Summer 7-15-2020

Essays on Emotional Well-being, Health Insurance Disparities and Health Insurance Markets

Disha Shende

Disha Shende

Candidate

Economics

Department

This dissertation is approved, and it is acceptable in quality and form for publication:

Approved by the Dissertation Committee:

Alok Bohara, Chairperson

Richard Santos

Sarah Stith

Smita Pakhale

Essays on Emotional Well-being, Health Insurance Disparities and Health Insurance Markets

DISHA SHENDE

B.Tech., Shri Guru Govind Singh Inst. of Engr. and Tech., India, 2010
M.A., Applied Economics, University of Cincinnati, 2015
M.A., Economics, University of New Mexico, 2017

DISSERTATION

Submitted in Partial Fulfillment of the
Requirements for the Degree of

Doctor of Philosophy
Economics

At the

The University of New Mexico
Albuquerque, New Mexico

July 2020

DEDICATION

To all the revolutionary figures who fought for my right to education

ACKNOWLEDGEMENT

This has been one of the most important bodies of work in my academic career so far. It would not have been possible without the people who directly or indirectly supported me throughout my doctoral journey. Firstly, I want to thank my mother, Kalpana, for believing in my dreams and ambitions; my father, Vasant, for his constant support throughout my academic and professional career. I also want to express gratitude towards my loving siblings, Shirani, Snehal and Purvesh and my brothers-in-law Ritesh and Atish for encouraging me not to give up. Also, I am thankful for the presence of my little nephews and niece in my life as they always cheer me up especially during stressful times.

I learnt a lot during my doctoral program and most importantly it helped improve my rational and critical thinking skills. Coming from a background of a computer science engineer with the experience of working in a corporate world, academia was a new world for me. I felt it would be tough to make a successful transition to the economics program since this area was new to me. However, with the help of my professors and mentors from my masters and doctoral programs this transition became easier. I sincerely want to thank my doctoral advisor, Prof. Alok Bohara for giving me the opportunity to work under his guidance and for helping me navigate through complex challenges in my doctoral program. He is one of the most knowledgeable people I met, and I wish to gain at least half the knowledge that he has. I cannot thank enough my dissertation committee member, Prof. Richard Santos, for always looking after me throughout my doctoral program and for always being available to answer my questions. My doctoral journey would have been difficult without his support. I also want to express my deepest gratitude towards Dr. Claudia Diaz Fuentes for choosing me to work with her and helping me develop the final research paper in my dissertation. I learnt a lot from her about doing the high-quality research and following the best research practices. Finally, I want to thank my other dissertation committee members Dr. Sarah Stith and Dr. Smita Pakhale for their valuable feedback and comments on my dissertation. Throughout my life, I gained a great deal of knowledge from my teachers, professors and mentors. While some of them have directly helped me to achieve my goals, others have given me important life lessons. I would not be where I am without them and I want to thank each one of them.

Essays on Emotional Well-being, Health Insurance Disparities and Health Insurance Markets

BY

DISHA SHENDE

B.Tech., Shri Guru Govind Singh Inst. of Engr. and Tech., India, 2010
M.A., Applied Economics, University of Cincinnati, 2015
M.A., Economics, University of New Mexico, 2017
Ph.D., Economics, University of New Mexico, 2020

ABSTRACT

This dissertation has three research papers. **First paper** looks at the effect of social networks on emotional well-being of cancer patients by studying the response of social networks on their depression symptoms. Using the data from a primary survey conducted in Nepal, the study finds that social networks significantly reduce depression symptoms among cancer patients. The results strongly advocate for the importance of the social networks in improving their emotional well-being. **Second paper** examines the health coverage disparities among Hispanic and non-Hispanic young adults in five southwestern states of the United States. Using the pooled data from American Community Survey 2015-2017, the study finds that despite ACA, ethnic-racial group, gender, education, income, employment status, age, school going status are still the key determinants of health coverage among young adults. States that expanded Medicaid showed a significant improvement in the health coverage of young adults. Findings also indicate that the disparities in health coverage among Hispanic and non-Hispanic young adults are largely attributed to the citizenship status and living in a household where language other than English is spoken. **Third paper** studies the association between increased market concentration and plan premiums for individuals and families from 2015-2020 in insurance marketplaces, as well as the impact of Medicaid expansion on the plan premiums. Results show a significant positive effect of high market concentration on plan premiums for all individuals and families regardless of Medicaid expansion status. This study emphasizes the importance of insurer competition in health insurance markets and can be useful in state and federal governments' decisions regarding insurance market regulation.

Table of Contents

CHAPTER 1

Introduction

This dissertation includes three research articles that relate to international development and public economics with a focus on health. Chapter 1 provides the introduction of the dissertation, Chapter 2 is the first research paper, Chapter 3 is the second research paper, Chapter 4 is the third research paper and finally Chapter 5 concludes the dissertation.

The first paper examines how social networks affect the emotional well-being of cancer patients by studying the effect of social networks on their depression symptoms. The data for this paper is from a field survey conducted in four major hospitals in Nepal from May-July 2018. The survey collected data on the quality of life of cancer patients and patients of other chronic illnesses. The data suggested that cancer patients suffered from higher levels of emotional stress compared to other patients which could have led to depression symptoms among them. One of the major contributors to this emotional stress was financial burden faced by the patients for the treatment. The hypothesis of this paper was that access to social networks can help reduce these depression symptoms and improve their emotional well-being. Social networks were measured by the quality of the relationships of cancer patients with their friends, family, and colleagues. Depression symptoms were measured using nine questions from Patient Health Questionnaire (PHQ-9) which could be suggestive of depression among the patients. This study used mediation analysis with structural equation modelling to understand the effect of the social networks in coping with depression symptoms. Using Stress Buffering Model and Direct Effect Model, I obtained direct, indirect and total effect (by adding direct and indirect effects) of social networks on depression symptoms. I found that social networks significantly reduced depression symptoms among cancer patients via both direct and indirect effects. I also found that social networks helped cancer patients differently by gender and that among females this effect was higher. These results strongly advocate for the importance of the social networks in improving the emotional well-being of cancer patients. Policies targeted towards improving social networks of the cancer patients should be implemented. Such policies could include the introduction of cancer support groups, hospital support groups and women's support groups in Nepal where cancer patients can get the much-needed emotional support and where they can freely share their feelings with other members of the group. Another policy recommendation is that government of Nepal should have policies which can help patients financially with their treatment thus significantly reducing patients' emotional stress and potential depression symptoms.

The second paper looks at the health insurance disparities among Hispanic and non-Hispanic young adults in the five southwestern (SW) states (Arizona, California, Colorado, New Mexico and Texas) of the United States. Young adults in the United States are a group of people with highest uninsured rates. The uninsured rates differ largely by race, ethnicity, and gender. Despite many attempts to reduce the ethno-racial differences in the insurance coverage, these disparities persist. The Patient Protection and Affordable Care Act (ACA) was one of the major health reforms in the United States which helped young adults to get insurance coverage through different provisions of ACA. However, ACA has not closed the ethno-racial disparities in the insurance coverage. Ethno-racial characteristics along with gender still determine the status of health insurance coverage for young adults. Hispanics are the largest minority group in all five SW states but also have highest uninsured rate in these states. This study used the data from American Community Survey (2015–2017) for the five SW states of the US. Ethno-racial groups for this study are defined as Hispanic, non-Hispanic White (White), and non-Hispanic Black (Black). There are three objectives in this paper. First was to estimate the effect of ethno-racial group on predicting the likelihood of the health insurance coverage type for young adults by gender between ages 18-26 years. Health insurance coverage type can be one of the three: private insurance, public insurance or uninsured. Second objective was to explain the ethno-racial gap for private insurance among employed Hispanic and White young adults by gender. The final objective was to explain the ethno-racial gap in health insurance coverage for Hispanic and White young adults who are neither in school nor in the labor force (NSNL). I used Multinomial logit regression to estimate the likelihood of the insurance type by gender for these ethno-racial groups. I found that ethno-racial group, citizenship, household speaking foreign language, gender education, income, employment status, age and school going status are key determinants of the health insurance coverage among young adults. The model also controlled for states which are used as a proxy for Medicaid expansion. States with Medicaid expansion show increased health coverages for young adults. To explain the ethno-racial and gender disparities in the insurance coverage among employed young adults and young adults who are neither in school nor in the labor force (NSNL), I used Blinder-Oaxaca decomposition. The interesting finding from the decomposition was that citizenship and speaking foreign language in the household explained major portions of the health coverage disparities among Hispanics and Whites. This was true for both employed young adults and young adults who are NSNL. The results showed that there is a systemic disparity that persist among Hispanic and non-Hispanic young adults in the SW United States. Health insurance is a necessity for everyone in the United States given the high medical costs. There is a need of a major health reform that can provide the health insurance coverage for uninsured and under insured populations irrespective of their age, ethno-racial group, household language, citizenships or other personal attributes.

The third paper studies the market concentration of the insurance companies and its effect on the premiums of the insurance plans. The State and Federal Marketplaces for health insurance came into existence under the Patient Protection and Affordable Care Act (ACA) to

provide affordable health insurance plans to Americans. In recent years there has been a significant increase in the premiums of all health insurance plans for individuals of different age. The health insurance market structure seems to influence the plan premiums as the plan premiums every year are correlated with the number of insurers. The health insurance market in year 2020 had much fewer competition compared to year 2015. This study looks at the effect of the increased market concentration of health insurance companies on changes in plan premiums from year 2015-2020. I used the extensive plan level data, insurance market structure data and socio-demographic data at the level of geographic rating area (GRA) to study the effect of monopolistic competition on the plan premiums. I also analyzed if the effect on premium changes is consistent across individuals of three different age groups: 27-year-old, 50-year-old and 30-year-old with children (family). Finally, I explored the impact of the provision of Medicaid expansion under ACA on plan premiums at the GRA level. To simplify the analysis, I used only second lowest cost silver plans for adults with non-CSR (cost-sharing subsidy) options from year 2015-2020. This study used random effects model for panel data 2015-2020 to estimate the effect of market concentration measured by a binary variable as well as a categorical variable on the plan premiums. I found a high market concentration increased the plan premiums regardless of the status of Medicaid expansion for individuals of all three ages. The study also revealed that this effect on premium increase is similar for individuals of different age groups thus making it consistent across general population. The results emphasize the importance of insurer competition in health insurance markets and can be instrumental in making future health reforms in the insurance markets.

CHAPTER 2

Effect of Social Network on Emotional Health of Cancer Patients in Nepal

Introduction

Globally, cancer continues to be the major cause of morbidity and mortality. One in five men and one in six women worldwide develop cancer during their lifetime, and one in eight men and one in 11 women die of the disease. The burden of cancer is huge for patients as they deal with not just physical burden but also psychological and mental burden. Compared to the developed countries, the burden of cancer is greater in low and middle-income countries. World Health Organization (WHO) states that in 2018, 9.6 million people died from cancer globally. Of these deaths, 70 percent of deaths came from central and low-income nations (WHO, 2018).

Nepal is a low-income country with lot of diversity in terms of culture, religion, and ethnicity. It is a country with a population of around 30 million people. In Nepal, non-communicable diseases (NCDs) are presently the main causes of deaths and are outperforming other communicable diseases and maternal or neonatal deaths. Nepal doesn't have a national cancer registry which can provide the exact number of cancer incidences per year but according to (Central Bureau of Statistics (Nepal), 2011), it is estimated to be between 50,000 - 70,000 per year. According to (WHO, 2018), cancer mortality in Nepal is higher in females compared to males; 7,400 and 6,900, respectively. Detection of cancer is not easy in Nepal as screening and early detection facilities are limited only to the cities. Rural communities are deprived of screening facilities in primary public health centers. This makes it hard to detect and treat cancer.

In Nepal, cancer patients go through multiple mental burdens. Firstly, the financial burden due to cancer is huge because of the high treatment costs and lower financial status. Secondly, cancer patients find it hard to deal with prognosis considering the cost of cancer treatment, as an individual's per capita income is only US $600. Therefore, many people find it difficult to afford cancer treatments. Also, there is no compulsory health insurance scheme in the country which can help reduce the financial burden on patients. Cancer patients bear all costs on their own and they often end up selling their houses and properties for treatment purposes. Estimated cancer treatment costs are much lower in a government hospitals such as Bir Hospital (US$ 68.22) compared to private clinics (US$ 200-250) (Piya & Acharya, 2012). However, these government hospitals are present only in the major cities of Nepal. The Nepal government has recently started providing multiple programs and therapy subsidies to tackle the escalating financial burden of cancer (NHRC, 2018). They started offering help with cancer treatment by offering a US$ 620.27 (NRs 50,000.00) fund to support every person with cancer. The payment is not paid to the patient but is given to the organization to cover radiation therapy, medication, and investigation expenses. However, since this is a recent development by the Nepalese government, there is no information available as to whether the grant is enough to protect patients from financial stress. Another major challenge is the attitude of patients, their families and even many doctors and health care professionals regarding cancer, specifically that cancer is incurable (Piya & Acharya, 2012). This belief can create a pessimistic attitude towards life from cancer patients.

Cancer is a life-threatening disease and leads to great distress in patients undergoing the treatment. Cancer can drastically change the economic, social, and physiological circumstances of a patient. High levels of mental distress in cancer patients may lead to anxiety, depression or both for long periods of time (Linden, Vodermaier, MacKenzie, & Greig, 2012). Depression leads to lower quality of life (QOL) and affects patient outcomes resulting in higher mortality rates (Colleoni et al., 2000; Pinquart & Duberstein, 2010).

Literature Review

(Massie, 2004) found that depression is more common in cancer patients than in the general population. Depression influences up to 20 percent of cancer patients, irrespective of the stage in the trajectory of cancer, and whether in curative or palliative treatment (Mitchell et al., 2011). A systematic review and meta-analysis of depression among cancer treated patients showed that 15 percent of patients suffer from major depression, 20 percent of patients suffer from minor depression and 10 percent of patients suffer from anxiety. Current depression, poorly regulated pain, advanced-stage cancer, absence of family support and diagnosis of specific kinds of cancer (i.e. pancreatic cancer) are all correlated with an enhanced danger of depression in patients with cancer (Ciaramella & Poli, n.d.; Karnell, Funk, Christensen, Rosenthal, & Magnuson, 2006). Depression is also associated with the weak cure of cancer and poor survival of cancer patients (DiMatteo & Haskard-Zolnierek, 2010). Studies have shown that if depression remains untreated, it can have an adverse impact on other health (Glassman et al., 2002; House, Knapp, Bamford, & Vail, 2001; Watson, Haviland, Greer, Davidson, & Bliss, 1999). Depression and suicidal thoughts are also closely linked together. Cancer increases the risk of suicidal thoughts in all cancer patients (Robson, Scrutton, Wilkinson, & MacLeod, 2010). The depression symptoms faced by the cancer patients depends on their age, gender and social connections. According to a study by (Walker et al., 2014), younger cancer patients, cancer patients who were socially deprived, and female cancer patients face a higher risk of depression.

A strong social support network for cancer patients undergoing therapy has been linked to an enhanced quality of life (Ludwig & Zojer, 2007). Several studies have shown that there is a positive relation between social support and mental health outcomes (Aneshensel & Frerichs, 1982; Billings & Moos, 1984; Holahan & Moos, 1981). Most patients in support groups felt more emotionally satisfied, received assistance in handling side effects, and experienced less pain and anxiety (Jones & Demark-Wahnefried, 2006). I was interested to study if the support provided by the social networks reduced the emotional distress caused because of cancer. I particularly wanted to focus on the depression symptoms faced by cancer patients. Hence, my first aim in this paper was to look at the effect of social networks on depression symptoms of cancer patients.

Literature has shown that, women, in general, have larger, denser, more supportive, and more diverse social networks than men (Acitelli & Antonucci, 1994; Antonucci, 1994; Antonucci & Jackson, 1987; Pugliesi & Shook, 1998; Turner, 1994; Umberson, Chen, House, Hopkins, & Slaten, 1996). (Liebler & Sandefur, 2002) found that women are more likely to be characterized as exchangers of emotional support than men. Relationships between women are more likely to rely on emotional closeness compared to men (Leavy, 1983). (Belle, 1982; Krause & Keith, 1989; Walen & Lachman, 2000) suggest that during stressful events, women are more likely than men to seek social support and (Dykstra & de Jong Gierveld, 2004) finds that social support outside the spousal relationship may be more important for women than men. Based on this literature, I wanted to analyze if male and female cancer patients have different effects of social networks on the depression symptoms which was also the second aim of this paper. To the best my knowledge none of the previous studies have looked at the gender differences of social networks in reducing depression symptoms in Nepal and this was one of the contributions of this paper.

While social networks have been shown to enhance the emotional well-being of patients, there has been inadequate analysis of the mechanism through which social networks help in reducing depression in cancer patients. The third aim of this paper was to understand how social networks of friends, family, and community can help cancer patients in coping with the depression symptoms. To understand this mechanism, I looked at how cancer patients evaluate their stress level from cancer. I captured this information in *Stress Appraisal*. Stress appraisal is a process through which patients evaluate their stress level because of the stressful event, in this case, their illness, cancer. Among many possible variables that can interact with social networks to increase or decrease depression none of the studies have looked at how stress appraisal of cancer patients is linked with their social networks. This is another contribution of this paper as I fill a gap in the literature by studying the link between social networks and stress appraisal.

Conceptual Framework and Hypothesis

The conceptual framework for this study was developed based on two models proposed by (S. Cohen & Wills, 1985) to examine the relevance of social relationships on health outcomes. First model is Stress Buffering Model and second model is Direct Effect Model. The overall framework of these models is given in Figure 4.

[Insert Figure 4]

In my empirical analysis, I used Direct Effect Model and Stress Buffering Model to estimate the direct and indirect effect of social networks on depression symptoms among cancer patients.

Stress Buffering Model:

In Stress Buffering Model, social ties are predicted to reduce the strength of the association between stress and physical health outcomes. According to (S. Cohen & Wills, 1985), individuals get less affected by the stress if they have a social support. This model assumes that stress causing variable (stressor) can lead to adverse health outcomes, but the presence of social networks can reduce these adverse health outcomes. According to Figure 4, social networks affect the stress appraisal in cancer patients by reducing the stressor which further helps in reducing depression symptoms.

Direct Effect Model:

In causal analysis, many times effect of the treatment variable on the outcome variable is mediated by other intermediate variables or mediator variables. The direct effect model refers to the effect of the components of social networks that are not mediated by other intermediate variables. The Direct Effect Model states that the social networks is effective irrespective of the stress levels of the individuals (S. Cohen & Wills, 1985). Social networks could be related to the physical health outcomes through emotionally induced effects (Jemmott & Locke, 1984). In case of this study, social networks can help cancer patients emotionally by reducing depression symptoms. This is because a regular positive environment through social networks and social support can create a stable and peaceful environment for individuals. The effects of such stability and rewarding atmosphere contributes towards a direct effect of social networks on reducing depression symptoms in case of cancer patients. Figure 4 shows a path for direct effect where social networks reduce depression symptoms without any mediator. Direct effect of social networks can improve the overall emotional well-being of the patients because it can encourage them to fight the illness by making them feel emotionally supported.

Overall, in this paper, I tested three hypotheses.

Hypothesis 1: *Social Networks* reduce *Depression Symptoms* among cancer patients

For this hypothesis, I tested the effect of social networks on depression symptoms using a linear regression model.

Hypothesis 2: *Social Networks* reduce *Depression Symptoms* by reducing the *Stress Appraisal* in cancer patients.

I tested this hypothesis using Stress Buffering Model described previously in this paper.

Hypothesis 3: The effect of *Social Networks* on reducing *Depression Symptoms* is different for male and female cancer patients.

Data and Measures

Data - Survey

For this study I used the data from the survey conducted in Nepal from May to July 2018. The survey titled "Health, Wellness and Quality of Life Choice Preference Study of the Cancer Patients of Nepal: A Discrete Choice Experiment" was conducted by Nepal Study Center, Department of Economics, University of New Mexico, in collaboration with Dhulikhel Hospital, Kathmandu University Hospital, Nepal. In this survey with the help of local enumerators I surveyed 1409 patients in four major hospitals of age 18 or older who had cancer and other chronic illnesses. Of these patients, 1002 were cancer patients and 407 were patients of other chronic illnesses (also referred as control patients). Both inpatients and outpatients were interviewed. The survey was primarily about the quality of life of cancer patients, from both financial and non-financial perspectives. Before starting the survey, I obtained patient's consent to go ahead with the survey questionnaire. A pre-testing of the survey was done in Dhulikhel hospital, which was one of the four hospitals included in the study. The survey started by asking the patients about their general health status, their preferences for quality and length of life, their domestic life, emotional health and social life. The cancer incidences are mapped at district and province levels in Figure 1 and Figure 2 respectively. The distribution of cancer patients by cancer types and gender is shown in Figure 3.

[Insert Figure 1]

[Insert Figure 2]

[Insert Figure 3]

Measures

Depression – outcome

The main outcome variable of this study is depression among the cancer patients. To measure this, I used a self-administered instrument called the Patient Health Questionnaire (PHQ). From several PHQ modules, I chose an open-source PHQ-9 instrument consisting of 9 questions used for screening, diagnosis, monitoring and measuring the severity of depression symptoms (Kroenke, Spitzer, & Williams, 2001). It has a total of 9 questions with response categories of 0 (not at all), 1 (several days), 2 (more than half the days), and 3 (nearly every day). I created two outcomes of depression symptoms using this instrument. First outcome is a continuous scale of depression ranging from 0-27 where 0 indicates no depression symptoms and 27 indicates all symptoms of depression. (Kroenke et al., 2001) suggests creating a depression severity index from PHQ-9 scale using the frequency of the symptoms. The authors use scores of 5, 10, 15, and 20 represent cut points for none to mild, moderate, moderately severe and severe depression symptoms, respectively. I created second outcome of depression symptoms using these cut points. The cut points of the scale are defined as given in Table 1. This outcome variable is an ordered rank variable from 1-5.

[Insert Table 1]

Figure 2 shows the mean level of depression symptoms in two groups. Figure 4 shows that the cancer patients on an average face higher level of depression symptoms compared to the patients of other chronic illnesses.

[Insert Figure 4]

Figure 5 shows the distribution of symptoms suggestive of depression level for both cancer and control groups on the continuous as well as categorical scale of depression symptoms. The first part of Figure 5 shows depression symptom level at the scale of 0-27. Here 0 indicates no symptoms of depression and 27 indicates all symptoms of depression. This graph has depression symptoms density curve shifted rightwards among cancer patients compared to the control group indicating higher levels of depression symptoms for cancer patients compared to the control group.

[Insert Figure 5]

Second part of Figure 5 also shows a comparison of depression symptoms between cancer and control groups using ordered categorical variable of depression symptoms that ranges from 1-5. According this graph, higher number of cancer patients suffer from depression symptoms from mild to severe levels compared to the control group.

If I only focus on cancer patients and plot the mean level of depression symptoms by gender, I see a higher mean for women cancer patients compared to the men cancer patients. See Figure 6.

[Insert Figure 6]

Social Networks

Social networks are a calculated index based on the questions related to the social life of patients during the survey. This is the independent variable of focus for this study. Table 2 describes the variables used to construct social network.

[Insert Table 2]

Social networks index is calculated by summing up all the variables in Table 2. This index ranges from 7-18 where higher value indicates a stronger social network. For the first hypothesis, I expect to see a decrease in depression symptoms as the index for social networks increase.

Stress Appraisal

Stress appraisal is an evaluation of the level of stress because of a stressful event. In this study, *Stress Appraisal* captures the level of stress of cancer patients. I calculated this variable by considering physical and financial stress experienced by an individual. The variables used to construct *Stress Appraisal* are in Table 3. This variable is a continuous variable and is a sum of standardized z-scores of five variables associated with physical and financial stress and ranges from 0-5.

[Insert Table 3]

Control variables

i. Cancer type

I included cancer type in this analysis to control for the effect of all types of cancer in the sample. To control for the cancer type, I created a dummy variable for each cancer type.

ii. Individual and household characteristics

In individual characteristics I controlled for age, gender, education, and marital status. Young patients can react differently to the depression symptoms compared to the older patients. Hence it is important to control for age. Adult women are approximately twice as likely as men to experience depression (Cyranowski, Frank, Young, & Shear, 2000). Hence, I controlled for gender. I controlled for education as studies suggest that education helps in preventing depression. One such study by (Lorant et al., 2003) indicates an inverse relationship between educational attainment and depression. To control for marital status, I created a dummy variable with single/separated as a base category and widow, divorced as other categories. Controlling for respondent's marital status is important as it can have an impact on the perceived support of the patient. Partner's support can help reducing the cancer related emotional stress.

To control for household characteristics, I controlled for wealth, caste, number of children in the household. Financial hardships can lead to depression (Heflin & Iceland, 2009). For cancer patients, financial hardships to treat cancer are huge and hence wealthy households can deal with depression symptoms better than poor households. To control for this effect, I used a wealth index in my model. Wealth index was constructed using the household items - radio, bicycle, motorcycle, fans, television, sewing machine, camera, car, refrigerator, washing machine and computer. Historically oppressed castes in Nepal suffer from higher levels of depression compared to other castes (Kohrt et al., 2009). To control for it, I used a dummy variable for caste where Brahmins/Chettri ("upper caste[1]") is the base category and Dalit, Janajati, Madhesi and Others as other caste/ethnicity categories. I also controlled for total children in the household in the model. Table 4 below shows the description and summary statistics of all the variables that are used for analysis.

[Insert Table 4]

Empirical Model

Estimating Depression

I was interested to study how social network helps in coping with depression symptoms among cancer patients. For this I estimated depression symptoms among the cancer patients as below.

Single equation model:

$$Depression\ Symptoms_i = \beta_0 + \beta_1 Social\ Networks_i + \beta_2(X_i) + \epsilon_i \qquad (1)$$

1 Nepal has a social hierarchy called as "caste" that divides people in four different categories. According to this hierarchy, Brahmins/Chettri are considered to have higher social status and are at the top level of hierarchy. They are also referred as "upper castes". Dalits are at the bottom level of the hierarchy and are historically discriminated by the castes above them in the hierarchy.

where, $Depression\ Symptoms_i$ is the depression symptom severity index ranging from 0-27, $Social\ Networks_i$ is an index ranging from 7-18 indicating the level of social networks to the cancer patient and X_i are the control variables. I ran an ordinary least squares model to estimate this depression index. X_l is a vector of other control variables that include cancer types, individual and household characteristics. For robustness checks I also ran this model on the ordered categorical variable for depression symptoms.

Mediation Analysis using Structural Equation Model (SEM)

I performed mediation analysis to study the underlying mechanism through which social networks help cancer patients in reducing depression symptoms. In mediation analysis, the effect of an intervention on an outcome is separated into indirect and direct effects. In this analysis, I hypothesized that *Stress Appraisal* is a mediator variable which mediates the relationship between a predictor, *Social Networks*, and an outcome, *Depression Symptoms*. The effect of *Social Networks* on *Depression Symptoms* with the intervention of *Stress Appraisal* is the indirect effect and the effect without the intervention of *Stress Appraisal* is the direct effect. Using the framework of Direct Effect Model and Stress Buffering Model described previously, I calculated the direct and indirect effects. The total effect is the sum of direct and indirect effects. In this study, I used Structural Equation Model (SEM) to perform mediation analysis. The advantage of using SEM is that it gives the estimates with direct, indirect and total effects by simultaneously estimating all the equations in the structural equation system. The SEM equations from (2) – (4) below are estimated by using maximum likelihood.

The SEM for the *i*th subject ($1 \leq i \leq n$) is given by:

$$Depression\ Symptoms_i = \gamma_0 + \gamma_1(Stress\ Appraisal_i) + \gamma_2(Social\ networks_i) + \gamma_1\ X_i + \delta_2'\ Y_i + \epsilon_i \qquad (2)$$

$$Stress\ Appraisal_i = \beta_0 + \beta_1(Social\ Networks_i) + \beta_2\ Y_i + \delta_1'\ Z_i + u_i \tag{3}$$

$$Social\ Network_i = \alpha_0 + \alpha_1(Z_i) + v_i \tag{4}$$

where, $Depression\ Symtoms_i$ is a continuous variable for depression symptoms ranging from 0-27, $Social\ Networks_i$ is a continuous variable indicating social networks of cancer patients ranging from 7-18 and $Stress\ Appraisal_i$ is a continuous variable evaluating the stress level of the cancer patients given their social networks; it ranges from 0-5 with decimal intervals. X_i is the vector of control variables that identifies equation (2). Y_i is the vector of control variables that identifies equation (3). Z_i is the vector of control variables that identifies equation (4). ϵ_i, u_i, v_i are the vectors of error terms for equation (2), (3) and (4) respectively. In three equations system, the error terms (ϵ_i, u_i) and (ϵ_i, v_i) are uncorrelated but error terms (u_i, v_i) are correlated with each other.

Robustness Checks

I perform robustness checks using step by step mediation analysis proposed by (Baron & Kenny, 1986). To test if direct and indirect effects are significant, (Baron & Kenny, 1986) proposed a four step method as below.

1) Perform linear regression of the explanatory variable on the outcome variable
2) Perform simple regression of the explanatory variable on the mediator variable
3) Perform simple regression of the mediator variable on the outcome variable
4) Perform multivariate regression of the explanatory and mediator variables on the outcome variable

Using the estimates from these steps, the direct and indirect effects are calculated. If the indirect effect is significant, it indicates the presence of mediation. Table 10 and 11 present the result of this analysis.

Results

The estimate of *Depression Symptoms* for cancer patients as both continuous and categorical outcome variable is shown in Table 5. Model (1) shows the estimate for *Depression Symptoms* as a continuous variable and Model (2) shows the estimate for *Depression Symptoms* as an ordered categorical variable. Both Model (1) and Model (2) show results first for all cancer patients and then on the sample separated by gender. In both models I controlled for *Cancer type*, and, *Individual and household characteristics*. Both models show that *Social Networks* help reducing *Depression Symptoms* in all cancer patients as well as in cancer patients separated by gender. When I compared the effect of *Social Networks* on male and female cancer patients, I saw that this effect was much higher for female patients. This suggests that female cancer patients cope better with *Depression Symptoms* with the help of *Social Networks* compared to the male cancer patients.

[Insert Table 5]

Next is the section that discusses the best model chosen for SEM. Table 6 has three model specifications. Model (1) was the most parsimonious model among all three with the lowest AIC and BIC. Hence, Model (1) was chosen to be the best model for further discussion and analysis. According to Model (1), *Stress Appraisal* which comprises of the physical and financial distress affects *Depression Symptoms* positively and significantly. This is expected as cancer can challenge patients physically as well as financially. Once again, it is evident that *Social Networks* help in reducing *Depression Symptoms* in cancer patients and this effect is also highly significant. *Social networks* also reduce stressor (physical and financial distress) in cancer patients.

[Insert Table 6]

Table 7 shows the results for mediation analysis using SEM using the best model chose from Table 6. The table shows the results for Direct Effect Model (direct effect) and Stress Buffering Model (indirect effect). I show the results for three different samples - pooled sample which includes all cancer patients, male cancer patients, and female cancer patients. In case of pooled sample, equation 1 for *Depression Symptoms* shows that *Stress Appraisal* has a direct effect of 1.817 which is also its total effect on *Depression Symptoms*. In the samples separated by gender, *Stress Appraisal* has similar effects on the *Depression Symptoms*. *Social Network*s has its total effect on *Depression Symptoms* split into direct and indirect effects. The direct effect of *Social Networks* is much less compared to the indirect effect in all three samples. Hence, in this study *Stress Buffering Model* overpowers *Direct Effect Model*. The total effect of *Social Networks* in case of female cancer patients (-1.749) is higher in magnitude compared to the male cancer patients (-1.659). This suggests that *Social Networks* help female patients more in coping with *Depression Symptoms* compared to the male cancer patients. This result is in line with the current literature of the effect of social support on women. For *Stress appraisal* (equation 3), *Social Networks* decrease stress appraisal similarly for both male and female cancer patients.

[Insert Table 7]

Table 8 shows the summary of results for all three hypotheses in this paper. The first hypothesis was if social networks help cancer patients in coping with the depression symptoms. I found that social networks are highly effective and significant in reducing depression symptoms among cancer patients. This result was robust on both continuous and ordered rank categories. Second hypothesis was that social networks reduce depression symptoms by reducing the stress appraisal in cancer patients. I found that social networks significantly reduced depression symptoms by reducing the stress appraisal. I found that this indirect effect is higher than direct effect. My third hypothesis was that male and female cancer patients benefit differently from social networks when coping with depression symptoms. The results confirm this hypothesis as the effect of social networks is higher for female cancer patients than male cancer patients.

[Insert Table 8]

Table 9, Table 10 and 11 check for robustness of the SEM model. Table 9 shows the results for mediation analysis with SEM for categorical index for *Depression Symptoms*. The results in Table 9 are consistent with the primary SEM model. Table 10 and Table 11 show the results for mediation analysis using step-by-step approach. Table 10 shows the result of the mediation analysis for the pooled sample and Table 11 shows the result of the mediation analysis for the samples separated by gender. Both direct and indirect effects are significant in Table 10 confirming the results from primary SEM model in this study. The step-by-step analysis by gender showed the significant direct effects of social networks on male and female cancer patients indicating that the social networks help both genders in coping up with depression symptoms. In case of the indirect effect of social networks on depression symptoms I still get the result like the primary model of SEM, but I lose its statistical significance in the result for female cancer patients.

Conclusion

Cancer is one of the leading causes of death by non-communicable illnesses in Nepal. In this study I analyzed the effect of social networks on improving the emotional well-being in cancer patients. Particularly I was interested in understanding if social networks help in reducing the depression symptoms among cancer patients. For this, I used the survey data collected in summer 2018 in Nepal in four major hospitals. I had a sample size of 1002 cancer patients and 401 patients from other chronic illnesses (control patients). This survey was of importance as Nepal did not have a national cancer registry as of 2018. With preliminary analysis I saw that cancer patients face higher level of depression symptoms compared to the control patients. Current literature suggests that depression has physical health consequences and can significantly reduce the life of a person suffering from it. Existing literature also suggests that social networks can be helpful in coping with depressive symptoms in the general population, but no such study has been done to understand if it helps cancer patients. In this paper I fill this gap in the literature. I found that social networks help cancer patients immensely in reducing depression symptoms associated with a cancer. I also studied the mechanism through which social networks help to reduce depression in cancer patients. For this I used Stress Buffering Model and Direct Effect Model. Stress Buffering Model gives the indirect effect of social networks on depression symptoms and Direct Effect Model gives the direct effect of social networks on depression symptoms. I found that both direct and indirect effects significantly reduce depression symptoms among cancer patients. The magnitude of indirect effect is higher compared to the direct effect which confirms the second hypothesis. The results showed that female cancer patients suffer from higher level of depression compared to the male patients. I also found that women get more help from social networks while dealing with depression compared to men.

The findings of this study suggest that it is important for cancer patients to get emotional support. To get this support, they need strong social networks where they can be surrounded by friends, family and community groups that can help them in coping with the depression symptoms that can arise with cancer. The cancer support groups, women's groups (for women) and hospital support groups can be very useful for improving the social networks of the cancer patients. Such support groups can provide a platform for the cancer patients to share their cancer experiences, treatment information and coping strategies with one another. They can also relate to the feelings of other cancer patients which can be a big emotional relief to many patients thus giving them the necessary motivation to fight such deadly disease. Cancer patients should also be made aware of the importance of social networks in reducing the depression symptoms associated with cancer so that they proactively avail benefits of such support groups. Financial stress is also a big factor in increasing stress among cancer patients. Hence policies targeted to reduce the financial burden of cancer should be looked at rigorously. The government is making attempts to tackle the current financial burden of cancer, but there is no evidence that is not enough.

References

(WHO), W. H. O. (2018). *Cancer*. Retrieved from http://gco.iarc.fr/,

Aaron, H. J., Fiedler, M., Ginsburg, P. B., Adler, L., & Rivlin, A. M. (2017, July 27). Turmoil in the individual insurance market — where it came from and how to fix it. *New England Journal of Medicine*. Massachussetts Medical Society. https://doi.org/10.1056/NEJMp1707593

Acitelli, L. K., & Antonucci, T. C. (1994). Gender Differences in the Link Between Marital Support and Satisfaction in Older Couples. *Journal of Personality and Social Psychology*, *67*(4), 688–698. https://doi.org/10.1037/0022-3514.67.4.688

Aneshensel, C. S., & Frerichs, R. R. (1982). Stress, support, and depression: A longitudinal causal model. *Journal of Community Psychology*, *10*(4), 363–376. https://doi.org/10.1002/1520-6629(198210)10:4<363::AID-JCOP2290100407>3.0.CO;2-8

Antonucci, T. C. (1994). Attachment in adulthood and aging. In *Attachment in adults: Clinical and developmental perspectives.* (pp. 256–272). New York, NY, US: Guilford Press.

Antonucci, T. C., & Jackson, J. S. (1987). Social support, interpersonal efficacy, and health: A life course perspective. In *Handbook of clinical gerontology.* (pp. 291–311). Elmsford, NY, US: Pergamon Press.

Antwi, B. Y. A., Moriya, A. S., & Simon, K. (2013). Effects of federal policy to insure young adults: Evidence from the 2010 affordable care act's dependent-coverage mandate. *American Economic Journal: Economic Policy*, *5*(4), 1–28. https://doi.org/10.1257/pol.5.4.1

Artiga, S., Orgera, K., & Damico, A. (2019). Changes in Health Coverage by Race and Ethnicity since Implementation of the ACA, 2013-2017. *Issue Brief*, (February), 2013–2017. Retrieved from http://files.kff.org/attachment/Issue-Brief-Changes-in-Health-Coverage-by-Race-and-Ethnicity-since-Implementation-of-the-ACA-2013-2017

Baicker, K., & Chandra, A. (2005). *The Labor Market Effects of Rising Health Insurance Premiums*. Retrieved from http://www.nber.org/papers/w11160

Baron, R. M., & Kenny, D. A. (1986). *The Moderator-Mediator Variable Distinction in Social*

Psychological Research: Conceptual, Strategic, and Statistical Considerations (Vol. 51). Psychological Association, Inc. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.169.4836&rep=rep1&type=pdf

Belle, D. E. (1982). The impact of poverty on social networks and supports. *Marriage & Family Review*, *5*(4), 89–103. https://doi.org/10.1300/J002v05n04_06

Billings, A. G., & Moos, R. H. (1984). Coping, stress, and social resources among adults with unipolar depression. *Journal of Personality and Social Psychology*, *46*(4), 877–891. https://doi.org/10.1037/0022-3514.46.4.877

Bonnie RJ, Stroud C, Breiner H, editors. (2015). The Health Care System - Investing in the Health and Well-Being of Young Adults - NCBI Bookshelf. Retrieved April 8, 2020, from https://www.ncbi.nlm.nih.gov/books/NBK284795/

Born, P. (2017). ACA Exchange Competitiveness in Florida. *Risk Management and Insurance Review*, *20*(2), 189–210. https://doi.org/10.1111/rmir.12074

Buchmueller, T. C., Levinson, Z. M., Levy, H. G., & Wolfe, B. L. (2016). Effect of the Affordable Care Act on Racial and Ethnic Disparities in Health Insurance Coverage. *American Journal of Public Health*, *106*(8), 1416–1421. https://doi.org/10.2105/AJPH.2016.303155

Callahan, S. T., & Cooper, W. O. (2005). Uninsurance and health care access among young adults in the United States. *Pediatrics*. https://doi.org/10.1542/peds.2004-1449

Callahan, S. T., Hickson, G. B., & Cooper, W. O. (2006). Health Care Access of Hispanic Young Adults in the United States. *Journal of Adolescent Health*, *39*(5), 627–633. https://doi.org/10.1016/j.jadohealth.2006.04.012

CBO. (2018). *Health Insurance Subsidies in 2018 for People Under Age 65 0 50 100 150 200 250 300 Support for Nongroup Coverage Federal Subsidies for Health Insurance Coverage for People At a Glance*. Retrieved from www.cbo.gov/publication/53826

Center on Budget and Policy Priorities. (2012). Why a State's Health Insurers Should Support Expanding Medicaid. Retrieved July 4, 2020, from https://www.cbpp.org/sites/default/files/atoms/files/medicaid-and-insurers-memo.pdf

Central Bureau of Statistics (Nepal). (2011). Nepal Census 2011. Retrieved September 30, 2019, from https://sites.google.com/site/nepalcensus/

Chernew, M., Cutler, D. M., & Keenan, P. S. (2005, August). Increasing health insurance costs and the decline in insurance coverage. *Health Services Research*. Health Research & Educational Trust. https://doi.org/10.1111/j.1475-6773.2005.00409.x

Ciaramella, A., & Poli, P. (n.d.). Assessment of depression among cancer patients: the role of pain, cancer type and treatment. *Psycho-Oncology*, *10*(2), 156–165. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11268142

CMS. (2017). *What You Should Know About Provider Networks What's a provider network?*

CMS. (2018). Market Rating Reforms | CMS. Retrieved March 19, 2020, from https://www.cms.gov/CCIIO/Programs-and-Initiatives/Health-Insurance-Market-Reforms/state-gra

Cohen, M. A., Kaur, R., & Darnell, B. (2013). *Office of the Assistant Secretary for Planning and Evaluation EXITING THE MARKET: Understanding the Factors behind Carriers' Decision to Leave the Long-Term Care Insurance Market*. Retrieved from http://aspe.hhs.gov/office_specific/daltcp.cfm

Cohen, S., & Wills, T. A. (1985, September). Stress, Social Support, and the Buffering Hypothesis. *Psychological Bulletin*. https://doi.org/10.1037/0033-2909.98.2.310

Colleoni, M., Mandala, M., Peruzzotti, G., Robertson, C., Bredart, A., & Goldhirsch, A. (2000). Depression and degree of acceptance of adjuvant cytotoxic drugs. *Lancet*, *356*(9238), 1326–1327. https://doi.org/10.1016/S0140-6736(00)02821-X

Cyranowski, J. M., Frank, E., Young, E., & Shear, M. K. (2000). Adolescent onset of the gender difference in lifetime rates of major depression: a theoretical model. *Archives of General Psychiatry*, *57*(1), 21–27. https://doi.org/10.1001/archpsyc.57.1.21

Denavas-Walt, C., Proctor, B. D., & Smith, J. C. (2012). *Income, Poverty, and Health Insurance Coverage in the United States: 2011 Current Population Reports*.

Diamond, R., Dickstein, M. J., Mcquade, T., & Persson, P. (2018). *Take-Up, Drop-Out, and Spending in ACA Marketplaces*. Retrieved from http://www.nber.org/papers/w24668

DiMatteo, M. R., & Haskard-Zolnierek, K. B. (2010). Impact of Depression on Treatment Adherence and Survival from Cancer. In *Depression and Cancer* (pp. 101–124). John Wiley and Sons. https://doi.org/10.1002/9780470972533.ch5

Dykstra, P. A., & de Jong Gierveld, J. (2004). Gender and marital-history differences in emotional and social loneliness among Dutch older adults. *Canadian Journal on Aging = La Revue Canadienne Du Vieillissement*, *23*(2), 141–155. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/15334814

Eibner, C., & Saltzman, E. (2015). How Does the ACA Individual Mandate Affect Enrollment and Premiums in the Individual Insurance Market?: Retrieved from https://www.rand.org/pubs/research_briefs/RB9812z4.html

Fehr, R., Rabah, K., & Cox, C. (2019). Insurer Participation on ACA Marketplaces, 2014-2020 | The Henry J. Kaiser Family Foundation. Retrieved March 19, 2020, from https://www.kff.org/private-insurance/issue-brief/insurer-participation-on-aca-marketplaces-2014-2020/

Foster Friedman, M., Fangmeier, J., Baum, N., & Udow-Phillips, M. (2017). ACA Exchange Competitiveness In Michigan. *Risk Management and Insurance Review*, *20*(2), 211–232. https://doi.org/10.1111/rmir.12077

Gabel, J. R., Lore, R., McDevitt, R. D., Pickreign, J. D., Whitmore, H., Slover, M., & Levy-Forsythe, E. (2012). More Than Half Of Individual Health Plans Offer Coverage That Falls Short Of What Can Be Sold Through Exchanges As Of 2014. *Health Affairs*, *31*(6), 1339–1348. https://doi.org/10.1377/hlthaff.2011.1082

Garfield, R., & Orgera, K. (2020). The Coverage Gap: Uninsured Poor Adults in States that Do Not Expand Medicaid | The Henry J. Kaiser Family Foundation. Retrieved April 7, 2020, from https://www.kff.org/medicaid/issue-brief/the-coverage-gap-uninsured-poor-adults-in-states-that-do-not-expand-medicaid/

Glassman, A. H., O'Connor, C. M., Califf, R. M., Swedberg, K., Schwartz, P., Bigger Jr., J. T., …

Harrison, W. M. (2002). Sertraline Antidepressant Heart Attack Randomized Trial (SADHART) Group. Sertraline treatment of major depression in patients with acute MI or unstable angina. *JAMA*, *288*(6), 701-9. Retrieved from http://www.ncbi.nlm.nih.gov/htbin-post/Entrez/query?db=m&form=6&dopt=r&uid=12169073

Graetz, I., Kaplan, C. M., Kaplan, E. K., Bailey, J. E., & Waters, T. M. (2014). The U.S. health insurance marketplace: Are premiums truly affordable? *Annals of Internal Medicine*, *161*(8), 599–604. https://doi.org/10.7326/M14-0757

Hall, M. A. (2017). ACA Exchange Competitiveness in North Carolina. *Risk Management and Insurance Review*, *20*(2), 233–247. https://doi.org/10.1111/rmir.12076

Heflin, C. M., & Iceland, J. (2009). Poverty, material hardship, and depression. *Social Science Quarterly*, *90*(5), 1051–1071. https://doi.org/10.1111/j.1540-6237.2009.00645.x

Holahan, C. J., & Moos, R. H. (1981). Social support and psychological distress: A longitudinal analysis. *Journal of Abnormal Psychology*, *90*(4), 365–370. https://doi.org/10.1037/0021-843X.90.4.365

House, A., Knapp, P., Bamford, J., & Vail, A. (2001). Mortality at 12 and 24 months after stroke may be associated with depressive symptoms at 1 month. *Stroke*, *32*(3), 696–701. https://doi.org/10.1161/01.str.32.3.696

IRS. (2019). Publication 969 (2019), Health Savings Accounts and Other Tax-Favored Health Plans | Internal Revenue Service. Retrieved March 20, 2020, from https://www.irs.gov/publications/p969#en_US_2019_publink1000204030

Jemmott, J. B., & Locke, S. E. (1984). Psychosocial factors, immunologic mediation, and human susceptibility to infectious diseases: How much do we know? *Psychological Bulletin*, *95*(1), 78–108. https://doi.org/10.1037/0033-2909.95.1.78

Jessica Gehr. (2017). Why the Affordable Care Act Is Critical for Young Adults Low-Income Young Adults Would Benefit from Medicaid Expansion, (April), 1–6.

Jones, L. W., & Demark-Wahnefried, W. (2006). Diet, exercise, and complementary therapies after primary treatment for cancer. *The Lancet. Oncology*, *7*(12), 1017–1026.

https://doi.org/10.1016/S1470-2045(06)70976-7

Karnell, L. H., Funk, G. F., Christensen, A. J., Rosenthal, E. L., & Magnuson, J. S. (2006). Persistent posttreatment depressive symptoms in patients with head and neck cancer. *Head & Neck*, *28*(5), 453–461. https://doi.org/10.1002/hed.20370

KFF. (2018). Health Insurance Coverage of the Total Population | The Henry J. Kaiser Family Foundation. Retrieved April 9, 2020, from https://www.kff.org/other/state-indicator/total-population/?dataView=1&currentTimeframe=0&selectedDistributions=employer&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

KFF. (2020). State Health Insurance Marketplace Types, 2020 | The Henry J. Kaiser Family Foundation. Retrieved March 24, 2020, from https://www.kff.org/health-reform/state-indicator/state-health-insurance-marketplace-types/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

Kohrt, B. A., Speckman, R. A., Kunz, R. D., Baldwin, J. L., Upadhaya, N., Acharya, N. R., … Worthman, C. M. (2009). Culture in psychiatric epidemiology: Using ethnography and multiple mediator models to assess the relationship of caste with depression and anxiety in Nepal. *Annals of Human Biology*, *36*(3), 261–280. https://doi.org/10.1080/03014460902839194

Krause, N., & Keith, V. (1989). Gender differences in social support among older adults. *Sex Roles*, *21*(9–10), 609–628. https://doi.org/10.1007/BF00289174

Kroenke, K., Spitzer, R., & Williams, W. (2001). The Patient Health Questionnaire PHQ-9: Validity of a brief depression severity measure. *Jgim*, *16*, 2–3. https://doi.org/10.1097/01.MLR.0000093487.78664.3C

LaVeist, T. A., Bowie, J. V, & Cooley-Quille, M. (2000). Minority health status in adulthood: the middle years of life. *Health Care Financing Review*, *21*(4), 9–21. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11481747

Leavy, R. L. (1983). Social support and psychological disorder: A review. *Journal of Community*

Psychology, *11*(1), 3–21. https://doi.org/10.1002/1520-6629(198301)11:1<3::AID-JCOP2290110102>3.0.CO;2-E

Leemore Dafny, B. S., Collins, W., Cutler, D., Dana, J., Dranove, D., Duggan, M., … Yamamoto, D. (2010). Are Health Insurance Markets Competitive? *Complaint, United States v. Aetna Inc*, *100*, 1399–1431. https://doi.org/10.1257/aer.100.4.1399

Liebler, C. A., & Sandefur, G. D. (2002). Gender differences in the exchange of social support with friends, neighbors, and co-workers at midlife. *Social Science Research*, *31*(3), 364–391. https://doi.org/10.1016/S0049-089X(02)00006-6

Linden, W., Vodermaier, A., MacKenzie, R., & Greig, D. (2012). Anxiety and depression after cancer diagnosis: Prevalence rates by cancer type, gender, and age. In *Journal of Affective Disorders* (Vol. 141, pp. 343–351). https://doi.org/10.1016/j.jad.2012.03.025

Lissenden, B. (2017). Three's a crowd?: The effect of insurer participation on premiums and cost-sharing parameters in the initial years of the ACA marketplaces. *American Journal of Health Economics*, *3*(4), 477–506. https://doi.org/10.1162/ajhe_a_00085

Lorant, V., Deliège, D., Eaton, W., Robert, A., Philippot, P., & Ansseau, M. (2003). Socioeconomic inequalities in depression: a meta-analysis. *American Journal of Epidemiology*, *157*(2), 98–112. https://doi.org/10.1093/aje/kwf182

Ludwig, H., & Zojer, N. (2007). Supportive care. *Annals of Oncology : Official Journal of the European Society for Medical Oncology*, *18 Suppl 1*, i37–i44. https://doi.org/10.1093/annonc/mdl449

Massie, M. J. (2004). Prevalence of depression in patients with cancer. *Journal of the National Cancer Institute. Monographs*, (32), 57–71. https://doi.org/10.1093/jncimonographs/lgh014

Mcmorrow, S., Kenney, G. M., Long, S. K., & Anderson, N. (2015). Uninsurance Among Young Adults Continues To Decline, Particularly In Medicaid Expansion States. *Health Affairs*. https://doi.org/10.1377/hlthaff.2015.0044

Mitchell, A. J., Chan, M., Bhatti, H., Halton, M., Grassi, L., Johansen, C., & Meader, N. (2011). Prevalence of depression, anxiety, and adjustment disorder in oncological, haematological, and palliative-care settings: A meta-analysis of 94 interview-based studies. *The Lancet Oncology*, *12*(2), 160–174. https://doi.org/10.1016/S1470-2045(11)70002-X

National Women's Law Center. (2015). *Medicaid Coverage for Pregnant Women Remains Critical for Women's Health Medicaid Is an Important Source of Coverage for Pregnant Women Medicaid Coverage of Pregnant Women is Critically Important to Women and Families*. Retrieved from http://www.medicaid.gov/medicaid-chip-program-information/by-population/pregnant-women/pregnant-women.html.

Neumark, D., Neumark, & David. (1988). Employers' Discriminatory Behavior and the Estimation of Wage Discrimination. *Journal of Human Resources*, *23*(3), 279–295.

New York Times. (2017). Why Trump Is Right and Wrong About Obamacare Premiums - The New York Times. Retrieved March 22, 2020, from https://www.nytimes.com/interactive/2017/12/04/us/healthcare-marketplace-insurance-premium-cost-2018.html

NHRC. (2018). Population Based Cancer Registry Launched by Nepal Health Research Council – Nepal Health Research Council. Retrieved September 30, 2019, from http://nhrc.gov.np/press-release-population-based-cancer-registry-launched-by-nepal-health-research-council/

Panhans, M. (2019). Adverse selection in ACA exchange markets: Evidence from Colorado. *American Economic Journal: Applied Economics*, *11*(2), 1–36. https://doi.org/10.1257/app.20170117

Pinquart, M., & Duberstein, P. R. (2010). Depression and cancer mortality: A meta-analysis. *Psychological Medicine*, *40*(11), 1797–1810. https://doi.org/10.1017/S0033291709992285

Piya, M. K., & Acharya, S. C. (2012). Oncology in Nepal. *South Asian Journal of Cancer*, *1*(1), 5–8. https://doi.org/10.4103/2278-330X.96490

Pugliesi, K., & Shook, S. L. (1998). Gender, ethnicity, and network characteristics: Variation in social support resources. *Sex Roles: A Journal of Research*, *38*(3–4), 215–238. https://doi.org/10.1023/A:1018733116398

Robert Wood Johnson Foundation. (2020). Health Insurance Plans Datasets - RWJF. Retrieved March 19, 2020, from https://hixcompare.org/individual-markets.html

Robson, A., Scrutton, F., Wilkinson, L., & MacLeod, F. (2010). The risk of suicide in cancer patients: a review of the literature. *Psycho-Oncology*, *19*(12), 1250–1258. https://doi.org/10.1002/pon.1717

Scheffler, R. M., Arnold, D. R., Fulton, B. D., & Glied, S. A. (2020). Differing Impacts Of Market Concentration On Affordable Care Act Marketplace Premiums. https://doi.org/10.1377/hlthaff.2015.1229

Sen, A. P., & Deleire, T. (2016). *ASPE ISSUE BRIEF THE EFFECT OF MEDICAID EXPANSION ON MARKETPLACE PREMIUMS*. Retrieved from http://aspe.hhs.gov

Sohn, H. (2017). Racial and Ethnic Disparities in Health Insurance Coverage: Dynamics of Gaining and Losing Coverage Over the Life-Course. *Population Research and Policy Review*, *36*(2), 181–201. https://doi.org/10.1007/s11113-016-9416-y

Sommers, B. D. (2012). Number of Young Adults Gaining Insurance Due to the Affordable Care Act Now Tops 3 Million | ASPE. Retrieved April 12, 2020, from https://aspe.hhs.gov/basic-report/number-young-adults-gaining-insurance-due-affordable-care-act-now-tops-3-million

Sommers, B. D., Buchmueller, T., Decker, S. L., Carey, C., & Kronick, R. (2013). The Affordable Care Act Has Led To Significant Gains In Health Insurance And Access To Care For Young Adults. *Health Affairs*, *32*(1), 165–174. https://doi.org/10.1377/hlthaff.2012.0552

Spencer, D. L., McManus, M., Call, K. T., Turner, J., Harwood, C., White, P., & Alarcon, G. (2018). Health Care Coverage and Access Among Children, Adolescents, and Young Adults, 2010–2016: Implications for Future Health Reforms. *Journal of Adolescent Health*, *62*(6), 667–673. https://doi.org/10.1016/j.jadohealth.2017.12.012

Terriquez, V., & Joseph, T. D. (2016). Ethnoracial inequality and insurance coverage among Latino young adults. *Social Science and Medicine*, *168*, 150–158. https://doi.org/10.1016/j.socscimed.2016.08.039

Turner, H. A. (1994). Gender and social support: Taking the bad with the good? *Sex Roles*, *30*(7–8), 521–541. https://doi.org/10.1007/BF01420800

Umberson, D., Chen, M. D., House, J. S., Hopkins, K., & Slaten, E. (1996). The effect of social relationships on psychological well-being: Are men and women really so different? *American Sociological Review*, *61*(5), 837–857. https://doi.org/10.2307/2096456

van der Goes, D. N., & Santos, R. (2018). Determinants of private health insurance coverage among Mexican American men 2010–2013. *Journal of Medical Economics*, *21*(11), 1139–1143. https://doi.org/10.1080/13696998.2018.1515083

Van Parys, J. (2018). ACA marketplace premiums grew more rapidly in areas with monopoly insurers than in areas with more competition. *Health Affairs*, *37*(8), 1243–1251. https://doi.org/10.1377/hlthaff.2018.0054

Walen, H. R., & Lachman, M. E. (2000). Social support and strain from partner, family, and friends: Costs and benefits for men and women in adulthood. *Journal of Social and Personal Relationships*, *17*(1), 5–30. https://doi.org/10.1177/0265407500171001

Walker, J., Hansen, C. H., Martin, P., Symeonides, S., Ramessur, R., Murray, G., & Sharpe, M. (2014). Prevalence, associations, and adequacy of treatment of major depression in patients with cancer: a cross-sectional analysis of routinely collected clinical data. *The Lancet. Psychiatry*, *1*(5), 343–350. https://doi.org/10.1016/S2215-0366(14)70313-X

Watson, M., Haviland, J. S., Greer, S., Davidson, J., & Bliss, J. M. (1999). Influence of psychological response on survival in breast cancer: a population-based cohort study. *Lancet (London, England)*, *354*(9187), 1331–1336. https://doi.org/10.1016/s0140-6736(98)11392-2

Weinberg, M., & Kallerman, P. (2017). ACA Exchange Competitiveness In California. *Risk Management and Insurance Review*, *20*(2), 173–188. https://doi.org/10.1111/rmir.12078

Yun, M.-S. (2003). *Decomposing Differences in the First Moment*. Retrieved from www.iza.org

Appendix

Tables

Table 1: PHQ-9 Severity Index and its Classification

PHQ-9 Score	Depression Severity	Proposed Treatment Actions
0-4	None-minimal (=1)	None
5-9	Mild (=2)	Watchful waiting; repeat PHQ-9 at follow-up
10-14	Moderate (=3)	Treatment plan, considering counseling, follow-up and/or pharmacotherapy
15-19	Moderately Severe (=4)	Active treatment with pharmacotherapy and/or psychotherapy
20-27	Severe (=5)	Immediate initiation of pharmacotherapy and, if severe impairment or poor response to therapy, expedited referral to a mental health specialist for psychotherapy and/or collaborative management

Source: https://www.pcpcc.org/sites/default/files/resources/instructions.pdf

Table 2: Variables for Social Networks

	Variable	Description	Values
1.	Someone to talk to	There is always someone I can talk to about my day-to-day problems?	1-NO, 2-MAYBE, 3-YES
2.	Plenty to lean-on	There are plenty of people I can lean on when I have problems?	1-NO, 2-MAYBE, 3-YES
3.	People to trust	There are many people I can trust completely?	1-NO, 2-MAYBE, 3-YES
4.	Close people	There are enough people I feel close to?	1-NO, 2-MAYBE, 3-YES
5.	Call friends in need	I can call on my friends whenever I need them?	1-NO, 2-MAYBE, 3-YES
6.	Limited friends	I find my circle of friends and acquaintances too limited?	1-NO, 2-MAYBE, 3-YES

Source: Quality of Life survey, May-July 2018; Nepal Study Center, University of New Mexico.

Table 3: Variables for Stress Appraisal

	Category	Variable	Description	Range
1.	Physical Stress	*Level of pain*	Current level of pain	0-1
2.		*Level of mobility*	Current level of mobility	0-1
3.		Self-care	Current level of performing self-care activities	0-1
4.		*Difficulty in usual activities*	Current level of performing usual activities	0-1
5.	Financial Stress	*Financial hardship*	Financial distress because of the cancer treatment	0-1

Source: Quality of Life survey, May-July 2018; Nepal Study Center, University of New Mexico.

