VA HEALTH ECONOMICS BULLETIN

A VA Health Services Research & Development Resource Center

Inside

Volume 17, Issue 1
February, 2017

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

Comparing Chronic Conditions in ICD-9 and ICD-10

Estimates of the prevalence of chronic disease in VA patients were largely unaffected by the shift to the new system of diagnosis codes adopted October 2015, according to a new technical report released by the Health Economics Resource Center. HERC researchers Jean Yoon and Adam Chow analyzed the prevalence of chronic conditions over the last three years. They found that overall the prevalence of chronic conditions was not affected by the shift from ICD-9 to ICD-10 codes. They found that the estimates of the prevalence of some conditions, including psychiatric illness and substance use disorders, may have been affected by the coding shift, however.

HERC Technical Report 33 compares the prevalence rates of chronic conditions before and after the transition to ICD-10 that occurred on October 1, 2015. The new ICD-10 coding system is much more specific, with five-times as many codes as were available in the ICD-9 system. Researchers and policy makers rely on diagnosis codes to identify care for different diagnoses, but it was unknown how adoption of the new system affected the assignment of diagnoses to VA patients. Authors Yoon and Chow used ICD-9-CM and ICD-10-CM codes to identify 34 common chronic conditions that account for most of VA health care costs. They compared the prevalence rates of these chronic conditions in a large sample of VA patients in order to measure the changes before and after transition to ICD-10.

Prevalence estimates for the 34 conditions by year are available on the HERC website. The technical report, available on the HERC website details the authors' methods for defining the chronic conditions and conducting the analysis.

De-Implementing Low Value Care

A VA Health Services Research and Development (HSR&D) panel described projects to reduce ineffective healthcare in the January HERC Health Economics Seminar. David Au, Eve Kerr, and Paul Barnett presented studies to de-implement low value care and discussed how others might work in this field.

"The Institute of Medicine estimates that every year $250 billion is spent on unnecessary health care," Barnett said in the seminar. "Unneeded care is the most important component of wasteful health care spending, which accounts for 5% of the Gross Domestic Product." Barnett said that the unneeded services include care that is not effective, including some services that are actually harmful, but there are also services that should be de-implemented because they yield too little benefit to justify cost.

Dr. David Au described his study to de-implement corticosteroids for patients with Chronic Obstructive Pulmonary Disease (COPD). His team chose this practice because it is widely used, poses a safety risk to patients, and because there are safer treatments. "We feel the loss of stopping therapies" Dr. Au explained, "so all of our interventions have a safer alternate." Dr. Au and team ultimately strive to design interventions that are collaborative, unobtrusive, and less work for providers. Au is the Director of the Center of Innovation for Veteran-Centered Value-Driven Care at the VA Puget Sound Health Care System,

Dr. Eve Kerr, Director of the Center for Clinical Management Research at the VA Ann Arbor Health Care System, described her work to de-intensify primary care. Dr. Kerr and team are systematically studying low-value practices, including diagnostic testing and prescriptions. "We feel that this area of de-intensification is particularly tricky" Dr. Kerr explained "because it often deals with things we've been doing for a long time. And sometimes stopping things that are routine is the most difficult."

Paul Barnett, Health Economist at the Health Economics Resource Center at the VA Palo Alto Health Care System, said that he is studying inappropriate MRI of the lumbar spine. His earlier work found that small percentage of providers ordered most of the inappropriate scans. His new study is trying to learn if the scans are responding to patient preferences, lack of knowledge about guidelines, or problems with the system of care for low back pain. "The cost of the unneeded scans is relatively small," Barnett said, "so we are also looking to see if they result in costly follow-up care."

Barnett asked seminar participants to prioritize hypothetical de-implementation projects. Although participants strongly favored projects to de-implement harmful care, Barnett said that there are cases in which the greatest improvement in the health of the population of patients could come from de-implementing widely used services that are low value and have a high cost, as this would free resources to be used in other parts of the health care system. He acknowledged that this efficiency argument is not a popular point of view.

The seminar also provided a brief introduction to published sources identifying services that should be de-implemented. A recording of the January cyberseminar "Panel Presentation: De-implementing low value health services" is available on the HSR&D cyberseminars website.

Major Changes for Healthcare Cost Effectiveness Studies

Major changes were made to guidelines on how U.S. cost-effectiveness studies should be conducted and reported. The new guidelines were released December 7 in a day-long meeting at the National Academy of Sciences in Washington DC. Members of the panel that developed the guidelines presented their recommendations and took questions from health economists in industry, government and academia. The new guidelines updated recommendations originally released 20 years ago.

A video archive of the meeting is available at: http://healtheconomics.tuftsmedicalcenter.org/cear4/Resources/2ndPanelonCostEffectivenessVideoArchive.aspx. Gillian Sanders, co-chair of the panel who developed the guidelines, will be presenting the new guidelines in the April 19 HERC Cyberseminar.

