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# Evaluating Consumer Preferences for Medicare Part D Using Conjoint Analysis

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# Evaluating Consumer Preferences for Medicare Part D Using Conjoint Analysis

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**EVALUATING CONSUMER PREFERENCES FOR MEDICARE PART D USING  
CONJOINT ANALYSIS**

A Dissertation  
Presented for  
The Graduate Studies Council  
The University of Tennessee  
Health Science Center

In Partial Fulfillment  
Of the Requirements for the Degree  
Doctor of Philosophy  
From The University of Tennessee

By  
La'Marcus Wingate  
May 2011

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## **DEDICATION**

This dissertation is dedicated to:  
My Lord and Savior: Jesus Christ  
My mother: Mary Wingate

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There are too many people to list that contributed to my being able to complete this project, but I only have a limited amount of space. First of all I would like to thank my mother, Mother Wingate, for her unending support, and the time that she dedicated in teaching me life principles from an early age. I would also like to thank my research advisor, Dr. Lawrence Brown for all of his valuable guidance through this process as well as all of my other committee members. I would like to thank the Boston College Center for Retirement Research for their generous efforts in selecting me as a recipient of their dissertation fellowship. In addition, I would like to thank Sawtooth Software for their donation of the Adaptive Choice Based Conjoint Analysis Software through their educational grant program and their superb technical support. I would also like to acknowledge the support of all the graduate students who shared in this particular program with me, but specifically I would like to acknowledge Dr. Crescent Rowell, Dr. Meghan Hufstader, Dr. Lawrence Brown, Dr. Brandi Franklin, Dr. Yi Yang, Dr. Varun Vadiya, Mekell Richardson, Enitra Jones, Adole Alipoe and Jun Tang. I would be remiss if I failed to mention several members of the College of Graduate Health Sciences at the University of Tennessee Health Science Center who have given me invaluable support throughout this process. I would like to thank Felicia Martin and Becky Brown for guiding me throughout my journey in graduate school and making sure that I meet all necessary requirements. Moreover, I would like to thank Ms. Elise Moore for providing whatever type of support I needed for any occasion. I would also like to thank Shirley Hancock and Hilliary Degive for providing outstanding editorial assistance. You have truly made this a more excellent product. I would also like to thank all of the wonderful people I have worked with at the Consortium for Health Education and Economic Empowerment Research including Dr. Shelley White Means, Dr. Murriel Rice, and Dr. Mona Wicks. In addition I would like to thank my church family at World Overcomers Outreach Ministries Church, in particular the Usher Ministry and the Hickory Hill Redevelopment Corporation. And last but not least, I would like to acknowledge my Lord and Savior, Jehovah God, without him, I would be powerless to accomplish anything of lasting value.

## ABSTRACT

The establishment of an outpatient prescription drug benefit in Medicare, Medicare Part D, was one of the more significant events in United States healthcare reform history. Many seniors have chosen to enroll in the plan as the program has an enrollment of over 27 million. One central premise of Medicare Part D was that the plan would be administered entirely through private insurance plans. Because many plans would be competing against one another for potential beneficiaries, it was expected that companies would offer seniors plans with high quality benefits at lower costs that would presumably be attractive to seniors. However, in order for this strategy to succeed, seniors must be sensitive to differences in price and the quality of benefits amongst different plans. This study sought to evaluate the relative importance seniors place on different attributes of Medicare Part D drug plans using a marketing technique called conjoint analysis.

An Adaptive Choice Based Conjoint Analysis Survey was constructed and administered to 497 seniors in the Greater Memphis/Shelby County Area. Seniors were recruited from local senior centers or senior apartment homes. The survey consisted of 7 attributes: premiums, brand copayments, generic copayments, deductible amounts, doughnut hole coverage, formulary provisions, and eligibility requirements for medication therapy management services.

The most important attribute in the aggregate sample was premiums with an importance score of 50.3%, followed by the formulary provisions (importance score of 12.1%), deductible (11.6%) and pharmacy access (10.1%). Seniors with higher incomes, those taking more than seven medications, and those with monthly medication costs above \$80 were less sensitive to premium increases than other groups. As a group, the seniors were willing to pay approximately \$20 more in monthly premiums to go from plans with the maximum allowed deductible to plans with no deductible and only \$3 more to have full coverage of generics in the doughnut hole; however these values differed amongst different segments. For example, seniors with reported medication costs of at least \$80 per month are willing to spend on average \$20 per month for doughnut hole coverage.

Adaptive Choice Based Conjoint Analysis represents a feasible way to elicit preferences for features in Medicare Part D drug plans. Seniors are sensitive to differences in cost and breadth of coverage across plans, although only a subset of seniors is sensitive to the doughnut hole. Seniors are particularly concerned with low premiums in their particular plans, although seniors with higher incomes, those taking more medications, and those with higher out of pocket medication costs are less sensitive to changes in premiums. The delivery system characteristics are also an important consideration for seniors in purchasing Medicare Part D plans, as most seniors exhibited strong preferences for being able to retain their relationship with their current pharmacy.

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## CHAPTER 1. INTRODUCTION

### Medicare and the Provision of Health Care Services

Medicare was established in 1965 through Title XVIII of the Social Security Act as a means of helping to provide security against the disproportionate health care risks borne by seniors at least 65 years old, and younger individuals under 65 with certain disabilities including end stage renal disease.<sup>1</sup> The majority of the program enrollees are senior citizens; in 2010 there were 47 million total beneficiaries with 39 million senior citizens.<sup>1</sup> Medicare is the nation's largest health insurance program in both enrollment and expenditures, as federal spending on the benefits amounts to over \$500 billion dollars.<sup>1</sup> The vast majority of the nearly 40 million Americans over the age of 65 are automatically enrolled in Medicare Part A, which provides coverage for inpatient hospital visits and skilled nursing visits among other services.<sup>1</sup> Virtually all (95%) of these seniors are automatically enrolled in Medicare Part B which covers outpatient hospital services, physician visits, preventive care, and other types of services.<sup>1</sup> During the 1970's beneficiaries were also given the option of enrolling in Medicare Part C where their services would be provided through a privately owned managed care corporation under the jurisdiction of Medicare Part D.<sup>1</sup> These companies were required to provide at minimum the benefits available in Medicare A and B, and offer additional services at their discretion.<sup>1,2</sup>

One notable exception to the services provided in Medicare A and B is prescription drug coverage. Medicare Part D, the outpatient prescription drug benefit available through Medicare, was enacted through the passage of the Medicare Modernization Act of 2003 (MMA) with the intention of helping to alleviate the burden of prescription drug costs for seniors, particularly those with no previous drug coverage and those with inadequate prescription coverage.<sup>2</sup> The program was not formally implemented until 2006.<sup>2</sup> The rationale for prescription drug coverage to be included in Medicare has been well documented. Senior citizens tend to have more chronic diseases which require pharmacologic therapy. Recent research indicated that senior citizens had nearly 23 prescriptions filled on an annual basis, nearly double that of the average for the U.S. population as whole.<sup>3,4</sup>

Approximately 65%-74% of seniors had some type of drug coverage in 1996-2003, primarily through Medicare Advantage Plans, Medicaid, employer sponsored insurance or plans purchased through the individual market, meaning there were well over 11 million seniors without prescription drug coverage.<sup>5-9</sup> One may surmise that most of the seniors without prescription coverage may not be taking any medications, but this is not always true, as between 80%-90% of the seniors without prescription insurance at this time were using some type of prescription medication.<sup>8,9</sup> The research during this period demonstrated that although seniors without prescription insurance used fewer prescriptions, they incurred higher medication related expenses.<sup>6</sup> As a result, seniors without prescription drug coverage were five times as likely to report experiencing financial hardship as a result of expenses related to prescription drugs.<sup>8</sup> Seniors adapted

many maladaptive behaviors to cope with the high medication expenses such as not obtaining refills of medications, skipping doses of medications, or splitting pills.<sup>8</sup> For example, in 2004 half of seniors without prescription drug coverage reported being noncompliant with medications for treatment of heart failure and diabetes.<sup>9</sup>

### **The Impact of Medicare Part D**

Following the implementation of Medicare Part D, seniors had several options for enrolling in the program.<sup>2,10</sup> Senior Citizens who had prior coverage which was actuarially superior to Medicare Part D were encouraged to retain their current coverage.<sup>2,10</sup> This group consisted primarily of individuals who had previous coverage from employers which received a government subsidy to continue providing the insurance.<sup>2,10</sup> Seniors could also access prescription drug coverage through enrollment in a Medicare Part C (Medicare Advantage) program.<sup>1,2,10</sup> The majority of seniors enrolled in Medicare Advantage already had some type of prescription drug coverage.<sup>1</sup> Seniors were already afforded these opportunities for accessing prescription drug coverage prior to passage of the MMA, but the legislation also created stand alone drug plans. These were known as Prescription Drug Plans (PDPs).<sup>1,2</sup> Senior citizens with limited incomes (less than 150% of poverty) and limited assets were eligible to receive a low income subsidy.<sup>10</sup> Certain seniors who met these qualifications were automatically enrolled into the Part D program and the low income subsidy programs, including those eligible for Medicaid (dual eligibles) and those only receiving SSI.<sup>10</sup> These were the only individuals automatically enrolled in Medicare Part D; enrollment was completely voluntary for other seniors.<sup>10</sup> However, unless they have creditable coverage superior to Medicare Part D, seniors are charged a penalty of 1% of the average national monthly premium for each month they delay enrollment in the program upon reaching eligibility.<sup>2,10</sup>

Medicare Part D is unique in that insurers are required to offer a prescription insurance plan which has benefits that are actuarially equivalent to or at least as good as the standard prescription benefit specified by the Center for Medicare and Medicaid Services (CMS).<sup>1,2,10</sup> For plans covering beneficiaries in 2011 this is defined as a plan with a \$310 deductible and 25% costs sharing for the patient up to \$2,840.<sup>10</sup> After reaching \$2,840 in total drug costs, the patient is responsible for 50% of the cost of brand name drugs and 93% of the cost of generic drugs until a total drug cost of \$6,448 is reached.<sup>10</sup> The sudden increase in copayments for seniors between \$2,840 and \$6,448 in drug costs has been termed the doughnut hole, and has been a major target of recent health care reform.<sup>10</sup> Prior to 2011, beneficiaries were solely responsible for all medication costs during this period.<sup>10</sup> However with the passage of the Affordable Care Act of 2010, drug manufacturers and prescription drug plans are slated to assume progressively greater cost sharing during this period so that patients will also have cost sharing of 25% during this phase of the plan by 2020.<sup>10</sup> Upon reaching \$6,448 in total drug costs, catastrophic coverage takes over, and the beneficiary is only responsible for 5% of the costs.<sup>10</sup>

However insurers are not restricted to this format in determining structure of their plans. They have the latitude to determine their copayment structures as long as their plans are

actuarially equivalent to the standard benefit.<sup>11</sup> In fact, less than 15% of PDPs use the structure whereby patients pay 25% for each medication.<sup>11</sup> The majority of PDPs use tiers to divide medications into three types of classes: generic, brand, and specialty.<sup>11</sup> Specialty medications are drugs used in cases where there is no alternative pharmacologic therapy available, and the cost is at least \$600 per month.<sup>11</sup> The most popular arrangement for the formulary is to have one tier for generic medications, one tier for specialty medications, and two tiers for brand name medications: preferred brand and non preferred brand.<sup>11</sup> However, there is wide variation in the arrangement of tiers available, and there is no typical structure.<sup>11</sup> It is most common for plans to have a flat dollar copayment on brand and generic medications while charging a coinsurance rate between 25%-33% on specialty medications.<sup>11</sup>

There is also considerable variation in the amount of deductibles offered by PDPs.<sup>11</sup> In a given year approximately a third of PDPs charge the maximum allowed deductible, which is the deductible specified in the standard benefit plan.<sup>11</sup> There are a smaller percentage of plans which may have a deductible smaller than the maximum allowed deductible.<sup>11</sup> In a given year, at least 40% of PDPs have no deductible.<sup>11</sup> Finally, there is also variation in the doughnut hole coverage offered by PDPs. Although most plans do not have doughnut hole coverage, there are a few plans which do.<sup>12</sup> Even among those offering doughnut hole coverage, there are differences among plans as plans may cover all, some, or only a few generics.<sup>12</sup> It is rare for plans to cover brand name drugs during this time.<sup>12</sup>

With all of the variation in plans, it is quite obvious that many may offer coverage which is in fact superior to that specified through the standard benefit. Plans which do feature this type of coverage where their actuarial value is superior to that of the standard benefit are called enhanced plans.<sup>13</sup> Plans may offer enhanced coverage through a variety of mechanisms. For example, plans may have a 25% coinsurance rate on all medications but offer coverage in the doughnut hole. Alternatively, plans may have a 25% coinsurance rate and no gap coverage, but they could have a partial deductible or no deductible at all. Some plans may have enhanced coverage, because although they have the maximum allowed deductible and include no gap coverage, the coinsurance on the medications is lower than that specified in the standard benefit plan.<sup>13</sup>

### **Competitive Markets in Health Care**

One central premise of the PDPs is that they are administered entirely through private companies, and seniors must choose from among the plans which are offered to them.<sup>2</sup> This was done in order to use market based principles of competition whereby plans would be compelled to compete with each other so that seniors would have premiums close to marginal cost.<sup>14</sup> This continued the trend of moving away from the fee for service structure which Medicare was established under in 1965.<sup>1</sup> The advent of Medicare Part C in the 1970s demonstrated that private organizations could be used to deliver services to seniors in the Medicare program.<sup>15</sup> Most of these plans are preferred provider organizations (PPOs) or health maintenance organizations (HMOs).<sup>15</sup> Although

a small portion of seniors are enrolled in Medicare Advantage plans (24% in 2010), the research done in this area provides valuable insight to the behavior of senior citizens in competitive health care markets.<sup>15</sup>

The literature is replete with examples of studies which demonstrate the sensitivity of the general population to changes in the price of health care plans.<sup>14,16-18</sup> However, one cannot assume that seniors share the same sensitivity to price as the younger population. Indeed, LaTour and colleagues concluded in their 1986 qualitative research that Medicare beneficiaries had relatively low price elasticity, although they did not quantify the extent of the seniors relative price elasticity.<sup>19</sup> However, seniors demonstrate a different degree of price sensitivity when compared to the younger population. Buchmueller demonstrated this phenomena in his 2000 study.<sup>20</sup> Before 1994, Medicare eligible retirees of the University of California system were not required to pay premiums on any of the health insurance plans offered to them.<sup>20</sup> However, fiscal pressures caused the university to reduce its contribution to a fixed amount so that the retirees were exposed to premiums in several plans.<sup>20</sup> Buchmueller's results indicated that in general beneficiaries were more likely to switch plans as the premiums increased.<sup>20</sup> For example, a premium increase of \$20 induced 3% of beneficiaries to switch plans, whereas a premium increase of \$50 induced 4.4% of beneficiaries to switch to another plan.<sup>20</sup> However age was a statistically significant variable in his probit regression model as increased age decreased the likelihood that an individual would switch plans.<sup>20</sup>

However it is important to note that Buchmueller's study did not explore the importance of the benefit package offered to employees. This is not an inconsequential omission, as Berki and Ashcroft's conceptual model of health plan choice<sup>16</sup> shows that both cost and benefits are of importance in selecting health care plans. Berki's financial loss hypothesis essentially states that, if all other factors are held constant, individuals or families will attempt to choose plans that minimize their expected financial outlays based upon the amount of services they believe will be incurred.<sup>16</sup> Yet, this is not a function of premium price only, but also copayments. So in studies examining the propensity of beneficiaries switching plans due to premiums, it is important to study the benefits package as beneficiaries may be willing to remain in plans with higher premiums if their copayments are low relative to other plans.

Berki's risk perception hypothesis proposes that when purchasing health insurance, if other factors are held the same, decision makers will avoid plans that do not have services that they believe they will utilize.<sup>16</sup> This more directly addresses the benefits package. If a health care plan offers services that are absent from other plans, it is conceivable that beneficiaries will choose to enroll in this plan even though it may have higher costs.

In addition, The Berki and Ashcraft Model acknowledges that the choice of consumers in deciding upon a health plan is influenced not only by the expected financial outlays and benefits, but also the context in which those services are delivered.<sup>16</sup> The beneficiary's personal attribute preferences are a set of preferences which describe how strongly the consumers feel about who, how, where, and in what setting the services are delivered.<sup>16</sup> The personal attribute preferences directly influence how consumers feel about the

delivery system characteristics of different plans.<sup>16</sup> The delivery system characteristics are concerned with questions such as from what providers (e.g. physicians and/or hospitals) the beneficiary will be able to obtain coverage, and how many services will they be able to obtain in one setting.<sup>16</sup> So, if it is important for a particular individual to retain their current physician, they may be willing to pay more for plans which allow them to do this.

Feldman and colleagues conducted one of the first studies which examined the relationship between both benefits and premiums in the senior population.<sup>21</sup> In their study of national 1989 data on Medicare Part C, they found that senior citizen's had a price elasticity of -2, meaning that a one percent increase in price decreased the enrollment in a plan by two percent.<sup>21</sup> They also attempted to study the effect of optional benefits on enrollee choice, but they concluded that offering extra benefits provided no incentive for beneficiaries to enroll in a plan.<sup>21</sup> Later studies cited the crude measure of optional benefits as a possible detriment in evaluating the significance of optional benefits to the senior population.<sup>22</sup> The next study conducted to evaluate senior citizen's sensitivity to price and benefits in the Medicare Part C market was published in 2003.<sup>22</sup> Dowd and colleagues found a much smaller price elasticity of -0.65 indicating that a ten percent increase in price would lead to a decrease in enrollment of 6.5%.<sup>22</sup> Moreover, they were able to demonstrate that the inclusion of certain benefits, including prescription drug coverage, were associated with higher enrollment in plans.<sup>22</sup> Atherly and associates provided the first study of beneficiary choice of a Medicare Part C plan which used individual level national data.<sup>23</sup> They found a price elasticity of -0.13 and also concluded that the inclusion of optional benefits was associated with greater enrollment.<sup>23</sup> In addition, because they used individual level data, they attempted to study the impact of beneficiaries' demographic characteristics on their choice of a Medicare Part C plan as opposed to traditional fee for service Medicare.<sup>23</sup>

The importance of defining the demographic characteristics of the beneficiaries and evaluating how they influence the choice of health plans is intuitively an important subject. Indeed, in their review of consumer health plan choice Scanlon and colleagues describe two broad groups of variables that should be included in health plan choice.<sup>18</sup> Primary variables deal with the health plan itself, and include features such as price, perceived quality of the plans, choice of provider, the benefits provided, and convenience.<sup>18</sup> Secondary variables on the other hand are concerned with external variables which may influence plan choice such as the demographic characteristics of the consumer, the health status of the consumer, and the economic status of the person choosing a plan.<sup>18</sup> The secondary variables impact how much weight a particular individual may place on a primary variable.<sup>18</sup> At the time of their review, these authors concluded that there was insufficient evidence in regards to how secondary variables influence health plan choice, although there has been a movement towards more of these secondary variables being included in these studies.<sup>18</sup> Knowing how secondary variables interact with primary variables would be of particular interest for those in the marketing field of healthcare plans, as this information would allow them to devise plans which would appeal to potential consumers based on the unique preferences which they have.

## Evolution of Studies within Consumer Choice

In the past marketing managers attempted to devise new health care plans on the basis of factors such as the opinions of what health care professionals felt should be included as coverage options.<sup>24</sup> However, through the course of time companies designing insurance plans have attempted to prospectively gauge what types of plans would offer the greatest appeal to the consumers who would be purchasing the plans. One example of how managed care companies have done this is through the use of decision support systems, where information regarding the use of consumer preferences and competitor offerings is gathered in order to make effective plans that will be successful when placed on the market.<sup>25</sup> These practices have become more commonplace as competition has increased and more effort has been placed on being able to more fully comprehend consumer choice.<sup>14,16-18,26</sup> More specifically, devisors of health care plans have come to recognize that when individuals have the option to choose among different plans, a model of choice behavior is helpful in studying consumer's decision making process. Models conforming to these principles assume that individuals will choose the health plan which offers them the highest level of utility according to their personal tastes and satisfaction.<sup>16</sup>

The methodological approaches in the marketing area have evolved over time, particularly those involving primary data collection.<sup>28-31</sup> Historical approaches that have been used include asking open ended questions<sup>28</sup> or asking patients to evaluate plans on the basis of a single attribute such as the premium.<sup>29</sup> However, these approaches have acknowledged limitations. Asking consumers of health care plans to evaluate only one attribute at a time is limited because it is recognized that in actual situations, individuals consider multiple attributes of potential plans simultaneously when making purchasing decisions.<sup>32</sup> Asking consumers open ended questions is limited also, as research shows that consumers self reported importance of health plan attributes is an inaccurate measure of the actual importance they place on different attributes.<sup>33</sup>

## Overview of Analysis

A marketing research technique that aligns more strongly with the principles of models of choice behavior and bypasses these limitations is conjoint analysis. Conjoint analysis operates on the premise that consumers choose products or services on the basis of the combined value of the aggregate attributes which compose the product or service.<sup>34,35</sup> So within conjoint analysis, products or services are composed of certain attributes which are further subdivided into different levels which carry a distinct value or part-worth for each person.<sup>35</sup> Within health insurance, possible attributes include the premium, copayments, and types of services covered. A level is a value that an attribute might take.<sup>35</sup> For example, in the simple example depicted in **Table 1-1**, levels for monthly premiums of health insurance could hypothetically include \$500, \$750, or \$1,000. Each of the different levels carries a unique value or part-worth for each respondent. The influence of a particular level depends on how important the attribute is to the respondent. Some individuals may believe that the premium is the most important attribute and the hospital copayment could be least important, while the importance's are reversed for someone else. Ultimately, conjoint analysis is able to simulate the process which consumers use in choosing products in the actual marketplace where they

**Table 1-1. Part worths for hypothetical study**

<b>Attributes</b>	<b>Utility</b>
<b>Premium</b>	
\$500	0.45
\$750	0.08
\$1000	-0.24
<b>Physician copayment</b>	
\$15	0.32
\$25	0.11
\$35	-0.12
<b>Hospital copayment</b>	
10%	0.66
20%	0.22
30%	-0.31

consider all of the product features simultaneously and choose the product which maximizes their utility as a function of having the greatest combined part worth values.<sup>35</sup>

In the terminology of conjoint analysis, an attribute is a feature that can vary from product to product or service to service.<sup>35</sup> In the most popular forms of conjoint analysis used today, respondents are presented with a profile where at least two different products are depicted.<sup>35</sup> These profiles are called choice tasks.<sup>35</sup> Each profile will have the same attributes, but the levels will vary from one profile to another.<sup>35</sup> Respondents are then asked to choose which product they prefer.<sup>35</sup> In this example, one product may have a premium of \$500, a physician copayment of \$15, and hospital copayments of 30%, whereas another product may have premium of \$750 physician copayments of \$25, and hospital copayments of 10%. When using conjoint analysis, one can derive the part-worth values that the sampled population has for each level.<sup>35</sup> In addition, when the sample size is large enough or advanced techniques are used, the part-worth values for each individual respondent may be estimated accurately.<sup>35</sup> In such cases, it is possible to estimate the products that each individual person would purchase.<sup>35</sup> This allows one to avoid false assumptions that may occur when one looks at the sample as an aggregate sample and avoids some heterogeneous preferences that may occur.<sup>35</sup>

Conjoint analysis has been used several times in order to analyze consumers decision making process in choosing health insurance as well as long term private insurance and dental insurance.<sup>36-42</sup> These research studies have demonstrated several benefits of using conjoint analysis in evaluating consumer preferences in choosing health plans. For example, these studies have demonstrated that some of the most important attributes consumers consider when choosing health care plans include premiums, freedom in choosing physicians, copayments for physicians visits, copayments for medications, freedom in choosing hospitals, and inclusion or exclusion of vision and dental coverage and strongly prefer plans which have high maximum liability.<sup>36,37,39</sup>

After finding out the most important attributes in plans and their relative importance, decision makers can make practical applications with this information. They can devise health plans which have an ideal blend of attributes and levels by figuring out which combination of proposed levels would be more successful in the marketplace.<sup>36</sup> For example, in the example shown in **Table 1-1** a plan with a premium of \$500, physician copayments of \$15, and hospital copayments of 30% would have a utility of .46 after adding up the part-worths associated with each level. Alternatively, plans with premiums of \$750, physician copayments of \$25, and hospital copayments of 10% would have a utility of 0.85. However, conjoint analysis can also allow one to adjust for heterogeneous preferences within the population.<sup>35</sup> Researchers can repeat the same procedure performed on the aggregate sample for each individual. In the “first choice” rule, one assumes that each individual will purchase the specific plan offering them the greatest utility so that one can simulate the proportion of patients who would purchase a given product.<sup>35</sup> Simulation procedures have been performed in several cases to simulate both current and hypothetical health plans performance in the market place.<sup>36,42</sup>

Studies have shown that the data gathered from conjoint analysis studies is reliable in predicting the market share of different types of insurance plans which are currently on the market when used in simulations.<sup>36,42</sup> Subgroup analysis on secondary variables can

also be performed so that differential preferences in between groups which are moderated by demographic variables may be analyzed.<sup>36,37,39</sup> The data derived from these studies also can allow decision makers to identify which specific demographic groups place more importance on certain features, so that plans may be tailored to these individuals preferences to obtain a higher yield. For example, elderly individuals have been shown to place more importance on freedom of choice with doctors and hospitals when compared to the younger population.<sup>37</sup>

### **Consumer Choice in Prescription Drug Markets**

Although conjoint analysis has been applied successfully several times in evaluating health insurance plans, it has only been used twice in evaluating prescription drug plans.<sup>43,44</sup> Although these studies helped to demonstrate the feasibility of using conjoint analysis to evaluate prescription drug plans, neither of these studies evaluated the preferences for Medicare Part D prescription drug plans. The relative lack of conjoint analysis studies in prescription drug plans alludes to the general scarcity of studies focusing on consumer choice in prescription drug plans.

Frakt and Pizer published the only study to date where the main focus was determining beneficiaries sensitivity to premiums in the Medicare prescription drug plan market.<sup>45</sup> They concluded that the premium elasticity in the prescription drug plan market of -1.45 was greater in magnitude than that seen in the Medicare Advantage market, for several reasons.<sup>45</sup> Namely that seniors may have to sever relationships with their physicians in order to switch plans in the Medicare Advantage market, and patients may have established brand loyalty with a Medicare Advantage plan.<sup>45</sup> There have been studies which have evaluated seniors whether seniors would enroll in a prescription drug plan or whether they would remain without coverage.<sup>46-48</sup> However these studies do not provide information on what factors are most important in the decision of seniors to choose one plan over other selections.

In addition, there have also been studies published before the actual implementation of Medicare Part D which examined the issues of whether seniors would be able to choose prescription drug plans which would minimize their expected cost.<sup>49,50</sup> However these may not be applicable to the Medicare Part D plan as it stands in the market as these studies do not feature the coverage gap or tiered copayments as is the case in the actual Medicare Part D plans. Heiss and colleagues study evaluated consumer's choices of health care plans in the current Medicare Part D market.<sup>51</sup> They found that senior citizens tended to choose plans with lower premiums when it might have actually been more favorable for them to select plans which had higher premiums, but offered more comprehensive benefits.<sup>51</sup> Accordingly, senior citizens were not selecting plans which minimized their expected annual out of pocket costs, a measure of "...the sum of all out-of-pocket beneficiary expenditures that are expected to occur during the year."<sup>52</sup> Abaluck and Gruber had similar conclusions, asserting that seniors tended to place to much value on premiums at the expense of other out of pocket cost components such as copayments on medications. They were able to demonstrate that if each senior had

chosen the plan which minimized costs, senior's expenditures in the program could have been nearly 30% lower.<sup>53</sup>

It is apparent that as a group, seniors tend to place more emphasis on premiums, even at the expense of greater overall cost sharing. However, it is not clear whether this generalization can be applied to the senior population as a whole, or whether there are heterogeneous preferences within the population. Indeed, in their qualitative study of important attributes that seniors consider when considering drug plans, Cline and Gupta identified three distinct groups.<sup>54</sup> Within one of these groups, mail order pharmacy was one of the two most important factors in selecting a drug plan.<sup>54</sup> This alludes to the premise that just as with health insurance plans, there may be secondary variables which moderate one's preferences for certain components of a prescription drug plan.<sup>18</sup> Furthermore, the context in which the medical services are delivered, in this case prescription medicines, may also be important.<sup>16</sup> The premise that these principles would be important is not surprising, as previous reviews on health plan choice indicate the importance of secondary variables as well as the significance of the setting in which services are delivered.<sup>16,18</sup>

### **Statement of Problem**

To date there is a significant gap in the literature. Although previous research has demonstrated the considerable benefits of studies utilizing conjoint analysis in the area of marketing research for health care plans,<sup>35-41</sup> these techniques have not yet been employed in a comprehensive manner in prescription drug plans, specifically with regard to the Medicare Part D prescription drug plan. Studies conducted in this area have the potential to yield valuable information, such as what specific attributes of the plans do consumers place the most value on, and also will allow market simulations in order to predict if newly developed plans will be successful.<sup>35</sup> This will not only allow insurance companies to have valuable insight in developing new plans, but will also save them wasted resources in marketing new plans which may not be in agreement with the Medicare Part D population's consumer preferences. Moreover, prospectively devising plans which are in alignment with consumer preferences is more important than ever now that health care reform is a major political topic.<sup>55</sup> Many of these changes will specifically affect the Medicare Part D prescription drug program. For example, under recently passed legislation, the doughnut hole will be progressively reduced so that it is phased out by 2020.<sup>10</sup> This will require insurance companies to make changes to their most popular Medicare Part D plans, as over 90% of patients in stand alone prescription drug programs are enrolled in plans which have little or no gap coverage.<sup>10</sup>

In addition, more information is needed in regards to whether there are any heterogeneous preferences in the senior population for Medicare Part D drug plans. There may be some seniors who place emphasis on factors in prescription drug plans which do not deal solely with cost.

## Conceptual Models

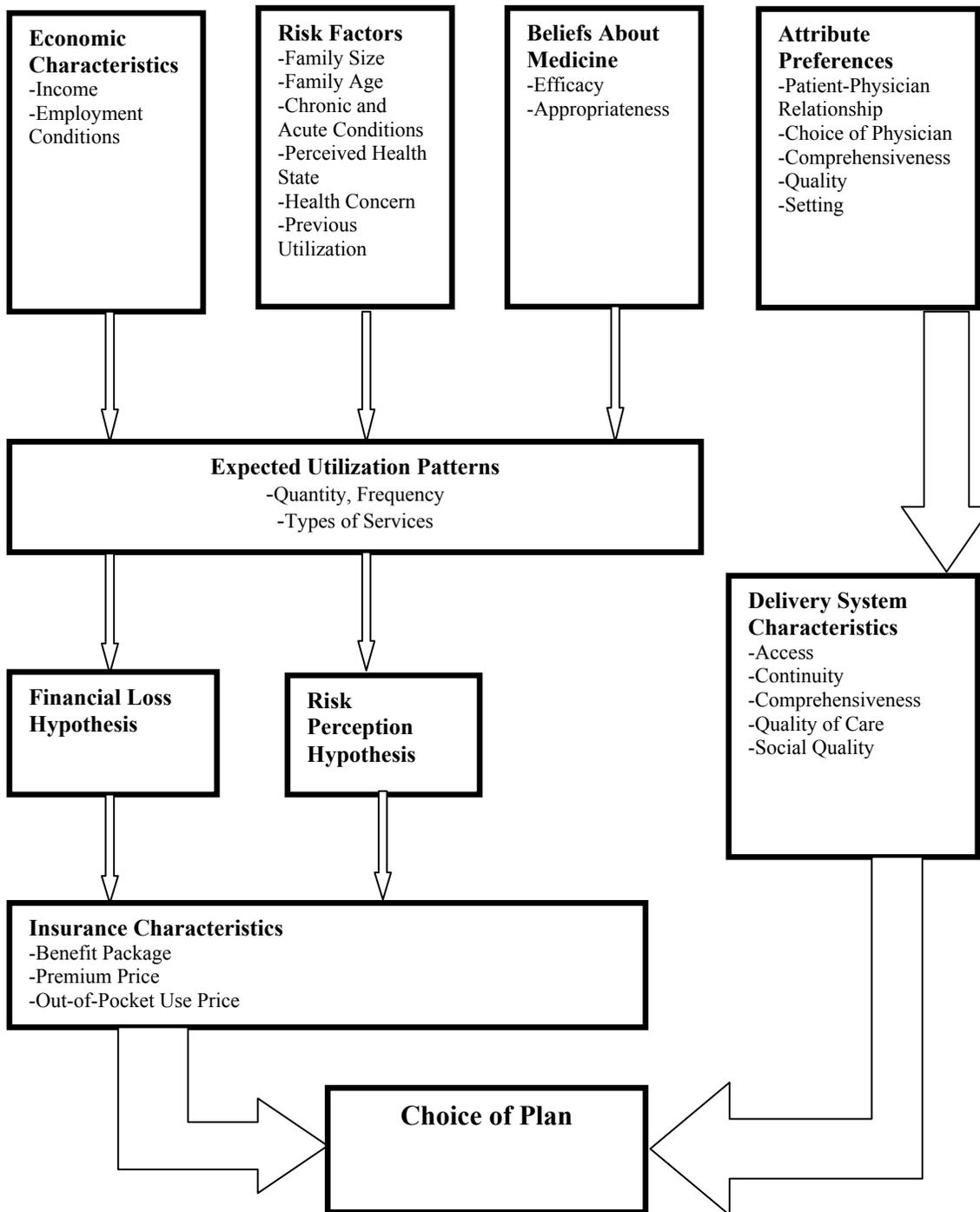
The conceptual model for this study is a modified version of Cline and Mott's Model for choosing a *prescription drug* plan,<sup>49</sup> which is in turn derived from Berki and Ashcraft's Model for choosing a *health care* plan.<sup>16</sup> Although the model for this study is largely based upon Cline and Mott's model for prescription drug plans, it is helpful to examine Berki's and Ashcraft's model of Health Care Plan Choice<sup>16</sup> depicted in **Figure 1-1** in order to gain greater understanding of the general theory underlying all of these models.

