

Type 2 Diabetes Mellitus cohort
as a project of
the General Practitioners' Morbidity
Sentinel Stations Program (GPMSSP)

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Lack of T2DM monitoring in Hungary

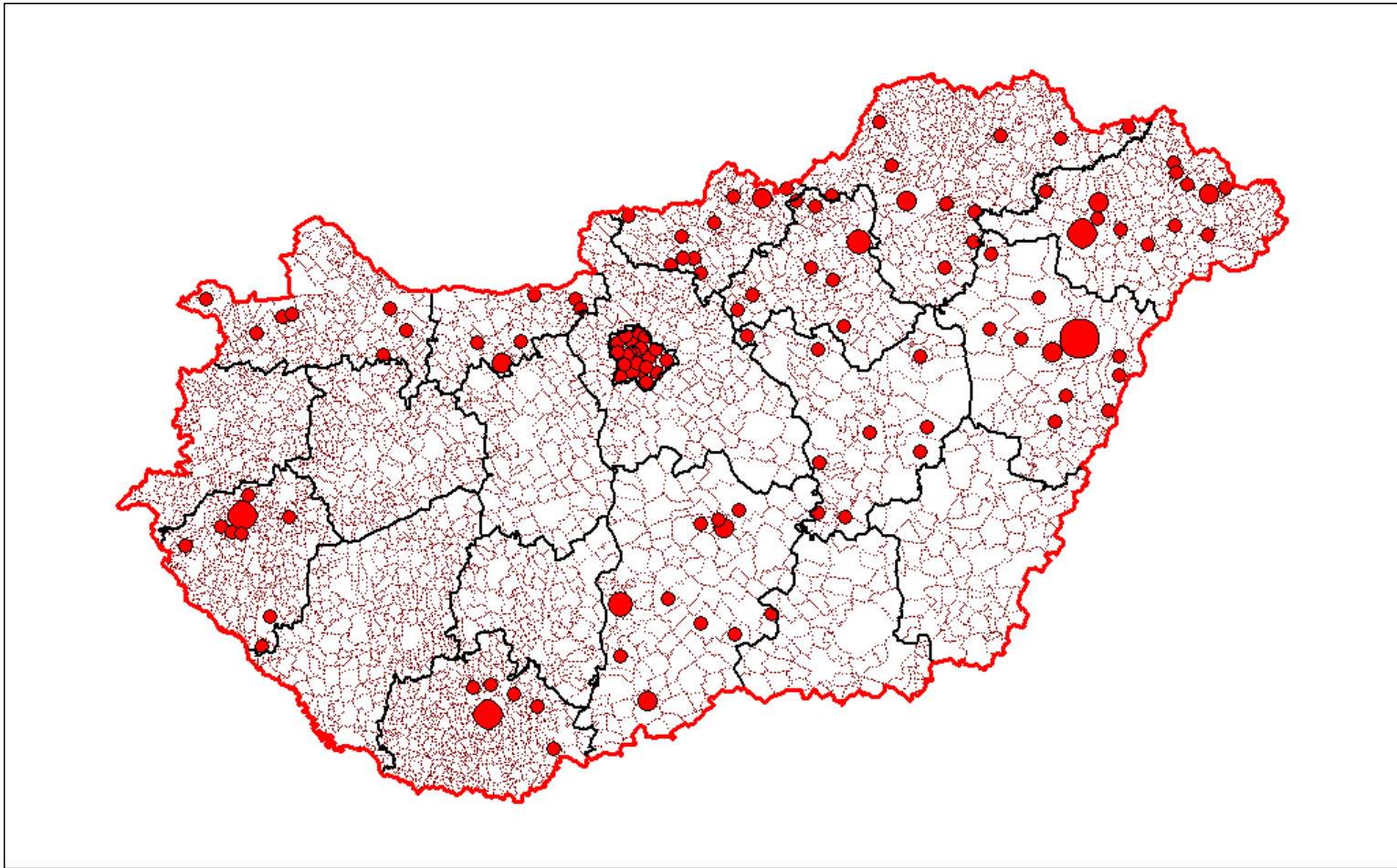
Surveys:

- DEPAC survey (2005): T2DM patients who were treated in **secondary care**; missing representation of GP cared patients [Diabet Med J Br Diabet Assoc 2008]
- Primary care-based national cross-sectional survey (2006): on epidemiological properties of metabolic syndrome, **sampling frame was broader** than patients with T2DM [Croat Med J 2010]
- Primary care-based national cross-sectional survey (2008): on T2DM **older than 50** years of age; results used in EUBIROD [Diabetes Res Clin Pract 2011; Diabetes Res Clin Pract 2013]
- **Telephone** interview survey (2012): prevalence of self-reported diabetes is 11.7% [Prim Care Diabetes, 2017]

Monitoring:

- National Institute of Health Insurance Fund Management (from 2009): monthly evaluation of GMPS by the proportion of T2DM patients with HbA1c evaluation and ophthalmological examination in the past 12 months, **without outcome indicator**

