modeled for a time horizon of 35-40 years or for a lifetime to demonstrate cost effectiveness. CONCLUSIONS: This analysis shows the range, variability, and methods used for calculation of ICER values for these high budget impact drugs and provides lessons for executives and policy makers.

PRM40 SYSTEMATIC LITERATURE REVIEW TO EVALUATE AND CHARACTERIZE THE HEALTH ECONOMICS AND OUTCOMES RESEARCH STUDIES IN INDIA
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OBJECTIVES: Health economics research is in its infancy in India. This systematic literature review aimed to identify, evaluate, and characterize the variety, quality, and intent of the health economics and outcomes studies being conducted in India.

METHODS: Studies published in English language journals between 1999 and 2012 were retrieved from Embase and PubMed databases using relevant search strategies. Two researchers independently reviewed studies as per Cochrane methodology, information on type of research and outcomes were extracted. Quality of reporting was assessed for model-based health economic studies using a published 100-point Quality of Health Studies (QHES) instrument. Subjective assessment was used for the remaining studies.

RESULTS: Of 546 studies screened, 132 studies were included in the review. The broad study categories were cost-effectiveness analyses (ICEA), 54 studies), cost analyses (19 studies), and burden of illness (18 studies). The outcomes evaluated in cost analyses were direct costs and indirect costs, as an in or a out. The cost-effectiveness ratio (ICER), quality-adjusted life years (QALYs), and disability-adjusted life years (DALYs). Most studies were conducted from societal perspective. Direct medical costs assessed included costs of medicines, monitoring tests, consultation and hospital charges along with non-medical costs (travel and food for patients and care-givers). Loss of productivity and loss of income of patients and care-givers were identified as components of indirect cost. Overall, 33 studies assessed QoL, and only one used QALY. The tornado diagram was the most used instrument in these studies. Quality assessment for modeling studies showed that most studies were of high quality (mean range QHES score to be 75 ± 10). CONCLUSIONS: This review identified various patterns of health economic studies in India. Majority of the CEA studies conducted in recent years were of high quality. Despite this, utilization of health care resources is inappropriate and economic evaluation needs relevance to the context of health care in India.

PRM41 A NOVEL APPROACH TO RANKING PARAMETER UNCERTAINTY IN ONE-WAY SENSITIVITY ANALYSIS - WHY TORNADO DIAGRAMS ARE MISSING
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OBJECTIVES: Economic evaluations of health technologies have long relied on one-way sensitivity analysis (SA) to examine the impact of parameter uncertainty on modeling outcomes. Traditionally, this impact has been measured and ranked based on absolute changes in the incremental cost-effectiveness ratio (ICER) across plausible parameter values and presented in a tornado diagram. This format does not adequately identify or prioritize parameters where the range of uncertainty causes the ICER to change quadrants in the cost-effectiveness (CE) plane. However, these quadrant changes, which represent fundamental changes to the CE conclusion, are arguably more meaningful than changes in the ICER within a quadrant. This research illustrates a novel approach to presenting one-way SA results that focuses on identifying parameters with the greatest potential to change the overall conclusion rather than narrowly focusing on changes to the ICER. METHODS: We developed a comprehensive algorithm for ranking the parameters varied in a one-way SA. Broadly, we first prioritize parameters with the potential to qualitatively change the CE conclusion and then rank parameters based on quantitative changes to modeling outcomes. Changes to the CE conclusion are identified based on quadrant changes in the CE plane, and parameters are categorized as having the potential to change the conclusion both positively and negatively, only positively, only negatively, or not at all. Within these categories, a secondary ranking based on costs and health outcomes is used. Furthermore, visualization techniques anchored in the CE plane help assess whether conclusion changes are driven by costs, QoL, and/or costs and QoL, or both. RESULTS: This research demonstrates that the conclusions-based ranking algorithm works in more general settings than the traditional tornado diagram format. CONCLUSIONS: The conclusions-based approach is a powerful method that provides a more complete picture of the impact of parameter uncertainty in economic evaluations.