### Berki and Ashcraft's Model of Health Care Plan Choice

Berki and Ashcraft proposed that there are several factors which directly influence the amount of health care services an individual or family will use.<sup>16</sup> These include economic characteristics which influence the amount of financial capital that the unit (either family or individual) will be able to apply towards health care services.<sup>16</sup> Certain risk factors such as the number of people in the unit, their age, and general health are also expected to influence the amount of health care services utilized.<sup>16</sup> Finally, the beliefs about the efficacy of medicine will also serve to influence utilization, as those people which have greater confidence in the effectiveness of medicine will utilize it more often.<sup>16</sup> The expected utilization patterns in turn influence the financial loss hypothesis and risk perception hypothesis.<sup>16</sup>

As explained before, the financial loss hypothesis essentially states that, if all other factors are held constant, individuals or families will attempt to choose plans that minimize their expected financial outlays based upon the amount of services they believe will be incurred.<sup>16</sup> The risk perception hypothesis proposes that when purchasing health insurance, if other factors are held the same, decision makers will avoid plans that do not have services that they believe they will utilize.<sup>16</sup> Taken together, the financial loss hypothesis and risk perception hypothesis influence the characteristics of the insurance plan chosen by consumers.<sup>16</sup>

The insurance plan characteristics are a function of what services are available, and how much the beneficiary will have to pay for these services.<sup>16</sup> Therefore, the insurance characteristics consist of the benefit package, and the premium price as well as out-of-pocket payments.<sup>16</sup> The Berki and Ashcraft Model acknowledges that the choice of consumers in deciding upon a health plan is influenced not only by the expected financial outlays, but also the context in which those services are delivered.<sup>16</sup> The beneficiary's personal attribute preferences are a set of preferences which describe how strongly the consumers feel about who, how, where, and in what setting the services are delivered.<sup>16</sup> The personal attribute preferences directly influence how consumers feel about the delivery system characteristics of different plans.<sup>16</sup> The delivery system characteristics are concerned with questions such as from what providers (e.g. physicians and/or hospitals) the beneficiary will be able to obtain coverage, and how many services will they be able to obtain in one setting.<sup>16</sup> Finally, the Berki and Ashcraft model proposes that the insurance characteristics and the delivery system characteristics taken together



**Figure 1-1. Berki and Ashcraft Model of Health Plan Choice**

Modified with permission. Berki SE, Ashcraft ML. HMO enrollment: who joins what and why: a review of the literature. The Milbank Memorial Fund Quarterly, Health and Society 1980;58(4):588-632.<sup>16</sup>

help consumers to decide on their choice of a health care plan.<sup>16</sup>

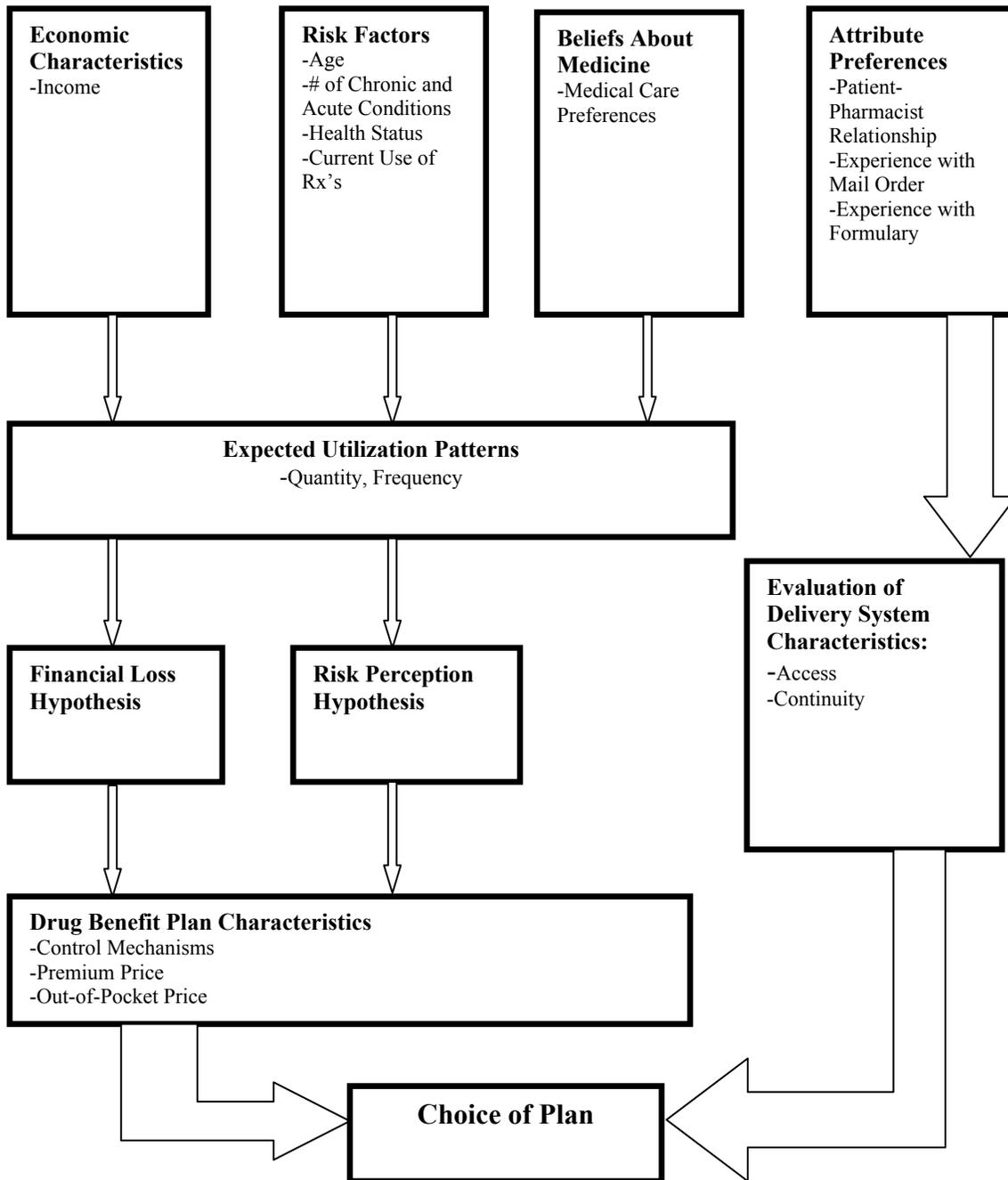
### **Cline and Mott's Model of Prescription Drug Plan Choice**

As stated previously, the proposed model for this research is actually a modified version of Cline and Mott's Model of Prescription Drug Plan Choice,<sup>49</sup> depicted in **Figure 1-2**. Although the Cline and Mott Model<sup>49</sup> and the Berki and Ashcraft Model<sup>16</sup> are very similar for the most part, there are a few substantive differences which are noted here. The most obvious difference between the two models is that the Cline and Mott model deals with the choice of a *prescription drug plan*,<sup>49</sup> whereas the Berki and Ashcraft Model was developed for choice of *health care plans*.<sup>16</sup> From this, it naturally follows that the Cline and Mott model does not deal with expected utilization of health care services such as physician or hospital visits, but rather anticipated consumption of prescription medications. Moreover, within the context of insurance characteristics, the benefit package in the Cline and Mott model is not concerned with the breadth of services covered, but rather the range of medicines which is covered by the beneficiary's plan.<sup>49</sup> Therefore, Cline and Mott replace the "benefit package" in the Berki and Ashcraft model with "control mechanisms." The control mechanisms are a measure of the amount of restrictions placed upon a beneficiary's formulary.<sup>49</sup>

These two models also differ with regards to how they describe the delivery of their respective goods. Within the attribute preferences, the Berki and Ashcraft Model is concerned with aspects of the consumer's preferences in regards to patient-physician relationships, choice of physician, the breadth of services that may be obtained in a setting, and the perceived quality.<sup>16</sup> Because these factors are not relevant within the context of prescription drug plans, the Cline and Mott models is concerned with patient's attribute preferences in relevant areas such as their relationship with their pharmacist, and their experience with formularies.<sup>49</sup> Finally, whereas the Berki and Ashcraft model describes the delivery system characteristics of hospitals and physicians in terms of access, continuity, comprehensiveness, quality of care, and social quality,<sup>16</sup> the Cline and Mott Model evaluates the delivery system characteristics of access and continuity with respect to pharmacists and pharmacies.<sup>49</sup> Continuity in the Cline and Mott Model refers to whether one is able to continue their relationship with their current pharmacy.<sup>48</sup>

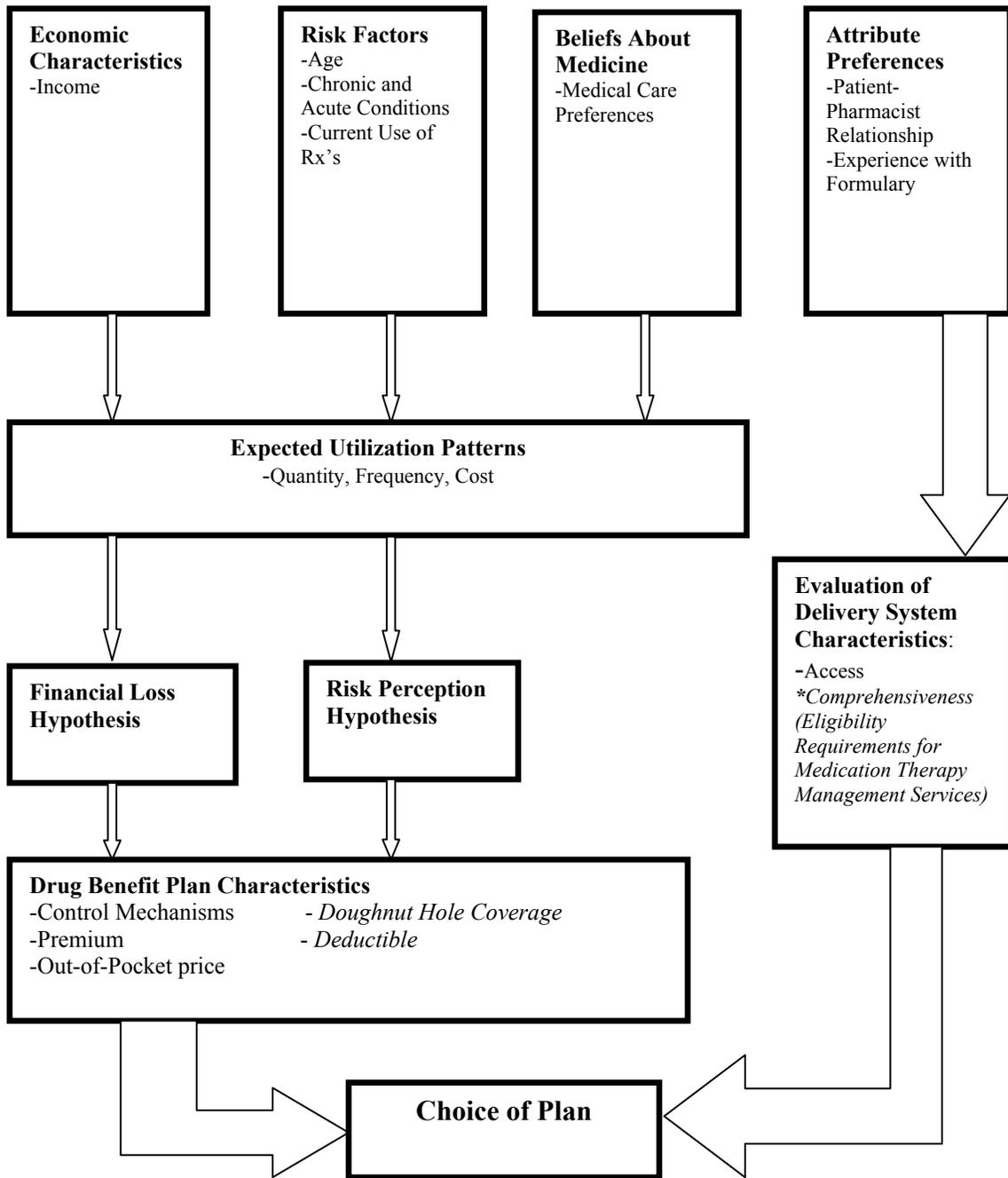
### **Conceptual Model for Prescription Drug Plan Choice in Medicare Part D**

The proposed model for this study is depicted in **Figure 1-3**. This model follows the Cline and Mott Model closely with two notable exceptions. Within the benefit plan characteristics, the deductible and doughnut hole coverage have been added, as these are prominent features of the Medicare Part D prescription drug plans.<sup>2</sup> Moreover, as seen in the attribute preferences and delivery system characteristics, this study will include a measure of the accessibility for comprehensive pharmaceutical care available to the patient. This is accomplished by including the restrictiveness of eligibility requirements for Medication Therapy Management Services (MTM) as an attribute. This is a set of



**Figure 1-2. Conceptual model of prescription drug plan choice**

Modified with permission. Cline RR, Mott DA. Demand for a Medicare prescription drug benefit: exploring consumer preferences under a managed competition framework. *Inquiry* 2003;40(2):169-183.<sup>49</sup>



**Figure 1-3. Conceptual model for prescription drug plan choice in dissertation**

services with the goals of providing education, improving adherence, or detecting adverse drug events in the Medicare population and legislation concerning the provision of these services was also a part of the Medicare Modernization and Improvement Act of 2003.<sup>56</sup> These services can be provided by a pharmacist on site at a pharmacy, or alternatively they may be provided over the phone.<sup>56</sup> As will be discussed later, insurance organizations have a considerable degree of latitude in determining patient's eligibility for MTM services.<sup>56</sup>

### **Specific Aims and Hypotheses**

The specific aims and hypotheses for this study are presented as follows:

Specific Aim 1: The first specific aim is to determine which drug benefit plan characteristics exert a significant influence on senior citizens preferences in choosing a Medicare Part D Prescription Drug Plan.

- Hypothesis 1: The premium price will be a significant attribute in determining consumer's preferences when deciding on a Medicare Part D plan whereby higher premiums will be associated with a lower probability in a plan being selected, all else being equal.
- Hypothesis 2: The copayment amount will be a significant attribute in determining consumer's preferences when deciding on a Medicare Part D plan whereby higher copayments will be associated with a lower probability in a plan being selected, all else being equal.
- Hypothesis 3: The deductible amount will be a significant attribute in determining consumer's preferences when deciding on a Medicare Part D plan whereby higher deductibles will be associated with a lower probability in a plan being selected, all else being equal.
- Hypothesis 4: The amount of coverage in the doughnut hole will be a significant attribute in determining consumer's preferences when deciding on a Medicare Part D plan, whereby seniors will be willing to pay more for plans which offer doughnut hole coverage, all else being equal.
- Hypothesis 5: The control mechanisms (formulary restrictiveness) will be a significant attribute in determining consumer's preferences when deciding on a Medicare Part D plan, whereby more restrictive formularies will be associated with a lower probability in a plan being selected, all else being equal.

Specific Aim 2: The second specific aim is to determine which delivery system characteristics will exert a significant influence on senior citizens preferences in choosing a Medicare Part D prescription Drug Plan.

- Hypothesis 6: The amount of access to pharmacy services will be a significant attribute in determining consumer's preferences when deciding on a Medicare Part D plan, whereby more restricted pharmacy access will be associated with a lower probability in a plan being selected, all else being equal.
- Hypothesis 7: The restrictiveness of eligibility requirements in obtaining Medication Therapy Management Services will be a significant attribute in determining consumer's preferences when deciding on a Medicare Part D plan, whereby more restricted eligibility requirements will be associated with a lower probability in a plan being selected, all else being equal.

Specific Aim 3: The third specific aim is to determine which of the demographic characteristics in the conceptual model for this study exert a significant effect on senior citizens preferences in choosing a Medicare Part D Prescription Drug Plan.

- Hypothesis 8: Individuals with higher incomes will be willing to pay higher premiums for prescription drug insurance in the Medicare Part D Prescription Drug Plan.
- Hypothesis 9: Older individuals will be willing to pay higher premiums for prescription drug insurance in the Medicare Part D Prescription Drug Plan.

Specific Aim 4: The fourth specific aim is to determine which of the explanatory variables in the conceptual model for this study exert a significant effect on senior citizens preferences in choosing a Medicare Part D Prescription Drug Plan.

- Hypothesis 10: Individuals with a greater number of chronic conditions will be willing to pay higher premiums for prescription drug insurance in the Medicare Part D Prescription Drug Plan.
- Hypothesis 11: Individuals taking a higher number of prescription medications will be willing to pay higher premiums for prescription drug insurance in the Medicare Part D Prescription Drug Plan.
- Hypothesis 12: Individuals with a stronger preference for Medical Care will be willing to pay higher premiums for prescription drug insurance in the Medicare Part D Prescription Drug Plan.
- Hypothesis 13: Individuals with a stronger relationship with their pharmacist will place greater importance on being able to have Medicare Part D Prescription Drug Plans with less stringent restrictions placed on being eligible for Medication Therapy Management Services.

## Definition of Terms

The following is a list of terms utilized throughout this study:

- **Attribute:** A characteristic of a product or service such as price or speed. Every attribute must have at least two levels when used in the context of conjoint analysis.<sup>35</sup>
- **Adaptive Choice-Based Conjoint Analysis:** Also known as ACBC. As one of the newest techniques used in conducting conjoint analysis studies, ACBC is available exclusively through Sawtooth Software (Sequim, WA). With ACBC, purchase intentions at the individual level can be determined.<sup>35</sup>
- **Coinsurance:** A designated percentage of the health care costs which an insured individual is responsible for paying after meeting a deductible.<sup>57,58</sup>
- **Conjoint Analysis:** A quantitative technique with origins in marketing research designed to elicit consumer preferences for products or services. In contrast to many other marketing techniques, conjoint analysis asks respondents to choose products by making tradeoffs simultaneously among the varying levels of characteristics (attributes) presented to them.<sup>35</sup>
- **Copayment:** A flat dollar copayment which designates the amount of health care expenses an insured party is responsible for paying after meeting a deductible.<sup>57,58</sup>
- **Creditable Coverage:** Insurance coverage which is at least as good as or actuarially superior to prescription drug coverage offered under Medicare Part D. Seniors citizens who do not have creditable coverage and fail to enroll in Medicare Part D are assessed a penalty of 1% of the Part D national base Beneficiary Premium for each month they delay enrollment. This was 32 cents for each month in 2010.<sup>10,58</sup>
- **Deductible:** The amount of health care related expenses that must be incurred by the beneficiary or any covered parties before the insurer assumes coverage for medical services, products, and/or care provided to the insured party. This amount could be up to \$310 for Medicare Part D prescription drug plans in 2010.<sup>57,58</sup>
- **Doughnut Hole:** A feature of many Medicare Part D plans wherein the beneficiary is responsible for 100% of the coinsurance of their prescription drugs after obtaining a certain amount of prescription drugs. In 2010, coverage gap began at \$2,830 in total drug costs and ended once there was \$6,440 in total drug costs.<sup>10,58</sup>
- **Estimated Annual Cost:** Also known as EAC. A measure of all estimated out of pocket expenses related to prescription drugs for a Medicare beneficiary in a year.

This includes premiums, copayments, coinsurance, deductibles, and costs for medications which are not included in a Part D formulary.<sup>52</sup>

- **Formulary:** An updated list of medications that is covered by an insurance plan. A closed or restrictive formulary generally covers fewer medications than an open formulary.<sup>57</sup>
- **Importance Score:** In conjoint analysis, a measure used to denote the relative significance of a given attribute in relation to other attributes in helping to determine the choice of the products or services being considered.<sup>35</sup>
- **Medicare Advantage:** Sometimes designated as Medicare Part C. An optional program whereby seniors may obtain coverage for medical expenses through private companies which contract with Medicare. Most often, these are managed care organizations which also confer coverage of prescription medications as part of the plan.<sup>15,58</sup>
- **Medicare Part D:** An optional program in Medicare which subsidizes the cost of outpatient prescription drugs for beneficiaries who choose to enroll. It was established with the passage of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, and instituted on January 01, 2006.<sup>10,58</sup>
- **Medication Therapy Management Services:** Also known as MTM. This is a set of services delivered by health care professionals with the goals of providing education, improving adherence, or detecting adverse drug events for medications in the Medicare population.<sup>56</sup>
- **Premium:** A designated amount of money which an insured party pays to an insurer in exchange for coverage of designated medical expenses.<sup>57,58</sup>
- **Prescription Drug Plan:** Also known as a PDP. Within Medicare, a private health plan which contracts with Medicare solely for the purpose of providing coverage for prescription drugs.<sup>10,58</sup>
- **Prior Authorization:** A utilization management tool or control mechanism used by PDPs to control seniors use of prescription medications by requiring the prescriber of a medication to provide documentation to show why a particular medication is medically necessary for a patient.<sup>58</sup>
- **Quantity Limit:** A utilization management tool or control mechanism used by PDPs to control seniors use of prescription medications by specifying a limit on how much medication can be obtained at one time.<sup>58</sup>
- **Step Therapy:** A utilization management tool or control mechanism used by PDPs to control seniors use of prescription medications by stipulating seniors try

to use similar, lower cost medications before they use more expensive prescribed medications.<sup>58</sup>

- Utility: An economic term for the measurement of an individual's overall preference for a certain state, product, or service. Utility measures a respondent's overall preferences for a product, while the part-worths are used to designate an individual's preferences for separate levels composing the product.<sup>35</sup>

## **CHAPTER 2. LITERATURE REVIEW**

### **Introduction**

The goal of this study is to determine the relative importance of different attributes and secondary characteristics in senior citizen's choice of prescription drug plans as guided by a proposed model of prescription drug plan choice in Medicare Part D. This chapter provides a review of literature pertinent to the study of consumer choice in Medicare Part D prescription drug plans. The chapter is divided into two broad sections. The first section provides a synopsis of specific studies relevant to consumer choice in prescription drug plans, while the second section evaluates the literature in the context of the variables featured in the proposed model of prescription drug plan choice in Medicare Part D.

### **Overview of Studies on Prescription Drug Plan Choice**

This section provides a concise overview of specific studies which have examined consumer choice within the context of prescription drug plans. This section is not only valuable in helping to show the benefit of conducting research on prescription drug plan choice, but it also helps to demonstrate which areas need further study.

### **Prescription Drug Plan Choice in Seniors before Medicare Part D**

Cline and Mott conducted a study which asked seniors to choose from among 4 hypothetical plans which varied with regard to the formulary, required use of a mail order pharmacy, the copayment amounts, and the monthly premiums.<sup>49</sup> A sample of 1,194 seniors in Wisconsin was surveyed.<sup>49</sup> Characteristics which were associated with enrollment into a more comprehensive plan featuring higher premiums were a college education, a higher number of medical conditions, greater drug expenditures, poor health status, higher income and previous exposure to formulary provisions.<sup>49</sup> Higher premiums and higher projected out of pocket costs were associated with a lower probability of a given prescription drug plan being selected.<sup>49</sup> Individuals who reported using a mail order pharmacy seemed to be more comfortable with plans featuring mail order, however seniors who placed a strong preference on their relationship with their pharmacist tended to stay away from plans which featured mail order.<sup>49</sup> This research suggests that benefit plan characteristics, delivery system characteristics, and some secondary characteristics may be important in determining choice of a prescription drug plan.<sup>49</sup> However, this study obviously has limited applicability to the Medicare Part D landscape as it lacks relevant features such as the doughnut hole, deductibles, and tiered cost sharing which are a prominent part of the Medicare Part D plans being offered.<sup>49</sup>

## Conjoint Analysis in Prescription Drug Plan Choice

The first study to utilize conjoint analysis in assessing consumer preferences for prescription drug programs was published by Holdford and Carroll in 2002.<sup>43</sup> In evaluating a convenience sample of 130 individuals, the researchers attempted to measure the tradeoffs that consumers of prescription drug plans make in regards to three different areas: copayments on medications, restrictiveness in the formulary, and restrictiveness in the choice of pharmacy.<sup>43</sup> Three levels were used in the access to pharmacy attribute: able to use any pharmacy, having a restricted network of pharmacies while having the usual pharmacy included, and having a restricted network of pharmacies in which the patient's usual pharmacy is not included.<sup>43</sup> Within the cost-sharing attribute, there were also three levels specified: no copayment, \$8 for each prescription, or \$15 for each prescription.<sup>43</sup> The final attribute related to formulary provisions. The first level within the formulary provisions stated that the plan would cover any medication without restrictions, while the second level stipulated that the plan would not cover brand medications if generics were available.<sup>43</sup> The final level within the formulary provisions stated that the plan would only cover a limited number of drugs on the formulary, and the patient would have to pay full cost for drugs other than these.<sup>43</sup>

The importance scores for formulary provisions (42%) were highest among the respondents, followed by copayment levels (32%) and pharmacy access (26%).<sup>43</sup> A market segmentation analysis demonstrated that the respondents could be divided into four major categories based upon what attributes determined their preference of drug coverage.<sup>43</sup> The largest group of respondents (44%) based their preferences primarily on formulary provisions, 23% based their decisions primarily on copayments, 23% based their preferences on a mixture of these attributes, and 10% based their decisions primarily on pharmacy access.<sup>43</sup>

While this study demonstrates the feasibility of using conjoint analysis to assess attributes within prescription drug programs, the applicability of these results to Medicare Part D PDPs is limited. Less than 6% of the respondents were over 65 years old.<sup>43</sup> Furthermore, the plans described within this study lack features intrinsic to Medicare Part D such as premiums, the doughnut hole, and deductibles.<sup>43</sup> However, the study does allude to the possibility that features other than limiting the out of pocket cost may help to determine one's choice of a prescription drug plan. For example, the difference in utility between no copayments and \$8 copayments (0.218) was much smaller than the change in utility (1.09) when going from mandatory generics to having a restricted drug list.<sup>43</sup> One may be tempted to conclude that there may be a portion of the market, particularly those which base their choice of a prescription drug plan primarily on the formulary provisions, which may be willing to trade off higher estimated annual costs for an open formulary.<sup>43</sup> However that conclusion cannot be drawn from this study, as this study does not include premiums or deductibles.<sup>43</sup>

Wellman and Vidican published the most comprehensive study to date using conjoint analysis in the analysis of prescription drug plans.<sup>44</sup> They obtained a sample of 143 respondents from a mailing list.<sup>44</sup> After consulting previous literature in the area of beneficiaries choice of prescriptions drug plans, they decided to use four attributes:

copayments (coinsurance), pharmacy access, formulary provisions, and premiums.<sup>44</sup> In addition they attempted to study the importance which beneficiaries placed on interaction with their pharmacist.<sup>44</sup> The levels for formulary in this study were similar to that used by Holdford and Carroll, and the pharmacy access variable was nearly identical with the exception of an additional level that stated beneficiaries must use a mail order pharmacy.<sup>44</sup> Six levels were used for the copayment/coinsurance attribute: \$2, \$10, \$20, \$30, 10% or 25% for each medications.<sup>44</sup> The premiums used were no premiums, \$10 per month, \$25 per month, \$100 per month, or \$200 per month.<sup>44</sup> The pharmacy interaction attribute featured three levels: the pharmacist does not discuss the medications with beneficiaries, the pharmacist reviews the medications at the time of dispensing, and the pharmacist conducts comprehensive medication reviews on a regular basis.<sup>44</sup> It is important to note that the pharmacy interaction attribute was included as a measure of how much consumers would value the inclusion of coverage for medication therapy management services.<sup>44</sup>

The importance scores were highest for monthly premium (37%), followed by copayment levels (25%), pharmacy access (16%), formulary control (14%) and interaction with the pharmacist (8%).<sup>44</sup> Particularly strong preferences were shown for \$2.00 copayments, being able to retain use of the current pharmacy, having all drugs covered even if generic medications were used, the ability to have a pharmacist regularly conduct comprehensive medication reviews, and premiums below \$10 per month.<sup>44</sup> In addition the authors performed market simulations which demonstrated that covering medication therapy management services could lead to a modest increase in the market share for a participating plan, while excluding one from their current pharmacy or telling them to use mail-order pharmacy would result in marked decreases in market share.<sup>44</sup>

Several important points can be gleaned from examining the studies on prescription drug plan choice which utilize conjoint analysis. This research as a whole substantiates the significance of using copayments, pharmacy access, and formulary control as attributes in studies involving conjoint analysis.<sup>43,44</sup> In addition, the Wellman and Vidican study helps to establish the significance of using premiums as an attribute when studying prescription drug plans using conjoint analysis.<sup>44</sup> Furthermore, this research alludes to the importance of including mail order pharmacy and contact with pharmacist in studies which examine prescription drug plans.<sup>43,44</sup> However, the results of these studies are not entirely generalizable to the Medicare Part D population as the general adult population was surveyed, and they do not include deductibles, the presence of the doughnut hole, or tiered copayments.<sup>44</sup>

### **Prescription Drug Plan Choice in Medicare Part D**

Frakt and Pizer's analysis of prescription drug plan choice was published in 2010.<sup>45</sup> Their study analyzed data from all Medicare Beneficiaries in 2007 after excluding those with creditable coverage, those enrolled in Medicare Advantage plans, and those enrolled in low income subsidy plans.<sup>45</sup> Their data sources were all publicly available files from CMS and included the PDP landscape source file, the annual enrollment by plan file, and

the prescription drug formulary and pharmacy network file.<sup>45</sup> In focusing exclusively on the Medicare PDP market, their two-stage least squares regression model was designed to model the probability of a particular Medicare Part D plan being chosen.<sup>45</sup> Several covariates were included such as the premium amount, the deductible amount, the minimum preferred copay, the maximum preferred copayment, the presence of generic gap coverage, the presence of brand name gap coverage, the number of formulary plans, and a designation of whether a plan was actuarially equivalent to a plan with standard benefits.<sup>45</sup> The authors demonstrated a premium elasticity of -1.45.<sup>45</sup> Variables which were inversely associated with choice of prescription drug plans included higher deductibles, greater minimum preferred copays, and an increased number of formulary tiers.<sup>45</sup> Factors which were positively associated with the probability of a prescription drug plan being chosen were a higher maximum preferred copayment, coverage for brand name medications in the coverage gap, and the plan being actuarially equivalent to the standard plan.<sup>45</sup> Coverage for generic medications in the doughnut hole was not significantly associated with a plan being selected.<sup>45</sup> Many of these findings are intuitive such as lower premiums, deductibles, and minimum copayments being associated with higher enrollment as these would lead to lower out of pocket costs. However the finding that basic benefits would be associated with greater probability of a plan being selected is puzzling, as plans have the option of offering superior enhanced coverage. However, the authors speculate that this may be due to these plans having lower cost.<sup>45</sup> The authors conclude that their premium elasticity is greater than that seen in the Medicare Advantage Market primarily due to three reasons:

1. Medicare HMOs have a higher cost to enter the market because they need to establish a network of providers.<sup>45</sup>
2. In 2007, beneficiaries did not have enough time to establish loyalty to a particular PDP, in contrast to the Medicare HMO market where beneficiaries had several years to establish loyalty to a particular company.<sup>45</sup>
3. Beneficiaries could choose a PDP without having to worry about breaking their relationship with their primary care physician.<sup>45</sup>

Heiss and colleagues used data collected from the 2005-2007 waves of the Retirement Perspectives Survey to analyze seniors perceptions and choices of Medicare Part D plans.<sup>51</sup> The Retirement Perspectives Survey is conducted by the researchers and surveys a random group of seniors chosen to be a representative sample of the non-institutionalized U.S. population.<sup>51</sup> In order to construct measures on the respondents projected and actual out of pocket medication costs, the researchers utilized the Medicare Current Beneficiary Survey along with median retail prices of drugs obtained from internet sites.<sup>51</sup> They concluded that the senior's amount of drug expenditures in 2005 was a very good predictor of determining which seniors without credible coverage would enroll in Medicare Part D plans and that most of the seniors who would benefit from enrollment in a Medicare Part D plan had in fact enrolled.<sup>51</sup> When choosing between different plans, seniors tended to choose ones with lower premiums, even if the actuarial value was less than another plan which may have been more comprehensive and actually

resulted in lower EAC.<sup>51</sup> The authors also explored beneficiaries willingness to pay for various plan features such as doughnut hole coverage and no deductibles.<sup>51</sup> Seniors were willing to pay significantly more to have plans with no deductible and doughnut hole coverage for brand name drugs when holding other features constant.<sup>51</sup> The use of drug tiers and restrictive formularies were associated with lower prices with which beneficiaries were willing to pay for plans.<sup>51</sup> This may be the most comprehensive study as of yet to look at seniors choice of prescription drugs, but like the Frakt and Pizer study, it ignores the potential impact of delivery system characteristics on prescription drug plan choice.<sup>45,51</sup>

Abaluck and Gruber used secondary data obtained from the prescription drug records of the Wolters Kluwer company which processes approximately 31% of all third party prescription claims in the United States.<sup>53</sup> The researchers had access to 2005 and 2006 data.<sup>53</sup> Variables which were associated with a lower probability of a prescription drug plan being chosen were higher premiums, the total out of pocket costs incurred with a plan, and higher deductibles.<sup>53</sup> Any type of doughnut hole coverage, a higher proportion of drug costs covered, and a greater number of drugs included on the formulary were associated with a greater probability of a plan being selected.<sup>53</sup> The authors concluded that premiums were far more important than other cost sharing characteristics in helping to determine seniors choice of a prescription drug plan, and seniors also had little appreciation for plans which would minimize their variability in spending.<sup>53</sup> According to their analysis, if seniors had done an optimal job of selecting plans which minimized their expected annual cost, then they could have saved approximately 27% in annual drug expenditures.<sup>53</sup> This paper contributes to the literature regarding the relationship of drug benefit plan characteristics to prescription drug plan choice, but it contributes little in regards to understanding the influence of delivery system characteristics and the influence of secondary variables.<sup>53</sup>

In summary, the research on choice of PDPs in the Medicare Part D population has shed variable information on the importance of benefit plan characteristics in determining the choice of prescription drug plans. However, much is left to be desired in the way of information regarding delivery system characteristics and how secondary variables may interact with primary variables in helping to determine prescription drug plan choice.

