some authorities, such as value-of-information analyses and scenario analyses for structural assumptions.

Hospital and Clinical Practice Studies

HP1
VALIDATED MODELS FOR PRE-TEST PROBABILITY OF STABLE CORONARY ARTERY DISEASE: A SYSTEMATIC REVIEW SUGGESTING HOW TO IMPROVE VALIDATION PROCEDURES

Bodini A,[1] Mincarone P,[2] Tumolo MR,[2] Vozzi F,[3] Rocchiccioli S,[4] Pelosi G,[3] Caselli C,[4] Sabina S,[5] Leo CG[6]

[1]*National Research Council - Institute for Applied Mathematics and Information Technologies "Enrico Magenes", Milano, Italy,* [2]*National Research Council - Institute for Research on Population and Social Policies, Brindisi, Italy,* [3]*National Research Council - Institute of Clinical Physiology, Pisa, Italy,* [4]*National Research Council - Institute of Clinical Physiology, Pisa, PI, Italy,* [5]*National Research Council - Institute of Clinical Physiology, Lecce, Italy,* [6]*National Research Council - Institute of Clinical Physiology, Lecce, LE, Italy*

Objectives: An overuse of invasive and non-invasive anatomical testing for the diagnosis of coronary artery disease (CAD) affects patients' and healthcare professionals' safety, and the sustainability of Healthcare Systems. Pre-test probability (PTP) models can be routinely used as gatekeeper for initial patient management. Several PTP models have been developed after the seminal work of Diamond and Forrester in the late 1970s, however to assess their generalizability to different populations extended validation procedures should be carried out and their results carefully analyzed. ***Methods:*** A systematic review has been carried out to assess the discrimination capabilities of PTP models validated on external populations. The main metric was the area under the ROC curve (AUC). A comprehensive search has been done in MEDLINE®, HealthSTAR, and Global Health databases on 22 April 2020. The review conforms to the PRISMA statement; protocol was registered in PROSPERO (CRD42019139388). ***Results:*** Nearly all the models considered in the 27 analysed papers include age, sex, and chest pain symptoms. Other common risk factors are smoking, hypertension, diabetes mellitus and dyslipidaemia. Only one model considers genetic profile. Reported AUCs range from 0.51 to 0.81. Relevant heterogeneity sources have been highlighted, such as the sample size, the presence of a PTP cut-off and the adoption of different definitions of CAD which can prevent comparisons of results and meta-analysis. Very few papers address a complete validation, making then impossible to understand the reasons why the model does not show a good discrimination capability on a different data set. ***Conclusions:*** We recommend a more clear statement of endpoints, their consistent measurement both in the derivation and validation phases, more comprehensive validation analyses and the enhancement of threshold validations of PTP to assess the effects of PTP on clinical management.

HP2
PATIENT-PROVIDER COST DISCUSSIONS AND OUT-OF-POCKET COSTS AMONG CANCER SURVIVORS WITH VARYING LEVELS OF CANCER-RELATED FINANCIAL HARDSHIPS

Zhang H, Zhang S, Chen S, Barner JC, Moczygemba L

The University of Texas at Austin, Austin, TX, USA

Objectives: Previous research showed patient-provider cost discussions may reduce cancer survivors' out-of-pocket spending. Meanwhile, survivors who experienced cancer-related financial hardships may be more likely to have cost discussions. This study examined whether cost discussions and financial hardships were related to out-of-pocket spending. ***Methods:*** Using the 2016–2017 Medical Expenditure Panel Survey Experiences with Cancer Survey, survivors were classified as with or without a detailed discussion about out-of-pocket cancer care costs, based on self-reports. The relationship between detailed discussion and out-of-pocket costs was estimated using generalized linear models with gamma distribution and log link. Model 1 covariates included age, sex, race/ethnicity, marital status, education, employment, income, region, insurance, overall health, comorbidities, ≥1 cancers, time since cancer treatment, ambulatory visits, hospitalization, and survey year. Model 2 additionally adjusted for cancer-related financial hardship intensity (presence of material, behavioral, and psychological hardships, range: 0, 1, 2+). Model 3 additionally included an interaction term for cost discussion and hardship intensity. ***Results:*** Among 1,428 survivors included, 11.4% (95% CI: 9.1%–13.7%) had a detailed cost discussion. Having a detailed discussion was associated with significantly lower out-of-pocket costs ($1,041) compared to without a detailed discussion ($1,389) (average marginal effect [AME]=$347, 95% CI, –$610 to –$30) in model 1, which remains significant after controlling for financial hardship (model 2: AME=–$365, 95% CI, –$616 to –$57). In model 3, having a detailed discussion was significantly associated with lower costs only among no-hardship or multiple-hardship survivors (no hardship: AME=–$380, 95% CI, –$688 to –$11; multiple hardships: AME=–$659, 95% CI, –$1056 to –$156), but not among single-hardship survivors. ***Conclusions:*** Detailed cost discussions were associated with reduced out-of-pocket costs independent of financial hardship intensity, yet the reduction extent may vary by hardship intensity and warrants further investigation. Providers should continue to be encouraged to have detailed cost discussions with patients.

