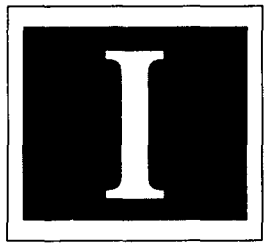

Introduction and Study Objectives

A. Introduction

A key component of many recent proposals for health care reform is a system of risk-adjustment payments among health plans. Such a system measures and removes the effects of plans' relative health risks on the prices consumers face in choosing a plan. The fundamental feature that accomplishes this is the transfer of funds from one plan to another based on the underlying risk characteristics of each plan's enrollees. In this way, consumer choice of a health plan can be based on its relative efficiency and quality rather than on the relative health status of its enrollees. Further, this system promotes the financial equity between health plans and more equitable access to them by individuals, particularly those of higher risk.

The rationale for risk adjustment is straightforward. Individuals know well their own needs and preferences for health care. Given a choice among competing health plans, they would choose a plan that is most suitable and advantageous to them. Plans can vary in their benefits, premiums, and access to providers. Persons with lower expected costs (lower risk) often choose plans with a higher deductible or coinsurance and limits on the services and providers covered. Alternatively, higher risk individuals tend to select plans with lower cost-sharing and wider benefits even if premiums are higher. At the same time, some plans may actively seek lower risk individuals to insure and avoid those with higher risks. In both cases, health plans' costs are affected by the particular combination of risks their enrollees represent.

As a result of selection, some health plans may face higher costs per enrollee. In the absence of accurate risk adjustment, such plans would in the longer run, be forced to either limit access to needed services or increase premiums. In either case, their competitive position would be threatened, particularly if premiums were compressed through community rating. Conversely, plans with lower risk enrollees would enjoy a competitive advantage. In addition, without risk adjustment, plans may have a strong incentive to selectively enroll lower risk individuals. To both induce health plans to compete on efficiency and quality of health services and to provide equitable compensation to health plans for the risks they insure, it is necessary to have reliable and valid methods for determining risk adjustment payments.

Health risk adjustment can be thought of as a two-step process. The first step involves a risk assessment of each group of individuals to be insured. This assessment would measure the deviation of each individual's expected cost of health care services from the average cost across all individuals.

The second step, risk adjustment, refers to the methods used to compensate for the differences in risk, as measured by risk assessment. In a competitive market environment, such as that fostered by a health alliance purchasing cooperative, risk adjustment could involve the transfer of payments between competing carriers based on the risk assessment. Carriers with the higher risk populations would receive payments, whereas carriers with the lower risk populations would make payments. Risk adjustment also has utility as a tool for setting appropriate provider payments under capitation and, eventually, for provider profiling and outcomes measurement.

In all of these applications, the risk adjustment mechanism will only be as good as the underlying risk assessment method. A good risk assessment method should be able to predict health costs with accuracy. If the risk adjusted premium received by the plan is sufficiently close to the expected cost of a healthy or sick

person's care, it may be more costly for the plan to pursue a selection strategy than to simply accept all enrollees without regard to health risk. A good risk assessment method also cannot be so complex and costly that it cannot be applied under real life circumstances. A system should limit the ability of health plans to benefit financially by "gaming" the system. It should also be timely and allow predictability in setting premiums and determining risk transfer payments. Finally, it should provide appropriate incentives for efficient and high quality medical care.

The literature on assessing health risk assessment and risk adjustment is substantial. In particular, there exist a number of competing methods for measuring the health risk of individuals and groups of individuals. Many studies have evaluated the abilities of a particular risk assessment model to accurately measure differences in risk. However, there have been few studies that have provided a comprehensive evaluation of the relative performance of different risk assessment methods.

In response to the need for a suitable risk assessment method, and in particular motivated by the heightened activity in health insurance market reform, the Society of Actuaries (SOA) funded a research study to explore the topics of health risk assessment and risk adjustment. This report describes the methods, data, and results of that effort.

In particular, in the study described here we conducted a comparative investigation of the current methods available for health risk assessment. To do this, we used a detailed data set developed by the SOA describing health use and expenditures for a large number of non-elderly individuals over a two-year period. We compared how well the different assessment models predict the financial cost of enrollees in various types of health plans. We also evaluated these methods using other criteria including the feasibility of their implementation and the incentives they provide. Finally, given the significance of higher cost individuals to any risk adjustment process, we analyzed separately the important issues for this group. The study findings provide insights into the adequacy of existing risk assessment methods and the major issues to be resolved in this area.