### **Conceptual Model Variables in the Literature**

The second section evaluates the literature in the context of the variables featured in the proposed model of prescription drug plan choice in Medicare Part D. This section helps to provide guidance on how these variables fit into the context of Medicare Part D as well as give guidance on how these variables may affect choice of Medicare PDPs.

#### **Premiums**

In 2006, the national weighted average for PDP premiums was approximately \$26 per month.<sup>59</sup> In 2009, this figure had increased to \$35 per month, and it was projected to be

approximately \$39 per month in 2010.<sup>59</sup> There is considerable variation in the range of premiums offered to beneficiaries. For example, in the Shelby county area of Tennessee, the range of premiums offered was \$22-\$100.70 during 2010, while the national range in premiums during 2011 was \$14.80-\$133.40.<sup>58,59</sup> The premiums are normally set so that they cover 25.5% of the average expenditures in PDPs, while the government subsidizes the remaining 74.5%.<sup>60</sup> However with the passage of the Patient Protection and Affordable Care Act of 2010, individual seniors making above \$85,000 annually or couples making over \$170,000 annually will be required to pay higher copayments.<sup>60</sup> Depending upon their income, these seniors will now have to pay 35%-85% of the total cost of their prescription drug program.<sup>60</sup> Whereas the average premium offered for Part D plans was \$32.34 in 2011 for most beneficiaries, the premiums offered to high income seniors ranged between \$44.34-\$101.44 in 2011.<sup>60</sup> This law will affect over 4 million seniors by 2019, as approximately 11% of all newly eligible beneficiaries will be affected by this law in upcoming years.<sup>60</sup>

Several studies have demonstrated the significance of premium as a factor in determining the choice of a prescription drug plan. Cline's study showed that higher premiums were inversely associated with the choice of a prescription drug plan in his study of senior's choices among hypothetical drug plans.<sup>49</sup> In their secondary analysis of consumer's selection of Medicare Part D plans, Abaluck and Gruber demonstrated that a \$100 increase in the *annual* premiums of a plan would lead to a 50% reduction in the probability that a particular Medicare PDP would be chosen, corresponding to an elasticity of -1.17.<sup>53</sup> Frakt and Pizer found a premium elasticity of -1.45 in PDPs when using secondary data analysis of 2006 Medicare Part D plans.<sup>45</sup> Finally, Wellman and Vidican concluded that premiums were the single most important attribute in prescription drug plans from their study which utilized conjoint analysis on the general population.<sup>44</sup>

### **Doughnut Hole Coverage**

Much of the range in premiums is due to gap coverage or other enhanced benefits.<sup>11,12</sup> In 2010, the average national premium for a PDP which was actuarially equivalent to the standard benefit was \$36.70, but for plans with any type of doughnut hole coverage this figure was nearly \$79.<sup>12</sup> Over 80% of the plans offered to beneficiaries have little or no gap coverage so that 94% of beneficiaries were enrolled in plans without gap coverage in 2010.<sup>12</sup> This is a decrease from that seen during the initial implementation of Medicare Part D as nearly 10% of patients were enrolled in plans with gap coverage during both 2006 and 2007.<sup>61</sup> The overwhelming majority of plans offer coverage for only generic medications during the coverage gap; in 2010 every state but Wisconsin had only one PDP which covered brand name prescription medications, and this one covered less than 10% of brand medications.<sup>61</sup> Before 2009, more plans were offering coverage for both generic and brand medications in the coverage gap as in 2006, nearly 5% of beneficiaries were enrolled in plans which offered gap coverage for brand and generic medications,<sup>61</sup> yet adverse selection has led to fewer and fewer of these plans being offered.<sup>12</sup>

Even though only a small number of beneficiaries enroll in Medicare Part D plans with

gap coverage, this feature has been the subject of great controversy and a large amount of research.<sup>62-73</sup> In general, approximately 6%-16% of those using Medicare Part D reach the coverage gap, but this percentage is higher for those with chronic conditions.<sup>68,71,73</sup> Approximately a quarter of individuals with diabetes and nearly 40% of individuals with dementia enter the coverage gap.<sup>68</sup> During the coverage gap, seniors entering the coverage gap experience a 9%-16% decrease in their drug usage, while their medication costs increase up to 89% during this period.<sup>62</sup> It is not surprising that these pressures may lead to acute health care exacerbations as seniors who enter the coverage gap are 60% more likely to utilize emergency room services.<sup>73</sup> Moreover, seniors who enter the coverage gap may often sacrifice food or rent money in order to be able to purchase medications.<sup>67,72</sup> For many Medicare beneficiaries, having plans which offer coverage for only generic medications in the coverage gap offers no appreciable benefit. Diabetic patients entering the coverage gap with coverage for only generic medications are no more likely to be compliant to their medications when compared to patients with no doughnut hole coverage.<sup>66,69</sup> In addition, seniors with coverage for only generic medications are just as likely as those with no gap coverage to have to split pills, skip days of medication, stop taking it altogether, or use over the counter medications instead of their prescription medications.<sup>67</sup>

The doughnut hole has also been targeted for healthcare reform under The Patient Protection and Affordable Care Act of 2010.<sup>74,75</sup> In 2010, seniors reaching the doughnut hole were given a \$250 rebate.<sup>74</sup> The doughnut hole will be effectively phased out by 2020 so that seniors have 25% coinsurance after meeting any deductibles until they reach catastrophic coverage.<sup>74</sup> This will be accomplished in different ways for brand drugs and generics drugs.<sup>74</sup> Beginning in 2011, Medicare began subsidizing 7% of the cost of generic medications in the coverage gap, and will assume progressively greater cost sharing so that by 2020 it will subsidize 75% of the cost of generic medications in this period.<sup>74</sup> Under the Patient Protection and Affordable Care Act, drug manufacturers will be required to provide a 50% discount on the cost of brand name medications when seniors reach the coverage gap.<sup>74</sup> Medicare will began subsidizing 2.5% of the cost of brand name medications in this period during 2013, and will assume progressively greater cost sharing so that by 2020 it will subsidize 25% of the cost so that seniors will be responsible for 25% of the cost.<sup>74,75</sup>

There has been a scarce amount of studies conducted on prescription drug plan choice which include the doughnut hole and none which use conjoint analysis. In their 2010 data, using secondary data analysis, Frakt and Pizer found that there was no association between doughnut hole coverage for generic medications and the probability of enrolling in a prescription drug plan when all other factors were held constant.<sup>45</sup> However, plans which had coverage for brand name drugs in the doughnut hole were more likely to be selected when holding all other factors constant.<sup>45</sup> Abaluck and Gruber's study of a national Medicare sample concluded that after controlling for other cost related expenses, seniors would be willing to pay \$50 annually to have generics covered in the donut hole and \$300 annually to have brands covered in the donut hole.<sup>53</sup> The study of Heiss et al. indicated that seniors were willing to pay approximately \$2.72 per month to have gap a coverage for generics and \$20.25 per month to have gap coverage for brand name

medications.<sup>51</sup>

The research conducted by Abaluck and Gruber and Heiss et al. may help to explain why Frakt and Pizer found no association between generic doughnut hole coverage and why coverage for brand drugs during the doughnut hole is associated with a greater probability of plans being selected, as all of these studies evaluate Medicare Part D plans as they appear in the marketplace.<sup>45,51,53</sup> In every year between 2006-2008 plans offering doughnut hole coverage had premiums which were at least \$11 higher on average per month than plans with no gap coverage.<sup>51</sup> This is higher than the price that seniors in general are willing to pay for generic doughnut hole coverage as demonstrated by the studies of Abaluck and Gruber<sup>52</sup> and Heiss et al.<sup>51</sup> Conversely, plans with doughnut hole coverage for generic and brand name drugs had premiums which were at least \$16 higher on average per month than plans with no gap coverage.<sup>51</sup> This is within the willingness to pay thresholds cited by Abaluck and Gruber<sup>53</sup> and Heiss et al.<sup>51</sup> This also helps explain why so few seniors are currently enrolled in plans with gap coverage, because the majority of them only provide coverage for generic medications.

## **Deductibles**

The number of Medicare PDPs with a deductible has increased in recent years. Less than half of PDPs featured a deductible each year from 2006-2009.<sup>55</sup> However in 2010, 60% of plans featured a deductible with, 36% of plans featuring the maximum allowed deductible of \$310, and 24% of plans featuring a deductible beneath this amount.<sup>11</sup> Plans with no deductible or reduced deductibles tend to have higher premiums than plans with the standard deductible.<sup>11</sup> One study indicated that the premiums for plans which were actuarially equivalent to the standard benefit were \$30.75, \$27.70, and \$28.41 respectively in 2006-2008 while plans without gap coverage and no or reduced deductibles offered premiums of \$37.92, \$31.93 and \$33.12 during the same years.<sup>51</sup> No or reduced deductible plans are very attractive to seniors. One study found that in 2006 and 2007, more than half of half of seniors were enrolled in plans with no or reduced deductibles and gap coverage.<sup>51</sup>

There is a sparse amount of literature regarding deductibles and prescription drug plan choice. As expected, Frakt and Pizer demonstrated that the amount of the deductible in Medicare PDPs was inversely associated with prescription drug plan choice.<sup>45</sup> Abaluck and Gruber demonstrated that seniors would be willing to pay approximately \$8 more per month for plans which had no deductible as opposed to the standard \$250 deductible offered in 2006.<sup>53</sup> In another study, Heiss and colleagues found that seniors were willing to pay just over \$14 more per month in 2006 and 2007 to have no deductible in lieu of the \$265 and \$275 standard deductibles offered during this time frame.<sup>51</sup> These studies are consistent in demonstrating that seniors are willing to pay some amount of money in order to avoid deductibles, although it may vary.

## Copayments

There is great variability in the copayment structure of Medicare Part D plans. One distinct feature is that most plans do not use the 25% coinsurance as proposed under the standard benefit. Instead most plans (89%) used some type of tiered structure in 2010 with the most popular being one generic tier and 2 tiers for brand name medications. In 2010 median copayments were \$7, \$42, and \$76 for generic, preferred brand, and non-preferred brand medications respectively.<sup>11</sup> By offering copayments which are less than the 25% coinsurance under the standard benefit, plans may offer enhanced coverage which is actuarially superior to the standard benefit, even in the absence of reduced deductibles or gap coverage. In general, seniors in Medicare Part D plans have higher copayments than retirees with employer sponsored insurance, but this is not associated with a lower quantity of medication use in the Medicare Part D population, instead seniors with coverage through Medicare Part D tend to use generic drugs more frequently than their counterparts with employer sponsored insurance.<sup>76</sup>

Copayments have been discussed frequently in the literature regarding prescription drug plan choice. Cline and Mott found that the expected out-of-pocket costs were inversely associated with the probability of a prescription drug plan being selected by seniors in a survey of hypothetical drug plans administered to seniors before the implementation of Medicare Part D, although their measure for copays was simplistic as it included only \$5 and \$10 copayments.<sup>49</sup> Seniors were less sensitive to out of pocket costs than they were to premiums however.<sup>49</sup> Holdford and Carroll's conjoint analysis study elicited the preferences for the general adult population in regards to copayments of \$0, \$8, or \$15.<sup>43</sup> They found that consumers preferred lower copayments, and the copayment attribute had an importance of 32% when considered alongside formulary provisions and pharmacy access.<sup>43</sup> In their conjoint analysis study of the general population, Wellman and Vidican used copays or coinsurance rates of \$2, \$10, \$20, \$30, 10% or 25%.<sup>44</sup> They found that copayments carried a 25% importance rating in the context of other attributes such as premiums, pharmacy access, formulary control, and interaction with the pharmacist with premiums being the most important attribute.<sup>44</sup> Frakt and Pizer demonstrated that lower minimum preferred copays were associated with a greater probability of a plan being selected while higher maximum preferred copays were associated with a lower probability of a plan being selected in the secondary data analysis of a national sample of Medicare Part D plans.<sup>45</sup> Alabuck and Gruber indicated that seniors are willing to pay approximately \$80 annually to go from a plan with 65% cost sharing to one with 25% cost sharing.<sup>53</sup>

## Control Mechanisms

A considerable amount of latitude is given in regards to the number of drugs which must be included in a PDP's formulary under Medicare. Regulations stipulate that at least two medications must be covered within each therapeutic class.<sup>77</sup> However there are six therapeutic classes where essentially all medications must be covered: antidepressants, antipsychotics, anticonvulsants, oncology agents, immunosuppressants, and medications

used in the treatment of HIV/AIDS.<sup>77</sup> All plans at a minimum cover these medications, but there are some plans which cover essentially all Medicare approved medications without restrictions, while other plans cover as few as 62% of all approved medications.<sup>55</sup> On average, PDPs cover approximately 87% of all medications approved for use by Medicare.<sup>55</sup>

Covered medications may be subject to some type of utilization management which serve as control mechanisms for medication use. The three primary types of utilization management tools are prior authorization, quantity limits, and step therapy.<sup>58</sup> Nearly 30% of covered medications operated under some type of control mechanism in 2010, with the most common tool being quantity limits (16% of medications), followed by prior authorization (15% of medications) and step therapy (3% of medications).<sup>55</sup>

Formulary management has been evaluated in the context of its effect on prescription drug plan choice. In their conjoint analysis of the general population, Holdford and Carroll concluded that the restrictiveness of the formulary was the most important attribute in determining prescription drug plan choice when considered along with copayment amounts and pharmacy access.<sup>43</sup> They found a stronger preference for more open formularies.<sup>43</sup> Wellman and Vidican concluded that formulary provisions ranked behind premiums, copayments, and pharmacy access in importance for determining choice of a prescription drug plan in their conjoint analysis survey of the general population.<sup>44</sup> Abalcuck and Gruber concluded that a higher proportion of the most popular medications being covered is associated with a greater probability of a given Medicare PDP being selected, but the emphasis is placed on drugs which are currently prescribed with little regard for medications which may be prescribed in the future.<sup>53</sup> Leaving popular medications off of a formulary led to a 0.95 cents reduction in the price which seniors were willing to pay for a given plan after holding other cost related factors constant.<sup>53</sup> Heiss et al. found that leaving one of the 100 medications uncovered in a Medicare PDP would lead to a \$1.40 decrease in the amount that seniors would be willing to pay for a plan.<sup>51</sup> They also found that having a top 100 drug covered, but with utilization management would lead to a \$1.01 decrease in the amount seniors would be willing to pay for a Medicare PDP.<sup>51</sup>

### **Pharmacy Access**

Medicare Part D acceptance is not universal within pharmacies. While 97% of retail pharmacies accept at least one Medicare Part D plan, only seven out of ten pharmacies have contracts with every PDP available in their region.<sup>77</sup> In particular, there is a shortage of independent pharmacies which contract with every PDP; only 44% of retail pharmacies have contracts with every PDP in their area.<sup>77</sup> This presents the greatest difficulty in rural areas where 30% of seniors must travel further than 15 miles to find a retail pharmacy which participates in Medicare Part D.<sup>78</sup> Plans have also been given the option to implement mail order pharmacy within Medicare Part D at lower cost sharing, however beneficiaries must still be given the option of using a retail pharmacy.<sup>77,78</sup>

The role of pharmacy access in prescription drug plan choice has been evaluated in the general population, but not in the context of Medicare Part D. Seniors who are not currently using mail order are less likely to enroll in plans which feature mail order.<sup>49</sup> In their conjoint analysis study of the general population, Holdford and Carroll found that the general adult population had a strong aversion for being forced to use prescription drug insurance at a different pharmacy than their usual one, as their pharmacy access variable had an importance of 26% when considered alongside formulary provisions and copay stipulations.<sup>43</sup> In their conjoint analysis study, Wellman and Vidican also demonstrated that the general adult population had a strong aversion for being forced to switch pharmacies, but there was an even greater dislike towards being forced to use mail order pharmacy.<sup>44</sup>

### **Medication Therapy Management Services**

Medication therapy management services (MTM) are a set of services provided by health care professionals with the goals of providing education, improving adherence, and detecting adverse drug events in medications for the Medicare population.<sup>56</sup> Medicare Part D PDPs have considerable freedom in determining the eligibility criteria for MTM.<sup>56</sup> These services are targeted towards beneficiaries who have more than one chronic disease, are taking at least two drugs which are covered by Medicare Part D plans, and are likely to have annual costs for their Part D drugs that are higher than a preset amount (initially \$4,000).<sup>56</sup> Senior citizens who take part in MTM programs have superior clinical outcomes when compared to seniors who do not participate in MTM services.<sup>79-82</sup> For example, participation in these programs is associated with better control of lipid levels and blood pressure among other conditions while decreasing medication related costs due to finding generic medications where applicable or discontinuing duplicate therapy.<sup>79-82</sup> One study demonstrated that seniors undergoing medication therapy management services were over 12 times as likely to achieve goal blood pressure when compared to senior citizens who were eligible but chose not to participate.<sup>79</sup>

MTM has not been studied extensively in the literature regarding choice of prescription drug plans. However, in their conjoint analysis study of the general population, Wellman and Vidican demonstrated that the general population had a strong positive preference for greater pharmacist interaction where a pharmacist would offer those services similar to medication therapy management services.<sup>44</sup>

### **Expected Utilization Patterns**

The implementation of Medicare Part D has been associated with increased drug use in the senior population while decreasing costs. A recent review published on the changes in drug utilization and out-of-pocket costs associated with Medicare Part D concluded that implementation of Medicare Part D was associated with a 6%-13% increase in utilization and a 13%-18% decrease in prescription drug costs among the senior population.<sup>63</sup> However, many of these studies used the data from one pharmacy chain, or

compared the decrease in costs of the Medicare population with the change in costs of the general adult population.<sup>63</sup> For example one study using data from a pharmacy chain demonstrated that Medicare Part D had saved seniors approximately \$9 per month on medication expenses while they took on average 14 pill more per month.<sup>83</sup> A more recent study not included in the review and using data from a national government database demonstrated that the program was particularly effective in helping alleviate the cost burden for low income seniors without prior insurance.<sup>84</sup> Seniors with Medicare Part D were found to have 4.2-5.5 prescriptions on average.<sup>84</sup> Another study found that Medicare beneficiaries who did not have prescription drug insurance in either 2005 or 2006 experienced a 31.6% decrease in their annual medication costs, as the annual expenditures dropped from \$1116 in 2005 to \$763 in 2006.<sup>85</sup> However seniors without prior drug coverage enrolling in Medicare Part D during this time experienced an even greater 48.8% reduction in their medication cost during this time period as their annual medication costs went from \$1533 to \$784 during this time.<sup>85</sup> These results suggest that while seniors enrolling in Medicare Part D did experience an approximately 13%-18% reduction in out-of-pocket drug costs relative to the general population, the absolute reduction in out-of-pocket drug costs may have been even greater due to a surprising decrease in out-of-pocket drug costs expenses for the general population.<sup>85</sup>

There is sufficient data to indicate that seniors without creditable coverage who take many medications or have high medication expenses are more likely to enroll in Medicare Part D when compared to seniors without creditable coverage who take few medications or have low medication expenses. In fact, seniors medication expenses prior to becoming eligible for Medicare Part D is the best predictor in determining whether they will enroll in Medicare Part D once they become eligible and do not have creditable coverage.<sup>46</sup> It is also logical to deduce that seniors who have high medication expenses may be willing to pay more for plans, presumably in order to obtain better coverage. However, this has not been studied exhaustively in the literature. This line of thinking may not prove to be entirely correct, as only a small minority (6%) of seniors enroll in plans with gap coverage which tend to be the most expensive plans, and enhanced coverage is not necessarily associated with higher premiums.<sup>12,13</sup> One study suggests that seniors who would have high medication expenses without prescription insurance tend to stay away from the most inexpensive plans offered, and a study of hypothetical drug plans presented to seniors demonstrated that seniors taking a higher number of medications with a greater number of chronic diseases may be willing to pay more for generous prescription coverage.<sup>49,51</sup>

### **Economic Characteristics**

The seniors enrolled in Medicare represent a diverse group in terms of income. Approximately 50% have household incomes of more than 200% of the federal poverty level while 38% have incomes below 150% of the federal poverty level.<sup>84</sup> Observational data of enrollment in actual Medicare PDPs does not indicate that there is any association between income and choice of whether to enroll in a plan or the choice of a particular plan.<sup>46,51</sup> However, there is some evidence from research prior to the implementation of

Medicare Part D which suggests that seniors with high incomes may be willing to pay more for plans which offer better benefits, consistent with the literature on health plan choice and income.<sup>16,49</sup>

### **Risk Factors**

Age has been shown to have an inverse relationship with enrollment in Medicare Part D plans where younger seniors without prior insurance coverage are more likely to enroll in a Medicare PDP.<sup>46,51</sup> However, there is currently no information on how age influences the choice of a particular type of plan. On average senior citizens have approximately 1.4–2.9 conditions for which they some type of medication.<sup>46,85</sup> A greater number of conditions for which one takes medications has been shown to be associated with a greater probability of enrolling in Medicare Part D, but the relationship with the type of plan chosen is unclear although preliminary evidence suggests that a greater number of chronic conditions may be associated with a willingness to pay higher costs for more generous prescription drug coverage.<sup>46</sup> Approximately 87%-91% of seniors take some type of prescription medication on a regular basis.<sup>46,84</sup> As stated in the expected utilizations pattern section, there is inconclusive evidence in regards to how much the medication burden affects the choice of a Medicare Part D plan.<sup>63,84,85</sup>

### **Beliefs about Medicine**

The relationship between Medical Care Preferences and prescription drug plan choice has not been studied extensively. A study of hypothetical prescription drug plans presented to seniors concluded that the preferences for receiving medical care had no appreciable effect on choice of a prescription drug plan.<sup>49</sup>

### **Attribute Preferences**

The relationship between the patient-pharmacist relationship and prescription drug plan choice has not been investigated thoroughly. A study of hypothetical prescription drug plans presented to seniors concluded that the preferences for receiving medical care had no obvious association with choice of a prescription drug plan.<sup>49</sup> Preliminary evidence also indicates that seniors who have prior experience with a formulary which restricts their use of medications tend to avoid prescription drug plans which limit their use of medications.<sup>49</sup>

## **Summary**

In summary, the research on choice of PDPs in the Medicare Part D population has shed variable information on the importance of benefit plan characteristics in determining the choice of prescription drug plans. However, much is left to be desired in the way of

information regarding delivery system characteristics and how secondary variables may interact with primary variables in helping to determine prescription drug plan choice.

## CHAPTER 3. METHODS

### Overview

This chapter provides a detailed description of the methods undertaken in this study. A brief description is provided for the rationale behind using Adaptive Choice-Based Conjoint Analysis (ACBC) for this survey. In addition, the operationalization of the variables is discussed as well as the techniques and processes used to collect the data. Finally, the data evaluation plan is presented.

### Rationale of Adaptive Choice-Based Conjoint Analysis as Survey Technique

Conjoint analysis has been used to evaluate consumer's preferences for multiple attributes of products and services in various fields such as psychology, decision theory, and economics ever since the early 1970's.<sup>86</sup> There are many different types of conjoint analysis techniques. The theoretical foundation for conjoint analysis was laid by Luce in 1964 and others followed soon thereafter.<sup>87</sup> Over time, several different approaches to conjoint analysis have evolved.<sup>88</sup>

### Full Profile Conjoint Analysis

One of the earliest methods for collecting data which became popular was known as the full profile or conjoint value analysis approach. During the 1970s this approach was often used in lieu of the "two-factor-at-a-time procedure" approach or trade off procedure where only two factors were considered at a time.<sup>86</sup> The respondents were then asked to rank the combinations so that the most desirable combination was most preferred and the least desirable combination was least preferred.<sup>86</sup> In contrast, the full profile approach used the full set of attributes, and displayed all of them on a card simultaneously.<sup>86</sup> Experts within the field acknowledge that it may be hard for respondents to look at more than six attributes at a time.<sup>88</sup> If more than six attributes are presented at a time, respondents may ignore attributes which they do not consider to be important, or ignore certain levels within important attributes due to information overload.<sup>88</sup> The full profile approach has different formats for presenting the data.<sup>86,89</sup> For example, all of the attributes may be presented for one product or service and the respondent may be asked how likely they are to purchase the product on a continuous scale.<sup>86</sup> The scale could have different lengths such as 1-10 or 1-100.<sup>89</sup> This approach is particularly good for new products that have not yet come onto the market.<sup>86</sup> Another option is for respondents to be presented with a full set of product profiles, and to rank the profiles from their most desirable to their least desirable.<sup>89</sup> Finally, respondents can be presented with two profiles at a time, known as pairwise presentation, and asked to evaluate which one they would purchase and the strength of their preference for that product.<sup>86</sup> For example, a respondent would have the option of saying they strongly prefer product A, somewhat prefer product A, have no preference for either product A or B, somewhat prefer product

B, or strongly prefer product B.<sup>86</sup> Some researchers believe that the ranking system may be more reliable, citing the premise that it may be harder for consumers to accurately express the magnitude of their preference for a product than simply stating which product they prefer.<sup>86</sup>

### **Adaptive Conjoint Analysis**

As stated previously, one of the main limitations of full profile conjoint analysis is that a limited amount of attributes may be used.<sup>88</sup> Adaptive conjoint analysis was developed by Richard Johnson of Sawtooth Software in the mid 1980s, principally as a means to bypass this limitation.<sup>90</sup> In adaptive conjoint analysis, the respondent's previous answers within a section are used by a computer in order to select the next question so as to provide the most information.<sup>90</sup>

While the number of maximum attributes to be analyzed under full profile conjoint analysis was six, the number of attributes that can be used in adaptive conjoint analysis can be up to 24.<sup>91</sup> In reality most studies using adaptive conjoint analysis have between 8-15 attributes.<sup>91</sup> This is accomplished by taking the respondent through a set of partial profiles where only a few of the attributes are displayed at one time.<sup>88</sup>

The adaptive conjoint analysis interview potentially goes through several stages. The first stage, the "adaptive conjoint analysis rating" question type is designed to find out which levels of an attribute the consumer prefers.<sup>91</sup> This question is not used for attributes where it is obvious that one level is preferred above another, where for example a lower price is understood to offer greater utility than a higher price.<sup>91</sup> The next stage in adaptive conjoint analysis involves the "adaptive conjoint analysis importance" question.<sup>91</sup> This set of questions is designed to find out which attributes are most important to the respondent.<sup>91</sup> The next stage involves the "adaptive conjoint analysis pairs" question which is comprised of questions which use conjoint analysis principles.<sup>91</sup> This is similar to the full profile pairwise presentation where the respondent is asked to choose between two products and services and indicate how strong their preference is for the product or service they choose.<sup>91</sup> However only a part of the full number of attributes is usually presented in a scenario, and the next question is chosen by the computer to find the most information possible about the attributes.<sup>91</sup>

Although Adaptive Conjoint Analysis has several advantages, it also has distinct limitations. One obvious limitation is that it requires the use of a computer.<sup>91</sup> It is also difficult to account for interactions with Adaptive Conjoint Analysis because it is a main effects model where the utilities for each attribute are measured in the context of other attributes being equal.<sup>88</sup> The Adaptive Conjoint Analysis method also has a tendency to underestimate the importance of price when it is included as an attribute, and this underestimation is more pronounced as the number of attributes increases.<sup>88</sup>

## **Choice-Based Conjoint Analysis**

Choice-Based Conjoint is relatively new, as it started to become popular in the early 1990s, and is now the most popular method for conjoint analysis.<sup>88</sup> Choice-based conjoint analysis does not ask respondents to rate or rank either one or two products; rather it asks respondents to choose one product or service from at least two.<sup>88</sup> In fact, there have been cases where respondents have been presented with up to eight different products or services at one time and asked to choose which one they would purchase.<sup>92</sup>

Choice-based conjoint analysis offers several theoretical advantages over ratings or ranking based systems. The process of choosing one product is analogous to what consumers actually do in real life situations, so that people are able to understand this process quite readily.<sup>92</sup> It is also possible to choose a none option.<sup>92</sup> This option in particular contributes data about demand for price increases.<sup>92</sup> Choice-based conjoint analysis is also capable of exploring interactions between different attributes, which has been cited as a limitation in full profile and adaptive conjoint analysis.<sup>92</sup>

However choice-based conjoint analysis does have limitations. Each question answered by a respondent offers less information because little information is gained about the products which were not chosen.<sup>88</sup> There is no data gathered on how strongly the chosen product was preferred or the rank order of the products which were not chosen.<sup>88,92</sup> Therefore, the choice-based conjoint analysis method may require more questions per respondent or a larger sample size.<sup>92</sup> Another limitation associated with conjoint analysis is the fact that it analyzes responses at the aggregate or group level and inferences may not always be made about individual level utilities as is possible when using rating or ranking systems.<sup>92</sup> However with newer methods such as hierarchical Bayesian estimation, individual level utilities can be gathered from choice-based conjoint analysis.<sup>92</sup> In addition, the limitation of attribute levels in choice-based conjoint analysis is even more pronounced than in full profile conjoint analysis.<sup>88</sup> Because more than two products or services may be presented at once, it is improbable that respondents will be able to process information for more than six attributes.<sup>88,92</sup> In fact, even this number of attributes may be too many when there are many complex levels within attributes.<sup>92</sup> With choice-based conjoint analysis, there is a lot of information to consider as all attributes are typically presented for each service.<sup>92</sup>

## **Potential Problems with Using Traditional Conjoint Analysis Methods**

With this dissertation, there were several factors that dictate what would be the most appropriate method to use. One of the most important factors was the fact that this study had eight attributes. Furthermore, the respondents were senior citizens who may have cognitive limitations. As stated earlier, the maximum number of attributes recommended for a full profile study and a choice-based conjoint analysis study is six. Therefore, this seemed to preclude the full panel analysis or the choice-based method from being used in this study. As stated previously, adaptive conjoint analysis is able to handle more than seven attributes.<sup>91</sup> This seemed to make adaptive conjoint analysis a

viable choice as the method to use in this study. However, this method has the limitation of being inaccurate as relates to price data.<sup>88</sup> Therefore, adaptive conjoint analysis was not without major flaws as a method to use in this study as this study had attributes which related to cost such as the premium price and the copayment amounts.

