



University
of Glasgow

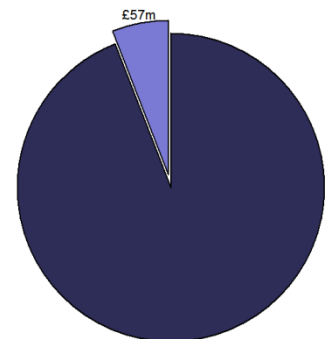
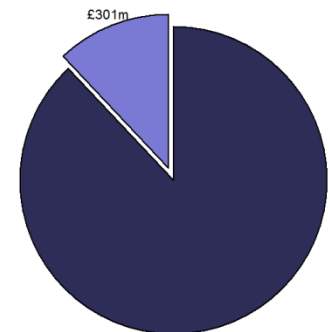
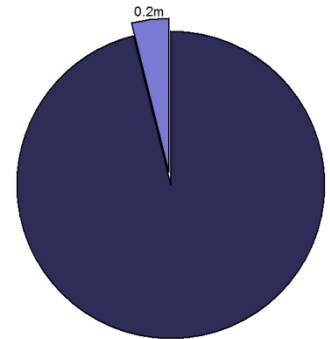
Estimating the total costs of prescribed medicines attributable to people with diabetes in Scotland

L Govan, A Briggs, O Wu, R Lindsay
University of Glasgow

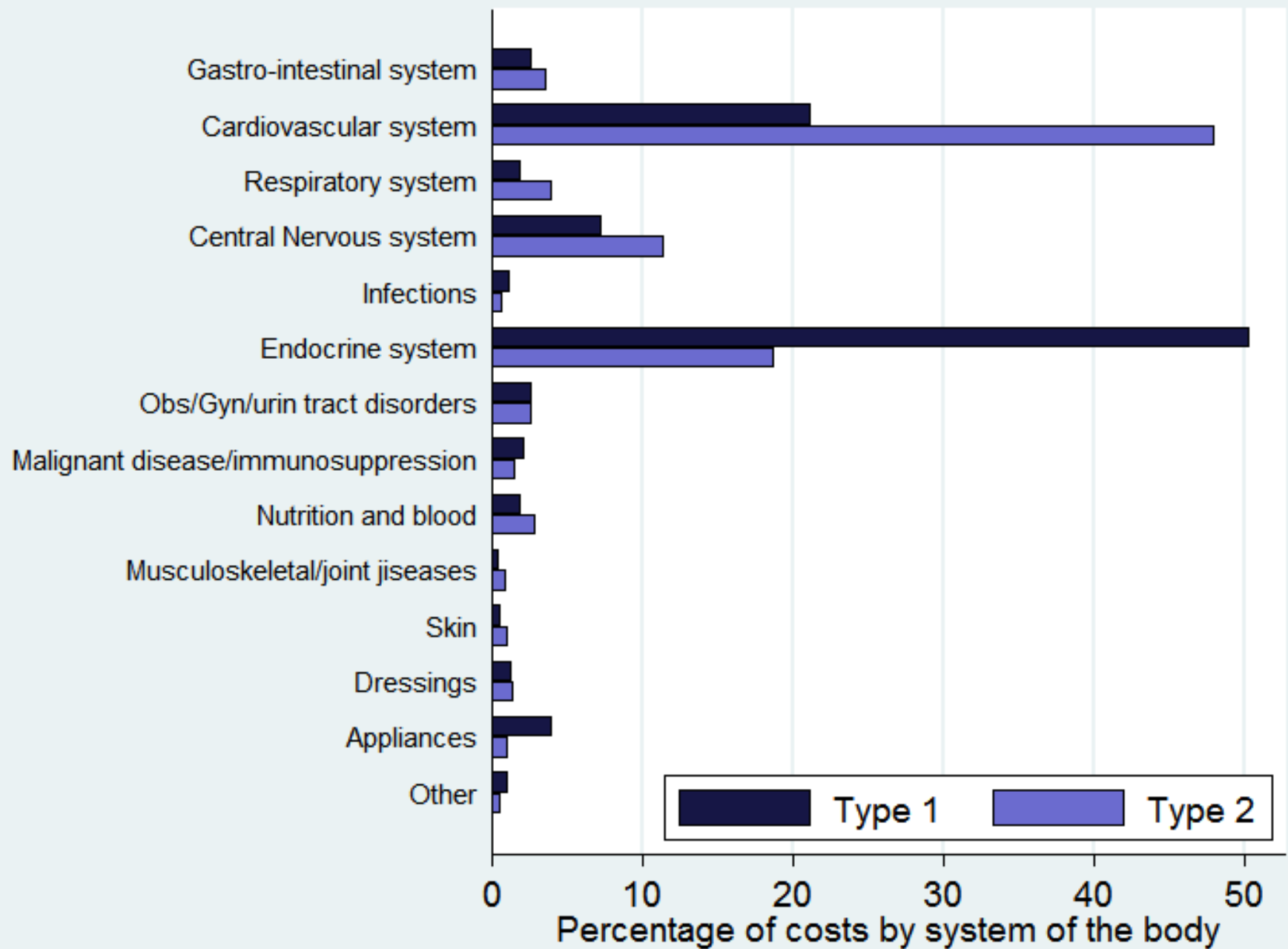
- Overall aim was to estimate total cost of diabetes in Scotland
 1. Estimate inpatient admissions costs and investigate characteristics associated with inpatient admission and cost
 2. Estimate prescription costs and investigate characteristics associated with prescription costs
 3. Create a base to develop economic model for health interventions

