



**ACTUARIAL STANDARDS BOARD**

---

**Actuarial Standard  
of Practice  
No. 45**

**The Use of Health Status Based Risk Adjustment Methodologies**

**Developed by the  
Health Risk Adjustment Task Force of the  
Health Committee of the  
Actuarial Standards Board**

**Adopted by the  
Actuarial Standards Board  
January 2012**

---

**(Doc. No. 164)**

**TABLE OF CONTENTS**

Transmittal Memorandum iv

**STANDARD OF PRACTICE**

Section 1. Purpose, Scope, Cross References, and Effective Date	1
1.1 Purpose	1
1.2 Scope	1
1.3 Cross References	1
1.4 Effective Date	1
Section 2. Definitions	1
2.1 Carve-out	1
2.3 Coding	1
2.3 Condition Category	2
2.4 Credibility	2
2.5 Diagnostic Services	2
2.6 Estimation Period	2
2.7 Expert	2
2.8 Health Status Based	2
2.9 Morbidity	2
2.10 Program	2
2.11 Recalibration	2
2.12 Risk Adjustment	2
2.13 Risk Weight	2
Section 3. Analysis of Issues and Recommended Practices	2
3.1 Model Selection and Implementation	2
3.1.1 Intended Use	3
3.1.2 Impact on Program	3
3.1.3 Model Version	3
3.1.4 Population and Program	3
3.1.5 Timing of Data Collection, Measurement, and Estimation	3
3.1.6 Transparency	3
3.1.7 Predictive Ability	3
3.1.8 Reliance on Experts	4
3.1.9 Practical Considerations	4
3.2 Input Data	4
3.2.1 Provider Contracts	4
3.2.2 Diagnostic Services	4
3.2.3 Coding and Other Data Issues	4
3.3 Program Specifics	4
3.4 Assigning Risk Scores to Individuals with Limited Data	5
3.5 Addressing Model and Methodology Limitations	5

**ASOP No. 45—January 2012**

3.6	Recalibration	5
3.7	Use in Combination with Other Rating Variables	5
3.8	Budget or Cost Neutrality	5
Section 4. Communications and Disclosures		6
4.1	Actuarial Communications	6
4.2	Disclosures	6

**APPENDIXES**

Appendix 1—Background and Current Practices		7
Appendix 2—Comments on the Exposure Draft and Responses		10

## ASOP No. 45—January 2012

January 2012

**TO:** Members of Actuarial Organizations Governed by the Standards of Practice of the Actuarial Standards Board and Other Persons Interested in the Use of Health Status Based Risk Adjustment Methodologies

**FROM:** Actuarial Standards Board (ASB)

**SUBJ:** Actuarial Standard of Practice (ASOP) No. 45

This document contains the final version of ASOP No. 45, *The Use of Health Status Based Risk Adjustment Methodologies*.

### Background

Health status based risk adjustment methodologies have been an important tool in the health insurance marketplace since the 1970s. The use of risk adjustment has significant effects on health insurance companies, healthcare providers, consumers, employers and others. The importance and influence of health status based risk adjustment methodologies are likely to increase as healthcare programs that currently use risk adjustment expand the populations they cover and other programs adopt the use of risk adjustment. ASOP No. 12, *Risk Classification (for All Practice Areas)*, provides guidance to “all actuaries when performing professional services with respect to designing, reviewing, or changing risk classification systems used in connection with financial or personal security systems.” It applies more broadly than this ASOP. This ASOP is intended to provide guidance regarding the appropriate use of health status based risk adjustment models and methods. This standard requires actuaries to explicitly consider important characteristics of the risk adjustment models and their use, rather than allowing actuaries to assume important issues are already addressed within any given risk adjustment software model.

### Exposure Draft

The exposure draft of this ASOP was approved for exposure in April 2011 with a comment deadline of July 31, 2011. Ten comment letters were received and considered in developing modifications that were reflected in the final ASOP. For a summary of the issues contained in these comment letters, please see appendix 2.

