

and 0.008 (D1) and 0.003, 0.013, 0.026 and 0.052 (S1) for baseline event rates of 1, 5, 10 and 20 per year respectively. **CONCLUSIONS:** Nonlinear models of NSHE disutility typically show greater benefit per NSHE avoided in subjects with a lower frequency of events. As hypoglycaemia frequency increases the marginal utility gain per NSHE avoided decreases. Nonlinear equations provide a more plausible estimate of the health benefit associated with the avoidance of NSHE.

## PDB81

## VALIDATING THE UKPDS 82 RISK EQUATIONS TO CONTEMPORARY OUTCOMES STUDIES IN TYPE 2 DIABETES

Grant D<sup>1</sup>, Foss V<sup>2</sup>, McEwan P<sup>3</sup><sup>1</sup>IMS Health, London, UK, <sup>2</sup>IMS Health, Basel, Switzerland, <sup>3</sup>HEOR Consulting, Monmouth, UK

**OBJECTIVES:** The IMS CORE Diabetes Model (CDM) is a widely published and previously validated decision support tool. The model uses the UKPDS 68 risk equations (REs) to predict cardiovascular events and recent studies have demonstrated the model's validity to predict event rates consistent with those reported in contemporary T2DM outcomes studies. The CDM has been updated to include the new UKPDS 82 REs; consequently the objective of this study was to compare the event rate predictions from the UKPDS 82 and 68 REs within the CDM. **METHODS:** A total of 86 validation simulations were performed to data from ACCORD, ADVANCE, VADT and UKPDS. Simulation cohorts mirroring baseline characteristics of each of the trials were generated and intensive and conventional treatment arms modeled for the relevant study specific follow-up. Predicted versus observed cardiovascular and microvascular complications and all-cause mortality (ACM) were assessed using the coefficient of determination (R<sup>2</sup>) goodness of fit measure. **RESULTS:** Across all validation studies the CDM simulations produced an R<sup>2</sup> statistic of 0.909 using UKPDS 68 and 0.762 using UKPDS 82. R<sup>2</sup> statistic for MI, stroke, CHF, CV death, and ACM were 0.773, 0.853, 0.499, 0.659 and 0.966 for the UKPDS 68 REs and 0.742, 0.848, 0.852, 0.672 and 0.88 for the UKPDS 82 REs. Validating against 20-year outcomes data (UKPDS) resulted in R<sup>2</sup> of 0.992 and 0.993 for UKPDS 68 and 82 respectively. **CONCLUSIONS:** The CDM model has been extensively validated using the UKPDS 68 risk equations and shown to have good predictive validity. Initial validation using the UKPDS 82 equations show an improved fit to the UKPDS data, but less accurate external validation to recent outcomes study trials data. This may be due to necessary assumptions applied regarding modifiable risk factor trajectories or the functional form of the new equations. Further research is required to assess the robustness of these new equations.

## PDB82

## ASSESSING SIMULATION RUN TIME REQUIREMENTS TO ACHIEVE STABILIZED ABSOLUTE AND INCREMENTAL COST EFFECTIVENESS RESULTS IN TYPE 2 DIABETES: A STUDY USING THE IMS CORE DIABETES MODEL

Foss V<sup>1</sup>, Grant D<sup>2</sup>, McEwan P<sup>3</sup><sup>1</sup>IMS Health, Basel, Switzerland, <sup>2</sup>IMS Health, London, UK, <sup>3</sup>HEOR Consulting, Monmouth, UK

**OBJECTIVES:** In cost effectiveness (CE) modeling previous studies have demonstrated incorporating parameter sampling is crucial to capture the effects of nonlinearity in base case simulation predictions of costs and quality adjusted life expectancy (QALE); however, run time requirements (RTR) to reach stabilized predictions may be increased. The objective of this study was to assess the RTR for analyses with parameter sampling necessary to reach predefined end point stabilization criteria. **METHODS:** The IMS CORE Diabetes Model was initiated using the following type 2 diabetes profile: 55 years of age, duration of diabetes of 5 years and baseline HbA1c of 7.49%. Treatment A versus B was assumed to have a 0.5% lower HbA1c and incremental treatment cost of \$1,500 (USD) with parameter sampling using standard errors of 1% of mean. The model was run with 10,000 patients over 10,000 replications. RTR was assessed in terms of replications required to reach stabilization of absolute and incremental costs and QALEs. Stabilization was defined as point estimates remaining within the interval of expected value (EV) +/- tolerance (%); tolerance was explored in a range of 0.1% to 5% surrounding EV. **RESULTS:** For total costs and QALE the RTR required to reach stabilization was 17 and 44 replications respectively for a tolerance of 0.5% and 425 (costs) and 3,459 (QALE) for a tolerance of 0.1%. The RTR for stabilized incremental results were considerably greater: 6,886 and 9,605 replications for costs and QALE respectively at 0.5% tolerance and 9,600 (costs) and 10,000 (QALE) for a tolerance of 0.1%. **CONCLUSIONS:** Demonstrating the stability of simulation output is crucial to ensuring the interpretation of CE output is robust. The additional simulation runtime required to achieve stabilized incremental results should be factored into simulation study plans and convergence of output should be reported routinely.