Background

- **220,000** people in Scotland have diabetes (4% of the Scottish population)
- Annual cost of admission for people with diabetes in Scotland is **£301m** (12% of Scottish inpatient expenditure)
- **£57m** was spent on Insulin, Oral anti-diabetics, and screening/monitoring agents (6% of Scottish prescription expenditure)

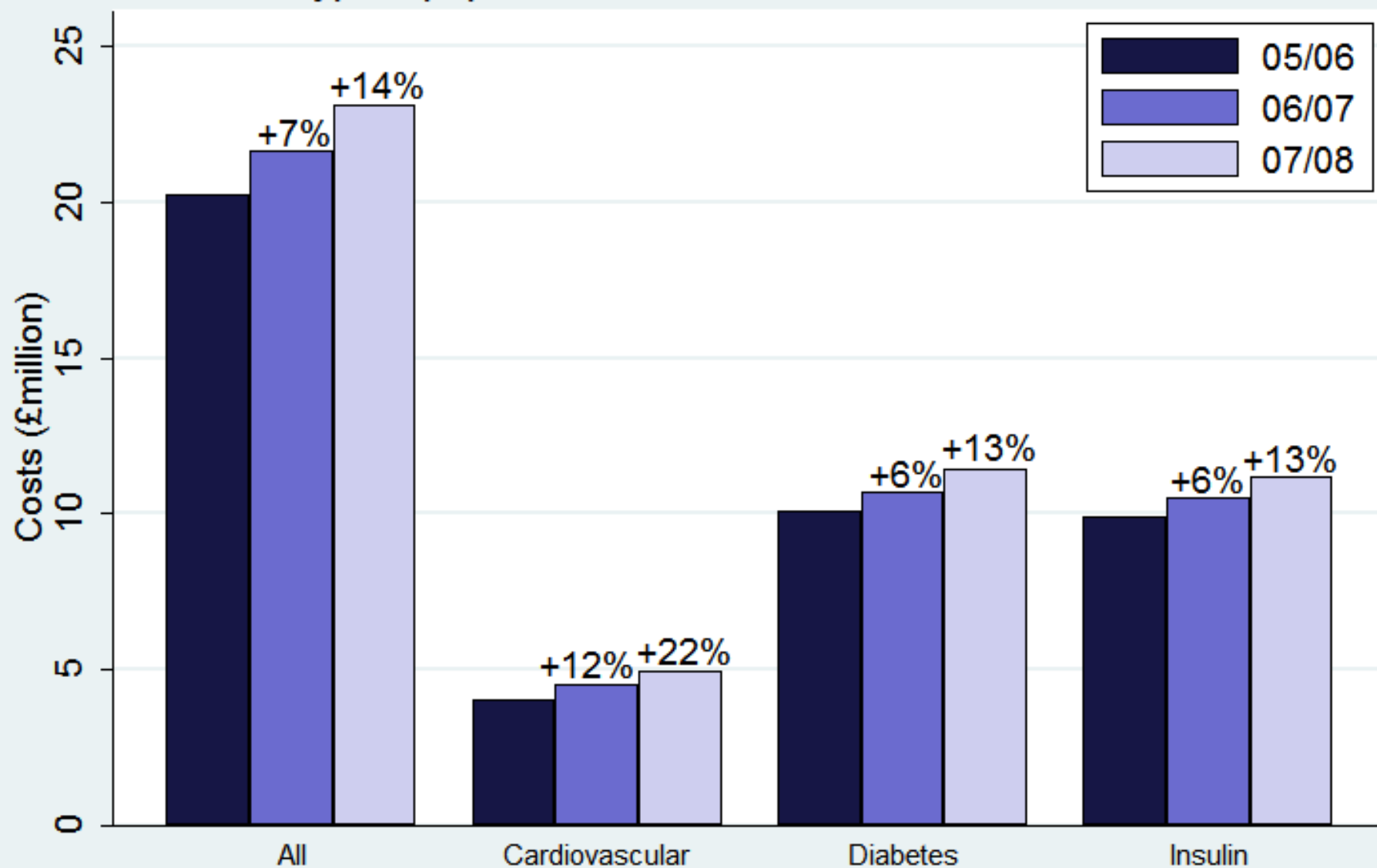


- Scottish Care Information – Diabetes Collaboration (SCI-DC)
 - National register of diagnosed diabetes in Scotland, 99% coverage
 - Contains detailed patient and clinical information, and data on **prescribed** medications
