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## Ensuring 'The Cupboard's Not Bare': Assessing Adequacy of Resources For Statistical Consulting in Health Plans and Agencies Serving Vulnerable Populations

**Session: 3013.0 Teaching Statistics and Consulting in Public Health**  
**Section: Applied Public Health Statistics**

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# Presenter Disclosures

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**The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:**

I am employed as a Senior Biostatistician at L.A. Care Health Plan – the Local Initiative Health Authority of Los Angeles County, California.

L.A. Care is a public entity competing with commercial insurers in the Medicaid and S-CHIP markets in L.A. County.

**Notes:**

CAHPS® is a registered trade name of the Agency for Healthcare Research and Quality (AHRQ).  
HEDIS® is a registered trade name of the National Committee for Quality Assurance (NCQA).

# Outline

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“Old Mother Hubbard;  
Went to the cupboard,  
To give the poor dog a bone;  
When she came there,  
The cupboard was bare,  
And so the poor dog had none.”...  
Traditional -- Sarah Martin, 1804



## I. Learning Objectives

1. Assess ways in which statistical consulting is organized in health plans and agencies serving vulnerable populations.
2. Discuss challenges and avoidable pitfalls within organizations that deploy statistical consultation as a service.
3. Discuss how statistical consulting is resourced in different healthcare organizations.
4. Describe how statistical services link to decision-makers in diverse settings.
5. Discuss how the linkage to management, affirmatively or adversely impacts the usefulness of statisticians in decision support roles.



## II. Background



L.A. Care Health Plan -- large, diverse membership in Los Angeles, California:

- Mostly Medicaid, urban, 2/3<sup>rd</sup> pediatric, often Spanish-speaking.
- Roughly 21% of Medicaid managed care population in California.
- Roughly 2.1% of Medicaid managed care population in the U.S.
- Roughly 1-in-14 L.A. County residents is an L.A. Care member.
- Mostly Medicaid, some S-CHIP, SNP, and special programs.
- Serves 10 distinct language concentrations ("threshold languages"):  
Spanish, English, Armenian, Korean, Cambodian, Chinese, Russian, Vietnamese, Farsi, Tagalog.
- Mostly urban and suburban; 1 semi-rural region in the high desert.

### III. Methodology

Small pilot study of analysts and statisticians doing analyses for quality improvement (QI) work in health care organizations.

- Focused on analytic units conducting or analyzing HEDIS or CAHPS or P4P studies.
- n=20 telephone or mail interviews of 17 organizations:
  - Between 09/20/2013 and 11/05/2013.
  - Diverse in setting: Mostly urban; some rural and dispersed.
  - Geographically diverse health care organizations in 12 states: CA, CO, FL, IL, MA, NY, OR, PA, RI, UT, TX, WA.
  - Sought geographical dispersion, since health plan (HP) performance scores are somewhat clustered regionally.
- 48-question instrument emailed in advance, and administered by telephone (n=17), by email (n=2), or in person (n=1).
  - Interviewed subjects (largely managerial) in various roles in quality improvement.
  - Questionnaire served as script, with capture of open-ended commentary.
  - One response per department (often the manager).
  - In 3 health plans, two separate respondents in different departments were surveyed – usually because HEDIS and CAHPS were tasked separately.
    - For plan-wide statistics below (Slide 9), such responses were averaged.



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## Methodology (Cont.)

- Convenience sample of Medicaid health plans from online lists, and contacts for commercial firms identified at conferences.
- Purposively sampled for variability within these sources.
  - Primarily focused on health plans (HPs) serving Medicaid.
  - Included four primarily commercial or Medicare plans.
  - Two of the health care organizations in the survey were not health plans, and were selected to ensure that the pilot study had a diverse sample, covering a broad range of health care organizations.
    - One organization provided medical service organization (MSO) services to a set of clinics.
    - One organization provided informational and reporting services to a set of independent medical centers serving largely rural communities.
- Limitations of the data-gathering methodology:
  - Although most health plans have many quality improvement components in common, they vary widely in structure, such that a single survey instrument only imperfectly captures the complexity in analytic departments for quality improvement.
  - Analytic units have no uniform names and are often not known as analytic departments by staff at company switchboards.
  - Health plans' main switchboard phone numbers are often intentionally not published, as an aid to patients, so that most calls go to Member Services. Such calls are scripted around services, and survey calls tend to be routed to dead ends.
  - Sponsored surveys (through trade groups, state agencies, etc.) would be an option for a narrow scope, large-scale survey – but for this pilot, direct contact carried less baggage.