Table 4: Summary Statistics of Cancer Patients

Variables	Description	Mean	Std. Dev.
Outcome variable			
Depression Symptoms	Two variations: 1) Continuous scale: ranges from 0-27 [0: no depression symptoms…...27: highest level of depression symptoms 2) Categorical index: ranges from 1-5 [1: Mild/no depression…….5: Severe depression]	6.58	4.65
Treatment Variable			
Social Networks	Social support from friends, family and acquaintances [Ranges from 7-18 where 7: no support…...18: full support. Questions used to construct this variable - 1) There is always someone to talk to about day-to-day problems 2) There are plenty of people to lean on when having problems 3) There are many people to trust completely 4) There are enough people to feel close to 5) Can call on friends whenever needed them 6) Circle of friends and acquaintances is not limited	14.39	2.42

Intermediate Variable			
Stress Appraisal	Physical distress (*Level of pain* + *Level of mobility* + *Self-care* + *Difficulty in usual activities*) + Financial distress (*Financial hardship*) [range: 0 to 5]	1.86	0.94
Cancer type			
Lung	=1 if type of cancer is Lung cancer, 0 otherwise	0.12	0.32
Breast	=1 if type of cancer is Breast cancer, 0 otherwise	0.19	0.39
Stomach	=1 if type of cancer is Stomach cancer, 0 otherwise	0.09	0.29
Head & neck	=1 if type of cancer is Head & neck cancer, 0 otherwise	0.09	0.29
Cervix	=1 if type of cancer is Cervix cancer, 0 otherwise	0.17	0.38
Colon	=1 if type of cancer is Colon cancer, 0 otherwise	0.05	0.23
Prostate	=1 if type of cancer is Prostate cancer, 0 otherwise	0.01	0.11
Bladder	=1 if type of cancer is Bladder cancer, 0 otherwise	0.03	0.16
Oral	=1 if type of cancer is Oral cancer, 0 otherwise	0.04	0.21
Other cancer	=1 if type of cancer is any Other cancer not listed above, 0 otherwise	0.21	0.41
Individual & Household controls			
Wealth index	Household wealth indicator (Items used to construct the index - radio, bicycle, motorcycle, fans, television, sewing machine, camera, car, refrigerator, washing machine and computer) [ranges from -2.27 to 6.45]	-0.12	1.68
Marital status			
Single	=1 If respondent is single or separated or divorced	0.06	0.24
Married	=1 if respondent is married	0.8	0.39
Widow	=1 if respondent is a widow	0.14	0.34
Female	=1 if respondent is a female patient	0.62	0.49
Respondent's education	=1 if No formal schooling =2 if Grades 1-5 =3 if Grades 6-8 =4 if Grades 9-12 =5 if Bachelors =6 if Masters =7 if Others	1.97	1.34
Respondent's age	Respondent’s age [ranges from 6 to 92]	51.72	14.68
Total children	Total children in household [ranges from 6 to 12]	3.19	2.03
Caste			

Brahmin/Chettri	=1 if respondent belongs to Brahmin or Chettri category, 0 otherwise	0.37	0.48
Janajati	=1 if respondent belongs to Janajati category, 0 otherwise	0.34	0.47
Dalit	=1 if respondent belongs to Dalit category, 0 otherwise	0.07	0.26
Madhesi	=1 if respondent belongs to Madhesi category, 0 otherwise	0.15	0.36
Other caste	=1 if respondent belongs to any other category, 0 otherwise	0.07	0.25
Observations		908	

Source: Quality of Life survey, May-July 2018; Nepal Study Center, University of New Mexico.

Table 5: Estimates for Depression Symptoms among Cancer Patients

	Model (1) OLS			Model (2) Ordered Logit		
	Depression Symptoms (continuous)			*Depression Symptoms* (categorical)		
	All Cancer Patients	Male Cancer Patients	Female Cancer Patients	All Cancer Patients	Male Cancer Patients	Female Cancer Patients
Social Networks	-0.571***	-0.489***	-0.602***	-0.203***	-0.197***	-0.209***
	(0.064)	(0.116)	(0.078)	(0.027)	(0.053)	(0.031)
Cancer type	YES	YES	YES	YES	YES	YES
Individual and household Controls	YES	YES	YES	YES	YES	YES
Constant	12.741***	10.738***	14.214***			
	(1.348)	(2.131)	(1.808)			
Cut1						
Constant				-2.922***	-1.917	-3.298***
				(0.564)	(0.998)	(0.731)
Cut2						
Constant				-1.039	-0.109	-1.321
				(0.558)	(0.991)	(0.722)
Cut3						
Constant				0.360	1.541	-0.028
				(0.569)	(0.998)	(0.740)
Cut4						
Constant				1.601**	2.872**	1.183
				(0.609)	(1.060)	(0.787)
N	1002.000	381.000	621.000	1002.000	381.000	621.000
AIC	5805.372	2187.126	3628.527	2422.957	901.719	1534.835
BIC	5908.477	2262.039	3712.722	2535.882	988.461	1632.325
R-square	0.147	0.192	0.145			
Log-likelihood	-2881.686	-1074.563	-1074.563	-1188.479	-428.86	745.418

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Std. errors in parenthesis;
Cancer type controls for all ten cancer types in the sample; *Individual and household Controls* include age, gender, education, marital status, wealth, caste and number of children in the household;
Depression Symptoms (continuous) ranges from 0-27 and *Depression Symptoms* (categorical) includes five categories ranging from Mild (1) to Extremely severe (5)

Table 6: Mediation Analysis of Depression Symptoms (continuous) in Cancer Patients using Structural Equation Modelling (Choosing best model)

	Model (1)			Model (2)			Model (3)		
	Depression Symptoms (Eq. 1)	*Stress Appraisal* (Eq. 2)	*Social Networks* (Eq. 3)	*Depression Symptoms* (Eq. 1)	*Stress Appraisal* (Eq. 2)	*Social Networks* (Eq. 3)	*Depression Symptoms* (Eq. 1)	*Stress Appraisal* (Eq. 2)	*Social Networks* (Eq. 3)
Stress Appraisal	1.817***			1.752***			1.759***		
	(0.149)			(0.154)			(0.154)		
Social Networks	-0.474***	-0.659***		-0.484***	-0.634***		-0.483***	-0.569***	
	(0.056)	(0.156)		(0.056)	(0.139)		(0.056)	(0.117)	
Controls									
Cancer type									
Lung		-0.330**			-0.333**			-0.313**	
		(0.118)			(0.117)			(0.117)	
Breast		-0.253***			-0.260***			-0.256***	
		(0.095)			(0.099)			(0.098)	
Stomach		-0.279*			-0.284*			-0.280 *	
		(0.131)			(0.129)			(0.130)	
Head & neck		-0.119			-0.122			-0.116	
		(0.117)			(0.118)			(0.118)	
Cervix		-0.363***			-0.373***			-0.357***	
		(0.100)			(0.105)			(0.104)	
Colon		-0.138			-0.137			-0.139	
		(0.143)			(0.141)			(0.142)	
Prostate		-0.407			-0.409			-0.401	
		(0.236)			(0.232)			(0.228)	
Bladder		0.004			-0.004			-0.008	
		(0.200)			(0.198)			(0.199)	
Oral		-0.239			-0.249			-0.285	
		(0.144)			(0.146)			(0.145)	
Female	0.646*		-0.226*	0.687**		-0.213*	0.683**		-0.256*
	(0.254)		(0.100)	(0.258)		(0.100)	(0.258)		(0.108)

Wealth index			0.175***			0.175***			0.188***
			(0.044)			(0.040)			(0.038)
Respondent's education			0.111**			0.126**			0.119*
			(0.038)			(0.043)			(0.043)
Marital status									
Married			-0.018	0.679		-0.034	0.785	0.088	0.289
			(0.166)	(0.551)		(0.168)	(0.552)	(0.122)	(0.370)
Widow			0.122	0.884		0.062	0.951	0.042	0.409
			(0.218)	(0.683)		(0.215)	(0.683)	(0.152)	(0.454)
Respondent's age		0.013***		0.013	0.019***	0.011*	0.017	0.017***	0.008
		(0.003)		(0.010)	(0.004)	(0.005)	(0.011)	(0.004)	(0.005)
Total children					0.021		-0.075	0.013	
					(0.018)		(0.074)	(0.018)	
Caste									
Janajati									-0.158
									(0.107)
Dalit									-0.078
									(0.192)
Madhesi									-0.413*
									(0.171)
Others									-0.369
									(0.216)
Constant	9.330***	10.880***	14.222***	8.239***	10.201***	13.650***	8.148***	9.126***	13.641***
	(0.940)	(2.296)	(0.207)	(1.048)	(1.979)	(0.340)	(1.042)	(1.671)	(0.427)
N		908			908			908	
AIC		25637.763			29174.865			30967.622	
BIC		25758.045			2319.202			31145.638	
Log-pseudolikelihood		-12793.882			-14557.432			-15446.811	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Std. errors in parenthesis;
For Cancer type "*Other cancer*" is the base category; *Brahmin/Chettri* is the base for caste; *Single* is the base for Marital status;

Table 7: Mediation Analysis of Depression Symptoms (continuous) in Cancer Patients by Gender using Structural Equation Modelling

	Pooled sample			Male Cancer Patients			Female Cancer Patients		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Depression Symptoms (Equation 1)									
Stress Appraisal	1.817***	0.000	1.817***	1.811***	0.000	1.811***	1.835***	0.000	1.835***
	(0.149)	(.)	(0.149)	(0.214)	(.)	(0.214)	(0.202)	(.)	(0.202)
Social Networks	-0.474***	-1.198***	-1.672***	-0.380***	-1.279*	-1.659**	-0.523***	-1.126***	-1.749***
	(0.056)	(0.283)	(0.293)	(0.089)	(0.532)	(0.558)	(0.070)	(0.391)	(0.398)
Stress Appraisal (Equation 2)									
Social Networks	-0.659***	0.000	-0.659***	-0.706*	0.000	-0.706*	-0.668***	0.000	-0.668***
	(0.156)	(.)	(0.156)	(0.294)	(.)	(0.294)	(0.213)	(.)	(0.213)
Social Networks (Equation 3)									
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
N		908			339			569	
AIC		25637.8			9535.9			13232.3	
BIC		25758.0			9623.9			13332.3	
Log-pseudolikelihood		-12793.9			-4744.9			-6593.2	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Std. errors in parenthesis;
Results in this table are based on Model (1) in Table 6 which is the preferred model; *Controls* include *Cancer type* and *Individual and household controls; Cancer type* controls for all ten cancer types in the sample; *Individual and household Controls* include age, gender, education, marital status, wealth, caste and number of children in the household; *Depression Symptoms* (continuous) ranges from 0-27

Table 8: Hypothesis table

Hypothesis 1: Social Networks reduce Depression Symptoms among cancer patients

	Depression Symptoms (continuous)			*Depression Symptoms* (categorical)		
	OLS			Ordered Logit		
	Pooled sample	Male Cancer Patients	Female Cancer Patients	Pooled sample	Male Cancer Patients	Female Cancer Patients
Social Networks	(-)***	(-)***	(-)***	(-)***	(-)***	(-)***

Hypothesis 2: Social Networks reduce Depression Symptoms by reducing the Stress Appraisal in cancer patients.

	Indirect effect on *Depression Symptoms*		
	Pooled sample	Male Cancer Patients	Female Cancer Patients
Social Networks	(-)***	(-)***	(-)***

Hypothesis 3: The effect of Social Networks on reducing Depression Symptoms is different among male and female cancer patients.

	Depression Symptoms			*Depression Symptoms*		
	Male Cancer Patients			Female Cancer Patients		
	Direct	Indirect	Total	Direct	Indirect	Total
Social Networks	-0.380***	-1.279*	**-1.659****	-0.523***	-1.126***	**-1.749*****

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Robustness Check:

Table 9: Mediation Analysis of Depression Symptoms (categorical) in Cancer Patients by Gender using Structural Equation Modelling

	Pooled sample			Male Cancer Patients			Female Cancer Patients		
	Depression Symptoms	*Stress Appraisal*	*Social Networks*	*Depression Symptoms*	*Stress Appraisal*	*Social Networks*	*Depression Symptoms*	*Stress Appraisal*	*Social Networks*
Stress Appraisal	0.518***			0.555***			0.497***		
	(0.043)			(0.067)			(0.057)		
Social Networks	-0.119***	-0.039**		-0.104***	-0.059*		-0.124***	-0.025	
	(0.016)	(0.012)		(0.027)	(0.024)		(0.019)	(0.014)	
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant		1.882***	13.775***		2.152***	14.222***		1.657***	13.604***
		(0.212)	(0.399)		(0.373)	(0.633)		(0.266)	(0.499)
N	908			339			569		
AIC	1002.000			381.000			621.000		
BIC	8967.569			3329.904			5652.580		
R-squared	9095.223			3424.532			5758.931		
Log-pseudolikelihood	-4457.784			-1640.952			-2802.290		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Std. errors in parenthesis.

Results in this table are based on Model (1) in Table 6 which is the preferred model; *Controls* include *Cancer type* and *Individual and household controls; Cancer type* controls for all ten cancer types in the sample; *Individual and household Controls* include age, gender, education, marital status, wealth, caste and number of children in the household; *Depression Symptoms* (categorical) includes five categories ranging from Mild (1) to Extremely severe (5)

Table 10: Step-by-Step Mediation Analysis of Depression Symptoms (continuous) in Cancer Patients

	(1) *Depression Symptoms*	(2) *Depression Symptoms*	(3) *Stress Appraisal*	(4) *Depression Symptoms*
Stress Appraisal		1.929***		1.828***
		(0.142)		(0.137)
Social Networks	-0.583***		-0.034*	-0.471***
	(0.059)		(0.013)	(0.054)
Constant	13.979***	1.930**	2.041***	8.836***
	(1.083)	(0.663)	(0.241)	(1.020)
Controls	YES	YES	YES	YES
N	1002.000	908.000	908.000	908.000
AIC	5827.438	5074.346	2449.379	5002.669
BIC	5910.904	5156.137	2531.171	5089.272
R-squared	0.121	0.202	0.053	0.265
Log-likelihood	-2896.719	-2520.173	-1207.690	-2483.335
Indirect effect	-.062*			
	(.025)			
Direct effect	-.471***			
	(.054)***			

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Std. errors in parenthesis.

Results in this table are based on Model (1) in Table 6 which is the preferred model; *Controls* include *Cancer type* and *Individual and household controls; Cancer type* controls for all ten cancer types in the sample; *Individual and household Controls* include age, gender, education, marital status, wealth, caste and number of children in the household; *Depression Symptoms* (continuous) ranges from 0-27

Table 11: Step-by-Step Mediation Analysis of Depression Symptoms (categorical) in Cancer Patients by Gender

	Male Cancer Patients				Female Cancer Patients			
	Depression Symptoms	*Depression Symptoms*	*Stress Appraisal*	*Depression Symptoms*	*Depression Symptoms*	*Depression Symptoms*	*Stress Appraisal*	*Depression Symptoms*
Stress Appraisal		1.943***		1.842***		1.940***		1.859***
		(0.211)		(0.208)		(0.190)		(0.181)
Social Networks	-0.496***		-0.054*	-0.350***	-0.614***		-0.022	-0.533***
	(0.100)		(0.024)	(0.090)	(0.074)		(0.016)	(0.069)
Constant	12.154***	1.090	2.573***	6.399***	15.061***	2.712**	1.848***	10.413***
	(1.803)	(0.976)	(0.421)	(1.662)	(1.351)	(0.866)	(0.294)	(1.292)
Controls	YES	YES	YES	YES	YES	YES	YES	YES
N	381.000	339.000	339.000	339.000	621.000	569.000	569.000	569.000
AIC	2195.812	1842.749	933.567	1829.128	3638.866	3232.379	1529.058	3175.772
BIC	2254.954	1900.139	990.957	1890.344	3709.768	3301.881	1598.560	3249.618
R-squared	0.155	0.279	0.089	0.311	0.122	0.181	0.055	0.262
Log-likelihood	-1082.906	-906.374	-451.784	-898.564	-1803.433	-1600.190	-748.529	-1570.886
Direct effect	-.350*** (.009)				-.532*** (-.019)			
Indirect effect	-.098* (-.003)				-.041 (-.006)			

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Std. errors in parenthesis.
Controls include *Cancer type* and *Individual and household controls*

Figures

Figure 1: Cancer Incidences in Nepal (Province Level)

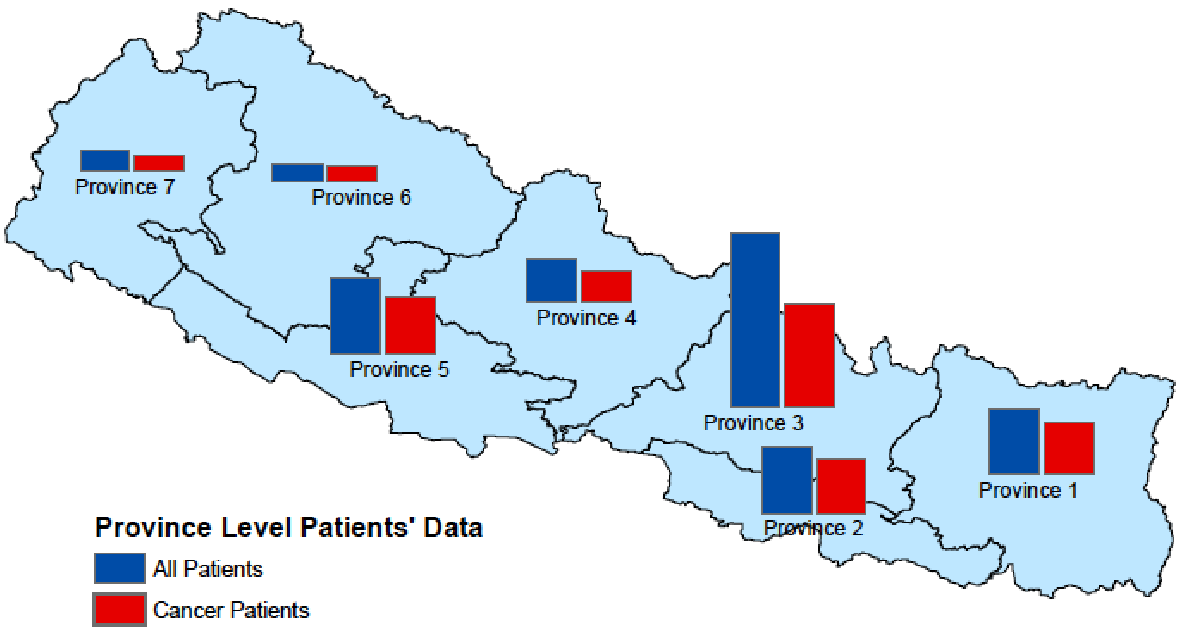


Figure 2: Cancer Incidences in Nepal (District Level)

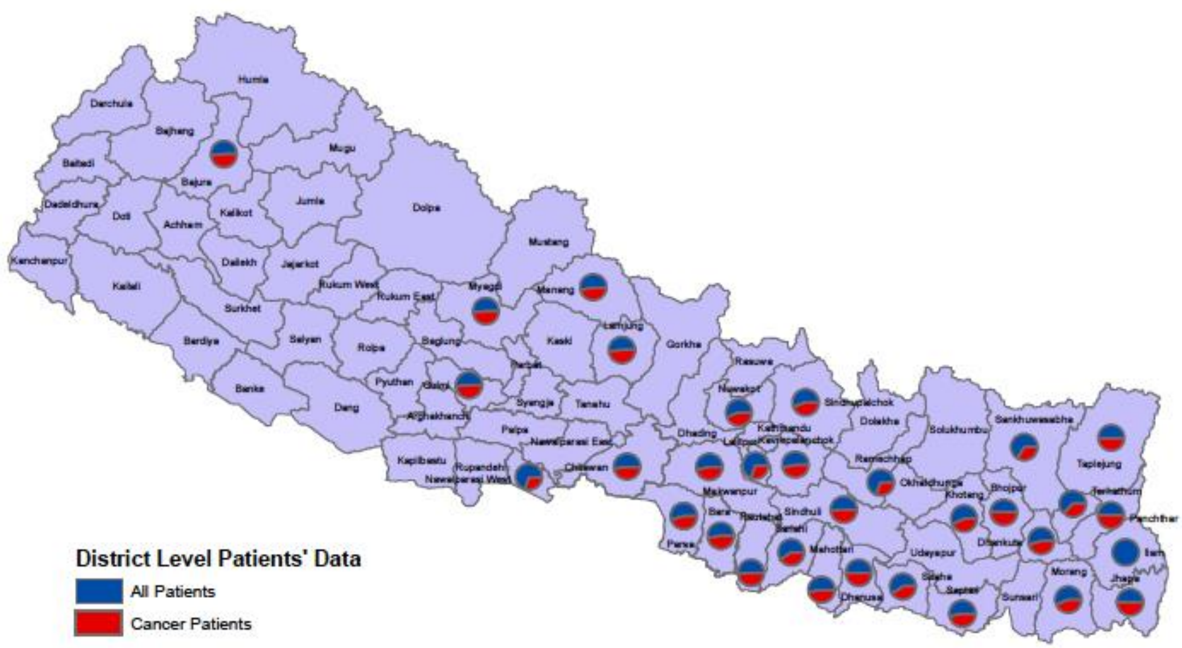


Figure 3: Distribution of Cancer Types

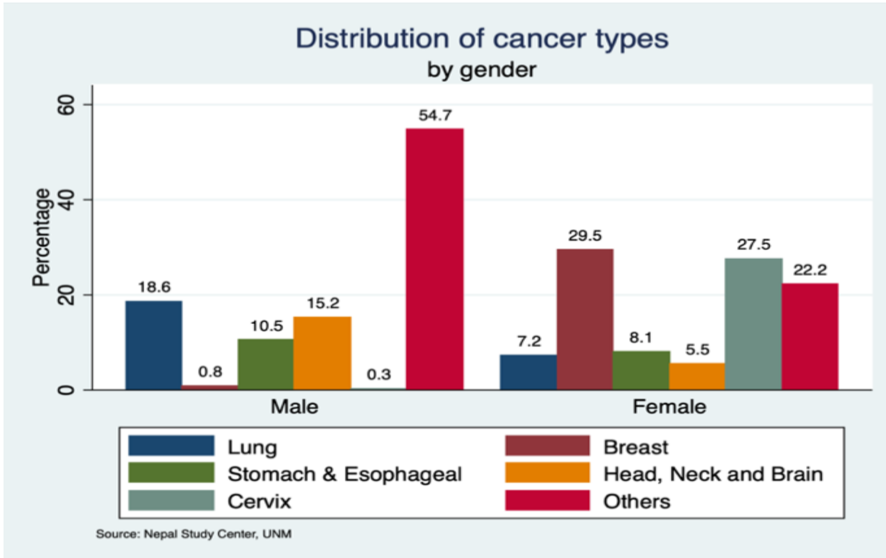


Figure 4: Mean Level of Depression Symptoms among Cancer and Control Groups

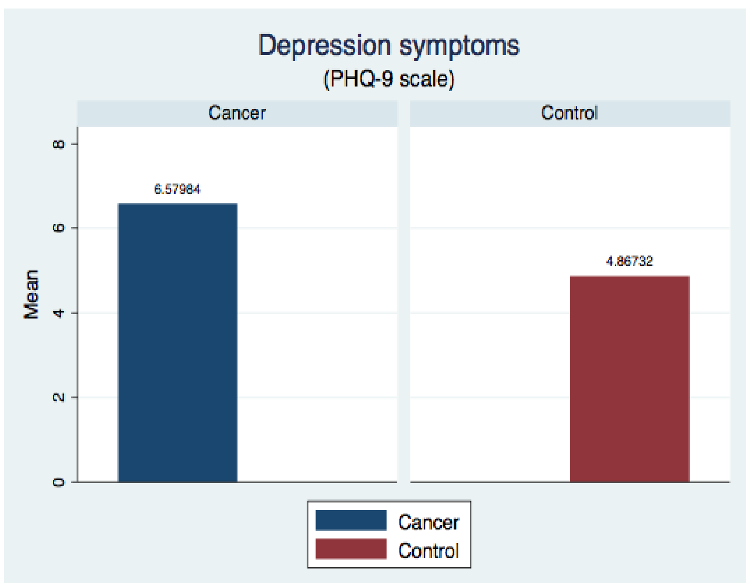


Figure 5: Distribution of Severity of Depression Symptoms (continuous and categorical) by Cancer and Control Groups

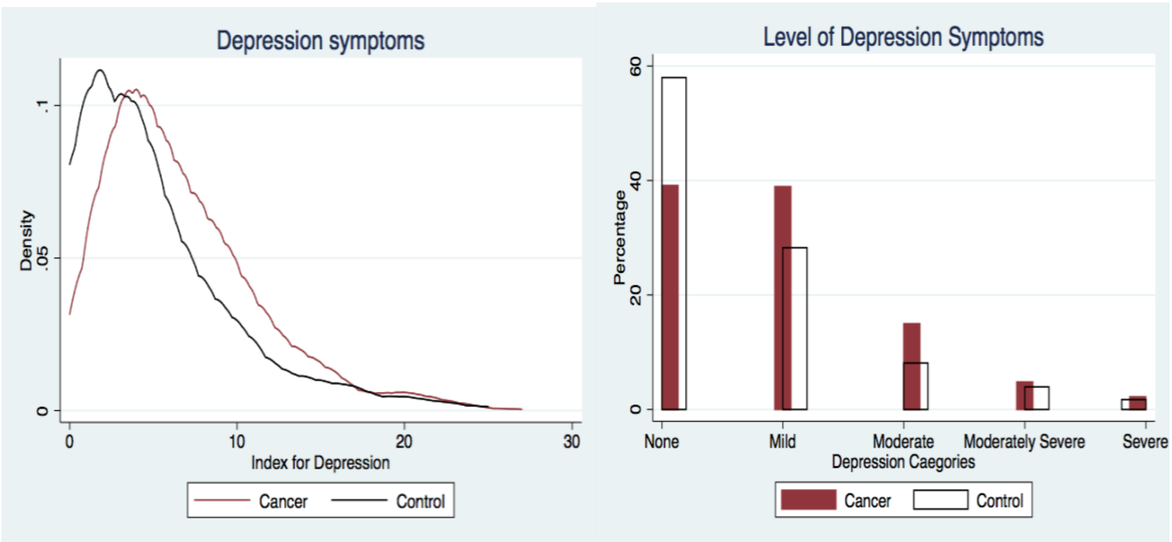


Figure 6: Mean level of Depression Symptoms by Gender

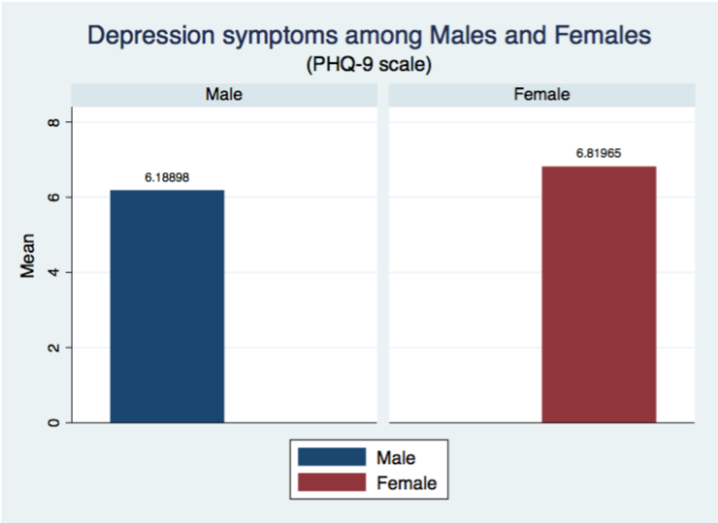
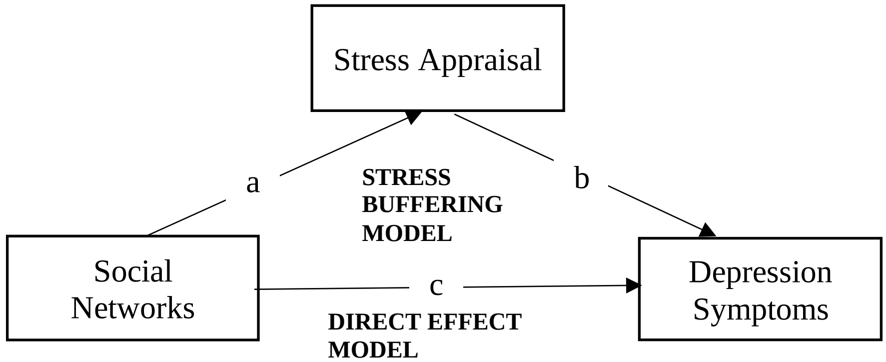


Figure 7. Stress Buffering Model and Direct Effect Model



Survey Questionnaire

Namaskar, I am [Enumerator's name: ....] from the Nepal Study Center at the University of New Mexico, USA. We are conducting a research survey to examine the determinants of quality of life of cancer patients in Nepal. The survey will take approximately 30 minutes.

You will be asked a series of questions to understand the importance of different factors of quality of life, the treatment available to improve those factors, your willingness to pay the cost associated with the treatment, and the trade-off between quality and length of life. Some questions in this survey may cause you to feel slightly uncomfortable. Some questions will be Yes/No, while some questions ask you to choose one of different options. Some questions in this survey may cause you to feel slightly uncomfortable. In such cases, you may refuse to answer any individual question. Through this, we can analyze the importance of different factors of quality of life, and this will help us in recommending policies on how to improve the quality of life of cancer patients.

All your responses will be *anonymous.* Only the researchers involved in this study and those responsible for research oversight will have access to the information you provide. Your responses will be handwritten and stored securely at the research facility at Nepal Study Center in the University of New Mexico. Your responses will be numbered and coded, and your name will not be on any documents. The coding will be used on all your documents but will not connect to your name. So, while we know from the record of your verbal consent that you participated in this research study, no data will be linked to you. The primary surveys will be stored in a locked safe until coding.

Participation in this study is completely voluntary. You are free to decline to participate, to end participation at any time for any reason, or, again, to refuse to answer any individual question. Refusing to participate will involve no penalty or loss of benefits to which you are otherwise entitled.

Thank you for participating in this study.

Do you want to participate in the survey? (*Tick one*)

1. Yes (Proceed) ☐
2. No (Quit) ☐

Hospitals	Bhaktapur	1	Bir	2	Dhulikhel	3	Army	4	Teaching	5	Bharatpur	6

1. Are you 18 years or older? *(Ask if respondent looks very young)*

18 years or older	1. (Start the Survey)
Less than 18 years old	2. Can't include in the survey

To be filled by enumerators

SURVEY VERSION:

PSU Code: ___________________

Date of Interview: ___________ (dd/mm/yyyy) e.g. 19 September 2017

Supervisor's Name: ....

Enumerator's Name: ....

Supervisor's Signature: ………………

Enumerator's Signature: …………..

Begin Time ....

End Time ....

<u>About the respondent:</u>

Respondent ID: ....

Respondent's Age .... (MUST be 18+)

Name of the place: ....

City: ………………………

VDC: ……………………...

District: ……………………

A. GENERAL HEALTH STATUS

1. What type of cancer do you have? (*Tick one*)	1	Lung	
	2	Breast	
	3	Stomach & Esophageal	
	4	Head &Neck & Brain	
	5	Cervix Uteri	
	6	Trachea	
	7	Colon and rectal	
	8	Prostate	
	9	Bladder	
	10	Oral & nasopharynx	
	11	Others (*Please specify*) …………….	

2. Why did you think cancer must have caused to you? (*Tick all that apply*) ***To enumerator: Ask for every single option, if they say yes, then tick it. But all the options should be presented to them.***	1	Genetics	
	2	Tobacco / Smoking	
	3	Diet and Physical activity	
	4	Sun and UV exposure	
	5	Cancer is due to bad karma	
	6	Because of my wrongdoings	
	7	Contagious –I got it from someone	
	8	Causes are unknown	
	9	Other reasons	
	10	Don't know	

3. What is the other major health disease do you have apart from cancer? (*Tick all that apply*)	1	Diabetic	
	2	Blood pressure	
	3	Mental disorder	
	4	Epilepsy	
	5	Asthma	
	6	Heart Disease	
	7	COPD	
	8	Alzheimer	
	9	Others	
	10	None	

B. GENERAL QUALITY OF LIFE

Quality of Life: Health-related quality of life is a multi-dimensional concept that consists of domains related to physical, mental, emotional, and social functioning. It includes subjective evaluations of both positive (well-being) and negative aspects (illnesses) of life, such as an individual's perception about his/her physical (Mobility, energy level, etc.) or mental health (depression, etc.) status.

4. How important do you think is improving the quality of life? (*Tick one*)

   a. Very Important (5) ☐
   b. Important (4) ☐
   c. Moderately Important (3) ☐
   d. Slightly Important (2) ☐
   e. Not Important at all (1) ☐

		Extremely (5)	Quite a bit (4)	Moderately (3)	Slightly (2)	Not at all (1)
5.	During the past 4 weeks, how much difficulty did you have doing your work or other regular daily activities as a result of your physical health? *(please check (☐) one box)*[2]	☐	☐	☐	☐	☐
6.	During the past 4 weeks, to what extent have you accomplished less than you would like in your work or other daily activities as a result of emotional problems (such as feeling depressed or anxious)? *(please check (☐) one box)*	☐	☐	☐	☐	☐

2 https://www.ok.gov/health2/documents/Health_Status_Questionnaire.pdf

		Extremely (5)	Quite a bit (4)	Moderately (3)	Slightly (2)	Not at all (1)
7.	During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups? *(please check (□) one box)*	▭	▭	▭	▭	▭

8. How much bodily pain have you had during the past 4 weeks? (*Tick one*)[3]

   a. No Pain (1) ☐
   b. Slight Pain (2) ☐
   c. Moderate Pain (3) ☐
   d. Severe Pain (4) ☐
   e. Extreme Pain (5) ☐

C. QUALITY OF LIFE PREFERENCE: CHOICE EXPERIMENT[4]

Introduction:

We are interested in learning the quality of life choice preferences of patients. Quality of life of patients is assessed by different factors: Pain, Depression, Mobility, Self-Care, and Usual-Activities. The hospital wants to introduce a treatment that affects the quality of life of patients by reducing pain and depression, increasing mobility, self-care, and usual activities. The treatment involves giving medicines, therapy, counselling, and care-giver services that affect different factors of quality of life. The treatment improves the quality of life of patients; however, it does not affect the expected probability of survival.

C.1 Pain:

Patients suffer from pain. It can affect their enjoyment of life from moderate to severe extent. The treatment involves pain medicine, therapy for reducing pain from extreme-pain to no-pain.

9. What is your current level of pain? (*Tick one*)

3 https://www.ok.gov/health2/documents/Health_Status_Questionnaire.pdf
4 https://euroqol.org/wp-content/uploads/2016/09/EQ-5D-5L_UserGuide_2015.pdf

a. No-Pain ☐
b. Moderate-Pain ☐
c. Extreme-Pain ☐

10. How important, do you think, is reducing the pain of cancer patients? (*Tick one*)

a. Very Important ☐
b. Important ☐
c. Moderately Important ☐
d. Slightly Important ☐
e. Not Important at all ☐

C.2 Depression:

Patients suffer from mental anxiety and depression. It does influence patient's quality of life. The treatment involves counselling services for reducing the depression from extreme-depression to no-depression

11. What is your current level of depression? (*Tick one*)

a. Not depressed at all ☐
b. Moderately depressed ☐
c. Extremely depressed ☐

12. How important, do you think, is reducing the depression of cancer patients? (*Tick one*)

a. Very Important ☐
b. Important ☐
c. Moderately Important ☐
d. Slightly Important ☐
e. Not Important at all ☐

C.3 Mobility:

Medical condition affects the mobility of the person. Sometimes, it affects the mobility to a moderate extent and patients can walk with some support; however, sometimes, patients are totally confined to bed and they can't even walk. The treatment provides care-giver services and therapy services that can help patient move.

13. What is your current level of mobility? (*Tick one*)

a. I can walk and run ☐
b. I can move/walk with some support ☐
c. Confined to Bed and Can't Move ☐

14. How important, do you think, is improving the mobility of cancer patients? (*Tick one*)

a. Very Important ☐
b. Important ☐
c. Moderately Important ☐
d. Slightly Important ☐
e. Not Important at all ☐

C.4 Self-Care:

Self-care involves patients performing activities, such as: eating, drinking, dressing, washing, etc. by himself. In some cases, cancer patients can perform self-care activities with difficulty, while in other cases, patients can't perform such activities and need an outside assistance. The treatment provides an outside assistance in the form of a caregiver who will help or perform patient's self-care activities.

15. Please tell me about your current level of performing self-care activities. (*Tick one*)

a. I can perform all activities by myself ☐
b. I can perform all activities with some support ☐
c. I cannot perform any activity by myself ☐

16. How important, do you think, is improving the ability of a cancer patient so that he/she can perform self-care activities by him/herself? (*Tick one*)

    a. Very Important ☐
    b. Important ☐
    c. Moderately Important ☐
    d. Slightly Important ☐
    e. Not Important at all ☐

C.5 Usual Activities:

Usual activities involve performing activities, such as outside work (bringing groceries, etc.), study, housework (cleaning, etc.), family or leisure activities. As medical condition affects the quality of life of patients, they may not be able to perform usual activities. The treatment provides an outside assistance in the form of a caregiver who will help or perform patient's usual activities.

17. Please tell me about your current level of performing usual activities. (*Tick one*)

    a. I can perform all activities by myself ☐
    b. I can perform all activities with some support ☐
    c. I cannot perform any activity by myself ☐

18. How important, do you think, is improving the ability of a cancer patient so that he/she can perform usual activities by him/herself? (*Tick one*)

    a. Very Important ☐
    b. Important ☐
    c. Moderately Important ☐
    d. Slightly Important ☐
    e. Not Important at all ☐

C.6 Treatment Cost:

Improving the quality of life involve improving the various components discussed above through treatment. The treatment involves medicine, therapy, counselling services, and care-giver services. Medicine helps reduce pain, counselling services help reduce depression, therapy and care-giver services help improve mobility, self-care, and usual-activities. To improve the quality of life, the patient may have to pay some additional cost for the treatment.

19. On the following scale, describe your hardship in paying the cost in terms of travel expenditure and visiting fee? (*Tick one in each row*).

	No Hardship	Small Hardship	Moderate Hardship	Great Hardship
NRS 1000	1	2	3	4
NRS 2500	1	2	3	4
NRS 5000	1	2	3	4
NRS 9000	1	2	3	4
NRS 15000	1	2	3	4

On the following pages, we will present you with different sets of alternatives and ask you to choose one.

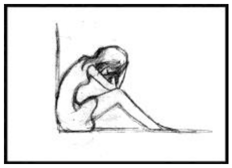
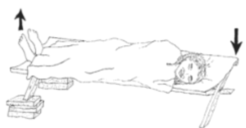
Each time we will show you three different possible alternatives that would fulfill the task of improving the quality of life of patients on different grounds and ask which of the plans you prefer. The alternatives vary depending on the level of pain, depression, mobility, self-care, and usual activities. Each alternative contains different levels of mentioned factors, and it costs you in terms of treatment.

You may not like either of the plans presented. Nonetheless, please choose the one you like the best (or dislike the least).

The following questions are very important, so please consider them carefully.

20. Consider the following three possible alternatives

	Alternative-A	**Alternative-B**	**Alternative-C**
Pain			No-Change

Depression			
Mobility			
Self-Care			
Usual Activities			
Treatment Cost			NRS 0
Which alternative do you prefer? *(Tick one)*	☐	☐	☐

21. How certain are you of your choice? (*Tick one*)

Very certain (1)	Somewhat certain (2)	Neither certain nor uncertain (3)	Somewhat uncertain (4)	Very uncertain (5)
☐	☐	☐	☐	☐

D. VALUING LIFE

Now, I would like to ask you some questions about the quality and length of life. This will allow us to understand patient's preferences for quality and length of life. Please answer the following questions as accurately as possible.

22. Please tell me how much you agree or disagree with the following statement? (*Tick one*)

		Strongly Agree	Agree (2)	Neither agree nor disagree	Disagree (4)	Strongly Disagree

		(1)		(3)		(5)
1	If a treatment could prolong my life, I would always accept it, whatever the side effects might be. *(please check (□) one box)*	☐	☐	☐	☐	☐
2	If a life-prolonging treatment would prevent me from leading a normal life, then I would rather not have it. *(please check (□) one box)*	☐	☐	☐	☐	☐
3	If I reached a point during treatment at which I felt like giving up, I would probably manage to find the strength to continue. *(please check (□) one box)*	☐	☐	☐	☐	☐
4	I can imagine some side effects being so bad that I would refuse the treatment, even if that meant a shorter life. *(please check (□) one box)*	☐	☐	☐	☐	☐
5	A moment might come at which I would say "I have done my best; this is the limit." *(please check (□) one box)*	☐	☐	☐	☐	☐
6	If I had to endure six months of intensive treatment in order to live for an extra half year, then I wouldn't bother. *(please check (□) one box)*	☐	☐	☐	☐	☐
7	I would always accept hard-to-tolerate treatment, even if the chance of its prolonging my life was as little as one percent. *(please check (□) one box)*	☐	☐	☐	☐	☐
8	In order to live a bit longer, I would clutch at any straw. *(please check (□) one box)*	☐	☐	☐	☐	☐

E. EMOTIONAL STATUS

Now, I would like to ask you some questions about the behavior and thinking pattern that suggests the presence of depression in past two weeks of time. This will allow us to understand if patients have any symptoms related to depression. Please answer the following questions as accurately as possible. If you are not comfortable on answering these questions and at any point if you feel uncomfortable then you can choose not to answer, or you can also withdraw from the survey.

The Patient Health Questionnaire (PHQ-9)

Over the past 2 weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More Than Half of the Days	Nearly Every Day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3
3. Trouble falling asleep, staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself – or that you're a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or, the opposite – being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3
Column Totals		______ +	______ +	______
Add Totals Together		________________________		
10. If you checked off any problems, how difficult have those problems made it for you to: Do your work, take care of things at home, or get along with other people? ☐ Not difficult at all ☐ Somewhat difficult ☐ Very difficult ☐ Extremely difficult				

F. SOCIAL LIFE

Now, I would like to ask you some questions about your social life that suggests the level with which you are happy with your social life. Please answer the following questions as accurately as possible.

		Yes (1)	More or less (2)	No (3)
1	There is always someone I can talk to about my day-to-day problems. *(please check (□) one box)*	☐	☐	☐
2	I miss having a really close friend. *(please check (□) one box)*	☐	☐	☐

3	I experience a general sense of emptiness. *(please check (□) one box)*	▢	▢	▢
4	There are plenty of people I can lean on when I have problems. *(please check (□) one box)*	▢	▢	▢
5	I miss the pleasure of the company of others. *(please check (□) one box)*	▢	▢	▢
6	I find my circle of friends and acquaintances too limited? *(please check (□) one box)*	▢	▢	▢
7	There are many people I can trust completely. *(please check (□) one box)*	▢	▢	▢
8	There are enough people I feel close to. *(please check (□) one box)*	▢	▢	▢
9	I miss having people around me. *(please check (□) one box)*	▢	▢	▢
10	I often feel rejected. *(please check (□) one box)*	▢	▢	▢
11	I can call on my friends whenever I need them? *(please check (□) one box)*	▢	▢	▢
12	Do you participate in any support groups? For e.g. Nepal Cancer Relief Society, Nepal Cancer Support Group etc.	NEVER(1) ▢	SOMETIMES(2) ▢	ALWAYS(3) ▢

G. PATIENT-CENTERED COMMUNICATION AND ENHANCED ACCESS TO CARE

Now, I would like to ask you some questions about the relationship/communication between you and your provider/doctor. This communication is used to find out the quality of care you are getting or the improvements that need to be made in them. Please answer the following questions as accurately as possible.

Next question focuses on how your providers monitor all other care received by you. Please answer it as accurately as possible.		
1. Does provider usually ask about prescription medications and components other doctors may give them?	YES (1) ☐	NO (2) ☐

Next few questions focus on if the care you receive is based on the needs and preferences of you and your families. Please answer them as accurately as possible.				
2. Thinking about the types of medical, traditional, and alternative components that person is happy with, how often does provider show respect for other components?	NEVER (1) ☐	SOMETIMES (2) ☐	USUALLY (3) ☐	ALWAYS (4) ☐
Next two questions focus on your level participation in selecting treatment options for your medical condition. Please answer them as accurately as possible.				
3. Does provider explain and provide all the options to the person?	YES (1) ☐	NO (2) ☐		
4. If there were a choice between components, how often would provider ask person to help make the decision?	NEVER (1) ☐	SOMETIMES (2) ☐	USUALLY (3) ☐	ALWAYS (4) ☐
Next four questions focus on assessing the current level of accessibility of the clinical care provided to you. Please answer them as accurately as possible.				
5. How difficult is it to get to usual source of care?	VERY DIFFICULT (1)	SOMEWHAT DIFFICULT (2) ☐	NOT TOO DIFFICULT (3)	NOT AT ALL DIFFICULT (4)

	☐		☐	☐
6. How difficult is it to contact usual source of care after hours?	VERY DIFFICULT (1) ☐	SOMEWHAT DIFFICULT (2) ☐	NOT TOO DIFFICULT (3) ☐	NOT AT ALL DIFFICULT (4) ☐
7. How difficult is it to contact usual source of care by phone?	VERY DIFFICULT (1) ☐	SOMEWHAT DIFFICULT (2) ☐	NOT TOO DIFFICULT (3) ☐	NOT AT ALL DIFFICULT (4) ☐

8. Does the usual source of care have office hours at night or during weekends?	YES (1) ☐	NO (2) ☐

H. DOMESTIC LIFE OF WOMEN SUFERING FROM CHRONIC ILLNESSES

ONLY FEMALE QUESTIONNAIRE: IF GENDER of the respondent is MALE, skip this section and go to module G

Now, I would like to ask you some questions about your domestic life since you were detected with your medical condition and before that. This will allow us to understand if having chronic illnesses have a healthy domestic life or not. Please answer the following questions as accurately as possible.

1. (Does/did) your (last) husband/partner ever do any of the following things to you in last 12 months?	OFTEN (1)	SOMETIMES (2)	NOT AT ALL (3)
a) push you, shake you, or throw something at you?	☐	☐	☐
b) slap you?	☐	☐	☐

c) twist your arm or pull your hair?	☐	☐	☐
d) punch you with his fist or with something that could hurt you?	☐	☐	☐
e) kick you, drag you or beat you up?	☐	☐	☐
f) try to choke you or burn you on purpose?	☐	☐	☐
g) threaten or attack you with a knife, gun or any other weapon?	☐	☐	☐
h) physically force you to have sexual intercourse with him even when you did not want to?	☐	☐	☐
i) force you to perform any sexual acts you did not want to?	☐	☐	☐

2. Did the following ever happen as a result of what your (last) husband/partner did to you:	YES (1)	NO (2)
a) You had cuts, bruises or aches?	☐	☐
b) You had eye injuries, sprains, dislocations or burns?	☐	☐
c) You had deep wounds, broken bones, broken teeth, or any other serious injury?	☐	☐

3. Has your partner ever physically assaulted you?	YES (1) ☐	NO (2) ☐

4. If yes, are the physical assaults increased since you were detected with medical condition? *(please check (□) one box)*	STRONGLY AGREE (1)	AGREE (2)	STAYED THE SAME (3)	DISAGREE (4)	STRONGLY DISAGREE (5)
	☐	☐	☐	☐	☐

5. (Does/did) your husband/partner drinks alcohol?	OFTEN (1)	SOMETIMES (2)	NEVER (3)

6. Thinking about what you yourself have experienced among the different things we have been talking about, from whom have you ever tried to seek help to stop (the/these) person(s) from doing this to you again? Anyone else? RECORD ALL MENTIONED.	NEVER SOUGHT HELP	
	OWN FAMILY	
	HUSBAND/LIVE-IN PARTNER's FAMILY	
	CURRENT/LAST/LATE HUSBAND/ LIVE-IN PARTNER	
	CURRENT/FORMER BOYFRIEND	
	FRIEND	
	NEIGHBOR	
	RELIGIOUS LEADER	
	DOCTOR/MEDICAL PERSONNEL	
	POLICE	
	LAWYER	
	SOCIAL SERVICE ORGANIZATION	
	OTHER (SPECIFY)________________	
	COMMENTS by the respondent:	

Now, I would like to ask you some questions about your role in your household. This will allow us to understand how women having chronic illnesses handle their household decisions. Please answer the following questions as accurately as possible.

7. Who usually decides how the money you earn will be used?	WIFE ALONE (1)	JOINTLY (2)	ANYONE ELSE (3)
8. Who usually decides how your (husband's/partner's) earnings will be used	WIFE ALONE (1)	JOINTLY (2)	ANYONE ELSE (3)
9. Who usually makes decisions about health care for yourself	WIFE ALONE (1)	JOINTLY (2)	ANYONE ELSE (3)
10. Who usually makes decisions about making major household purchases?	WIFE ALONE (1)	JOINTLY (2)	ANYONE ELSE (3)

11. Who usually makes decisions about visits to your family or relatives?	WIFE ALONE (1) ☐	JOINTLY (2) ☐	ANYONE ELSE (3) ☐
12. Would you say that using contraception is mainly your decision, mainly your (husband's/partner's) decision, or did you both decide together?	WIFE ALONE (1) ☐	JOINTLY (2) ☐	ANYONE ELSE (3) ☐

I. DEMOGRAPHICS

In order for us to perform a detailed study, we need to know about you and your family. This will help us know how different or similar our survey respondents are. In order to cater our project to fit the needs of this community, it is important that you answer these questions as accurately as possible.

All the survey information will be fully confidential. Your responses will be completely anonymous.

13. Gender of the respondent (*Tick one*)

    a. Male ☐

    b. Female ☐

14. Age of the respondent (*record in years*) _____________

15. Caste/ethnicity of the household head (*Tick one*)

    a. Brahmin ☐

    b. Chhetri ☐

    c. Newar ☐

    d. Janajati ☐

    e. Madhesi, Tharu, Musalman ☐

    f. Pahadi Dalit ☐

    g. Madhesi Dalit ☐

h. Others (*Please specify*) ………………………….

16. Religion of the household head (*Tick one*)

i. Hinduism ☐

j. Buddhism ☐

k. Muslim ☐

l. Kirat ☐

m. Christian ☐

n. Others (*Please specify*) ………………………….

17. Education level of respondent (*Tick one*)

o. No formal Schooling ☐

p. Grades 1-5 ☐

q. Grades 6-8 ☐

r. Grades 9-12 ☐

s. Bachelors ☐

t. Masters or other professional degree ☐

u. Others (*Please specify*) ………………………….

18. What is your current marital status? (*Tick one*)

v. Never Married ☐

w. Currently Married ☐

x. Divorced ☐

y. Separated ☐

z. Widowed ☐

19. Does your household own any of the following items? (*Tick one in each row*)

Item	**Yes (1)**	**No (0)**	**How many?**
Radio/Tape/CD player	☐	☐	
Bicycle	☐	☐	
Motorcycle/scooter	☐	☐	
Fans (all kinds)	☐	☐	
Television/deck	☐	☐	
Telephone set/cordless phone/ mobile phone/pager	☐	☐	
Sewing machine	☐	☐	
Camera (still/movie)	☐	☐	
Motor car, etc.	☐	☐	
Refrigerator or freezer	☐	☐	
Washing machine	☐	☐	
Computer/Printer	☐	☐	

At the end, I would like to ask you about your household income:

20. Approximately, what is your monthly income from all sources, before taxes? (*Tick one*)

aa. < NRS 10,000 ☐

bb. NRS 10,001 to NRS 20,000 ☐

cc. NRS 20,001 to NRS 30,000 ☐

dd. NRS 30,001 to NRS 50,000 ☐

ee. NRS > 50,000 ☐

ff. Don’t know ☐

gg. Refused ☐

21. Approximately, what is your monthly household income from all sources, before taxes? (*Tick one*) ☐

hh. < NRS 10,000

ii. NRS 10,001 to NRS 20,000 ☐

jj. NRS 20,001 to NRS 30,000 ☐

kk. NRS 30,001 to NRS 50,000 ☐

ll. NRS > 50,000 ☐

mm. Don't know ☐

nn. Refused ☐

22. Is household income equal to your income? (*Tick one*)

oo. Yes ☐

pp. No ☐

Thank you very much for your cooperation!

********************************End of Survey*******************************

Survey Protocol

UNM IRB PROTOCOL

TITLE:	**Health, Wellness and Quality of Life Choice Preference Study of the Cancer Patients of Nepal: A Discrete Choice Experiment**
VERSION DATE:	**2nd March 2018**
INVESTIGATOR/RESPONSIBLE FACULTY:	**Prof. Alok Bohara**
STUDENT INVESTIGATOR:	**Adnan Shahid** **Disha Shende**
FUNDING AGENCY:	**American Cancer Society**

BACKGROUND/SCIENTIFIC RATIONALE

In the context of developing countries, chronic illness is one of the dominant health burdens, and cancer alone is responsible for 70% of the total deaths. The cost associated with the chronic illness is estimated to increase to $84 billion by 2015 (Nuget, 2008). Cancer care is expensive, time consuming and is life altering for the entire family, which includes not only the cancer patients but also the family members who care for them (Nelson, 2010). In a country like Nepal, such burdens can be quite significant and devastating especially for the poor. Although cancer develops slowly, the impact on financial and non-financial stress can be speedy, deep, and irreversible for the patient as well as for the family members (caregivers). Even in a system where care falls under the public funding envelope, burden of the out-of-pocket cost can also be significantly high (16.5%) (Longo et al., 2006). This study will attempt to measure and quantify such *costs*, which could be direct as well as indirect in the context of Nepal.

Our involvement with this research topic started last year when Nepal Study Centre (NSC), a research wing located at the Economics Department of University of New Mexico received the funding from American Cancer Society to undertake a project on Nepal about the incidence and socio-economic consequences of cancer. We were involved in the process since the preparation of the grant for research. Currently we are in the process of organizing all the ground details necessary for the study. Muhammad Adnan Shahid and Disha Shende will be responsible to reach out to Nepal for data collection process.

Literature Review:

Given below is the brief description of three literatures which are equally important and pertinent to the main objective of our research agenda. The first paper 'Burden of Illness in Cancer Survivors: Findings from a Population-Based National Sample' is a USA based study aims at measuring the economic cost of cancer, the second paper 'Multi-institution Hospital-based Cancer Incidence Data for Nepal - An Initial Report' is one of the very first attempts to quantify the cancer incidents in Nepal. The third paper 'Economic burden of cancer across the European Union: a population-based cost analysis' portrays the impact of cancer on the countries of European Union.

<u>'Burden of Illness in Cancer Survivors: Findings from a Population-Based National Sample'</u>

<u>K. Robin Yabroff, William F. Lawrence, Steven Clauser, William W. Davis, Martin L. Brown</u>

<u>Journal of the National Cancer Institute, Vol. 96, No. 17, September 1, 2004</u>

The major objective of the paper is to measure the burden of Illness among cancer survivors in a population-based sample. It stands out from the contemporary literature in its attempt to push the envelope of measuring cost in capturing not only the direct hospitalization cost but also other components such as intangible cost and productivity loss. Through using a large national survey data, they could delineate specifically the burden of cancer illness by comparing patients of a similar demographic background without cancer.

The authors used 2000 National Health Interview survey data to identify the potential cancer survivors and the corresponding control group. The control group was formed based on age, educational attainment and sex. The final sample consisted of 1823 cancer survivors and 5469 matched controlled subjects. Health related utility which captures the overall state of health across multiple domains of quality of life is measured using Health Activities and Limitation Index (HALex). Loss in productivity is captured by asking them the number of days lost due to the illness, limitations in the ability to work due to health problems. Moreover, the survivors were asked specific question on types of cancer, age of diagnosis and time since it got diagnosed. The highest percentage of cancer survivors were diagnosed from that of prostate cancer followed by colorectal cancer. As compared to that of the controlled subject, cancer survivor reports lower health utility status across all measures of health and productivity. Burden is measured by the HALex utility value, lost productivity (e.g. jobs in past 12 months, unable to work due to health reasons, limitation in the kind and amount of work, days lost, etc.), general health status, number of bed days, and through measuring other limitations. Co-morbid situations are also considered like heart problems, stroke, lung/breath problem to see how the burden of cancer gets increased with additional morbidity issues. All these measures have been separately analyzed across cancer survivors and controlled subjects. The analysis results in every single measure significantly different and results in worst outcomes for the cancer patients.

Thus, the paper concludes that apart from the direct cost, the productivity cost due to morbidity and the intangible burden associated with cancer are substantial that it leaves an impact even in the long run. For cancer survivors with 11 years and above have still substantial different burden as compared to their matched controlled. The next set of results includes in studying the burden associated with respective types of cancer survivors. Survival of lung cancer reported greater burden as compared to those breast, colorectal and prostate cancer.

Multi-institution Hospital-based Cancer Incidence Data for Nepal - An Initial Report

Kishore K Pradhananga, Mina Baral, Bhakta Man Shrestha

Asian Pacific Journal of Cancer Prevention, Vol 10, 2009

A very short paper but important in the context of giving an overview on the cancer registration system of some of the developing countries like Nepal. This paper is very important in giving a credible reason that why cancer related research should be promoted and undertaken in such countries. Prior to this study, there was only one publication available with cancer incidents of one cancer specialty hospital in Nepal. This paper collects data from seven major hospitals to study the rate of incidence of the disease. These hospitals which form the basis of the study are BP Koirala Memorial Cancer Hospital, Bharatpur; Bir, Tribhuvan Kanti Children’s and Bhaktapur Hospitals in Kathmandu; BP Koirala Institute of Health Sciences in Dharan; and Manipal Teaching Hospital in Pokhara. The data has been collected over a period of one year from 1st Jan 2005- 31st December 2005. Given below in Table 1 is a description of number of cases being diagnosed with cancer in one year across different institutional setting.

Table 1: Distribution of cancer patients according to hospitals

Institution	Females		Males		Total	
BP Koirala	1,197	51.2	957	46.5	2,154	49
Bhaktapur	522	22.3	486	23.6	1008	22.9
Bir	87	3.7	119	5.8	206	4.7
Tribhuvan	80	3.4	54	2.6	134	3
BP Koirala	354	15.1	348	16.9	702	16
Manipal	87	3.7	75	3.6	162	3.7
Kanti	13	0.6	18	0.9	31	0.7
Total	2,340	100	2,057	100	4,397	100

The paper then finds the incidents based on the different cancer sites. A gender wise declassification of a detailed list of 19 types of cancer sites across all these cancer institutions have been presented, of which the most common cancer sites were found to be lung, oral cavity and stomach in males, and cervix, breast and lung in females. The Nepal cancer incidents figures have as well been compared against India and Pakistan. A crude age wise distribution of cancer incidents across the gender of male and female states that female of age below 60 years are much more likely to be diagnosed with cancer as compared to their male counterpart. For males, they are more likely to be diagnosed with cancer at their later ages with lung cancer standing out alone as the major player of all the types. For female, the variation of diagnosis varies significantly across time. From an early age as close to 20 years, there are symptoms of breast, cervix, and ovary and lung cancer. Owing to the figures, the paper indicates an immediate urgency and commitment is needed in the process of compiling data to understand the various risk factors associated with the study. The paper limits itself in studying the impacts such disease which becomes the rationale for our proposed study.

Economic burden of cancer across the European Union: a population-based cost analysis

Ramon Luengo-Fernandez, Jose Leal, Alastair Gray, Richard Sullivan, Lancet Oncology,2013

This paper is done in the context of assessing the economic burden imposed by cancer on the European Union in 2008. The study indicates the inadequacy of cancer statistics which prompts them to use various sources of information like country-specific aggregate data from international and national sources like WHO, the Organization for Economic Co-operation and Development, EUROSTAT, national ministries of health, and statistical institutes. This shows registering and documenting cancer incidence is the need of the hour. They evaluated the cost of all cancers and those associated with breast, colorectal, lung, and prostate cancers. With their country specific morbidity, mortality data, they estimated health-care costs from expenditure on care in the primary, outpatient, emergency, and inpatient settings, and drugs. The significant contribution of the paper rests in their estimating the costs of unpaid care provided by relatives or friends of patients (i.e., informal care), lost earnings after premature death, and costs associated with individuals who temporarily or permanently left employment because of illness. The analysis is done using OLS through the following set of dependent and independent variables: Independent variables: national income, crude cancer incidence, crude cancer mortality, case fatality (mortality divided by incidence), 5-year cancer relative survival, and cancer specific disability-adjusted life-years as explanatory variables. Dependent variables: Cancer related health care expenditure across various types of cancer

Cancer cost is as high in EU as €126 billion in 2009, with health care accounting for €51·0 billion (40%). The two-major component bearing the cost is productivity losses because of early death cost €42·6 billion and lost working days €9·43 billion. Informal care is the unpaid services of the family and it accounts for €23·2 billion of the total cost. The results of the ordinary least-squares regression showed a strong positive relation between cancer-related health-care expenditure and national income ($p<0·0001$) and cancer incidence ($p=0·003$). Lung cancer had the highest economic cost (€18·8 billion, 15% of overall cancer costs), followed by breast cancer (€15·0 billion, 12%), colorectal cancer (€13·1 billion, 10%), and prostate cancer (€8·43 billion, 7%). Highest productivity lost is associated with lung cancer followed by colorectal cancer then breast cancer and prostate cancer. Highest morbidity is for breast cancer. Hospital inpatient accounted for more than half of the cancer related cost followed by drug, outpatient, primary and emergency care. Cancer related health care expenditure decrease the deaths, but they are not significant. 60% of the cancer related cost is in the non-health areas with majority is due to productivity lost because of early death.

OBJECTIVES/AIMS/HYPOTHESES

The purpose of the study is threefold. The first objective is to build a valuable cancer care dataset that may be used as a follow-up cohort study in the future. The second objective is to assess the impact cancer demand care has on the entire family unit in terms of both financial and non-financial burdens. The third objective is methodological where we will explore new approaches to analyze the multi-dimensional complex linkages between health and other socio-economic and behavioral factors.

A set of tentative research questions is outlined as follows:

- Assessment of depression in cancer patients using a standard depression scale
- Assessing the quality of life and time trade off in cancer patients
- Assessing the impact of cancer on patient's social involvement
- Estimating the impact of cancer on the domestic violence
- Assessing the effect of patient-centered communication and enhanced care access on general health, mental health and patients' rating of health care quality

- Assessing the impact of cancer on financial stress, emotional stress, physical stress, and quality of life
- Assessing the spillover effect of cancer patients on their caretakers
- Identifying coping strategies (e.g., support network) and examining its effect on the cost of care (e.g., providing hospital ride, time sharing), quality of care, and the emotional state.