### Key Changes

The most significant changes from the exposure draft were as follows:

1. A definition for estimation period was added to the definitions section, the term “data collection period” was changed to “incurral period” in section 3.1.5 and further background on timing issues was added to appendix 1.

**ASOP No. 45—January 2012**

2. In Section 3.1.3, language was added to address instances where descriptions of changes from a prior model version were not available.
3. Section 3.2, Input Data, was rewritten to clarify the meaning.
4. In section 3.6, the level of transparency afforded by the model was added as a consideration in recalibration of the model.

The ASB thanks everyone who took the time to contribute comments and suggestions on the exposure draft.

The ASB voted in January 2012 to adopt this standard.

**ASOP No. 45—January 2012**

Health Risk Adjustment Task Force

Ross A. Winkelman, Chairperson

Robert G. Cosway	Kevin C. McAllister
Ian G. Duncan	Julie A. Peper
Vincent M. Kane	William M. Pollock
John C. Lloyd	

Health Committee of the ASB

Robert G. Cosway, Chairperson

David Axene	Nancy F. Nelson
John C. Lloyd	Donna Novak
Cynthia Miller	Ross A. Winkelman

Actuarial Standards Board

Robert G. Meilander, Chairperson

Albert J. Beer	Thomas D. Levy
Alan D. Ford	Patricia E. Matson
Patrick J. Grannan	James J. Murphy
Stephen G. Kellison	James F. Verlautz

*The ASB establishes and improves standards of actuarial practice. These ASOPs identify what the actuary should consider, document, and disclose when performing an actuarial assignment. The ASB's goal is to set standards for appropriate practice for the U.S.*

**ACTUARIAL STANDARD OF PRACTICE NO. 45**

**THE USE OF HEALTH STATUS BASED RISK ADJUSTMENT METHODOLOGIES**

**STANDARD OF PRACTICE**

**Section 1. Purpose, Scope, Cross References, and Effective Date**

1.1 **Purpose**—This actuarial standard of practice (ASOP) provides guidance to actuaries applying health status based risk adjustment methodologies to quantify differences in relative healthcare resource use due to differences in health status.

1.2 **Scope**—This standard applies to actuaries quantifying differences in morbidity across organizations, populations, programs and time periods using commercial, publicly available or other health status based risk adjustment models or software products. It does not apply to actuaries designing health status based risk adjustment models. Actuaries who perform professional services with respect to designing, reviewing, or changing risk classification systems should be guided by ASOP No. 12, *Risk Classification (for all Practice Areas)*.

If the actuary departs from the guidance set forth in this standard in order to comply with applicable law (statutes, regulations, and other legally binding authority) or for any other reason the actuary deems appropriate, the actuary should refer to section 4.

1.3 **Cross References**—When this standard refers to the provisions of other documents, the reference includes the referenced documents as they may be amended or restated in the future, and any successor to them, by whatever name called. If any amended or restated document differs materially from the originally referenced document, the actuary should consider the guidance in this standard to the extent it is applicable and appropriate.

1.4 **Effective Date**—This standard is effective for any professional services using health status based risk adjustment methodologies performed on or after July 1, 2012.

**Section 2. Definitions**

2.1 **Carve-out**—A medical service or condition not covered by the program under review or covered under a different reimbursement arrangement, such as a capitation. A common carve-out is mental health services.

2.2 **Coding**—The process of recording and submitting information (for example, diagnoses or services provided) on claims forms.

