2 years health administration experience, or ii. Master's degree, or iii. licensed RN, or iv. licensed physician or NP	<ul style="list-style-type: none"> <li>Leads implementation and coordination</li> <li>Leads practice transformation</li> <li>Develops and maintains relationships with external providers</li> <li>Monitors health home performance at population and participant level and leads quality improvement efforts</li> <li>Designs and develops prevention and wellness initiatives</li> </ul>
Health home care manager	0.5 FTE / 0-249 enrollees 1.0 FTE / 250-374 enrollees 1.5 FTE / 375-499 enrollees 2 FTE / 500-624 enrollees 2.5 FTE / 625-749 enrollees 3.0 FTE / 750-874 enrollees 3.5 FTE / 875-999 enrollees	i. RN or NP, or ii. PA under supervision of physician	<ul style="list-style-type: none"> <li>Develops wellness and prevention initiatives</li> <li>Facilitates health education groups</li> <li>Participates in care plan development for enrollees</li> <li>Consults with staff about health conditions</li> <li>Assists in contacting medical providers</li> <li>Provides training on medical issues</li> <li>Tracks assessments and screenings for patients</li> <li>Assists in implementing IT programs and initiatives</li> <li>Monitors health IT systems, including CRISP</li> <li>Monitors and reports services, performance measures, and outcomes</li> </ul>
Medical consultant	1.5 hours / enrollee / year	MD or NP	<ul style="list-style-type: none"> <li>Reviews and signs off on initial intake assessments</li> <li>Participates in treatment planning, case reviews</li> <li>Consults with other practitioners in the health home</li> <li>Consults regarding particular enrollee issues</li> <li>Assists in coordinating with external providers</li> <li>Provides staff training</li> </ul>

Note: Table recreated from material in Maryland Department of Health and Mental Hygiene's Health Home Provider Manual accessible online at: [http://dhhm.maryland.gov/bhd/Documents/MD\\_HealthHomeServices.pdf](http://dhhm.maryland.gov/bhd/Documents/MD_HealthHomeServices.pdf)

## **Appendix 3.2: Interview guides**

### Opioid Treatment Program Health Home Interview Guide

1. What were the primary factors contributing to the OTP's decision to apply to become a health home?
2. Describe the adoption and implementation timeline to-date and any important objectives in the near future. Begin with adoption and transition period and then we can move onto the current state of implementation and finish with discussion of future directions and goals for this health home.
3. What were your main concerns, if any, about becoming a health home?
4. How has your work flow as [position on health home] changed as a result of the health home implementation?
5. What have been the most significant barriers the OTP has faced during the process of implementing the health home so far?
6. What have been the most important facilitators of the process of implementing the health home so far?
7. How have patients responded to the health home?
  - a. Has the OTP health home solicited patient feedback during the implementation process?
  - b. How has the OTP / health home staff responded to patient criticism (if any) of the implementation process?
  - c. How have the needs of your patients influenced the implementation of the health home? How have you adapted the health home model to address patient needs?
8. How do you obtain and track patient information for internal quality improvement efforts? Do you use the eMedicaid system for these purposes or your regular health IT system?
9. Do you think the health home implementation has affected the experience of patients in the OTP who are not eligible to participate in the health home (e.g., not insured through Medicaid, no chronic illness)? In what ways?
10. What are the particular strengths of this OTP that have made it a good candidate for becoming a health home?
11. In what ways do you think your organization differs from OTPs that have not applied to become health homes?
12. Why do you think other OTPs have not applied to become a health home?
13. What advice would you have for other OTPs interested in applying to become a Medicaid health home?
14. What additional assistance could the Maryland Medicaid office provide to OTP health homes or OTPs interested in becoming health homes?

15. What support or guidance have you obtained from local substance use treatment organizations? (e.g., Behavioral Health System Baltimore, National Council on Alcoholism and Drug Dependence of Maryland, Maryland Addictions Directors Council, Maryland Association of Addiction Professionals, Baltimore City Needle Exchange, or others)
16. Is there anything I missed that you want to share about the OTP health home demonstration or your health home's experience?
17. Is there anyone that you would recommend I talk to at [this OTP health home / partner organization / other OTP]?
18. Is there anyone that you would recommend I talk to at a partner organization, local non-profit, or consumer advocacy organization?