STUDY DESIGN AND PROCEDURES

Study Design

The research will mainly be a survey-based study administered through questionnaire. The questionnaire will contain the socio demographic profile, questions on economic and mental burden that the patient and the family must go through during the process of diagnosis and treatment of cancer. After the data is collected, the analysis part of it will be conducted using the econometric software STATA.

Study Procedures

The study will be on cancer patients and will be administered through a formatted questionnaire. The interview will be a verbal communication between the interviewer and the participants and will NOT include any kind of clinical trials, neither the participants will be asked to show any lab reports. There will NOT be any recordings or photography of the participants, the entry in the questionnaire is entirely based on the verbal answers given by the participants.

The questionnaire will be divided in sections such as participants' self-reported health status, diagnosis and the treatment processes of the disease, cost of treatment (economic burden), palliative care options available, mental burden caused to the participant and family on account of the disease.

A wide and varied literature review on the socio-economic consequences on cancer gives us the idea as to what variables are particularly important to our study. The questionnaire is prepared with the help of some existing surveys and as well as incorporating our own project agenda. Some pre-existing cancer patient questionnaires are: EUROQOL-5D-3L, DHS Questionnaire, and PHQ 9 questionnaires.

The survey area for this study is Nepal, where Nepali is the popular spoken language. Both English and Nepali questionnaires will be with me throughout the survey. I believe most of the participants will be able to read the questionnaire on their own, if some participants want me to read it out to them; I will do that as well. Both the English and Nepali versions of the questionnaire are attached.

A pre-testing or a pilot survey will be done in Nepal with some patients of Dhulikhel hospital to start with. The testing will be done to assure about the time and to feel the level of comfortability of the participants regarding answering the questions related to their disease. As I will survey them, if it is seen that there is missing observation related to the main research questions then the participants will be dropped from the analysis. To have any follow up regarding the present study and more importantly to keep the opportunity open for extending the study into a Panel data of Cancer patients, we may have to contact those patients again who will give us the consent of providing personal information. If the follow up study happens to be possible, it is going to open a unique and significant contribution in filling up the data gaps of cancer patients in Nepal. The consent procedures are detailed below.

Consent Procedures

We are requesting to have two different consent processes, first for those who agrees to share their personal information and second for those who don't consent to give any personal information for any follow up. All the participants will be asked whether they agree to provide us information about their personal details like name, contact details and address. They can agree or disagree with that.

If they agree to share the information, they are asked to document it by signing the consent form. For those participants who disagree to provide the necessary details, the data will be completely anonymous and no identifiable information will be collected. Hence, to respect the demand of those participants who don't want to share their personal information, we request IRB to have a waiver of consent documentation for them only whereas for those who will share their personal information with us will document it by signing the consent form.

The consent procedures will solely involve the member of the study. A scripted consent is given below in English. The translated Nepali version with be attached to the protocol. The research will not involve minors. All the participants in the research will be 18 years or older.

Script

Namaste (Hello),

You are requested to participate in a research study that is done by Professor Alok Bohara, who is the principal investigator and Muhammad Adnan Shahid and Disha Shende, the student investigators from the Department of Economics, University of New Mexico, USA. The research is studying the Socio-economic consequences of cancer in Nepal and is funded by American Cancer Society. This is a consent form that describes the purpose of the study, your role and the possible risks and benefits that are associated with the study. After knowing all the details, if you feel comfortable, you are very welcome to participate in the survey.

If you agree to participate, I will ask you some questions on how cancer impacts your life and the life of your family. In answering these questions, you will have to describe about the type of cancer you have, the impact of cancer on your emotional well-being, domestic life etc. We would also like to know how it is impacting your life and life of your family members'. This discussion will not take more than 30 minutes.

I should however mention that there are some risks of participating in this research. You may feel awkward, uncomfortable and upset. If you do feel so, you don't have to answer the questions. Your participation in the study is entirely voluntary. There are no direct benefits that you will get from this project, but the information will be helpful in building knowledge about the impact of cancer from a societal perspective.

In future, if I need to contact you for any follow up regarding this study or for any new study, do you give your consent to collect some of your personal information like your name, phone number, address or any other alternative contact id (you will be given a separate sheet to be filled out). If you are not comfortable with sharing your personal information, you don't have to do so.

☐ Yes ☐ No

It is however important to mention that we will take all measures to protect the security of all your personal information. Participants providing personal details can withdraw anytime within 1- 3 months of the survey (if you decide to withdraw within 1 month, you can get the paper copy back, otherwise we will delete your responses from the soft version of the data) whereas others need to make the decision of withdrawal before I leave from the interview venue. No names will be entered while data gets transferred in a soft version as your responses will be coded by an id number and not by your name. Only the student investigator and personal investigator will have your name and id links and will de-identify that at the close of the project. The University of New Mexico Institutional Review Board (IRB) that oversees human subject research and/or other entities may be permitted to access your records. There may be times when we are required by law to share your information. Your name will not be used in any published reports about this study.

If you don't want to give the interview in the hospital, you can give us any appointment place and time where I can go and meet you. If you have any questions or concerns about this study, you may contact the student investigator through the following contact details (…………………….. (Nepal) / 513-399-1680 (USA) / dvshende@unm.edu) or 505-339-7036 (USA)/shahid@unm.edu. If you would like to speak with someone other than the research team, you may call the UNM Office of the IRB at (505) 277-2644. If you have questions regarding your rights as a research participant, you may call the UNM Office of the IRB (OIRB) at (505) 277-2644. The IRB is a group of people from UNM and the community who provide independent oversight of safety and ethical issues related to research involving human participants. For more information, you may also access the OIRB website at http://irb.unm.edu.

Only if you have given consent above regarding disclosing your personal information, you need to sign in the following. If you disagree to provide personal details, then you don't need to sign the consent form. Do you have any questions at this time?

……………………………….. ……………

(Date)

(Participant signature)

……………………………….. ……………

(Date)

(Investigators signature)

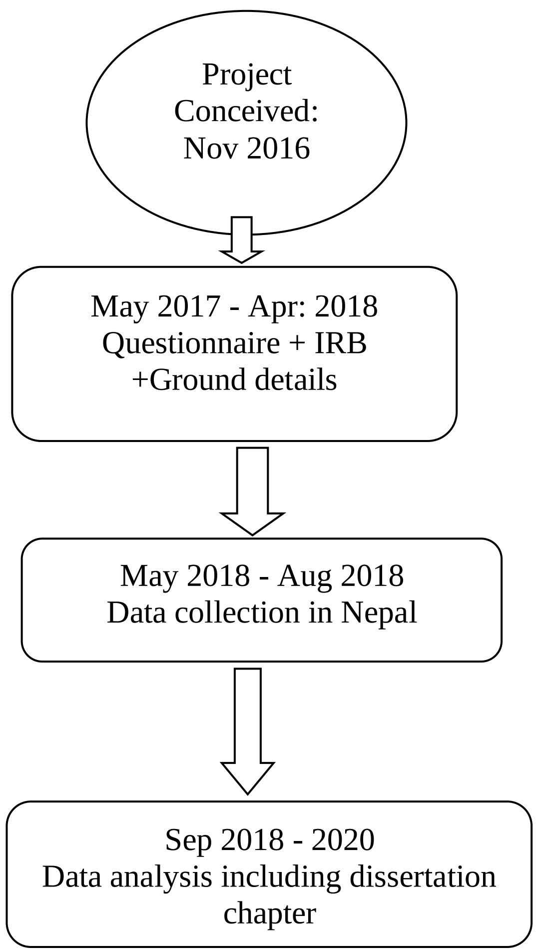
Privacy of Consent process

The consent process will hold at any place deemed private by the participants. It will mainly be in any health facility like hospitals where participants come for check-ups. Inpatients admitted for cancer are given separate room facilities which will thus ensure their privacy during the interview process. Outpatients will also be approached for interview, if they don't feel comfortable in giving interview in the hospital and wanted me to meet in a private place (e.g home etc), I will also do that. Most of the outpatients will likely be from Kathmandu Valley close to the hospital, so reaching out to their comfortable place will not be a problem. All the participants will be approached with due permission of their physician who are treating them. Physicians will be provided IRB approved letters to be given to the patients and if the patients agree to join the survey, then the project researchers will meet the patients.

The enumerator will give enough time to the respondent regarding their decision to participate in the survey, so that if they need time, enumerators will approach them at later date within a week. The consent form will be read out to them and proper attention will be given to ensure that the participants understand the context of the consent script. As has been mentioned in the protocol, the personal information will only be asked from patients who will agree to do that. For the participants who will not give any consent of collecting personal information, the data will be anonymous with no single identifiable information attached to them. The request of identifying information is only to open the possibility of any follow up on the present study or future study that may take place. Such a measure will be completely unique and innovative in this area of research. A separate sheet is attached to highlight the specific information that will be requested for. Since in Nepal, Nepali is the most widely spoken language, we will use both English and Nepali consent form and questionnaire throughout the process of survey. I will carry both the English and Nepali versions with me as I expect that the young adults will feel comfortable with the English version whereas the old people will go with Nepali.

The translated version of the consent form is attached.

Study Timelines



Study Location(s)

The research will be in Kathmandu, the capital city of Nepal. The reason we choose the site is because:

- We needed to have the study on developing country.
- Cancer incidences are growing in Nepal.
- Nepal Study Centre-UNM and KU's Memorandum of understanding facilitate the successful completion of the study.

The NSC, through its offices at UNM and a branch in Nepal's Kathmandu University, strives to foster collaboration between the University of New Mexico, Kathmandu University, and the International Centre for Integrated Mountain Development (ICIMOD). Kathmandu University and Nepal Study Centre of UNM has a Memorandum of Understanding which helps in undertaking many projects of NSC-UNM in Nepal. Following link will help in understanding the collaborative work that Kathmandu University is doing with NSC over years.

http://nepalstudycenter.unm.edu/KUVC_UNMVisit.htm

Kathmandu University provides a separate locked office and cabinet for ensuring the safety of the investigator as well as for the data. All the paper works and the collected questionnaire will be kept in the safety lock and will not be made accessible to any other persons except for me. The paper form of the questionnaire will be transferred, entered and saved in an electronic format before bringing that to USA for analysis. Once the data is securely stored in electronic format, the paper form of the questionnaire will be destroyed.

We have a letter of support from Kathmandu University which shows their commitment towards the project. The permission is hereby attached.

Participant Compensation

As a part of compensation, the respondents will be given showpieces as a mark of thanking them for their time and energy. We have set aside 80,000 Nepali rupees as a part of the compensation which means 160 NRs. per showpiece which should be a good amount.

Study Resources

Staffs:

1) Prof. Alok Bohora, University of New Mexico

2) Adnan Shahid, Graduate Student- University of New Mexico

3) Disha Shende, Graduate Student- University of New Mexico

May 2018 - Aug 2018 will be used for data collection.

University of Kathmandu will provide an office space to the investigator and will give a locked cabinet for the preservation of the data.

The major medical support facility will be Dhulikhel hospital which is the school of medical science under Kathmandu University. I will stay and operate closely to this hospital so in any kind of medical emergency this will be my first reference point. Except for that, general hospitals and medical stores are in proximity of the university where investigator can avail for any medical help.

Unanticipated Problems

Unanticipated problems will be reported to the IRB of UNM and the doctors of the patients apart from reporting to the Principal Investigator of the project.

EXPECTED RISKS/BENEFITS

Risks

The potential risk though remains how much time they will be willing to allot towards the study as most likely there is certainly going to be time constraint. The challenge to the enumerator remains in creating a reasonable informal environment where participants feel comfortable in discussing about their personal health information as we can absolutely understand that discussing personal issues like health to any stranger is not always an easy job to do. They may feel uncomfortable and awkward on some questions. If at any point of the dialogue, I feel that the patients are psychologically getting stressed, there will be no compulsion imposed on them to continue with the study. There is no economic burden being imposed on the participants of the study, nor did they have to go through any political or social stigmatization. We understand that the relative risks are higher for those patients that agree to disclose their personal information, but sincere efforts will be done to protect the confidentiality. The right of accessibility of individual name and their corresponding id will only be limited to the Principal Investigator and student investigator otherwise required by law.

As a step towards minimizing the risk, all the researchers associated with the project have gone through the Human Research Protection Training to be aware of the guidelines needed for such research. The student investigator will be extremely cordial and respectful while talking to the participants as she understands that the participants are cancer patients and must be in a very delicate state of their minds.

Benefits

There will be no immediate benefit from the study to the participants but there will be long term benefits through knowledge gathering and information. This research is meant to identify the consequences (financial and emotional) a patient and the family goes through throughout the treatment process. It mainly studies the impact that it leaves on the patients and the family members. We believe such a research will be beneficial from the perspective of society in developing appropriate safety nets to mitigate such burden.

Human Subjects Interactions

Target Population

The target population for our study is the cancer patients. They can be either male or female. Since the research is about the socio-economic consequences of cancer, we have to track down the cancer patients for this research. They are our sole targeted sample of the study.

Inclusion and Exclusion Criteria

Exclusion:

All the patients under 18 years of age are excluded from the analysis.

Patients who are severely disabled are also exempted from the study.

Inclusion:

All patients above 18 years will be a part of the study.

Participant Enrollment

Surveying 500 cancer patients will be our targeted agenda.

Recruitment and Screening Procedures

As mentioned earlier, Dhulikhel hospital which is a School of Medical Science affiliated under Kathmandu University work closely with NSC-UNM in any kinds of health-related research. Dhulikhel also gets cancer patients on a regular basis, the physicians of Dhulikhel will be our primary contact person regarding patients. Physicians will be provided IRB approved letters to be given to the patients and if the patients agree to join the survey, then the project researchers will meet them in hospital itself or wherever the patients are comfortable meeting with. We can get information regarding other oncologists operating in different other hospitals using the contact of Dhulikhel physicians. That is how we can repeat the survey procedure onto other hospitals as well.

In case of any screening failures, the paperwork will be immediately destroyed and no information about the interviewee will be sustained anymore.

The PI will draft the letter and will give to the physicians who will then communicate with their respective patients.

Privacy of Participants

Investigators will give the patients the flexibility of meeting anywhere wherever the patients will feel comfortable. If the patients would like to meet in hospital, they can be interviewed there with prior permission from the treating physician since mostly patients will have their own rooms for treatment. Whereas if they would like the researchers to come to their home or in other meeting place for conducting the survey, that too will be welcomed. Physicians help will be needed during the process of recruitment, where there is no possibility that any outsider will know about the communication. After screening, there will be a one to one dialogue between the researcher and participants in participant's preferred location where he will feel the privacy. Once the information is collected, it will be kept safely locked in Katmandu University's locked cabinet which will be only accessible to me. The data will be entered and stored in personal hard drive and then will be brought to USA in an electronic format. All the paper documents will be destroyed before coming to USA. In the Nepal Study Centre of Economic Department UNM, we have a security coded gate which is only accessible to few. The data will be stored in a password protected computer accessible to the primary investigator Prof. Bohara.

STUDY DATA

Data Management Procedures

At this point in the project, no secondary sources of data will be used. The main data that we will have is from the primary investigation. After having the signed consent forms of the participants, I will scan them and keep the soft copy in a password protected hard drive within 1 month of the survey. All the paper documents will be destroyed back in Nepal after scanning.

A link will be created for those participants that have agreed to give the personal information. I will have their names and the contact details entered in an excel soft copy and then I will create an individual id corresponding to each of their names. This process will go on continuously as I survey throughout the two months. After each entry, I will go on destroying the paper copy of the contact details. The individual id will be noted down in that participant's survey questionnaire which will be the base of entering the data later.

I will give myself one month to convert the paper responses of survey questionnaire in soft copy. The responses of the individual for whom we don't have the data will be entered anonymously. If we have the data for participants, we enter the data under the id created.

So, at the end of the process, the PI and the Student Investigator (myself) will have a soft excel copy of the link, soft copy of the survey data with the individual ids and the scanned consent forms. Once it gets into an electronic version, it is not possible for anyone other than the Principal Investigator and the Student Investigator to identify any individual participant by their survey responses. The electronic form of the data will be brought back to USA through a protected hard drive and will be stored in password protected computer of NSC-UNM office which has a security gate code accessible only to a few. The data will be looked through and analyzed by PI and me. The final de- identification of the data will happen at the time of the close of the study.

Data Analysis/Statistical Considerations

Sampling Technique

Of the seven hospitals as identified by Kumar et.al 2009 in their study which mainly cater to cancer patients in Nepal, at least three hospitals are situated in Kathmandu valley. These three hospitals will be included as a target population for survey sampling. The hospitals respectively are Bhaktapur, Dhulikhel and Bir. Teaching hospitals situated in Kathmandu will also be considered for sampling purposes. Tentatively, a sample of 500 cancer patients will be included in our survey.

Statistical Technique

Given our increasing involvement in field research work in Nepal, and the multi-disciplinary nature of our collaboration, we feel that there is a need for methods that can detect and unravel complex socio-economic and health linkages. We will explore three possible methods: Structural Equation Model (SEM), Partial Least Squares (PLS), and directed acyclic graphs (DAG), a graphical algorithm developed by Greenland (1999). These methods are generally suitable for survey research with extensive set of variables that are generally collinear and are hard to write as a causally well-defined regression equation. For example, a financial stress variable may have to be entered the model as a latent factor rather than a well-define observable variable. Likewise, the whole structural linkages between the health status (e.g., cancer), risk factors, demographics, financial and emotional stress may have to be treated as a multidirectional network (e.g., Bayesian network) instead of a bi-directional causal regression model.

Quality Control and Quality Assurance

---------------------NA------------------------------

Participant Confidentiality

Throughout the survey in Nepal, I will be given a locked office space in Kathmandu University to be used for keeping and storing the required and important documents. The accessibility of the office space will be restricted only to me. I will have a separate computer and hard drive apart from my laptop which are password protected for storing the data files.

As the data gets into a soft version and after I bring it to USA, we will keep the data in the administrative server of Nepal Study Centre of Economics Department, UNM which is protected by administrative password accessible only to the director of NSC and Principal Investigator of this study. The office of NSC in the Economics Department, UNM is security locked with the accessibility available only to few of us in the department.

Participant Withdrawal

I have kept the timeline of withdrawal for those who provided personal information to 1-3 months. If they contact me within 1 month, I will give them their paper copy back and if they contact me within 3 months, I will drop them from the version of the soft copy and no analysis will be run based on their data. The reason I have limited the withdrawal to three months is because, the analysis of the data will likely to start by then and once it starts, withdrawal can hamper the process of analysis.

But for those patients of whom we don't have any identifiable information, they will need to decide on their withdrawal before I leave the interview venue, since there will not be any other ways of identifying their survey questionnaire.

If the participants want to participate but are not comfortable to certain sections of the questionnaire, we will keep the participation and put the undisclosed information as missing. Depending on the extent of the missing information, we will decide whether to drop the participant from the analysis. Irrespective of which category of participants they are, they have the right to withdraw during the survey if they are not comfortable and don't want to go ahead with it.

Also, there might be some sections that could be sensitive for the participants to respond to. Hence, we want to give full freedom to the participants on whether to respond to these questions or not. At any point if they feel uncomfortable in answering these sensitive questions, they can ask the enumerators to be withdraw them from the survey.

PRIOR APPROVALS/REVIEWED AT OTHER IRBS

No, this is not reviewed by any other IRB

REFERENCES

Greenland S, Pearl J, Robins JM (1999). "Causal diagrams for epidemiologic research." *Epidemiology* 10(1):37-48.

Longo, C., Fitch, M., Deber, R., Williams, A.P. (2006). Financial and Family burden associated with cancer treatment in Ontario, Canada. *Support Care Cancer, 14,* 10771085.

Nuget, R. (2008): Chronic Diseases in Developing Countries Health and Economic Burdens. *New York Academy of Sciences. Ann. N.Y. Acad. Sci. 1136: 70–79*

Nelson, C. (2010): The Financial Hardship of Cancer in Canada: A Literature Review. *The Canadian Cancer Society Manitoba Division*

Pradhananga, K., Baral,M.,Shrestha,BM.(2009): Multi-institution Hospital-based Cancer Incidence Data for Nepal - An Initial Report. A*sian Pacific Journal of Cancer Preentionv, 10, 259-262*

Yabroff, K. R., Lawrence, F W., Clauser,S., Davis, W., Brown, ML. (2004): Burden of Illness in Cancer Survivors: Findings From a Population-Based National Sample. *Journal of the National Cancer Institute, 96,(17)*

Luengo-Fernandez, Ramon, et al. "Economic burden of cancer across the European Union: a population-based cost analysis." The lancet oncology 14.12 (2013): 1165-1174.

CHAPTER 3

Health Insurance Coverage Disparities among Young Adults in the Southwest United States 2015–2017

Introduction

Prior to the Affordable Care Act(ACA), one third of Hispanics were uninsured (Sohn, 2017). ACA provided different provisions for young adults to get their insurance coverage. First provision was *the dependent coverage expansion* under which adults until the age of 26 are eligible to be covered under their parent's private insurance plan. Second provision, *the employer mandate*, provided an opportunity for private coverage for working adults, irrespective of age. The third provision was *Medical Expansion* under which states had an option to reduce the income limit for adults to be eligible for *Medicaid*. However, not all states followed the provision of *Medical Expansion* which led to ineligibility of many low income young adults to have insurance coverage (Garfield & Orgera, 2020). The fourth provision was ACA's *Marketplaces* with which young adults and other adults could compare and buy health insurance. This was useful mainly for those who could not qualify for *the dependent coverage expansion* or *Medicaid.* All these provisions were crucial for improving the insurance coverage among uninsured young adults. (Jessica Gehr, 2017) found that in 2016 the uninsured rate for young adults was around 15 percent, which is almost half of the uninsured rate prior to ACA. Hispanics had the largest percentage point decrease in their uninsured rate, which fell from 32.6 percent to 19.1 percent between 2010 and 2016 (Artiga, Orgera, & Damico, 2019). Although the ACA improved the coverage among Hispanics significantly, disparities in insurance coverage persist among Hispanics and non-Hispanics. Hispanics continue to have lower insurance rates compared to other ethno-racial groups.

Under *the dependent coverage expansion,* many young adults were eligible to get health insurance. Young adults are vulnerable in case of having health coverage. Many of them pursue education, take up low income jobs, are at the beginning stage of their career which makes it difficult for them to afford health coverage. Also, young adults are usually perceived as healthy, so they have lower utilization of healthcare system. However, as (Bonnie RJ, Stroud C, Breiner H, 2015) young adults also have very high emergency room visits compared to their younger and older age groups which can significantly increase their medical costs in the case of lack of health coverage. To avoid such extreme cases, under ACA, there was an *individual mandate* which put a tax penalty on those who did not have any health insurance coverage. This mandate was repealed by the Trump administration effective from January 1st, 2019 but was in place during the timeline of the data for this study.

This study looks at the aftereffects of these ACA provisions to analyze the health insurance among young adults in the five southwest (SW) states (Arizona, California, Colorado, New Mexico and Texas) of the United States. I focus on the SW states of the United States since Hispanics are the focus of this study and majority of the Hispanics reside in these states. This study is important because (1) After ACA, not much attention has been paid to the health insurance coverage issues of young adults especially Hispanic young adults; (2) the findings of this study will help policymakers address the disparities in low health coverage for Hispanic and Non-Hispanic young adults.

Literature Review

There are many studies on the health coverage of non-elderly people but not many studies focus on Hispanic young adults. Some literature on health insurance among young adults after the implementation of ACA discusses the positive effects of ACA on increasing the health coverage among young adults. (Denavas-Walt, Proctor, & Smith, 2012) found that in year 2010 before the expansion of ACA-dependent coverage, 29.8% of adults aged 19–25 lacked coverage, which was almost double the national rate of 16.3%. (Mcmorrow, Kenney, Long, & Anderson, 2015) studied the data from the National Health Interview Survey (NHIS) for ages 19–25 from 2009 to 2014 and found that the uninsured rate for young adults fell from over 30 percent in 2009 to 19 percent in the second quarter of 2014. This shows that ACA proved to be very crucial for obtaining the health insurance coverage for young adults. ACA's *dependent coverage expansion* was significant in determining the status of the health coverage of young adults up to age 26. (Antwi, Moriya, & Simon, 2013) studied the health insurance and labor market implications of ACA's *dependent coverage expansion* that allows young adults up to age 26 remain on parental policies using data from the Survey of Income and Program Participation (SIPP). They found that this provision increased insurance coverage for young adults from age 19–25 after comparing them with age groups 12–18 and 26–35. A similar study by (Spencer et al., 2018) uses 2010–2016 data from the NHIS and shows the evidence for significant improvements in coverage among young adults since 2010. (Sommers, Buchmueller, Decker, Carey, & Kronick, 2013) examined the *dependent coverage expansion* policy's effect on access to care using the data from National Health Interview Survey (NHIS) and Current Population Survey (CPS). They found that by the third quarter of 2011, this policy increased the health coverage for age 19-25 by 6.7 percentage points compared to the control group of age 26-34. They also found that this ACA policy reduced the number of young adults who delayed getting care or who did not receive needed care because of its cost. Similar study by (Sommers, 2012) studied the effect of this policy on the health coverage of young adults using data from the

National Center for Health Statistics. Author found that between September 2010 and December 2011 over 3 million additional young adults received health coverage. (Buchmueller, Levinson, Levy, & Wolfe, 2016) examined the health insurance coverage for White, Black, and Hispanic non-elderly adults after ACA and how Medicaid expansion affected the health coverage. They found that coverage gains were greater in states that expanded Medicaid programs.

Compared to the non-Hispanic Whites, Hispanics are more likely to suffer from chronic conditions such as hypertension, diabetes, HIV, cervical cancer, obesity, homicide (LaVeist, Bowie, & Cooley-Quille, 2000). With such chronic conditions it is vital to have access to usual healthcare services to avoid emergency medical visits and costs associated with them. (Callahan, Hickson, & Cooper, 2006) studied the health insurance coverage and health care access and utilization for different young adult Hispanic subgroups in the U.S. using data for young adults (19–29 years old) from the National Health Interview Survey (NHIS) from 1999–2002. They found that Hispanic young adults have lower insurance rates compared to Whites which prevents them from usual source of care. A similar study by (Callahan & Cooper, 2005) analyzed the association between health insurance status and health care access among young adults while controlling for other determinants of access to care using data from NHIS survey from 1999-2001. They found that 27% of women and 33% of men were uninsured and the uninsured remained at significantly higher risk for reporting delayed or missed medical care.

There has been some research on the disparities in insurance coverage among Hispanics and non-Hispanics. A study by (van der Goes & Santos, 2018) examined the factors associated with the gap in private health insurance coverage between Mexican American and non-Hispanic American men using the NHIS data from 2010-2013 for non-elderly adults. They found that income, low educational achievement, foreign-born status, and language barriers have limited the probability of private health insurance coverage for Mexican Americans, and 10% of the difference remained unexplained. ACA was useful in improving the health coverage of young adults but there still exists a gap in the health coverage among Hispanics and non-Hispanics. Hispanics continue to be the group with lowest insured rates. Literature shows that factors such as high cost of the insurance, loss of employment or job change, loss of Medicaid, and ineligibility for employer sponsored insurance are some of the factors behind absence of health coverage. (Terriquez & Joseph, 2016) studied the patterns of Latino young adults' insurance coverage during early ACA implementation using the data from the California Young Adult Study for 18–26-year-olds. They found that socioeconomic background, immigrant characteristics, college enrollment, and employment are the key factors which decide the health coverage of Latino young adults.

There is a limited literature that studies the disparities among Hispanics and non-Hispanic young adults, and with this study I add to this literature using a pooled cross-sectional data from American Community Survey from 2015-2017 by focusing on young adults of age 18-26. Also, of these young adults, those who are neither in school nor in the labor force (NSNL) have not been given much attention for their health coverage issues and this study is the first one to do so. I fill this gap in the literature by studying the factors that explain the health insurance disparities among these NSNL young adults of Hispanic and non-Hispanic origins using Oaxaca decomposition. I also explore the effects of Medicaid expansion in the SW states and its impact on the health coverage of young adults in SW region.

Data and Measures

The focus of this study is on young adults between age 18-26 in the SW region of the United States which includes states California, Arizona, Colorado, New Mexico and Texas. The study uses a sample of the young adults who belong to one of the following racial groups: Hispanic, Non-Hispanic White (henceforth referred as White), and Non-Hispanic Black (henceforth referred as Black). There are total 54,884 Whites, 60,481 Hispanics and 11,813 Blacks in the sample with similar distribution of men and women from year 2015-2017.

Summary Statistics

Table 1 presents summary characteristics by race and gender of all young adults chosen for this sample from year 2015-2017. Health coverage type is divided as private, uninsured and public as an individual's health coverage can fall into one of these categories. On an average private coverage among White men is 77% compared to 49% for Hispanic men and 54% of Black men. White women have on average 78% private insurance compared Hispanic women who have 50% of private coverage and 57% for Black women. Of the three groups, Hispanics of both the genders have lower private insurance coverage. The average uninsured rates for White men, Hispanic men and Black men are 14%, 33% and 30% respectively making Hispanic men the most uninsured group of young men in the SW states. In the case of women, the story is very similar. Hispanic women have highest average uninsured rate of 27% compared to 11% for White women and 22% for Black women. However, in case of public coverage among men and women, Hispanics have on average the highest public coverage followed by Blacks followed by Whites. Employment status is one of the main explanatory variables that determines the health coverage as employer sponsored health insurance is the most common health insurance in the US

(KFF, 2018). Of those who are employed, White men and women have highest rate for full time workers, but Black men and Hispanic women have the highest rate for part-time workers. 44% percent of Hispanic men are out of labor force followed by 32% of Black men but Hispanic women and Black women have same percent of women out of labor force. Also, Hispanic men have the highest unemployment rate at 10% compared to White men and Black men for whom the unemployment rates are at 7%. However, the average rate of unemployed is highest among Black women followed by White women. Personal income plays a role in obtaining the Medicaid coverage and people who have very low annual income are eligible for it. After comparing the personal earnings across all the groups, I see that Hispanic men and Black women on average earn less than $15,000 per annum which make them eligible for Medicaid and can possibly explain the high public coverage rates among them. Educational attainment is linked to employment which is highly correlated with the full-time employment and hence with the employer sponsored health coverage. On average, Hispanic men have highest rate of young adults with less than high school degree and White women have highest rate of young adults with less than high school degree. Only 6% of Hispanic men have associate and bachelor's degrees which is lowest among all the groups. However Hispanic women have the highest rate of associate and bachelor's degree holders. Marital status is also an important determinant of the health insurance coverage. Black men and Hispanic women have largest number of marriage rates in the sample. Young adults in this study are between 18-26 years old but there is a variation in the health coverage among different subgroups of age. Hence, I create different subgroups of age to see if these subgroups have any effect on coverage status. These subgroups are distributed evenly for all three ethnic-racial groups. One important determinant in this study sample is whether an individual is currently going to school or not. The variable, In School, takes a value 1 if a person is attending public or private school. The table shows that Hispanic women are the highest in school attendance school among women, and similar proportions of men in all three groups attend school. Health coverage and access to healthcare can be highly affected by citizenship status, birthplace and language spoken. In this study sample, citizenship is a binary variable that has value 1 if a person is born in USA or its territories, a naturalized citizen or is born to parents in a foreign country. Identifying populations that identify themselves as Hispanics have the lowest rate of citizenships. Foreign language is a variable that has a value 1 if a person speaks a language other than English in their household. Hispanic men and women are the majority for speaking a foreign language at home.

[Insert Table 1]

This study also examines the health insurance status of the young adults who are NSNL. Table 7 shows summary statistics for this group of young adults.

Empirical model

I estimate the likelihood of coverage type using Multinomial Logistic Regression as there are three types of health coverage status. Given that there are three possibilities for insurance coverages, i.e. public, private and uninsured I need the calculation of 3–1 = 2 equations, one for each category relative to the reference category (private) to estimate the effect of the ethno-racial group on the type of insurance coverage. I choose the first category (private) as the reference, then, for n = 2, 3, the multinomial logistic regression can be defined as:

$$\ln\left\{\frac{p(Coverage\ type_i=n)}{p(Coverage\ type_i=1)}\right\} = \beta_{n0} + \beta_{n1}Ethnoracial\ group_{ni} + \beta_{n2}X_{ni} + \beta_{n3}State_{ni} + \beta_{n4}Year_{ni} + \epsilon_{ni} = Z_{ni} \quad \text{[eq.1]}$$

where, β_{n0} is a constant and $\beta_{n1} \ldots . \beta_{n4}$ is a vector of regression coefficients. $Coverage\ type_i$ is a vector of three types of coverage types: private, uninsured and public insurance coverage;

$Ethnoracial\ group_i$ indicates one of the three different ethno-racial groups: Hispanics, Whites and Blacks; X_{ni} is a vector of sociodemographic variables such as employment status, income, education, marital status, age group, disability, citizenship, and household language; $State_i$ is a dummy variable for five southwestern states: California, Arizona, Colorado, New Mexico and Texas; $Year_{ni}$for year fixed effects from 2015-2017; and finally I have ϵ_{ni} which is the vector of residuals. The model uses robust standard errors.

For each $coverage\ type_i$, there will be two predicted log odds, one for each category relative to the reference category. When there are more than two groups, computing probabilities is a little problematic than it is in logistic regression, for n = 2,3 and can be given as:

$$p(Coverage\ type_i = n) = \frac{\exp(Z_{ni})}{1 + \sum_{r=2}^{3} \exp(Z_{ri})} \quad [\text{eq. } 2]$$

For the reference category the probability is given as;

$$p\left(Coverage\ type_i = 1\right) = \frac{1}{1 + \sum_{r=2}^{3} \exp(Z_{ri})} \quad [\text{eq. } 3]$$

I used the estimates from Multinomial Logistic Regression model to calculate the relative risk ratios with 95% confidence interval for all the explanatory variables. Table 2 shows this result. For robustness, I also subsampled the data by race and gender and then perform the Multinomial Logistic Regression Model on each ethno-racial group by gender separately. The results for this are given in tables Table 3(a) and Table 3(b).

Employment rates among Whites and Hispanics are very similar. It is 90.54% for White men compared to 88.77% of Hispanic men and 92.05% for White women compared to 89.71% of Hispanic women. However, of the employed men, only 56.56% of Hispanic men have the private insurance compared to 82.82% of White men. For Hispanic women this rate is 58.66% Hispanic women compared to 82.91% of White women. To understand this huge disparity in the private insurance rates of these two groups, I used non-linear Blinder-Oaxaca decomposition; since, the dependent variable, private health insurance, is a binary outcome variable. It is equal to one for young adults with private health insurance or zero otherwise. I used a non-linear logit model of Blinder-Oaxaca decomposition by (Yun, 2003) as below.

$$\overline{Y_A} - \overline{Y_B} = \overline{F(X_A\beta_A)} - \overline{F(X_B\beta_B)} \qquad [\text{eq. }4]$$

$$= \underbrace{\left\{\overline{F(X_A\beta_A)} - \overline{F(X_B\beta_B)}\right\}}_{E} - \underbrace{\left\{\overline{F(X_A\beta_A)} - \overline{F(X_B\beta_B)}\right\}}_{C} \qquad [\text{eq. }5]$$

where; $Y = F(X\beta)$ is a logit function defined as $\frac{e^{X\beta}}{1+e^{X\beta}}$, the bar represents the averages, A and B are two comparison groups separated by ethnic-racial groups (Hispanics vs Whites), E is the explained component and C is the unexplained component.

The decomposition model has two specifications where first model specification excludes *citizenship* and *foreign language* variables that are included in the second model specification. I used two model specification to understand the changes in explained component as these two variables can explain a lot of the differences in Hispanics and Whites. I included the effect of state specific policy changes in the five SW states by including the state dummies where California is the base category. State dummies also capture the effect of Medicaid expansion policy by indicating whether the state has gone through Medicaid expansion or not. The base categories for education, income, age and states are high school or less, less than 15k, age between 18-20 and California respectively. All models included dummies for year of survey. I used a pooled sample weighting to perform the decomposition (Neumark, Neumark, & David, 1988) . Table 6 shows this result.

Third aim of this study is to analyze the health insurance status of the young adults who are NSNL. Preliminary look at the overall insurance rates of this group by race and gender shows us a big disparity in the insurance rates of Hispanics and Whites as well as Whites and Blacks.

Figure 3 is the graph of coverage rates for all three groups which shows that Hispanics have the lowest health coverage of all three groups. To understand this gap in the overall insurance rates of Hispanics and Whites I again implemented Blinder-Oaxaca decomposition using the non-linear logit model explained previously. The dependent variable, in this case is health insurance coverage, which takes value one for young adults with any type of health insurance and zero otherwise. As above, I also perform the decomposition on the subsamples separated by gender. Like the previous decomposition model, here there are two model specifications where the first model specification excluded *citizenship* and *foreign language* variables which are included in the second model specification. I also included state dummies to capture the effect of Medicaid expansion, year dummies for year fixed effects. Table 8 shows the result for this decomposition analysis.

Results

Multinomial Logistic Regression

Results from Multinomial Logistic Regression are in Table 2. It shows three model specifications where Model (3) is chosen to be the best model with lowest AIC and BIC. The reference category for coverage type is private insurance. Comparing the relative risk ratio across different race categories reveals that Hispanics are 3.2 times more likely to be uninsured when compared to Whites with private insurance. Blacks however are 2.08 times more likely to be uninsured compared to Whites with private insurance. This suggests that being Hispanic is associated with highest risk of being uninsured of all three groups. In case of public insurance, Hispanics and Blacks are 2.9 times and 2.7 times more likely to hold public insurance respectively, than Whites with private insurance. Gender also plays a role in determining the health insurance coverage. Being a male is associated with higher risk of being uninsured compared to females with private insurance. However, males have a less likelihood of holding public insurance compared to females with private insurance. Being a part-time employee increases the risk of being uninsured compared to a full-time employee with private insurance. Part-time employment is associated with increased likelihood of public insurance. Unemployed young adults are more likely to be uninsured and more likely to hold public insurance compared to full time employed young adults. Higher income and higher education decrease the risk of being uninsured and decrease the likelihood of holding public insurance. In this model, marital status is not significant in predicting the type of coverage. Likewise, year did not have any significant effect on predicting the outcome. I included state fixed effects in the model to capture the variation in state policies especially Medicaid expansion under ACA. Studies have shown that Medicaid expansion has tremendously helped states to reduce uninsured rates. California is the base category and compared to California all other states have a higher likelihood of being associated with a high uninsured rate and a low likelihood of public insurance except New Mexico. Age was separated in three categories with base category of years 18-20. Higher age groups are more likely to be uninsured compared to the base group with private insurance. I also controlled for young adults with disability in the model. Surprisingly, I found that disability is associated with less likelihood of holding public insurance. Finally, I controlled for adults going to school and found that those who attend school are less likely to be uninsured and less likely to be on private insurance.

[Insert Table 2]

The results for Multinomial Logistic Regression on the subsamples separated by ethno-racial group and gender are in Table 3a and Table 3b. Table 3a shows the results for the sample for men and Table 3b shows the results for sample of women on all ethno-racial groups. I do not discuss the results for these tables as they are very similar to the results in Table 2. However, these tables have two more variables for citizenship (*citizen*) and household speaking foreign language (*foreign language*) for Hispanic groups. For both Hispanic men and women, having a citizenship decreases the likelihood of being uninsured. It also decreases the likelihood of being on public insurance, but this effect is statistically not significant. However, young adults who speak a language other than English at their household are more likely to be uninsured or to be on a public insurance.

Blinder-Oaxaca Decomposition

Employed Hispanics and Whites

The percentage of employed Hispanics and Whites in the labor force are similar as shown in Figure 2, so it is concerning to see such big disparity in their private insurance coverage rates.

[Insert Figure 2]

The results of Blinder-Oaxaca decomposition between White and Hispanic employed young adults by gender are given in Table 6. Table 6 has two model specifications – Model (1) and Model (2) by gender. Both the models included explanatory variables for employment type (part-time vs full-time), industry codes, income, education, marital status, age groups, school going status, and year fixed effects. Model (2) controlled for additional information on citizenship and household language of the young adults. Model (1) for men showed that the difference between the means of private insurance rates between White and Hispanic men was 25.5 percentage points of which only 23.13%[5] is the explained difference and 76.86%[6] is the unexplained

[5] Explained percentages are calculated as: (Explained portion from the decomposition / Difference in the means of two ethno-racial groups) *100
[6] Unexplained percentages are calculated as: (Unexplained portion from the decomposition / Difference in the means of two ethno-racial groups) *100

difference. Keeping everything else same as Model (1), as I added *citizen* and *foreign language* to Model (2), the explained portion was increased to 62.36% and the unexplained portion was decreased to 37.64%. Model (1) for women showed the difference between the means of the private insurance rates was 21.3 percentage points of which only 21.12% was the explained portion and 78.87% was the unexplained portion. After adding *citizen* and *foreign language* to Model (2) for women, the unexplained portion was decreased from 78.87% to 36.62%.

[Insert Table 6]

The models did not control for many unobservable characteristics which could have contributed to the unexplained portions. After controlling for all the observable characteristics in the data, the unexplained portions could be suggestive of the discrimination faced by the Hispanics while obtaining employer sponsored insurance.

Neither in School nor in the Labor Force (NSNL) – Hispanic and White Young Adults

Next I look at the results for NSNL young adults among White and Hispanic young adults. As shown in Figure 3, the uninsured rate for NSNL young adults among Hispanics was very high compared to Whites for both men and women. Table 7 showed the summary statistics for this group of young adults. The average health insurance coverage for White and Hispanic men were 64% and 47% respectively and for White and Hispanic women were 76% and 59% respectively. Compared to Whites, more Hispanics fell into the lower income groups, and had lower education levels. Marital rates were higher for women compared to men for Hispanics as well as Whites. Hispanics were on average younger compared to the Whites. The two important variables for Hispanics were *citizen* and *foreign language.* 98% of White men and 97% White women have citizenships compared to 83% of Hispanic men and 73% of Hispanic women. This is a key variable that distinguished Hispanic population from White population. 65% of Hispanic men and 72% of the Hispanic women spoke language other than English in their households. This percentage was only 6% for White men and 7% for White women. This was another distinguishing factor for Hispanics and Whites of this group. These two key variables can explain majority of the differences among the health insurance coverage rates of these groups.

[Insert Table 7]

The results for Blinder-Oaxaca decomposition are in Table 8. Model (1) and Model (2) are two model specifications in Table 8. The difference in two model specifications is that Model (2) included variables on citizenship and language spoken in the household. The ethno-racial difference in the averages of health coverages for men and women two groups for men was 17.2 percentage points and for women was 17.4 percentage points respectively. In Model (1), in case of men, only 15.11% of the difference was explained and in case of women 11.5% of the difference was explained. After adding *citizen* and *foreign language* in Model (2), the explained portion increased to 50% for men and 67.18% for women. 50% of the difference remained unexplained for men and 31.6% for women. Like the employed young adults, these unexplained portions could suggest the discrimination faced by NSNL young adults while obtaining any kind of health insurance. The decomposition models for the NSNL left out many important variables from the analysis which is one of the limitations of this study. The data did not provide much information on what these Hispanic young adults do in their everyday life which could have helped explain more the disparities in health insurance coverage between them and White young adults.

[Insert Figure 3]

[Insert Table 8]

Conclusion

In the United States (US), low insurance coverage is one of the key healthcare issues among the young population which is concerning. There have been several attempts to reduce this disparity in health insurance coverage among Hispanics and other ethno-racial groups, but this disparity persists. Young adults in the United States are still a section of the population with the lowest insurance rates. The Patient Protection and Affordable Care Act (ACA) which was implemented in 2010 was a major health reform which helped to increase health coverage among young adults. However, ACA did not remove the disparity of insurance coverage among Hispanics and other ethno-racial groups. Also, this disparity is not just by race or ethnicity but also by gender. Men have lower rates of insurance coverage compared to women. One reason could be that women are usually eligible for public insurance such as Medicaid when they bear children. Among men, Hispanic men suffer the most from this problem of low coverage of health insurance. This disparity in the health coverage by gender can be because of the eligibility of young women to receive pregnancy and parenting benefits via Medicaid (National Women's Law Center, 2015).

In this paper, I examined the health insurance disparities in southwestern states in the US for three ethno-racial groups by gender. First, I estimated the insurance coverage type for young adults in the southwestern states of the US. For this estimation I used multinomial logistic regression and found that ethno-racial group, employment status, income, education, age group, disability status and school going status are key factors which determine the health coverage status of the young adults which is consistent with the existing literature. States with Medicaid expansion showed a significant increase in the health insurance coverage of young adults residing in those states which is also consistent with the literature (Buchmueller et al., 2016; Jessica Gehr, 2017).

Next, I looked at the employed young adults of the southwestern states. Among those who are employed in the labor force, Hispanic young adults have significantly lower insurance rates compared to White young adults. This is true for both genders. I found that after controlling for industry, education, income, marital status, employment type (part-time vs full-time), citizenship, and household speaking foreign language I got 37.64% of the unexplained disparity between White men and Hispanic men. In case of women, this unexplained portion was 36.62%. I argue that this unexplained portion was because of characteristics that are unobservable to this study such as choice of purchasing health coverage, lack of information about the insurance markets and plans, willingness to take risks by not buying insurance and possible discrimination faced by Hispanics because of their observable characteristics.

Finally, I examined the health coverage disparity among young adults neither in school nor in the labor force. Again, the comparison groups for this analysis is: Whites and Hispanics. The results indicated 50% percent of unexplained component of difference in health coverage between the Hispanic and White men. In case of women, the unexplained component was 31.6%. Similar to the explanation above, I argue that this unexplained portion also is suggestive of the possible discrimination faced by Hispanics because of their observable characteristics. Like employed young adults, young adults of this group have characteristics that are unobservable to this analysis which contributed towards to the unexplained portions.

This study has few limitations. First limitation is that I do not have information about the source of the private insurance of the young adults. They can get it from their parents through ACA's *dependent coverage* provision or they can obtain it through *employer-sponsored* *insurance*. Since the data I used does not provide this information, thus I could not control for it in the analysis. Second limitation is that the data did not have information on the life of young adults who are neither in school nor in labor force which could have explained the disparities among Hispanic and White young adults of this group. Further research can be built on the findings presented in this paper. Policies on immigration, health coverage policies for undocumented young adults also need to be addressed in the future research. Recent debates about new citizenship laws for Anchor babies[7] or Deferred Action for Childhood Arrivals (DACA)[8] can determine the validity of the citizenship of young adults under these programs. If these programs are removed, then obtaining public health coverage such as Medicaid will be difficult for these young adults. Hence, it would be important to study the impact of these new laws on the health coverage of young adults if or when they are implemented.

The findings of this study suggest that ethno-racial group, gender, citizenship and foreign language, education level, income, school going status are the significant factors that determine the health insurance coverage of the young adults in the southwest United States. These factors also indicate that systemic ethno-racial disparities in the insurance coverage persist and are difficult to remove without major health reforms. The policy implication of this paper is that there is a need for health reform which covers all the vulnerable social groups that are systemically uninsured or under-insured. Such health reform should also rule out the possibilities of losing health insurance coverage because of the personal or professional reasons such as leaving or changing jobs.

7 https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-taking-action-end-birth-tourism-protect-national-security-curb-abuse-public-resources/

8 https://www.migrationpolicy.org/news/all-eyes-turn-congress-following-trump-decision-terminate-daca-program

References

(WHO), W. H. O. (2018). *Cancer*. Retrieved from http://gco.iarc.fr/,

Aaron, H. J., Fiedler, M., Ginsburg, P. B., Adler, L., & Rivlin, A. M. (2017, July 27). Turmoil in the individual insurance market — where it came from and how to fix it. *New England Journal of Medicine*. Massachussetts Medical Society. https://doi.org/10.1056/NEJMp1707593

Acitelli, L. K., & Antonucci, T. C. (1994). Gender Differences in the Link Between Marital Support and Satisfaction in Older Couples. *Journal of Personality and Social Psychology*, *67*(4), 688–698. https://doi.org/10.1037/0022-3514.67.4.688

Aneshensel, C. S., & Frerichs, R. R. (1982). Stress, support, and depression: A longitudinal causal model. *Journal of Community Psychology*, *10*(4), 363–376. https://doi.org/10.1002/1520-6629(198210)10:4<363::AID-JCOP2290100407>3.0.CO;2-8

Antonucci, T. C. (1994). Attachment in adulthood and aging. In *Attachment in adults: Clinical and developmental perspectives.* (pp. 256–272). New York, NY, US: Guilford Press.

Antonucci, T. C., & Jackson, J. S. (1987). Social support, interpersonal efficacy, and health: A life course perspective. In *Handbook of clinical gerontology.* (pp. 291–311). Elmsford, NY, US: Pergamon Press.

Antwi, B. Y. A., Moriya, A. S., & Simon, K. (2013). Effects of federal policy to insure young adults: Evidence from the 2010 affordable care act's dependent-coverage mandate. *American Economic Journal: Economic Policy*, *5*(4), 1–28. https://doi.org/10.1257/pol.5.4.1

Artiga, S., Orgera, K., & Damico, A. (2019). Changes in Health Coverage by Race and Ethnicity since Implementation of the ACA, 2013-2017. *Issue Brief*, (February), 2013–2017. Retrieved from http://files.kff.org/attachment/Issue-Brief-Changes-in-Health-Coverage-by-Race-and-Ethnicity-since-Implementation-of-the-ACA-2013-2017

Baicker, K., & Chandra, A. (2005). *The Labor Market Effects of Rising Health Insurance Premiums*. Retrieved from http://www.nber.org/papers/w11160

Baron, R. M., & Kenny, D. A. (1986). *The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations* (Vol. 51). Psychological Association, Inc. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.169.4836&rep=rep1&type=pdf

Belle, D. E. (1982). The impact of poverty on social networks and supports. *Marriage & Family Review*, *5*(4), 89–103. https://doi.org/10.1300/J002v05n04_06

Billings, A. G., & Moos, R. H. (1984). Coping, stress, and social resources among adults with unipolar depression. *Journal of Personality and Social Psychology*, *46*(4), 877–891. https://doi.org/10.1037/0022-3514.46.4.877

Bonnie RJ, Stroud C, Breiner H, editors. (2015). The Health Care System - Investing in the Health and Well-Being of Young Adults - NCBI Bookshelf. Retrieved April 8, 2020, from https://www.ncbi.nlm.nih.gov/books/NBK284795/

Born, P. (2017). ACA Exchange Competitiveness in Florida. *Risk Management and Insurance Review*, *20*(2), 189–210. https://doi.org/10.1111/rmir.12074

Buchmueller, T. C., Levinson, Z. M., Levy, H. G., & Wolfe, B. L. (2016). Effect of the Affordable Care Act on Racial and Ethnic Disparities in Health Insurance Coverage. *American Journal of Public Health*, *106*(8), 1416–1421. https://doi.org/10.2105/AJPH.2016.303155

Callahan, S. T., & Cooper, W. O. (2005). Uninsurance and health care access among young adults in the United States. *Pediatrics*. https://doi.org/10.1542/peds.2004-1449

Callahan, S. T., Hickson, G. B., & Cooper, W. O. (2006). Health Care Access of Hispanic Young Adults in the United States. *Journal of Adolescent Health*, *39*(5), 627–633. https://doi.org/10.1016/j.jadohealth.2006.04.012

CBO. (2018). *Health Insurance Subsidies in 2018 for People Under Age 65 0 50 100 150 200 250 300 Support for Nongroup Coverage Federal Subsidies for Health Insurance Coverage for People At a Glance*. Retrieved from www.cbo.gov/publication/53826

Center on Budget and Policy Priorities. (2012). Why a State’s Health Insurers Should Support Expanding Medicaid. Retrieved July 4, 2020, from https://www.cbpp.org/sites/default/files/atoms/files/medicaid-and-insurers-memo.pdf

Central Bureau of Statistics (Nepal). (2011). Nepal Census 2011. Retrieved September 30, 2019, from https://sites.google.com/site/nepalcensus/

Chernew, M., Cutler, D. M., & Keenan, P. S. (2005, August). Increasing health insurance costs and the decline in insurance coverage. *Health Services Research*. Health Research & Educational Trust. https://doi.org/10.1111/j.1475-6773.2005.00409.x

Ciaramella, A., & Poli, P. (n.d.). Assessment of depression among cancer patients: the role of pain, cancer type and treatment. *Psycho-Oncology*, *10*(2), 156–165. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11268142

CMS. (2017). *What You Should Know About Provider Networks What’s a provider network?*

CMS. (2018). Market Rating Reforms | CMS. Retrieved March 19, 2020, from https://www.cms.gov/CCIIO/Programs-and-Initiatives/Health-Insurance-Market-Reforms/state-gra

Cohen, M. A., Kaur, R., & Darnell, B. (2013). *Office of the Assistant Secretary for Planning and Evaluation EXITING THE MARKET: Understanding the Factors behind Carriers’ Decision to Leave the Long-Term Care Insurance Market*. Retrieved from http://aspe.hhs.gov/office_specific/daltcp.cfm

Cohen, S., & Wills, T. A. (1985, September). Stress, Social Support, and the Buffering Hypothesis. *Psychological Bulletin*. https://doi.org/10.1037/0033-2909.98.2.310

Colleoni, M., Mandala, M., Peruzzotti, G., Robertson, C., Bredart, A., & Goldhirsch, A. (2000). Depression and degree of acceptance of adjuvant cytotoxic drugs. *Lancet*, *356*(9238), 1326–1327. https://doi.org/10.1016/S0140-6736(00)02821-X

Cyranowski, J. M., Frank, E., Young, E., & Shear, M. K. (2000). Adolescent onset of the gender difference in lifetime rates of major depression: a theoretical model. *Archives of General Psychiatry*, *57*(1), 21–27. https://doi.org/10.1001/archpsyc.57.1.21

Denavas-Walt, C., Proctor, B. D., & Smith, J. C. (2012). *Income, Poverty, and Health Insurance Coverage in the United States: 2011 Current Population Reports*.

Diamond, R., Dickstein, M. J., Mcquade, T., & Persson, P. (2018). *Take-Up, Drop-Out, and Spending in ACA Marketplaces*. Retrieved from http://www.nber.org/papers/w24668

DiMatteo, M. R., & Haskard-Zolnierek, K. B. (2010). Impact of Depression on Treatment Adherence and Survival from Cancer. In *Depression and Cancer* (pp. 101–124). John Wiley and Sons. https://doi.org/10.1002/9780470972533.ch5

Dykstra, P. A., & de Jong Gierveld, J. (2004). Gender and marital-history differences in emotional and social loneliness among Dutch older adults. *Canadian Journal on Aging = La Revue Canadienne Du Vieillissement*, *23*(2), 141–155. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/15334814

Eibner, C., & Saltzman, E. (2015). How Does the ACA Individual Mandate Affect Enrollment and Premiums in the Individual Insurance Market?: Retrieved from https://www.rand.org/pubs/research_briefs/RB9812z4.html

Fehr, R., Rabah, K., & Cox, C. (2019). Insurer Participation on ACA Marketplaces, 2014-2020 | The Henry J. Kaiser Family Foundation. Retrieved March 19, 2020, from https://www.kff.org/private-insurance/issue-brief/insurer-participation-on-aca-marketplaces-2014-2020/

Foster Friedman, M., Fangmeier, J., Baum, N., & Udow-Phillips, M. (2017). ACA Exchange Competitiveness In Michigan. *Risk Management and Insurance Review*, *20*(2), 211–232. https://doi.org/10.1111/rmir.12077

Gabel, J. R., Lore, R., McDevitt, R. D., Pickreign, J. D., Whitmore, H., Slover, M., & Levy-Forsythe, E. (2012). More Than Half Of Individual Health Plans Offer Coverage That Falls Short Of What Can Be Sold Through Exchanges As Of 2014. *Health Affairs*, *31*(6), 1339–1348. https://doi.org/10.1377/hlthaff.2011.1082

Garfield, R., & Orgera, K. (2020). The Coverage Gap: Uninsured Poor Adults in States that Do Not Expand Medicaid | The Henry J. Kaiser Family Foundation. Retrieved April 7, 2020, from https://www.kff.org/medicaid/issue-brief/the-coverage-gap-uninsured-poor-adults-in-states-that-do-not-expand-medicaid/

Glassman, A. H., O'Connor, C. M., Califf, R. M., Swedberg, K., Schwartz, P., Bigger Jr., J. T., … Harrison, W. M. (2002). Sertraline Antidepressant Heart Attack Randomized Trial (SADHART) Group. Sertraline treatment of major depression in patients with acute MI or unstable angina. *JAMA*, *288*(6), 701-9. Retrieved from http://www.ncbi.nlm.nih.gov/htbin-post/Entrez/query?db=m&form=6&dopt=r&uid=12169073

Graetz, I., Kaplan, C. M., Kaplan, E. K., Bailey, J. E., & Waters, T. M. (2014). The U.S. health insurance marketplace: Are premiums truly affordable? *Annals of Internal Medicine*, *161*(8), 599–604. https://doi.org/10.7326/M14-0757

Hall, M. A. (2017). ACA Exchange Competitiveness in North Carolina. *Risk Management and Insurance Review*, *20*(2), 233–247. https://doi.org/10.1111/rmir.12076

Heflin, C. M., & Iceland, J. (2009). Poverty, material hardship, and depression. *Social Science Quarterly*, *90*(5), 1051–1071. https://doi.org/10.1111/j.1540-6237.2009.00645.x

Holahan, C. J., & Moos, R. H. (1981). Social support and psychological distress: A longitudinal analysis. *Journal of Abnormal Psychology*, *90*(4), 365–370. https://doi.org/10.1037/0021-843X.90.4.365

House, A., Knapp, P., Bamford, J., & Vail, A. (2001). Mortality at 12 and 24 months after stroke may be associated with depressive symptoms at 1 month. *Stroke*, *32*(3), 696–701. https://doi.org/10.1161/01.str.32.3.696

IRS. (2019). Publication 969 (2019), Health Savings Accounts and Other Tax-Favored Health Plans | Internal Revenue Service. Retrieved March 20, 2020, from https://www.irs.gov/publications/p969#en_US_2019_publink1000204030

Jemmott, J. B., & Locke, S. E. (1984). Psychosocial factors, immunologic mediation, and human susceptibility to infectious diseases: How much do we know? *Psychological Bulletin*, *95*(1), 78–108. https://doi.org/10.1037/0033-2909.95.1.78

Jessica Gehr. (2017). Why the Affordable Care Act Is Critical for Young Adults Low-Income Young Adults Would Benefit from Medicaid Expansion, (April), 1–6.

Jones, L. W., & Demark-Wahnefried, W. (2006). Diet, exercise, and complementary therapies after primary treatment for cancer. *The Lancet. Oncology*, *7*(12), 1017–1026. https://doi.org/10.1016/S1470-2045(06)70976-7

Karnell, L. H., Funk, G. F., Christensen, A. J., Rosenthal, E. L., & Magnuson, J. S. (2006). Persistent posttreatment depressive symptoms in patients with head and neck cancer. *Head & Neck*, *28*(5), 453–461. https://doi.org/10.1002/hed.20370

KFF. (2018). Health Insurance Coverage of the Total Population | The Henry J. Kaiser Family Foundation. Retrieved April 9, 2020, from https://www.kff.org/other/state-indicator/total-population/?dataView=1&currentTimeframe=0&selectedDistributions=employer&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

KFF. (2020). State Health Insurance Marketplace Types, 2020 | The Henry J. Kaiser Family Foundation. Retrieved March 24, 2020, from https://www.kff.org/health-reform/state-indicator/state-health-insurance-marketplace-types/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

Kohrt, B. A., Speckman, R. A., Kunz, R. D., Baldwin, J. L., Upadhaya, N., Acharya, N. R., … Worthman, C. M. (2009). Culture in psychiatric epidemiology: Using ethnography and multiple mediator models to assess the relationship of caste with depression and anxiety in Nepal. *Annals of Human Biology*, *36*(3), 261–280. https://doi.org/10.1080/03014460902839194

Krause, N., & Keith, V. (1989). Gender differences in social support among older adults. *Sex Roles*, *21*(9–10), 609–628. https://doi.org/10.1007/BF00289174

Kroenke, K., Spitzer, R., & Williams, W. (2001). The Patient Health Questionnaire PHQ-9: Validity of a brief depression severity measure. *Jgim*, *16*, 2–3. https://doi.org/10.1097/01.MLR.0000093487.78664.3C

LaVeist, T. A., Bowie, J. V, & Cooley-Quille, M. (2000). Minority health status in adulthood: the middle years of life. *Health Care Financing Review*, *21*(4), 9–21. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11481747

Leavy, R. L. (1983). Social support and psychological disorder: A review. *Journal of Community Psychology*, *11*(1), 3–21. https://doi.org/10.1002/1520-6629(198301)11:1<3::AID-JCOP2290110102>3.0.CO;2-E

Leemore Dafny, B. S., Collins, W., Cutler, D., Dana, J., Dranove, D., Duggan, M., … Yamamoto, D. (2010). Are Health Insurance Markets Competitive? *Complaint, United States v. Aetna Inc*, *100*, 1399–1431. https://doi.org/10.1257/aer.100.4.1399

Liebler, C. A., & Sandefur, G. D. (2002). Gender differences in the exchange of social support with friends, neighbors, and co-workers at midlife. *Social Science Research*, *31*(3), 364–391. https://doi.org/10.1016/S0049-089X(02)00006-6

Linden, W., Vodermaier, A., MacKenzie, R., & Greig, D. (2012). Anxiety and depression after cancer diagnosis: Prevalence rates by cancer type, gender, and age. In *Journal of Affective Disorders* (Vol. 141, pp. 343–351). https://doi.org/10.1016/j.jad.2012.03.025

Lissenden, B. (2017). Three’s a crowd?: The effect of insurer participation on premiums and cost-sharing parameters in the initial years of the ACA marketplaces. *American Journal of Health Economics*, *3*(4), 477–506. https://doi.org/10.1162/ajhe_a_00085

Lorant, V., Deliège, D., Eaton, W., Robert, A., Philippot, P., & Ansseau, M. (2003). Socioeconomic inequalities in depression: a meta-analysis. *American Journal of Epidemiology*, *157*(2), 98–112. https://doi.org/10.1093/aje/kwf182

Ludwig, H., & Zojer, N. (2007). Supportive care. *Annals of Oncology : Official Journal of the European Society for Medical Oncology*, *18 Suppl 1*, i37–i44. https://doi.org/10.1093/annonc/mdl449

Massie, M. J. (2004). Prevalence of depression in patients with cancer. *Journal of the National Cancer Institute. Monographs*, (32), 57–71. https://doi.org/10.1093/jncimonographs/lgh014

Mcmorrow, S., Kenney, G. M., Long, S. K., & Anderson, N. (2015). Uninsurance Among Young Adults Continues To Decline, Particularly In Medicaid Expansion States. *Health Affairs*. https://doi.org/10.1377/hlthaff.2015.0044

Mitchell, A. J., Chan, M., Bhatti, H., Halton, M., Grassi, L., Johansen, C., & Meader, N. (2011). Prevalence of depression, anxiety, and adjustment disorder in oncological, haematological, and palliative-care settings: A meta-analysis of 94 interview-based studies. *The Lancet Oncology*, *12*(2), 160–174. https://doi.org/10.1016/S1470-2045(11)70002-X

National Women's Law Center. (2015). *Medicaid Coverage for Pregnant Women Remains Critical for Women's Health Medicaid Is an Important Source of Coverage for Pregnant Women Medicaid Coverage of Pregnant Women is Critically Important to Women and Families*. Retrieved from http://www.medicaid.gov/medicaid-chip-program-information/by-population/pregnant-women/pregnant-women.html.

