

Controlling Indirect Selection under Healthcare Reform

BY

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THESIS

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“I want to become a thought leader for public and private healthcare finance systems, using my leadership to help build quality systems and to communicate reasonable expectations.”

Tia Goss Sawhney

March 2008, DrPH Application, Statement of Purpose, First Sentence

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LIST OF ABBREVIATIONS

AAA	American Academy of Actuaries
AHIP	America's Health Insurance Plans
AHRQ	U.S. Department of Health and Human Services' Agency for Healthcare Research and Quality
AMA	American Medical Association / American Marketing Association, distinguish contextually
AP	Associated Press
ASB	Actuarial Standards Board
CDC	Center for Disease Control and Prevention
CDPS	Chronic Illness and Disability Payment System
CHIP	Children's Health Insurance Program
CMS	Centers for Medicare and Medicaid Services
CO-OP	Consumer Operated and Oriented Plan
DHHS	U.S. Department of Health and Human Services
EASI	Easy Analytic Software, Inc.
EMTALA	Emergency Medical and Labor Act
ESRD	End Stage Renal Disease
FCRA	Fair Credit Reporting Act
FPL	Federal Poverty Level
HC	Healthcare
HCC-CMS	Hierarchical Condition Category - Centers for Medicare and Medicaid Services (a risk adjustment model)
HIPAA	Health Insurance Portability and Accountability Act
ICD9	International Classification of Disease, Version 9

MEPS	Medical Expenditure Panel Survey
P&C	Property and Casualty
PBM	Prescription Benefit Manager
PHI	Protected Health Information
PPACA	Patient Protection and Affordable Care Act
RA	Risk Adjustment
SES	Socioeconomic Status
SOA	Society of Actuaries
TANF	Temporary Aid to Needy Families
WHO	World Health Organization
WSJ	Wall Street Journal

SUMMARY

This paper is intended to help regulators understand and be better prepared to address indirect selection under healthcare reform. Specifically, the paper discusses the general concept of selection, describes the potential indirect selection techniques under healthcare reform, discusses the public policy implications of such selection, and suggests a range of potential regulatory interventions and monitoring. The paper relies upon original, conceptual diagrams to explain concepts without mathematical formulas. The paper is supported by “Health Insurance Risk Adjustment: The Income Effect” (Appendix), a stand-alone paper which examines risk adjustment from a conceptual and mathematical perspective.

I. INTRODUCTION

Consultants from the consulting firm of McKinsey & Company¹ gave a presentation on November 11 the America's Health Insurance Plans' (AHIP's) 2010 Health Exchange Conference in Chicago, Illinois. The consultants urged insurers to analyze potential post-healthcare reform business by market segment and then to use the data to build products targeting certain customer profiles, to create target marketing strategies, and to manage churn (lapsation) risk by customer profile, inside and outside of the health insurance exchanges.²

During the question and answer portion of the session an actuary and academic from the audience³ stood up. She pointed out that while medical underwriting, which will no longer be permitted under healthcare reform, is direct selection, that market segmentation, differential product design, target marketing, and churn management as described by McKinsey are indirect selection and that either form of selection results in some people being categorized as desirable risks and others being categorized as undesirable risks. She asked if McKinsey had considered the public policy implications of indirect selection.

The question appeared to touch a nerve. The consultants took a deep breath, thanked the audience member for the "excellent question", took another deep breath and then said that it was the job of the regulators, not consultants, to assess the public policy implications of indirect selection. The consultants went on to say that while indirect selection is imperfect and that some undesirable risks will always be covered, that insurers must, if permitted by regulation, actively indirectly select in order to avoid the negative financial impact of insuring a disproportionate share of undesirable risks. Finally, the

¹ Jenny Cordina, Principal and Alissa Meade, Consultant.

² As witnessed by Tia Goss Sawhney. Presentations were not distributed in advance. The McKinsey speakers were the only conference participants who declined to make their presentations available in the after-event packet.

³ Tia Goss Sawhney, the author of this paper.

consultants noted that insureds or potential insureds with high risk scores⁴ are not necessarily undesirable -- that McKinsey has identified “pockets of opportunity” among people with high risk scores.

The November presentation is not McKinsey’s only AHIP presentation advising insurers to adopt target marketing strategies. In June 2010 McKinsey gave a talk at AHIP’s massive annual conference which emphasized the need to build post-reform product and marketing strategies based on market segmentation (McKinsey & Company, 2010). McKinsey reached a broad audience of health insurers as AHIP bills itself as “the national association representing nearly 1,300 member companies providing health insurance coverage to more than 200 million Americans” (AHIP, 2011).

Indirect selection is a threat to the intentions of healthcare reform. If there is any insurer-to-insurer consistency in how insurers categorize desirable and undesirable risks and insurers have success in differentially attracting and retaining the desirable risks, undesirable risks will have less access to affordable, quality health insurance than other people – contrary to the intent of healthcare reform. At a minimum, regulators need to watchful of this possibility.

Yet the regulators at the conference had nothing to say about indirect selection.⁵ The most prominent regulator, the Director of the Office of Insurance Exchanges, U.S. Department of Health and Human Services,⁶ who spoke the day before the McKinsey consultant, presented slides that implied that selection will be eliminated under healthcare reform and that insurers will concentrate their efforts exclusively on quality, price, and efficiency. Selection issues were not raised by any of the other regulators⁷ speaking at the conference.

⁴ Presumably as defined by today’s commonly used risk adjustment methods, of which Medicare’s HCC method is one.

⁵ As witnessed by Tia Goss Sawhney, confirmed by presentations distributed post-conference.

⁶ Joel Ario, Director of Office of Insurance Exchanges, Department of Health and Human Services.

⁷ Kimberly Belshe, Secretary of the California Health and Human Services Agency; Sean Dilweg, Commissioner of Insurance for the State of Wisconsin; Bruce Goldberg, Director of the Oregon Department of Human Services; and Molly Voris, Program Director, Health Division, National Governors Association.

This paper is meant to be a primer for regulators. Much of the post reform health insurance regulatory burden falls upon the States. Overburdened and financially strained federal and state healthcare reform regulators, struggling with the massive logistical challenges of healthcare reform and with limited access to data sources and data analysis, are behind McKinsey⁸ and other consultants with respect to understanding the potential for indirect selection under healthcare reform. The regulators have not fully analyzed the public policy implications of indirect selection and are not yet prepared to design appropriate selection control regulations and monitoring.

This paper will help regulators understand and be better prepared to address indirect selection under healthcare reform. Specifically, the paper will discuss the general concept of selection, describe the potential indirect selection techniques under healthcare reform, discuss the public policy implications of such selection, and suggest a range of potential regulatory interventions and monitoring. The paper will rely upon original, conceptual diagrams to explain concepts without mathematical formulas.

The paper is supported by “Health Insurance Risk Adjustment: The Income Effect” (Appendix), a stand-alone paper which examines risk adjustment from a conceptual and mathematical perspective.

⁸ McKinsey has and plans to devote significant resources to finding ways for insurers to profit from risk selection. McKinsey has established a Center for US Health System Reform. Within the center they have multi-disciplinary professionals assigned to the Center’s Risk Attraction Knowledge Development Team. The Team “aims to develop an approach to designing health insurance products which attract and retain a differentiated risk profile” (McKinsey, 2010).

II. SELECTION – CONCEPTUAL MODELS

A. Selection and Adverse Selection

Individual health insurance in the US is a contract, consummated in the private market between a consumer and an insurer. Contracts require offer, acceptance, and consent (Lawyers.com, 2011).

Individual health insurance involves an insurer choosing to offer insurance and a consumer choosing to accept the offer. The consumer becomes an insured only if and when the contract is finalized. Both insurers and insureds therefore select. They presumably select, at least more often than not, out of their own self-interest.

When insurance companies discuss selection, they inevitably discuss “adverse selection”, also known as “anti-selection”. Adverse selection refers to the disproportionate tendency for high-risk consumers to seek and retain insurance and low-risk consumers to avoid or drop out of voluntary insurance pools. Adverse selection is a long accepted truth in insurance markets.⁹ The selection literature with respect to life insurance goes back to at least King (1876) and Lippincott (Lippincott, 1905).¹⁰ By 1957 (Angell) adverse selection was being discussed in the context of health insurance.¹¹ A portion of every insurance premium goes to insurer administrative expenses; the remainder is the risk premium. A health insurance consumer (insured) is high risk when his or her expected healthcare costs exceed his or her risk premium.¹²

A series of theoretical insurance papers in the 1970’s described the disproportionate tendency of high-risk purchaser to buy more comprehensive (“richer”) insurance benefits than lower-risk purchasers. These papers referred to “separating equilibrium” and “information asymmetries” (Akerlof,

⁹ And other markets, such as credit markets, which involve the pooling of risk.

¹⁰ As cited by Baker (2003).

¹¹ As cited by Akerlof (1970).

¹² This definition is commonly used in the health insurance literature. In statistics risk is defined in terms of variance, not expected values. But because health insurance claim cost variance is dominated by large “right tail” (highly skewed) claims, populations of people with high variance almost inevitably also have high expected costs.

1970; Rothschild & Stiglitz, 1976; Wilson, 1977; Miyazaki, 1977).¹³ In the 1990's health insurance benefit-level selection was substantiated empirically and incorporated under the general definition adverse selection (Brown, 1992; Browne & Doeringhaus, 1995; Browne & Doeringhaus, 1993; Cutler & Zeckhauser, 1997). Cutler and Zeckhauser (1997) explored not only the benefit level, but the fit between the specific benefits and the insured's personal health needs. Hence health insurance adverse selection relates to 1) the decision to purchase insurance and 2) the benefit levels and specific benefits associated with the purchase.¹⁴

At any insurance price, the people who buy and retain the insurance are disproportionately¹⁵ those who expect to benefit from the insurance -- those who expect to file claims in excess of their insurance premiums. In a voluntary market, people who feel that the insurance "is a bad deal" by virtue of expecting to file no or few claims relative to their premiums, disproportionately do not buy insurance or discontinue their insurance. Yet in order to just break even health insurers typically need a large number of people who will likely not benefit from the insurance in order to offset the few who will have substantial healthcare costs.

"Disproportionately" is a key word. Because insurance average costs are so heavily influenced by the minority of insureds with high costs, a modest shift in the proportions of low and high risk insureds can be financially devastating or rewarding.

An insurer who sets a fixed price (community rate¹⁶) for insurance and sells the insurance to anyone who chooses to buy (open enrollment) it is all but guaranteed losses due to consumer selection. Raising rates is not a solution and can, in fact, lead to higher losses as more of the relatively low risk

¹³ As cited by Browne and Doeringhaus (1993)

¹⁴ The expanded definition of adverse selection will be particularly relevant under healthcare reform where everyone (theoretically) is mandated to have insurance, but can select from among an array of benefit levels and designs.

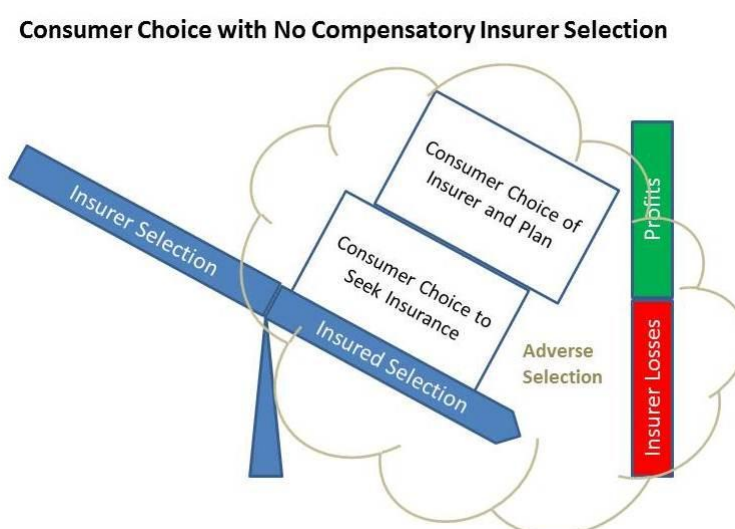
¹⁵ Disproportionately is the key word. As will be demonstrated later in this paper a small change in the risk distribution can be very destabilizing to the system.

¹⁶ Because rates are allowed to vary by age and smoking status PPACA calls for what are strictly speaking "modified community" rates. Modified community rates, however, are often simply referred to as community rates.

insureds drop out and only the high risk insureds persist. Raising rates can lead to a cycle of increased rates, disenrollment, and increased losses. The cycle is known as a “death spiral” or an “anti-selection spiral”. The spiral ends when insurers, who are a cycle or more behind suffer sufficient losses to quit; in the interim fewer and fewer people have insurance. Ultimately there may no longer be a competitive (more than one insurer) private health insurance market.¹⁷

Adverse selection can be depicted as:^{18,19}

Figure 1



The picture suggests one way to bring the system into balance: remove consumer choice with respect to whether to seek insurance and with respect to insurer and plan. This removes weight from

¹⁷ Although the near inevitability of death spirals for community rated open enrollment plans is widely accepted wisdom in the insurance industry, there are authors who disagree. The dissenters include Buchmueller and DiNardo (2002) and Barrett and Conlon (2002).

¹⁸ While they are informed by the work of many authors, the selection depictions featured in this paper are the original work of Tia Goss Sawhney, developed specifically for this paper.

¹⁹ The figures and discussion make reference to insurer profits and losses and the need to achieve “balance” at the breakeven point between profits and losses. This is a simplification for the sake of pictorial and verbal economy. Private companies, even not-for profits, need some amount of profit to stay in business. To be technically correct the pictures and discussion should reference “excess profits” and “insufficient profits/losses” rather than profits and losses.

the right side of the bar. With respect to health insurance some countries have done this. In Canada health insurance is compulsory with premiums, if any, automatically deducted from paychecks, and everyone is covered under the same provincial plan (see <http://www.canadian-healthcare.org/>). The US, however, has rejected the possibility of a mandatory, single payer system.

The picture also suggests another way to bring the system into balance: use insurer selection to offset insured selection, thus putting weight on the left side of the bar. This strategy compensates for the effect of, rather than eliminates, adverse selection. The US has relied upon this strategy for the individual health insurance market. While insurers and actuaries often refer to this strategy as “insurer control of adverse selection”, I don’t prefer the term as it conjures images of consumers as villains who need to be policed by insurers. I will refer to the strategy as “balanced selection”, a label that acknowledges that both insureds and insurers are selecting.²⁰ I will likewise henceforth tend to avoid the term adverse selection and discuss insured and consumer selection and the respective components thereof. When I must refer to adverse selection it will be as “adverse consumer selection”.

The final strategy for balancing the system is a hybrid of the above two strategies: reduce the range of consumer choices on the insured side of the bar and thus reduce the required “weight” on the insurer side of the bar.²¹ This strategy will be particularly important as I discuss potential interventions to limit indirect selection under healthcare reform.

B. Pre-Healthcare Reform Balanced Selection

Insurers can directly and indirectly select in order to balance insured selection. Direct selection occurs whenever an insurer makes an explicit choice with respect to an individual consumer. The

²⁰ This perspective is consistent with Baker (Baker T. , 2003) and Heimer (Heimer, 2003) as published in “Risk and Morality” (Ericson & Doyle, 2003). They see adverse selection on the part of both insureds and insurers that, unless controlled by regulation, gets played out in the context of a dynamic game with adverse societal consequences.

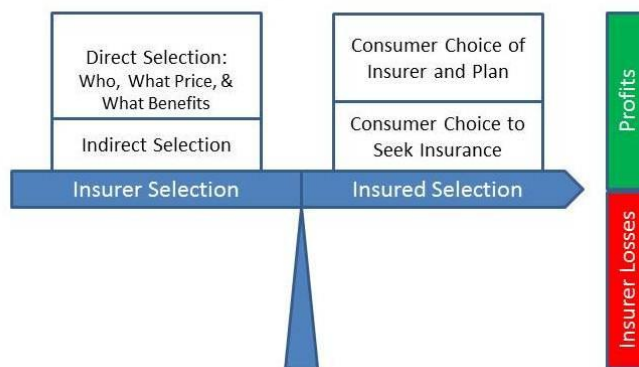
²¹ A strategy advocated by Baker (2003).

consumer may be a potential or a current insured. Specifically, the insurer may decide whether to offer the consumer insurance, what benefits to offer, and the price for the new or renewal offer.²² Indirect selection occurs when the insurers make decisions that influence the propensity of consumers with different risk characteristics to buy or retain insurance. Insurers indirectly select by influencing consumers' direct (explicit) selection. In recent decades, direct selection has been the dominant risk balancing mechanism for the US individual health insurance market.²³

This suggests the following model for balanced selection:

Figure 2

**Pre-Healthcare Reform Individual Health Insurance Market
Balanced Selection – Incomplete Model**



The model depicted in Figure 2, however, is incomplete with respect to consumer choice. While direct and indirect selection preserves and even expands choice for low-risk consumers,²⁴ it eliminates choice for some high risk consumers (who cannot get any insurance from any insurer at any price) and

²² I will consistently use this definition within this paper. There is, however, not uniform agreement regarding indirect selection. For example, Zweifel (1997) asserts that target marketing, since it involves identifying specific consumers, is direct selection. Targeting a consumer is, however, is a much less direct selection than having the power to overtly deny a consumer coverage. Therefore van de Ven and Ellis (2000), Puig-Junoy (1999), and other authors feel that target marketing is indirect selection.

²³ Health insurance first became available in the 1930's. Underwriting in the fledgling individual health insurance market did not become accepted practice until the 1950's (Cunningham III & Cunningham Jr., 1997).

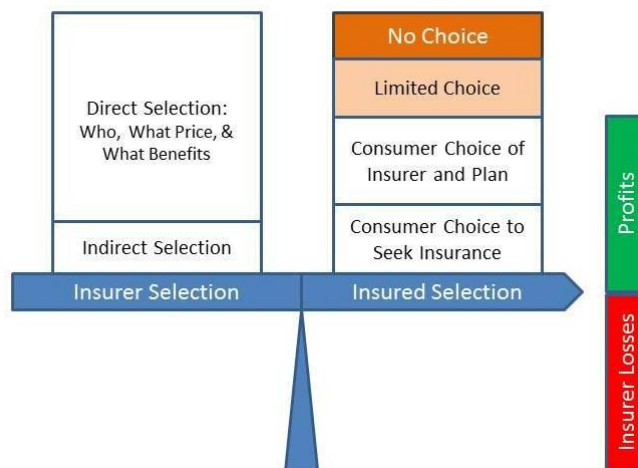
²⁴ A desirable outcome for low-risk insureds and a direct selection benefit often cited by the insurance industry (AAA, 2009).

limits choice for other high risk consumers (who may be able to get as little as one high premium, restricted plan, from one company).

The balance therefore is more completely depicted as:

Figure 3

**Pre-Healthcare Reform Individual Health Insurance Market
Balanced Selection – Complete Model**



While they are integral to system balance, no choice and limited choice are arguably not choices and are not socially desirable outcomes.

The next section concerns direct and indirect selection and the relationships between insurer selection and insured selection.

C. Direct Selection

The process of directly selecting insureds is known as underwriting. Underwriting utilizes the risk classification system established by the insurer's actuaries,²⁵ reinsurers, and technical consultants.

²⁵ See Actuarial Standard of Practice No. 12 (ASB, 2005) for information concerning how actuaries design risk classification systems.

The insurer collects detailed information (risk characteristics) about the insured, assesses the insured's health risk, and assigns the insured to a risk classification. Based on the risk classification guidelines the insurer decides whether to offer insurance and whether to surcharge the insured with extra premiums or to restrict benefits (AAA, 2009). If the insurer subsequently finds out that the insured misrepresented his or her risk characteristics, the insurer may rescind (cancel) the policy.²⁶

The Society of Actuaries feels that risk classification is essential to the financial stability of insurers in a competitive insurance market. They promote a "more is better" approach to risk classification and posit that to the extent direct selection does not work to balance adverse selection, it is because consumers have an information advantage over insurers with respect to their risk characteristics or that the insurer has not been allowed by regulators to fully use the risk characteristics information (ASB, 2005) -- the consumer has information which allows them to "take advantage of" the insurer. This perspective leads to an actuarial definition of adverse selection which is quite different than the academic definitions given above:

Adverse Selection—Actions taken by one party using risk characteristics or other information known to or suspected by that party that cause a financial disadvantage to the financial or personal security system (sometimes referred to as antiselection). (ASB, 2005)

Direct selection can be described in terms of impact and process:

1. Impact. Direct selection explicitly limits the choices of one consumer (or at most a family).

²⁶ Recently effective provisions of PPACA (Section 2712) curtail but don't eliminate insurer rescissions.

2. Process. Direct selection is a defined process. As such, it has a beginning, an end, and steps in between. There are underwriting manuals and risk classification charts. The process can be evaluated and the outcomes measured (outcome example: applicants denied coverage). The process can be regulated²⁷ or even forbidden.

D. Indirect Selection

In contrast, indirect selection is much different than direct selection with respect to impact and process:

1. Impact. Indirect selection influences rather than explicitly limits the choices of consumers. As the result of indirect selection a particular insurer or plan is somewhat more or somewhat less appealing to categories of consumers who share one or more risk characteristics.

2. Process. Indirect selection is embedded into the essential, everyday insurer processes and cannot be entirely eliminated from those processes. There is no way to have a multi-insurer, multi-plan, competitive insurance market and not have some degree of indirect selection – some insurers or plans will have more or less appeal to specific categories of consumers. Because indirect selection is embedded in necessary business processes it can be very difficult to evaluate, measure, and regulate; it can be forbidden, but not eliminated.

Although indirect selection is embedded and not always obvious to outsiders, particularly consumers, it can be and is purposefully manipulated by insurers. Any business activity that makes a product more or less appealing to a category of customers can be used to affect selection. While indirect selection possibilities include the traditional marketing activities, such as product design and

²⁷ Insurers, for example, are not allowed to use race as an underwriting consideration regardless of the statistical relationship between race and health risk (AAA, 2009).

pricing, marketing, sales, and customer service, they also include any business activity which ultimately affects the potential or actual customer. The possibilities are endless. For example, every insurer has glossy brochures. The content, pictures, and layout of a brochure may make the insurance product more or less appealing to certain categories of consumers without any changes to the underlying insurance product.

The indirect selection is not always intentional. The definition of indirect selection only requires an insurer (and its agents) to make a decision which differentially impacts the choices made by consumers with different risk characteristics. Although “smarter” insurers might have a specific intent, the definition does not require that the insurer even be aware of the potential impact on consumer choices.²⁸ I will discuss specific indirect selection techniques in a later section.

Later in this paper I will use “indirect selection” almost synonymously with “target marketing”. Indirect selection is a term specific to insurance and a limited number of other fields. Target marketing is a term specific to the field of marketing. The terms converge with respect to the marketing of insurance products.

As of 2004, the official definition of marketing was *“Marketing is an organizational function and a set of processes for creating, communicating, and delivering value to customers and for managing customer relationships in ways that benefit the organization and its stakeholders.”* In 2007 the definition was expanded to include societal value *“Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large”* (AMA, 2007). The AMA clearly states that the definition is intended to position marketing *“as a broader activity in a company/organization, and not*

²⁸ While indirect selection overall benefits insurers, a particular selection decision may in fact be detrimental to an insurer. In today’s market, insurers have the luxury of relying primarily on direct selection to achieve balanced selection. They can be “sloppy” with respect to indirect selection.

just a department. This expansive view of marketing is consistent with the concept of indirect selection being embedded in a full range of insurance business processes.

Target marketing in turn refers to marketing activities and processes directed toward identified populations. Target marketing follows from market segmentation – the process of recognizing the differences among customers.²⁹ Conceptually indirect selection is neither new nor unique to health insurance; it is a well-established concept across a broad range of industries, albeit with a different name.

Finally, while target marketing and indirect selection within the health insurance industry have negative consequences, it is important to note that not all target marketing results in negative consequences. Social marketing – using marketing to target the health behaviors of specific populations – is a well-established, socially-beneficial public health strategy (Grier & Bryant, 2005).

E. Individual Insurers vs. The Collective

Thus far I have discussed health insurance as a system. Even if the risk selection system as a whole is in balance as shown in Figure 3, a given insurer may be advantaged or disadvantaged via indirect selection. Insurers use selection prowess to their competitive advantage. An insurer who is better at direct or indirect selection can tip the selection bar in their favor and drive a profit. One insurer's success in doing so is often at the detriment of the other insurers in the system. Classic Adam Smith economic theory argues that this will result in consumer benefit. To the extent that it lowers prices and fosters innovation it does, but that benefit to specific individuals may not be sufficient to

²⁹ Kotler and Armstrong (2009) define market segmentation as “dividing a market into distinct groups of buyers who have different needs, characteristics, or behaviors, and who might require separate products or marketing programs. They then define target marketing as the process of evaluating each market segment’s attractiveness and selecting one or more segments to enter.

offset the societal and individual cost of excluding people from the insurance market. Economists refer to such costs as externalities.

If the number and risk characteristics of insureds in a system are fixed at least over the short-term, then the insurer-specific selection strategies result in insureds being traded from one insurer to the other. The insurer who can do a better job getting low-risk insureds to apply for coverage, sorting the low-risk applications from the high risk applications, and retaining low-risk insureds has a better portfolio of insureds. The other insurance companies in turn get that company's risk-leftovers. The companies that select best make money, the other companies lose money.

The other companies respond. They attempt to return to profitability by enhancing their direct and indirect selection efforts. Enhancing almost always means tightening.³⁰ A selection "arms race" emerges. As a result, insurance becomes increasingly unavailable to those consumers that insurers assume have or might have risk impairments.

Essentially the weight on both sides of the balance bar increases as a result of selection-based competition: insurers select more (left side) and more consumers have no or limited choices (right side – peach shading). In addition low-risk consumers, because of the increased competition, may have more choices at a lower price than ever (right side – white shading). An increased range of choices and lower prices for low-risk consumers is one of the "advantages" of direct selection frequently mentioned by actuaries (AAA, 2009).³¹ Actuaries, however, talk much less about the societal implications of excluding people.

³⁰ Insurers know the risk characteristics of their profitable and unprofitable insureds (consumers who applied for and were accepted for coverage). Insurers will seek to avoid applicants with the unprofitable characteristics in the future. Insurers do not know the risk characteristics of the consumers who they rejected or who otherwise did not accept the offered insurance and who would have been profitable. Insurers therefore (usually) don't seek and accept such applicants in the future.

³¹ Baker (2003) discusses how selection operates to the detriment of consumers and society even though insurers have traditionally sold selection as being on net beneficial to consumers.

F. Consumers Demand Change

Direct selection and continuously improved risk classification may work well for insurers, but it does not work well for society. Since insurers can deny coverage, some consumers cannot get insurance at any price. Since insurers can charge premium surcharges and limit benefits, other consumers cannot afford insurance or cannot get insurance coverage for precisely the health impairment that does, or is likely to, make them ill. The U.S. has seen this with respect to individual health insurance. People who cannot get insurance, who can only get limited benefits, or who must pay a high price are unhappy and so are the people who care for them.

An increasing portion of Americans feel that access to affordable health insurance, regardless of one's risk characteristics, is a right. This opinion is much different than with auto insurance where people have generally accepted that some people will pay substantially more than others based on their age, automobile, and driving record and where society expects people to forgo having a car if they cannot afford insurance. No one expects that those who cannot afford health insurance should forgo life-saving care.³²

After decades of societal discontent with the health insurance system, Congress and the President listened, and in March 2010 the Patient Protection and Affordable Care Act (PPACA, May 2010)³³ became law. PPACA forbids direct selection in the individual health insurance market as of January 2014. No one will be denied coverage, be offered only restricted benefits, or be charged higher premiums because of a health impairment (PPACA, Section 2704). PPACA intends to curtail indirect selection efforts.³⁴ Furthermore the reform will expand consumer choice, or at least perceived choice,

³² Sawhney (2007) compares societal perspectives of auto and health insurance.

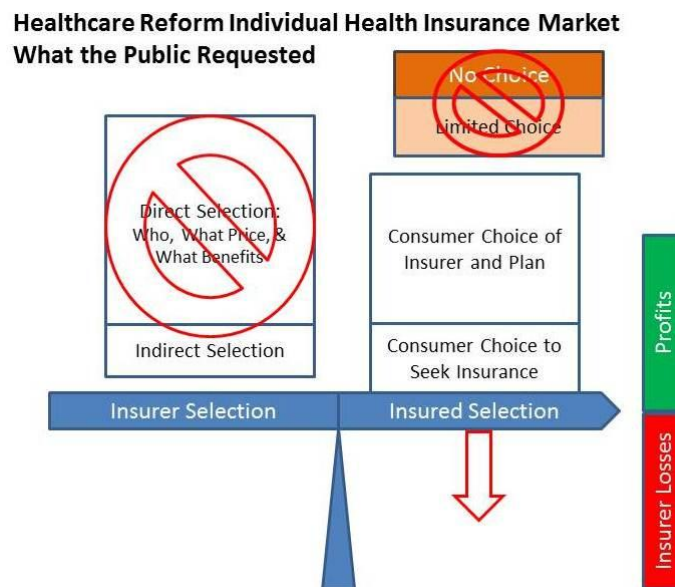
³³ Known both as the PPACA and ACA. Technically PPACA/ACA refers to the initial PPACA legislation to the amendments that passed days later -- the Health Care and Education Reconciliation Act of 2010 (HCERA).

³⁴ General language about non-discrimination by health status (Section 2704) curtails indirect selection. Section 1302, (b) Essential Health Benefits, (4) (a)-(d) concerning plans sold on exchanges goes a step further and makes it clear that exchange plans must provide service to people with diverse health needs, including people traditionally underserved.

with respect to insurers and plans by making information and enrollment available via centralized, electronic health insurance exchanges (PPACA, Subtitle D).

As favorable as these changes are to consumers, these changes cannot be made without other offsetting changes as they unbalance the system by removing most of the weight from the left side of the bar, leaving most of the weight on the right side:

Figure 4



G. Other Changes to Balance the System

Figure 4 shows that insured selection will outweigh insurer selection when insurer direct selection is removed, swinging the system toward insurer losses. In order to re-balance selection, other changes must occur. Two such changes are built into the healthcare reform legislation:

1. Requirement that everyone have health insurance – mandatory insurance (PPACA, Section 1501).

2. Risk adjustment (PPACA, Section 1343).³⁵

Mandatory insurance eliminates consumer choice with respect to seeking insurance. Removing this element of consumer choice considerably decreases insured selection. That is why the health insurance industry lobbied hard for mandatory insurance (AHIP, 2008).

So called mandatory health insurance under PPACA, however, is not truly mandatory. Certain individuals are exempt from the insurance requirement (PPACA, Section 1411). Furthermore even the majority required to have insurance can opt instead to pay a tax penalty. The tax penalty is trivial in 2014 and even at full value in 2016 is a fraction of the cost of purchasing health insurance (PPACA, Section 1501). Also, tax penalties can be assessed only on those who actually file a tax return. No insurance will still be a component of the selection balance, just a smaller component.

Something, therefore, is needed on the left side of the bar to offset the continued consumer choice forces associated with selecting an insurer, a plan, and whether to purchase insurance. That something is risk adjustment. Risk adjustment refers to a *“process of adjusting payments to health plans or health care providers in order to reflect the health status, or illness burden, of the members”* (SOA, 2009).

Under healthcare reform insurers must charge everyone the same premium³⁶ regardless of health status. There is then a non-consumer facing risk adjustment mechanism (PPACA, Section 1343) which shifts money between insurers and from the government to insurers depending upon the health status of the insurer’s insureds. The ideal is that risk adjustment will immunize insurers from the effects of insured selection. Risk adjustment is not insurer selection, but because it offsets the effect of insured

³⁵ In addition to Section 1343, Sections 1341 and 1342 provide for transition period (3 year) risk mitigation via reinsurance and risk corridor provisions. These provisions are transitional and this portion of the discussion is with respect to long term balance, so I have omitted them here. I will, however, discuss them later in a section relating to the likely evolution of selection efforts ([The Game](#)).

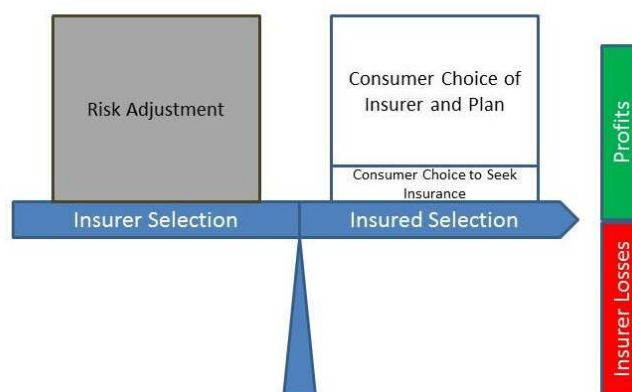
³⁶ Rates must be uniform except with respect to family coverage, rating area, age, and smoking status (PPACA, Section 2701). Age and smoking status rate differentials are capped.

selection, it belongs on the same side of the depiction as insurer selection. I will, however, depict it differently -- as a solid grey, an intentionally neutral color.

The healthcare reform vision is to have a balanced system that looks like this:

Figure 5

**Post-Healthcare Reform Individual Health Insurance Market:
The Compromise – As Ideally Envisioned**



In this depiction consumer choice with respect to seeking insurance is considerably less than before and consumer choice with respect to choice of insurer and plan is about the same.³⁷ Risk adjustment fully offsets consumer choice. Indirect selection is not depicted because to the extent that it exists (consumers will always have preferences for specific insurers and plans), insurers no longer benefit from manipulating it – no amount of indirect selection moves the arrow to green. Insurers will not intentionally manipulate indirect selection; insurers will simply accept selection “as is” and be fully compensated for doing so. Reality, however, often falls short of a vision.

Figure 5 assumes risk adjustment will fully offset consumer selection. While risk adjustment will certainly help offset selection, there are good reasons to believe that risk adjustment will not fully offset

³⁷ Consumer choice may be less if individual insurance can be only bought on an exchange and how many options will be available on and off the exchange.

consumer selection. This section and the next will discuss risk adjustment and the reasons why it may not fully offset consumer selection. The third section will discuss an alternative way the system may balance if risk adjustment falls short.

H. Risk Adjustment

1. Described

Life is risky. People are continuously subjected to the possibility of loss of health or injury. Health costs are associated with these risks. Some people are already suffering from the effects of a chronic disease, condition, or injury. Many chronic conditions are not, strictly speaking, risk –they are already present, will exist in the future, and are not mere possibilities. But their costs are risky. No one's future health costs are certain, even with respect to a single, known condition. A single course of breast cancer treatment might cost \$15,000 or \$500,000.³⁸ Some people die before any significant costs are expended.

Not all health cost risk emanates from an individual's health status and health events. The healthcare system itself generates risk. Diagnosis is an art, not a science. Compared to the range of health situations, there are few standard treatment protocols; even few are faithfully followed by health care providers. There is no standard pricing. Treatment errors happen. Therefore two people may have identical objectively defined healthcare "needs" but ultimately have very different health care use and costs. Some people receive more health care than they need and others less care than they need.

Risk adjustment uses statistical techniques to make a prediction as to the average cost for people with a similar risk profile and pays the insurer accordingly. Risk prediction is often expressed in

³⁸ Campbell and Ramsey (2009) surveyed the literature with respect to breast cancer costs and found little agreement as to the cost of cancer treatment. Lamerato and coauthors (Lamerato, Havstad, Gandhi, Jones, & Nathanson, 2006) calculated standard deviations for breast treatment costs and found that the standard deviations were nearly as large as the average costs – indicating substantial uncertainty.

terms of a risk score. A risk score is the ratio of the predicted cost for an individual (or group of individuals) to the average cost for the entire population.

A risk score is a prediction, not a certainty. Among the people with a shared risk profile, some will ultimately have low costs, some will have high costs, but if the risk scores are unbiased, if the insurer selects a random sample of people from within the risk scores, and if the insurer gets enough people to “spread the risk”, the insurer will collect sufficient premium to cover the costs. If the insurer can then figure out how to take care of the people in a manner more cost efficient than the historical average treatments upon which the risk scores were based, the insurer makes a profit.

Of course, one way to make a profit is to provide less care, irrespective of need. The hope, however, is that the system will self-correct with respect to the under-provision of care. If an insurer in an effort to save money skimps on care, the insurer will suffer a reputational loss and lose future profitable business – especially if there are a variety of public quality of care measures and feedback forums for consumers to evaluate when selecting an insurer.

There are theorists who have a great deal of faith in the concept of risk-based payments. Regina Herzlinger of Harvard has been a major proponent of the concept of providing patients risk-based insurance vouchers. She wrote a mass market book “Who Killed Health Care?: America's \$2 Trillion Medical Problem - and the Consumer-Driven Cure” (2007) that advocated giving every consumer a voucher with a value based on the consumer’s health status that consumers could take to insurers and or directly to provider groups in order to contract for care.

