

Note: This ASOP is no longer in effect.
It was superseded by ASOP No. 23, Doc. No. 097.



ACTUARIAL STANDARDS BOARD

**Actuarial Standard
of Practice
No. 23**

Data Quality

**Developed by the
Data Quality Task Force of the
Specialty Committee of the
Actuarial Standards Board**

**Adopted by the
Actuarial Standards Board
July 1993**

(Doc. No. 044)

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July 1993

TO: Members of Actuarial Organizations Governed by the Standards of Practice of the Actuarial Standards Board and Other Persons Interested in Data Quality

FROM: Actuarial Standards Board (ASB)

SUBJ: Actuarial Standard of Practice No. 23

This booklet contains the final version of Actuarial Standard of Practice (ASOP) No. 23, *Data Quality*.

Background

The catalyst for development of an actuarial standard of practice on data quality was a publicized discussion of a situation in which an actuary, engaged to express an opinion on the claim reserves of an insurer, did so on the basis of data that had not been audited by a certified public accountant. The resulting discussions, which included state insurance department officials, covered a broad range of issues that highlighted both the importance of the quality of data to the actuarial work product and the need for a standard to provide greater consistency in actuarial practice and between actuarial practice and public expectations.

The issues raised included: the responsibility of the actuary for reasonably selecting among alternative types and sources of data; the actuary's responsibility when relying on data supplied by others; and the actuary's responsibility to disclose deficiencies in data. The American Academy of Actuaries became engaged in the discussions, and the issues were referred to the ASB.

The ASB, recognizing that all areas of actuarial practice have an interest in the quality of data, asked each of its operating committees to appoint a member to serve on an ad hoc task force of the ASB Specialty Committee. This task force was formed in February 1990 and included life, health, pension, and property/casualty actuarial practitioners.

The task force addressed two critical questions before proceeding:

1. Are actuarial standards needed in the area of data quality?
2. If such standards are needed, is a single, comprehensive standard feasible, or should data quality be addressed as part of separate standards associated with specific areas of actuarial practice?

While the task force recognized the difficulty of developing a single, comprehensive standard, it concluded that such a standard was needed and recommended to the ASB that one be drafted. The recommendation was approved at the April 1990 ASB meeting. A first draft of the proposed standard was approved for exposure at the April 1991 meeting of the ASB.

In the course of its drafting deliberations, the task force considered expanding this standard to include “non-numerical” information, the accuracy of which also affects the actuarial work product—for example, information that there has been a change in claims department procedures resulting in acceleration of claims payment. Such non-numerical information, the task force believed, would more appropriately be addressed in separate practice standards that involve methods of interpreting and analyzing data.

Comments on the First Exposure Draft

The first draft of the standard was exposed for review in a document dated April 1991, with a comment deadline of August 15, 1991. Thirty letters of comment were received. Summarized below are the significant issues and questions contained in the comment letters. The task force's responses appear in **boldface**.

Definition of *Data*

Several respondents expressed concerns as to the scope of the definition of *data*: Did it include actuarial assumptions that are in numeric form? Can sampling techniques be used, and should recognized techniques be recommended? Did the standard apply equally to both census and experience data? Respondents also asked if the standard applied to computer software.

The task force responded by clarifying the definitions of *data* and of *comprehensive data*. Specifically, within the definition of *data*, census and classification information were explicitly included as data. The task force did not believe census data warranted separate treatment. In addition, actuarial assumptions were noted as not data per se. The definition of *comprehensive data* was clarified with respect to sampling techniques. Sampling techniques can be used. As long as each data element or record needed under the sampling technique is present, the data are comprehensive.

The standard does not apply to computer software and does not set criteria for the quality of actuarial data systems. However, the data generated by such systems should be reviewed for reasonableness and consistency.

Material Bias

Two general themes emerged under this heading:

1. Several respondents asked for more specific direction on what is a *material bias*.

A formal definition of *materiality* was not included in this standard as this term is common to many standards and should be treated globally. The task force noted that while the accounting profession does not define *materiality*, it does offer guidance on considerations for evaluating materiality. Development of such guidance is under consideration by the ASB.

2. Several respondents suggested that the standard make clear that it places an obligation on the actuary with respect to only those errors of which the actuary becomes aware during the course of the assignment.

The task force revised sections 5.2 and 6.2 to make clear that only material biases that the actuary is aware of need to be considered and disclosed.

Consistency and Reasonableness

Several respondents asked for more specific direction on what is entailed in a review of the data for reasonableness and consistency.