### **Adaptive Choice-Based Conjoint Analysis**

Fortunately, there is a method which combines features of both choice-based and adaptive conjoint analysis which is known as adaptive choice-based conjoint analysis (ACBC).<sup>93</sup> This form of conjoint analysis was developed in response to the fact that many respondents seemed to be answering choice-based conjoint analysis items too quickly in order to be able to fully evaluate all of the attributes and levels presented for each scenario.<sup>93</sup> Therefore it was proposed that many respondents have a “must have” feature which they look for and select no matter what other options are available, or they may have features which they attempt to avoid at all costs.<sup>93</sup> ACBC analysis has several stages just as adaptive conjoint analysis does.<sup>93</sup> The first stage is a “build your own” question where the respondent chooses their preferred levels for each attribute.<sup>93</sup> Where it is obvious that certain levels will be preferred for a particular attribute they are left out of this question.<sup>93</sup> This would include attributes such as price where it is obvious that a lower price would be preferred.<sup>93</sup> Based upon responses to this question, a pool of variations of the product or service being offered is created where all of the attributes and levels are included, but ones which are closer to the preferred levels of the respondent occur more often.<sup>93</sup> The subsequent stage is called the screening section.<sup>93</sup> In this section, approximately four variations of the product or service being evaluated are presented to respondents at a time.<sup>93</sup> Respondents are asked to indicate which of these they think are possibilities for them to buy.<sup>93</sup> Based upon the responses to the screening section, the respondent may be presented with the option of selecting a certain feature (level) which they believe is a must have.<sup>93</sup> Also, the respondent may be presented with the option of selecting a feature which they would always like to avoid.<sup>93</sup> The next stage is the choice tasks section.<sup>93</sup> The respondent is presented with multiple variations of the product of the service being offered and asked to choose which one they prefer, just as in choice-based conjoint analysis.<sup>93</sup> However, all of the choices presented have any feature which was identified as a must have, and they omit any feature that was identified as one the respondent must avoid.<sup>93</sup> In addition, any attributes which are the same among the products are highlighted so that the respondent can concentrate only on those features which are dissimilar.<sup>93</sup> Even though all attributes are presented, this helps reduce the amount of information which the respondent must process.<sup>93</sup> Because of this, one can measure more than six attributes, with recommendations that no more than a dozen are measured.<sup>93</sup> Furthermore, ACBC is recognized as being a good method to analyze price attributes, and is able to produce estimates for part worth values at the individual level.<sup>93</sup>

For the aforementioned reasons, ACBC represented the most reasonable approach for this study. There are potential limitations to ACBC. ACBC does tend to take more time to complete as respondents may take twice as long to complete an adaptive conjoint analysis survey as they do with choice-based conjoint analysis.<sup>93</sup> In addition the administration of

ACBC requires a computer.<sup>93</sup> When all factors were taken into consideration, the benefits of using ACBC outweighed any problems that may be associated with its use in this study.

### **Operationalization of Variables**

This section describes the operationalization of the variables used in this study. Separate sections are used to describe the variables that are in the conceptual model as well as variables included in the study that are not a part of the conceptual model.

#### **Variables outside of Conceptual Model**

Although some variables such as gender, education, and race are not part of the conceptual model for this study, they are standard sociodemographic variables. These variables may be useful in helping to identify certain demographic segments of the market which may have unique preferences. In addition the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) recommends that these variables be included in the study, and in addition their interaction with the attribute levels may be studied as recommended in the review by Scanlon and colleagues.<sup>18,94</sup> In addition, seniors will be asked whether they selected their own current plan, or if they received assistance from physicians, pharmacists, their family, or another source. This question is important to implement because many times seniors may receive assistance in selecting their Medicare Part D plans.<sup>95</sup> These variables are described in **Table 3-1**.

#### **Explanatory Variables within Conceptual Model**

The economic characteristics were evaluated by asking seniors about their household income. This question took the form of a categorical variable, and income ranges were included which were appropriate for seniors. It was explicitly stated to the respondents to include their social security and retirement benefits in their estimation of income as it is expected that few, if any of them, will be working.

Several questions were asked to evaluate the use of risk factors. Seniors were asked to provide their self reported age. The number of acute and chronic Medical Conditions was evaluated by asking patients whether they have the conditions which are listed in the 2005 Medicare Current Beneficiary Health Status and Functioning Survey (MCBHFS).<sup>96</sup> This survey asks about several conditions such as arteriosclerosis, hypertension, myocardial infarctions, angina, congestive heart failure, arrhythmias, strokes, various cancers, rheumatoid arthritis, osteoporosis, a broken hip, chronic obstructive pulmonary disease, asthma, benign prostatic hypertrophy, or diabetes.<sup>96</sup> The patient's use of prescription medications was ascertained by asking them to self report the number of prescription medications they have been taking for the previous 30 days and the out of pocket cost for these medications. Thus, this question was also used in determining the

**Table 3-1. Operationalization of variables outside conceptual model**

<b>Variable</b>	<b>Possible response</b>
<b>Gender</b>	Male Female
<b>Race/ethnicity</b>	Non Hispanic white Non Hispanic black
<b>Education</b>	Less than high school High school graduate Some college Bachelor's degree or higher
<b>Who helped select Medicare Part D plan</b>	Primarily self Family members Physician Pharmacist Other source

respondents expected utilization patterns. The patient's preferences for medical care were evaluated by using a validated scale developed by Ganther and colleagues for the express purpose of measuring patient's preferences for self care as opposed to formal medical care.<sup>97</sup> A version of the survey was graciously provided by Doctor Julie Ganther (Ganther, Personal Communication, 04-26-2011) as seen in Appendix A.

The strength of the respondent's relationship with their pharmacist was evaluated using a 3 item scale by Worley and Schommer.<sup>98</sup> This scale included three questions:

1. It is important for me to take my prescription to the same pharmacist or group of pharmacists whenever I need a prescription filled.
2. If I had a general health related question that did not require me to obtain a prescription, I would still rely on my pharmacist for advice related to these questions.
3. If a less expensive pharmacy opened near my present pharmacy, I would change pharmacies.

The patient's experience with formularies was evaluated by asking them to state whether they thought they were in an unrestrictive (open) formulary or a closed formulary and measured on a Likert scale. The respondents were asked to evaluate their satisfaction with their formulary on a 5 point Likert scale. The operationalization of the explanatory variables is included in **Table 3-2** for quick reference.

### **Operationalization of Premiums, Deductibles, and Doughnut Hole**

The drug benefit plan characteristics, including the premium, deductibles, and doughnut hole were all included as attributes within the conjoint analysis survey. In general, it is recommended to include 3 to 5 levels for each attribute.<sup>56</sup> The levels chosen should represent what a consumer would see in the actual market place, and be mutually exclusive.<sup>56,99</sup> Therefore, in order to ensure that the presented attributes were realistic, the cost sharing features of the 2010 PDPs were consulted.

These cost sharing features were derived after consulting the Medicare Part D plans available in Shelby County during 2010 using Medicare Part D's Drug Plan Finder website and the Medicare and You 2010 publication.<sup>58,100-102</sup> The website displays each of the plans which are offered to seniors in a region during each year, and also offers them the opportunity to see their EAC after they input their medications and pharmacy preferences.<sup>102</sup> Although information on the 2010 plans is no longer available on the Medicare Drug Plan Finder website, this information is available through the Q1 Medicare organization which provides educational materials and decision support tools for the Medicare community.<sup>100-102</sup> Previous studies using conjoint analysis to analyze prescription drug insurance did not include a deductible or doughnut hole.<sup>42,43</sup> The premium was used as an attribute in one previous study which used levels of \$10, \$25, \$100, and \$200.<sup>44</sup>

**Table 3-2. Operationalization of explanatory variables in conceptual model**

<b>Variable</b>	<b>Description</b>
<b>Household income</b>	Less than \$10,000 \$10,001-\$15,000 \$15,001-\$20,000 \$20,001-\$30,000 \$30,001-\$40,000 \$40,001-\$50,000 More than \$50,000
<b>Age</b>	Self reported age
<b>Chronic and acute conditions</b>	Respondents indicated which conditions on the 2005 MCBHFS they have. <sup>96</sup>
<b>Current Rx use/expected utilization patterns</b>	Respondents were asked to indicate the number of prescription medications they take and the out of pocket cost associated with these.
<b>Medical care preferences</b>	Respondents were administered a 9 item scale developed by Ganther and colleagues. (See Appendix A for details). <sup>97</sup>
<b>Patient pharmacist relationship</b>	Respondents were administered a 3 item scale developed by Worley and Schommer. <sup>98</sup>
<b>Formulary exposure</b>	Respondents answered two 5 point Likert scales, one designed to measure the restrictiveness of their current formulary, and another designed to assess their satisfaction with their current formulary.

Characteristics of plans with the maximum \$310 deductible and no gap coverage are displayed in **Table 3-3**. There was wide variation in the premium for these types of plans as they ranged from \$22 to \$63.<sup>58</sup> The average premium for these types of plans was \$31.66, however after taking out the plan with a \$63 premium, the average premium was \$29.42.<sup>58</sup> The median premium was \$31.30.<sup>58</sup> However after taking out the plan with a premium of \$63, the median premium was \$30.10.<sup>58</sup> The premium does not necessarily seem to be related to the patients out of pocket costs for their medications. For example, the lowest premium for a plan with the standard 25% coinsurance rate is \$22 while there is a plan with the same coverage which has a premium of \$33.60.<sup>58</sup> However, it is important to remember that some plans may have more expensive medications included on their formulary that other plans do not offer coverage for.

**Table 3-4** shows characteristics of plans with intermediate deductibles and no gap coverage. The premiums for these plans were generally higher than those plans with maximum deductibles, yet the premiums for some of these plans were lower than some of those found in the plans which featured maximum deductibles.<sup>58</sup> The average premium for these plans was \$38.40, while the median premium was \$37.20.<sup>58</sup> The average deductible in these plans was \$138 with a median deductible of \$150.<sup>58</sup> As with the maximum deductible plans, there was no discernable pattern in regards to the deductibles and copayment amounts.

**Table 3-5** shows the characteristics of plans with no deductible and no gap coverage. The average premium of these plans was \$45.76 and the median premium was \$45.40.<sup>58</sup> There was no obvious correlation between the premiums and the copayment amounts.

The copayment features of plans with no deductible and gap coverage are featured in **Table 3-6**. The average premium within these types of plans was \$72.24 with a median of \$68.30.<sup>58</sup> However, after a plan with a premium of \$100.74 was removed, the average premium and median premium were approximately \$68.<sup>58</sup>

Most of the differences in the range of premiums were determined by the plans deductibles and doughnut hole coverage, which was as expected based upon the information discussed in the literature review concerning the doughnut hole and deductible.<sup>12,61</sup> In order to present realistic prices, the summed pricing approach of Sawtooth Software's Adaptive Choice-Based Conjoint Analysis Program was used.<sup>103</sup> This feature allows the price, in this case the premium, to function as a continuous variable by allowing random variation around a price that is based upon the components intrinsic to the product which may affect price.<sup>103</sup> In this study, the price was allowed to fluctuate from between 30% below or 30% above the "average" price of the prescription drug plan package based upon the deductible and gap coverage it contained. This 30% variation allowed the investigator to have enough variation in price to cover most of the premiums that were being offered in the market in 2010, and also represented the recommended levels to be used with the Adaptive Choice-Based Conjoint Analysis Software.<sup>103</sup>

Generally it was found that plans with the maximum allowed deductible of \$310 and no

**Table 3-3. Plans with maximum deductible and no gap coverage in 2010**

Premium	Generic copay			Brand copay		
	One tier	Preferred	Non preferred	One tier	Preferred	Non preferred
\$22.00	25%			25%		
\$23.50	\$0				30%	65%
\$25.10		\$5	45%		20%	45%
\$26.40	\$3				\$30	\$79
\$26.50	\$6				\$25	\$71.50
\$30.00	25%			25%		
\$30.20	25%			25%		
\$31.20		\$6	25%	25%		
\$31.50	25%			25%		
\$32.40		\$3.50	45%		25%	45%
\$32.80	\$4				\$38	\$95
\$33.00	\$7				\$19.75	\$95
\$33.60	25%			25%		
\$33.70	\$4				\$33	\$65
\$63.00	\$9			\$31		

**Table 3-4. Plans with intermediate deductible and no gap coverage in 2010**

Premium	Generic copay			Brand copay		
	One tier	Preferred	Non preferred	One tier	Preferred	Non preferred
\$27.80		\$5	\$35		\$35	33%
\$28.50		\$3	\$5		\$35	\$60
\$30.00		\$4	52%		20%	52%
\$30.70		\$7	43%		11%	43%
\$32.30		\$0	\$8		\$37	\$84
\$35.80	\$6			\$43		
\$38.60	\$5				\$35	\$65
\$39.10		\$7	62%		20%	62%
\$40.30	\$4				\$45	\$90
\$43.80	\$6				\$39	75%
\$51.30		\$2.50	\$7.50		\$25	\$35 or \$90
\$62.60		\$4	\$30		\$25	25%

**Table 3-5. Plans with no deductible and no gap coverage in 2010**

Premium	Generic copay			Brand copay		
	One tier	Preferred	Non preferred	One tier	Preferred	Non preferred
\$37.90		\$7	\$85		\$43	\$85
\$40.90		\$7	\$63.25		\$42	\$63.25
\$43.60		\$8	\$40		\$40	\$75
\$44.00	\$0				\$42	\$85
\$46.80		12%	49%		16%	49%
\$48.10	\$8.00				\$37	\$74
\$48.60		\$2.50	\$5	33%		
\$56.20		\$0	\$95		\$42	\$95

**Table 3-6. Plans with no deductible featuring gap coverage in 2010**

Premium	Generic copay			Brand copay	
	One tier	Preferred	Non preferred	Preferred	Non preferred
\$60.50	\$6			\$35	\$60
\$61.10		\$2	\$4	\$35	\$60
\$63.20		\$2.50	\$7.50	\$39	\$98
\$64.30		\$5.00	\$25	20%	75%
\$72.30		\$6		\$35	\$65
\$76.60	\$7			\$42	\$90
\$79.20	\$6			\$40	75%
\$100.70		\$7	\$45	\$45	\$75

doughnut hole coverage had an average premium of approximately \$30 per month. Those plans with an intermediate deductible lower than \$310 had an average premium of approximately \$38 per month, so that the price in this survey was on average \$8 higher in a plan with an intermediate deductible when compared to a plan with the maximum allowed deductible when holding the gap coverage constant. It was decided to use \$150 as the intermediate deductible in this study because it was easy to comprehend and would allow for linear relationships to increase statistical efficiency when used with a \$300 deductible.<sup>103</sup> Plans with no deductible had premiums that were on average approximately \$46 per month. Accordingly, plans with no deductible in this survey had premiums that were on average \$16 higher than plans with a \$310 deductible when holding gap coverage constant. This fits along well with data from Heiss et al. which shows that when smaller deductibles were offered in 2006 and 2007, seniors were willing to pay approximately \$14 to go from maximum deductible plans to no deductible plans.

There were differing amounts of doughnut hole coverage offered: no gap coverage at all, few generics (less than 65%) covered in the doughnut hole, many (65%-99%) generic drugs covered within the gap, or essentially all generic drugs covered within the gap.<sup>99-101</sup> These same levels were utilized within this study. As noted before in the literature review, only a few customers choose plans with gap coverage indicating that demand for these plans may be low. Furthermore, Heiss et al. noted that the willingness to pay for plans with generic doughnut hole coverage was lower than the implicit price insurers use for these products. Therefore, the researcher used a slightly more conservative estimate, where \$20 was added to the premium if it included full doughnut hole coverage, even though the average premium was on average \$22 higher for these plans in comparison to plans with no doughnut hole coverage. Plans with some generics covered in the doughnut hole had \$15 added to the base price, and plans with few generics covered in the doughnut hole had \$10 added to the base price. Once again, this allowed for a linear relationship so that demand for different levels of gap coverage could be evaluated. The base prices and potential price ranges for the price attribute are depicted in **Table 3-7**. This framework allowed the researcher to capture all premium prices with the exception of one offered in the Shelby County PDP market during 2010.

### **Operationalization of Copayments**

In previous studies conjoint analysis studies of prescription drug payment, the most comprehensive copayment structure presented to respondents was levels of \$2, \$10, \$20, \$30, 10% or 25%.<sup>44</sup> While this structure has wide variation in the copayment range and encompasses a broad array of values, it fails to encompass the tiered structure which predominates in the Medicare Part D market. Therefore, for this study the decision was made to use two attributes to capture copayment levels, one for generic medications and one for brand medications. As seen in **Tables 3-3** through **3-6**, there is a wide range of copayment structures in Medicare Part D Prescription Drug Plans currently being offered in these plans with no standard copayment amounts.

When looking at coverage for generic drugs within these plans, many plans only use one tier level for generics, while some plans make a distinction between a preferred group of

**Table 3-7. Summed pricing for premium**

<b>Deductible</b>	<b>Gap coverage</b>	<b>Average premium</b>	<b>Minimum premium</b>	<b>Maximum premium</b>
\$300	None	\$30	\$21	\$39
\$300	Few generics	\$40	\$28	\$52
\$300	Some generics	\$45	\$32	\$59
\$300	All generics	\$50	\$35	\$65
\$150	None	\$38	\$27	\$49
\$150	Few generics	\$48	\$34	\$62
\$150	Some generics	\$53	\$37	\$69
\$150	All generics	\$58	\$41	\$75
\$0	None	\$46	\$32	\$60
\$0	Few generics	\$56	\$39	\$73
\$0	Some generics	\$61	\$43	\$79
\$0	All generics	\$66	\$46	\$86

generic drugs and a non-preferred group of generic drugs. In those plans with one tier for generics, the copayment amount ranges from \$0 to \$9.<sup>58</sup> In plans with two tiers for generic drugs, the copayment amount ranges from \$0 to \$8 for preferred generics, and from \$45 to \$95 for non-preferred generics.<sup>58</sup> In addition there are various coinsurance amounts, with several plans using the standard benefit plan 25% coinsurance rate for all generics, while several plans use a percentage coinsurance rate for non-preferred generics.<sup>58</sup> The copayments for generic medications are depicted in **Table 3-8**. The zero dollar and seven dollar copayment amounts were chosen to capture copayments on the low and high end for plans which use one tier copayments for generic medications. The 25% coinsurance rate was used to represent a coinsurance rate, and evaluate how respondents react to variable copayments. Finally, the \$7 and 50% copayment was chosen in order to evaluate how respondents felt about two tier generic plans.

When looking at coverage for brand name drugs, there are only two plans which employ one copayment level for brand name drugs, while all of the rest have either preferred brands and non-preferred brands, or a coinsurance rate.<sup>58</sup> The lowest copayment on a preferred brand is one plan with an amount of \$19.75, while there are three plans with preferred copayments of \$25 and six with preferred copayments of \$35.<sup>58</sup> There are nine plans which have preferred copayments of \$45.<sup>58</sup> Copayments for non preferred brands were \$35 to \$95.<sup>58</sup> Finally, there were six plans which included the 25% coinsurance amount.<sup>58</sup> Accordingly, the levels for brand copayment as depicted in **Table 3-8** were chosen in order to form a representative range of copayments.

### **Operationalization of Control Mechanisms**

The inclusion of control mechanisms has been incorporated in prior studies through the inclusion of formulary provisions.<sup>43,44</sup> One study acknowledged that a formulary has restrictions only in the sense that it requires use of generics when they are available, while another study stated that the formulary was limited in the sense that it covers a more limited set of drugs. While these definitions do address the issue of a formulary in some sense, they do not speak to the utilization management tools used by some of the Medicare Part D plans such as prior authorization, stepped care, and quantity limits.<sup>55,58</sup> An attempt to include these provisions were made in this study. The utilization management tools, along with the requirement that patients use generic medications if they were available fall up under the term “some restrictions.” It was explicitly stated to patients what the term some restrictions meant when they were taking the survey. Furthermore, the levels within the survey stated whether prescription drug plan covered all or some of the patient’s medications.

In this study, four levels were used for control mechanisms as seen in **Table 3-8**. Level one was the most unrestrictive level where the plan covered any medication the physician prescribed with no type of control mechanism. This level was stated as “all drugs covered and no restrictions on covered drugs.” Level two also covered all drugs but some types of control mechanisms were imposed. This was termed as “all drugs covered but some restrictions on covered drugs.” In level three, there were some drugs which the physician prescribes that would not covered by the plan. However for those drugs which

**Table 3-8. Attributes and levels used in conjoint analysis survey**

<b>Attributes</b>	<b>Level</b>
<b>Premium</b>	Summed pricing approach (\$21-\$86)
<b>Brand copayment</b>	
Level 1	\$25 or \$40
Level 2	25%
Level 3	\$35 or \$60
Level 4	\$45 or \$95
<b>Generic copayment</b>	
Level 1	\$0
Level 2	\$7
Level 3	25%
Level 4	\$7 or 50%
<b>Doughnut hole coverage</b>	
Level 1	None
Level 2	Few generics covered in doughnut hole
Level 3	Some generics covered in doughnut hole
Level 4	All generics covered in doughnut hole
<b>Formulary coverage</b>	
Level 1	All of your drugs are covered with no restrictions.
Level 2	All of your drugs are covered with some restrictions.
Level 3	Some of your drugs are covered with no restrictions.
Level 4	Some of your drugs are covered with some restrictions.
<b>Pharmacy access</b>	
Level 1	You can use all pharmacies.
Level 2	You can only use some pharmacies including your current one.
Level 3	You can only use some pharmacies not including your current one.
Level 4	You must use mail order for best benefits.
<b>Deductible</b>	
Level 1	\$0
Level 2	\$150
Level 3	\$310
<b>MTM eligibility</b>	
Level 1	2 diseases and 3 drugs required
Level 2	2 diseases and 6 drugs required
Level 3	3 diseases and 6 drugs required
Level 4	4 diseases and 9 drugs required

were covered, no utilization management tools were used, although respondents were instructed that they may be required to use generics if they were available. This level was stated as “some drugs are covered but there are no restrictions on covered drugs.” In level four, there were also some drugs which the plan does not cover. Moreover, for some of those drugs which the plan covered, utilization management tools may have been used. This level was stated as “some of your drugs are covered and there are some restrictions on covered drugs.”

### **Operationalization of Delivery System Characteristics**

One key component of the delivery system characteristics is concerned with the access that beneficiaries have to the health care professionals themselves so that the services and/or medications may be rendered to them. This feature was included as an attribute in the conjoint analysis survey. Within the framework of prescription drug plans, previous studies have examined access from the standpoint of whether beneficiaries were able to use their plans at all pharmacies, or even whether the beneficiary is restricted to using mail order pharmacies.<sup>43,44</sup> This study proposed to look at all these factors as a measure of access to pharmacies. Other conjoint analysis studies have looked at delivery system characteristics from a point of continuity by exploring whether it is important to consumers if they will be able to use their benefits at the pharmacies which they have patronized in the past.<sup>43,44</sup> This feature was also incorporated within this study so that this question in the conjoint analysis survey had levels that examine this feature from both the number of pharmacies that patrons were able to use, and also whether they were able to continue with their current pharmacy.

As depicted in **Table 3-8**, the first level of pharmacy access was one where the patient was able to use any pharmacy. Within the survey, this level was stated as “you can use all pharmacies.” The second level of access was one where patients were not able to use all pharmacies, but they could continue to use their current pharmacy with the PDP. In this survey, this level was stated as one where patients were not able to use all pharmacies and their current pharmacy or pharmacies were *not* included in the covered network. In the survey this level was stated as “you can use some pharmacies, but not including your current one.” The fourth level of access addressed the fact that some prescription drug plans like to encourage mail order pharmacy. Within the conjoint analysis survey, this level was stated as “you must use mail order for full benefits.” It was not stated that patients had to use mail order pharmacy as previous surveys stated, because within Medicare Part D, plans must provide some type of retail pharmacy coverage.<sup>43,44,77,78</sup>

In addition, there has been some research which has looked at the pharmacies and the pharmacist from the point of comprehensiveness, or the degree of interaction the patient has with their pharmacist.<sup>44</sup> Although, this was not a part of Cline and Mott’s Model on Prescription Drug Plan Choice,<sup>49</sup> it was included in this model. This study proposes to examine consumer preferences for the restrictiveness in being eligible to obtain Medication Therapy Management Services (MTM). These are a set of services which can be provided by pharmacists, and are available to beneficiaries enrolled in Medicare

Part D plans in order to ensure optimal use of medications and reduce the risk of adverse drugs events.<sup>56</sup>

At the time when this study was being constructed, Medicare Part D Prescription Drug Plans had considerable freedom in determining the eligibility criteria for MTM.<sup>56</sup> MTM was targeted towards beneficiaries who had more than one chronic disease, were taking at least two drugs which were covered by Medicare Part D plans, and were likely to have annual costs for their Part D drugs that were higher than a preset amount (initially \$4,000).<sup>56</sup> Recent data demonstrated that approximately 55% of national Medicare Part D plans required patients to have only 2 chronic diseases to meet the requirement pertaining to multiple chronic diseases.<sup>56</sup> Approximately a quarter of plans required patients to have at least three chronic diseases, 11.7% required patients to have at least 4 chronic diseases, and 6.8% required patients to have at least 5 chronic diseases in order to be eligible for MTM.<sup>56</sup> When looking at the minimum drug requirement, the data demonstrated that over 60% of plans required patients to have 5-8 drugs in order to meet this requirement.<sup>56</sup> Just over 20% of plans required patients to have only 2-4 drugs in order to meet the requirement of having multiple drugs.<sup>56</sup> The remainder of plans required patients to take at least 9 drugs in order to be eligible for MTM.<sup>56</sup> These eligibility criteria are important in determining who participates in MTM, as over 75% of those who are eligible for MTM choose to participate.<sup>56</sup>

This study used 4 different levels to access the restrictiveness of eligibility requirements for MTM as depicted in **Table 3-8**. The first level was the least restrictive and required patients to have only 2 chronic diseases and take only 3 drugs in order to be eligible for MTM. The next level was slightly more restrictive in that patients had to have at least 2 chronic diseases and take at least 6 drugs in order to be eligible for MTM. The third level required patients to have three chronic diseases and take at least 6 drugs in order to be eligible for MTM. Finally, the fourth level required patients to have 4 chronic diseases and take at least 9 drugs in order to be eligible for MTM.

### **Survey Instrumentation**

The survey was administered to seniors via Sawtooth Software's ACBC.<sup>103</sup> Representative screens from the survey are shown in Appendix B. The first part of the adaptive choice-based conjoint analysis instrument consisted of the build your own section. In the first part of this section, respondents indicated which of the following they would prefer, holding all other factors constant:

1. A PDP with a \$310 deductible and a \$30 monthly premium;
2. A PDP with a \$150 deductible and a \$38 monthly premium;
3. A PDP with a \$0 deductible and a \$46 monthly premium.

After indicating their preference for this section, respondents were given the option to add doughnut hole coverage to their preferred plan. Plans with a few generics covered

added \$10 to the monthly premium, plans with many generics covered added \$15 to the monthly premium, and plans with all generics covered added \$20 to the monthly premium.

After completing the Build-Your-Own section, the survey consisted of alternating sections of three types: a screening task, an unacceptable section, or a must have section. In the screening tasks section, respondents were presented with four concepts and asked to indicate whether each one was a possibility or whether they would not consider each one in real life. After completing the first three screening tasks, respondents were taken to the “unacceptables” section. The features presented in this section involved levels where the respondent had not chosen a concept which included the level. For example, if the respondent had not chosen any plans with a \$45 or \$95 copay for brand name medications, or any plans where the deductible was \$310, then these levels could be presented in the unacceptables section. After a respondent designated a level as unacceptable, it would not appear in the remainder of the survey. Respondents were only allowed to mark one feature as unacceptable at a time, and there was no more than one level presented for an attribute at a time. The “must have” section gave respondents a chance to select levels which they considered essential to have in a PDP. For example if they felt that they would only select plans which had no deductible, they were given the opportunity to select a \$0 deductible as a must have. From this point on, all plans presented would have \$0 deductibles. The flow of this section was as follows: 3 screening tasks, unacceptable #1, one screening task, unacceptable #2, must have #1, one screening task, unacceptable #3, must have #2, one screening task, unacceptable #4, must have #3, two screening tasks.

After completing the screening tasks, unacceptable, and must have sections in their entirety, the respondent was directed to complete the choice task tournament. This section included the concepts which the respondent had indicated that they considered a possibility in the screening tasks. Three concepts at a time were presented to respondents, and they were asked indicate which PDP they would select in real life. “winning” concepts were retained for subsequent rounds in the choice tournament so that respondents would have to select from among the concepts which they had chosen in previous rounds.

## **Study Design**

This study focused on seniors who are Medicare members or eligible for Medicare, as this is the population that eligible for enrollment in Medicare Part D Prescription Drug Plans. People who are over the age of 65, or younger individuals with permanent disabilities are eligible for enrollment in Medicare.<sup>1</sup> During 2010, there were over 47 million people enrolled in Medicare, and over 39 million of these were enrolled due to their age.<sup>1</sup> This study focused on the elderly population as they comprise the bulk of the Medicare population. Therefore, seniors who were at least 65 and currently enrolled in any form of Medicare were included in this study. An informed consent form approved by the University of Tennessee Institutional Review Board was administered to participants in order to ensure that they understand the purpose of the study. This

document is presented in Appendix C. Due to time constraints and limited financial resources, this analysis will be restricted to the Shelby County area of Tennessee. In 2007, there were just over 110,000 individuals on Medicare in Shelby County, and nearly 87,000 of these individuals were eligible for enrollment in Medicare based on their age.<sup>104</sup> Within Medicare, approximately 56% of the population is female, and over 52% of the population in Shelby County is female.<sup>105,106</sup> Therefore, the proposed sample for this study was approximately 55% female. Also, within Shelby County, approximately 52% of the population is African American, and approximately 45% of the population is white.<sup>106</sup> People derived from other ethnic groups were not included in this study due to inadequate sample size. Therefore, the proposed sample composition for this research was approximately 52%-55% black and 45%-48% white. Accordingly, the inclusion criteria for this study was Non-Hispanic Black or Non-Hispanic White seniors over the age of 65 currently enrolled in Medicare who attended or resided at one of the sites where the study was conducted.

Patients who had mental conditions such as retardation, Alzheimer's disease or other psychiatric conditions which may preclude them from answering the questions correctly were excluded from the study. In addition, the respondents had to be able to read and understand English. Therefore, the exclusion criteria for this study included any cognitive challenges that precluded the respondent from accurately being able to respond to the questions such as psychiatric conditions and the inability to comprehend written or spoken English.

### **Sample Size**

The computation of sample size within conjoint analysis studies is an unsettled issue.<sup>35</sup> Previous studies using conjoint analysis in the analysis of prescription drug plans have used 150 respondents or less.<sup>43,44</sup> However there are some "rules of thumb" which may be helpful in deciding the sample size for a conjoint analysis study. For example one formula used in traditional choice-based conjoint analysis suggests that  $nta/c \geq 500$ .<sup>35</sup> In this formula, n is the number of respondents, t is the number of tasks or questions which each respondent answers, a is the number of alternative choices presented to a patient in each question, and c is equal to the number of attributes in the study multiplied by the number of levels in the attribute with the greatest number of levels.<sup>35</sup> If this study were done using traditional choice-based conjoint analysis, a good figure for the number of proposed tasks for each participant would be approximately 15, and the number of proposed alternatives presented for each task would be 4. The number of attributes in this study was 8, and the highest number of levels within any attribute was limited to 4. Therefore, a good sample size for this study using traditional choice-based conjoint analysis would be approximately 267 participants. However, this study used Adaptive Choice-Based Conjoint Analysis which actually requires a smaller sample size.<sup>103</sup> However in order to obtain accurate estimates for individual level estimates, a larger sample size was used and ensure adequate numbers for each of the genders and races in this group a sample size of 500 was targeted.

## Study Setting

The conjoint analysis survey was piloted among a small sample of students and staff at the University of Tennessee Health Science Center. The survey was then piloted among 15 seniors at the Bartlett Senior Center to refine clarity of questions and ensure that there were not too many attributes, and that the seniors were able to understand all of the material presented to them. Initially, an attribute was included in order to define the quality of the plan, but in general seniors indicated that this attribute was not relevant.

