EDUCATION COMMITTEE

OF THE

SOCIETY OF ACTUARIES

PREDICTIVE ANALYTICS STUDY NOTE

CHAPTER 24 OF

HEALTHCARE RISK ADJUSTMENT AND

***PREDICTIVE MODELING,* SECOND EDITION**

by

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The Education Committee provides study notes to persons preparing for the examinations of the Society of Actuaries. They are intended to acquaint candidates with some of the theoretical and practical considerations involved in the various subjects. While varying opinions are presented where appropriate, limits on the length of the material and other considerations sometimes prevent the inclusion of all possible opinions. These study notes do not, however, represent any official opinion, interpretations or endorsement of the Society of Actuaries or its Education Committee. The Society is grateful to the authors for their contributions in preparing the study notes.

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24 COMMUNICATING RESULTS

Unlike other chapters in this book, this chapter is partly a personal reflection on the subject of communication, based on my 25+ years of management and actuarial consulting, together with some practical tips and a note on the requirements of the Actuarial Standard of Practice (ASOP) for actuarial communications.

24.1 BACKGROUND

There is a common belief that actuaries are poor communicators. Whether or not this is true (and actuaries are probably no worse than other technical professions at communicating their results), actuaries start at a disadvantage because the results that they have to communicate frequently tend to be disappointing to their audience. Some professions, such as marketers, journalists, lawyers and politicians, are, on average, much better at communication. What distinguishes these professions from actuaries? One important differentiator may be that communication is a requirement of these professions. Their practitioners practice writing and speaking to varied audiences frequently.

Rule #1 of Communication
Practice as often as you can, to as many audiences as you can.

Traditionally, actuaries have communicated results in writing (e.g., a memo, a report, a white paper, or a peer-reviewed publication) or orally. The latter category covers anything from meetings with a client to presentations to large audiences. There are some newer media, such as webcasts (a presentation to an invisible audience, which can be unnerving to the presenter the first few times), videos that can be shared or posted (such as on YouTube or in online learning platforms) or other social media outlets. In this chapter, we will focus on the traditional settings, with extensions to newer media when appropriate.

24.2 PERSUASION: THE PURPOSE OF COMMUNICATION

Certainly, some communication is simply to update a manager on some new data that you have crunched. You *could* email the data. However, there is no guarantee that the email would be read—I had a rule in my own companies that I did not read emails past the first two lines unless the sender included a warning that the email was important enough that I should read to the end. If you want your data to be studied and absorbed, schedule a meeting. But generally there

is, or should be, some business purpose to your communication, and this requires you to persuade someone or some group to take action based on your analysis.

Years ago, when I first became a consultant, I read an article called "The making of a consultant." The article was written by Francis Xavier (Xie) O'Lanie,[1] a veteran of World War II, an alumnus of McKinsey and Co., and one of the founders of an employee benefits and compensation consulting firm in Los Angeles that was later to become part of Towers Perrin (now Willis Towers Watson). O'Lanie stated that the purpose of the consultant and the purpose for which he or she is communicating is "getting the client to take action that is in their best interests." This is an important idea, fundamental to communication. O'Lanie was writing in the context of the consultant, with years of experience of the particular issue at hand. The consultant would have sufficient background and experience that, supplemented by data and analysis, would lead to an opinion as to the best course of action (recommendation) for the client. The client's natural tendency is inertia, leavened (in the case of interactions with actuaries) with some degree of skepticism. This leads to

Rule #2 of communication
Have a point of view and be prepared to defend it.

This rule may seem contradictory—isn't it management's responsibility to develop a course of action and to decide what to do when confronted with your data and analysis? This line of thought misses the point of the analyst's role. An analyst must not just develop a model, but also *interpret* the model in such a way that it leads to *action.* Anyone can crunch numbers, and at some point in the future, if that's all you do, you may be replaced by a machine. An analyst's job is to understand the implication of their analysis or their model and to translate this into a course of action for the client. To do this successfully, you will need to be an advocate for your point of view, which requires you to be familiar not only with the study and the data, but also the context in which you are making a recommendation, and the alternatives that the audience is likely to be considering. Above, I termed this a *Point of View,* but I could have called it a recommended course of action or a recommendation. The key point is that your communication should be such that it conveys *what* the client should do and *why* the client should follow your recommendation, including *the benefits* of following your recommendation and the risks of not doing so.