A wider range of consequences

This second panel identified a much broader range of consequences analysts should consider when conducting cost-effectiveness studies. Louise Russell, a Professor at Rutgers University who participated in the first panel, said that expected consequences outside the health care system need to be quantified and valued. She noted that while the first panel specified the societal perspective, the second panel found that this advice was usually not followed. The second panel broadened the definition of the societal perspective to include non-health consequences, including criminal justice, education, social services, housing and the environment. Analysts are also now asked to produce a separate analysis from the perspective of the health care system.

The new guidelines also require identification of impacts on productivity. Anirban Basu, a member of the second guideline panel, explained that this change was adopted because quality of life measures don't reliability capture changes in productivity. As a result, the second panel changed how the impact of an intervention on future productivity should be considered. "It was moved from the denominator to the numerator of the cost-effectiveness ratio," he said. Productivity can be valued at the median wage, including the cost of benefits, and should capture not only formal employment, but also informal employment and household work.

Changes in measured costs

Basu, the Director of the Pharmaceutical Outcomes Research and Policy Program at the University of Washington, also described the second panel's recommendation on measurement of pharmaceutical costs. The analysis should include more than the marginal manufacturing cost, but also the cost of bringing the drug to market. Since this is difficult to estimate, the panel recommended using the long-term rate negotiated by government. The most available source is the Federal Supply Schedule, the rates paid by most U.S. government agencies.

Basu also described changes regarding which cost should be included. The second panel recommended that when the intervention prolongs survival, costs related to longer life should be included, regardless of whether they are otherwise related to the effect of the intervention.

Comparability problem

Several audience members asked how studies conducted under the new recommendations could be compared to earlier studies. Russell said that the health plan perspective described by the second panel should be comparable to the analyses done under the earlier guidelines. Panel member Doug Owens said that comparability between new and old guidelines "was something we talked about at every session." He noted that lack of comparability will be less important over time. "A 10 years old analysis may not be very useful for present day policy," said Owens.

Continued on page 4

Major Changes for Healthcare Cost Effectiveness Studies

Continued from page 3

Owens presented the second panel's recommendations for the design of cost-effectiveness analysis, and noted that many elements about defining the intervention, the population it effects, and the time horizon of the analysis, remained unchanged from the earlier guidelines. Owens is Director of the Stanford University Center for Health Policy Research and a researcher in the U.S. Department of Veterans Affairs.

Guidelines for modeling

Models are often important to estimating cost-effectiveness over the long-run. Karen Kuntz of the University of Minnesota described the panel's recommendation regarding the construction of these models. She noted that the topic was barely addressed by the first panel. The second panel recommended that models should be transparent and made available for others to use. Bill Padula of Johns Hopkins worried the complete transparency could be the basis of "price gouging," and referred to Martin Shkreli, the pharmaceuticals executive who gained notoriety from increasing the price of a generic drug used for HIV prophylaxis. Other questioners focused on practicalities of others being able to understand highly specialized models, and the loss of intellectual property, concerns that suggest practical limitations to this recommendation.

Importance of the guidelines

Several speakers addressed the importance of the guidelines. Tufts University professor John Wong said that the new guidelines represent the "state of the art" as articulated by a world class panel. He said that evaluations based on the guidelines will be key to addressing U.S. health care costs, which are now $3.2 trillion per year and account for 17.8% of the US economy.

Former Medicare director Mark McClellan of Duke University said that payment reforms are designed to get better outcomes for the lowest population of patients, but that "this is hard to do." Even qualitative studies based on these new guidelines could help make health plans more efficient. Robert Golub, Deputy Editor of the medical journal JAMA said that the guidelines are a valuable step forward; they will indicate to reviewers that analysts have considered all relevant information.

Other speakers described the potential international implications. "This will affect the rest of the world" said Lou Garrison, President of the International Society of Pharmacoeconomics and Outcomes Research. Garrison said, "They are putting into practice what we preach." Andrew Briggs of the University of Glasgow said the first U.S. panel made the important contribution of defining a reference case, a standard analytic method allowing intervention from different studies to be compared. He predicted that after the second panel, analysts will be referring to the dual reference case, following the second panel's recommendation to report findings from two different perspectives—that of the health system and of society.

Others were less certain of the value of the guidelines. Robert Dubois of the National Pharmaceutical Council said, "one size won't fit all situations." Some factors have been left out when setting the price of drugs, such as the value of hope, he said. Dubois supported the second panel's recommendation that models be transparent and distributed. "This is essential if they are going to be used to set policy," said Dubois.

Continued on page 5

Major Changes for Healthcare Cost Effectiveness Studies

Continued from page 4

An increased burden for analysts?

Milton Weinstein, co-chair of the first panel and Harvard University Professor, said that second panel was to be commended. "You came to consensus in areas which we just kicked on down the road," he said.