## ASOP No. 45—January 2012

- 2.3 Condition Category—A grouping of medical conditions that have similar expected healthcare resource use or clinical characteristics.
- 2.4 Credibility—A measure of the predictive value in a given application that the actuary attaches to a particular body of data (predictive is used here in the statistical sense and not in the sense of predicting the future).
- 2.5 Diagnostic Services—Services (for example, lab or radiology) provided to determine whether a medical condition exists. Having these services performed does not by itself indicate a condition exists, although the result of the test may indicate it does.
- 2.6 Estimation Period—The period for which differences in morbidity are being quantified by the risk adjustment methodology.
- 2.7 Expert—One who is qualified by knowledge, skill, experience, training, or education to render an opinion concerning the matter at hand.
- 2.8 Health Status Based—Using healthcare claims, pharmacy claims, lab test results, health risk appraisal or other data based on underlying conditions or treatment as well as demographic information such as age and gender.
- 2.9 Morbidity—The incidence of or resource use associated with a medical condition or group of conditions.
- 2.10 Program—Health benefit programs including but not limited to commercial and employer sponsored health insurance, self-funded employer health insurance, and government sponsored health insurance, such as Medicaid and Medicare.
- 2.11 Recalibration—The process of modifying the risk adjustment model, usually the risk weights. Recalibration is often used to make the risk adjustment model more specific to the population, data, and other characteristics of the project for which it is being used.
- 2.12 Risk Adjustment—The process by which relative risk factors are assigned to individuals or groups based on expected resource use and by which those factors are taken into consideration and applied.
- 2.13 Risk Weight—The value assigned to each condition category that indicates the expected contribution of that condition category to an individual’s estimated resource use.

### Section 3. Analysis of Issues and Recommended Practices

- 3.1 Model Selection and Implementation—The actuary should select an appropriate risk adjustment model and implementation methodology, based on the actuary’s professional judgment, with consideration given to the items discussed below.



## ASOP No. 45—January 2012

- 3.1.1 Intended Use—The actuary should consider the degree to which the model was designed to estimate what the actuary is trying to measure. For example, the model may have been developed to estimate differences in total allowed costs, while the actuary may be trying to measure or project differences in paid costs for a high deductible plan, or differences in allowed costs for a single service category such as pharmacy.
- 3.1.2 Impact on Program—The actuary should consider whether the risk adjustment system may cause changes in behavior because of underlying incentives. For example, it may not be appropriate to include a health plan’s cost or provider’s prior charges as a risk adjustment variable when risk adjustment is used in determining health plan or provider payment.
- 3.1.3 Model Version—Since models are often updated, the actuary should consider the specific version of the model being utilized. If the actuary is using a new version of a previously utilized model, the actuary should consider the materiality of changes to the model. If a description of the changes from a prior version is not available, the actuary should consider comparing results under different model versions.
- 3.1.4 Population and Program—The actuary should consider if the population and program to which the model is being applied are reasonably consistent with those used to develop the model. For example, some models are intended for a commercial population and program while others are intended for Medicare or Medicaid. In addition, some Medicaid programs exclude carve-outs such as pharmacy and mental health services from the list of health plan at-risk services.
- 3.1.5 Timing of Data Collection, Measurement, and Estimation—Typically, at least small differences in timing between the development of the model and the application of the model will exist. The actuary should consider the impact of differences between the application of the model and its development with respect to timing issues such as the incurral period, estimation period, and claims run-out period.
- 3.1.6 Transparency—The actuary should consider the level of transparency that is appropriate for the intended use, and whether the model affords that level of transparency. For example, some commercially available models do not allow risk weights to be published.
- 3.1.7 Predictive Ability—The actuary should consider the predictive ability of the model and the characteristics of the various predictive performance measures commonly used and published.

