The Relevance of Regional Variation

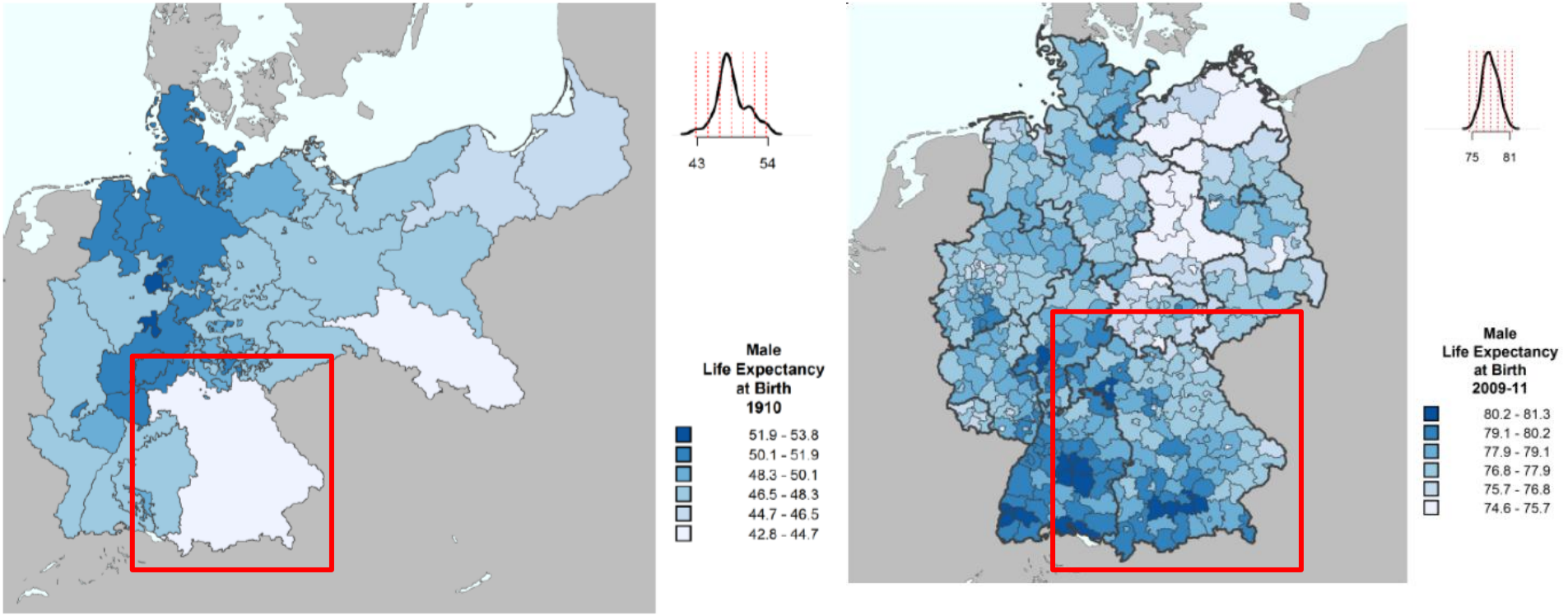
Experiences from the Bavarian DMP

Ewan Donnachie

4 June 2015 | WIC Policy Conference, Berlin

Background: Changing Priorities in Health Care

In the past century, Bavaria has undergone a radical transformation:



Source: Kibele et al. (2014). *Regional mortality disparities in Germany: long-term dynamics and possible determinants.* Working Paper. Max Planck Institute for Demographic Research. http://demogr.mpg.de

Disease Management Programmes in Germany

- The idea:
  - Promote evidence-based care
  - Strengthen GP‘s role as care co-ordinator
  - Encourage active participation of patients
  - Support the development of suitable health care structures
  - Collect and use data to measure and improve quality of care (Mandatory patient record, quality of care indicators and feedback)
- Criticisms:
  - Bureaucratic monster – DMP reduced to paper-pushing and the production of expensive „data graveyards“
  - No robust evaluation – utility unknown

