



# Hypoglycaemia in the community

---

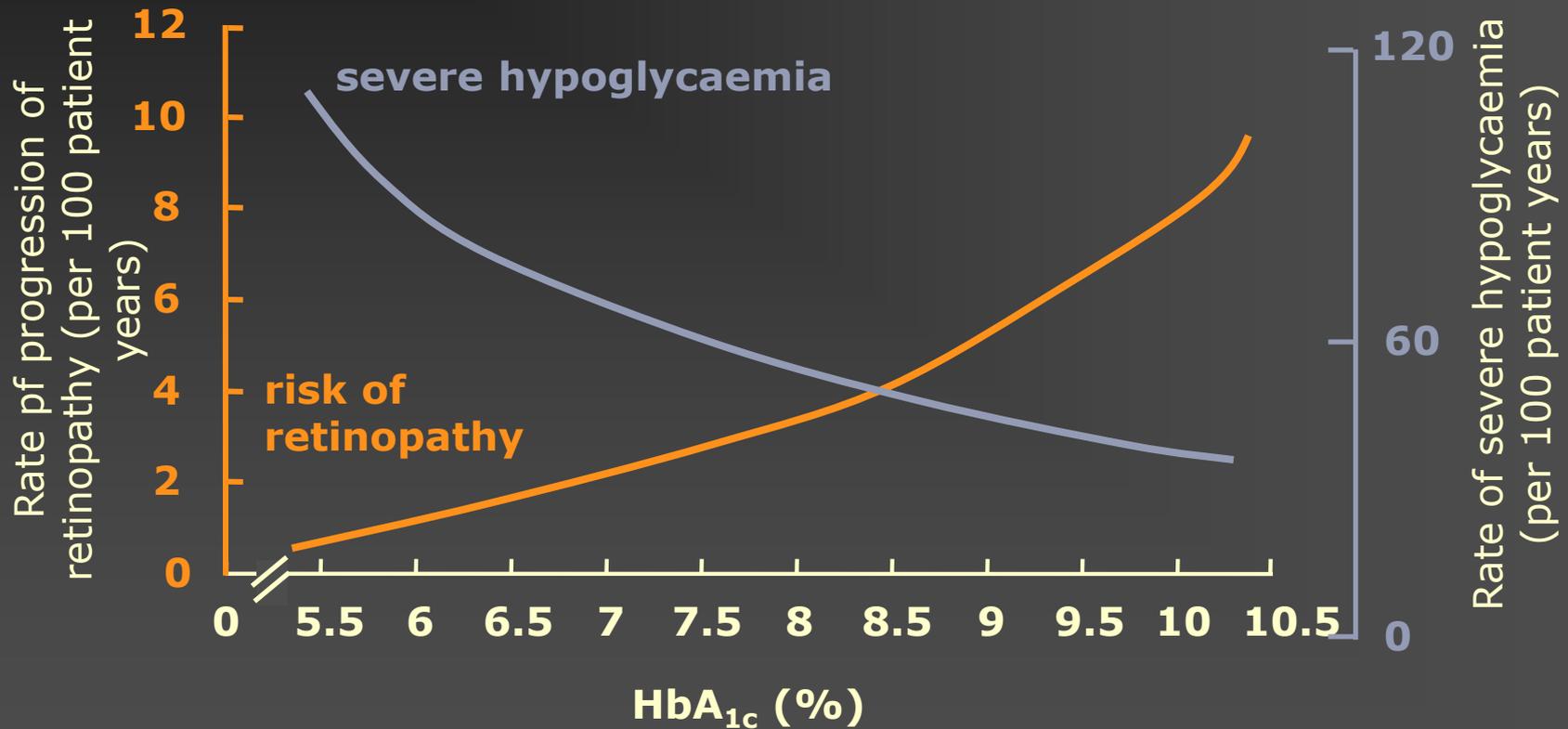
Using local data to monitor the  
quality of diabetes services