The original proposal was for this study to be conducted exclusively at senior centers located within Shelby County. The investigator obtained the phone numbers of local senior centers and called the directors to enquire about the possibility of administering the survey, and also to find out how many senior citizens attend the facilities.<sup>107</sup> The senior centers with which the investigator established contact and which gave verbal consent to allow the investigator to come in and administer the survey included the Raleigh-Frayser Senior Center, the J.K. Lewis Senior Center, the Bartlett Senior Center, the McWherter Senior Center, and the Orange Mound Community Service Center. These senior centers represent diverse populations in Memphis. The director of the Raleigh-Frayser Senior Center estimated that they have a “couple hundred” seniors on any given day, and approximately 90% of them are over the age of 65. The director of the J.K. Lewis Senior Center related that their daily census is approximately 100 seniors each day, and she estimates that 98% of them are at least 65 years old. The McWherter Senior Center has approximately 90-100 seniors each day, and approximately 60% of them are estimated to be over the age of 65. The director of the Orange Mound Community Service Center stated that there are approximately 200-250 seniors at the center daily, and approximately 65% are over the age of 65.

The investigator worked with each director to set up times to come by the senior center and administer the survey to those seniors who are willing to participate. Flyers were posted to inform seniors of the times and dates where the survey would be conducted at the respective center. The director of the senior center and/or the service coordinator helped to inform seniors of the availability of the survey and kept records of who had taken the survey so that seniors would not take the survey more than once.

After administering the survey at these senior centers for at three months, the investigator reached a saturation point at approximately 220 patients whereby most of the seniors encountered at these locations had either taken the survey or declined to take the survey. Accordingly, the investigator sought out alternative sites to conduct the study. The investigator was able to establish contact with several senior homes which exclusively housed a senior population.<sup>108</sup> These included apartments such as Latham Terrace, Magnolia Terrace, John Exum Towers, Linden Camilla Towers, Wesley Highland Meadows and Wesley Graceland Gardens.<sup>108</sup> While working with resident coordinators, the investigator was able to interview as many as 15 patients in one day. This represented a dramatic increase in the rate of interviews obtained by going to senior centers so that the investigator was able to obtain 497 completed interviews. The data collection took place over a time period of six months.

The investigator sat down with participants and administered all materials to participants so that they were able to ask questions and gain clarification on items which they did not understand clearly. This leads to better data quality as the investigator can explain the information to respondents so that they make a well informed decision. The conjoint analysis portion itself took approximately 15 minutes per respondent, with some respondents completing this section in as little as 10 minutes and some taking as long as 25 minutes. The additional questions of the survey which were not attributes such as demographic information were also included in the survey. On average, it took respondents about 10 minutes to complete these questions, so that the total survey took approximately 25 minutes to administer.

## **Data Analysis**

This section discusses the analysis of the data gathered during the study. Descriptions are provided in regards to the methods used to evaluate the three major outcomes produced as a result of conducting this study: the part worth values, the importance scores, and the willingness to pay.

### **Part Worth Values**

The utility values for the sample were derived using hierarchical bayes (HB) estimation through the use of Sawtooth Software's CBC/HB software.<sup>109</sup> Hierarchical bayes has lower and upper level models used in estimating the part worth values.<sup>110</sup> A lower level model is used in estimating part worths at the individual level, and an upper level model is used in measuring population parameters.<sup>110</sup> The lower model assumes that the individual's partworths for each attribute which ultimately determine their probability for choosing a plan with specified characteristics conform to a multinomial logit model.<sup>110</sup> The lower model is described mathematically by the following equation:

$$p_k = \exp(x_k' \beta_i) / \sum \exp(x_j' \beta_i).^{110}$$

The probability of choosing a particular product in comparison to other products is designated by  $p_k$ .<sup>110</sup> Several factors help to determine the probability in selecting a specific product or service,  $X_k$ .<sup>110</sup> More specifically, this probability is a function of  $X_i$ , the levels which make up the product or service, and  $\beta_i$ , the individual's part worths for those specific levels.<sup>110</sup> As the equation shows, the total utility derived by an individual from a given product is obtained by adding up the respondents part worths for each level presented in the specified product.<sup>110</sup> The total utility is then exponentiated.<sup>110</sup> After these same functions have been performed for all other alternatives presented to the respondent, the probability that the respondent will choose a given product is derived by dividing that product's exponentiated utility by the total exponentiated utility of all alternatives presented.<sup>110</sup> For example, consider product A with a total utility of 5, product B with a total utility of 7, and product C with a total utility of 8. Raising e to the fifth power yields 148, while raising e to the sixth power yields 1097, and raising e to the

eighth power yields 2981. In order to find the probability that any particular product will be chosen, one simply divides that products exponentiated utility by the sum of the total exponentiated utilities.<sup>110</sup> In this example, the probability that product B will be chosen is  $1097/4,226$  or 26%.

The upper model in HB is described by the mathematical formula  $B_i \sim \text{Normal}(\alpha, D)$ .<sup>110</sup> Once again  $\beta_i$  represents the part worths for an a specific respondents, while  $\alpha$  is used to describe the estimate for the average part worth for the specified level across all respondents taking the survey.<sup>110</sup> The distribution of the variances and covariances across all of the respondents is described by  $D$ .<sup>110</sup> The HB model assumes that  $\alpha$  and  $D$  can be approximated by a normal distribution.<sup>110</sup>

The estimates for  $\beta_i$ ,  $\alpha$ , and  $D$  are obtained using an iterative process called Gibbs Sampling.<sup>110</sup> During this process, the program borrows information from the population parameters to influence the individual estimates so that they roughly conform to a normal distribution.<sup>110</sup> In particular, when individual responses are uncharacteristic of the population's responses as a whole, information is borrowed from the population characteristics in order to bring these responses more in line with population parameters.<sup>110</sup> In this way, the utility estimates for each individual are stabilized by the population estimates.<sup>110</sup> This process is repeated thousands of times until the estimates are assumed to converge to a set of values that fits the data well.<sup>110</sup> After convergence is assumed, the program makes thousands of estimates of each respondent's utilities using the data derived from the previous section.<sup>110</sup> A point estimate of the respondent's utility is produced after averaging all of these estimates.<sup>110</sup> An estimate of  $\alpha$  is obtained by taking the mean value of the thousands of estimates produced after convergence has been assumed.<sup>110</sup>

The covariate feature of Sawtooth Software's CBC/HB software was used in determining if the part worth values differed significantly between segments.<sup>110,111</sup> For each covariate examined the software produces a point estimate of the magnitude of the difference in between the part worth being examined and the reference level examined.<sup>110,111</sup> For example in examining race, the reference group of Caucasians may have a part worth 0.787 for zero dollar copayments on generic medications. However, the program also reports that blacks on average have a part worth value which is 0.165 higher than whites. In order to determine statistical significance, one examines the estimates of the added values in part worth due to the covariate after convergence has been assumed.<sup>110,111</sup> In this study, 20,000 iterations were performed to allow for convergence, and an additional 20,000 iterations were performed to allow for stable estimates of the  $\alpha$  parameter. The parth-worth estimates from the covariate of interest were examined at the 2.5% percentile and the 97.5% percentile in order to obtain a 95% confidence interval and evaluate whether they were statistically significant.<sup>110,111</sup> If the values crossed zero then they were not assumed to be significant. So in this example, the value of the added part worth due to being black may be -0.031 at the 2.5% percentile and 0.293 at the 97.5% percentile, so it can not be termed significant because it includes zero. This process is explained in detail in a technical paper.<sup>110</sup>

After the part worth values were obtained using covariates in Sawtooth Software's CBC/HB, the respective utility runs were imported into Software's SMRT program and the utility runs were utilized with the appropriate group.<sup>112</sup> For example, if the sample was divided into three groups based upon their pharmacy preference scores, the utility run obtained by using these preference scores as a covariate in CBC/HB were imported into SMRT and the sample was divided into these three segments in SMRT. The SMRT program rescales the scores using a method known as zero centered diffs so that the total sum of the part worth between the least preferred and most preferred levels of each attribute across attributes is equal to the number of attributes times 100.<sup>112</sup>

### **Importance Scores**

The importance scores for each attribute were determined to assess the relative importance consumers placed on each attribute. Within each attribute the difference in utilities between levels holding the highest utility and the lowest utility were calculated to obtain the attribute utility range for that particular attribute. These attribute utility ranges were summed to produce a utility range total. The attribute utility ranges were divided by the utility range total to produce an importance score for the respective attribute. These measures were performed using Sawtooth Software's SMRT program.<sup>112</sup>

### **Willingness to Pay**

The willingness to pay values were computed using standard methods in conjoint analysis. The differences between the partworths values for the reference level and the level of interest were obtained and divided by the appropriate premium coefficient.<sup>113,114</sup>

### **Protection of Human Subjects**

The study procedures were approved Institutional Review Board of the University of Tennessee Health Science Center in Memphis, TN. A copy of the consent forms is available in the Appendix C. All information was kept confidential and only the researcher had access to sensitive data.

## CHAPTER 4. RESULTS

### Description of Sample Characteristics

A description of the sample's demographic characteristics are provided in **Table 4-1**. A total of 497 seniors were interviewed. The sample had a mean age of approximately 74 years. Approximately 72% of the sample was female and approximately 28% was male. Most of the respondents (71%) were African American but there were also 144 Caucasians interviewed. Over 70% of the sample had graduated from high school, but just over 14% had obtained at least a bachelor's degree. Nearly a quarter (26%) of the respondents indicated they had completed some college without obtaining a four year degree. A large portion of the seniors (53.5%) had incomes under \$15,000, indicating that they were on relatively fixed incomes. Only 7.6% of the respondents indicated that they had annual incomes in excess of \$40,000 annually. Nearly four out of ten (38.8%) of the seniors interviewed had incomes of \$15,000-\$40,000 annually. Less than half (42.3%) of the seniors indicated that they selected their prescription drug insurance plans on their own. A few seniors reported receiving help from their family members (10.1%) or physician (2.2%) in helping to select a plan, but a sizable portion indicated that they received help from "other sources" such as service coordinators or social workers at their respective facilities or representatives from an insurance company.

The characteristics of the study sample which are specific to their health status or their preferences for receiving health care are shown in **Table 4-2**. On average, the sample had 2 comorbidities, although there was wide variation as the number of self reported comorbidities varied from 0-12. There was also wide variation in the number of prescription medications utilized by the sample. The mean number of medications utilized by respondents was 5.15, but there were some seniors who reported taking no prescription medications while some seniors reported taking as many as 20. The study sample also had large differences in their monthly out of pocket expenditures on prescription medications. While seniors reported spending over \$38 per month on average, the range for this variable was \$0 per month to \$900 per month. The respondent's scores on the medical preferences ranged from 11-45 with a mean score of 30.38 and a standard deviation of 8.30, indicating that there was also heterogeneity in the group regarding their medical preferences. The pharmacy loyalty scores also had wide variation as the highest possible score was 15 and the lowest possible score was 3. The mean score on this scale was 10.28 with a standard deviation of 2.41. Some seniors were unable to respond to the questions designed to measure formulary generosity or formulary satisfaction, because they stated that may not have had to use the plan yet to obtain medications, they did not have a prescription insurance plan, or they had just recently obtained their current plan so that they had no experience with it yet. In general, most of the seniors answering these questions indicated that their plan had an open formulary, and they were satisfied with their current insurance. On a scale of 1-5 the mean score for the formulary generosity variables was 4.46 and the mean score on the formulary satisfaction variables was 4.41.

**Table 4-1. Demographics of sample**

<b>Variables (N=497)</b>	<b>Number</b>	<b>%</b>
<b>Gender</b>		
Male	138	27.8
Female	359	72.2
<b>Race</b>		
White	144	29.0
Black	353	71.0
<b>Education</b>		
Less than high school	144	29.0
High school graduate	154	31.0
Some college	129	26.0
Bachelor's or higher	70	14.1
<b>Income</b>		
\$0-\$10,000	113	22.7
\$10,001-\$15,000	153	30.8
\$15,001-\$20,000	87	17.5
\$20,001-\$30,000	78	15.7
\$30,001-\$40,000	28	5.6
\$40,001-\$50,000	14	2.8
More than \$50,000	24	4.8
<b>How prescription drug insurance selected</b>		
Primarily on own	210	42.3
Family members	50	10.1
Physician	11	2.2
Pharmacist	0	0
No drug plan	6	1.2
Other source	219	44.1

Note: Mean age (SD)=73.93 (7.21).

**Table 4-2. Medical care specific variables**

<b>Variable (N=497)</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>SD</b>
Comorbidities	0	12	1.97	1.82
Number of prescription medications	0	20	5.15	3.64
Monthly cost of medications (dollars)	0	900	38.61	69.74
Medical preference score	9	45	30.38	8.30
Pharmacy loyalty score	3	15	10.28	2.41
Formulary generosity score	1	5	4.46	0.86
Formulary satisfaction score	1	5	4.41	0.89

Notes: Formulary generosity score computed from 460 valid responses and formulary satisfaction score computed from 467 valid responses.

**Table 4-3** shows the average part worth values for the sample without using any covariates and before rescaling. The premium had a strong effect on respondent's utility as every marginal dollar increase above the average decreased a respondent's utility for a plan by 0.551. This lends strong support for study hypothesis number 1, so that the null hypothesis of stating that the premium has no effect on beneficiary's choice of a plan could be rejected. Within brand copayments, the seniors who were surveyed displayed a strong preference for plans offering copayments of \$25 or \$50, as these copayment types had a part worth of 2.134. The next level within copayments that was preferred most among the sample was copayments of \$35 or \$60 followed by copayments of 25%. However, there was relative indifference between 25% cost sharing levels and copayment levels of \$35 or \$60 as the upper 95% confidence interval for 25% costsharing plans is higher than the lower 95% confidence interval of \$35 or \$60 copayments. The \$45 or \$95 copayment had the lowest part worth value. These results support study hypothesis number 2 as it is clear that lower copayment amounts are associated with higher utility values, ultimately leading to a greater probability that a plan would be selected.

Within generic copayments the most preferred level was \$0 copayments, followed by copayments of \$7. The copayment structure of \$7 or 50% was the third most preferred level, while 25% coinsurance was the least preferred level within this attribute. However, there was not a statistically significant difference between the 25% costsharing levels and the \$7 or 50% copayment structure as the confidence intervals for these two levels crossed. These results also help to support study hypothesis #2.

Strong consumer preferences were displayed within the deductible attribute and followed a logical order. The difference in part worth values from \$0 to \$150 (5.147) was nearly identical to the difference in part worth values in going from \$150 to \$310 (5.194). These results clearly support study hypothesis #3 so that the null hypothesis of the deductible amount having no effect on a senior's choice of a PDP may be rejected.

Within the attribute of doughnut hole coverage, the least preferred level was few generics covered followed by no generics covered in the doughnut hole. However, there is no statistical significance in between these levels as the confidence intervals share common values. With both of these levels, the part worth was approximately -2. The most preferred level in this attribute was coverage for all generics in the doughnut hole, with a part worth over 4 followed by having some generics covered in the doughnut hole. These results seem to support research hypothesis #4 but only to a certain degree. In general the seniors seem to exhibit greater utility for having plans where all or most of the generics are covered within the doughnut hole, but only including a few generics covered during this period does not affect their utility in a way that is different from having no doughnut hole coverage whatsoever. Within the attribute of formulary coverage, respondents indicated a rational order where they preferred to have all of their medications without restrictions. The most preferred level was to have all drugs covered with no restrictions, followed by having all drugs covered with some restrictions. However these measures are not statistically significant from each other as their confidence intervals share common values. The level that was preferred the third most in this attribute was some drugs covered with no restrictions, level. These results support research hypothesis #5.

**Table 4-3. Part worths for aggregate sample**

<b>Attributes</b>	<b>Part worth</b>	<b>SE</b>	<b>Lower 95% CI</b>	<b>Upper 95% CI</b>
<b>Premium (per dollar increase at average)</b>	-0.551	0.01	-0.600	-0.506
<b>Brand copayment</b>				
\$25 or \$40	2.134	0.05	1.899	2.342
25%	0.522	0.05	0.305	0.750
\$35 or \$60	0.845	0.05	0.628	1.103
\$45 or \$95	-3.502	0.10	-3.94	-3.073
<b>Generic copayment</b>				
\$0	1.536	0.06	1.311	1.785
\$7	-0.065	0.03	-0.313	0.127
25%	-0.879	0.04	-1.130	-0.625
\$7 or 50%	-0.593	0.03	-0.835	-0.401
<b>Doughnut hole coverage</b>				
None	-1.914	0.04	-2.343	-1.296
Few generics covered	-2.133	0.07	-2.925	-1.285
Some generics covered	-0.104	0.06	-0.354	0.184
All generics covered	4.151	0.08	3.397	5.020
<b>Formulary coverage</b>				
All drugs covered no restrictions	4.911	0.11	4.465	5.391
All drugs covered some restrictions	4.077	0.12	3.661	4.568
Some drugs covered no restrictions	-2.123	0.11	-2.697	-1.600
Some drugs covered some restrictions	-6.864	0.11	-7.637	-6.247
<b>Pharmacy access</b>				
All pharmacies available	3.071	0.08	2.625	3.385
Some pharmacies available including current	2.885	0.09	2.490	3.248
Some pharmacies available not including current	-3.986	0.14	-4.597	-3.359
Mail order used for best benefits	-1.970	0.11	-2.466	-1.465
<b>Deductible</b>				
\$0	5.163	0.14	4.724	5.646
\$150	0.016	0.05	-0.211	0.251
\$310	-5.178	0.12	-5.681	-4.747
<b>MTM eligibility</b>				
2 diseases and 3 drugs required	-0.090	0.03	-0.268	0.081
2 diseases and 6 drugs required	-0.022	0.02	-0.167	0.150
3 diseases and 6 drugs required	0.105	0.03	-0.069	0.259
4 diseases and 9 drugs required	0.007	0.02	-0.160	0.171

**Table 4-3. (continued)**

<b>Attributes</b>	<b>Part worth</b>	<b>SE</b>	<b>Lower 95% CI</b>	<b>Upper 95% CI</b>
<b>None</b>	-9.300	0.43	-10.747	-7.397

Notes: SE indicates standard error and CI indicates confidence interval.

However, in general the seniors indicated no significant differences in between having all of their medications covered with no restrictions and all of their medications covered with some restrictions.

Within the pharmacy access attribute the most preferred level was to have all pharmacies available, although it was not statistically different from having only some pharmacies available but being able to continue using the current one. The least preferred level within this attribute was not being able to use the current pharmacy, while having to use mail order to obtain the best benefits was the third most preferred level and significantly different from other levels in this attribute. These results clearly support research hypothesis 6.

The part worth values for MTM eligibility do not reflect a logical order and have relatively small part worths. This may indicate that this attribute was not clearly understood by the respondents despite the researcher's efforts to explain them, or the respondents may not have placed great importance on this attribute when compared to other attributes. Therefore, in this study we fail to reject the null hypothesis that the restrictiveness in MTM eligibility requirements affects beneficiary's selection of a prescription drug plan.

The value placed on the none parameter was -9.300 which represents the intercept for the purchaser's decision threshold. In order for a respondent to consider purchasing the product, the product must have a positive magnitude greater than the none threshold. For the general sample, a Part D plan must have a utility greater than 9.300 for the consumer to consider purchasing it.

The part worths are shown after they have been rescaled using the zero centered diff's method in **Table 4-4**. The part worths were scaled so that the total sum of the part worth between the least preferred and most preferred levels of each attribute across attributes is equal to the number of attributes times 100 as specified by the Sawtooth SMRT system. Throughout the remainder of the results sections, part worth values will be presented using this method, as it facilitates easier interpretation of the results.

The importance scores for the total sample are shown in **Table 4-5**. The premium was overwhelmingly the most important factor with an importance score of 50.3%. the second most important attribute was formulary coverage with a score of 12.1% followed closely by the deductible with an importance score of 11.6%. Pharmacy access was the fourth most important attribute with an importance score of 10.1% and the brand copayment was the fifth most important attribute with an importance score of 7.0%. The generic copayment (3.7%) was slightly more important than doughnut hole coverage (3.5%), while MTM eligibility had an importance score of 1.7%.

The marginal willingness to pay values are presented in **Table 4-6**. In this study the marginal WTP represents the change in premiums that customers would need in order to have the characteristic in that level as opposed to the reference level within the specified attribute. In general copayments had a relatively modest effect on this parameter,

**Table 4-4. Part worths for aggregate sample rescaled**

<b>Attributes (N=497)</b>	<b>Part worth</b>
<b>Premium (per dollar increase at average)</b>	-4.71
<b>Brand copayment</b>	
\$25 or \$40	20.09
25%	3.33
\$35 or \$60	7.81
\$45 or \$95	-31.23
<b>Generic copayment</b>	
\$0	14.16
\$7	-0.11
25%	-8.57
\$7 or 50%	-5.49
<b>Doughnut hole coverage</b>	
None	-2.81
Few generics covered	-10.11
Some generics covered	-2.21
All generics covered	10.70
<b>Formulary coverage</b>	
All drugs covered no restrictions	46.95
All drugs covered some restrictions	38.09
Some drugs covered no restrictions	-38.52
Some drugs covered some restrictions	-46.52
<b>Pharmacy access</b>	
All pharmacies available	28.90
Some pharmacies available including current	26.83
Some pharmacies available not including current	-38.08
Mail order used for best benefits	-17.65
<b>Deductible</b>	
\$0	45.52
\$150	0.70
\$310	-46.22
<b>MTM eligibility</b>	
2 diseases and 3 drugs required	-0.80
2 diseases and 6 drugs required	-0.03
3 diseases and 6 drugs required	0.77
4 diseases and 9 drugs required	0.06
<b>None</b>	-73.06

**Table 4-5. Importance scores for total sample**

<b>Attributes</b>	<b>Importance scores</b>
<b>Premium</b>	50.3%
<b>Formulary coverage</b>	12.1%
<b>Deductible</b>	11.6%
<b>Pharmacy access</b>	10.1%
<b>Brand copayment</b>	7.0%
<b>Generic copayment</b>	3.7%
<b>Doughnut hole coverage</b>	3.5%
<b>MTM eligibility</b>	1.7%

**Table 4-6. Marginal WTP for aggregate sample rescaled**

<b>Attributes</b>	<b>Marginal WTP</b>
<b>Premium (per dollar increase at average)</b>	-4.71
<b>Brand copayment</b>	
\$25 or \$40	\$4
25%	Reference
\$35 or \$60	\$1
\$45 or \$95	-\$7
<b>Generic copayment</b>	
\$0	\$5
\$7	\$2
25%	Reference
\$7 or 50%	\$1
<b>Doughnut hole coverage</b>	
None	Reference
Few generics covered	&
Some generics covered	\$0
All generics covered	\$3
<b>Formulary coverage</b>	
All drugs covered no restrictions	\$2
All drugs covered some restrictions	Reference
Some drugs covered no restrictions	-\$16
Some drugs covered some restrictions	-\$18
<b>Pharmacy access</b>	
All pharmacies available	\$0
Some pharmacies available including current	Reference
Some pharmacies available not including current	-\$14
Mail order used for best benefits	-\$9
<b>Deductible</b>	
\$0	\$10
\$150	Reference
\$310	-\$10
<b>MTM eligibility</b>	
2 diseases and 3 drugs required	&
2 diseases and 6 drugs required	&
3 diseases and 6 drugs required	&
4 diseases and 9 drugs required	&

Note: & indicates willingness to pay not calculated due to irrational order.

although respondents indicated that they would have to be paid approximately \$7 in order to accept a brand copayments of \$45 or \$95 when compared to the reference of 25% cost sharing. Including free generics increased the marginal WTP by \$4 from the reference of 25% cost sharing. Having all generics covered in the doughnut hole increased the marginal WTP by \$3 from the reference of having no drugs covered within the doughnut hole. Due to the illogical part worth values in the study, where many seniors seemed to indicate a greater preference for having no generics covered at all in the doughnut hole as opposed to having a few generics covered in the doughnut hole, no marginal WTP values were presented for comparing the preference level of a few generics in comparison to none at all. Within formulary coverage, the attribute level of only covering some drugs without any restrictions decreased the marginal WTP by \$16 from the reference of having all drugs covered with some restrictions. Seniors indicated that they would have to be paid \$18 to accept plans which covered some drugs with some restrictions in comparison to the reference of having all drugs covered with some restrictions. Within the pharmacy access attribute, plans which did not contract with the respondent's current pharmacy had a marginal WTP \$14 lower than the reference level of covering some pharmacies including the respondent's current pharmacy. On average, seniors indicated that they would have to be paid \$9 in order to accept having to use mail order for the best benefits. With regards to the deductible, seniors indicated that they would be willing to pay approximately \$10 more in premiums to have no deductibles in comparison to a \$150 deductible. Likewise, the study sample demonstrated that including a \$310 deductible in a plan would lower their WTP in premiums by approximately \$10 per month when compared to a similar plan with a \$150 deductible.

### **Results by Age**

The parts worths by age are presented in **Table 4-7**. The seniors were divided into two groups according to their age, those who were 65-75 years old, and those over the age of 75. In general, the younger senior citizens between the ages of 65-75 had similar preferences to those over the age of 75. However, seniors between 65-75 had a greater aversion to having few generics covered in the doughnut hole and stronger preferences to having all generics covered in the doughnut hole. In addition, the part worth values for older senior citizens was significantly higher for having some drugs covered with no restrictions and also some drugs covered with some restrictions. However, in these particular cases the seniors still displayed logical preferences for plans which would offer greater drug coverage. Another noteworthy feature of this table is the fact that the none parameter is nearly 20 points higher for the seniors above the age of 75 as it is for those seniors between the age of 65-75 although this value is not statistically significant. This is probably due to the relatively large standard error of this parameter, but it is a difference that stands out nevertheless. In addition, it is important to note that these results do not support study hypothesis number 9 as there is no statistically significant difference in between these two groups in regards to the part worth value for the premium. The importance scores by age are shown in **Table 4-8**. In both of these groups, the premium is the most important factor, although it seems to take on slightly greater importance for the older seniors. Within both groups, the amount of drugs

**Table 4-7. Part worth values by age rescaled**

<b>Attributes</b>	<b>65-75</b>	<b>Over 75</b>
<b>Premium (per dollar increase at average)</b>	-4.64	-4.83
<b>Brand copayment</b>		
\$25 or \$40	21.83	17.96
25%	3.73	3.42
\$35 or \$60	8.95	6.40
\$45 or \$95	-34.51	-27.78
<b>Generic copayment</b>		
\$0	15.52	10.66
\$7	-0.56	0.36
25%	-9.34	-6.58
\$7 or 50%	-5.62	-4.43
<b>Doughnut hole coverage</b>		
None	-4.70	-2.96
Few generics covered	-10.16	-8.99*
Some generics covered	2.45	3.70
All generics covered	12.41	8.25*
<b>Formulary coverage</b>		
All drugs covered no restrictions	49.02	42.83
All drugs covered some restrictions	39.91	35.70
Some drugs covered no restrictions	-43.24	-35.01*
Some drugs covered some restrictions	-45.39	-43.52*
<b>Pharmacy access</b>		
All pharmacies available	27.73	28.71
Some pharmacies available including current	27.14	25.40
Some pharmacies available not including current	-38.29	-33.96
Mail order used for best benefits	-16.59	-20.15
<b>Deductible</b>		
\$0	46.25	44.16
\$150	3.21	0.83
\$310	-49.47	-44.98
<b>MTM eligibility</b>		
2 diseases and 3 drugs required	0.15	-1.55
2 diseases and 6 drugs required	0.13	0.44
3 diseases and 6 drugs required	-0.59	2.11
4 diseases and 9 drugs required	0.31	-1.01
<b>None</b>	-66.42	-85.34

Note: \* indicates significant difference from age 65-75 at P=0.05 level.

**Table 4-8. Importance scores by age**

<b>Attributes</b>	<b>65-75 importance scores</b>	<b>Over 75 importance scores</b>
<b>Premium</b>	49.4%	52.4%
<b>Formulary coverage</b>	12.1%	11.5%
<b>Deductible</b>	12.0%	11.6%
<b>Pharmacy access</b>	9.9%	9.7%
<b>Brand copayment</b>	7.5%	6.6%
<b>Generic copayment</b>	3.9%	3.3%
<b>Doughnut hole coverage</b>	3.6%	3.1%
<b>MTM eligibility</b>	1.7%	1.8%

covered in the formulary and the deductible amount are nearly equivalent in importance and similar to that seen in the aggregate group. In the 65-75 year old group and the group with ages over 75, the degree of pharmacy access was the fourth most important factor in decisions of purchasing a prescription drug plan with an importance score of approximately 9.8%. The copayments on brand medications were the fifth most important factor in determining choice of a prescription drug plan.

The marginal WTP values by age are presented in **Table 4-9**. The stronger preference for younger seniors in having comprehensive generic doughnut hole coverage is reflected by a slightly higher marginal WTP when compared to older individuals. Younger senior citizens were willing to pay \$4 for full doughnut hole coverage while older senior citizens were only willing to pay \$2 for full doughnut hole coverage. The slightly greater decrease in part worths for having only some drugs covered in younger senior citizens is reflected in the WTP for measures. In addition, the WTP was decreased by \$16 for having some drugs covered with restrictions for seniors over the age of 75 and \$22, for seniors ages 65-75, reflecting the fact that younger seniors had lower utilities for this attribute level. The seniors under the age of 65 as well as the seniors over the age of 65 indicated that they would have be paid at least \$12 monthly in order to accept plans which did not feature coverage with their current pharmacy, and they also demonstrated that they would have to be paid \$9 per month in order to accept plans where mail order was used in order to obtain the best benefits.

### **Results by Gender**

The parts worths are presented by gender in **Table 4-10**. The preferences levels within each attribute are consistent with what is observed in the general sample. However, the part worths for no doughnut hole coverage and a \$150 deductible were significantly lower in females than males. The part worth for having all generics covered in the doughnut hole was significantly higher for males than males. Within the brand copayments, the female senior citizens had stronger preferences for the \$25 or \$40 level in brand copayments, but this difference was not statistically significant. Similarly, they displayed greater preferences for \$0 generic medications but this difference was not statistically significant. The female senior citizens also had a greater aversion to the higher priced brand medications priced at \$45 for preferred brand medications and \$95 for non preferred brand medications, although once again this was not statistically significant. Males did not seem to place quite as great as a preference on being able to retain their current pharmacy. The part worth values for being able to use all pharmacies, and being able to use some pharmacies including the current one were lower for males in comparison to females. Moreover, the part worth value for females was lower when only some pharmacies were covered in a plan but the respondent's current pharmacy was not one of those covered. In general, these results do not indicate a considerable degree of difference in between males and females in regards to their preferences for different attributes within PDPs.

**Table 4-9. Marginal WTP by age rescaled**

<b>Attributes</b>	<b>65-75</b>	<b>Over 75</b>
<b>Premium (per dollar increase at average)</b>	-4.64	-4.83
<b>Brand copayment</b>		
\$25 or \$40	\$4	\$3
25%	Reference	Reference
\$35 or \$60	\$1	\$1
\$45 or \$95	-\$8	-\$6
<b>Generic copayment</b>		
\$0	\$5	\$4
\$7	\$1	\$1
25%	Reference	Reference
\$7 or 50%	\$1	\$0
<b>Doughnut hole coverage</b>		
None	Reference	Reference
Few generics covered	&	&
Some generics covered	\$2	\$1
All generics covered	\$4	\$2
<b>Formulary coverage</b>		
All drugs covered no restrictions	\$2	\$1
All drugs covered some restrictions	Reference	Reference
Some drugs covered no restrictions	-\$18	-\$15
Some drugs covered some restrictions	-\$18	-\$16
<b>Pharmacy access</b>		
All pharmacies available	\$0	\$1
Some pharmacies available including current	Reference	Reference
Some pharmacies available not including current	-\$14	-\$12
Mail order used for best benefits	-\$9	-\$9
<b>Deductible</b>		
\$0	\$9	\$9
\$150	Reference	Reference
\$310	-\$11	-\$9
<b>MTM eligibility</b>		
2 diseases and 3 drugs required	&	&
2 diseases and 6 drugs required	&	&
3 diseases and 6 drugs required	&	&
4 diseases and 9 drugs required	&	&

Note: & indicates willingness to pay not calculated due to irrational order.