PRM42 IDENTIFYING ACCURATE PATIENT-BASED HEALTH AND SOCIAL CARE COSTS OF OLDER PEOPLE FOR TRIAL-BASED ECONOMIC EVALUATION: IS IT REALLY WORTH IT?
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OBJECTIVES: Acute Medical Units (AMUs) identify individuals requiring inpatient care and those who can be discharged. However, readmission rates for older people in the year following AMU discharge are high. We aimed to identify patient-based health and social-care costs of a cohort of older (70+) people discharged home from AMU within 72 hours. METHODS: Although resource-use data from social and health care sectors in England is available electronically, there is little systems-linkage so data were obtained from each sector separately. Hospitalisation and social care data were collected retrospectively for 644 patients for three months post AMU discharge using patient administration systems (57% of cohort). In addition, further approvals were gained for general practices, ambulance services, intermediate and mental health care. Of 118 general practices serving our cohort, data were obtained from 48 (250/456 participants). Seventy-four were not covered by our approvals, and a team, led by a research nurse, dedicated team, 53 declined access or did not respond. RESULTS: We obtained data on hospitalisations for all participants, and “full” costs for 250 participants. Mean cost was £1,500, median range £700-£2,470 (0, 0-2,362). Secondary care constituted 76.2% costs. Contribution from other sectors was: primary care (10.9%), ambulance service (0.7%), intermediate care (0.1%), mental health care (2.1%) and social care (10.9%). The top 10% most resource-intensive were: intermediate care, social care, and home visits. CONCLUSIONS: One methodology or another can generate diametrically opposite conclusions. Proofs demonstrate that the expected values of Metrics #1, #2, and #3 varies, demonstrated that Metrics #1 and #2 would result in opposite inferences. Mathematical proofs and simulations demonstrate the types of bias that can be introduced.

PRM43 THE LOWER AND UPPER LIMITS OF AN INCREMENTAL COST-EFFECTIVENESS RATIO ASSOCIATED WITH THE EFFICIENCY FRONTIER: A CASE OF HIV/AIDS PREVENTION AND TREATMENT
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OBJECTIVES: To validate a theoretical method, using a case study of efficiency frontiers for HIV/AIDS prevention and treatment. METHODS: An important study was conducted based on the evidence published on the Journal of Medical Economics as one of the first studies that identified cost-effectiveness variation in efficient frontiers for HIV/AIDS prevention and treatment documented in the database. Cost-Effectiveness Analysis Registry. RESULTS: Recognizing that there are two types of efficiency frontier represented with a monotonically increasing function of QALY on the Y-axis and Cost on the X-axis, each efficiency frontier is formulated by two regression models: log and square-root models, two of the mathematical formula of derivatives were obtained according to each regression model. The formula of derivatives can provide the slope of the tangent on the efficiency frontier curve, giving an arbitrary value of cost (or QALY). Therefore, we developed the formula that can provide lower and upper slopes of the two tangents, given an arbitrary ICER slope which is represented by connecting two points on the efficiency frontier curve. Examples of calculations conducted are graphically illustrated according to each regression model. CONCLUSIONS: Through this validation study, we can confirm that an application of our method is theoretically and practically feasible to estimate the lower and upper limits of an ICER arbitrarily given on the efficiency frontier curve. This approach will provide us with more useful information on the question how we could interpret and justify the high value of ICER of new technologies such as molecular-targeted drugs.

PRM44 BIAS IN RELATIVE ACCURACY METRICS
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OBJECTIVES: Reimbursement to beneficiaries and cost-effectiveness analyses depend on the availability of estimates of billed-charge amounts. In the United States, no single data source is universally accepted, rather, several vendors compile distributions of billed charges. Studies use these estimates interchangeably and there is no preferred metric for characterizing differences in conducting comparisons. Nonetheless, the conventional wisdom suggests that Medicare data tend to underestimate means and other values relative to commercial data. This paper investigates the statistical properties of three metrics used to characterize relative differences between two sources of values. For these metrics, the difference between the tested and reference values is the numerator; the denominators are the tested value (Metric #1), or the reference value (#2), or the average of the two (#3). METHODS: Each metric is described; mathematical proofs and simulations demonstrate the types of bias that can be introduced.

RESULTS: Two simulations of constructed distributions with identical means, one with small value differences and the other with large value differences, demonstrate that Metrics #1 and #2 would result in opposite interpretations. The results demonstrated that the expected values of Metrics #1, #2, and #3, respectively, are negative, positive, and zero. The head to head comparison of two billed charge benchmarks finds bias present across all three averages (simple, weighted by claim count, and weighted by claim dollars), although it is most apparent accounted for 50% of overall cost. CONCLUSIONS: This study was consistently negative, while that for Metric #2 is positive and Metric #3 varies. When many observations are aggregated to generate an overall average, the choice of metric affects results, offering the potential to change the conclusion both positively and negatively, only impacts differently depending on the context of the data.