Opioid Treatment Program (non-adopter) Interview Guide

1. Can you tell me about your OTP (history, size, patient population, proportion of patients enrolled in Medicaid, types of services provided, any somatic or primary health care services provided, etc.)?
2. How you describe your OTP in terms of its similarities or differences from other OTPs in Maryland (e.g., size, location, services provided, financing, etc.)?
3. Does your OTP engage in information-sharing about best practices and lessons learned with other OTPs in Maryland? About what sorts of topics?
4. What have you heard about Medicaid health homes in Maryland? Where have you obtained this information (e.g., state, other OTPs, professional associations like MATOD, etc.)?
5. Has your OTP considered applying to become a health home? What factors have influenced the OTP's decision not to apply to become a health home at this point?
6. Do you think OTPs are an appropriate setting for implementing a health home?
7. How familiar are you with the Medicaid reimbursement for health home services? Do the terms seem feasible for implementing the health home?
8. What relationships with primary care providers and medical specialists in the community does your OTP already have?
9. Do you already provide some of the health home services (e.g., care coordination, health promotion, etc.)?
10. Do you think the health home is more appropriate for certain types of OTPs or geographic settings (e.g., community-based, hospital-based, county-based, in urban or rural or suburban area, etc.)?

11. What barriers exist to implementing a health home at this time (e.g., disinterest, no leader, financial limitations, lack of partnerships with primary care providers, lack of information on how to become a health home, etc.)?
12. Why do you think so few OTPs in Maryland have become health homes?
13. What additional support could the Maryland Medicaid office provide to OTPs that serve Medicaid patients?
14. What might DHMH do to help more OTPs implement a health home?
15. Is there anything I missed that you want to share about your OTP or the health home demonstration?
16. Is there anyone that you would recommend I talk to about this topic?

#### Maryland State Government Interview Guide

1. Briefly describe your role at DHMH and your office or division's role in supporting the health home demonstration.
  - a. What are the responsibilities of [DHMH Behavioral Health Administration / Medicaid] in supporting the health home demonstration?
  - b. How would you differentiate the roles and responsibilities of BHA and Medicaid with respect to the health home demonstration?
2. Implementation: Describe the roll-out of the Medicaid health home demonstration from the beginning of your involvement with this initiative.
  - a. How did the state promote adoption of the health home among OTPs?
  - b. Did you target specific OTPs that seemed as though they would be good candidates for implementing a health home? If so, how did you identify these OTPs?
  - c. What factors influenced the decision to implement opt-in rather than opt-out enrollment?
  - d. What type of technical assistance have you provided to those OTPs implementing or interested in implementing a health home?
  - e. What criteria has the state used to evaluate OTPs during the health home approval process?
  - f. What challenges has the OTP component of the health home demonstration faced to-date?
  - g. What have been the lessons learned to-date with respect to the OTP component of the health home demonstration?
3. Sustainability: What are the prospects for sustainability of health homes in Maryland beyond these initial two years of enhanced federal matching?
  - a. Will this affect reimbursement to OTPs for health home services?
  - b. Are there efforts underway to encourage additional OTPs to become health homes?
4. Monitoring: How is the state monitoring the implementation of health homes among OTPs?
  - a. What type of data is being collected? (Who collects this data? Use of eMedicaid?)
  - b. How does DHMH and Medicaid divide responsibilities for the monitoring process?
  - c. Is the monitoring process dynamic? Do OTPs have access to information or summary reports to engage in ongoing quality improvement with respect to the health home?
5. Evaluation: By what metrics will the state assess the effectiveness of the health home demonstration, specifically with respect to OTPs (quality measures? Or costs?)?