**Table 4-10. Part worth values by gender rescaled**

<b>Attributes</b>	<b>Males</b>	<b>Females</b>
<b>Premium (per dollar increase at average)</b>	-4.80	-4.67
<b>Brand copayment</b>		
\$25 or \$40	18.13	20.58
25%	2.34	4.27
\$35 or \$60	7.58	7.74
\$45 or \$95	-28.05	-32.59
<b>Generic copayment</b>		
\$0	11.52	14.07
\$7	2.36	-0.71
25%	-8.73	-7.81
\$7 or 50%	-5.15	-5.55
<b>Doughnut hole coverage</b>		
None	-4.50	-2.69*
Few generics covered	-13.14	-8.10
Some generics covered	2.88	1.57
All generics covered	14.76	9.22*
<b>Formulary coverage</b>		
All drugs covered no restrictions	48.37	47.40
All drugs covered some restrictions	35.58	40.32
Some drugs covered no restrictions	-36.54	-38.99
Some drugs covered some restrictions	-47.42	-48.73
<b>Pharmacy access</b>		
All pharmacies available	25.19	29.32
Some pharmacies available including current	21.15	27.31
Some pharmacies available not including current	-33.99	-38.96
Mail order used for best benefits	-12.35	-17.66
<b>Deductible</b>		
\$0	40.33	47.17
\$150	5.72	-0.47*
\$310	-46.06	-46.70
<b>MTM eligibility</b>		
2 diseases and 3 drugs required	-0.84	-1.14
2 diseases and 6 drugs required	-0.58	0.89
3 diseases and 6 drugs required	0.05	0.08
4 diseases and 9 drugs required	1.37	0.17
<b>None</b>	-82.85	-70.68

Note: \* indicates significant difference from males at P=0.05 level.

The importance scores are presented by gender in **Table 4-11**. In general, the importance scores are similar and are consistent with results seen in the aggregate sample. However there are some features of note. In particular, the premium appeared to be marginally more important to males where the value was 51.7% in males and 50.0% in females. The slightly higher value of doughnut hole coverage to males is reflected in this table as the value of doughnut hole coverage is 4.1% in males and 2.9% in females. The pharmacy access attribute was marginally more important in females as it carried a value of just over 10% in females while it was 9.1% in males.

The marginal WTP for attribute levels by gender are shown in **Table 4-12**. In general, these results are very similar to each other and follow the same trends as seen in the general sample. The biggest differences in between the groups are in the formulary coverage and pharmacy access components. Females had to be paid more in order to accept plans with limited drug coverage. In order to accept plans with some drugs covered but no restrictions, females indicated that they would have to be paid \$17 per month as opposed to \$15 monthly for males. In addition, the female senior citizens demonstrated that they would have to be paid \$19 per month in order to accept plans where only some drugs were covered with some restrictions, while this value was \$17 monthly for males. There also seemed to be slight differences in between the groups with regards to their willingness to pay for in regards to pharmacy access. Female senior citizens indicated that they would have to be paid \$14 monthly to accept plans which offered coverage at some pharmacies, but not their current one. Males demonstrated that they would have to be paid \$12 per month in order to take a plan where their current pharmacy was not covered.

### **Results by Race**

The parts worths by race are presented in **Table 4-13**. Whites were significantly less sensitive to increases in premiums than blacks. In addition whites displayed relative higher part worths to having a copayment of \$45 or \$95 on a brand name medication, and also in regards to having greater amounts of doughnut hole coverage, and these values were significantly different at the  $P=0.05$  level. Whites had significantly lower part worth values for plans which lacked doughnut hole coverage. Blacks had higher utility values for a zero deductible and lower utility values for a \$310 deductible. In addition, the value of the none parameter was significantly higher for blacks when compared to whites. Moreover there were some results which were not statistically significant, but may be noteworthy. Whites had higher part worth values for having all of their medicines covered with no restrictions, and also having all of their medicines covered with some restrictions. In addition, the part worth value was lower for whites when only some drugs were covered with some restrictions, although this value was not statistically significant. Finally, the white seniors demonstrated lower part worth values for having only some pharmacies included in the plan where their current pharmacy was not included. Although there are some differences in between blacks and whites, the differences between these groups is not as great as the difference seen in other groups.

**Table 4-11. Importance scores by gender**

<b>Attributes</b>	<b>Males importance scores</b>	<b>Females importance scores</b>
<b>Premium</b>	51.7%	50.0%
<b>Formulary coverage</b>	12.3%	12.5%
<b>Deductible</b>	11.2%	11.8%
<b>Pharmacy access</b>	9.1%	10.2%
<b>Brand copayment</b>	6.6%	7.2%
<b>Generic copayment</b>	3.3%	3.6%
<b>Doughnut hole coverage</b>	4.1%	2.9%
<b>MTM eligibility</b>	1.7%	1.7%

**Table 4-12. Marginal WTP by gender rescaled**

<b>Attributes</b>	<b>Males</b>	<b>Females</b>
<b>Premium (per dollar increase at average)</b>	-4.80	-4.67
<b>Brand copayment</b>		
\$25 or \$40	\$3	\$3
25%	Reference	Reference
\$35 or \$60	\$1	\$1
\$45 or \$95	-\$6	-\$8
<b>Generic copayment</b>		
\$0	\$4	\$5
\$7	\$2	\$2
25%	Reference	Reference
\$7 or 50%	-\$1	\$0
<b>Doughnut hole coverage</b>		
None	Reference	Reference
Few generics covered	&	&
Some generics covered	\$2	\$1
All generics covered	\$3	\$3
<b>Formulary coverage</b>		
All drugs covered no restrictions	\$3	\$2
All drugs covered some restrictions	Reference	Reference
Some drugs covered no restrictions	-\$15	-\$17
Some drugs covered some restrictions	-\$17	-\$19
<b>Pharmacy access</b>		
All pharmacies available	\$1	\$0
Some pharmacies available including current	Reference	Reference
Some pharmacies available not including current	-\$12	-\$14
Mail order used for best benefits	-\$7	-\$10
<b>Deductible</b>		
\$0	\$7	\$10
\$150	Reference	Reference
\$310	-\$11	-\$10
<b>MTM eligibility</b>		
2 diseases and 3 drugs required	&	&
2 diseases and 6 drugs required	&	&
3 diseases and 6 drugs required	&	&
4 diseases and 9 drugs required	&	&

Note: & indicates willingness to pay not calculated due to irrational order.

**Table 4-13. Part worth values by race rescaled**

<b>Attributes</b>	<b>Blacks</b>	<b>Whites</b>
<b>Premium (per dollar increase at average)</b>	-4.93	-4.19*
<b>Brand copayment</b>		
\$25 or \$40	18.84	23.06
25%	5.22	-1.55*
\$35 or \$60	8.12	5.90
\$45 or \$95	-32.17	-27.40*
<b>Generic copayment</b>		
\$0	14.34	11.71
\$7	-0.31	0.54
25%	-9.38	-6.78
\$7 or 50%	-4.65	-5.48
<b>Doughnut hole coverage</b>		
None	-0.93	-8.69*
Few generics covered	-6.30	-20.38*
Some generics covered	0.90	8.21*
All generics covered	6.33	20.87*
<b>Formulary coverage</b>		
All drugs covered no restrictions	43.60	55.64
All drugs covered some restrictions	36.30	53.43
Some drugs covered no restrictions	-37.71	-40.89
Some drugs covered some restrictions	-42.18	-58.18
<b>Pharmacy access</b>		
All pharmacies available	27.06	30.81
Some pharmacies available including current	25.37	27.73
Some pharmacies available not including current	-35.20	-43.20
Mail order used for best benefits	-17.23	-15.34
<b>Deductible</b>		
\$0	46.65	42.40*
\$150	1.38	2.08
\$310	-48.02	-44.48*
<b>MTM eligibility</b>		
2 diseases and 3 drugs required	-1.18	1.03
2 diseases and 6 drugs required	0.35	0.42
3 diseases and 6 drugs required	0.47	-0.26
4 diseases and 9 drugs required	0.37	-1.19
<b>None</b>	-86.28	-44.93

Note: \* indicates significant difference from blacks at P=0.05 level.

The importance scores are presented by race in **Table 4-14**. The higher value that African Americans place on the premium is reflected in this table as the value for this attribute is nearly 7 points higher in blacks than whites. Caucasians place more emphasis on formulary provisions than blacks as reflected by the fact that this was the second most important attribute to Caucasians while it was the third most important attribute for African Americans. The value for this attribute was over 14% in whites and 11.2% in blacks. The deductible was the second most important attribute for African Americans and the third most important for whites. Another distinction in between the groups is that doughnut hole coverage was more important than generic copayments in the whites, a departure from the pattern seen in the aggregate sample. In blacks, however the generic copayments were more important than doughnut hole coverage. This alludes to the fact that doughnut hole carried a higher importance in whites at 5.5% compared to 2.7% for blacks.

The marginal WTP values are presented by race in **Table 4-15**. The greater preferences by whites for lower brand copays are reflected in a marginal WTP of \$6 for \$25 or \$40 brand copays in comparison to blacks having a marginal WTP of \$3 when using a reference of 25% costsharing. In addition, the marginal WTP is decreased \$2 more in blacks than in whites when a \$45 or \$95 copayment is imposed. The greater emphasis that whites place on formulary coverage is demonstrated by their marginal WTP thresholds being decreased by greater amounts than blacks when plans cover some medications as opposed to the reference of covering all drugs with some restrictions. On average, whites indicated that they would have to be paid at least \$23 in order to accept plans where only some of their medications were covered, a contrast to the \$15 figure for blacks. One particular finding of note is that in general, whites were willing to pay \$4 more for some generics covered in the doughnut hole, and \$7 more to have all generics covered in the doughnut hole.

### **Results by Income**

**Table 4-16** shows the part worths by income. There were marked differences between these groups in premium sensitivity as both low (up to \$15,000 annual income, and middle income (\$15,000-\$30,000 in annual income) were more sensitive to increases in premiums than high income seniors (above \$30,000 annually). Furthermore, both of the lower income groups tended to have a greater aversion to being required to use mail order for the best benefits when compared to the high income group. In addition, the middle and lower income groups placed greater utility on being able to use all pharmacies or their current pharmacy. In regards to the level some pharmacies available but not including the current one, the low income group demonstrated significantly lower part worth values in comparison to the high income group. There were also differences between the high income group and the other groups in their part worths for deductible levels. The middle and low income groups had significantly higher part worths for zero dollar incomes and significantly lower part worths for the \$310 deductible. Finally, both the middle and low income groups had a greater magnitude on the “none” parameter in comparison to the high income group.

**Table 4-14. Importance scores by race**

<b>Attributes</b>	<b>Blacks importance scores</b>	<b>Whites importance scores</b>
<b>Premium</b>	52.5%	45.3%
<b>Formulary coverage</b>	11.2%	14.1%
<b>Deductible</b>	11.9%	11.0%
<b>Pharmacy access</b>	9.7%	10.9%
<b>Brand copayment</b>	6.9%	7.3%
<b>Generic copayment</b>	3.5%	4.0%
<b>Doughnut hole coverage</b>	2.7%	5.5%
<b>MTM eligibility</b>	1.6%	1.9%

**Table 4-15. Marginal WTP by race rescaled**

<b>Attributes</b>	<b>Blacks</b>	<b>Whites</b>
<b>Premium (per dollar increase at average)</b>	-4.93	-4.19
<b>Brand copayment</b>		
\$25 or \$40	\$3	\$6
25%	Reference	Reference
\$35 or \$60	-\$1	\$2
\$45 or \$95	-\$8	-\$6
<b>Generic copayment</b>		
\$0	\$4	\$4
\$7	\$1	\$2
25%	Reference	Reference
\$7 or 50%	\$1	\$0
<b>Doughnut hole coverage</b>		
None	Reference	Reference
Few generics covered	&	&
Some generics covered	\$0	\$4
All generics covered	\$1	\$7
<b>Formulary coverage</b>		
All drugs covered no restrictions	\$1	\$1
All drugs covered some restrictions	Reference	Reference
Some drugs covered no restrictions	-\$15	-\$23
Some drugs covered some restrictions	-\$16	-\$27
<b>Pharmacy access</b>		
All pharmacies available	\$0	\$1
Some pharmacies available including current	Reference	Reference
Some pharmacies available not including current	-\$12	-\$17
Mail order used for best benefits	-\$9	-\$9
<b>Deductible</b>		
\$0	\$9	-\$9
\$150	Reference	Reference
\$310	-\$10	-\$11
<b>MTM eligibility</b>		
2 diseases and 3 drugs required	&	&
2 diseases and 6 drugs required	&	&
3 diseases and 6 drugs required	&	&
4 diseases and 9 drugs required	&	&

Note: & indicates willingness to pay not calculated due to irrational order.

**Table 4-16. Part worth values by income rescaled**

<b>Attributes</b>	<b>Low</b>	<b>Middle</b>	<b>High</b>
<b>Premium (per dollar increase at average)</b>	-5.11*	-4.35*	-3.34
<b>Brand copayment</b>			
\$25 or \$40	19.86	19.27	31.93
25%	6.97*	0.18	-10.46
\$35 or \$60	8.13*	10.84*	-0.38
\$45 or \$95	-34.97*	-30.29	-21.10
<b>Generic copayment</b>			
\$0	14.38	11.87	15.11
\$7	-2.44	1.25	10.62
25%	-7.38	-9.12	-9.22
\$7 or 50%	-4.56	-4.00	-16.51
<b>Doughnut hole coverage</b>			
None	1.57*	-7.11*	-12.72
Few generics covered	-4.45*	-15.74*	-20.04
Some generics covered	-0.90*	6.84*	4.00
All generics covered	3.78	16.01*	28.77
<b>Formulary coverage</b>			
All drugs covered no restrictions	42.02	48.74	68.29
All drugs covered some restrictions	36.07	38.63	55.46
Some drugs covered no restrictions	-37.22	-39.58	-49.95
Some drugs covered some restrictions	-40.87	-47.79	-73.80
<b>Pharmacy access</b>			
All pharmacies available	26.93*	31.16*	22.33
Some pharmacies available including current	25.84*	29.29*	15.05
Some pharmacies available not including current	-33.70*	-44.99	-32.92
Mail order used for best benefits	-19.07*	-15.45*	-4.46
<b>Deductible</b>			
\$0	48.35*	41.93*	40.31
\$150	-1.85	4.46	6.04
\$310	-46.50*	46.39*	-46.35
<b>MTM eligibility</b>			
2 diseases and 3 drugs required	-0.79	1.04	-7.48
2 diseases and 6 drugs required	-0.38	1.84	2.15
3 diseases and 6 drugs required	1.09	-2.23	6.17
4 diseases and 9 drugs required	0.09	-0.65	-0.83
<b>None</b>	86.99*	61.93*	-12.15

Note: \* indicates significant difference from high income group at P=0.05 level.

The importance scores are presented by income in **Table 4-17**. Although premium is the most important attribute within each group, the magnitude of the value is 9.1 percentage points higher in the middle income group and 15.6% points higher in the low income group. These values, along with the part worth of the premiums support hypothesis #8 in demonstrating that high income seniors are willing to pay higher premiums after holding all other factors constant. Formulary coverage is relatively more important in the high income group and the middle income group in comparison to the low income groups, as it is the second most important attribute in the middle income and high income groups, but the third most important attribute in the low income groups. In addition, copayments carry greater importance in the high income group in comparison to the low and high income groups. There is also a trend of doughnut hole coverage becoming more important as income increases.

The marginal WTP values are presented by income in **Table 4-18**. The high income group had noticeably higher marginal WTP values for low copayments. The greater emphasis that the high income group places on formulary provisions is reflected by the larger relative decrease in marginal WTP for having only some medications covered when compared to the groups with lower incomes. Having to use mail order for the best benefits also decreased marginal WTP by a smaller amount in the high income group when compared to the middle and low income groups. The effect of the \$310 deductible on marginal WTP was also greater in the high income groups than in the lower income groups, yet this was largely a consequence of the smaller magnitude of the premium attribute in higher income senior citizens as the magnitude of their utility values for deductibles was actually smaller than the other two groups. Finally the differences in preferences in doughnut hole coverage between the groups is reflected in this table as high income groups were willing to pay \$12 for full generic doughnut hole coverage compared to \$5 and \$0 respectively for middle and low income groups. When looking at these results, one should keep in mind that higher income seniors may have more disposable income to spend, so that \$10 for a high income senior may represent a lower percentage of the income which they receive than \$10 for a low income senior. Overall, these results along with the importance scores and part worth values show important distinctions between low income seniors and high income seniors.

### **Results by Medical Preferences**

**Table 4-19** shows the part worths by medical preferences. There were no significant differences in between these groups in their sensitivity to premiums as was hypothesized. Therefore, we are unable to reject the null hypothesis of study hypothesis #12 and cannot say that higher preferences for medical care are associated with greater willingness to pay more for Medicare Part D PDPs. Interestingly, the group with higher medical preferences had lower part worth for the attribute level of using some pharmacies including the current one and a higher relative utility for using mail order benefits in comparison to the group with low medical preferences. In general these groups appear to be similar to one another.

**Table 4-17. Importance scores by income**

<b>Attributes</b>	<b>Low importance scores</b>	<b>Middle importance scores</b>	<b>High importance scores</b>
<b>Premium</b>	54.1%	47.6%	38.5%
<b>Formulary coverage</b>	10.9%	12.7%	17.2%
<b>Deductible</b>	11.9%	11.3%	11.4%
<b>Pharmacy access</b>	9.5%	10.9%	9.7%
<b>Brand copayment</b>	6.8%	7.0%	8.5%
<b>Generic copayment</b>	3.4%	3.7%	5.2%
<b>Doughnut hole coverage</b>	2.0%	5.0%	6.8%
<b>MTM eligibility</b>	1.4%	1.9%	2.7%

**Table 4-18. Marginal WTP by income rescaled**

<b>Attributes</b>	<b>Low</b>	<b>Middle</b>	<b>High</b>
<b>Premium (per dollar increase at average)</b>	-5.11	-4.35	-3.34
<b>Brand copayment</b>			
\$25 or \$40	\$3	\$4	\$13
25%	Reference	Reference	Reference
\$35 or \$60	\$0	\$3	\$3
\$45 or \$95	-\$8	-\$7	-\$3
<b>Generic copayment</b>			
\$0	\$4	\$5	\$7
\$7	\$1	\$2	\$6
25%	Reference	Reference	Reference
\$7 or 50%	\$1	\$1	-\$2
<b>Doughnut hole coverage</b>			
None	Reference	Reference	Reference
Few generics covered	&	&	&
Some generics covered	\$0	\$3	\$5
All generics covered	\$0	\$5	\$12
<b>Formulary coverage</b>			
All drugs covered no restrictions	\$1	\$2	\$4
All drugs covered some restrictions	Reference	Reference	Reference
Some drugs covered no restrictions	-\$14	-\$18	-\$32
Some drugs covered some restrictions	-\$15	-\$20	-\$38
<b>Pharmacy access</b>			
All pharmacies available	\$0	\$0	\$2
Some pharmacies available including current	Reference	Reference	Reference
Some pharmacies available not including current	-\$17	-\$17	-\$14
Mail order used for best benefits	-\$12	-\$10	-\$6
<b>Deductible</b>			
\$0	\$10	\$9	\$10
\$150	Reference	Reference	Reference
\$310	-\$9	-\$10	-\$16
<b>MTM eligibility</b>			
2 diseases and 3 drugs required	&	&	&
2 diseases and 6 drugs required	&	&	&
3 diseases and 6 drugs required	&	&	&
4 diseases and 9 drugs required	&	&	&

Note: & indicates willingness to pay not calculated due to irrational order.

**Table 4-19. Part worth values by medical preferences rescaled**

<b>Attributes</b>	<b>Low</b>	<b>Middle</b>	<b>High</b>
<b>Premium (per dollar increase at average)</b>	-4.63	-4.79	-4.54
<b>Brand copayment</b>			
\$25 or \$40	19.85	20.60	21.26
25%	3.61	3.42	3.64
\$35 or \$60	6.08	10.19	7.33
\$45 or \$95	-29.54	-34.21	-32.23
<b>Generic copayment</b>			
\$0	15.56	14.00	12.15
\$7	-3.51	0.29	1.65*
25%	-8.37	-8.53	-8.58
\$7 or 50%	-3.68	-5.76	-5.23
<b>Doughnut hole coverage</b>			
None	-1.52	-4.14	-0.63
Few generics covered	-6.12	-11.06*	-13.19
Some generics covered	0.67	3.71*	2.22
All generics covered	6.96	11.49*	11.60
<b>Formulary coverage</b>			
All drugs covered no restrictions	48.81	43.76	49.76
All drugs covered some restrictions	39.04	34.49	42.55
Some drugs covered no restrictions	-35.54	-35.82*	-43.92
Some drugs covered some restrictions	-52.30	-2.42	-48.39*
<b>Pharmacy access</b>			
All pharmacies available	31.65	25.82*	29.24
Some pharmacies available including current	30.16	24.84	24.71*
Some pharmacies available not including current	-36.63	-35.70	-40.39
Mail order used for best benefits	-25.17	-14.92	-13.56*
<b>Deductible</b>			
\$0	46.95	43.37	45.60
\$150	1.13	0.83	1.29
\$310	-48.08	-44.20	-46.89
<b>MTM eligibility</b>			
2 diseases and 3 drugs required	-1.76	-0.79	0.56
2 diseases and 6 drugs required	1.86	-0.23	-0.46
3 diseases and 6 drugs required	0.38	0.94	0.66
4 diseases and 9 drugs required	-0.49	0.08	-0.75
<b>None</b>	-71.17	-78.17	-61.65

Note: \* indicates significant difference from low medical preferences at P=0.05 level.

**Table 4-20** presents the importance scores by medical preferences. The trends for all three of these groups closely mimic that seen in the aggregate sample, although doughnut hole coverage is slightly more important than brand copayments in the group which has high preferences for medical care.

**Table 4-21** presents the marginal WTP by Medical Preferences. The largest difference in between the groups is that the group with low medical preferences has their marginal WTP decreased by a greater amount when having to use mail order to obtain the best benefits.

### **Results by Number of Prescription Medications**

**Table 4-22** shows the part worths by number of prescription medications. An obvious trend occurs which demonstrates that as the number of medications increases, the premium sensitivity decreases. However, this difference is only statistically significant when comparing the group with at least 7 medications with the group which takes no prescription medications at all. Therefore, we cannot say that hypothesis #11 is true for most seniors. For this study, this was only found to be true when comparing seniors taking at least seven medications with seniors taking no medications at all. This makes intuitive sense as individuals who have no medications may perceive that they do not need to purchase prescription insurance.

In addition, although it is not statistically significant, this table shows a trend where seniors who have more medications place more value on having lower copayments for the medications. For example, seniors taking at least 7 medications placed greater value on having brand medications at \$25 or \$40 when compared to seniors taking no medications at all, and the same comparison holds true as well when looking at \$0 copayments for generic medications.

Moreover, a trend is apparent where higher medication costs seem to cause a greater decrease in utility for those taking more medications. For example, seniors taking no medications at all had the highest relative part worth values for \$45 and \$95 brand copays. This also makes intuitive sense, because some of these seniors may believe that they may not be exposed to these copayments at all. However, seniors taking multiple medications probably have been or have reason to believe that there is a strong probability that they will be exposed to these types of copayments. Furthermore, the group with no medications at all seems to have much lower preferences for having any type of substantive doughnut hole coverage in comparison to other groups as the results seemed to indicate that they actually have greater preferences for no doughnut hole coverage of all. Of course, this may be a result of these seniors repeatedly choosing plans with the lowest premium which were associated with lower levels of doughnut hole coverage, although the software is supposed to evaluate components featured in the summed pricing independent of the price. The number of medications appears to be one of the most important factors in determining senior's preferences within Medicare Part D plans.

**Table 4-20. Importance scores by medical preferences score**

<b>Attributes</b>	<b>Low importance scores</b>	<b>Middle importance scores</b>	<b>High importance scores</b>
<b>Premium</b>	50.1%	51.3%	49.3%
<b>Formulary coverage</b>	12.2%	11.6%	12.7%
<b>Deductible</b>	12.1%	11.3%	11.6%
<b>Pharmacy access</b>	10.3%	9.8%	10.1%
<b>Brand copayment</b>	7.1%	6.8%	7.2%
<b>Generic copayment</b>	3.6%	3.7%	3.6%
<b>Doughnut hole coverage</b>	2.9%	3.7%	3.7%
<b>MTM eligibility</b>	1.7%	1.6%	1.8%

**Table 4-21. Marginal WTP by medical preferences rescaled**

<b>Attributes</b>	<b>Low</b>	<b>Middle</b>	<b>High</b>
<b>Premium (per dollar increase at average)</b>	-4.63	-4.79	-4.54
<b>Brand copayment</b>			
\$25 or \$40	\$4	\$4	\$4
25%	Reference	Reference	Reference
\$35 or \$60	\$1	\$1	\$1
\$45 or \$95	-\$7	-\$8	-\$8
<b>Generic copayment</b>			
\$0	\$5	\$5	\$5
\$7	\$1	\$2	\$2
25%	Reference	Reference	Reference
\$7 or 50%	\$1	\$1	-\$1
<b>Doughnut hole coverage</b>			
None	Reference	Reference	Reference
Few generics covered	&	&	&
Some generics covered	\$0	\$2	\$1
All generics covered	\$2	\$3	\$3
<b>Formulary coverage</b>			
All drugs covered no restrictions	\$2	\$2	\$2
All drugs covered some restrictions	Reference	Reference	Reference
Some drugs covered no restrictions	-\$16	-\$15	-\$19
Some drugs covered some restrictions	-\$20	-\$16	-\$20
<b>Pharmacy access</b>			
All pharmacies available	\$0	\$0	\$1
Some pharmacies available including current	Reference	Reference	Reference
Some pharmacies available not including current	-\$14	-\$13	-\$14
Mail order used for best benefits	-\$12	-\$8	-\$8
<b>Deductible</b>			
\$0	\$10	\$9	\$10
\$150	Reference	Reference	Reference
\$310	-\$11	-\$9	-\$11
<b>MTM eligibility</b>			
2 diseases and 3 drugs required	&	&	&
2 diseases and 6 drugs required	&	&	&
3 diseases and 6 drugs required	&	&	&
4 diseases and 9 drugs required	&	&	&

Note: & indicates willingness to pay not calculated due to irrational order.

**Table 4-22. Part worth values by number of prescription medications rescaled**

<b>Attributes</b>	<b>0</b>	<b>1-3</b>	<b>4-7</b>	<b>Over 7</b>
<b>Premium (per dollar increase at average)</b>	-5.45	-4.87	-4.65	-4.41*
<b>Brand copayment</b>				
\$25 or \$40	13.49	18.67	23.39	20.21
25%	2.76	2.46	4.08	4.42
\$35 or \$60	6.07	8.23	8.70	8.15
\$45 or \$95	-22.32	-29.36	-36.17	-32.77
<b>Generic copayment</b>				
\$0	10.22	15.26	12.59	14.16
\$7	-2.64	0.10	0.77	-1.30
25%	-5.99	-7.67	-8.25	-8.49
\$7 or 50%	-1.59	-7.69	-5.11	-4.37
<b>Doughnut hole coverage</b>				
None	7.86	-1.69	0.93	-10.97*
Few generics covered	-4.95	-3.47	-8.74	-29.69*
Some generics covered	-2.32	0.56	0.03	13.59*
All generics covered	-0.59	4.60	7.78	27.07*
<b>Formulary coverage</b>				
All drugs covered no restrictions	43.03	46.83	47.04	47.37
All drugs covered some restrictions	35.55	37.84	36.93	37.36
Some drugs covered no restrictions	-39.27	-40.81	-40.97	-38.50
Some drugs covered some restrictions	-39.31	-43.45	-43.00	-46.24*
<b>Pharmacy access</b>				
All pharmacies available	28.73	27.67	29.09	27.62
Some pharmacies available including current	24.96	25.53	29.94	22.27
Some pharmacies available not including current	-33.86	-35.09	-45.52	-39.43
Mail order used for best benefits	-19.83	-18.10	46.23	-10.45
<b>Deductible</b>				
\$0	48.51	45.16	46.23	41.30
\$150	-1.72	2.27	1.82	2.22
\$310	-46.79	-47.44	-48.05	-43.51
<b>MTM eligibility</b>				
2 diseases and 3 drugs required	-0.41	-1.99	-1.44	0.34

**Table 4-22. (continued)**

<b>Attributes</b>	<b>0</b>	<b>1-3</b>	<b>4-7</b>	<b>Over 7</b>
2 diseases and 6 drugs required	-2.48	2.20	0.04	-2.14
3 diseases and 6 drugs required	-0.28	0.52	1.91	-0.70
4 diseases and 9 drugs required	3.18	-0.73	-0.51	2.50
<b>None</b>	-95.93	-84.21	-67.65	-62.04

Note: \* indicates significant difference from group with no medications at P=0.05 level.

The importance scores by the number of medications are presented in **Table 4-23**. This table helps to demonstrate that as consumers are taking more medications, they are less sensitive to premiums, as the importance score for premium for those taking over 7 medications is more than 10% points lower than those who do not take any medications. This table also helps to demonstrate the fact that seniors who are taking any number of medications seem to place higher priority on copayments in comparison to seniors who are currently taking no medications as their importance scores in these respective categories are higher than for those who are taking no medications at all. However, it is interesting to note that these values are virtually equal amongst those who are taking any type of medication.

With regards to the deductible amount, this table and demonstrate that seniors who are taking no medications may prefer plans with no deductible more so than seniors that are taking many medications. This makes sense as seniors who are taking no medications may feel that even if they do have to use their prescription insurance, they may not meet the deductible. For example, if they have to take the medication for only acute conditions, then they may not meet the deductible if they do not have to take the medication on a recurring basis. On the other hand, seniors taking multiple medications may believe that they will exceed the deductible during the year.

There is also a trend towards formulary coverage becoming more important with increasing amounts of medication. As seniors take more medications, it is important for them not to have multiple medications that are not covered so that they incur the full price of the medication.

**Table 4-24** shows the marginal WTP by the number of medications. This table helps to demonstrate the greater value placed on lower copayments by seniors taking multiple medications. As an example, seniors taking at least seven medications would be willing to pay \$4 more per month in premiums for \$25 or \$40 brand name medications instead of the 25% cost sharing as stated in the standard benefit. Meanwhile, seniors currently taking no medications indicated that they would be willing to pay \$2 more per month for having the \$25 or \$40 brand copayments instead of the 25% cost sharing stipulated in the standard benefit. Likewise, seniors taking multiple medications are affected more negatively by higher copayments than seniors taking no medications. The senior citizens taking over seven medications indicated that they would have to have premiums which were \$8 lower in order to accept \$45 or \$95 brand name copayments instead of the 25% copayments, while seniors taking no medications indicated that they would have to have premiums which were \$5 lower in order to accept the \$45 or \$95 brand name copayments. Similar trends are found when one examines the preferences in regards to copayments for generic medications.

In addition, this table helps to demonstrate that seniors taking over 7 medications would be willing to pay approximately \$9 more in premiums to have doughnut hole coverage, a greater amount than that seen in other groups. Also, as alluded to in **Table 4-22** and **Table 4-23**, seniors taking more medications also indicated that they would have to be paid more in order to accept plans with more restrictive formulary coverage.

**Table 4-23. Importance scores by number of prescription medications**

<b>Attributes</b>	<b>0 importance scores</b>	<b>1-3 importance scores</b>	<b>4-7 importance scores</b>	<b>Over 7 importance scores</b>
<b>Premium</b>	57.6%	51.8%	50.2%	46.5%
<b>Formulary coverage</b>	10.8%	11.7%	11.9%	13.3%
<b>Deductible</b>	12.0%	11.7%	11.9%	10.7%
<b>Pharmacy access</b>	8.6%	9.9%	10.2%	10.3%
<b>Brand copayment</b>	5.6%	7.0%	7.1%	7.1%
<b>Generic copayment</b>	2.6%	3.8%	3.6%	3.9%
<b>Doughnut hole coverage</b>	1.6%	2.4%	3.2%	6.4%
<b>MTM eligibility</b>	1.2%	1.7%	1.7%	1.7%

**Table 4-24. Marginal WTP by number of prescription medications rescaled**

<b>Attributes</b>	<b>0</b>	<b>1-3</b>	<b>4-7</b>	<b>Over 7</b>
<b>Premium (per dollar increase at average)</b>	-5.45	-4.87	-4.65	-4.41
<b>Brand copayment</b>				
\$25 or \$40	\$2	\$3	\$4	\$4
25%	Reference	Reference	Reference	Reference
\$35 or \$60	-\$1	\$1	\$1	\$1
\$45 or \$95	-\$5	-\$7	-\$9	-\$8
<b>Generic copayment</b>				
\$0	\$3	\$5	\$4	\$5
\$7	\$1	\$2	\$2	\$2
25%	Reference	Reference	Reference	Reference
\$7 or 50%	\$1	\$0	-\$1	-\$1
<b>Doughnut hole coverage</b>				
None	Reference	Reference	Reference	Reference
Few generics covered	&	&	&	&
Some generics covered	-\$2	\$0	\$0	\$6
All generics covered	-\$2	\$1	\$1	\$9
<b>Formulary coverage</b>				
All drugs covered no restrictions	\$1	\$2	\$2	\$2
All drugs covered some restrictions	Reference	Reference	Reference	Reference
Some drugs covered no restrictions	-\$14	-\$16	-\$17	-\$17
Some drugs covered some restrictions	-\$14	-\$17	-\$17	-\$19
<b>Pharmacy access</b>				
All pharmacies available	\$1	\$0	\$0	\$1
Some pharmacies available including current	Reference	Reference	Reference	Reference
Some pharmacies available not including current	-\$11	-\$12	-\$16	-\$14
Mail order used for best benefits	-\$8	-\$9	-\$4	-\$7
<b>Deductible</b>				
\$0	\$9	\$9	\$10	\$9
\$150	Reference	Reference	Reference	Reference
\$310	-\$8	-\$10	-\$11	-\$10
<b>MTM eligibility</b>				
2 diseases and 3 drugs required	&	&	&	&

**Table 4-24. (continued)**

<b>Attributes</b>	<b>0</b>	<b>1-3</b>	<b>4-7</b>	<b>Over 7</b>
2 diseases and 6 drugs required	&	&	&	&
3 diseases and 6 drugs required	&	&	&	&
4 diseases and 9 drugs required	&	&	&	&

Note: & indicates willingness to pay not calculated due to irrational order.