Neumark, D., Neumark, & David. (1988). Employers' Discriminatory Behavior and the Estimation of Wage Discrimination. *Journal of Human Resources*, *23*(3), 279–295.

New York Times. (2017). Why Trump Is Right and Wrong About Obamacare Premiums - The New York Times. Retrieved March 22, 2020, from https://www.nytimes.com/interactive/2017/12/04/us/healthcare-marketplace-insurance-premium-cost-2018.html

NHRC. (2018). Population Based Cancer Registry Launched by Nepal Health Research Council – Nepal Health Research Council. Retrieved September 30, 2019, from http://nhrc.gov.np/press-release-population-based-cancer-registry-launched-by-nepal-health-research-council/

Panhans, M. (2019). Adverse selection in ACA exchange markets: Evidence from Colorado. *American Economic Journal: Applied Economics*, *11*(2), 1–36. https://doi.org/10.1257/app.20170117

Pinquart, M., & Duberstein, P. R. (2010). Depression and cancer mortality: A meta-analysis. *Psychological Medicine*, *40*(11), 1797–1810. https://doi.org/10.1017/S0033291709992285

Piya, M. K., & Acharya, S. C. (2012). Oncology in Nepal. *South Asian Journal of Cancer*, *1*(1), 5–8. https://doi.org/10.4103/2278-330X.96490

Pugliesi, K., & Shook, S. L. (1998). Gender, ethnicity, and network characteristics: Variation in social support resources. *Sex Roles: A Journal of Research*, *38*(3–4), 215–238. https://doi.org/10.1023/A:1018733116398

Robert Wood Johnson Foundation. (2020). Health Insurance Plans Datasets - RWJF. Retrieved March 19, 2020, from https://hixcompare.org/individual-markets.html

Robson, A., Scrutton, F., Wilkinson, L., & MacLeod, F. (2010). The risk of suicide in cancer patients: a review of the literature. *Psycho-Oncology*, *19*(12), 1250–1258. https://doi.org/10.1002/pon.1717

Scheffler, R. M., Arnold, D. R., Fulton, B. D., & Glied, S. A. (2020). Differing Impacts Of Market Concentration On Affordable Care Act Marketplace Premiums. https://doi.org/10.1377/hlthaff.2015.1229

Sen, A. P., & Deleire, T. (2016). *ASPE ISSUE BRIEF THE EFFECT OF MEDICAID EXPANSION ON MARKETPLACE PREMIUMS*. Retrieved from http://aspe.hhs.gov

Sohn, H. (2017). Racial and Ethnic Disparities in Health Insurance Coverage: Dynamics of Gaining and Losing Coverage Over the Life-Course. *Population Research and Policy Review*, *36*(2), 181–201. https://doi.org/10.1007/s11113-016-9416-y

Sommers, B. D. (2012). Number of Young Adults Gaining Insurance Due to the Affordable Care Act Now Tops 3 Million | ASPE. Retrieved April 12, 2020, from https://aspe.hhs.gov/basic-report/number-young-adults-gaining-insurance-due-affordable-care-act-now-tops-3-million

Sommers, B. D., Buchmueller, T., Decker, S. L., Carey, C., & Kronick, R. (2013). The Affordable Care Act Has Led To Significant Gains In Health Insurance And Access To Care For Young Adults. *Health Affairs*, *32*(1), 165–174. https://doi.org/10.1377/hlthaff.2012.0552

Spencer, D. L., McManus, M., Call, K. T., Turner, J., Harwood, C., White, P., & Alarcon, G. (2018). Health Care Coverage and Access Among Children, Adolescents, and Young Adults, 2010–2016: Implications for Future Health Reforms. *Journal of Adolescent Health*, *62*(6), 667–673. https://doi.org/10.1016/j.jadohealth.2017.12.012

Terriquez, V., & Joseph, T. D. (2016). Ethnoracial inequality and insurance coverage among Latino young adults. *Social Science and Medicine*, *168*, 150–158. https://doi.org/10.1016/j.socscimed.2016.08.039

Turner, H. A. (1994). Gender and social support: Taking the bad with the good? *Sex Roles*, *30*(7–8), 521–541. https://doi.org/10.1007/BF01420800

Umberson, D., Chen, M. D., House, J. S., Hopkins, K., & Slaten, E. (1996). The effect of social relationships on psychological well-being: Are men and women really so different? *American Sociological Review*, *61*(5), 837–857. https://doi.org/10.2307/2096456

van der Goes, D. N., & Santos, R. (2018). Determinants of private health insurance coverage among

Mexican American men 2010–2013. *Journal of Medical Economics*, *21*(11), 1139–1143. https://doi.org/10.1080/13696998.2018.1515083

Van Parys, J. (2018). ACA marketplace premiums grew more rapidly in areas with monopoly insurers than in areas with more competition. *Health Affairs*, *37*(8), 1243–1251. https://doi.org/10.1377/hlthaff.2018.0054

Walen, H. R., & Lachman, M. E. (2000). Social support and strain from partner, family, and friends: Costs and benefits for men and women in adulthood. *Journal of Social and Personal Relationships*, *17*(1), 5–30. https://doi.org/10.1177/0265407500171001

Walker, J., Hansen, C. H., Martin, P., Symeonides, S., Ramessur, R., Murray, G., & Sharpe, M. (2014). Prevalence, associations, and adequacy of treatment of major depression in patients with cancer: a cross-sectional analysis of routinely collected clinical data. *The Lancet. Psychiatry*, *1*(5), 343–350. https://doi.org/10.1016/S2215-0366(14)70313-X

Watson, M., Haviland, J. S., Greer, S., Davidson, J., & Bliss, J. M. (1999). Influence of psychological response on survival in breast cancer: a population-based cohort study. *Lancet (London, England)*, *354*(9187), 1331–1336. https://doi.org/10.1016/s0140-6736(98)11392-2

Weinberg, M., & Kallerman, P. (2017). ACA Exchange Competitiveness In California. *Risk Management and Insurance Review*, *20*(2), 173–188. https://doi.org/10.1111/rmir.12078

Yun, M.-S. (2003). *Decomposing Differences in the First Moment*. Retrieved from www.iza.org

Appendix

Figures

Figure 1: Uninsured Rates by Ethno-racial Groups

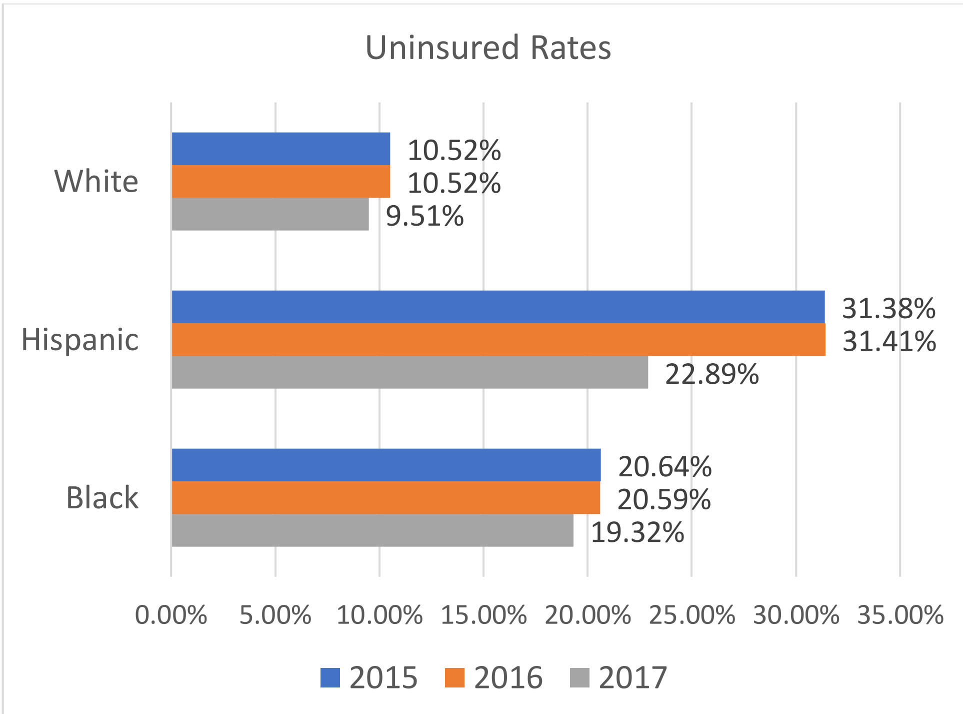


Figure 2: Private Insurance Rates among Employed Youth (age 18-26)

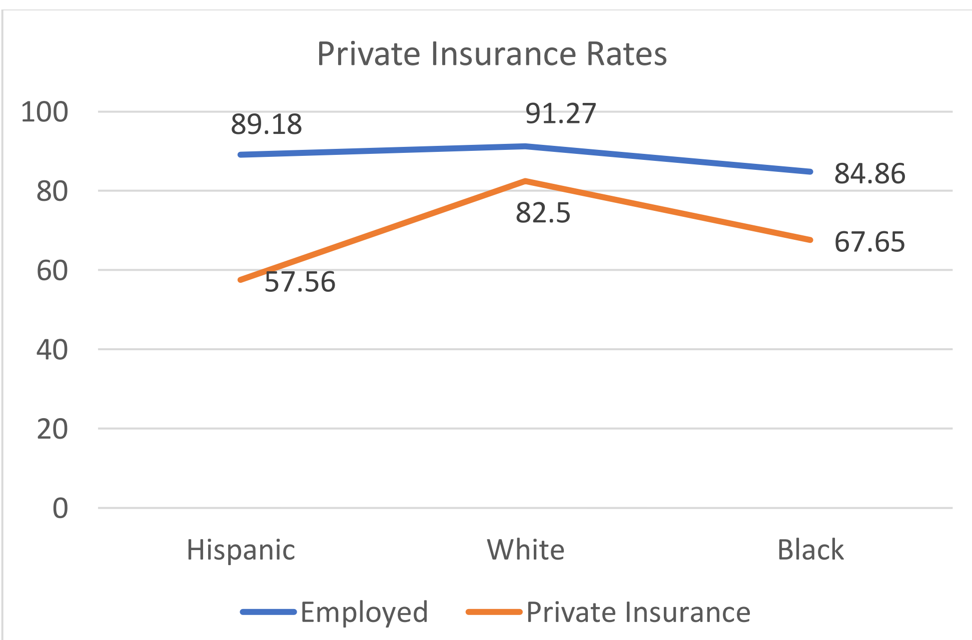
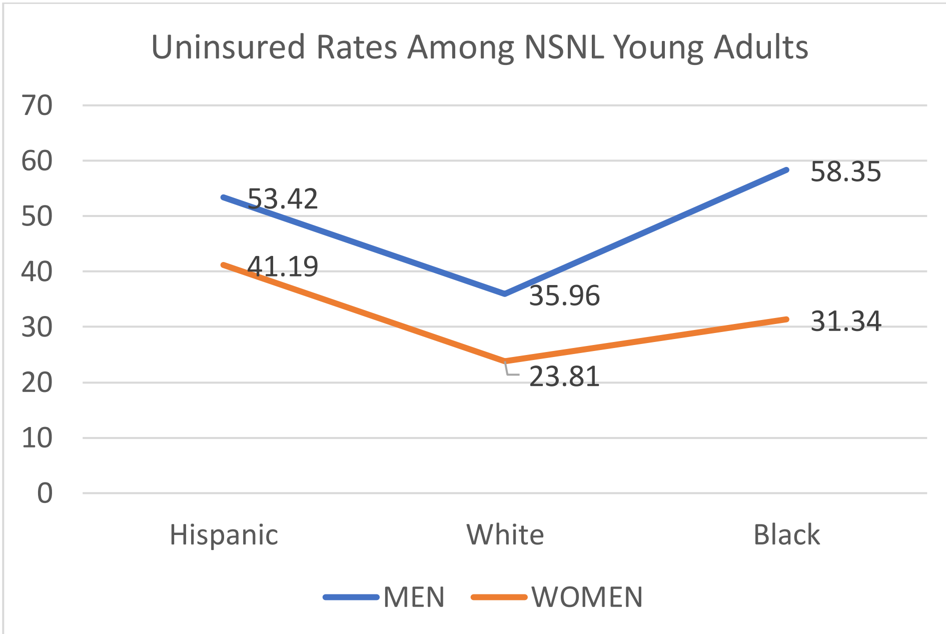


Figure 3: Uninsured Rates among Young Adults Neither in School nor in the Labor-force (NSNL) (age 18-26)



Tables

Table 1: Summary Statistics of Young Adults in the Southwest United States by Ethno-racial Group (age 18-26)

		WHITE				HISPANIC				BLACK			
		MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
	Variable Description	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Coverage Type	Categorical variable:												
Private	=1 if coverage type is	.77	.41	.78	.41	.49	.49	.50	.49	.54	.49	.57	.49
Uninsured	Private, 2 if Uninsured	.14	.35	.11	.31	.33	.47	.27	.44	.30	.45	.22	.41
Public	and 3 if Public	.08	.27	.10	.30	.18	.38	.23	.42	.16	.36	.21	.41
Employment status	Categorical variable: =1 if employed and												
Part time	number of hours	.16	.37	.14	.34	.12	.33	.21	.41	.19	.4	.19	.39
Full time	worked<30	.47	.5	.49	.5	.34	.47	.42	.49	.39	.49	.41	.49
Unemployed	=2 if employed and number of hours worked>=30	.07	.25	.08	.27	.10	.3	.05	.23	.07	.25	.09	.29
Out of labor force	=3 if unemployed =4 if not in the labor force	.3	.46	.29	.46	.44	.5	.32	.47	.35	.48	.32	.46
Income	Categorical variable:												
Less than 15k	=1 if personal annual income <$15,000	.59	.49	.6	.49	.73	.44	.65	.48	.71	.46	.71	.46
Between 15k to 25k	=2 if personal annual income >$15,000 and <$25,000	.16	.36	.21	.41	.13	.34	.15	.36	.17	.38	.16	.37
More than 25k	=3 if personal annual income >$25,000	.25	.43	.2	.4	.14	.34	.2	.4	.12	.33	.13	.34
Education	Categorical variable:												
High School or less	=1 if education is less than High School	.1	.31	.21	.41	.18	.39	.08	.27	.15	.35	.1	.3

High school or equivalent	=2 if education is High school or equivalent	.29	.46	.36	.48	.35	.48	.23	.42	.31	.46	.28	.45
Some college	=3 if education is some college	.37	.48	.33	.47	.38	.48	.39	.49	.38	.49	.46	.5
Associate degree	=4 if education is Associate degree	.05	.22	.04	.2	.03	.18	.07	.25	.06	.24	.05	.22
Bachelor's degree	=5 if education is bachelor’s degree	.16	.37	.05	.22	.06	.23	.21	.41	.08	.28	.1	.3
Master's degree or above	=6 if education is master’s degree or above	.02	.13	0	.07	.01	.08	.03	.17	.01	.1	.01	.1
Married	Binary variable: =1 if married; 0 otherwise	.1	.3	.12	.32	.06	.24	.18	.38	.18	.38	.07	.26
Age group	Categorical variable:												
Age 18-20	=1 if age is between 18 and 20	.34	.47	.36	.48	.35	.48	.34	.47	.35	.48	.34	.48
Age 21-23	=2 if age is between 21 and 23	.32	.47	.32	.47	.34	.47	.3	.46	.33	.47	.33	.47
Age 24-26	=3 if age is between 24 and 26	.34	.47	.32	.47	.31	.46	.36	.48	.32	.47	.33	.47
Disability	Binary variable: =1 if presence of any physical disability; 0 otherwise	.93	.25	.94	.24	.9	.3	.94	.24	.95	.22	.93	.26
In school	Binary variable: =1 if goes to school; 0 otherwise	.45	.5	.37	.48	.41	.49	.49	.5	.45	.5	.48	.5
Citizen	Binary variable: =1 if Born in the U.S. or Born in Puerto Rico, Guam, the U.S. Virgin	.98	.14	.97	.37	.84	.19	.85	.14	.96	.35	.95	.22

	Islands, or the Northern Marianas or Born abroad of American parent(s) or U.S. citizen by naturalization; 0 otherwise												
Foreign language	Binary variable: =1 if household language is Spanish or Other Indo-European languages or Asian and Pacific Island languages or any other language; 0 otherwise	.06	.24	.06	.47	.65	.24	.66	.24	.06	.47	.08	.27
Year													
2015		.21	.41	.21	.4	.26	.44	.22	.41	.21	.4	.27	.44
2016	Year dummy variables	.21	.41	.2	.4	.26	.44	.21	.41	.2	.4	.27	.44
2017		.57	.49	.59	.49	.48	.5	.57	.49	.59	.49	.47	.5
State													
California		.23	.42	.31	.46	.18	.38	.23	.42	.31	.46	.17	.38
Arizona		.06	.24	.04	.2	.03	.17	.06	.23	.04	.2	.02	.15
Colorado	State dummy variables	.07	.25	.02	.14	.02	.14	.07	.25	.02	.14	.02	.13
New Mexico		.03	.16	.04	.2	.01	.1	.03	.16	.04	.2	.01	.08
Texas		.61	.49	.58	.49	.76	.43	.62	.49	.58	.49	.78	.41
N		**27,896**		**26,988**		**30,720**		**29,761**		**6,097**		**5,716**	
		54,884				**60,481**				**11,813**			

Source: American Community Survey, 2015-2017

Table 2: Multinomial Logistic Regression on Health Insurance Coverage among Young Adults in Southwest United States

(Private Insurance as a Reference Group)

	Model (1)		Model (2)		Model (3)	
	Uninsured	Public	Uninsured	Public	Uninsured	Public
Race (base: White)						
Hispanic	3.231***	2.801***	3.234***	2.932***	3.206***	2.910***
	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Black	2.248***	2.889***	2.123***	2.824***	2.086***	2.783***
	(0.06)	(0.09)	(0.06)	(0.09)	(0.06)	(0.09)
Male	1.237***	0.718***	1.239***	0.699***	1.235***	0.692***
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Employment (base: Full time)						
Part time	0.816***	1.079*	0.929**	1.135***	1.158***	1.329***
	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.04)
Unemployed	1.684***	2.356***	1.828***	2.352***	1.898***	2.437***
	(0.05)	(0.08)	(0.06)	(0.09)	(0.06)	(0.09)
Out of labor force	1.190***	1.870***	1.336***	1.816***	1.629***	2.110***
	(0.03)	(0.05)	(0.03)	(0.05)	(0.04)	(0.06)
Income (base: Less than 15k)	1.000	1.000	1.000	1.000	1.000	1.000
	(.)	(.)	(.)	(.)	(.)	(.)
Between 15k to 25k	0.967	0.753***	0.823***	0.698***	0.779***	0.666***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
More than 25k	0.549***	0.364***	0.430***	0.313***	0.397***	0.294***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Education (base: High School or less)	1.000	1.000	1.000	1.000	1.000	1.000
	(.)	(.)	(.)	(.)	(.)	(.)
High school or equivalent	0.593***	0.508***	0.561***	0.504***	0.518***	0.473***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Some college	0.314***	0.251***	0.288***	0.256***	0.356***	0.297***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Associate degree	0.295***	0.227***	0.224***	0.204***	0.289***	0.246***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Bachelor's degree	0.164***	0.115***	0.114***	0.099***	0.132***	0.110***
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Master's degree or above	0.144***	0.134***	0.095***	0.108***	0.117***	0.127***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Married	1.398***	1.246***	1.068**	1.112***	0.965	1.021

	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)
Year (base: 2015)	1.000	1.000	1.000	1.000	1.000	1.000
	(.)	(.)	(.)	(.)	(.)	(.)
year=2016	1.001	1.001	1.002	1.001	1.001	1.001
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)
year=2017	1.005	1.010	1.014	1.005	1.017	1.006
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)
State (base: California)						
Arizona	1.544***	0.713***	1.583***	0.705***	1.534***	0.690***
	(0.06)	(0.03)	(0.07)	(0.03)	(0.06)	(0.03)
Colorado	1.239***	0.874**	1.326***	0.882**	1.312***	0.876**
	(0.06)	(0.04)	(0.07)	(0.04)	(0.07)	(0.04)
New Mexico	1.505***	1.188***	1.554***	1.176***	1.494***	1.141**
	(0.08)	(0.05)	(0.08)	(0.05)	(0.08)	(0.05)
Texas	2.439***	0.305***	2.565***	0.297***	2.515***	0.292***
	(0.06)	(0.01)	(0.06)	(0.01)	(0.06)	(0.01)
Age (base: 18-20)			1.000	1.000	1.000	1.000
			(.)	(.)	(.)	(.)
Age 21-23			1.968***	1.184***	1.594***	1.021
			(0.04)	(0.03)	(0.03)	(0.02)
Age 24-26			2.923***	1.790***	2.118***	1.412***
			(0.06)	(0.04)	(0.05)	(0.04)
Disability			0.883***	0.290***	0.954	0.307***
			(0.03)	(0.01)	(0.03)	(0.01)
In school					0.427***	0.539***
					(0.01)	(0.01)
N	127284.000		127284.000		127284.000	
AIC	198301.233		193757.094		191615.932	
BIC	198710.909		194225.294		192103.641	
Log-likelihood	-99108.617		-96830.547		-95757.966	

Exponentiated coefficients; Table report Odds Ratios; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; t statistics in parentheses
Base outcome category is *Private* insurance

Table 3(a): Multinomial Logistic Regression on Health Insurance Coverage Among Young Men in Southwest United States

(Private Insurance as a Reference Group)

	White		Hispanic		Black	
	Uninsured	Public	Uninsured	Public	Uninsured	Public
Employment (base: Full time)						
Part time	1.201**	1.388***	1.226***	1.251***	1.077	1.508**
	(0.08)	(0.12)	(0.06)	(0.08)	(0.14)	(0.24)
Unemployed	2.143***	2.317***	2.177***	2.576***	2.114***	2.182***
	(0.16)	(0.22)	(0.13)	(0.18)	(0.27)	(0.35)
Out of labor force	1.929***	2.318***	2.052***	2.339***	3.350***	2.394***
	(0.11)	(0.17)	(0.09)	(0.13)	(0.34)	(0.31)
Income (base: Less than 15k)						
Between 15k to 25k	0.868*	0.608***	0.828***	0.703***	0.586***	0.538***
	(0.05)	(0.05)	(0.04)	(0.04)	(0.07)	(0.08)
More than 25k	0.429***	0.227***	0.415***	0.320***	0.348***	0.346***
	(0.03)	(0.02)	(0.02)	(0.02)	(0.04)	(0.06)
Education (base: High School or less)						
High school or equivalent	0.545***	0.440***	0.516***	0.504***	0.496***	0.437***
	(0.03)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Some college	0.364***	0.257***	0.380***	0.328***	0.272***	0.236***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Associate degree	0.274***	0.244***	0.355***	0.239***	0.140***	0.184***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)
Bachelor's degree	0.109***	0.098***	0.177***	0.132***	0.114***	0.119***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)
Master's degree or above	0.071***	0.164***	0.203***	0.202***	0.064***	0.059**
	(0.02)	(0.04)	(0.05)	(0.07)	(0.04)	(0.06)
Married	1.219**	1.773***	0.929	1.370***	0.912	1.617**
	(0.07)	(0.15)	(0.04)	(0.09)	(0.13)	(0.29)
Age 18-20						
Age 21-23	1.779***	1.208**	1.465***	0.765***	2.479***	1.031
	(0.09)	(0.08)	(0.05)	(0.03)	(0.21)	(0.11)
Age 24-26	2.797***	2.155***	1.680***	0.903*	3.858***	1.397**
	(0.16)	(0.15)	(0.07)	(0.05)	(0.38)	(0.17)

Disability	0.984	0.240***	1.025	0.293***	0.835	0.238***
	(0.07)	(0.02)	(0.07)	(0.02)	(0.10)	(0.03)
In school	0.323***	0.404***	0.435***	0.779***	0.372***	0.664***
	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.07)
Year (base: 2015)						
year=2016	0.994	0.998	1.004	1.007	0.999	0.989
	(0.05)	(0.09)	(0.04)	(0.07)	(0.09)	(0.12)
year=2017	1.039	0.992	1.018	1.060	1.078	0.921
	(0.05)	(0.09)	(0.04)	(0.07)	(0.10)	(0.11)
State (base: California)						
Arizona	1.390***	0.728***	1.919***	0.643***	1.385	0.885
	(0.13)	(0.07)	(0.15)	(0.05)	(0.32)	(0.19)
Colorado	1.323**	0.924	1.151	0.993	2.055*	1.919**
	(0.12)	(0.08)	(0.14)	(0.10)	(0.62)	(0.48)
New Mexico	1.715***	1.237	1.863***	1.224*	1.173	0.990
	(0.22)	(0.15)	(0.16)	(0.10)	(0.46)	(0.34)
Texas	2.059***	0.253***	2.629***	0.258***	2.185***	0.282***
	(0.13)	(0.02)	(0.11)	(0.01)	(0.25)	(0.03)
Citizen			0.316***	0.983		
			(0.01)	(0.06)		
Foreign language			2.135***	**2.006*** **		
			(0.07)	(0.08)		
N	27936.000		30749.000		6112.000	
AIC	32247.530		51479.114		9865.967	
BIC	32609.988		51879.127		10161.560	
Log-likelihood	-16079.765		-25691.557		-4888.984	

Exponentiated coefficients; Table report Odds Ratios; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; t statistics in parentheses;
Base outcome category is *Private* insurance

Table 3(b): Multinomial Logistic Regression on Health Insurance Coverage Among Young Women in Southwest United States

(Private Insurance as a Reference Group)

	White		Hispanic		Black	
	Uninsured	Public	Uninsured	Public	Uninsured	Public
Employment (base: Full time)						
Part time	1.085	1.368***	1.258***	1.364***	1.182	1.578***
	(0.07)	(0.10)	(0.06)	(0.07)	(0.13)	(0.19)
Unemployed	1.994***	2.466***	1.769***	2.285***	3.081***	3.598***
	(0.17)	(0.23)	(0.12)	(0.16)	(0.42)	(0.53)
Out of labor force	1.282***	1.888***	1.401***	2.089***	1.591***	2.472***
	(0.08)	(0.13)	(0.06)	(0.10)	(0.17)	(0.28)
Income (Less than 15k)						
Between 15k to 25k	0.693***	0.663***	0.703***	0.653***	0.763*	0.800
	(0.05)	(0.05)	(0.03)	(0.03)	(0.08)	(0.10)
More than 25k	0.396***	0.255***	0.318***	0.284***	0.377***	0.461***
	(0.03)	(0.03)	(0.02)	(0.02)	(0.05)	(0.07)
Education (High School or less)						
High school or equivalent	0.647***	0.437***	0.676***	0.494***	0.574***	0.350***
	(0.05)	(0.03)	(0.03)	(0.03)	(0.08)	(0.04)
Some college	0.415***	0.237***	0.512***	0.332***	0.426***	0.216***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.06)	(0.03)
Associate degree	0.390***	0.210***	0.391***	0.274***	0.187***	0.127***
	(0.04)	(0.02)	(0.03)	(0.02)	(0.04)	(0.03)
Bachelor's degree	0.119***	0.064***	0.223***	0.141***	0.185***	0.062***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)
Master's degree or above	0.099***	0.107***	0.217***	0.072***	0.131***	0.000
	(0.02)	(0.02)	(0.04)	(0.02)	(0.07)	(0.00)
Married	0.811***	0.777***	0.799***	0.809***	0.707*	0.570***
	(0.04)	(0.05)	(0.03)	(0.04)	(0.10)	(0.10)
Age (base: 18-20)						
Age 21-23	1.702***	1.656***	1.266***	0.909*	1.772***	1.249*
	(0.10)	(0.10)	(0.05)	(0.04)	(0.17)	(0.12)
Age 24-26	2.695***	2.628***	1.416***	1.100*	2.682***	2.043***
	(0.17)	(0.18)	(0.06)	(0.05)	(0.28)	(0.22)

Disability	0.806**	0.328***	0.892	0.387***	0.875	0.377***
	(0.07)	(0.02)	(0.07)	(0.03)	(0.13)	(0.05)
In school	0.399***	0.403***	0.512***	0.517***	0.549***	0.465***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)	(0.04)
Year (base: 2015)						
year=2016	1.003	1.001	1.004	1.001	1.001	0.999
	(0.06)	(0.07)	(0.04)	(0.06)	(0.09)	(0.11)
year=2017	1.004	0.913	1.011	1.028	1.163	1.104
	(0.06)	(0.07)	(0.04)	(0.06)	(0.11)	(0.12)
State (base: California)						
Arizona	1.251*	0.717***	1.848***	0.821*	1.543	0.727
	(0.14)	(0.07)	(0.16)	(0.06)	(0.47)	(0.16)
Colorado	1.364**	0.929	1.313*	0.834	2.403**	1.118
	(0.15)	(0.08)	(0.18)	(0.09)	(0.81)	(0.29)
New Mexico	1.707***	1.083	1.987***	1.578***	2.795*	0.336*
	(0.25)	(0.13)	(0.20)	(0.13)	(1.27)	(0.17)
Texas	2.225***	0.326***	3.041***	0.322***	3.338***	0.395***
	(0.16)	(0.02)	(0.14)	(0.02)	(0.49)	(0.04)
Citizen			0.361***	1.034		
			(0.02)	(0.06)		
Foreign language			2.346***	2.024***		
			(0.08)	(0.07)		
N	27001.000		29767.000		5719.000	
AIC	31116.183		51702.323		9790.662	
BIC	31477.143		52100.779		10083.330	
Log-likelihood	-15514.092		-25803.162		-4851.331	

Exponentiated coefficients; Table report Odds Ratios; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; t statistics in parentheses;
Base outcome category is *Private* insurance

Table 4: Employment Rates Among Young Adults in the Southwest United States

Employed	MEN				WOMEN			
	Hispanic	White	Black	Total	Hispanic	White	Black	Total
No	2449	1849	596	4894	1999	1465	513	3977
	11.30	9.46	17.48	10.97	10.29	7.95	13.11	9.52
Yes	19225	17693	2814	39732	17422	16956	3400	37778
	88.70	**90.54**	82.52	89.03	**89.71**	**92.05**	86.89	90.48
Total	21674	19542	3410	44626	19421	18421	3913	41755
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table 5: Health Insurance Coverage Among White and Hispanic Young Adults in the Southwest United States

Coverage Type	MEN				WOMEN			
	Hispanic	White	Black	Total	Hispanic	White	Black	Total
Private	10874	14526	1981	27381	10219	14058	2223	26500
	56.56	**82.10**	70.40	68.91	**58.66**	**82.91**	65.38	70.15
Uninsured	6002	2213	546	8761	4180	1673	662	6515
	31.22	12.51	19.40	22.05	23.99	9.87	19.47	17.25
Public	2349	954	287	3590	3023	1225	515	4763
	12.22	5.39	10.20	9.04	17.35	7.22	15.15	12.61
N	19225	17693	2814	39732	17422	16956	3400	37778
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table 6: Blinder-Oaxaca Decomposition of Private Insurance Coverage Among White and Hispanic Young Adults in Southwest United States

	MEN		WOMEN	
	Model (1)	Model (2)	Model (1)	Model (2)
White	0.821***	0.821***	0.800***	0.800***
	(0.00)	(0.00)	(0.00)	(0.00)
Hispanic	0.566***	0.566***	0.587***	0.587***
	(0.00)	(0.00)	(0.00)	(0.00)
Difference	0.255***	0.255***	0.213***	0.213***
	(0.00)	(0.00)	(0.00)	(0.00)
Explained	0.059***	0.159***	0.045***	0.135***
	(0.00)	(0.00)	(0.00)	(0.00)
Unexplained	0.196***	0.096***	0.168***	0.078***
	(0.00)	(0.01)	(0.00)	(0.01)
Explanatory variables	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
State FE (Medicaid expansion)	YES	YES	YES	YES
Citizen		YES		YES
Foreign language		YES		YES
N	**36918**	**36918**	**37778**	**37778**

Explanatory variables include industry codes, education, income, marital status, employment type (part-time vs full-time), age, school going status

Note: The sample for this table excludes Black population;

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Summary Statistics of Neither in School not in the Labor-force Young Adults in Southwest United States

	MEN				WOMEN			
	White		**Hispanic**		**White**		**Hispanic**	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Health coverage	.64	.48	.47	.5	.76	.43	.59	.49
Income								
Less than 15k	.91	.28	.93	.26	.94	.24	.96	.19
Between 15k to 25k	.05	.22	.04	.19	.04	.19	.03	.16
More than 25k	.04	.19	.03	.18	.02	.15	.01	.11
Education								
High School or less	.24	.43	.37	.48	.16	.37	.3	.46
High school or equivalent	.52	.5	.47	.5	.42	.49	.47	.5
Some college	.18	.38	.13	.33	.25	.44	.19	.39
Associate degree	.02	.13	.01	.11	.05	.22	.02	.14
Bachelor's degree	.04	.21	.02	.13	.09	.29	.03	.16
Master's degree or above	.01	.09	0	.03	.02	.13	0	.04
Married	.06	.25	.1	.29	.42	.49	.4	.49
Age group								
age 18 20	.26	.44	.29	.45	.19	.4	.24	.43
age 21 23	.32	.47	.34	.47	.31	.46	.32	.47
age 24 26	.42	.49	.38	.48	.49	.5	.44	.5
Disability	.73	.45	.81	.39	.85	.36	.91	.28
Citizen	.98	.14	.83	.37	.97	.18	.73	.44
Foreign language	.06	.24	.65	.48	.07	.25	.72	.45
Year								
2015	.21	.41	.22	.42	.25	.43	.24	.43
2016	.21	.41	.22	.41	.25	.43	.23	.42
2017	.58	.49	.56	.5	.51	.5	.53	.5
State								
California	.25	.43	.28	.45	.18	.38	.24	.43
Arizona	.07	.26	.06	.23	.05	.22	.04	.19
Colorado	.04	.19	.01	.12	.05	.22	.01	.11
New Mexico	.03	.16	.06	.23	.04	.2	.05	.21
Texas	.62	.49	.59	.49	.68	.47	.66	.47
N	**2,386**		**3,963**		**2,910**		**4,771**	

Table 8: Blinder-Oaxaca Decomposition of Health Insurance Coverage Among Young Adults Neither in School nor in Labor-force (NSNL)

	MEN		WOMEN	
	Model (1)	Model (2)	Model (1)	Model (2)
White	0.637***	0.637***	0.762***	0.762***
	(0.01)	(0.01)	(0.01)	(0.01)
Hispanic	0.465***	0.465***	0.588***	0.588***
	(0.01)	(0.01)	(0.01)	(0.01)
Difference	0.172***	0.172***	0.174***	0.174***
	(0.01)	(0.01)	(0.01)	(0.01)
Explained	0.026***	0.085***	0.020***	0.118***
	(0.01)	(0.01)	(0.00)	(0.01)
Unexplained	0.146***	0.086***	0.154***	0.055***
	(0.01)	(0.01)	(0.01)	(0.01)
Explanatory variables	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
State FE (Medicaid expansion)	YES	YES	YES	YES
Citizen		YES		YES
Foreign language		YES		YES
N	**6325**	**6325**	**7681**	**7681**

Explanatory variables include industry codes, education, income, marital status, age.
Note: The sample for this table excludes Black population;
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; t statistics in parentheses

CHAPTER 4

National Evidence of Health Insurance Market Concentration on ACA Marketplace Plans

Introduction

Health insurance Marketplaces (also referred as “exchanges”) came into existence under the Patient Protection and Affordable Care Act (ACA) as a market platform improve access to health insurance. As of 2020, thirty-two states are part of Federally-facilitated Marketplaces, thirteen states are under State-based Marketplace and the remaining six states are considered State-based Marketplace but they use Federal platform to sell their plans (KFF, 2020). The Marketplace has a provision to sell health insurance plans to small businesses, individuals and families. This paper focuses on individual and family plans, with actuarial values (60%, 70%, 80% and 90%) that are labeled according to the metal scale (Bronze, Silver, Gold and Platinum). Under the ACA, insurers cannot refuse health insurance to candidates with pre-existing conditions, but they can charge plan premiums based on geographic region, known as Geographic Rating Areas (GRA), family size, age, and tobacco use. ACA also provides subsidies to the enrollees which is determined by their income level and premium cost of the second lowest cost silver plan (benchmark plan) in the GRA (Graetz, Kaplan, Kaplan, Bailey, & Waters, 2014).

One of the main objectives of ACA was to provide an affordable and stable source of health insurance plans. However, health plan premiums have been drastically increasing in the Marketplace since its inception. Researchers have given different explanations for this increase in the premiums. There have been drastic changes in insurer participation in the Marketplace over the years. Insurers have been entering or leaving the Marketplace every year. As of 2020, there are on average 4.5 insurers per state compared to the average of 6 insurers in 2015 (Fehr, Rabah, & Cox, 2019). Insurance company losses are the primary reasons behind the exit of the insurers from the Marketplace (M. A. Cohen, Kaur, & Darnell, 2013). Federal government's discontinuation of cost-sharing subsidies is said to be one of the reasons behind the premium increases in 2018 (Aaron, Fiedler, Ginsburg, Adler, & Rivlin, 2017; New York Times, 2017).

Another aspect of insurer participation is that, for several states, insurers may not participate across all GRAs. Rural areas, for instance, tend to have fewer insurers compared to non-rural counterparts, which are more likely to have a single insurer in the Marketplace. There also have been fluctuations in the health plan availability over the years with carriers dropping high Actuarial Value plans in favor of low or catastrophic AV (Gabel et al., 2012).

An added source of instability in the ACA Marketplaces has been the ongoing proposals to repeal and/or replace parts of the ACA. One of such effort resulted in the repeal of the Individual Mandate[9] which required every individual to have health insurance in order to avoid tax penalty as high as $695 or 2.5% of income (for year 2016)[10]. Under the Individual Mandate, the uninsured rate decreased significantly and it also kept off the rise in premiums by creating a large and diverse risk pool (Eibner & Saltzman, 2015). The Congressional Budget Office (CBO) has projected that the repeal of this mandate would reduce the health insurance enrollment by 3 million to 6 million between 2019 and 2021 and that the premiums would increase by 10% (CBO, 2018).

Given the relationship between marketplace stability and insurer participation, as well as the potential role of market competition on premiums, this study investigates how the market

[9] https://www.healthinsurance.org/glossary/individual-mandate/

[10] Individual Mandate exempted individuals for whom the lowest-cost bronze plan would cost more than 8%.

structure of the insurance Marketplace affects the premiums. The first aim of this study is to assess the changing dynamics of insurer participation in geographic rating areas and its association with the premiums of benchmark plans. The second aim to understand if these changes in premiums vary according to the age of the individuals and their family status. One of the provisions under ACA was Medicaid expansion in which adults up to age 64 with an income limit of 138% of Federal Poverty Limit (FPL) became eligible for Medicaid coverage. States that expanded Medicaid includes larger number of higher income groups (above 138% FPL) compared to the states that did not expand Medicaid. Income groups below 138% FPL in general have poorer health status compared to the income groups above 138% FPL (Center on Budget and Policy Priorities, 2012). This makes the pool of enrollees in the states with Medicaid expansion riskier compared to the pool of enrollees in the states which did not expand Medicaid. Lower risk pool can lower the premiums charged by the insurers in the Marketplace. The third and final aim of this study is to look at the effect of Medicaid expansion on changes in premiums. I also analyze the impact of high-deductible plans on the premiums as high deductible plans are usually cheaper compared to the low-deductible plans.

Literature Review

The literature on the effect of market structure or market concentration on health plan attributes remains limited. Current literature focuses on the effects of high insurance premiums on the economy and the insurance coverage rates. Research by (Baicker & Chandra, 2005), for instance, studied the effects of rising health insurance premiums on the labor market. The authors used data from the Kaiser Family Foundation/HRET survey for 1996 to 2002 to show that firms employ fewer people in response to the health insurance premiums. They also showed that employers respond to rising health insurance premiums by converting the full-time positions to the part-time positions. (Chernew, Cutler, & Keenan, 2005) studied the role of rising health insurance premiums on coverage rates using data of two cohorts of nonelderly urban residents surveyed in the Current Population Survey in 1989–1991 and 1998–2000. They found that more than half of the decline in the health insurance coverage rates over the 1990s is in response to the increase in health insurance premiums.

Studies also find a link between increased premiums and the presence of adverse selection. (Diamond, Dickstein, Mcquade, & Persson, 2018) studied the role of new enrollees dropping coverage using California marketplace data. They found that non-drop-out enrollees bear the brunt of the costs associated with drop-out behavior through increased insurance premiums. These findings are similar to those in (Panhans, 2019) who used claims data from Colorado and find that adverse selection increases premiums, which in turn is associated with a $0.85–0.95 increase in annual medical expenditures for each $1 increase in monthly premiums of the insured population in 2014.

An additional driver behind the increase of health insurance premiums is the entry and exit of insurers in the Marketplace. (Leemore Dafny et al., 2010) studied whether health insurers charge higher premiums, ceteris paribus, when they are already more profitable. They achieved this with a national database of health plans offered by a sample of large multisite firms from 1998–2005. They found that firms with positive profit shocks see higher premium growth for health plans comparable to others in the market, and this increase is greatest in markets with the fewest insurance carriers (particularly six or fewer). These findings are similar to those in (Lissenden, 2017), who found that insurer entry's into the marketplace has a negative association with premiums in the first two years of federally facilitated Marketplaces. (Scheffler, Arnold, Fulton, & Glied, 2020) also examined the impact of market concentration on the growth of health insurance premiums between 2014 and 2015 in two Affordable Care Act state-based Marketplaces: Covered California and NY State of Health. They used claims data combined with Herfindahl-Hirschman Index (HHI) scores to measure the market concentration of providers and found that both states have a positive association between hospital concentration and premium growth and a positive (but not statistically significant) association between medical group concentration and premium growth.

State level studies analyzing the effect of number of insurers on the premiums reveal that the presence of a greater number of insurer carriers in the Marketplace helps making the state marketplace successful by providing insurance access to a greater population. (Foster Friedman, Fangmeier, Baum, & Udow-Phillips, 2017) studied Michigan's marketplace success and found that it is linked to the presence of several regional insurance carriers apart from the giant carrier, Blue Cross Blue Shield. These regional carriers continue to offer insurance coverage in the state which keeps the premiums of the plans in check. These findings are similar to those in (Weinberg & Kallerman, 2017) for the state of California, (Born, 2017) for the state of Florida and (Hall, 2017) for the state of North Carolina.

Literature looking at the effect of market concentration on premiums at a national level does not exist. However, work from (Van Parys, 2018) studied federally facilitated Marketplaces to assess the association between competition of health insurers and premiums. The author found that higher premiums are associated with local health insurance monopolies. The limitation of this study is that it looks only at federally facilitated Marketplaces and hence leaves out the State based Marketplace from its analysis. I fill this gap in the literature as I look at both State and Federal Marketplace health plans by using the data from Kaiser Family Foundation to measure the insurer competition. Another way I add to the literature is by looking at the effect on premiums for individuals of three different age groups, as well as families.

Current literature shows evidence on how Medicaid expansion can reduce the premiums of the health plans. (Sen & Deleire, 2016) examined the effect of Medicaid expansion on Marketplace plan premiums using 2015 administrative data on Marketplace plans and enrollment. They found that the Marketplace plan premiums are reduced by about 7 percent in the states that expanded Medicaid compared to those that did not expand Medicaid. Medicaid expansion covered individuals below 138% FPL with no or low cost-sharing. As the health status of the low-income groups is generally poor compared to the high-income groups, removal of this group from the pool of Marketplace enrollees reduced the number of high-risk enrollees in the Marketplace. The reduced number of high-risk enrollees from the Marketplace drove down the premiums of the health plans. I provide an extension to this analysis as I explore the impact of Medicaid expansion on the premiums for people of three different age groups.

Data

This study uses different sources for plan level data, market structure data and socio-demographics. The plan level data comes from HIX Compare (Robert Wood Johnson Foundation, 2020) which are plan-level public use files of individual and small group insured market in all 50 states plus D.C. It has information on health plan characteristics, such as premiums and plan benefit design at geographic rating area (GRA) level from 2014-2020. For the data on health insurance market structure I used public data from Kaiser Family Foundation (Fehr et al., 2019). This data source provides insurer market participation in every county in the United States from 2014-2020. Finally, the socio-demographic information at county level comes from American Community Survey which is a nationwide survey that collects information on social, economic, housing, and demographic characteristics in the United States every year. To create a final dataset, I merged all the data sources at GRA level. GRA is a geographical unit that is made up of either counties, metropolitan statistical areas or 3-digit zip codes as defined by (CMS, 2018). GRA unit is determined independently by each state.

The timeframe for study is 2015-2020. To create a final dataset from all different sources, first, I appended individual HIX Compare files from year 2015-2020 to create a combined dataset for plan level data at GRA level. This data was later merged to the data from Kaiser Family Foundation and American Community Survey. The analysis excluded child only and small business plans and the plans with Cost Sharing Reduction (CSR). CSR provides discount that lowers the amount an individual must pay for deductibles, copayments, and coinsurance. Even though HIX Compare data has plans that are available on and off the State and Federal marketplaces for individuals and small businesses, this study focused on plans that are on the State and Federal Marketplaces. Health plans come in four metal levels: Bronze, Silver, Gold, and Platinum. Metal level defines the actuarial value or cost splitting of the health plan between an individual and the insurer. Silver plans which provide 70 percent of the actuarial value with respect to the essential benefits are the most common choice of marketplace shoppers from all four plan categories. Hence, I focused only on silver metal plans in this analysis. There are multiple silver plans in one GRA so to create a balanced panel dataset, I only chose the second lowest cost silver plan (SLCSP) in each GRA. SLCSP is also considered as a benchmark plan and it is the standard in the literature. Federal subsidies are based on the difference on premiums of plan purchased and the benchmark. There are 498 GRA in each year from 2015-2020 so the final dataset has 2,988 observations of SLCSP plans.

The data for market insurer participation shows a drastic change in the number of insurer participants at a county level for almost all the states from year 2014-2020. Figure 1 in the Appendix shows the number of insurers in year 2014 and Figure 2 shows the number of insurers in year 2020. Hence, with such major changes in the market structure over the years, it is worthwhile to look at its effect of premiums which I try to accomplish in this study.

[Insert Figure 1]

[Insert Figure 2]

While observing the premium changes over the years, an upward trend can be seen in the premiums of the individuals of all three age groups. Figure 3 shows this change over the years from 2015-2020. Hence, there seems to be some correlation of changing market structure on the premiums. Figure 4 shows the average of the premium for GRA with monopoly and GRA without monopoly for the timeframe of this study for all three individuals. The average of the premium for the GRA with monopoly of insurers is much higher compared to the GRA without monopoly.

[Insert Figure 3]

[Insert Figure 4]

Variables

The HIX Compare data has the plan level information for these three age groups so I chose these age groups for analysis. The three outcome variables in this study are: premium for 27-year-old, premium for 50-year-old and premium for a 30-year-old with two children. All the three outcomes are estimated for SLCSP in each GRA in all fifty states for both State and Federal marketplaces. The explanatory variable of interest is the type of market structure at GRA level. I measured it using two approaches: 1) An indicator of either monopolistic or non-monopolistic market structure at GRA level, and 2) a multicategorical variable measuring three levels of market concentration in the GRA. A binary indicator for Medicaid expansion is used to measure its effect on the premiums. I expected that the plans with high deductibles would have lower premiums, so I controlled for them in the model. Specifically, I have used the 2020 definition of a high deductible health plan, which is a plan with a deductible of at least $1,400 for an individual (IRS, 2019). To create an indicator for High Deductible Health Plan (HDHP), I flagged all the plans with $1,400 and above as high deductible plans. I also controlled for type of plans. These plan types dictate the provider network of doctors, hospitals, pharmacies, and other medical services. There are four types of plans: 1) Preferred Provider Organizations (PPOs) 2) Point-of-Service (POS) Plans: 3) Health Maintenance Organizations (HMOs) and 4) Exclusive Provider Organizations (EPOs). For PPOs individuals pay less to use providers in the plan's network and more for doctors, providers, and hospitals outside of the plan's network. PPOs usually have higher out-of-pocket costs for services and does not require referrals if one must visit a doctor of their choice. Second plan type is POS plan which allows medical care from both in-network and out-of-network providers. An individual must choose a primary doctor from a list of participating providers. However, doctor in network can refer the individual to another doctor when needed. This plan type incurs higher out-of-pocket costs when visiting out-of-network provider. Third plan type is HMO plans, which usually do not cover for out-of-network care except for emergency and one needs to pay the full cost of the services. The final plan type is EPO plans which generally limits the coverage to care from providers in the EPO's network (except in an emergency). PPOs are the most common type of plan (CMS, 2017). Other control variables that I use are: 1) State or Federal marketplace 2) Percent of women in the GRA 3)

Percent of Hispanics in the GRA 4) Percent of population between 35 and 65-year-old in the GRA.

Descriptive Statistics

The descriptive statistics of the data are given in Table [1] and Table [2]. Table [1] shows the descriptive statistics of the overall data from year 2015-2020 and Table [2] splits the descriptive statistics by Monopoly and Non-Monopoly GRA. As per Table [1], the average premium throughout the years was $344.9 for 27-year-old, $580.2 for a 50-year-old and $835.1 for a 30-year-old with two children. After comparing the premiums for Monopoly and Non-Monopoly GRAs in Table [2], there was a statistically significant difference in the average premiums for all three individuals. The difference in the average premium for age 27 for GRA with Monopoly and Non-Monopoly was at least $100. This difference was higher for the individuals of age 50 and individuals of age 30 with two children. The binary measure of the market concentration, *Monopoly*, indicates that 24 percent of GRA had only one insurer. Categorical measure of the market concentration, *Insurer Type*, shows that only 40 percent of the GRA had more than two insurers. Nearly half of the GRA fell under states where Medicaid expansion took place as of year 2020. Also, Medicaid expansion took place GRA with Non-Monopolistic market structure.

[Insert Table 1]

[Insert Table 2]

Empirical Model

This study uses a panel regression with random effects to estimate the association between market concentration and premiums of the health plans. The standard errors of the models are clustered at the state-level to allow for correlation in premiums across rating areas within states. Clustering the standard errors at the state-level is valid since the state can take decisions related to the increase/decrease of premiums and these decisions can affect the all rating areas within a state. The equations below show the model using two different approaches of measuring the market concentration. First approach (equation [1]) shows a model where I measured market concentration using a binary indicator for monopoly and a second approach (equation [2]) measures market concentration using a multicategorical variable. The equations for both approaches are as below.

$$Premium_{it} = \alpha_0 + \alpha_1 Monopoly_{it} + \alpha_2 MedicaidExpansion_{it} + \alpha_3 X_{it} + u_{it} + \epsilon_{it} \text{ ; t} = 1, 2, \ldots, \text{T}. \quad [1]$$

$$Premium_{it} = \alpha_0 + \alpha_1 InsurerType_{it} + \alpha_2 MedicaidExpansion_{it} + \alpha_3 X_{it} + u_{it} + \epsilon_{it} \text{ ; t} = 1, 2, \ldots, \text{T}. \quad [2]$$

where; in equation [1], $Monopoly_{it}$ is the binary explanatory variable indicating the monopoly of health insurers at GRA i and year t; in equation [2], $InsurerType_{it}$ is a categorical variable measuring three different levels of competition of insurers at GRA i and year t - One firm, Two firms and More than two firms; $MedicaidExpansion_{it}$ is a binary variable indicating the presence of Medicaid expansion at GRA i and year t; X_{it} is a vector of control variables at GRA i and year t; u_{it} is the between-entity error term and ϵ_{it} is within-entity error term at GRA i and year t. Vector of control variables include an indicator for plans with high deductibles, type of plan (PPO, POS, HMO, EPO) and, percentage of the poor in the GRA (percentage of people annually earning income up to $14,999), percentage of women in the GRA, and percentage of population between age 35 and age 65. The results of random effects model are in Table [3] in Appendix.

Hausman test recommended Fixed Effects model (Reject the null hypothesis as p-value < 0.05) but it omitted the time invariant variables in the model since the Fixed Effects model assumes that there's no systematic variation in them. Hence, the preferred model for this analysis was Random Effects model. For Random Effects model, I assumed that individual effects are not correlated with any other regressors (Cov (u_{it}, X_{it}) = 0). To check robustness of the model, I used Pooled OLS and Panel Regression with Fixed Effects and I got consistent results. The results for Pooled OLS and Fixed Effects for panel data are in Table [4] and Table [5] respectively in the Appendix.

[Insert Table 4]

[Insert Table 5]

Results

The first aim of this study was to examine the changes in premiums in the presence of monopoly or market concentration. The results showed a positive and significant coefficient of Monopoly on the premiums for individuals of all age, confirming the hypothesis that monopoly makes health plans costlier by increasing their premiums. For monopolistic GRA, average annual increase in the premiums for age 27 is $68, 50-year-old was $117 and 30-year-old with two children was $170 holding everything else constant. For a categorical variable measuring the variations of market concentration, I got similar results. GRA with two firms showed a decrease in annual average premiums of that compared to GRA with one firm. The average annual premiums of a 27-year-old in GRA with two firms decreased by $67, for 50-year-old decreased by $115 and for 30-year-old with two children decreased by $167 holding everything else constant. However, this coefficient was much higher for GRA where there were more than two firms providing the health plans. The average annual premiums of a 27-year-old in GRA with more than two firms decreased by $73, for 50-year-old decreased by $129 and for 30-year-old with two children decreased by $190 holding everything else constant.

The second aim of the study was to understand if the changes in premiums vary by age and family status. The average increase of premiums was consistent across different age groups and family status. The percent increase in premiums for all three individuals was about 19-20% [% premium increase = 100*(Average increase in premium / Average premium)][11].

The final aim of the paper was to analyze the effect of Medicaid expansion on premium changes. I found that the premiums were significantly lower in states that expanded Medicaid. On an average this effect was $125, $214 and $313 for the model with binary indicator for monopoly (Columns 1, 2 and 3) holding everything else constant. This result was consistent for the model with a categorical measure of market concentration. Plans with high deductibles were associated with the decreased premiums. For such plans the decrease in the plan premiums was by $64, $110 and $165 for 27-year-old, 50-year-old and 30-year-old with two children holding everything else constant. The control variables for socioeconomic characteristics of the GRA population did not show significant effects on the premiums for any of the individuals.

Conclusion

This study used the data from different data sources to study the impact of high market concentration in geographical rating area (GRA) defined by CMS on the health plan premiums and I found that market concentration has a significant and positive impact on determining the health premiums. I measured the market concentration using the data from Kaiser Family Foundation. I used this data to determine the market concentration of the firms at the GRA level using two approaches. In the first approach I used a binary indicator for monopolistic market structure at the GRA level. In second approach I used a categorical variable to indicate three levels of market concentration at the GRA level. In both approaches I found that the market concentration of the insurer firms increased the premiums significantly for people of all age 27,

[11] Avg increase in premium: Average premium increase for an individual because of the monopoly from Table [3];
Average premium: Average premium for an individual from Table [1]

age 50 and age 30 with two children. This result aligns with the existing literature on market concentration and premiums. I also found that the percent increase in premiums is similar across all three individuals thus it can be concluded that the effect of premium increase does not vary by age or family status and is consistent for the entire population. I found that Medicaid expansion also plays a significant role in determining the plan premiums. The two possible explanations for this finding were given in the literature(Van Parys, 2018). The first is the risk selection across plans and within the Marketplace. If one health insurer only attracts sick people and other health insurer attracts only healthy people, then the insurer with sick people would charge a high premium compared to the other insurer. This would move the enrollees of the high premium plan to move towards the low premium plan. This would incur losses for the insurers charging high premiums forcing them to exit the Marketplace and thus creating a monopoly for the other insurer. Another explanation is barriers to entry in the insurance Marketplace. If there are many barriers to entry the insurers thus creating a monopoly, then they can easily charge high premiums to the enrollees. Since the competition of the insurers has reduced since the beginning of ACA, there is a possibility that the monopolistic insurers tried to undercut the competition by artificially charging lower premiums in earlier years to capture the Marketplace. This study's results reveal that GRA covered by the states where Medicaid was expanded led to lower premiums and this effect is largest for a person of age 30 with two children. The possible explanation behind reduced premiums in Medicaid expansion states is the risk the insurers face from having low income families in the pool of enrollees. Medicaid is for families who have low income status. Since low income families generally have lower health status, it can significantly increase the risk of insurers which insurers try to mitigate by increasing the premiums of the plans. States which cover Medicaid for such poor families remove the pool of risky enrollees and hence they can afford to reduce the premiums in such states. The plans with high deductibles showed a decrease in the premiums for all age groups which is an expected result. For high deductible plans the enrollee is responsible for all the costs until the deductibles are met. To offset these high deductibles, the premiums would have to be cheaper. The policies encouraging competition the health insurance Marketplace should to be implemented to keep the premiums in check.

References

(WHO), W. H. O. (2018). *Cancer*. Retrieved from http://gco.iarc.fr/,

Aaron, H. J., Fiedler, M., Ginsburg, P. B., Adler, L., & Rivlin, A. M. (2017, July 27). Turmoil in the individual insurance market — where it came from and how to fix it. *New England Journal of Medicine*. Massachussetts Medical Society. https://doi.org/10.1056/NEJMp1707593

Acitelli, L. K., & Antonucci, T. C. (1994). Gender Differences in the Link Between Marital Support and Satisfaction in Older Couples. *Journal of Personality and Social Psychology*, *67*(4), 688–698. https://doi.org/10.1037/0022-3514.67.4.688

Aneshensel, C. S., & Frerichs, R. R. (1982). Stress, support, and depression: A longitudinal causal model. *Journal of Community Psychology*, *10*(4), 363–376. https://doi.org/10.1002/1520-6629(198210)10:4<363::AID-JCOP2290100407>3.0.CO;2-8

Antonucci, T. C. (1994). Attachment in adulthood and aging. In *Attachment in adults: Clinical and developmental perspectives.* (pp. 256–272). New York, NY, US: Guilford Press.

Antonucci, T. C., & Jackson, J. S. (1987). Social support, interpersonal efficacy, and health: A life course perspective. In *Handbook of clinical gerontology.* (pp. 291–311). Elmsford, NY, US: Pergamon Press.