- Prescription Cost Analysis (PCA)
 - Standard NHS costs for **dispensed** medications
 - Prescription data and PCA matched using drug name, strength and formulation; matching was achieved in 96% of records in SCI-DC prescription file
- Cost of prescriptions assessed using generalised linear model with gamma family and log link functions
- For type1 and type 2 diabetes, models examined associations of costs with age, sex, deprivation, creatinine, BMI, HbA1c, and diabetes duration



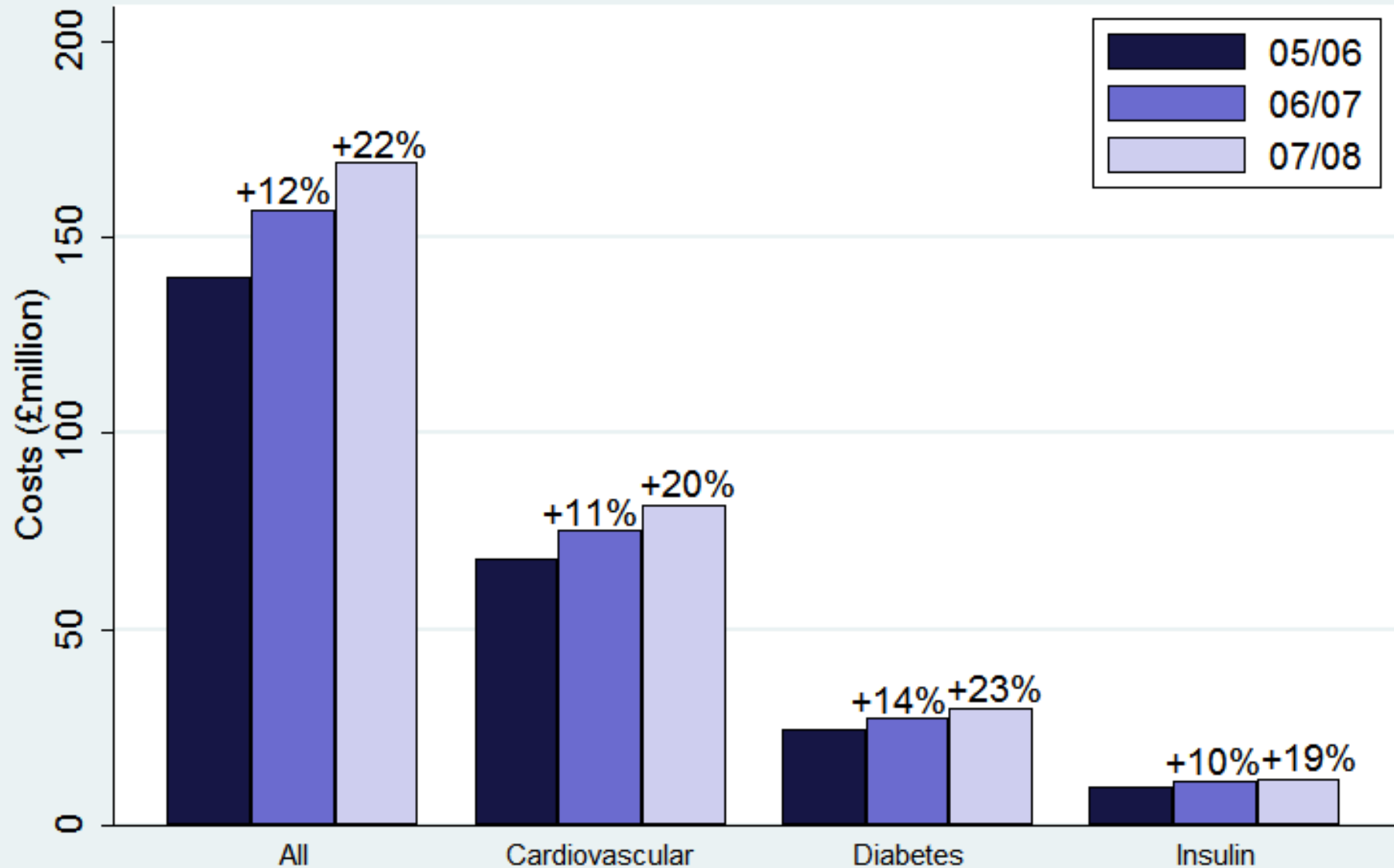
Type 1 costs 14% increase between 2005-2007

