VA HEALTH ECONOMICS BULLETIN

A VA Health Services Research & Development Resource Center

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The VA Health Economics Bulletin is a quarterly publication of the Health Economics Resource Center (HERC) to bring VA researchers updates on datasets and data sources.

For more information on VA datasets, visit the HERC web pages for Guidebooks and Technical Reports.

For economics-related questions, please view our Methods web pages.

For economics advice, please call the HERC consulting service at (650) 617-2630 or email us at herc@va.gov.

Dedicated to improving the quality of health economics research

HERC Panel: De-implementing Low Value Health Services

The Institute of Medicine estimated that $210 billion worth of unnecessary services were provided in the U.S. health care system in 2009 (Institute of Medicine, 2012). In response, specialty societies have coordinated efforts to identify ineffective and inefficient services. The efforts to reduce unnecessary, and sometimes harmful, services that are not cost-effective are called "de-implementation" or "disinvestment."

On January 18, 2017, HERC will hold a panel focused on current and future de-implementation efforts at VHA. Panel members will include HSR&D researchers David Au, MD, Eve Kerr, MD, MPH, and Paul Barnett, PhD, who are working on studies to promote greater safety and efficiency by reduction of inappropriate care. They will describe current studies, discuss criteria for selecting services for de-implementation, and field questions from participants.

The target audience for this panel is HSR&D researchers looking to develop a high-impact research agenda, and VHA operations leadership interested in strategies to improve the efficiency of care. Please visit the HSR&D Cyberseminars webpage for registration information.

Institute of Medicine (Ed.). (2012). *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America*: National Academies Press.

New Technical Report: Mental Health Codes for ICD-10

HSR&D researchers lead by a HERC team have updated methods to measure the risks associated with psychiatric illnesses. The new measure updates previously a developed case-mix method with ICD-10 diagnosis codes and expands the number of risk categories from 46 to 62.

The PsyCMS psychiatric case mix measure was originally developed by Amy Rosen and other HSR&D researchers at the VA Boston Health Care System. It used ICD-9 diagnosis codes to define 46 risk categories.

HERC worked with Rosen and Marcia Valenstein of the HSR&D program in Ann Arbor, Michigan, to update the measure. The updated measure classifies risk using ICD-10 codes. The revised measure now includes 62 mental health and substance use disorder risk categories.

HERC Technical Report #31 describes the updated PsyCMS and presents the final coding scheme. "Technical Report 31: Updating the Psychiatric Case Mix System (PsyCMS) Mental Health and Substance Use Grouper for ICD-10-CM" by Todd Wagner, Elizabeth Gehlert, Amy Rosen, and Marcia Valenstein, is available in on the HERC website.

Updated Recommendations for Cost-Effectiveness Analysis

After three and a half years of deliberation, U.S. experts have released new recommendations on how cost-effectiveness research should be conducted. The recommendations are the focus of a December 7 meeting to be held at the National Academy of Sciences that will be broadcast over the internet.

"We hope the new panel guidelines will be broadly useful, both for the conduct of cost effectiveness analysis, and in highlighting important areas for future research on methods of cost-effectiveness analysis" said panel member and VA Palo Alto senior investigator Douglas Owen, MD.

The panel made many changes to the original U.S. cost-effectiveness recommendations, which had not been updated since 1996. Key recommendations of the 18 member panel were published in September of this year in JAMA. Publication of the complete, book-length, recommendations is expected by the end of the year.

The new recommendations strengthen many of the principles from the first panel, and include several new recommendations. Major changes include broadening the number and type of reference cases and using an "impact inventory" listing the health and non-health effects of the intervention. These changes are intended to make cost effectiveness analysis more applicable and useful to analysts and stakeholders.

The one day conference highlighting the panel's findings and recommendations. will be held December 7, 2016 in Washington, D.C. Register to attend in person at http://tinyurl.com/cea-in-person or access the live webcast free at http://tinyurl.com/cea-webcast.

New Technical Report: Costing Methods in VA Research

Health care costs are the focus of a growing number of VA research studies, and MCA cost estimates are becoming the predominant source of information used by VA researchers. A literature review by HERC staff found over 250 publications on the cost of VA health care between 1980 and 2012. The studies were conducted over a wide range of clinical areas and using a range of costing methods.

The reviewers identified four principal costing methods available to VA researchers: HERC Average cost estimates, MCA Activity based costing, Micro-costing, and Community care. They found that the MCA activity based cost estimates have become the predominant method of determining VA health care costs in peer reviewed-publications. MCA data, and to a lesser extent the HERC average cost data, supplanted micro-costing methods. Nearly half of the studies were from the last 5 years of this 23 year long time period.

The full report, "Costing Methods Used in VA Research, 1980-2012" by Elizabeth Gehlert, Josephine Jacobs, and Paul Barnett, is available on the HERC website. The report includes a listing of the reviewed studies.

2017 Econometrics Course Overview

Course Overview

HERC economists will teach an introductory course in econometrics for health services research starting in February next year. The course consists of 10 lectures that can be accessed via the HSR&D Cyberseminar wepage. This course is intended to provide an introduction to econometric methods used to analyze observational studies in health services research. Topics will include: linear regression; research design; propensity scores; instrumental variables; quasi-experiments and difference-in-differences; mixed effects modeling; specifying the regression model; limited dependent variables; and cost as the dependent variable. Course material will assume knowledge of basic probability and statistics and familiarity with linear regression. Lectures are held on Wednesdays, with each hourly session beginning at 11:00AM Pacific/2:00PM Eastern.