Healthcare reform essentially proposes the same, except without a physical voucher. Everyone will be able to buy insurance at the same price regardless of their health, but risk adjustment will operate in the background (generally unknown to the consumer) to move money around between insurers so that in the end each insurer has about the same amount that the insurer would have had if each consumer had presented a health-status based voucher.

Whether the adjustment occurs via risk-adjusted vouchers or inter-insurer risk adjustment, insurers should then theoretically be indifferent to which risks they assume, have no incentive to either avoid or work to attract consumers with certain risk profiles, and concentrate instead on taking care of insureds in a cost efficient manner. That's the theory, but there are reasons to believe that it will not be fully actualized. If they believed risk adjustment would work as advertised, McKinsey would not be talking about selection strategies under healthcare reform, nor would the other consultants and experts detailed in Chapter III.

An understanding of today's risk adjustment models³⁹ and the nature of health risk is necessary to an understanding of where risk adjustment will likely fall short. The models used today within the insurance industry rely primarily upon a limited number of variables (Winkelman, Mehmud, & Wachenheim, 2007; AAA, 2010; Fontana & Rong, 2010). They are:

Figure 6

Today's Risk Adjustment Variables

Variable	Note
1. Recent Diagnostic History	Based on diagnostic codes and/or prescription drug codes
2. Age	
3. Sex	
4. Area	Defined on a county or regional basis

³⁹ PPACA, Section 1343 does not mandate a particular risk model, but it suggests that the model may be like today's Medicare risk adjustment models, CMS-HCC for medical and RxHCC for prescription drugs (CMS, 2010). The CMS models are respectively described by Pope and coauthors (Pope, et al., 2004) and Robst and coauthors (Robst, Levy, & Ingber, 2007).

These are the primary variables. Depending upon the specific use, a handful of other variables may also be included.⁴⁰

These variables were chosen over the course of the last approximately 25 years as risk adjustment slowly emerged within health insurance practice,⁴¹ not because they are the only variables that can be used to predict healthcare costs, but because they were variables that were and are available within insurer files for most insureds, generally considered reliable, and less susceptible to gaming than other potential variables (Dunn, et al., 1996).⁴² These are truly important practical considerations. The problem, however, is that the resulting risk assessment captures only some of the variables that affect health risk.

2. Omitted Variables

As discussed above, there are two components to health risk: the risk of new conditions and injuries and the risk associated with a known condition or injury. Today's risk adjustment models focus on known conditions and injuries, specifically the conditions and injuries implied by recent (typically one year) of health insurance claim diagnoses and/or prescription drug codes. The risk of an entirely new condition or injury or recurrence of an old condition can, for simplicity, be thought of as "incidence"

⁴⁰ Miscellaneous adjustments related to enrollment status are sometimes made as part of the risk adjustment process. Medicare adjusts for end stage renal disease (ESRD) status, Medicaid enrollment ("dual eligibility"), whether the beneficiary was originally disabled, and institutional status (CMS, 2010). Medicaid risk adjustment typically applies separate factors for people who qualify based on disability versus those who qualify based on poverty (Kronick, Gilmer, Dreyfus, & Lee, 2000; Yi, undated). Commercial insurers may adjust for benefit design, cost sharing, and other plan-specific characteristics.

⁴¹ Risk adjustment entered health policy discussions in the mid-1980s with the advent of Medicare risk contracting. It was alleged that the HMO contractors were profiting by collecting an area-average Medicare premium for insuring particularly healthy enrollees and avoiding expensive enrollees (Newhouse, 1986). There was a surge of risk adjustment analysis (Ellis, et al., 1996). It was not, however, until 2000 that Medicare instituted its first attempt at health-based risk adjustment (Pope, et al., 2004).

⁴² There is no consensus on the criteria for selecting risk adjustment variables. Authors have explored various criteria for variable selection, applied different names to essentially the same criterion, and debated the relative importance of the criterion. The early authors included Anderson et al (1986), Ash et al (1989), Gruenberg et al (1986), and Thomas et al (1983).

risk.⁴³ Today’s risk adjustment models capture incidence risk by the age and sex variables. In contrast, the cost of treatment for recent conditions and the risk of complicating conditions (like renal failure for diabetes) and high cost events associated with recent conditions (like a heart attack as a result of heart disease) may be thought of as “prognosis” risk. Today’s models assume that prognosis risk is the same for everyone given their age, sex, and recent comorbidities.

The nearly exclusive focus on age, sex, and recent diagnostic history, omits a host of other variables that affect incidence and prognosis risk. The omitted variables are known to anyone familiar with health literature, especially public health literature.

The core public health variables not included in risk adjustment are:

Figure 7

Other Predictive Variables: Public Health	
Variable	
A.	Behavior (a.k.a. Lifestyle)
B.	Environment (a.k.a. Community, Neighborhood, Social Network)

Much of what causes us to be sick or injured is a consequence of our own behavior. As a society, we smoke, we eat too much, we don’t exercise, we drive while drunk and engage in other risky behaviors, and we don’t follow medical advice. The World Health Organization, Centers for Disease Control, and other health authorities agree that behaviors are the primary risk factors for assorted chronic diseases (WHO, 2005; CDC, 2010).

Our physical (Kawachi & Berkman, 2003) and social environments (Marmot & Wilkinson, 2006) impact our health. The physical environment may expose us to pollution (Ash & Fetter, 2002), infectious

⁴³ The recurrence of an old condition is not strictly speaking incidence, particularly since the condition may not have actually gone away – the consumer may have simply not sought treatment over the last year.

disease (Fullilove, 2003), or inadequate food supply (Beaulec, Kristjansson, & Cummins, 2009). The social environment associated within our physical environment may include the risk of intimate and stranger violence (Sampson, Raudenbush, & Earls, 1997) and the stress of enduring discrimination (Williams, Neighbors, & Jackson, 2008). Furthermore, our social environment extends beyond our physical environment to our entire social network. There is a growing body of evidence (Smith & Christakis, 2010) that our social networks are linked to our health. There is a high degree of overlap and interaction between physical and social environments and behavior. “Birds of a feather flock together” (McPherson, Smith-Lovin, & Cook, 2001).

Healthcare providers (or a lack thereof) are an integral part of the interaction between neighborhood and health, especially for the poor who may not have access to an automobile (Shi & Starfield, 2000; Prentice, 2006). Even free, quality healthcare within walking distance may not be easily accessed in a crime-ridden neighborhood. Neighborhood may also influence the practice style of our physicians. Franks and coauthors (Franks, Fiscella, Beckett, Zwanziger, Mooney, & Gorthy, 2003) found that the socioeconomic status (SES) characteristics associated with a physician’s address affected healthcare consumption independently of the SES associated with the patient’s address.

While area is often included in today’s risk adjustment models, it is not included in sufficient granularity. The typical smallest area of consideration is a county. Neighborhoods are much smaller. Other healthcare systems take a more granular approach. The British National Health Service has neighborhood as an integral part of its risk adjustment model (Babad, Bardsley, Childs, Ghiselli, MLure, & Mateja, 2011).

In addition to behavior and environment, there are other variables omitted from risk adjustment that affect healthcare cost risk. These include:

Figure 8

Other Predictive Variables: More

Variable
A. Behavior
B. Environment
C. Healthcare utility
D. Physical and cognitive limitations
E. Severity
F. Timing
G. Genetics

Healthcare utility is a person's healthcare utility. There is more to healthcare consumption than an objective evaluation of a person's health status. Some people truly value the experience of receiving healthcare; they actively seek healthcare. They are known as hypochondriacs. They cost a lot, especially in today's fragmented health system where determined seekers will eventually find doctors willing to conduct an expensive test, operate, or admit them to the hospital (Hollifield, Paine, Tuttle, & Kelner, 1999). There are also people who actively avoid the health system, at least until they are in the middle of a health crisis. Their avoidance may save a lot of small costs, but it likely makes the big cost events costlier (Byrne, 2008).

Physical and cognitive limitations are not well captured via current diagnostic coding system and coding practices and yet have a significant role with respect to health risk. The lack of physical and cognitive ability to take care of one's self relates to healthcare utilization in excess of what can be predicted by diagnostic history (Lewin Group, 2010; Gruenberg, Tompkins, & Porell, 1989). Cognitive abilities include not only general awareness, self-control, and self-management skills, but tangible skills such as literacy. Ignorance can kill (Keller, Wright, & Pace, 2008; Weiser & Brugger, 2009; Baker, Wolf,

Feinglass, Thompson, Gazmararian, & Huang, 2007). Physical and cognitive limitations may be leading indicators of undiagnosed conditions or indicators of severity of diagnosed conditions.

Severity is a particular concern. People with more severe conditions have typically had higher past costs, are more likely to have been hospitalized in the past (hence the high costs), are more likely to be disabled, are more likely to have comorbid conditions. On average today's models consistently under-predict costs for such people (van Kleef & van Vliet, 2010; Winkelman, Mehmud, & Wachenheim, 2007; MedPAC, 2005; Pope, et al., 2004; van de Ven & Ellis, 2000).

Part of the reason why severity is poorly captured is that the US currently uses ICD-9 diagnostic codes, which are notoriously poor at capturing severity. Absent distinguishable comorbidities, all people with a given disease are coded the same. Yet someone with coronary artery disease might be functionally unimpaired or may be bedridden and on the wait list for a heart transplant. ICD-10 diagnostic codes which will be implemented in 2013 will better capture severity (AMA, 2010). Even ICD-10, however, does not consistently capture severity. For example, Zenner and coauthors (2008) note that *"ICD-10 offers no better help than ICD-9 in identifying or differentiating severity of illnesses within populations with coronary artery disease."* Furthermore it will take several years for providers to master the new coding and for statisticians to recalibrate risk adjustment models. Zenner and coauthors predict that this will be a period of diagnostic *"fog"*.

Today's models also have a simplistic approach with respect to time. For most models, a diagnosis within the typical one year base period has the same impact on the prediction whether it first appeared on the first or last day of the base period; yet a diagnosis from the day before the beginning of the base period means nothing. Most of today's popular risk models consider a woman who had her last treatment for uncomplicated stage-one breast cancer 11 months ago and a woman diagnosed 1 week ago and yet to start treatment as identical risks (AAA, 2010; Winkelman, Mehmud, & Wachenheim, 2007).

Genetics are also important. A direct relationship between genes and disease is well established with respect to a few diseases; with other diseases genetics interact with environmental factors to cause disease (Genome.gov, 2011). People with certain genetic profiles and people from family groups or communities who disproportionately have certain genetic profiles are unfavorable healthcare cost risks even if they have yet to be diagnosed with a genetic-related disease. Risk adjustment takes genetic conditions into account only when they are symptomatic and diagnosed.

Thus far, I have discussed variables omitted from risk adjustment which affect healthcare cost risk as if they are separate and distinct. In reality they are overlapping and intertwined. It can be impossible to tease out independent effects and to distinguish between cause and effect. From a purely statistical perspective it doesn't matter. Any attribute of a person or population of people can be tested for statistical significance with respect to healthcare cost risk. From the purely statistical perspective, the pathway by which the attribute either causes risk or describes risk matters little. Causation may be ideal, but correlation is sufficient.

This brings us to the last two omitted variables:

Figure 9

Other Predictive Variables: Final List

Variable
A. Behavior
B. Environment
C. Healthcare utility
D. Physical and cognitive limitations
E. Severity
F. Timing
G. Genetics
H. Socioeconomic status (SES)
I. Race and ethnicity

Researchers typically define SES as some combination of income, education, wealth, employment, and occupation, measured at the individual, family, or community level. The operational measurement for a given study may be as little as one parameter, one level (Krieger, Williams, & Moss, 1997). In the U.S. income and education are the most common measurements of SES. Income and education are related to behavior (Pampel, Krueger, & Denney, 2010), environment (Diez Roux, 2001), and, to at least some extent, genetics (Johnson & Krueger, 2005). While there is considerable debate concerning the causal pathways and the relative dominance of income versus education, no one disputes that income and education are related to nearly every measure of health and health risk. People with more education and higher incomes are healthier; they have lower incidence of disease and when they become ill they have a more favorable prognosis. Assorted authors (Cutler, Lleras-Muney, & Vogl, 2008; Isaacs & Schroeder, 2004; Cutler & Lleras-Muney, 2006)⁴⁴ have surveyed the literature.

Likewise, while there is no agreement as to whether race is a biological or social construct, let alone agreement on the causal pathways that relate race and ethnicity to health, no one disputes that race and ethnicity are related to health and healthcare use (Nickens, 1995). Across a broad spectrum of measures, black Americans are significantly less healthy than white and Asian Americans. The black American health disadvantage is greater than what can be predicted based strictly on lower education and income levels (Geronimus, Hicken, Keene, & Bound, 2006). Understanding why falls within a field of study known as “health disparities research” and is a public health priority (OMHD, 2011). Paradoxically, Hispanic Americans, who like black Americans, also have low education and income levels, have comparatively good health (Gallo, Penedo, Expinosa de los Monteros, & Arguelles, 2009). Many Hispanic American health measures are comparable to white Americans even though the population is

⁴⁴ Additionally Sawhney (2010) cites a variety of research to build a conceptual model for the relationship between SES, particularly income, and health and health consumption.

generally socially and economically disadvantaged.⁴⁵ In public health circles this is known as the “Hispanic paradox”.

Clearly, today’s risk models do not include the full universe of variables that impact health risk. Some researchers and risk adjustment practitioners would argue that they don’t need to, that they do an adequate job of differentiating basically healthy people from unhealthy people. They may be good enough for what risk adjustment models need to do today. But today’s adequacy may not be tomorrow’s adequacy. As discussed by McKinsey (see Introduction), under PPACA insurers and their consultants will try to identify “pockets of opportunity” within the risk adjustment system and build indirect risk selection strategies accordingly.

3. Pockets of Opportunity

What is a pocket of opportunity? A pocket of opportunity is created whenever a (sub)population of people with the same risk score (whether the score is high, low, or in between) can be further segmented, using variables outside of the risk score model, between people with lower risk and people with higher risk. For example, it might be possible for an insurer to identify the heart disease patients most at risk of an acute heart episode.

While a pocket of opportunity is good find, a pattern of pockets (a “vein” in mining terminology) is a better find from the perspective of an insurer. If so, an insurer may wish to avoid such patients as potential insureds or, if the patients are already insured, encourage them to get insurance elsewhere. As good a risk marker is for a single condition, it would be even better to identify a variable that affects incidence and prognosis risk across a spectrum of potential conditions.

⁴⁵ Given their income and education status, Hispanics have particularly good birth outcomes (MMWR, 2011). They also appear to have particularly good longevity (Turra & Elo, 2008).

Income may be one such variable. In a working paper Sawhney (2010) built a conceptual model which supported the argument that income (a component variable of SES) was a variable that could be used to differentiate risk beyond what is predicted by risk adjustment. She then used a publicly available database and a publicly available risk adjustment methodology to demonstrate that income most likely has a financially and statistically significant marginal health risk predictive value after risk adjustment has been applied to account for the costs associated with age, sex, and prevalent conditions.

McKinsey seems to concur that such broad-based variables can be used to segment risk. In one-on-one discussions with me over the summer of 2010, McKinsey consultants consistently named SES and race as variables that they would use for building indirect risk selection strategies.

4. Mechanics

The reader who is somewhat more technical will benefit from a mathematical demonstration of how risk segmentation will work in a risk-adjusted environment. A reader not much interested in numbers, should skip to the next section with this thought in mind: risk scores predict the average cost for a (sub)population of similar people, not any one person. There is still considerable person-to-person variance within a risk score population – however the population is defined. Additional factors may be used to identify the people within the population most likely to be low cost from the people most likely to be high cost – to segment the original population. Although there are usually diminishing returns to segmentation, the number of potential segmentations is limited only to the available data.⁴⁶

Suppose for simplicity that over the course of a year 100,000 people will have \$0, \$200, \$2,000, \$10,000, \$20,000, \$50,000, or \$200,000 of healthcare costs. Assume that most people have \$0 or \$200

⁴⁶ With respect to age, sex, and diagnostic data (including using prescription drugs as a supplement or proxy for diagnosis), statistical models are at the point of diminishing returns. That does not imply, however, that there is no return to be found in other data within insurer claims and enrollment files. Furthermore, as will be discussed in Chapter III, there are now data sources beyond traditional insurance enrollment and claims files.

of costs and very few have \$50,000 or \$200,000 costs. This type of distribution is very typical of healthcare costs (Stanton, 2006). The average expected healthcare costs for this population is \$5,790.

Figure 10

Demonstration: Starting Population

Expected Annual HC Cost	Starting Population
Percentage of People	
\$0	30.0%
\$200	20.0%
\$2,000	20.0%
\$10,000	20.0%
\$20,000	8.0%
\$50,000	1.5%
\$200,000	0.5%
Total	100.0%
Number of People	
\$0	30,000
\$200	20,000
\$2,000	20,000
\$10,000	20,000
\$20,000	8,000
\$50,000	1,500
\$200,000	500
Total	100,000
Average Expected Cost:	\$5,790

Now suppose that the population can be divided into two equal subpopulations: those with any recent diagnoses related to chronic condition or the ongoing effects of an injury (50,000 – Unhealthy People) and those without such diagnoses (50,000 – Healthy People). Those without a diagnostic history will be far more likely than those with a diagnostic history to have \$0 or \$200 of costs the next year and far less likely to have high costs. Average expected costs for the 50,000 Healthy People are 50% less than the average costs for all 100,000 people and the average costs for the 50,000 Unhealthy People are 50% more.

Figure 11

Demonstration: Healthy and Unhealthy People

Expected Annual HC Cost	Starting Population	Healthy People	Unhealthy People
Percentage of People			
\$0	30.0%	45.0%	15.0%
\$200	20.0%	25.0%	15.0%
\$2,000	20.0%	15.0%	25.0%
\$10,000	20.0%	10.0%	30.0%
\$20,000	8.0%	4.5%	11.5%
\$50,000	1.5%	0.3%	2.7%
\$200,000	0.5%	0.2%	0.8%
Total	100.0%	100.0%	100.0%
Number of People			
\$0	30,000	22,500	7,500
\$200	20,000	12,500	7,500
\$2,000	20,000	7,500	12,500
\$10,000	20,000	5,000	15,000
\$20,000	8,000	2,250	5,750
\$50,000	1,500	150	1,350
\$200,000	500	100	400
Total	100,000	50,000	50,000
Average Expected Cost:	\$5,790	\$2,800	\$8,780
Differential: As Compared To:		-51.6%	51.6%
		Starting Population	

One might be tempted to think that if an insurer, via risk adjustment, gets 50% less for Healthy People insureds and 50% more for Unhealthy People insureds, the system should work fine. It will, if the two populations are internally “homogenous”,⁴⁷ meaning that there are no further ways to differentiate meaningful segments within the two populations. But the populations are likely not homogenous.

For example, some of the Healthy People may not actually be healthy. They may instead be people who resist going to the doctor, as the result of denial, philosophy, or general irresponsibility. Generally irresponsible people may also routinely engage in risky behaviors and activities which undermine their future health. People who resist going to the doctor may have poor health, but they

⁴⁷ Homogeneity of risk classes is an important risk adjustment precept articulated by the DxCG researchers who have constructed several generations of Medicare risk models (Pope, et al., 2004). Unfortunately it is very difficult to achieve.

have no recent diagnoses or prescription drug history and will only show up in the health care when they are in a crisis. I will refer to those who should go to the doctor or modify their behavior, but don't, as the Unidentified Sick and assume that they are 10% (5,000) of the Healthy. While they are even more likely than the Healthy People to have \$0 costs, they are also considerably more likely to have high costs. Overall they have costs on par with the Unhealthy People. When the Unidentified Sick are removed from the Healthy, the resulting Truly Healthy have even lower average costs than the Healthy.

Figure 12

Demonstration: Further Differentiation of Healthy People

Expected Annual HC Cost	Starting Populatio	Healthy People	Unhealthy People	Unidentified Sick	Truly Healthy
Percentage of People					
\$0	30.0%	45.0%	15.0%	40.0%	45.6%
\$200	20.0%	25.0%	15.0%	20.0%	25.6%
\$2,000	20.0%	15.0%	25.0%	10.0%	15.6%
\$10,000	20.0%	10.0%	30.0%	11.0%	9.9%
\$20,000	8.0%	4.5%	11.5%	15.0%	3.3%
\$50,000	1.5%	0.3%	2.7%	2.5%	0.1%
\$200,000	0.5%	0.2%	0.8%	1.5%	0.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Number of People					
\$0	30,000	22,500	7,500	2,000	20,500
\$200	20,000	12,500	7,500	1,000	11,500
\$2,000	20,000	7,500	12,500	500	7,000
\$10,000	20,000	5,000	15,000	550	4,450
\$20,000	8,000	2,250	5,750	750	1,500
\$50,000	1,500	150	1,350	125	25
\$200,000	500	100	400	75	25
Total	100,000	50,000	50,000	5,000	45,000
Average Expected Cost:	\$5,790	\$2,800	\$8,780	\$8,590	\$2,157
Differential: As Compared To:		-51.6%	51.6%	206.8%	-23.0%
		Starting Population		Healthy People	

Notes: Starting Population = Healthy People + Unhealthy People
Healthy People = Unidentified Sick + Truly Healthy

If risk adjustment does not recognize the difference between the Unidentified Sick and the Truly Healthy, then the insurer who figures out how to attract and retain more of the Truly Healthy from within the Healthy People and avoid the Unidentified Sick will come out financially ahead of the insurer who gets a disproportionate number of Unidentified Sick. In this scenario, the insurer will not care whether it gets more or less Unhealthy People as the insurer will receive a “fair” premium for the Unhealthy People.⁴⁸ But the insurer cares a lot about whether it gets more or less of the Unidentified Sick within the Healthy. The insurer will lose money with too many Unidentified Sick and make money by successfully avoiding them. Figure 13 demonstrates that successful selection is predicated on the percentage of Unidentified Sick, not the percentage of (known) Unhealthy People. A successful strategy, in fact, can include a disproportionate number of Unhealthy People as the Expected Cost is exactly equal to the Risk Adjusted Premium for the Unhealthy People.

Figure 13

Demonstration: Financial Impact of Selecting on the Unidentified Sick

Population	Number	Expected Cost	Risk Adjusted Premium	Distribution of Insureds		
				"Normal"	Successful Selection	Unsuccessful Selection
Unidentified Sick	5,000	\$8,590	\$2,800	5.0%	2.0%	10.0%
Truly Healthy	45,000	\$2,157	\$2,800	45.0%	38.0%	50.0%
Unhealthy People	50,000	\$8,780	\$8,780	50.0%	60.0%	40.0%
Total	100,000			100.0%	100.0%	100.0%
Expected Cost				\$5,790	\$6,259	\$5,449
Risk Adjusted Premium				\$5,790	\$6,388	\$5,192
Gain/(Loss)				\$0	\$129	-\$257
Gain/(Loss) as % of Premium				0.0%	2.0%	-5.0%

The above example is simplistic, but realistic. Today’s risk adjustment systems do not recognize the difference between the Unidentified Sick and the Truly Healthy. They cannot; after all the

⁴⁸ In fact the insurer probably does care as there are probably ways to subdivide the Unhealthy People just as there are ways to divide the (seemingly) Healthy People. This will be discussed in subsequent paragraphs.

Unidentified Sick are unidentified as per today's risk adjustment techniques. I will demonstrate in Chapter III, however, that there is reason to believe that by looking at variables outside of claim files insurers will be able to identify the people who are most likely to be the Truly Healthy and those most likely to be the Unidentified Sick and develop indirect risk selection strategies accordingly.

Large claims have a disproportionate effect worthy of specific discussion. Insurers will choose to select if the selection will likely cause a profitability impact. Simplistically, the profitability impact is the product of the number of people selected and the profitability differential between those selected and those that would have been selected by default. More profit therefore can be made by either 1) selecting more people or 2) selecting people who have the largest profitability differential.

The largest profit differentials are with respect to people who have severe health conditions that are likely to generate \$100,000 more in claims, but for whose risk adjusted premium is much less than their expected costs. This is quite possible. A typical heart patient might have expected costs under \$20,000 a year. A heart patient who is a candidate for a heart transplant, however, might have expected costs of well over \$100,000, either because the patient will have the transplant or because the patient will have expensive care while the patient waits for the transplant or possibly dies. As previously discussed current risk adjustment models do a poor job differentiating by illness severity; none of them differentiate by intended treatment.⁴⁹

So far the discussion has focused on rather broad-based selection strategies, such as selecting between the Truly Healthy and the Unidentified Sick. The other possibility is much more specific: actively avoid the people who are most likely to produce large losses and if they are already insureds, "encourage" them to go elsewhere, such as making sure not to have an affiliation with the region's high

⁴⁹ No one suggests a model which uses intent to treat. As a matter of social policy, no one wants to pay insurers or providers more for simply providing more care, irrespective of whether care is needed or not. Hence the use of prior healthcare utilization was rejected early on as a risk prediction variable even though prior utilization is statistically valuable (Dunn, et al., 1996; Ellis, et al., 1996).

volume transplant surgeons. The example in Figure 14 and Figure 15 shows that gaining or losing just 0.5% of “Very Ill” potential enrollees can have a very significant bottom line profitability impact.⁵⁰

Figure 14

Demonstration: Differentiation of the Unhealthy by Severity

Expected Annual HC Cost	Starting Population	Healthy People	Unhealthy People	Somewhat Unhealthy	Very Ill
Percentage of People					
\$0	30.0%	45.0%	15.0%	15.3%	0.0%
\$200	20.0%	25.0%	15.0%	15.2%	5.0%
\$2,000	20.0%	15.0%	25.0%	25.4%	7.5%
\$10,000	20.0%	10.0%	30.0%	30.4%	10.0%
\$20,000	8.0%	4.5%	11.5%	11.2%	25.0%
\$50,000	1.5%	0.3%	2.7%	2.1%	32.5%
\$200,000	0.5%	0.2%	0.8%	0.4%	20.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Number of People					
\$0	30,000	22,500	7,500	7,500	-
\$200	20,000	12,500	7,500	7,450	50
\$2,000	20,000	7,500	12,500	12,425	75
\$10,000	20,000	5,000	15,000	14,900	100
\$20,000	8,000	2,250	5,750	5,500	250
\$50,000	1,500	150	1,350	1,025	325
\$200,000	500	100	400	200	200
Total	100,000	50,000	50,000	49,000	1,000
Average Expected Cost:	\$5,790	\$2,800	\$8,780	\$7,686	\$62,410
Differential:		-51.6%	51.6%	-12.5%	610.8%
As Compared To:		Starting Population	Unhealthy Population	Unhealthy Population	

Notes: Starting Population = Healthy People + Unhealthy People
 Unhealthy People = Somewhat Unhealthy + Very Ill

⁵⁰ In health insurance there are always a few very large claims, creating what is known in statistics as a “long-tailed distribution”. Average costs are very sensitive to the number and size of the largest claims; “the tail wags” average costs (Stanton, 2006). Furthermore, it is well acknowledged that risk adjustment models don’t work well in predicting the largest claims. Because the largest claims don’t fit well and will skew the predictions with respect to all other people, risk models are more often than not developed and tested with the largest claims truncated down to a lower value (Schwartz & Ash, 2003; Winkelman, Mehmud, & Wachenheim, 2007).

Figure 15

Demonstration: Financial Impact of Selecting on a Few Truly III

Population	Number	Expected Cost	Risk Adjusted Premium	Distribution of Insureds		
				"Normal"	Successful Selection	Unsuccessful Selection
Healthy People	50,000	\$2,800	\$2,800	50.0%	50.0%	50.0%
Somewhat Unhealthy	49,000	\$7,686	\$8,780	49.0%	49.5%	48.5%
Truly III	1,000	\$62,410	\$8,780	1.0%	0.5%	1.5%
Total	100,000			100.0%	100.0%	100.0%
Expected Cost				\$5,790	\$5,516	\$6,064
Risk Adjusted Premium				\$5,790	\$5,790	\$5,790
Gain/(Loss)				\$0	\$274	-\$274
Gain/(Loss) as % of Premium				0.0%	4.7%	-4.7%

I. Deciding to Select

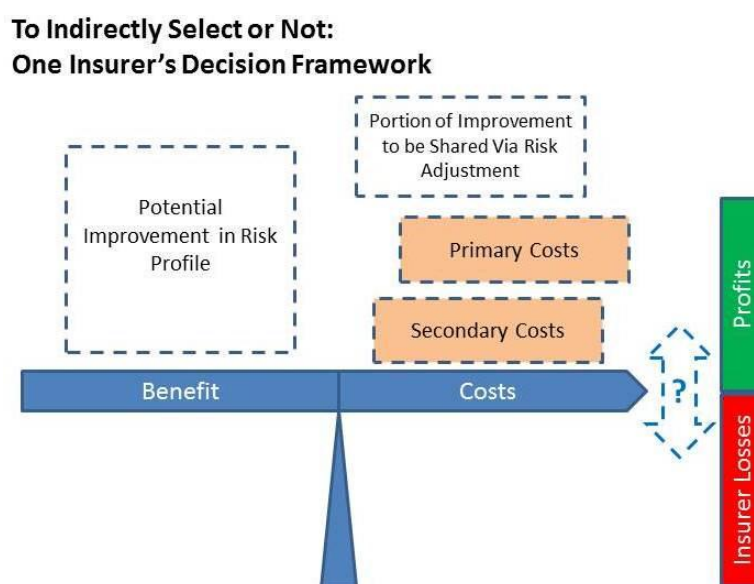
If risk adjustment is incomplete, insurers may be able to benefit from indirect selection – particularly if they can identify variables not in the risk adjustment model which help them to broadly segment risk or to identify the most unprofitable potential insureds. If so, insurers may then then deliberately use indirect selection to obtain competitive advantages or to at least guard themselves from being at a competitive disadvantage. If multiple insurers do so, an arms race could emerge. As insurers in an arms race increasingly work to attract potentially more profitable insureds to their plans and to discourage potentially less profitable insureds, de facto insurance choices for categories of consumers who share one or more risk characteristics will become increasingly limited. The system may balance at some point, but when it does some categories of insureds may no longer be able to purchase insurance from a competitive market of insurers and plans. Chapter III will discuss the details of how indirect selection might be accomplished. This section will concentrate on the decision to engage in such behavior.

Insurers who have been utilizing direct selection (underwriting) for decades in order to meet their profit goals and maintain competitiveness now have a strategic void to fill. Their competitive will

has not been lost, but their primary means for maintaining competitiveness has been curtailed. They may look to indirect selection to fill the void, particularly if competing on quality and price is proves to be daunting. Profit maximizing insurers will engage in indirect selection if they see a profitable opportunity; even less-than-profit-maximizing insurers⁵¹ will engage in indirect selection if they see their profit maximizing competitors doing so and they are concerned with the loss potential caused by insuring the market “leftovers”.

Insurers will assess potential profitability of indirect selection by examining the associated benefits and costs. The benefit is an improved risk profile and hence lower expected healthcare costs. Some portion of the changes in risk profile will flow through into risk adjustment. On the cost side, are the primary and secondary costs associated with developing and executing an indirect selection strategy. The insurer’s analysis can be depicted as:

Figure 16



Note that unlike the previous figures, this figure represents one insurer, not an entire system. The outer boundaries of the boxes and the profit/loss arrow are dashed to indicate that sizes are unknown.

⁵¹ Not all insurers are for-profit corporations.

The benefits of indirect selection must exceed the risk sharing primary and secondary costs in order for the indirect selection strategy to be profitable. It is useful to examine each of the new blocks.

Primary costs are the immediate monetary costs necessary to develop, deploy, and maintain an indirect selection strategy. These costs include the cost to acquire outside data and the internal and consultant time in order to develop and implement the strategy. Primary costs are associated with an indirect selection strategy.

In contrast secondary costs result from an indirect selection strategy. They may be intangible and probabilistic, such as the potential loss of a positive consumer image or a regulatory license. These costs are important considerations. Even though indirect selection may be difficult to regulate, it is clearly not sanctioned under the healthcare reform legislation. Sections 1302, 1331, 1557, 2704, 2705, and 2706 variously prohibit “*discrimination*” with respect to “*pre-existing conditions*”, “*health status*”, “*health status related factors*”, “*expected length of life*”, disability, age, race, gender, national origin, religion, and other factors. Section 2706 says that wellness efforts should not be a “*subterfuge for discrimination*”. Section 1311 mandates that qualified health plans “*include within health insurance plan networks those essential community providers, where available, that serve predominately low-income, medically-underserved individuals*”. These passages suggest that purposeful indirect selection is not acceptable. An insurer who is found or suspected of purposefully benefiting from indirect select may garner unfavorable press and face potential regulatory sanctions. These potential costs will be factored into the insurer’s decision to indirectly select or not.

Figure 16 suggests how regulators can minimize indirect selection. One method is to refine risk adjustment so that an increasing portion of any selection gain (and loss) is shared with other insurers. Another method is to increase the secondary costs, primarily by actively monitoring for indirect selection and imposing penalties when indirect selection is detected. The third method, increasing

primary costs, can be accomplished by taxing indirect selection efforts or the data required to develop indirect selection strategies. The third method involves sanctioning indirect selection. Indirect selection is against the letter and intent of healthcare reform. I therefore will not discuss the third method any further. Regulators need to concentrate on the first two methods: enhancing risk adjustment and increasing secondary costs.

J. Social Costs

The societal costs of not minimizing indirect selection must be an integral part of any discussion as to when, why, and how regulators should take action to minimize indirect selection. The societal costs may be substantial and multi-faceted. Joseph Newhouse (Newhouse, Risk Adjustment: Where Are We Now, 1998), a Harvard professor and one of the preeminent authorities on health insurance systems, writes that absent adequate risk adjustment:

1. *Plans have an incentive to configure their product(s) and market their services so as not to appeal to bad risks. Because all plans have such an incentive, bad risks could find themselves treated as pariahs.*
2. *Plans have an incentive to appeal to good risks. In effect, competition for good risks means some of the potential profit on good risks is likely to be spent attracting them, but resources so spent may be socially wasteful.*

Baker (Baker T. , 2003) points out that both results tend to maintain, rather than eliminate, social inequalities. The person who most needs insurance to maintain or improve his status does not

get insurance or gets it on less favorable terms. The person who least needs insurance has more insurance options and better insurance benefits.⁵²

Van de Van and van Vliet (1992) pointed out that favorable⁵³ indirect selection is counterproductive with respect to “*the three supposedly positive effects of competition*”, “*quality and efficiency of care and becoming more responsive to the consumers’ preferences*”. Competition, quality, efficiency, and responsiveness to consumer preferences are central goals of today’s healthcare reform.

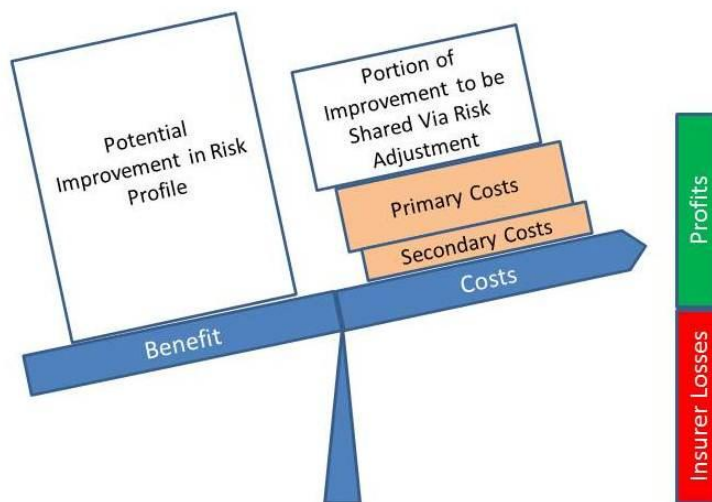
Newhouse’s effects can be placed into the conceptual models. I will start with the second effect – the social waste of resources in the form of direct and secondary selection costs. If, as before, I identify socially undesirable model elements of the model via colored shading, the decision to indirectly select is depicted as:

⁵² It is interesting to note that the social costs of indirect selection result from insurance being oversold to the privileged and undersold to the vulnerable. This is the opposite direction of the typical discussion of the social costs of target marketing. The typical discussions of the social costs of targeting market concern the overselling of potentially harmful consumer products (such as unhealthy food, alcohol, and cigarettes) to vulnerable populations (Smith & Cooper-Martin, 1997). Health insurance is a beneficial rather than potentially harmful product and therefore the concern is its limited availability to vulnerable populations. The same applies to other financial risk products, including life insurance and mortgages (Holmes & Horvitz, 1994). Regardless of whether a product is over or under sold to a particular population target marketing results in distributional effects which are of concern to society.

⁵³ Profitable.

