the good follow-up of diabetes patients in Sweden with continuous treatments adaptations to keep HbA1c low. ***Conclusions:*** Progression of HbA1c is slower with the SNDR equation. We advise to use this equation to do health policy analyses where treatment changes are inherent to the policy. To define HbA1c progression in cost-effectiveness analysis, we advise to use the UKPDS68 equation, which is a better representation of the progression without treatment adaptations.

PDB53
TRENDS IN PRICES OF INSULIN MARKETED IN THE US (1984-2020)

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Objectives: Diabetes mellitus is one of the most prevalent and costly diseases in the US. Insulin is an essential drug for many diabetes patients. We assessed trends in prices of injectable insulin in the period January 1984-January 2020. ***Methods:*** Data for insulin marketed in the US during the period January 1984- January 2020 was derived from the FDA databases; and the wholesale acquisition cost (WAC) from the RedBook (IBM Micromedex). We converted prices to 30-day-supply (30-DDD). Prices increases were compared with the consumer price index (CPI). Descriptive analyses were conducted in this study. ***Results:*** The WAC of the first human short-acting insulin and the first intermediate-acting insulin increased from $12.42 on January 1, 1984, to $178.44 per 30-DDD on January 1, 2020, representing a price increase 6.4 times higher than the CPI. Similar 30-DDD WAC increases were observed for intermediate-acting insulin ($12.42 in 1987 to $178.44 in 2020, 6.4 times higher than the CPI increase), rapid-acting insulin ($24.98 in 1997 to 329.64 in 2020, 8.4 times higher than the CPI increase), long-acting insulin ($43.51 in 2002 to $340.27 in 2020, increase 5.5 times higher than the CPI), short and intermediate-acting premixed insulin (13.68 in 1990 to $178.44 in 2020, 6.7 times higher than the CPI increase), and rapid/intermediate-acting premixed insulin ($47.70 in 2001 to $341.64 in 2020, 5 times higher than the CPI increase). Prices varied by form (vial, cartridge, pen, syringe) and strength. Follow-on and authorized generics entered the market at a median of 50% the reference insulin price. Prices of brand insulin products competing in the same class had a very similar price trend in the period of analysis. ***Conclusions:*** The price of insulin increased substantially during the period 1984-2020 threatening the affordability of these life-saving drugs. Authorized generics and follow-on products reduced in half the listed prices.

PDB54
EVALUATING THE IMPACT OF POOR GLYCEMIC CONTROL ASSOCIATED WITH THERAPEUTIC INERTIA ON LIFE EXPECTANCY IN PATIENTS WITH TYPE 2 DIABETES IN THE UK

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Objectives: Therapeutic inertia (failure to intensify therapy to address poor glycemic control in a timely manner) has been widely reported in the UK despite the well-established importance of maintaining good glycemic control. The aim of the present study was to evaluate the impact on life expectancy of poor glycemic control due to therapeutic inertia for the type 2 diabetes population in the UK. ***Methods:*** A validated long-term model (IQVIA CORE Diabetes Model) was used to project outcomes for a population with type 2 diabetes based on data from The Health Improvement Network primary care database. Life expectancy and complication rates were estimated for populations achieving different glycated hemoglobin (HbA1c) targets in a range of delayed treatment intensification scenarios. Population estimates of burden were based on epidemiological studies and published studies of glycemic targets in the UK. ***Results:*** Published data indicates that approximately 1,163,547 patients with type 2 diabetes in the UK have poor glycemic control (failing to meet HbA1c targets). Assuming a mean baseline HbA1c level of 8.2% (66 mmol/mol) in line with primary care data, 1 year of poor control was projected to cost 5,818 life years in a population of this size versus good glycemic control (HbA1c 7.0%, 53 mmol/mol) over a 3-year time horizon. Assuming a 5-year time horizon, approximately 15,126 years of life were lost in the population with only 1 year of poor glycemic control (HbA1c 8.2% [66 mmol/mol]) versus good glycemic control (HbA1c 7.0%, 53 mmol/mol). ***Conclusions:*** The clinical burden associated with poor glycemic control in type 2 diabetes in the UK is substantial. Efforts to avoid therapeutic inertia could substantially improve outcomes for the type 2 diabetes population even in the short term.