Course Schedule

02/01/17 **Econometrics Course: Introduction and Identification**
Todd Wagner, PhD

02/08/17 **Research Design**
Christine Pal Chee, PhD

02/22/17 **Propensity Scores**
Todd Wagner, PhD

03/01/17 **Natural Experiments and Difference-in-Differences**
Christine Pal Chee, PhD

03/08/17 **Instrumental Variables**
Christine Pal Chee, PhD

03/22/17 **Fixed Effects and Random Effects**
Josephine Jacobs, PhD

03/29/17 **Specifying the Regression Model**
Ciaran Phibbs, PhD

04/05/17 **Limited Dependent Variables**
Ciaran Phibbs, PhD

04/12/17 **Cost as the Dependent Variable (Part I)**
Paul Barnett, PhD

04/26/17 **Cost as the Dependent Variable (Part II)**
Paul Barnett, PhD

Econometrics Lecture Descriptions

Econometrics Course: Introduction and Identification

We start by briefly describing a randomized trial and the leverage of experimental design to understand causation. We then transition into understanding causal pathways when experimentation isn't possible. We introduce the concept of endogeneity and walk participants through the elements of an equation, as these equations often come up in other classes. Finally, we discuss the five main assumptions underlying the classic linear model, setting the stage for future classes.

Research Design

This lecture will provide a conceptual framework for research design. We will review the linear regression model and define the concepts of exogeneity and endogeneity. We will discuss three forms of endogeneity: omitted variable bias, sample selection, and simultaneous causality. The discussion will include examples of possible solutions.

Propensity Scores

Understanding causation with observational data is often more dependent on what we don't observe than what we do observe. Multivariate techniques can be very useful for understanding observed characteristics. Propensity scores have emerged over the past 20 years as another way to control for observables. We describe the concepts behind propensity scores and how they have been used (and misused) in practice. Finally, we work through an example using propensity scores.

Natural Experiments and Difference-in-Differences

Natural experiments have been increasingly utilized by researchers in recent years. In this lecture, we will define what a natural experiment is and describe different types of natural experiments. We will also provide an overview of the difference-in-differences estimator and discuss how it can be used to evaluate treatment effects in natural experiments. Finally, we discuss potential threats to validity when evaluating natural experiments.

Instrumental Variables

This lecture will provide an introduction to instrumental variables (IV) regression. We will discuss necessary conditions for valid instruments, the intuition for how and why IV regression works, examples, and limitations.

Fixed Effects and Random Effects

This is an overview of mixed effects models. We will begin by describing how mixed effects models are related to other statistical models. Real-world applications will be used as examples to demonstrate model fitting and estimation and interpretation of estimates. Finally, we will address how statisticians think about mixed effects models and how this can differ from an economist's perspective.

Specifying the Regression Model

Standard introductions to the ordinary least square (OLS) model pay limited attention to the right hand side variables. Several strong assumptions are made about the independent variables, including linearity and independence, that don't always hold in health applications. This lecture will address some of the common problems with right hand side variables, and introduce methods to test for them, and methods to correct these problems. Issues to be addressed include non-linearity and functional form, multicollinearity, clustering, and robust standard errors.

Limited Dependent Variables

The ordinary least squares (OLS) model is based on a continuous dependent variable. This lecture will introduce some of the methods available to treat other forms of dependent variables. Topics will include dichotomous (yes/no) outcomes, count data models, and choice models.

Cost as the Dependent Variable (Part I)

Statistical analysis of health care cost is made difficult by two data problems: disproportionate costs (skewness) or no cost (truncated distribution). As a result, it is rarely a good idea to analyze cost using the classic linear statistical model, ordinary least squares (OLS). Transforming cost by the taking its log results in a variable that is more normally distributed, allowing use of an OLS regression. Recommendations and limitations of Log models will be discussed.

Cost as the Dependent Variable (Part II)

In addition to skewness and truncation, the variance in cost data may be correlated with one of the predictor variables, a problem call heteroscedasticity. As a result, OLS regression models may generate biased regression parameters and inaccurate predictions. Generalized linear models (GLM) and two-part models, important alternatives to OLS, will be discussed.

HERC

The Health Economics Resource Center produces pioneering, rigorous health economics and related research that improves health care within and beyond VA.

Our research activities include innovation and excellence in:
- Performing cost and cost-effectiveness analyses
- Studying the efficiency of health care
- Evaluating health programs and interventions
- Planning, managing, and analyzing randomized clinical trials
- Health care decision modeling
- Assessing health-related quality of life
- Health economics and health services research

We are committed to:
- Integrity
- High quality of work
- Productivity
- Transparency
- Mutual trust and respect
- Teamwork
- Investment in people through learning and mentoring
- A flexible, supportive, and enjoyable work environment

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HERC Cyberseminars

HERC cyberseminars feature presentations on a variety of health economics and health services topics. Each hourly session begins at 11:00am Pacific (2:00pm Eastern), unless otherwise noted.

Upcoming Cyberseminars

December 8, 2016

Labor Force Dropout Among Young Service-Disabled Veterans: The Economics of Documenting the Problem and Designing Solutions

George G. Sheldon, PhD

Economist, Office of Policy and Planning (now Office of Enterprise Integration), Data Governance and Analytics

Register:
http://www.hsrd.research.va.gov/Cyberseminars
Schedule & archives:
http://www.herc.research.va.gov/include/page.asp?id=courses-seminars

Interested in presenting in the HERC Health Economics Cyberseminar Series? Contact HERC Economist Jean Yoon (Jean.Yoon@va.gov) for more information.

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