Harold Chesson of the U.S. Centers for Disease Control said that such specificity will make it much harder to conduct cost-effectiveness analysis. "There are 111 recommendations," he said. Others noted the difficulty of including all required information in the abstract of a journal article, which are frequently limited to 250 words, and that the example analysis in the second panel's book are 6,000 words long, approximately twice the length allowed by many journals. David Kim of Tufts University, who contributed to one of the examples in the full report of the second panel, said that the extra work will be worthwhile if it results in greater acceptance of cost-effectiveness findings.

Areas for future work

The co-chairs of the earlier panel described some areas for future work. Weinstein said that setting a threshold value for what is considered cost effective has always been problematic and has now been made more difficult by including the broader definition of societal perspective. Other unresolved questions he cited were including the effect of an intervention on the quality of life of family members and measuring quality of life in special populations such as children or persons with mental illnesses or cognitive impairment.

Marthe Gold of the Academy of Medicine, the other co-chair of the first panel, said it will be important to place medical cost-effectiveness in a broader framework of public policy. "Non-health interventions like food and housing can have larger effects on health than health care," Gold said, noting that these programs compete for the same funding. "We need systematic methods to compare health and non-health interventions."

Audience members raised other issues, such as interventions that have an effect in the population that last beyond the lifetime of those treated.

The panel was co-chaired by Peter Neumann of Tuft University and Gillian Sanders of Duke University. The panel took five years to arrive at its recommendations. A journal article describing the future research agenda for cost effectiveness research is underway.

For further information

A summary of the second panel's recommendations appeared in JAMA earlier this year, http://jamanetwork.com/journals/jama/article-abstract/2552214. The complete book length report has now been published by Oxford University Press. The book, "Cost-Effectiveness in Health and Medicine, second edition," by Peter J. Neumann, Gillian D. Sanders et al, includes the full recommendations of the second panel, and several examples of cost-effectiveness studies according to the new guidelines. The book shares the same title as the first edition, so purchasers will want to make sure that they are getting the second edition published in 2016.

A video archive of the meeting is available at: http://healtheconomics.tuftsmedicalcenter.org/cear4/Resources/2ndPanelonCostEffectivenessVideoArchive.aspx.

Gillian Sanders, co-chair of the panel who developed the guidelines, will be presenting the new guidelines in the April 19 HERC Cyberseminar.

HERC Econometrics Course

The HERC econometrics course is happening now! The remaining 8 lectures can be accessed via the HSR&D Cyberseminar website. 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.

Propensity Scores

February 22, 2017

Understanding causation with observational data is often more dependent on what we don't observe than what we do observe. Multivariate techniques can be 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

March 1, 2017

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

March 8, 2017

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

March 22, 2017

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

March 29, 2017

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

April 5, 2017

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)

April 12, 2017

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)

April 26, 2017

In addition to skewness and truncation, the variance in cost data may be correlated with one of the predictor variables,. 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

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

February 15, 2017

The Cost-Effectiveness of Complementary and Alternative Treatments to Reduce Pain

Stephanie L. Taylor, PhD; Patricia Herman, ND, PhD; Karl Lorenz, MD

Chronic musculoskeletal disorder pain, such as head, neck, shoulder, knee, facial, joint, and back pain, is highly prevalent among Veterans and is costly to treat. Some complementary and integrative health (CIH, formerly complementary and alternative medicine or CAM) therapies appear effective in treating pain and its comorbidities. This study is examining the cost effectiveness of CIH in reducing musculoskeletal disorder pain and its comorbidities among Veterans.

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.

HERC Staff

Director
Todd Wagner, PhD

Associate Director
Christine Pal Chee, PhD

Health Economists
Paul Barnett, PhD
Risha Gidwani, DrPH
Josephine Jacobs, PhD
Ciaran Phibbs, PhD
Jean Yoon, PhD
Wei Yu, PhD

Administrative Officer
Yoko Ogawa, BS

Associate Staff
Lakshmi Ananth, MS
Adam Chow, BA
Elizabeth Gehlert, MPH
Sharon Dally, MS
Angela Fan, MPH
Nicole Flores, BA
Juliette Hong, MS
Howard Jiang, MS
Vilija Joyce, MS
Jeanie Lo, MPH
Samantha Murrell, MPH
Angel Park, MS, MPH
Susan Schmitt, PhD
Winifred Scott, MPH
Pon Su, MS

Health Economics Resource Center
VA Palo Alto Health Care System
795 Willow Road (152 MPD)
Menlo Park, CA 94025

Phone: (650) 617-2630
Fax: (650) 617-2639
Email: herc@va.gov

Visit us online at:
http://www.herc.research.va.gov

Follow us on Twitter:
@herc_va

Editors:
Samantha Murrell
Paul Barnett