Disease Management Programmes in Bavaria

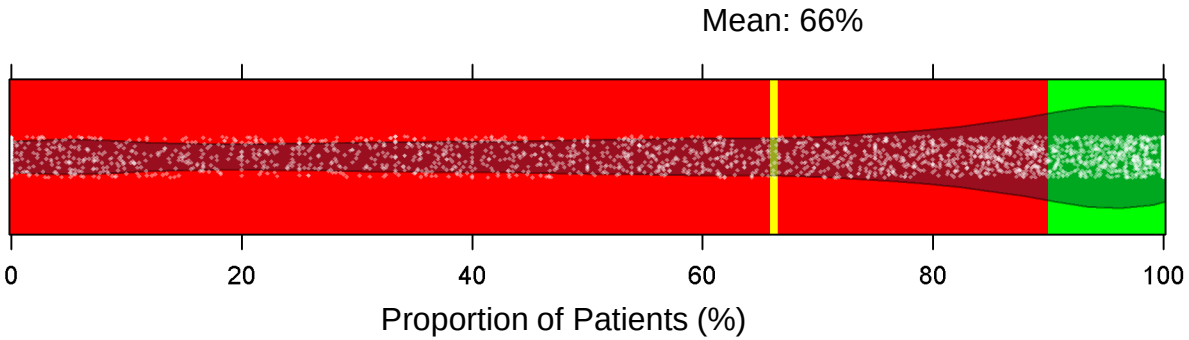
Participating physicians and patients (2014Q3 - 2014Q4, rounded)

Programme	Start	# Physicians	# Patients
Type 2 Diabetes	2003	8,200	540,000
Breast Cancer	2004	1,600	17,000
Coronary Heart Disease	2005	8,200	240,000
Asthma	2007	9,000	134,000
COPD	2007	9,000	94,000
Type 1 Diabetes	2007	2,600	27,000
Total		**13,000**	**900,000**

Quality Indicators in DMP

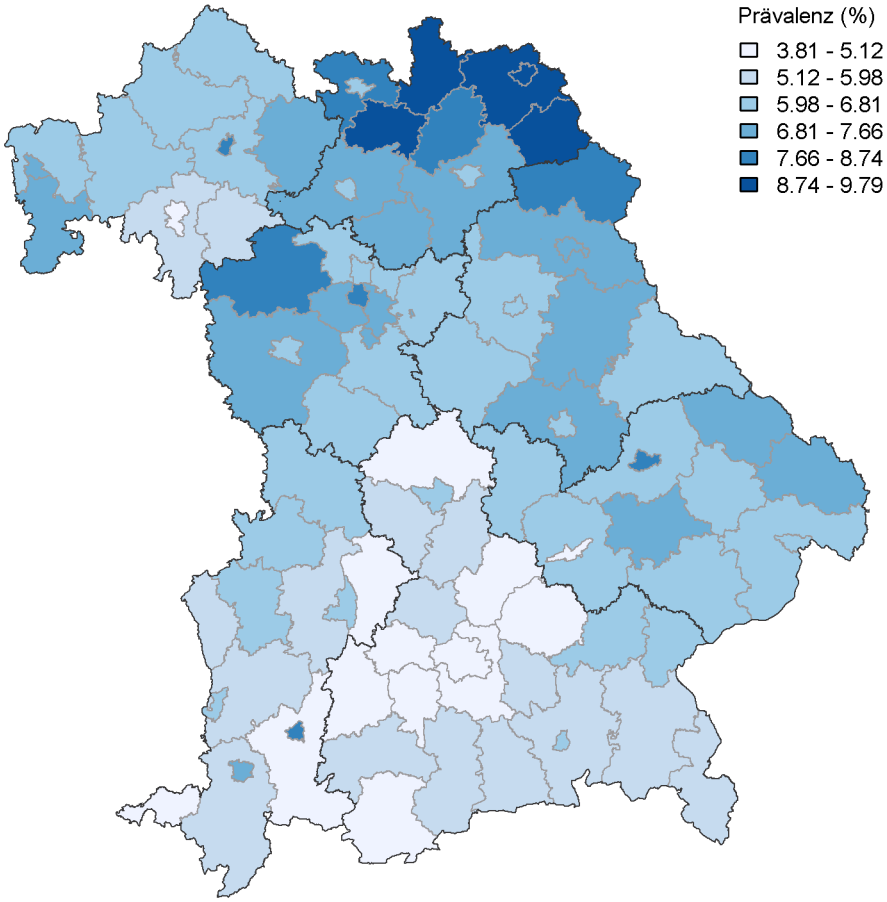
Example: Retinopathy Screening (Type 2 Diabetes)
At least 90% of all patients should have undergone retinopathy screening during the previous 12 months (patients with shorter DMP history excluded).

