

METHODS: A published economic simulation model of diabetes has been modified to allow for the calculation of the costs of glycaemic management and of treating diabetic complications over time. Age, gender, racial composition, cardiovascular risk factors and glycaemic parameters were taken from a recent clinical trial in diabetic patients. The risks of complications were derived from epidemiological studies. Costs of management of diabetes and its complications were based on French tariffs, published literature, and expert opinion. A cohort of 10,000 diabetic patients was simulated for 30 years. Future costs were discounted at 5% per year.

RESULTS: On average, the cumulative direct medical costs of managing diabetes and treating complications accrue to FFR 103,431 (€15,767) per patient. During the first eight years, more than 50% of the total costs are attributed to the treatment of macrovascular complications, stroke and myocardial infarction. Over more than 20 years, the cost of microvascular complications will rise to over 50%, driven primarily by the cost of end-stage renal disease. The cost of managing diabetes will remain at approximately 10% of the total cost throughout the model period.

CONCLUSIONS: Treatment of macrovascular complications dominates the total cost of diabetes over the first decade. Only after 20 years or more of treatment do the costs of microvascular complications become more important. Thus, the focus should be on efforts to reduce the risks of stroke and myocardial infarction in these patients.

PDG8

A POPULATION STUDY OF HEALTH-CARE COSTS ASSOCIATED WITH HYPOGLYCAEMIA

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OBJECTIVE: To quantify use of health-care resources for management of severe hypoglycaemia.

METHODS: We defined severe hypoglycaemia as an episode of coma or seizure requiring assistance from NHS personnel. We excluded any episodes managed exclusively by persons outside the health services. We included all patients with Type 1 or Type 2 diabetes registered with DARTS (Diabetes Audit and Research in Tayside Scotland) and receiving treatment with insulin or oral hypoglycaemic drugs from June 1, 1997 to May 31, 1998. We identified episodes from the records of three acute-care hospital emergency rooms, eight minor injury units in primary-care hospitals and from Tayside Ambulance Service records.

RESULTS: Over 150,000 records were searched to identify 295 people with one or more episodes, of which 39 were excluded because they were not residents of Tayside and another 12 because their identity could not be reliably confirmed. The incidence of major hypoglycaemia

per 100 patient years was 12.0 (95% CI 8.2-13.7) in Type 1 diabetics, 6.8 (CI 5.2-8.9) in Type 2 diabetics taking insulin and 0.8 (CI 0.6-1.0) in Type 2 diabetics on oral hypoglycaemics. Fifty-two patients required inpatient treatment. This compares with an incidence of 2.3 per 100 patient years for patients treated with insulin in the UKPDS trial and 5.4 in the conventional arm of the DCCT trial. The total health-care costs were £115,541 of which 64% was for inpatient stay, 25% for ambulance and 11% for emergency room.

CONCLUSIONS: The incidence of hypoglycaemia was three- to five-fold higher than previously reported in clinical trials, and extrapolation of our costs suggests that hypoglycaemia could cost the UK NHS as much as £16.2m per year.

PDG9

THE EVENT AND STATE COST OF COMPLICATIONS OF DIABETES IN THE NETHERLANDS

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OBJECTIVE: Prospective studies like UKPDS have shown that improved glycaemic control in diabetic patients can reduce the risk of micro- and macrovascular complications. To estimate the potential savings to health-care systems due to interventions aimed at improving glycaemic control, the cost of complications must be known. The objective of this study was to assess the cost of complications in type 2 diabetic patients in the Netherlands.

METHODS: A review of published literature and guidelines was combined with data from ongoing research projects and expert interviews to define the management patterns for diabetic complications. Data from detailed cost studies were used to estimate the Event cost (i.e., acute and post-acute care cost in the first year) and State cost (i.e., subsequent recurring annual cost) of complications in 2000 NLG.

RESULTS: The cost of nephropathy was dominated by the State cost of end stage renal disease (NLG 132,692). Event and State costs due to retinopathy were relatively low, except for the State cost of blindness (NLG 5,000). Lower extremity amputation costs NLG 33,683 per event and NLG 1,148 per year for subsequent management. The event cost for AMI and stroke were NLG 21,877 and NLG 39,867, respectively. The subsequent State costs were estimated at NLG 4,286 and NLG 16,131. Over a simulated 30-year time horizon, the cost due to macrovascular complications would account for 46% of the total cost of complications discounted at 4%.

CONCLUSION: The cost of diabetic complications in the Netherlands is substantial. Interventions that improve glycaemic control, and moreover, that affect the incidence

of end stage renal disease, AMI or stroke are likely to result in substantial cost-offsets.