6. Context: How does the health home program fit within broader efforts to integrate behavioral health services and somatic care in Maryland?
  - a. What was the thinking behind the transition to the carve-out Value Options while DHMH also integrated behavioral health services administratively?
7. How would you describe the health home demonstration in Maryland currently in terms of its status in the implementation process (e.g., early implementation, implementation in progress, implementation complete, etc.)?
8. What are the state's plans for the health home demonstration among OTPs within the next 2-5 years?
9. Is there anything I missed that you want to share about the OTP health homes?
10. Is there anyone that you would recommend I contact about the OTP health home demonstration?

Additional questions (if time)

1. How often does internal staff at [Maryland Medicaid / BHA] communicate with one another and meet formally about the health home demonstration?
2. How often does staff at [Maryland Medicaid / BHA / SOTA] communicate or meet with OTP health homes?
3. Can you tell me about the health home advisory committee?
  - a. Who is represented on the Health Home Advisory Committee?
  - b. What is the function of the Health Home Advisory Committee?
  - c. What activities has the committee engaged in to-date?
  - d. What future activities are planned?
4. What sort of contact have you had with OTPs during the health home demonstration so far?
  - a. Have any formal processes been established for soliciting OTP feedback?
  - b. What sorts of questions or concerns have OTPs raised regarding the health home demonstration?
  - c. Has [Maryland Medicaid / BHA] been in contact with non-participating OTPs? What sorts of explanations have these OTPs provided for not participating in the health home program?
5. What do you see as the major barriers facing OTPs in terms of participating in the health home demonstration?
6. What do you view as the major factors inhibiting participation in the health home demonstration among OTPs?
7. What characteristics distinguish OTPs that applied to become health homes from those that did not?
8. How would you describe a successful health home implementation? What factors do you view as critical to the successful implementation of health homes in OTPs?
9. Have you engaged in information-sharing with state officials in Vermont or Rhode Island regarding their health home demonstrations among OTPs?

# Curriculum Vitae

## Alene Kennedy Hendricks

### Contact Information

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### Education

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**PhD Candidate, Health and Public Policy**, anticipated completion 2015  
Johns Hopkins Bloomberg School of Public Health, Baltimore, MD  
Certificate in Health Disparities and Health Inequality, 2014

**Bachelor of Arts, Anthropology with Special Honors**, *magna cum laude*, 2006  
The George Washington University, Washington, DC

### Awards

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Agency for Healthcare Research and Quality National Research Service Award (T32 Training Grant), 2011-2013  
NORC at the University of Chicago Employee Recognition Award, 2008  
Jane B. Hart Award for Outstanding Undergraduate Thesis, 2006  
George Washington University Honors Program Scholarship, 2002-2006  
Phi Beta Kappa, inducted 2006

### Research Experience

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**Research Assistant to Dr. Colleen Barry and Dr. Emma McGinty**, May 2013-Present

- Collaborated on quantitative content analysis of the U.S. news media's coverage of prescription opioid abuse during the period 1998-2012.
- Assisted in development of 2014 nationally representative public opinion survey of knowledge and attitudes surrounding prescription opioid abuse, stigma toward people addicted to prescription opioids, and potential policy responses to reduce misuse of these medications. Conducted analysis of survey data.
- Contributed to development of message framing experiment assessing public attitudes related to naloxone to prevent overdose.
- Supported development of 2015 public opinion survey of knowledge and attitudes surrounding safe home practices among adults who have used prescription opioids in the last year and have children living in the home.
- Conducted multiple interrupted time series study to assess impact of Florida policies targeting pill mills on opioid overdose mortality.

- Project tasks have included: instrument development, data analysis and interpretation, and manuscript preparation.

**Research Assistant to Dr. Craig Pollack, Jan 2013-Present**

- Participated in set of studies focusing on Maryland public housing population that: examine how caretakers' social networks influence children's mental and physical health outcomes; assess impact of dispersed v. clustered public housing on health composition of children's social networks; assess how the diversity of children's social networks influences BMI and obesity status; and explore how different measures of socioeconomic status relate to health in this vulnerable population.
- Project tasks have included generating study questions, identifying appropriate study design, conducting data analysis, and preparing manuscripts for publication.