Result in Bavaria:



Consideration of the variation between practices leads to important insight for the improvement of health care services!

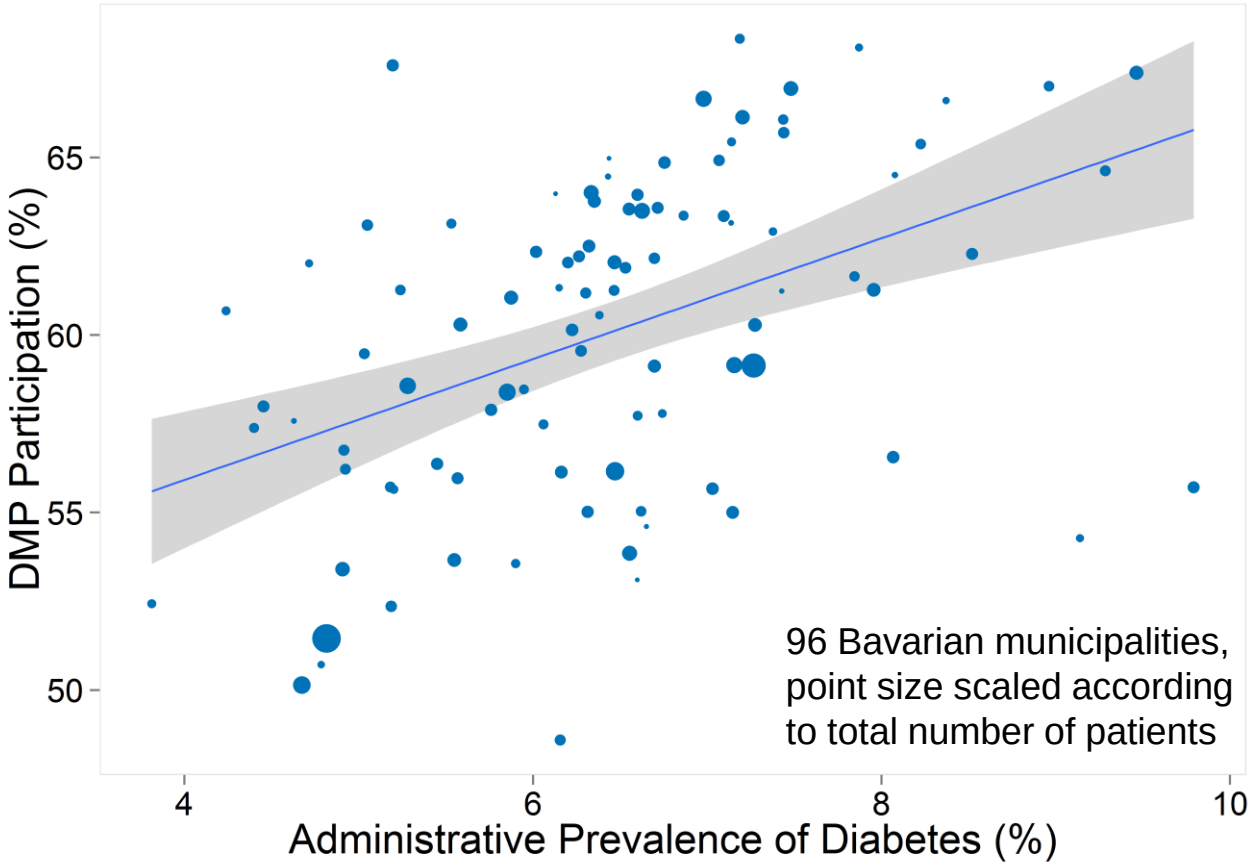
Regional Variation in Diabetes Prevalence



Administrative prevalence of type 2 diabetes in Bavaria:

- ICD E11 in the first and second halves of 2011
- 772,232 patients identified
- Population with statutory insurance in Bavaria: approx. 10.4 million
- Yields prevalence of 7.4%
- Result: Clear north-south divide within Bavaria

Diabetes Prevalence and DMP Participation



The higher the prevalence of type 2 diabetes in a municipality,
the higher the proportion of diabetes patients with participation in DMP

Diabetes Prevalence and DMP Participation

Possible explanations:

- Higher DMP participation artificially inflates the administrative prevalence (Automatic ICD-10 Code E11)
- Areas with high diabetes prevalence have more GP-centric services (related: deprivation as common influence)
- Higher diabetes prevalence makes it more worthwhile for physicians to participate in DMP

Practical relevance:

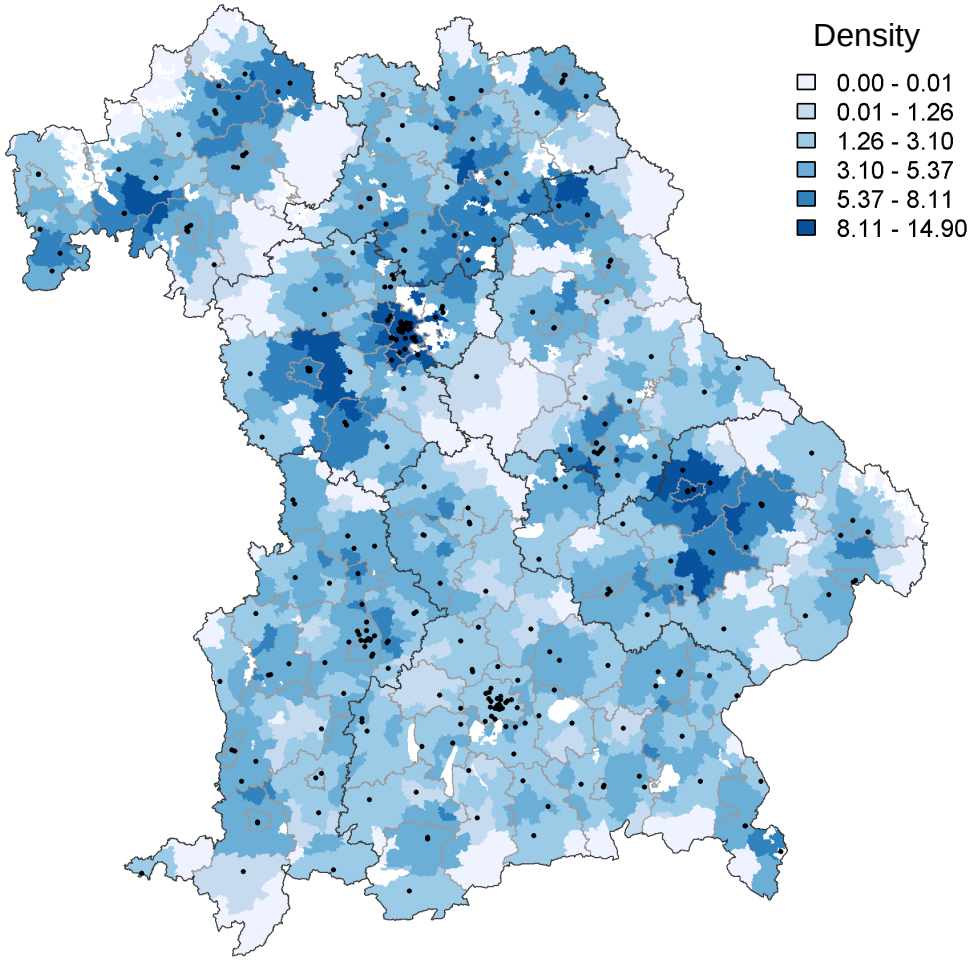
- **Possible bias** when making regional comparisons using administrative data (regardless whether DMP records or claims data)

Structural Quality: Specialist Diabetes Practices

Specialist diabetes practices are a major feature of the DMP contract

- Structural Requirements
  - Diabetologist with appropriate specialist training
  - Practice employs diabetes assistent
  - Minimum case numbers
  - Co-operation with podiatrist, surgeon and gynaecologist
- No regional planning:
  Are the diabetes practices evenly distributed within Bavaria?