Figure 17

One Insurer's Decision to Select



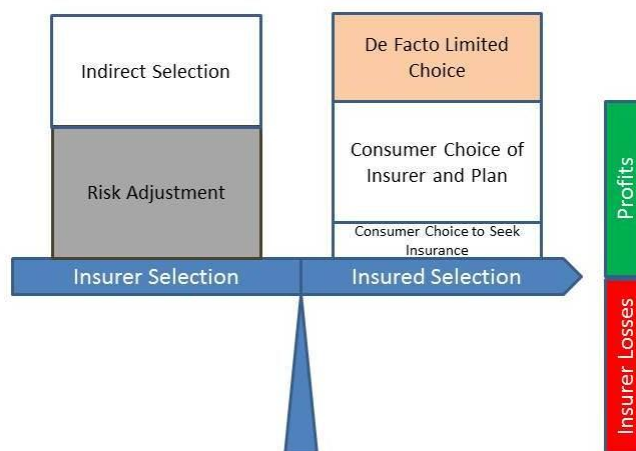
The arrow is pointing to profitability as insurers will only expend selection costs if they believe selection will be profitable. Van de Ven and coauthor's (van de Ven W. P., van Vliet, van barneveld, & Lamers, 1994) discussion of risk adjustment within the Dutch health system is entirely consistent with Figure 17.

An important takeaway from Figure 17 is that risk adjustment does not need to be perfect. It does not need to absorb the gain from an improved risk profile. It just needs only to absorb the gain net of costs. The analysis of potential profitability will vary by the circumstance of the particular insurer. For example, Van de Ven and coauthors (1994) point out that the costs may be different for small companies and large companies as larger companies may have more to lose reputationally and therefore assign a higher secondary cost to reputation risk.

Assuming that at least some insurers will select, we will now incorporate Newhouse’s first social waste – limited choice for certain risks into the insurance system model. When risk adjustment is not sufficient, insurers select, and the market subsequently balances,⁵⁴ the balance looks like this:

Figure 18

**Post-Healthcare Reform Individual Health Insurance Market:
With Indirect Selection – If it Balances**



This Figure 18 uses the term “de facto limited choice”. De facto limited choice includes both limited choice (such as a narrow range of plans in a market) and scenarios where choice appears to be present, but is not practical from the perspective of some portion of consumers. For example, a consumer may have the choice of 4 insurers but maybe only 1 insurer will have providers within a reasonable distance of the consumer’s home. For all effective purposes that consumer does not have a choice of insurers.

The natural consequence of a market in which insurers compete based on indirect selection is a limited set of choices for a portion of the consumer population – generally, but not necessarily, high risk

⁵⁴ It is not a given that the competitive market will balance – reach equilibrium. In 1976, in one of the most cited insurance papers ever, theoretic economists demonstrated that “*not only may a competitive equilibrium not exist, but when equilibria do exist, they may have strange properties*” (Rothschild & Stiglitz, 1976). Absent a competitive equilibrium a market may collapse or shrink to only one insurer.

individuals. Other people, however, will still have a competitive variety of choices. We will discuss indirect selection actions and consequences in more detail in the next two sections.

Fortunately there are a range of potential regulatory interventions and monitoring strategies which can be deployed by regulators to limit indirect selection. They will be the topic of the final chapter of this paper. In the next chapter we will discuss how insurers may construct indirect selection strategies.

III. INDIRECT SELECTION UNDER HEALTHCARE REFORM

A. Intent

The previous chapter was theoretical. Any discussion of post-healthcare reform must be theoretical as the provisions of healthcare reform which will fundamentally restructure the individual health insurance market will not go into effect until January 2014. While it is impossible to know what insurers will actually do, it is possible to assess their intent, the intent of their consultants, and the availability of necessary data and technical skills.

The **Error! Reference source not found.** documents McKinsey's intent to help clients develop indirect selection strategies and methodologies. McKinsey is not the only consulting firm offering such advice. Market segmentation is nearly a mantra for the consultants, and even some academics, who are thinking about how insurers will competitively succeed in the post healthcare reform market.

Some of the thinking is an extension of thinking that started before healthcare reform. Since 2008 Deloitte has been advising insurers to "*expand market segmentation analyses beyond demographics and health status*" (Keckley & Eselius). Sometime in 2009 Booz & Company predicted that in response to reform "*insurers will need to deepen their retail capabilities and adopt a more sophisticated consumer lifetime value business model*" and "*reevaluate their consumer targeting marketing strategies*" (Knott, Nallicheri, Lall, & Kaura). Based on a survey of healthcare payer experts, IDC Health Insights researchers in January 2010 predicted that "*segmentation will become the new strategic asset*".

Just as healthcare reform was being passed in February 2010, Ingenix,⁵⁵ the consulting arm of the insurance giant United Health Group, advised insurance clients that they should "*design pro-active products and programs that attract, retain, incent and balance a membership... to remain profitable*".

⁵⁵ Now named Optum.

Oliver Wyman, presumably in early 2010,⁵⁶ advised insurers to post-reform *“segment your customers based on sensitivity to price, brand, and product – but also in terms of their attitudes: how they want to access product, for example, and their potential for engagement in wellness programs, disease management, and other ‘pro-health’ activities”* (Oliver Wyman). Forte Partners published an article in March 2010 titled *“Healthcare Marketing (The Basics): Market Segmentation”*. It specifically advised segmentation by geography, demography, values, lifestyle, and behavior (Forte Partners).

In June 2010, three months after healthcare reform was passed, an article appeared in Health Affairs (Brennan & Studdart) that talked of the importance of *“strategic market segmentation”* under healthcare reform. Sometime in mid-2010 CloserLook, a boutique firm dedicated to serving health insurance clients, wrote *“A bold new world without medical underwriting doesn't mean you can't do everything in your power to attract young, healthy customers. It just means you have to find different ways of doing it. You won't be able to eliminate the unhealthy. You will have to find ways to attract and close your target customers, and they may not be who you think they are now”* (Riley, 2010). In an earlier essay they seemingly advocated given worse customer service to less desirable existing customers (Riley, 2009) and in more recent essays Riley talks about specific strategies for identifying and targeting the *“best insurance customer”* (Riley, 2011-1; Riley, 2011-2)

In September 2010, the Director of Product development for Emblem Health, gave a presentation at a health insurance marketing conference where he said that future success will require a *“new understanding and definition of the customer and more sophisticated customer segmentation”*, *“more customer sensitive product design”*, *“sensitive pricing and risk modeling”* (WorldRG.com, 2010).

Milliman, the largest actuarial consulting firm, and Deloitte are more specific than the consultants and others cited above concerning *“the how”* of market segmentation. Milliman prepared a marketing piece March 2010 which advised health insurance clients that post-healthcare reform

⁵⁶ Article is not dated but appears to be post healthcare reform.

insurers should use a Lifestyle Based Analytics (LBA) tool, such as the one developed by Milliman, to *“focus specifically on how to attract good risks”* (Draaghtal, 2010).

Chris Stehno, previously with Milliman, and now with Deloitte has been giving talks and writing articles for years about using lifestyle-based analytics as a supplement to or replacement for medical underwriting. Lifestyle analytics, as envisioned by both Milliman and Deloitte use individual-level consumer marketing databases and neighborhood-level demographic and consumer databases to assign risk scores to potential and current customers (Stehno & Johns, 2006; Stehno, 2009; Shreve J. , 2009-1; Shreve J. , 2009-2; Shreve J. , 2009-3; Moore, 2010).

In November 2010 the Wall Street Journal (WSJ, 2010) published an article about how the U.S. arm of a British life insurer has tested Deloitte methodology and consumer marketing data for life insurance underwriting and found that the model yielded results *“closely aligned with those of purely traditional underwriting decisions”*. Hence consumer marketing databases could be used to at least partially replace traditional medical underwriting. Granted, the WSJ article concerns life underwriting, but the same factors that predict mortality often also predict morbidity.

Because underwriting, whether direct or indirect, is a less politically sensitive topic within life, property, and casualty insurance than health insurance, insurers and their consultants are more willing to talk about the use of consumer marketing data for underwriting these lines of insurance. In May 2010 the Society of Actuaries sponsored a seminar concerning Predictive Modeling for Life Insurance. Deloitte presented their services (Moore, 2010). Equifax⁵⁷, a large consumer marketing data vendor, pitched their data (Rubeck, 2010). And a property and casualty (P&C) insurance actuary presented (Wu, 2010) the history of predictive analytics within the sector (P&C pioneered the use of predictive analytics within insurance). He noted that at first predictive analytics was a *“secret weapon”* whereby *“early believers and users... gained significant competitive advantage”*.

⁵⁷ Since acquired by Alliance Data Systems Corp.

The next two subsections will describe consumer marketing data and how such data might be used by health insurers in predictive models as a secret weapon to enable target marketing and to gain an early advantage under healthcare reform.

B. Consumer Marketing Data

Consumer marketing data can be divided into two broad categories. The first is geographically defined data, which I will refer to as neighborhood-level data. The second is individual/household-level data. Multiple, competing marketing data companies have invested huge resources in developing consumer datasets. These datasets are used every day by a spectrum of industries.

This paper will describe the data offered by two vendors. While there is variation in the depth, breadth, quality, and price of data between vendors, there is a fair amount of similarity as they are all pulling from a finite number of data sources.

Easy Analytic Software, Inc. (EASI) is one of the vendors cited in a presentation prepared by Stehno (Houston & Stehno, 2007) as a provider of geographically-defined data. EASI provides US data at the block group, census tract, zip code, city, and county levels. Most of the data is available for the most recent census, the current year, and a 5 year forecast. The following types of data are available (EASI, 2010):

Figure 19

Neighborhood-Level Data Available from EASI

DEMOGRAPHICS

- *Ancestry, Asian Country of Origin*
- *Ancestry, Country of Origin*
- *Ancestry, Hispanic Country of Origin*
- *Demographic Profiles*
- *Education, Detailed Characteristics*
- *Employment, Detailed Characteristics*
- *Households, Detailed Characteristics*
- *Housing, Detailed Characteristics*
- *Income, Distribution by Age of Householder*
- *Income, Family Characteristics*
- *Income, Household Characteristics*
- *Income, Racial Characteristics*
- *Population, Detailed Characteristics*
- *Population, Distribution by Age, Race, Gender*
- *Population, Family Characteristics*
- *Population, Racial Characteristics*

CONSUMER EXPENDITURES

- *Current Year Estimates*
- *5 Year Forecasts*

RETAIL SALES

- *Total Retail Sales*
- *Retail Sales by Store Groups*

BUSINESS COUNTS

- *Employee Counts (Broad)*
- *Employee Counts (Detailed)*
- *Establishment Counts (Broad)*
- *Establishment Counts (Detailed)*
- *Occupation Counts*

MISCELLANEOUS

- *Cost of Living*
- *EASI Profiles*
- *Quality of Life (includes Crime and Weather)*
- *Sales Potentials*

ADD-ON DATABASES

- *Life Stage Clusters*
- *Minor Store Group Sales*
- *Major Merchandise Line Sales*
- *Time Use Variables*

In contrast to the above neighborhood-level data, infoUSA provides individual/household-level data. According to the WSJ (WSJ, 2010) the leading vendors for individual/household-level data are: Acxiom, Alliance Data Systems Corp (formerly Equifax⁵⁸), Experian, and InfoUSA (aka, InfoGroup).

infoUSA's data includes (infoUSA.com, 2010):

Figure 20

Individual/Family-Level Data Available from infoUSA.com

GEOGRAPHY

Use virtually any definition of geography to define a dataset of individuals and/or families

DEMOGRAPHICS

- *Adult Age*
- *Estimated Household Income*
- *Marital Status & Gender*

HOUSING AND FINANCE

- *Home Ownership*
- *Home Value*
- *Housing Type / Number of Units*
- *Length of Residence*
- *Year Home Built*
- *Mortgage (Y/N)*
- *Mortgage Type*
- *Estimated Wealth*
- *Number of Credit Cards*

OTHER

- *Hobbies and interests (multiple subcategories of each of the following)*
Apparel/Fashion/Beauty, Books/Magazines/Music, Charitable Donor, Cooking/Wine, Collectibles, Crafts/Sewing, Ethnic Products, Gambling/Games/Sweepstakes, Health/Diet/Fitness, Home Improvement/Décor, Motor Vehicles/Motorsports, Outdoor Recreation, Personal Finance/Self-Help, Pets/Animals, Photography, Politics/Religion/News, Purchase Behavior, Sports, Technology/Entertainment, Travel
- *Household with children, grandparents, or veterans*
- *Ethnicity (50 categories)*
- *Religion (10 categories)*
- *Voter Information*
- *Type of mailing address*

⁵⁸ The Direct Marketing Service Division of Equifax was acquired by Alliance Data Systems as of July 1, 2010 (Reuters, 2011).

This list of data elements aligns reasonably well with Experian's list (Experian, 2010). Experian has additional interesting fields, such as estimated home equity and occupation. Equifax's data may be even more nuanced.

The individual-family level data is compiled from a variety of sources, including public records, warranty cards, customer surveys, magazine subscriptions, credit card purchase patterns, on-line registrations, store preferred-customer applications and purchase records (Stehno & Johns, 2006). Public records include motor vehicle, property, and court records. Credit card data can be particularly robust and may originate from the credit card company or from the store where the purchase is made. Stores routinely ask credit card purchasers their zip code. Stores use the name from the credit card and the zip code to link the purchase to a specific person and address (AP, 2011).⁵⁹ They then use the data for their own marketing purposes and also resell it to consumer marketing companies. Credit card companies, of course, already have detailed data on most adults.

Although analysts often work from summarized data, such as the data shown above, the data is also available in a more granular form. Stehno commonly speaks of up to 3,000 data fields per person (Stehno, 2009). Consumer data companies will work with clients to build custom summaries different than those detailed above. For example, Stehno claims that he can assess the quality of a person's/family's diet, including the probability of obesity, based on their fast food, grocery store, and dining purchase data. Individual/family-level data is available for approximately 95% of the people in the US (SOA Record, 2005).

The individual-family level data outlined above is considered to be neither protected health information (PHI) as regulated under the Health Insurance Portability and Accountability Act (HIPAA) nor credit information as regulated under the Fair Credit Reporting Act (FCRA). As such, insurance

⁵⁹ Gas stations are the exception. They transmit zip codes to the credit card company for identification purposes and do not store the number for their own use (AP, 2011).

companies can access the data without individual consent and use it for insured segmentation, target marketing, and other strategies (Shreve J. , 2009-2).

Ultimately neighborhood-level and individual-family level datasets converge. The neighborhood-level data starts with US census data, at the block and census tract level and builds from there. Individual-family level data is rolled up to the neighborhood level. Stehno said at a conference that neighborhood-level data is nearly as good as individual/family level data for making individual-level predictions.⁶⁰ In addition to consumer data, business and other data is collected from a variety of sources and mapped to neighborhoods. Business data can tell a lot about the characteristics of a neighborhood, including safety and availability of healthy food choices – characteristics which affect health risk.

It is important to note that consumer data is never 100% accurate. The data companies start with bits and pieces of data, some of which is old (up to 10+ years for census data) and much of which is incomplete (people still anonymously pay cash for some purchases). They then build predictive models in order to make best guesses regarding the variables in the above lists.⁶¹ But even with the resulting inaccuracies, client companies in a variety of industries have found value in using the data for market segmentation.

It is also important to note, that unlike epidemiology, with respect to predictive modeling, correlation is as good as causation. For example, middle-aged people who drive sports cars may be healthier than their peers. If so, even though owning a sports car clearly doesn't cause good health, sports car ownership may legitimately be used in a predictive model to identify healthy people. Slimmer, more mobile (no bad knees and backs), and more affluent people may own sports cars. Weight, mobility, and affluence are not captured by today's risk adjustment systems.

⁶⁰ Predictive Modeling Symposium, Oct 8-9, 2009, Chicago, IL, a Society of Actuaries sponsored event, as witnessed by Tia Goss Sawhney. Stehno did not provide handouts.

⁶¹ Hence why I, a European-American with an Indian surname, has received marketing calls in Hindi and Punjabi.

Consumer marketing databases provide information concerning 5 of the 9 categories of variables not included in today's health risk adjustment models discussed in Chapter II:

Figure 21

Consumer Marketing Databases Provide Missing Information

Predictive Variable	Consumer Marketing Databases
A. Behavior	X
B. Environment	X
C. Healthcare utility	X
D. Physical and cognitive limitations	
E. Severity	
F. Timing	
G. Genetics	
H. Socioeconomic status (SES)	X
I. Race and ethnicity	X

C. Predictive Model Recipes

Predictive modeling uses the past to predict the future. Consumer marketing data is only a portion of the data required to build the predictive models that will underlay target marketing strategies. Predictive models require a historical data set with input (predictive) variables and at least one outcome variable.

The outcome of most concern for insurers is profit:

Figure 22

$$\begin{aligned} \text{Profit} = & \text{Premium} \\ & - \text{Administrative Expenses} \\ & +/\text{- Risk Adjustment} \\ & - \text{Claim Costs} \end{aligned}$$

But other outcomes are also valuable, often because they are intermediate variables⁶² on the path to profit predictions. For example, an insurer may wish to predict heart disease costs as one of several chronic disease category predictions necessary to predict the claims costs portion of profit.

No one knows the final details of post healthcare reform premiums, administrative expenses, and risk adjustment, but informed estimates can be made. Profit predictions don't need to be precise – they merely have to distinguish the clearly profitable, the marginally profitable, the not profitable, and the biggest losers. Insurers and their consultants can use today's claims files and assumptions about post-healthcare reform premiums, administrative expenses, and risk adjustment to calculate each insured's profitability as if the post healthcare reform market were today.

Insurers can then use names, addresses, and other identifying information to link each of today's insureds to consumer marketing data. Once linked, the insurers can then use predictive modeling techniques to discern which consumer marketing characteristics are most associated with profitable and unprofitable insureds. A profitability score can be developed via the following recipe which can then be used to assess the suitability of future insureds based on their consumer marketing data characteristics. Marketing strategies can be built to disproportionately enroll the most profitable insureds.

⁶² An intermediate variable is an outcome variable for an initial predictive model and a predictive variable for a successive predictive model.

Figure 23

New Business Predictive Modeling Recipe

Ingredients:

- Claims data of today's insureds for one period⁶³
- Reasonable approximations of premiums, expenses, and risk adjustment under healthcare reform
- Consumer marketing data for today's insureds
- Consumer marketing data for prospective new insureds post healthcare reform

Steps:

1. Use claims data of today's insureds
2. Calculate profitability of each insured, assuming post healthcare reform premiums, expenses, and risk adjustment
3. Link profitability to that insured's consumer marketing data
4. Use predictive modeling techniques to determine the profiles of the most profitable and least profitable insureds, perhaps expressed via a profitability score
5. Develop a marketing strategy that post healthcare reform disproportionately enrolls profitable new insureds based on the prospective insureds' consumer marketing data profiles
6. Repeat steps 1 through 5 as new claims data emerges, substituting actual post healthcare reform premiums, expenses, and risk adjustment when they become available

As already discussed, indirect selection is predicated on disproportionately attracting *and retaining* the most desirable (profitable) insureds. The above predictive modeling recipe can be used to build an attraction strategy.

Predictive modeling can also be used to build a retention strategy. Disproportionate retention can be accomplished by keeping the desirable insureds fully satisfied and/or creating sufficient dissatisfaction among the undesirable that they disproportionately move to another insurer. Desirability is forward looking. A profitability loss in the prior period may have significant or no relevance for desirability. The latter is likely in the case of an expensive but fully resolved accidental injury or an acute condition for otherwise low accident, healthy person.

Retention involves people who are already insured. Therefore the insurer has claims data for them. As previously discussed, claims data has predictive value beyond the value already incorporated into risk adjustment. For example procedure codes and total costs can be used to assess severity. Dates

⁶³ One year is the most common period for risk adjustment modeling. But predictive modeling for insurer profitability does not need to be a year. An insurer might be interested in knowing who the most profitable insureds will be over three years.

indicate whether the condition /treatment is current or resolved – highly relevant to future costs. Some insurers also have clinical data.⁶⁴ Finally, the insurer still has access to consumer marketing data.

Claims data, clinical data, and consumer marketing data collectively describe all of the variables described in Chapter II (**Omitted Variables**) that are omitted from today’s risk adjustment models.

Figure 24

Omitted Information Available for Retention Modeling

Predictive Variable	Consumer Marketing Databases	Insurer Claims Files	Insurer Clinical Files, if Available
A. Behavior	X		
B. Environment	X		
C. Healthcare utility	X		X
D. Physical and cognitive limitations		X	
E. Severity		X	X
F. Timing		X	X
G. Genetics			X
H. Socioeconomic status (SES)	X		
I. Race and ethnicity	X		

Collectively the data provides a nuanced view of the insured. This is where narrowly-defined pockets of opportunity can be found. For example, the insurer may find that higher income, better educated insureds with recently diagnosed, mild diabetes are unlikely to have diabetic complications over the next several years. If the risk adjustment is adequate for the costs associated for the average “diabetic w/o complications” (an actual diagnostic group description) then insurers may embrace these

⁶⁴ Insurers with integrated managed care organizations, such as Kaiser Permanente have access to clinical data (Terry, 2011). In recent years other insurers have been adding clinical data to their claims data, mostly in the form of laboratory test result data from preferred laboratories (Grossman, Zayas-Caban, & Kemper, 2009). Emerging health information exchanges may provide a wealth of clinical information.

diabetics while finding ways to send the impoverished, alcoholic, non-controlled diabetic, at high risk for an amputation and kidney failure, elsewhere.

The predictive modeling recipe for retention uses claims data as both a source of predictive variables and a component of the outcome profitability calculation. The recipe therefore requires two periods of claims data.

Figure 25

Retention Predictive Modeling Recipe

Ingredients:

- Claims data of today's insureds *for two periods*⁶⁵
- Reasonable approximations of premiums, expenses, and risk adjustment under healthcare reform
- Clinical data for today's insureds, if available, for the first of the two periods
- Consumer marketing data for today's insureds
- Claims, clinical information (if available), and consumer marketing data for post healthcare reform insureds

Steps:

1. Use the *second period* claims data of today's insureds
2. Calculate profitability of each insured, assuming post healthcare reform premiums, expenses, and risk adjustment
3. Link profitability to each insured's first period claims data, any available clinical data, and consumer marketing data.
4. Use predictive modeling techniques to determine the first period profiles of the insureds who will be most profitable and least profitable in the second period, perhaps expressed via a profitability score
5. Develop a customer strategy that post healthcare reform disproportionately retains profitable post healthcare reform insureds based on the insureds' claim histories, available clinical data, and consumer marketing data profiles
6. Repeat steps 1 through 5 as new claims and clinical data emerges, substituting actual post healthcare reform premiums, expenses, and risk adjustment when they become available.

If these recipes sound complicated it is because they are. Making them work is the province of MS and PhD statisticians working with big datasets on big computers. But they are not novel recipes.

⁶⁵ Risk adjustment models typically use one year of claims data to predict the next year of claims – two one year periods. But predictive modeling for insurer profitability may be different. The periods may be equal or unequal length. For example, an insurer may be interested in using one year of claims data to predict profitability over the next three years.

Very similar recipes have been deployed for years in other industries.⁶⁶ McKinsey and other consulting firms have statisticians with the requisite skills.⁶⁷

D. Selection Touch Points

1. **Conceptual Model**

In Chapter II discussed indirect selection in broad generalities. So this Chapter has simply assumed that insurers will be able to use predictive modeling results to implement indirect selection strategies – strategies that yield a profit net of risk adjustment, primary costs, and secondary costs (see Figure 17). I will now present a conceptual model to depict the touch points that insurers have available for implementing an indirect selection strategy. “Selection touch points” refer to the various decisions and activities by which insurers may influence consumer direct selection – ways by which insurers potentially indirectly select.

The conceptual model calls upon the literature of van de Ven and Ellis (2000), Newhouse (1994), van de Ven and van Vliet (1992), and Ellis (1988), who have provided relatively comprehensive reviews of indirect selection. Unfortunately there is no consistent nomenclature for indirect selection. Van de Ven (van de Ven & van Vliet, 1992; van de Ven & Ellis, 2000) refers to advantageous indirect selection as “cream skimming”, as do other authors. Still other authors refer to “preferred risk selection” and “cherry picking”.⁶⁸ Ellis (1988) refers to “creaming” with respect to the overprovision of services to low

⁶⁶ The recipes are exercises in “predictive modeling”. Predictive models are the basis for market segmentation strategies for a broad range of industries. Predictive modeling for market segmentation is sometimes also known as “database marketing”. Google.scholar.com yields 112,000 articles for “marketing” + “predictive”.

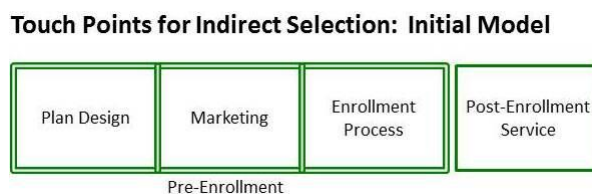
⁶⁷ McKinsey pioneered using non-MBA consultants (McKinsey, 2011). McKinsey employs more than 3,000 masters and higher-level educated consultants who do not have MBA degrees. 1,400 of these consultants have PhDs.

⁶⁸ Depending on context, preferred risk selection and cherry picking can refer to either indirect or direct (underwriting) selection. The authors cited in this section are referring to preferred risk selection and cherry picking in the context of indirect selection. There are sometimes also definitional differences with respect to indirect selection. For example Zweifel (1997) asserts that target marketing, since it involves identifying specific consumers, is direct selection. Targeting a consumer is, however, is a much less direct selection than having the

risk insureds, “skimping” with respect to the under provision of services to high risk insureds, and “dumping” as the explicit avoidance of high risk insureds. Although it has not yet made it into academic literature, the popular press sometimes refers to “cherry picking and lemon dropping”. Although more cumbersome, I prefer “advantageous indirect selection” rather than “cream skimming” and other potential terms as it offers maximum clarity and allows for an easy transition to discussions of disadvantageous indirect selection and direct selection.

Turning now to the touch point model, there is general concurrence that selection can occur pre-enrollment and post-enrollment via differential attraction and retention of insureds. Furthermore, pre-enrollment insurer activities can be divided into three phases: plan design, marketing, and enrollment. Therefore the initial indirect selection touch point model is:⁶⁹

Figure 26



This model, however, is not sufficient. Health insurers can manipulate post-enrollment insured satisfaction and hence retention and disenrollment by imposing barriers to care via their care management processes.⁷⁰ Furthermore, given that PPACA creates at least 50 state markets and the possibility of distinct markets within states (Section 2701), an insurer’s initial selection decision is

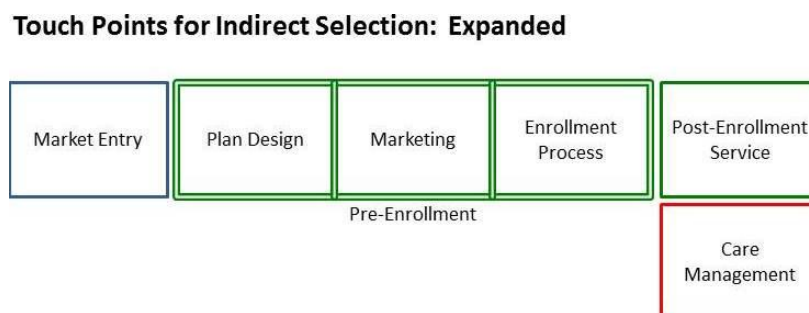
power to overtly deny a consumer coverage, therefore the authors cited in this section and I feel that target marketing is indirect selection.

⁶⁹ The elements of this model are frequently discussed in insurance literature. Denoncour (2010) provides an example.

⁷⁰ Glazer & McGuire (2000), authors of one of the cornerstone papers concerning the use of care management practices as a selection tool, refer to barriers that insurers may impose on services, such as advanced diagnostic tests, which lead to high cost treatments and services, as “shadow prices”.

whether to enter a market or not. Therefore a more expanded selection extends the initial model on both ends:

Figure 27

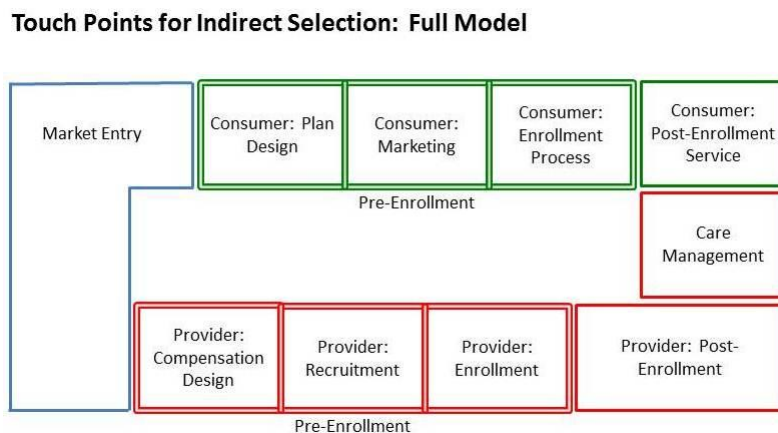


This model is still incomplete, however, as it omits providers. Insurers seek to attract and retain both insureds and providers. An insurer decides to enter and to stay in a market based on the market's potential insureds and providers.⁷¹ An insurer and insurance plan is more or less attractive to insureds based on the providers who provide services. Care management occurs at the interface of insureds and providers. Hence providers must be an integral part of the model, inclusive of the compensation offered the provider, the recruitment of providers, which providers actually enroll with the insurer, whether the provider stays enrolled, and how the provider manages care.

A complete model therefore is:

⁷¹ Preferred provider networks are the norm for today's health insurance plans. Some insurance plans go a step further and have "closed panels". PPACA assumes that insurers will have preferred providers (see PPACA, Sections 2719A, 2709, and 1320).

Figure 28



The model is consistent with the table of selection techniques (Table 2: Health plan response to incentives created by the way that health plans are reimbursed) that van de Ven and Ellis (van de Ven & Ellis, 2000) present and their associated discussion.

In this model, time is loosely represented from left to right. The consumer (green) and provider (red) boxes are purposefully not vertically aligned with each other in order to make the point that consumer decisions are often made based upon the availability and quality of providers and that insurers need to have at least some providers in place before they can attract potential insureds.

2. System Perspective

Figure 28 depicts the touch points by which insurers may be able to affect indirect selection. When considering touch points, it is important to keep the system perspective presented in Chapter II in mind. Insurers indirectly select by influencing the consumer's (or insured's) selection. There needs to be something for consumers to select in order for there to be insurer indirect selection. The more consumers can select, the more insurers will indirectly select (Figure 18). Insurers manipulate the touch points to influence which consumers buy, what plan, from what insurer, at what price; which consumers

continue with their plan at renewal; and which consumers leave. Controlling indirect selection involves 1) improving risk adjustment, 2) limiting consumer choices and/or 3) limiting the ability of insurer's to manipulate the touch points.

A system perspective is also essential to understanding the interrelationship between the touch points. Ultimately these touch points and consumer choice exist in a complex interrelated system, hence the circular design. Change with respect to one touch point may result in change with respect to other touch points. For example, a change in a care management policy, such as requiring a cumbersome pre-approval of certain services, will affect the retention of providers and insureds. The loss of providers may elicit additional losses of insureds and the loss of insureds may elicit the loss of additional providers, which may then cause the insurer to pay the remaining providers more.

E. Market Segmentation

There are therefore three necessary components to an indirect selection strategy: consumer choice, the ability to differentiate between consumers most likely to be profitable and consumers most likely to be unprofitable – market segmentation, and ability to influence consumer choice via one or more of the touch points. The touch points may be either consumer-side (top of Figure 28) or provider-side (bottom of Figure 28) touch points. A full range of touch points is ideal, but either consumer-side or provider-side touch points may be sufficient to affect indirect selection.

Figure 29

Indirect Selection Strategies Require:

Consumer Choice + Market Segmentation + Available Touch Points

Ideally, but not required (one side may be sufficient):

Available Consumer-Side Touch Points + Available Provider-Side Touch Points

Insurers will rely upon predictive models to describe the profitable and unprofitable (post risk adjustment) market segments. They will then design their touch points accordingly. The segments may be defined using any available predictive variable that an insurer has available either in-house or from a consumer marketing databases. As discussed in Chapter II, the variables will most likely be variables not incorporated in today's risk models⁷² and will describe either sizeable populations of people who have at least modest post-risk adjustment risk differences or smaller groups of people who have substantially greater cost differences. No academic who has considered health insurance indirect selection would disagree.

F. Academic Shortcomings

Academic thinking with respect to health insurance indirect selection, however, has not kept up with professional practice. First, academics have not considered the power of consumer marketing databases. I have been unable to find a single reference in the academic literature that discusses the possibility of incorporating consumer marketing databases into the development of health insurance (direct or indirect) selection strategies. The closest that I have found is by Duncan (2011), a practicing actuary with an academic affiliation, who prepared a risk adjustment textbook for actuaries. He devotes several early pages of his book to the use of consumer databases. Clearly the practitioners are well ahead of the academics. Seemingly unnoticed by the academics and, most likely, the regulators that the academics advise, practitioners have tapped into and plan to increasingly tap into this massive and powerful data source. Even if academics have noticed, there is little that they can do with respect to empirical analysis. Insurers and their consultants have access to identified claims data, inclusive of

⁷² Variables included in today's models may be used if the estimates associated with those variables are biased or the outcomes heterogeneous. But such results are not the "low hanging fruit" and lead to technical discussions beyond the scope of this paper.

addresses, that they can link to consumer marketing databases. Because of privacy constraints, the insurance information that gets passed to academics is de-identified. Academics therefore cannot link insurance data to consumer databases.

Second, academic thinking with respect to health insurance also falls short with its nearly exclusive focus on the individual. Academics focus on whether a given person is healthy or not healthy and whether risk adjustment appropriately adjusts for that person's risk. Risk adjuster performance is most commonly reported in terms of R^2 (R-squared) – the fit between the risk prediction and the actual costs at the individual level. Any errors in the prediction are assumed to be randomly distributed. The purpose of insurance, however, is to spread risk. The profitability or non-profitability of a single insured does not matter if the total number of insureds is big enough. An insurer with a sufficiently large number of insureds can “afford” an unprofitable insured; an insurer cannot necessarily afford an unprofitable block⁷³ of insureds.

Under healthcare reform insurers will not target individuals; they will target “market segments” of individuals. Market segments are one way to define a block of insureds. Market segments, at least for other industries, are very often defined by neighborhood, SES, and race and ethnicity. While within any segment there are healthy and unhealthy people, desirable and undesirable risks post risk-adjustment, the marketing focus is on the overall potential profitability of the segment not any one person. The academic literature has not systematically looked at the ability of risk adjusters to correctly predict risk for market segments as opposed to individuals.⁷⁴ There are reasons to believe that if academics examined market segments, they would find that the risk adjustment errors are not random,

⁷³ I use the term “block” to refer to a collection of insureds although “group” is more common. This avoids confusion with the group insurance market.

⁷⁴ In the only academic papers that I have been able to find concerning selection within risk selection, Shen and Ellis (2002) empirically demonstrated the possibility of using competitive risk adjusters to risk select against a given risk adjuster and Kronick (2000) demonstrated that high and low-risk population subsets may have costs different than the costs predicted by CDPS risk adjustment. These are valuable papers, but they don't examine neighborhood, SES, or race and ethnicity.

that they are related to the characteristics of the individuals' market segments. If so, some segments will be consistently profitable while others will be consistently unprofitable.

G. Neighborhoods

Market segments can be defined by neighborhood. Because most people seek primary care and, to a lesser extent, hospital and specialist care from providers near their homes, it is relatively easy for an insurer to design both consumer and provider touch points to differentially appeal to potential insureds in different neighborhoods. In our society people live in neighborhoods⁷⁵ that are segregated by socioeconomic, race, and ethnicity. Furthermore there is abundant evidence of health and healthcare use disparities by socioeconomics, race, and ethnicity. There is therefore reason to believe that healthcare costs vary by neighborhood characteristics -- even after risk adjustment. The convergence of cost differences and available touch points creates opportunities for indirect selection.

Examples will help clarify. Imagine two neighborhoods dominated by young adults and their children. The young adults in one neighborhood are college graduates, living middle class or higher lives, with at least one member of most households professionally employed. The neighborhood grocery store is overflowing with vegetables and fruits from around the world. Births are typically planned in the context of stable relationships. The other neighborhood consists of young adults who typically did not finish high school, most of whom have no stable employment, with everyone living at or near poverty. The neighborhood is known for drugs and violence. The men are in and out of jail. The nearest full-service grocery store is miles away and few households have cars. Nearly all children are born to unwed mothers. Yet, the neighborhoods have similar age and diagnostic health profiles, in part

⁷⁵ There is no consistent definition of neighborhood in either the academic or practitioner literature. In this context I mean geographies that incorporate relatively homogenous groups of people based on socioeconomics, race, ethnicity, and community healthcare providers.

because although people in the second neighborhood have more chronic health conditions many have not sought treatment for the conditions in the past year.