Adrian R Scott

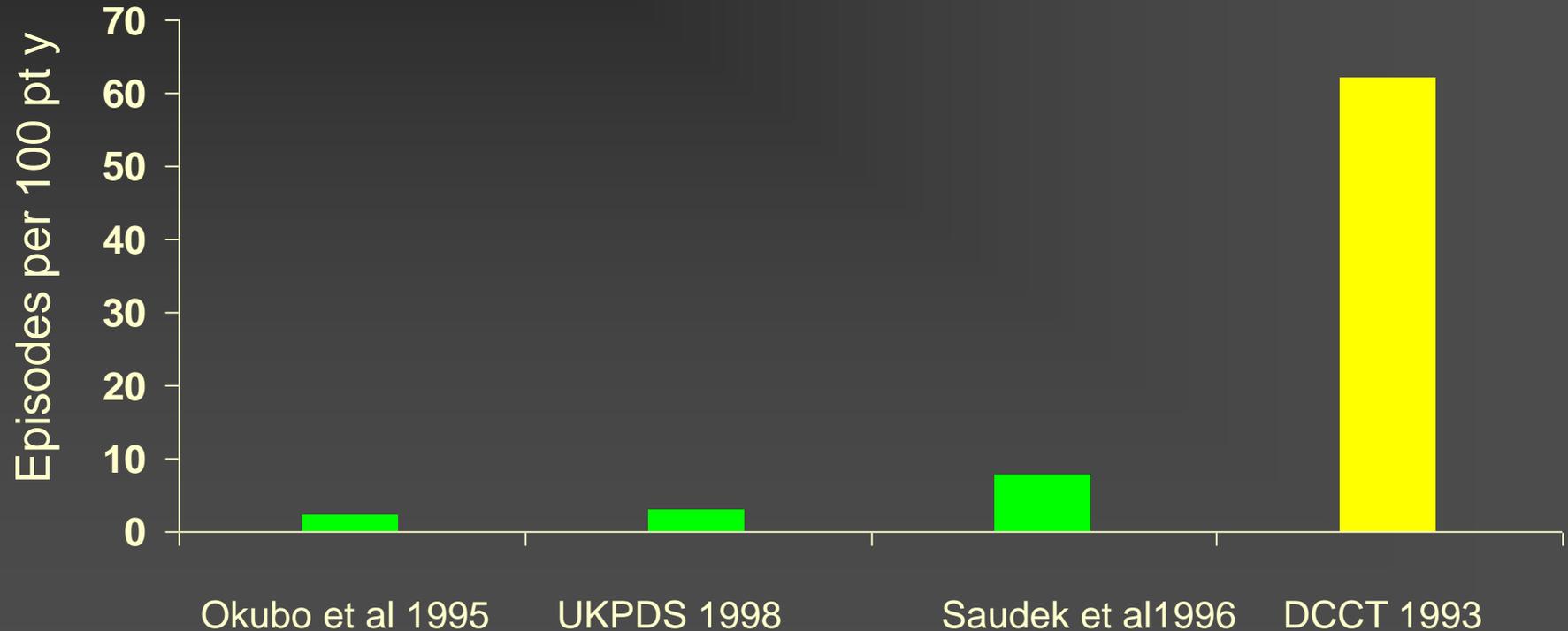
11<sup>th</sup> April 2008

Sheffield Teaching Hospitals NHS Foundation Trust

# DCCT: the price of improved diabetic control – hypoglycaemia



# Risks of hypoglycaemia during intensive insulin therapy in Type 1 and Type 2 diabetes



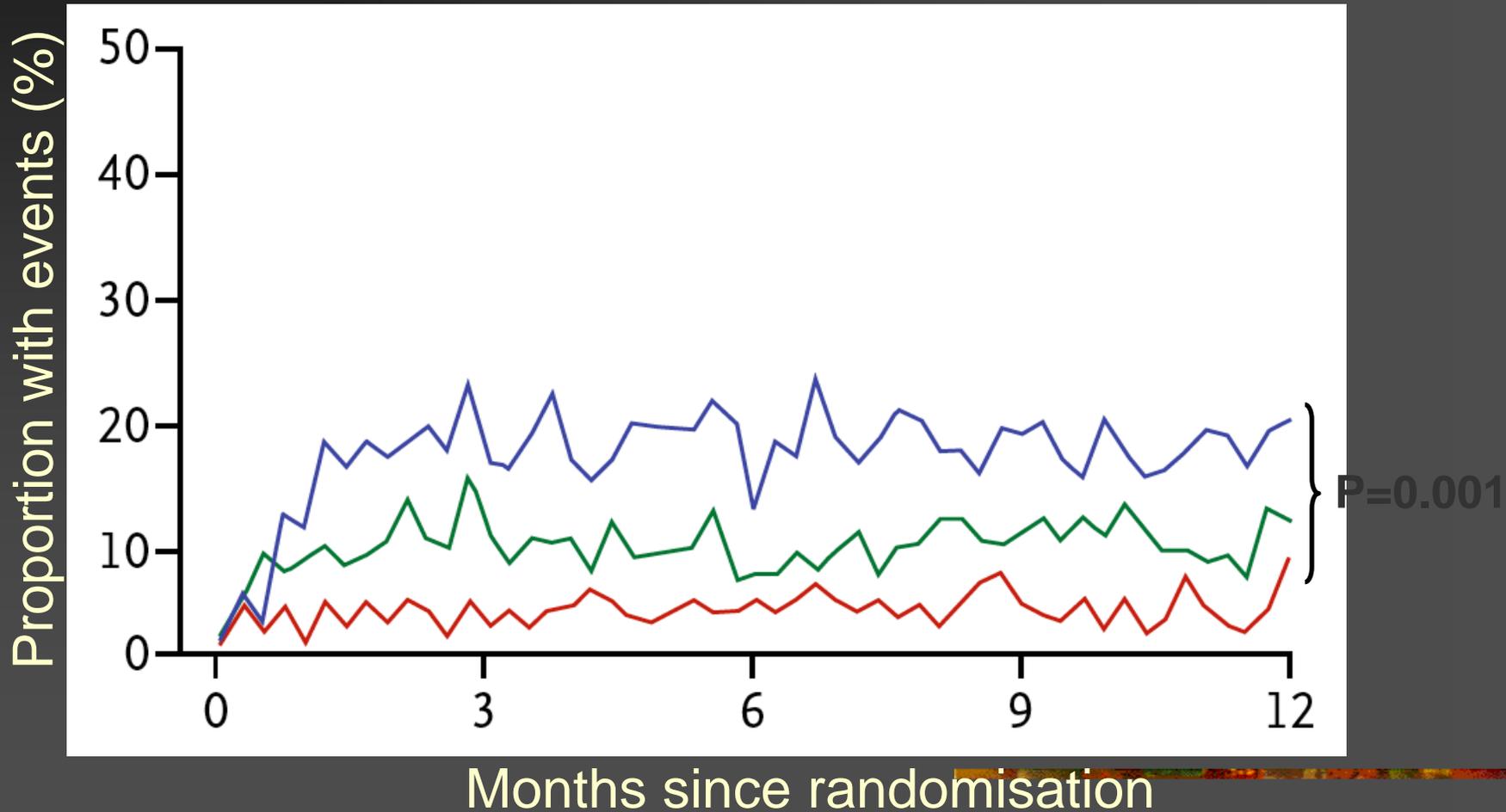
# Dusseldorf / DAFNE

---

- Berger et al demonstrated hypo rates in intensively treated people with T1DM to be much lower than in DCCT
  - DAFNE study showed similar (low) rates as Dusseldorf
-

# 4T study - hypoglycaemia ( $\geq$ Grade 2) over 1 Year

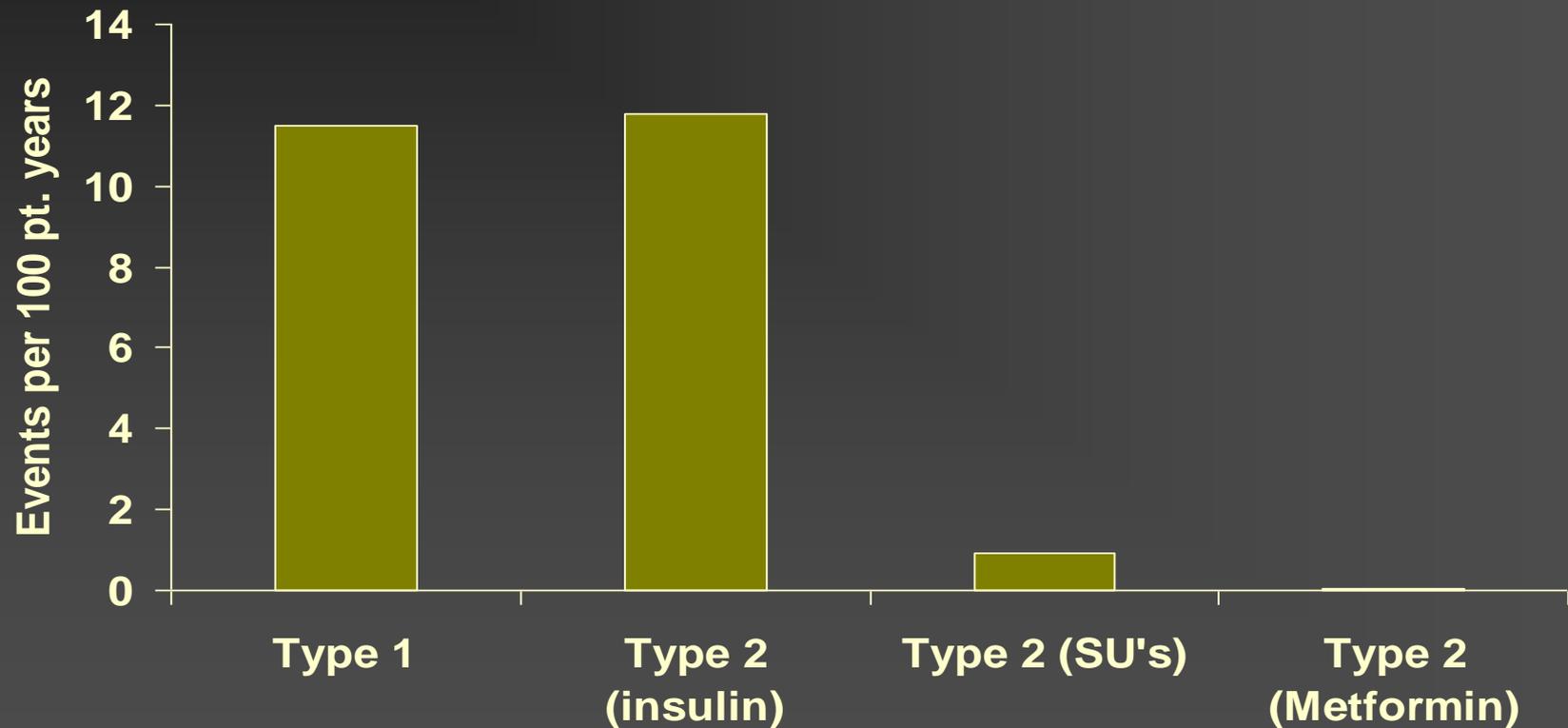
— Biphasic	5.7	<b>Mean events/patient/year</b>
— Prandial	12.0	
— Basal	2.3	



# Frequency of Severe Hypoglycemia Requiring Emergency Treatment in Type 1 and Type 2 Diabetes

- Tayside study looked at routinely collected datasets in a population of 367,051 people, including 8,655 people with diabetes
- All episodes of hypoglycemia between June 1997 and May 1998 that required emergency treatment from primary care, ambulance, and accident and emergency or hospital services were identified

# Frequency of Severe Hypoglycaemia Requiring Emergency Treatment in Type 1 and Type 2 Diabetes



# Frequency and outcome of severe hypos

- 11 events per 100 pt years in insulin treated patients
- 69 individuals with type 1 diabetes suffering 112 events
- 91 individuals with type 2 diabetes suffering 132 events.
- Of 260 episodes, 89 (34%) involved contact with the ambulance service only
- 19 (7%) were with accident and emergency/primary care services only
- 134 (52%) were with both
- 52 cases (28%) resulted in direct or indirect hospital admission (230 bed days)

	Ambulance	A & E	Ward
No. of episodes	223	153	52
Tayside (cost per day)	£127	£89	£218
Cost of hypoglycaemia	£28,321	£13,167	£50,140

***Cost analysis of hypoglycaemia in Tayside (for comparison costs per case in Scotland for ambulance, Accident and Emergency [A&E] attendance, and ward admission [per day] is £130, £41, and £1593, respectively.)***



Hypoglycaemia - an avoidable  
complication of diabetes therapy?