HP4
DOSE MEDICAID EXPANSION PROVIDE AFFORDABILITY OF HELATHCARE SERVICE FOR ASTHMA POPULATION

Shi L, Luck J

Oregon State University, Corvallis, OR, USA

Objectives: The purpose of this analysis is to estimate the impact of Medicaid expansion in 2014 on healthcare services among asthma patients. ***Methods:*** A retrospective cross-section study was conducted among asthma patients aged 26-64 years in the United States between 2007-2018 using the Medical Expenditure Panel Surveys. The total expenditure and utilization of healthcare services, including prescription drugs, emergency department (ED) visits, hospital inpatients stay, outpatient department visits, office-based medical provider visits, and home health visits, served as the outcome variables. The study sample included 9,564 adults identified as having asthma by Clinical Classifications Software (CCS) disease categorization scheme. We excluded individuals who were covered by Medicare. We estimated a difference-in-difference (DID) design compared two outcomes of patients under 138% federal poverty level (FPL) and upper 138% FPL before and after the Medicaid expansion. The expenditures of healthcare services were estimated by two-part model with logit in the first part and generalized linear model in the second part. The utilization was estimated by negative binomial regression. Other covariates were included to adjust potential confounding factors. Expenditures were inflated to 2018 US dollars as a common year by using the Medical Care component of the Gross Domestic Product (GDP) price index. Estimates were survey-weighted and adjusted for complex multi-stage sampling design. ***Results:*** A significant difference was found in asthma prescription drug expenditure and utilization. The DID estimates indicated that the Medicaid expansion increased expenditure by $344.39 ($p<0.001$) and utilization by 2.15 claims ($p<0.001$) for asthma population under 138% FPL after Medicaid expansion. Expenditures of outpatient department visits decreased by 65.9% ($p<0.01$) for asthma population under 138% FPL after Medicaid expansion. ***Conclusions:*** Medicaid expansion were benefit to asthma patients under 138% FPL, especially on prescription drug utilization.

Health Technology Assessment Studies

HT1
EFFECTS OF STAKEHOLDER ENGAGEMENT WITH ICER ON COST-EFFECTIVENESS OF NEW INTERVENTIONS: LESSONS LEARNED FROM A CRITICAL REVIEW OF EVALUATIONS FROM 2018 TO 2019

Ronquest N,[1] Paret K,[2] Gould I,[3] Barnett CL,[4] Mladsi D[5]

[1]*RTI Heatlh Solutions, Durham, NC, USA,* [2]*RTI Heatlh Solutions, Research Triangle Park, NC, USA,* [3]*RTI Heatlh Solutions, Durham, NC, USA,* [4]*RTI Heatlh Solutions, Research Triangle Park, NC, USA,* [5]*RTI Heatlh Solutions, Waltham, NC, USA*

Objectives: Since its foundation in 2006, the Institute for Clinical and Economic Review (ICER) has had increasing influence on drug pricing and reimbursement decisions in the US. Such decisions directly affect all stakeholders—insurers, providers, manufacturers, patients, and others—yet there is little synthesis of the effectiveness of engagements by stakeholders on ICER's assessment of the cost-effectiveness of new interventions. The objective of this study is to evaluate the effectiveness of stakeholder engagement approaches and inform stakeholders of their potential role in collaborating with ICER. ***Methods:*** ICER evaluations from 2018 (n=12) and 2019 (n=8) were systematically reviewed. Key characteristics were extracted from 172 letters with a total of 1,463 comments documenting interactions between ICER and all stakeholders. Stakeholder engagement approaches were analyzed in terms of their effectiveness indicated by ICER's modification of its original cost-effectiveness analysis. ***Results:*** 30% of reviewed letters and 5% of comments resulted in a change in ICER's base-case analysis (49 comments in 2018, 23 in 2019); nearly half of these comments included specific data or a published article to support the stakeholder's recommendations. Other common types of suggestions that resulted in analysis revisions included comments relating to inconsistent model inputs across treatments (12/49 in 2018, 5/23 in 2019), clinical validity (12/49 in 2018, 0/23 in 2019), and concerns based on patients' perspectives (1/49 in 2018, 5/23 in 2019). Although these comments led ICER to amend the analysis, the revisions rarely affected ICER's conclusion on the cost-effectiveness of evaluated