People in the second neighborhood are more likely to experience traumatic events (accidental, inflicted by others, and self-inflicted), have premature and low birth weight births, and have undiagnosed or non-treated chronic health conditions, including substance addictions and mental health conditions. These costs account for the majority of child and young adult healthcare (CDC, 2009). Yet, today's risk adjustment models do not reflect the added costs associated with these health risk differentials. Therefore if an insurer will collect the same average premium for insureds from each neighborhood, insurers will compete for insureds and providers from the first neighborhood and avoid the second neighborhood.

A similar comparison is possible for two neighborhoods populated by middle aged people of disparate socioeconomics. Socioeconomic healthcare differentials persist into middle age when healthcare costs are increasingly related to chronic health conditions rather than traumatic events. While risk adjustment models adjust for chronic health conditions, they do so only to the extent that the condition has been recently diagnosed and/or treated. Furthermore, the adjustment then assumes that everyone with a given condition has the same expected marginal costs on a go forward basis. People with lower socioeconomic status have more undiagnosed and undertreated conditions and more complications associated with their conditions (Sawhney, 2010). They have more complications, at least in part, because they don't have the education, economic resources, and social support systems that allow for medical compliance. Consider diabetes. Successful control of diabetes and hence avoidance of diabetic complications requires diet modifications, diet control, routine exercise, self-testing, prescription medications and devices, and regular physician visits and tests – a complex and expensive treatment package – requiring significant education, self-organization, self-control, and expenses not entirely covered by insurance. Once again, because insurers expect the first neighborhood to be

profitable and the second neighborhood not to be profitable, insurers will compete for insureds and providers from the first neighborhood and avoid the second neighborhood -- even though insurers may collect more in premium, net of risk adjustment, by insuring the second neighborhood.

H. Income

Because researchers cannot link health insurance data to consumer databases, they need to work from “second best” data and therefore can only, at best, provide tests of concept with respect to the potential post-risk adjustment profitability of market segments. I (Sawhney, 2010) (Appendix A) performed a test of concept with respect to income. I built a conceptual model, supported by a literature review, to hypothesize that there is a relationship between income and healthcare costs that persists after risk adjustment using today’s risk adjustment models. I then used the Medical Expenditure Panel Survey (MEPS) dataset prepared by the U.S. Department of Health and Human Services’ Agency for Healthcare Research and Quality (AHRQ) that includes healthcare cost data and family income to test the hypothesis. Finally, I demonstrated that the effect is large enough that indirect selection strategies based on family income could potentially yield significant insurer profits. While I had to make a number of analytic compromises due to data limitations of the MEPS dataset, the work provides a positive test of concept.

I. The Game

The selection game has begun. It may be, however, some time, if at all, before it has much effect. As documented beginning of this chapter, consultants are already touting their ability to analyze data, identify target markets, and build insurer indirect selection strategies for the post-underwriting health insurance era. They have apparently examined the data and concluded that indirect selection

should be profitable. Presumably at least some insurers are listening to the consultants. It is less clear, however, what insurers are doing with the information at this point.

Healthcare reform presents dramatic changes with respect to individual and small group enrollment, regulation, benefit design, and pricing. Insurers are overwhelmed by the system and process redesign necessary to support these changes and the associated uncertainties. The uncertainty is significant. Recent proposed federal rules (DHHS, 2011-1; DHHS, 2011-2) leave significant open questions which will not be resolved until the late fall of 2012. For example, pricing actuaries rely upon experience, yet no one has costs for the new populations that will be insured under healthcare reform. I have been on actuarial committee calls and health actuaries have said clearly and repeatedly that even when benefit designs are final they don't know how they will price products for the new populations.

These considerable uncertainties are why the PPACA includes two three-year transitional risk mitigating programs: reinsurance and risk corridors (PPACA, Sections 1341 and 1342). Reinsurance provides a temporary subsidy from the group market to partially compensate individual market insurers for the costs of the costliest insureds. The focus on the costliest insureds, as opposed to a subsidy for all insureds that would be administratively much simpler, is an implicit acknowledgement that risk adjustment is inadequate with respect to the costliest insureds. The other mechanism, risk corridors, provides funds to insurers experiencing excess losses in the first three years and collects funds from insurers experiencing excess profits. Insurers with profits and losses are taxed and subsidized, respectively, thereby flattening profits and losses and inter-insurer disparities (DHHS, 2011-2).

Insurers may well have decided that they will consider indirect selection, if at all, as a tuning mechanism after they have the basic foundation in place to effectively participate and compete in the post healthcare reform market. This may be particularly true for insurers who currently have a dominant market share. These insurers will lose their current market share if they do not 'hit the ground running' in the new market – they do not want that to happen. Furthermore, selection is less

relevant to insurers with a large portion of the market. A dominant market share cannot be constructed exclusively from “pockets of opportunity” and the addition of a pocket of opportunity is unlikely to sway the overall profitability of the insurer’s block of business.

Once the challenges of participation in the new market are conquered and profitability, or lack thereof, emerges at the end of year one or two, insurers are then likely to give considerable thought as to how to improve their risk profile and profitability, especially in light of the expiration of the transitional risk programs at the end of year three. At that point insurers are likely to be most receptive to the message from consultants that there are opportunities via indirect selection to improve their profitability or, at the very least, protect them from being at a competitive disadvantage.

The advantage in building an indirect selection strategy at that point is that post-healthcare reform data will be available. Like pricing, predictive models rely upon data. The past is used to predict the future. While data exists, even now, to develop indirect selection strategies, post healthcare reform data will enable a much better analysis.

Even once indirect selection efforts start, it will take time to analyze data and develop, deploy, and refine indirect selection strategies. Therefore, should an indirect selection arms race emerge, it is unlikely to commence before years 4 or 5. Depending on how the market evolves, it may be much later or never. Selection efforts will emerge sooner and accelerate to an arms race faster if insurers experience post-healthcare reform losses and don’t see other paths to profitability – desperation fosters creativity.

Should it emerge, the arms race will elicit the social costs already described, namely curtailed choices for some portions of the population and wasted spending to attract other portions of the population. Ultimately winners and losers will emerge and the losers will exit the market. Over years as losers exit the market, it will become difficult for the surviving insurer or couple of insurers to avoid the least desirable risks. Indirect selection will then likely be less of an issue. But market competitiveness

will be an issue as the market will by then be a monopoly or oligopoly. The remaining insurer(s) may be the insurer(s) best at gaming the indirect selection, not the insurer best at providing high quality, cost efficient care.

Regulation may prevent an arms race or curtail a nascent one. But even without regulation, an arms race may not develop. It may be that indirect selection is not as profitable or as easy to operationalize consultants think that it will be. As discussed above, indirect selection may not work well for market dominant players. Finally, market dominant players may not feel the need to engage in indirect selection or feel that the secondary costs of engagement are too high.

If market dominance is essential to post healthcare reform success (and it may well be due to administrative economies and provider pricing clout) then even if smaller insurers successfully deploy indirect selection, their efforts may not be sufficient to threaten the dominant insurers. Indirect selection will be confined to the market edges. While indirect selection is less than ideal, indirect selection efforts on the edges may be tolerable. This is not unlike today's individual insurance market. If permitted by state regulation, all insurers underwrite, but dominant Blue Cross Blue Shield organizations have very often had relatively lax underwriting. In contrast, non-dominant insurers often have the strictest standards.⁷⁶

At a minimum, regulators should be prepared to respond to indirect selection efforts. Chapter IV will examine the public policy challenges associated with regulatory efforts to control anti-selection under healthcare reform.

⁷⁶ According to conversations that I have had with several ex-employees, Assurant Health, a national individual health insurer, not dominant in any market, has had a predictive modeling group, working on direct and indirect selection strategies, for at least 10 years. There are not details as current and ex-employees are bound to confidentiality agreements.

IV. PUBLIC POLICY CHALLENGES

Indirect selection is contrary to the intent and to some extent the letter of healthcare reform. If insurers deploy selection strategies some consumers will have more or less access to high quality, affordable healthcare than others. Some of society's healthcare resources will be redirected to selection rather than healthcare. These are not socially desirable outcomes. Yet regulating indirect selection out of existence in the context of a competitive health insurance market is likely impossible. This section will examine the conceptual difficulties in using regulation to limit indirect selection. The next chapter will discuss specific regulatory approaches.

A. Regulating the Invisible

Indirect selection will be covert and subtle. It has to be. An insurer obtains competitive advantage from indirect selection only to the extent that the insurer selects better than its competitors. Therefore an insurer will not announce the specifics of its indirect selection strategy; to announce the strategy would invite replication. Furthermore, insurers will be reluctant to announce even they even have an indirect selection strategy as indirect selection, at a minimum, conflicts with the non-discrimination intent of healthcare reform. An insurer who announces a selection strategy will invite bad press, punitive regulatory action, and changes in regulation. A successful indirect selection strategy will be a quiet strategy.⁷⁷ The insurer who successfully deploys an indirect selection strategy will take a bow for excellent care management practices rather than indirect selection.

Insurer actions to affect indirect selection may be subtle, but the impact on consumers will be real. Simply put, less desirable people, particularly those living in less desirable geographies, will be less welcomed and embraced as customers. Their mailboxes will not be filled with glossy solicitation

⁷⁷ See Introduction. One might surmise that this is why the McKinsey speakers were the only AHIP conference participants to advocate for indirect selection and the only participants who declined to make their presentations available in the after-event presentation packet of the AHIP's 2010 Health Exchange Conference in Chicago.

materials featuring people who look like them and have similar health needs. There will not be a broad selection of primary care providers in their neighborhoods and specialists will be located well outside the neighborhood and not be accessible via public transportation. Their Little League teams will not have insurer or provider sponsorship. Their service calls to their insurer may be answered a bit slower.⁷⁸ There may be a limited availability of specialists to treat the diseases endemic to their ethnic community.

The definition of less desirable will be closely related to historical societal discrimination patterns with respect to minorities, particularly blacks, and people of lower socio-economic status. Insurers, if confronted by their underservice, may well hide behind these historical patterns. They may assert that they cannot provide the same number of primary care providers in underserved areas, simply because there are not enough providers in those areas or that they cannot provide more primary care providers because there are not enough providers who meet their “quality standards”. They may assert that they are certainly not responsible for the fact the specialists chose to locate themselves in upscale neighborhoods off the public transportation routes. There is merit to such assertions. But these local condition works to their advantage – it allows them to avoid insuring people who are disproportionately likely to have costs in excess of their risk adjusted premiums. Insurers could invest to build local community access to primary care and specialists, but they will have no incentive to do so. “As is” will be fine.

B. Legitimate Ambiguity

In a competitive market, insurers must differentiate themselves and their products. They must be different. Yet, as discussed above, anything that makes an insurance company or insurance plan more or less appealing to particular populations is a potential component of a selection strategy. There

⁷⁸ Or rather conversely the calls of preferred insureds may be responded to faster. This is doable with call center technology and suggested by Riley (2010).

will never be a clear line between what should be considered socially-desirable, legitimate competition and socially-undesirable indirect selection.

C. Asymmetrical Challenge

Under PPACA an unprecedented amount of health insurance data is expected to move into the public domain, available for a range of interested parties to analyze (PPACA, Sections 3011-3020). The government hopes that this will promote accountability, transparency, and quality. It will. Regulators, academics, and public interest groups can use the data to watch for signs of indirect selection. When they find signs of indirect selection they will publicize the findings. Publicizing the findings will have several effects. One will be that the insurer may suffer a reputational blow – an indirect cost of indirect selection. Another will be that the other insurers may be able to copy the strategy, eliminating the first insurer's competitive advantage (but unfortunately probably further disadvantaging certain consumers). Finally, the publication may lead to changes in risk adjustment and/or regulation.

Unfortunately regulators, academics, and public interest groups, will need to watch for selection based on only part of the data. Many of the indirect selection strategies outlined above are predicated on the linkage of claims files with consumer marketing databases. The link requires identification of the insureds. The claims data that will move to the public domain will be de-identified. Therefore, while insurers will be building indirect selection strategies using "claims + consumer marketing data" the organizations tasked with watching the insurers will only have claims data. Without access to the linked data, it may be difficult for outside parties to appropriately risk adjust. As Shen and Ellis, two of the grandfathers of risk adjustment, point out "*Conventional risk adjustment, which sets capitation payments equal to the average cost of individuals with similar observable characteristics, is not optimal if health plans can use private information to select low-cost enrollees*" (2002). Furthermore, without

access to the private information it will also be difficult to discern selection strategies, monitor, and take non-risk adjustment regulatory action.

D. Moving Target

The US has chosen to rely upon a competitive, largely for-profit insurer market for the provision of health insurance to the non-poor and non-elderly. Insurers will therefore seek to continuously outsmart each other in order to make money. If regulation closes off one opportunity, such as direct selection, insurers will explore other opportunities, such as indirect selection. They may find them. Further down the road, if too many insurers attempt the same indirect selection activity or if regulators prohibit an activity, (at least some) insurers may find other selection opportunities. In short, leading insurers will try to stay “one step ahead” of the masses of insurers who in turn will try to stay one step ahead of regulators. Regulators will therefore most likely be perpetually behind, attempting to regulate a moving target.

E. Appropriate Incentives

Risk adjustment involves dividing healthcare cost risk into two categories: the portion of the risk for which the insurer should not be responsible and the portion for which the insurer should be responsible. The former is captured by risk adjustment and the insurer is compensated. The insurer is “at risk” for the latter. The insurer then has incentive to control the costs associated with the at risk portion, presumably by good healthcare cost management practices.⁷⁹

The US cannot afford ever spiraling healthcare costs. Society needs insurers (and providers) to have incentives to control costs. That means leaving a substantial portion of the person-to-person

⁷⁹ Using the vocabulary of social choice literature Schokkaert explores this “normative” division between “legitimate” and “illegitimate” risk adjusters (Schokkaert, Dhaene, & Van de Voorde, 1998; Schockaert & Van de Voorde, 2004). Same concept, different terminology.

healthcare cost variance outside of risk adjustment and “at risk”. Deciding what should be in and out of risk adjustment is a value-laden societal challenge – not just a mathematical challenge. Furthermore, Schokkaert (1998; 2004) points out that the risk factors for healthcare costs are sufficiently intertwined that once society decides which factors should be in and out of risk adjustment, it may still be mathematically impossible to cleanly separate the risks.

E. Regulatory Costs

Regulations are expensive: for governments, regulated entities (in this context insurers), and citizens. The expense is with respect to money, time, constrained and lost opportunities, and unintended consequences. Excessive regulation can cripple systems.

The best regulation is most often the minimum regulation required to address the problem at hand without creating bigger problems. The challenge of regulating indirect selection under healthcare reform is that the post healthcare reform market is still largely undefined. We do not yet know what problems will emerge, let alone the potential trade-offs between problems. We hope that healthcare reform will usher in a competitive era of health insurance and healthcare innovation which will improve societal health and decrease costs. Too much regulation is counter to this goal.

The best regulatory strategy is therefore “just enough, just in time” as the post-healthcare reform market develops. The challenge, however, is that traditionally regulatory systems, mired in endless political debate and subject to quick fix approaches, have not been particularly good at appropriate, dynamic regulation.

F. Political Acceptability

Ultimately regulators are accountable to the public. The public is comprised of both consumers and the regulated insurers. Regulation is subject to political forces and compromises. Decisions that

appear to be normatively correct and provide the proper incentives may be deemed politically unacceptable.

An example illustrates the complexity of political acceptability. Suppose that higher costs are associated with being married and being poor. If an insurer could build a strategy to disproportionately attract single people, it seems likely that married people would notice and insurers would simply be shamed into doing the right thing. Absent that, there would undoubtedly be political pressure for some sort of risk adjustment or regulatory correction to alleviate the selection. After all, discrimination against married people is contrary to the “family values” that our political system holds dear.

Now, suppose that in pursuit of wealthier insureds an insurer markets more heavily in higher income areas and contracts with relatively few physicians and hospitals in low income areas. Theoretically anyone, regardless of income, could enroll, but in practicality, the insurer’s plan would be more appealing to higher income people than lower income people. That insurer would profit while the competitive insurer actively marketing in the low income market would lose money. Low income people would then be left with a choice of a financially struggling insurer actively marketing and offering providers in their area or travelling long distances to get care from the providers of a financially healthy insurer. This would not be a socially good outcome; yet low income people so impacted by such indirect selection may not have the political power to demand a system correction. This will not be so different than a lot of other things our political system: more plentiful, higher quality choices for the wealthy.

The technically “perfect solution” to the income selection problem is to put an income variable into the risk adjustment model. If insurers were to receive more money for low income people than high income people, they would no longer have incentive to indirectly select by income. The solution, however, might be politically unacceptable. Shifting money around via risk adjustment in order to pay more for insurers to care for the poor is akin to shifting tax money around in order to pay schools more

to educate poor children. Although it is well recognized that it costs more to educate a disadvantaged child than an affluent child to the same level, our political system has been unable to bring school funding for poor children to parity, let alone provide schools serving poor children with extra funds.

Continuing with the example, assuming that there was political will for change, it may be more politically acceptable to prevent indirect selection by income via regulation than by the more technically correct and efficient risk adjustment.⁸⁰ The regulations might prohibit blatant discriminatory marketing and require that all insurers provide a minimum number of providers in low income areas.

Political acceptability also extends to insurers. Insurers want to eliminate indirect selection to the extent that other insurer's indirect selection strategies may cause them disadvantage; they don't want to eliminate indirect selection strategies that they feel give them advantages over their competitors. Big insurance companies will have the most advanced analytic and strategic teams; they will also have the most political clout in protecting their strategies. If insurers, big or otherwise, feel that they have a winning game, they will fight to maintain the status quo regulations and enforcement. Health insurers are a powerful lobby (The Hill, 2010; Bloomberg, 2010; Bloomberg, 2011).

Chapter V will discuss how regulators can most effectively manage indirect selection within the context of the public policy challenges.

G. Regulatory Resources

Effective regulation is a costly exercise involving data collection, data processing, and highly skilled people – either as employees or consultants. Selection regulation does not produce a revenue stream or a tangible cost savings. All governmental regulatory budgets are strained.

⁸⁰ Political acceptability varies between healthcare systems. Other health systems, including the UK (Babad, Bardsley, Childs, Ghiselli, MLure, & Mateja, 2011), risk adjust for socioeconomic characteristics.

V. CONTROLLING INDIRECT SELECTION

Indirect selection is a threat to the intentions of healthcare. In a competitive market, insurers will continuously be looking for ways to improve their profitability and defend their market position against competitors. They may turn to indirect selection to do so. Consultants, who already have experience with predictive models and target marketing strategies from both insurance and other industries, are already pointing insurers to potential opportunities. Although risk adjustment will reduce indirect selection's potential, there is reason to believe that risk adjustment will not fully eliminate opportunities. It seems inevitable that eventually at least some insurers will try to implement indirect selection strategies. It is less clear whether they will implement successful strategies, whether other insurers will follow, and whether indirect selection will become a standard part of the competitive game.

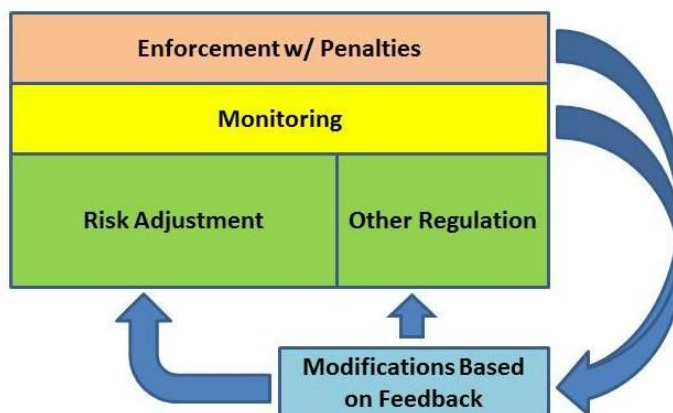
Regulators need to be prepared for whatever may happen. They need a strategy and mechanisms to effectively control indirect selection so as to minimize its effect on consumers and the generation of socially wasteful costs. Their ability to develop strategies and implement mechanisms, however, will be hampered by the limited staff and budgets, invisibility of selection efforts, ambiguity, asymmetrical data, political acceptability, and the challenges of keeping up with the insurers.

A. Conceptual Model

The following is a conceptual model of a dynamic system for controlling indirect selection:

Figure 30

A Dynamic System for Controlling Indirect Selection



Dynamic System: The key words are “dynamic” and “system”. Controlling selection will involve a host of moving parts. Insurers are likely to be perpetually one step ahead of the regulators. A dynamic system of risk adjustment and regulation is necessary to simply maintain the inevitable gap between insurers and regulators. Furthermore, Van de Ven and coauthors (1994) point out that regular regulatory adjustments inherently hamper insurer selection efforts by increasing insurers’ uncertainty as to whether a selection strategy will be profitable over time and hence worth the associated costs.

Risk Adjustment: Risk adjustment and other regulation are the foundational blocks for the system. Because it is better to align insurer and societal interests than to simply forbid insurers to do what’s in their self-interest, risk adjustment should have a larger role than other regulation -- hence its larger size in the diagram. Risk adjustment also has the advantage of mitigating unintentional indirect selection. Risk adjustment is the first way to prevent indirect selection and perhaps even the dominate way, but it is

not the only way. “Other Regulation” supplements risk adjustment. It is called “Other” as risk adjustment is itself a form of regulation.⁸¹

Other Regulation: Risk adjustment strives to create a system that removes the economic incentives from indirect selection. Risk adjustment will be imperfect and therefore insufficient. Some level of “thou shall not” and “thou shall” regulation will be required. Furthermore, in some situations, regulation may be more politically acceptable than risk adjustment. This chapter will explore both enhanced risk adjustment (as compared to today’s most common models) and a full range of other regulatory options.

Monitoring: Monitoring will be required to evaluate whether risk adjustment is working as planned, regulations are being followed, insurers are being advantaged by selection, and/or consumer are being disadvantaged by indirect selection. The monitoring should be both quantitative and qualitative and performed by one or more non-insurer parties. As van de Ven and van Vliet write *“because of the large financial interests involved, one should not set the fox to watch the geese”* (1992). This Chapter will explore several broad types of monitoring.

Enforcement w/ Penalties: Enforcement actions and penalties are essential to any regulatory system. It is not sufficient to simply tell companies what they may or may not do. This paper will not explore enforcement actions and penalties other than to note that the high certainty that there will be enforcement, quick the enforcement action, and substantial penalties reduce the financial incentive to misbehave.

Feedback Loops: Feedback loops are essential to dynamic systems. There is every reason to believe that insurance companies will be at least one step ahead of

⁸¹ Insurers who benefit from positive selection do not voluntarily send a portion of their premiums to insurers disadvantaged by selection.

regulators. If regulators don't periodically modify the risk adjustment and regulations, what was yesterday an acceptable level of indirect selection may grow to be an unacceptable/de-stabilizing level tomorrow. This Chapter will make recommendations for formalizing portions of the feedback process.

B. Federal or State

The other dynamic with respect to controlling indirect selection is the dynamic between the federal government and the states. PPACA is explicit with respect to certain healthcare reform standards. For example it limits the rate ratio to between the oldest adult and the youngest adult to a factor of 3. In other areas it establishes broad regulatory guidelines and explicitly grants the power for creating the necessary detailed regulation to the US Department of Health and Human Services (DHHS) or another federal agency. Other times it explicitly directs the DHHS and states to work together to create regulation. And other times PPACA is silent as to who is responsible for the necessary regulation, suggesting only that "DHHS may" issue regulation. Furthermore, even when regulatory power explicitly lies in federal hands, states are allowed to impose regulations that are stricter than federal regulation. For example, states can say that every adult must be charged the same premium, irrespective of age. Finally, the DHHS has the power to grant waivers to the states, excepting them from specific federal regulation (Copeland, 2011; Oechsner & Schaler-Haynes, 2011).

States will have a great deal of regulatory authority with respect to controlling indirect selection – assuming that they wish to exercise it. Recent DHHS proposed rules reinforce this point (DHHS, 2011-1; DHHS, 2011-2). While the proposed rules make it clear that states may deviate from the federal standard, they don't provide final federal standards. Alternative rules for topics critical to anti-selection control are simply discussed without settling on a final rule. The reader should consult Copeland (2011), Oechsner and Schaler-Haynes (2011), Jost (2010) and Lueck (2010) for more information about

how regulatory authority may be divided between federal and state entities under PPACA. With the exception of the next section, this chapter will focus on combined federal and state regulation.

Ultimately it is the system that is created via the convergence of the two regulatory authorities that matters more than the allocation of the authority.

C. Regulatory Timing

Regulations need to be in place in advance of the behavior that regulators wish to influence or prohibit. Too few regulations may lead to a chaotic market that does not serve the public interest. Yet, too many regulations may stifle a market. A nascent market may not get off the ground if over-regulated. The best strategy therefore is likely a strategy that is initially relatively light on regulation but reacts quickly to emerging market conditions.

DHHS, the federal agency charged with administering healthcare reform, is struggling to prepare comprehensive regulations. Although proposed federal rules have been issued already and will be issued between now and then, federal rules are not expected to be finalized until January 2013 -- less than a year before the January 2014 implementation date for healthcare reform. Some rules relevant to indirect selection control, such as rules defining essential health benefits, actuarial value and other benefit design standards and standards for exchanges and qualified health plan issuers related to quality have not been released, even in proposal form.

The January 2013 completion date leaves essentially no time for a state to decide to 'tweak' federal regulations.⁸² The alternative is for states to draft their own regulations and preemptively apply for waiver (DHHS, 2011-3) from federal regulation or permission to use an alternative risk adjustment methodology (DHHS, 2011-2). A pre-emptive waiver or alternative risk adjustment methodology requires states to gather the technical expertise and work even faster than the federal government

⁸² As noted above, states can adopt regulation that is stricter than Federal regulation. States can also modify certain parameters within Federal regulation, such as risk adjustment parameters (DHHS, 2011-2).

regulatory front, while struggling with the logistical challenges of healthcare reform. Very few states are in position to even consider these options.

Therefore, for most states, the initial regulation therefore is likely to be the federal regulation, with very little if any state supplementation. There will, however, presumably be wide variation in rule interpretation and monitoring and enforcement practices.

After the initial federal regulation is in place, states will then have the ongoing opportunity to modify (within bounds) specific federal regulations to their local market or to apply for a waiver. Their ability to do so, however, may be constrained in a number of dimensions. First, states will not know how they should respond to market conditions unless they are actively monitoring the market. This will require an up-front investment in data collection, data processing, and the technical analysts in an era of highly constrained resources.

Then, even if it is clear that there is an emergent market problem and a regulatory solution, getting the necessary regulations in place may be a protracted or even impossible process. State legislative bodies are overwhelmed by a variety of issues and often quagmired. The solution may be technically correct but politically unacceptable. The solution may require the expenditure of state resources – resources which are not available. In the interim period an emergent problem may evolve to an arms race and, unless the problem affects other state markets, the federal government may not have intervened.

State regulators would be better equipped to respond to local market conditions if they could bypass the state legislative bodies. One way to do so would be if the legislative bodies would give the regulators regulatory authority up-front – authority that regulators can decide to exercise on an as needed basis. It would be even better if legislative bodies would similarly give regulators taxing authority that they can call upon if needed to support new regulation.

Therefore, even if state regulators decide that federal regulation is a practical place to start via indirect selection regulations, they should not feel that it will be several years before they need to concern themselves with indirect selection. Sooner rather than later they should:

1. Create and fund an indirect selection monitoring system.
2. Seek advance regulatory and taxing authority from the state legislative bodies.

D. Tools

There is a range of regulatory tools that can be used to control anti-selection. This section will describe the tools irrespective of whether the regulation may be federal, state, or a combination of the two. PPACA already contains provisions which help control selection. Jost (2010) and Oechsner and Schaler-Haynes (2011) review the selection-control provisions. They are already law. I will not reiterate them here. I will instead discuss regulatory options that enhance or supplement the PPACA provisions.

Think of the options as tools within a tool box – tools available to manage indirect selection. Some combination of the tools will likely get the job done. Certain tools may be mutually exclusive or somewhat redundant. For example a given task requires a Phillip’s head screw driver or a flat screw driver, but not both. Other times a given tool is a more advanced version of a simpler tool. For example there are power saws and hand saws, either of which may work for the job at hand. Not every regulatory tool is listed – just the most obvious ones. Because a dynamic system is required, the regulatory strategy will need to be adjusted, “re-tooled”, over time.

As shown in the conceptual model, risk adjustment is the cornerstone of the regulatory strategy for controlling indirect selection. This section will therefore discuss risk adjustment options first. No one, however, who has seriously considered risk adjustment, has assumed that risk adjustment will eliminate all opportunities for risk selection. Therefore, after discussing risk adjustment, this section will discuss an array of regulatory options, loosely aligned with the indirect selection touch points discussed

in Chapter 3. The discussion will include the technical and political barriers to the regulatory options. Sometimes one regulatory option is an alternative to another option. Such relationships will be noted.

It is important to understand that 1) no list can include all regulatory options and that 2) there is no need to implement all options described. Given the tight timelines and considerable uncertainty regarding insurer and consumer behavior under healthcare reform, the ideal level of initial regulation may be a minimum level. Regulation can evolve as the market evolves. Too much initial regulation may create unnecessary barriers to market entry and innovation.

Furthermore, regulators don't need to remove all potential opportunity for indirect selection -- just enough that intentional indirect selection becomes "not worth the effort" (as per Figure 16) and that no insurer is significantly advantaged or disadvantaged by even unintentional selection. Finally, but by no means least importantly, after discussing the regulatory options, the chapter will conclude by discuss monitoring, enforcement, and feedback loops. Monitoring, enforcement, and feedback loops are essential to a sustainable, dynamic system.

Various authors have considered regulatory options. As expected, many of the regulatory options they have considered are overlapping. This paper will cite a previous author(s) with respect to a specific option only if the author(s) offers a unique or non-intuitive perspective or empirical support for the option. For a general review of regulatory options for controlling risk selection, see van de Ven and Ellis (2000), Newhouse (1994), and van de Ven and van Vliet (1992). For a review of regulatory options, specifically within the context of PPACA, see Jost (2010), Oechsner and Schaler-Haynes (2011), and Lueck (2010).

Most of the regulatory options flow intuitively from the selection conceptual models and discussions in Chapter 1. They can be broadly categorized as:

1. Increase the efficacy of risk adjustment,
2. Reduce (eliminate) consumer choice to seek insurance,

3. Reduce consumer choice of insurer and plan, and/or
4. Limit and control on the decisions and activities of insurers,
5. Make indirect selection more costly⁸³

The second and third options are particularly problematic politically. The value of limiting consumer selection is difficult to explain in a society that fundamentally values consumer choice. The fourth and fifth are particularly unpopular with the insurance lobby.

1. Improved Risk Adjustment

Risk adjustment, therefore, is the most widely acceptable regulatory option. Risk adjustment mitigates the effects of both intentional and unintentional selection. If risk adjustment works well, there are fewer opportunities to benefit from selection and less need for other regulatory options.

There are a number of ways by which today's risk adjustment models can be improved in order to be more effective in mitigating the effects selection. The following are the most obvious:

Figure 31

Regulatory Options

Selection Control or Mitigation Option		Alternative To
1	Risk Adjustment (RA)	
A	Include family income in RA	--
B	Include other variables in RA	--
C	Accentuate RA factors	--
D	Partial retrospective RA	1E
E	Exempt certain insureds from RA	1D
F	Forbid use of consumer marketing data	--

⁸³ Indirect selection costs may be the primary costs of implementing an indirect selection strategy or the secondary potential costs of being out of compliance with the letter or spirit of regulation.

1A: Include family income in risk adjustment. Sawhney (2010) has demonstrated that people with lower family incomes cost more to insure after adjustment with today's risk adjustment models (which do not include income). She has shown that this offers a potentially significant advantage to insurers who select based on income. There are no substantial technical barriers to including family income in risk adjustment. The data will be available; it is just a matter of “doing the math”.⁸⁴ The barriers to including income in risk adjustment are political. The electorate may object to “paying insurers more” for poor people. Furthermore, insurers, particularly the large for-profit-insurers, are likely already building selection strategies around income and other socio-demographic variables and will be reluctant to give up this potential source of advantage.

1B: Include other variables in risk adjustment. Beyond family income, additional potential variables include functional and cognitive disabilities, education, race, ethnicity, work status, family status, and neighborhood. Data is a major technical barrier to including these variables. The many of these variables can be known or imputed using consumer marketing databases. Yet researchers and regulators who establish risk adjustment systems don't have the same access to consumer marketing databases. This creates an information asymmetry. For example, while insurers know the precise address of each of their insureds, researchers are “lucky” to know an insured's county.⁸⁵ A necessary precondition to including new variables in risk

⁸⁴ See Sawhney (2010) for more information.

⁸⁵ Unless a researcher has a data use agreement with the holder of the data, the Health Insurance Portability and Accountability Act (HIPAA) privacy rule requires that individual-level health insurance data used for research to be

adjustment is to require insurers to collect and share data with researchers and regulators. This requirement will need to be weighed against privacy concerns. Furthermore, should the necessary data be made available, there are still political barriers. The political barriers are identical to the barriers discussed with respect to 1A with added sensitivity with respect to race and ethnicity.

Finally, neither insurers nor regulators have good data for some potentially very relevant risk factors. For example, there is little doubt that functional status measures could greatly enhance risk adjustment. Given a disease state, people with impaired physical and cognitive functional status have higher healthcare costs (see **Omitted Variables** discussion). Yet diagnosis codes found in insurance claims provide little information regarding functional status. Recently van Kleef and van Vliet (2010) explored including durable medical equipment (DME) claims as a risk adjustment as a partial proxy for functional status and found that DME claims add predictive value.

1C: Accentuate RA factors. Glazer and Maguire (2000) have demonstrated that it is often mathematically optimal to accentuate risk factors – that is make high factors higher and low factors lower. Risk factors should be accentuated whenever 1) there is a variable(s) relevant to future health, 2) upon which insurers will select upon, 3) that is not included in the risk factor calculation, but 4) is correlated to variables that are included in the risk factor calculation. Interestingly, the weaker the correlation, the stronger the required accentuation. Van de Ven and Ellis (2000) go a step further and suggest that on normative rather than mathematical grounds risk factors should be accentuated so that insurers have incentive to care for the sick. This may include, for

stripped of any reference to geographical areas smaller than a state. A data use agreement with the holder of the data allows a researcher access to a “limited data set” which can include county and zip code, but still may not include street addresses (Gunn, Fremonth, Bottrell, Shugarman, Galegher, & Bikson, 2004).

example, assigning a risk premium to individuals living in medically underserved areas so that there are incentives to build capacity in those areas.

1D: Partial concurrent risk adjustment. The default assumption in the actuarial world is that risk adjustment is prospective: that the insured's current status and past healthcare history is used to predict future (prospective) costs and the insurer is compensated accordingly. Prospective risk adjustment is considered the gold standard for incenting insurer and provider efficiency (van de Ven & Ellis, 2000). It is the standard for Medicare Advantage risk adjustment (CMS, 2010). Newhouse (1994), however, argues that because risk adjustment systematically under estimates costs for people with particularly high costs and/or high healthcare utilization in the in the prior period that the ideal risk adjustment should be a blend of prospective risk adjustment and prior period (retrospective) actual costs and/or healthcare utilization. The recently released proposed federal rules for risk adjustment (DHHS, 2011-2) seemed to indicate that the final rules would specify a concurrent model whereby diagnostic and drug history from within a year would be used to risk adjust that year. The rules, however, were not explicit. The American Academy of Actuaries is requesting clarification (AAA, Oct 2011) as the choice between prospective and concurrent risk adjustment methodologies has policy and logistical implications.

1E: Except a certain number or percentage of insureds from risk adjustment.

Van Barneveld and coauthors (van Barneveld, van Vliet, & van de Ven, 1996) first proposed this idea. It addresses the same problem as partial retrospective risk adjustment: that risk adjustment is inadequate for a small portion of the population. The authors proposed prospectively exempting a small percentage or number of insureds from risk adjustment and instead placing them in a reinsurance pool that

could be funded by the government or the insurers. The pool would then reimburse insurers for the actual costs of these insureds. The reimbursements would not need to be 100%. Later authors (van de Ven & van Vliet, 1992) carried the idea one step further and proposed that the insurers could volunteer which insureds they would like exempted on the condition that they explain “what” about the insured makes them conclude that risk adjustment is likely to be particularly inadequate. That information could then be fed back into risk adjustment improvements. The PPACA authors had similar ideas. PPACA has a 3 year transitional reinsurance provision (Section 1341). Regulators should consider making the reinsurance provision, perhaps in a modified form, permanent.