Type 1 population 4% increase between 2005-2007



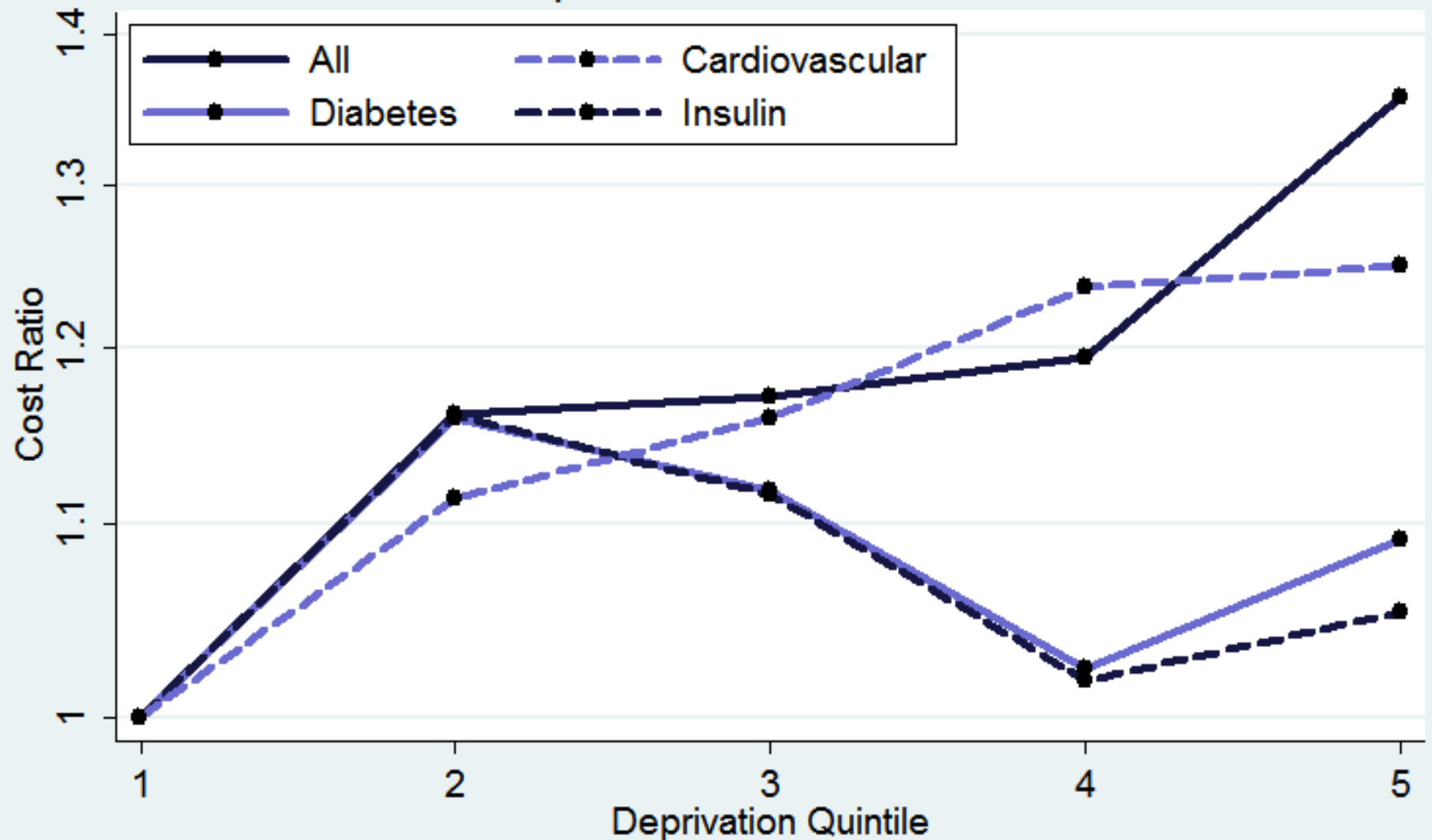
Type 2 costs 21% increase between 2005-2007