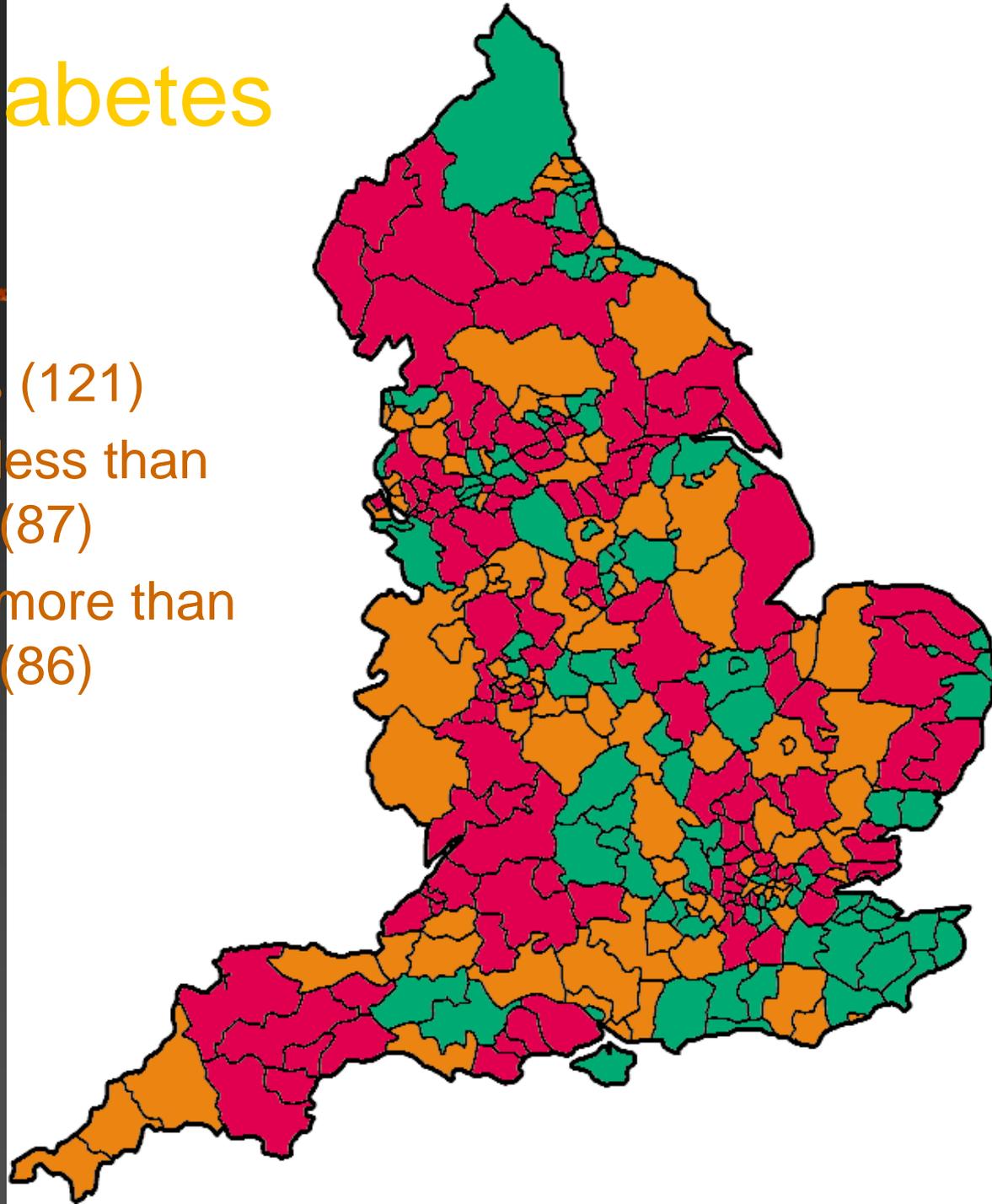
---

# Practice based commissioning

- The Commissioning Toolkit recommends that PCT's should undertake a health needs assessment prior to commissioning diabetes services.
- Data hard to come by:
  - GP disease registers
  - Hospital Episode Statistics (HES)
  - Dr Foster (HES)
  - National Diabetes Audit (HES)
  - Quality Outcomes Framework (QOF)
  - Retinal screening programmes
  - Laboratory databases

# National Diabetes Audit

- No registrations (121)
- Registered but less than 60% submitted (87)
- Registered but more than 50% submitted (86)



# Rates of Hypoglycaemia

---

- Not monitored by QOF
  - Not collected by National Diabetes Audit
  - Not reported by Ambulance services
-

# Purpose of project

---

- What is the burden of diabetes locally?
  - What are the local rates of severe hypoglycaemia?
  - Are they increasing?
  - Can we set up mechanisms to reduce risk of recurrence?
  - What is the national picture?
-



# How to obtain the data?

---

First calculate the  
denominator....

# How many people with diabetes in Sheffield?

---

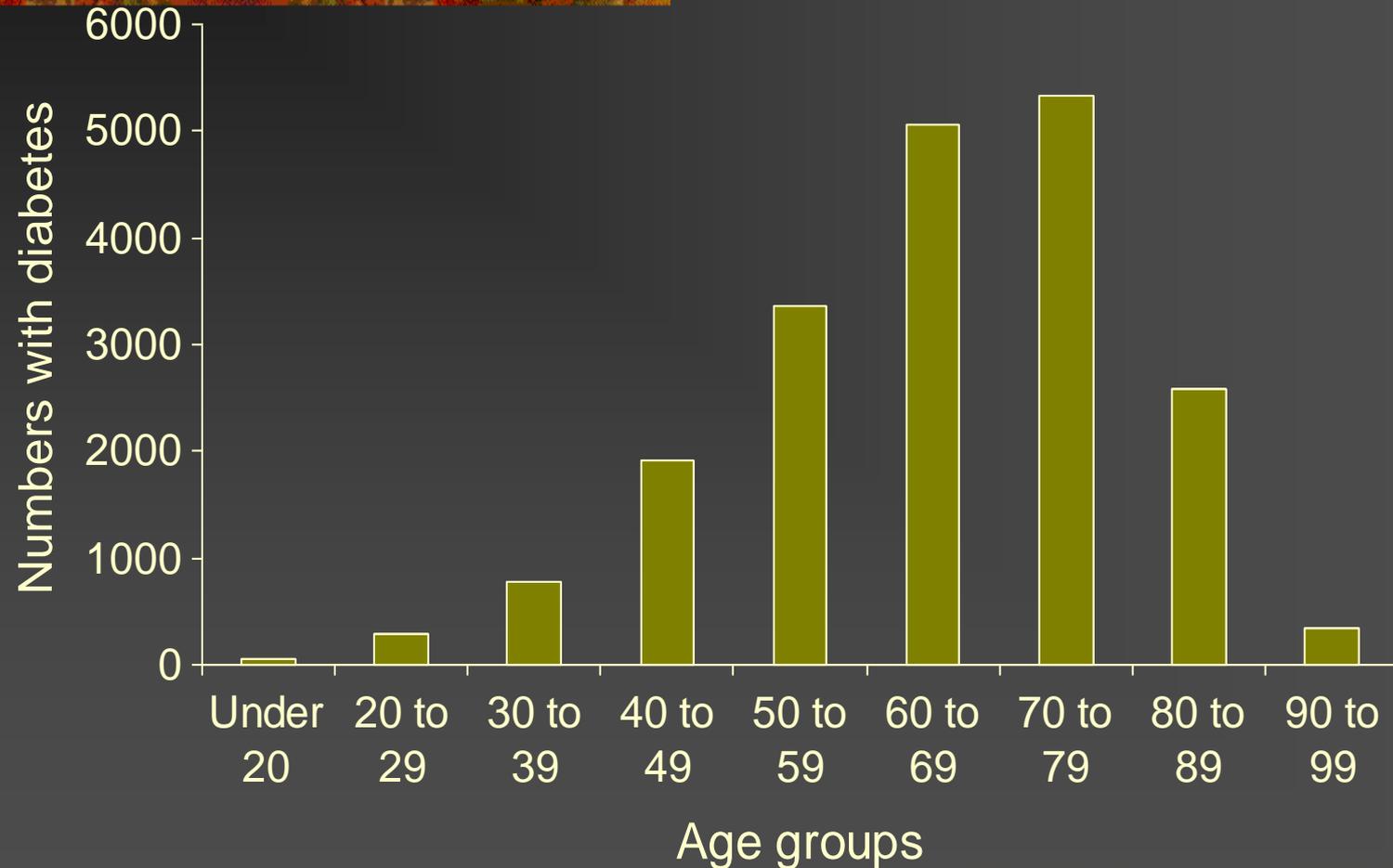
- GP disease registers
  - Sheffield Diabetes Retinal screening programme run by Ophthalmology dept. of STH NHS Foundation Trust
  - Registrations from GP disease registers and hospital diabetes clinics
  - By 2007 98% offered screening
-