1F: Forbid use of consumer marketing data. Risk adjustment is inadequate if insurers are using factors for indirect selection that are not included in risk adjustment. But, as discussed in 1B, consumer marketing database variables cannot currently be included in risk adjustment as the regulators and academics cannot link the data. One way to enhance the adequacy of risk adjustment, therefore, is to forbid insurers from using consumer marketing database data. This is, of course, a difficult rule to enforce given that insurers in the best of times are not going to advertise the use of consumer marketing data. But if there were sufficient financial penalties and moral outrage against insurers who used consumer marketing data, the firms that sold the data to them, and the consultants who analyzed the data, many if not most insurers would likely comply.

2. Market Entry

Regulators design insurance markets. Insurers then decide whether they want to enter these markets or not and how to play within them. PPACA legislation defined certain aspects of the new markets, but left considerable discretion to DHHS and the States with respect to market design. Jost (2010) is the leading authority on how the markets might be configured under PPACA to best control selection. Jost emphasizes that *“it is absolutely necessary that exchanges be protected against adverse selection”*. Jost also discusses a number of key policy issues not directly related to selection.

Every split in the individual and small group market expands the opportunities for indirect selection. An insurer can decide (select) whether to be within each split market. An insurer can then develop a distinct selection strategy for each market, optimizing selection strategies across markets. A selection strategy that works for a given (sub)market is less likely to work for a combined market. From the regulatory perspective of controlling selection, splits are not good.

The default assumption under PPACA is that individual and small group market will be distinct and that within the individual market, individuals who do not qualify for federal subsidy will be able to buy their insurance off the exchanges (Jost, 2010). It would appear to also be possible for a given individual to buy a low level of subsidized coverage (bronze plan or catastrophic plan⁸⁶) from the exchange and supplement their coverage with insurance bought of the exchange. The supplemental coverage could presumably be underwritten.⁸⁷ States, however, have the right to unify exchanges, require insurance to be bought on the exchange, and to forbid supplemental coverage.

Supplemental coverage is particularly subversive of the intent of healthcare reform. PPACA requires insurers to offer and insureds to buy health insurance policies which cover a range of “essential health benefits” (PPACA, Section 1302). Insurers on the exchange must offer plans that are designed to

⁸⁶ Catastrophic plans are essential health benefit plans with particularly large deductibles. They are available only to insureds under the age of 30 (PPACA, Section 1303).

⁸⁷ McKinsey (2010) suggested this strategy at the AHIP conference.

pay 60%, 70%, 80%, and 90% of the full benefit cost of the insurer's benefit offering. The levels are referred to as bronze, silver, gold, and platinum, respectively. Subsidies are based on the market price of the silver plan, irrespective of which plan the insured enrolls in (PPACA, Section 1331).⁸⁸

A healthy insured (able to clear underwriting) could take the subsidy, buy the minimum required bronze plan, and take the premium saved by downgrading his/her insurance from silver to bronze and use it to buy a supplemental policy which would fill the gap between the bronze and platinum benefits. Hence the healthy insured would have platinum coverage for the price of silver coverage. This opportunity would not be available to the unhealthy. The only way an unhealthy insured could get platinum coverage would be via the exchange at a substantially higher total price. The platinum benefit level would therefore be subject to adverse consumer selection.

There are a number of ways that the market can be consolidated in order to control selection.

The options include:

Figure 32

Regulatory Options

Selection Control or Mitigation Option	Alternative To
2 Market entry	
A Individual insurance only from exchange	2B
B Same plans and prices on and off exchange	2A
C Same qualification requirements on and off exchange	--
D Merger of individual and small group exchanges (with same plans and prices)	--
E No essential health benefits supplemental coverage	--

⁸⁸ PPACA does not require exchange insurers to offer platinum plans (Section 1301). Because of the potential anti-selection against the platinum plan, McKinsey (2010) suggests that insurers not offer platinum plans. If no one offers platinum, however, then much of the problem shifts to the next best plan -- gold.

2A: Individual insurance only from exchange. Bi-furcating the individual market between exchange and non-exchange creates opportunity to select based on income. Because exchange purchases are subsidized for people with family incomes up to 400% of the family poverty level, the individuals who would potentially buy insurance off the exchange have (relatively) high incomes. Sawhney (2010) has demonstrated that even after risk adjustment, people with higher incomes cost less than low income people. State regulators are already considering the option of eliminating off exchange insurance (Oechsner & Schaler-Haynes, 2011). The barriers are political. Insurers want to preserve selection opportunities and consumers want to preserve maximum “choice” and avoid “government takeover”.

2B: Same plans and prices on and off exchange. This is a weaker version of 2A. An insurer could not sell individual insurance only off the exchange and would have limited opportunity to develop distinct exchange and non-exchange strategies. PPACA only requires that an insurer who offers an exchange plan off the exchange must offer it at the same rates. But an insurer is not required to offer the exchange plan off the exchange; the insurer may offer only novel plans off the exchange. Nor is an insurer required to offer non-exchange plans on the exchange (Jost, 2010; Oechsner & Schaler-Haynes, 2011; Lueck, 2010)

2C: Same qualification standards on and off exchange. This is a companion to option 2B. Irrespective of benefit design and rates, plan sold on Exchanges should meet qualification standards with respect to provider networks, reporting on health care quality, grievance procedures, and marketing practices. Jost (2010) asserts that the qualification standards will add costs to exchange plans making them less appealing to

consumers. Regardless of the net effects on cost and (average) appeal, just the fact that exchange and non-exchange plans are different will cause selection.

2B and 2C are likely to be fiercely opposed by both insurers and consumer choice advocates.

2D: Merger of individual and small group exchanges (with same plans and prices). The default PPACA assumption is that there will be separate individual and small group exchanges. Bi-furcating the individual and small group market allows insurers to select which exchange they wish to participate and to build a separate selection strategy for each. While it would control selection, there are substantial logistical challenges associated with implementing this option. Nearly everything about the sale and administration of small group insurance is different than the sale and administration of individual insurance. Individual insurance is direct to the consumer while small group insurance has the employer as an intermediary for both the sale and billing process. Jost (2010) discusses this option and the associated challenges in detail.

2E: No essential health benefits supplemental benefits. Allowing the healthy to supplement their exchange plans by off-exchange purchases creates selection against the platinum plans. As discussed above, there will be particularly adverse consumer selection against the platinum benefit plan if healthy people can assemble a platinum-like plan by purchasing a bronze plan on the exchange and an underwritten supplemental policy off the exchange. Supplemental plans should be permitted only for medical services which are outside the scope of essential health benefits.

Other than the merger of the individual and small group exchanges, the barriers to the above options are political. Consumers are concerned that “government is taking over” their healthcare and

“restricting choices”. It is in insurer interest to encourage these consumer views as it allows insurers maximum opportunities to select their markets and design custom indirect selection strategies.

3. Plan Design

Plan design encompasses both the benefits and rates associated with a plan. Traditionally, plan design has been one of the primary touch points that insurers manipulate in order to affect indirect selection. The ultimate solution is one plan for everyone. That, however, is not politically acceptable. Absent one plan for everyone, there a host of considerations with respect to the indirect selection potential of plan design worthy of a stand-alone paper. The following is a summary of some high level considerations.

PPACA (Section 1302) requires insurers to design plans which are “*actuarially equivalent*” to 60%, 70%, 80%, and 90% of the “*full actuarial value of the benefits provided under the plan*”. The actuarial equivalence has to be calculated based on “*a standard population and without regard to the population the plan may actually provide benefits to.*” The benefits have to include all of the prescribed “*essential health benefits*”. Although this is an important first to standardizing benefits and therefore limiting selection opportunities, it is not sufficient. There is still significant opportunity for insurers to design benefits to attract insureds with specific risk profiles.

An example will make this clear. For the standard population, a \$500 deductible which applies to all healthcare services in a year maybe actuarially equivalent to having a \$5,000 deductible for inpatient care and a \$0 deductible on other services. Yet these plans appeal to people with very different risk profiles. The key is remembering that no individual person is “standard”. The person who has a high likelihood of needing inpatient care will prefer the \$500 deductible which caps his or her costs for the year. The person who has a low likelihood of needing inpatient care is much more likely to prefer having his or her miscellaneous healthcare costs covered without a deductible in return for

risking the \$5,000 inpatient deductible. The differences between the two populations attracted to these plans will not be entirely reflected in risk adjustment as people know more about their upcoming healthcare and inpatient hospital needs than is reflected in the age, sex, and diagnostic histories used for risk adjustment. For example, a healthy woman knows if she is planning to have a baby. A person with arthritis knows that hip replacement is on the horizon or not. An asthmatic knows whether his asthma is an occasional exercise induced nuisance or a series of life-threatening events. Yet none of this knowledge is reflected in risk adjustment.

Actuarially equivalent benefits do not attract equivalent risk profiles, even after risk adjustment. Two plans may be platinum (90% of full benefits) but attract very different risk profiles. Benefit designs need to be constrained in order to minimize selection between actuarially equivalent plans. But even if benefit designs are “fully” constrained so that there is only one allowed benefit design for each metal-level (platinum, gold, silver, and bronze), there will still be selection between levels. The actuarial equivalence between the levels is based on a standard population. But no one person is ‘standard’; people will make choices in their personal circumstance and best interest. For example, a plan with a \$500 deductible for all services may provide 90% of the full actuarial plan value (platinum level coverage) and a plan with a \$5,000 deductible for all services may provide 70% of the full actuarial value (silver coverage). There will be a price difference between the two plans. Under either plan costs under \$500 are paid for by the insured and costs over \$5,000 are paid by the insurer. The \$500-\$5,000 corridor is essential to the benefit decision. The person who feels that his or her costs will almost certainly be under \$500⁸⁹ will be hesitant to pay the additional premium to cover the \$500-\$5,000 corridor and will likely select the \$5,000 silver plan. The larger the price differential, the less likely the healthy person is to select the platinum plan. Yet the person nearly certain to have costs in excess of the corridor will be willing to pay a significant differential. The platinum plan therefore will experience

⁸⁹ A significant percentage of people feel this way given that costs for preventive care services, including routine physicals, are not subject to deductibles and will be covered at 100% under all plans (PPACA, Section 2713).

adverse consumer selection. While to some of the impact of the selection will be reflected in risk adjustment, van de Ven and coauthors (van de Ven W. P., van Vliet, Barnevald, & Lamars, 1998) demonstrated that risk adjustment does not fully account for the risk differential between people in high and low deductible plans.

PPACA requires plans operating on the exchanges to offer at least one gold and one silver plan (PPACA, Section 1311). Knowing that platinum plans will be selected against, McKinsey (2010) suggests that insurers not offer platinum plans. If most but not all insurers take McKinsey's advice, the one or two insurers in a market offering a platinum plan will be disadvantaged. If no one offers a platinum plan, the gold plan will become most attractive to poor risks.

In order to minimize selection against a particular insurer it is important that all insurers offer the "richest" benefit plan, presumably platinum. It is also important that no insurer be allowed to charge a disproportionately higher price (as compared to benefit levels) for its platinum plan than for its other plans as the price will accentuate adverse consumer selection and/or drive enrollment to other insurers with more proportional prices. Although PPACA clearly states that plan benefits must be designed to cover 90%, 80%, 70%, or 60% of costs of the full benefit package based on a standard population "*without regard to the population the plan may actually provide benefits to*" (Section 1302), PPACA is silent as to whether plan rates can be adjusted to reflect the health of the population covered under the plan. Therefore, it is not obvious that insurers must charge 50% more for a platinum plan (90% plan) than for a bronze plan (60% plan).⁹⁰ If a differential of more than 50% is charged, fewer people will enroll in the platinum plan, and they will be more likely to be the people at risk for expensive healthcare. There will be a selection spiral with respect to platinum plan.

⁹⁰ $90\%/60\% = 1.50$. A 90% plan is therefore worth 50% more than a 60% plan. This is a very complicated aspect of PPACA for which the Federal government has not yet issued proposed rules. See the American Academy of Actuaries Issue Brief (AAA, 2011) for more information concerning actuarial equivalence and pricing.

Add-on benefits pose another dilemma. PPACA requires insurers to at a minimum offer the essential health benefits; it does not prevent them from offering additional benefits. Section 2712 talks specifically about the possibilities of physical fitness, healthy lifestyle support, weight management, and stress management benefits. Although theoretically such benefits should benefit the less healthy than the healthy, they typically have maximum appeal to the healthy and can be used to “steer” healthy people into specific plans. Vaithianathan (2004) provides a good discussion and examples of how such benefits can be used to attract the young, healthy, and fit. Such benefits are perceived to be health-enhancing. But if most of the people who take advantage of them are already healthy and would have stayed healthy on their own, then they are not health enhancing. Instead, the sick people are subsidizing the healthy habits of the healthy.

Figure 33

Regulatory Options

Selection Control or Mitigation Option	Alternative To
3 Plan design	
A Constrained benefit designs	3B
B Fixed benefit designs	3A
C All 4 levels required	--
D Premiums proportional to actuarial value	--
E Add-on benefits optional and fully priced	3F
F Add-on benefits prohibited	3E

3A: Constrained benefit designs. There are various ways that benefit designs can be constrained to situations like above whereby a \$500 all service deductible competes against a \$5,000 hospital only deductible. For example, service specific deductibles, such as hospital admission deductibles, can be forbidden.

3B: Fixed benefit designs. It is entirely possible for a state to “standardize benefits” by specifying one (or two or three) benefit designs per mineral-level.⁹¹ Although this is contra to the expectation of maximizing consumer choice and the norms in most of today’s individual health insurance markets, it is not without precedent. Medicare supplemental policies have been standardized, irrespective of carrier, for more than 20 years (CMS, 2011). Some time ago New York standardized individual health insurance policies (Oechsner & Schaler-Haynes, 2011). Policies offered under Massachusetts health reform, the model for PPACA, are standardized (Oechsner & Schaler-Haynes, 2011; Gordon, 2011)

3C: All 4 levels required. Insurers could be required to offer plans at all four levels. Currently insurers selling on the exchange are only required to offer Gold and Silver plans. Insurers off the exchange have no requirements and thus can offer only Bronze plans. This allows an insurer to bypass the expected adverse consumer selection against platinum plans (Jost, 2010).

3D: Premiums proportional to actuarial value. PPACA is very specific as to the relative value of the plan designs. Platinum is a 90% actuarial value benefit, gold is an 80% benefit, etc. based on a standard population. PPACA is not, however, specific about pricing. It would appear that insurers are not compelled to price according to the benefit value. This, however, opens the possibility of a platinum plan (or whatever the defacto top plan becomes) getting caught in an adverse consumer selection death spiral. Regulations can require that prices and benefits be both calculated from the same standard population.

3E: Add-on benefits optional and fully priced. If add-on benefits are optional and fully priced then the unhealthy would no longer be subsidizing the pre-existing good health of the healthy.

⁹¹ Mineral-level refers to platinum (90% actuarial value), gold (80%), silver (70%), and bronze (60%) plans.

3F: Add-on benefits prohibited. If add-on benefits were to be prohibited, benefits would be more standardized and insurers would not be able to use add-ons as an indirect selection tool. There are, however, both political and technical barriers. Consumers, particularly the healthy, like add-on benefits; it makes them feel like they are “getting something” from their insurance. There is also the technical problem of deciding where good health management ends and add-ons begin. Health club membership is likely an add-on, but what about access to a nurse hotline? Add-on plans (rather than benefits) could still be sold, but only independently of health insurance.

4. Marketing

Marketing regulations to reduce indirect selection should assure that 1) marketing efforts reach even the least desirable potential insureds and 2) that insurers have limited opportunity to craft marketing strategies that disproportionately appeal to the most desirable risks and/or tacitly discourage the least desirable risks. Unfortunately it is nearly impossible to simultaneously achieve these goals. A single marketing approach cannot reach all people. Yet every custom marketing strategy provides a unique opportunity to facilitate indirect selection.

Consider the challenge posed by illiterate and marginally literate consumers. Such people are not desirable health insurance risks. They have poor health status and poor prognosis given their health status (see previous discussions of education and health literacy in **Omitted Variables**). Internet and paper-based marketing strategies will not effectively reach these people. Special outreach will be required to enroll them. Requiring insurers to make an effort to reach them is good. But even then, no one should not be surprised if the insurer that does an amazing job soliciting well-educated people through internet and paper strategies, falls short in communicating its message to the illiterate via outreach efforts. It is not in insurers’ interest to be effective.

There is general consensus in the literature that marketing materials should be more standardized than today, that insurer marketing efforts should be constrained, and that all things equal it is better to have a neutral party, such as a community advocate, talk to vulnerable populations about insurance rather than commissioned sales agents.⁹² But there is hot debate concerning how standardized the marketing materials need to be, how constrained insurer marketing efforts should be, and the appropriate role of sales agents and sales agent compensation.

Agents provide the in-person support to consumers who otherwise may not have the skills or be willing to invest the time to understand complex written material or who simply prefer human interaction. That's a valuable public service. Agents, however, can also be invaluable to insurer indirect selection efforts. Agents can steer consumers to buy insurance on and off exchanges and particular products. The steering is often referred to as "street underwriting" or "field underwriting". Furthermore, if the agent is being paid a commission, unless the commissions across all products are the same, it can be difficult to discern whether an agent has worked in his or the consumer's best interest.

PPACA takes initial steps to standardize marketing materials. PPACA requires the exchanges to offer an internet portal and telephone assistance (Section 1311). Information on the portal will be presented in a standardized format that facilitates comparison between plans. All plans, on and off the exchange, individual and group, will have to summarize their benefits via DHHS standards (Section 2715). This will allow for better comparisons.

Other steps that could be taken by federal and state regulation include:

⁹² The general approach taken by Massachusetts (Raymond, 2007; Gordon, 2011)

Figure 34

Regulatory Options

Selection Control or Mitigation Option		Alternative To
4	Marketing	
A	Multi-channel marketing and sales support	--
B	Multi-lingual marketing and sales support	--
C	Proactive outreach	--
D	Agent restrictions	--
E	Marketing material review	--
F	Marketing activity constraints	--

4A: Multi-channel marketing and sales support. Not everyone has access to and is comfortable using the internet, even with telephone assistance. A mechanism for providing paper and in-person explanations and enrollment support would also be helpful.

4B: Multi-lingual marketing and sales support. Marketing is a communication exercise. Many consumers do not comfortably speak and read English. Marketing efforts will not be effective unless they are in the consumer's language. It is not feasible to support all of the world's languages. But regulators could require that a language be supported if the number of consumers speaking the language in the region exceeds a threshold.

4C: Proactive outreach. As will be discussed in the upcoming E.

Monitoring section, a community that is underinsured is most likely, from the perspective of insurers, an undesirable community. Insurers should not be permitted to passively accept that they have low penetration in underinsured communities; they should be required to document what they have done specifically to reach such communities.

4D: Agent restrictions. At a minimum, agents should have to demonstrate their knowledge of healthcare under PPACA via the state licensing and renewal licensing processes. Agent commissions could be capped or standardized. The ultimate restriction would be to forbid health insurance commissions in favor of internet sales with salaried call center support⁹³ and salaried community outreach educators.

4E: Marketing material review. A picture can be worth a 1,000 words. Marketing material review should examine words and pictures. A central question concerning marketing material review is whether the review should be mandatory prior to the use of the materials, mandatory after the use of the materials (with the power to require the material to be revised), or only when a complaint is filed after use.

4F: Marketing activity constraints. There should be constraints on when, where, how, and to whom insurers market their product. For example, should insurers be allowed to send direct mail exclusively to families living in middle class and upper class neighborhoods that have a history of buying adult sporting equipment? (The marketing material could feature obviously healthy people engaging in sports and could tout the fitness benefit included in the base premium.) Or should mailing only go to all or none in the entire market? Massachusetts adopted versions of 4D, 4E, and 4F (Raymond, 2007; Gordon, 2011).

The above options, even if enacted into regulation, take a good deal of commitment to implement, monitor, and enforce. States may not be willing to take on this challenge for either political or logistical reasons.

⁹³ With the ability to enroll the caller over the phone using the internet interface rather than simply directing the caller how to use the internet interface.

5. Enrollment

Adverse consumer selection (anti-selection) occurs when insureds have selection choices with respect to buying insurance, renewing insurance, benefit levels, benefit designs, and provider networks. There cannot be anti-selection without selection. Adverse consumer selection in turn begets insurer selection. Reducing consumer selection reduces the need for insurer selection. The value of limiting consumer selection is difficult to explain, however, in a society that fundamentally values consumer choice. Politicians are reluctant to espouse the virtues of limited choice.

The first consumer choice is the choice to buy (aka “enroll in”) insurance. Although insurance is supposedly mandatory under PPACA (Section 1501), potential insureds do, in fact, have the choice whether to buy insurance. Certain individuals are exempt from the insurance requirement (PPACA, Section 1411). The penalties for not having insurance are nominal in 2014 and even when they max-out in 2016 they are modest in comparison to the cost of purchasing insurance. The penalty in 2016 is \$695 and is indexed for years beyond 2016. The penalty is significantly less in 2014 and 2015 and less for low income people, children, and families (PPACA, Section 1501). Tax penalties only work to the extent that the individual is tax compliant.

Furthermore, a person without insurance still has access to costly healthcare. The federal Emergency Medical and Labor Act (EMTALA) of 1986 requires hospitals to provide emergency care regardless of ability to pay (CMS, 2011). Some states have similar laws. If non-insurance penalties are modest and insurance can be purchased on demand, then it will often make financial sense for a healthy person with few assets to lose to emergency healthcare bills to wait for a significant deterioration in his/her health before buying insurance.

Figure 35

Regulatory Options

Selection Control or Mitigation Option	Alternative To
5 Enrollment	
A Stiffen non-insurance penalties	--
B Eliminate or weaken EMTALA	--
C Annual enrollment	--
D Penalty for late enrollment	--
E Enrollment into lower plans only	--

5A: Stiffen non-insurance penalties. The penalty for not having insurance is low in comparison to the cost of insurance. Selection will occur if the healthiest people are financially better off without insurance. While the insurance industry would strongly support increased financial penalties; consumers, already unhappy with “mandatory” insurance, would not. The penalty change could be either federal or state as states have the right under PPACA to introduce regulations more strict than federal regulation. If the state imposes the penalty it would also need a mechanism for collecting it.

5B: Eliminate or weaken EMTALA. Giving people care regardless of insurance status decreases the incentive for having insurance. Eliminating EMTALA is, however, unrealistic with respect to true life-threatening emergencies. Americans simply don’t have a tradition of standing by and watching someone die. But what constitutes an emergency and the amount of care a hospital must provide to patients without insurance could perhaps be narrowed.

5C: Annual enrollment. People should not be able to wait and buy insurance exactly when they need it. Therefore, except for certain circumstances, such as losing

employer insurance, new enrollment should be limited to once a year, ideally with the enrollment period ending a month or more in advance of the plan year. This regulation should not be difficult for consumers or insurers to accept. The group health insurance has long had a tradition of annual open enrollment periods. In the group insurance market, if an employee or dependent does not enroll when the employee is hired, he must wait for the annual open enrollment period. The only exceptions are for certain changes of family and insurance circumstance. Family circumstances include marriage, divorce, and birth. Insurance circumstances include discontinuation of a spouse's insurance plan. Massachusetts health reform did not include an annual enrollment provision and there is evidence that on-demand enrollment is hurting Massachusetts reform efforts (Lazar, 2010).

5D: Penalty for late enrollment. There could be a premium penalty for anyone who enrolls late or after a more than minimal gap in insurance. Medicare and Medicare Advantage plans have annual enrollment periods which end more than a month before the beginning of the new plan year and premium penalties for late enrollment (CMS, 2011).

5E: Enrollment into lower plans only. After January 2014 allow new enrollees to buy insurance only at the silver or bronze level. People who wait to buy insurance when they need it should not be immediately entitled to a "Cadillac" plan. As a quasi-penalty for not buying insurance when they did not need it, they should have significant initial cost sharing. They can then upgrade their plan, perhaps limited to one level at a time, during the annual open enrollment period. See the next **Post-Enrollment** discussion.

6. Post-Enrollment

Consumer selection can occur after the consumer enrolls. He or she may choose to change (select) plans or to drop coverage. Changing plans within the plans offered by one insurer or dropping coverage altogether is subject to much the same adverse consumer selection as enrolling in insurance in the first place: the insured may be changing insurance to “get a better deal” specific to his or her current circumstances. Likewise, changing plans between insurers (disenrollment) may be adverse consumer selection or it may be the result of the current insurer somehow “encouraging” the insured to leave – insurer skimping and dumping. Even if an insured enrolls for health insurance in a timely fashion, he or she should not be able to increase and decrease benefit levels to have high benefit levels while undergoing care and to save premium when care is not needed.

Insurers will gain less and therefore have less incentive to skimp or dump if they have to pay a penalty for each insured that disenrolls. The penalties also draw attention to the disenrollment rates. It is important to note, however, that penalties reduce, but don't eliminate incentives to skimp and dump. It is possible that a given insured's needs may be so expensive (even with the extra money the insurer gets from risk adjustment), that the savings associated with the insured disenrolling dwarfs any possible penalty.

The following are regulatory options:

Figure 36

Regulatory Options

Selection Control or Mitigation Option		Alternative To
6 Post-Enrollment		
A	Annual plan changes	--
B	Maximum one tier change	--
C	Disenrollment rates as a quality measure	--
D	Disenrollment rate penalties	6EF
E	Disenrollment per head penalty	6DF
F	Disenrollment reinsurance	6DE

6A: Annual plan changes. Just like an insured should be able to enroll once a year, he or she should be able to change coverage only once a year, ideally with the window for making the change ending a couple of months before the new plan year begins. This is also standard in the group health insurance market.

6B: Maximum one tier change. In order to encourage everyone to buy the insurance that they need over the long term and not just at the moment, insureds should not be able to upgrade their coverage more than one mineral-level per enrollment cycle.

6C: Disenrollment rates as a quality measure. Because insurers may skimp and dump, it is important to closely watch disenrollment rates, particularly for the most expensive or other vulnerable insureds.

6D: Disenrollment rate penalties. Simply being watched may not be enough reason for insurers to avoid skimping and dumping. 6D, 6E, and 6F impose direct financial costs. One option is that an insurer could be penalized if more than a certain percentage of insureds, or more than a certain percentage of vulnerable insureds, move to another insured.

6E: Disenrollment per head penalty. Alternatively insurers could have to pay a flat penalty (tax) to either the government or to the insurer receiving the insured for every insured that moves.

6F: Disenrollment reinsurance. Another alternative is to have the prior insurer reinsure the new insurer for insureds who leave. For example, the prior insurers could have to reimburse the new insurer for 50% of the claim costs for the insured for the first 6 months after the insured moves.

7. Care Management

Care management is a very difficult arena for the government, whether federal or state, to regulate. Consumers fear government “death panels”. Unnecessary care frequently meets consumer emotional needs, if not physical ones. Unproven care from the scientific perspective may be a healthcare consumer’s only hope for quality of life, or even life itself. Yet, healthcare costs will not be controlled if we don’t, as a society, do a better job of managing and limiting care. PPACA has given insurers and the providers who work with them the task of figuring out how to do this. The problem is that they might overstep and perform the task too well, thereby limiting necessary and proven care and encouraging expensive insureds to go elsewhere. Yet, given the lack of general consensus regarding necessary and proven care, it will be impossible to “prove” that an insured or provider has overstepped.

The following regulatory options should help:

Figure 37

Regulatory Options

Selection Control or Mitigation Option		Alternative To
7	Care Management (CM)	
A	CM principles	--
B	CM governance	--
C	CM standardization/safe harbors	--

7A: CM principles. Care management policies and rule will and should change over time. An insurer should, however, be able to articulate care management principles, which are relatively invariant, under which the policies and rules are developed, changed, and otherwise governed.

7B: CM governance. Regulators should require insurers to establish and follow a formal care management governance process, including a mechanism for providing timely and authoritative appeals of specific decisions.

7C: CM standardization/safe harbors. PPACA encourages the development of consensus standards regarding necessary and proven care and treatment protocols. Regulators should provide insurers and providers who follow the standards a safe harbor from allegations of using care management to affect indirect selection.

8. Providers

Although providers are last on this list, it does not reflect their importance to indirect selection. As depicted the Chapter 3 conceptual model, providers have a central role in indirect selection. Because a provider network approach to healthcare is now the standard in US, PPACA assumes that insurers will have “panels” of “preferred providers”, often also referred to as “network providers”.

While insurers cannot directly select their insureds, they can still directly select their providers and different providers attract different insureds. Insureds join plans because of providers; insureds leave plans because of providers. If an insured has a good relationship with his providers, the insured is likely to stay with his or her plan; if the insured doesn't he or she is more likely to change plans.

There are several broad areas of concern with respect to providers: 1) primary care and first tier specialist local area availability, 2) availability of super specialists, 3) compensation, 4) incentives, 5) inter-plan comparability, and 6) transparency.

The best way to discourage enrollment by people from a specific geographic area is not to have primary care and first tier specialists in their area. People want to receive most of their healthcare locally. They also want healthcare providers who provide culturally sensitive care. Buchmeller and coauthors (Buchmueller, Gilmer, & Harris, 2004) found that certain groups of people are prone to disenrollment because of lack of cultural fit with their providers.

The best way to discourage enrollment by the people with very specific, very expensive healthcare needs is not to provide the super specialists that such people need. For example, sickle cell is an inherited blood disorder found mostly among people of African descent. Some people with sickle cell go years without a serious sickle cell episode. Others have regularly recurring episodes that necessitate hospital care and lead to organ damage. Severe sickle cell is treated via a multi-disciplined team of physicians and non-physicians. While any hematologist theoretically may treat sickle cell, there are only a handful of hematologists and associated teams even in a city as big as Chicago that specialize in the treatment of severe sickle cell. The insurer that does not contract with these physicians and teams will not likely get insureds with severe sickle cell.

Obviously compensation is an important issue with respect to providers. Providers have to be paid enough in total to cover their costs and income expectations. Increasingly compensation is being delivered by incentive systems, often called pay-for-performance, or by capitation. This is a paradigm

shift from the traditional, more-care-is-more-profit, fee-for-service approach to physician compensation. The intent of pay-for-performance is sound, but it could lead to non-intended consequences with respect to “non-performing” patients. Some patients, for regardless of the quality of care the provider provides, do not adhere to (comply with) medical advice. This is especially true with respect to conditions such as diabetes for which proper disease management requires significant lifestyle changes. A physician looking to meet his or her disease management performance goals, may find it easier to encourage a non-adherent patient to find care elsewhere than to get the patient to change his or her lifestyle. Or the physician may decide that it’s much easier to make his or her performance goals when treating educated, middle-class patients in the suburbs than treating patients in the inner city who struggle to take care of themselves even when healthy – and select his office location accordingly. Therefore an insurer with a strong incentive program, even if that program pays even more in total than a fee-for-service program, may unintentionally encourage dropping of non-adherent patients and the under-provision of medical care in certain neighborhoods.

It is important to make benefits and rates more standard, on and off the exchange, and between mineral-levels. Likewise, in order to minimize selection, it is important to standardize the offering of providers. An insurer may offer the same plan and rates, on an off the exchange, but if the exchange plan offers a narrow selection of providers and the non-exchange plan a wider selection of providers, or the non-exchange plan compensates its providers better and therefore make its providers more welcoming to non-exchange patients, the non-exchange plan will be more attractive.

Plan benefits and rates should be transparent – insureds and potential insureds should be able to easily make comparison between plans. Likewise there should be transparency with respect to providers. Unfortunately there is little emphasis on provider transparency, even at the time of care. An insured may get a diagnostic test from a participating provider only to find out after the fact that the physician who interpreted the test is not a participating provider. Such unhappy experiences will make

the insureds who have a diagnostic test during a year more likely to find another insurer than the healthy insureds who don't have such tests. Lack of provider transparency is discussed by Oechsner and Schaler (2011).

Although most authors feel that providers have a role in indirect selection, few have articulated regulatory options. The following is an initial a list:

Figure 38

Regulatory Options

Selection Control or Mitigation Option	Alternative To
8 Providers	
A "Must have" providers	--
B One panel for all plans	--
C Compensation equity	--
D Incentive equity	--
E Non-preferred provider transparency	--
F Out of network exceptions	--
G Geographical dispersion	--
H Cultural appropriateness	--

8A: "Must have" providers. If a provider is truly the only provider in a community to offer a type of care or the only one to provide an advanced level of that care and the care is a medical necessity, that provider must be a network provider.

8B: One panel for all plans. Insurers should be required to have one panel for all their plans, irrespective of whether the plan is sold on or off the exchange, or the level of benefits. Ideally the insurer should be required to have one plan for individual, small group, and large group business, including employer self-insured business.⁹⁴

⁹⁴ I heard that insurer was considering setting up a separate company specifically for exchange business. The insurer is dominant in its market with respect to large group and self-insured employer-sponsored insurance.

8C: Compensation equity. Insurers should be required to offer the same capitation and fee-for-service payments across their entire panel.

8D: Incentive compensation equity. Providers who provide high quality care to more challenging patients should receive additional incentive compensation.

8E: Non-preferred provider transparency. Insurers need easily assessing the quality, depth, and breadth of provider networks. They also need to know whether specific providers are preferred providers both at the time of enrollment and prior to a service. There should be no surprises. Oechsner and Schaler-Hayes, from the New York State Insurance Department, discuss this further (2011).

8F: Out of network exceptions. There are times when appropriate care cannot be provided in network. There needs to be a timely and transparent process for granting permission to use an out of network provider without additional cost to the insured.

8G: Geographical dispersion. Providers must be available in all neighborhoods of the insurance market. Insurers should not be able to avoid high cost areas by not having providers in those areas.⁹⁵

8H: Cultural appropriateness. Providers should provide culturally sensitive care, which among other things means that physicians who live and work in the community are generally preferred to those who visit for office hours once a week.

The next section will discuss monitoring, enforcement and penalties, and feedback loops.

Employers require a large selection of providers. The supposed intent of a separate company was to allow for a narrower selection of providers for individual insureds than for group insureds. I have been unable to confirm the insurer's ultimate decision.

⁹⁵ This expectation conflicts with PPACA goal of promoting health CO-OPs – provider owned, often local insurance plans (PPACA, Section 1322). Co-OPs may be located in low cost areas, which would allow them to skim from the larger market.

E. Monitoring

If regulations are ignored, they are worthless. Monitoring and enforcement are necessary for existing regulations to be effective and to indicate when more or different regulation may be necessary. Therefore, monitoring should be used to assess adherence to specific regulations and equally, if not more importantly, monitoring should assess whether the regulation has effectively minimized and mitigated indirect selection opportunities. As previously discussed, insurers will likely be continuously modifying their selection strategies. Monitoring a moving target is a difficult, but not impossible task. Effective monitoring must be comprehensive and dynamic with a particular focus on the most vulnerable insureds and geographies with the most vulnerable insureds. Monitoring should be both quantitative and qualitative as perceptions may well precede empirical evidence.

Figure 39

Regulatory Monitoring to Assess Presence and Impact of Indirect Selection

Type of monitoring	
1	Broad monitoring
2	Marketing review
3	Research and ad hoc monitoring
4	Vulnerable people
5	Vulnerable areas
6	Stakeholder feedback

1. Broad monitoring. Regulators should broadly monitor the health insurance market with respect to insurer profitability, enrollment, business mix, and disenrollment, plans offered and selected, diagnosis, SES, age of insured, and numerous other variables. Deviations from expected and changes over time should be noted and explored. This macro-level, quantitative analysis should be ideally be based upon data

for the entire US or state population, including those insured under large group insurance (including self-insured plans), small group, individual, Medicaid, Medicare, other insurance plans and the non-insured. Only then can key questions concerning the uninsured and selection between the markets be addressed. While PPACA calls for the collection and centralization of national health insurance data (PPACA, Sections 3011-3020); PPACA does not specify who needs to do what with the data. Thought leadership is very much needed in this domain. States may not have the technical expertise or resources to develop and implement a monitoring strategy on their own.

2. Marketing review. Regulators and others should routinely review marketing materials and activities. While it is almost certain that marketing materials will be used to affect selective marketing, it is impossible to set an unambiguous standard as to what constitutes selective marketing.

3. Research and ad hoc monitoring. Non-regulatory public health and academic researchers have resources and a fresh perspective for analyzing data. In order to eliminate information asymmetry, all data available to insurers should be passed to regulators, who, in turn, should pass the data to researchers with the requirement that they must publish their findings in public forums. The challenge lies with finding ways to pass such data while still preserving individual consumer privacy. Compromises will undoubtedly need to be made, but, from the perspective of monitoring and ultimately controlling indirect selection, more data is better.