Experienced consultants will have well-honed points of view. From years of experience, they will instinctively know what a client should do in a particular situation. Provided the data and analysis supports the point of view, the task of persuading the client may be relatively simple. When you start in business, be it actuarial, consulting, analytics, or something else you will not have many points of view. Your recommendations will be informed by data, analysis, colleagues, other projects in the firm, and reading. The role of reading cannot be overstated: you will need to be a consumer of as much opinion as you can. Note that I recommend reading *opinion*—that is, writers with a point of view. Even if it is not your point of view and you disagree with the writer, what is important is evaluating the writer's case, the way that he or she persuades you, the reader, of this viewpoint, and if you disagree, formulating the arguments that you would marshal in opposition.

[1] If you are interested in reading this article, it is posted on the supplements section of www.actexmadriver.com.

Rule #3
The point of view should be clear.

You will meet many people in your career that tell you to develop an "elevator pitch."[2] I have never been in an elevator with someone that I was pitching, so I cannot vouch for this technique, and besides, it is never a good idea to discuss business in a public space, particular one as confined as an elevator. Nevertheless, it has an important corollary—if you cannot distill your viewpoint (or "pitch") to a brief 5-10 words, then you don't understand your viewpoint (or "pitch"). This may require more work than almost any other phase of your communication—it requires you to distill the fundamental proposition to a brief few words. If you really understand your viewpoint, you should be able to convey it in simple terms. If you cannot, you need to do more work. There is a well-known quotation of uncertain provenance that sums up this process, attributed variously to Mark Twain and Cicero, but probably from the French Mathematician, Blaise Pascal: "If I had more time I would have written a shorter letter."

24.3 WHAT CONSTITUTES GOOD WRITING?

You are not competing for the Booker or Nobel prizes in literature, so the writing is not the primary focus of your report. Remember that the purpose of the report is to *persuade* someone to take action that they otherwise would not be inclined to take. There is a simple rule about good writing:

Rule #4
Good writing is transparent. It doesn't get in the way of the reader or interrupt the argument.

There are those who think that good writing consists of multiple, flowery adjectives. Others view good writing as containing multisyllabic words. Each of these has a place. One of the best writers of the 20th Century was William F. Buckley, founder of the periodical *National Review* and host of the television program *Firing Line.* Bill Buckley delighted in verbal precision, often choosing an obscure word with a very precise meaning to convey his thought. But Bill Buckley wrote for a small, highly-educated audience who enjoyed checking the dictionary. This is not your audience. You do not want the audience checking the dictionary, because that would interrupt your persuasive argument. As for the use of adjectives, these should be used sparingly in business communications. The English writer Sir Ernest Gowers wrote a book that has regrettably fallen out of use in modern communication, *The Complete Plain Words* [167]. The idea that Gowers promoted was that simple, monosyllabic, Anglo-Saxon words convey the message and should be used in preference to multisyllabic words of exotic origin. American readers are probably more familiar with the famous (and excellent) *The Elements of Style* [168] originally written by William Strunk Jr. and updated and expanded by E.B. White (of *Charlotte's Web* fame).

[2] Or perhaps "elevator speech," although "speech" sounds altogether too formal, reminiscent of Queen Victoria's remark that her Prime Minister W.E. Gladstone addressed her as though she were a public meeting.

Rule #4 states that good writing is transparent, that it advances the *point of view* without the reader pausing to ponder the writer's meaning. English has grammatical rules. These may not always be enforced, but there are good reasons for rules. The most precious commodity that your audience has is time. You do not want to waste their time by having them pause over words to second-guess what you are saying. For example, one universally misused word is the plural form of "criterion" ("criteria") which has been confused as a singular female Latin word when it is actually Greek and plural. In English, the use of "criteria" when a single criterion is being discussed causes the reader to pause and to ponder—the author only mentioned a single criterion; did he mean more than one criterion (in which case what are the other criteria?), or has the author mistakenly used a plural word to describe a single condition? Either way, you have wasted the reader's valuable time, interrupted the flow of your argument and your opportunity to persuade.

24.4 COMMUNICATING TECHNICAL TOPICS

As an actuary (or predictive modeler), you have the task of communicating technical topics to non-technical audiences such as marketing, senior management or client representatives. Terms that actuaries or statisticians take for granted, such as "PMPM" or "independent" may require explanation for some audiences, such as senior management.

Rule # 5
Simplify the explanation, not the analysis. If you can't explain a term or a concept, don't include it; if you include it, explain it in layman's terms.