# Initial data extraction

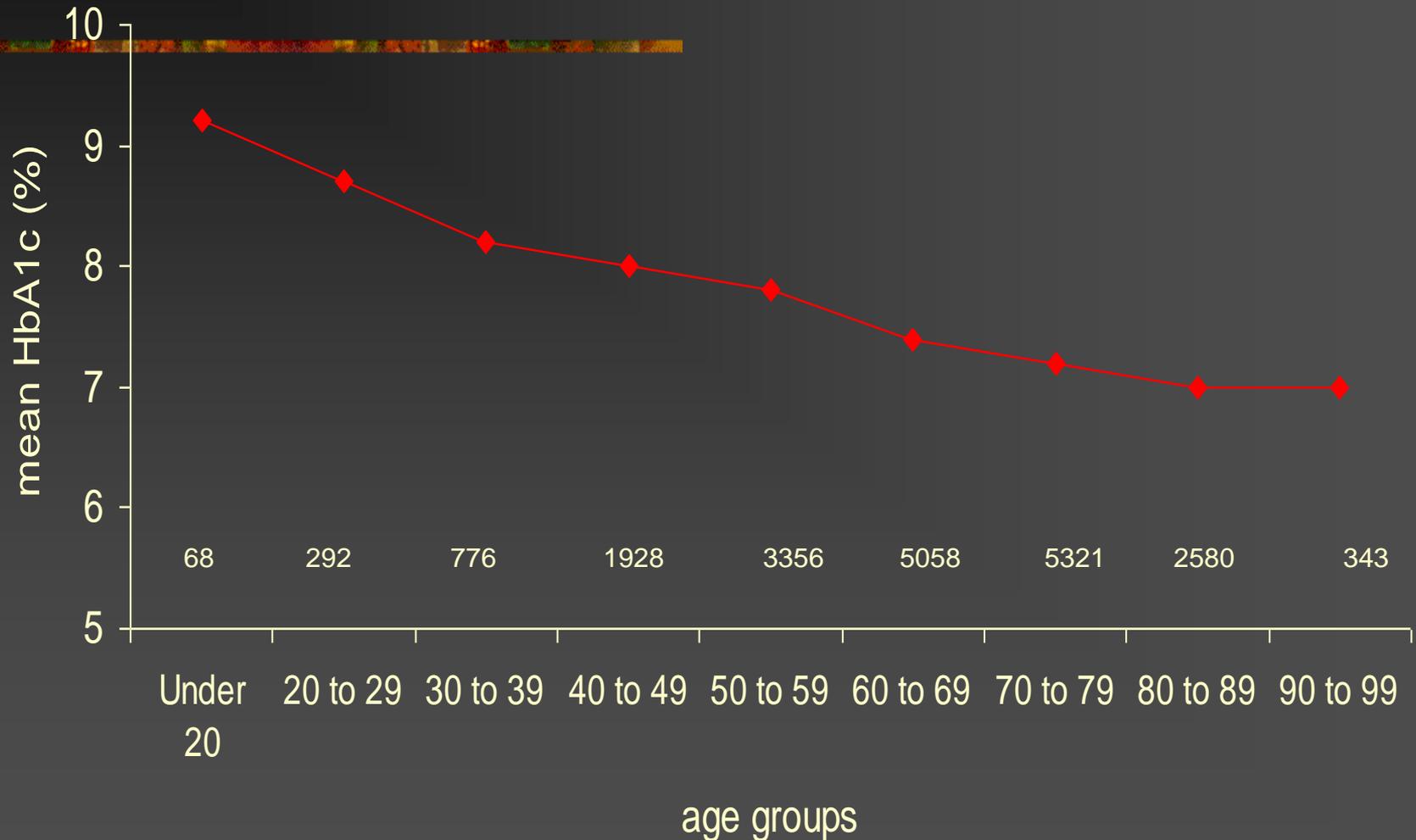
---

- April 2007, 19786 living individuals identified with a Sheffield postcode on Retinal Screening database
  - Pathology database searched for last HbA1c, Creatinine and lipids measured in past 15 months
-

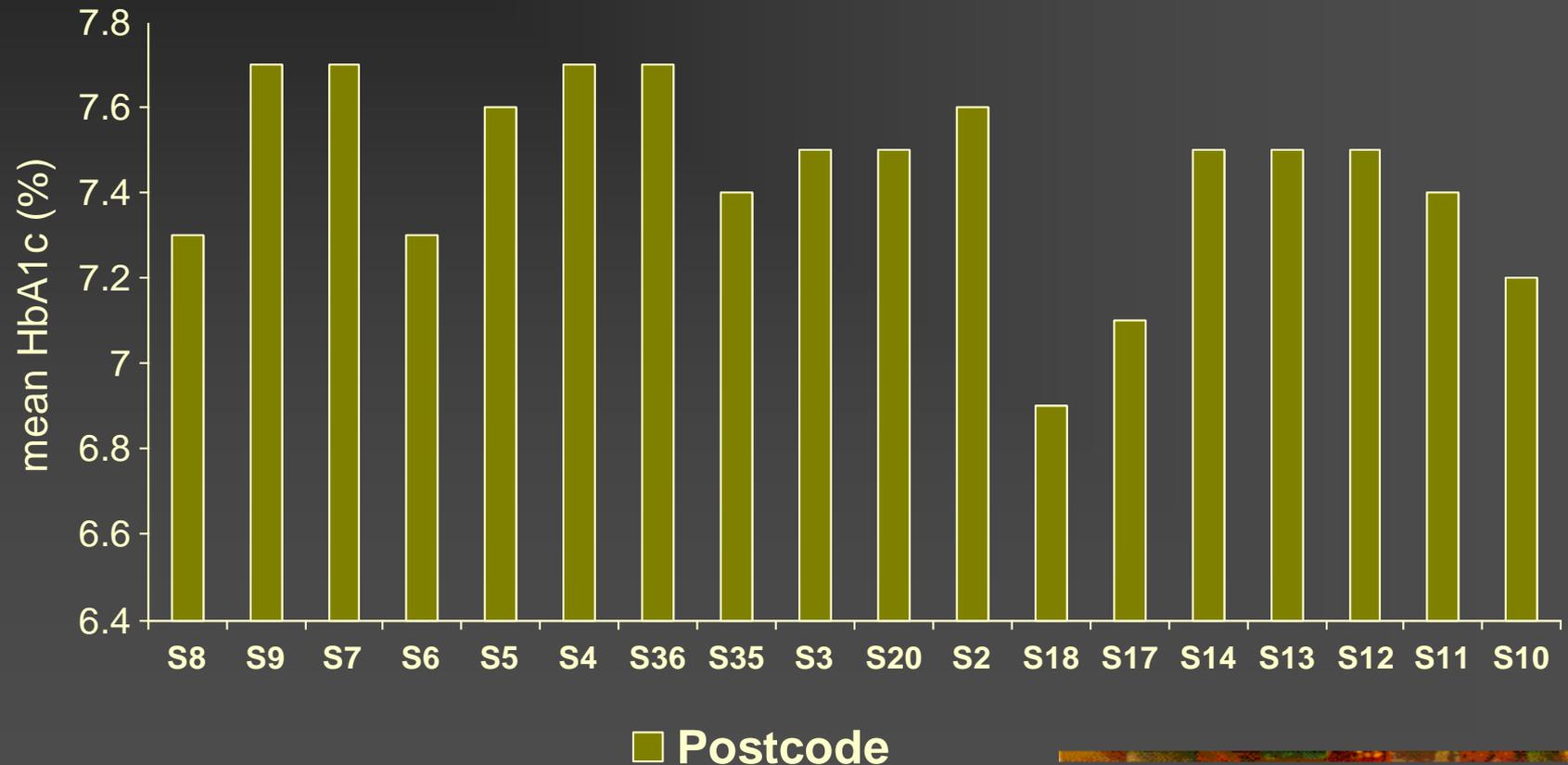
# Diabetes by age group (all Sheffield N=19722)



