tively. The anti-logged residuals of MAOI group were positively skewed (skewness = 11.71). MAOI cases had greater costs than controls ($3866) when the mean smearing estimator was used. However, employing the median smearing estimator decreased cost difference to $385, and provided a better model fit (mean: MSE = 3.80 \times 10^3; median: MSE = 1.19 \times 10^3). For modeling costs of anti-coagulant DDI cohorts, skewness of anti-logged residuals in controls was 28.44 as compared to 11.60 for cases. Consequently, retransformed costs of controls were exaggerated and had greater expenditures by $6674 when the mean smearing estimator was employed. Conversely, using the median smearing estimator, cases had greater costs by $216, and the model fit was better (mean: MSE = 3.04 \times 10^3; median: MSE = 2.41 \times 10^3). CONTRUCTION: In this study, employment of the median instead of the mean smearing estimator provided a better fitting model and was more accurate in predicting expenditures. The results also suggest researchers should examine the distribution of anti-logged residuals when using the smearing retransformation.

THE USE OF A LIFE ANNUITY TO MORE ACCURATELY CALCULATE MEDICAL COSTS IN A COST-EFFECTIVENESS ANALYSIS

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OBJECTIVES: To demonstrate how to use a life annuity to calculate medical costs for a cost-effectiveness analysis, and why researchers should use this method. METHOD: A cost-effectiveness analysis typically requires a single value to represent annual medical costs over time. While a straight average of claims over several years of claims data seems to be a common method to obtain this estimate, the value needed for the analysis is more accurately calculated using the actuarial concept of a life annuity. A life annuity is a series of payments (or costs) made at equal intervals while a given life survives. The researcher creating a model that includes future annual medical claims needs to take into account both the future value of the claim dollars with discounting, and the likelihood that a person will live to need medical claims each year with the probability of survival. Once this “annuitized” claim cost is created, it is ready to be used in a model where the relevant factors—discounting and survival—are present. This presentation will demonstrate how to calculate an annuitized claim cost using medical claims data from MedStat's MarketScan database. RESULTS: This demonstration will show proper use of discounting, survivorship, and the likelihood that a person will live to need medical claims each year with the probability of survival. The results also suggest researchers should examine the distribution of anti-logged residuals when using the smearing retransformation.

PMC4

ACCUARATE AND RAPID PREDICTION OF DRUG PLAN EXPENDITURE WHILE PLANNING REIMBURSEMENT CHANGES USING POLICY SIMULATION

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Drug plan decision makers need accurate financial impact projections for planning new drug policies. Projections should have minimal margins of error and be transparent and easy to communicate to stakeholders. OBJECTIVES: We explain how ad hoc methods typically used for financial impact projections are inadequate. METHODS: We describe a flexible tool for projecting the financial impact of drug policy changes based on historical dispensing data. The tool uses a random sample of a drug plan’s beneficiaries to simulate the drug claim adjudication process under the proposed policy regulations. We explore the validity of the simulation tool using a recent example of a complex drug policy change in British Columbia (BC). Over 500 different policy options were simulated in the planning phase of the BC policy. Drug plan spending was projected for each option before the final policy was selected two months prior to the policy start. RESULTS: Predicted future total spending for the chosen policy option was within 1% of actual spending in the first 11 months ($535.8M and $560.0M, respectively). The average difference per week between actual and predicted amounts was 0.015% ($86,500, SD: $968,700). CONCLUSIONS: Such policy simulation can be applied to a wide range of health plans and policy changes.

PMC6

PERSONNEL COSTS, LEARNING CURVES, AND SCALE ECONOMIES FOR TELEPHONE-BASED NURSE INTERVENTIONS

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OBJECTIVE: For most telephone-based nurse interventions, the assumption of constant marginal and average personnel costs is unrealistic. In spite of this fact, researchers frequently report nursing personnel costs as simple functions of wage rates and hours worked. In order to better forecast personnel costs, it is necessary to understand learning and scale effects involving the cumulative volumes of questions, encounters, and patients. For an ongoing telephonic blood pressure intervention, we provide summary statistics and regression output concerning learning curve effects and economies of scale. METHODS: Using data on personnel costs and cumulative production from the intervention “Take Control of Your Blood Pressure,” we obtain least squares estimates for learning curve elasticities. We include separate terms in our regression to identify the elasticities of unit costs with respect to 1) the cumulative volume of patient-specific encounters; 2) the cumulative volume of specific questions; and 3) the cumulative volume of specific questions for specific patients. In addition, we assess alternative returns-to-scale based on Nerlove’s classic method. RESULTS: The elasticity of personnel cost is significantly negative with respect to the cumulative volume of specific questions (p = 0.036), and with respect to the patient-specific cumulative volume of specific questions (p = 0.001). Regarding patient-specific encounters, there is mixed evidence concerning learning curve effects and economies of scale. CONCLUSIONS: To forecast personnel costs in telephone-based nursing interventions, it is important to account for learning curve effects. Including only wage rates and patient grand means will result in an overestimation of costs. To a significant extent, unit costs decline systematically as cumulative output rises.

PMC5

BRIDGING THE REQUIREMENT-CAPABILITY GAP BETWEEN DRUG PLAN DECISION MAKERS AND THEIR DATA ANALYSTS IN DRUG POLICY PLANNING

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OBJECTIVES: Drug plan decision makers make choices of considerable financial impact in short periods of time. To reduce