Antwi, B. Y. A., Moriya, A. S., & Simon, K. (2013). Effects of federal policy to insure young adults: Evidence from the 2010 affordable care act's dependent-coverage mandate. *American Economic Journal: Economic Policy*, *5*(4), 1–28. https://doi.org/10.1257/pol.5.4.1

Artiga, S., Orgera, K., & Damico, A. (2019). Changes in Health Coverage by Race and Ethnicity since Implementation of the ACA, 2013-2017. *Issue Brief*, (February), 2013–2017. Retrieved from http://files.kff.org/attachment/Issue-Brief-Changes-in-Health-Coverage-by-Race-and-Ethnicity-since-Implementation-of-the-ACA-2013-2017

Baicker, K., & Chandra, A. (2005). *The Labor Market Effects of Rising Health Insurance Premiums*. Retrieved from http://www.nber.org/papers/w11160

Baron, R. M., & Kenny, D. A. (1986). *The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations* (Vol. 51). Psychological Association, Inc. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.169.4836&rep=rep1&type=pdf

Belle, D. E. (1982). The impact of poverty on social networks and supports. *Marriage & Family*

Review, *5*(4), 89–103. https://doi.org/10.1300/J002v05n04_06
Billings, A. G., & Moos, R. H. (1984). Coping, stress, and social resources among adults with unipolar depression. *Journal of Personality and Social Psychology*, *46*(4), 877–891. https://doi.org/10.1037/0022-3514.46.4.877
Bonnie RJ, Stroud C, Breiner H, editors. (2015). The Health Care System - Investing in the Health and Well-Being of Young Adults - NCBI Bookshelf. Retrieved April 8, 2020, from https://www.ncbi.nlm.nih.gov/books/NBK284795/
Born, P. (2017). ACA Exchange Competitiveness in Florida. *Risk Management and Insurance Review*, *20*(2), 189–210. https://doi.org/10.1111/rmir.12074
Buchmueller, T. C., Levinson, Z. M., Levy, H. G., & Wolfe, B. L. (2016). Effect of the Affordable Care Act on Racial and Ethnic Disparities in Health Insurance Coverage. *American Journal of Public Health*, *106*(8), 1416–1421. https://doi.org/10.2105/AJPH.2016.303155
Callahan, S. T., & Cooper, W. O. (2005). Uninsurance and health care access among young adults in the United States. *Pediatrics*. https://doi.org/10.1542/peds.2004-1449
Callahan, S. T., Hickson, G. B., & Cooper, W. O. (2006). Health Care Access of Hispanic Young Adults in the United States. *Journal of Adolescent Health*, *39*(5), 627–633. https://doi.org/10.1016/j.jadohealth.2006.04.012
CBO. (2018). *Health Insurance Subsidies in 2018 for People Under Age 65 0 50 100 150 200 250 300 Support for Nongroup Coverage Federal Subsidies for Health Insurance Coverage for People At a Glance*. Retrieved from www.cbo.gov/publication/53826
Center on Budget and Policy Priorities. (2012). Why a State's Health Insurers Should Support Expanding Medicaid. Retrieved July 4, 2020, from https://www.cbpp.org/sites/default/files/atoms/files/medicaid-and-insurers-memo.pdf
Central Bureau of Statistics (Nepal). (2011). Nepal Census 2011. Retrieved September 30, 2019, from https://sites.google.com/site/nepalcensus/
Chernew, M., Cutler, D. M., & Keenan, P. S. (2005, August). Increasing health insurance costs and the decline in insurance coverage. *Health Services Research*. Health Research & Educational Trust. https://doi.org/10.1111/j.1475-6773.2005.00409.x
Ciaramella, A., & Poli, P. (n.d.). Assessment of depression among cancer patients: the role of pain, cancer type and treatment. *Psycho-Oncology*, *10*(2), 156–165. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11268142
CMS. (2017). *What You Should Know About Provider Networks What's a provider network?*
CMS. (2018). Market Rating Reforms | CMS. Retrieved March 19, 2020, from https://www.cms.gov/CCIIO/Programs-and-Initiatives/Health-Insurance-Market-Reforms/state-gra
Cohen, M. A., Kaur, R., & Darnell, B. (2013). *Office of the Assistant Secretary for Planning and Evaluation EXITING THE MARKET: Understanding the Factors behind Carriers' Decision to Leave the Long-Term Care Insurance Market*. Retrieved from http://aspe.hhs.gov/office_specific/daltcp.cfm
Cohen, S., & Wills, T. A. (1985, September). Stress, Social Support, and the Buffering Hypothesis. *Psychological Bulletin*. https://doi.org/10.1037/0033-2909.98.2.310
Colleoni, M., Mandala, M., Peruzzotti, G., Robertson, C., Bredart, A., & Goldhirsch, A. (2000). Depression and degree of acceptance of adjuvant cytotoxic drugs. *Lancet*, *356*(9238), 1326–1327. https://doi.org/10.1016/S0140-6736(00)02821-X
Cyranowski, J. M., Frank, E., Young, E., & Shear, M. K. (2000). Adolescent onset of the gender

difference in lifetime rates of major depression: a theoretical model. *Archives of General Psychiatry*, *57*(1), 21–27. https://doi.org/10.1001/archpsyc.57.1.21
Denavas-Walt, C., Proctor, B. D., & Smith, J. C. (2012). *Income, Poverty, and Health Insurance Coverage in the United States: 2011 Current Population Reports*.
Diamond, R., Dickstein, M. J., Mcquade, T., & Persson, P. (2018). *Take-Up, Drop-Out, and Spending in ACA Marketplaces*. Retrieved from http://www.nber.org/papers/w24668
DiMatteo, M. R., & Haskard-Zolnierek, K. B. (2010). Impact of Depression on Treatment Adherence and Survival from Cancer. In *Depression and Cancer* (pp. 101–124). John Wiley and Sons. https://doi.org/10.1002/9780470972533.ch5
Dykstra, P. A., & de Jong Gierveld, J. (2004). Gender and marital-history differences in emotional and social loneliness among Dutch older adults. *Canadian Journal on Aging = La Revue Canadienne Du Vieillissement*, *23*(2), 141–155. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/15334814
Eibner, C., & Saltzman, E. (2015). How Does the ACA Individual Mandate Affect Enrollment and Premiums in the Individual Insurance Market?: Retrieved from https://www.rand.org/pubs/research_briefs/RB9812z4.html
Fehr, R., Rabah, K., & Cox, C. (2019). Insurer Participation on ACA Marketplaces, 2014-2020 | The Henry J. Kaiser Family Foundation. Retrieved March 19, 2020, from https://www.kff.org/private-insurance/issue-brief/insurer-participation-on-aca-marketplaces-2014-2020/
Foster Friedman, M., Fangmeier, J., Baum, N., & Udow-Phillips, M. (2017). ACA Exchange Competitiveness In Michigan. *Risk Management and Insurance Review*, *20*(2), 211–232. https://doi.org/10.1111/rmir.12077
Gabel, J. R., Lore, R., McDevitt, R. D., Pickreign, J. D., Whitmore, H., Slover, M., & Levy-Forsythe, E. (2012). More Than Half Of Individual Health Plans Offer Coverage That Falls Short Of What Can Be Sold Through Exchanges As Of 2014. *Health Affairs*, *31*(6), 1339–1348. https://doi.org/10.1377/hlthaff.2011.1082
Garfield, R., & Orgera, K. (2020). The Coverage Gap: Uninsured Poor Adults in States that Do Not Expand Medicaid | The Henry J. Kaiser Family Foundation. Retrieved April 7, 2020, from https://www.kff.org/medicaid/issue-brief/the-coverage-gap-uninsured-poor-adults-in-states-that-do-not-expand-medicaid/
Glassman, A. H., O'Connor, C. M., Califf, R. M., Swedberg, K., Schwartz, P., Bigger Jr., J. T., … Harrison, W. M. (2002). Sertraline Antidepressant Heart Attack Randomized Trial (SADHART) Group. Sertraline treatment of major depression in patients with acute MI or unstable angina. *JAMA*, *288*(6), 701-9. Retrieved from http://www.ncbi.nlm.nih.gov/htbin-post/Entrez/query?db=m&form=6&dopt=r&uid=12169073
Graetz, I., Kaplan, C. M., Kaplan, E. K., Bailey, J. E., & Waters, T. M. (2014). The U.S. health insurance marketplace: Are premiums truly affordable? *Annals of Internal Medicine*, *161*(8), 599–604. https://doi.org/10.7326/M14-0757
Hall, M. A. (2017). ACA Exchange Competitiveness in North Carolina. *Risk Management and Insurance Review*, *20*(2), 233–247. https://doi.org/10.1111/rmir.12076
Heflin, C. M., & Iceland, J. (2009). Poverty, material hardship, and depression. *Social Science Quarterly*, *90*(5), 1051–1071. https://doi.org/10.1111/j.1540-6237.2009.00645.x
Holahan, C. J., & Moos, R. H. (1981). Social support and psychological distress: A longitudinal analysis. *Journal of Abnormal Psychology*, *90*(4), 365–370. https://doi.org/10.1037/0021-843X.90.4.365

House, A., Knapp, P., Bamford, J., & Vail, A. (2001). Mortality at 12 and 24 months after stroke may be associated with depressive symptoms at 1 month. *Stroke*, *32*(3), 696–701. https://doi.org/10.1161/01.str.32.3.696

IRS. (2019). Publication 969 (2019), Health Savings Accounts and Other Tax-Favored Health Plans | Internal Revenue Service. Retrieved March 20, 2020, from https://www.irs.gov/publications/p969#en_US_2019_publink1000204030

Jemmott, J. B., & Locke, S. E. (1984). Psychosocial factors, immunologic mediation, and human susceptibility to infectious diseases: How much do we know? *Psychological Bulletin*, *95*(1), 78–108. https://doi.org/10.1037/0033-2909.95.1.78

Jessica Gehr. (2017). Why the Affordable Care Act Is Critical for Young Adults Low-Income Young Adults Would Benefit from Medicaid Expansion, (April), 1–6.

Jones, L. W., & Demark-Wahnefried, W. (2006). Diet, exercise, and complementary therapies after primary treatment for cancer. *The Lancet. Oncology*, *7*(12), 1017–1026. https://doi.org/10.1016/S1470-2045(06)70976-7

Karnell, L. H., Funk, G. F., Christensen, A. J., Rosenthal, E. L., & Magnuson, J. S. (2006). Persistent posttreatment depressive symptoms in patients with head and neck cancer. *Head & Neck*, *28*(5), 453–461. https://doi.org/10.1002/hed.20370

KFF. (2018). Health Insurance Coverage of the Total Population | The Henry J. Kaiser Family Foundation. Retrieved April 9, 2020, from https://www.kff.org/other/state-indicator/total-population/?dataView=1&currentTimeframe=0&selectedDistributions=employer&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

KFF. (2020). State Health Insurance Marketplace Types, 2020 | The Henry J. Kaiser Family Foundation. Retrieved March 24, 2020, from https://www.kff.org/health-reform/state-indicator/state-health-insurance-marketplace-types/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

Kohrt, B. A., Speckman, R. A., Kunz, R. D., Baldwin, J. L., Upadhaya, N., Acharya, N. R., … Worthman, C. M. (2009). Culture in psychiatric epidemiology: Using ethnography and multiple mediator models to assess the relationship of caste with depression and anxiety in Nepal. *Annals of Human Biology*, *36*(3), 261–280. https://doi.org/10.1080/03014460902839194

Krause, N., & Keith, V. (1989). Gender differences in social support among older adults. *Sex Roles*, *21*(9–10), 609–628. https://doi.org/10.1007/BF00289174

Kroenke, K., Spitzer, R., & Williams, W. (2001). The Patient Health Questionnaire PHQ-9: Validity of a brief depression severity measure. *Jgim*, *16*, 2–3. https://doi.org/10.1097/01.MLR.0000093487.78664.3C

LaVeist, T. A., Bowie, J. V, & Cooley-Quille, M. (2000). Minority health status in adulthood: the middle years of life. *Health Care Financing Review*, *21*(4), 9–21. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11481747

Leavy, R. L. (1983). Social support and psychological disorder: A review. *Journal of Community Psychology*, *11*(1), 3–21. https://doi.org/10.1002/1520-6629(198301)11:1<3::AID-JCOP2290110102>3.0.CO;2-E

Leemore Dafny, B. S., Collins, W., Cutler, D., Dana, J., Dranove, D., Duggan, M., … Yamamoto, D. (2010). Are Health Insurance Markets Competitive? *Complaint, United States v. Aetna Inc*, *100*, 1399–1431. https://doi.org/10.1257/aer.100.4.1399

Liebler, C. A., & Sandefur, G. D. (2002). Gender differences in the exchange of social support

with friends, neighbors, and co-workers at midlife. *Social Science Research*, *31*(3), 364–391. https://doi.org/10.1016/S0049-089X(02)00006-6
Linden, W., Vodermaier, A., MacKenzie, R., & Greig, D. (2012). Anxiety and depression after cancer diagnosis: Prevalence rates by cancer type, gender, and age. In *Journal of Affective Disorders* (Vol. 141, pp. 343–351). https://doi.org/10.1016/j.jad.2012.03.025
Lissenden, B. (2017). Three's a crowd?: The effect of insurer participation on premiums and cost-sharing parameters in the initial years of the ACA marketplaces. *American Journal of Health Economics*, *3*(4), 477–506. https://doi.org/10.1162/ajhe_a_00085
Lorant, V., Deliège, D., Eaton, W., Robert, A., Philippot, P., & Ansseau, M. (2003). Socioeconomic inequalities in depression: a meta-analysis. *American Journal of Epidemiology*, *157*(2), 98–112. https://doi.org/10.1093/aje/kwf182
Ludwig, H., & Zojer, N. (2007). Supportive care. *Annals of Oncology : Official Journal of the European Society for Medical Oncology*, *18 Suppl 1*, i37–i44. https://doi.org/10.1093/annonc/mdl449
Massie, M. J. (2004). Prevalence of depression in patients with cancer. *Journal of the National Cancer Institute. Monographs*, (32), 57–71. https://doi.org/10.1093/jncimonographs/lgh014
Mcmorrow, S., Kenney, G. M., Long, S. K., & Anderson, N. (2015). Uninsurance Among Young Adults Continues To Decline, Particularly In Medicaid Expansion States. *Health Affairs*. https://doi.org/10.1377/hlthaff.2015.0044
Mitchell, A. J., Chan, M., Bhatti, H., Halton, M., Grassi, L., Johansen, C., & Meader, N. (2011). Prevalence of depression, anxiety, and adjustment disorder in oncological, haematological, and palliative-care settings: A meta-analysis of 94 interview-based studies. *The Lancet Oncology*, *12*(2), 160–174. https://doi.org/10.1016/S1470-2045(11)70002-X
National Women's Law Center. (2015). *Medicaid Coverage for Pregnant Women Remains Critical for Women's Health Medicaid Is an Important Source of Coverage for Pregnant Women Medicaid Coverage of Pregnant Women is Critically Important to Women and Families*. Retrieved from http://www.medicaid.gov/medicaid-chip-program-information/by-population/pregnant-women/pregnant-women.html.
Neumark, D., Neumark, & David. (1988). Employers' Discriminatory Behavior and the Estimation of Wage Discrimination. *Journal of Human Resources*, *23*(3), 279–295.
New York Times. (2017). Why Trump Is Right and Wrong About Obamacare Premiums - The New York Times. Retrieved March 22, 2020, from https://www.nytimes.com/interactive/2017/12/04/us/healthcare-marketplace-insurance-premium-cost-2018.html
NHRC. (2018). Population Based Cancer Registry Launched by Nepal Health Research Council – Nepal Health Research Council. Retrieved September 30, 2019, from http://nhrc.gov.np/press-release-population-based-cancer-registry-launched-by-nepal-health-research-council/
Panhans, M. (2019). Adverse selection in ACA exchange markets: Evidence from Colorado. *American Economic Journal: Applied Economics*, *11*(2), 1–36. https://doi.org/10.1257/app.20170117
Pinquart, M., & Duberstein, P. R. (2010). Depression and cancer mortality: A meta-analysis. *Psychological Medicine*, *40*(11), 1797–1810. https://doi.org/10.1017/S0033291709992285
Piya, M. K., & Acharya, S. C. (2012). Oncology in Nepal. *South Asian Journal of Cancer*, *1*(1), 5–8. https://doi.org/10.4103/2278-330X.96490
Pugliesi, K., & Shook, S. L. (1998). Gender, ethnicity, and network characteristics: Variation in

social support resources. *Sex Roles: A Journal of Research*, *38*(3–4), 215–238. https://doi.org/10.1023/A:1018733116398

Robert Wood Johnson Foundation. (2020). Health Insurance Plans Datasets - RWJF. Retrieved March 19, 2020, from https://hixcompare.org/individual-markets.html

Robson, A., Scrutton, F., Wilkinson, L., & MacLeod, F. (2010). The risk of suicide in cancer patients: a review of the literature. *Psycho-Oncology*, *19*(12), 1250–1258. https://doi.org/10.1002/pon.1717

Scheffler, R. M., Arnold, D. R., Fulton, B. D., & Glied, S. A. (2020). Differing Impacts Of Market Concentration On Affordable Care Act Marketplace Premiums. https://doi.org/10.1377/hlthaff.2015.1229

Sen, A. P., & Deleire, T. (2016). *ASPE ISSUE BRIEF THE EFFECT OF MEDICAID EXPANSION ON MARKETPLACE PREMIUMS*. Retrieved from http://aspe.hhs.gov

Sohn, H. (2017). Racial and Ethnic Disparities in Health Insurance Coverage: Dynamics of Gaining and Losing Coverage Over the Life-Course. *Population Research and Policy Review*, *36*(2), 181–201. https://doi.org/10.1007/s11113-016-9416-y

Sommers, B. D. (2012). Number of Young Adults Gaining Insurance Due to the Affordable Care Act Now Tops 3 Million | ASPE. Retrieved April 12, 2020, from https://aspe.hhs.gov/basic-report/number-young-adults-gaining-insurance-due-affordable-care-act-now-tops-3-million

Sommers, B. D., Buchmueller, T., Decker, S. L., Carey, C., & Kronick, R. (2013). The Affordable Care Act Has Led To Significant Gains In Health Insurance And Access To Care For Young Adults. *Health Affairs*, *32*(1), 165–174. https://doi.org/10.1377/hlthaff.2012.0552

Spencer, D. L., McManus, M., Call, K. T., Turner, J., Harwood, C., White, P., & Alarcon, G. (2018). Health Care Coverage and Access Among Children, Adolescents, and Young Adults, 2010–2016: Implications for Future Health Reforms. *Journal of Adolescent Health*, *62*(6), 667–673. https://doi.org/10.1016/j.jadohealth.2017.12.012

Terriquez, V., & Joseph, T. D. (2016). Ethnoracial inequality and insurance coverage among Latino young adults. *Social Science and Medicine*, *168*, 150–158. https://doi.org/10.1016/j.socscimed.2016.08.039

Turner, H. A. (1994). Gender and social support: Taking the bad with the good? *Sex Roles*, *30*(7–8), 521–541. https://doi.org/10.1007/BF01420800

Umberson, D., Chen, M. D., House, J. S., Hopkins, K., & Slaten, E. (1996). The effect of social relationships on psychological well-being: Are men and women really so different? *American Sociological Review*, *61*(5), 837–857. https://doi.org/10.2307/2096456

van der Goes, D. N., & Santos, R. (2018). Determinants of private health insurance coverage among Mexican American men 2010–2013. *Journal of Medical Economics*, *21*(11), 1139–1143. https://doi.org/10.1080/13696998.2018.1515083

Van Parys, J. (2018). ACA marketplace premiums grew more rapidly in areas with monopoly insurers than in areas with more competition. *Health Affairs*, *37*(8), 1243–1251. https://doi.org/10.1377/hlthaff.2018.0054

Walen, H. R., & Lachman, M. E. (2000). Social support and strain from partner, family, and friends: Costs and benefits for men and women in adulthood. *Journal of Social and Personal Relationships*, *17*(1), 5–30. https://doi.org/10.1177/0265407500171001

Walker, J., Hansen, C. H., Martin, P., Symeonides, S., Ramessur, R., Murray, G., & Sharpe, M. (2014). Prevalence, associations, and adequacy of treatment of major depression in patients with cancer: a cross-sectional analysis of routinely collected clinical data. *The Lancet.*

Psychiatry, *1*(5), 343–350. https://doi.org/10.1016/S2215-0366(14)70313-X
Watson, M., Haviland, J. S., Greer, S., Davidson, J., & Bliss, J. M. (1999). Influence of psychological response on survival in breast cancer: a population-based cohort study. *Lancet (London, England)*, *354*(9187), 1331–1336. https://doi.org/10.1016/s0140-6736(98)11392-2
Weinberg, M., & Kallerman, P. (2017). ACA Exchange Competitiveness In California. *Risk Management and Insurance Review*, *20*(2), 173–188. https://doi.org/10.1111/rmir.12078
Yun, M.-S. (2003). *Decomposing Differences in the First Moment*. Retrieved from www.iza.org

Appendix

Tables

Table 1: Descriptive statistics from 2015-2020

Variable	Description	Mean	SD
Outcome Variables			
PREMI27	Premium in $ of the health plan of 27-year-old	344.9	117.3
PREMI50	Premium in $ of the health plan of 50-year-old	580.2	198.2
PREMI2C30	Premium in $ of the health plan of 30-year-old with two children	835.1	309.4
Measure of Market Concentration			
Monopoly	=1 if Number of firms are one, 0 otherwise	.24	.4
Insurer Type	=1 if Number of firms are one	.24	.427
	=2 if Number of firms are two	.353	.478
	=3 if Number of firms are more than two	.405	.491
Medicaid expansion	=1 if the State where GRA belongs has expanded Medicaid, 0 otherwise	.46	.5
High deductible plans	=1 if plan has deductibles more than $ 1,400 for an individual, 0 otherwise	.98	.1
Plan Type			
PPO plan type	=1 if plan type is Preferred Provider Organizations	.18	.4
HMO plan type	=1 if the plan type is Health Maintenance Organizations	.47	.5
POS plan type	=1 if the plan type is Point-of-Service (POS) Plans	.05	.2
EPO plan type	=1 if the plan type is Exclusive Provider Organizations	.28	.5
% Poor	Percentage of people below $14,999	5.6	1.7
% Women	Percentage of women in the GRA	50.1	3.7
% Hispanics	Percentage of Hispanics in the GRA	11.2	14

% Above Age 35	Percentage of sample above age 35 in the GRA	38.3	3.5
State marketplace	=1 if the health plan is available on State Marketplace =0 if the health plan is available on Federal Marketplace	.16	.4
N	2788		

Note: The data has health plans of second lowest cost silver plan for adults

Table 2: Descriptive statistics by Non-Monopoly vs Monopoly 2015-2020

		Non-Monopoly		Monopoly	
Variable	Description	MEAN	SD	MEAN	SD
Outcome Variables					
PREMI27	Premium of health plan of 27-year-old	312	95.5	448.9	118.9
PREMI50	Premium of health plan of 50-year-old	521.8	156.5	764.9	202.9
PREMI2C30	Premium of health plan of 30-year-old with two children	749.2	249.3	1106.4	324.1
Measure of Market Concentration					
Monopoly	=0 if Number of firms are one, 0 otherwise	-	-	-	-
Insurer Type	=1 if Number of firms are one	0	0	1	0
	=2 if Number of firms are two	.465	.498	0	0
	=3 if Number of firms are more than two	.534	.498	0	0
Medicaid expansion		.6	.5	.2	.4
High deductible plans		1	.1	1	.2
PPO plan type		.2	.4	.3	.4
HMO plan type		.5	.5	.3	.4
POS plan type		.1	.3	0	.2
EPO plan type		.2	.4	.5	.5
% Poor		5.3	1.6	6.5	1.9
% Women		50.1	3.9	49.8	2.8
% Hispanics		12.3	15.1	7.9	9
% Above Age 35		38.2	3.7	38.7	2.5
State Marketplace	=1 if the health plan is available on State Marketplace =0 if the health plan is available on Federal Marketplace	.2	.4	0	.1
N		2270		718	

Note: The data has health plans of second lowest cost silver plan for adults

Table 3: Panel Regression with Random Effects to Estimate the Effect of Market Concentration on SLCSP Premiums for Individuals of Different Age Groups 2015-2020

	(1) PREMI27	(2) PREMI50	(3) PREMI2C30	(4) PREMI27	(5) PREMI50	(6) PREMI2C30
Monopoly	67.762***	117.077***	170.719***			
	14.032	23.988	36.041			
Type of insurer (One firm as a base)						
Two firms				-67.025***	-115.451***	-167.883***
				14.003	23.979	36.145
More than two firms				-73.844***	-129.215***	-190.669***
Medicaid expansion	-125.763***	-214.250***	-313.628***	-125.522***	-213.898***	-313.157***
	9.082	15.685	24.237	9.222	15.968	24.645
High deductible plans	-64.323*	-110.316*	-165.484*	-64.423*	-110.491*	-165.638**
	26.875	45.421	64.985	26.579	44.875	64.076
Plan type (PPO as a base)						
HMO plan type	-2.800	-4.162	-2.292	-3.199	-4.858	-3.388
	9.830	16.930	26.100	9.905	17.090	26.320
POS plan type	-17.953	-32.038	-44.552	-18.812	-33.715	-47.313
	19.096	32.638	49.240	19.011	32.481	48.943
EPO plan type	-6.784	-7.853	-7.500	-7.658	-9.438	-9.947
	10.183	17.440	27.584	10.105	17.297	27.306
% Women	-2.043	-3.436	-5.085	-1.988	-3.326	-4.906
	2.005	3.421	4.968	1.994	3.400	4.935
% Hispanics	-0.418	-0.734	-1.032	-0.386	-0.669	-0.925
	0.377	0.647	0.934	0.376	0.647	0.934
% Above Age 35	2.704	4.560	6.671	2.656	4.466	6.517
	1.900	3.243	4.716	1.909	3.264	4.753
State Marketplace	-4.233	-6.191	-12.153	0.042	2.376	1.977
	12.077	20.679	29.455	14.414	24.673	35.501
Year Fixed Effects	YES	YES	YES	YES	YES	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES
Constant	450.276***	769.543***	1086.408***	519.186***	888.924***	1260.816***
	63.553	108.054	155.345	62.040	105.114	151.091
N	2988.000	2988.000	2988.000	2988.000	2988.000	2988.000

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Std errors below the coefficient estimate;
Year FE have 2015 as a base year; State FE has CA as a base state

Hypothesis Table

		Monopoly	Medicaid Expansion
Panel Regression with Random Effects (Monopoly as an indicator for market concentration)	Premium (27-year-old)	(+)***	(-)***
	Premium (50-year-old)	(+)***	(-)***
	Premium (30-year-old with two children)	(+)***	(-)***
Panel Regression with Random Effects (Insurer Type as a categorical measure for market concentration)	Premium (27-year-old)	(+)***	(-)***
	Premium (50-year-old)	(+)***	(-)***
	Premium (30-year-old with two children)	(+)***	(-)***
Robustness Checks			
Pooled OLS Regression (Monopoly as an indicator for market concentration)	Premium (27-year-old)	(+)***	(-)***
	Premium (50-year-old)	(+)***	(-)***
	Premium (30-year-old with two children)	(+)***	(-)***
Pooled OLS Regression (Insurer Type as a categorical measure for market concentration)	Premium (27-year-old)	(+)***	(-)***
	Premium (50-year-old)	(+)***	(-)***
	Premium (30-year-old with two children)	(+)***	(-)***
Panel Regression with Fixed Effects (Monopoly as an indicator for market concentration)	Premium (27-year-old)	(+)***	N/A
	Premium (50-year-old)	(+)***	N/A
	Premium (30-year-old with two children)	(+)***	N/A
Panel Regression with Fixed Effects (Insurer Type as a categorical measure for market concentration)	Premium (27-year-old)	(+)***	N/A
	Premium (50-year-old)	(+)***	N/A
	Premium (30-year-old with two children)	(+)***	N/A

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Effect of Medicaid Expansion in Fixed Effects model is N/A because Medicaid Expansion is time invariant variable

Robustness Checks

Table 4: Pooled OLS Regression to Estimate the Effect of Market Concentration on SLCSP Premiums for Individuals of Different Age Groups 2015-2020

	(1) PREMI27	(2) PREMI50	(3) PREMI2C30	(4) PREMI27	(5) PREMI50	(6) PREMI2C30
Monopoly	77.169***	132.888***	192.875***			
	15.405	26.328	39.513			
Type of insurer (One firm as a base)						
Two firms				-73.150***	-125.691***	-182.151***
				14.925	25.523	38.371
More than two firms				-91.569***	-158.675***	-231.297***
				17.156	29.186	43.072
Medicaid expansion	-115.807***	-197.287***	-289.345***	-116.939***	-199.315***	-292.366***
	9.998	17.196	26.267	10.031	17.271	26.332
High deductible plans	-65.905**	-113.085**	-168.255**	-64.608**	-110.763**	-164.795**
	22.538	38.119	54.850	22.257	37.592	53.939
Plan type (PPO as base)						
HMO plan type	-11.373	-18.888	-23.841	-11.203	-18.585	-23.390
	9.319	16.024	24.824	9.407	16.187	24.983
POS plan type	-19.964	-34.866	-49.153	-21.541	-37.692	-53.362
	18.201	31.175	47.022	17.990	30.793	46.392
EPO plan type	-21.912*	-34.294*	-45.094	-21.809*	-34.110*	-44.820
	9.847	17.030	26.521	9.773	16.850	26.181
Other plan types	0.000	0.000	0.000	0.000	0.000	0.000
	.	.	.	.	.	.
% Women	-1.892	-3.183	-4.728	-1.774	-2.972	-4.413
	1.893	3.231	4.703	1.876	3.201	4.660
% Hispanics	-0.388	-0.682	-0.961	-0.307	-0.537	-0.744
	0.376	0.645	0.932	0.385	0.662	0.956
% Above Age 35	2.587	4.363	6.394	2.483	4.178	6.117
	1.825	3.115	4.539	1.863	3.185	4.645
State Marketplace	0.297	1.480	-1.196	11.002	20.651	27.369
	11.349	19.371	27.724	13.559	23.138	33.329
Year Fixed Effects	YES	YES	YES	YES	YES	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES
Constant	441.192***	754.244***	1063.782***	520.041***	890.141***	1261.140***
	59.377	101.042	145.775	56.185	95.336	137.505
AIC	32718.731	35865.091	38215.660	32685.899	35828.094	38178.234
BIC	32796.762	35943.122	38293.691	32769.933	35912.127	38262.267
N	2988.000	2988.000	2988.000	2988.000	2988.000	2988.000
R-squared	0.760	0.759	0.783	0.762	0.762	0.785

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Std errors below the coefficient estimate;
Year FE have 2015 as a base year; State FE has CA as a base state

Table 5: Panel Regression with Fixed Effects to Estimate the Effect of Market Concentration on SLCSP Premiums for Individuals of Different Age Groups 2015-2020

	(1) PREMI27	(2) PREMI50	(3) PREMI2C30	(4) PREMI27	(5) PREMI50	(6) PREMI2C30
Monopoly	61.757***	107.014***	155.300***			
	13.125	22.440	33.338			
Type of insurer (One firm as a base)						
Two firms				-62.074***	-107.198***	-155.302***
				12.994	22.283	33.323
More than two firms				-59.706***	-105.819***	-155.283***
				15.727	26.969	39.514
Medicaid expansion	0.000	0.000	0.000	0.000	0.000	0.000
	.	.	.	.	.	.
High deductible plans	-62.503*	-107.161*	-161.313*	-62.397*	-107.099*	-161.312*
	29.258	49.414	71.138	29.320	49.479	71.195
Plan type (PPO as base)						
HMO plan type	2.016	4.024	10.840	2.056	4.048	10.840
	10.192	17.566	26.944	10.183	17.600	27.028
POS plan type	-16.267	-29.510	-40.252	-15.966	-29.335	-40.250
	19.723	33.641	50.850	19.729	33.641	50.833
EPO plan type	2.718	8.582	18.021	2.864	8.667	18.022
	11.101	18.870	29.921	11.008	18.730	29.724
% Women	0.000	0.000	0.000	0.000	0.000	0.000
	.	.	.	.	.	.
% Hispanics	0.000	0.000	0.000	0.000	0.000	0.000
	.	.	.	.	.	.
% Above Age 35	0.000	0.000	0.000	0.000	0.000	0.000
	.	.	.	.	.	.
State Marketplace	0.000	0.000	0.000	0.000	0.000	0.000
	.	.	.	.	.	.
Year Fixed Effects	YES	YES	YES	YES	YES	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES
Constant	292.478***	492.922***	681.686***	352.490***	598.919***	836.971***
	29.842	50.465	73.293	32.232	54.638	78.953
AIC	31187.905	34323.467	36745.147	31189.265	34325.390	36747.147
BIC	31247.929	34383.490	36805.170	31255.291	34391.416	36813.173
N	2988.000	2988.000	2988.000	2988.000	2988.000	2988.000
R-squared	0.779	0.779	0.813	0.779	0.779	0.813

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Std errors below the coefficient estimate;
Year FE have 2015 as a base year; State FE has CA as a base state

Maps and Graphs

Figure 1: Insurer Participation in year 2014

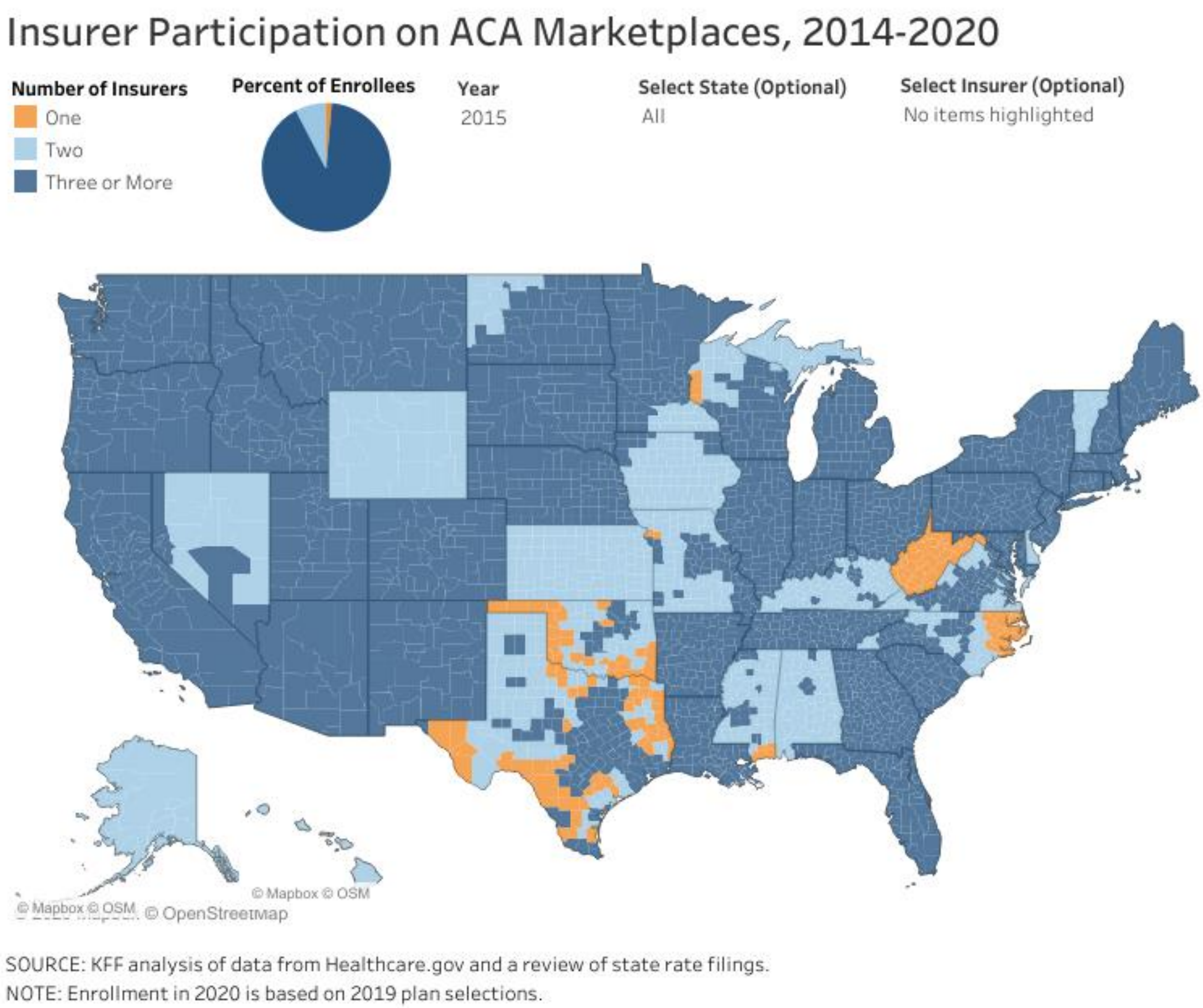


Figure 2: Insurer Participation in year 2020

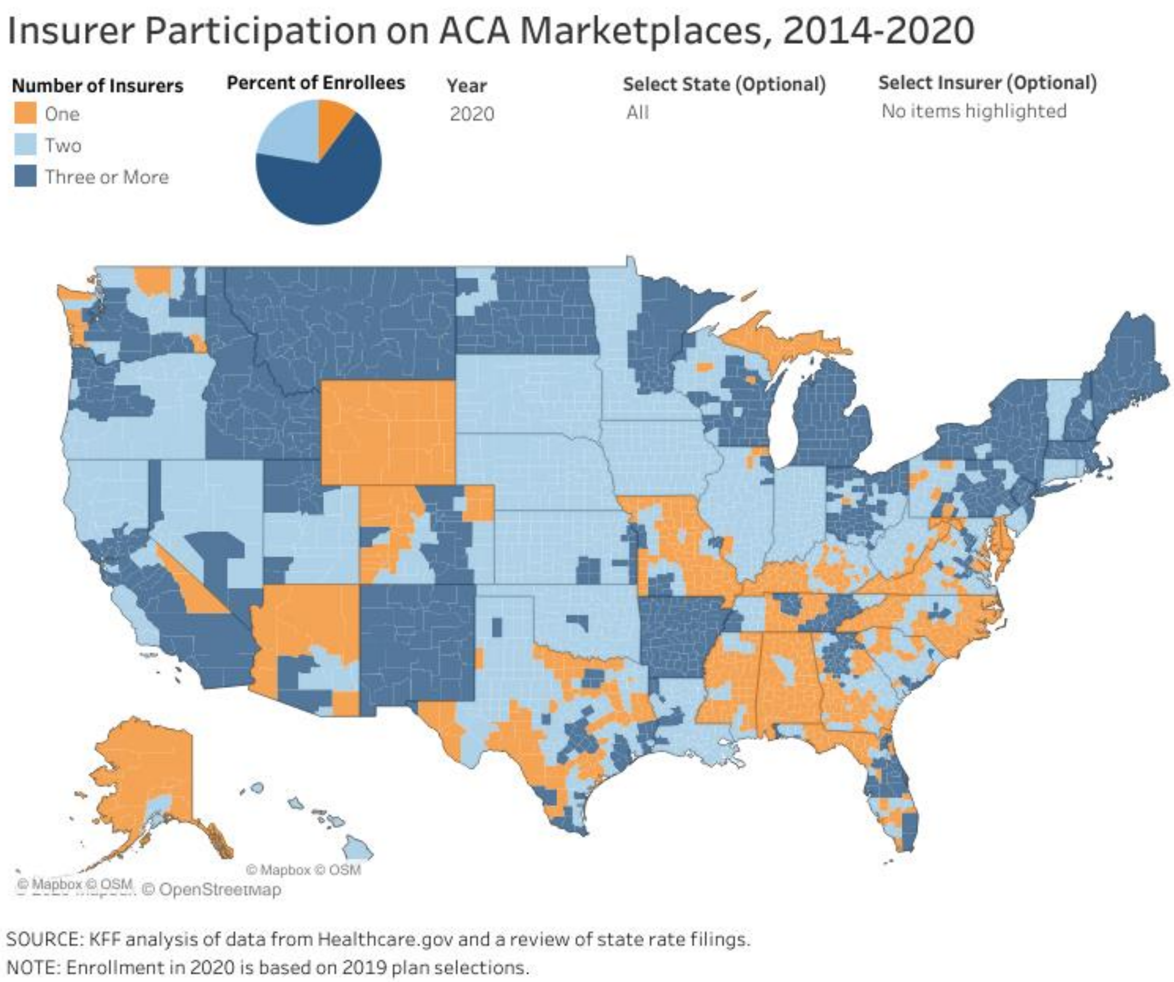


Figure 3: Premiums Changes over the years 2015-2020

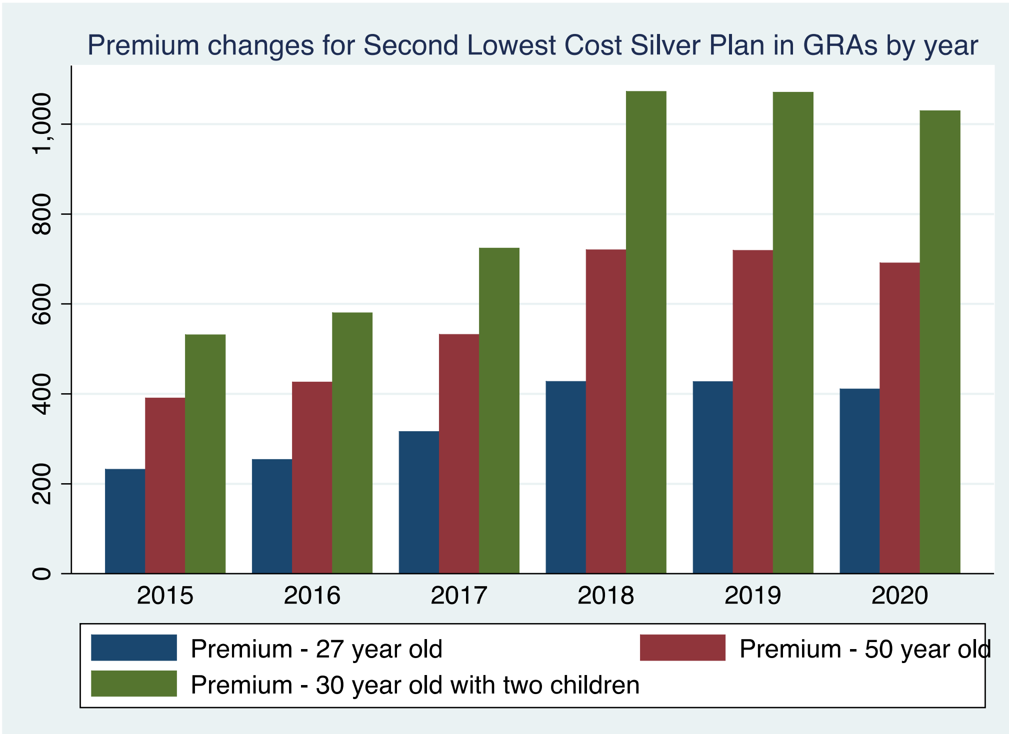
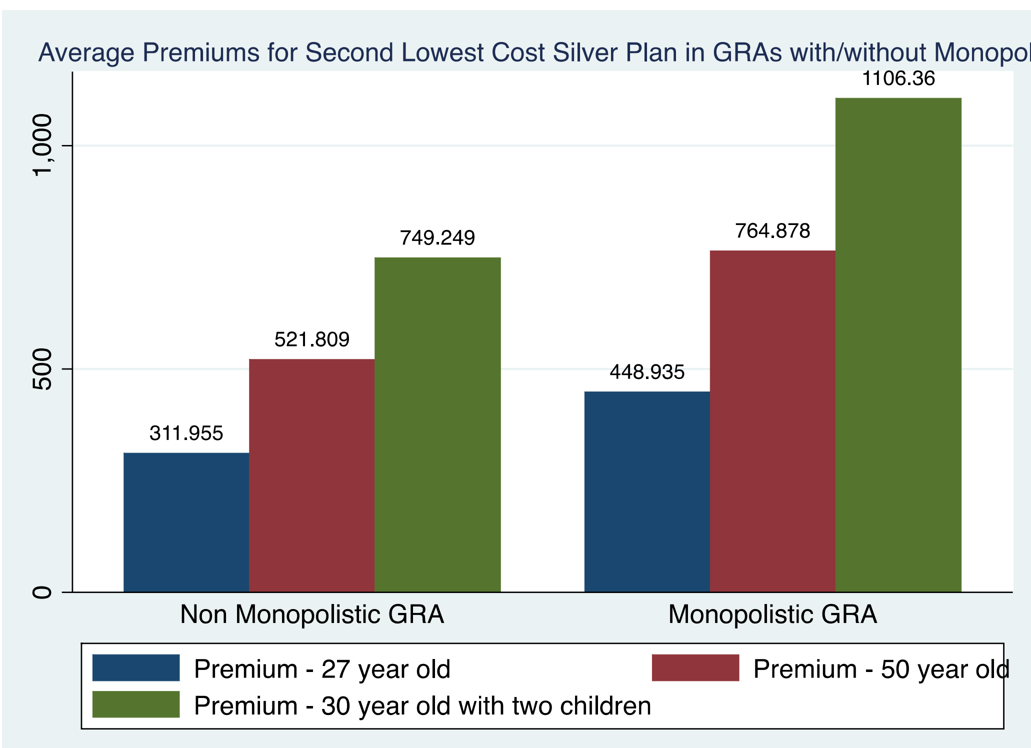


Figure 4: Average Premiums from 2015-2020 in GRAs with/without Monopoly



CHAPTER 5

CONCLUSION

This dissertation is based on the emotional health issues faced by cancer patients in Nepal, health insurance issues of Hispanic community in the Southwest United States and finally the relation of health insurance market structure with the insurance plan designs. All three papers are important in terms of policy decisions.

The second chapter examines the extreme mental health issues experienced by the cancer patients in Nepal. Results showed that mental burden faced by the cancer patients is sometimes extreme which can lead to depression symptoms among cancer patients. Social networks of family and friends can significantly decrease the depression symptoms faced by the cancer patients. Social networks bring mental stability and willingness to fight unfortunate situations and this study also suggests that social networks can significantly improve the emotional well-being of cancer patients. The policy implication for this paper is that there is a need for the cancer support groups for improving the social networks for the cancer patients in Nepal. These groups can help cancer patients to share their cancer experiences, treatment related information, and coping strategies with one another. These groups can also be a medium to express their feelings with others who are going through similar struggles. This paper also shows the need of government intervention in reducing the financial burden of the cancer patients as it is one of the key determinants of the depression symptoms among them.

The third chapter is an important study as Hispanics and young adults in the United States face many challenges for obtaining health coverage and have the lowest coverage among all the ethnic-racial groups. Among Hispanics, young adults have the lowest health coverage. After Patient Health and Affordable Care Act (ACA), there have been improvements in the health coverage of Hispanic young adults, but the coverage disparity persists. In this paper I looked at the population of young adults in the southwest United States and found that ethno-racial group, citizenship and household language are the key determinants of health coverage along with education, employment, income, age and school going status. The disparities in health insurance among Hispanic and White young adults can also explained by these factors. Of these factors, citizenship and household speaking a language other than English explain a major component of the disparities among Hispanics and Whites. The difference in the health insurance coverage that remain unexplained could be because of the characteristics that are unobservable to this study such as choice of purchasing health coverage, lack of information about the insurance markets and plans, willingness to take risks by not buying insurance. I also argue that this unexplained component is suggestive of the discrimination faced by Hispanics while obtaining the health insurance coverage. There is a systemic disparity that persists among Hispanic young adults and young adults from other ethno-racial groups. Hence, a health reform that aims to reduce this disparity and that provides health insurance coverage to all the vulnerable groups is a necessity. Such health reform should also rule out the possibilities of anyone losing health insurance coverage because of personal reasons such as leaving or changing jobs.

The fourth chapter analyzes the market structure and its effect on the insurance plan premiums. I look at the market concentration of insurance firms in both the State and Federal Marketplace which has not been examined previously. I find the evidence of rising insurance premiums because of the decreasing market competition or increasing market concentration. This study shows the importance of a competitive insurance market to have affordable insurance plans for the insurance shoppers. Policies that can help keeping the small insurers in the Marketplace should be encouraged.

STATA CODES

```
****************************************************************
**************************Chapter two**************************
****************************************************************
*******DATA DEFINITION FILE***********
clear all
set more off

**Using the raw data file**
import delimited "/Users/admin/Desktop/OneDrive - University of New
Mexico/Dissertation/Modified Datasets/Cancer_RawData.csv", clear

****************************************************************RENAMING****
*****************************************************************
************SECTION A: GENERAL HEALTH STATUS******************
***************************************************************
** First, I would like to ask you some questions about your general
** health status. Please answer these questions as accurately as possible.

label var version "Version number of the questionnaire"
label var pretest "Pretest version"
label var hospital "Hospital Name"

***Section: To be filled by enumerators
label var date_interview "Interview Date"
label var enumerator_name "Name of the enumeratoe who interviewed the respondent"
label var name_respondent "Name of the respondent"
label var cntact_no "Contact number of the respondent"
label var city_respondent "Name of the city of respondent"
label var ward_no "Ward number of the respondent's residence"
label var address_respondent "Address of the respondent"
label var district_respondent "District of the respondent's residence"
label var vdc_municipality "VDC recorded during interview"
label var vdc "Corrected VDCs as per GIS file for VDCs"

rename gender gender
label var gender "48. Gender of the respondent"
label def gen 0 "Male" 1 "Female"
label values gender gen

******A. GENERAL HEALTH STATUS******
label var cancer_control "Is the patient Cancer or Control?"
label def l_cancer_control 1 "Cancer" 2 "Control"
label values cancer_control l_cancer_control
```

```
** 1. Is the patient Inpatient or Outpatient?
label var patient_type "1. Is the patient Inpatient or Outpatient?"
label def l_patient_type 1 "Inpatient" 2 "Outpatient"
label values patient_type l_patient_type

** 2. Does the patient know he/she has Cancer?
label var patient_know "2. Does the patient know he/she has Cancer?"
label def l_patient_know  1 "Yes" 2 "No"
label values patient_know l_patient_know

** 2. When was the cancer first diagnosed?
label var cancer_diag_year "2. When was the cancer first diagnosed? - years"
label var cancer_diag_mth "2. When was the cancer first diagnosed? - months"
label var cancer_diag_weeks "2. When was the cancer first diagnosed? - weeks"

** 3. What type of disease do you have?
rename type_of_disease disease_type
label var disease_type "3. What type of disease do you have? (Tick one)"
label def l_disease_type 1"Cancer" 2"Diabetic" 3"Blood pressure" 4"Mental disorder"
5"Epilepsy" 6"Asthma" 7 "Others"
label values disease_type l_disease_type

** 4. What type of cancer do you have?
rename types_of_cancer cancer_type
label var cancer_type "4. What type of cancer do you have? (Tick one)"
label def l_cancer_type 0"No cancer" "1"Lung" 2"Breast" 3"Stomach & Esophageal" 4"Head
&Neck & Brain" 5"Cervix Uteri" 6"Trachea" 7 "Colon and rectal" 8"Prostate" 9"Bladder"
10"Oral & nasopharynx" 11"Others"
label values cancer_type l_cancer_type

** 5. Why did you think cancer/disease must have caused to you?
rename reason_disease_1 cause_genes
rename reason_disease_2 cause_smoking
rename reason_disease_3 cause_phyact
rename reason_disease_4 cause_sunexpose
rename reason_disease_5 cause_wrongdoing
rename reason_disease_6 cause_contagious
rename reason_disease_7 cause_pollutant
rename reason_disease_8 cause_dirtywater
rename reason_disease_9 cause_diet
rename reason_disease_10 cause_other
rename reason_disease_11 cause_dontknow

label var cause_genes "5.1 Why did you think cancer must have caused to you?: Genetics"
label var cause_smoking "5.2 Why did you think cancer must have caused to you?:
Tobacco/Smoking"
```

label var cause_phyact "5.3 Why did you think cancer must have caused to you?: Physical activity"
label var cause_sunexpose "5.4 Why did you think cancer must have caused to you?: Sun and UV exposure"
label var cause_wrongdoing "5.5 Why did you think cancer must have caused to you?: Because of wrongdoings"
label var cause_contagious "5.6 Why did you think cancer must have caused to you?: Contagious"
label var cause_pollutant "5.7 Why did you think cancer must have caused to you?: Exposure to pollutants"
label var cause_dirtywater "5.8 Why did you think cancer must have caused to you?: Dirty water"
label var cause_diet "5.9 Why did you think cancer must have caused to you?: Diet"
label var cause_other "5.10 Why did you think cancer must have caused to you?: Other reasons"
label var cause_dontknow "5.11 Why did you think cancer must have caused to you?: Don't know the reason"

** 6. What are the other major health diseases do you have apart from cancer?

rename healthdisease_other_1 diabetes
rename healthdisease_other_2 bloodpressure
rename healthdisease_other_3 mentaldisorder
rename healthdisease_other_4 epilepsy
rename healthdisease_other_5 asthma
rename healthdisease_other_6 heartdisease
rename healthdisease_other_7 copd
rename healthdisease_other_8 alzheimer
rename healthdisease_other_9 otherdisease
rename healthdisease_other_10 nodisease

label var diabetes "6.1 What are the other major health diseases do you have apart from cancer?: Diabetes"
label var bloodpressure "6.2 What are the other major health diseases do you have apart from cancer?: Blood pressure"
label var mentaldisorder "6.3 What are the other major health diseases do you have apart from cancer?: Mental disorder"
label var epilepsy "6.4 What are the other major health diseases do you have apart from cancer?: Epilepsy"
label var asthma "6.5 What are the other major health diseases do you have apart from cancer?: Asthma"
label var heartdisease "6.6 What are the other major health diseases do you have apart from cancer?: Heart disease"
label var copd "6.7 What are the other major health diseases do you have apart from cancer?: COPD"
label var alzheimer "6.8 What are the other major health diseases do you have apart from cancer?: Alzheimer"

```
label var otherdisease "6.9 What are the other major health diseases do you have apart from cancer?: Other"
label var nodisease "6.10 What are the other major health diseases do you have apart from cancer?: None"


***********************SECTION B: VALUING LIFE*****************************
******************************************************************
** Now, I would like to ask you some questions about the quality and length of life.
** This will allow us to understand patient's preferences for quality and length of life.
** Please answer the following questions as accurately as possible.

** 7. On the following 5-point scale, please rate the importance of quality of life?
rename imp_qol imp_qol
label var imp_qol "7. On the following 5-point scale, please rate the importance of quality of life?"

** 8. On the following 5-point scale, please rate the importance of length of life?
label var imp_lol "8. On the following 5-point scale, please rate the importance of length of life?"

** 9. Please state your preference for quality of life vs length of life by choosing one of the following options?
label var pref_qol_lol "9. Please state your preference for quality of life vs length of life by choosing one of the following options?"


****SECTION D: QUALITY OF LIFE PREFERENCE: CHOICE EXPERIMENT**************
*****************************************************************************

** 27. What is your current level of pain?
label var level_pain "27. What is your current level of pain?"

** 28. How important, do you think, is reducing the pain of patients?
rename imp_red_pain imp_pain
label var imp_pain "28. How important, do you think, is reducing the pain of patients?"

**29. What is your current level of depression?
rename depression level_dep
label var level_dep "29. What is your current level of depression?"

**30. How important, do you think, is reducing the depression of patients?
rename imp_red_dep imp_dep
label var imp_dep "30. How important, do you think, is reducing the depression of patients?"
```

**31. What is your current level of mobility?
rename mobility level_mob
label var level_mob "31. What is your current level of mobility?"

**32. How important, do you think, is improving the mobility of patients?
rename imp_mob imp_mob
label var imp_mob "32. How important, do you think, is improving the mobility of patients?"

**33. Please tell me about your current level of performing self-care activities?
rename selfcare level_selfcare
label var level_selfcare "33. Please tell me about your current level of performing self-care activities?"

**34. How important, do you think, is improving the ability of a patient so that he/she can perform self-care activities by him/herself?
rename imp_selfcare imp_selfcare
label var imp_selfcare "34. How important, do you think, is improving the ability of a patient so that he/she can perform self-care activities by him/herself?"

**35. Please tell me about your current level of performing usual-activities?
rename usualactivities level_usualact
label var level_usualact "35. Please tell me about your current level of performing usual-activities?"

**36. How important, do you think, is improving the ability of a patient so that he/she can perform usual-activities by him/herself?
rename imp_usualactivities imp_usualact
label var imp_usualact "36. How important, do you think, is improving the ability of a patient so that he/she can perform usual-activities by him/herself?"

** 37. How much money are you or your relatives can or willing to spend in terms of your treatment?
rename wts_treat wts_treat
label var wts_treat "37. How much money are you or your relatives can or willing to spend in terms of your treatment?"