You may be surprised at the level of understanding that non-actuaries acquire from working with actuaries and statisticians. This leads to **Rule 5a: Don't talk down to the audience.** Some members of the audience appreciate their information in graphical form, and some in numerical form. Unless you know the preference of the audience, you are better off providing both forms of information, and you may often be able to learn the audience's preference during the communication and adjust accordingly. The rule about good writing also applies to good graphics—they shouldn't get in the way of the message. Graphics take more time to understand than written communication, so in the case of graphs some rules are important:

- Title the graph.
- Label the axes.
- Labels should be large enough to read.
- Don't overload the graph (unless complexity is the message you want to convey).
- Always include an explanation of the graphic. Guide the audience and tell them what they are supposed to see.

24.5 A WORD ABOUT POWERPOINT PRESENTATIONS

When I started in business, we communicated through memoranda ("memos"). These have largely been replaced by a combination of e-mails and PowerPoint presentations. There are plenty of resources available on developing good PowerPoint presentations, but the following rules are worth observing:

- Do Not Overcrowd—Obey the 7-7 rule
  - No more than 7 lines per slide no more than 7 words per line
  - Use keywords not sentences
- State the problem clearly—do not jump immediately into your solution or a description of your work.
- Do not overload—stick to the key message without extraneous ideas, and plan to end within the allotted time (to allow for questions). A general rule is to expect 1 minute (or more) per slide.
- Use large clear fonts in contrast with the background,
  - Limit pictures and animation.
  - Check spelling.
  - Label graphs and charts and make sure that lines on graphs are large enough to show up on a screen.
  - Number the pages.
- Use color and different fonts for emphasis.
- Memorize the slides—eye contact with the audience is the key. Do not read your slides! Use flashcards if necessary.
- Use good posture, stand up straight and avoid nervous gestures. Do not cling to the podium! Use pointer or pen to point.
  - If you give frequent presentations, buy a small portable "clicker" to advance your slides.
- Thank the audience for their participation.
- Repeat key insights and practice!

I am sometimes guilty of displaying Excel sheets with a lot of numbers on slides, a bad habit that is the PowerPoint equivalent of using too many words because you haven't mastered your argument. This is difficult for actuaries because we are "numbers people." But for most presentations, your audience will not be, and numbers should be used sparingly, lest they interrupt the flow of the argument.

24.6 REPORT STRUCTURE

A report should have a clear structure. If you read published papers, you will see that invariably they follow a common structure that will work for most reports, memos and even PowerPoint presentations. The following is a typical structure for a technical report. Chapter 20, which reports on an assignment to develop a model for predicting hospital readmissions largely follows this format, and you may want to refer to it as an example.

1. **Title and Executive Summary**. The executive summary is your opportunity to state your point of view and ask for action. The executive summary is a one- to two-paragraph summary of your investigation. In a published paper, the Executive Summary is replaced by the Abstract, although the rules are the same—from one to two hundred words. The language may be non-technical, depending on the audience. This section should summarize the main findings of your report and the required action. Issues to be covered include: What problem was studied? How was it studied (non-technical description of methodology)? What were the findings? This section is generally the last to be written, particularly if the findings are subject to change (as they often are).

2. **Introduction**. The introduction should provide the context for the study, as well as the motivation: Why are the study and its results important? This section should contain the following subsections:
    a. Orientation material. This subsection covers the context and motivation for the study. In an academic paper, this would include a literature review. In a commercial report, this section would include prior work that had been completed on the particular problem.
    b. Key aspects of the report. Identify the source and nature of the data used in your study. This section identifies the source of data; the data themselves are summarized in the next (data) section. Give an indication of the modeling techniques that you intend to use in order to make inferences about the problem. Is the purpose behind this model selection clear (e.g., understanding versus forecasting)?
    c. A plan of the report. This section outlines what the reader can expect to find in the succeeding sections of the report.