4. Vulnerable people. Certain people are vulnerable in any health system. They include the severely ill, the severely mentally ill, and the politically and socially marginalized. Regulators should identify certain populations of people as vulnerable and track their specific health insurance and healthcare experience. Watching their

enrollment and disenrollment rates compared to the non-vulnerable is good, but not sufficient. Schlesinger and coauthors (Schlesinger, Druss, & Thomas, 1999) found that whereas people with serious health problems may be dissatisfied with their care they don't necessarily switch plans because they fear the disruption in their provider relationship. Beyond examining the data regulators should seek feedback from vulnerable populations and their advocates.

5. Vulnerable areas. Areas may be vulnerable because they contain a disproportionate number of vulnerable people, with poverty being one form of vulnerability. At given income level, areas may also be vulnerable because of geography or the political or social marginalization of its inhabitants. For example, remote rural areas and blighted inner cities are frequently vulnerable. Vulnerable areas deserve special attention. Regulators should designate certain geographic areas as underinsured and pay particular attention to availability of plans, providers, and the experience of insureds within these areas. If insurance participation is low in a particular area, whether the area is officially designated as vulnerable or not, regulators should not assume that the only reason for the underinsurance is lack of compliance on the part of the consumers with respect to mandatory insurance requirements. People in that area may not have the same access to the same price and quality insurance as people in other areas.

6. Stakeholder feedback. Regulators should establish a process for evaluating consumer, provider, insurer, and other complaints from the perspective of indirect selection. There will be a fine, even non-existent line, between good insurance and care management and indirect selection. Sick insureds will be dissatisfied and may change insurers if an insurer denies certain care. The care requested may be evidence based.

In such a case the insurer's legitimately 'good' practices will have resulted in indirect selection. Alternatively the insurer may be systematically and inappropriately blocking sick people from accessing expensive treatment. One complaint may not be worthy of concern, but a consistent stream of complaints should trigger an empirical and normative evaluation. Besides consumers, complaints should be accepted from providers and other insurers who are often in the best position to detect patterns. Newhouse (1994) advocated for local (state as opposed to federal) control of risk adjustment and other regulations as local regulators can respond best to the feedback concerning activities in their specific market. The downside of state control is that state regulators may be inappropriately swayed by one dominant player.

F. Enforcement with Penalties

Enforcement and penalties are essential to effective regulation, but they are well beyond my expertise. Therefore, as foretold in the initial Conceptual Model portion of this chapter, this paper will not discuss enforcement and penalties other than to note the obvious: the more certain, quicker, and bigger the enforcement and penalty actions, the more insurers are likely to adhere to the letter and spirit of the regulations. Also, as previously noted, public outrage against an insurer and the resulting loss of reputation is itself a penalty.

G. Feedback Loops

Feedback loops are essential to the operation of a dynamic system. Monitoring identifies and, at least sometimes, quantifies the effects of indirect selection. But without subsequent action, monitoring is worthless. If the indirect selection is in violation of current regulations, then penalties and enforcement are called for. With or without a regulatory violation, the indirect selection should be

publicly discussed. Discussing indirect selection may result in moral suasion which causes a specific insurer or even the insurance industry to modify their ways.

If enforcement and moral suasion are not sufficient, regulators should modify the risk adjustment or make other regulatory changes – the sooner the better. Van de Ven (1994) points out that insurers are less likely to select if the selection effort is associated with high potential costs and a potential short life. Potential costs are high when there is a high likelihood of “getting caught”, public discussion resulting in reputational loss, and potential penalties. Potential life is short when there is a high likelihood of getting caught, reputational loss, regulatory enforcement, and corrective changes to risk adjustment or other regulations.

There will be a need to change risk adjustment over time; yet big changes to risk adjustment are highly destabilizing. Therefore, there may be merit for pre-emptively declaring that risk adjustment will be changed on an annual or two year cycle. Then there is no debate about the timing of the change, just the content of the change. Big changes can be phased in to minimize the destabilizing effects. There is also merit to having the bulk of regulation in the form of administrative rules, rather than legislation, as rules are easier to update on a regular and timely basis.

VI. CONCLUSION

Healthcare reform emerged, in part, from dissatisfaction with today's health insurance system which makes insurance unobtainable or unaffordable for many of the people who need it the most. People stay in unpleasant jobs and marriages in order to preserve group health insurance. Someone who becomes ill and can no longer work loses both his/her income and health insurance. Insurance companies invest substantial resources in deciding whom to insure at what price – direct risk selection.

The healthcare reform strategy with respect to insurance availability and affordability is to eliminate direct selection by forbidding underwriting and requiring community rating, to subsidize premiums for those who cannot afford the community rate, and to instruct insurers not to indirectly select and thereby cause insurers to focus on healthcare quality, price, and efficiency. However, it is possible that insurers are not going to voluntarily forfeit selection. Insurers must stay competitive and profitable. If they cannot directly select, they may seek out ways to quietly indirectly select in order to enhance profitably or, at the very least, not to lose profitability by being the recipient of another insurer's less desirable risks.

To reduce the profit impact of intentional and inadvertent indirect selection, the authors of healthcare reform included risk adjustment as part of the new healthcare system. Via risk adjustment there will be a behind the scenes (from the perspective of the consumer) flow of money from insurers who have healthier insureds to insurers who have less healthy insureds. Risk adjustment is an essential tool for reducing and mitigating indirect selection. It does not, however, offer a complete solution. Today's risk adjustment models leave ample opportunity for indirect selection. Improving risk adjustment, while a worthy endeavor, will not fully eliminate the opportunities. The best hope of minimizing indirect selection lies with a comprehensive strategy of risk adjustment and other regulation, the detailed configuration of which should change over time as insurers develop and modify their indirect selection strategies.

Such a strategy is dependent upon astute, well-informed regulators with the time and resources required to develop, monitor, enforce, and modify a strategy and the political will of the regulators' constituents, both consumers and insurance companies. Unfortunately regulators are currently so overwhelmed by the massive logistical challenges of establishing the exchanges and other mechanics of healthcare reform that little cognitive or tangible resources remain for selection control considerations. Fortunately, insurers are similarly overwhelmed by the unknowns associated with the new insurance market and regulations. Assuming that it happens at all, it may be some time before insurers can develop effective indirect selection strategies in the context of the new market. This gives regulators time to catch up.

Putting regulation in place may not be easy. Consumers and insurers are firmly entrenched in a "more choice" philosophy. While choice is generally considered to be socially desirable within competitive markets, within insurance markets choice inevitably creates opportunity for indirect selection. Consumers like choice because they can immediately use choice to benefit themselves as individuals. Insurers know that choices beget indirect selection opportunities; that's why they want to maximize choices. Therefore effective regulation for minimizing indirect selection will not be welcomed by either consumers or insurers. Yet it is essential that regulators be able to respond to emerging market conditions on a timely basis.

Should an indirect selection "arms race" emerge, health insurer resources and management attention will be diverted away from healthcare quality, price, and efficiency. Some insurers will lose the race and drop from the market. The shrinking market will be disruptive to consumers and less competitive overall. As insurers leave the market, their insureds, healthy and unhealthy, will have to change insurers and, quite possibly, healthcare providers. Some of the displaced consumers will have multiple quality insurance options; other displaced consumers will struggle to find a quality plan with providers within a convenient distance to their home.

Even without a comprehensive, dynamic regulatory strategy for indirect selection control, health insurance availability under healthcare reform will be less constrained than today: insurance will be available, often at subsidized rates, to everyone regardless of their health status. But without a regulatory strategy for indirect selection control the offering may be far from equal, with resources that could be used for healthcare will be spent on selection. Furthermore as the selection losers (insurers) depart the market there may no longer be a vibrant competitive market. Even if it is initially modest, regulators will need to have indirect selection control strategy. This paper will hopefully provide regulators guidance as they take on the challenge of creating such a strategy and adapting it over time.

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APPENDIX

Health Insurance Risk Adjustment: The Income Effect

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ABSTRACT

The U.S. Patient Protection and Affordable Care Act of 2010, commonly referred to as “healthcare reform,” partitions the individual health insurance market in 2014 and beyond by income level. In order to take advantage of healthcare reform’s income-based premium subsidies and out of pocket limits, people with incomes under 400% of the family poverty level will need to buy their insurance within a state exchange in order to take advantage of premium subsidies. People with incomes over 400% of the poverty level will be able to select health insurance from within or outside of the exchanges.¹ Furthermore, even within or outside an exchange, insurers may be able to create and market health insurance plans that differentially attract and retain people based on their income level, either intentionally or incidentally to other goals.

Healthcare reform mandates health risk adjustment to equalize risk between insurers within and outside of the exchanges and within exchanges. The health risk adjustment models most used today, including those currently used by Medicare and Medicaid, employ age, sex, and recent diagnosis codes to assess health risk. Recent prescription drug codes may be used to supplement or replace diagnosis codes. A separate adjustment is then often applied to account for regional cost variations, typically at a level no smaller than county. Income is not directly included in any of the widely used models, in part because income information is not routinely available in health insurer databases. Income will, however, be available in insurance databases post-healthcare reform.

This paper will explore income’s potential value as a predictor variable for health risk assessment. Then, using a publicly available database and a publicly available risk adjustment methodology, the paper will demonstrate that income most likely has a financially and statistically significant marginal health risk predictive value – a value over and above the value provided by today’s

¹ States may pre-empt federal law and require all individual insurance to be purchased via an exchange. See Discussion and Recommendations.

risk adjustment models. Consequently, the paper will endorse the inclusion of income in post-health care reform risk adjustment in order to mitigate the impact of income-based selection and enhance the stability of the individual health insurance market.

BACKGROUND

As expressed in the The U.S. Patient Protection and Affordable Care Act of 2010 and associated amendments (PPACA, May 2010), the three dominant social policy goals of the effort to reform individual health insurance market are:

- 1) **Affordability:** make health insurance affordable to low and middle income families.
- 2) **Accessibility:** assure that everyone, regardless of health status, has access to comprehensive health insurance.
- 3) **Competition:** structure the system so that insurers focus on managing healthcare quality and cost efficiency,² rather than selection of insureds.

A fourth goal follows from the second and third:

- 4) **Risk Selection:** structure the system so as insurers can no longer compete on or benefit from risk selection.

The goals were discussed extensively in the academic, trade, and popular literature before the passage of the reform legislation.³ Since reform was passed, Jost (2010) has written an academic paper which addresses the varied challenges of limiting selection in the post-reform individual health insurance market.

In pursuit of these goals, medical underwriting will be no longer allowed. Insurers must cover everyone who applies without “preexisting condition exclusions or other discrimination based on health status” (PPACA, Section 1201). Insurers operating within an exchange may not employ marketing

² The joint goals of quality and cost efficiency appear throughout the Act. Title I of the Act, the Title governing reforms to the individual and group markets, is titled “Quality, Affordable Health Care For All Americans”. Section 2717 is “Ensuring the quality of care”, followed immediately by Section 2718 which is “Bringing down the cost of health care coverage”. Section 2718 requires insurers to “*provide value for premium payments*”.

³ Examples include trade/popular literature: Obama (2009), Fronstin and Ross (2009), Reinhardt (2009) and academic literature: Puig-Junoy (1999) and Cogan, Hubbard, and Kessler (Cogan, Hubbard, & Kessler, 2005).

practices or benefit designs that have the effect of discriminating by health status and must demonstrate that they have an adequate supply of providers, particularly in underserved and low-income communities (PPACA, Section 1311).⁴

Furthermore, premium rates may not be discriminatory (PPACA, Section 1201). Insurers must rate all of their non-group business, across all plans offered both within and outside of the exchange, as a single pool.⁵ Rates can vary only according to actuarial value plan design differences, as calculated based on a standard population. Rates cannot vary based on the risk profile of the specific plan (PPACA, Section 1312) or between business sold within or outside of the exchange (PPACA, Sections 1301 & 1312).

As a final guard against insurers, even unintentionally, benefiting or being disadvantaged by selection, the states will use risk adjustment to balance inter-insurer risk pool differences. Insurers with pools that overall experience favorable selection will pay insurers with pools that experience unfavorable selection. Risk adjustment will apply across the exchange and non-exchange market. The legislation does not specify the risk adjustment methodology other than to suggest that it might resemble the risk adjustment methodology currently used by Medicare (PPACA, Section 1343).

It is impossible to simultaneously maximize multiple goals within complex systems. Tradeoffs are inevitable. Healthcare reform is no exception. As part of the effort to curb selection, the legislation generally prohibits discrimination by insurance companies. Yet, in pursuit of the affordability goal, the legislation allows unequal access to insurance options with respect to family income.

People with incomes under 400% who don't qualify for Medicaid, must buy their insurance within a state exchange in order to take advantage of healthcare reform's income-based premium subsidies and out of pocket limits (PPACA, Sections 1401 & 1402). People with incomes over 400% are

⁴ The law clearly precludes blatant discrimination. But it is not clear how enforceable it will be in terms of more subtle discrimination. Jost (2010) and Kingsdale and Bertko (2010) discuss this concern.

⁵ States have the option of forcing insurers to rate their individual and small group business as a single pool (PPACA, Section 1312).

not eligible for subsidies and limits and may buy coverage within or outside the exchange (PPACA, Section 1312).

Insurers in turn are allowed decide whether they wish to sell individual coverage within the exchange. If they sell within the exchange, they must sell the same coverage outside the exchange – at the same premium rate. But an insurer may sell insurance only outside the exchange.⁶ This allows insurers to choose whether they want to insure people with a full range of incomes or almost exclusively those over 400% of poverty. Insurers who choose to sell insurance only off the exchange, have smaller potential markets, but the markets are wealthier and the insurers are subject to less regulation and monitoring.⁷

Furthermore, in spite of an exchange requirements requiring service in low income neighborhoods and against discrimination, it is not difficult to imagine that insurers could design their products, marketing materials and practices, and/or provider panels, to differentially attract and retain insureds with different average family incomes.⁸ This could even happen unintentionally. Van de Van and Ellis (2000) provide a well-researched discussion of differential attraction and retention, which they refer to as “cream skimming.”

Healthcare reform provides funding for the formation of community health “CO-OP” plans (PPACA, Section 1322). While preference is given to statewide plans, a newly formed community plan is

⁶ Implied by PPACA, Section 1311 which lies out the criterion for health plans to be certified as exchange-qualified health plans and affirms the consumer’s right to buy off the exchange and by PPACA, Section 1511 which requires individuals to buy minimum essential coverage, not qualified coverage. Interpretation confirmed by Jost (2010), who in turn points out that individual states have a right to pre-empt the federal legislation and make individual coverage available only through exchanges. See Discussion section of this paper.

⁷ Exchange qualified plans are subject to more regulation and monitoring (PPACA, Section 1311).

⁸ Under healthcare reform insurers will have income data with respect to their insureds. Income data will be collected and verified at enrollment for everyone under 400% of poverty who buys insurance via an exchange. Even if the data is not transferred to the insurer, the insurer will be able to impute income based on the magnitude of the subsidy. Most everyone not receiving a subsidy will be above 400% of poverty. Furthermore, insurers can easily obtain income estimates and a host of other types of data on their current and prospective insureds via a variety of demographic (neighborhood-level) and consumer (person-family-level) commercial databases. Vendors include Easy Analytic Software for neighborhood-level data and Experian, Equifax, Axiom, and infoUSA for person-family-level data.

most likely to start by serving a relatively small geographic area, such as the area around a cluster of providers. Such an area may have a disproportionate number of high or low income people. CO-OP plans therefore may be particularly likely to attract customers with particularly high or low incomes.

For example, according to the U.S. Census Bureau estimates (U.S. Census Bureau, 2010), in 2006-2008 the median household income in Chicago was \$38,625 with 19.6% of households having an income under the federal poverty line. In contrast, the mean household income in suburban DuPage County was \$77,040 and only 5.8% of households were in poverty and the mean household income for Gary, Indiana, just a few miles from Chicago was \$27,526 with 27.9% of households in poverty. Although all three areas are part of the metropolitan Chicago, they represent three very different markets with respect to population incomes.

Thus, the critical question of this analysis: will the income-based bifurcation of the market between exchange and non-exchange markets and perhaps differences in income levels within the exchange and non-exchange markets, create potential income-related selection advantages and disadvantages for insurers? There will be potential income-related selection advantages and disadvantages if income is related to health costs and the risk adjustment methodology does not sufficiently adjust for the income-related cost differentials. Risk adjustment does not need to fully close any differentials. It just needs to make the remaining differentials small enough that there is little exploitable benefit to insurers. If the benefit is small enough, insurers will concentrate their efforts on building competitive strategies based on quality and cost rather than selection – one of the primary goals of healthcare reform.

Relatively small income differentials in terms of percentage of premium when spread over an entire block of business may still offer significant advantage or disadvantage. The health insurers among the Fortune 500 had profits of 2.2% of revenue in 2009 (CNNMoney.com, 2010). Milliman reports that the median 2009 profit for all health insurers was 1.1% of premiums (Milliman, 2010).

Starting in 2011 insurers offering individual health insurance must pay at least 80% of individual health premiums toward health costs (80% “minimum loss ratio”), leaving 20% of premiums for all administrative costs, commissions, and profits. If insurers do not reach the targeted 80% payout they will need to rebate premiums at the end of the year in order to reach the 80% target (PPACA, May 2010; NAIC, October 2010).⁹ From 2011 onward even a 2% profit may be a “stretch” goal. There is articulated concern that the 80% minimum loss ratio requirement may eliminate profit margins, causing insurers to leave some markets, thus destabilizing the state markets (PPACA, May 2010; NAIC, October 2010). This paper will therefore consider a potential 2% differential in health costs across a block of business¹⁰ to be a significant advantage or disadvantage that has the potential to destabilize the state insurance markets if not removed via risk adjustment.

The next section of the paper, Conceptual Foundation, will lay the conceptual foundation for income being related to health costs in ways not fully accounted for by today’s risk adjustment models, including the model used by Medicare. The Analysis section of the paper will use a publically available database and one of today’s publically available risk adjustment methodologies to confirm that there are statistically significant income differentials that persist after risk adjustment and that these differentials may generate significant business advantage and disadvantage for insurers. The Recommendations section will endorse the inclusion of income in post-health care reform risk adjustment in order to remove the potential for significant income-based selection advantage and disadvantage.

⁹ The rebate calculation will be for all of an insurer’s individual business within a single state (NAIC, October 2010).

¹⁰ Rebates and most of the other legal requirements and calculations associated with healthcare reform are at the state level. “A block” is therefore all of an insurer’s individual business within a state.

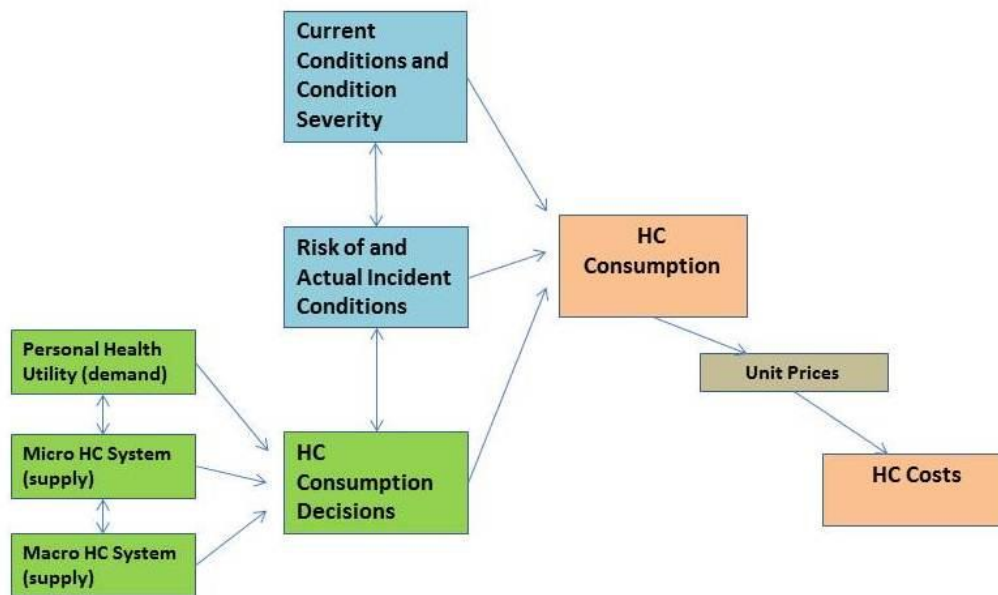
CONCEPTUAL FOUNDATION

Income and HC Consumption

The conceptual foundation starts with **Model 1**, a basic model for healthcare consumption¹¹ and costs. Model 1 assumes that everyone is covered under the same insurance plan/program. Otherwise it would be necessary to model the interactions between benefit and cost sharing structures and consumption.

Figure 1

Model 1: Healthcare (HC) Consumption and Cost Model



Model 1 is best considered from right to left. Healthcare (HC) costs for an individual person are a function of healthcare consumption and unit costs. Healthcare consumption is, in turn, a function of an interaction (hence the bidirectional arrows) between the individual's:

¹¹ Healthcare consumption is also known as healthcare utilization.

1) **Current conditions and condition severity.** For example, the individual may or may not have diabetes and the diabetes may or may not be controlled.

2) **Incident conditions and the risk thereof.** Incident conditions may be entirely “out of the blue”, such as a car accident, or they may be an acute manifestation of a current condition, such as a complication of diabetes. Incident conditions will trigger healthcare consumption. Furthermore, simply the risk of an incident condition will trigger consumption by way of prevention and screening.

3) **Consumption decisions.** While current and incident conditions can be thought of as the best measure of an individual’s healthcare “need”, individuals with the same need will not consume the same resources. Consumption decisions are a function of the interaction of individual’s healthcare need, the individual’s personal health utility (demand), and the healthcare system (supply) in which the individual is seeking treatment. Demand and supply can interact via “induced demand” (Leonard, Stordeur, & Roberfroid, 2009).

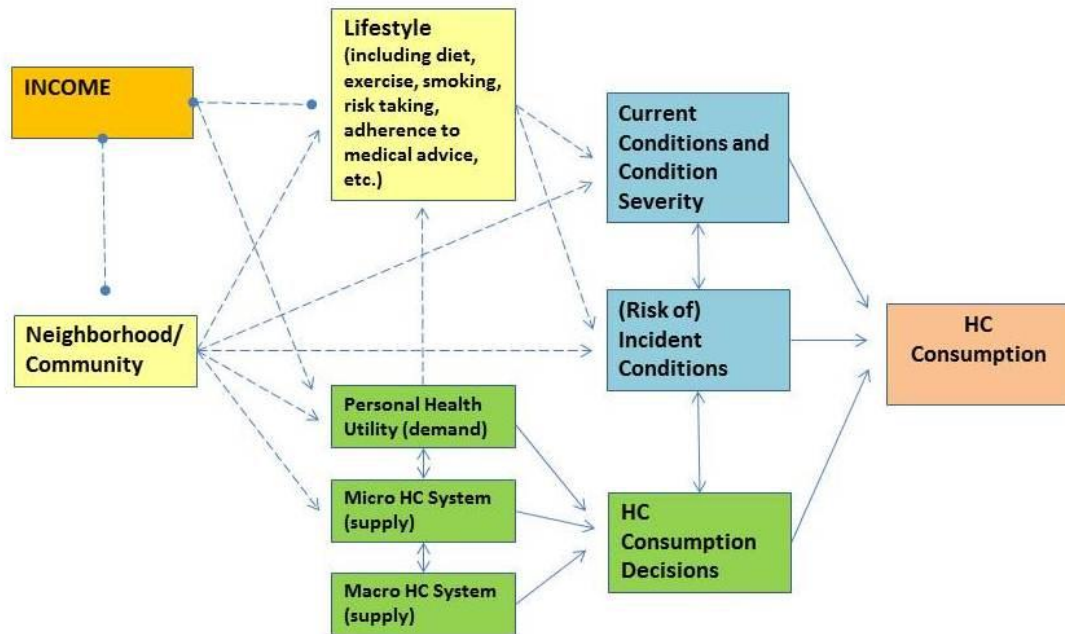
The healthcare system, in turn can be described at a micro and macro level. The micro represents the specific providers from whom the individual seeks advice and treatment and even whether providers are conveniently available. The macro includes regional health practice patterns.¹²

So how does income affect this model? In order to reduce the model and also for reasons which will be explained in the ANALYSIS section, **Model 2** drops the Unit Prices and Healthcare Costs from the right side of **Model 1**. It depicts Healthcare Consumption as the end point and then depicts the various ways that income is related to Healthcare Consumption.

¹² The Dartmouth Atlas has been exploring this relationship for more than two decades. A list of Dartmouth Atlas publications is available at <http://www.dartmouthatlas.org/publications/articles.aspx>.

Figure 2

Model 2: Income's Relationship to HC Consumption



The theories supporting **Model 2** are not new. Although the model is organized somewhat differently and focuses on income, it is consistent with Andersen and Newman's model of "Societal and Individual Determinants of Medical Care Consumption in the United States" (1973).

Although cause and effect direction is not entirely clear (Goldman, 2001) (hence the use of lines, not arrows¹³), researchers agree that income is clearly related to 1) how we live our individual lives – "lifestyle" and 2) who we live our lives with – "neighborhood/community". Neighborhood is the collection of people who physically reside near us. Community is our combined neighborhood and social network.

¹³ The direction of cause and effect is not relevant to income's potential role in predicting healthcare consumption as long as income is measurable and temporally comes before the consumption.

First consider the link between income and lifestyle. Numerous lifestyle-related behaviors are linked to income. These include diet quality, overeating/obesity, smoking, physical activity, risk taking, and adherence to medical advice. A summary of Behavioral Risk Surveillance System (BRFSS) data, as shown in Table 3, makes this clear. These behaviors are, in turn, linked to health to such an extent that they are accepted by the World Health Organization, Centers for Disease Control, and other health authorities as the primary risk factors for assorted chronic diseases (WHO, 2005; CDC, 2010).

Then neighborhood/community. Housing is the largest single household expense and zoning essentially segregates people by how much they spend on housing. Money buys housing quality as defined by a variety of neighborhood-level health determinants (Kawachi & Berkman, 2003; Diez Roux, 2001), including pollution (Ash & Fetter, 2002), exposure to infectious disease (Fullilove, 2003), and intimate and stranger violence (Sampson, Raudenbush, & Earls, 1997). Flying fists and bullets are physical and psychological health risks. Most people seek healthcare close to home. Therefore healthcare providers (or a lack thereof) are an integral part of the interaction between neighborhood and health, especially for the poor who may not have access to an automobile (Shi & Starfield, 2000; Prentice, 2006). Even free, quality healthcare within walking distance may not be easily accessed in a crime-ridden neighborhood.

Physician practice styles vary by local environment. This is supported by Franks and coauthors (Franks, Fiscella, Beckett, Zwanziger, Mooney, & Gorthy, 2003), who found that the socioeconomic status (SES)¹⁴ characteristics associated with a physician's address affected healthcare consumption independently of the SES associated with the patient's address.

¹⁴ Researchers typically consider socioeconomic status (SES) as some combination of income, education, wealth, employment, and occupation, measured at the individual, family, or community level. The operational measurement for a given study may be as little as one parameter, one level (Krieger, Williams, & Moss, 1997). Race and ethnicity are sometimes considered as separate constructs and other times alternative measures of status (Adler & Rehkopf, 2008). Shaver (2007) discusses the strengths and limitations of various SES measurements and methodologies, including the difficulties posed by SES and race and ethnicity interaction.

Finally, there is a growing body of evidence (Smith & Christakis, 2010) that our social networks, which are only partially overlapping with our neighborhoods, are also linked to our health. Since SES “likes attract” socially (McPherson, Smith-Lovin, & Cook, 2001), income and health are linked through social networks.

As noted above, each of the individual links shown in **Model 2** are supported by research. In addition there is a body of research that 1) directly relates income to health and 2) income to healthcare consumption. This body of research sometimes considers potential intermediate variables, but does not necessarily attempt to definitively define, accept, or reject them.

Various researchers have examined the body of research relating income (and other SES factors) to health and reviewed the proposed intermediate variables. They include Cutler, Lleras-Muney, and Vogl (2008), Mechanic (2007), Adler and Newman (2002), and Adler and Ostrove (1999).

Much of the research that directly relates income to healthcare consumption focuses on hospital consumption. Because each day in a hospital is expensive, total healthcare costs are very sensitive to inpatient hospital consumption. In the 2007 MEPS data (described below) I find that less than 6% of the population has a hospital discharge, but that inpatient hospital costs are 29% of expenditures and 43% of charges. Whether they look across all admissions (Billings, Zeital, Lukomnik, Carey, Blank, & Newman, 1993; Hofer, Wolfe, Tedeschi, McMahon, & Griffith, 1998) or at admissions related to specific conditions (McConnochie, Russo, McBride, Szilagyi, Brooks, & Roghmann, 1999; Claudio, Tulton, Doucette, & Landrigan, 1999), at an individual’s income or his community’s income (Hofer, Wolfe, Tedeschi, McMahon, & Griffith, 1998), researchers find an inverse income gradient for hospital use.

Some have proposed that higher consumption of costly hospital services among the poor may result from inadequate primary care, due in part to cost barriers (Billings, Zeital, Lukomnik, Carey, Blank, & Newman, 1993). But studies from Canada, where everyone is guaranteed access to primary care,

counter this argument. Researchers have found that a substantial income gradient among Canadian populations. The Canadian poor use more primary care and more hospital services (Disano, Goulet, Muhajarine, Neudorf, & Harvey, 2010; Roos, Walid, Uhanova, & Bond, 2005; Glazier, Badley, Gilbert, & Rothman, 2000; Roos, Burchill, & Carriere, 2003) and still suffer higher mortality (Ross & Mustard, 1997; Booth, Li, Zhang-Salomons, & Mackillop, 2010). Poor women and women living in poor neighborhoods are more likely to experience (expensive) adverse birth outcomes (Luo, Wilkins, & Kramer, 2006). On the very bottom of the income spectrum, Salit and coauthors (Salit, Kuhn, Hartz, Vu, & Mosso, 1998) show that the homeless, the poorest and most disenfranchised of our society, have health needs and consumption patterns well in excess of people who are merely low income.

At this point, however, words of caution are in order. Although the above research supports the links shown in **Model 2** and implies or asserts causal relationships, causal relationships are far from certain. Lower income does not necessarily cause unhealthy lifestyle behaviors.¹⁵ Pampel and coauthors (Pampel, Krueger, & Denney, 2010) review a variety of possible explanations and empirical support for the possible underlying causes for the relationship between low SES and unhealthy behaviors. And even the link between behaviors and health may ultimately be proved to be less than direct. For example Darmon and Drewnowski (2008) affirm the relationship between diet quality and health, but challenge the extent of the causal effect. Similarly Campos and coauthors (Campos, Saguy, Ernsberger, Oliver, & Gaesser, 2006) question the causal relationship between obesity and ill health.

Even when there is reason to believe that “cause” exists, it can still be difficult to identify the most salient causal factors as potential factors are often highly correlated with each other. This is particularly a problem with SES variables. For example, the differential impacts of income and education on health are difficult to tease out (Cutler & Lleras-Muney, 2006). But even non-SES variables can be difficult to identify and isolate. Confounding is an ever present possibility. Dormuth and

¹⁵ It is particularly difficult to argue that poverty causes smoking as smoking has a significant cost.

coauthors (Dormuth, et al., 2009), in a study of 114,000 Canadians taking statins, found that those who were adherent had substantially lower motor vehicle and other accident rates than those who were not adherent. There is no reason to believe that statin adherence makes one less accident-prone. Statin adherence is most likely a proxy for health-seeking, risk-averse behavior (Dormuth, et al., 2009).¹⁶

Finally, it is worth noting that even if lifestyle and neighborhood/community are on the causal pathway to health, they may not be the only pathways between income and health. Researchers have pointed out that there appears to be “*something about lower socioeconomic status itself*” that increases health risk beyond “*behavior, neighborhoods, environmental hazards, and insurance*” (Isaacs & Schroeder, 2004). One theory is that lower SES is related to chronic stress which in turn negatively affects health (Baum, Garofalo, & Yali, 1999; Seeman, Epel, Gruenewald, Karlamangla, & McEwen, 2010) via the physiologic toll exacted on the body by the stress. The cumulative effect of stress is known as allostatic load (McEwen & Stellar, 1993). Furthermore, a part of the relationship between income and health may be due to common determinants of income and health. Common determinants possibilities include genetics (Johnson & Krueger, 2005) and prenatal and childhood nutrition (Case, Fertig, & Paxson, 2004).

Fortunately, for risk adjustment purposes, a direct causal relationship between income and healthcare consumption is not required. And since this paper considers only one variable, income, it is not necessary to differentiate between income’s independent contribution and the contribution it makes as a proxy for other SES and related variables. A statistical relationship between income in one time period and healthcare consumption in a later period is sufficient. There is clearly such a relationship and most researchers feel that it is at least partly mediated by lifestyle behaviors and neighborhood/community.

¹⁶ This is an example of “the healthy adherer effect”. The seminal healthy adherer paper is Simpson’s (Simpson, et al., 2006) meta-analysis which found that people who faithfully took placebo drugs as part of blind trials had significantly better mortality than those who took their placebos less regularly.

Current Risk Adjustment Methods

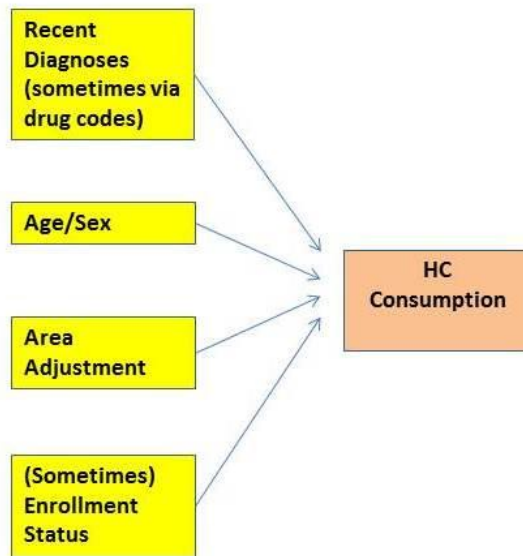
The most common risk adjustment models for the under age 65 market are described and evaluated by the Society of Actuaries (SOA) (Winkelman, Mehmud, & Wachenheim, 2007). The models include the CDPS and ACG models which are most commonly used for Medicaid risk adjustment (Winkelman & Damler, 2008). Because the SOA paper focuses on the under age 65 market, it does not describe and evaluate Medicare's HCC (Pope, et al., 2004) and Rx-HCC (Robst, Levy, & Ingber, 2007) risk adjustment models. The HCC models were, however, developed by the same team that developed the DxCG models which the paper does describe and evaluate. In addition, the American Academy of Actuaries (AAA, 2010) and Milliman (Fontana & Yi, 2010) have recently published high-level issue briefs describing risk adjustment models.

Although there are a number of models, they are conceptually quite similar to each other. As depicted in **Model 3**, they all use essentially the same data to make either a concurrent or prospective healthcare cost predictions. Specifically they use:

- 1) **Recent diagnosis codes and/or recent prescription drug codes.** "Recent" is typically one year. Drug codes, when used are either a supplement or proxy for diagnosis codes.
- 2) **The insured's age and sex.**

Figure 3

Model 3: Today's Risk Adjustment Model



In addition, when risk adjustment models are implemented they are usually adjusted to reflect average costs for the insured's area:

3) **Area**, usually no smaller than county.¹⁷

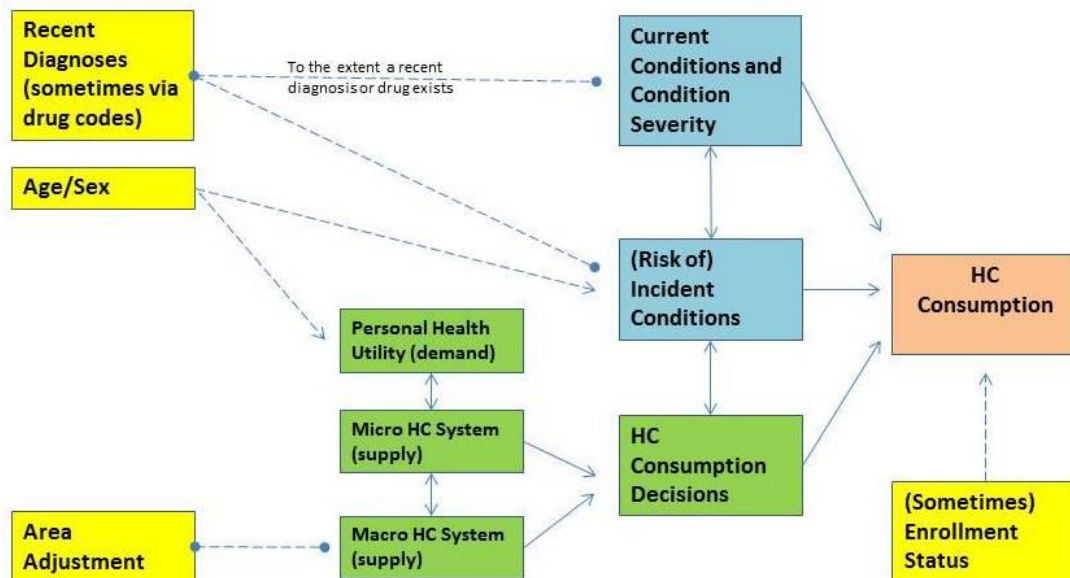
4) **(Sometimes) Enrollment status.** Miscellaneous adjustments related to enrollment status are sometimes made as part of the risk adjustment process. Medicare adjusts for end stage renal disease (ESRD) status, Medicaid enrollment ("dual eligibility"), whether the beneficiary was originally disabled, and institutional status (CMS, 2010). Medicaid risk adjustment typically applies separate factors for people who qualify based on disability versus those who qualify based on poverty (Kronick, Gilmer, Dreyfus, & Lee, 2000; Yi, undated). Commercial insurers may adjust for benefit design, cost sharing, and other plan-specific characteristics.