## ASOP No. 45—January 2012

- 3.1.8 Reliance on Experts—Risk adjustment models may incorporate specialized knowledge that may be outside of an actuary’s area of expertise. The actuary should consider whether the individual or individuals upon whom the actuary is relying are experts in risk adjustment and should understand the extent to which the model has been reviewed or opined on by experts in risk adjustment models.
- 3.1.9 Practical Considerations—The actuary should consider practical limitations and issues with any given model and methodology including the cost of the model, the actuary’s and other stakeholders’ familiarity with the model, and its availability.
- 3.2 Input Data—The type of input data that is used in the application of risk adjustment should be reasonably consistent with the type of data used to develop the model. Also the type of input data should be reasonably consistent across organizations, populations, and time periods. If such consistency is not possible, the actuary should document why the combination of that data and the selected model was used, and any adjustments made to the data, model, or methodology to address limitations in the data. If sufficient information concerning the quality and type of input data used to develop or apply the model is not available, the actuary should consider whether use of the model is appropriate. When evaluating consistency of input data, the actuary should consider the following:
- 3.2.1 Provider Contracts—The actuary should consider the differences in provider contracts and the potential impact of these differences on the risk adjustment results. For example, one organization may pay fee for service and another may pay capitation. This can cause significant differences in risk adjustment results based on data quality rather than morbidity.
- 3.2.2 Diagnostic Services—The actuary should determine how the model handles diagnostic services and whether data for those services should be included in the data input into the model.
- 3.2.3 Coding and Other Data Issues—Because risk adjustment model results are affected by the accuracy and completeness of diagnosis codes or services coded, the actuary should consider the impact of differences in the accuracy and completeness of coding across organizations and time periods. This standard does not require the actuary to quantify the portion of measured morbidity differences due to coding or other data issues and the portion due to true morbidity differences. However, the actuary should consider how coding, incomplete data, and other data issues may be affecting the results and consider whether adjustments to the risk adjustment process are appropriate. Adjustments may include phase-in, the use of alternate models, and adjustment for changes in coding over time or across organizations.
- 3.3 Program Specifics—The specifics of the program for which risk adjustment is being used should be considered. For example, the presence of reinsurance may affect the impact of

## ASOP No. 45—January 2012

high cost individuals or the program may carve out some services from costs that are at risk to health plans or providers.

3.4 Assigning Risk Scores to Individuals with Limited Data—The actuary should consider the minimum criteria required for an individual to be included in the risk adjustment analysis such as a minimum number of months of eligibility in the incurral period. Where these minimum criteria are not met, the actuary should identify an appropriate measure of morbidity to be used. Approaches to handling these individuals include, but are not limited to, assigning an age/gender factor, assigning an average risk score for the scored individuals or excluding them from the analysis while also dampening the results.

3.5 Addressing Model and Methodology Limitations—When implementing risk adjustment results, the actuary should consider any limitations with the data, model or underlying program fundamentals. The actuary may determine that risk adjustment results should be modified before application due to such limitations.

If using a risk adjustment model on a population for which it was not originally designed, the actuary should consider appropriate adjustments, such as recalibration and condition or demographic category groupings.

3.6 Recalibration—The actuary should consider the necessity and advantages of recalibration in the context of available resources, materiality of expected changes in results, appropriateness of the unadjusted model risk weights, level of transparency afforded by the model, and limitations in the data available for recalibration.

The actuary should consider the credibility of data and observations for specific condition categories before changes to the model are made. The actuary should consider the reasonability and implications of any changes to the relative weights for condition or other groupings.

3.7 Use in Combination with Other Rating Variables—When risk adjustment is used in combination with other rating variables such as age or gender, industry or area, the actuary should consider whether those variables capture differences in morbidity already captured by the risk adjustment model, and make the appropriate modifications.

3.8 Budget or Cost Neutrality—One of the goals of the risk adjustment application may be to shift funds without increasing or decreasing the overall budget or cost. In this situation, the actuary should consider changes in the composition of the group being risk-adjusted between the historic and projected time periods, changes in data coding and quality, program changes, and any other changes that have the potential to materially affect overall results.

## ASOP No. 45—January 2012

### Section 4. Communications and Disclosures:

- 4.1 Actuarial Communications—When issuing actuarial communications under this standard, the actuary should refer to ASOP No. 41, *Actuarial Communications*.
- 4.2 Disclosures—The actuary should include the following, as applicable, in an actuarial communication:
- a. the disclosure in ASOP No. 41, section 4.2, if any material assumption or method was prescribed by applicable law (statutes, regulations, and other legally binding authority);
  - b. the disclosure in ASOP No. 41, section 4.3., if the actuary states reliance on other sources and thereby disclaims responsibility for any material assumption or method selected by a party other than the actuary; and
  - c. the disclosure in ASOP No. 41, section 4.4, if, in the actuary’s professional judgment, the actuary has otherwise deviated materially from the guidance of this ASOP.