3. **Sources and structure of the data**. The first need in a report is a summary of the data. The reader needs to understand the context in which you are analyzing the problem, which means understanding the dataset. This initial description need not be extremely complex. A more complex analysis of the dataset, (for example one that reports on the frequency of every variable in the dataset) could be assigned to the Appendix. The data description should give a sense of the contents of the dataset such as age, sex, geography and one or two major points of interest. In the data characteristics section, identify the component variables, and state whether each variable is longitudinal or cross-sectional, observational or experimental. Here, you should present any basic summary statistics that would help the reader develop an overall understanding of the dataset. Readers fall into two categories with respect to data: those that like to absorb numbers graphically and those that like to see numbers in tabular form. Given that the audience is unpredictable, it is wise to include both. Graphically, it is a good idea to include one or two plots. Use scatter plots to indicate primary relationships in cross-sectional data or time series plots to indicate important trends in longitudinal data. Box plots have become popular in some reports although some readers find box plots difficult to interpret, as they frequently end up looking the same. The plots, and accompanying summary statistics, should not only isolate the most important trends or relationships, but may also serve to identify unusual points that are worthy of special consideration. Finally, you cannot rely on the reader to make the same interpretation of the numbers and graphical figures that you do. Remembering that your purpose is

to *persuade*, you should include a brief description of the main points that you want the reader to take away from any table or figure. See Chapter 20.4 and Table 20.1 for an example of a discussion of a dataset and presentation of a summary of key variables.

4. **Model Selection and Interpretation.** This is the heart of the work. The model took a long time to produce and analysis may still be ongoing when you are writing the final report. However, the length of the section need not be in proportion to the time it took you to accomplish the analysis. Here is an outline for the Model Selection and Interpretation section that incorporates the key elements that should appear:
    - an outline of the section;
    - a statement of the recommended model;
    - why the chosen model is appropriate for the assignment and the database;
    - an interpretation of the model, parameter estimates. and any broad implications of the model;
    - the basic justifications of the model; and
    - a discussion of alternative models.

    Remember that it is quite likely that the general reader will either skip this section or look for the highlights, so these should be positioned for the more general reader. The first 3 bullets above are of more general interest. The fourth bullet, which contains key model statistics such as *p*-values; χ^2 or *t*-tests, will be of interest to specialists.

    This section begins with an outline that allows the reader to choose which subsections to concentrate on. Many readers will wish only to examine your recommended model and the corresponding interpretations and will assume that your technical work is reliable. Immediately after the outline, provide a *statement of the recommended model* and why it is preferred. It may not be clear at all from the dataset that your recommended model is superior to alternative models and, if that is the case, say so. Several competing models often may represent the underlying dataset equally well, but you need to pick one model and provide justification for it (even if that justification may be operational, such as ease of implementation).

    The statement of a model is often in statistical terminology, which allows you to describe the model and its key validation statistics precisely. In Chapter 20, Table 20.2 contains the variables and coefficients of the logistic regression model used for prediction. Significant variables have been bolded in this table to distinguish them from non-significant variables. Immediately following the statement of the recommended model is the model interpretation. Interpretation can be made in technical (statistical) format but should also include a description for the non-technical audience in layman's language. In addition to discussing the overall form of the model, the parameter estimates may provide an indication of the strength of any relationships that you have discovered. Table 20.2 contains confidence intervals for the coefficients of the model. However, model evaluation requires several other steps. Logistic regression models are more difficult than linear regression models to interpret, particularly when they include interaction terms. Chapter 20 addresses first the overall accuracy of the model with an ROC curve (Figure 20.1). In Section 20.3.5, the discussion centers on alternative models with fewer variables, and why the

recommended model is optimal. Finally, in Section 20.5.4 there is a (non-technical) discussion of interpretation of coefficients of the logistic regression model.

Chapter 20.6 and 20.7 present an alternative approach to model validation that is more business-focused and less statistical. The approach taken here was to rank the predicted patients in the holdout dataset according to risk and then to test the accuracy of the model by percentiles. This alternative approach is useful in a business report, although in an academic paper the focus is more likely to be on the statistical evaluation.

5. **Summary and Conclusions.** This section should repeat the results of the report in a concise fashion, in different words than both the executive summary and any discussion that appears in the modeling section. Refer to the key questions posed when you began the study and tie these to the results. This section may look back over the analysis and may cover limitations (when are the results of the analysis generally applicable and when not?) and questions and suggestions about future investigations. Include ideas that you have about future investigations, keeping in mind costs and other considerations that may be involved in collecting further information.

6. **References and Appendix.** It is unusual to include references in a business report, although if the work is performed in response to a new government regulation or law, it would be appropriate to include the source that caused the analysis. Academic papers, white papers and reports for client consumption, on the other hand, should contain references. There are a number of different reference styles which you can easily find on the internet. If you are going to be using references regularly, it is a good idea to acquire a reference database such as EndNote (www.endnote.com) which is both powerful and inexpensive.