PDB55
ANNUAL HEALTH INSURANCE TREATMENT COST OF NON-INSULIN-DEPENDENT DIABETES WITH MULTIPLE COMPLICATIONS BASED ON ROUTINELY COLLECTED FINANCING DATA

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Objectives: Type 2 diabetes, represents a considerable burden for both the patient and the health insurance system. Our aim was to determine the annual health insurance treatment cost of non-insulin-dependent diabetes with multiple complications in Hungary. ***Methods:*** Data were derived from the financial database of the NHIFA, for the year 2018. Data analysed included annual health insurance costs, patient numbers and cost distribution calculated for age groups and sex. The following cost categories were included into the study: general practice care, home care, in- and outpatient care, medical imaging, laboratory diagnostics, pharmaceuticals and medical aids. Patients with non-insulin-dependent diabetes with multiple complications were identified with the following code of the International Classification of Diseases 10th revision: E1170. ***Results:*** In 2018, the Hungarian National Health Insurance Fund Administration spent 4.81 billion Hungarian Forints (HUF) on the treatment of patients with diabetes with multiple complications [17.80 million American Dollars (USD), or 15.09 million Euros (EUR)]. 50.4% of costs was spent on the treatment of male, 49.6% on female patients. The highest patient numbers were in general practice care: 30,028 men (48.1%), 32,355 women (51.9%) in total 62,383 patients. Pharmaceuticals (74.9% of total health insurance costs in men, 72.2% in women), medical aids (6.9% in men, 8.1% in women) and outpatient care (6.9% in men, 6.4 % in women) were the main cost drivers, while all other forms of medical care amounted to 11.2% in men and 13.1% in women. Annual health care treatment cost per patient was 80.711 HUF (299 USD/253 EUR) in men and 73.778 HUF (273 USD/231 EUR) in women. ***Conclusions:*** Pharmaceuticals were the major cost drivers. Major cost drivers showed no difference between men and women. Average annual health insurance costs per patient was 9% higher in men.

PDB56
CONTRASTING THREE TYPE 2 DIABETES CARDIOVASCULAR RISK EQUATIONS FOR EAST ASIA WITH UKPDS82 USING THE IQVIA CORE DIABETES MODEL

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Objectives: To assess the impact on cardiovascular risk, life-years (LYs), quality-adjusted life-years (QALYs) and incremental cost-effectiveness ratio (ICER) of three East Asian risk-prediction models (RPMs) and UKPDS82 using the IQVIA Core Diabetes Model v9.5. ***Methods:*** Analyses were conducted for a Chinese cohort with recent type 2 diabetes (T2D) onset. A hypothetical treatment effect of -10% relative to baseline was simulated separately on the following parameters: HbA1c, systolic blood pressure (SBP), total or low-density lipoprotein cholesterol and body-mass index (BMI). A comparison of 10-year cumulative incidence (CI) of cardiovascular disease, LYs, QALYs and ICERs was undertaken for the following RPMs: UKPDS82, China-PAR (Yang, 2016), Korea (Park, 2015), and Japan (Yatsuya, 2016). ***Results:*** The 10-year CI of stroke and myocardial infarction (MI) across the five RPM was: 7.1% and 2.4% (Chinese PAR), 11.8% and 4.0% (Korean RPM), 7.2% and 4.9% (Japanese RPM), 3.0% and 11.2% (UKPDS82). SBP was the main driver of cardiovascular benefit and LY gains in the Chinese and Korean RPMs whereas cholesterol TC was the main driver of LY gains with Japanese and UKPDS82. A -change in BMI was the main driver of QALYs gains across all RPMs. Despite the reversed stroke-to-MI ratio using East European RPMs there was only a small change in total LYs (0.03-0.09LY) and QALYs (0.02-0.07QALY) and hardly any change in incrementals (max 0.02QALY) applying the different treatments. Also, incremental costs did not change a lot (a few 100USD) and as such ICERs and conclusions did not change. ***Conclusions:*** An expected reversed stroke-to-MI ratio in East Asian populations compared with Western countries was shown, highlighting the importance of RPM selection. Nevertheless, the choice of risk equation hardly changed LYs and QALYs nor the ICERs, although the latter depend on the cost of an MI and a stroke.

