



SOCIETY OF ACTUARIES

**Health Valuation Boot Camp
August 12- 13, 2009**

Session 8: Data Quality

[Darrell Spell, FSA, MAAA](#)

Valuation Boot Camp

Data Quality

Presented by
Darrell Spell
Consulting Actuary
Tampa, Florida

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Data Quality

Resources

- Required Reading

- ASOP 23:
- <http://www.actuarialstandardsboard.org/asops.asp>

- Optional

- Common Sense: partially inherited, environmentally developed
- “PLAYING WITH MATCHES
EXPLORING DATA QUALITY ISSUES WITH AN EMPHASIS ON
RECORD LINKAGE TECHNIQUES”
-- By THOMAS N. HERZOG, PH.D., A.S.A., 2004
-- “http://www.soa.org/files/pdf/018_herzog-ny04.pdf”

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Data Quality



Begins with ASOP 23

Purpose is to give guidance on:

1. Selecting data underlying actuarial work
2. Relying on data supplied by others
3. Reviewing data
4. Using data
5. Making appropriate disclosures

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Data Quality



1. Selecting data underlying actuarial work
 - What do you need?
 - Consider data elements desired
 - Consider alternate data elements

- What should you consider?
 - Appropriateness for the intended purpose
 - Reasonableness and comprehensiveness of data (internal consistency)
 - Known, material limitations of data (adjustments, collection errors, etc.)
 - Cost and feasibility of alternate data
 - Benefits of alternative data balanced against cost in time and dollars to get
 - Sampling methods



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Data Quality



So, how do you know if you have “quality” data?



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Data Quality

Widely Recognized Properties of Quality

- Relevance
 - Accuracy
 - Timeliness
 - Comparability
 - Completeness
 - Accessibility and clarity of results
- by Herzog, Scheuren and Winkler, SOA Annual Meeting, 2007.

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Data Quality

Why Care About Data Quality?

- Major business asset
- Lost revenue
- Capital risk
- Customer satisfaction **HIGH** or **LOW**
- Employee job satisfaction
- Organizational mistrust



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Data Quality

2. Relying on data supplied by others
 - It is OK to rely on others
 - Disclose reliance
 - Accuracy is the responsibility of the provider
 - User is responsible to review the data



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3. Reviewing data

- Review for reasonableness and consistency
- Key considerations
 - Data Definitions
 - Identify Questionable Data Values
 - Review of Prior Data

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Data Quality

Deterministic Tests

- Range Test
- If-Then Test
- Ratio Control Test
- Zero Control Test
- Internal Consistency Test



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If-Then Example

- If in a household survey, the relationship of one member of the household to the head of the household is given as **“daughter”**,
- then the gender of that individual must be **“female”**.

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Data Quality

One Key “Take Away”

- Of the three dimensions of quality (*prevention, detection, and repair*)?
- **Prevention** is far and away the superior investment. Ignoring Quality Failures is not a Survivable Option

- SOA 2007 Annual Meeting & Exhibit; Session 94: Data Quality: Playing with Matches



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4. Use of data

- Sufficient quality
- Other data needed
- Judgmental adjustments
- Defects
- Decline use



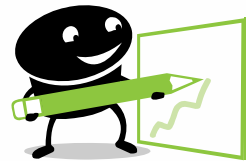
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5. Documentation

- Process used
- Data defects
- Data adjustments
- Other appropriate documentation



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6. Disclosure

- Source
- Review
- Reliance on others
- Material adjustments or assumptions
- Limitations on use of workproduct due to data
- Unresolved concerns
- Uncertainty or bias in results
- Conflicts with law, regulation, etc.



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Data Quality

■ Herzog comment on management...

“Organizations do best at improving the data quality of their key databases when the top management of the organization is leading the way and is totally committed to such efforts.

(See Deming, Juran & Godfrey, or Redman)



“DATA QUALITY AND RECORD LINKAGE TECHNIQUES”, by Herzog, Scheuren and Winkler, SOA Annual Meeting, 2007.

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