   The Appendix is a useful tool for implementing Rule #4. Technical details that may distract the reader from the main flow of the argument may be consigned to the Appendix (e.g., auxiliary figures and analyses). The reader will not give the Appendix the same level of attention as the main body of the report. However, the Appendix is a useful place to include crucial details for the technically inclined reader. Because the level of technical content here is higher than in the main body of the report, it is important that each portion of the Appendix be clearly identified, especially with respect to its relation to the main body of the report.

After you have completed a draft of your report you can begin the important work of reducing it to the key points necessary to convey your argument. The following are important points to keep in mind when reviewing the report before submitting:

- Is the recommendation clear?
- Is the recommendation responsive to the assignment?
- Have all extraneous adjectives, adverbs and subordinate clauses been removed?
- Is it always clear what is being referred to by pronouns (e.g., “this,” “they,” and “their”)?
- Is the proposed model appropriate for the dataset?
- Is the statistical justification for the proposed model clear?
- Were the appropriate tests of validity performed?

With these steps, and one final read-through with a red pen, your report should be ready for submission!

24.7 ACTUARIAL REPORTING REQUIREMENTS

Readers who are actuaries and members of the American Academy of Actuaries are required to conform to the requirements of the Actuarial Standard of Practice (ASOP) No. 41: "Actuarial Communications" [169]. While the format required by ASOP 41 is generally consistent with the structure provided in this chapter, there are additional requirements for an actuary drafting a formal actuarial communication. ASOP 41 covers "actuarial communications," which it defines as "a written, electronic or oral communication issued by an actuary with respect to actuarial services." The standard defines "actuarial services" as "professional services provided by an individual…acting in the capacity of an actuary," leading to potential confusion in some of our newer areas of practice such as Predictive Analytics (where actuaries and non-actuaries essentially perform the same work). Is a statistician who performs predictive analytics for an insurance client "acting in the capacity of an actuary?" Or is the actuary acting in the capacity of a statistician?

Leaving aside this interesting philosophical issue, we can look to the requirements of ASOP 41 to supplement the contents of the report we described above. In what follows, we report those paragraphs of ASOP 41 that supplement this chapter. The actuarial reader should, of course, consult the full standard for appropriate guidance.

3.1.4 Identification of Responsible Actuary—An actuarial communication should clearly identify the actuary responsible for it.

3.2 Actuarial Report—The actuary should complete an actuarial report if the actuary intends the actuarial findings to be relied upon by any intended user….. In the actuarial report, the actuary should state the actuarial findings, and identify the methods, procedures, assumptions, and data used by the actuary with sufficient clarity that another actuary qualified in the same practice area could make an objective appraisal of the reasonableness of the actuary's work as presented in the actuarial report.

3.3 Specific Circumstances—The content of an actuarial report may be constrained by circumstances. The actuary should follow the guidance of this standard to the extent reasonably possible within such constraints. When those constraints exist, it may be appropriate not to include some of the otherwise required content in the actuarial report. However, limiting the content of an actuarial report may not be appropriate if that report or the findings in that report may receive broad distribution.

If the actuary believes circumstances are such that including certain content is not necessary or appropriate, the actuary must be prepared to identify such circumstances and justify limiting the content of the actuarial report.

3.4 Disclosures Within an Actuarial Report—Consideration of the items to be disclosed is an important part of the preparation of any actuarial communication. The actuary

should review the list of required disclosure items included in section 4 of ASOP 41, and in any other relevant ASOP. Further discussion regarding some of these disclosure items follows:

3.4.1 Uncertainty or Risk—The actuary should consider what cautions regarding possible uncertainty or risk in any results should be included in the actuarial report.

3.4.2 Conflict of Interest—An actuary who is not financially, organizationally, or otherwise independent concerning any matter related to the subject of an actuarial communication should disclose any pertinent information that is not apparent. This includes any situation where the actuary acts, or may appear to be acting, as an advocate. However, applicable financial disclosure is limited in accordance with Precept 6 of the *Code of Professional Conduct* to sources of material compensation that are known to, or are reasonably ascertainable by, the actuary.