PDB57
VALIDATION OF UKPDS OUTCOMES AND TAIWAN DIABETES MODELS ON TAIWAN TYPE 2 DM POPULATION

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Objectives: Asians with predisposition for diabetes mellitus (DM) contributed to over 60% of the world's diabetic population. DM model has been widely applied in assisting healthcare decision. Only few studies comparing validity of DM models developing from different races for Asian DM population. We examined model validity of United Kingdom Prospective Diabetes Study (UKPDS) Outcomes and Taiwan Diabetes Mellitus Hoslistic Care (TwDM) models against major complications of Taiwan type 2 DM population. ***Methods:*** TwDM model with first-hitting-time approach was developed based on population-based data containing nearly 140 thousand newly-diagnosed type 2 DM patients from 2002 to June of 2016. Multilayer DM complication (ischemic heart disease, chronic heart failure, ischemic stroke, end-stage renal disease, and eye disease) validation simulations were performed. A simulation cohort representing baseline of Taiwan DM population namely age, sex, HbA1C, systolic blood pressure, weight, high, low density lipoprotein, high density lipoprotein, and estimated glomerular filtration rate were generated and applied to both models. We assessed consistent predicted and observed complication number in TwDM mode by correlation coefficient and compared consistent predicted and

observed complication probability with those from UKPDS outcomes model. ***Results:*** The simulation cohort whose average age of 55 years was with a median of follow-up time 15 years. There was a significant high correlation (R^2= 98.4%) between multilayer predicted and observed complication number in TwDM model. An overestimated probability in chronic heart failure (0.08 vs. 0.002) and stroke (0.006 vs. 0.003) but underestimated probability in end-stage renal disease (0.002 vs. 0.013) was found when applying UKPDS outcomes model in Taiwan type 2 DM population. ***Conclusions:*** This analysis demonstrated that TwDM model compared to UKPDS outcomes model is more appropriately applied in Asian population. Further studies are necessary to elucidate the validity of TwDM model on different Asian races.

PDB58
REAL WORLD EVIDENCE ON THE IMPACT OF ELAGOLIX UTILIZATION ON PAIN SYMPTOMS, TREATMENT PATTERNS AND HEALTH RESOURCE USE AMONG ENDOMETRIOSIS PATIENTS IN THE UNITED STATES

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Objectives: To describe changes in pain symptoms, treatment rates and healthcare resource utilization patterns among endometriosis patients who received elagolix, an oral gonadotropin releasing-hormone (GnRH) antagonist ***Methods:*** This was a retrospective cohort study where women with ≥ 1 pharmacy claim for elagolix between August 2018 and September 2019 were selected from commercial and early view claims databases. Women also had to have ≥ 1 ICD-9/10 code for endometriosis (617.X or N80.X) on or before the earliest date of an Elagolix claim (index date) continuous health plan enrolment for 6 months before and after index date (pre and post index periods, respectively) and be aged 18 to 49 years old on index date. Patient demographics were summarized descriptively. Differences between the pre-index and post-index periods in the frequency of pain symptoms and utilization of endometriosis-related treatments (medical and surgical) and healthcare resources was analyzed using McNemar's test. ***Results:*** Final study sample included 643 patients. Mean age was 33.2±8.2 years. Pain symptoms prevalence was lower in the post-index period compared to the pre-index period (pelvic pain: 40.6% vs. 63.3%, dysmenorrhea: 13.1% vs. 20.4% and dyspareunia 9.0% vs. 13.1%, respectively; all $p<0.02$). Utilization of hormonal contraceptives, progestins, GnRH agonists and opioids was significantly less in the post-index period compared to the pre-index period (16.0% vs. 31.9%, 20.8% vs. 25.5%,1.6% vs. 7.9%, 35.5% vs. 44.3%, respectively; all $p<0.02$). Rates of undergoing any endometriosis-related surgery also decreased in the post-index period (13.1% vs. 23.0%; $p<0.001$). Similarly, frequency of receiving endometriosis-related outpatient and emergency department visits decreased in the post-index period (63.8% vs. 84.9% and2.2% vs. 4.8% respectively; all $p<0.01$) ***Conclusions:*** In the 6 months following elagolix therapy initiation, patients experienced reduction in rates of receiving endometriosis-related medical treatments, surgeries, opioids, outpatient and emergency department visits