The task force felt that no list of procedures could be developed because of the diversity of actuarial work, the diversity of data used in that work, and the need for judgment dependent upon circumstances. The standard does state that “the intended use [of the analysis] will indicate the level of review needed” (section 5.1).

Accuracy and Comprehensiveness

Many respondents asked if the standard recommends that only audited data be used in an actuarial analysis; some noted that an actuary may not be qualified to audit data. Many respondents expressed concern that the standard may recommend the quantification of errors and that it was not specific enough on how to measure accuracy and comprehensiveness.

The task force responded by adding an opening paragraph to section 5 that states explicitly that “this standard does not recommend that an actuary audit data.”

The language in section 1.1 of the first exposure draft that recommended “determining” the accuracy of data has been deleted.

The standard does not preclude the use of imperfect data (sections 5.2, 6.2(b) and 6.2(c)); rather, it contains a discussion of the use of imperfect data, and recommends appropriate disclosures.

Other respondents questioned whether the standard recommends the review of data to a greater detail than used in the analysis, and how to handle errors that are discovered after the report is released.

The standard states that the intended use will indicate the nature and extent of review and, thus, the level of detail needed for the actuarial analysis. The report should address only those imperfections in the data that the actuary is aware of at the time the report is completed. More generalized guidance on the issues of disclosing material changes or errors discovered subsequent to a report is under development by the ASB.

One respondent asked for guidance when the actuary's review of data uncovers an error in audited data.

If the error is material, the standard recommends that the actuary give a qualified report disclosing the discrepancy in the data and any corrective action taken.

Reliance on Others

Many respondents were concerned with the burden placed on the actuary to know the “reputation, integrity, and qualifications of the person whose work is relied on.”

The task force extensively reworked section 5.3 to reflect these concerns. The actuary may rely on data supplied by others whether the source is an organization or an individual. In such cases, where practicable, the actuary should review the data for reasonableness and consistency.

The task force further clarified the intention of this section by changing the wording from “reliance on the work of others” to “reliance on the data supplied by others.”

Other comments on this section included a recommendation that the actuary should directly supervise the collection of data whenever possible; a question whether less stringent standards should apply to reliance on data within the corporate environment without a specific statement of opinion; and a recommendation that the actuary should inform those who supply the data as to its intended use.

The task force believed that the first suggestion would be too costly a requirement for every actuarial analysis. Even within the corporate environment, the obligation to review the data for reasonableness and consistency still remains. The task force also thought it was

good business practice to discuss the use of the data with those who were compiling the data, but to make that a *requirement* would place too costly a burden on every analysis.

Documentation and Report

Commentators asked the following questions: When should the actuary do a report on the data—for public reports only? As part of public statements of actuarial opinion? Does the standard apply to all analyses or just those available to the public?

The standard applies to all actuarial analyses, although the degree to which the data should be reviewed is dictated by the data's intended use. A separate report on the data is not recommended by this standard. The standard only recommends including certain disclosures in the report the actuary submits as the actuary's work product.

Several respondents commented on section 6.1 as follows: Should the actuary keep a copy of the data? And what is a reasonable period of time?

Section 6.1 recommends only that adequate documentation be maintained to support the use of specific data. It does not recommend that the actual data be kept; the data may be returned to the client. The documentation could simply include a description of the tests or checks applied to the data and the results obtained. The task force did add to section 6.1 a clarification as to what is a reasonable period of time, although as in other standards no specific time period was specified.

Several respondents commented on section 6.2 as follows: Should the use of the data be noted in the report? Should the factors considered in selecting the data (per section 5.1(b)) be noted in the report? How extensive a listing of those relied on should be in the actuarial report?

Within the report accompanying an actuarial analysis, the use of the data should be self-evident. As the items listed in section 5.1(b) are criteria that the actuary may use in selecting data to underlie the analysis, the specific citation of these items is not called for. However, it would be prudent for actuaries to retain this information in their work papers. (Note also that the statement of purpose of the proposed standard now reads, “to give guidance to the actuary in selecting the data . . .”.) The actuary, though, should be able to support the use of specific data. The report should list the principal source for the data.

Relationship to Clients

Two respondents sought clarification for circumstances when the client supplies data that either the actuary does not approve of or that are of poor quality and not correctable. Can the actuary accept the assignment?

Actuarial judgment as to the severity of the data problems will indicate whether any actuarial analysis should be performed. In situations where imperfect data are used, it is recommended that the actuary disclose the materiality of any potential biases of which the actuary is aware (section 6.2(b)).