**Evaluator, Behavioral Health Systems Baltimore, November 2014-present**

- Independent evaluator of Chrysalis House Healthy Start, a program that aims to prevent recidivism and improve mother and child outcomes by providing diagnostic, treatment and transitional services to pregnant offenders with mental health and substance use disorders
- Tasks include: conducting structured interviews with program participants, reviewing program materials, and preparing monthly and annual reports for Maryland's Department of Health and Mental Hygiene and Behavioral Health Systems, Baltimore

**Research Assistant to Dr. Roland Thorpe, Jan-June 2014**

- Conducted analyses of data from National Health Interview Survey and Exploring Health Disparities in Integrated Communities Study-Southwest Baltimore (EHDIC-SWB) on racial disparities in health behaviors among men and the role of racial residential segregation.
- Collaborated on manuscript development.

**Research Assistant to Dr. Leiyu Shi, June - August 2012 and 2013**

- Conducted literature reviews on various issues related to the primary care infrastructure and the impact of the Affordable Care Act on primary care, the health safety net workforce, insurance coverage, and disease management.
- Revised and updated textbook chapter for new edition on the US public health infrastructure.

**Teaching Experience**

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Health Policy IV: Research and Evaluation Methods for Health Policy Teaching Assistant, 2013-2014

Led lab sessions, helped to develop new course assignments, worked with students to develop final papers, and graded student assignments.

The Research and Proposal Writing Process I Teaching Assistant, 2013-2014

Supported course logistics, provided student feedback, and led multiple sessions on proposal development.

Introduction to Methods for Health Services Research and Evaluation Teaching Assistant, 2013

Oversaw multiple lab groups, provided feedback to students, and graded student assignments.

**Other Professional Experience**

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**U.S. Peace Corps Volunteer, June 2009 – July 2011**

Rustavi, Republic of Georgia

- Served as: English teacher in local school; trained teachers in pedagogy and computer applications; chair of public health promotion committee; organized women's health education fair involving 16 non-governmental organizations; and led school sanitation improvement project.
- Grand awards: USAID Small Projects Assistance Grant, Peace Corps Partnership Program Grant, Appropriate Projects (Water Charity) Grant

**NORC at the University of Chicago, Health Research Division**, July 2006 - May 2009

Research Analyst, Jan 2008 – May 2009

Research Assistant, July 2006 - Dec 2007

Bethesda, MD

- Supported survey and interview protocol development; collected and analyzed qualitative data; conducted literature reviews; prepared Internal Review Board (IRB) applications; assisted in presentations at professional meetings; prepared research proposals and project reports; provided technical assistance to federally-funded grantees; and collaborated with clients.
- Project work funded by: U.S. Department of Health and Human Services (DHHS) Agency for Healthcare Research and Quality (AHRQ), Health Resources and Services Administration (HRSA), Office of Minority Health (OMH) and the Office of the Assistant Secretary for Planning and Evaluation (ASPE); National Association of County and City Health Officials (NACCHO); and the National Rural Health Association (NRHA).

### **Peer-reviewed publications**

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Thorpe, Jr., RJ, **Kennedy-Hendricks A**, Griffith, D.M., Bruce MA, Coa K, Bell CN, Young J, Bowie J, LaVeist TA. (in press). Race, Social and Environmental Conditions, and Health Behaviors in Men. Accepted June 2, 2015 by *Family and Community Health*.

Bachhuber MA, McGinty EE, **Kennedy-Hendricks A**, Niederdeppe J, Barry CL. (in press) Messaging to increase public support for naloxone distribution policies in the United States: results from a randomized survey experiment. Accepted May 21, 2015 by *PLOS*.

**Kennedy-Hendricks A**, Schwartz H, Thornton RJ, Griffin BA, Green Jr HD, Kennedy DP, Burkhauser S, Pollack CE. (in press) Intergenerational social networks and health behaviors among children living in public housing. Accepted March 3, 2015 by *Am J Public Health*.