## Results by Pharmacy Preferences

**Table 4-25** shows the part worths by pharmacy preferences. There is no significant difference in between the groups in their premium sensitivity. The insignificance of the requirements for MTM eligibility attribute prevents us from testing hypothesis #13 in this study. In addition, although there are no statistically significant differences between part worth values in the pharmacy attribute, the results are counterintuitive in that lower levels of pharmacy preferences seem to be associated with higher utilities for more liberal access to pharmacy and lower part worth values for restricted access to pharmacies. No other significant details of note are found in this table.

The importance scores are presented by pharmacy preferences in **Table 4-26**. No outstanding features of note are presented within this table. The marginal WTP is presented by pharmacy preferences in **Table 4-27**. In general, these groups are similar to each other.

## Results by Education

**Table 4-28** shows the part worths by education level. The premium sensitivity of those who have at least some college education is significantly lower than those who have no higher than a high school education. Having higher levels of doughnut hole coverage was more important to those with higher levels of education. Maintaining access to the current pharmacy and having lower deductibles were more important for seniors with lower levels of education. There was also large difference in the none parameter between these two groups, but it was not statistically significant, presumably due to the large standard error of this particular parameter.

**Table 4-29** shows the importance scores by education. This table reflects the higher importance that seniors without a college education place on the premiums. Those seniors with a college education place slightly more importance on formulary coverage and deductibles. In addition, seniors with at least some college education had slightly more importance placed on doughnut hole coverage.

**Table 4-30** presents the marginal WTP by education. One notable difference occurs in regards to doughnut hole coverage, where seniors with at least some college education were willing to pay \$6 for doughnut hole coverage and seniors with no more than a high school education were only willing to pay \$1 for doughnut hole coverage. In addition, seniors with at least some college education would have to be paid \$24 in order to accept plans where only some of their drugs were covered with some restrictions in comparison to \$17 for seniors with no more than a high school education. There were also differences in WTP for mail order services. Seniors with lower levels of education indicated that they would have to be paid \$9 in order to have to use mail order for the best benefits, but seniors with at least some college education indicated that they would have to be paid \$3 in order to use mail order for the best benefits.

**Table 4-25. Part worth values by pharmacy preferences rescaled**

<b>Attributes</b>	<b>Low</b>	<b>Middle</b>	<b>High</b>
<b>Premium (per dollar increase at average)</b>	-4.77	-4.66	-4.65
<b>Brand copayment</b>			
\$25 or \$40	21.68	20.71	19.37
25%	2.42	3.90	4.25
\$35 or \$60	6.40	7.45	10.40
\$45 or \$95	-30.50	-32.05	-34.02
<b>Generic copayment</b>			
\$0	15.70	14.16	12.18
\$7	-1.06	0.87*	-0.47
25%	-7.05	-8.32	-10.79
\$7 or 50%	-7.59	-6.71	-0.92
<b>Doughnut hole coverage</b>			
None	-1.11	-2.17	-4.48
Few generics covered	-2.20	-11.12*	-11.55*
Some generics covered	-0.68	4.03*	0.87*
All generics covered	3.99	9.27*	15.15*
<b>Formulary coverage</b>			
All drugs covered no restrictions	42.67	46.31	48.79
All drugs covered some restrictions	36.38	37.01	40.57
Some drugs covered no restrictions	-37.12	-36.09	-39.79
Some drugs covered some restrictions	-41.93	-47.22	-49.57
<b>Pharmacy access</b>			
All pharmacies available	29.47	28.40	29.19
Some pharmacies available including current	26.32	27.68	25.46
Some pharmacies available not including current	-35.06	-38.86	-38.61
Mail order used for best benefits	-20.73	-17.21	-16.04
<b>Deductible</b>			
\$0	46.62	47.23	39.65
\$150	1.72	1.44	2.31
\$310	-48.34	-48.67	-41.96
<b>MTM eligibility</b>			
2 diseases and 3 drugs required	1.97	-2.06	-1.10
2 diseases and 6 drugs required	0.12	1.16	-0.88
3 diseases and 6 drugs required	-0.33	0.13	0.40
4 diseases and 9 drugs required	-1.76	0.78	1.58
<b>None</b>	-79.34	-70.72	-67.06

Note: \* indicates significant difference from low pharmacy preferences at P=0.05 level.

**Table 4-26. Importance scores by pharmacy preferences**

<b>Attributes</b>	<b>Low importance scores</b>	<b>Middle importance scores</b>	<b>High importance scores</b>
<b>Premium</b>	54.1%	47.6%	38.5%
<b>Formulary coverage</b>	10.9%	12.7%	17.2%
<b>Deductible</b>	11.9%	11.3%	11.4%
<b>Pharmacy access</b>	9.5%	10.9%	9.7%
<b>Brand copayment</b>	6.8%	7.0%	8.5%
<b>Generic copayment</b>	3.4%	3.7%	5.2%
<b>Doughnut hole coverage</b>	2.0%	5.0%	6.8%
<b>MTM eligibility</b>	1.4%	1.9%	2.7%

**Table 4-27. Marginal WTP by pharmacy preferences rescaled**

<b>Attributes</b>	<b>Low</b>	<b>Middle</b>	<b>High</b>
<b>Premium (per dollar increase at average)</b>	-4.77	-4.66	-4.65
<b>Brand copayment</b>			
\$25 or \$40	\$4	\$4	\$3
25%	Reference	Reference	Reference
\$35 or \$60	\$1	\$1	\$1
\$45 or \$95	-\$7	-\$8	-\$8
<b>Generic copayment</b>			
\$0	\$5	\$5	\$5
\$7	\$1	\$2	\$2
25%	Reference	Reference	Reference
\$7 or 50%	-\$0	\$0	\$2
<b>Doughnut hole coverage</b>			
None	Reference	Reference	Reference
Few generics covered	&	&	&
Some generics covered	\$0	\$1	\$1
All generics covered	\$1	\$2	\$4
<b>Formulary coverage</b>			
All drugs covered no restrictions	\$1	\$2	\$2
All drugs covered some restrictions	Reference	Reference	Reference
Some drugs covered no restrictions	-\$15	-\$16	-\$17
Some drugs covered some restrictions	-\$16	-\$18	-\$19
<b>Pharmacy access</b>			
All pharmacies available	\$1	\$0	\$1
Some pharmacies available including current	Reference	Reference	Reference
Some pharmacies available not including current	-\$13	-\$14	-\$14
Mail order used for best benefits	-\$10	-\$9	-\$9
<b>Deductible</b>			
\$0	\$9	\$10	\$8
\$150	Reference	Reference	Reference
\$310	-\$10	-\$11	-\$10
<b>MTM eligibility</b>			
2 diseases and 3 drugs required	&	&	&
2 diseases and 6 drugs required	&	&	&
3 diseases and 6 drugs required	&	&	&
4 diseases and 9 drugs required	&	&	&

Note: & indicates willingness to pay not calculated due to irrational order.

**Table 4-28. Part worth values by education rescaled**

<b>Attributes</b>	<b>Low</b>	<b>High</b>
<b>Premium (per dollar increase at average)</b>	-4.98	-4.19*
<b>Brand copayment</b>		
\$25 or \$40	18.92	22.59
25%	4.93	2.94
\$35 or \$60	9.36	6.63
\$45 or \$95	-33.21	-32.17
<b>Generic copayment</b>		
\$0	13.87	13.85
\$7	-1.86	1.68
25%	-7.75	-9.92
\$7 or 50%	-4.25	-5.60
<b>Doughnut hole coverage</b>		
None	-1.056	-5.81
Few generics covered	-4.82	-19.39*
Some generics covered	0.19	5.93*
All generics covered	3.59	19.28*
<b>Formulary coverage</b>		
All drugs covered no restrictions	44.57	54.51
All drugs covered some restrictions	38.20	42.65
Some drugs covered no restrictions	-36.01	-40.45
Some drugs covered some restrictions	-46.76	-56.71
<b>Pharmacy access</b>		
All pharmacies available	28.40	27.25*
Some pharmacies available including current	27.97	23.41*
Some pharmacies available not including current	-37.66	-38.43
Mail order used for best benefits	-18.71	-12.23*
<b>Deductible</b>		
\$0	45.16	44.10
\$150	1.87	1.87
\$310	-47.03	-45.90*
<b>MTM eligibility</b>		
2 diseases and 3 drugs required	0.35	-2.72
2 diseases and 6 drugs required	0.51	0.73
3 diseases and 6 drugs required	0.68	0.04
4 diseases and 9 drugs required	-1.54	1.95
<b>None</b>	-84.30	-46.80

Note: \* indicates significant difference from low education group at P=0.05 level.

**Table 4-29. Importance scores by education**

<b>Attributes</b>	<b>Low importance scores</b>	<b>High importance scores</b>
<b>Premium</b>	49.4%	45.0%
<b>Formulary coverage</b>	12.1%	14.2%
<b>Deductible</b>	12.0%	11.4%
<b>Pharmacy access</b>	9.9%	10.2%
<b>Brand copayment</b>	7.5%	7.5%
<b>Generic copayment</b>	3.9%	4.1%
<b>Doughnut hole coverage</b>	3.6%	5.5%
<b>MTM eligibility</b>	1.7%	2.0%

**Table 4-30. Marginal WTP by education rescaled**

<b>Attributes</b>	<b>Low</b>	<b>High</b>
<b>Premium (per dollar increase at average)</b>	-4.98	-4.19
<b>Brand copayment</b>		
\$25 or \$40	\$3	\$5
25%	Reference	Reference
\$35 or \$60	\$1	\$1
\$45 or \$95	-\$8	-\$8
<b>Generic copayment</b>		
\$0	\$4	\$6
\$7	\$1	\$3
25%	Reference	Reference
\$7 or 50%	\$1	\$1
<b>Doughnut hole coverage</b>		
None	Reference	Reference
Few generics covered	&	&
Some generics covered	\$0	\$3
All generics covered	\$1	\$6
<b>Formulary coverage</b>		
All drugs covered no restrictions	\$1	\$3
All drugs covered some restrictions	Reference	Reference
Some drugs covered no restrictions	-\$15	-\$19
Some drugs covered some restrictions	-\$17	-\$24
<b>Pharmacy access</b>		
All pharmacies available	\$0	\$1
Some pharmacies available including current	Reference	Reference
Some pharmacies available not including current	-\$13	-\$15
Mail order used for best benefits	-\$9	-\$3
<b>Deductible</b>		
\$0	-\$9	\$10
\$150	Reference	Reference
\$310	-\$10	-\$11
<b>MTM eligibility</b>		
2 diseases and 3 drugs required	&	&
2 diseases and 6 drugs required	&	&
3 diseases and 6 drugs required	&	&
4 diseases and 9 drugs required	&	&

Note: & indicates willingness to pay not calculated due to irrational order.

## Results by Disease Burden

**Table 4-31** shows the part worth values by disease burden. Although there is a tendency for the premium to increase as the disease burden increases, it is not statistically significant. Therefore we cannot reject the null hypothesis of hypothesis #10. The data also suggest that seniors with at least one comorbidity may place a greater value on having \$0 generics. Seniors with at least one comorbidity had lower relative part worths in regards to having all pharmacies available for use or at least their own compared to seniors without a comorbidity.

**Table 4-32** displays the importance scores by disease burden. This table reflects the decreasing influence of the premium as the disease burden increases. Copayments, doughnut hole coverage, and formulary provisions seem to take on increasing importance as seniors have higher disease burdens. **Table 4-33** shows the marginal WTP by disease burden. This table demonstrates that seniors with a greater disease burden may be willing to pay slightly more for plans with doughnut hole coverage, and they are also particularly averse to having plans with only some drugs covered, and some restrictions on those covered drugs.

## Results by Out of Pocket Medication Cost

**Table 4-34** shows the part worths by monthly out of pocket medication cost. The premium sensitivity of the groups which pay either at least \$41 for their medications and those paying at least \$80 per month is significantly lower than the group which pays at most \$10 for their medications on a monthly basis. The group which pays at least \$80 per month for their medications had significantly lower part worth values for lower levels of doughnut hole coverage and significantly higher part worths for higher levels of doughnut hole coverage when compared to the those spending the least amount of money on their medications. The deductible also was not as important of a factor for seniors with the highest medication costs. In addition, the none parameter was significantly lower for seniors who spent at least \$40 per month on their medications in comparison to seniors who spent no more than \$10 monthly on their medications.

**Table 4-35** displays the importance scores by the monthly out of pocket medication cost. This table reflects the decreased relative importance of premiums for those spending at least \$80 per month on their medications as the importance score for premium is highest for those who currently have no out of pocket medication cost and lowest for those who have out of pocket medication cost of at least \$80. The doughnut hole and formulary provisions are also most important for those who spend at least \$40 per month on their medications.

**Table 4-36** displays the marginal WTP values by monthly out of pocket medication cost. Seniors spending more than \$80 per month on their medications were willing to pay more per month for free generics and doughnut hole coverage, and had to be paid more in order to accept plans where all of their medications were not covered.

**Table 4-31. Part worth values by disease burden rescaled**

<b>Attributes</b>	<b>None</b>	<b>1-2</b>	<b>&gt;2</b>
<b>Premium (per dollar increase at average)</b>	-4.84	-4.67	-4.29
<b>Brand copayment</b>			
\$25 or \$40	18.97	20.28	19.82
25%	1.82	4.99	3.45
\$35 or \$60	8.72	6.21	10.71
\$45 or \$95	-29.51	-31.47	-33.97
<b>Generic copayment</b>			
\$0	10.27	14.77	15.61
\$7	0.54	-0.17	-2.46
25%	-6.74	-8.41	-11.29
\$7 or 50%	-4.08	-6.20	-1.86
<b>Doughnut hole coverage</b>			
None	-0.44	-2.31	-7.94
Few generics covered	-6.23	-8.18	-18.48*
Some generics covered	1.00	2.04	6.59*
All generics covered	5.67	8.46	19.83*
<b>Formulary coverage</b>			
All drugs covered no restrictions	47.65	48.00	46.93
All drugs covered some restrictions	36.03	40.55	39.04
Some drugs covered no restrictions	-36.57	-37.16	-25.94*
Some drugs covered some restrictions	-47.11	-51.39	-60.03
<b>Pharmacy access</b>			
All pharmacies available	35.75	24.72*	28.21*
Some pharmacies available including current	35.22	22.67*	22.47*
Some pharmacies available not including current	-50.59	-33.77*	-35.72*
Mail order used for best benefits	-20.38	-13.63	-14.96
<b>Deductible</b>			
\$0	44.58	46.60	39.26
\$150	1.96	1.43	3.79
\$310	-46.86	-48.03	-43.05
<b>MTM eligibility</b>			
2 diseases and 3 drugs required	-0.78	-0.42	1.60
2 diseases and 6 drugs required	0.31	0.70	0.86
3 diseases and 6 drugs required	0.28	-0.34	-4.67*
4 diseases and 9 drugs required	0.19	-0.61	2.21
<b>None</b>	-70.68	-74.71	-54.24

Note: \* indicates significant difference from no disease group at P=0.05 level.

**Table 4-32. Importance scores by disease burden**

<b>Attributes</b>	<b>Low importance scores</b>	<b>Middle importance scores</b>	<b>High importance scores</b>
<b>Premium</b>	51.3%	50.3%	47.3%
<b>Formulary coverage</b>	11.9%	13.0%	14.3%
<b>Deductible</b>	11.5%	12.0%	11.1%
<b>Pharmacy access</b>	11.8%	9.1%	10.1%
<b>Brand copayment</b>	6.4%	7.2%	7.7%
<b>Generic copayment</b>	3.2%	3.8%	4.2%
<b>Doughnut hole coverage</b>	2.4%	3.0%	5.4%
<b>MTM eligibility</b>	1.6%	1.7%	2.1%

**Table 4-33. Marginal WTP by disease burden rescaled**

<b>Attributes</b>	<b>Low</b>	<b>1-2</b>	<b>&gt;2</b>
<b>Premium (per dollar increase at average)</b>	-4.84	-4.67	-4.29
<b>Brand copayment</b>			
\$25 or \$40	\$4	\$3	\$4
25%	Reference	Reference	Reference
\$35 or \$60	\$1	\$0	\$2
\$45 or \$95	-\$6	-\$8	-\$9
<b>Generic copayment</b>			
\$0	\$4	\$5	\$6
\$7	\$2	\$2	\$2
25%	Reference	Reference	Reference
\$7 or 50%	\$0	\$0	\$2
<b>Doughnut hole coverage</b>			
None	Reference	Reference	Reference
Few generics covered	&	&	&
Some generics covered	\$0	\$1	\$3
All generics covered	\$1	\$2	\$6
<b>Formulary coverage</b>			
All drugs covered no restrictions	\$2	\$1	\$2
All drugs covered some restrictions	Reference	Reference	Reference
Some drugs covered no restrictions	-\$15	-\$17	-\$15
Some drugs covered some restrictions	-\$17	-\$20	-\$23
<b>Pharmacy access</b>			
All pharmacies available	\$0	\$0	\$1
Some pharmacies available including current	Reference	Reference	Reference
Some pharmacies available not including current	-\$18	-\$12	-\$14
Mail order used for best benefits	-\$12	-\$8	-\$9
<b>Deductible</b>			
\$0	\$9	\$10	\$8
\$150	Reference	Reference	Reference
\$310	-\$10	-\$11	-\$11
<b>MTM eligibility</b>			
2 diseases and 3 drugs required	&	&	&
2 diseases and 6 drugs required	&	&	&
3 diseases and 6 drugs required	&	&	&
4 diseases and 9 drugs required	&	&	&

Note: & indicates willingness to pay not calculated due to irrational order.

**Table 4-34. Part worth values by out of pocket medication cost rescaled**

<b>Attributes</b>	<b>\$0-\$10</b>	<b>\$11-\$40</b>	<b>\$41-\$79</b>	<b>&gt;\$80</b>
<b>Premium (per dollar increase at average)</b>	-5.01	-4.86	-4.31*	-3.60*
<b>Brand copayment</b>				
\$25 or \$40	17.64	21.11	19.93	24.40
25%	1.74	5.81	-0.73	0.22
\$35 or \$60	8.14	7.93	2.87	8.70
\$45 or \$95	-27.52	-34.86	-22.10	-33.32
<b>Generic copayment</b>				
\$0	16.63	13.73	5.20*	14.57*
\$7	0.01	-0.07	-2.95	-4.21
25%	-8.15	-8.90	-3.69*	-8.62
\$7 or 50%	-8.49	-4.76	-4.47	-1.74*
<b>Doughnut hole coverage</b>				
None	0.82	-0.19	-1.94	-23.99*
Few generics covered	-7.44	-4.10	-11.50	-36.45*
Some generics covered	0.57	0.44	-1.49	21.11*
All generics covered	6.05	3.86	14.94	39.33*
<b>Formulary coverage</b>				
All drugs covered no restrictions	46.25	43.68	56.82	61.05
All drugs covered some restrictions	38.30	34.12	41.36	53.94
Some drugs covered no restrictions	-42.08	-37.82*	-47.25*	-44.92
Some drugs covered some restrictions	-42.47	-39.98	-50.94	-70.07
<b>Pharmacy access</b>				
All pharmacies available	29.14	26.94	34.73	26.14*
Some pharmacies available including current	24.90	25.66	33.12	24.98
Some pharmacies available not including current	-34.39	-38.02	-42.48	-40.83
Mail order used for best benefits	-19.65	-14.58	-25.38	-10.29*
<b>Deductible</b>				
\$0	48.48	45.20	44.56	34.01*
\$150	-0.91	4.65*	0.73	2.80
\$310	-47.57	-49.85	-45.29	-36.81*
<b>MTM eligibility</b>				
2 diseases and 3 drugs required	-0.41	-1.99	-1.44	0.34

**Table 4-34. (continued)**

<b>Attributes</b>	<b>\$0-\$10</b>	<b>\$11-\$40</b>	<b>\$41-\$79</b>	<b>&gt;\$80</b>
2 diseases and 6 drugs required	-0.24	0.70	2.10	-2.89
3 diseases and 6 drugs required	1.21	0.23	-3.10	1.48
4 diseases and 9 drugs required	1.83	-0.40	-3.87	0.64
<b>None</b>	-80.10	-83.90	-52.04*	-29.50*

Note: \* indicates significant difference from \$0-\$10 group at P=0.05 level.

**Table 4-35. Importance scores by out of pocket medication cost**

<b>Attributes</b>	<b>\$0-\$10 importance scores</b>	<b>\$11-\$40 importance scores</b>	<b>\$41-\$79 importance scores</b>	<b>&gt;\$80 importance scores</b>
<b>Premium</b>	53.3%	52.3%	45.5%	39.0%
<b>Brand copayment</b>	6.1%	7.4%	7.1%	7.6%
<b>Formulary coverage</b>	11.4%	10.9%	14.1%	16.7%
<b>Deductible</b>	11.9%	12.2%	11.4%	9.3%
<b>Pharmacy access</b>	9.3%	9.8%	11.6%	10.7%
<b>Generic copayment</b>	3.8%	3.6%	3.5%	4.3%
<b>Doughnut hole coverage</b>	2.5%	2.0%	4.5%	10.3%
<b>MTM eligibility</b>	1.6%	1.8%	2.4%	2.1%

**Table 4-36. Marginal WTP by monthly out of pocket medicine cost rescaled**

<b>Attributes</b>	<b>\$0-\$10</b>	<b>\$11-\$40</b>	<b>\$41-\$79</b>	<b>&gt;\$80</b>
<b>Premium (per dollar increase at average)</b>	-5.01	-4.86	-4.31	-0.376
<b>Brand copayment</b>				
\$25 or \$40	\$3	\$3	\$5	\$7
25%	Reference	Reference	Reference	Reference
\$35 or \$60	\$1	\$0	\$1	\$2
\$45 or \$95	-\$6	-\$8	-\$5	-\$9
<b>Generic copayment</b>				
\$0	\$5	\$5	\$2	\$6
\$7	\$2	\$2	\$0	\$1
25%	Reference	Reference	Reference	Reference
\$7 or 50%	\$0	\$1	\$0	\$2
<b>Doughnut hole coverage</b>				
None	Reference	Reference	Reference	Reference
Few generics covered	&	&	&	&
Some generics covered	-\$0	-\$0	\$0	\$13
All generics covered	\$1	\$1	\$4	\$20
<b>Formulary coverage</b>				
All drugs covered no restrictions	\$2	\$2	\$4	\$2
All drugs covered some restrictions	Reference	Reference	Reference	Reference
Some drugs covered no restrictions	-\$16	-\$15	-\$21	-\$27
Some drugs covered some restrictions	-\$16	-\$15	-\$21	-\$34
<b>Pharmacy access</b>				
All pharmacies available	\$1	\$0	\$0	\$0
Some pharmacies available including current	Reference	Reference	Reference	Reference
Some pharmacies available not including current	-\$12	-\$13	-\$17	-\$18
Mail order used for best benefits	-\$9	-\$8	-\$13	-\$10
<b>Deductible</b>				
\$0	\$10	\$8	\$10	\$9
\$150	Reference	Reference	Reference	Reference
\$310	-\$9	-\$11	-\$11	-\$11
<b>MTM eligibility</b>				
2 diseases and 3 drugs required	&	&	&	&

**Table 4-36. (continued)**

<b>Attributes</b>	<b>\$0-\$10</b>	<b>\$11-\$40</b>	<b>\$41-\$79</b>	<b>&gt;\$80</b>
2 diseases and 6 drugs required	&	&	&	&
3 diseases and 6 drugs required	&	&	&	&
4 diseases and 9 drugs required	&	&	&	&

Note: & indicates willingness to pay not calculated due to irrational order.

## CHAPTER 5. DISCUSSION

This study sought to evaluate the preferences for Shelby County seniors in regards to Medicare Part D drug plans using the guidance of a conceptual framework developed from previous research regarding beneficiaries selection of health plans and prescription drug plans. The research indicated that several factors influence senior's choice of prescription drug plans including drug benefit plan characteristics and delivery system characteristics. The most important factors for the aggregate sample in selecting drug plans in decreasing order were premiums, formulary coverage, deductible amount, and pharmacy access.

In terms of drug benefit plan characteristics, greater amounts of control mechanisms, higher premiums, and greater copayments were associated with lower utilities in a PDP, and hence a lower probability of a plan being selected. These findings are not surprising as previous research has demonstrated this relationship.<sup>43-45,49,51,53</sup> In addition as expected, higher deductibles were found to be associated with lower utility. In general, doughnut hole coverage appeared to have a positive association with the probability of a plan being selected, but this was only true where plans had coverage for at least some generics within the doughnut hole.

This study also indicated that access to the pharmacy is an important component in the selection of prescription drug plans. While previous research on medication insurance had explored this issue,<sup>43,44</sup> it had not been investigated within the context of Medicare Part D plans. In most cases, there was not an appreciable difference between the part worth values for seniors being able to use all pharmacies with their prescription insurance or being able to use only some pharmacies as long as their current pharmacy was included in the insurance plan. However, the part worth values were much lower when seniors were presented with plans which did not allow them to use their insurance within their current pharmacy. Seniors also indicated that they preferred not to have to use mail order to get the best benefits from their prescription drug plan. The results gathered from this study indicated that the eligibility requirements for MTM services are not an important component in seniors selection of prescription drug plans. This may indicate that many of these seniors are not aware of these services, and that greater efforts must be put in place in order to ensure that seniors are aware of these benefits.

This study also sought to analyze the impact of secondary factors, that is factors which are not characteristics of the drug plans themselves, on the choice of prescription drug plans.<sup>18</sup> Exploring the impact of economic characteristics in senior's choice of prescription drug plans demonstrated the role that income plays when they decide on a plan. Out of all the sub groups analyzed within this study, seniors with high incomes demonstrated the smallest sensitivity to increases in premiums. The importance score for premiums for this group was nearly 30% lower than that seen in low income seniors. These results suggest that although, the seniors with higher incomes are sensitive to changes in premiums, they probably would be willing to pay higher prices for prescription insurance as will be the case in the Affordable Care Act.<sup>60</sup> The results

indicate that doughnut hole coverage is more important to seniors with higher incomes than lower income groups. While lower income seniors did not indicate that they would be willing to pay any additional money for doughnut hole coverage, and middle income seniors indicated that they would be willing to pay \$5 more for full generic coverage in the doughnut hole, higher income seniors indicated that they would pay \$12 for doughnut hole coverage. These findings help to explain some of the general ambiguity concerning the doughnut hole in this study, as it may only be important to certain groups such as high income seniors. Seniors with high incomes also indicated that formulary coverage was an important factor to them, and they would be willing to pay generous premiums in order to ensure that all of their medications were covered. Another finding of note is the particular affinity that low income seniors have for choosing plans which allow them to use their current pharmacy. This may be due to many reasons, but it is possible that these seniors choose a pharmacy which is within close proximity to them so that they may access it even without some type of motor transportation. Alternatively, the pharmacy may offer some type of delivery service that the senior citizen may value, but this is an area in which more research may prove helpful.

Within the risk factors, the number of chronic conditions and the current use of prescription medications were found to affect the choice of plan most. Specifically, seniors taking more than 7 medications had a part worth for premium that was of significantly lower magnitude than seniors taking no medications. These results suggest that these seniors may be willing to pay higher premiums for plans which offer more generous coverage, a premise that is supported by their significantly higher part worths for plans offering full doughnut hole coverage and the greater importance they place on formulary coverage. However, these seniors probably have high medical expenses, so it is important to ensure that their costs as relates to medication experience do not become overwhelming. The number of current medications also had a significant effect on the amount of doughnut hole coverage seniors are willing to accept.

The senior citizens beliefs of medical care preferences, not their relationship with their pharmacist seemed to be significant factors for their selection of a prescription drug plan in this study. This may be due to the fact that the medial care preferences scale is mostly concerned with an individual's perception of their relationship with their physician, and their preferences for receiving general health care as opposed to their relationship with their pharmacy and pharmacologic therapy.<sup>97</sup> This study also did not find that the strength of the relationship between patients with their pharmacy or pharmacist had an impact on their selection of a prescription drug plan. This may be due to the fact that some seniors choose their pharmacy for reasons other than the pharmacist who works there. Alternatively, it may be the case that in general, the senior population surveyed displayed strong preferences for retaining their current pharmacy, so that a significantly greater preference than this may be hard to obtain. Finally, the cost of seniors out of pocket cost had a significant impact on how they go about choosing prescription drug plans. Seniors with medication costs of at least \$41 monthly had lower premium sensitivity when compared to seniors who spent \$10 or less per month on their medications. These groups also were relatively less sensitive to increases in the deductible amount when compared to seniors who spent \$10 or less per month out of

pocket on their medicines. Furthermore, the group which spent at least \$80 per month on their medications was the only group which exhibited a rational preference order for the doughnut hole coverage attribute where the lowest part worth value was when no generic medications were covered. This is fortunate for these senior citizens, as their medication costs place them in imminent danger of reaching the doughnut hole, and they are the ones who need this coverage the most.<sup>12</sup> It is possible however, that seniors may initially have low medication related expenses at the time they choose to enroll in a plan and end up with some type of condition which subjects them to high medication costs. Therefore, it would be ideal if all seniors demonstrated this rational order in dealing with doughnut hole coverage as these part worths are independent of higher premiums. However, this does point to the need for the doughnut hole to be subsidized as promulgated in the affordable care act as many seniors do not seem to be able to comprehend the need for doughnut hole coverage.<sup>12</sup> And once again, the seniors with high medication costs are already under increased pressure due to their high medication expenses, so having to purchase insurance plans with higher premiums due to doughnut hole coverage only exacerbates their situation.

Abaluck and Gruber indicated that seniors over value premiums in relation to other determinates of out of pocket costs, and in their statistical models, the coefficient on premiums was five times larger than that found on out of pocket costs.<sup>53</sup> In this study, the importance of the premium was five times larger than the combined importance scores of the copayments for generic and brand medications. They also indicated that seniors would have to be paid approximately \$80 in order to go to plans with the lowest cost sharing in their study (25%) to plans with the highest cost sharing.<sup>53</sup> In this study seniors would have to be paid \$84 annually to go from a plan with 25% brand cost sharing to the attribute level with the highest level of cost sharing. However, this study shows how these figures may be slightly different depending on the group which is being studied. For example, for seniors with medications expenses over \$80 monthly they would have to be paid \$108, but seniors with high incomes would have to be paid as little as \$36. Abaluck and Gruber also indicated that seniors would be willing to pay \$50 for generic doughnut hole coverage<sup>53</sup> while Heiss and colleagues found a value of \$33,<sup>51</sup> similar to the value of \$36 found in this study for full doughnut hole coverage. However, the Heiss study alluded to the fact that this amount would be different between seniors with high and low costs as this study did.<sup>51</sup> In addition, Heiss and associates found that beneficiaries would be willing to pay \$14 monthly for no deductible plans during 2006-2007.<sup>51</sup> This is smaller than the \$18 amount in this study to go from full deductibles to no deductibles, yet the deductible amounts were smaller. In 2006, the deductible was \$250.<sup>62</sup>

This study has several limitations. The internal validity of this sample is limited because it is not a random sample, it is possible that there may be unobserved factors which may introduce systematic bias. Furthermore, the respondents are depended upon to provide answers to questions about their past or current situation which has the possibility of bringing in recall bias. Also this study is limited in the external validity because the results will only be able to be extrapolated to the Shelby County Medicare population as this population is distinct in nature from even other areas of Tennessee. In addition, all of

the information is derived from senior citizens who have attend seniors centers, who may have differential preferences in comparison to the senior population at large. The population who attends seniors centers is ambulatory which may make them different from other types of senior populations such as those found in a nursing home.