All comments were considered carefully and many suggestions were directly reflected in the second exposure draft. The task force believed the revised document was substantially improved as a result. At the same time, the changes were deemed to be significant enough to warrant a second exposure.

Comments on the Second Exposure Draft

The second draft of the standard was exposed for review in a document dated July 1992, with a comment deadline of January 15, 1993. Twenty-one letters of comment were received. Summarized below are the significant issues and questions contained in the letters. The task force's responses to these appear in **boldface**.

Definitions

Several respondents raised questions about specific definitions and the relationships among the definitions.

The task force discussed these questions and concluded that major changes were not needed. Some minor changes were made in the definition of *data element*, and the definition of *accurate data* was deleted.

Consistency and Reasonableness

Several respondents expressed concerns about the standard's recommendation that data be reviewed for internal and external consistency and reasonableness (section 5.1(b)).

The task force concluded that such a review needs to be done where practicable. A discussion of the types of review that might be appropriate in various situations was added to section 5.3, *Reliance on Others*, and the heading was changed to *Reliance on Data Supplied by Others*. See the discussion below for further discussion.

Reliance on Data Supplied by Others

Many respondents were concerned with the exposure draft's recommendation that the actuary make a judgment about the reliability of the source of data supplied by others (section 5.3). There

was concern about what the basis could be for such a judgment.

The task force changed the emphasis of the section in question to a review of the data supplied by another, rather than the source of these data. The nature and extent of the review of these data will vary with the circumstances of the actuarial assignment, the section now reads, and it goes on to include discussions of the types of review needed.

Report

Several comments were submitted about the disclosures to be included in the actuary's report (section 6.2).

The task force added two items of disclosure related to the extent of the actuary's review of the data. Otherwise, the task force did not believe it was necessary to amend the disclosure items.

The task force expresses its gratitude to the reviewers who took the time to send comments on the second exposure draft; all of the letters were helpful in the development of the final version of the standard.

Data Quality Task Force

Philip D. Miller, Chairperson

Lall Bachan	James B. Milholland
Richard S. Biondi	Virginia R. Prevosto
Larry M. Gorski	Donald E. Sanning

Specialty Committee of the ASB

Stephen G. Kellison, Chairperson

Harold L. Barney	Robert J. Myers
Steven A. Harrold	Alwyn V. Powell
Philip D. Miller	

Actuarial Standards Board

Jack M. Turnquist, Chairperson

Edward E. Burrows	Daniel J. McCarthy
Gary Corbett	Richard S. Robertson
Willard A. Hartman	Harry L. Sutton Jr.

Frederick W. Kilbourne

P. Adger Williams

ACTUARIAL STANDARD OF PRACTICE NO. 23

DATA QUALITY

PREAMBLE

Section 1. Purpose, Scope, and Effective Date

- 1.1 Purpose—The purpose of this standard of practice is to give guidance to the actuary in:
- a. selecting the data that underlie the actuarial work product;
 - b. reviewing these data for appropriateness, reasonableness, and comprehensiveness; and
 - c. making appropriate disclosures.
- 1.2 Scope—This standard applies to all areas of practice. Other actuarial standards may contain additional data quality requirements that are applicable to particular areas of practice.
- 1.3 Effective Date—This standard will be effective December 31, 1993.

Section 2. Definitions

- 2.1 Appropriate Data—Data suitable for the intended purpose of an analysis; data that are relevant to the system or process being analyzed.
- 2.2 Comprehensive Data—Data obtained from inventory or sampling methods that contain each data element or record needed for the analysis.
- 2.3 Data—For purposes of this standard, the term refers to numerical, census, or classification information and not to general or qualitative information. Assumptions are not data per se, but data are commonly used in the development of actuarial assumptions.
- 2.4 Data Element—An item of information, such as date of birth or risk classification.

Section 3. Background and Historical Issues

An actuarial analysis is based upon a thorough review of data, along with practical knowledge of the field of practice and training in actuarial theory, which together enable the actuary to interpret the results of calculations. Throughout the analytic process, data play an important role. The accuracy and validity of the actuarial analysis are dependent on, among other things, the quality of the data used. Hence, an actuarial standard of practice concerning data quality is appropriate.

Another impetus for the development of this standard arises from the perspective of the users of actuarial reports. Users expect that actuaries will seek and use appropriate data in their work, and that actuaries will make disclosures in their actuarial communications of any material imperfections in the underlying data of which the actuaries are aware as of the date of the actuarial communication.

Section 4. Current Practices and Alternatives

Informed judgment is used by actuaries to determine what kinds of data are appropriate for a particular analysis. It is important that the data used are germane to the system or process being analyzed.