** 38. On the following scale, describe your hardship in paying the treatment cost?

rename hard_pay_1 hardpay_1
rename hard_pay_2 hardpay_2
rename hard_pay_3 hardpay_3
rename hard_pay_4 hardpay_4
rename hard_pay_5 hardpay_5
rename hard_pay_6 hardpay_6
rename hard_pay_7 hardpay_7

rename hard_pay_8 hardpay_8
rename hard_pay_9 hardpay_9
rename hard_pay_10 hardpay_10
rename hard_pay_11 hardpay_11
rename hard_pay_12 hardpay_12

label var hardpay_1 "38.1 On the following scale, describe your hardship in paying the treatment cost? NRS 1,000"
label var hardpay_2 "38.2 On the following scale, describe your hardship in paying the treatment cost? NRS 25,000"
label var hardpay_3 "38.3 On the following scale, describe your hardship in paying the treatment cost? NRS 50,000"
label var hardpay_4 "38.4 On the following scale, describe your hardship in paying the treatment cost? NRS 100,000"
label var hardpay_5 "38.5 On the following scale, describe your hardship in paying the treatment cost? NRS 175,000"
label var hardpay_6 "38.6 On the following scale, describe your hardship in paying the treatment cost? NRS 300,000"
label var hardpay_7 "38.7 On the following scale, describe your hardship in paying the treatment cost? NRS 500,000"
label var hardpay_8 "38.8 On the following scale, describe your hardship in paying the treatment cost? NRS 900,000"
label var hardpay_9 "38.9 On the following scale, describe your hardship in paying the treatment cost? NRS 1,200,000"
label var hardpay_10 "38.10 On the following scale, describe your hardship in paying the treatment cost? NRS 1,700,000"
label var hardpay_11 "38.11 On the following scale, describe your hardship in paying the treatment cost? NRS 2,500,000"
label var hardpay_12 "38.12 On the following scale, describe your hardship in paying the treatment cost? NRS 3,500,000"

** 39. Consider the following three possible alternatives - Choice Set 1

label var cs1_a_pain "39.A.1 Level of pain in Choice set 1 Alternative A"
label var cs1_a_dep "39.A.2 Level of depression in Choice set 1 Alternative A"
label var cs1_a_mob "39.A.3 Level of mobility in Choice set 1 Alternative A"
label var cs1_a_sc "39.A.4 Problem performing selfcare activities in Choice set 1 Alternative A"
label var cs1_a_ua "39.A.5 Problem performing usual activities in Choice set 1 Alternative A"
label var cs1_a_price "39.A.6. Price of Choice set 1 Alternative A"
label var cs1_b_pain "39.B.1 Level of pain in Choice set 1 Alternative B"
label var cs1_b_dep "39.B.2 Level of depression in Choice set 1 Alternative B"
label var cs1_b_mob "39.B.3 Level of mobility in Choice set 1 Alternative B"
label var cs1_b_sc "39.B.4 Problem performing selfcare activities in Choice set 1 Alternative B"
label var cs1_b_ua "39.B.5 Problem performing usual activities in Choice set 1 Alternative B"
label var cs1_b_price "39.B.6 Price of Choice set 1 Alternative B"

```
label var cs1_choice1 "39.1 Choice set 1 Alternative A"
label var cs1_choice2 "39.2 Choice set 1 Alternative B"
label var cs1_choice3 "39.3 Choice set 1 Status quo"

** 40. How certain are you of your choice? - Choice Set 1
label var certainity_cs1 "40. How certain are you of your choice? - CS1"

** 41. Which attribute did you like in your recent choice of treatment alternative? - Choice Set 1
rename attribute_cs1_pain att_cs1_pain
rename attribute_cs1_dep att_cs1_dep
rename attribute_cs1_mob att_cs1_mob
rename attribute_cs1_sc att_cs1_sc
rename attribute_cs1_ua att_cs1_us
rename attribute_cs1_price att_cs1_price
rename certainity_cs1 certainity_cs1

label var att_cs1_pain "41.1 Which attribute did you like in your recent choice of treatment alternative? - Pain CS1"
label var att_cs1_dep "41.2 Which attribute did you like in your recent choice of treatment alternative? - Depression CS1"
label var att_cs1_mob "41.3 Which attribute did you like in your recent choice of treatment alternative? - Mobility CS1"
label var att_cs1_sc "41.4 Which attribute did you like in your recent choice of treatment alternative? - Self-care CS1"
label var att_cs1_us "41.5 Which attribute did you like in your recent choice of treatment alternative? - Usual activities CS1"
label var att_cs1_price "41.6 Which attribute did you like in your recent choice of treatment alternative? - Treatment cost CS1"

** 42. Consider the following three possible alternatives - Choice Set 2


label var cs2_a_pain "42.A.1 Level of pain in Choice set 2 Alternative A"
label var cs2_a_dep "42.A.2 Level of depression in Choice set 2 Alternative A"
label var cs2_a_mob "42.A.3 Level of mobility in Choice set 2 Alternative A"
label var cs2_a_sc "42.A.4 Problem performing selfcare activities in Choice set 2 Alternative A"
label var cs2_a_ua "42.A.5 Problem performing usual activities in Choice set 2 Alternative A"
label var cs2_a_price "42.A.6 Price of Choice set 2 Alternative A"
label var cs2_b_pain "42.B.1 Level of pain in Choice set 2 Alternative B"
label var cs2_b_dep "42.B.2 Level of depression in Choice set 2 Alternative B"
label var cs2_b_mob "42.B.3 Level of mobility in Choice set 2 Alternative B"
label var cs2_b_sc "42.B.4 Problem performing selfcare activities in Choice set 2 Alternative B"
label var cs2_b_ua "42.B.5 Problem performing usual activities in Choice set 2 Alternative B"
label var cs2_b_price "42.B.6 Price of Choice set 2 Alternative B"
label var cs2_choice1 "42.1 Choice set 2 Alternative A"
label var cs2_choice2 "42.2 Choice set 2 Alternative B"
```

```
label var cs2_choice3 "42.3 Choice set 2 Status quo"

** 43. How certain are you of your choice? Choice Set 2
label var certainity_cs2 "43. How certain are you of your choice? - CS2"

** 44. Which attribute did you like in your recent choice of treatment alternative? Choice Set 2
rename attribute_cs2_pain att_cs2_pain
rename attribute_cs2_dep att_cs2_dep
rename attribute_cs2_mob att_cs2_mob
rename attribute_cs2_sc att_cs2_sc
rename attribute_cs2_ua att_cs2_us
rename attribute_cs2_price att_cs2_price
rename certainity_cs2 certain_cs2

label var att_cs2_pain "44.1 Which attribute did you like in your recent choice of treatment alternative? - Pain CS2"
label var att_cs2_dep "44.2 Which attribute did you like in your recent choice of treatment alternative? - Depression CS2"
label var att_cs2_mob "44.3 Which attribute did you like in your recent choice of treatment alternative? - Mobility CS2"
label var att_cs2_sc "44.4 Which attribute did you like in your recent choice of treatment alternative? - Self-care CS2"
label var att_cs2_us "44.5 Which attribute did you like in your recent choice of treatment alternative? - Usual activities CS2"
label var att_cs2_price "44.6 Which attribute did you like in your recent choice of treatment alternative? - Treatment cost CS2"

** 45. Consider the following three possible alternatives - Choice Set 3

label var cs3_a_pain "45.A.1 Level of pain in Choice set 3 Alternative A"
label var cs3_a_dep "45.A.2 Level of depression in Choice set 3 Alternative A"
label var cs3_a_mob "45.A.3 Level of mobility in Choice set 3 Alternative A"
label var cs3_a_sc "45.A.4 Problem performing selfcare activities in Choice set 3 Alternative A"
label var cs3_a_ua "45.A.5 Problem performing usual activities in Choice set 3 Alternative A"
label var cs3_a_price "45.A.6 Price of Choice set 3 Alternative A"
label var cs3_b_pain "45.B.1 Level of pain in Choice set 3 Alternative B"
label var cs3_b_dep "45.B.2 Level of depression in Choice set 3 Alternative B"
label var cs3_b_mob "45.B.3 Level of mobility in Choice set 3 Alternative B"
label var cs3_b_sc "45.B.4 Problem performing selfcare activities in Choice set 3 Alternative B"
label var cs3_b_ua "45.B.5 Problem performing usual activities in Choice set 3 Alternative B"
label var cs3_b_price "45.B.6 Price of Choice set 3 Alternative B"
label var cs3_choice1 "45.1 Choice set 3 Alternative A"
label var cs3_choice2 "45.2 Choice set 3 Alternative B"
label var cs3_choice3 "45.3 Choice set 3 Status quo"
```

** 46. How certain are you of your choice? Choice Set 3
label var certainity_cs3 "46. How certain are you of your choice? - CS3"

** 47. Which attribute did you like in your recent choice of treatment alternative? Choice Set 3

rename attribute_cs3_pain att_cs3_pain
rename attribute_cs3_dep att_cs3_dep
rename attribute_cs3_mob att_cs3_mob
rename attribute_cs3_sc att_cs3_sc
rename attribute_cs3_ua att_cs3_us
rename attribute_cs3_price att_cs3_price
rename certainity_cs3 certain_cs3

label var att_cs3_pain "47.1 Which attribute did you like in your recent choice of treatment alternative? - Pain CS3"
label var att_cs3_dep "47.2 Which attribute did you like in your recent choice of treatment alternative? - Depression CS3"
label var att_cs3_mob "47.3 Which attribute did you like in your recent choice of treatment alternative? - Mobility CS3"
label var att_cs3_sc "47.4 Which attribute did you like in your recent choice of treatment alternative? - Self-care CS3"
label var att_cs3_us "47.5 Which attribute did you like in your recent choice of treatment alternative? - Usual activities CS3"
label var att_cs3_price "47.6 Which attribute did you like in your recent choice of treatment alternative? - Treatment cost CS3"

*********************SECTION H: DEMOGRAPHICS***************************
****
**48. Gender of the respondent
rename gender gender
label var gender "48. Gender of the respondent"
label def l_gender 0 "Male" 1 "Female"
label values gender l_gender

**49. Age of the respondent
rename age age
label var age "49. Age of the respondent"

**50. Caste/ethnicity of the household head
label var caste "50. Caste of the respondent"
label def l_caste 1 "Brahmin" 2 "Chhetri" 3 "Janajati" 4 "Pahadi Dalit" 5 "Tarai Dalit" 6 "Madhesi" 7 "Others"
label values caste l_caste

**51. Religion of the household head

```
label var religion "51. Religion of the respondent"
label def l_religion 1 "Hinduism" 2 "Buddhism" 3 "Muslim" 4 "Kiratism" 5 "Christianity" 6 "Sikhism" 7 "Jainism" 8 "Others"
label values religion l_religion

**52. Education level of respondent
rename education educ
label var educ "52. Education level of the respondent"
label def l_educ 1 "No Schooling" 2 "Grade 1-5" 3 "Grade 6-8" 4 "Grade 9-12" 5 "Bachelors" 6 "Masters or other Professional degree" 7 "Others"
label values educ l_educ

**53. What is your current marital status?
label var marital_status "53. What is your current marital status?"
label def l_marital_status 1 "Never Married" 2 "Currently Married" 3 "Divorced" 4 "Separated" 5 "Widowed"
label values marital_status l_marital_status

**54. Does your household own any of the following items?
rename sewingmachine sew_mach
rename sewing_no sewmach_no
rename freeze refrigerator
rename freeze_no refrig_no
rename washing wash_mach
rename washing_no washmach_no

label var radio "54.1 Does your household own any of the following items? radio?"
label var radio_no "54.1.1 Does your household own any of the following items? No of radios"
label var bicycle "54.2 Does your household own any of the following items? bicycle?"
label var bicycle_no "54.2.1 Does your household own any of the following items? Number of bicycles"
label var motorcycle "54.3 Does your household own any of the following items? motorcycle?"
label var motorcycle_no "54.3.1 Does your household own any of the following items? Number of motorcycles"
label var fans "54.4 Does your household own any of the following items? fans?"
label var fans_no "54.4.1 Does your household own any of the following items? Number of fans"
label var television "54.5 Does your household own any of the following items? television?"
label var television_no "54.5.1 Does your household own any of the following items? Number of televisions"
label var sew_mach "54.6 Does your household own any of the following items? sewing machine?"
label var sewmach_no "54.6.1 Does your household own any of the following items? Number of sewing machines"
label var camera "54.7 Does your household own any of the following items? camera?"
label var camera_no "54.7.1 Does your household own any of the following items? Number of cameras"
```

label var car "54.8 Does your household own any of the following items? car?"
label var car_no "54.8.1 Does your household own any of the following items? Number of cars"
label var refrigerator "54.9 Does your household own any of the following items? refrigerator?"
label var refrig_no "54.9.1 Does your household own any of the following items? Number of refrigerators"
label var wash_mach "54.10 Does your household own any of the following items? washing machine?"
label var washmach_no "54.10.1 Does your household own any of the following items? Number of washing machines"
label var computer "54.11 Does your household own any of the following items? computer?"
label var computer_no "54.11.1 Does your household own any of the following items? Number of computers"

**55. Approximately, what is your monthly income from all sources, before taxes?
rename income_personal per_inc
label var per_inc "55. Approximately, what is your monthly income from all sources, before taxes?"
label def inco 1 "NRS 0" 2 "< NRS 5,000" 3 "NRS 5,001 - NRS 10,000" 4 "NRS 10,001 - NRS 20,000" 5 "NRS 20,001 - NRS 30,000" 6 "NRS 30,001 - NRS 50,000" 7 "> NRS 50,000" 8 "Don't know" 9 "Refused"
label values per_inc inco

**56. Approximately, what is your monthly household income from all sources, before taxes?
rename household_income hhd_inc
label var hhd_inc "56. Approximately, what is your monthly household income from all sources, before taxes?"
label def l_hhd_inc 1 "< NRS 10,000" 2 "NRS 10,001 - NRS 20,000" 3 "NRS 20,001 - NRS 30,000" 4 "NRS 30,001 - NRS 50,000" 5 "> NRS 50,000" 6 "Don't know" 7 "Refused"
label values hhd_inc hhd_inc

**57. Is household income equal to your income?
label var per_hhd_same "57. Is household income equal to your income?"

**58. How many children do you have?
rename children child_no
rename girls girl_no
rename boys boy_no

label var child_no "58. How many children do you have?"
label var girl_no "58.a No. of girls"
label var boy_no "58.b No. of boys"

*********************RECODING**************************
****

recode patient_know cause_genes cause_smoking cause_phyact cause_sunexpose cause_wrongdoing cause_contagious cause_pollutant cause_dirtywater cause_diet cause_other cause_dontknow diabetes bloodpressure mentaldisorder epilepsy asthma heartdisease copd alzheimer otherdisease nodisease cs1_choice1 cs1_choice2 cs1_choice3 att_cs1_pain att_cs1_dep att_cs1_mob att_cs1_sc att_cs1_us att_cs1_price cs2_choice1 cs2_choice2 cs2_choice3 att_cs2_pain att_cs2_dep att_cs2_mob att_cs2_sc att_cs2_us att_cs2_price cs3_choice1 cs3_choice2 cs3_choice3 att_cs3_pain att_cs3_dep att_cs3_mob att_cs3_sc att_cs3_us att_cs3_price gender radio bicycle motorcycle fans television telephone sew_mach camera car refrigerator wash_mach computer (2=0)

****
****
****

/*
C. DOMESTIC LIFE OF WOMEN SUFERING FROM CHRONIC ILLNESSES***
ONLY FEMALE QUESTIONNAIRE: IF GENDER of the respondent is MALE, skip this section and go to module D

Now, I would like to ask you some questions about your domestic life since you were detected with your medical condition and before that. This will allow us to understand if having chronic illnesses have a healthy domestic life or not. Please answer the following questions as accurately as possible.

Section I
Now start asking questions to the patient
10. Is your husband alive? CODE:[1=yes; 2=no]
*/
If No, then skip to Section II
****
/*Enumerators, answer this yourself:

11. Is patient answering in privacy or her husband is present?CODE:[1=yes; 2=no]*/
rename privacy answered_privately
label var answered_privately "Violence: 11. Is patient answering in privacy or her husband is present?"
label def l_answered_privately 1 "YES" 2 "NO"
label values answered_privately l_answered_privately

/*12. Do you currently live with your husband? CODE:[1=yes; 2=no]*/

```
rename live_hus living_with_hus
label var living_with_hus "Violence: 12. Do you currently live with your husband?"
label def l_living_with_hus 1 "YES" 2 "NO"
label values answered_privately l_living_with_hus

/*
13. What is your husband’s education level?
a. No formal Schooling
b. Grades 1-5
c. Grades 6-8
d. Grades 9-12
e. Bachelors
f. Masters or other professional degree
g. Others (Please specify) ……………………….
*/
rename educ educ_hus
label var educ_hus "Violence: 13. What is your husband’s education level?"
label def l_educ_hus 1 "No formal Schooling" 2 "Grades 1-5" 3 "Grades 6-8" 4 "Grades 9-12" 5
"Bachelors" 6 "Masters or other professional degree" 7 "Others (Please specify)"
label values educ_hus l_educ_hus

*14. (Does/did) your (last) husband/partner ever do any of the following things to you in last 12
months? CODE[1=OFTEN 2=SOMETIMES 3=NOT AT ALL]
*a) push you, shake you, or throw something at you?
rename voilence_a push_throw
label var push_throw "14.a) push you, shake you, or throw something at you?"
label def l_violence 1 "OFTEN" 2 "SOMETIMES" 3 "NOT AT ALL"
label values push_throw l_violence

*b) slap you?
rename voilence_b slap
label var slap "Violence: 14.b) slap you?"
label values slap l_violence

*c) twist your arm or pull your hair?
rename violence_c twist_arm
label var twist_arm "Violence: 14.c) twist your arm or pull your hair?"
label values twist_arm l_violence

*d) punch you with his fist or with something that could hurt you?
rename violence_d punch
label var punch "Violence: 14.d) punch you with his fist or with something that could hurt you?"
label values punch l_violence

*e) kick you, drag you or beat you up?
rename violence_e kick_beat
```

label var kick_beat "Violence: 14.e) kick you, drag you or beat you up?"
label values kick_beat l_violence

*f) try to choke you or burn you on purpose?
rename violence_f choke_burn
label var choke_burn "Violence: 14.f) try to choke you or burn you on purpose?"
label values choke_burn l_violence

*g) threaten or attack you with a knife, gun or any other weapon?
rename violence_g threat_attack
label var threat_attack "Violence: 14.g) threaten or attack you with a knife, gun or any other weapon?"
label values threat_attack l_violence

*h) physically force you to have sexual intercourse with him even when you did not want to?
rename violence_h forced_sex
label var forced_sex "Violence: 14.h) physically force you to have sexual intercourse with him even when you did not want to?"
label values forced_sex l_violence

*i) force you to perform any sexual acts you did not want to?
rename violence_i forced_sexual_acts
label var forced_sexual_acts "Violence: 14.i) force you to perform any sexual acts you did not want to?"
label values forced_sexual_acts l_violence

*15. Did the following ever happen as a result of what your (last) husband/partner did to you: CODE[1=YES 2=NO]
*a) You had cuts, bruises or aches?
rename via_affect_a cuts_bruises
label var forced_sex "Violence: 15.a) You had cuts, bruises or aches?"
**used previously defined label l_yesno here to label values
label values forced_sex l_yesno

*b) You had eye injuries, sprains, dislocations or burns?
rename vio_affects_b eyeinjury_burns
label var eyeinjury_burns "Violence: 15.b) You had eye injuries, sprains, dislocations or burns?"
label values eyeinjury_burns l_yesno

*c) You had deep wounds, broken bones, broken teeth, or any other serious injury?
rename vio_affects_c broken_bones
label var broken_bones "Violence: 15.c) You had deep wounds, broken bones, broken teeth, or any other serious injury?"
label values broken_bones l_yesno

/*16. Has your partner ever physically assaulted you?: CODE[1=YES 2=NO]

If NO, then jump to 18*/
rename assault partner_assault
label var partner_assault "Violence: 16. Has your partner ever physically assaulted you?"

/*17. If yes, are the physical assaults increased since you were detected with medical condition? (please check one box) : CODE[1=STRONGLY AGREE 2=AGREE 3=STAYED THE SAME 4=DISAGREE 5=STRONGLY DISAGREE*/
rename assault_freq assault_incr
label var assault_incr "Violence: 17. If yes, are the physical assaults increased since you were detected with medical condition? (please check one box)"
label def l_assault_incr 1 "STRONGLY AGREE" 2 "AGREE" 3 "STAYED THE SAME" 4 "DISAGREE" 5 "STRONGLY DISAGREE"
label values assault_incr l_assault_incr

/*18. (Does/did) your husband/partner drinks alcohol? CODE[1=OFTEN 2=SOMETIMES 3=NEVER]*/
rename drink hus_drink
label var hus_drink "Violence: 18. (Does/did) your husband/partner drinks alcohol?"
label def l_hus_drink 1 "OFTEN" 2 "SOMETIMES" 3 "NEVER"
label values hus_drink l_hus_drink

/*Section II
19. Has anyone in your family (except husband) ever physically assaulted you after the medical condition was detected?CODE[1=YES 2=NO] */
rename assault_other assault_others
label var assault_others "Violence: 19. Has anyone in your family (except husband) ever physically assaulted you after the medical condition was detected?"
label def l_assault_others 1 "YES" 2 "NO"
label values assault_others l_assault_others

/*
If YES, who tried to physically assault you?
a. Children
b. In-laws
c. Own Parents
d. Siblings
e. Others (please specify) ………......*/
rename assault_who who_assaults
label var who_assaults "Violence: If YES, who tried to physically assault you?"
label def l_who_assaults 1 "Children" 2 "In-laws" 3 "Own Parents" 4 "Siblings" 5 "Others (please specify)"
label values who_assaults l_who_assaults

*If answered NO for questions 14-19 then skip question 20
/*

20. Thinking about what you yourself have experienced among the different things we have been talking about,
from whom have you ever tried to seek help to stop (the/these) person(s) from doing this to you again?
Anyone else?

RECORD ALL MENTIONED.
NEVER SOUGHT HELP
OWN FAMILY
HUSBAND/LIVE-IN PARTNER’s FAMILY
CURRENT/LAST/LATE HUSBAND/LIVE-IN PARTNER
CURRENT/FORMER BOYFRIEND
FRIEND
NEIGHBOR
RELIGIOUS LEADER
DOCTOR/MEDICAL PERSONNEL
POLICE
LAWYER
SOCIAL SERVICE ORGANIZATION
OTHER (SPECIFY)________________
COMMENTS by the respondent:
*/

rename seek_help_1 never_seeked_help
label var never_seeked_help "NEVER SOUGHT HELP"
label def l_never_seeked_help 1 "YES" 2"NO"
label values never_seeked_help l_never_seeked_help

rename seek_help_2 seek_help_ownfamily
label var seek_help_ownfamily "OWN FAMILY"
label def l_seek_help_ownfamily 1 "YES" 2"NO"
label values seek_help_ownfamily l_seek_help_ownfamily

rename seek_help_3 seek_help_hus_fam
label var seek_help_hus_fam "HUSBAND/LIVE-IN PARTNER’s FAMILY"
label def l_seek_help_hus_fam 1 "YES" 2"NO"
label values seek_help_ownfamily l_seek_help_hus_fam

rename seek_help_4 seek_help_current_partner
label var seek_help_current_partner "CURRENT/LAST/LATE HUSBAND/LIVE-IN PARTNER"
label def l_seek_help_current_partner 1 "YES" 2"NO"
label values seek_help_current_partner l_seek_help_current_partner

rename seek_help_5 seek_help_current_bf
label var seek_help_current_bf "CURRENT/FORMER BOYFRIEND"

```
label def l_seek_help_current_bf 1 "YES" 2"NO"
label values seek_help_current_bf l_seek_help_current_bf

rename seek_help_6 seek_help_friend
label var seek_help_friend "FRIEND"
label def l_seek_help_friend 1 "YES" 2"NO"
label values seek_help_friend l_seek_help_friend

rename seek_help_7 seek_help_neighbor
label var seek_help_neighbor "NEIGHBOR"
label def l_seek_help_neighbor 1 "YES" 2"NO"
label values seek_help_neighbor l_seek_help_neighbor

rename seek_help_8 seek_help_rlgn_leader
label var seek_help_rlgn_leader "RELIGIOUS LEADER"
label def l_seek_help_rlgn_leader 1 "YES" 2"NO"
label values seek_help_rlgn_leader l_seek_help_rlgn_leader

rename seek_help_9 seek_help_doctor
label var seek_help_doctor "DOCTOR/MEDICAL PERSONNEL"
label def l_seek_help_doctor 1 "YES" 2"NO"
label values seek_help_doctor l_seek_help_doctor

rename seek_help_10 seek_help_police
label var seek_help_police "POLICE"
label def l_seek_help_police 1 "YES" 2"NO"
label values seek_help_police l_seek_help_police

rename seek_help_11 seek_help_lawyer
label var seek_help_lawyer "LAWYER"
label def l_seek_help_lawyer 1 "YES" 2"NO"
label values seek_help_lawyer l_seek_help_lawyer

rename seek_help_12 seek_help_soc_servc
label var seek_help_soc_servc "SOCIAL SERVICE ORGANIZATION"
label def l_seek_help_soc_servc 1 "YES" 2"NO"
label values seek_help_soc_servc l_seek_help_soc_servc

rename seek_help_13 seek_help_other
label var seek_help_other "OTHER (SPECIFY)"
label def l_seek_help_other 1 "YES" 2"NO"
label values seek_help_other l_seek_help_other
/*
rename seek_help_14 seek_help_cmnts
label var seek_help_cmnts "COMMENTS by the respondent.."
label def l_seek_help_cmnts 1 "YES" 2"NO"
```

label values seek_help_cmnts l_seek_help_cmnts
*/

/*Now, I would like to ask you some questions about your role in your household. This will allow
us to understand how women having chronic illnesses handle their household decisions. Please answer the following questions as accurately as possible.
*/

*21. Who usually decides how the money you earn will be used? : CODE[1=WIFE ALONE 2=JOINTLY 3=ANYONE ELSE 4=HUSBAND ALONE]
rename dec_mak_18 own_money_spending
label var own_money_spending "Decision: 21. Who usually decides how the money you earn will be used?"
label def l_own_money_spending 1 "WIFE ALONE" 2 "JOINTLY" 3 "ANYONE ELSE" 4 "HUSBAND ALONE"
label values own_money_spending l_own_money_spending

*22. Who usually decides how your (husband's/partner's) earnings will be used : CODE[1=WIFE ALONE 2=JOINTLY 3=ANYONE ELSE 4=HUSBAND ALONE]
rename dec_mak_19 hus_money_spending
label var hus_money_spending "Decision: 22. Who usually decides how your (husband's/partner's) earnings will be used"
label def l_hus_money_spending 1 "WIFE ALONE" 2 "JOINTLY" 3 "ANYONE ELSE" 4 "HUSBAND ALONE"
label values hus_money_spending l_hus_money_spending

*23. Who usually makes decisions about health care for yourself? : CODE[1=WIFE ALONE 2=JOINTLY 3=ANYONE ELSE 4=HUSBAND ALONE]
rename dec_mac_20 dec_own_healthcare
label var dec_own_healthcare "Decision: 23. Who usually makes decisions about health care for yourself"
label def l_dec_own_healthcare 1 "WIFE ALONE" 2 "JOINTLY" 3 "ANYONE ELSE" 4 "HUSBAND ALONE"
label values dec_own_healthcare l_dec_own_healthcare

*24. Who usually makes decisions about makingmajor household purchases? : CODE[1=WIFE ALONE 2=JOINTLY 3=ANYONE ELSE 4=HUSBAND ALONE]
rename dec_mak_21 dec_hh_purchases
label var dec_hh_purchases "Decision: 24. Who usually makes decisions about making major household purchases?"
label def l_dec_hh_purchases 1 "WIFE ALONE" 2 "JOINTLY" 3 "ANYONE ELSE" 4 "HUSBAND ALONE"
label values dec_hh_purchases l_dec_hh_purchases

/*25. Who usually makes decisions about visitsto your family or relatives? : CODE[1=WIFE ALONE 2=JOINTLY 3=ANYONE ELSE 4=HUSBAND ALONE]
: CODE[1=WIFE ALONE 2=JOINTLY 3=ANYONE ELSE 4=HUSBAND ALONE]*/
rename dec_mak_22 dec_fam_visits
label var dec_fam_visits "Decision: 25. Who usually makes decisions about visits to your family or relatives?"
label def l_dec_fam_visits 1 "WIFE ALONE" 2 "JOINTLY" 3 "ANYONE ELSE" 4 "HUSBAND ALONE"
label values dec_fam_visits l_dec_fam_visits

*26. Would you say that using contraception is mainly your decision, mainly your (husband's/partner's) decision, or did you both decide together?
rename dec_mak_23 dec_contraception
label var dec_contraception "Decision: 26. Would you say that using contraception is mainly your decision,mainly your (husband's/partner's) decision, or did you both decide together?"
label def l_dec_contraception 1 "WIFE ALONE" 2 "JOINTLY" 3 "ANYONE ELSE" 4 "HUSBAND ALONE"
label values dec_contraception l_dec_contraception

/*
E. EMOTIONAL STATUS
Now, I would like to ask you some questions about the behavior and thinking pattern that suggests the presence of depression in past two weeks of time. This will allow us to understand if patients have any symptoms related to depression. Please answer the following questions as accurately as possible.
The Patient Health Questionnaire (PHQ-9)

Over the past 2 weeks, how often have you been
bothered by any of the following problems? CODE[1=Not at all 2=Several days 3=More Than Half of the Days 4=Nearly Every Day]
*/

rename es_phq_1 e_little_interest
label var e_little_interest "Emotional: 1. Little interest or pleasure in doing things"
label def l_little_interest 1 "NOT AT ALL" 2 "SEVERAL DAYS" 3 "MORE THAN HALF OF DAYS" 4 "NEARLY EVERY DAY"
label values e_little_interest l_little_interest

rename es_phq_2 e_feeling_down
label var e_feeling_down "Emotional: 2. Feeling down, depressed or hopeless"
label def l_e_feeling_down 1 "NOT AT ALL" 2 "SEVERAL DAYS" 3 "MORE THAN HALF OF DAYS" 4 "NEARLY EVERY DAY"
label values e_feeling_down l_e_feeling_down

rename es_phq_3 e_trouble_sleep

label var e_trouble_sleep "Emotional: 3. Trouble falling asleep, staying asleep, or sleeping too much"
label def l_e_trouble_sleep 1 "NOT AT ALL" 2 "SEVERAL DAYS" 3 "MORE THAN HALF OF DAYS" 4 "NEARLY EVERY DAY"
label values e_trouble_sleep l_e_trouble_sleep

rename es_phq_4 e_tireness
label var e_tireness "Emotional: 4. Feeling tired or having little energy"
label def l_e_tireness 1 "NOT AT ALL" 2 "SEVERAL DAYS" 3 "MORE THAN HALF OF DAYS" 4 "NEARLY EVERY DAY"
label values e_tireness l_e_tireness

rename es_phq_5 e_poor_appetite
label var e_poor_appetite "Emotional: 5. Poor appetite or overeating"
label def l_e_poor_appetite 1 "NOT AT ALL" 2 "SEVERAL DAYS" 3 "MORE THAN HALF OF DAYS" 4 "NEARLY EVERY DAY"
label values e_poor_appetite l_e_poor_appetite

rename es_phq_6 e_feeling_failure
label var e_feeling_failure "Emotional: 6. Feeling bad about yourself – or that you're a failure or have let yourself or your family down"
label def l_e_feeling_failure 1 "NOT AT ALL" 2 "SEVERAL DAYS" 3 "MORE THAN HALF OF DAYS" 4 "NEARLY EVERY DAY"
label values e_feeling_failure l_e_feeling_failure

rename es_phq_7 e_concentration_prob
label var e_concentration_prob "Emotional: 7. Trouble concentrating on things, such as reading the newspaper or watching television"
label def l_e_concentration_prob 1 "NOT AT ALL" 2 "SEVERAL DAYS" 3 "MORE THAN HALF OF DAYS" 4 "NEARLY EVERY DAY"
label values e_concentration_prob l_e_concentration_prob

rename es_phq_8 e_slow_movement_restless
label var e_slow_movement_restless "Emotional: 8. Moving or speaking so slowly that other people could have noticed. Or, the opposite – being so fidgety or restless that you have been moving around a lot more than usual"
label def l_e_slow_movement_restless 1 "NOT AT ALL" 2 "SEVERAL DAYS" 3 "MORE THAN HALF OF DAYS" 4 "NEARLY EVERY DAY"
label values e_slow_movement_restless l_e_slow_movement_restless

rename es_phq_9 e_better_dead
label var e_better_dead "Emotional: 9. Thoughts that you would be better off dead or of hurting yourself in some way"
label def l_e_better_dead 1 "NOT AT ALL" 2 "SEVERAL DAYS" 3 "MORE THAN HALF OF DAYS" 4 "NEARLY EVERY DAY"
label values e_better_dead l_e_better_dead

```
rename es_phq_10 e_overall_difficulty
label var e_overall_difficulty "Emotional: If you checked off any problems, how difficult have those problems made it for you to; Do your work, take care of things at home, or get along with other people?"
label def l_e_overall_difficulty 1 "NOT AT ALL" 2 "SEVERAL DAYS" 3 "MORE THAN HALF OF DAYS" 4 "NEARLY EVERY DAY"
label values e_overall_difficulty l_e_overall_difficulty

/*
F. SOCIAL LIFE
Now, I would like to ask you some questions about your social life that suggests the level with which you are happy with your social life. Please answer the following questions as accurately as possible. CODE: [1=YES 2=MAY BE 3=NO]*/

rename sl_1 someone_to_talk
label  var someone_to_talk "Social: 1. There is always someone I can talk to about my day-to-day problems? (please check (ü) one box)"
label def l_someone_to_talk 1 "YES" 2 "MAY BE" 3 "NO"
label values someone_to_talk l_someone_to_talk

rename sl_2 miss_close_frnd
label var miss_close_frnd "Social: 2. I miss having a really close friend? (please check (ü) one box)"
label def l_miss_close_frnd 1 "YES" 2 "MAY BE" 3 "NO"
label values miss_close_frnd l_miss_close_frnd

rename sl_3 emptiness
label  var emptiness "Social: 3. I experience a general sense of emptiness? (please check (ü) one box)"
label def l_emptiness 1 "YES" 2 "MAY BE" 3 "NO"
label values emptiness l_emptiness

rename sl_4 plenty_to_leanon
label  var plenty_to_leanon "Social: 4. There are plenty of people I can lean on when I have problems? (please check (ü) one box)"
label def l_plenty_to_leanon 1 "YES" 2 "MAY BE" 3 "NO"
label values plenty_to_leanon l_plenty_to_leanon

rename sl_5 miss_others_company
label  var miss_others_company "Social: 5. I miss the pleasure of the company of others? (please check (ü) one box)"
label def l_miss_others_company 1 "YES" 2 "MAY BE" 3 "NO"
label values miss_others_company l_miss_others_company

rename sl_6 limited_frnds
```

label var limited_frnds "Social: 6. I find my circle of friends and acquaintances too limited? (please check (ü) one box)"
label def l_limited_frnds 1 "NOT AT ALL" 2 "SEVERAL DAYS" 3 "MORE THAN HALF OF DAYS" 4 "NEARLY EVERY DAY"
label values limited_frnds l_limited_frnds

rename sl_7 ppl_to_trust
label var ppl_to_trust "Social: 7. There are many people I can trust completely? (please check (ü) one box)"
label def l_ppl_to_trust 1 "YES" 2 "MAY BE" 3 "NO"
label values ppl_to_trust l_ppl_to_trust

rename sl_8 close_ppl
label var close_ppl "Social: 8. There are enough people I feel close to? (please check (ü) one box)"
label def l_close_ppl 1 "YES" 2 "MAY BE" 3 "NO"
label values close_ppl l_close_ppl

rename sl_9 miss_ppl_around
label var miss_ppl_around "Social: 9. I miss having people around me? (please check (ü) one box)"
label def l_miss_ppl_around 1 "YES" 2 "MAY BE" 3 "NO"
label values miss_ppl_around l_miss_ppl_around

rename sl_10 feel_rejected
label var feel_rejected "Social: 10. I often feel rejected? (please check (ü) one box)"
label def l_feel_rejected 1 "YES" 2 "MAY BE" 3 "NO"
label values feel_rejected l_feel_rejected

rename sl_11 call_frnds_in_need
label var call_frnds_in_need "Social: 11. I can call on my friends whenever I need them? (please check (ü) one box)"
label def l_call_frnds_in_need 1 "YES" 2 "MAY BE" 3 "NO"
label values call_frnds_in_need

rename sl_12 support_grp_participate
label var support_grp_participate "Support Group: 12. Do you participate in any support groups? For e.g. Nepal Cancer Relief Society, Nepal Cancer Support Group etc."
label def l_support_grp_participate 1 "NEVER" 2 "SOMETIMES" 3 "ALWAYS"
label values support_grp_participate l_support_grp_participate

/*
G. PATIENT-CENTERED COMMUNICATION AND ENHANCED ACCESS TO CARE
Now, I would like to ask you some questions about the relationship/communication between you

and your provider/doctor. This communication is used to find out the quality of care you are getting or the improvements that need to be made in them. Please answer the following questions as accurately as possible.
*/

*1. How difficult is it to get to usual source of care? CODE[1=VERY DIFFICULT 2=SOMEWHAT DIFFICULT 3=NOT TOO DIFFICULT 4=NOT AT ALL DIFFICULT]
rename pcc_1 difficulty_getting_care
label var difficulty_getting_care "Patient Healthcare: 1. How difficult is it to get to usual source of care?"
label def l_difficulty_getting_care 1 "VERY DIFFICULT" 2 "SOMEWHAT DIFFICULT" 3 "NOT TOO DIFFICULT" 4 "NOT AT ALL" 5 "DIFFICULT"
label values difficulty_getting_care l_difficulty_getting_care

*2. How difficult is it to contact usual source of care after hours? CODE[1=VERY DIFFICULT 2=SOMEWHAT DIFFICULT 3=NOT TOO DIFFICULT 4=NOT AT ALL DIFFICULT]
rename pcc_2 difficulty_contacting_care
label var difficulty_contacting_care "Patient Healthcare: 2. How difficult is it to contact usual source of care after hours?"
label def l_difficulty_contacting_care 1 "VERY DIFFICULT" 2 "SOMEWHAT DIFFICULT" 3 "NOT TOO DIFFICULT" 4 "NOT AT ALL" 5 "DIFFICULT"
label values difficulty_contacting_care l_difficulty_contacting_care

save "/Users/admin/Desktop/OneDrive - University of New Mexico/Dissertation/Modified Datasets/Cancer_Data.dta", replace

*****************Analysis******************
clear all

use Cancer_Data.dta
set more off

***Wrong cancer type for one male patient so change it to others
replace cancer_type=11 if cancer_type==5 & gender==0

****************GRAPH perceived causes of cancer known?Yes/no**************
gen cancer_cause_unknown=1 if cause_dontknow==1
replace cancer_cause_unknown=0 if cancer_cause_unknown==.
label def l_cancer_cause_unknown 1"Don't know" 0"Know"
label values cancer_cause_unknown l_cancer_cause_unknown

****************GRAPH perceived causes of cancer****************************
gen causes_cancer=1 if cause_genes==1
replace causes_cancer=2 if cause_smoking==1
replace causes_cancer=3 if cause_phyact==1
replace causes_cancer=4 if cause_sunexpose==1

```
replace causes_cancer=5 if cause_wrongdoing==1
replace causes_cancer=6 if cause_contagious==1
replace causes_cancer=7 if cause_pollutant==1
replace causes_cancer=8 if cause_dirtywater==1
replace causes_cancer=9 if cause_diet==1
replace causes_cancer=10 if cause_other==1
*replace causes_cancer=11 if cause_dontknow==1

label def l_causes_cancer 1"Genetics" 2"Tobacco/smoking" ///
3"lack of physical activity" 4"Sun exposure" 5"Because of bad Karma" ///
6"Contagios" 7"Pollution" 8"Dirty Water" 9"Lack of proper diet" 10"Others"
label values causes_cancer l_causes_cancer

**************Generate dummies for gender**************
gen female=1 if gender==1
replace female=0 if female==.

**************Generate dummies for Cancer/Control**************
gen cancer=1 if cancer_control ==1
replace cancer=0 if cancer==.

gen control=1 if cancer==0
replace control=0 if control==.

*combining trachea in lung
recode cancer_type(6=1)

**************Generate dummies for Cancer Types********
gen lung=1 if cancer_type==1
replace lung=0 if lung==.

gen breast=1 if cancer_type==2
replace breast=0 if breast==.

gen stomach=1 if cancer_type==3
replace stomach=0 if stomach==.

gen headneck=1 if cancer_type==4
replace headneck=0 if headneck==.

gen cervix=1 if cancer_type==5
replace cervix=0 if cervix==.

*gen trachea=1 if cancer_type==6
*replace trachea=0 if trachea==.
```

```
gen colon=1 if cancer_type==7
replace colon=0 if colon==.

gen prostate=1 if cancer_type==8
replace prostate=0 if prostate==.

gen bladder=1 if cancer_type==9
replace bladder=0 if bladder==.

gen oral=1 if cancer_type==10
replace oral=0 if oral==.

gen other_cancer=1 if cancer_type==11
replace other_cancer=0 if other_cancer==.

pca radio bicycle motorcycle fans television sew_mach camera car refrigerator wash_mach
computer
predict wealth_index
label var wealth_index "wealth index"

egen min_wealth_index=min(wealth_index)
egen max_wealth_index=max(wealth_index)
gen z_wealth_index=(wealth_index-min_wealth_index)/(max_wealth_index-min_wealth_index)

gen cancer_causes=1 if cause_genes==1
replace cancer_causes=2 if  cause_smoking==1
replace cancer_causes=3 if  cause_phyact ==1
replace cancer_causes=4 if  cause_sunexpose ==1
replace cancer_causes=5 if  cause_wrongdoing ==1
replace cancer_causes=6 if  cause_contagious ==1
replace cancer_causes=7 if  cause_pollutant ==1
replace cancer_causes=8 if  cause_dirtywater ==1
replace cancer_causes=9 if  cause_diet ==1
replace cancer_causes=10 if  cause_other ==1
replace cancer_causes=11 if  cause_dontknow ==1

****************GRAPH diseases apart from cancer if any************************
gen other_diseases=1 if diabetes==1
replace other_diseases=2 if bloodpressure==1
replace other_diseases=3 if mentaldisorder==1
replace other_diseases=4 if epilepsy==1
replace other_diseases=5 if asthma==1
replace other_diseases=6 if heartdisease==1
replace other_diseases=7 if copd==1
replace other_diseases=8 if alzheimer==1
replace other_diseases=9 if otherdisease==1
```

```
replace other_diseases=10 if nodisease==1

label def l_other_diseases 1"Diabetes" 2"Bloodpressure" ///
3"Mental disorder" 4"Epilepsy" 5"Asthma" ///
6"Heart disease" 7"COPD" 8"Alzheimer" 9"Other disease" 10"None"
label values other_diseases l_other_diseases

*********************************
********Emotional Status*********
*********************************

*recoding emotional status variables**
recode e_little_interest(1=0) (2=1) (3=2) (4=3)
recode e_feeling_down(1=0) (2=1) (3=2) (4=3)
recode e_trouble_sleep(1=0) (2=1) (3=2) (4=3)
recode e_tireness(1=0) (2=1) (3=2) (4=3)
recode e_poor_appetite(1=0) (2=1) (3=2) (4=3)
recode e_feeling_failure(1=0) (2=1) (3=2) (4=3)
recode e_concentration_prob(1=0) (2=1) (3=2) (4=3)
recode e_slow_movement_restless(1=0) (2=1) (3=2) (4=3)
recode e_better_dead(1=0) (2=1) (3=2) (4=3)

*generating emotional status : range 0-27
gen emo_status= e_little_interest+ e_feeling_down+ e_trouble_sleep+ e_tireness+
e_poor_appetite+ e_feeling_failure+ e_concentration_prob+ e_slow_movement_restless+
e_better_dead
label var emo_status "Depression"

****************GRAPH emotional status : range 0-27 for cancer and
control*************************
graph bar emo_status, over(cancer_control) blabel(bar) by(, title(Depression symptoms)
subtitle((PHQ-9 scale))) ///
by(cancer_control) asy legend(col(1) ring(0) position(11)) graphregion(color(white)) name(bar1,
replace) ytitle(Mean)

*generate categories for emotional status: 0-4 None, 5-9 Mild, 10-14 Moderate, 15-19
Moderately Severe, 20-27 Severe
gen emo_status_cat=1 if emo_status>=0 & emo_status<=4
replace emo_status_cat=2 if emo_status>=5 & emo_status<=9
replace emo_status_cat=3 if emo_status>=10 & emo_status<=14
replace emo_status_cat=4 if emo_status>=15 & emo_status<=19
replace emo_status_cat=5 if emo_status>=20 & emo_status<=27

label def l_emo_status_cat 1"None" 2"Mild" 3"Moderate" 4"Moderately Severe" 5"Severe"
label values emo_status_cat l_emo_status_cat
```

```
****************GRAPH emotional status(categorical) : range 0-27 for cancer and
control************************
//graph bar emo_status_cat, over(cancer_control) blabel(bar) by(, title(Level of Depression
Symptoms) subtitle((PHQ-9 scale))) ///
//by(cancer_control) asy legend(col(1) ring(0) position(11)) graphregion(color(white))
name(bar1, replace) ytitle(Mean)

twoway (hist emo_status_cat if cancer_control==1,  color(maroon) percent) ///
	(hist emo_status_cat if cancer_control==2,  fcolor(none) lcolor(black) percent ), ///
		legend(order(1 "Cancer" 2 "Control" )) title(Level of Depression Symptoms)
ytitle(Percentage) xtitle(Depression Caegories)

********Social Life**********************
*****************************************

******Rotate Social life variables are some are in positive context and some are in negative
context******
gen miss_close_frnd_rot=1 if miss_close_frnd==3
replace miss_close_frnd_rot=3 if miss_close_frnd==1
replace miss_close_frnd_rot=2 if miss_close_frnd==2

gen emptiness_rot=1 if emptiness==3
replace emptiness_rot=3 if emptiness==1
replace emptiness_rot=2 if emptiness==2

gen miss_others_company_rot=1 if miss_others_company==3
replace miss_others_company_rot=3 if miss_others_company==1
replace miss_others_company_rot=2 if miss_others_company==2

gen limited_frnds_rot=1 if limited_frnds==3
replace limited_frnds_rot=3 if limited_frnds==1
replace limited_frnds_rot=2 if limited_frnds==2

gen miss_ppl_around_rot=1 if miss_ppl_around==3
replace miss_ppl_around_rot=3 if miss_ppl_around==1
replace miss_ppl_around_rot=2 if miss_ppl_around==2

gen feel_rejected_rot=1 if feel_rejected==3
replace feel_rejected_rot=3 if feel_rejected==1
replace feel_rejected_rot=2 if feel_rejected==2

**create index for social life**
gen soc_life = someone_to_talk + miss_close_frnd_rot + emptiness + plenty_to_leanon +
miss_others_company + limited_frnds + ppl_to_trust  + close_ppl + miss_ppl_around +
feel_rejected + call_frnds_in_need
```

```
/****generate social network variable based on positive questions Currently 1-yes 2-may be 3-no for all positive questions
You need to flip the values which would suggest higher value of social network is better
Prefix all variables with sn to indicate social network*******/
gen sn_someone_to_talk=1 if someone_to_talk==3
replace sn_someone_to_talk=2 if someone_to_talk==2
replace sn_someone_to_talk=3 if someone_to_talk==1
label define soc_network 1"NO" 2"MAY BE" 3"YES"
label values sn_someone_to_talk soc_network

gen sn_plenty_to_leanon=1 if plenty_to_leanon==3
replace sn_plenty_to_leanon=2 if plenty_to_leanon==2
replace sn_plenty_to_leanon=3 if plenty_to_leanon==1
label values sn_plenty_to_leanon soc_network

gen sn_ppl_to_trust=1 if ppl_to_trust==3
replace sn_ppl_to_trust=2 if ppl_to_trust==2
replace sn_ppl_to_trust=3 if ppl_to_trust==1
label values sn_ppl_to_trust soc_network

gen sn_close_ppl=1 if close_ppl==3
replace sn_close_ppl=2 if close_ppl==2
replace sn_close_ppl=3 if close_ppl==1
label values sn_close_ppl soc_network

gen sn_call_frnds_in_need=1 if call_frnds_in_need==3
replace sn_call_frnds_in_need=2 if call_frnds_in_need==2
replace sn_call_frnds_in_need=3 if call_frnds_in_need==1
label values sn_call_frnds_in_need soc_network

***Generate soc_network variable based on the variables above
gen soc_network = sn_someone_to_talk + sn_plenty_to_leanon + sn_ppl_to_trust +
sn_close_ppl + sn_call_frnds_in_need + limited_frnds_rot
label var soc_network "social network"

/*Generate caste variables
50 Caste of |
        the |
 respondent |      Freq     Percent        Cum.
------------+-----------------------------------
    Brahmin |       277       19.66       19.66
    Chhetri |       279       19.80       39.46
   Janajati |       518       36.76       76.22
Pahadi Dalit |       57        4.05       80.27
 Tarai Dalit |       36        2.56       82.82
    Madhesi |       169       11.99       94.82
```

```
     Others |         73        5.18      100.00
-------------+-----------------------------------
      Total |      1,409      100.00
*/

gen brahmin=1 if caste==1
replace brahmin=0 if brahmin==.

gen chhetri=1 if caste==2
replace chhetri=0 if chhetri==.

gen brahmin_chettri=1 if caste==1 | caste==2
replace brahmin_chettri=0 if brahmin_chettri==.

gen janajati=1 if caste==3
replace janajati=0 if janajati==.

gen dalit=1 if caste==4 | caste==5
replace dalit=0 if dalit==.

gen madhesi=1 if caste==6
replace madhesi=0 if madhesi==.

gen others=1 if caste==7
replace others=0 if others==.

gen madhesi_others=1 if  caste==6 | caste==7
replace madhesi_others=0 if madhesi_others==.

gen married=1 if marital_status==2
replace married=0 if married==.

gen single_separated=1 if marital_status==1 | marital_status==3 | marital_status==4
replace single_separated=0 if single_separated==.

gen widow=1 if marital_status==5
replace widow=0 if widow==.

label var other_cancer "other cancer"
label var edu_res "respondent's education"
label var others "other caste"
label var age "respondent's age"
label var child_no "total children"

***Generate a variable for financial hardships using the cost of treatment from Soumi's Phase I
survey of Cancer in Nepal
```

```
*combining cancer types*
gen treatment_cost=85414.8 if cancer_type==1
replace treatment_cost=112734 if cancer_type==2
replace treatment_cost=90717.7 if cancer_type==3
replace treatment_cost=128954 if cancer_type==4
replace treatment_cost=68459 if cancer_type==5
replace treatment_cost=63391.3 if cancer_type==7
replace treatment_cost=118750 if cancer_type==8
replace treatment_cost=101769 if cancer_type==9
replace treatment_cost=87794.1 if cancer_type==10
replace treatment_cost=113813 if cancer_type==11

***calculate hardships for paying for cancer treatment***
count if hardpay_1==4
count if hardpay_1!=4 & hardpay_2==4

gen hardship1=1 if hardpay_1==4
replace hardship1=0 if hardship1==.

gen hardship2=1 if hardpay_2==4 & hardpay_1!=4
replace hardship2=0 if hardship2==.

gen hardship3=1 if hardpay_3==4 & hardpay_2!=4 & hardpay_1!=4
replace hardship3=0 if hardship3==.

gen hardship4=1 if hardpay_4==4 & hardpay_3!=4 & hardpay_2!=4 & hardpay_1!=4
replace hardship4=0 if hardship4==.

gen hardship5=1 if hardpay_5==4 & hardpay_4!=4 & hardpay_3!=4 & hardpay_2!=4 &
hardpay_1!=4
replace hardship5=0 if hardship5==.

gen hardship6=1 if hardpay_6==4 & hardpay_5!=4 & hardpay_4!=4 & hardpay_3!=4 &
hardpay_2!=4 & hardpay_1!=4
replace hardship6=0 if hardship6==.

gen hardship7=1 if hardpay_7==4 & hardpay_6!=4 & hardpay_5!=4 & hardpay_4!=4 &
hardpay_3!=4 & hardpay_2!=4 & hardpay_1!=4
replace hardship7=0 if hardship7==.

gen hardship8=1 if hardpay_8==4 & hardpay_7!=4 & hardpay_6!=4 & hardpay_5!=4 &
hardpay_4!=4 & hardpay_3!=4 & hardpay_2!=4 & hardpay_1!=4
replace hardship8=0 if hardship8==.

gen hardship9=1 if hardpay_9==4 & hardpay_8!=4 & hardpay_7!=4 & hardpay_6!=4 &
hardpay_5!=4 & hardpay_4!=4 & hardpay_3!=4 & hardpay_2!=4 & hardpay_1!=4
```

```
replace hardship9=0 if hardship9==.

gen hardship10=1 if hardpay_10==4 & hardpay_9!=4 & hardpay_8!=4 & hardpay_7!=4 &
hardpay_6!=4 & hardpay_5!=4 & hardpay_4!=4 & hardpay_3!=4 & hardpay_2!=4 &
hardpay_1!=4
replace hardship10=0 if hardship10==.

gen hardship11=1 if hardpay_11==4 & hardpay_10!=4 & hardpay_9!=4 & hardpay_8!=4 &
hardpay_7!=4 & hardpay_6!=4 & hardpay_5!=4 & hardpay_4!=4 & hardpay_3!=4 &
hardpay_2!=4 & hardpay_1!=4
replace hardship11=0 if hardship11==.

gen hardship12=1 if hardpay_12==4 &  hardpay_11!=4 & hardpay_10!=4 & hardpay_9!=4 &
hardpay_8!=4 & hardpay_7!=4 & hardpay_6!=4 & hardpay_5!=4 & hardpay_4!=4 &
hardpay_3!=4 & hardpay_2!=4 & hardpay_1!=4
replace hardship12=0 if hardship12==.

*create categorical variable for hardships
gen hardship=1 if hardship1==1
replace hardship=2 if hardship2==1
replace hardship=3 if hardship3==1
replace hardship=4 if hardship4==1
replace hardship=5 if hardship5==1
replace hardship=6 if hardship6==1
replace hardship=7 if hardship7==1
replace hardship=8 if hardship8==1
replace hardship=9 if hardship9==1
replace hardship=10 if hardship10==1
replace hardship=11 if hardship11==1
replace hardship=12 if hardship12==1

gen threshold=1000 if hardship==1
replace threshold=25000 if hardship==2
replace threshold=50000 if hardship==3
replace threshold=100000 if hardship==4
replace threshold=175000 if hardship==5
replace threshold=300000 if hardship==6
replace threshold=500000 if hardship==7
replace threshold=900000 if hardship==8
replace threshold=1200000 if hardship==9
replace threshold=1700000 if hardship==10
replace threshold=2500000 if hardship==11
replace threshold=3500000 if hardship==12

*calculate maximum affordability and financial hardships for the treatment
replace hardpay_1=99 if hardpay_1==.
```

```
replace hardpay_1=. if hardpay_1==99

replace hardpay_1 = . in 10
replace hardpay_1 = 1 in 305

 replace hardpay_1 = 1 in 291
 replace hardpay_1 = 1 in 288
 replace hardpay_1 = 1 in 281
 replace hardpay_1 = 1 in 129
 replace hardpay_1 = 1 in 123
 replace hardpay_1 = 1 in 122
 replace hardpay_1 = 1 in 119
 replace hardpay_1 = 1 in 118
 replace hardpay_1 = 1 in 10
 replace hardpay_1 = 1 in 419
 replace hardpay_1 = 1 in 413
 replace hardpay_1 = 1 in 412
 replace hardpay_1 = 1 in 545
 replace hardpay_1 = 1 in 546
 replace hardpay_1 = 1 in 554
 replace hardpay_1 = 1 in 555
 replace hardpay_1 = 1 in 578
 replace hardpay_1 = 1 in 581
 replace hardpay_1 = 1 in 602
 replace hardpay_1 = 1 in 672
 replace hardpay_1 = 1 in 680
 replace hardpay_1 = 1 in 691
 replace hardpay_1 = 1 in 750
 replace hardpay_1 = 1 in 764
 replace hardpay_1 = 1 in 765
 replace hardpay_1 = 1 in 767
 replace hardpay_1 = 1 in 689
 replace hardpay_1 = 1 in 953
 replace hardpay_1 = 1 in 949
 replace hardpay_1 = 1 in 970
 replace hardpay_1 = 1 in 974
 replace hardpay_1 = 1 in 1066
 replace hardpay_1 = 1 in 1074
 replace hardpay_1 = 1 in 1156
 replace hardpay_1 = 1 in 1161
 replace hardpay_1 = 1 in 1162
 replace hardpay_1 = 1 in 1177
 replace hardpay_1 = 1 in 1209
 replace hardpay_1 = 1 in 1319
 replace hardpay_1 = 1 in 1320
 replace hardpay_1 = 1 in 1323
```

```
replace hardpay_1 = 1 in 124
replace hardpay_1 = 1 in 112
replace hardpay_1 = 1 in 287
replace hardpay_1 = 1 in 248
replace hardpay_1 = 1 in 341
replace hardpay_1 = 1 in 417
replace hardpay_1 = 1 in 482
replace hardpay_1 = 1 in 543
replace hardpay_1 = 1 in 552
replace hardpay_1 = 1 in 560
replace hardpay_1 = 1 in 565
replace hardpay_1 = 1 in 579
replace hardpay_1 = 1 in 580
replace hardpay_1 = 1 in 582
replace hardpay_1 = 1 in 583
replace hardpay_1 = 1 in 685
replace hardpay_1 = 1 in 686
replace hardpay_1 = 1 in 692
replace hardpay_1 = 1 in 757
replace hardpay_1 = 1 in 760
replace hardpay_1 = 1 in 808
replace hardpay_1 = 1 in 810
replace hardpay_1 = 1 in 838
replace hardpay_1 = 1 in 878
replace hardpay_1 = 1 in 928
replace hardpay_1 = 1 in 931
replace hardpay_1 = 1 in 932
replace hardpay_1 = 1 in 952
replace hardpay_1 = 1 in 954
replace hardpay_1 = 1 in 1013
replace hardpay_1 = 1 in 1014
replace hardpay_1 = 1 in 1100
replace hardpay_1 = 1 in 1101
replace hardpay_1 = 1 in 1158
replace hardpay_1 = 1 in 1160
replace hardpay_1 = 1 in 1283
replace hardpay_1 = 1 in 1289
replace hardpay_1 = 1 in 1318
replace hardpay_1 = 1 in 1322
replace hardpay_1 = 2 in 9
replace hardpay_1 = 2 in 38
replace hardpay_1 = 2 in 79
replace hardpay_1 = 2 in 121
replace hardpay_1 = 2 in 125
replace hardpay_1 = 2 in 289
replace hardpay_1 = 2 in 356
```

```
replace hardpay_1 = 2 in 553
replace hardpay_1 = 2 in 577
replace hardpay_1 = 2 in 668
replace hardpay_1 = 2 in 673
replace hardpay_1 = 2 in 674
replace hardpay_1 = 2 in 917
replace hardpay_1 = 2 in 1021
replace hardpay_1 = 2 in 1163


replace hardpay_1 = 2 in 1305
replace hardpay_1 = 2 in 1309
replace hardpay_1 = 2 in 1324
replace hardpay_6 = 4 in 113
replace hardpay_6 = 2 in 118
replace hardpay_6 = 4 in 159
replace hardpay_6 = 4 in 181
replace hardpay_6 = 4 in 247
replace hardpay_6 = 4 in 249
replace hardpay_6 = 4 in 308
replace hardpay_6 = 4 in 309
replace hardpay_6 = 4 in 310
replace hardpay_6 = 4 in 338
replace hardpay_6 = 4 in 339
replace hardpay_7 = 4 in 341
replace hardpay_6 = 4 in 348
replace hardpay_6 = 4 in 352
replace hardpay_6 = 4 in 353
replace hardpay_6 = 3 in 382
replace hardpay_6 = 3 in 408
replace hardpay_6 = 4 in 409
replace hardpay_6 = 4 in 410
replace hardpay_6 = 4 in 414
replace hardpay_6 = 1 in 415
replace hardpay_6 = 4 in 416
replace hardpay_6 = 4 in 456
replace hardpay_6 = 4 in 458
replace hardpay_6 = 4 in 489
replace hardpay_6 = 4 in 544
replace hardpay_6 = 3 in 549
replace hardpay_6 = 4 in 550
replace hardpay_6 = 4 in 551
replace hardpay_6 = 4 in 559
replace hardpay_6 = 4 in 561
replace hardpay_6 = 4 in 564
replace hardpay_6 = 4 in 566
```

```
replace hardpay_6 = 4 in 573
replace hardpay_6 = 1 in 574
replace hardpay_6 = 4 in 575
replace hardpay_6 = 3 in 576
replace hardpay_6 = 4 in 669
replace hardpay_6 = 4 in 670
replace hardpay_6 = 4 in 671
replace hardpay_6 = 4 in 675
replace hardpay_6 = 4 in 677
replace hardpay_6 = 4 in 679
replace hardpay_6 = 4 in 736
replace hardpay_6 = 4 in 756
replace hardpay_6 = 4 in 759
replace hardpay_6 = 3 in 761
replace hardpay_6 = 3 in 772
replace hardpay_6 = 4 in 784
replace hardpay_6 = 4 in 792
replace hardpay_6 = 4 in 839
replace hardpay_6 = 4 in 840
replace hardpay_6 = 4 in 841
replace hardpay_6 = 4 in 945
replace hardpay_6 = 4 in 1004
replace hardpay_6 = 4 in 1017
replace hardpay_6 = 4 in 1041
replace hardpay_6 = 3 in 1066
replace hardpay_6 = 4 in 1075
replace hardpay_6 = 4 in 1096
replace hardpay_6 = 4 in 1159
replace hardpay_6 = 4 in 1165
replace hardpay_6 = 4 in 1179
replace hardpay_6 = 4 in 1240
replace hardpay_6 = 4 in 1270
replace hardpay_6 = 4 in 1282
replace hardpay_6 = 4 in 1292
replace hardpay_6 = 4 in 1294
replace hardpay_6 = 4 in 1310
replace hardpay_6 = 4 in 1316
replace hardpay_6 = 4 in 1317
replace hardpay_2=4 if hardpay_1==4
replace hardpay_3=4 if hardpay_2==4
replace hardpay_4=4 if hardpay_3==4
replace hardpay_5=4 if hardpay_4==4
replace hardpay_6=4 if hardpay_5==4
replace hardpay_7=4 if hardpay_6==4
replace hardpay_8=4 if hardpay_7==4
replace hardpay_9=4 if hardpay_8==4
```

```
replace hardpay_10=4 if hardpay_9==4
replace hardpay_11=4 if hardpay_10==4
replace hardpay_12=4 if hardpay_11==4

replace hardpay_2=1 if hardpay_1==1 & hardpay_3==1
replace hardpay_3=1 if hardpay_2==1 & hardpay_4==1
replace hardpay_4=1 if hardpay_3==1 & hardpay_5==1
replace hardpay_5=1 if hardpay_4==1 & hardpay_6==1
replace hardpay_6=1 if hardpay_5==1 & hardpay_7==1
replace hardpay_7=1 if hardpay_6==1 & hardpay_8==1
replace hardpay_8=1 if hardpay_7==1 & hardpay_9==1
replace hardpay_9=1 if hardpay_8==1 & hardpay_10==1
replace hardpay_10=1 if hardpay_9==1 & hardpay_11==1
replace hardpay_11=1 if hardpay_10==1 & hardpay_12==1

replace hardpay_2=2 if hardpay_1==2 & hardpay_3==2
replace hardpay_3=2 if hardpay_2==2 & hardpay_4==2
replace hardpay_4=2 if hardpay_3==2 & hardpay_5==2
replace hardpay_5=2 if hardpay_4==2 & hardpay_6==2
replace hardpay_6=2 if hardpay_5==2 & hardpay_7==2
replace hardpay_7=2 if hardpay_6==2 & hardpay_8==2
replace hardpay_8=2 if hardpay_7==2 & hardpay_9==2
replace hardpay_9=2 if hardpay_8==2 & hardpay_10==2
replace hardpay_10=2 if hardpay_9==2 & hardpay_11==2
replace hardpay_11=2 if hardpay_10==2 & hardpay_12==2

replace hardpay_2=3 if hardpay_1==3 & hardpay_3==3
replace hardpay_3=3 if hardpay_2==3 & hardpay_4==3
replace hardpay_4=3 if hardpay_3==3 & hardpay_5==3
replace hardpay_5=3 if hardpay_4==3 & hardpay_6==3
replace hardpay_6=3 if hardpay_5==3 & hardpay_7==3
replace hardpay_7=3 if hardpay_6==3 & hardpay_8==3
replace hardpay_8=3 if hardpay_7==3 & hardpay_9==3
replace hardpay_9=3 if hardpay_8==3 & hardpay_10==3
replace hardpay_10=3 if hardpay_9==3 & hardpay_11==3
replace hardpay_11=3 if hardpay_10==3 & hardpay_12==3

replace hardpay_2=4 if hardpay_1==4 & hardpay_3==4
replace hardpay_3=4 if hardpay_2==4 & hardpay_4==4
replace hardpay_4=4 if hardpay_3==4 & hardpay_5==4
replace hardpay_5=4 if hardpay_4==4 & hardpay_6==4
replace hardpay_6=4 if hardpay_5==4 & hardpay_7==4
replace hardpay_7=4 if hardpay_6==4 & hardpay_8==4
replace hardpay_8=4 if hardpay_7==4 & hardpay_9==4
replace hardpay_9=4 if hardpay_8==4 & hardpay_10==4
replace hardpay_10=4 if hardpay_9==4 & hardpay_11==4
```

```
replace hardpay_11=4 if hardpay_10==4 & hardpay_12==4

gen affordability1=3500000 if hardpay_12==1 & hardpay_12!=.
replace affordability1=0 if affordability1==.

gen affordability2=2500000 if hardpay_11==1 & hardpay_12>1 & hardpay_11!=. &
hardpay_12!=.
replace affordability2=0 if affordability2==.

gen affordability3=1700000 if hardpay_10==1 & hardpay_11>1 & hardpay_12>1 &
hardpay_10!=. & hardpay_11!=. & hardpay_12!=.
replace affordability3=0 if affordability3==.

gen affordability4=1200000 if hardpay_9==1 & hardpay_10>1 & hardpay_11>1 &
hardpay_12>1 & hardpay_9!=. & hardpay_10!=. & hardpay_11!=. & hardpay_12!=.
replace affordability4=0 if affordability4==.

gen affordability5=900000 if hardpay_8==1 & hardpay_9>1 & hardpay_10>1 & hardpay_11>1
& hardpay_12>1 & hardpay_8!=. & hardpay_9!=. & hardpay_10!=. & hardpay_11!=. &
hardpay_12!=.
replace affordability5=0 if affordability5==.

gen affordability6=500000 if hardpay_7==1 & hardpay_8>1 & hardpay_9>1 & hardpay_10>1 &
hardpay_11>1 & hardpay_12>1 & hardpay_7!=. & hardpay_8!=. & hardpay_9!=. &
hardpay_10!=. & hardpay_11!=. & hardpay_12!=.
replace affordability6=0 if affordability6==.

gen affordability7=300000 if hardpay_6==1 & hardpay_7>1 & hardpay_8>1 & hardpay_9>1 &
hardpay_10>1 & hardpay_11>1 & hardpay_12>1 & hardpay_6!=. & hardpay_7!=. &
hardpay_8!=. & hardpay_9!=. & hardpay_10!=. & hardpay_11!=. & hardpay_12!=.
replace affordability7=0 if affordability7==.

gen affordability8=175000 if hardpay_5==1 & hardpay_6>1 & hardpay_7>1 & hardpay_8>1 &
hardpay_9>1 & hardpay_10>1 & hardpay_11>1 & hardpay_12>1 & hardpay_5!=. &
hardpay_6!=. & hardpay_7!=. & hardpay_8!=. & hardpay_9!=. & hardpay_10!=. &
hardpay_11!=. & hardpay_12!=.
replace affordability8=0 if affordability8==.

gen affordability9=100000 if hardpay_4==1 & hardpay_5>1 & hardpay_6>1 & hardpay_7>1 &
hardpay_8>1 & hardpay_9>1 & hardpay_10>1 & hardpay_11>1 & hardpay_12>1 &
hardpay_4!=. & hardpay_5!=. & hardpay_6!=. & hardpay_7!=. & hardpay_8!=. & hardpay_9!=.
& hardpay_10!=. & hardpay_11!=. & hardpay_12!=.
replace affordability9=0 if affordability9==.

gen affordability10=50000 if hardpay_3==1 & hardpay_4>1 & hardpay_5>1 & hardpay_6>1 &
hardpay_7>1 & hardpay_8>1 & hardpay_9>1 & hardpay_10>1 & hardpay_11>1 &
```

hardpay_12>1 & hardpay_3!=. & hardpay_4!=. & hardpay_5!=. & hardpay_6!=. & hardpay_7!=. & hardpay_8!=. & hardpay_9!=. & hardpay_10!=. & hardpay_11!=. & hardpay_12!=.
replace affordability10=0 if affordability10==.

gen affordability11=25000 if hardpay_2==1 & hardpay_3>1 & hardpay_4>1 & hardpay_5>1 & hardpay_6>1 & hardpay_7>1 & hardpay_8>1 & hardpay_9>1 & hardpay_10>1 & hardpay_11>1 & hardpay_12>1 & hardpay_2!=. & hardpay_3!=. & hardpay_4!=. & hardpay_5!=. & hardpay_6!=. & hardpay_7!=. & hardpay_8!=. & hardpay_9!=. & hardpay_10!=. & hardpay_11!=. & hardpay_12!=.
replace affordability11=0 if affordability11==.

gen affordability12=1000 if hardpay_1==1 & hardpay_2>1 & hardpay_3>1 & hardpay_4>1 & hardpay_5>1 & hardpay_6>1 & hardpay_7>1 & hardpay_8>1 & hardpay_9>1 & hardpay_10>1 & hardpay_11>1 & hardpay_12>1 & hardpay_1!=. & hardpay_2!=. & hardpay_3!=. & hardpay_4!=. & hardpay_5!=. & hardpay_6!=. & hardpay_7!=. & hardpay_8!=. & hardpay_9!=. & hardpay_10!=. & hardpay_11!=. & hardpay_12!=.
replace affordability12=0 if affordability12==.