There are several recommendations for research that come as a result of conducting this study. One suggestion is to use the results and part worths in order to determine if they are able to assist in developing models which may predict changes in market share as a result of changes made to the plan. Two factors which may be important in choice of PDPs which were not studied in this research are the plan's quality ratings and the concept of "brand loyalty": that is whether seniors forgo the time and effort needed on an annual basis to evaluate their enrollment decision and just decide to remain with their current plan without exploring other options. These were not included due to the possibility of presenting the seniors with too much information at one time. This would contribute to imperfect market conditions and diminish the efforts of competing plans to enhance their products by finding ways to offer lower cost and greater coverage. In addition, although this study explored many secondary characteristics, it did not study them all in a simultaneous manner. It would be prudent to utilize multivariate techniques which allow one to study the most important characteristics and evaluate whether their effects are independent of others.

## LIST OF REFERENCES

- (1) Medicare: A Primer. Kaiser Family Foundation 2010. Available at: <http://www.kff.org/medicare/upload/7615-03.pdf>. Accessed January 08, 2011.
- (2) Medicare's New Adventure: The Part D Drug Benefit. The Commonwealth Fund 2006. Available at: <http://www.commonwealthfund.org>. Accessed April 18, 2011.
- (3) Adamcik BM. The consumers of health care. In: Fincham JE, Wertheimer AI, eds. Pharmacy and the US health care system, 2<sup>nd</sup> ed. Binghamton, NY: Pharmaceutical Products Press, 1998:337-94.
- (4) Cost Overdose: Growth in Drug Spending for the Elderly 1992 - 2010. Families USA 2000. Available at: <http://familiesusa2.org/assets/pdfs/drugod852b.pdf>. Accessed January 08, 2011.
- (5) Schommer JC, Mott DA, Hansen RA, Cline RR. Selected characteristics of senior citizens prescription drug payment and procurement in 1998 and 2001. *Journal of Managed Care Pharmacy* 2003;9(5):408-15.
- (6) Poisal JA, Chulis GS. Medicare beneficiaries and drug coverage. *Health Affairs* 2000;19(2):248-56.
- (7) Davis M, Poisal J, Chullis G, Zarabozo C, Cooper B. Prescription drug coverage, utilization, and spending among Medicare beneficiaries. *Health Affairs* 1999;18(1):231-43.
- (8) Safran DG, Neuman P, Schoen C, Kitchman MS, Wilson IB, Cooper B, Li A, Chang H, Rogers WH. Prescription drug coverage and seniors: findings from a 2003 national survey. *Health Affairs* 2005;W5:152-6.
- (9) Safran DG, Stollo MK, Guterman S, Li A, Rogers WH, Neuman P. Prescription coverage, use and spending before and after Part D implementation: a national longitudinal panel study. *Journal of General Internal Medicine* 2010;25(1):10-7.
- (10) The Medicare Prescription Drug Benefit Fact Sheet. Kaiser Family Foundation 2010. Available at: <http://www.kff.org/medicare/upload/7044-11.pdf>. Accessed November 11, 2010.
- (11) Medicare Part D 2010 Data Spotlight Benefit Design and Cost Sharing. Kaiser Family Foundation 2009. Available at: <http://www.kff.org/medicare/upload/8033.pdf>. Accessed January 08, 2011.

- (12) Medicare Part D 2010 Data Spotlight the Coverage Gap. Kaiser Family Foundation 2009. Available at <http://www.kff.org/medicare/upload/8008.pdf>. Accessed January 09, 2011.
- (13) Medicare Part D 2010 Data Spotlight a Comparison of PDPs Offering Basic and Enhanced Benefits. Kaiser Family Foundation 2009. Available at: <http://www.kff.org/medicare/upload/8034.pdf>. Accessed January 09, 2011.
- (14) Morrisey MA. Competition in hospital and health insurance markets: a review and research agenda. *Health Services Research* 2001;36:191-221.
- (15) Medicare Advantage Fact Sheet. Kaiser Family Foundation 2009. Available at: <http://www.kff.org/medicare/upload/2052-14.pdf>. Accessed January 09, 2011.
- (16) Berki SE, Ashcraft ML. HMO enrollment: who joins what and why: a review of the literature. *The Milbank Memorial Fund Quarterly. Health and Society* 1980;58(4):588-632.
- (17) Buchmueller TC. Consumer-oriented health care reform strategies: a review of the evidence on managed competition and consumer-directed health insurance. *Milbank Quarterly* 2009;87(4):820-41.
- (18) Scanlon DP, Chernew M, Lave JR. Consumer health plan choice: current knowledge and future directions. *Annual Review of Public Health* 1997;18:507-28.
- (19) LaTour SA, Friedman B, Hughes EF. Medicare beneficiary decision making about health insurance. Implications for a voucher system. *Medical Care* 1986;24(7):601-14.
- (20) Buchmueller TC. The health plan choices of retirees under managed competition. *Health Services Research* 2000;35(5 Pt 1):949-76.
- (21) Feldman R, Wisner CL, Dowd B, Christianson J. An empirical test of competition in the Medicare HMO market. In: Arnould RJ, Rich RF, White WD, eds. *Competitive approaches to health care reform*. Washington, DC: Urban Institute Press, 1993:179-203.
- (22) Dowd BE, Feldman R, Coulam R. The effect of health plan characteristics on Medicare + Choice enrollment. *Health Services Research* 2003;38(1 Pt 1):113-35.
- (23) Atherly A, Dowd BE, Feldman R. The effect of benefits, premiums, and health risk on health plan choice in the Medicare program. *Health Services Research* 2004;39(4 Pt 1):847-64.

- (24) Ellsbury KE, Montano DE. Attitudes of Washington State primary care physicians toward capitation based insurance plans. *The Journal of Family Practice* 1990;30(1):89-94.
- (25) Forgionne G. Effectively marketing prepaid medical care with decision support systems. *Health Marketing Quarterly* 1991;8(3-4):107-18.
- (26) Kolstad JT, Chernew ME. Quality and consumer decision making in the market for health insurance and health care services. *Medical Care Research and Review: MCRR* 2009;66(Suppl 1):28S-52S.
- (27) Bernstein AB, Gauthier AK. Choices in health care: what are they and what are they worth? *Medical Care Research and Review: MCRR* 1999;56(Suppl 1):5-23.
- (28) Moustafa AT, Hopkins CE, Klein B. Determinants of choice and change of health insurance plan. *Medical Care* 1971;9(1):32-41.
- (29) Woodside AG, Nielsen RL, Walters F, Muller GD. Preference segmentation of health care services: the old-fashioned, value conscious, affluents and professional want-italls. *Journal of Health Care Marketing* 1988;8(2):14-24.
- (30) Allen HM Jr, Darling H, McNeil DN, Bastien F. The Employee Health Care Value Survey: round one. *Health Affairs* 1994;13(4):25-41.
- (31) Davis K, Collins KS, Schoen C, Morris C. Choice matters: enrollees' views of their health plans. *Health Affairs* 1995;14(2):99-112.
- (32) France KR, Grover R. What is the health care product? *Journal of Health Care Marketing* 1992;12(2):31-8.
- (33) Fishbein M, Ajzen I. *Belief, attitude, intention, and behavior: an introduction to theory and research*. Reading, MA: Addison-Wesley, 1975.
- (34) Louviere JL. *Analyzing decision making metric conjoint analysis*. Newbury Park, CA: Sage Publications, 1988.
- (35) Orme BK. *Getting started with conjoint analysis*. Madison, WI: Research Publishers LLC, 2010.
- (36) Gates R, McDaniel C, Braunsberger K. Modeling consumer health plan choice behavior to improve customer value and health plan market share. *Journal of Business Research* 2000;48(3):247-57.
- (37) Chakraborty G, Ettenson R, Gaeth G. How consumers choose health insurance. *Journal of Health Care Marketing* 1994;14(1):21-33.

- (38) Akaah IP, Becherer RC. Integrating a consumer orientation into the planning of HMO programs: an application of conjoint segmentation. *Journal of Health Care Marketing* 1983;3(2):9-18.
- (39) Hershey JC, Kunreuther H, Schwartz JS, Williams SV. Health insurance under competition: would people choose what is expected? *Inquiry* 1984;21(4):349-60.
- (40) Rosko MD, DeVita M, McKenna WF, Walker LR. Strategic marketing applications of conjoint analysis: an HMO perspective. *Journal of Health Care Marketing* 1985;5(4):27-38.
- (41) Noordewier TG, Rogers D, Balakrishnan PV. Evaluating consumer preference for private long-term care insurance. *Journal of Health Care Marketing* 1989;9(4):34-40.
- (42) Cunningham MA, Gaeth GJ, Juang C, Chakraborty G. Using choice-based conjoint to determine the relative importance of dental benefit plan attributes. *Journal of Dental Education* 1999;63(5):391-9.
- (43) Holdford D, Carroll NV. Consumer preferences for types of cost containment in prescription drug programs. *Journal of Managed Care Pharmacy* 2002;8(3):192-8.
- (44) Wellman GS, Vidican C. Pilot study of a hierarchical Bayes method for utility estimation in a choice-based conjoint analysis of prescription benefit plans including medication therapy management services. *Research in Social and Administrative Pharmacy: RSAP* 2008;4(3):218-30.
- (45) Frakt AB, Pizer SD. Beneficiary price sensitivity in the Medicare prescription drug plan market. *Health Economics* 2010;19(1):88-100.
- (46) Levy H, Weir DR. Take-up of Medicare Part D: results from the Health and Retirement Study. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences* 2010;65(4):492-501.
- (47) Heiss F, McFadden D, Winter J. Who failed to enroll in Medicare Part D, and why? Early results. *Health Affairs* 2006;25(5):W334-54.
- (48) Neuman P, Stollo MK, Guterman S, Rogers WH, Li A, Rodday AM, Safran DG. Medicare prescription drug benefit progress report: findings from a 2006 national survey of seniors. *Health Affairs* 2007;26(5):W630-43.
- (49) Cline RR, Mott DA. Demand for a Medicare prescription drug benefit: exploring consumer preferences under a managed competition framework. *Inquiry* 2003;40(2):169-83.

- (50) Winter J, Balza R, Caro F, Heiss F, Jun BH, Matzkin R, McFadden D. Medicare prescription drug coverage: consumer information and preferences. *Proceedings of the National Academy of Sciences of the United States of America* 2006;103(20):7929-34.
- (51) Heiss F, McFadden DL, Winter JK. Mind the Gap! Consumer Perceptions and Choices of Medicare Part D Prescription Drug Plans. NBER Working Paper Series, Volume W13627, 2007. Available at SSRN: <http://ssrn.com/abstract=1033753>. Accessed January 13, 2011.
- (52) Walberg MP, Patel RA. Potential opportunity cost of neglecting to annually reassess Medicare Part D stand alone prescription drug plan offerings: the price of contentment? *Journal of the American Pharmacists Association* 2009;49(6):777-82.
- (53) Abaluck JT, Gruber J. Choice Inconsistencies among the Elderly: Evidence from Plan Choice in the Medicare Part D Program? NBER Working Paper No 14759, 2009. Available at: <http://www.nber.org/papers/w14759>. Accessed January 13, 2011.
- (54) Cline RR, Gupta K. Drug benefit decisions among older adults: a policy capturing analysis. *Medical Decision Making* 2006;26(3):273-81.
- (55) Hoadley J, Summer L, Hargrave E, Cubanski J, Neuman T. Medicare Prescription Drug Plans in 2010 and Key Changes over Five Years: Summary of Findings. Kaiser Family Foundation 2010. Available at: <http://www.kff.org/medicare/upload/8096.pdf>. Accessed January 08, 2011.
- (56) Medication Therapy Management (MTM) Programs 2008 Fact Sheet. Centers for Medicare and Medicaid Services 2009. Available at: [http://www.cms.hhs.gov/prescriptiondrugcovcontra/082\\_mtm.asp](http://www.cms.hhs.gov/prescriptiondrugcovcontra/082_mtm.asp). Accessed October 04, 2009.
- (57) Berger ML, Bingefors K, Hedblom EC, Pashos CL, Torrance GW. Health care cost, quality, and outcomes: ISPOR book of terms. Lawrenceville, NJ: International Society for Pharmacoeconomics and Outcomes Research, 2003.
- (58) Medicare and You 2010. Centers for Medicare and Medicaid Services. Baltimore, MD: 2009.
- (59) Gold M, Jacobson G, Damico A, Neuman T. Plan Availability and Premiums. Kaiser Family Foundation 2010. Available at: <http://www.kff.org/medicare/upload/8117.pdf>. Accessed January 08, 2011.

- (60) Income-Relating Medicare Part B and Part D Premiums: How Many Medicare Beneficiaries Will Be Affected? Kaiser Family Foundation 2010. Available at: <http://www.kff.org/medicare/upload/8126.pdf>. Accessed January 08, 2011.
- (61) Hoadley J, Cubanski J, Hargrave E, Summer L, Neuman T. Part D Plan Availability in 2010 and Key Changes Since 2006. Kaiser Family Foundation 2010. Available at: <http://www.kff.org/medicare/upload/7986.pdf>. Accessed January 09, 2011.
- (62) Polinski JM, Kilabuk E, Schneeweiss S, Brennan T, Shrank WH. Changes in drug use and out-of-pocket costs associated with Medicare Part D implementation: a systematic review. *Journal of the American Geriatrics Society* 2010;58(9):1764-79.
- (63) Hales JW, George S. How the doughnut hole affects prescription fulfillment decisions involving cardiovascular medications for Medicare Part D enrollees. *Managed Care* 2010;19(12):36-44.
- (64) Sun SX, Lee KY. The Medicare Part D doughnut hole: effect on pharmacy utilization. *Managed Care Interface* 2007;20(9):51-5,59.
- (65) Zhang Y, Donohue JM, Newhouse JP, Lave JR. The effects of the coverage gap on drug spending: a closer look at Medicare Part D. *Health Affairs* 2009;28(2):W317-25.
- (66) Gu Q, Zeng F, Patel BV, Tripoli LC. Part D coverage gap and adherence to diabetes medications. *The American Journal of Managed Care* 2010;16(12):911-8.
- (67) Duru OK, Mangione CM, Hsu J, Steers WN, Quiter E, Turk N, Ettner SL, Schmittdiel JA, Tseng CW. Generic-only drug coverage in the Medicare Part D gap and effect on medication cost-cutting behaviors for patients with diabetes mellitus: the translating research into action for diabetes study. *Journal of the American Geriatrics Society* 2010;58(5):822-8.
- (68) Ettner SL, Steers N, Duru OK, Turk N, Quiter E, Schmittdiel J, Mangione CM. Entering and exiting the Medicare part D coverage gap role of comorbidities and demographics. *Journal of General Internal Medicine* 2010;25(6):568-74.
- (69) Fung V, Mangione CM, Huang J, Turk N, Quiter ES, Schmittdiel JA, Hsu J. Falling into the coverage gap: Part D drug costs and adherence for Medicare Advantage prescription drug plan beneficiaries with diabetes. *Health Services Research* 2010;45(2):355-75.

- (70) Schmittziel JA, Ettner SL, Fung V, Huang J, Turk N, Quiter ES, Swain BE, Hsu JT, Mangione CM. Medicare Part D coverage gap and diabetes beneficiaries. *American Journal of Managed Care* 2009;15(3):189-93.
- (71) Schneeweiss S, Patrick AR, Pedan A, Varasteh L, Levin R, Liu N, Shrank WH. The effect of Medicare Part D coverage on drug use and cost sharing among seniors without prior drug benefits. *Health Affairs* 2009;28(2):W305-16.
- (72) Hsu J, Fung V, Price M, Huang J, Brand R, Hui R, Fireman B, Newhouse JP. Medicare beneficiaries' knowledge of Part D prescription drug program benefits and responses to drug costs. *Journal of the American Medical Association* 2008;299(16):1929-36.
- (73) Raebel MA, Delate T, Ellis JL, Bayliss EA. Effects of reaching the drug benefit threshold on Medicare members' healthcare utilization during the first year of Medicare Part D. *Medical Care* 2008;46(10):1116-22.
- (74) Explaining Health Care Reform: Key Changes to the Medicare Part D Drug Benefit Coverage Gap. Kaiser Family Foundation 2010. Available at: <http://www.kff.org/healthreform/upload/8059.pdf>. Accessed January 09, 2011.
- (75) Traynor K. Health reform law offers relief in Medicare Part D coverage gap. *American Journal of Health System Pharmacy* 2010;67(13):1049.
- (76) Goedken AM, Urmie JM, Farris KB, Doucette WR. Impact of cost sharing on prescription drugs used by Medicare beneficiaries. *Research in Social and Administrative Pharmacy* 2010;6(2):100-9.
- (77) Retail Pharmacy Participation in Medicare Part D Prescription Drug Plans in 2006. Department of Health and Human Services 2007. Available at: <http://oig.hhs.gov/oei/reports/oei-05-06-00320.pdf>. Accessed January 10, 2011.
- (78) O'Sullivan J. Medicare Part D Prescription Drug Benefit: A Primer. Congressional Research Service 2008. Available at: <http://aging.senate.gov/crs/medicare12.pdf>. Accessed January 10, 2011.
- (79) Planas LG, Crosby KM, Mitchell KD, Farmer KC. Evaluation of a hypertension medication therapy management program in patients with diabetes. *Journal of the American Pharmacists Association* 2009;49(2):164-70.
- (80) Pindolia VK, Stebelsky L, Romain TM, Luoma L, Nowak SN, Gillanders F. Mitigation of medication mishaps via medication therapy management. *The Annals of Pharmacotherapy* 2009;43(4):611-20.

- (81) Winston S, Lin YS. Impact on drug cost and use of Medicare Part D of medication therapy management services delivered in 2007. *Journal of the American Pharmacists Association* 2009;49(6):813-20.
- (82) Fox D, Ried LD, Klein GE, Myers W, Foli K. A medication therapy management program's impact on low-density lipoprotein cholesterol goal attainment in Medicare Part D patients with diabetes. *Journal of the American Pharmacists Association* 2009;49(2):192-9.
- (83) Yin W, Basu A, Zhang JX, Rabbani A, Meltzer DO, Alexander GC. The effect of the Medicare Part D prescription benefit on drug utilization and expenditures. *The Annals of Internal Medicine* 2008;148:169-77.
- (84) Safran DG, Strollo MK, Guterman S, Li A, Rogers WH, Neuman P. Prescription coverage, use and spending before and after Part D implementation: a national longitudinal panel study. *Journal of General Internal Medicine* 2010;25(1):10-7.
- (85) Millet C, Everett CJ, Matheson EM, Bindman AB, Mainous AG. Impact of Medicare Part D on seniors' out-of-pocket expenditures on medications. *Archives of Internal Medicine* 2010;170(15):1325-30.
- (86) Green PE, Srinivasan V. Conjoint analysis in consumer research: issues and outlook. *The Journal of Consumer Research* 1978;5:103-23.
- (87) Carrol JD, Green PE. Psychometric methods in marketing research: part 1, conjoint analysis. *Journal of Marketing Research* 1995;4:385-91.
- (88) Orme BK. Which Conjoint Method Should I Use? Sawtooth Software 2009. Available at: <http://www.sawtoothsoftware.com/education/techpap.shtml>. Accessed December 02, 2009.
- (89) Conjoint Value Analysis. Sawtooth Software 2002. Available at: <http://www.sawtoothsoftware.com/download/techpap/cva3tech.pdf>. Accessed December 02, 2009.
- (90) Green PE, Srinivasan V. Conjoint analysis in marketing: new developments with implications for research and practice. *The Journal of Marketing* 1990;54:3-19.
- (91) ACA/Web v6.0 Technical Paper. Sawtooth Software 2007. Available at: <http://www.sawtoothsoftware.com/download/techpap/acatech.pdf>. Accessed December 02, 2009.
- (92) CBC/Web v6.0 Technical Paper. Sawtooth Software 2008. Available at: <http://www.sawtoothsoftware.com/download/techpap/cbctech.pdf>. Accessed December 02, 2009.

- (93) ACBC Technical Paper. Sawtooth Software 2009. Available at: <http://www.sawtoothsoftware.com/download/techpap/acbctech.pdf>. Accessed December 02, 2009.
- (94) Bridges JF, Hauber AB, Marshall D, Lloyd A, Prosser LA, Regier DA, Johnson FR, Mauskopf J. Conjoint analysis applications in health-a checklist: a report of the ISPOR good research practices for conjoint analysis task force. *Value Health* 2011;14(4):403-13.
- (95) National Survey of Pharmacists and National Survey of Physicians. Kaiser Family Foundation 2006. Available at: <http://www.kff.org/kaiserpolls/upload/7556.pdf>. Accessed December 02, 2009.
- (96) Medicare Current Beneficiary Survey 2005 Health Status and Functioning Survey. Centers for Medicare and Medicaid Services 2009. Available at: [http://www.cms.hhs.gov/MCBS/Downloads/2005\\_CBQ\\_hs.pdf](http://www.cms.hhs.gov/MCBS/Downloads/2005_CBQ_hs.pdf). Accessed August 27, 2009.
- (97) Ganther JM, Wiederholt JB, Kreling DH. Measuring patients' medical care preferences: care seeking versus self-treating. *Medical Decision Making* 2001;21(2):133-40.
- (98) Worley MM, Schommer JC. Pharmacist-patient relationships: factors influencing quality and commitment. *Journal of Social and Administrative Pharmacy* 1999;16(3/4):157-73.
- (99) Orme B, King C, Hill A, eds. Proceedings of the summer 2010 Choice-based conjoint modeling workshop; 2010 July 21-23; Seattle, WA.
- (100) The 2010 PDP-Finder Medicare Part D Prescription Drug Plan Search. Q1Group LLC. Available at: <http://www.q1medicare.com/PartD-SearchPDPMedicare-2010PlanFinder.php?state=TN>. Accessed January 11, 2011.
- (101) 2010 Tennessee Medicare Part D Plans. Q1Group LLC. Available at: <http://www.q1medicare.com/2010/2010D-Medicare-PartD-PDP-for-Tennessee.php>. Accessed January 11, 2011.
- (102) Medicare Prescription Drug Plan Finder: Plans in Area. Centers for Medicare and Medicaid. Available at: <https://www.medicare.gov/find-a-plan/questions/home.aspx>. Accessed September 29, 2010.
- (103) Version ACBC/Web Version 2010. Sawtooth Software [computer program]. Available at: [www.sawtoothsoftware.com](http://www.sawtoothsoftware.com). Accessed March 10, 2010.

- (104) Medicare County Enrollment as of: July 01, 2007. Centers for Medicare and Medicaid 2007. Available at: <http://www.cms.hhs.gov/MedicareEnrpts/>. Accessed August 31, 2009.
- (105) Medicare's Role for Women. Kaiser Family Foundation 2009. Available at: <http://www.kff.org/womenshealth/upload/7913.pdf>. Accessed August 31, 2009.
- (106) Shelby County MapStats from FedStats. Kaiser Family Foundation 2009. Available at: <http://www.kff.org/womenshealth/upload/7913.pdf>. Accessed August 31, 2009.
- (107) Senior Centers. City of Memphis 2009. Available at: <http://www.cityofmemphis.org/framework.aspx?page=7>. Accessed October 14, 2009.
- (108) Annual Retirement Housing Guide. The Best Times 2009. Available at: <http://www.thebesttimes.com/PDF/HG2.pdf>. Accessed November 3, 2010.
- (109) Version CBC/HB Web Version 2011. Sawtooth Software [computer program]. Available at: [www.sawtoothsoftware.com](http://www.sawtoothsoftware.com). Accessed March 15, 2011.
- (110) The CBC/HB System for Hierarchical Bayes Estimation Version 5.0 Technical Paper. Sawtooth Software 2009. Available at: <http://www.sawtoothsoftware.com/download/techpap/hbtech.pdf>. Accessed February 14, 2011.
- (111) Howell J, Orme B. Application of Covariates within Sawtooth Software's CBC/HB Program: Theory and Practical Example. Available at: <http://www.sawtoothsoftware.com/download/techpap/HBCovariates.pdf>. Accessed February 19, 2011.
- (112) SMRT Web Version 2010. Sawtooth Software [computer program]. Available at: [www.sawtoothsoftware.com](http://www.sawtoothsoftware.com). Accessed March 15, 2010.
- (113) Phillips KA, Maddala T, Johnson FR. Measuring preferences for health care interventions using conjoint analysis: an application to HIV testing. *Health Services Research* 2002;37(6):1681-705.
- (114) Ratcliffe J. The use of conjoint analysis to elicit willingness-to-pay values. *International Journal of Technology Assessment in Health Care* 2000;16(1):270-90.

## APPENDIX A. MEDICAL CARE PREFERENCE SCALE

### Part D: Medical Care Preferences

Now we want to know some of your feelings about doctors and medications. When answering the questions, try to think about your general preferences and not a specific situation.

Please circle your level of agreement with each statement, using the scale provided.

	Strongly Disagree SD	Disagree D	Neutral N	Agree A	Strongly Agree SA
1. For most health problems, I would rather treat myself than go to the doctor.					
2. For most health problems, I prefer to avoid taking prescription drugs.	SD	D	N	A	SA
3. I usually like to talk to a doctor when I have a health problem.	SD	D	N	A	SA
4. For most health problems, I wait and see if I get better on my own before going to see a doctor.	SD	D	N	A	SA
5. For most health problems, I wait to see if I get better on my own before taking a prescription drug.	SD	D	N	A	SA
6. When I have a health problem, I often prefer to use home remedies instead of prescription drugs.	SD	D	N	A	SA
7. When I have a health problem, I usually contact a doctor right away.	SD	D	N	A	SA
8. When I have a health problem, it is sometimes hard to convince me to see a doctor.	SD	D	N	A	SA
9. For most health problems, I would rather take a prescription drug than a non-prescription drug.	SD	D	N	A	SA

(Ganther, Personal Communication, 04-26-2011)

## APPENDIX B. CONJOINT ANALYSIS SURVEY

Please select the plan you'd be most likely to purchase. For each feature, select your preferred level.

Feature	Select Feature	Cost for Feature
doughnut hole coverage	<input type="radio"/> No generics covered in doughnut hole <input type="radio"/> Few generics covered in doughnut hole (+ \$10) <input type="radio"/> Some generics covered in doughnut hole (+ \$15) <input type="radio"/> All generics covered in doughnut hole (+ \$20)	\$
deductible	<input type="radio"/> \$0 deductible (+ \$16) <input type="radio"/> \$150 deductible (+ \$8) <input type="radio"/> \$310 deductible	\$
<b>Total</b>		\$



Here are a few plans you might like. For each one, indicate whether it is a possibility or not.

(1 of 8)

premium	\$48	\$53	\$38	\$44
brand copay	\$45 or \$95 for brands	\$25 or \$40 for brands	\$35 or \$60 for brands	25% for brands
generic copay	\$0 for generics	\$7 for generics	25% for generics	\$7 or 50% for generics
doughnut hole coverage	Few generics covered in doughnut hole	Some generics covered in doughnut hole	No generics covered in doughnut hole	All generics covered in doughnut hole
formulary	some drugs are covered and there are some restrictions on covered drugs	some drugs are covered but there are no restrictions on covered drugs	all drugs covered and no restrictions on covered drugs	all drugs covered but some restrictions on covered drugs
pharmacy access	you can use some pharmacies including your current one	you can use some pharmacies but not including your current one	you can use all pharmacies	you must use mail order for full benefits
deductible	\$310 deductible	\$0 deductible	\$150 deductible	\$150 deductible
mtm eligibility	2 diseases and 3 drugs required	4 diseases and 9 drugs required	3 diseases and 6 drugs required	2 diseases and 6 drugs required
	<input type="radio"/> A possibility <input type="radio"/> Won't work for me	<input type="radio"/> A possibility <input type="radio"/> Won't work for me	<input type="radio"/> A possibility <input type="radio"/> Won't work for me	<input type="radio"/> A possibility <input type="radio"/> Won't work for me

0%  100%

We don't want to jump to conclusions, but we've noticed that you've selected plans with certain characteristics shown below. If any of these is an **absolute requirement**, it would be helpful to know. If so, please check the **one most important** feature, so we can just focus on plans that meet your needs.



- generic copay - At most: 25% for generics
- formulary - At least: some drugs are covered but there are no restrictions on covered drugs
- pharmacy access - At least: you can use some pharmacies but not including your current one
- deductible - \$0 deductible
- mtn eligibility - At most: 3 diseases and 6 drugs required
- doughnut hole coverage - No generics covered in doughnut hole
- brand copay - At most: \$35 or \$60 for brands
  
- None of these is an absolute requirement.



Among these three, which is the best option? (I've grayed out any features that are the same, so you can just focus on the differences.)

(1 of 7)

premium	\$67	\$30	\$43
brand copay	\$45 or \$95 for brands	\$35 or \$60 for brands	\$25 or \$40 for brands
generic copay	\$7 for generics	\$0 for generics	\$7 or 50% for generics
doughnut hole coverage	Some generics covered in doughnut hole	Few generics covered in doughnut hole	All generics covered in doughnut hole
formulary	all drugs covered but some restrictions on covered drugs	some drugs are covered and there are some restrictions on covered drugs	all drugs covered and no restrictions on covered drugs
pharmacy access	you can use all pharmacies	you must use mail order for full benefits	you can use some pharmacies but not including your current one
deductible	\$0 deductible	\$310 deductible	\$310 deductible
mtrn eligibility	2 diseases and 3 drugs required	2 diseases and 6 drugs required	4 diseases and 9 drugs required

0%  100%

## APPENDIX C. CONSENT FORM

### Main Consent Form



### Examining Consumer Preferences for Medicare Part D Prescription Drug Plans with Conjoint Analysis

You are being given the opportunity to participate in this survey research study. The purpose of the study is to see which parts of the Medicare Part D Insurance Plan Shelby County seniors think are most important. This study is being conducted by La'Marcus Wingate, a graduate student in the Health Outcomes and Policy Research Program at the University of Tennessee Health Science Center.

The survey will take about 30 minutes, and you will be asked a series of questions concerning demographic information such as your age, education, race, and income, and another series of questions regarding your personal preferences for prescription drug insurance. You may feel that some of the questions are about private matters, and if this is so, you do not have to answer those questions. The information which is gathered from this study may be used to develop prescription drug insurance which takes seniors preferences into consideration.

Your participation in this study is totally voluntary, and there will be no negative consequences if you choose not to participate in this study. You can choose to stop answering questions at any time. All of the information gathered from this study will be kept confidential so that no one will be able to tell what your answers were to these questions. If you do complete the survey, you will be provided with a \$5 Wal-Mart gift card to compensate you for your time.

If you have any questions about the research you may contact La'Marcus Wingate at 901-494-4564. If you have any questions about your rights as a research subject or you have a concern about a research related injury, you may contact Dr. Terrence F. Ackerman at 901-448-4824.

March 23, 2010

 IRB NUMBER: 10-00778-XM  
IRB APPROVAL DATE: 4/9/2010

## VITA

La'Marcus Wingate, the only child of Mary and James Wingate, is a native of Cheraw, South Carolina where he was born in 1980. He graduated Magna Cum Laude from Clemson University in 2003 with a bachelor's degree in Microbiology. La'Marcus entered the Pharm.D./Ph.D. dual degree program at the University of Tennessee Health Science center in June of 2003. He graduated from the Pharm.D. program in 2007. He graduated from the Ph.D. program of the Health Outcomes and Policy Research division in May of 2011 with a major in Health Policy. La'Marcus was awarded a dissertation fellowship through the Boston College Center for Retirement Research for his dissertation focusing on the evaluation of consumer preferences in Medicare Part D. While at the University of Tennessee Health Science Center, La'Marcus has been involved in many leadership positions. He has served as social chair and chaplain for the Student National Pharmaceutical Association, pharmacy representative and vice president for the Black Student Association, chapter president and international treasurer for the International Society of Pharmacoeconomics and Outcomes Research, and treasurer for the Black Graduate Student Association. La'Marcus has also served in the United States Marine Corps Reserve where he received an honorable discharge in 2005. While in Memphis, La'Marcus has been a part of several community outreach groups including the Hickory Hill Community Redevelopment Corporation where he was voted volunteer of the year in 2010 as well as the Consortium for Health Education, Economic Empowerment, and Research.