PDB59
THE IMPACT OF HYPERKALAEMIA AND ITS CONCURRENCE WITH CARDIORENAL COMORBIDITIES ON HEALTHCARE RESOURCE USE IN THE UK

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Objectives: Hyperkalaemia (HK) is a potentially life-threatening electrolyte abnormality characterized by elevated serum potassium concentrations above 5.0mmol/L. The clinical and economic burden of HK is of concern for patients with cardiovascular and renal comorbidities. However, there is limited data on the impact of HK and its concurrence with comorbidities on healthcare resource use (HRU) in the UK. In this study we aimed to characterise HRU associated with HK hospitalisations in patients with different cardiovascular and renal comorbidities in the UK. ***Methods:*** A retrospective cohort analysis was conducted using patient data from the Clinical Practice Research Datalink linked to the Hospital Episode Statistics database. The study population included patients aged ≥18 years between January 2003 and June 2018 with HK and a record of relevant cardiovascular and renal comorbidities (hypertension, heart failure, diabetes, non-dialysis dependent chronic kidney disease (CKD), dialysis dependent CKD). HRU was examined for each comorbidity considering the number of hospitalisations for HK and the prevalence of the comorbidity. ***Results:*** The cohort consisted of 498,196 patients. Of these, 36.9% had hypertension, 33.8% diabetes, 35.1% CKD, 11.0% heart failure, and 0.6% were in receipt of dialysis. HK specific hospitalisation rates were 4.3 (95% confidence interval 4.2-4.4), 5.1 (5.0-5.3), 8.2 (8.0-8.5), 16.9 (16.2-17.6) and 62.7 (57.7-68.0) per 1,000 patient years, respectively. There were no significant differences in length of stay observed for each comorbidity (range 15.2-17.6 days). Hospitalisation rates increased with an accumulation of comorbidities. Total resource use costs were £49,745,643, £52,186,175, £76,567,465, £32,245,605 and £6,490,852 for hypertension, diabetes, CKD, heart failure and dialysis patients respectively. ***Conclusions:*** Understanding at risk patients could help treat/prevent HK and therefore reduce HRU. When considering HK preventative strategies, although patients with dialysis have increased hospitalisation rates, prioritising comorbidities with significant resource use has the potential to have the greatest impact on NHS budgets.