****Now we have many values that are in negative for affordability ratio. assign maximum value for someone whose affordability is higher than cost
gen aff_ratio=.

replace aff_ratio=affordability1/85414.8 if cancer_type==1 & affordability1==3500000
replace aff_ratio=affordability1/112734 if cancer_type==2 & affordability1==3500000
replace aff_ratio=affordability1/90717.7 if cancer_type==3 & affordability1==3500000
replace aff_ratio=affordability1/128954 if cancer_type==4 & affordability1==3500000
replace aff_ratio=affordability1/68459 if cancer_type==5 & affordability1==3500000
replace aff_ratio=affordability1/63391.3 if cancer_type==7 & affordability1==3500000
replace aff_ratio=affordability1/118750 if cancer_type==8 & affordability1==3500000
replace aff_ratio=affordability1/101769 if cancer_type==9 & affordability1==3500000
replace aff_ratio=affordability1/87794.1 if cancer_type==10 & affordability1==3500000
replace aff_ratio=affordability1/113813 if cancer_type==11 & affordability1==3500000

replace aff_ratio=affordability2/85414.8 if cancer_type==1 & affordability2==2500000
replace aff_ratio=affordability2/112734 if cancer_type==2 & affordability2==2500000
replace aff_ratio=affordability2/90717.7 if cancer_type==3 & affordability2==2500000
replace aff_ratio=affordability2/128954 if cancer_type==4 & affordability2==2500000
replace aff_ratio=affordability2/68459 if cancer_type==5 & affordability2==2500000
replace aff_ratio=affordability2/63391.3 if cancer_type==7 & affordability2==2500000
replace aff_ratio=affordability2/118750 if cancer_type==8 & affordability2==2500000
replace aff_ratio=affordability2/101769 if cancer_type==9 & affordability2==2500000
replace aff_ratio=affordability2/87794.1 if cancer_type==10 & affordability2==2500000
replace aff_ratio=affordability2/113813 if cancer_type==11 & affordability2==2500000

replace aff_ratio=affordability3/85414.8 if cancer_type==1 & affordability3==1700000

```
replace aff_ratio=affordability3/112734 if cancer_type==2 & affordability3==1700000
replace aff_ratio=affordability3/90717.7 if cancer_type==3 & affordability3==1700000
replace aff_ratio=affordability3/128954 if cancer_type==4 & affordability3==1700000
replace aff_ratio=affordability3/68459 if cancer_type==5 & affordability3==1700000
replace aff_ratio=affordability3/63391.3 if cancer_type==7 & affordability3==1700000
replace aff_ratio=affordability3/118750 if cancer_type==8 & affordability3==1700000
replace aff_ratio=affordability3/101769 if cancer_type==9 & affordability3==1700000
replace aff_ratio=affordability3/87794.1 if cancer_type==10 & affordability3==1700000
replace aff_ratio=affordability3/113813 if cancer_type==11 & affordability3==1700000

replace aff_ratio=affordability4/85414.8 if cancer_type==1 & affordability4==1200000
replace aff_ratio=affordability4/112734 if cancer_type==2 & affordability4==1200000
replace aff_ratio=affordability4/90717.7 if cancer_type==3 & affordability4==1200000
replace aff_ratio=affordability4/128954 if cancer_type==4 & affordability4==1200000
replace aff_ratio=affordability4/68459 if cancer_type==5 & affordability4==1200000
replace aff_ratio=affordability4/63391.3 if cancer_type==7 & affordability4==1200000
replace aff_ratio=affordability4/118750 if cancer_type==8 & affordability4==1200000
replace aff_ratio=affordability4/101769 if cancer_type==9 & affordability4==1200000
replace aff_ratio=affordability4/87794.1 if cancer_type==10 & affordability4==1200000
replace aff_ratio=affordability4/113813 if cancer_type==11 & affordability4==1200000

replace aff_ratio=affordability5/85414.8 if cancer_type==1 & affordability5==900000
replace aff_ratio=affordability5/112734 if cancer_type==2 & affordability5==900000
replace aff_ratio=affordability5/90717.7 if cancer_type==3 & affordability5==900000
replace aff_ratio=affordability5/128954 if cancer_type==4 & affordability5==900000
replace aff_ratio=affordability5/68459 if cancer_type==5 & affordability5==900000
replace aff_ratio=affordability5/63391.3 if cancer_type==7 & affordability5==900000
replace aff_ratio=affordability5/118750 if cancer_type==8 & affordability5==900000
replace aff_ratio=affordability5/101769 if cancer_type==9 & affordability5==900000
replace aff_ratio=affordability5/87794.1 if cancer_type==10 & affordability5==900000
replace aff_ratio=affordability5/113813 if cancer_type==11 & affordability5==900000

replace aff_ratio=affordability6/85414.8 if cancer_type==1 & affordability6==500000
replace aff_ratio=affordability6/112734 if cancer_type==2 & affordability6==500000
replace aff_ratio=affordability6/90717.7 if cancer_type==3 & affordability6==500000
replace aff_ratio=affordability6/128954 if cancer_type==4 & affordability6==500000
replace aff_ratio=affordability6/68459 if cancer_type==5 & affordability6==500000
replace aff_ratio=affordability6/63391.3 if cancer_type==7 & affordability6==500000
replace aff_ratio=affordability6/118750 if cancer_type==8 & affordability6==500000
replace aff_ratio=affordability6/101769 if cancer_type==9 & affordability6==500000
replace aff_ratio=affordability6/87794.1 if cancer_type==10 & affordability6==500000
replace aff_ratio=affordability6/113813 if cancer_type==11 & affordability6==500000

replace aff_ratio=affordability7/85414.8 if cancer_type==1 & affordability7==300000
replace aff_ratio=affordability7/112734 if cancer_type==2 & affordability7==300000
replace aff_ratio=affordability7/90717.7 if cancer_type==3 & affordability7==300000
```

```
replace aff_ratio=affordability7/128954 if cancer_type==4 & affordability7==300000
replace aff_ratio=affordability7/68459 if cancer_type==5 & affordability7==300000
replace aff_ratio=affordability7/63391.3 if cancer_type==7 & affordability7==300000
replace aff_ratio=affordability7/118750 if cancer_type==8 & affordability7==300000
replace aff_ratio=affordability7/101769 if cancer_type==9 & affordability7==300000
replace aff_ratio=affordability7/87794.1 if cancer_type==10 & affordability7==300000
replace aff_ratio=affordability7/113813 if cancer_type==11 & affordability7==300000

replace aff_ratio=affordability8/85414.8 if cancer_type==1 & affordability8==175000
replace aff_ratio=affordability8/112734 if cancer_type==2 & affordability8==175000
replace aff_ratio=affordability8/90717.7 if cancer_type==3 & affordability8==175000
replace aff_ratio=affordability8/128954 if cancer_type==4 & affordability8==175000
replace aff_ratio=affordability8/68459 if cancer_type==5 & affordability8==175000
replace aff_ratio=affordability8/63391.3 if cancer_type==7 & affordability8==175000
replace aff_ratio=affordability8/118750 if cancer_type==8 & affordability8==175000
replace aff_ratio=affordability8/101769 if cancer_type==9 & affordability8==175000
replace aff_ratio=affordability8/87794.1 if cancer_type==10 & affordability8==175000
replace aff_ratio=affordability8/113813 if cancer_type==11 & affordability8==175000

replace aff_ratio=affordability9/85414.8 if cancer_type==1 & affordability9==100000
replace aff_ratio=affordability9/112734 if cancer_type==2 & affordability9==100000
replace aff_ratio=affordability9/90717.7 if cancer_type==3 & affordability9==100000
replace aff_ratio=affordability9/128954 if cancer_type==4 & affordability9==100000
replace aff_ratio=affordability9/68459 if cancer_type==5 & affordability9==100000
replace aff_ratio=affordability9/63391.3 if cancer_type==7 & affordability9==100000
replace aff_ratio=affordability9/118750 if cancer_type==8 & affordability9==100000
replace aff_ratio=affordability9/101769 if cancer_type==9 & affordability9==100000
replace aff_ratio=affordability9/87794.1 if cancer_type==10 & affordability9==100000
replace aff_ratio=affordability9/113813 if cancer_type==11 & affordability9==100000

replace aff_ratio=affordability10/85414.8 if cancer_type==1 & affordability10==50000
replace aff_ratio=affordability10/112734 if cancer_type==2 & affordability10==50000
replace aff_ratio=affordability10/90717.7 if cancer_type==3 & affordability10==50000
replace aff_ratio=affordability10/128954 if cancer_type==4 & affordability10==50000
replace aff_ratio=affordability10/68459 if cancer_type==5 & affordability10==50000
replace aff_ratio=affordability10/63391.3 if cancer_type==7 & affordability10==50000
replace aff_ratio=affordability10/118750 if cancer_type==8 & affordability10==50000
replace aff_ratio=affordability10/101769 if cancer_type==9 & affordability10==50000
replace aff_ratio=affordability10/87794.1 if cancer_type==10 & affordability10==50000
replace aff_ratio=affordability10/113813 if cancer_type==11 & affordability10==50000

replace aff_ratio=affordability11/85414.8 if cancer_type==1 & affordability11==25000
replace aff_ratio=affordability11/112734 if cancer_type==2 & affordability11==25000
replace aff_ratio=affordability11/90717.7 if cancer_type==3 & affordability11==25000
replace aff_ratio=affordability11/128954 if cancer_type==4 & affordability11==25000
replace aff_ratio=affordability11/68459 if cancer_type==5 & affordability11==25000
```

```
replace aff_ratio=affordability11/63391.3 if cancer_type==7 & affordability11==25000
replace aff_ratio=affordability11/118750 if cancer_type==8 & affordability11==25000
replace aff_ratio=affordability11/101769 if cancer_type==9 & affordability11==25000
replace aff_ratio=affordability11/87794.1 if cancer_type==10 & affordability11==25000
replace aff_ratio=affordability11/113813 if cancer_type==11 & affordability11==25000

replace aff_ratio=affordability12/85414.8 if cancer_type==1 & affordability12==1000
replace aff_ratio=affordability12/112734 if cancer_type==2 & affordability12==1000
replace aff_ratio=affordability12/90717.7 if cancer_type==3 & affordability12==1000
replace aff_ratio=affordability12/128954 if cancer_type==4 & affordability12==1000
replace aff_ratio=affordability12/68459 if cancer_type==5 & affordability12==1000
replace aff_ratio=affordability12/63391.3 if cancer_type==7 & affordability12==1000
replace aff_ratio=affordability12/118750 if cancer_type==8 & affordability12==1000
replace aff_ratio=affordability12/101769 if cancer_type==9 & affordability12==1000
replace aff_ratio=affordability12/87794.1 if cancer_type==10 & affordability12==1000
replace aff_ratio=affordability12/113813 if cancer_type==11 & affordability12==1000

/****Lower affordability indicates higher hardships. We want to have an index in such a way
which means higher the index higher the burden.
so we create hardship variable from affordability variables*/
gen fin_burden=1-aff_ratio

*replace negative fin burden = 0
replace fin_burden=0 if fin_burden<0
*replace fin_burden=1 if fin_burden>1 need to deal with missing values for fin_burden

**Stadarardize all the qol attributes
	egen min_level_pain=min(level_pain)
	egen max_level_pain=max(level_pain)
gen z_level_pain=(level_pain-min_level_pain)/(max_level_pain-min_level_pain)

gen mobility_problem=1 if level_mob==2 | level_mob==3
	egen min_level_mob=min(level_mob)
	egen max_level_mob=max(level_mob)
gen z_level_mob=(level_mob-min_level_mob)/(max_level_mob-min_level_mob)

	egen min_level_selfcare=min(level_selfcare)
	egen max_level_selfcare=max(level_selfcare)
gen z_level_selfcare=(level_selfcare-min_level_selfcare)/(max_level_selfcare-
min_level_selfcare)

	egen min_level_usualact=min(level_usualact)
	egen max_level_usualact=max(level_usualact)
gen z_level_usualact=(level_usualact-min_level_usualact)/(max_level_usualact-
min_level_usualact)
```

***pain, mobility, self-care, usual-activities, (depression?). Use stressor as a mediator in mediation analysis.
gen stressor3=z_level_pain + z_level_mob + z_level_selfcare + z_level_usualact + fin_burden

Summary Statistics of cancer patients
sum emo_status soc_network stressor3 lung breast stomach headneck cervix colon prostate bladder ///
oral other_cancer wealth_index single married widow female edu_res age child_no brahmin_chettri ///
janajati dalit madhesi others if cancer==1

***Running simple ols regression on depression
***Table 5, Model sp(1) : regression on depression index on CANCER sample using cancer type and social network(only cancer, N=1002)
clear matrix
reg emo_status soc_network lung breast stomach headneck cervix colon prostate bladder oral ///
married widow female edu_res age child_no janajati dalit madhesi others if cancer==1, robust
eststo

***Table 5, Model sp(2) : regression on depression index on MALE CANCER sample using cancer type and social network(only cancer, N=381)
reg emo_status soc_network lung breast stomach headneck cervix colon prostate bladder oral ///
married widow edu_res age child_no janajati dalit madhesi others if female==0 & cancer==1, robust
eststo

***Table 5, Model sp(3) : regression on depression index on FEMALE CANCER sample using cancer type and social network(both cancer and control, N=621)
reg emo_status soc_network lung breast stomach headneck cervix colon prostate bladder oral ///
married widow edu_res age child_no janajati dalit madhesi others if female==1 & cancer==1, robust
eststo

***OLOGIT: next three columns for ologit of depression categories
***Table 5, Model sp(4) : ologit on depression categories on CANCER sample using cancer type and social network(both cancer and control, N=1002)
ologit emo_status_cat soc_network lung breast stomach headneck cervix colon prostate bladder oral ///
married widow edu_res age child_no janajati dalit madhesi others if cancer==1, robust
eststo

***Table 5, Model sp(5) : ologit on depression categories on MALE CANCER sample using cancer type and social network(both cancer and control, N=381)
ologit emo_status_cat soc_network lung breast stomach headneck cervix colon prostate bladder oral ///

```
married widow edu_res age child_no janajati dalit madhesi others if female==0 & cancer==1,
robust
eststo

***Table 5, Model sp(6) : ologit on depression categories on FEMALE CANCER sample using
cancer type and social network(both cancer and control, N=621)
ologit emo_status_cat soc_network lung breast stomach headneck cervix colon prostate bladder
oral  ///
married widow edu_res age child_no janajati dalit madhesi others if female==1 & cancer==1,
robust
eststo

esttab using "ols_ologit.rtf", replace cells(b(star fmt(%9.3f)) se(par)) drop(${cancer_type}
${controls}) ///
stats(cancer_type controls sp N aic bic r2 ll chi2, labels(`"Cancer Type"' `"Individual and
Household Controls"' ///
`" "' `"N"' `"AIC"' `"BIC"' `"Rsquare"' `"Log-likelihood"' `"Chi-square"')) title(Estimates of
depression among cancer patients)

********Table 6 - SEM - Choose best model first********
clear matrix
sem (emo_status <-  stressor3 soc_network female) ///
(stressor3 <- soc_network lung breast stomach headneck cervix colon prostate bladder oral age)
///
(soc_network <- wealth_index married widow edu_res) if cancer==1, vce(robust)
cov(e.soc_network*e.stressor3)
eststo
*estat teffects
est store main1
te_direct
est store direct1
est restore main1
te_indirect
est store indirect1
est restore main1
te_total
est store total1
*esttab direct indirect total, mtitles(direct indirect total)

sem (emo_status <-  stressor3 soc_network female married widow age) ///
(stressor3 <- soc_network lung breast stomach headneck cervix colon prostate bladder oral age
child_no) ///
(soc_network <- wealth_index age married widow edu_res) if cancer==1, vce(robust)
cov(e.soc_network*e.stressor3)
eststo
est store main2
```

```
te_direct
est store direct2
est restore main2
te_indirect
est store indirect2
est restore main2
te_total
est store total2

sem (emo_status <-  stressor3 soc_network female married widow age child_no) ///
(stressor3 <- soc_network lung breast stomach headneck cervix colon prostate bladder oral ///
married widow  age child_no) ///
(soc_network <- wealth_index age married widow edu_res janajati dalit madhesi others) if
cancer==1, vce(robust) cov(e.soc_network*e.stressor3)
eststo
*estat teffects
est store main3
te_direct
est store direct3
est restore main3
te_indirect
est store indirect3
est restore main3
te_total
est store total3

**Table 7: after choosing best model above - sem model on pooled cancer, men cancer and
women cancer sample***
clear matrix
**pooled
sem (emo_status <-  stressor3 soc_network female) ///
(stressor3 <- soc_network lung breast stomach headneck cervix colon prostate bladder oral age)
///
(soc_network <- wealth_index married widow edu_res) if cancer==1, vce(robust)
cov(e.soc_network*e.stressor3)
eststo
*estat teffects
est store main
te_direct
est store direct
est restore main
te_indirect
est store indirect
est restore main
te_total
est store total
```

```
**men cancer sample
sem (emo_status <-  stressor3 soc_network) ///
(stressor3 <- soc_network lung breast stomach headneck cervix colon prostate bladder oral age)
///
(soc_network <- wealth_index married widow edu_res) if cancer==1 & female==0, vce(robust)
cov(e.soc_network*e.stressor3)
eststo
*estat teffects
est store main_men
te_direct
est store direct_men
est restore main_men
te_indirect
est store indirect_men
est restore main_men
te_total
est store total_men

**women cancer sample
sem (emo_status <-  stressor3 soc_network) ///
(stressor3 <- soc_network lung breast stomach headneck cervix colon prostate bladder oral age)
///
(soc_network <- wealth_index married widow edu_res) if cancer==1 & female==1, vce(robust)
cov(e.soc_network*e.stressor3)
eststo
*estat teffects
est store main_women
te_direct
est store direct_women
est restore main_women
te_indirect
est store indirect_women
est restore main_women
te_total
est store total_women

esttab direct indirect total direct_men indirect_men total_men direct_women indirect_women
total_women ///
using "sem_men_women_bestmodel.rtf", replace cells(b(star fmt(%9.3f)) se(par))
drop(${cancer_type}) ///
stats(cancer_type controls sp N aic bic r2 ll, labels(`"Cancer Type"' ///
`" "' `"Observations"' `"AIC"' `"BIC"' `"Rsquare"' `"Log-pseudolikelihood"')) ///
title(Estimates of depression in cancer patients by gender using Structural Equation Modelling)
///
mtitles(Direct Indirect Total Direct Indirect Total) label
```

```
*******Table 9-depression categorical by gender******
clear matrix
gsem (emo_status_cat <-  stressor3 soc_network female, oprobit) ///
(stressor3 <- soc_network lung breast stomach headneck cervix colon prostate bladder oral age)
///
(soc_network <- wealth_index married widow edu_res) if cancer==1, vce(robust)
eststo

gsem (emo_status_cat <-  stressor3 soc_network, oprobit) ///
(stressor3 <- soc_network lung breast stomach headneck cervix colon prostate bladder oral age)
///
(soc_network <- wealth_index married widow edu_res) if cancer==1 & female==0, vce(robust)
eststo

gsem (emo_status_cat <-  stressor3 soc_network, oprobit) ///
(stressor3 <- soc_network lung breast stomach headneck cervix colon prostate bladder oral age)
///
(soc_network <- wealth_index married widow edu_res) if cancer==1 & female==1, vce(robust)
eststo

esttab using "sem_men_women_best_cat.rtf", unstack replace cells(b(star fmt(%9.3f)) se(par))
drop(${cancer_type}) ///
stats(cancer_type controls sp N aic bic r2 ll, labels(`"Cancer Type"' ///
`" "' `"Observations"' `"AIC"' `"BIC"' `"Rsquare"' `"Log-pseudolikelihood"')) ///
title(Estimates of depression in cancer patients by gender using Structural Equation Modelling)
///
mtitles(Depression Stress appraisal Social network Depression Stress appraisal Social network)
label

**Table 10-long hand mediation
clear matrix
reg emo_status soc_network lung breast stomach headneck cervix colon prostate bladder oral ///
married widow female janajati dalit madhesi_others if cancer==1
eststo

reg emo_status stressor3 lung breast stomach headneck cervix colon prostate bladder oral ///
married widow female janajati dalit madhesi_others if cancer==1
eststo

reg stressor3 soc_network lung breast stomach headneck cervix colon prostate bladder oral ///
married widow female janajati dalit madhesi_others if cancer==1
eststo

reg emo_status stressor3 soc_network lung breast stomach headneck cervix colon prostate
bladder oral ///
```

```
married widow female janajati dalit madhesi_others if cancer==1
eststo

esttab using "mediation_all.rtf", replace cells(b(star fmt(%9.3f)) se(par)) drop(${cancer_type})
///
stats(cancer_type controls N aic bic r2 ll, labels(`"Cancer Type"' ///
`" "' `"N"' `"AIC"' `"BIC"' `"Rsquare"' `"Log-likelihood"')) ///
title(Mediation analysis of depression in cancer patients) label


	***get direct and indirect effects using sgmediation package for above regressions and
manually enter in table 10
	bootstrap _b r(dir_eff) r(ind_eff), reps(100): ///
	sgmediation emo_status if cancer==1, mv(stressor3) ///
	iv(soc_network) cv(lung breast stomach headneck cervix colon prostate bladder oral ///
	married widow female janajati dalit madhesi_others)
	estat bootstrap, percentile


*step by step mediation analysis*
*gender wise - men only
clear matrix
reg emo_status soc_network lung breast stomach headneck cervix colon prostate bladder oral ///
married widow female janajati dalit madhesi_others if cancer==1 & female==0
eststo

reg emo_status stressor3 lung breast stomach headneck cervix colon prostate bladder oral ///
married widow female janajati dalit madhesi_others if cancer==1 & female==0
eststo

reg stressor3 soc_network lung breast stomach headneck cervix colon prostate bladder oral ///
married widow female janajati dalit madhesi_others if cancer==1 & female==0
eststo

reg emo_status stressor3 soc_network lung breast stomach headneck cervix colon prostate
bladder oral ///
married widow female janajati dalit madhesi_others if cancer==1 & female==0
eststo

	***get direct and indirect effects using sgmediation package for above regressions and
manually enter in table 11
	bootstrap _b r(dir_eff) r(ind_eff), reps(100): ///
	sgmediation emo_status if cancer==1 & female==0, mv(stressor3) ///
	iv(soc_network) cv(lung breast stomach headneck cervix colon prostate bladder oral ///
	married widow janajati dalit madhesi_others)
	estat bootstrap, percentile
```

```
*women only
bootstrap _b r(dir_eff) r(ind_eff), reps(100):
reg emo_status soc_network lung breast stomach headneck cervix colon prostate bladder oral ///
married widow female janajati dalit madhesi_others if cancer==1 & female==1
eststo

reg emo_status stressor3 lung breast stomach headneck cervix colon prostate bladder oral ///
married widow female janajati dalit madhesi_others if cancer==1 & female==1
eststo

reg stressor3 soc_network lung breast stomach headneck cervix colon prostate bladder oral ///
married widow female janajati dalit madhesi_others if cancer==1 & female==1
eststo

reg emo_status stressor3 soc_network lung breast stomach headneck cervix colon prostate
bladder oral ///
married widow female janajati dalit madhesi_others if cancer==1 & female==1
eststo

esttab using "mediation_gender.rtf", replace cells(b(star fmt(%9.3f)) se(par))
drop(${cancer_type}) ///
stats(cancer_type controls N aic bic r2 ll, labels(`"Cancer Type"' `"Controls"' ///
 `"N"' `"AIC"' `"BIC"' `"Rsquare"' `"Log-likelihood"')) ///
title(Mediation analysis of depression in cancer patients by gender) label

	***get direct and indirect effects using sgmediation package for above regressions and
manually enter in table 11
	bootstrap _b r(dir_eff) r(ind_eff), reps(100): ///
	sgmediation emo_status if cancer==1 & female==1, mv(stressor3) ///
	iv(soc_network) cv(lung breast stomach headneck cervix colon prostate bladder oral ///
	married widow janajati dalit madhesi_others)
	estat bootstrap, percentile

***************************************************************
*************************Chapter three***********************
***************************************************************
clear all
set more off
cd "/Users/admin/Desktop/OneDrive - University of New Mexico/UNM courses & duties/RA
Fall 2019/Datasets/Merged/ACS 1 year"
use ACS151617_pus_hus_ab_young.dta, replace
set more off

bro dis mil fincp hins1 hins2 hins3 hins4 hins5 hins6 hins7 if privcov==1 & pubcov==1
**drop people other than young adults from the sample.
```

```
keep if agep>17 & agep<27

*delete ppl on active duty in military and reserves
keep if mil!=1 & mil!=3

gen pub_priv_cov=1 if privcov==1 & pubcov==1
	recode pub_priv_cov(.=0)
keep if pub_priv_cov!=1

****generate race dummies
gen hispanic=1 if hisp!=1
	recode hispanic(.=0)
	label var hispanic "Hispanic"

gen white=1 if rac1p==1 & hisp==1
	recode white(.=0)
	label var white "White"

gen black=1 if rac1p==2 & hisp==1
	recode black(.=0)
	label var black "Black"

**drop other races. Keep only H W and Blacks in sample
keep if hispanic==1 | white==1 | black==1

**create race category
gen race_cat=1 if hispanic==1
replace race_cat=2 if white==1
replace race_cat=3 if black==1

label def l_race_cat 1"Hispanic" 2"White" 3"Black"
label values race_cat l_race_cat

***create gender dummies
gen male=1 if sex==1
	recode male(.=0)

gen female=1 if sex==2
	recode female(.=0)

****create a var for insured vs uninsured
gen coverage=1 if hicov==1
	replace coverage=0 if hicov==2
	label def l_coverage 1"Insured" 0"Uninsured"
	label values coverage l_coverage
```

```
****create a binary var for uninsured
gen uninsured=1 if hicov==2
	replace uninsured=0 if hicov==1
	label var uninsured "Uninsured"
	label def yesno 1"Yes" 0"No"
	label values uninsured yesno

**** a binary var for public
	recode pubcov(2=0)
	label values pubcov yesno
	label var pubcov "Public"

**** a binary var for private
	recode privcov(2=0)
	label values privcov yesno
	label var privcov "Private"

*gen new variable to categorize uninsured, public and private coverage
gen cov_type=1 if privcov==1
	replace cov_type=2 if uninsured==1
	replace cov_type=3 if pubcov==1
	label var cov_type "Coverage Type"
	label def l_cov_type 1"Private" 2"Uninsured" 3"Public"
	label values cov_type l_cov_type

*source of insurance
gen cov_source=1 if fhins1p==1
	replace cov_source=2 if fhins2p==1

	label def l_cov_source 1"Employer" 2"Purchased directly"
	label values cov_source l_cov_source
	label var cov_source "Source of health insurance coverage"

*create health status variable
gen disability=1 if dis==2
	replace disability=0 if dis==1

	label var disability "Disability"
	label values disability yesno

**gen year dummies
tab year, gen(dyear)
	renvarlab dyear1 dyear2 dyear3  \ year_2015 year_2016 year_2017
	labvars year_2015 year_2016 year_2017  \ "2015" "2016" "2017"

**gen region dummies
```

```
tab region, gen(dregion)
	renvarlab dregion1 dregion2 dregion3 dregion4 \ northeast midwest south west
	labvars northeast midwest south west \ "Northeast" "Midwest" "South" "West"

***create dummy for US citizenship
gen citizen=1 if cit==1 | cit==2 | cit==3 | cit==4
	replace citizen=0 if cit==5
	label values citizen yesno

***create category var for Education level
gen educ=1 if schl==1 | schl==2| schl==3 | schl==4 | schl==5 | schl==6 | schl==7 | schl==8 |
schl==9 | schl==10 | schl==11 | schl==12 | schl==13 | schl==14 | schl==15
	replace educ=2 if schl==16 | schl==17
	replace educ=3 if schl==18 | schl==19
	replace educ=4 if schl==20
	replace educ=5 if schl==21
	replace educ=6 if  schl==22 | schl==23 | schl==24

	label def l_educ 1"High School or less" 2"High school or equivalent" 3"Some college"
4"Associate's degree" 5"Bachelor's degree" 6"Master's degree or above"
	label values educ l_educ
	label var educ "Education level"

tab educ, gen(deduc)
	renvarlab deduc1 deduc2 deduc3 deduc4 deduc5 deduc6\ educ_lt_HS educ_HS
educ_somecol educ_associate educ_bachelor educ_grad
	labvars educ_lt_HS educ_HS educ_somecol educ_associate educ_bachelor educ_grad \
///
	"High School or less" "High school or equivalent" "Some college" "Associate's degree"
"Bachelor's degree" "Master's degree or above"

***gen labor_force
gen labor_force=1 if esr==1 | esr==2 | esr==3
	replace labor_force=0 if esr==6
	label values labor_force yesno

gen out_of_laborforce=1 if esr==6
	replace out_of_laborforce=0 if esr==1 | esr==2 | esr==3
	label var out_of_laborforce "Out of labor force"
	label values out_of_laborforce yesno

***Work-employment
gen employed=1 if esr==1 | esr==2
	replace employed=0 if esr==3
	label var employed "Employed"
	label values employed yesno
```

```
gen unemployed=1 if esr==3
	replace unemployed=0 if esr==1 | esr==2
	label var unemployed "Unemployed"
	label values unemployed yesno

gen emp_status=1 if employed==1
	replace emp_status=2 if unemployed==1
	replace emp_status=3 if out_of_laborforce==1

label def l_emp_status 1"Employed" 2"Unemployed" 3"Out of labor force"
label values emp_status l_emp_status

**number of hours worked**
gen numhrs=wkhp
	replace numhrs=0 if unemployed==1

gen hours_worked=1 if numhrs<30 & unemployed==0
	replace hours_worked=2 if numhrs>=30 & unemployed==0
	replace hours_worked=3 if unemployed==1
	replace hours_worked=4 if out_of_laborforce==1

	label def l_hours_worked 1"Part time" 2"Full time" 3"Unemployed" 4"Out of labor
force"
	label values hours_worked l_hours_worked //use this variable instead of emp_status as
this captures parttime, fulltime, unemp and oolf

tabulate hours_worked, generate(dhours_worked)
renvarlab dhours_worked1 dhours_worked2 dhours_worked3 dhours_worked4\ hw_part_time
hw_full_time hw_unemployed hw_olf
labvars hw_part_time hw_full_time hw_unemployed hw_olf\"Part time" "Full time"
"Unemployed""Out of labor force"

///Only employed and parttime
gen emp_parttime=1 if employed==1 & numhrs<30
	replace emp_parttime=0 if employed==1 & numhrs>=30
	label var emp_parttime "Employed and working part-time"

gen parttime=1 if hours_worked==1
	replace parttime=0 if hours_worked==2 | hours_worked==3 //| hours_worked==4 :
excluding outoflabor
	label values parttime yesno
	label var parttime "Part-time"

***Those who are not working, Why not working? This is only asked to those who said they
didnt work last week
```

```
gen going_school=1 if sch==2 | sch==3
	replace going_school=0 if sch==1
	label values going_school yesno
	label var going_school "In school"

***create out of laborforce , out of school sample
gen olfoos=1 if emp_status==3 & going_school==0
	replace olfoos=0 if (emp_status==1 | emp_status==2 | going_school==1)

gen married=1 if mar==1
	replace married=0 if mar==2 | mar==3 | mar==4 | mar==5
	label def l_married 1"Married" 0"Not married"
	label values married l_married

*create var for foreginborn and noncitizen
gen non_cit_foreign_born=1 if nativity==2 & cit==5
	replace non_cit_foreign_born=0 if non_cit_foreign_born==.
	label var non_cit_foreign_born "Foreign born non citizen"
	label values non_cit_foreign_born yesno

***english proficiency
gen english_speaking=1 if eng==1 | eng==2
	replace english_speaking=0 if eng==3 | eng==4
	label var english_speaking "Can speak English well"
	label values english_speaking yesno

gen hh_language=0 if hhl==1
	replace hh_language=1 if hhl==2 | hhl==3 | hhl==4 | hhl==5
	label def l_hh_lang 0"English only" 1"Other than English"

gen hh_lang_other=1 if lanx==1
	replace hh_lang_other=0 if lanx==2
	label var hh_lang_other "Foreign language"
	label def hh_lang_other 0"English only" 1"Other than English"

***income level
gen income=1 if pincp<15000
	replace income=2 if pincp>=15000 & pincp<=25000
	replace income=3 if pincp>25000

	label var income "Income level"
	label def l_income 1"Less than 15k" 2"Between 15k to 25k" 3"More than 25k"
	label values income l_income

tabulate income, generate(dinc)
renvarlab dinc1 dinc2 dinc3\ inc_lt15k inc_lt25k inc_gt25k
```

```
labvars inc_lt15k inc_lt25k inc_gt25k\"Less than 15k" "Between 15k to 25k" "More than 25k"

***create occupation categories
gen occ_code=1 if inrange(occp,10,430)
	replace occ_code=2 if inrange(occp,500,740)
	replace occ_code=3 if inrange(occp,800,950)
	replace occ_code=4 if inrange(occp,1005,1240)
	replace occ_code=5 if inrange(occp,1300,1560)
	replace occ_code=6 if inrange(occp,1600,1965)
	replace occ_code=7 if inrange(occp,2000,2060)
	replace occ_code=8 if inrange(occp,2100,2160)
	replace occ_code=9 if inrange(occp,2200,2550)
	replace occ_code=10 if inrange(occp,2600,2920)
	replace occ_code=11 if inrange(occp,3000,3540)
	replace occ_code=12 if inrange(occp,3600,3655)
	replace occ_code=13 if inrange(occp,3700,3955)
	replace occ_code=14 if inrange(occp,4000,4150)
	replace occ_code=15 if inrange(occp,4200,4250)
	replace occ_code=16 if inrange(occp,4300,4650)
	replace occ_code=17 if inrange(occp,4700,4965)
	replace occ_code=18 if inrange(occp,5000,5940)
	replace occ_code=19 if inrange(occp,6005,6130)
	replace occ_code=20 if inrange(occp,6200,6765)
	replace occ_code=21 if inrange(occp,6800,6940)
	replace occ_code=22 if inrange(occp,7000,7630)
	replace occ_code=23 if inrange(occp,7700,8965)
	replace occ_code=24 if inrange(occp,9000,9750)
	replace occ_code=25 if inrange(occp,9800,9830)
	replace occ_code=26 if occp==9920

	label def l_occ_code 1"Managerial" 2"Business" 3"Financial" 4"Computer and Mathematical" 5"Architecture and Engineering" ///
	6"Life, Physical, and Social Science" 7"Community and Social Service" 8"Legal" 9"Educational Instruction and Library" ///
	10"Arts, Design, Entertainment, Sports, and Media" 11"Healthcare Practitioners and Technical" 12"Healthcare Support" ///
	13"Protective Service" 14"Food Preparation and Serving" 15"Building and Grounds Cleaning and Maintenance" 16"Personal Care and Service" ///
	17"Sales and Related Occupations" 18"Office And Administrative Support" 19"Farming, Fishing, And Forestry" 20"Construction" ///
	21"Extraction" 22"Repair" 23"Production" 24"Transportation" 25"Military" 26"Unemployed"
	label values occ_code l_occ_code

tabulate occ_code, generate(docc)
```

```
labvars docc1 docc2 docc3 docc4 docc5 docc6 docc7 docc8 docc9 docc10 docc11 docc12
docc13 docc14 docc15 docc16 ///
docc17 docc18 docc19 docc20 docc21 docc22 docc23 docc24 docc25 docc26 \ "Managerial"
"Business" "Financial" "Computer and Mathematical" ///
"Architecture and Engineering" "Life, Physical, and Social Science" "Community and Social
Service" "Legal" ///
"Educational Instruction and Library" "Arts, Design, Entertainment, Sports, and Media"
"Healthcare Practitioners and Technical" ///
"Healthcare Support" "Protective Service" "Food Preparation and Serving" "Building and
Grounds Cleaning and Maintenance" ///
"Personal Care and Service" "Sales and Related Occupations" "Office And Administrative
Support" ///
"Farming, Fishing, And Forestry" "Construction"     "Extraction" "Repair" "Production"
"Transportation" "Military" "Unemployed"


***create Industry categories //referred: https://www2.census.gov/programs-
surveys/cps/methodology/Industry%20Codes.pdf
gen ind_code=1 if inrange(indp,170,290)
        replace ind_code=2 if inrange(indp,370,490)
                replace ind_code=3 if indp==770
        replace ind_code=4 if inrange(indp,1070,3990)
        replace ind_code=5 if inrange(indp,4070,5790)
        replace ind_code=6 if inrange(indp,6070,6390)
                replace ind_code=6 if inrange(indp,570,690)
        replace ind_code=7 if inrange(indp,6470,6780)
        replace ind_code=8 if inrange(indp,6870,7190)
        replace ind_code=9 if inrange(indp,7270,7790)
        replace ind_code=10 if inrange(indp,7860,8470)
        replace ind_code=11 if inrange(indp,8560,8690)
        replace ind_code=12 if inrange(indp,8770,9290)
        replace ind_code=13 if inrange(indp,9370,9590)
        replace ind_code=14 if inrange(indp,9670,9870)
        replace ind_code=15 if indp==9920

tabulate ind_code, generate(dind)
labvars dind1 dind2 dind3 dind4 dind5 dind6 dind7 dind8 dind9 dind10 dind11 dind12 dind13
dind14 dind15 ///
"Agriculture, forestry, fishing, and hunting" "Mining" "Construction" "Manufacturing"
"Wholesale and retail trade" ///
"Transportation and utilities" "Information" "Financial activities" "Professional and business
services" ///
"Educational and health services" "Leisure and hospitality" "Other services" "Public
administration" "Armed Forces" "Unemployed"
//drop military industry
keep if ind_code!=14
```

```
***State medicaid expansion***
gen medicaid_exp=0 if inlist(st,1,12,13,16,20,28,29,31,37,40,45,46,47,48,49,55,56)
	recode medicaid_exp(.=1)

**internet access
gen internet=1 if access==1 | access==2
	replace internet=0 if access==3
	label values internet yesno

gen have_children=1 if noc>0
	recode have_children(.=0)
	label var have_children "Have own children"
	label values have_children yesno

**********************************
*****Summary statistics**********
**********************************
sum privcov uninsured pubcov hw_part_time hw_full_time hw_unemployed hw_olf inc_lt15k
inc_lt25k inc_gt25k ///
educ_lt_HS educ_HS educ_somecol educ_associate educ_bachelor educ_grad ///
married age_18_20 age_20_23 age_24_26 disability going_school citizen hh_lang_other
year_2015 year_2016 year_2017 ///
california arizona colorado newmexico texas if sw==1 & black==1 & male==1

asdoc
sum privcov uninsured pubcov hw_part_time hw_full_time hw_unemployed hw_olf inc_lt15k
inc_lt25k inc_gt25k ///
educ_lt_HS educ_HS educ_somecol educ_associate educ_bachelor educ_grad ///
married age_18_20 age_20_23 age_24_26 disability going_school citizen hh_lang_other
year_2015 year_2016 year_2017 ///
california arizona colorado newmexico texas if sw==1 & white==1 & male==1

, save(sum_stats_ch2.doc) ///
label replace title(Health coverage among Young Adults in the Southwest by race and gender
(age 18-26)) stat(mean sd) dec(2)

asdoc sum privcov uninsured pubcov hw_part_time hw_full_time hw_unemployed hw_olf
inc_lt15k inc_lt25k inc_gt25k ///
educ_lt_HS educ_HS educ_somecol educ_associate educ_bachelor educ_grad ///
married age_18_20 age_20_23 age_24_26 disability going_school citizen hh_lang_other
year_2015 year_2016 year_2017 ///
california arizona colorado newmexico texas if sw==1 & hispanic==1 & male==1,
save(sum_stats_ch2.doc) ///
label append title(Health coverage among Young Adults in the Southwest by race and gender
(age 18-26)) stat(mean sd) dec(2)
```

asdoc sum privcov uninsured pubcov hw_part_time hw_full_time hw_unemployed hw_olf inc_lt15k inc_lt25k inc_gt25k ///
educ_lt_HS educ_HS educ_somecol educ_associate educ_bachelor educ_grad ///
married age_18_20 age_20_23 age_24_26 disability going_school citizen hh_lang_other year_2015 year_2016 year_2017 ///
california arizona colorado newmexico texas if sw==1 & black==1 & male==1, save(sum_stats_ch2.doc) ///
label append title(Health coverage among Young Adults in the Southwest by race and gender (age 18-26)) stat(mean sd) dec(2)

asdoc sum privcov uninsured pubcov hw_part_time hw_full_time hw_unemployed hw_olf inc_lt15k inc_lt25k inc_gt25k ///
educ_lt_HS educ_HS educ_somecol educ_associate educ_bachelor educ_grad ///
married age_18_20 age_20_23 age_24_26 disability going_school citizen hh_lang_other year_2015 year_2016 year_2017 ///
california arizona colorado newmexico texas if sw==1 & white==1 & male==0, save(sum_stats_ch2.doc) ///
label append title(Health coverage among Young Adults in the Southwest by race and gender (age 18-26)) stat(mean sd) dec(2)

asdoc sum privcov uninsured pubcov hw_part_time hw_full_time hw_unemployed hw_olf inc_lt15k inc_lt25k inc_gt25k ///
educ_lt_HS educ_HS educ_somecol educ_associate educ_bachelor educ_grad ///
married age_18_20 age_20_23 age_24_26 disability going_school citizen hh_lang_other year_2015 year_2016 year_2017 ///
california arizona colorado newmexico texas if sw==1 & hispanic==1 & male==0, save(sum_stats_ch2.doc) ///
label append title(Health coverage among Young Adults in the Southwest by race and gender (age 18-26)) stat(mean sd) dec(2)

asdoc sum privcov uninsured pubcov hw_part_time hw_full_time hw_unemployed hw_olf inc_lt15k inc_lt25k inc_gt25k ///
educ_lt_HS educ_HS educ_somecol educ_associate educ_bachelor educ_grad ///
married age_18_20 age_20_23 age_24_26 disability going_school citizen hh_lang_other year_2015 year_2016 year_2017 ///
california arizona colorado newmexico texas if sw==1 & black==1 & male==0, save(sum_stats_ch2.doc) ///
label append title(Health coverage among Young Adults in the Southwest by race and gender (age 18-26)) stat(mean sd) dec(2)

****

*************Don't use this: use the next one without medicaid exp var Choosing the best model**************

```
******************************************************************************
**********************
clear matrix //can't use language and citizenship variable here as they are very specific to
Hispanics
mlogit cov_type ib2.race_cat medicaid_exp male ib2.hours_worked i.income i.educ ///
married i.year ib6.st if sw==1, base(1) rrr
eststo

mlogit cov_type ib2.race_cat medicaid_exp male ib2.hours_worked i.income i.educ ///
married i.age_cat disability i.year ib6.st if sw==1, base(1) rrr
eststo

mlogit cov_type ib2.race_cat medicaid_exp male ib2.hours_worked i.income i.educ ///
married i.age_cat disability going_school i.year ib6.st if sw==1, base(1) rrr
eststo

esttab using mlogit_bestmodel_sw.rtf, stats(N aic bic pr2 ll) eform replace not unstack label
cells(b(star fmt(3)) se(par fmt(2)))

	margins race_cat, atmeans predict(outcome(1))
		marginsplot, name(race_Private)
	margins race_cat, atmeans predict(outcome(2))
		marginsplot, name(race_Uninsured)
	margins race_cat, atmeans predict(outcome(3))
		marginsplot, name(race_Public)

******************************************************************************
*********************************************************
***Use this for chooseing best model: removing medicaid expansion and just using state fixed
effects
******************************************************************************
**********************
clear matrix //can't use language and citizenship variable here as they are very specific to
Hispanics
mlogit cov_type ib2.race_cat male ib2.hours_worked i.income i.educ ///
married i.year ib6.st if sw==1, base(1) rrr
eststo

mlogit cov_type ib2.race_cat male ib2.hours_worked i.income i.educ ///
married i.age_cat disability i.year ib6.st if sw==1, base(1) rrr
eststo

mlogit cov_type ib2.race_cat male ib2.hours_worked i.income i.educ ///
married i.age_cat disability going_school i.year ib6.st if sw==1, base(1) rrr
eststo
```

```
esttab using mlogit_bestmodel_sw2.rtf, stats(N aic bic pr2 ll) eform replace not unstack label
cells(b(star fmt(3)) se(par fmt(2)))

***********************************************
*******Run the best model by race and gender*******
***********************************************
***Men
clear matrix
mlogit cov_type ib2.hours_worked i.income i.educ ///
married i.age_cat disability going_school i.year ib6.st if sw==1 & white==1 & male==1, base(1)
rrr
eststo

mlogit cov_type ib2.hours_worked i.income i.educ ///
married i.age_cat disability going_school citizen hh_lang_other i.year ib6.st if sw==1 &
hispanic==1 & male==1, base(1) rrr
eststo

mlogit cov_type ib2.hours_worked i.income i.educ ///
married i.age_cat disability going_school i.year ib6.st if sw==1 & black==1 & male==1, base(1)
rrr
eststo

        esttab using mlogit_bestmodel_race_men.rtf, stats(N aic bic pr2 ll) eform replace ///
        unstack label cells(b(star fmt(3)) se(par fmt(2)))

***women
clear matrix
mlogit cov_type ib2.hours_worked i.income i.educ ///
married i.age_cat disability going_school i.year ib6.st if sw==1 & white==1 & male==0, base(1)
rrr
eststo

mlogit cov_type ib2.hours_worked i.income i.educ ///
married i.age_cat disability going_school citizen hh_lang_other i.year ib6.st if sw==1 &
hispanic==1 & male==0, base(1) rrr
eststo

mlogit cov_type ib2.hours_worked i.income i.educ ///
married i.age_cat disability going_school i.year ib6.st if sw==1 & black==1 & male==0, base(1)
rrr
eststo

        esttab using mlogit_bestmodel_race_women.rtf, stats(N aic bic pr2 ll) eform replace ///
        unstack label cells(b(star fmt(3)) se(par fmt(2)))
```

```
clear matrix

***Blinder-Oaxaca decomposition***
*****MEN***** //drop hours_worked dind14(military) dind15(unemployed) cause of we are only selecting employed adults
//removed disability as they will tend to have public??
oaxaca privcov emp_parttime dind2 dind3 dind4 dind5 dind6 dind7 dind8 dind9 dind10 dind11 dind12 dind13 ///
inc_lt25k inc_gt25k educ_HS educ_somecol educ_associate educ_bachelor educ_grad married age_20_23 age_24_26 going_school ///
year_2016 year_2017 arizona colorado newmexico texas ///
if employed==1 & sw==1 & male==1 & black!=1, by(hispanic) pooled logit noisily
eststo //emp hispanic men and emp white men

oaxaca privcov emp_parttime dind2 dind3 dind4 dind5 dind6 dind7 dind8 dind9 dind10 dind11 dind12 dind13 ///
inc_lt25k inc_gt25k educ_HS educ_somecol educ_associate educ_bachelor educ_grad married age_20_23 age_24_26 going_school ///
citizen hh_lang_other year_2016 year_2017 arizona colorado newmexico texas ///
if employed==1 & sw==1 & male==1 & black!=1, by(hispanic) pooled logit noisily
eststo

*****WOMEN***** //drop hours_worked dind14(military) dind15(unemployed) cause of we are only selecting employed adults
oaxaca privcov emp_parttime dind2 dind3 dind4 dind5 dind6 dind7 dind8 dind9 dind10 dind11 dind12 dind13 ///
inc_lt25k inc_gt25k educ_HS educ_somecol educ_associate educ_bachelor educ_grad married age_20_23 age_24_26 going_school ///
year_2016 year_2017 arizona colorado newmexico texas ///
if employed==1 & sw==1 & male==0 & black!=1, by(hispanic) pooled logit noisily
eststo

oaxaca privcov emp_parttime dind2 dind3 dind4 dind5 dind6 dind7 dind8 dind9 dind10 dind11 dind12 dind13 ///
inc_lt25k inc_gt25k educ_HS educ_somecol educ_associate educ_bachelor educ_grad married age_20_23 age_24_26 going_school ///
citizen hh_lang_other year_2016 year_2017 arizona colorado newmexico texas ///
if employed==1 & sw==1 & male==0 & black!=1, by(hispanic) pooled logit noisily
eststo

	esttab using oxaca_hispanic_bygender_ind.rtf, stats(N aic bic pr2 ll) replace ///
	label cells(b(star fmt(3)) se(par fmt(2)))

*******Sample: olfoos. Run separate regresssion by gender
//sum stats
```

```
asdoc sum coverage inc_lt15k inc_lt25k inc_gt25k educ_lt_HS educ_HS educ_somecol
educ_associate educ_bachelor educ_grad ///
married age_18_20 age_20_23 age_24_26 disability citizen hh_lang_other year_2015 year_2016
year_2017 ///
california arizona colorado newmexico texas if sw==1 & white==1 & male==1 & olfoos==1,
save(sum_stats_ch2_olfoos.doc) ///
label replace title(Health coverage among Young Adults in the Southwest by race and gender
(age 18-26)) stat(mean sd) dec(2)

asdoc sum coverage inc_lt15k inc_lt25k inc_gt25k educ_lt_HS educ_HS educ_somecol
educ_associate educ_bachelor educ_grad ///
married age_18_20 age_20_23 age_24_26 disability citizen hh_lang_other year_2015 year_2016
year_2017 ///
california arizona colorado newmexico texas if sw==1 & hispanic==1 & male==1 & olfoos==1,
save(sum_stats_ch2_olfoos.doc) ///
label append title(Health coverage among Young Adults in the Southwest by race and gender
(age 18-26)) stat(mean sd) dec(2)

asdoc sum coverage inc_lt15k inc_lt25k inc_gt25k educ_lt_HS educ_HS educ_somecol
educ_associate educ_bachelor educ_grad ///
married age_18_20 age_20_23 age_24_26 disability citizen hh_lang_other year_2015 year_2016
year_2017 ///
california arizona colorado newmexico texas if sw==1 & white==1 & male==0 & olfoos==1,
save(sum_stats_ch2_olfoos.doc) ///
label append title(Health coverage among Young Adults in the Southwest by race and gender
(age 18-26)) stat(mean sd) dec(2)

asdoc
sum coverage inc_lt15k inc_lt25k inc_gt25k educ_lt_HS educ_HS educ_somecol educ_associate
educ_bachelor educ_grad ///
married age_18_20 age_20_23 age_24_26 disability citizen hh_lang_other year_2015 year_2016
year_2017 ///
california arizona colorado newmexico texas if sw==1 & hispanic==1 & male==0 & olfoos==1
, save(sum_stats_ch2_olfoos.doc) ///
label append title(Health coverage among Young Adults in the Southwest by race and gender
(age 18-26)) stat(mean sd) dec(2)

asdoc tab cov_type race_cat if olfoos==1 & sw==1 & male==1 , col
asdoc tab cov_type race_cat if olfoos==1 & sw==1 & male==0 , col

clear matrix

logit coverage inc_lt25k inc_gt25k educ_HS educ_somecol educ_associate educ_bachelor
educ_grad ///
	married age_20_23 age_24_26 disability citizen i.year ib6.st ///
	if olfoos==1 & sw==1 & male==1
```

```
eststo
eststo margin1: margins, dydx(*)
estimates store m1, title(Men Sample)

logit coverage inc_lt25k inc_gt25k educ_HS educ_somecol educ_associate educ_bachelor
educ_grad ///
	married age_20_23 age_24_26 disability citizen i.year ib6.st ///
	if olfoos==1 & sw==1 & male==0
eststo
eststo margin2: margins, dydx(*)
estimates store m2, title(Women Sample)

	esttab m1 m2 using olfoos_logit_bygender.rtf, stats(N aic bic pr2 ll) replace ///
	label cells(b(star fmt(3)) se(par fmt(2))) //perform oxaca on olfoos for white NH vs
Hispanics

//Black vs White non-Hispanics - oaxaca OLFOOS sample
clear matrix
oaxaca coverage inc_lt25k inc_gt25k educ_HS educ_somecol educ_associate educ_bachelor
educ_grad ///
married age_20_23 age_24_26 disability year_2016 year_2017 arizona colorado newmexico
texas ///
if olfoos==1 & sw==1 & male==1 & hispanic!=1, by(black) pooled logit relax
eststo

oaxaca coverage inc_lt25k inc_gt25k educ_HS educ_somecol educ_associate educ_bachelor
educ_grad ///
married age_20_23 age_24_26 disability citizen hh_lang_other year_2016 year_2017 arizona
colorado newmexico texas ///
if olfoos==1 & sw==1 & male==1 & hispanic!=1, by(black) pooled logit relax
eststo

oaxaca coverage inc_lt25k inc_gt25k educ_HS educ_somecol educ_associate educ_bachelor
educ_grad ///
married age_20_23 age_24_26 disability year_2016 year_2017 arizona colorado newmexico
texas ///
if olfoos==1 & sw==1 & male==0 & hispanic!=1, by(black) pooled logit relax
eststo

oaxaca coverage inc_lt25k inc_gt25k educ_HS educ_somecol educ_associate educ_bachelor
educ_grad ///
married age_20_23 age_24_26 disability citizen hh_lang_other year_2016 year_2017 arizona
colorado newmexico texas ///
if olfoos==1 & sw==1 & male==0 & hispanic!=1, by(black) pooled logit relax
eststo
```

```
	esttab using oxaca_black_olfoos.rtf, stats(N aic bic pr2 ll) replace ///
	label cells(b(star fmt(3)) se(par fmt(2)))

*************************************************************
*************************Chapter four************************
*************************************************************
**Create HIX data for 2015-2020 by appending data from these years
clear all
cd "/Users/admin/Desktop/OneDrive - University of New Mexico/UNM courses & duties/RA Fall 2019/Datasets/HIX Compare/Merged"
set more off
use plans_2015.dta, clear
append using plans_2016.dta
append using plans_2017.dta
append using plans_2018.dta
append using plans_2019.dta
append using plans_2020.dta

cd "/Users/admin/Desktop/OneDrive - University of New Mexico/University of New Mexico/Claudia Diaz Fuentes - Disha-OSI II-Paper/Data/"
save hix_plans_2015to2020.dta, replace

*******************Merge ACS with CMS data to get ratingarea*****************
use IPUMS_ACS_county_5yr.dta, clear
merge 1:1 stcountyfip using CMS_RatingAreaID_StateCountyfips_Jan24_noproblematicstates.dta, force
rename _merge merge_acs_cms_noproblemstates
drop if merge_acs_cms_noproblemstates==2

tostring stcountyfip, replace
merge 1:1 stcountyfip using ZIP_problematic_states_with_county_Jan30.dta, force
rename _merge merge_acs_cms_problemstates
replace ratingarea=rating_area if ratingarea==""

save ACS_CMS.dta, replace

gen state_nonmissing="AL" if state=="Alabama" //creating two letter statecode to be able to create var area as given in HIX
	replace state_nonmissing="AK" if state=="Alaska"
		replace state_nonmissing="AK" if state=="AK"
	replace state_nonmissing="AZ" if state=="Arizona"
	replace state_nonmissing="AR" if state=="Arkansas"
	replace state_nonmissing="CA" if state=="California"
		replace state_nonmissing="CA" if state=="CA"
	replace state_nonmissing="CO" if state=="Colorado"
	replace state_nonmissing="CT" if state=="Connecticut"
```

```
replace state_nonmissing="DE" if state=="Delaware"
replace state_nonmissing="DC" if state=="District of Columbia"
replace state_nonmissing="FL" if state=="Florida"
replace state_nonmissing="GA" if state=="Georgia"
replace state_nonmissing="HI" if state=="Hawaii"
replace state_nonmissing="ID" if state=="Idaho"
replace state_nonmissing="IL" if state=="Illinois"
replace state_nonmissing="IN" if state=="Indiana"
replace state_nonmissing="IA" if state=="Iowa"
replace state_nonmissing="KS" if state=="Kansas"
replace state_nonmissing="KY" if state=="Kentucky"
replace state_nonmissing="LA" if state=="Louisiana"
replace state_nonmissing="ME" if state=="Maine"
replace state_nonmissing="MD" if state=="Maryland"
replace state_nonmissing="MA" if state=="Massachusetts"
        replace state_nonmissing="MA" if state=="MA"
replace state_nonmissing="MI" if state=="Michigan"
replace state_nonmissing="MN" if state=="Minnesota"
replace state_nonmissing="MS" if state=="Mississippi"
replace state_nonmissing="MO" if state=="Missouri"
replace state_nonmissing="MT" if state=="Montana"
replace state_nonmissing="NE" if state=="Nebraska"
        replace state_nonmissing="NE" if state=="NE"
replace state_nonmissing="NV" if state=="Nevada"
replace state_nonmissing="NH" if state=="New Hampshire"
replace state_nonmissing="NJ" if state=="New Jersey"
replace state_nonmissing="NM" if state=="New Mexico"
replace state_nonmissing="NY" if state=="New York"
replace state_nonmissing="NC" if state=="North Carolina"
replace state_nonmissing="ND" if state=="North Dakota"
replace state_nonmissing="OH" if state=="Ohio"
replace state_nonmissing="OK" if state=="Oklahoma"
replace state_nonmissing="OR" if state=="Oregon"
replace state_nonmissing="PA" if state=="Pennsylvania"
replace state_nonmissing="RI" if state=="Rhode Island"
replace state_nonmissing="SC" if state=="South Carolina"
replace state_nonmissing="SD" if state=="South Dakota"
replace state_nonmissing="TN" if state=="Tennessee"
replace state_nonmissing="TX" if state=="Texas"
replace state_nonmissing="UT" if state=="Utah"
replace state_nonmissing="VT" if state=="Vermont"
replace state_nonmissing="VA" if state=="Virginia"
replace state_nonmissing="WA" if state=="Washington"
replace state_nonmissing="WV" if state=="West Virginia"
replace state_nonmissing="WI" if state=="Wisconsin"
replace state_nonmissing="WY" if state=="Wyoming"
```

```
replace ratingarea="01" if ratingarea=="Rating Area 1" //creating two letter ratingarea to be able to create var area as given in HIX
replace ratingarea="02" if ratingarea=="Rating Area 2"
replace ratingarea="03" if ratingarea=="Rating Area 3"
replace ratingarea="04" if ratingarea=="Rating Area 4"
replace ratingarea="05" if ratingarea=="Rating Area 5"
replace ratingarea="06" if ratingarea=="Rating Area 6"
replace ratingarea="07" if ratingarea=="Rating Area 7"
replace ratingarea="08" if ratingarea=="Rating Area 8"
replace ratingarea="09" if ratingarea=="Rating Area 9"
replace ratingarea="10" if ratingarea=="Rating Area 10"
replace ratingarea="11" if ratingarea=="Rating Area 11"
replace ratingarea="12" if ratingarea=="Rating Area 12"
replace ratingarea="13" if ratingarea=="Rating Area 13"
replace ratingarea="14" if ratingarea=="Rating Area 14"
replace ratingarea="15" if ratingarea=="Rating Area 15"
replace ratingarea="16" if ratingarea=="Rating Area 16"
replace ratingarea="17" if ratingarea=="Rating Area 17"
replace ratingarea="18" if ratingarea=="Rating Area 18"
replace ratingarea="19" if ratingarea=="Rating Area 19"
replace ratingarea="20" if ratingarea=="Rating Area 20"
replace ratingarea="21" if ratingarea=="Rating Area 21"
replace ratingarea="22" if ratingarea=="Rating Area 22"
replace ratingarea="23" if ratingarea=="Rating Area 23"
replace ratingarea="24" if ratingarea=="Rating Area 24"
replace ratingarea="25" if ratingarea=="Rating Area 25"
replace ratingarea="26" if ratingarea=="Rating Area 26"
replace ratingarea="27" if ratingarea=="Rating Area 27"
replace ratingarea="28" if ratingarea=="Rating Area 28"
replace ratingarea="29" if ratingarea=="Rating Area 29"
replace ratingarea="30" if ratingarea=="Rating Area 30"
replace ratingarea="31" if ratingarea=="Rating Area 31"
replace ratingarea="32" if ratingarea=="Rating Area 32"
replace ratingarea="33" if ratingarea=="Rating Area 33"
replace ratingarea="34" if ratingarea=="Rating Area 34"
replace ratingarea="35" if ratingarea=="Rating Area 35"
replace ratingarea="36" if ratingarea=="Rating Area 36"
replace ratingarea="37" if ratingarea=="Rating Area 37"
replace ratingarea="38" if ratingarea=="Rating Area 38"
replace ratingarea="39" if ratingarea=="Rating Area 39"
replace ratingarea="40" if ratingarea=="Rating Area 40"
replace ratingarea="41" if ratingarea=="Rating Area 41"
replace ratingarea="42" if ratingarea=="Rating Area 42"
replace ratingarea="43" if ratingarea=="Rating Area 43"
replace ratingarea="44" if ratingarea=="Rating Area 44"
```

```
replace ratingarea="45" if ratingarea=="Rating Area 45"
replace ratingarea="46" if ratingarea=="Rating Area 46"
replace ratingarea="47" if ratingarea=="Rating Area 47"
replace ratingarea="48" if ratingarea=="Rating Area 48"
replace ratingarea="49" if ratingarea=="Rating Area 49"
replace ratingarea="50" if ratingarea=="Rating Area 50"
replace ratingarea="51" if ratingarea=="Rating Area 51"
replace ratingarea="52" if ratingarea=="Rating Area 52"
replace ratingarea="53" if ratingarea=="Rating Area 53"
replace ratingarea="54" if ratingarea=="Rating Area 54"
replace ratingarea="55" if ratingarea=="Rating Area 55"
replace ratingarea="56" if ratingarea=="Rating Area 56"
replace ratingarea="57" if ratingarea=="Rating Area 57"
replace ratingarea="58" if ratingarea=="Rating Area 58"
replace ratingarea="59" if ratingarea=="Rating Area 59"
replace ratingarea="60" if ratingarea=="Rating Area 60"
replace ratingarea="61" if ratingarea=="Rating Area 61"
replace ratingarea="62" if ratingarea=="Rating Area 62"
replace ratingarea="63" if ratingarea=="Rating Area 63"
replace ratingarea="64" if ratingarea=="Rating Area 64"
replace ratingarea="65" if ratingarea=="Rating Area 65"
replace ratingarea="66" if ratingarea=="Rating Area 66"
replace ratingarea="67" if ratingarea=="Rating Area 67"

*generate unique id to match with HIX*
egen area=concat(state_nonmissing ratingarea)

collapse ah*, by(area)
save ACS_CMS_collapsed.dta, replace

*******************Merge KFF with CMS data to get ratingarea****************
use market_concentration.dta, clear //KFF data
merge 1:1 stcountyfip using
CMS_RatingAreaID_StateCountyfips_Jan24_noproblematicstates.dta, force //merging with
nonproblematic states first
rename _merge merge_kff_cms_noproblemstates
drop if merge_kff_cms_noproblemstates==2 //two counties Shannon(46113) in SD and Bedford
county(51515) in VA
                                                                    //are not there in ACS
file hence these are not matched. We will drop them from the data to avoid confusion.

tostring stcountyfip, replace
merge 1:1 stcountyfip using ZIP_problematic_states_with_county_Jan30.dta, force //merging
with problematic states
rename _merge merge_kff_cms_problemstates
replace ratingarea=rating_area if ratingarea==""
```

```
*convert to long from wide
reshape long NumberofInsurers InsurerList InsurerCategory, i(stcountyfip) j(year) //converting
from wide to long

drop if year==2014 //dropping 2014 as we don't have plan data for 2014

save KFF_CMS.dta, replace

rename State state

gen state_nonmissing="AL" if state=="Alabama" //creating two letter statecode to be able to
create var area as given in HIX
	replace state_nonmissing="AK" if state=="Alaska"
		replace state_nonmissing="AK" if state=="AK"
	replace state_nonmissing="AZ" if state=="Arizona"
	replace state_nonmissing="AR" if state=="Arkansas"
	replace state_nonmissing="CA" if state=="California"
		replace state_nonmissing="CA" if state=="CA"
	replace state_nonmissing="CO" if state=="Colorado"
	replace state_nonmissing="CT" if state=="Connecticut"
	replace state_nonmissing="DE" if state=="Delaware"
	replace state_nonmissing="DC" if state=="District Of Columbia"
	replace state_nonmissing="FL" if state=="Florida"
	replace state_nonmissing="GA" if state=="Georgia"
	replace state_nonmissing="HI" if state=="Hawaii"
	replace state_nonmissing="ID" if state=="Idaho"
	replace state_nonmissing="IL" if state=="Illinois"
	replace state_nonmissing="IN" if state=="Indiana"
	replace state_nonmissing="IA" if state=="Iowa"
	replace state_nonmissing="KS" if state=="Kansas"
	replace state_nonmissing="KY" if state=="Kentucky"
	replace state_nonmissing="LA" if state=="Louisiana"
	replace state_nonmissing="ME" if state=="Maine"
	replace state_nonmissing="MD" if state=="Maryland"
	replace state_nonmissing="MA" if state=="Massachusetts"
		replace state_nonmissing="MA" if state=="MA"
	replace state_nonmissing="MI" if state=="Michigan"
	replace state_nonmissing="MN" if state=="Minnesota"
	replace state_nonmissing="MS" if state=="Mississippi"
	replace state_nonmissing="MO" if state=="Missouri"
	replace state_nonmissing="MT" if state=="Montana"
	replace state_nonmissing="NE" if state=="Nebraska"
		replace state_nonmissing="NE" if state=="NE"
	replace state_nonmissing="NV" if state=="Nevada"
	replace state_nonmissing="NH" if state=="New Hampshire"
```

```
    replace state_nonmissing="NJ" if state=="New Jersey"
    replace state_nonmissing="NM" if state=="New Mexico"
    replace state_nonmissing="NY" if state=="New York"
    replace state_nonmissing="NC" if state=="North Carolina"
    replace state_nonmissing="ND" if state=="North Dakota"
    replace state_nonmissing="OH" if state=="Ohio"
    replace state_nonmissing="OK" if state=="Oklahoma"
    replace state_nonmissing="OR" if state=="Oregon"
    replace state_nonmissing="PA" if state=="Pennsylvania"
    replace state_nonmissing="RI" if state=="Rhode Island"
    replace state_nonmissing="SC" if state=="South Carolina"
    replace state_nonmissing="SD" if state=="South Dakota"
    replace state_nonmissing="TN" if state=="Tennessee"
    replace state_nonmissing="TX" if state=="Texas"
    replace state_nonmissing="UT" if state=="Utah"
    replace state_nonmissing="VT" if state=="Vermont"
    replace state_nonmissing="VA" if state=="Virginia"
    replace state_nonmissing="WA" if state=="Washington"
    replace state_nonmissing="WV" if state=="West Virginia"
    replace state_nonmissing="WI" if state=="Wisconsin"
    replace state_nonmissing="WY" if state=="Wyoming"

replace ratingarea="01" if ratingarea=="Rating Area 1" //creating two letter ratingarea to be able
to create var area as given in HIX
replace ratingarea="02" if ratingarea=="Rating Area 2"
replace ratingarea="03" if ratingarea=="Rating Area 3"
replace ratingarea="04" if ratingarea=="Rating Area 4"
replace ratingarea="05" if ratingarea=="Rating Area 5"
replace ratingarea="06" if ratingarea=="Rating Area 6"
replace ratingarea="07" if ratingarea=="Rating Area 7"
replace ratingarea="08" if ratingarea=="Rating Area 8"
replace ratingarea="09" if ratingarea=="Rating Area 9"
replace ratingarea="10" if ratingarea=="Rating Area 10"
replace ratingarea="11" if ratingarea=="Rating Area 11"
replace ratingarea="12" if ratingarea=="Rating Area 12"
replace ratingarea="13" if ratingarea=="Rating Area 13"
replace ratingarea="14" if ratingarea=="Rating Area 14"
replace ratingarea="15" if ratingarea=="Rating Area 15"
replace ratingarea="16" if ratingarea=="Rating Area 16"
replace ratingarea="17" if ratingarea=="Rating Area 17"
replace ratingarea="18" if ratingarea=="Rating Area 18"
replace ratingarea="19" if ratingarea=="Rating Area 19"
replace ratingarea="20" if ratingarea=="Rating Area 20"
replace ratingarea="21" if ratingarea=="Rating Area 21"
replace ratingarea="22" if ratingarea=="Rating Area 22"
replace ratingarea="23" if ratingarea=="Rating Area 23"
```

```
replace ratingarea="24" if ratingarea=="Rating Area 24"
replace ratingarea="25" if ratingarea=="Rating Area 25"
replace ratingarea="26" if ratingarea=="Rating Area 26"
replace ratingarea="27" if ratingarea=="Rating Area 27"
replace ratingarea="28" if ratingarea=="Rating Area 28"
replace ratingarea="29" if ratingarea=="Rating Area 29"
replace ratingarea="30" if ratingarea=="Rating Area 30"
replace ratingarea="31" if ratingarea=="Rating Area 31"
replace ratingarea="32" if ratingarea=="Rating Area 32"
replace ratingarea="33" if ratingarea=="Rating Area 33"
replace ratingarea="34" if ratingarea=="Rating Area 34"
replace ratingarea="35" if ratingarea=="Rating Area 35"
replace ratingarea="36" if ratingarea=="Rating Area 36"
replace ratingarea="37" if ratingarea=="Rating Area 37"
replace ratingarea="38" if ratingarea=="Rating Area 38"
replace ratingarea="39" if ratingarea=="Rating Area 39"
replace ratingarea="40" if ratingarea=="Rating Area 40"
replace ratingarea="41" if ratingarea=="Rating Area 41"
replace ratingarea="42" if ratingarea=="Rating Area 42"
replace ratingarea="43" if ratingarea=="Rating Area 43"
replace ratingarea="44" if ratingarea=="Rating Area 44"
replace ratingarea="45" if ratingarea=="Rating Area 45"
replace ratingarea="46" if ratingarea=="Rating Area 46"
replace ratingarea="47" if ratingarea=="Rating Area 47"
replace ratingarea="48" if ratingarea=="Rating Area 48"
replace ratingarea="49" if ratingarea=="Rating Area 49"
replace ratingarea="50" if ratingarea=="Rating Area 50"
replace ratingarea="51" if ratingarea=="Rating Area 51"
replace ratingarea="52" if ratingarea=="Rating Area 52"
replace ratingarea="53" if ratingarea=="Rating Area 53"
replace ratingarea="54" if ratingarea=="Rating Area 54"
replace ratingarea="55" if ratingarea=="Rating Area 55"
replace ratingarea="56" if ratingarea=="Rating Area 56"
replace ratingarea="57" if ratingarea=="Rating Area 57"
replace ratingarea="58" if ratingarea=="Rating Area 58"
replace ratingarea="59" if ratingarea=="Rating Area 59"
replace ratingarea="60" if ratingarea=="Rating Area 60"
replace ratingarea="61" if ratingarea=="Rating Area 61"
replace ratingarea="62" if ratingarea=="Rating Area 62"
replace ratingarea="63" if ratingarea=="Rating Area 63"
replace ratingarea="64" if ratingarea=="Rating Area 64"
replace ratingarea="65" if ratingarea=="Rating Area 65"
replace ratingarea="66" if ratingarea=="Rating Area 66"
replace ratingarea="67" if ratingarea=="Rating Area 67"

*generate unique id to match with HIX*
```