Type 2 population 10% increase between 2005-2007



Type 1: Deprivation and costs

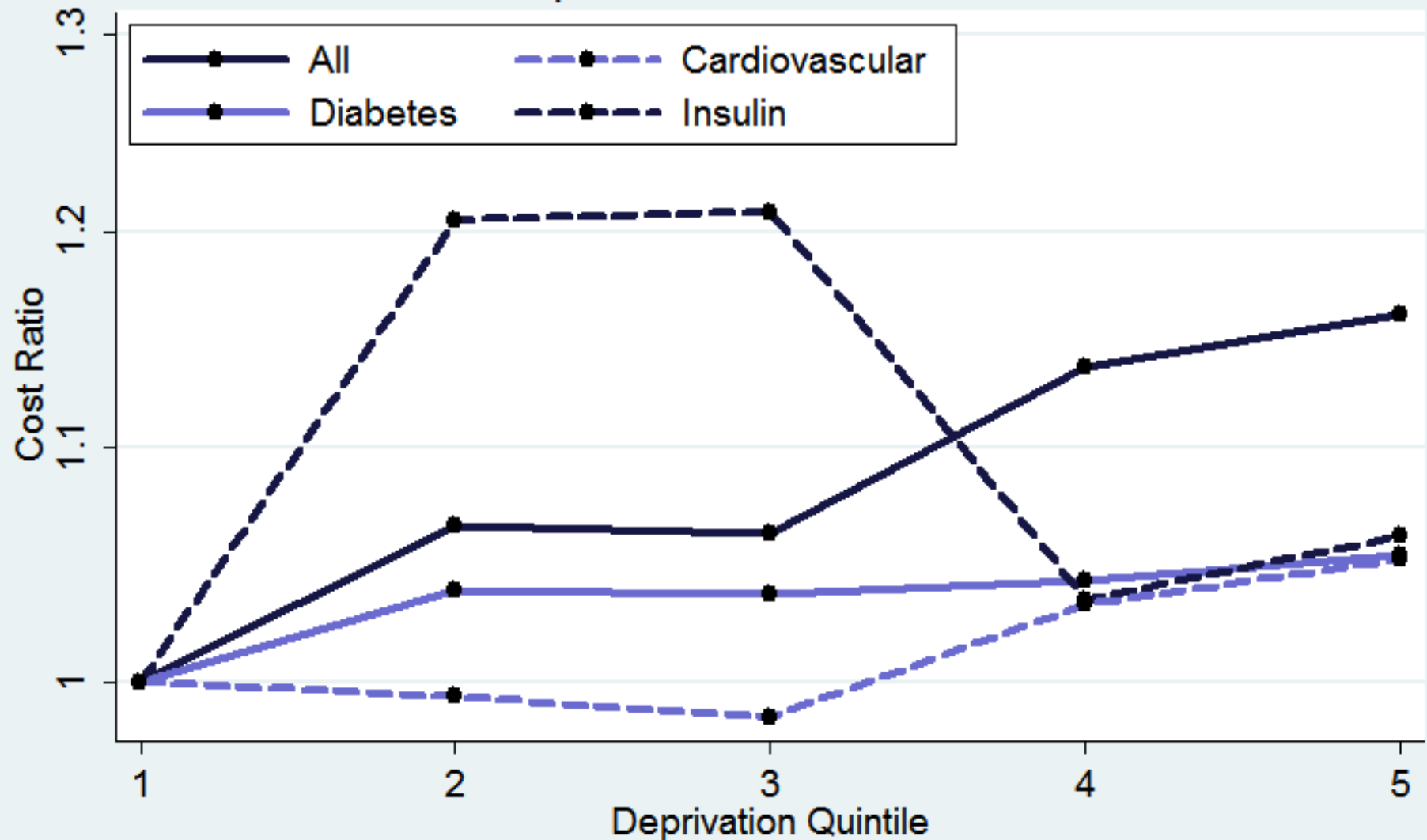
Increased deprivation has increased costs overall