## IV. Purposes of the Survey



### Premises:

- Medicaid typically reimburses at lower levels than Medicare, or commercial health insurance.
- In Medicaid health plans and agencies, in-house analytic capabilities (to explore root causes, program effectiveness, etc.), are sometimes seen as a luxury, replaceable by canned reports from outside firms.

### Purposes:

- How are analytic services organized, staffed, educated, and resourced with tools? Do the answers offer any insights about how organizations right-size and use their analytic teams.
- Seeking transferrable knowledge and best practices on how resource-strapped Medicaid health plans organize analytics for quality improvement.
- Identify how the analytic function in health care settings is organized, staffed, trained, and used; identify norms; seek insights.
- Seek insights on how to tell when a health plan (HP) is *right-sized* in terms of analytic staff to serve decision support and quality improvement (QI) goals.

## V. Overview of Survey Instrument

The survey instrument consisted of 48 questions: a mix of close-ended and open ended questions.\* Follow-up questions were asked, and produced some of the insights in this briefing.



The questions explored the skills, tools, and resources available to statistical staff in health plans and agencies. Topical sections were roughly as follows:

- I. How is the analytic department for quality improvement structured at your organization?
- II. How is the analytic function for quality improvement staffed?
- III. Level of training.
- IV. Types and content of work.
- V. Tools and techniques used for statistical analysis.
- VI. How is the statistician or statistical analyst linked to clients?
- VII. How is the statistical analyst linked to management?
- VIII. Challenges and assets.
- IX. About your organization.
- X. About you.

\* Questions in the following slides are denoted by “Q” followed by the question number from the survey. Questions are paraphrased here for brevity and space. For inquiries about the survey instrument, contact information is provided on the last slide.

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## VI. Demographics of Respondents and Their Firms



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**Q39. Average age of firms in the sample: 26.2+ years (left-censored).**

- *Mature organizations in a mature but evolving industry.*

**Q40. Average employment among non-commercial firms in the sample: 386 employees. (Commercial firms were much larger.)**

- *Ratio of quality improvement (QI) analysts to total staff varied widely in non-profit firms.*
  - Median number of QI statistical analysts was 50 per 10,000 FTE employees.
  - QI analysts ranged from 20 to 59 per 10,000 FTE employees in non-profit firms.

**Q41. Average size of non-commercial firms in sample: 346,639 covered lives.**

- *Ratio of quality improvement analysts varied widely in non-profit firms.*
  - Median number of QI analysts in non-profits was 55.5 per 10 million members.
  - QI statistical analysts ranged from 15 to 102 per 10 million members in non-profits.
  - High-performing non-profit plans had somewhat higher ratios of QI analysts to membership
- In contrast, commercial firms' ratios of QI analysts to staff were smaller than ratios in non-profit firms, by an order of magnitude, and the same was true of analyst-to-member ratios in commercial firms.
  - Those findings may reflect efficiencies of scale in large commercial firms.

*(Reminder: Cohort was not sampled to represent the health care market in general.)*

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## Demographics of Respondents and Their Firms (Cont.)



### Q42. Percent in product lines among primarily Medicaid health plans (non-profit and commercial):

<u>Avg %</u>	<u>Responses</u> (n=12 plans responding)
<b>74.0%</b>	<b>Medicaid.</b>
6.5%	Children's Health Insurance Program (CHIP).
8.6%	Medicare.
1.8%	Dual-Eligible.
1.6%	Commercial.
3.0%	Exchange.
4.5%	Other and Uninsured.

*(Caution: Not sampled to be representative of health care market in any specific region.)*

## Respondent Demographics



**43. Average years since respondent finished formal statistical training: 16.3 years.**

- *Fairly long-term employees.*

**44. Average years employed fulltime in statistical work: 12.2 years.**

- *Experienced in health statistics.*

**45. Average years employed fulltime in health care: 19.9 years.**

- *Experienced in the industry. (Statistical training sometimes came mid-career.)*

**46. Average years at current job: 6.0 years.**

- *Relatively experienced in administering analytics in quality improvement.*

**47. Percent female: 75.0%.**

- *Frequency a nurse heading a quality improvement department.*

**48. Average age of respondent: 49.5 years.**

- *Implication for statistics graduates: Statistician or analyst will typically be reporting to a 50-year-old nurse with applied experience treating patients.*

## VII. Descriptive Results – Analytics at Large

- The study sought to speak with directors/managers/senior analysts doing statistical analysis for QI and P4P, so the finding for QI was expected.
- Most had an actuarial department doing work for finance or operations.
- Differentiation: In larger organizations, medical informatics often did *production reporting*, while analysts attached to quality improvement (QI) departments tended to focused on *analytic support for designing and deploying interventions, and on evaluation of programs and projects*.
- Caution throughout: Percents are vulnerable to the low sample size, where each respondent controls 5-6% of the raw score, purely due to integer math.