¹⁷ Medicare uses county. Commercial insurers usually use multi-county "regions".

Model 4 fits the risk adjustment variables into the healthcare consumption model. It is important to note that **Model 4** shows recent diagnosis and drug codes having a non-identity relationship with current conditions and condition severity. One obvious point of mismatch is the possibility of inappropriate diagnoses/drugs. Conditions routinely get misdiagnosed and mistreated. The other point of mismatch is more subtle, but potentially even more significant: the lack of recent diagnoses and drugs. Not everyone with a health condition will seek medical treatment for the condition during a year. Furthermore, even if they do, the physician may not code the diagnosis on the insurance claim or prescribe a drug clearly related to the condition.

Figure 4

Model 4: Risk Adjustment's Relationship to HC Consumption



For example, in the MEPS database (described later) I find that fewer than 50% of the people under age 65 who report ever having heart disease or having had a significant heart event, have sought care within the last year which led to a cardiac diagnosis or purchase of a cardiac drug (exclusive of

hypertension and cholesterol drugs). Somewhat more often, about 75% of people ever diagnosed with hypertension have received a diagnosis or drugs in the past year; the 75% also applies to people ever diagnosed with high cholesterol.¹⁸ By relying on recent diagnosis and drug codes, risk adjusters are not “picking up” all sick people. Furthermore, the people who are being missed are likely not receiving treatment and may therefore be most at risk for future complications and/or acute episodes – risk that the risk adjusters are not assessing.

Today’s risk adjusters do not include income because risk adjustment requires data and insurance companies, other than Medicaid, where everyone is poor, have never systematically captured income data. Income data, however, at least up to 400% of poverty, will be systematically collected under healthcare reform.¹⁹ Now that income is systematically available its potential contribution to risk adjustment should be assessed.

Overlap

Although income is not an explicit part of today’s risk adjustment models, it is possible that the variables being used by the models are variables on the pathway between income and healthcare consumption and that therefore income’s effects on healthcare consumption are, in fact, being captured by today’s risk adjustment models. A comparison of **Model 2** and **Model 4**, however, reveals that only some of income’s effect is being captured.

The risk adjustment variables and income overlap the most with respect to current conditions. To the extent that recent diagnoses and drugs capture all current conditions, the addition of lifestyle via an income model is unnecessary. But, as discussed above, recent diagnoses and drugs do not capture all current conditions.

¹⁸ The data is not all bad. 95% people with a history of diabetes have a recent diagnosis or drug. And some of the remaining 5% may have had gestational diabetes which does not necessarily require ongoing care.

¹⁹ Everyone with a family income under 400% of FPL who purchases individual health insurance will need to report their income to qualify for premium subsidies. Anyone who does not report is presumably over 400% or close enough to 400% that they are not interested in the subsidy.

An examination of the MEPS data reveals that the 50% under-identification of heart disease and the 25% under-identification of high blood pressure and high cholesterol are relatively invariant by income. This, however, creates bias. Poor people have higher prevalence of most conditions.²⁰ Therefore, if the same percentage gets identified via recent diagnosis or drug codes, the poor people *as a percentage of the total poor population* will have more unidentified conditions. As a result, risk adjustment models will underestimate the costs of the poor relative to the wealthy.

An example makes this clear. Suppose 10% of the poor population and 5% of the wealthier population have a diagnosed condition. Furthermore assume that the people with the condition have had recent, coded care 60%²¹ of the time, irrespective of income. Then 4% of the poor will be unidentified and only 2% of wealthy will be unidentified.

Since identified conditions do not entirely supplant the relationship between income and current conditions, income should be usable in conjunction with identified conditions to better estimate the risk posed by current conditions.

A continued examination of **Model 2** and **Model 4**, reveals no further significant overlap between the risk adjustment variables and the pathways by which income affects healthcare consumption. Age and sex and income affect incident condition and personal health utility, but are clearly different concepts. Risk adjustment's area factor represents the macro healthcare system, while income primarily relates to the insured's micro healthcare system.

²⁰ The MEPS data shows a strong age-adjusted income gradient for high blood pressure, heart disease, and diabetes. The poorest adults are 38%, 62%, and 112% more likely to report ever having high blood pressure, heart disease, and diabetes, respectively. There is, however, no income gradient with respect to ever having high cholesterol. Is this perhaps because lower income people are less likely to get their cholesterol checked?

²¹A higher probability of diagnosis and recent, coded care for the wealthy than for the poor would further exacerbate the differential.

Statistical and Business Significance

The above models suggest that that healthcare consumption is related to income and that the income effect is not fully eliminated by today's risk adjustment models. The forthcoming Analysis Section of this paper will seek to demonstrate:

- 1) **Statistical Significance:** that there is a statistically significant income effect and
- 2) **Business Significance:** that the income effect is sufficiently large that insurers might reasonably experience a 2% advantage (or disadvantage) simply based on the income distribution of their insureds sans inclusion of income in the post-reform risk adjustment model.

The specific hypotheses and parameters for establishing statistical and business significance are described in the Analysis Section.

ANALYSIS

Data Description

This analysis uses the Medical Expenditure Panel Survey (MEPS) dataset prepared by the U.S. Department of Health and Human Services' Agency for Healthcare Research and Quality (AHRQ).

MEPS is a continuous study that uses an overlapping, two year panel design. A new panel is initiated each year and tracked for two years. Each panel has approximately 16,000 people. MEPS therefore tracks approximately 32,000 people per year. About 28,000 of these people are under age 65.²² The data is free and publicly available.

The MEPS dataset includes extensive demographic, socioeconomic, and health status information for panel participants. The demographic and socioeconomic fields include family income, race, ethnicity, and family status. The health status fields include information not typically found in claim files, such as self-assessed health, BMI, and assorted disability indicators. The MEPS dataset also includes detailed healthcare consumption and cost information. Every encounter with the healthcare system is captured, including the type of service, the diagnosis, the amount charged, the amount paid (expended), and the payer(s).

MEPS contains a variable POVCATyy which assigns each participant to an income category based on the ratio of their family income to the federal poverty level (FPL). Family income and the relationship of that income to poverty are calculated via the federal government's Current Population Survey (CPS) definitions of family income and poverty (AHRQ, 2009). Poverty is function of income and family size. CPS is a product of the U.S. Census Bureau. There are differences between the Census Bureau's definition of poverty and the Department of Health and Human Services definitions (ASPE.HHS.gov).

²² Summarized at http://www.meps.ahrq.gov/mepsweb/survey_comp/hc_sample_size.jsp.

Under healthcare reform citizens and lawful immigrants are eligible for Medicaid and individual health insurance subsidies based on the ratio of their family income to FPL (PPACA Sections 1401 and 2001). The MEPS categories are closely aligned with the eligibility categories for healthcare reform:

Figure 5

Income Categories

MEPS Family Income Category (POVCATyy)	Ratio of Family Income to FPL	HC Reform Insurance Market Eligibility
1 POOR/NEGATIVE	Less than 1.00	Medicaid
2 NEAR POOR	1.00 to 1.24	Medicaid (up to 1.33)
3 LOW INCOME	1.25 to 1.99	Exchange
4 MIDDLE INCOME	2.00 to 3.99	Exchange
5 HIGH INCOME	4.00 or Greater	Market

MEPS also provides insurance status for every person for every month during the year. Finally, MEPS assigns a weight to every participant. The weights sum to the U.S. population. Since MEPS oversamples poor and minority populations, such populations have lower weights than participants from more dominant populations.

The MEPS dataset has some significant limitations. It would be ideal to have 10 times the number of people and it would be good to have more than 2 years of longitudinal data. But both the number of people and the period of time are adequate for a prospective risk adjustment system.

The two most substantial data field limitations are the result of the de-identification process which allows the data to be placed in the public domain. There is no zip code information and diagnostic codes are presented only at the three-digit level. These limitations will be discussed later.

Specifically, the analysis uses the 2005, 2006, and 2007 “Household” files²³ and the 2004, 2005, 2006, and 2007 “Condition” files.²⁴ The extra year of Condition files is required for prospective risk adjustment.

Expenditures and Charges

MEPS data provides two healthcare cost fields: expenditures and charges. Charges are the amounts billed by providers for the healthcare services rendered. Expenditures are the amounts actually paid. Paid amounts for a given service are almost always less than charged. That’s because most services are paid for via some negotiated contract between the provider and the payer, sometimes with a network or prescription benefit manager (PBM) as an intermediary. Furthermore, some charges are never paid at all, particularly when the patient does not have insurance.

Billed charges are largely fictitious amounts – virtually no payer pays the billed amount. The average ratio between paid and billed in the 2007 MEPS dataset is 50%. One could argue that expenditures are more “real”. Expenditures, however, are dependent on the payer. Some private payers pay a higher percentage of billed amounts than do others. Medicaid and its sister program, the Children’s Health Insurance Program (CHIP),²⁵ typically pay less than private payers; people without insurance pay the least. Lower income people are the most likely have no insurance or Medicaid.²⁶ Hence there are clear differences in the expenditure to charge ratio by income:

²³ “Household” data. Data files, codebooks, and more are available at http://www.meps.ahrq.gov/mepsweb/data_stats/download_data_files_results.jsp?cboDataYear=All&cboDataTyp eY=1%2CHousehold+Full+Year+File&buttonYearandDataType=Search&cboPufNumber=All&SearchTitle=Consolidat ed+Data.

²⁴ “Medical Condition” data. Data files, codebooks, and more are available at http://www.meps.ahrq.gov/mepsweb/data_stats/download_data_files_results.jsp?cboDataYear=All&cboDataTyp eY=103%2CMedical+Conditions&buttonYearandDataType=Search.

²⁵ MEPS does not distinguish between Medicaid and CHIP enrollees.

²⁶ Not everyone covered by Medicaid and CHIP is “Poor” or even “Near Poor”. Disabled people living in non-poor families can qualify for Medicaid. CHIP is explicitly for children in lower and middle income families.

Figure 6

Ratio of Expenditures to Charges

Family Income Category	Ratio of Family Income to FPL	Ratio Expenditures to Charges
1 POOR/NEGATIVE	Less than 1.00	40%
2 NEAR POOR	1.00 to 1.24	42%
3 LOW INCOME	1.25 to 1.99	48%
4 MIDDLE INCOME	2.00 to 3.99	53%
5 HIGH INCOME	4.00 or Greater	59%
Mean		50%

FPL = Federal Poverty Level.

Developed from MEPS 2005-2006-2007 cost data for people under age 65.

Expenditures represent the total paid from all sources, including the patient.

Expenditures are clearly not an appropriate outcome measure for predicting healthcare costs by income for people who will be covered under individual health insurance. Charges are not necessarily appropriate either. As stated, they are a largely fictitious value and their level may well vary by income.

MEPS provides high-level counts of the healthcare units consumed per participant, per year. For example, the number of office based encounters with sub-counts for physician visits, physical therapy visits, etc; the number of hospital admissions and days; and the number of drugs. The mean cost per unit can be calculated across the entire MEPS dataset, including for inpatient stays. (Inpatient stays require the use of linear regression to separately calculate a mean cost per admission and per hospital day.)

This paper develops and uses two new outcome measures: “proxy expenditures” and “proxy charges” that assign mean costs to each participant’s units of healthcare consumption.²⁷ Mean costs are calculated for each service category, separately for adults and children, by year.

²⁷ I have been unable to find references to other researchers developing such proxies or otherwise normalizing expenditures for differences in payer mix.

Equation 1

$$\text{Proxy Expenditure}_{i,AC,yr} = \sum_k (\# \text{ of Units Consumed}_{k,i,AC,yr} \times \text{Mean Unit Expenditure}_{k,AC,yr})$$

$$\text{Proxy Charge}_{i,AC,yr} = \sum_k (\# \text{ of Units Consumed}_{k,i,AC,yr} \times \text{Mean Unit Charge}_{k,AC,yr})$$

Where i = MEPS participant in year yr

AC = adult or child

yr = year

k = healthcare service type

An analysis of the proxy expenditures and charges revealed that children have lower unit costs (expenditures and charges) than adults, hence the above adult/child differentiation. Intuitively it makes sense that the average child unit of care is less resource intensive than the average adult unit of care.²⁸ Hence the differentiation between children and adults in the above formula.

More problematic is that higher income people have higher unit charges than lower income people. Based on this data it is impossible to determine the cause of the income-charge differentials and to speculate whether the differentials would persist if everyone was covered under the same insurance plan. It could be that higher income people tend to go to providers who charge more for essentially the same services. Or it could be that higher income people receive more intensive services. For example, that they are more likely to have a cardiac surgical procedure if admitted to a hospital for myocardial infarction.

Proxy Expenditures and Proxy Charges represent cost-weighted aggregate consumption measures. To the extent that the higher unit costs for wealthier people reflect higher quality or intensity of services, actual charges are also an aggregate consumption measure. To the extent that they reflect simply higher prices for the same service, actual charges are not a consumption measure.

²⁸ Children might be expected to have proportionately more primary care visits for routine care and minor illnesses and fewer visits for chronic and comorbid condition management, specialist visits, and expensive diagnostic tests.

Rather than choose one consumption measure this paper will examine three aggregate consumption measures: Proxy Expenditures, Charges, and Proxy Charges²⁹. Since the consumption measures are expressed in dollars, I will refer to them generically as “cost measures” and sometimes simply “costs”.

All cost measures used in this analysis are trended to 2007 at 3.5% per annum, corresponding to the approximate annual healthcare inflation level in the 2005-2007 period (AHRQ, 2010). Trending is done after the creation of the proxies and before truncation (discussed below). The following table summarizes mean cost measures.

Figure 7

Summary of Costs

Family Income Category	Average Age	Proxy Expenditures		Charges		Proxy Charges	
		2007 \$	Ratio to Mean	2007 \$	Ratio to Mean	2007 \$	Ratio to Mean
1 POOR/NEGATIVE	23.3	2,925	1.25	5,856	1.27	6,274	1.34
2 NEAR POOR	25.5	2,405	1.03	5,025	1.09	4,982	1.06
3 LOW INCOME	26.9	2,168	0.93	4,250	0.92	4,472	0.95
4 MIDDLE INCOME	30.5	1,958	0.84	3,820	0.83	3,840	0.82
5 HIGH INCOME	36.2	2,357	1.01	4,553	0.99	4,429	0.94
Overall	29.6	2,336	1.00	4,600	1.00	4,692	1.00

Developed from MEPS 2005-2006-2007 cost data for people under age 65. See paper for description of proxy values.

Note that the youngest people (the poorest) in the above table cost the most and that the higher unit charges for wealthier people tend to flatten the cost differentials by income for charges as compared to proxy charges. High income people are older and therefore not unexpectedly cost more than middle income people.

²⁹ Optical and dental costs included in MEPS have been removed from the analysis as they are not covered under the standard health insurance contract.

Expenditures have been omitted from this analysis. Different payers pay different percentages of charges. Differences in payer mix create an expenditure income effect: less is paid for poor people and more for wealthy people. The intent is to assess the income effect “as if” everyone is covered under the same plan of insurance. Hence expenditures are not appropriate.

Risk Adjustment Methods

Two of today’s risk adjustment models are available in the public domain. The first is CDPS, developed specifically for Medicaid populations (Kronick, Gilmer, Dreyfus, & Lee, 2000). The other is the HCC-CMS model used by Medicare (Pope, et al., 2004). The Medicare model was developed based for a largely over age 65 population. CDPS model was developed based for an under age 65, including children, poor and disabled population. Although not necessarily ideal, CDPS provides the best match for the under age 65 population that will be covered in the post healthcare reform individual market. This paper will therefore use CDPS, specifically version 5.2.³⁰

Risk adjusted cost prediction as modeled by CDPS and several other leading risk adjustment vendors requires four steps: 1) apply an algorithm (aka “hierarchy”) to set age/sex and condition flags and 2) apply cost factors to each flag, 3) sum across flags to get the individual’s relative cost, 4) multiply by the average cost for the population (AAA, 2010; Winkelman, Mehmud, & Wachenheim, 2007).

³⁰ University of California at San Diego, Chronic Illness and Disability System, version 5.2 as downloaded from <http://cdps.ucsd.edu/> on Aug 12, 2010.

Equation 2

$$\text{Predicted Costs}_i = \left(\sum_j (\text{Flag}_{i,j} \times \text{Cost Factor}_j) \right) \times \text{Mean Population Cost}$$

Where i = MEPS participant

j = an age/sex flag or a condition flag

(each participant will have one and only one age/sex flag and 0 to several condition flags)

And where all costs are in 2007 dollars and a participant with two years of data is treated as two participants for purposes of concurrent predictions.

Recognizing that CDPS is an imperfect fit and following the guidance of the Society of Actuaries (Winkelman, Mehmud, & Wachenheim, 2007) this paper adjusts for risk via two methods. The methods both rely upon CDPS condition hierarchies, but differ with respect to cost factors.

Method 1: Risk Adjustment Using CDPS Hierarchies and CDPS Cost Factors

The first method uses CDPS condition hierarchies and CDPS factors. Specifically it uses CDPS's factors for adult and children "TANF" Medicaid insureds,³¹ normalized to 1.00. CDPS provides factors for adult and child TANF Medicaid insureds, for prospective and concurrent predictions. The mean CDPS factor for the MEPS adult and child participants is less than 1.00. This is because there is less ability to identify high cost using MEPS data (see forthcoming About Diagnosis Codes section) than with typical diagnosis codes and that the MEPS population is healthier than the Medicaid population used to develop the factors. In order to preserve MEPS mean costs, I normalized the CDPS cost factors to 1.00 as follows:

³¹ CDPS distinguishes between Temporary Assistance to Needy Family (TANF) insureds who qualify for Medicaid exclusively by virtue of poverty and Disabled insureds who qualify based on their disability status. Medicaid expansion CHIP children are included in the TANF category. State funded CHIP children are excluded. The calibrations use 2001-2002 data from the CMS's MAX Medicaid data collection system.

Equation 3

$$\text{Normalized CDPS Factor}_{i,AC,CP} = \text{CDPS Factor}_{i,AC,CP} / \text{Mean CDPS Factor}_{AC,CP}$$

Where i = MEPS participant

AC = adult or child

CP = concurrent or prospective

Method 2: Risk Adjustment Using CDPS Hierarchies and Regression Factors

This method uses CDPS condition hierarchies and multiple regression factor estimates developed from the MEPS data set. This method develops factor estimates by regressing the CDPS age/sex and condition flags against a full sample of the MEPS cost data. The regression is less than ideal. One of the problems is overfit; the other is the relatively small sample size of the MEPS dataset.³² In a perfect world, a much larger dataset would be available and it would be possible to split the dataset into development and test subsets. Another approach to avoid overfit is to assign factors that are some blend of the CDPS and regression factors -- as Winkelman (2007) did.

Neither of the two methods is ideal and, in fact, a blended method as performed by Winkelman might be most appropriate. I will employ each method separately and display the resulting range of income effect estimates.

About Diagnosis Codes

MEPS provides public access to diagnosis codes at the 3-digit ICD9 level rather than the full 5-digit level. CDPS hierarchy software which assigns condition flags is structured to run using either 5-digit

³² Children are less than 1/3 of the MEPS population and have relatively few chronic conditions. Therefore it was impossible to develop meaningful children-only regression factors from the MEPS dataset. Child and adult factors were developed on a combined basis with the only difference between and adult and child being the age/sex flags.

or 3-digit diagnostic codes, but it does not run as precisely with 3-digit codes as it does with 5-digit codes. Since the most costly severity levels are often associated with specific 5-digit codes nested within moderate cost 3-digit codes, much of the power to differentiate the most costly condition severity levels is lost. Because high cost conditions are mixed into moderate cost conditions and assigned costs consistent with the moderate cost level, CDPS factors for seemingly moderate cost conditions are probably too low. The underestimation theoretically self-corrects when regression factors are used in place of CDPS factors. In either case, there are less differentiated predictions than there would be using CDPS using 5-digit codes and therefore less overall predictive power. That is presumably the reason that the R^2 (“R-squared”³³) values (see **Tables 1 and 2**) are not as high as the CDPS R^2 values reported by Winkelman (2007).

Other Risk Adjustment Considerations

Two other considerations are relevant to risk adjustment. The first is to decide between concurrent and prospective predictions. The other is whether to truncate costs or not. Similar to earlier decisions, I decided not to decide for purposes of this paper, and to instead show a range of income effect results for both prediction models.

Prospective predictions use diagnosis codes from a given year to predict the following year’s costs. Concurrent predictions use diagnosis codes from a given year to predict the same year’s costs. Medicare (Pope, et al., 2004) and most Medicaid plans use prospective predictions. A minority of Medicaid plans, however, use concurrent predictions (Winkelman & Damler, 2008). The Academy of Actuaries recently published an issue brief which discusses the topic of prospective and concurrent predictions (AAA, 2010). No decision has been made regarding concurrent or prospective risk adjustment under healthcare reform.

³³ R^2 values are measurement of predictive power, also known as “coefficients of determination”.

The technical difficulty with respect to making prospective predictions using MEPS data is that the predictions require two years of data. Because of the overlapping panel design, only half of the people captured each year have prior year data. The relatively modest n is cut by half from 87,949 to 44,729.

Finally, healthcare costs have significant outliers. A single \$1,000,000 claim is quite disruptive to a multiple regression process, even when n is large. Therefore nearly every risk adjustment exercise truncates claims at some level (Iezzoni, 2003). No academic or practitioner claims to have the theoretically correct answer as to whether costs should be truncated and at what level. I therefore will perform risk adjustment and calculate residuals using both untruncated and truncated costs. Since expenditures are approximately 50% of charges, I have truncated proxy expenditures at \$125,000 and proxy and actual charges at \$250,000.³⁴ Truncation was applied as a final step after costs were trended to 2007 levels.

Individual Health Insurance Market

The MEPS data base can be used to estimate the income distribution of the post-healthcare reform individual insurance market. Estimating the income distribution of the post-healthcare reform market is necessary for accessing the potential business significance of any income effect.

The following tables assign each MEPS participant in the 2005-2007 to an insurance status based on their status for the majority of the calendar year (7 months or more) and then tally the MEPS weights for each income and insurance category. On a weighted basis, about 1.5% of participants did not have a single status for 7 months or more; their status is labeled "Mixed".

³⁴ Consistent with the truncation points in Winkelman's (2007) evaluation.

Figure 8

U.S. Population Distribution

(Age 65 and Under, Years 2005-2007, Using MEPS Data and Population Weights)

Family Income Category	People by Insurance Status for 7 or More Months					
	Private	State	Medicare	Mixed	No Insurance	Total
1 POOR/NEGATIVE	4,752,333	15,288,271	1,867,363	724,521	11,042,584	33,675,072
2 NEAR POOR	2,524,552	3,470,003	612,053	314,664	3,642,982	10,564,254
3 LOW INCOME	13,312,424	7,438,835	1,172,480	842,193	10,934,130	33,700,062
4 MIDDLE INCOME	57,418,919	5,692,838	1,783,974	1,285,252	16,460,785	82,641,768
5 HIGH INCOME	89,646,250	1,213,378	1,337,947	719,306	8,596,555	101,513,435
Total	167,654,478	33,103,325	6,773,817	3,885,936	50,677,036	262,094,592

Figure 9

Post-Reform Individual Market

Family Income Category	People Likely to be in Post-Reform Individual Market				
	Subsets of Private Insurance		No Insurance	Total	% Total
	Individual	Self-Employed			
1 POOR/NEGATIVE	<i>Medicaid Eligible*</i>				
2 NEAR POOR	<i>Medicaid Eligible*</i>				
3 LOW INCOME	656,825	114,761	10,934,130	11,705,716	28.1%
4 MIDDLE INCOME	1,673,440	311,297	16,460,785	18,445,522	44.3%
5 HIGH INCOME	2,338,484	532,595	8,596,555	11,467,633	27.6%
Total	4,668,749	958,653	35,991,470	41,618,872	100.0%

* Except for illegal immigrants and recent legal immigrants. Recent legal immigrants in these income categories may purchase insurance on the Exchange and receive subsidies. MEPS does not provide immigration status.

The base distribution for the post-healthcare reform individual insurance potential market is therefore 28% low income, 44% middle income, and 28% high income insureds (in bold above).

Income Effect Evaluation

The above covers everything required to generate risk-adjusted cost predictions and to calculate prediction residuals. The salient question then becomes: how, if at all, does income relate to the

prediction residuals? As discussed in Conceptual Foundation, evaluating the income effect will be a two-step process. The first step will be to determine if there a statistically significant income effect and the second step will be to determine whether the effect has potential business significance.

Step 1: Statistical Significance Criteria

I will examine three specific hypotheses to consider when examining residuals by income:

Null hypothesis: After adjustment for health risk (as defined by today's risk models), there is no income effect on healthcare consumption

- 1) Across the full range of income categories (poor, near poor, low, middle, and high),
- 2) Between low and middle income people who will be on the Exchange in order to take advantage of subsidies and the high income people who may be able to seek insurance elsewhere, and
- 3) Between the low, middle, and high income people who will be in the individual health insurance market.

Alternative hypothesis: There is an income effect on healthcare consumption.

Since the lowest two income categories, poor and near poor, will be covered by Medicaid, the first statistical test is included mostly to satisfy curiosity with respect to the full continuum of income differentials. The last two statistical significance tests relate directly to the business significance tests.

Step 2: Business Significance Criteria

As discussed in Background, there are two business concerns. The first is that individual health insurers who do not sell insurance on the exchange will have a significant advantage over those who sell on the exchange. Those who sell exclusively off the exchange will sell to people in families of 400% of the FPL and perhaps to a few families with incomes somewhat under 400% and who are willing to forgo a small insurance premium subsidy that they would be entitled to if they purchased a policy from the exchange. I will therefore calculate the relative advantage of an insurer insuring a population that is almost entirely people at 400%+ of poverty versus an insurer selling to typical income distribution of the potential market.

The next business concern is whether, across the entire individual health insurance market, an insurer can be advantaged or disadvantaged by income selection. I will therefore calculate the advantage for an insurer with a higher income distribution relative to the income distribution for the potential market and the disadvantage for an insurer with a lower income distribution relative to the income distribution for the potential market.

Figure 10

Income Distributions for Business Significance Tests

Family Income	Potential Market*	Non-Exchange	Lower Income	Higher Income
3 LOW INCOME	28%		43%	13%
4 MIDDLE INCOME	44%	10%	44%	44%
5 HIGH INCOME	28%	90%	13%	43%
Total	100%	100%	100%	100%

* Advantage and disadvantage of the other distributions will be relative to this distribution.

The lower income and higher income distributions used for testing business significance should be realistic distributions that can be obtained by insurers by virtue of geography or making their products and services differentially appealing to various income levels. As discussed in Background, geography is of particular concern as healthcare reform encourages the development of Consumer Operated and Oriented Plans (CO-OPs) which very likely will be centered around a cluster of healthcare providers.

The following table demonstrates that geography, even within one metropolitan area may significantly impact income distribution. While the following table appears to resemble the above Business Significance Tests table, it is different as it is a distribution of households, not people; is based on income as expressed in dollars, not ratios to the federal poverty level; and is for all ages, not just for people under age 65. In spite of these limitations, however, the table confirms the general reasonableness of the Business Significance Test lower and higher income distributions.

Figure 11

Distribution of Households* by Income

Only Households with Incomes \$25,000+, All Ages

Select Parts of the Chicago Metropolitan Area

Household Income	City of Chicago	Lake County, IL	City of Gary
\$25,000 to \$49,999	33.1%	19.7%	50.3%
\$50,000 to \$99,999	39.8%	36.7%	38.7%
\$99,999+	27.1%	43.6%	10.9%

* Households includes single person households.

Source: 2006-2008 American Community Survey 3-Year
Incomes adjusted to 2008 \$'s.

I will assign potential business significance to income effects if the effects when combined with the Non-Exchange, Lower Income, and Higher Income distributions produce advantages or disadvantages of 2% or more as compared to the Potential Market distribution.

RESULTS

The results are shown in **Table 1** and **Table 2**. **Table 1** shows the income effect after concurrent risk adjustment. Compared to prospective risk adjustment, concurrent risk adjustment is expected to explain more variance compared to prospective adjustment; hence the R^2 values are relatively high -- up to nearly 30%. The residual unexplained variance, however, is clearly related to income. Every income effect estimate on the page shows that poor people cost more than expected on a risk adjusted basis (as indicated by positive signs on the effect estimates³⁵) and wealthy people cost less (as indicated by negative signs on the effect estimates). The income effect estimated differentials between the poorest and wealthiest people are in the 20-40% range with an average of 28%.

Although the greatest effect differentials appear to be associated with the lowest incomes -- people who will be covered by Medicaid and therefore not directly of concern for this paper, an income effect appears across the entire income spectrum. All of the income effect tests for Table 1, as defined by the above three hypotheses, are statistically significant. The estimated effect differential between the low income people and the high income people who will buy insurance in the individual market averages 13% and ranges up to 20%. The estimated effect differential between the low and middle income people who must buy insurance on the exchange to get government subsidies and the high income people who may buy insurance off the exchange averages 8% and ranges up to 11%.

The prospective risk adjustment analysis shown in **Table 2** has the disadvantage of being based on half as many participants. Differences in effect estimates are therefore less likely to reach statistical significance. That's what **Table 2** shows. Also, as expected, prospective risk adjustment explains less variance. The maximum R^2 value is 21%. All of the income effect tests associated with Hypothesis 1 and most of the tests associated with Hypothesis 2, however, are significant. The estimated income effect

³⁵ Effect estimate = mean residual for the income level / mean cost. Mean cost = value shown in the top row of Tables 1 and 2. Residual = Actual cost – risk adjusted predicted cost.

differentials between the poorest and wealthiest people are in the 30-50% range with an average of 40% – about 10% more than the concurrent spreads. This was expected, based on the conceptual model, as concurrent risk adjustment should account for some of the differential incident condition costs attributable to income.

With prospective risk adjustment there is an unexpected flattening of the income effects between middle and high income people – both categories have costs on average 12% less than expected. (In contrast on concurrent basis middle income people cost 6% less than expected and high income people cost 11% less than expected.) The conceptual model provides no explanation for this anomaly.³⁶ As a result of the anomaly, most of the income effect tests associated with Hypothesis 2 are not significant.

The following table summarizes **Table 1** and **Table 2**:

³⁶ I can hypothesize that while high income people are healthier than middle income people with respect to prevalent and incident conditions, that they are more aggressive consumers of care. Exploring this hypothesis is beyond the scope of the paper.

Figure 12

Income Effect Summary

Family Income Category	Concurrent Risk Prediction		Prospective Risk Prediction	
	n	Average Income Effect	n	Average Income Effect
1 POOR/NEGATIVE	18,441	18%	9,326	28%
2 NEAR POOR	5,638	6%	2,939	11%
3 LOW INCOME	14,825	3%	7,472	1%
4 MIDDLE INCOME	24,874	-6%	12,503	-12%
5 HIGH INCOME	24,171	-11%	12,489	-12%
Total	87,949		44,729	
Mean		0%		0%
Income Effect Differential				
Poor vs. High		28%	40%	
Low vs. High		13%	14%	
Low&Middle Combined vs. High		8%	6%	

Although there is some question of whether high income people are different than middle income people when risk is adjusted on a prospective basis, overall there appears to be statistically significant income effects. The next question is whether these effects have potential business significance. The first step is calculating the business effect. This is done by combining the distributions from **Figure 5** with the respective average income effects (in bold) from **Figure 7**.

The resulting business effect estimates are:

Figure 13

Business Effect Summary

Family Income Category	Risk Adjusted Costs Relative to Mean MEPS Participant*			
	Potential Market*	Non-Exchange	Lower Income	Higher Income
Prospective				
Costs	-8.3%	-12.3%	-6.3%	-10.3%
Business Effect		4.1%	-2.0%	2.1%
Concurrent				
Costs	-4.7%	-10.1%	-2.8%	-6.7%
Business Effect		5.3%	-1.9%	2.0%

* Potential Market risk adjusted costs are lower than the costs for the mean MEPS participant. This is because the potential market excludes people eligible Medicaid and assumes a different distribution for the remaining categories of family income.

The business effects are near or above 2%. The fact that the lower and higher income effects are close to 2% is not particularly bothersome given that the combined range is 4%. A insurer with a lower income distribution has a 4% disadvantage compared to an insurer with a higher income distribution.

I therefore conclude, based on the MEPS dataset and the above analysis, that

- 1) Individual health insurers who do not sell insurance on the exchange will have a potentially significant business advantage over those who sell on the exchange.
- 2) Across the entire individual health insurance market insurers may be significantly advantaged or disadvantaged by income selection.

LIMITATIONS

The analysis tested the marginal statistical “effect” of income, and only income, on healthcare consumption. A statistical effect is a relationship and should not be confused with “cause and effect”.

Assuming that there is an effect, factors other than income may be causing the effect. But, to the extent that those factors are correlated with income, an income effect will emerge. A multivariate analysis with income and other socioeconomic indicators/measures (such as race/ethnicity, education, wealth, employment, and occupation) and health measures (such as mental health and resiliency, self-assessed health, and functional limitations) may well find that income no longer dominates as a predictive variable.³⁷

It is important to understand that this paper focuses solely on income because, among the above potential variables, only income will be consistently collected and verified as part of health insurance enrollment and hence readily available for health risk adjustment.³⁸

The analysis is meant to provide a test of concept rather than the definitive analysis of income effect. Although MEPS provides a combination of data that simply is not readily available elsewhere,³⁹ it is a less than ideal data source. In the world of risk adjustment, both in theory and in practice, 88,000 participant-years is small and 44,000 years is particularly small. Healthcare costs defy all the assumed normality and constant variance rules of statistical analysis (Lumley, Diehr, Emerson, & Chen, 2002). It

³⁷ There is extensive literature (Cutler, Lleras-Muney, & Vogl, 2008) available concerning the relationship between the various dimensions of socioeconomic status and health of which income is just one dimension. All the dimensions are, however, correlated. With respect to the effect of income vs. education, some have concluded that education is dominant (Cutler & Lleras-Muney, 2006).

³⁸ Race/ethnicity might at some point be available for risk adjustment. Under healthcare reform race and ethnicity data will be used in the evaluation of hospital quality (PPACA, Section 3001) and public health programs (PPACA, Section 3101). Furthermore all federal health surveys must collect race and ethnicity data (PPACA, Section 3101). But the legislation makes no mention of race and ethnicity in conjunction with insurance data.

³⁹ There are more robust healthcare claims databases, but I don't know of another database that combines healthcare claims with income for an under age 65, non-Medicaid population. See following Further Research section.

takes a large amount of data to generate stable estimates, particularly with respect to high cost, uncommon conditions.

There are other limitations. As discussed above, 3-digit diagnosis codes are less than ideal. 5-digit codes are the standard for diagnostic reporting and risk adjustment. Furthermore, even though most risk adjustment incorporates some sort of area adjustment, MEPS does not identify the data by state, county, or zip code.

The nature of MEPS is problematic. MEPS is an aggregation of data from various payers and, for the non-insured, non-payers. Although I attempt to adjust for the challenge by using proxy charges and proxy expenditures, payer status may be effecting consumption and confounding the income effect analysis. To assess this concern, I calculated Table 1 and Table 2 results for each of the three major payer statuses: private insurance, state insurance, and no insurance. The results are summarized in **Table 4** and **Table 5**. In spite of the inherent stability of small samples, there appears to be an income effect within each major payer category.

Finally, CDPS is not the only risk adjustment methodology commonly in use today. Other methodologies will produce at least somewhat different results. Income effects should ideally be tested in conjunction with the risk adjustment model most likely to be adopted. But no one has identified such a model.

The above are technical limitations with respect to the dataset and methodology. Even if those limitations were removed, there is, however, a much bigger yet more subtle limitation: MEPS is a historical database and the future under healthcare reform is going to be different than the past.