This report is organized as follows. In the remainder of this chapter, we describe the study objectives and organization. Chapter II provides some background on risk assessment and risk adjustment, including a summary of the previous research in this area. In Chapter III, we describe the methods, data and results of our investigation of the predictive accuracy of the different risk assessment methods. Chapter IV describes our analysis of risk adjustment for high cost individuals and conditions, while Chapter V presents an application of the study findings to a risk adjustment transfer process. Chapter VI compares the competing methods based on criteria other than predictive accuracy. In Chapter VII, we summarize our key findings, provide conclusions and note implications for public policy and research on risk adjustment. Finally, Chapter VIII suggests some directions for future research. In addition to these chapters, we also include several appendixes that describe in greater detail study methods, data, and results.

B. Study Objectives

The research project had three primary objectives. In addition, a number of related objectives were identified. These objectives determined the important research questions to be answered and the methods to be used in answering them.

1. Primary Research Objectives

1. Compare the predictive accuracy of different risk assessment methods. How close are actual expenditures to those predicted by a method? How does this accuracy compare across methods?
2. Compare the different risk assessment methods based on other criteria, including administrative practicality, ability to restrict manipulation and gaming, and incentives for efficiency.
3. Explore the issues for risk adjustment related to high-cost individuals and conditions.

2. Related Research Objectives

4. Compare risk assessment methods in terms of predictive accuracy when used in prospective versus retrospective adjustment.
5. Compare risk assessment methods in terms of predictive accuracy for nonrandom subpopulations of enrollees—including enrollees with selected diagnoses such as cancer patients and individuals with extremely high or low actual expenditures.
6. Investigate the sensitivity of the study findings to the type of health plan and mix of enrollees analyzed. Do the results differ between indemnity, PPO and HMO plans? Are the estimated risk assessment formulas sensitive to the type of data used in their

estimation? Can a standard set of weights be developed for each method for the purposes of risk adjustment?[1]

Eight different risk assessment methods were tested: a simple age-sex model, two different ambulatory care group (ACG) models, and five variants of the diagnostic cost group (DCG) methodology. All these models can be applied using data available through computerized records collected commonly by many insurance companies. We did not explore alternative classes of models such a those involving medical underwriting where historical health information could be used to evaluate risk or methods based on self-reporting of health status, such as that obtained using the SF-36 questionnaire. Such models are outside the scope of this study.

Each of the eight models we tested are described in detail in Chapter III of this report.

C. Organization of the Study

The project was conducted jointly by researchers from the Harvard University School of Public Health and Coopers & Lybrand, LLP and was staffed by actuaries, economists, and a physician. The actuaries on the project provided a unique understanding of the practical issues involved in risk assessment and risk adjustment. The economists contributed perspectives from the area of health services research and related public policy issues. The physician on the project provided insight into the clinical issues of risk assessment, including the interpretation of diagnostic and procedural information and the identification of diagnoses and events for the analysis of high-cost individuals.

In addition to the project team, a committee of national experts was assembled to advise the project. These individuals have extensive experience in the areas of actuarial science, statistics, health services research, and health policy analysis. The four members of the committee were:

- James C. Hickman, Ph.D., FSA, Emeritus Dean and Professor, University of Wisconsin
- William C. Hsiao, Ph.D., FSA, Professor of Health System Economics, Harvard University
- Harold S. Luft, Ph.D., Professor, Institute for Health Policy Studies, University of California, San Francisco
- Joseph P. Newhouse, Ph.D., Professor of Health Policy and Management, Harvard University.

The Advisory Committee met with the project staff twice during the study. The first meeting was held at the beginning of the study. At that time, the advisors assisted the project team in defining more precisely the questions to be answered, the development of the study design, and the mathematical and statistical methods to be used. The second meeting took place midway through the study, after some preliminary analyses of the data had been completed. The committee members reviewed with the project staff the study progress and problems encountered and advised us of any necessary midcourse corrections that needed to be taken. Finally, the Advisory Committee reviewed and commented on the draft version of the final report.

In addition to the formal Advisory Committee, the project also benefited from input provided by the SOA Risk Adjustment Task Force. Members of the task force attended both meetings of the Advisory Committee. They also provided consultation on selected issues throughout the project. The task force and representatives from the SOA reviewed and commented on the draft version of the final report.

Finally, during the study, we met with individuals conducting research on the two major risk assessment methods we tested, ACGs and DCGs. These individuals also provided comments on the draft version of the final report.

The project benefited greatly from the comments, input, and advice of all these individuals.

END NOTE

1. The estimation of a standard set of risk weights was not an objective of the study. However, a comparative analysis of such weights across health plans can provide insights into the feasibility of developing standard factors.