### Q1. Departments in Respondent's company that do statistical analysis.

<u>Avg %</u>	<u>Responses</u> (Marked all that apply.)
<b>94.1% (n=16)</b>	<b>Quality Improvement or Quality Management department.</b>
<b>76.5% (n=13)</b>	<b>Medical Informatics or health informatics department.</b>
44.4% (n=8)	Actuarial department.
25.0% (n=5)	Statistics department separate from Medical Informatics.
33.3% (n=6)	Other.
15.8% (n=3)	Other (if a second "Other" department is named).

- *Higher-rated (and larger?) organizations tended to have several different units doing statistical analysis. For later analysis: Much of the variation in performance throughout the briefing, may reflect large-plan versus small-plan effects.*

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## Descriptive Results -- Centralization and Staffing

- Analytic departments in the sample varied in centralization.



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### Q2. Degree of centralization of the analytic function in firms.

#### Percent

#### Responses

30.0% (n=6)

Centralized department doing statistical analysis.

35.0% (n=7)

Centralized analytic department reviewing/signing off.

35.0% (n=7)

Independent analytic departments with different purposes.

- *Unranked and somewhat smaller organizations were more likely to have centralized analytics (sometimes a single individual).*
- *Middle-ranked health plans (HPs) had multiple departments doing statistical analyses, with a single central one tending to do review and signoff.*

## Descriptive Results – Hierarchy and Staffing

Analytic departments doing quality improvement (QI) work or risk-adjustment/pay-for-performance (P4P) analyses varied widely in size.

- The remaining questions focused on such departments.
- Few QI departments had staff with degrees or minors in statistics.

Definition of "statistical analysis" ranged from formal statistics to simple tabulation.

### Q4. Number of levels of management inside analytic department for QI.

High=3 Average=1.85 Median=2 Low=1.

- *Very flat structures and non-hierarchical.*

### Q5. Number of FTE staff (including management) in QI analytic department.

High=65\* Average=15.15 Median=9 Low=2.

- *Higher-rated and unranked organizations tended to have smaller QI analytic departments. (Higher-rated health plans (HPs) often had diffused the analytic function across the organization, and middle-rated HPs were centralized.)*

\* The largest departments may have counted operations staff doing production reporting.

### Q6. Number of FTE analysts who have formal statistical training in that count.

High=8 Average=1.78 Median=7 Low=0.

- *Many unranked healthcare organizations use vendor reports and turnkey software.*
- *Some have analytic responsibilities, but no formally trained statistical analysts.*

### Q7. Number of FTE analysts in that department with no statistical training.

High=15 Average=3.78 Median=3 Low=0.

- *No particular pattern related to performance.*

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## Descriptive Results – Work Environment

- Work setting reflects on the status and resourcing of the analytic function in health plans, and may also matter in orienting newly-minted graduates.
- Most often the statistical work in quality improvement is solitary.



### Q8. Work settings.

**Avg %** (n=20)

**Responses**

9.7%

Work from home.

3.2%

Working offsite or travel.

**61.6%**

**Work in cubicle.**

7.1%

Work in personal office.

3.7%

Work in team area or lab.

3.2%

Work in client departments' work areas.

9.3%

Meetings / briefings.

2.5%

Other.

- ***Cubicle work was common. Setting of remainder of work varied widely.***

**Q21. Percent of time in various settings:** On average, 51.8% of time was spent working alone, and the remainder was in various team settings.

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## Descriptive Results – Education and Training

- Advanced degrees were common in analytic departments doing QI work. (Proportions below are average percents.)

### Q9. Typical training among staff doing statistical analysis:

10.5% (n=2)	Doctorate.	
<b>63.2% (n=12)</b>	<b>Master's.</b>	
31.6% (n=6)	4-year degree.	(Multiple response list.)
5.3% (n=1)	2-year degree.	
0.0% (n=0)	Some college, no degree.	
0.0% (n=0)	High school graduate or less.	