egen area=concat(state_nonmissing ratingarea) //creating unique var area to match with HIX

collapse NumberofInsurers*, by(area year) //only NumberofInsurers is a collapsible var from KFF
save KFF_CMS_collapsed.dta, replace

***Merge HIX with KFF and ACS
*use HIX_plans_15_16_17_18_19_20.dta, clear
use hix_plans_2015to2020.dta, clear
merge n:1 year area using KFF_CMS_collapsed.dta
rename _merge merge_hix_kff_cms
save HIX_KFF_CMS.dta, replace

merge n:1 area using ACS_CMS_collapsed.dta //we don't have year in ACS_CMS_collapsed.dta so merging only based on area
rename _merge merge_HIX_ACS_CMS
save HIX_ACS_CMS_merged_5FEB20.dta, replace

use URR_wksht2_2015.dta, clear
append using URR_wksht2_2016 URR_wksht2_2017 URR_wksht2_2018 URR_wksht2_2019 URR_wksht2_2020, generate(appendvar) force
gen year=2015 if appendvar==0
recode year (.=2016) if appendvar==1
recode year (.=2017) if appendvar==2
recode year (.=2018) if appendvar==3
recode year (.=2019) if appendvar==4
recode year (.=2020) if appendvar==5

*use urr-worksheet2-2017.dta, clear
drop if exchange=="No" | market=="Small Group"
drop if plan_cat=="Terminated"
gen planid=plan_id
duplicates drop planid year, force
duplicates report planid year
save URR_wksht2_151617181920.dta, replace

****************************Merge HIX_ACS_CMS with URR data*************************************
*create unique planid
use HIX_ACS_CMS_merged_5FEB20.dta, clear
drop if childonly
drop if planmarket==2
drop if csr==1 //we are left with 54666 plans
merge n:1 planid year using URR_wksht2_151617181920.dta
rename _merge merge_urr
save HIX_ACS_CMS_KFF_URR.dta, replace

```
rename _merge merge_urr

label var state     `"State Name"'
label var ahyqe001  `"Estimates: Total"'
label var ahyqe002  `"Estimates: Male"'
label var ahyqe003  `"Estimates: Male: Under 5 years"'
label var ahyqe004  `"Estimates: Male: 5 to 9 years"'
label var ahyqe005  `"Estimates: Male: 10 to 14 years"'
label var ahyqe006  `"Estimates: Male: 15 to 17 years"'
label var ahyqe007  `"Estimates: Male: 18 and 19 years"'
label var ahyqe008  `"Estimates: Male: 20 years"'
label var ahyqe009  `"Estimates: Male: 21 years"'
label var ahyqe010  `"Estimates: Male: 22 to 24 years"'
label var ahyqe011  `"Estimates: Male: 25 to 29 years"'
label var ahyqe012  `"Estimates: Male: 30 to 34 years"'
label var ahyqe013  `"Estimates: Male: 35 to 39 years"'
label var ahyqe014  `"Estimates: Male: 40 to 44 years"'
label var ahyqe015  `"Estimates: Male: 45 to 49 years"'
label var ahyqe016  `"Estimates: Male: 50 to 54 years"'
label var ahyqe017  `"Estimates: Male: 55 to 59 years"'
label var ahyqe018  `"Estimates: Male: 60 and 61 years"'
label var ahyqe019  `"Estimates: Male: 62 to 64 years"'
label var ahyqe020  `"Estimates: Male: 65 and 66 years"'
label var ahyqe021  `"Estimates: Male: 67 to 69 years"'
label var ahyqe022  `"Estimates: Male: 70 to 74 years"'
label var ahyqe023  `"Estimates: Male: 75 to 79 years"'
label var ahyqe024  `"Estimates: Male: 80 to 84 years"'
label var ahyqe025  `"Estimates: Male: 85 years and over"'
label var ahyqe026  `"Estimates: Female"'
label var ahyqe027  `"Estimates: Female: Under 5 years"'
label var ahyqe028  `"Estimates: Female: 5 to 9 years"'
label var ahyqe029  `"Estimates: Female: 10 to 14 years"'
label var ahyqe030  `"Estimates: Female: 15 to 17 years"'
label var ahyqe031  `"Estimates: Female: 18 and 19 years"'
label var ahyqe032  `"Estimates: Female: 20 years"'
label var ahyqe033  `"Estimates: Female: 21 years"'
label var ahyqe034  `"Estimates: Female: 22 to 24 years"'
label var ahyqe035  `"Estimates: Female: 25 to 29 years"'
label var ahyqe036  `"Estimates: Female: 30 to 34 years"'
label var ahyqe037  `"Estimates: Female: 35 to 39 years"'
label var ahyqe038  `"Estimates: Female: 40 to 44 years"'
label var ahyqe039  `"Estimates: Female: 45 to 49 years"'
label var ahyqe040  `"Estimates: Female: 50 to 54 years"'
label var ahyqe041  `"Estimates: Female: 55 to 59 years"'
label var ahyqe042  `"Estimates: Female: 60 and 61 years"'
label var ahyqe043  `"Estimates: Female: 62 to 64 years"'
```

```
label var ahyqe044  `"Estimates: Female: 65 and 66 years"'
label var ahyqe045  `"Estimates: Female: 67 to 69 years"'
label var ahyqe046  `"Estimates: Female: 70 to 74 years"'
label var ahyqe047  `"Estimates: Female: 75 to 79 years"'
label var ahyqe048  `"Estimates: Female: 80 to 84 years"'
label var ahyqe049  `"Estimates: Female: 85 years and over"'
label var ahy1e001  `"Estimates: Total"'
label var ahy2e001  `"Estimates: Total"'
label var ahy2e002  `"Estimates: White alone"'
label var ahy2e003  `"Estimates: Black or African American alone"'
label var ahy2e004  `"Estimates: American Indian and Alaska Native alone"'
label var ahy2e005  `"Estimates: Asian alone"'
label var ahy2e006  `"Estimates: Native Hawaiian and Other Pacific Islander alone"'
label var ahy2e007  `"Estimates: Some other race alone"'
label var ahy2e008  `"Estimates: Two or more races"'
label var ahy2e009  `"Estimates: Two or more races: Two races including Some other race"'
label var ahy2e010  `"Estimates: Two or more races: Two races excluding Some other race, and
three or "'
label var ahzbe001  `"Estimates: Total"'
label var ahzbe002  `"Estimates: Not Hispanic or Latino"'
label var ahzbe003  `"Estimates: Hispanic or Latino"'
label var ah0qe001  `"Estimates: Total"'
label var ah0qe002  `"Estimates: Male"'
label var ah0qe003  `"Estimates: Male: Never married"'
label var ah0qe004  `"Estimates: Male: Now married"'
label var ah0qe005  `"Estimates: Male: Now married: Married, spouse present"'
label var ah0qe006  `"Estimates: Male: Now married: Married, spouse absent"'
label var ah0qe007  `"Estimates: Male: Now married: Married, spouse absent: Separated"'
label var ah0qe008  `"Estimates: Male: Now married: Married, spouse absent: Other"'
label var ah0qe009  `"Estimates: Male: Widowed"'
label var ah0qe010  `"Estimates: Male: Divorced"'
label var ah0qe011  `"Estimates: Female"'
label var ah0qe012  `"Estimates: Female: Never married"'
label var ah0qe013  `"Estimates: Female: Now married"'
label var ah0qe014  `"Estimates: Female: Now married: Married, spouse present"'
label var ah0qe015  `"Estimates: Female: Now married: Married, spouse absent"'
label var ah0qe016  `"Estimates: Female: Now married: Married, spouse absent: Separated"'
label var ah0qe017  `"Estimates: Female: Now married: Married, spouse absent: Other"'
label var ah0qe018  `"Estimates: Female: Widowed"'
label var ah0qe019  `"Estimates: Female: Divorced"'
label var ah04e001  `"Estimates: Total"'
label var ah04e002  `"Estimates: No schooling completed"'
label var ah04e003  `"Estimates: Nursery school"'
label var ah04e004  `"Estimates: Kindergarten"'
label var ah04e005  `"Estimates: 1st grade"'
label var ah04e006  `"Estimates: 2nd grade"'
```

```
label var ah04e007  `"Estimates: 3rd grade"'
label var ah04e008  `"Estimates: 4th grade"'
label var ah04e009  `"Estimates: 5th grade"'
label var ah04e010  `"Estimates: 6th grade"'
label var ah04e011  `"Estimates: 7th grade"'
label var ah04e012  `"Estimates: 8th grade"'
label var ah04e013  `"Estimates: 9th grade"'
label var ah04e014  `"Estimates: 10th grade"'
label var ah04e015  `"Estimates: 11th grade"'
label var ah04e016  `"Estimates: 12th grade, no diploma"'
label var ah04e017  `"Estimates: Regular high school diploma"'
label var ah04e018  `"Estimates: GED or alternative credential"'
label var ah04e019  `"Estimates: Some college, less than 1 year"'
label var ah04e020  `"Estimates: Some college, 1 or more years, no degree"'
label var ah04e021  `"Estimates: Associate's degree"'
label var ah04e022  `"Estimates: Bachelor's degree"'
label var ah04e023  `"Estimates: Master's degree"'
label var ah04e024  `"Estimates: Professional school degree"'
label var ah04e025  `"Estimates: Doctorate degree"'
label var ah1he001  `"Estimates: Total"'
label var ah1he002  `"Estimates: English only"'
label var ah1he003  `"Estimates: Spanish"'
label var ah1he004  `"Estimates: Spanish: Limited English speaking household"'
label var ah1he005  `"Estimates: Spanish: Not a limited English speaking household"'
label var ah1he006  `"Estimates: Other Indo-European languages"'
label var ah1he007  `"Estimates: Other Indo-European languages: Limited English speaking
household"'
label var ah1he008  `"Estimates: Other Indo-European languages: Not a limited English speaking
househo"'
label var ah1he009  `"Estimates: Asian and Pacific Island languages"'
label var ah1he010  `"Estimates: Asian and Pacific Island languages: Limited English speaking
househol"'
label var ah1he011  `"Estimates: Asian and Pacific Island languages: Not a limited English
speaking ho"'
label var ah1he012  `"Estimates: Other languages"'
label var ah1he013  `"Estimates: Other languages: Limited English speaking household"'
label var ah1he014  `"Estimates: Other languages: Not a limited English speaking household"'
label var ah1je001  `"Estimates: Total"'
label var ah1je002  `"Estimates: Under .50"'
label var ah1je003  `"Estimates: .50 to .99"'
label var ah1je004  `"Estimates: 1.00 to 1.24"'
label var ah1je005  `"Estimates: 1.25 to 1.49"'
label var ah1je006  `"Estimates: 1.50 to 1.84"'
label var ah1je007  `"Estimates: 1.85 to 1.99"'
label var ah1je008  `"Estimates: 2.00 and over"'
label var ah1oe001  `"Estimates: Total"'
```

```
label var ah1oe002  `"Estimates: Less than $10,000"'
label var ah1oe003  `"Estimates: $10,000 to $14,999"'
label var ah1oe004  `"Estimates: $15,000 to $19,999"'
label var ah1oe005  `"Estimates: $20,000 to $24,999"'
label var ah1oe006  `"Estimates: $25,000 to $29,999"'
label var ah1oe007  `"Estimates: $30,000 to $34,999"'
label var ah1oe008  `"Estimates: $35,000 to $39,999"'
label var ah1oe009  `"Estimates: $40,000 to $44,999"'
label var ah1oe010  `"Estimates: $45,000 to $49,999"'
label var ah1oe011  `"Estimates: $50,000 to $59,999"'
label var ah1oe012  `"Estimates: $60,000 to $74,999"'
label var ah1oe013  `"Estimates: $75,000 to $99,999"'
label var ah1oe014  `"Estimates: $100,000 to $124,999"'
label var ah1oe015  `"Estimates: $125,000 to $149,999"'
label var ah1oe016  `"Estimates: $150,000 to $199,999"'
label var ah1oe017  `"Estimates: $200,000 or more"'
label var ah1pe001  `"Estimates: Median household income in the past 12 months (in 2017
inflation-adju"'
label var ah1ye001  `"Estimates: Aggregate household income in the past 12 months (in 2017
inflation-a"'
label var ah1ze001  `"Estimates: Aggregate household income in the past 12 months (in 2017
inflation-a"'
label var ah11e001  `"Estimates: Median household income in the past 12 months (in 2017
inflation-adju"'
label var ah11e002  `"Estimates: Median household income in the past 12 months (in 2017
inflation-adju"'
label var ah11e003  `"Estimates: Median household income in the past 12 months (in 2017
inflation-adju"'
label var ah11e004  `"Estimates: Median household income in the past 12 months (in 2017
inflation-adju"'
label var ah11e005  `"Estimates: Median household income in the past 12 months (in 2017
inflation-adju"'
label var ah2re001  `"Estimates: Per capita income in the past 12 months (in 2017 inflation-
adjusted d"'
label var ah3be001  `"Estimates: Total"'
label var ah3be002  `"Estimates: Male"'
label var ah3be003  `"Estimates: Male: $1 to $2,499 or loss"'
label var ah3be004  `"Estimates: Male: $2,500 to $4,999"'
label var ah3be005  `"Estimates: Male: $5,000 to $7,499"'
label var ah3be006  `"Estimates: Male: $7,500 to $9,999"'
label var ah3be007  `"Estimates: Male: $10,000 to $12,499"'
label var ah3be008  `"Estimates: Male: $12,500 to $14,999"'
label var ah3be009  `"Estimates: Male: $15,000 to $17,499"'
label var ah3be010  `"Estimates: Male: $17,500 to $19,999"'
label var ah3be011  `"Estimates: Male: $20,000 to $22,499"'
label var ah3be012  `"Estimates: Male: $22,500 to $24,999"'
```

```
label var ah3be013  `"Estimates: Male: $25,000 to $29,999"'
label var ah3be014  `"Estimates: Male: $30,000 to $34,999"'
label var ah3be015  `"Estimates: Male: $35,000 to $39,999"'
label var ah3be016  `"Estimates: Male: $40,000 to $44,999"'
label var ah3be017  `"Estimates: Male: $45,000 to $49,999"'
label var ah3be018  `"Estimates: Male: $50,000 to $54,999"'
label var ah3be019  `"Estimates: Male: $55,000 to $64,999"'
label var ah3be020  `"Estimates: Male: $65,000 to $74,999"'
label var ah3be021  `"Estimates: Male: $75,000 to $99,999"'
label var ah3be022  `"Estimates: Male: $100,000 or more"'
label var ah3be023  `"Estimates: Female"'
label var ah3be024  `"Estimates: Female: $1 to $2,499 or loss"'
label var ah3be025  `"Estimates: Female: $2,500 to $4,999"'
label var ah3be026  `"Estimates: Female: $5,000 to $7,499"'
label var ah3be027  `"Estimates: Female: $7,500 to $9,999"'
label var ah3be028  `"Estimates: Female: $10,000 to $12,499"'
label var ah3be029  `"Estimates: Female: $12,500 to $14,999"'
label var ah3be030  `"Estimates: Female: $15,000 to $17,499"'
label var ah3be031  `"Estimates: Female: $17,500 to $19,999"'
label var ah3be032  `"Estimates: Female: $20,000 to $22,499"'
label var ah3be033  `"Estimates: Female: $22,500 to $24,999"'
label var ah3be034  `"Estimates: Female: $25,000 to $29,999"'
label var ah3be035  `"Estimates: Female: $30,000 to $34,999"'
label var ah3be036  `"Estimates: Female: $35,000 to $39,999"'
label var ah3be037  `"Estimates: Female: $40,000 to $44,999"'
label var ah3be038  `"Estimates: Female: $45,000 to $49,999"'
label var ah3be039  `"Estimates: Female: $50,000 to $54,999"'
label var ah3be040  `"Estimates: Female: $55,000 to $64,999"'
label var ah3be041  `"Estimates: Female: $65,000 to $74,999"'
label var ah3be042  `"Estimates: Female: $75,000 to $99,999"'
label var ah3be043  `"Estimates: Female: $100,000 or more"'
label var ah3pe001  `"Estimates: Total"'
label var ah3pe002  `"Estimates: In labor force"'
label var ah3pe003  `"Estimates: In labor force: Civilian labor force"'
label var ah3pe004  `"Estimates: In labor force: Civilian labor force: Employed"'
label var ah3pe005  `"Estimates: In labor force: Civilian labor force: Unemployed"'
label var ah3pe006  `"Estimates: In labor force: Armed Forces"'
label var ah3pe007  `"Estimates: Not in labor force"'
label var ah6ie001  `"Estimates: Total"'
label var ah6ie002  `"Estimates: Under 19 years"'
label var ah6ie003  `"Estimates: Under 19 years: With one type of health insurance coverage"'
label var ah6ie004  `"Estimates: Under 19 years: With one type of health insurance coverage:
With empl"'
label var ah6ie005  `"Estimates: Under 19 years: With one type of health insurance coverage:
With dire"'
```

label var ah6ie006 `"Estimates: Under 19 years: With one type of health insurance coverage: With Medi"'
label var ah6ie007 `"Estimates: Under 19 years: With one type of health insurance coverage: With Medi"'
label var ah6ie008 `"Estimates: Under 19 years: With one type of health insurance coverage: With TRIC"'
label var ah6ie009 `"Estimates: Under 19 years: With one type of health insurance coverage: With VA H"'
label var ah6ie010 `"Estimates: Under 19 years: With two or more types of health insurance coverage"'
label var ah6ie011 `"Estimates: Under 19 years: With two or more types of health insurance coverage: "'
label var ah6ie012 `"Estimates: Under 19 years: With two or more types of health insurance coverage: "'
label var ah6ie013 `"Estimates: Under 19 years: With two or more types of health insurance coverage: "'
label var ah6ie014 `"Estimates: Under 19 years: With two or more types of health insurance coverage: "'
label var ah6ie015 `"Estimates: Under 19 years: With two or more types of health insurance coverage: "'
label var ah6ie016 `"Estimates: Under 19 years: With two or more types of health insurance coverage: "'
label var ah6ie017 `"Estimates: Under 19 years: No health insurance coverage"'
label var ah6ie018 `"Estimates: 19 to 34 years"'
label var ah6ie019 `"Estimates: 19 to 34 years: With one type of health insurance coverage"'
label var ah6ie020 `"Estimates: 19 to 34 years: With one type of health insurance coverage: With empl"'
label var ah6ie021 `"Estimates: 19 to 34 years: With one type of health insurance coverage: With dire"'
label var ah6ie022 `"Estimates: 19 to 34 years: With one type of health insurance coverage: With Medi"'
label var ah6ie023 `"Estimates: 19 to 34 years: With one type of health insurance coverage: With Medi"'
label var ah6ie024 `"Estimates: 19 to 34 years: With one type of health insurance coverage: With TRIC"'
label var ah6ie025 `"Estimates: 19 to 34 years: With one type of health insurance coverage: With VA H"'
label var ah6ie026 `"Estimates: 19 to 34 years: With two or more types of health insurance coverage"'
label var ah6ie027 `"Estimates: 19 to 34 years: With two or more types of health insurance coverage: "'
label var ah6ie028 `"Estimates: 19 to 34 years: With two or more types of health insurance coverage: "'
label var ah6ie029 `"Estimates: 19 to 34 years: With two or more types of health insurance coverage: "'

```
label var ah6ie030  `"Estimates: 19 to 34 years: With two or more types of health insurance coverage: "'
label var ah6ie031  `"Estimates: 19 to 34 years: With two or more types of health insurance coverage: "'
label var ah6ie032  `"Estimates: 19 to 34 years: With two or more types of health insurance coverage: "'
label var ah6ie033  `"Estimates: 19 to 34 years: No health insurance coverage"'
label var ah6ie034  `"Estimates: 35 to 64 years"'
label var ah6ie035  `"Estimates: 35 to 64 years: With one type of health insurance coverage"'
label var ah6ie036  `"Estimates: 35 to 64 years: With one type of health insurance coverage: With empl"'
label var ah6ie037  `"Estimates: 35 to 64 years: With one type of health insurance coverage: With dire"'
label var ah6ie038  `"Estimates: 35 to 64 years: With one type of health insurance coverage: With Medi"'
label var ah6ie039  `"Estimates: 35 to 64 years: With one type of health insurance coverage: With Medi"'
label var ah6ie040  `"Estimates: 35 to 64 years: With one type of health insurance coverage: With TRIC"'
label var ah6ie041  `"Estimates: 35 to 64 years: With one type of health insurance coverage: With VA H"'
label var ah6ie042  `"Estimates: 35 to 64 years: With two or more types of health insurance coverage"'
label var ah6ie043  `"Estimates: 35 to 64 years: With two or more types of health insurance coverage: "'
label var ah6ie044  `"Estimates: 35 to 64 years: With two or more types of health insurance coverage: "'
label var ah6ie045  `"Estimates: 35 to 64 years: With two or more types of health insurance coverage: "'
label var ah6ie046  `"Estimates: 35 to 64 years: With two or more types of health insurance coverage: "'
label var ah6ie047  `"Estimates: 35 to 64 years: With two or more types of health insurance coverage: "'
label var ah6ie048  `"Estimates: 35 to 64 years: With two or more types of health insurance coverage: "'
label var ah6ie049  `"Estimates: 35 to 64 years: With two or more types of health insurance coverage: "'
label var ah6ie050  `"Estimates: 35 to 64 years: No health insurance coverage"'
label var ah6ie051  `"Estimates: 65 years and over"'
label var ah6ie052  `"Estimates: 65 years and over: With one type of health insurance coverage"'
label var ah6ie053  `"Estimates: 65 years and over: With one type of health insurance coverage: With e"'
label var ah6ie054  `"Estimates: 65 years and over: With one type of health insurance coverage: With d"'
label var ah6ie055  `"Estimates: 65 years and over: With one type of health insurance coverage: With M"'
```

```
label var ah6ie056  `"Estimates: 65 years and over: With one type of health insurance coverage: With T"'
label var ah6ie057  `"Estimates: 65 years and over: With one type of health insurance coverage: With V"'
label var ah6ie058  `"Estimates: 65 years and over: With two or more types of health insurance coverag"'
label var ah6ie059  `"Estimates: 65 years and over: With two or more types of health insurance coverag"'
label var ah6ie060  `"Estimates: 65 years and over: With two or more types of health insurance coverag"'
label var ah6ie061  `"Estimates: 65 years and over: With two or more types of health insurance coverag"'
label var ah6ie062  `"Estimates: 65 years and over: With two or more types of health insurance coverag"'
label var ah6ie063  `"Estimates: 65 years and over: With two or more types of health insurance coverag"'
label var ah6ie064  `"Estimates: 65 years and over: With two or more types of health insurance coverag"'
label var ah6ie065  `"Estimates: 65 years and over: With two or more types of health insurance coverag"'
label var ah6ie066  `"Estimates: 65 years and over: No health insurance coverage"'
label var ah6ne001  `"Estimates: Total"'
label var ah6ne002  `"Estimates: Native"'
label var ah6ne003  `"Estimates: Native: Allocated"'
label var ah6ne004  `"Estimates: Native: Not allocated"'
label var ah6ne005  `"Estimates: Foreign born"'
label var ah6ne006  `"Estimates: Foreign born: Allocated"'
label var ah6ne007  `"Estimates: Foreign born: Not allocated"'

label var NumberofInsurers "Number of Insurers"

*label URR
label var incr_pmpm_inp "Inpatient"
label var incr_pmpm_out "Outpatient"
label var incr_pmpm_prof "Professional"
label var incr_pmpm_rx "Prescription"
label var incr_pmpm_oth "Other"
label var incr_pmpm_cap "Capitation"
label var incr_pmpm_adm "Administration"
label var incr_pmpm_tax "Taxes and Fees"
label var incr_pmpm_rsk "Risk & Profit Charge"
label var incr_pmpm_tot "Total Rate Increase"
label var incr_cst_shr_pmpm "Member Cost Share Increase"
label var cur_rate_pmpm "Average Current Rate PMPM"
label var prj_mm_sec2 "Projected Member Months"
```

*drop margins of error variables
drop ahyqm* ahy1m* ahy2m* ah3pm* ahzbm* ah0qm* ah04m* ah1hm* ah1jm* ah1om* ah1pm* ah1ym* ah1zm* ah11m* ah2rm* ah3bm* ah6im* ah6nm*

save HIX_ACS_CMS_KFF_URR.dta, replace

****
****

State medicaid expansion
/*label def l_states 1"Alabama" 2"Alaska" 4"Arizona" 5"Arkansas" 6"California" 8"Colorado" 9"Connecticut" 10"Delaware" ///
11"District of Columbia" 12"Florida" 13"Georgia" 15"Hawaii" 16"Idaho" 17"Illinois" 18"Indiana" 19"Iowa" 20"Kansas" ///
21"Kentucky" 22"Louisiana" 23"Maine" 24"Maryland" 25"Massachusetts" 26"Michigan" 27"Minnesota" 28"Mississippi" ///
29"Missouri" 30"Montana" 31"Nebraska" 32"Nevada" 33"New Hampshire" 34"New Jersey" 35"New Mexico" 36"New York" ///
37"North Carolina" 38"North Dakota" 39"Ohio" 40"Oklahoma" 41"Oregon" 42"Pennsylvania" 44"Rhode Island" 45"South Carolina" ///
46"South Dakota" 47"Tennessee" 48"Texas" 49"Utah" 50"Vermont" 51"Virginia" 53"Washington" 54"West Virginia" ///
55"Wisconsin" 56"Wyoming" */

//gen medicaid_exp=0 if inlist(statefip,1,12,13,16,20,28,29,31,37,40,45,46,47,48,49,55,56)

gen medicaid_exp=0 if inlist(st,"AL","FL","GA","ID","KS","MS","MO","MN","NE")
replace medicaid_exp=0 if inlist(st,"NC","OK","SC","SD","TN","TX","UT","WI","WY")
recode medicaid_exp(.=1)
gen medicaid_not_implemented=1 if inlist(st,"ID","NE","UT")
recode medicaid_not_implemented(.=0)
gen medicaid_not_adopted=1 if inlist(st,"AL","FL","GA","KS","MS","MO","NC","OK","SC")
replace medicaid_not_adopted=1 if inlist(st,"SD","TN","TX","WI","WY")
recode medicaid_not_adopted(.=0)
gen medicaid_exp_2014=1 if inlist(st,"AZ","AR","CA","CO","CT","DE","DC","HI","IL")
replace medicaid_exp_2014=1 if inlist(st,"IA","KY","MD","MA","MI","MN","NV","NH","NJ")
replace medicaid_exp_2014=1 if inlist(st,"NM","NY","ND","OH","OR","RI","VT","WA","WV")
recode medicaid_exp_2014(.=0)
gen medicaid_exp_2015=1 if inlist(st,"AK","IN","PA")
recode medicaid_exp_2015(.=0)
gen medicaid_exp_2016=1 if inlist(st,"LA","MT") //what month to consider for expansion?? i took ay month in a year to construct vars
recode medicaid_exp_2016(.=0)
gen medicaid_exp_2018=1 if inlist(st,"ME","VA")
recode medicaid_exp_2018(.=0)

```
gen medicaid_timeline=1 if medicaid_exp_2014==1
	replace medicaid_timeline=2 if medicaid_exp_2015==1
	replace medicaid_timeline=3 if medicaid_exp_2016==1
	replace medicaid_timeline=4 if medicaid_exp_2018==1
	replace medicaid_timeline=5 if medicaid_not_implemented==1
	replace medicaid_timeline=6 if medicaid_not_adopted==1

label def l_medicaid_timeline 1"2014" 2"2015" 3"2016" 4"2018" 5"Adopted but not implemented" 6"Not adopted"
label values medicaid_timeline l_medicaid_timeline
label var ah1je001 "Total:Ratio of Income to Poverty Level in the Past 12 Months"

save HIX_ACS_CMS_KFF_URR.dta, replace
set more off

graph bar premi27 premi50 premi2c30, over(year) title("Premium changes for Second Lowest Cost Silver Plan in GRAs by year")
graph bar (mean) premi27 (mean) premi50 (mean) premi2c30, over(monopoly) blabel(bar) title("Average Premiums for Second Lowest Cost Silver Plan in GRAs with/without Monopoly")

//there are two vars for states in this data. both vars have some missing on one or the other. Fixing it below.
replace st=state if st==""
replace state=st if state==""
encode state,gen(stateid)

gen monopoly=1 if Number==1
	recode monopoly(.=0)
	label var monopoly "Monopoly"

gen oligopoly=1 if Number>1 & Number<3
	recode oligopoly(.=0)
	label var oligopoly "Oligopoly"

gen competition=1 if Number>=3
	recode competition(.=0)
	label var competition "Competition"

gen type_insurers=1 if monopoly==1
	replace type_insurers=2 if oligopoly==1
	replace type_insurers=3 if competition==1
	replace type_insurers=0 if type_insurers==.
	label var type_insurers "Type of insurers"

*gen poverty var
gen percent_poor=(ah1oe003/ah1oe001)*100
```

```
        recode percent_poor(.=0)
        label var percent_poor "% Poor"

*gen hispanic percent
gen percent_hispanic=(ahzbe003/ahzbe001)*100
        replace percent_hispanic=0 if percent_hispanic==.
        label var percent_hispanic "% Hispanics"

*gen variables for desc stats
gen percent_women=(ahyqe026/ahyqe001)*100 //creating percentage of women in each GRA
        replace percent_women=0 if percent_women==.
        label var percent_women "% Women"

gen age_men_abv35_below65=ahyqe013 + ahyqe014 + ahyqe015 + ahyqe016 + ahyqe017 + ///
        ahyqe018 + ahyqe019 //adding men above above age 35
        recode age_men_abv35_below65(.=0)
        label var age_men_abv35_below65 "% Men Above Age 35"

gen age_women_abv35_below65=ahyqe037 + ahyqe038 + ahyqe039 + ahyqe040 + ahyqe041 +
///
        ahyqe042 + ahyqe043 //adding categories of women above age 35
        recode age_women_abv35_below65(.=0)
        label var age_women_abv35_below65 "% Women Above Age 35"

gen percent_age_abv35_below65=((age_men_abv35_below65 +
age_women_abv35_below65)/ahyqe001)*100
        recode percent_age_abv35_below65(.=0)
        label var percent_age_abv35_below65 "% Above Age 35"

gen age_men_abv65=ahyqe020 + ahyqe021 + ahyqe022 + ahyqe023 + ahyqe024 + ahyqe025
        recode age_men_abv65(.=0)
        label var age_men_abv65 "% Men Above Age 65"

gen age_women_abv65=ahyqe044 + ahyqe045 + ahyqe046 + ahyqe047 + ahyqe048 + ahyqe049
        recode age_women_abv65(.=0)
        label var age_women_abv65 "% Women Above Age 65"

gen percent_age_abv65=((age_men_abv65 + age_women_abv65)/ahyqe001)*100
        recode percent_age_abv65(.=0)
        label var percent_age_abv65 "% Above Age 65"

*percent of foreign born
gen percent_foreignborn=(ah6ne005/ah6ne001)*100
        recode percent_foreignborn(.=0)

gen percent_spanish_speaking=(ah1he003/ah1he001)*100
```

```
	recode percent_spanish_speaking(.=0)

/*integrated deductibles-total deductibles
For 2020, the IRS defines a high deductible health plan as any plan with a deductible of at least
$1,400
for an individual or $2,800 for a family.
An HDHP's total yearly out-of-pocket expenses
(including deductibles, copayments, and coinsurance) can't be more than $6,900 for an individual
or $13,800 for a family.

High Deductible Health Plan (HDHP) - HealthCare.gov ...www.healthcare.gov › glossary › high-
deductible-health-plan
*/
gen high_deduc=1 if tehbdedinntier1individuala>1400
	recode high_deduc(.=0)
	label var high_deduc "High deductible plans"

gen plantype_ppo=1 if plantype==1
	recode plantype_ppo(.=0)
	label var plantype_ppo "PPO plan type"

gen plantype_hmo=1 if plantype==2
	recode plantype_hmo(.=0)
	label var plantype_hmo "HMO plan type"

gen plantype_pos=1 if plantype==3
	recode plantype_pos(.=0)
	label var plantype_pos "POS plan type"

gen plantype_epo=1 if plantype==4
	recode plantype_epo(.=0)
	label var plantype_epo "EPO plan type"

gen plantype_other=1 if plantype==5
	recode plantype_other(.=0)
	label var plantype_other "Other plan types"

label var medicaid_exp "Medicaid expansion"

*Controlling for state based vs federal marketplaces. Creating its variable.
gen state_marketplace=1 if inlist(state,"CA","CO","CT","DC")
	replace state_marketplace=1 if
inlist(state,"ID","MD","MA","MN","NV","NY","RI","VT","WA")
	recode state_marketplace(.=0)

save "intermediate_HIX_ACS_CMS_KFF_URR.dta", replace
```

```
********************************** Descriptive Statistics
******************************************
asdoc tabstat premi27 premi50 premi2c30 ///
monopoly oligopoly competition medicaid_exp high_deduc plantype_ppo plantype_hmo
plantype_pos plantype_epo percent_poor percent_women percent_hispanic ///
percent_age_abv35_below65 state_marketplace, statistics(mean sd N) replace label dec(2)

*************************************************************************
***************************************************
*************************************************************************
***************************************************
********************************** Regressions OLS and PANEL
******************************************
*************************************************************************
***************************************************
*************************************************************************
***************************************************
//Start here :Main Results: monopoly(0/1)
************NEW PANEL REGRESSIONS: RANDOMEFFECTS***************
use intermediate_HIX_ACS_CMS_KFF_URR.dta, clear
set more off
eststo clear
//preserve
	drop if metal!="Silver" //dropping non silver plans
	egen rank_premi27 = rank(premi27), by(area year) unique //ranking premiums by area
and year
	egen maxplan=max(rank_premi27), by(area year) //some gras have only one plan so
selecting that in this step
	egen id_slcsp_premi27=concat(area rank_premi27) if (maxplan==1 | rank_premi27==2)
//selecting slcsp or the only silver plan (if gra has only one plan)
	encode id_slcsp_premi27,gen(ID_slcsp_premi27)
	tab area year if ID_slcsp_premi27!=. & metal=="Silver"
	keep if ID_slcsp_premi27!=. //deleting everything except slcsp
	*keep if rank_premi27==2
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07") //problematic GRAs

	encode area, gen(gra) //converting to string
	xtset gra year

//	xtreg premi27 i.monopoly##i.state_marketplace medicaid_exp high_deduc plantype_hmo
plantype_pos plantype_epo plantype_other ///
//	percent_women percent_hispanic percent_age_abv35_below65  i.year ib5.stateid, re
//	eststo
```

```
	xtreg premi27 i.monopoly#i.year monopoly medicaid_exp high_deduc plantype_hmo 
plantype_pos plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year 
ib5.stateid, re
	eststo

	/*xtreg premi27 monopoly medicaid_exp high_deduc plantype_hmo plantype_pos 
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year 
ib5.stateid, fe
	eststo

	hausman est1 est2

	/*xtreg premi27 monopoly medicaid_exp high_deduc plantype_hmo plantype_pos 
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year 
ib5.stateid, re vce(cluster stateid)
	eststo*/
	*/

restore
preserve
*use intermediate_HIX_ACS_CMS_KFF_URR.dta, clear
*set more off
*Premiunm for 50 year old
	drop if metal!="Silver"
	egen rank_premi50 = rank(premi50), by(area year) unique
	egen maxplan=max(rank_premi50), by(area year)
	egen id_slcsp_premi50=concat(area rank_premi50) if (maxplan==1 | rank_premi50==2)
	encode id_slcsp_premi50,gen(ID_slcsp_premi50)
	keep if ID_slcsp_premi50!=.
	*keep if rank_premi27==2
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
		tab area year if ID_slcsp_premi50!=. & metal=="Silver"

	encode area, gen(gra)
	xtset gra year

	xtreg premi50 monopoly medicaid_exp high_deduc plantype_hmo plantype_pos 
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year 
ib5.stateid, re vce(cluster stateid)
	eststo

restore
```

```
preserve
drop if metal!="Silver"
	egen rank_premi2c30 = rank(premi2c30), by(area year) unique
	egen maxplan=max(rank_premi2c30), by(area year)
	egen id_slcsp_premi2c30=concat(area rank_premi2c30) if (maxplan==1 |
rank_premi2c30==2)
	encode id_slcsp_premi2c30,gen(ID_slcsp_premi2c30)
	keep if ID_slcsp_premi2c30!=.
	*keep if rank_premi27==2
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
		tab area year if ID_slcsp_premi2c30!=. & metal=="Silver"

	encode area, gen(gra)
	xtset gra year

	xtreg premi2c30 monopoly medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, re vce(cluster stateid)
	eststo

restore
preserve
	drop if metal!="Silver"
	egen rank_premi27 = rank(premi27), by(area year) unique
	egen maxplan=max(rank_premi27), by(area year)
	egen id_slcsp_premi27=concat(area rank_premi27) if (maxplan==1 | rank_premi27==2)
	encode id_slcsp_premi27,gen(ID_slcsp_premi27)
	tab area year if ID_slcsp_premi27!=. & metal=="Silver"
	keep if ID_slcsp_premi27!=.
	*keep if rank_premi27==2
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")

	encode area, gen(gra)
	xtset gra year

	xtreg premi27 i.type_insurers medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, re vce(cluster stateid)
	eststo

restore
preserve
*use intermediate_HIX_ACS_CMS_KFF_URR.dta, clear
*set more off
```

```
*Premiunm for 50 year old
	drop if metal!="Silver"
	egen rank_premi50 = rank(premi50), by(area year) unique
	egen maxplan=max(rank_premi50), by(area year)
	egen id_slcsp_premi50=concat(area rank_premi50) if (maxplan==1 | rank_premi50==2)
	encode id_slcsp_premi50,gen(ID_slcsp_premi50)
	keep if ID_slcsp_premi50!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
		tab area year if ID_slcsp_premi50!=. & metal=="Silver"

	encode area, gen(gra)
	xtset gra year

	xtreg premi50 i.type_insurers medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, re vce(cluster stateid)
	eststo

restore
preserve
drop if metal!="Silver"
	egen rank_premi2c30 = rank(premi2c30), by(area year) unique
	egen maxplan=max(rank_premi2c30), by(area year)
	egen id_slcsp_premi2c30=concat(area rank_premi2c30) if (maxplan==1 |
rank_premi2c30==2)
	encode id_slcsp_premi2c30,gen(ID_slcsp_premi2c30)
	keep if ID_slcsp_premi2c30!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
		tab area year if ID_slcsp_premi2c30!=. & metal=="Silver"

	encode area, gen(gra)
	xtset gra year

	xtreg premi2c30 i.type_insurers medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, re vce(cluster stateid)
	eststo

	esttab using "slcsp_regression_panel_mar26.rtf", stat(aic bic N r2) label cells(b(star
fmt(%9.3f)) se(fmt(%9.3f))) replace title(Effect of Market Concentration on Premiums for
different individuals based on second lowest cost plan)

***Pooled OLS***
use intermediate_HIX_ACS_CMS_KFF_URR.dta, clear
```

```
set more off
eststo clear
preserve
	drop if metal!="Silver"
	egen rank_premi27 = rank(premi27), by(area year) unique
	egen maxplan=max(rank_premi27), by(area year)
	egen id_slcsp_premi27=concat(area rank_premi27) if (maxplan==1 | rank_premi27==2)
	encode id_slcsp_premi27,gen(ID_slcsp_premi27)
	tab area year if ID_slcsp_premi27!=. & metal=="Silver"
	keep if ID_slcsp_premi27!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")

eststo clear

	reg premi27 monopoly medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, robust cluster(stateid) //plantype_ppo is the base category for plantype //agebelow35
is the base for age
	eststo

restore
preserve
	drop if metal!="Silver"
	egen rank_premi50 = rank(premi50), by(area year) unique
	egen maxplan=max(rank_premi50), by(area year)
	egen id_slcsp_premi50=concat(area rank_premi50) if (maxplan==1 | rank_premi50==2)
	encode id_slcsp_premi50,gen(ID_slcsp_premi50)
	keep if ID_slcsp_premi50!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
	tab area year if ID_slcsp_premi50!=. & metal=="Silver"

	reg premi50 monopoly medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, robust cluster(stateid) //plantype_ppo is the base category for plantype
	eststo

restore
preserve
	egen rank_premi2c30 = rank(premi2c30), by(area year) unique
	egen maxplan=max(rank_premi2c30), by(area year)
	egen id_slcsp_premi2c30=concat(area rank_premi2c30) if (maxplan==1 |
rank_premi2c30==2)
	encode id_slcsp_premi2c30,gen(ID_slcsp_premi2c30)
	keep if ID_slcsp_premi2c30!=.
```

```
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
	tab area year if ID_slcsp_premi2c30!=. & metal=="Silver"

	reg premi2c30 monopoly medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, robust cluster(stateid)
	eststo

//Main Results: type_insurers(categorical-monopoly/oligopoly/competition)
*************OLS REGRESSIONS with time and state FE****************
restore
preserve
	drop if metal!="Silver"
	egen rank_premi27 = rank(premi27), by(area year) unique
	egen maxplan=max(rank_premi27), by(area year)
	egen id_slcsp_premi27=concat(area rank_premi27) if (maxplan==1 | rank_premi27==2)
	encode id_slcsp_premi27,gen(ID_slcsp_premi27)
	tab area year if ID_slcsp_premi27!=. & metal=="Silver"
	keep if ID_slcsp_premi27!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")

	reg premi27 i.type_insurers medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, robust cluster(stateid) //plantype_ppo is the base category for plantype //agebelow35
is the base for age
	eststo

restore
preserve
	drop if metal!="Silver"
	egen rank_premi50 = rank(premi50), by(area year) unique
	egen maxplan=max(rank_premi50), by(area year)
	egen id_slcsp_premi50=concat(area rank_premi50) if (maxplan==1 | rank_premi50==2)
	encode id_slcsp_premi50,gen(ID_slcsp_premi50)
	keep if ID_slcsp_premi50!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
	tab area year if ID_slcsp_premi50!=. & metal=="Silver"

	reg premi50 i.type_insurers medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, robust cluster(stateid) //plantype_ppo is the base category for plantype
	eststo
```

```
restore
preserve
	egen rank_premi2c30 = rank(premi2c30), by(area year) unique
	egen maxplan=max(rank_premi2c30), by(area year)
	egen id_slcsp_premi2c30=concat(area rank_premi2c30) if (maxplan==1 |
rank_premi2c30==2)
	encode id_slcsp_premi2c30,gen(ID_slcsp_premi2c30)
	keep if ID_slcsp_premi2c30!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
	tab area year if ID_slcsp_premi2c30!=. & metal=="Silver"

	reg premi2c30 i.type_insurers medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, robust cluster(stateid)
	eststo

esttab using "slcsp_regression_ols.rtf", stat(aic bic N r2) label cells(b(star fmt(%9.3f))
se(fmt(%9.3f))) replace title(Effect of Market Concentration on Premiums for different
individuals based on second lowest cost plan)

*************NEW PANEL REGRESSIONS: FIXED EFFECTS****************
use intermediate_HIX_ACS_CMS_KFF_URR.dta, clear
set more off
eststo clear
preserve
	drop if metal!="Silver"
	egen rank_premi27 = rank(premi27), by(area year) unique
	egen maxplan=max(rank_premi27), by(area year)
	egen id_slcsp_premi27=concat(area rank_premi27) if (maxplan==1 | rank_premi27==2)
	encode id_slcsp_premi27,gen(ID_slcsp_premi27)
	tab area year if ID_slcsp_premi27!=. & metal=="Silver"
	keep if ID_slcsp_premi27!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")

	encode area, gen(gra)
	xtset gra year

	xtreg premi27 monopoly medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, fe vce(cluster stateid)
	eststo

	/*xtreg premi27 monopoly medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
```

```
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, re vce(cluster stateid)
	eststo*/

restore
preserve
*use intermediate_HIX_ACS_CMS_KFF_URR.dta, clear
*set more off
*Premiunm for 50 year old
	drop if metal!="Silver"
	egen rank_premi50 = rank(premi50), by(area year) unique
	egen maxplan=max(rank_premi50), by(area year)
	egen id_slcsp_premi50=concat(area rank_premi50) if (maxplan==1 | rank_premi50==2)
	encode id_slcsp_premi50,gen(ID_slcsp_premi50)
	keep if ID_slcsp_premi50!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
		tab area year if ID_slcsp_premi50!=. & metal=="Silver"

	encode area, gen(gra)
	xtset gra year

	xtreg premi50 monopoly medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, fe vce(cluster stateid)
	eststo

restore
preserve
	drop if metal!="Silver"
	egen rank_premi2c30 = rank(premi2c30), by(area year) unique
	egen maxplan=max(rank_premi2c30), by(area year)
	egen id_slcsp_premi2c30=concat(area rank_premi2c30) if (maxplan==1 |
rank_premi2c30==2)
	encode id_slcsp_premi2c30,gen(ID_slcsp_premi2c30)
	keep if ID_slcsp_premi2c30!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
		tab area year if ID_slcsp_premi2c30!=. & metal=="Silver"

	encode area, gen(gra)
	xtset gra year

	xtreg premi2c30 monopoly medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, fe vce(cluster stateid)
```

```
	eststo

restore
preserve
	drop if metal!="Silver"
	egen rank_premi27 = rank(premi27), by(area year) unique
	egen maxplan=max(rank_premi27), by(area year)
	egen id_slcsp_premi27=concat(area rank_premi27) if (maxplan==1 | rank_premi27==2)
	encode id_slcsp_premi27,gen(ID_slcsp_premi27)
	tab area year if ID_slcsp_premi27!=. & metal=="Silver"
	keep if ID_slcsp_premi27!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")

	encode area, gen(gra)
	xtset gra year

	xtreg premi27 i.type_insurers medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, fe vce(cluster stateid)
	eststo

restore
preserve
*use intermediate_HIX_ACS_CMS_KFF_URR.dta, clear
*set more off
*Premiunm for 50 year old
	drop if metal!="Silver"
	egen rank_premi50 = rank(premi50), by(area year) unique
	egen maxplan=max(rank_premi50), by(area year)
	egen id_slcsp_premi50=concat(area rank_premi50) if (maxplan==1 | rank_premi50==2)
	encode id_slcsp_premi50,gen(ID_slcsp_premi50)
	keep if ID_slcsp_premi50!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
		tab area year if ID_slcsp_premi50!=. & metal=="Silver"

	encode area, gen(gra)
	xtset gra year

	xtreg premi50 i.type_insurers medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, fe vce(cluster stateid)
	eststo

restore
```

```
preserve
drop if metal!="Silver"
	egen rank_premi2c30 = rank(premi2c30), by(area year) unique
	egen maxplan=max(rank_premi2c30), by(area year)
	egen id_slcsp_premi2c30=concat(area rank_premi2c30) if (maxplan==1 |
rank_premi2c30==2)
	encode id_slcsp_premi2c30,gen(ID_slcsp_premi2c30)
	keep if ID_slcsp_premi2c30!=.
	drop if inlist(area, "WA06","WA07","WA08","WA09","ID07")
		tab area year if ID_slcsp_premi2c30!=. & metal=="Silver"

	encode area, gen(gra)
	xtset gra year

	xtreg premi2c30 i.type_insurers medicaid_exp high_deduc plantype_hmo plantype_pos
plantype_epo plantype_other ///
	percent_women percent_hispanic percent_age_abv35_below65 state_marketplace i.year
ib5.stateid, fe vce(cluster stateid)
	eststo

	esttab using "slcsp_regression_panel_FE.rtf", stat(aic bic N r2) label cells(b(star
fmt(%9.3f)) se(fmt(%9.3f))) replace title(Effect of Market Concentration on Premiums for
different individuals based on second lowest cost plan)
```