Schwartz H, Burkhauser S, Griffin BA, Kennedy DP, Green Jr HD, **Kennedy-Hendricks A**, Pollack CE. Do the Joneses help you keep up? A natural experiment in exposure to non-poor neighbors. *Housing Policy Debate*. 2014 Sep 26. [Epub ahead of print].

Thorpe RT, Bell CN, **Kennedy-Hendricks A**, Harvey J, Smolen JR, Bowie JV, LaVeist T. Disentangling race and social context in understanding disparities in chronic conditions among men. *J Urban Health*. 2015 Feb;92(1):83-92. doi: 10.1007/s11524-014-9900-9.

Pollack CE, Green HD Jr, Kennedy DP, Griffin BA, **Kennedy-Hendricks A**, Burkhauser S, Schwartz H. The impact of public housing on social networks: A natural experiment. *Am J Public Health*. 2014;104(9): 1642-1649. doi: 10.2105/AJPH.2014.301949.

### **Book chapter**

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Mayes G and **Kennedy-Hendricks A**. Chapter 5: Organization of the public health system. In: Novick & Morrow's Public Health Administration: Principles for Population-Based Management. 3rd ed. Eds: Shi L and JA Johnson. Jones & Bartlett Learning, 2013.

### **Manuscripts under review or in progress**

---

**Kennedy-Hendricks A**, Richey M, McGinty EE, Barry CL, Stuart E, Webster D. Opioid overdose deaths and Florida's crackdown on pill mills. Accepted with revisions at *Am J Public Health*.

McGinty EE, **Kennedy-Hendricks A**, Baller J, Niederdeppe J, Gollust S, Barry CL. Crime wave or public health crisis? News media framing of prescription pain medication abuse in the United States, 1998-2012. Revise and resubmit at *Psychiatric Services*.

Barry CL, **Kennedy-Hendricks A**, Gollust S, Niederdeppe J, Bachhuber MA, Webster D, McGinty EE. Understanding Americans' views on the prescription pain medication abuse epidemic. Revise and resubmit at *Addiction*.

**Kennedy-Hendricks A**, Schwartz H, Griffin BA, Burkhauser S, Green Jr HD, Kennedy DP, Pollack CE. Social networks and health among children living in different types of suburban public housing. Under review.

**Kennedy-Hendricks A**, McGinty EE, Barry CL. Effects of competing narratives on public perceptions of prescription opioid addiction during pregnancy. Under review.

Pachucki MC, **Kennedy-Hendricks A**, Pollack CE. Network diversity and adolescent obesity in an ethnically diverse youth cohort. In progress.

### **Dissertation papers**

---

Effects of competing narratives on public perceptions of prescription opioid addiction during pregnancy (under review)

Stigma toward persons with prescription opioid addiction and public support for punitive and public health-oriented policies (in progress)

Implementation of Medicaid health homes in Maryland opioid treatment programs (in progress)

### **Policy briefs**

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Meit M, Briggs T, **Kennedy A**, Sutton J. Spontaneous evacuation following a dirty bomb or pandemic influenza: Highlights from a national survey of urban residents' intended behavior. NORC Walsh Center for Rural Health Analysis W. Series No. 12. November 2007.

Sutton J, **Kennedy A**, Hammer L, Yang G. How will elimination of hospital bad debt reimbursement affect rural PPS hospitals? NORC Walsh Center for Rural Health Analysis W. Series No. 11. July 2007.

Meit M, **Kennedy A**, Briggs T. Urban-to-rural evacuation: Planning for population surge. NORC Walsh Center for Rural Health Analysis W. Series No. 9. April 2007.

### **Professional activities**

---

Member, American Public Health Association, 2011-present

Member, AcademyHealth, 2011-present

Vice President, AcademyHealth Johns Hopkins Bloomberg School of Public Health (JHSPH)  
Student Chapter, 2012-2013

Student Representative, JHSPH Dept. of Health Policy and Management's Public Health Practice  
Committee, 2011-2012

Student Representative, JHSPH Dept. of Health Policy and Management's Student Coordinating  
Committee, 2011-2012