- *Higher-rated (and larger?) firms tended to have more advanced degrees.*

### Q10. Degree of most senior person conducting analyses in the department.

<b>Master's degree:</b>	<b>55.0%</b>	(n=11 of 18 responding)
Doctorate degree:	25.0%	(n=5) (Includes MDs.)
Bachelor's degree:	5.0%	(n=1)
High school graduate:	5.0%	(n=1)

- *No strong interaction between degrees and health plan performance: Master's degrees were distributed throughout. MPH is common.*

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## Descriptive Results – Training (Cont.)

- In this study, most staff doing statistical work in quality improvement did not major or minor in statistics.



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### Q12. Percent of statistical analysts holding statistics degrees.

**Avg %** (n=20)

#### **Responses**

25.2%

Analysts who majored or minored in statistics.

**59.3%**

**Non-stat. degree with substantial statistical component.**

13.4%

No degree with statistical training.

2.1%

No college degree.

- *Higher-rated organizations somewhat tended to report more staff having formal statistical training (majors and minors).* (This is not a proof of causation, but the association is thought-worthy.)

### Q13. Where analysts with statistical training got their statistical training.

- Masters of Public Health (MPH) and Health Administration programs were the most common source of statistical training for staff in these analytic departments: **65.0%** (n=13).

## Descriptive Results – Allied Skills

- Departments in this sample doing statistical analysis for QI work, exercise various other skills.



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### Q14. Other types of skills used in QI work. (Multiple response list.)

#### Percent

#### Responses

90.0% (n=18)	Management and supervision. (Respondents were often directors.)
85.0% (n=17)	Project management. (Tended to be done by analytic staff.)
80.0% (n=16)	Teaching / training.
75.0% (n=15)	Database management.
70.0% (n=14)	Program evaluation.
55.0% (n=11)	Total Quality Mgmt / Six Sigma / Statistical Process Control.
45.0% (n=9)	Organizational design / team building.
40.0% (n=8)	Economics / Health Economics.
40.0% (n=8)	Contracting.
35.0% (n=7)	Behavioral science.
30.0% (n=6)	Medical license.
15.0% (n=3)	Other.

- *These skills were reported across all rankings of HPs.*

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## Descriptive Results – Allied Skills (Cont.)

- Departments in this sample reported doing other tasks needed for actionable analysis – skills not necessarily taught in MPH statistics courses.



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### **Q20. Other types of skills used in QI work. (Multiple response list.)**

#### **Percent**

#### **Responses**

90.0% (n=18)	Defined measures of effectiveness for projects.
85.0% (n=17)	Support for go/no-go decisions.
85.0% (n=17)	Designed an evaluation strategy for a project or program.
75.0% (n=15)	Using multiple independent data sources to validate a finding.
75.0% (n=15)	Performed pilot study. [Rather than start with a total roll-out.]
70.0% (n=14)	Root cause analysis.
60.0% (n=12)	Formed multidisciplinary teams.

- *These skills were reported across all rankings of HPs.*

## Descriptive Results – Type and Tempo of Work

- Departments in this sample doing statistical analysis for QI work, exercise various other skills.



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### Q15. Types of projects.

**Avg % (n=20)**

**Responses**

32.3%

Continuous long term reporting (utilization stats, monthly HEDIS rates, etc.).

9.3%

Multi-year projects with final report.

**37.0%**

**Recurring annual projects w/final report (HEDIS, CAHPS, etc.).**

19.9%

Ad hoc analytic projects.

1.6%

Other.

- *The percents conceal a pattern: Frequently, departments doing QI analytics were largely specialized in one of those areas – and the area of that specialization distinctly differed among the HPs.*

**Q16. Of the 18 departments doing QI analyses that reported doing *ad hoc* projects, the average duration (in calendar days) of the typical *ad hoc* project was: High=183 Average=25.5 Median=14 Low=0 calendar days.**

- *Q15 and Q16, taken together, imply that the work varies in tempo.*

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## Descriptive Results – Analytic Techniques

- Departments reported using a broad set of analytic techniques.

### Q19. Types of analytic techniques (including statistical analyses) statistical analyses used in QI departments' work.



<b>Percent</b>	<b>Responses</b> (Multiple response list.)
95.0% (n=19)	Descriptive statistics.
95.0% (n=19)	Difference of proportions tests. [E.g. for HEDIS and CAHPS rates.]
85.0% (n=17)	Time series.
75.0% (n=15)	Pivot tables.
75.0% (n=15)	Statistical tests other than difference of proportions.
65.0% (n=13)	Benefit cost analysis; return-on-investment analysis.
60.0% (n=12)	Sensitivity analysis.
55.0% (n=11)	Predictive modeling.
35.0% (n=7)	Linear regression modeling.
30.0% (n=6)	Free-text data. [E.g. verbatim answers from surveys or member calls.]
30.0% (n=6)	Decision tree analysis.
20.0% (n=4)	Non-linear regression modeling. [Likely using, not performing.]
15.0% (n=3)	Other.

