

# Kilem L. Gwet, Ph.D., Statistical Consultant

## Advanced Analytics, LLC

PO Box 2696, Gaithersburg, MD 20886-2696. Phone: 301-326-3001. Fax: 301-560-3473. E-mail: [gwet@advancedanalyticsllc.com](mailto:gwet@advancedanalyticsllc.com)

---

Dr. Gwet currently provides statistical consultation on a number of projects sponsored by the Centers for Medicare & Medicaid Services (CMS), and being conducted by IMPAQ International. He previously worked on Task D related to the Performance Metrics project, where he designed the survey of complaints filed by Medicare beneficiaries against their health plans. He developed the sampling plan as well as the weighting methods used for analysis. Dr Gwet revised and improved the statistical methods used by CMS for estimating the Medicare payment errors and their associated statistical precision.

Prior to consulting with IMPAQ International, Dr. Gwet was a statistical consultant for Booz-Allen & Hamilton. He was the statistical expert in the study on Human Dynamics in IT Teams sponsored by the Defense Acquisition University. As a Sr. Healthcare statistician for the National Committee for Quality Assurance, he worked on the development of various healthcare quality measures. As a Sr. Sampling Statistician for Westat, he worked on the design of various government surveys.

### Computer Skills:

• SAS Programming (Data Step & Macro Programming, SQL) • R • S-PLUS • Excel  
VBA Programming

### Areas of Interest:

• Healthcare analytics • Design of statistical survey • Inter-rater reliability assessment  
• Outlier detection & analysis • Statistical computing • Audit Sampling • Optimization of Marketing Strategies • Program Evaluation (Education / Energy) • Epidemiological Data Analysis. • Wealth transfer modeling

## Education

Ph.D., Statistics, Carleton University (Ottawa, Canada)

## Professional Experience:

<b>IMPAQ International, LLC</b> <i>Columbia, MD</i>	Statistical Consultant	2006 – Present
<b>Booz-Allen &amp; Hamilton – ADI Technology</b> <i>McLean, VA</i>	Statistical Consultant	2004 – 2006
<b>University of Phoenix</b> <i>(Reston &amp; Alexandria)</i>	Adjunct Professor of Statistics	2004 – 2012
• MBA/510: Managerial Decision Making – Statistics	• QNT/531: Advanced Problems in Statistics and Research Methods	

---

- QNT/554: Statistics and Research Methods for Managerial Decisions
- RES/342: Research and Evaluation II
- RES/341: Research and Evaluation I

**National Committee for Quality Assurance** Senior Healthcare Statistician 2002 – 2004  
Washington, DC

**Westat** Senior Sampling Statistician 1997 – 2002  
Rockville, MD

## Selected Project Experience

### Power Calculations for the Post-Discharge Patient Experience Survey (PES)

**Sponsored by:** Centers for Medicare & Medicaid Services, U.S. Department of Health and Human Services.

**Study:** Evaluation and Monitoring of the Bundled Payments for Care Improvement Model 1 Initiative

This is a satisfaction/functioning status survey on Medicare beneficiaries who undergo an inpatient procedure in selected hospitals and who returned to the hospital 60 days later for a follow-up visit. Its objective is to evaluate the quality of care received. Dr Gwet developed a statistical procedure to test improvement in the patient's condition, for statistical significance. He conducted an analysis showing the impact that various sample sizes have the power of the statistical test.

### Maternal Fetal Triage Inter-Rater Reliability Study

**Sponsored by:** Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN)

**Study:** Maternal Fetal Triage Study.

AWHONN has developed the Maternal Fetal Triage Index (MFTI) to formally separate the prioritization process of pregnant women in obstetric units, from the full evaluation process. The study's goal was to test the ability of two or more nurse reviewers to assign the same MFTI Priority to patient encounter. Dr Gwet first designed a pilot study aimed at evaluating the quality of the training materials. Secondly, he designed the main study, determined the sample requirements, the data collection protocols as well as the computation procedures.

### Development of Medicare Part C and Part D Monitoring Methods

**Sponsored by:** Centers for Medicare & Medicaid Services, U.S. Department of Health and Human Services

The purpose of this project was to utilize information recorded in the CMS' Complaint Tracking Module, along with additional information collected from Part C and Part D contracts through statistical surveys, to develop performance and monitoring measures that capture the appropriateness of complaint closures by contracts. Dr Gwet designed various surveys of

complaints filed against plans. He developed optimal stratified, and statistically valid sampling plan to ensure the developed measures fairly represent how contracts close the beneficiary complaints. Dr Gwet also performed sample size calculations to obtain the minimum number of complaints sufficient to ensure the validity of the performance measures. **[Project Role: Statistical Consultant]**

### **National Library of Medicine (NLM) Validation Mapping Contract**

**Sponsored by:** American Health Information Management Association (AHIMA)

**Study:** SNOMED – ICD-9CM Inter-Rater Reliability Study

SNOMED CT (Systematized Nomenclature of Medicine--Clinical Terms) is a comprehensive clinical terminology and a designated standard for use in U.S. Federal Government systems for the electronic exchange of clinical health information. In order to provide information to all with legitimate need, healthcare data must be translated between core reference terminologies, which maintain highly specific and descriptive patient care data, and administrative / epidemiologic classifications which are organized for aggregate reporting. The purpose of this project was to validate the maps between SNOMED concepts and ICD-9-CM codes

Dr. Gwet designed the inter-rater reliability study used to evaluate the reliability of AHIMA map validators prior to assigning them SNOMED concepts for mapping with ICD-9-CM codes. He wrote SAS programs to analyze AHIMA validators' mapping skills. He created several AHIMA comparison databases, and used them to obtain several measures of the extent of agreement between AHIMA and SNOMED.