## PDB83

## COST-UTILITY ANALYSES IN DIABETES: A SYSTEMATIC REVIEW AND POTENTIAL GAINS FROM USING ECONOMIC EVIDENCE

Zhong Y<sup>1</sup>, Lin P<sup>1</sup>, Cohen JT<sup>1</sup>, Winn A<sup>2</sup>, Neumann P<sup>1</sup><sup>1</sup>Tufts Medical Center, Boston, MA, USA, <sup>2</sup>University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

**OBJECTIVES:** Diabetes-related cost-effectiveness analyses (CEA) have become more common, though little is known about the actual use of cost-saving services in real-world settings. This study systematically reviewed cost-effectiveness analyses of diabetes interventions, identified cost-saving diabetes services, and estimated potential gains from increasing use of cost-saving diabetes interventions in the United States. **METHODS:** We conducted a systematic review of cost-utility analyses (CUAs) related to diabetes published through 2012, using the Tufts Medical Center CEA Registry. We also examined factors independently associated with favorable ratios. We used the 2008-2012 Humedica electronic medical record data to estimate the potential cost savings and health benefits gained by switching patients to cost-saving diabetes interventions identified in our review. **RESULTS:** We identified 196 diabetes CUAs. Most examined pharmaceuticals (55%) and focused on treatment rather than prevention (70%). Most used a health care payer perspective (71%) and were industry-sponsored (52%). Of 497 published cost-utility ratios, 82% examined

a guideline-recommended intervention. Approximately 73% of interventions examined in diabetes CUAs were found to be either cost-saving or below \$50,000 per QALY. Logistic regression analysis showed that higher-quality CUAs or CUAs conducted from the US perspective were more likely to report favorable ratios. Ratios for surgical interventions and interventions recommended by diabetes guidelines were more favorable than other intervention types. Of 7,907 eligible patients in Humedica, 6,500 could be shifted to cost-saving treatments, saving more than \$11 million and gaining more than 1,800 QALYs. **CONCLUSIONS:** Our findings suggest that most diabetes interventions evaluated by CUAs are recommended by practice guidelines and may provide good value for money. Our results also indicate that patients and the health care system could benefit considerably from shifting to greater use of cost-saving interventions.

## PDB84

## WEIGHT CHANGE AND HEALTH CARE RESOURCE USE (HCRU) IN ENGLISH PATIENTS WITH TYPE 2 DIABETES MELLITUS (T2DM) INITIATING A NEW ANTIDIABETIC DRUG CLASS

Rigney U<sup>1</sup>, Blak BT<sup>1</sup>, Sternhufvud C<sup>2</sup>, Ycas J<sup>3</sup>, Racketa J<sup>3</sup>, Hammar N<sup>2</sup><sup>1</sup>AstraZeneca UK Ltd, Luton, UK, <sup>2</sup>AstraZeneca, Mölndal, Sweden, <sup>3</sup>AstraZeneca Pharmaceuticals US, Wilmington, DE, USA