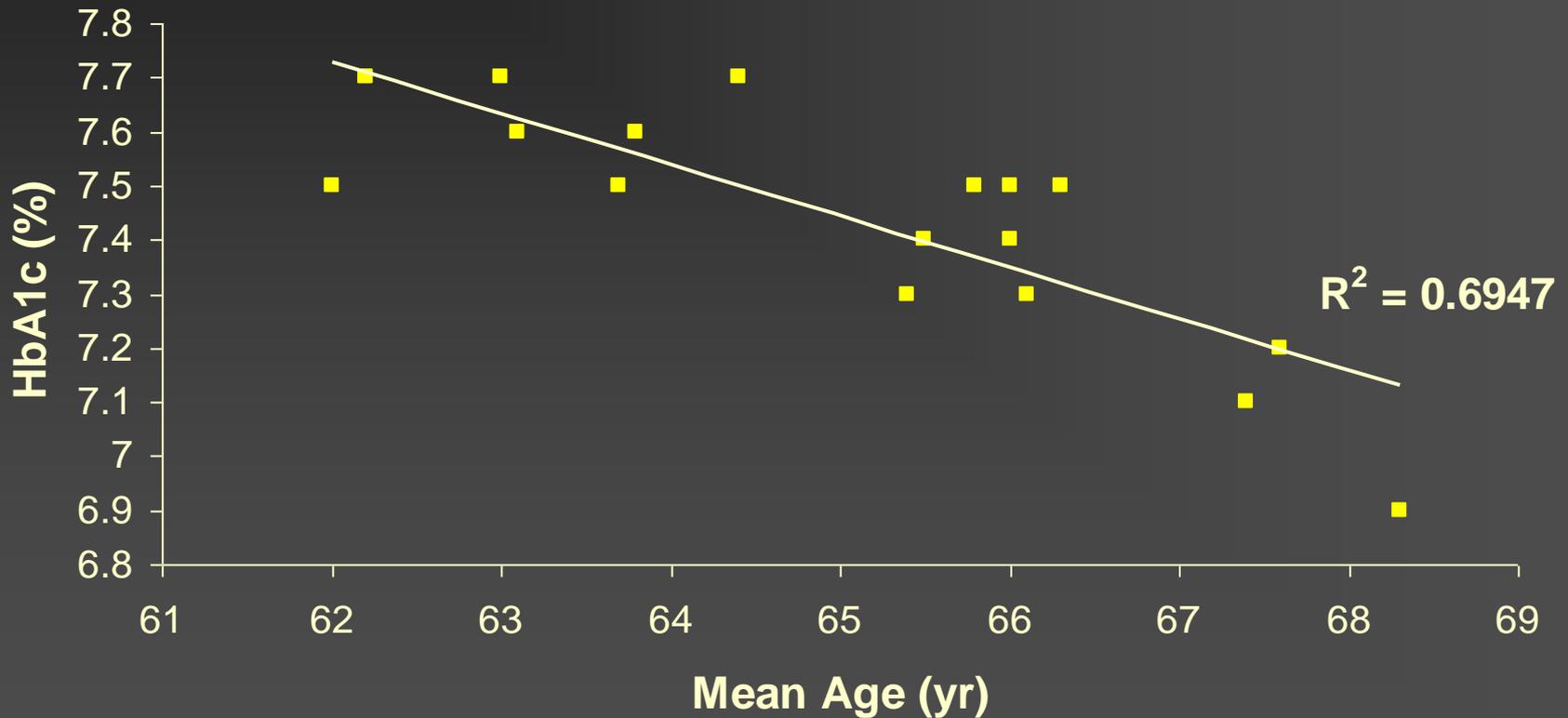
# Mean HbA1c by age group (19,577)



# Mean HbA1c by postcode



# Relationship between age and HbA1c by Postcode





# Admissions

---

# Prevalence of diabetes in hospital in-patients

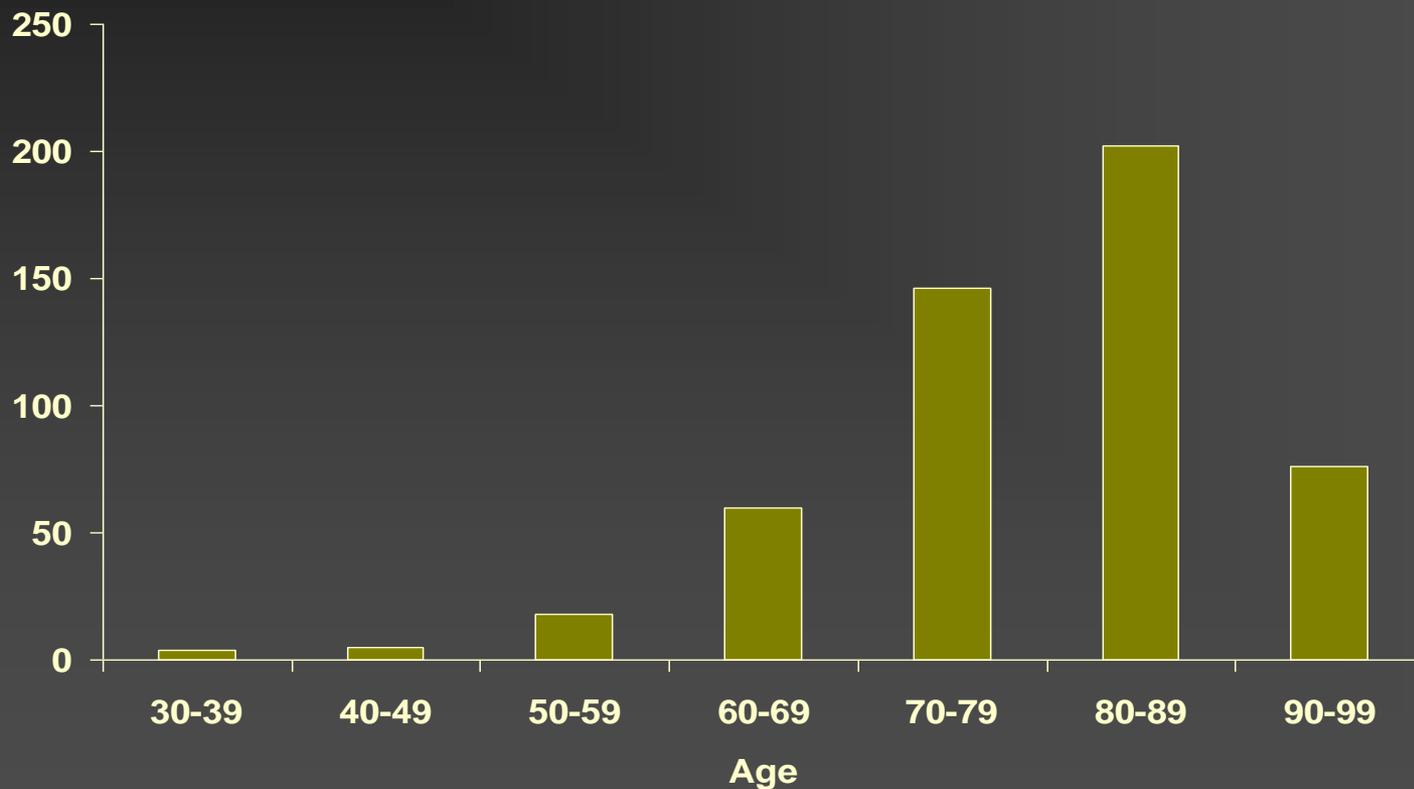
---

- HES data from 2004 recorded fewer than 2% of admissions having a 1<sup>o</sup> or 2<sup>o</sup> diagnosis of diabetes (E110 to E114).
  - In May 2007 the diabetes team undertook a survey on a single day and examined the notes on all hospital wards.
  - The overall prevalence of diabetes was 16% (21% at NGH).
-