*(Cautions: Meanings of these terms may have varied among the respondents.*

*Using these techniques doesn't necessarily mean that these were analyzed in-house.)*

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## Descriptive Results – Purpose of the Analytic Work

- Most of the statistical analytic work in QI is generated inside HPs, but regulatory work is a close second.



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### Q28. From what source(s) do the requirement(s) for your analytic work originate?

<b>Avg %</b> (n=20)	<b>Responses</b> (Respondents marked all that apply.)
30.5%	Voluntary QI studies.
30.3%	Regulatory requirements. (Percent included Accreditation for some respondents.)
16.1%	Accreditation requirements separate from regulatory.
14.7%	Non-QI analysis.
5.3%	Contractual requirements from payers. [E.g. commercial.]
1.7%	Other.
1.1%	Grant or funder requirements.

## Descriptive Results – Linkage to Management



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### **Q29. Head of department that does analytics for QI:**

- Typically a Director: 65.0% (n=13 of 20).

### **Q30. Person to whom the head of the QI analytic department reports:**

- Typically a Chief Medical Officer (30.0%, n=6); a CEO or vice president (40.0%, n=8); director, executive director, or medical director (20.0%, n=5).

### **Q31. Highest authority to whom staff in the analytic department [ever] personally deliver work products:**

- Direct delivery by analysts is high (85.0%) up to the officer level (Division Chief); still high (60.0%) at the Board level and (65.0%) at the regulatory level (external); but drops to roughly 33% for other outside reporting (public, conferences, etc.).

### **Q34. How often analytic staff are approached *a priori* to design program evaluations: 60.0% “Usually” or “Always” (versus “Sometimes” or “Never”).**

### **Q35. How often are program evaluations independent of program being assessed: 52.9% “Usually” or “Always” (versus “Sometimes” or “Never”).**

### **Q36. How often statistical analyses are acted upon appropriately: 75.0% “Usually” or “Always” (versus “Sometimes” or “Never”).**

### **Q37. How often analytic staff are used appropriately: 76.5% “Usually” or “Always” (versus “Sometimes” or “Never”).**

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## Descriptive Results – Barriers and Assets



### **Q32. Top barriers facing respondents doing analytic work.**

- Resources: money, time; statistical software.
- Lack of stat. training in clientele seeking to resist findings or specify a statistical approach.
- Lack of staff with stat/math skills, but who also understand the business.
- Competing priorities.
- Data access; data from providers on time.

### **Q33. Top assets for respondents doing analytic work.**

- Visionary clients who are interested/curious about the data.
- Corporate culture willing to try things; creativity. Willing to break down silos; young organization, no layers of red tape.
- Strong business knowledge (i.e. clinical).
- Access to data. Automation. Have statistical software.
- Have dedicated resources (staff) that won't be diverted.
- Small company; know each other; easy to go get what you need.

*Some of the assets echo the list of barriers (both within and between firms).*

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## Descriptive Results – Miscellany

### Outsourcing of work (Q17, Q18):

- Only 40.0% of analytic departments in QI outsource analytic work.
- Among them, outsourcing accounts for an average of 10.0% of the departments' analytic work. (High was 95%. Low was 5%.)
- Much of the outsourcing involved CAHPS analyses (excluding fielding), etc.

### Software in use (Q22 to Q25):

- One statistical software package dominated among the highly-ranked plans. Among unranked plans, spreadsheets were commonly used for statistical analysis. [Per APHA rules related to CME credit, commercial products are not named herein.]
- Departments reported that the statistical software was typically used in tandem with a relational database management system that is independent of the statistical package (even when that package has RDBMS capabilities).
- Eight departments (40%) used major business intelligence (BI) packages that are independent of analytic and statistical software, for reporting. These tools were more common among higher performing plans, but were throughout the performance range.
- Among departments with single foci (e.g., HEDIS), some used proprietary commercial software with that single focus.



## VIII. Discussion and Insights

Medicaid health care organizations have some common features (mostly to do with standardized national studies), but differ widely in deployment. The next observations are derived from verbal comments by respondents. (Recall that the findings are from a convenience sample, best suited for guiding a larger study, not for making definitive generalizations.)