**Appendix 1—Background and Current Practices**

Health status based risk adjustment methodologies have been an important tool in the health insurance marketplace since the 1970s. The use of risk adjustment has significant effects on health insurance companies, healthcare providers, consumers, employers and others. Its importance and influence are likely to increase as healthcare programs that currently use risk adjustment expand the populations they cover and other programs adopt the use of risk adjustment.

Risk-adjustment is a powerful tool in the health insurance marketplace. Risk adjusters allow health insurance programs to measure the morbidity of the members within different groups and pay participating health plans fairly. In turn, health plans can better protect themselves against adverse selection and are arguably more likely to remain in the marketplace. This in turn increases competition and choice for consumers.

Risk adjusters also provide a useful tool for health plan underwriting and rating. They allow health plans to more accurately estimate future costs for the members and groups they currently insure.

Finally, risk adjusters provide a ready, uniform tool for grouping people within clinically meaningful categories. This categorization allows for better trend measurement, care management and outcomes measurement. The risk adjustment structure, like benchmarks for service category utilization, creates consistency in reporting and communication across different departments within an insurance company. For example, medical management, actuarial and finance professionals can measure the impacts of their care management programs.

Risk adjustment is widely used in government programs including Medicare Advantage, state Medicaid, and healthcare reform programs. In addition, it is used in provider payment, medical management, employer multi-option contribution setting and in many other applications that require objective estimation of morbidity.

Actuaries typically use models developed by commercial vendors or publicly available models such as CDPS, MedicaidRx or CMS' HCC models. Concurrent models are usually used to measure morbidity when the incurral and measurement periods are the same, while prospective models are usually used if the estimation period is after the incurral period.

Concurrent models are used to analyze historical costs. Concurrent models can be used to assess relative resource use and to determine compensation to providers for services rendered because it normalizes costs across members with different health statuses. Normally, concurrent models provide an assessment of what costs should have been for members, given the conditions with which they presented in the past year. Prospective models are used to estimate future costs for a group of members.

**ASOP No. 45—January 2012**

The following are examples of risk assessment (evaluation of risk at the individual or population level, resulting in risk scores) and risk adjustment (the use of risk scores to allocate reimbursement or assign costs among different individuals or populations). The risk assessment examples (Examples 1 and 2) below are taken from the American Academy of Actuaries' May 2010 Issue Brief, titled "Risk Assessment and Risk Adjustment." These examples show how the risk score for two different 32 year old males is developed based on their health claims history. (This is illustrative; not all risk adjustment models use this type of additive convention.)

Example 1: John Smith, age 32, has diabetes, asthma/COPD and dermatology diagnoses in his claims history.

<b>Risk Marker</b>	<b>Risk Weight</b>
Male, Age 32	0.22
Diabetes with significant co-morbidities	1.32
Asthma/COPD	0.96
Low cost dermatology	0.30
<b>Total Risk Score</b>	<b>2.80</b>

The "Total Risk Score" in the table above is equal to the sum of the demographic and condition risk weights shown in the table. Usually, risk scores are stated relative to 1.0, with 1.0 being equal to the average expected risk score across the entire population. In this example, John Smith would be expected to cost 2.8 times an average member.

Example 2: Mark Johnson, age 32, has eligibility history but no claims.

<b>Risk Marker</b>	<b>Risk Weight</b>
Male, Age 32	0.22
<b>Total Risk Score</b>	<b>0.22</b>

In this example, the total risk score is equal to only the demographic risk weight and is much lower than the total risk score for John Smith. The estimated cost ratio using risk adjustment factors would be  $0.22 / 2.80$  or 0.079. Therefore, Mark Johnson's costs would be expected to be 7.9% of those of John Smith, and 22% of those of an average member.