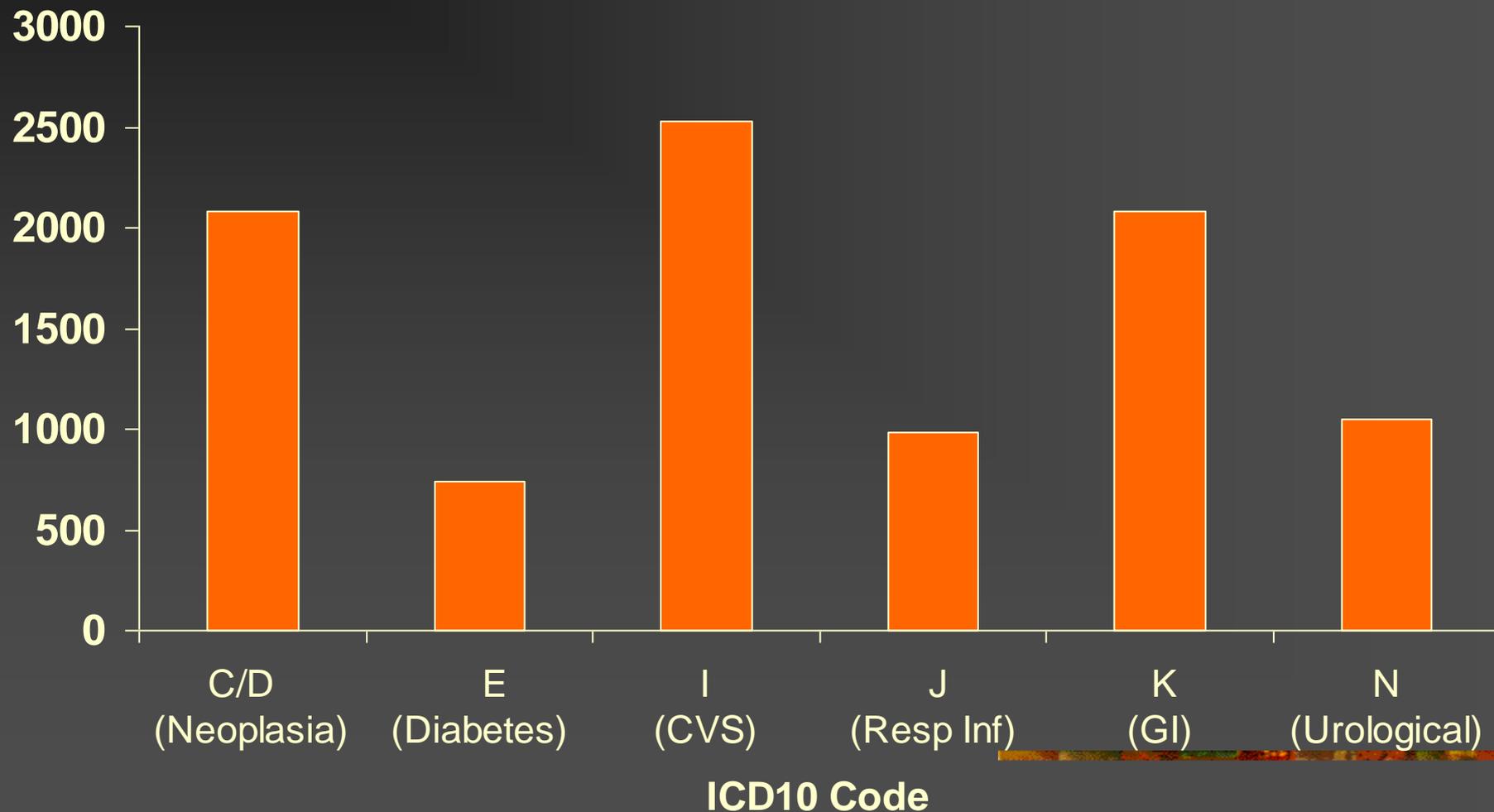
# Hospital admissions of adults with diabetes

- HES data extract from July 1<sup>st</sup> 2006 to June 30<sup>th</sup> 2007 – how many people from the retinal screening database admitted?
- 12083 admissions
- 70057 bed days
- Over 5000 attendances for dialysis
- Only 45% of admissions had a 1<sup>o</sup> or 2<sup>o</sup> diagnosis of diabetes recorded

# Annual deaths in people with diabetes in Sheffield (n=500)



# Primary Diagnosis in 12083 admissions in adults with diabetes (over 1 year)





Do admissions for hypoglycaemia  
reflect frequency of severe  
hypoglycaemia in the community?

---

# Sheffield Audit of A&E adult attenders with hypoglycaemia (Mackie 2003)

- 125 cases in 12 months in people with diabetes (+7 incorrect codes)
- 102 (87%) via ambulance
- 50 (40%) admitted
- 90 (72%) insulin treated
- 56 no cause identified
- Cost £800,000

# Ambulance callouts for hypoglycaemia

---

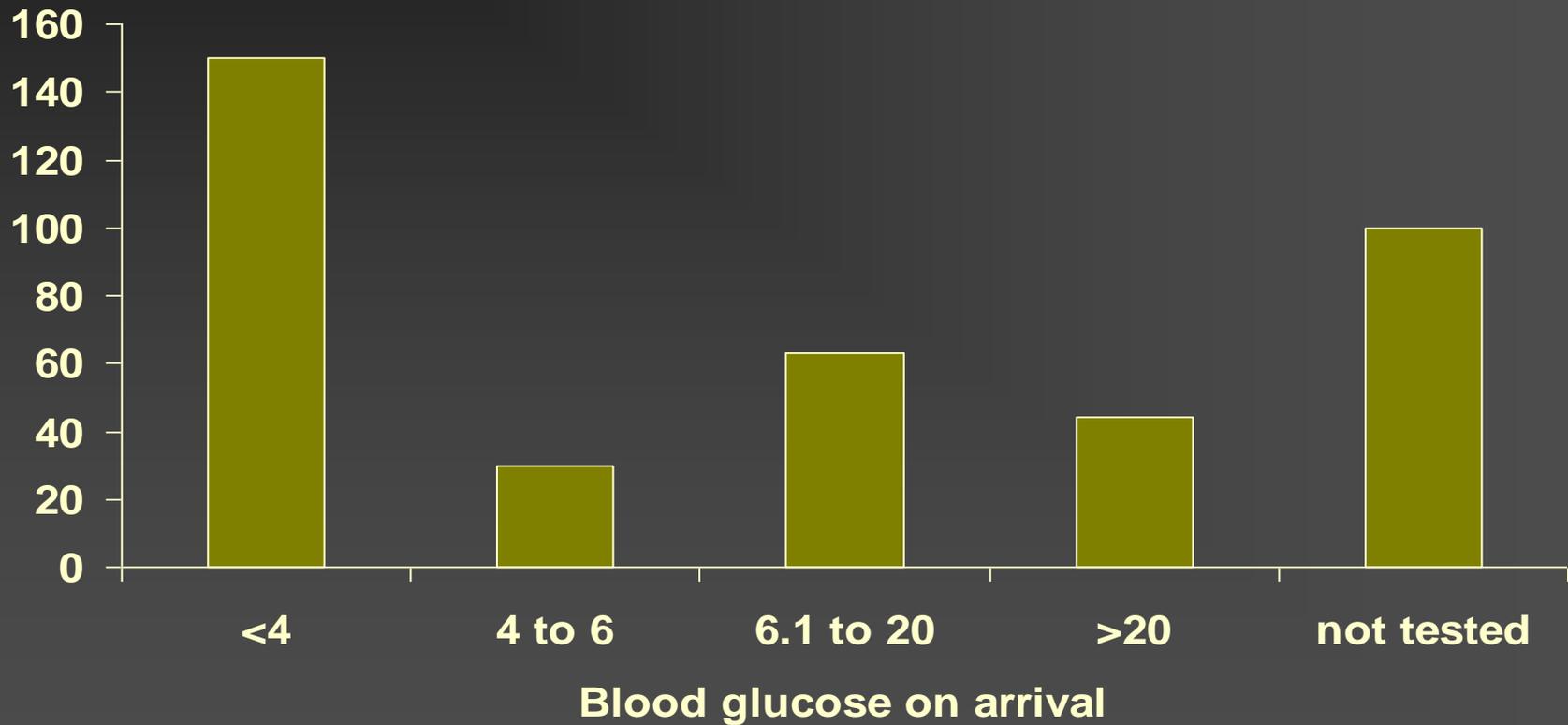
- South Yorks Ambulance Service approached
  - Dataset agreed
  - Data for 6 month period in 2006 extracted
  - A&E notes audited
  - Hospital Episode Statistics (HES) data examined
-

# SYAS audit

---

- Over a 6 month period there were 385 call outs to people with diabetes.
  - Of these 285 (74%) had a blood sugar measured on arrival.
  - Mean blood glucose of the group was  $8.6 \pm 10.3$  (mean  $\pm$  SD) mmol/l.
  - The mean age was  $58 \pm 19$  years
-

# Blood glucose values on arrival of ambulance (all diabetes N=385)



# SYAS audit

- 148 (138 with a Sheffield postcode) people had a blood glucose  $<4$  mmol/l (296 per year)
- 55 females, 81 males (12 no gender)
- Mean age  $59 \pm 19$ yr. Seventy-two were aged over 60yr, 13 under 30yr (no age in 8 subjects).
- 36 (24%) were taken to hospital (72 per year)
- 58 (39%) made the emergency call between the hours of 2200 and 0800 (no time recorded in 8 subjects).