GPMSSP in 2015 ($N_{\text{GMP}}=131$;
 $N=207333$)



Morbidity monitoring

Aim

- Priority setting and capacity development in health care
- Data base for planning and controlling public health programs

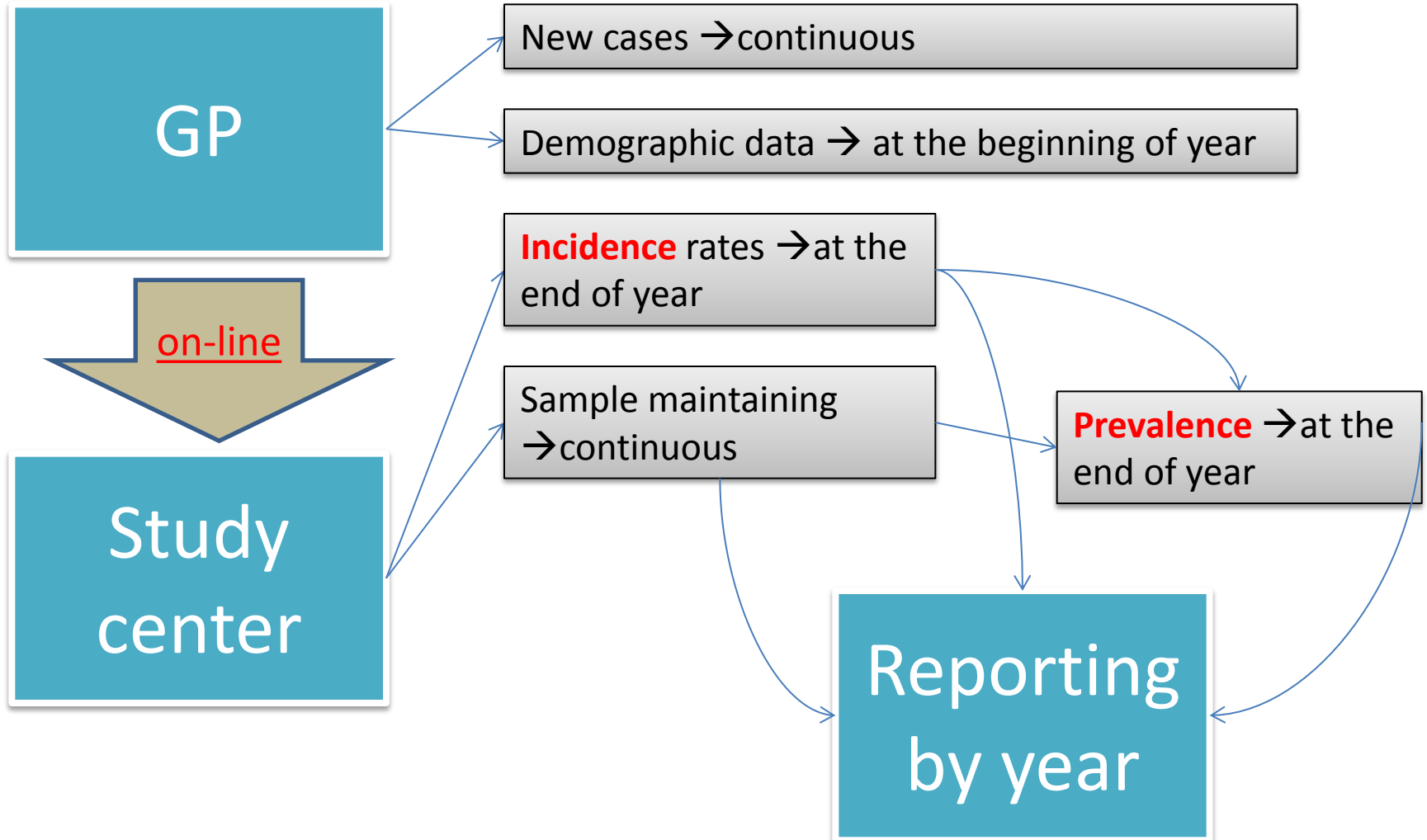
Data collection based on:

- general practitioners reporting
- Network of GPs

Disease-based

- Focusing selected diseases (hypertension, T2DM, IHD, MI, stroke, chronic liver diseases)
- Representative for Hungarian adults (age, sex, settlement type)
- Established in 1997