Risk scores can be aggregated for groups of individuals. The following example shows the application of relative risk scores within the risk adjustment process for the Massachusetts Health Insurance Connector (Exchange). This example is taken from Ian Duncan: *Healthcare Risk Adjustment and Predictive Modeling* (Actex Publications, 2011). In this example, the claim cost portion of the capitation rate was \$393.67 per member per month (PMPM) at a 1.0 average plan type factor, 1.0 average geographic factor, and 1.0 average risk factor.

**ASOP No. 45—January 2012**

<b>Example of Calculation of Overall Adjustment Factor</b>								
Member	Plan Type	Region	Age	Gender	Rating Factors			
					Plan Type (a)	Geographic (b)	Risk (c)	Total (a)x(b)x(c)
001	I	North	27	F	1.0619	0.9468	0.8694	0.8741
002*	I	North	22	F	1.0619	0.9468	0.9970	1.0024
003	II	North	35	M	0.9461	0.9468	0.9108	0.8159
004*	II	Central	44	F	0.9461	1.1589	1.0350	1.1348
005	III	Central	54	M	0.8909	1.1589	1.2533	1.2941
							<b>Average</b>	<b>1.0242</b>

\*Members 002 and 004 had seven or more months of experience during the historic experience period. Therefore, they receive a condition-based risk factor rather than an age/gender risk factor.

The relative risk factor, adjusted for geographic and plan type risk, is applied to the baseline risk premium and an administrative load (\$32.00) is added:

$$\$393.67 \times 1.0242 + \$32.00 = \$435.20.$$

This Health Plan would be paid \$435.20 PMPM.

**Appendix 2**

**Comments on the Exposure Draft and Responses**

The exposure draft of this ASOP, *The Use of Health Status Based Risk Adjustment Methodologies*, was issued in April 2011 with a comment deadline of July 31, 2011. Ten comment letters were received, some of which were submitted on behalf of multiple commentators, such as by firms or committees. For purposes of this appendix, the term “commentator” may refer to more than one person associated with a particular comment letter. The Health Risk Adjustment Task Force of the Health Committee of the Actuarial Standards Board carefully considered all comments received, and the Health Committee and ASB reviewed (and modified, where appropriate) the changes proposed by the Task Force.

Summarized below are the significant issues and questions contained in the comment letters and the responses.

The term “reviewers” in appendix 2 includes the Task Force, the Health Committee, and the ASB. Also, unless otherwise noted, the section numbers and titles used in appendix 2 refer to those in this final version.

<b>GENERAL COMMENTS</b>	
Comment	One commentator stated that the ASOP should describe the core knowledge an actuary needed to have in order to perform analysis using risk adjustment methods.
Response	ASOPs do not include qualification requirements. The reviewers refer the commentator to Precept 2 of the <i>Code of Professional Conduct</i> and the U.S. Qualification Standards promulgated by the American Academy of Actuaries.
Comment	Several commentators stated that the ASOP should provide more guidance and noted specific areas where they thought guidance should be provided. In many instances, the commentators suggested adding technical details and more specificity, including examples. In addition, one commentator stated that the ASOP did not provide meaningful standards of practice, only a list of considerations.
Response	The reviewers believe the ASOP provides sufficient guidance. Additional details might be appropriate for a practice note or textbook. The reviewers did add additional guidance concerning specific issues around the timing of models, as discussed below.
Comment	Several commentators stated that the ASOP should list reference material.
Response	The reviewers believe it is not appropriate for this ASOP to list reference material since material in this area can quickly become out of date. Therefore, no change was made to the ASOP.
Comment	One commentator stated that many of the considerations in the ASOP were not practical or significant, particularly for employer-specific health plan analyses. The commentator stated that the ASOP briefly mentioned practical considerations, but requested that examples of where the ASOP was not applicable be documented.
Response	The reviewers believe the scope of the ASOP is clearly defined, and that section 3.1.9, Practical Considerations, provides sufficient weight to practical considerations. Therefore, no change was made to the ASOP.