PDG10

A PHARMACOECONOMIC MODEL OF HbA1c CONTROL IN THE TREATMENT OF TYPE 2 DIABETES

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OBJECTIVE: The UK Prospective Diabetes Study (UKPDS) has proven the relevance of an intensive glucose control policy in type 2 diabetes. UKPDS 35 has provided the evidence of a significant association between diabetes-related complications and level of HbA1c. We used the UKPDS findings to assess the cost-effectiveness of a new fixed-dose combination of metformin and glibenclamide, compared to the conventional strategy of the UKPDS.

METHODS: We developed a Markov model reflecting the management of two diabetic cohorts. The follow-up of a cohort of newly diagnosed 50-year-old patients, similar to the conventional group of the UKPDS, was simulated to follow HbA1c progression over a 10-year period. The second cohort, treated with metformin-glibenclamide, had the same demographic and clinical characteristics at baseline. The reduction rate of HbA1c under metformin-glibenclamide was extracted from a 20-week randomized double-blind trial. The HbA1c level in the metformin-glibenclamide cohort was assumed to progressively converge with that in the conventional group. The occurrence of complications was modeled through risk functions linking HbA1c levels to a conditional probability using UKPDS 23 and 35 results. Results were computed in a French context using a payer perspective. Only medical costs were considered. A sensitivity analysis was performed on the reduction rate of HbA1c under metformin-glibenclamide between 0.8 (best case) and 1.5 (worst case).

RESULTS: Cumulative medical costs amounted to EUR 7,240 in the conventional group versus EUR 7,759 in the metformin-glibenclamide group. A 6.1% decrease in the mean number of events per patient was obtained. The additional cost per life year saved was EUR 13,142 (9,924 (best case), 17,912 (worst case)) and the additional cost per complication-free year was EUR 5,736 (4,312 (worst case), 7,842 (best case)).

CONCLUSION: These results suggest that metformin-glibenclamide is cost-effective in the treatment of type 2 diabetes when compared with conventional therapy.

PDG11

HEALTH AND ECONOMIC OUTCOMES OF A NEW ORAL DIABETES DRUG, PIOGLITAZONE (ACTOS*NF, TAKEDA), IN THE MANAGEMENT OF TYPE 2 DIABETES MELLITUS IN NORWAY

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OBJECTIVE: To assess the cost-effectiveness of pioglitazone (PIO) based combinations versus alternatives for patients with type 2 diabetes in Norway.

METHODS: A published/validated model for type1 diabetes developed by IMIB was adapted to simulate long-term management, health outcomes, resource utilisation and treatment costs of patients with type2 diabetes. The model accounts for most complications in diabetes patients: nephropathy; retinopathy; acute myocardial infarction; angina pectoris; stroke, and amputation. The analysis was done from third-party-payer perspective and costs figured relative to the year 2000. A 5% discount rate was applied and sensitivity analysis was done to test the results.

RESULTS: Pioglitazone PIO 30 mg and metformin (MF) were associated with longer life expectancy (16.10 years) than sulphonylureas(SU)/MF (15.24) or rosiglitazone (RSG)/MET (15.95). PIO 30 mg/SU and PIO 15 mg/SU are associated with the lowest number of serious complications per 100 patients treated. For every 95 patients treated with PIO 30 mg/MF rather than SU/MF or every 27 patients, respectively, for PIO,30 mg/SU rather MF/SU, one complication is avoided. Combinations of PIO 30 mg/SU, PIO 30 mg/MF and PIO 15 mg/SU are associated with lower mortality than the other treatment combinations available. Thus, for every 34 patients treated with PIO 30 mg/MF rather than SU/MF, one death will be avoided after 15 years of treatment. After discounting both costs and life years at 5%, the above incremental cost-per-life-year is 29,406 Norway Kroner (NOK) in comparison to SU/MF, but still PIO dominates the combination therapy with RSG 8 mg. The picture is similar in the case of PIO 30 mg/SU combination compared to MFSU, where in the undiscounted incremental cost per life year gained, PIO dominates, and the cost per life year gained is raised to 25,992 NOK after discounting at 5%. **CONCLUSION:** Pioglitazone-based treatment for patients with type2 diabetes improves survival and reduces complications and therefore represents a cost-effective use of health-care resources in Norway. Nonetheless, these results must be confirmed by long-term observational studies.

PDG12

CLINICAL BENEFITS AND COST-OFFSETS OF COMBINATION THERAPY WITH NATEGLINIDE PLUS METFORMIN VERSUS METFORMIN ALONE IN DIABETES IN THE NETHERLANDS

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OBJECTIVE: The objective of this study is to assess the