Persons or organizations responsible for generating, collecting, or publishing data may apply different standards of quality assurance, ranging from straightforward compilation of figures to extensive verification. Actuaries, in turn, deal with the question of the quality of data underlying their work products in a variety of ways, ranging from reliance on the data supplied by others without any checking to a complete and independent verification of the data.

Actuaries are called upon to provide analyses for a broad range of uses, from limited distribution within an organization to public exposure.

There is also a range of practices with respect to documentation and disclosure of such items as:

1. sources of data,
2. material biases due to imperfect data,
3. adjustments made to correct for imperfect data, and
4. extent of reliance on the data supplied by others.

STANDARD OF PRACTICE

Section 5. Analysis of Issues and Recommended Practices

Data that are completely accurate, appropriate, and comprehensive are seldom, if ever, available. An actuary performs an analysis with available data and includes in the report sufficient information so that users may be aware of material data limitations known to the actuary, and their implications. Furthermore, a review of data may not always reveal imperfections. This standard does not recommend that an actuary audit data.

- 5.1 Selection of Data—In undertaking any analysis, an actuary should consider what data to use. The actuary should understand the intended use of the analysis being performed. The intended use will indicate the nature and extent of review needed and the number of alternatives to be reviewed. In evaluating these alternatives, the actuary should:
- a. consider the data elements that are desired, and possible alternative data elements; and
 - b. select the data with due consideration of:
 - i. appropriateness for the intended purpose of the analysis, including whether the data are sufficiently current;
 - ii. reasonableness and comprehensiveness of the necessary data elements, with particular attention to internal and external consistency;
 - iii. any limitations of the data, and modifications or assumptions needed in order to use the data;
 - iv. the cost and feasibility of alternatives, including the ability to obtain the information in a reasonable time frame (the benefit to be gained from an alternative data element or data source should be balanced with its relative availability and the cost to collect and compile it); and
 - v. sampling methods, if used to collect data.
- 5.2 Use of Imperfect Data—The actuary may be aware that the data are incomplete, inaccurate, or not as appropriate as desired. In such cases, the actuary should consider whether the use of such imperfect data may produce material biases in the results of the study, or whether the data are so inadequate that the data cannot be used to satisfy the purpose of the study.
- 5.3 Reliance on Data Supplied by Others—The actuary may rely on data supplied by another. In doing so, the actuary should disclose such reliance. The accuracy and comprehensiveness of

data supplied by others are the responsibility of those who supply the data. However, the actuary should, when practicable, review the data for reasonableness and consistency. The nature and extent of the review should be based on the circumstances of the actuarial assignment.

When such a review is performed,

- a. The actuary should review the data used directly in the actuary's analysis for the purpose of identifying data values that are questionable or relationships that are materially inconsistent. The actuary is not expected to develop additional data compilations solely for the purpose of searching for questionable or inconsistent data.
- b. If the actuary has reason to believe that the data may contain material defects, the actuary should determine, if possible and practicable, the nature and extent of any checking, verification, or auditing that may have been performed on the data. Then, if in the actuary's judgment the actuary should perform a more extensive review, this should be done if practicable.

There may be situations where it is impossible or impracticable to perform a sufficient review of the data. In these instances, the actuary should disclose that the actuary has not sufficiently reviewed the data and should disclose any resulting limitation in the use of the actuarial work product (see section 6.2).

Section 6. Communications and Disclosures

- 6.1 Documentation—An actuary should maintain, for a reasonable period of time, adequate documentation to support the use of specific data underlying the actuarial work product. The time period for maintaining documentation will depend on considerations such as the purpose of the analysis, the needs of the client, and any applicable regulatory requirements.
- 6.2 Report—The actuary's report should include the following disclosures:
 - a. the source(s) of the data;
 - b. the materiality of any potential biases of which the actuary is aware that are due to imperfect data;
 - c. adjustments or modifications made because of imperfect data, other than routine corrections made by reference to source documents;
 - d. the extent of reliance on data supplied by others (see also section 5.3);
 - e. in the event that the actuary has not sufficiently reviewed the data, any resulting

limitation on the use of the actuarial work product (see also section 5.3); and

- f. any unresolved concern the actuary may have about the data that could have a material effect on the actuarial work product.

6.3 Deviation from Standard—An actuary must be prepared to justify the use of any procedures that depart materially from those set forth in this standard and must include, in any actuarial communication disclosing the results of the procedures, an appropriate statement with respect to the nature, rationale, and effect of such departures.