**OBJECTIVES:** The contribution of weight change to the economic burden of T2DM is unclear. This study investigated associations between weight change and HCRU in patients with T2DM initiating new antidiabetic drug class. **METHODS:** Patients with T2DM initiating new antidiabetic drug classes (first-line, switch or add-on) between 01/01/05-01/01/12 were identified in UK Clinical Practice Research Datalink primary care (PC) records linked with Hospital-Episode-Statistics. Baseline characteristics were assessed before drug class initiation and weight change (index date) was observed 6 months after. HCRU was followed up to one year after index and included diabetes-related PC contacts and prescriptions, and all-cause hospitalisation days. Weight change was categorized as: <3.0% change (weight-neutral), 3.0%-5.4% gain (gain+), ≥5.5% gain (gain++), 3.0%-5.4% loss (loss+), ≥5.5% loss (loss++). Comparisons between weight groups were conducted using negative binomial regression. **RESULTS:** Of 9031 patients with mean age 59.2 years and 57.4% men; 54.3% were weight-neutral, 12.0% gain+, 10.2% gain++, 12.8% loss+, 10.7% loss++. Mean baseline BMI ranged from 30.1 kg/m<sup>2</sup> (gain++) to 33.8 kg/m<sup>2</sup> (loss++). Follow-up crude mean PC contacts for all patients was 4.6 per person-year (PPY), mean prescriptions 15.3 PPY, mean hospitalisation days 1.5 PPY. For the weight-neutral group, crude mean PC contacts, prescriptions and hospitalisation days were 4.6, 14.9 and 1.2 PPY, respectively. In initial adjusted comparisons to weight-neutral patients, gain++ had more PC contacts, gain+ and gain++ had more prescriptions whereas loss+ patients had fewer. Gain+ and loss++ patients had more hospitalisation days than weight-neutral patients. **CONCLUSIONS:** T2DM patients gaining weight after initiating new antidiabetic treatment may have increased health care resource use compared to weight-neutral patients. Higher weight loss, possibly due to underlying health problems, may also be associated with increased resource use. Causal interpretations of these results require detailed information on social and medical factors driving resource use in diabetic patients that were unavailable.

## PDB85

## IMPACT OF HEALTH INSURANCE STATUS ON HEALTH CARE RESOURCE UTILIZATION AMONG DIABETIC PATIENTS IN THE UNITED STATES

Dabbous FM<sup>1</sup>, Dorey J<sup>2</sup>, Thokagevist K<sup>3</sup>, Toumi M<sup>4</sup><sup>1</sup>University of Illinois at Chicago, Chicago, IL, USA, <sup>2</sup>Creativ-Ceutical United States, Chicago, IL, USA, <sup>3</sup>Creativ-Ceutical, Chicago, IL, USA, <sup>4</sup>University of Lyon, Lyon, France

**OBJECTIVES:** This study was aimed to estimate the impact of health insurance status in adult diabetic patients on health care resource utilization and costs. **METHODS:** Patients were identified in the Medical Expenditure Panel for the 2011 cycle and were included if they had a diabetes diagnosis and were 18 or older. Insurance status was defined as private, public or uninsured. **RESULTS:** Of the 2,180 patients, 9% were uninsured, 31% had public health insurance and 60% had private health insurance. Uninsured patients were younger, more likely to be a racial minority, in the lower income or poor categories, with lower education compared to those with private insurance. After age adjustment, they were significantly less likely to be on Thiazolidinedione (2.03%, 11.4% and 11.17%) or anti-diabetic combination (5.2%, 14.6% and 17.3%), for uninsured, public and private, respectively. Average health care resource utilization was lowest among patients without health insurances compared to private and public, office visits (4.9, 11.1 and 9.5), outpatient facility visits (0.4, 0.9 and 1) and hospital discharge (0.1, 0.3 and 0.2). Uninsured patients had lower average health care expenditures, (\$4,319.5, \$10,558.4, \$10,377.6), emergency room expenditures (\$110.4, \$253 and \$282.9) and office visits expenditures (\$832.4, \$2202.5 and \$2414.6), for uninsured, public and private, respectively. **CONCLUSIONS:** It is important to assess whether lower resource utilization for uninsured patients impacts their current health status and is associated with long term worse outcomes and increased health care.

## PDB86

## METHODOLOGICAL CHALLENGES IN CALCULATION OF DAILY AVERAGE CONSUMPTION (DACON) FOR GLP-1 RECEPTOR AGONIST INJECTABLES FROM CLAIMS DATA

Swindle R<sup>1</sup>, Yu M<sup>2</sup>, Xie J<sup>2</sup><sup>1</sup>Eli Lilly and Company, Indianapolis, IN, USA, <sup>2</sup>Eli Lilly and Company, Toronto, ON, Canada

**OBJECTIVES:** This US study aimed to determine average daily dosing of liraglutide from a national payer perspective. **METHODS:** This study utilized 211,184 liraglutide pharmacy claims from the national Truven MarketScan<sup>®</sup> Database (10/1/2011-9/30/2012). Patients had type 2 diabetes (DM) diagnoses x 2, no type 1 or gestational DM, and were ≥18 years old (N=56,971). Liraglutide is typically dosed in 1.2 and 1.8 mg/day injections. DACON was based on total daily quantity prescribed (ml x 6 mg/ml ÷ days' supply). A number of claim quantities and days' supply values ranged from negative/zero to very high and implausible values, which translated