Distribution of Specialist Diabetes Practices



- **Results:**
  1. Most districts have „good“ access.
  2. Potential for improvement in some peripheral areas.

- **Surprising:**
  Munich has „average“ density relative to population

- **Open question:**
  What is a „good“ or „sufficient“ level of access?

Two-stage floating area algorithm: Luo W, Wang F (2003). "Measures of spatial accessibility to health care in a GIS environment: synthesis and a case study in the Chicago region" Environment and Planning B: Planning and Design 30(6) 865 – 884

Risk Adjustment using Hierarchical Models

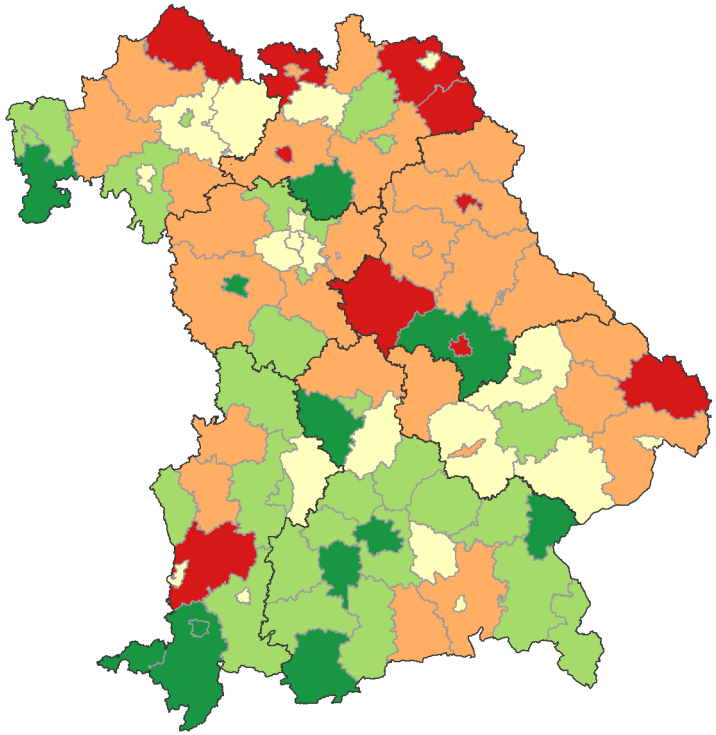
Problem:

- Raw quality indicators give a poor indication of performance:
  - No adjustment for case-mix
  - Ecological fallacy (answering the wrong question)

Solution:

- Hierarchical Models using patient-level data:
  - Adjust for characteristics at the level of patient and region
  - „Random effect“ for region captures regional variation not explained by the model
  - „Random effect“ for practice to help prevent distortion of regional effects