From a multivariate model

Type 2: Deprivation and costs

Increased deprivation has increased costs overall



From a multivariate model

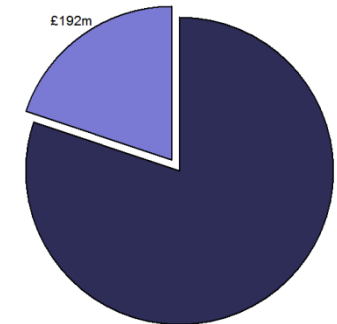
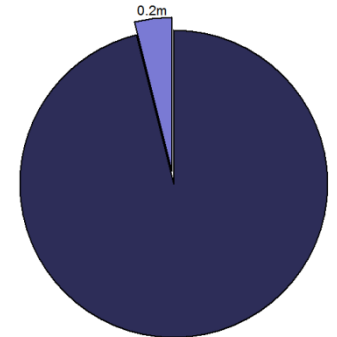
Results

	All	Diabetes	Insulin
Type 1	Cost Ratio (95%CI)	Cost Ratio (95%CI)	Cost Ratio (95%CI)
Male	1.033 (0.964-1.107)	1.229 (1.143-1.321)	1.224 (1.139-1.315)
Age	1.006 (1.004-1.008)	0.989 (0.986-0.991)	0.989 (0.986-0.991)
BMI	1.015 (1.007-1.023)	1.032 (1.026-1.039)	1.033 (1.027-1.040)
LN(HbA1c)/0.0953	1.002 (0.986-1.019)	1.036 (1.011-1.062)	1.037 (1.011-1.063)

	All	Diabetes	Insulin
Type 2	Cost Ratio (95%CI)	Cost Ratio (95%CI)	Cost Ratio (95%CI)
Male	0.943 (0.921-0.967)	1.018 (0.990-1.047)	0.815 (0.734-0.907)
Age	0.999 (0.998-1.001)	0.981 (0.980-0.983)	0.956 (0.952-0.960)
BMI	1.009 (1.005-1.012)	1.038 (1.036-1.040)	1.019 (1.013-1.026)
LN(HbA1c)/0.0953	1.014 (1.008-1.021)	1.257 (1.247-1.268)	1.494 (1.455-1.535)

Summary

- Diabetes patients account for 4.3% of the Scottish population
- Prescriptions for people with diabetes accounts for **£192m** (20% of total Scottish prescription expenditure)
- In type 1 diabetes, males are associated with higher costs, whereas the opposite is true in type 2
- Younger people and larger BMI assoc. with higher costs
- For diabetes and insulin costs, higher HbA1c is associated with greater costs



Future directions

- Examine associations between characteristics and cost of prescriptions in more detail
- Compare estimated costs of prescribed medications to dispensed medications (in collaboration with Information Services Division, NHS Scotland)
- Which factors can be used to predict prescription cost?