Diabetes/Endocrine/Metabolic Disorders - Epidemiology & Public Health

PDB60
IMPACT OF THE ANEMIA: SOCIO-ECONOMIC INEQUITIES ANALYZING THE DEMOGRAPHY AND FAMILY HEALTH SURVEY IN PERU

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Objectives: Estimate the costs, public spending and socio-economic inequities of anemia in the Public Health System of Peru ***Methods:*** Cross-sectional study based on ENDES 2018. A partial economic evaluation of disease cost type (EC) was carried out. The study population was a cohort 11,377 children under 36 months. The costs were estimated from the perspective of the funder taken for the year 2018. The definition of clinical management schemes (medical procedures and medications for the diagnosis, treatment and monitoring of the disease) come from the Insurable Conditions of the Essential Insurance Plan in Health (PEAS). ***Results:*** The hypothetical cohort of total children under 36 months with anemia in Peru is 1,225,466 for the year 2018 (Prevalence of anemia: 43.5%). The total cost to combat anemia would be USD 104,560,007.17 (unit cost USD 85.2), corresponding to diagnosis USD 53.3 (62.4%), treatment USD 10.8 (12.7%) and for follow-up USD 21.2 (24.9%). The fixed cost corresponded to USD 28.1 (39.9%) and the variable cost to USD 42.4 (60.1%). The public budget in the Articulated Nutrition Program for 2018 was USD 738,730,387.6. This amount represents 14% of the budget for the year 2018 in the results-based Budget Program called Nutritional Article. Anemia was higher in the rural area (50.9%), Andean population (50.2%) and Amazon (50.5%), illiteracy by the mother (51.9%), the poor population (47.9%) and extremely poor (53.6 %) is the most affected and the beneficiaries of social programs (51.4%). ***Conclusions:*** Increasing the budget to combat anemia in Peru is a very relevant aspect, however this must be complemented by improvements in access to health services of the most vulnerable population, this will improve financing policies and invest in equity within the framework of universal health coverage in the country.

PDB61
MULTIVARIATE LOGISTIC REGRESSION APPLIED TO CLINICAL EFFECTIVENESS IN THE DIABETES PREVENTION PROGRAM (DPP)

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Objectives: Knowler et al published the initial results of the DPP trial in 2002. The study reported a crude incidence density (ID) of 4.8, 7.8 and 11.0 cases per 100 person-years for lifestyle, metformin, and placebo respectively. The three-year cumulative incidence (CI) of diabetes was 14.4%, 21.7% and 28.9% respectively. These results adjusted neither for baseline covariates nor for treatment interactions. While randomization is expected to ensure baseline balance, that is not guaranteed. Using subgroup analysis to handle the heterogeneity of treatment effect (HTE) is problematic due to multiple testing and inadequate statistical power. The main purpose of the study is to estimate adjusted CI, assessing the HTE using multiple logistic regression (MLR). ***Methods:*** A 95% subset of the original DPP data was available. Fitted multiple logistic regression was used to compute an adjusted CI for each treatment. ***Results:*** Adjusted CIs controlling for baseline covariates and including treatment interaction terms were 14.5%, 20.9% and 28.3%, similar, though not identical to the unadjusted full sample. Based on these CI, the ID was 5.2, 7.8 and 11.1 cases per 100 person-years. There was a statistically significant HTE effect by age and BMI. The odds ratios of lifestyle and metformin compared to placebo in 40-64 years old participants compared to 25-39 years old were 0.49; [95% CI: 0.25,0.97] and 0.57;[95% CI: 0.29,1.12], respectively. The analogous odds ratios in those with BMI of ≥35kg/m2 compared to those with BMI of <30kg/m2 were 1.18; [95% CI: 0.63,2.21] and 0.36; [95% CI: 0.20,0.63]. ***Conclusions:*** Our findings from MLR generated similar results for CI and ID as in the DPP despite differences in sample sizes and the methods used (life table versus MLR). Both lifestyle and metformin were similarly effective in reducing the incidence of diabetes compared to placebo after adjustment. Age and BMI levels were identified as effect modifiers.

PDB62
INTERACTION OF HOUSEHOLD AND NEIGHBORHOOD SOCIOECONOMIC STATUS IN THE CHILDHOOD OBESITY EPIDEMIC IN THE UNITED STATES

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Objectives: To determine if the association between neighborhood socioeconomic status (SES) and childhood overweight or obesity varies across household SES levels. Second, determine if having higher household or neighborhood SES mitigates any negative effect of having lower levels in the other SES dimension. ***Methods:*** We used the first-grade round of 2012 Early Childhood Longitudinal Study (ECLS-K).