3.4.3 Reliance on Other Sources for Data and Other Information—An actuary who makes an actuarial communication assumes responsibility for it, except to the extent the actuary disclaims responsibility by stating reliance on other sources. Reliance on other sources for data and other information means making use of those sources without assuming responsibility for them. An actuarial communication making use of any such reliance should define the extent of reliance, for example by stating whether or not checks as to reasonableness have been applied. An actuary may rely upon other sources for information, except where limited or prohibited by applicable standards of practice or law or regulation. Further guidance on when such reliance is appropriate, and what the actuary's responsibilities are when such reliance is stated, is found in ASOP No.23, *Data Quality*.

3.4.4 Responsibility for Assumptions and Methoda—An Actuarial Communication should identify the party responsible for each material assumption and method. …

3.4.5 Information Date of Report—The actuary should communicate to the intended user the date(s) through which data or other information has been considered in developing the findings included in the report.

These requirements are largely repeated in Section 4 of the ASOP, with some additions:

4.1.2 Identification of Actuarial Documents—Any actuarial document should include the date and subject of the document with any additional modifier (such as "version 2" or time of day) to make this entire description unique.

4.1.3 Disclosures in Actuarial Reports—In addition to the information necessary to satisfy section 3.2, any actuarial report should disclose the following information, unless the actuary determines that it is inappropriate to do so (see section 3.3):

a. the intended users of the actuarial report;
b. the scope and intended purpose of the engagement or assignment;
c. the acknowledgement of qualification as specified in the Qualification Standards;
d. any cautions about risk and uncertainty (see section 3.4.1);

e. any limitations or constraints on the use or applicability of the actuarial findings contained within the actuarial communication including, if appropriate, a statement that the communication should not be relied upon for any other purpose;
f. any conflict of interest as described in section 3.4.2;
g. any information on which the actuary relied that has a material impact on the actuarial findings and for which the actuary does not assume responsibility (see section 3.4.3);
h. the information date as described in section 3.4.5;
i. subsequent event(s) (if any) as described in section 3.4.6.; and
j. if appropriate, the documents comprising the actuarial report.

Note that other ASOPs that apply to a particular assignment may have additional disclosure requirements that should also be followed.

4.2 Certain Assumptions or Methods Prescribed by Law—Where any material assumption or method was prescribed by applicable law (statutes, regulations, and other legally binding authority), the actuary should disclose the following in the actuarial report: a. the applicable law under which the report was prepared; b. the assumptions or methods that are prescribed by the applicable law; and c. that the report was prepared in accordance with the applicable law. If the actuarial report is in a prescribed form that does not accommodate these disclosures, the actuary should make these disclosures in a separate communication (such as a cover letter to the principal), requesting that both communications be disseminated together where practicable.

4.3 Responsibility for Assumptions and Methods—In any situation not covered under section 4.2, where the actuary states reliance on other sources (as described in section 3.4.4(b) 2 and 3) and thereby disclaims responsibility for any material assumption or method, the actuary should disclose the following in the actuarial report, unless it is inappropriate to do so (see section 3.3):
a. the assumption or method that was set by another party;
b. the party who set the assumption or method;
c. the reason that this party, rather than the actuary, has set the assumption or method; and
d. either 1. that the assumption or method significantly conflicts with what, in the actuary's professional judgment, would be reasonable for the purpose of the assignment; or 2. that the actuary was unable to judge the reasonableness of the assumption or method without performing a substantial amount of additional work beyond the scope of the assignment, and did not do so, or that the actuary was not qualified to judge the reasonableness of the assumption. If the actuarial report is in a prescribed form that does not accommodate these disclosures, the actuary should make these disclosures in a separate communication (such as a cover letter to the principal), requesting that both communications be disseminated together where practicable.

4.4 Deviation from the Guidance of an ASOP—If, in the actuary's professional judgment, the actuary has deviated materially from the guidance set forth in an applicable ASOP, other than as covered under sections 4.2 or 4.3 of this standard, the actuary can still

comply with that ASOP by providing an appropriate statement in the actuarial communication with respect to the nature, rationale, and effect of such deviation.

24.8 CONCLUSION

Section 24.4 describes general requirements for a report. However, a report (written or oral) prepared by an actuary is deemed to be an actuarial communication and therefore subject to the additional requirements of ASOP 41. The purpose and contents of compliant actuarial communications are designed as much to keep the actuary out of trouble as they are for the purpose of persuasion. Nevertheless, there are some important additions to the underlying report format that the ASOP makes us aware of, such as the required disclosure of the intended users and the purpose of the report. But the actuary should also keep in mind the rules mentioned in this chapter, because the ultimate purpose of any communication (even a formal actuarial communication) is still persuasion.