### Organizational Features

- *Mature but evolving organizations:* Most firms in the sample had been operating more than 25 years. Some reported continuing reorganization of analytics.
- Analytic departments in the sample were relatively flat and non-hierarchical.
- *Structure:* Some firms had adopted structures that allowed ad hoc sharing of staff.
  - **Pro:** Larger and higher-performing plans were more likely to organize analytics using flexible (ad hoc) matrix structures.
  - **Con:** Managers of analysts in flexible structures sometimes mentioned “firmly-assigned” or dedicated resources (staff, etc.) as a concern.
  - Some virtual departments had employees based in several different U.S. states.
  - In discussing barriers and assets, managers in larger or higher-performing plans were somewhat more likely to talk about organizational culture, while managers in smaller or lower-performing plans, were somewhat more likely to talk about tangible resources (staff, money, software, data).

## Discussion and Insights (Cont.)



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### Differentiation and Integration

- **Analytic departments differed in function and organization:**
  - Among smaller plans, the department doing analytics for quality improvement was often a catch-all department, and analysts could be pressed into service on other business topics (with pros and cons for the department).
  - Among larger plans, analytics was typically differentiated into many independent analytic units with different missions.
- ***Ad hoc analysis versus production reporting:***
  - Production reporting and *ad hoc* analytics were often staffed and administered separately.
  - Production reporting and informatics appeared associated with health plan management and oversight of ongoing operations.
  - *Ad hoc* analyses served functions such as exploring for root causes of a specific problem; design of measures of effectiveness for evaluating projects and programs.
- **Integration of functions:**
  - Staff in organizations with flexible structures, exhibited somewhat more awareness of the work done in other analytic departments, and of the organizational chart connecting them. (For example, in three unsolicited instances, respondents volunteered their counterparts in other units, to be surveyed to give a fuller picture.)

## Discussion and Insights (Cont.)

### Training and Background of Statistical Analysts and Their Managers

- Statistical analysts often had little formal training from a statistics program but obtained statistical training in other programs or settings.
  - Managers often mentioned a need for analytical skills in staff.
  - But some who reported that need, explicitly avoided recruiting formal statisticians, preferring knowledge about health care and the business of health care.
  - Some of the statistical experience in departments appears to be home-grown.
  - Because analytic staff acquire statistical skills from a variety of disciplines, applied public health statistics, as a discipline, should likely adopt an ecumenical approach:
    - The discipline is naturally focused on advancing the boundaries of statistical methods in the health sciences. Elegant and novel techniques are appealing.
    - However, to be of value to organizations directly serving patients, the discipline should also showcase practical uses of familiar statistics in applied settings.



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## Discussion and Insights (Cont.)

### Training and Background of Statistical Analysts and Their Managers

- Where the analytic function was well-developed, the manager or director of the unit typically held a Master's degree or higher.
  - Was often a nurse (although a few were doctors), with hands-on clinical experience earlier in the career. Was generally female, and typically near age 50 or above.
  - Implication: The analyst's boss and clientele may often be pragmatic, clinical, savvy in clinical data, valuing simple statistics that doctors, administrators, and regulators can quickly understand.
  - Pro: In hiring statisticians, practicality may trump elegance of skillset and approach. That ensures that the statistical effort serves the organization.
  - Con: Sound design and statistical choices often have substantial implications for four scarce resources: money, staff, calendar, and management access to act on the findings. If the person making the final ruling, is not a statistician, is the analytic process vulnerable, and does this pose a risk to evidence-driven decision-making?
  - A solution sometimes used in professional settings, is to produce decisions in written form, explicitly including dissenting views in the text or in footnotes. The memo is routed to the project sponsor and other senior stakeholders for review prior to launch of projects, programs, or acceptance of final deliverables.



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## Discussion and Insights (Cont.)



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### Where Q.I. Analytics Is Housed Inside the Health Care Organization

- The analytic unit often attaches directly beneath senior management and reports at that level.
- The analytic unit is typically part of clinical oversight; but is sometimes part of Operations.
  - In small or unranked organizations, some analytic functions are performed by I.T. Out of expediency, statistical work appeared to be assigned wherever the necessary statistical skillsets, data, and software exist.
  - In larger and/or higher-ranking organizations, ad hoc structures are also used. The difference is that such organizations appear to purposely build ad hoc analytic teams and consciously resource them.
- One organization had analytic units in Operations; complemented by an analytic unit reporting to the chief clinician.
  - The Chief Medical Officer administered oversight and independent evaluation of clinical quality.
  - Clinical activities were administered in Operations.
  - The analytic unit focused on review and evaluation of programs.