Results – All prescriptions

	Type 1	Type 2
	Cost Ratio (95%CI)	Cost Ratio (95%CI)
Male	1.033 (0.964-1.107)	0.943 (0.921-0.967)
Age	1.006 (1.004-1.008)	0.999 (0.998-1.001)
SIMD – Q1 (least deprived)	-	-
SIMD – Q2	1.161 (1.067-1.263)	1.065 (1.026-1.106)
SIMD – Q3	1.171 (1.100-1.246)	1.062 (1.036-1.089)
SIMD – Q4	1.194 (1.133-1.259)	1.136 (1.082-1.193)
SIMD – Q5 (most deprived)	1.358 (1.170-1.576)	1.161 (1.140-1.182)
Diabetes duration	1.004 (1.001-1.006)	1.023 (1.022-1.024)
LN(Creatinine)	1.409 (1.289-1.541)	1.236 (1.131-1.350)
BMI	1.015 (1.007-1.023)	1.009 (1.005-1.012)
LN(HbA1c)/0.09531	1.002 (0.986-1.019)	1.014 (1.008-1.021)
Year 2006	1.057 (1.003-1.113)	1.057 (1.033-1.081)
Year 2007	1.079 (1.014-1.149)	1.071 (1.043-1.099)

Results – Diabetes prescriptions

	Type 1	Type 2
	Cost Ratio (95%CI)	Cost Ratio (95%CI)
Male	1.229 (1.143-1.321)	1.018 (0.990-1.047)
Age	0.989 (0.986-0.991)	0.981 (0.980-0.983)
SIMD – Q1 (least deprived)	-	-
SIMD – Q2	1.159 (1.030-1.304)	1.038 (0.983-1.095)
SIMD – Q3	1.118 (1.029-1.216)	1.036 (0.995-1.079)
SIMD – Q4	1.024 (0.980-1.069)	1.042 (1.004-1.081)
SIMD – Q5 (most deprived)	1.091 (0.981-1.213)	1.053 (1.015-1.093)
Diabetes duration	1.002 (0.998-1.007)	1.117 (1.115-1.120)
LN(Creatinine)	0.959 (0.899-1.023)	1.158 (1.107-1.212)
BMI	1.032 (1.026-1.039)	1.038 (1.036-1.040)
LN(HbA1c)/0.09531	1.036 (1.011-1.062)	1.257 (1.247-1.268)
Year 2006	1.046 (0.965-1.134)	1.079 (1.053-1.106)
Year 2007	1.063 (0.988-1.144)	1.077 (1.056-1.099)

Results – Insulin prescriptions

	Type 1	Type 2
	Cost Ratio (95%CI)	Cost Ratio (95%CI)
Male	1.224 (1.139-1.315)	0.815 (0.734-0.907)
Age	0.989 (0.986-0.991)	0.956 (0.952-0.960)
SIMD – Q1 (least deprived)	-	-
SIMD – Q2	1.160 (1.031-1.305)	1.206 (0.998-1.456)
SIMD – Q3	1.116 (1.025-1.214)	1.210 (1.065-1.374)
SIMD – Q4	1.018 (0.974-1.063)	1.034 (0.929-1.150)
SIMD – Q5 (most deprived)	1.053 (0.953-1.165)	1.061 (0.952-1.183)
Diabetes duration	1.001 (0.997-1.005)	1.214 (1.205-3.917)
LN(Creatinine)	0.961 (0.904-1.022)	3.283 (2.751-3.917)
BMI	1.033 (1.027-1.040)	1.019 (1.013-1.026)
LN(HbA1c)/0.09531	1.037 (1.011-1.063)	1.494 (1.455-1.535)
Year 2006	1.034 (0.957-1.117)	1.086 (0.989-1.194)
Year 2007	1.065 (0.988-1.148)	1.059 (0.998-1.123)