**ASOP No. 45—January 2012**

Comment	One commentator suggested adding a section on uncertainty.
Response	The reviewers note that section 3.1.7, Predictive Ability, requires the actuary to consider the predictive ability of the model; and ASOP No. 41, <i>Actuarial Communications</i> , requires the actuary to communicate any cautions related to uncertainty. Therefore, no change was made to the ASOP.
Comment	Several commentators suggested adding additional examples under several sections.
Response	The reviewers believe the examples provided are sufficient, and note that the material in appendix 1 was expanded to provide additional background.
Comment	A commentator stated that actuaries should be required to educate intended users on the purpose of risk adjustment, the models available, their different uses, and the advantages and disadvantages.
Response	The reviewers believe ASOP No. 41 provides sufficient guidance on communication. Therefore, no change was made to the ASOP.
<b>SECTION 1. PURPOSE, SCOPE, CROSS REFERENCES, AND EFFECTIVE DATE</b>	
<b>Section 1.2, Scope</b>	
Comment	One commentator suggested adding “publicly available” to “commercial or other.”
Response	The reviewers agreed and added “publicly available” to the list in section 1.2.
<b>SECTION 2. DEFINITIONS</b>	
Comment	Two commentators suggested that definitions for data collection period, estimation period, and claim run-out period be added.
Response	A definition for estimation period was added to the definitions section. In section 3.1.5, “data collection period” was modified to “incurral period.” Appendix 1 was expanded to include additional discussion on timing issues.
Comment	Several commentators suggested adding definitions and guidance regarding prospective and concurrent models, and making the distinction between “risk adjustment” and “risk assessment.”
Response	The reviewers agreed and added discussion of these topics to the appendix.
<b>Section 2.8, Health Status Based</b>	
Comment	One commentator suggested that the definition of “health status based” be expanded to specifically list pharmacy claims.
Response	The reviewers believe this explicit recognition of pharmacy claims would be useful in understanding the definition and added pharmacy claims to the definition.
<b>SECTION 3. ANALYSIS OF ISSUES AND RECOMMENDED PRACTICES</b>	
Comment	One commentator suggested making the terminology referring to risk adjustment model and risk adjustment methodology consistent with the proposed rules under the Affordable Care Act.
Response	The reviewers believe the terms are appropriate as included. Terminology in various ASOPs is sometimes different from that used in regulations. ASOPs are generally developed so that they do not need to be revised as new laws and regulations are proposed, passed, and changed. Therefore, no change was made to the ASOP.

