OBJECTIVES: Updated risk equations are available for predicting outcome in people with type 2 diabetes (T2D): the UKPDS Outcomes Model (UKPDS 68). It is important to assess the validity of applying risk equations to populations other than those from which they were derived. The objective was to evaluate how well the UKPDS-68 equations predicted vascular morbidity and mortality in real-life data from Cardiff, UK, and compare estimates with the previous UKPDS Risk Engine equations (UKPDS-RE [from UKPDS publications 56 and 60]). **METHODS:** The equations were incorporated into a stochastic simulation model that estimated the incidence and prevalence of complications (DiabForecaster). Predicted results from the model were compared with population data from Cardiff for coronary heart disease (CHD), stroke and all cause mortality. The annual incidence of newly diagnosed T2D, baseline modifiable risk factors and demographic profiles were matched to the Cardiff data. **RESULTS:** Internal validation, using a baseline cohort matched to the UKPDS study, demonstrated that the model predicted 12-year cumulative incidence in line with previous UKPDS publications. Real life and predicted event rates for CHD were: 116, 153 and 137 events/1000 T2D patients/yr for the Cardiff data, UKPDS-RE and UKPDS-68, respectively. For stroke: 178, 153 and 128 events/1000 T2D patients/yr, respectively. For all cause mortality: 418, 430, and 475 events/1000 T2D patients/yr, respectively. **CONCLUSIONS:** All UKPDS equations demonstrated internal validity when compared with published UKPDS data, however both UKPDS-RE and UKPDS-68 equations over predicted the incidence of CHD and mortality and under predicted stroke. While all endpoints predicted were reasonably concordant with observational data discrepancies between UKPDS-68 and UKPDS-RE are worthy of further investigation.

PDB24

EFFECTS OF INDUCING CORRELATION AMONG CHOLESTEROL PARAMETERS ON OUTCOMES IN SIMULATION OF PHARMACEUTICAL EFFECTIVENESS

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OBJECTIVES: To determine whether inducing correlation among triglyceride, HDL, and LDL levels in a pharmaceutical treatment Monte Carlo simulation affects parameters' means and variances; proportion with all parameters controlled; and summary statistics of estimated total cholesterol. **METHODS:** Means, standard deviations, and correlations among the cholesterol parameters were estimated from NHANES data for metabolic syndrome (MS) and diabetic patients with all parameters uncontrolled. For simulation, distributions were fit to the data. Analyses used 1000 replications of populations of 1000. Populations were generated without correlated parameters and with correlation induced in the uncorrelated data. Estimated changes with fenofibrate, statins, and a combination were taken from the literature. Total cholesterol was approximated using HDL, plus LDL, plus 20% of triglycerides. Differences in means and ratios of variances comparing uncorrelated and correlated results were calculated for each replication. Null hypotheses were rejected when the interval the middle 95% of replications spanned did not include zero for differences and one for ratios. **RESULTS:** Correlations were higher for diabetic than MS patients. Despite the data's and distribution's non-normality, induced correlations were close to NHANES correlations. Correlation did not affect the summary statistics of individual parameters or the proportion with all parameters under control. Correlation affected results for total cholesterol, the sum of other parameters. For MS, variance of total cholesterol was less than 7% lower with uncorrelated data than with correlated data. For diabetic patients, variance of total cholesterol was more than 20% higher with uncorrelated data. Findings held for subpopulations with and without all parameters controlled after taking medication. Variance results were similar across treatments. Total cholesterol means differed primarily for MS subgroups. **CONCLUSIONS:** Summary statistics (particularly variance) for sums of parameters are affected by correlation in Monte Carlo simulations. Underestimated and overestimated variances increase the risk of Type I and II error respectively.

PDB25

MARGINAL STRUCTURAL MODELS—AN EXPLANATION AND ILLUSTRATION

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OBJECTIVES: 1) Provide a concise explanation of "inverse probability of treatment weights" (IPTWs) for estimating marginal structural models (MSM), pointing out its advantages and disadvantages to alternative methods of adjusting for covariates in observational studies, and 2) illustrate use of MSM for comparing impact of drug use on medical costs. **METHODS:** Confounding can be controlled by stratification or with covariates in regression. When there are many confounders adjustment using propensity scores is sometimes used but these are 1) not easily generalized with more than two comparison groups, and 2) may result in residual confounding when matching is used, and is not helpful with time dependent covariates affected by the exposures being compared. An alternative is based on modeling the "marginal" distribution of counterfactuals associated with each group (as described by Robins, Hernan, and Brumback [2000]). This is accomplished using weights related to propensity scores. A MSM will be illustrated by comparing outpatient medical costs for patients taking diabetic drug treatments, adjusting for both baseline and subsequent time dependent diagnoses and lab data. A multinomial logit model is used to estimate each subject's conditional probability of receiving TZD, sulfonylurea, or metformin given their history of baseline and time dependent covariates. **RESULTS:** These predicted probabilities are basis for IPTWs used to estimate mean marginal outpatient costs for each drug group. **CONCLUSIONS:** Effects of confounders are broken when their associations with drug treatment groups are broken, and this can be done using MSM where the data is reweighted such that confounders have similar distributions within drug comparison groups.

PDB26

ANTIPSYCHOTIC UTILIZATION AND TREATMENT-EMERGENT DIABETES—A METHODOLOGICAL COMPARISON USING A CLAIMS DATABASE

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OBJECTIVE: To evaluate the robustness of the relationship between antipsychotic utilization and treatment-emergent diabetes among patients newly initiated on therapy, when methodologies were varied while controlling for covariates. **METHODS:** Seven models were created based on the following methodological variations: 1) study designs (retrospective cohort and case-control); 2) treatment exposure assignment (intent-to-treat (ITT) and as-treated (AT)); and 3) statistical approaches