Unexplained Variation: Patient Education

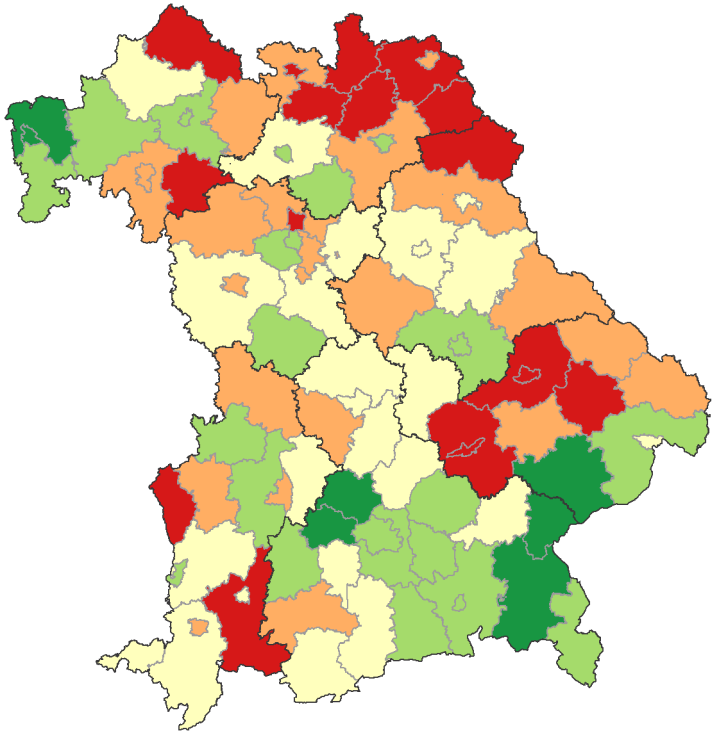


Red:
Fewer patients with patient education than expected

Green:
More patients with patient education than expected

- Adjustment:
  Age, sex, antidiabetic therapy, long-term DMP patient (>2 years), coordination by specialist diabetes practice
- North-south divide:
  Areas with high morbidity have low take-up of patient education
- Separation of regional and practice variation is difficult:
  Some extreme outliers are due to the presence of particularly large and active specialist diabetes practices

Unexplained Variation: HbA1c Levels



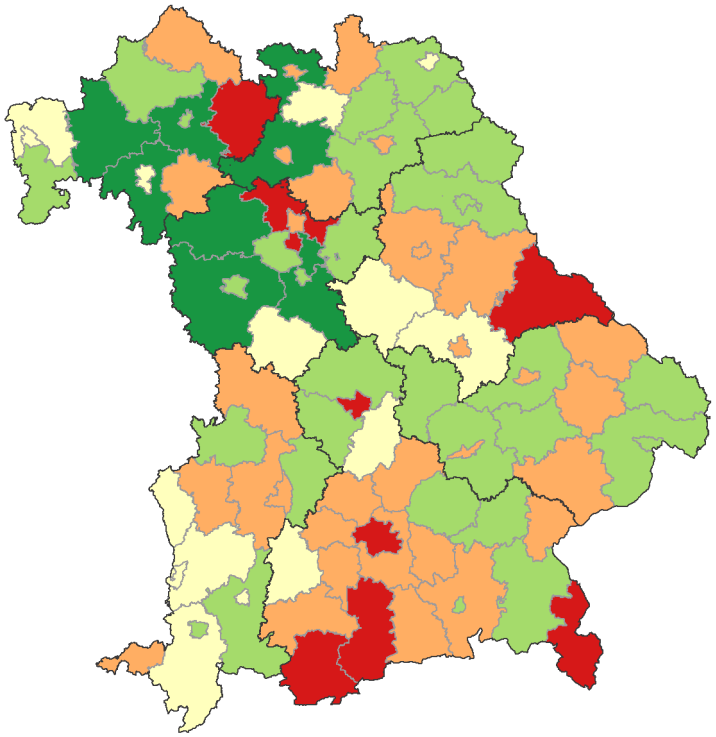
Red:
More patients with high HbA1c than expected

Green:
Fewer patients with high HbA1c than expected

- Adjustment:
  Age, sex, antidiabetic therapy, long-term DMP patient (>2 years), coordination by specialist diabetes practice, patient education

- North-south divide:
  Areas with high diabetes prevalence also have high rates of poor glycaemic control (and low take-up of patient education)

Unexplained Variation: Retinopathy Screening



Red:
Fewer patients with retinopathy screening than expected

Green:
More patients with retinopathy screening than expected

- Adjustment:
  Age, sex, antidiabetic therapy, long-term DMP patient (>2 years), coordination by specialist diabetes practice, patient education
- More complex picture:
  Possible correlation with access to ophthalmologists?
- Surprising:
  Munich, with good access to ophthalmologists, has the lowest proportion of DMP diabetes patients with retinopathy screening!

Conclusion

- Regional variation is a relevant consideration for quality improvement
- DMP lacks the necessesary framework to deal with regional variation
  - Regional comparisons using existing indicators are highly problematic
  - Further research necessary to develop suitable risk adjustment models
  - No risk adjustment is perfect: limitations must be acknowledged and discussed
- The active participation of local physicians must be seen as an essential prerequisite of a successful quality improvement system
  - Feedback systems are important to inform and engage physicians
  - DMP must be lived as quality programmes, not bureaucracy programmes

Thankyou for your attention!

Further Information:
Internet: http://www.ge-dmp-bayern.de
E-mail: ewan.donnachie@kvb.de