This analysis implicitly assumes that when people move from whatever insurance does or does not cover them today to an individual health insurance policy under healthcare reform that their healthcare consumption patterns will remain unchanged. This is unlikely to be true.

Likewise, due to healthcare reform, the entire healthcare system is going to be in a state of flux for a number of years. Reform will alter the financial relationships between patients, providers, and payers and hence healthcare decisions and consumption patterns. Additionally, separate from reform, technology and research will continue to drive changes in healthcare consumption patterns. Finally, while healthcare reform is underway, another significant change is set to take place: the switchover from ICD9 diagnostic codes to ICD10 diagnostic codes. Despite the similar names, there is no unambiguous mapping between the coding schemes (Kasey, Naugle, & Zenner, 2010). This will affect the stability and reliability of diagnostic code-reliant risk adjustors.

FURTHER RESEARCH

The challenge in incorporating income into risk adjustment in advance of healthcare reform is in estimating the initial factors. MEPS has limitations and other sources of combined income and health claims data are not widely available. There are two additional potential datasets, neither perfect, that could help.

The first is an expanded version of MEPS. The same MEPS data is available with 5-digit diagnosis codes. Accessing the 5-digit codes, however, requires special research clearance, procedures, and cost.⁴⁰ An analysis using 5-digit codes would be better with respect to condition specificity and R² values, but would still suffer the other limitations.

Another data source would be large employers and/or unions, particularly those who employ people at a range of various income levels. Unlike insurance companies, who have access to only health claims data, employers and unions can access both income and claims data. Income and healthcare records have not necessarily been merged in the past, but they could be. It is not clear, however, why employers and/or unions would want to prepare and share this information, even on a de-identified basis.

The employer data itself, even if it had millions of records, would have limitations. The income would be employee income, not family income; healthcare consumption of people covered under group policies may not be representative of the consumption of people who will be covered under individual policies; and employers and unions usually often have large regional/social concentrations of employees who may not be representative of broader populations.

⁴⁰ As described on the “Restricted Data files Available at the Data Centers” page of the MEPS website http://www.meps.ahrq.gov/mepsweb/data_stats/onsite_datacenter.jsp.

DISCUSSION

Even with the limitations of the study and need for further research, the above conceptual modeling and data analysis provide reason to believe that healthcare consumption is subject to an income effect that remains after adjusting for the insureds' age, sex, and recent diagnosis history. There is furthermore reason to believe that the potential income effect could equal or exceed insurers' profits under healthcare reform.

At a minimum, insurers will likely be passively (unintentionally) advantaged or disadvantaged by income selection. In addition, given the relationship of the potential advantage or disadvantage to their profitability, insurers may decide to compete on income selection, rather than healthcare quality and cost efficiency. Insurers have been trying to improve healthcare quality while reducing costs for decades.⁴¹ Given the ever increasing cost of healthcare, well above general inflation levels, there is little evidence of success. Attempting to differentially attract and retain people based on their income levels may be seem "easy" from the insurer perspective as compared to the challenges of more effectively managing healthcare quality and cost efficiency than their competitors.

In contrast, consumer marketing professionals have been successfully working for and within other (non-health insurance) industries to differentially attract and retain customers based on their income levels for decades. They are willing to attempt the same in the individual health insurance market. Leading national consulting firms already actively pitching "market segmentation" and "target marketing" to individual health insurers include Milliman (Draaghtal, 2010), McKinsey & Company (McKinsey & Company, 2010), Deloitte (Keckley & Eselius, 2008), Booz & Company (Knott, Nallicheri, Lall, & Kaura, 2009), Ingenix Consulting (the consulting arm of the insurance giant United Health Group) (Denoncour, 2010), Oliver Wyman (Oliver Wyman, 2010?), and Forte Partners (Forte Partners, 2010).

⁴¹ The growth of HMOs and the introduction of DRG payments by Medicare, both in the mid 1980's, were the first major health insurance initiatives with respect to healthcare quality and cost efficiency.

Health Affairs has published an article that discusses the importance of “strategic market segmentation” for insurance company success under healthcare reform (Brennan & Studdart, 2010).

More than 10 years ago Joseph Newhouse (1998), a Harvard professor and one of the preeminent authorities on health insurance systems, wrote about the consequences of inadequate risk adjustment:

1. *Plans have an incentive configure their product(s) and market their services so as not to appeal to bad risks. Because all plans have such an incentive, bad risks could find themselves treated as pariahs.*
2. *Plans have an incentive to appeal to good risks. In effect, competition for good risks means some of the potential profit on good risks is likely to be spent attracting them, but resources so spent may be socially wasteful.*

Newhouse’s second, consequence, concerning socially wasteful resources, links directly to the efforts of the above consulting firms. Hiring these consulting firms to give advice on market segmentation and target marketing is expensive.

Active efforts to select business are clearly contrary to the healthcare reform goals of accessibility for all and competition based on healthcare quality and cost efficiency, rather than selection of insureds. Selection, whether passive or active, is also detrimental to market stability. An insurer may be doing a fine job managing healthcare quality and cost efficiency, but fail to make a profit and therefore be forced to exit a market by virtue of a detrimental income mix as compared to his competitors. Every time an insurer exists there is a scramble of the insurer’s insureds to find new plans and, often as a consequence, new providers.

Much of Jost's timely and quality working paper "Health Insurance Exchanges and the Affordable Care Act: Key Policy Issues" (2010) concerns controlling "adverse selection"⁴² when designing and managing the post-reform health insurance market and exchanges. He considers this to be one of the paramount reform challenges. Jost's paper has been widely circulated among state insurance regulators.⁴³

Jost recommends that in order to minimize adverse selection, states should consider pre-empting federal legislation (which they are allowed to do if they are making the rules more stringent) to mandate that individual insurance can be bought only on exchanges. At least some state regulators are apparently considering the suggestion. This would eliminate the bifurcation of the individual insurance market by income. But it will not eliminate the possibility that insurers operating on the exchange might be able to create and market health insurance plans that differentially attract and retain people based on their income level, either intentionally or incidental to other goals.

Regardless as to whether individual insurance is sold off the exchanges, a risk adjustment methodology that includes income will provide better protection against income-based selection than a methodology that does not include income. Income should be included health reform's risk adjustment model.

Income has not been used in risk adjustment models in the past because income data, linked to health costs, has not in been available in most circumstances.⁴⁴ But under healthcare reform, income

⁴² "Adverse selection" is Jost's term and an unfortunately common insurance industry term as it assumes a direction (adverse) and is ambiguous with respect to perspective. As described in this paper, selection can be either advantageous or disadvantageous (adverse). One insurer's advantageous selection, will be its competitors' and society's disadvantageous selection.

⁴³ Per my contact with the Illinois Department of Insurance.

⁴⁴ As noted earlier, Medicare adjusts for Medicaid eligibility. Impoverished people who are eligible for Medicaid cost more (CMS, 2010). This is a de facto income adjustment.

data, at least up to 400% of poverty, will be not only available, but verified by the IRS.⁴⁵ Over 400% can be treated as a single category in a risk adjustment model.

In many ways, income is an ideal risk adjustment factor. Dunn and coauthors (1996) in the first Society of Actuaries review of risk adjustment proposed that the ideal risk adjustment model/variable should 1) have predictive power, 2) be administratively feasible, 3) not be open to gaming behavior by insurers, such as up-coding, and 4) not give insurers or providers incentives to engage in socially uneconomic behavior, such as unnecessary hospitalizations. Income meets all of these tests.

⁴⁵ People under 400% of the poverty line qualify for Medicaid, premium subsidies, and/or out of pocket limits. To get these benefits they must purchase insurance through an exchange (or from Medicaid) and document their income. The income will be electronically verified with the IRS.

RECOMMENDATIONS

Based on the above background, conceptual foundation, analysis and discussion, I specifically make the following policy suggestions:

- 1. Require all individual health insurance to be purchased on the exchanges**
 - a. Why: eliminate the bifurcation of the individual health insurance by income
 - b. Who: state-level departments of insurance
 - c. When: as soon as possible and well in advance of the Jan 2014 opening of the exchanges

- 2. Perform further research to extend the above analysis** (as suggested under Further Research)
 - a. Why: to better estimate income effect
 - b. Who: researchers
 - c. When: as soon as possible and in advance of the announcement of the post-healthcare reform risk adjustment methodology

- 3. Include income in the post-healthcare reform risk adjustment methodology**
 - a. Why: to assure that potential insureds are equally welcomed by insurers, regardless of their income, and to promote market stability
 - b. Who: the U.S. Department of Health and Human Services (DHHS) in consultation with the States⁴⁶
 - c. When: presumably by January 2014

- 4. Establish a post-healthcare reform monitoring system**
 - a. Why: to assure that income-based risk selection is effectively minimizing income-based selection efforts and to watch for evidence of other forms of SES selection

⁴⁶ As required by Section 1343 of the PPACA.

- b. Who: DHHS, state-level Departments of Insurance, and researchers
 - c. When: from January 2014
5. **Consider further Post-healthcare reform risk adjustment methodology changes**
- a. Why: to incorporate new information (gathered via monitoring) into the risk adjustment methodology
 - b. Who: the U.S. Department of Health and Human Services (DHHS) in consultation with the States
 - c. When: as needed post January 2014

TABLES

Table 1: Analysis of Income Effect After Concurrent Risk Adjustment

	CDPS 3digit ICD9 Hierarchy, CDPS Risk Factors						CDPS 3digit ICD9 Hierarchy, Regression Factors						Average All Columns
	No Cost Truncation			Costs Truncated			No Cost Truncation			Costs Truncated			
	Proxy Expenditures	Actual Charges	Proxy Charges	Proxy Expenditures	Actual Charges	Proxy Charges	Proxy Expenditures	Actual Charges	Proxy Charges	Proxy Expenditures	Actual Charges	Proxy Charges	
n	none	none	none	\$125,000	\$250,000	\$250,000	none	none	none	\$125,000	\$250,000	\$250,000	
Truncation Point													
Mean Cost (\$2007)	\$ 87,949	\$ 4,651	\$ 4,651	\$ 2,327	\$ 4,401	\$ 4,558	\$ 2,327	\$ 4,651	\$ 4,651	\$ 2,310	\$ 4,401	\$ 4,558	\$ 2,310
R-sq of Risk Adjustment	24%	12%	18%	27%	18%	21%	27%	14%	20%	29%	19%	24%	24%
Residual Analysis:													
Income Effect -- Full Spectrum													
Effect Estimates													
Poor/Negative	18,441	17%	24%	18%	16%	24%	13%	16%	18%	14%	14%	18%	18%
Near Poor	5,638	6%	9%	6%	7%	9%	4%	6%	7%	5%	6%	6%	6%
Low Income	14,825	2%	3%	5%	1%	3%	1%	3%	5%	2%	2%	3%	3%
Middle Income	24,874	-7%	-9%	-9%	-6%	-8%	-5%	-4%	-7%	-5%	-3%	-6%	-6%
High Income	24,171	-9%	-15%	-15%	-9%	-10%	-7%	-12%	-12%	-7%	-10%	-11%	-11%
Full Effect Range	87,949	26%	39%	27%	25%	37%	20%	29%	30%	21%	24%	29%	28%
F-Stat*	31.30	13.75	45.03	36.81	16.48	51.85	18.85	11.89	27.41	23.05	15.10	32.09	32.09
F-prob*	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
Significant at alpha=.05	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income Effect -- Exchange vs. Market													
Effect Estimates													
Low & Middle Income	39,699	-4%	-2%	-3%	-4%	-4%	-2%	-1%	-2%	-3%	-1%	-3%	-3%
High Income	24,171	-9%	-12%	-15%	-9%	-10%	-7%	-12%	-12%	-7%	-10%	-11%	-11%
Effect Range	63,870	5%	10%	11%	5%	7%	4%	11%	9%	4%	9%	8%	8%
F-Stat**	6.65	9.41	23.09	7.13	7.99	22.76	4.67	12.32	14.93	5.08	12.64	15.14	15.14
F-prob**	0.0099	0.0022	<.0001	0.0076	0.0047	<.0001	0.0307	0.0004	0.0001	0.0242	0.0004	0.0001	0.0001
Significant at alpha=.05	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income Effect -- Individual Health Market													
Effect Estimates													
Low Income	14,825	2%	3%	5%	1%	3%	2%	3%	5%	1%	2%	3%	3%
Middle Income	24,874	-7%	-5%	-9%	-6%	-8%	-5%	-4%	-7%	-5%	-3%	-6%	-6%
High Income	24,171	-9%	-12%	-15%	-9%	-10%	-7%	-12%	-12%	-7%	-10%	-11%	-11%
Effect Range	63,870	11%	15%	20%	9%	10%	9%	16%	17%	8%	12%	14%	13%
F-Stat***	9.01	6.39	22.27	8.18	5.05	19.25	6.96	7.64	15.87	6.18	7.30	13.45	13.45
F-prob***	0.0001	0.0017	<.0001	0.0003	0.0064	<.0001	0.0009	0.0005	<.0001	0.0021	0.0007	<.0001	<.0001
Significant at alpha=.05	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* For an income effect in aggregate where null hypothesis is no income effect. Differences between any two categories may or may not be significant.
 ** For an income effect between low & middle income combined vs. high income where null hypothesis is no income effect.
 *** For an income effect between low vs. middle vs. high income where null hypothesis is no income effect.
 Poor = < 1x Poverty; Near Poor = 1.00 to 1.24x Poverty; Low Income = 1.25 to 1.99x Poverty; Middle Income = 2.0 to 3.99x Poverty; High Income = 4.00+x Poverty with poverty defined as the federal family poverty level (FPL).
 Developed from MEPS 2005-2006-2007 cost and 2005-2006-2007 condition data for people under age 65, trended to 2007 \$'s at 6%. See paper for further details.

Table 2: Analysis of Income Effect After Prospective Risk Adjustment

	CDPS 3digit ICD9 Hierarchy, CDPS Risk Factors						CDPS 3digit ICD9 Hierarchy, Regression Factors						Average All Columns			
	No Cost Truncation			Costs Truncated			No Cost Truncation			Costs Truncated						
	Proxy Expenditures	Actual Charges	Proxy Charges	Proxy Expenditures	Actual Charges	Proxy Charges	Proxy Expenditures	Actual Charges	Proxy Charges	Proxy Expenditures	Actual Charges	Proxy Charges				
n	none	none	none	none	none	none	none	none	none	none	none	none	\$125,000	\$250,000	\$250,000	
Truncation Point																
Mean Cost (\$2007)	44,729	\$ 2,336	\$ 4,600	\$ 4,692	\$ 2,314	\$ 4,317	\$ 4,574	\$ 2,336	\$ 4,600	\$ 4,692	\$ 2,314	\$ 4,317	\$ 4,574	\$ 2,314	\$ 4,317	\$ 4,574
R-sq of Risk Adjustment	16%	6%	11%	18%	11%	14%	14%	18%	8%	13%	21%	13%	16%	13%	16%	
Residual Analysis:																
Income Effect -- Full Spectrum																
Effect Estimates																
Poor/Negative	9,326	27%	29%	36%	28%	26%	34%	22%	28%	30%	23%	24%	28%	23%	24%	28%
Near Poor	2,939	10%	16%	13%	10%	14%	12%	7%	14%	10%	7%	13%	10%	7%	13%	10%
Low Income	7,472	1%	0%	3%	-1%	-1%	0%	3%	2%	4%	1%	2%	2%	1%	2%	2%
Middle Income	12,503	-13%	-14%	-15%	-13%	-12%	-13%	-10%	-10%	-11%	-9%	-9%	-10%	-9%	-9%	-10%
High Income	12,489	-10%	-11%	-16%	-10%	-10%	-15%	-10%	-14%	-15%	-10%	-13%	-15%	-10%	-13%	-15%
Effect Range	44,729	37%	41%	52%	38%	36%	49%	32%	42%	45%	33%	37%	43%	33%	37%	43%
F-Stat*	31.45	13.62	37.31	37.35	18.56	44.01	44.01	22.32	12.89	27.87	26.95	17.75	32.69	26.95	17.75	32.69
F-prob*	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
Significant at alpha=.05	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income Effect -- Exchange vs. Market																
Effect Estimates																
Low & Middle Income	19,975	-8%	-9%	-8%	-8%	-8%	-8%	-5%	-6%	-6%	-6%	-5%	-6%	-6%	-5%	-6%
High Income	12,489	-10%	-11%	-16%	-10%	-10%	-15%	-10%	-14%	-15%	-10%	-13%	-15%	-10%	-13%	-15%
Effect Range	32,464	2%	3%	8%	1%	3%	7%	5%	8%	10%	4%	8%	9%	4%	8%	9%
F-Stat**	0.24	0.29	4.73	0.19	0.46	4.77	4.77	2.42	3.05	8.08	2.75	4.71	8.92	2.75	4.71	8.92
F-prob**	0.6209	0.5915	0.0296	0.6667	0.4960	0.0289	0.0289	0.1197	0.0808	0.0045	0.0972	0.0301	0.0028	0.0972	0.0301	0.0028
Significant at alpha=.05	No	No	Yes	No	No	Yes	Yes	No	No	Yes	No	Yes	Yes	No	Yes	Yes
Income Effect -- Individual Health Market																
Effect Estimates																
Low Income	7,472	1%	0%	3%	-1%	-1%	0%	3%	2%	4%	1%	2%	2%	1%	2%	2%
Middle Income	12,503	-13%	-14%	-15%	-13%	-12%	-13%	-10%	-11%	-12%	-9%	-9%	-10%	-9%	-9%	-10%
Middle Income	12,489	-10%	-11%	-16%	-10%	-10%	-15%	-10%	-14%	-15%	-10%	-13%	-15%	-10%	-13%	-15%
Effect Range	32,464	10%	11%	19%	8%	9%	15%	12%	17%	20%	11%	15%	16%	11%	15%	16%
F-Stat***	6.37	2.78	10.80	5.24	2.55	8.42	8.42	6.38	3.95	10.85	5.50	4.66	9.24	5.50	4.66	9.24
F-prob***	0.0017	0.0623	<.0001	0.0053	0.0785	0.0002	0.0002	0.0017	0.0192	<.0001	0.0041	0.0095	<.0001	0.0041	0.0095	<.0001
Significant at alpha=.05	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* For an income effect in aggregate where null hypothesis is no income effect. Differences between any two categories may or may not be significant.
 ** For an income effect between low & middle income combined vs. high income where null hypothesis is no income effect.
 *** For an income effect between low vs. middle vs. high income where null hypothesis is no income effect.
 Poor = < 1x Poverty; Near Poor = 1.00 to 1.24x Poverty; Low Income = 1.25 to 1.99x Poverty; Middle Income = 2.0 to 3.99x Poverty; High Income = 4.00+x Poverty with poverty defined as the federal family poverty level (FPL).
 Developed from MEPS 2005-2006-2007 cost and 2005-2006-2007 condition data for people under age 65, trended to 2007 \$'s at 6%. See paper for further details.

Table 3: Health Risk, Current Health, and Healthcare Adherence Indicators by Income
 For Americans Ages 18-64
 Source: BRFSS, 2005, via on-line query tool

	Percentage of Respondents by Annual Household Income Level					Ratio of Percentage to Population Mean by Annual Household Income Level					
	< \$15K	\$15K to \$25K	\$25K to \$35K	\$35K to \$50K	>= \$50K	All	< \$15K	\$15K to \$25K	\$25K to \$35K	\$35K to \$50K	>= \$50K
	23,881	36,585	30,085	41,599	106,055	238,205					
(Respondants (n))											
Health Risk:											
1 or more binge drinking episodes in last month	37.0	32.2	30.3	27.8	24.1	28.1	1.32	1.15	1.08	0.99	0.86
3 or more drinks on average day with any drink	45.1	39.9	36.4	33.4	26.5	32.9	1.37	1.21	1.11	1.01	0.81
Obese	33.9	32.8	30.4	28.0	23.0	27.4	1.24	1.20	1.11	1.02	0.84
Less than 5 fruits/vegetables a day	80.0	79.3	79.3	78.3	74.3	76.9	1.04	1.03	1.03	1.02	0.96
Have not exercised in last 30 days	45.2	38.1	29.5	24.0	15.0	25.0	1.81	1.53	1.18	0.96	0.60
No physical activity	27.7	20.8	14.2	11.2	7.2	12.9	2.14	1.61	1.10	0.86	0.56
Little or no physical activity	64.0	59.5	54.8	51.9	45.9	52.0	1.23	1.15	1.05	1.00	0.88
Daily Smoker	25.8	23.8	21.9	18.7	11.0	17.2	1.50	1.39	1.28	1.09	0.64
Ever Smoked	53.0	52.2	50.4	49.1	41.5	46.7	1.13	1.12	1.08	1.05	0.89
Six or more teeth removed*	32.9	27.7	21.3	15.2	7.1	16.1	2.05	1.72	1.33	0.95	0.44
Current Health:											
Currently have asthma	12.9	10.0	8.2	7.7	6.8	8.3	1.56	1.21	1.00	0.93	0.83
Ever told have diabetes**	14.7	10.6	8.3	6.6	4.9	7.5	1.97	1.42	1.11	0.88	0.65
Fair or Poor Self-Assessed Health Status	45.2	29.3	18.9	12.1	6.2	16.3	2.77	1.80	1.16	0.74	0.38
Healthcare Adherence:											
No cholesterol check in past 5 years	38.2	35.3	29.2	25.0	17.8	25.2	1.51	1.40	1.16	0.99	0.70
Last teeth cleaning more than 1 year ago or never	60.3	54.2	43.5	31.5	20.4	34.5	1.75	1.57	1.26	0.92	0.59

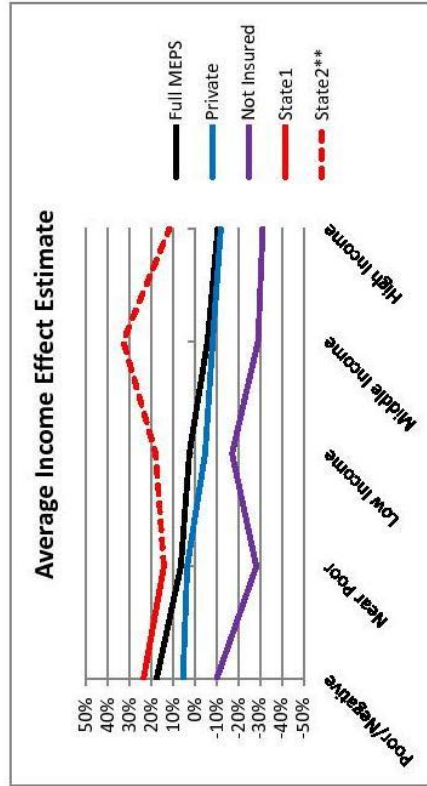
* Indicative of chronic infection and/or risky behavior.

** Excluding gestational diabetes.

% values for each income level are standardized by age using the all-income 5-year age band distribution. Respondents who did not report their income are excluded.

Table 4
Income Effect Estimates after Concurrent Risk Adjustment for Major Payer Categories
 (Summary of Table 1's by Major Payer Category)

Family Income	Full MEPS	Private*	Not Insured*	State*
Average Income Effect Estimate				
Poor/Negative	18%	6%	-10%	24%
Near Poor	6%	4%	-28%	14%
Low Income	3%	-5%	-17%	18%
Middle Income	-6%	-8%	-29%	33%
High Income	-11%	-12%	-31%	12%
MEPS Participants (n)				
Poor/Negative	18,441	1,714	6,028	9,433
Near Poor	5,638	1,027	2,026	2,183
Low Income	14,825	4,848	5,198	3,890
Middle Income	24,874	15,790	5,888	2,202
High Income	24,171	20,773	2,449	392
Total	87,949	44,152	21,589	18,100



* Based on MEPS participant's status for 7 months or more.

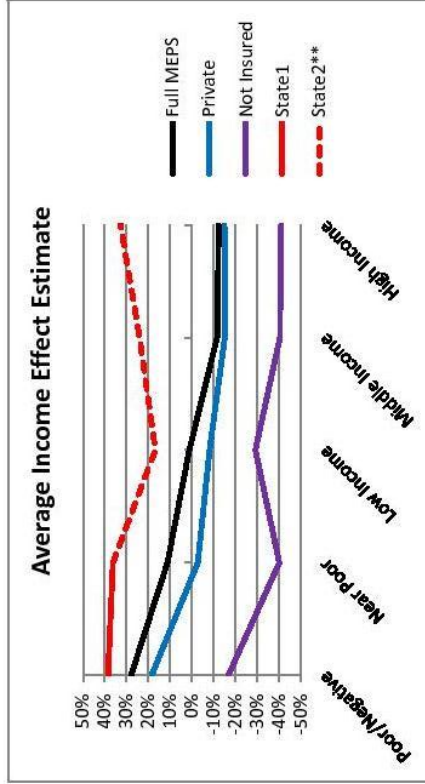
** Increasing costs believed to be because of increasing numbers of Medicaid disabled adults. Age/sex distribution supports this hypothesis. The high income data point has n<1,000, making it particularly unreliable. MEPS does not identify Medicaid participants by disability status.

Other notes:

- 1) State = Medicaid + CHIP + Other State Programs such as high risk pools. MEPS does not differentiate between Medicaid and CHIP.
- 2) Full MEPS > Private + Not Insured + State as some participants had Medicare and others did not have a single insurance status for seven months or more. Statistics for the Medicare and Mixed Insurance participants are not reported as n's for all cells are <1,000. But, as expected, Medicare participants had particularly high costs. (Significant disability is the only way for someone under age 65 to get Medicare.)
- 3) Gray shading indicates n<1,000.

Table 5
Income Effect Estimates after Prospective Risk Adjustment for Major Payer Categories
 (Summary of Table 2's by Major Payer Category)

Family Income	Full MEPS	Private*	Not Insured*	State*
Average Income Effect Estimate				
Poor/Negative	28%	19%	-17%	39%
Near Poor	11%	-3%	-40%	36%
Low Income	1%	-8%	-29%	17%
Middle Income	-12%	-15%	-41%	24%
High Income	-12%	-15%	-41%	33%
MEPS Participants (n)				
Poor/Negative	9,326	821	2,976	4,858
Near Poor	2,939	553	1,017	1,173
Low Income	7,472	2,377	2,517	2,074
Middle Income	12,503	7,928	2,939	1,105
High Income	12,489	10,691	1,273	208
Total	44,729	22,370	10,722	9,418



* Based on MEPS participant's status for 7 months or more.

** Increasing costs believed to be because of increasing numbers of Medicaid disabled adults. Age/sex distribution supports this hypothesis. The high income data point has n<1,000, making it particularly unreliable. MEPS does not identify Medicaid participants by disability status.

Other notes:

- 1) State = Medicaid + CHIP + Other State Programs such as high risk pools. MEPS does not differentiate between Medicaid and CHIP.
- 2) Full MEPS > Private + Not Insured + State as some participants had Medicare and others did not have a single insurance status for seven months or more. Statistics for the Medicare and Mixed Insurance participants are not reported as n's for all cells are <1,000. But, as expected, Medicare participants had particularly high costs. (Significant disability is the only way for someone under age 65 to get Medicare.)
- 3) Gray shading indicates n<1,000.

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- Dissertation Defense Complete: Controlling Indirect Selection Under Healthcare Reform
- James C. Hickman Scholar, Society of Actuaries (SOA), 2010-2011
- Training Fellow, Centers for Disease Control and Prevention (CDC), 2010
- Teaching Assistant, Principles of Management in Public Health, 2010

University of Pennsylvania, Fels Center of Government

M.S., Government Administration 1992

- Governmental Accounting TA

University of Pennsylvania, Wharton School

B.S., Finance Concentration..... 1986

- Summa cum laude, 3.9 GPA

State University of New York, Jefferson Community College

A.S., Science 1982

- Highest honors, 4.0 GPA, "Outstanding Freshman Chemist" award
- Statistics tutor

Professional Credentials

Society of Actuaries, Fellow (FSA) 1993

Current Section Memberships: Health, Social Insurance and Public Finance

American Academy of Actuaries, Member (MAAA)..... 1990

Qualified to Issue Statements of Actuarial Opinion concerning Health Insurance

under the American Academy of Actuaries Qualification Standards.....Current

Professional Employment

State of Illinois, Department of Healthcare and Family Services.....2011-Current

- Director of Data, Analytics, and Research
- Director of Research

TS Strategic Consulting, LLC..... 2007-2010

- Owner

Precedent Insurance Company ("A New Spin on Health Insurance")..... 2006-2007

- Chief Strategy Officer and Vice President

Milliman..... 2005-2006

- Healthcare Management Consultant

Sawhney Enterprises, Inc. 1999-2005

- Owner/Business Manager

Blue Cross Blue Shield of Illinois 1993-1997

- Director, IT Projects, Underwriting Department

- Director and Department Manager, Actuarial Department, Fort Dearborn Life Insurance Company (Owned by BCBS IL)
- Group Actuary, Fort Dearborn Life Insurance Company

Commercial Life Insurance Company..... 1990-1993

- Group Actuary

Milliman & Robertson (now Milliman), Health Practice..... 1986-1989

- Assistant Actuary
- Student Actuary

Professional Internship

Cook County Health and Hospital System

Strategic Planning Team Member..... 2009

Academic Papers and Proposals (unpublished)

- “Controlling Indirect Selection Under Healthcare Reform”, Tia Goss Sawhney, June 2011.
- “Health Insurance Risk Adjustment: The Income Effect”, Tia Goss Sawhney, September 2010.
- “Health Insurance Risk Adjustment: Looking Beyond R-Squared”, Tia Goss Sawhney, August 2010.
- “Illinois’s Public Health System Response to Injury Mortality: An Initial Analysis and a Proposal for an Evaluation Case Study”, Tia Goss Sawhney, December 2009.
- “IPLAN or weDREAM? Translating public health strategic planning into strategic action”, Tia Goss Sawhney, May 2009.
- “Compression of Disability: A National Imperative”, Tia Goss Sawhney, May 2009.
- “The Impact of Low Cost Generics on Prescription Drug Adherence: A Natural Experiment”, Tia Goss Sawhney, December 2008.

Published Trade Articles

- “Lives Well-Lived: Socioeconomic Status and Mortality”, Tia Goss Sawhney, Contingencies (American Academy of Actuaries), March/April 2010.
- “Improving Prescription Drug Risk Assessment Tools”, Tia Goss Sawhney, Contingencies (American Academy of Actuaries), March/April 2009.
- “The Case Against Paper Based Risk Assessment”, Tia Goss Sawhney, Software Supplement, Contingencies (American Academy of Actuaries), November 2008.
- “The Post-Millennial Metamorphosis in Life Underwriting”, Hank George and Tia Goss Sawhney, Contingencies (American Academy of Actuaries), November/December 2008. Republished with permission by Insurance Chronicle (The ICFAI University Press).
- “A Holistic Approach to Health Underwriting”, Tia Goss Sawhney, Contingencies (American Academy of Actuaries), March/April 2008. Republished with permission by Insurance Chronicle (The ICFAI University Press).
- “Auto Insurance Principles Should Apply to Health Insurance”, Tia Goss Sawhney, Contingencies (American Academy of Actuaries), January/February 2007.

“Health Insurance and Managed Care: Uses of Information Technology”, Tia Goss Sawhney, Alam Singh, and Richard Moyer, Journal of Insurance Regulatory and Development Authority (India), June 2006.

“Health Insurance Lessons from the Auto Industry”, Tia Goss Sawhney, Health Insurance Underwriter, March 2006.

“Local Experience for International Healthcare”, Tia Sawhney, Milliman Global Annual Report, 2005.

“Predictive Analytics and the New World of Retail Healthcare”, Simmi P. Singh and Tia Goss Sawhney, Health Management Technology, January 2006.

Published Essays

Letter to the editor regarding “Predictive Modeling with Consumer Data” article, Tia Goss Sawhney, The Actuary (Society of Actuaries), December/January 2011/2012.

“Insight: Underwrite Health, But Do It Only Once”, Tia Goss Sawhney, Best’s Review, Life and Health Edition, June 2009.

“Where are the Actuaries?”, Tia Goss Sawhney, CompAct (Technology Section of the Society of Actuaries), November 2008. Won “Article of the Year”.

“Back to the Numbers”, Tia Goss Sawhney, Actuary of the Future (Actuary of the Future Section of the Society of Actuaries), October 2008. Lead article.

Published Interviews

“Risk Selection: Considering New Mortality Markers”, Transamerica Reinsurance, Forecaster Newsletter, June 2009.

Presentations

“Population Health and Public Health: Why Should We Care”, Society of Actuaries Health Section Meeting, (scheduled) June 2012.

“Jyoti School: A Jewel of Kanpur, Many Thanks to Rotary”, Skokie Valley Rotary Club, October 2010.

“Provider Payment Reform and Risk Adjustment”, co-presenter, Society of Actuaries Annual Meeting, October 2010.

“Jyoti School: A Jewel of 21st Century Kanpur”, Fundraising Event, Kanpur, India, March 2010.

“Introduction to Relational Databases”, Master of Healthcare Administration Seminar Series (University of Illinois at Chicago), February 2010.

“Are we asking the right questions?”, 5th Annual Teleunderwriting Conference (Society of Actuaries), February 2009.

Conference Panels

“Challenges of Provider Payment Risk Adjustment”, Panelist, 2010 Annual Meeting (Society of Actuaries), October 2010.

“The Application and Information Collection”, Panelist, Life Insurance Conference (Life Office Management Association – LOMA), April 2010.

"Business Rules Engines: The Future of Life Underwriting or the Death of Human Existence as We Know It", Moderator, 5th Annual Teleunderwriting Conference (Society of Actuaries), February 2009.

"Predictive Modeling in Underwriting: Panacea or Sham?", Moderator, Individual and Small Group Health Insurance Underwriting Seminar (Society of Actuaries), September 2009.

Webinars / Podcasts

"Tia Goss Sawhney on Post Issue Underwriting", BestDay Audio, Best's Review, June 26, 2009.

"Reaching the 'Young Invincibles': Successfully Marketing to the Uninsured", Panelist, Corporate Research Group, October, 2007.

"Changing the Rules in Insurance", Panelist, Corticon Online Seminar Series, July 2007.

"Impact of Consumer Directed Health Plans on Hospitals: 'A New Health Plan or A New Era of Health Insurance?'", Panelist, Healthcare Web Summit: Consumer Driven Care 2006, MCOL, March 2006.

Select Press Quotes

"Prescription Data Used To Assess Consumers – Records Aid Insurers but Prompt Privacy Concerns", The Washington Post, Print Edition, August 4, 2008.

"They Know What's in Your Medicine Cabinet", Special Report (Cover), Business Week, July 23, 2008.

"New Insurance Plan Has Novel Pitch -- Get Sick, Buy More Coverage", Wall Street Journal, Print Edition, September 14, 2007.

"Plan Activates Increased Coverage on Demand", Managed Healthcare Executive, October 1, 2007.

"Unique New Health Plan Allows Members to Buy Additional Coverage After an Illness or Injury Occurs", AIS's Health Business Daily, Featured Story, September 27, 2007.

"Precedent Launches Revolutionary Individual Health Insurance Plans in Texas", PRNewswire, September 14, 2007.

Leadership Roles

Centers of Actuarial Excellence Evaluation Committee, Member, Society of Actuaries, 2011+.

Illinois Department of Insurance, Advisor for Risk Adjustment and Selection Control under Health Care Reform, 2011+.

Risk Sharing Work Group, Member, American Academy of Actuaries, 2011+.

- Contributing writer.

Social Insurance and Public Finance Section Council, Member, Society of Actuaries, 2010+.

- Organized webcast: *The Public Actuary: Serving the Public in Challenging Times*, May 2011

Risk Adjustment Work Group, Member, American Academy of Actuaries, 2010.

Health Section Council Research Committee, Member, Society of Actuaries, 2010+.

- Project Oversight Group: Quantifying Uncertainty, 2010+
- Project Oversight Group: Non-Traditional Risk Predictors, 2010+

- Project Oversight Group Chairperson: End of Life Costs, 2011+

Develop Knowledge Team, Member, Society of Actuaries, Knowledge Management Initiative, 2009-2012.

DrPH Oversight Committee, Student Representative, University of Illinois, School of Public Health, 2008-2011.

Jyoti Foundation, Vice-President and Board Member, supporting the Jyoti School for Deaf Children (Kanpur, India), 2006+.

Committee on Education Programs, Student Representative, University of Illinois, School of Public Health, 2008-2010.

Illinois Anti-Obesity Task Force, Volunteer Researcher and Participant, 2008-2009.

Awards

Rotary Foundation of Rotary International, Paul Harris Fellow, awarded 2010

Other Activities

Attended World Economic Forum meetings: Davos, Switzerland and other locations.

Extensive international travel: Asia, Europe, Middle East, Australia, and Africa.

Political fundraiser: Barack Obama for US Senate, Finance Committee, 2004.

Melissa Bean for US House of Representatives, Leadership Council, 2004.