### **Maryland Patient Centered Medical Homes (PCMH) Patient Survey**

**Sponsored by:** Maryland Health Care Commission (MHCC)

On April 14, 2011, the MHCC launched the Maryland Multi-payer Patient Centered Medical Home Program (MMPP) to improve healthcare quality for the patients. IMPAQ International, Johns Hopkins University, HealthCare Resolution Services and the University of Maryland School of Pharmacy comprise the evaluation team that sought to provide MHCC with a concrete assessment of whether the MMPP can improve health care quality and, thereby, health outcomes, while reducing costs of care. This evaluation was based on a statistical survey of patients to be selected from the 53 practices that participated in the program.

Dr. Gwet prepared the sampling plan, the data collection protocols, and specified the sample size requirements for this evaluation study. He optimized the sampling plan to ensure an adequate representation of children, minorities, as well as chronically-ill patients.

### **Medicare Part C and D Payment Error Analysis Logical Follow-on**

**Sponsored by:** Centers for Medicare & Medicaid Services, U.S. Department of Health and Human Services

The purpose of this project was to develop methods for quantifying the MARx Payment Error (MPE), the Risk Adjustment Error (RAE), the Composite Error resulting from both sources of error, as well as the associated variances. Dr. Gwet developed new methods for estimating the error dollar amounts and their associated variances, and proposed ways to improve existing approaches. [**Project Role:** *Statistical Consultant*]

### **Medicare Part D Organizations' Performance Metrics & Composite Scoring Report Card**

**Sponsored by:** *Centers for Medicare & Medicaid Services, U.S. Department of Health and Human Services*

The purpose of this project was to develop and implement an annual “report card” system which evaluates Medicare Part D drug benefit providers' performance and assists consumers using the CMS Medicare Plan Finder website in making an informed choice when choosing a drug plan. To obtain the report card, IMPAQ developed sophisticated business logic and statistical models using Part D plan sponsor performance data from multiple data sources, produced star ratings at the individual levels, and produced a summary score representing the plan's overall performance.

Furthermore, IMPAQ performed the following to evaluate plans' performances: (a) trend analysis; (b) weighting schemes; and (c) multivariate analysis. Dr. Gwet's roles have been (1) to develop an alternative method for computing the percentiles and (2) to develop new summary scores that resolve the central tendency problem. The newly-developed method for calculating the percentiles, can account for both the rankings and the distance between consecutive data points, and proved to be effective for deriving the most suitable thresholds. He also developed several alternatives to the arithmetic mean for calculating the summary scores. The outcome was a set of summary scores that account for both the overall plan's performance level as well as the distribution of stars among the measures used in the composite score. [**Project Role:** *Statistical Consultant*]

### **Statistical Analysis of National Institute on Drug Abuse (NIDA) Survey Data**

**Sponsored by:** *Albert Einstein College of Medicine*

The data to be analyzed was collected from a nationwide cross-sectional survey of substance abuse treatment physicians. The purpose of this survey was to define the physicians' knowledge, attitudes and practice patterns regarding hepatitis C management; and to study how knowledge, attitudes, and provider / practice characteristics relate to referral and treatment of patients with hepatitis C. Data has been collected on approximately 150 variables. I imputed all missing values in a way that was consistent with skip pattern. For each recipient record one or multiple potential donor records were identified and the nearest neighbor chosen for imputation. Using the SAS system, I performed numerous multivariate analyses required to address many research hypotheses, including logistic regression, and linear and loglinear regression models.

### **Medicare Part C and Part D Payment Error Analysis: Payment Validation /MPE Support**

**Sponsored by:** *Centers for Medicare & Medicaid Services, U.S. Department of Health and Human Services*

The MARx Payment Error (MPE) is a stand-alone indicator of the precision of the Medicare Advantage and Prescription Drug System (MARx) prospective payments. The objective of this project was to describe the estimation methods used to calculate error dollar amounts and error rates associated with Medicare Parts C and D payments, as well as the minimum sample size required to meet OMB's precision requirements. In addition to describing the error estimation methods, Dr. Gwet derived the variance estimation methods necessary to determine the minimum sample sizes required to meet OMB's requirements. He also participated in the writing of the methodology section of the final report. [**Project Role:** *Statistical Consultant*]

## **Additional Professional Experience:**

### **National Committee for Quality Assurance, Senior Healthcare Statistician**

- Dr Gwet consulted on several pilot studies aimed at testing new healthcare quality measures for cardiovascular diseases, arthritis, and osteoporosis. Collected and analyzed clinical data that included patient-level administrative, pharmacy, and laboratory data, as well as medical record abstracts from administrative and medical records regarding the care received by patients suffering from cardiovascular diseases, arthritis, or osteoporosis. Performed computations to validate new healthcare quality measures prior to launching the full-scale study.

### **Westat, Senior Sampling Statistician**

- Designed many complex social and business studies sponsored by the federal government and private companies.
- Produced estimates and related precision measures from complex sample data using either the SUDAAN or WesVar software.
- Performed data weighting, nonresponse adjustment, imputation of missing values (hotdeck, regression, multiple), and report writing. Developed SAS programs to implement special estimation techniques. Used S-Plus for graphics.
- Statistical Support to the Internal Revenue Service (IRS)  
The objective was to provide statistical support to researchers in modeling the wealth transfer between decedents and beneficiaries using statistical data from the IRS triennial estate collation study. I built client relations to promote understanding of relevant statistical issues to non-technical data users. I developed several logistic regressions to help understand the impact of wealth transfer on beneficiary participation in the labor market. Using the SAS software, I manipulated a large and very complex database of taxpayers.