**ASOP No. 45—January 2012**

<b>Section 3.1.1, Intended Use</b>	
Comment	One commentator suggested that section 3.1.1 could be interpreted to have a “yes” or “no” answer when the more typical situation involved a degree or spectrum of closeness.
Response	The reviewers agreed and replaced “whether” with “the degree to which.”
<b>Section 3.1.3, Model Version</b>	
Comment	One commentator stated that compliance with the requirement that a comparison to prior versions be conducted may not always be possible.
Response	The reviewers agreed that the language in the ASOP may unintentionally imply too high of a standard. Further language was added clarifying that the information may not be readily available and that the actuary should consider comparing results under different versions.
<b>Section 3.1.7, Predictive Ability</b>	
Comment	One commentator suggested that the actuary should consider who may have accountability to monitor predictive ability on an ongoing basis.
Response	The reviewers believe such a requirement is unnecessary. Therefore, no change was made to the ASOP.
<b>Section 3.1.8, Reliance on Experts</b>	
Comment	One commentator suggested that a statement such as the following be added: “the actuary should consider, if appropriate, relying on outside expertise if aspects of the model are not readily understood by the actuary.” The commentator used an example of an actuary not fully understanding the clinical input used to develop a model and seemed to suggest the actuary should understand such clinical input and aspects before using a model. Another commentator stated that the reliance on experts section was potentially too prescriptive and stated that it would be impossible to know if the model developer was an expert if they were deceased. Another commentator had a concern similar to the second one listed here and asked if a reliance statement from the expert would be necessary.
Response	The reviewers believe actuaries relying on others can assess the expertise of those individuals. The reliance on experts language in this ASOP is consistent with the relevant requirements in ASOP No. 38, <i>Using Models Outside the Actuary’s Area of Expertise (Property and Casualty)</i> . Therefore, no change was made to the ASOP.
<b>Section 3.2, Input Data</b>	
Comment	One commentator stated that actuaries may not have access to input data used to develop a model and therefore could not assess the consistency of the model development and the application of the model.
Response	The reviewers believe this section needed further clarification and additional flexibility for practicing actuaries. This section has been edited to address these issues.
Comment	One commentator stated that actuaries should have a deep understanding of the data used to develop the model and be aware of any hidden variables such as race or income.
Response	The reviewers believe the revised section 3.2 places an appropriate level of responsibility on the actuary. Therefore, no change was made to the ASOP.
Comment	One commentator suggested adding other input data such as income level or socioeconomic information, self-reported health data (health-risk assessments), and lifestyle-related data.
Response	Sections 3.2.1, 3.2.2, and 3.2.3 talk about specific data issues that may exist in widely used models. The reviewers believe including discussion of variables not widely used may unnecessarily complicate the ASOP. If used in a model, the ASOP (specifically, section 3.2) requires the actuary to consider consistency of these variables even if they are not specifically listed. Therefore, no change was made to the ASOP.

**ASOP No. 45—January 2012**

<b>Section 3.2.3, Coding and Other Data Issues</b>	
Comment	One commentator suggested that the term coding be included in the definitions.
Response	The reviewers agreed and added the definition in section 2.2.
Comment	One commentator suggested adding data validation to the section 3.2.2 heading and further detail and requirements regarding considering differences in coding.
Response	The reviewers believe the suggested changes are unnecessary and may overlap with other sections where data issues are also discussed. Therefore, no change was made to the ASOP.
<b>Section 3.4, Assigning Risk Scores to Individuals with Limited Data</b>	
Comment	One commentator requested that the discussion of assigning risk scores to individuals with limited experience be more explicit.
Response	The reviewers agreed and added “such as a minimum number of months of eligibility in the incurral period.”
Comment	One commentator suggested that excluding individuals from the analysis did not dampen the results.
Response	The reviewers removed the word “effectively” and added “while also” since the intent in the example was an active dampening of the results, not that excluding the individuals would automatically dampen the results.
<b>Section 3.5, Addressing Model and Methodology Limitations</b>	
Comment	Two commentators suggested that, while existing communication standards require certain communications, this ASOP reinforce requirements in specific areas including adjustments to address model and methodology limitations.
Response	The reviewers note ASOP No. 41 includes the following statement regarding required documentation in section 3.6: “Such documentation should identify the data, assumptions, and methods used by the actuary with sufficient clarity that another actuary qualified in the same practice area could evaluate the reasonableness of the actuary’s work.” Therefore, no change was made to the ASOP.
<b>Section 3.6, Recalibration</b>	
Comment	One commentator suggested that an actuary should consider the extent to which an actuary could recalibrate the model because of a lack of transparency.
Response	The reviewers agreed the level of transparency would affect an actuary’s ability to recalibrate a model, and added transparency in the list of considerations in this section.
Comment	One commentator suggested that actuaries be required to recalibrate when there are inconsistencies between model development and model application or communicate uncertainty if recalibration is not performed.
Response	The reviewers disagree and believe the ASOP requires the appropriate level of review and communication. Therefore, no change was made to the ASOP.
<b>APPENDIX 1—BACKGROUND AND CURRENT PRACTICES</b>	
Comment	One commentator noted that the background and current practices section of the appendix stated that risk adjustment has been an important tool in the health insurance marketplace since the 1970s while the background section in the exposure draft’s transmittal memorandum referenced the 1980s.
Response	The reviewers note that the 1970s was the correct reference.