## Discussion and Insights (Cont.)

### Implications for Business -- Using Analytics To Improve Quality

- Although health plans in the sample do many of the same analytic activities for HEDIS (quality of care measures), some plans reported using business intelligence (BI) software, which may indicate that HEDIS performance is being tracked and reported to management.
- For the health plans in the sample that participate in CAHPS (quality of service measures), some reported using the survey firms for custom analysis.
  - Few of the organizations reported using more than the survey firms' standard CAHPS reports. Firms vary in the sophistication of the reports that they offer, and some of the report templates are analytically quite robust.
  - Little in the survey indicated that CAHPS results receive the same degree of analysis and intervention that HEDIS receives. Point-wise, that is plausible for NCQA Accreditation, but less plausible for CMS Star ratings work.
- Matrix structures seemed more facile at connecting analytic skills, data, and departments owning touch-points with doctors or patients.
- Healthcare business knowledge was valued more than statistical knowledge. The profession, itself, may need to make itself more accessible in the applied world.
  - One respondent noted that this is a two-way street: Clients often need training in how to understanding and use statistical methods and findings in business contexts.



## Possible Implications Regarding the Market for Statisticians



- Ratios of QI statistical analytic staff to other staff were much smaller in large commercial health plans than in small non-profit health plans.
  - Efficiencies of scale result from consolidated marketing, contracting, automation; high-volume contracting; marketing; and other services that produce sharable value (where having produced a design or program for one employee or one patient, the same program can be used for all other employees or patients).
  - CAHPS surveys; HEDIS administrative measures; design of informational and marketing materials; and many other facets of health plan work have that property. (Conversely, other activities, such as call centers, case managers, etc., must grow as membership grows.)
- Industry analysts predict a trend of consolidation in the health insurance market. With pressure to reduce costs, the trend may result in part to pursue efficiencies of scale, and is expected to accelerate under regulations related to health care reform.
  - Medicaid health plans are funded through state and federal governments with ongoing budget concerns.
  - Will that environment lead to a similar consolidation of health plans in the Medicaid market within a given state?
  - Vis-à-vis this paper, that trend could shrink total analytic employment in the market. But in the remaining firms, it could stimulate more analytic work to pursue savings from quality of care (wellness), and quality of services (member retention).

## IX. Assessing the Adequacy of Statistical Consulting Resources In Health Plans in the Industry



The following are tentative inferences observations about quality improvement (QI) analytic resources in the industry, within the bounds of a small pilot study.

- The interviews and findings tend to suggest that analytic departments focused on quality improvement (QI) were staffed somewhat better in higher-performing Medicaid health plans. If true, low performance on national rankings, should perhaps trigger an evaluation of staffing needs.
  - Nor were the analytic staffing levels in the high-performing firms particularly associated with larger plan size.
  - Whether the analytic resource improves performance, or whether both performance and analytic staffing are driven by other attributes of higher-performing Medicaid health plans, is unknown.

Although each plan's environment was different, the nature of their QI work (HEDIS, CAHPS) and their regulatory environments made for substantial similarities in mission. Thus, the differences among the firms were surprising.

- Among the firms, staffing ratios of statistical analysts compared to membership, varied widely.

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## Assessing the Adequacy of Statistical Consulting Resources In Health Plans in the Industry (Cont.)



Many of the respondents mentioned common tangible needs: staff, training, software, data access, etc. Some less tangible needs were also mentioned by respondents:

- Respondents stated the need for analytic staff with suitable statistical skills but grounded in industry knowledge.
- A few identified a need for statistical and methodological understanding in the clients using the results of analyses.
- Some noted the value of supportive management, both in terms of management's interest in evidence-driven quality improvement; and in terms of dedicating staff and resources to QI projects and not pulling them away to do other work.

Some high-performing Medicaid plans, and large commercial firms, described flexibility in how work among departments was set up, referring to ad hoc teams within a matrix structure. Among lower-performing plans, adequate fit of the organizational structure to the work may merit assessment and experimentation.