# A National audit?

---

- 
- ABCD awarded funding to facilitate a National audit
  - Ambulance authorities reorganised to 13 larger Trusts end of 2006
  - East Midlands holds the audit and research portfolio
  - ‘not a priority’
- 

# A&E Hypoglycaemia audit

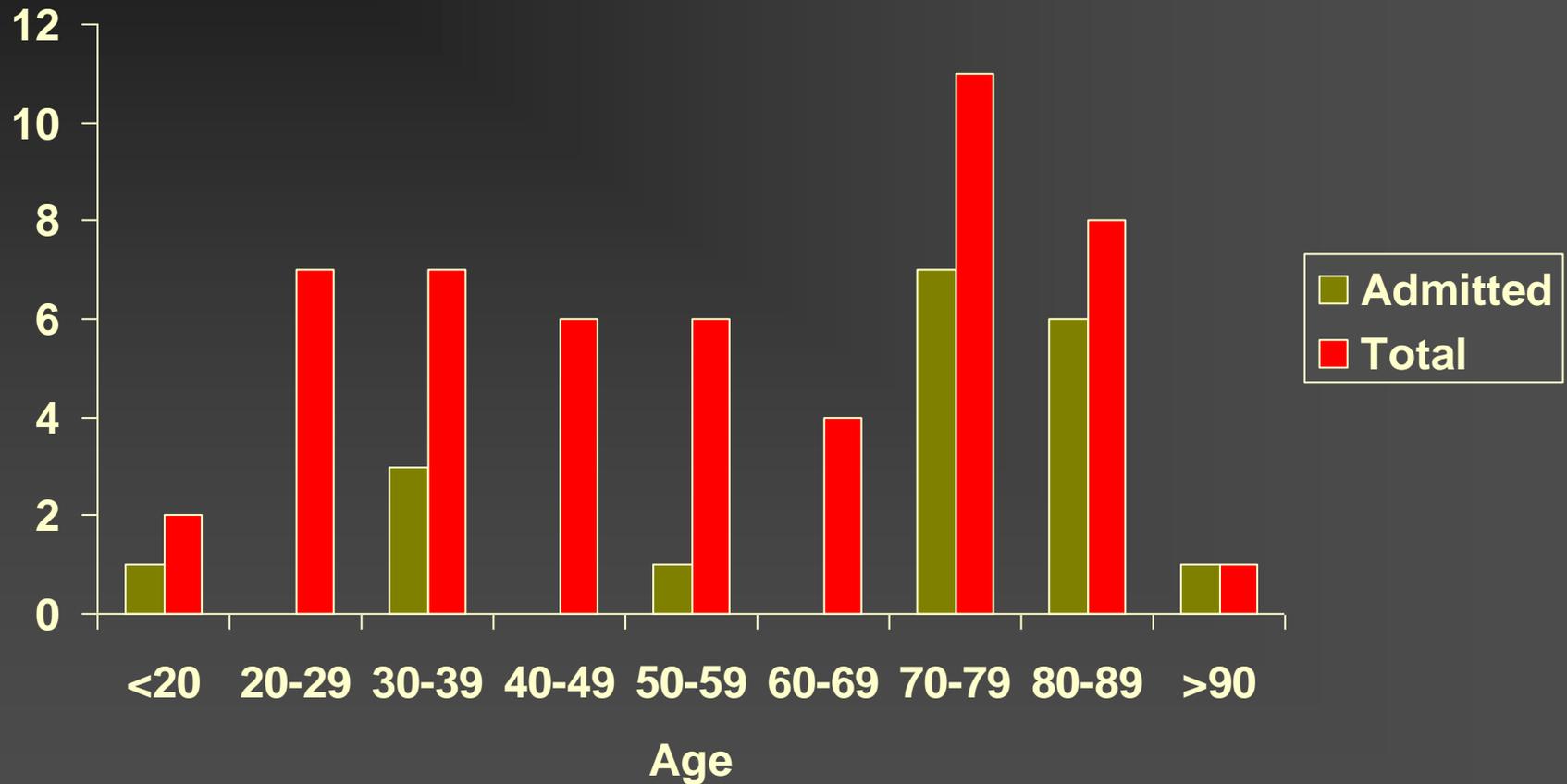
---

- Numbers seen in A&E with hypoglycaemia
  - Age, gender, diabetes type
  - Number admitted from A&E
  - Length of Stay
  - Cause of hypo
  - Treatment
  - Referral to diabetes team and/or education in A&E
-

# A&E attenders with hypoglycaemia

- 57 in 5 months with diagnosis of hypoglycaemia (137 per year)
- 5 wrong codes or in person without diabetes
- 50 (96%) by ambulance
- 14/52 (27%) were sent home <4hrs
- 18/52 (35%) were observed in A&E <24hrs then sent home
- 20/52 (38%) were admitted