## Some Challenges to Statistical Consulting in Health Plans



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Main barriers and scarcities:

- Resources: Money; Staff; Calendar (time); space; software and hardware.
  - Control over intake of assignments.
- Access to management to hear and act on findings
  - Lack of direct reporting authority of findings to management and committees.
  - Need clear definition of department's scope and duties to obtain staffing and control workload and quality.
  - Analytic needs often arise outside of the budgeting cycle.
- Professional status: Lack signoff authority (reviews, analyses, methods, program evals).
  - Many clients had some stat training, so may bypass or overrule the statistician.
  - Most clients outrank the statistician.
- Clients' lack of understanding of the analyst's role and work:
  - Requesting "little" vs "big" studies:
    - The issue is really one of "validity" versus "invalidity".
  - Statistical problems are viewed as quick and easy.
    - Hence statistical consultation is an afterthought.
    - Projects not designed for sound evaluation.
    - Resistance to using treatment/control designs for exploring the effectiveness of expensive or risky programs.



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## Some Challenges to Statistical Consulting in Health Plans (Cont.)



### Main barriers and scarcities (cont.):

- Resource pitfalls: staff and resources.
  - Need clear definition of department's scope and duties to obtain staffing, budget, control of calendar, and control of workload and quality standards.
  - Analytic needs often arise outside of the budgeting cycle.
- Potential pitfalls in roles, and ethical pitfalls with respect to projects or programs being assisted or evaluated on interdisciplinary teams:
  - Subordination and disempowerment: Conversion from being analyst and reviewer into being a team member and employee of the project being assisted or evaluated. Ethical pitfall: Risk of analyst being coopted and disempowered by the project or program being assisted or evaluated in an inter-disciplinary context.
  - Substitution: Project substitutes own survey or methods to get more favorable results..
- Ethics: What to do if a client shortcuts sound processes.
  - Help bail out clients from innocent mistakes.
  - Use reporting chain to address repeated/willful violations.
  - "Tit-for-tat regulation" as a model:
    - Light ongoing scrutiny across evaluated programs.
    - Then apply intensive scrutiny if/when find problems.



## X. Recap of Learning Objectives

1. Assess ways in which statistical consulting is organized in health plans and agencies serving vulnerable populations.  
Some common aspects across firms: Small size, flat hierarchies.  
In highly-ranked firms, the analytic function was differentiated across independent units. (Large-plan versus small-plan effects?)
2. Discuss challenges and avoidable pitfalls within organizations that deploy statistical consultation as a service.  
Resources. Respect for statistics as a profession in environments dominated by other professions (medicine, accounting, law).  
Differentiate between production reporting and statistical analysis for quality improvement.
3. Discuss how statistical consulting is resourced in different healthcare orgs.  
Departments are typically small, but staff, software, etc., vary widely.
4. Describe how statistical services link to decision-makers in diverse settings.  
Analysts for QI tended to be only 1-2 steps removed from company officers.
5. Discuss how the linkage to management, affirmatively or adversely impacts the usefulness of statisticians in decision support roles  
Most barriers (resources, management culture) mentioned in one set of firms, were listed as assets in more supportive firms.



## XI. Actionability

What can the applied statistician do to be useful in a health plan or agency?



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- Design analyses to address applied business questions (where quality impacts retention, revenue, public reputation for quality).  
Priming the pump: These analyses may need to be designed and conducted “on spec” at first to establish a habit in the client for using evidence in decisions.
- The connection to senior management is key to getting findings seen and used. *The gatekeeper to management will often be a non-statistician -- often a clinician – usually a veteran nurse. Tailor the message accordingly, in practical tone.*
- Despite differences in resources, highly-ranked plans and unranked plans tended to use many of the same techniques.
  - That is potentially because Medicaid health plans tend to undergo many of the same regulatory audits and accreditation reviews.
  - If regulation and accreditation impact how the analytic function is organized, resourced and used for evidence-driven quality improvement, that might be a proof of positive impact from having external accountability.
- The findings affirm the relevance of cultivating allied skills (briefings, project management, interdisciplinary team building, etc.) for managing analytic work.
- Analytic departments that keep an accounting of the analysts’ work (hours, projects), may use the data to attach resource requests to new assignments.

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## -- THE MORAL OF THIS STORY --

Playing out the metaphor in this paper's title, to completion:

“Old Mother Hubbard;  
Went to the cupboard,  
To give the poor dog a bone;  
When she came there,  
The cupboard was bare,  
And so the poor dog had none.”...

*But the poem continues: When resourced with food, water, praise, respect, and a warm covering:*

...“This wonderful dog  
Was Dame Hubbard's delight,  
He could read, he could dance,  
He could sing, he could write”...

Traditional -- Sarah Martin, 1804 (1<sup>st</sup> and 5<sup>th</sup> stanzas)

The same is true for designing and resourcing the analytic department, to be management's best friend for evidence-based decision-making.

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