# A&E attenders with hypoglycaemia



# A&E attenders requiring admission

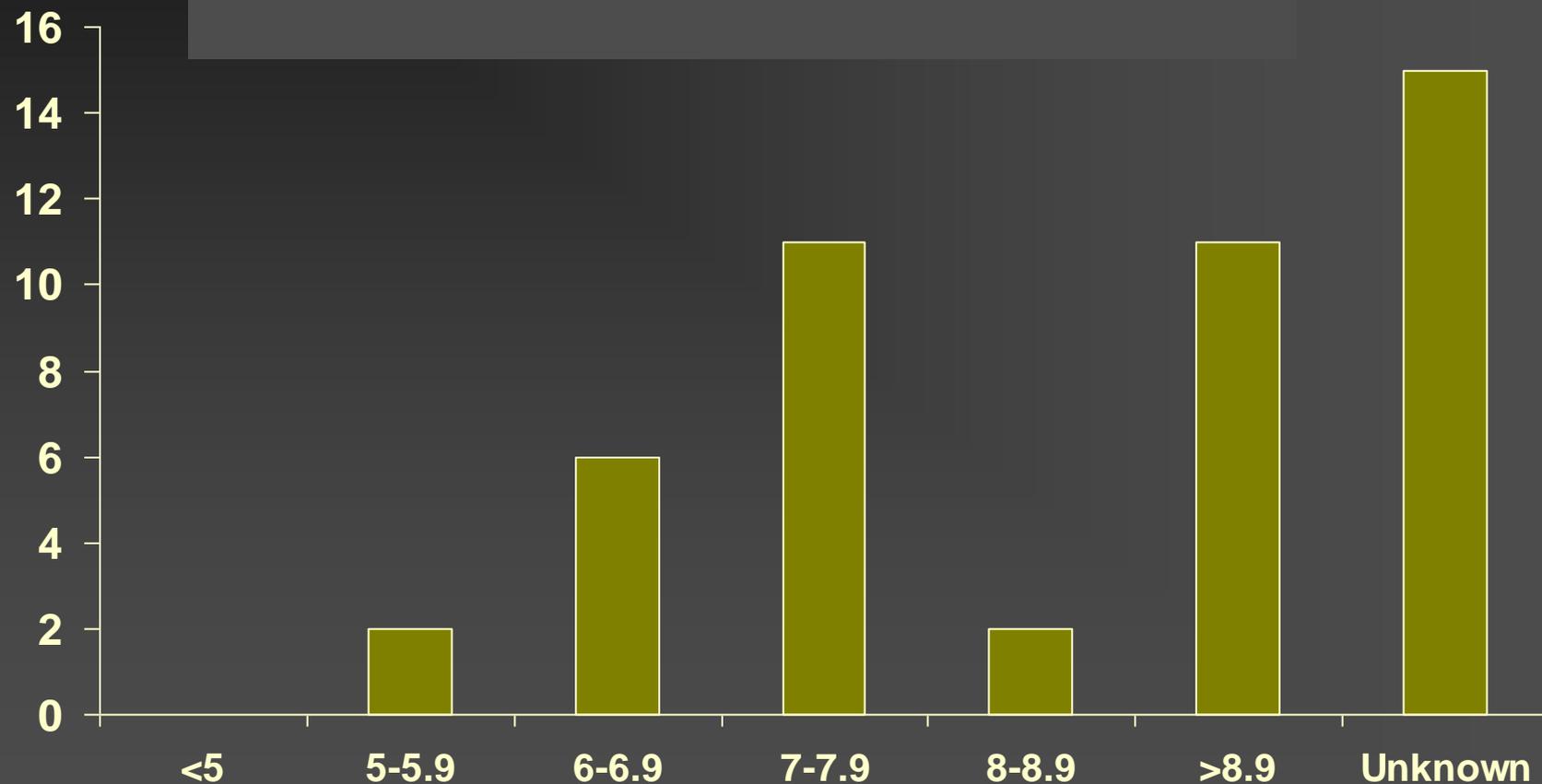
## ■ Reason for admission

- 11 severity
- 5 social
- 3 complications of hypo
- 1 infected hand abscess

## ■ Type of DM

- |                |                        |
|----------------|------------------------|
| ■ Type 1       | 7                      |
| ■ Type 2       | 11 (7 insulin treated) |
| ■ Not recorded | 2                      |

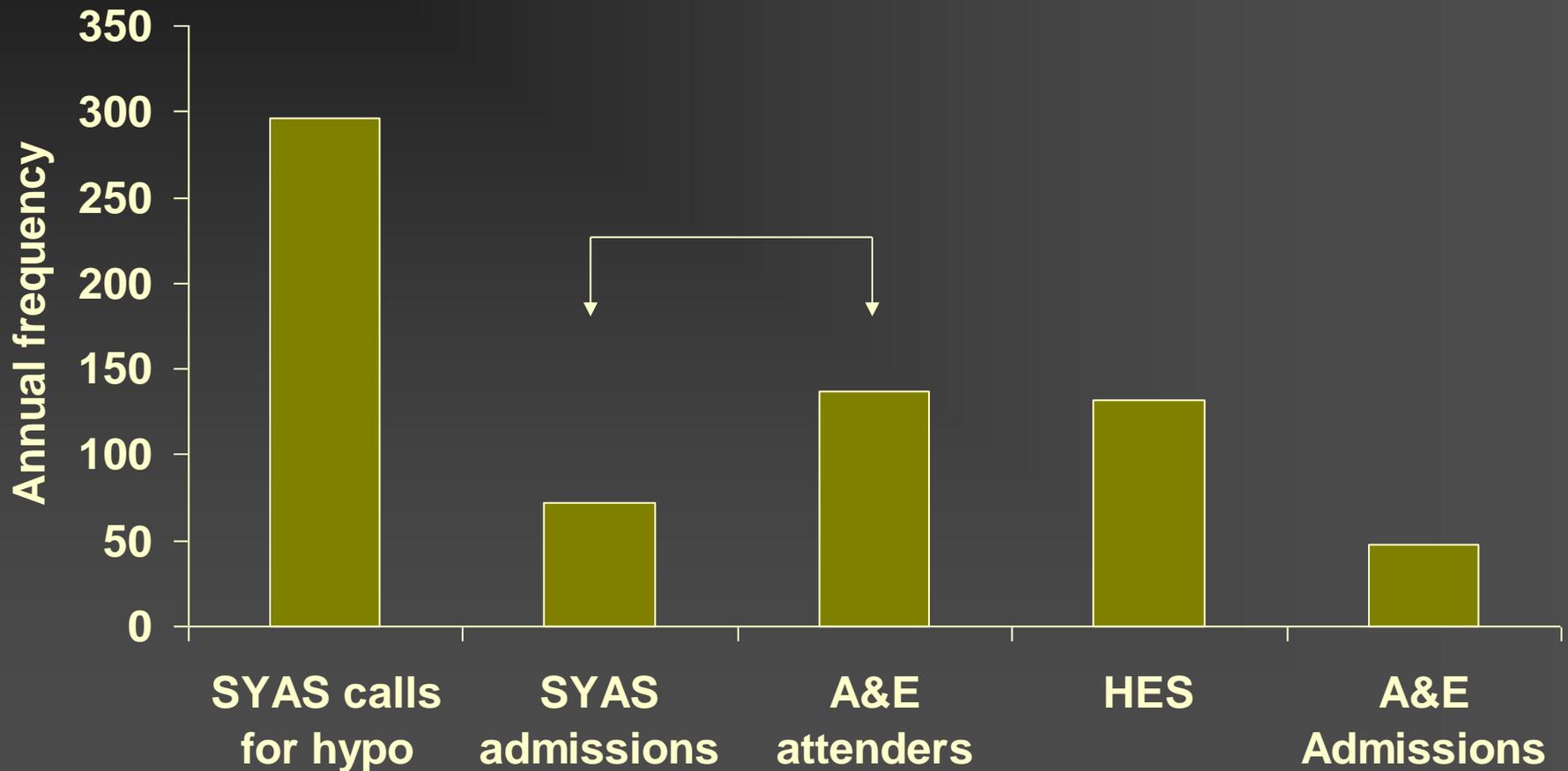
## HbA1c in A&E attenders for hypoglycaemia (only 68% checked at event or in previous 6 months)



# A&E attenders – post hypo management

- Hypo education documented in 1/3 notes
- Referred to Diabetic Nurse Specialist (32%)
  - In patient 13/15
  - A&E 2/15
- 4/47 had driving status documented
- None had injection site assessed
- 15/47 (32%) had GP / hospital care for DM stated

# Differences in assessment of frequency of severe hypoglycaemia in the community



# Limitations and Actions

---

- No idea what subsequently happened to patients
  - Uncertainty if GP informed or action taken
  - Negotiations with PCT and ambulance authority to set up similar system as in place in Bradford – Ambulance call-desk inform diabetes team of all call-outs to people with hypoglycaemia
-

# Summary

---

- Ambulance call-outs for hypoglycaemia in S Yorks appear to be significantly less than that of Tayside (2.8 vs 1.5 events per 100pt years)
  - Between 25 and 40% of ambulance call-outs are taken to A&E
  - Approximately 40% of these are admitted
  - There is poor communication between ambulance / A&E and diabetes team
  - Little is known about the role of primary care in post-hypoglycaemia management
-



What can we learn from this?



- 
- Data is hard to come by and accuracy questionable
  - Retinal screening databases can be used to identify the local burden of diabetes and improve coding
- 

# Improve coding quality

## The 2007/08 tariff and diabetes

The following table gives potential financial gains available in certain circumstances

Condition (HRG – all non-elective)	Additional £ per case for the Trust**
Hip or lower limb fracture (H36/37)*	1,894
Other neck of femur fracture (H88/89)	1,569
Stroke (A22/A23)*	1,516
Acute myocardial infarction (E11/12)	1,697
Bronchopneumonia (D42/43)	1,282
UTI (L09/10)*	1,596

\* for these conditions, being over 69 automatically means the patient receives the with complications/comorbidites tariff

\*\* (before Market Forces Factor is applied) if diabetes is a complicating factor in treatment

Of the top 25 HRGs, 5 are directly related to diabetes

## Diabetes in the NHS:

Commissioning and providing specialist services



We need to

- identify measurable quality standards for diabetes services
- ensure they are included in Commissioning agreements (eg ambulance Trusts monitoring call-outs for hypos)
- Ensure hospital Trusts and PCT's contribute to the National Diabetes Audit
- Influence the Local System Providers for NHS Connecting for Health to ensure that both diabetes 'templates' and the Secondary User Service provide us with the data we need to monitor and improve diabetes services



NHS Connecting for Health National Clinical  
Lead for Diabetes

[Adrian.Scott@sth.nhs.uk](mailto:Adrian.Scott@sth.nhs.uk)