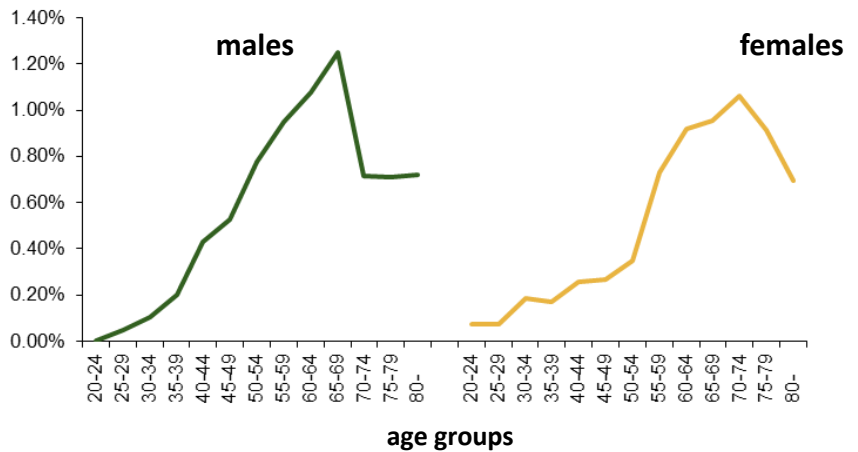
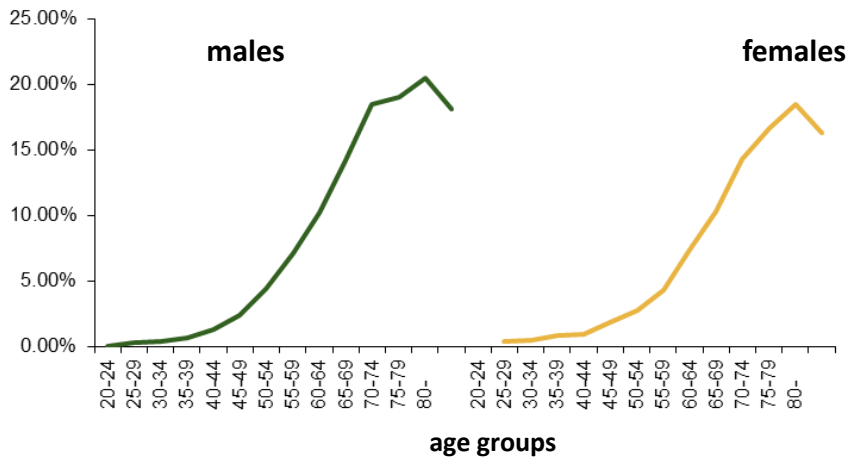
GPMSSP data management



Data quality

- Definition for diseases
- Standardized sample maintaining
- Quality indicators from database
- Regular site visits
- Comparison to external study results

Age and gender specific prevalence and incidence of T2DM in 2015 (GPMSSP)



Crude estimated prevalence for Hungary:

males: 6.98%

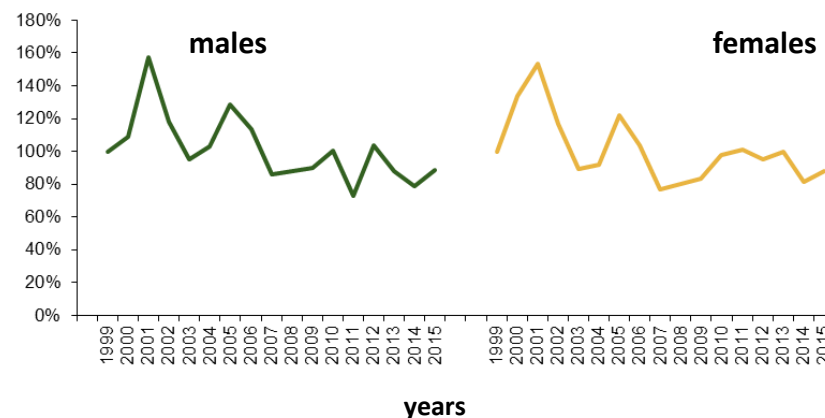
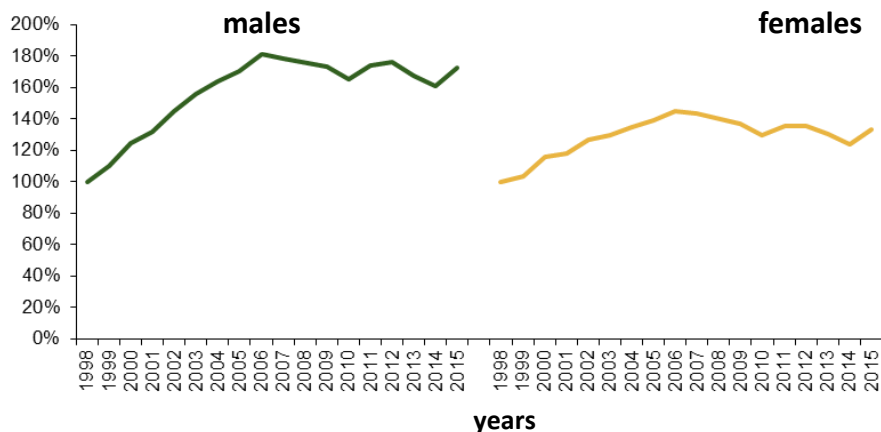
females: 6.85%

Crude estimated incidence for Hungary:

males: 0.53%

females: 0.50%

Age and gender standardized prevalence and incidence ratios of T2DM in 1998-2015 (GPMSSP)



Standardized prevalence ratio in 2015 for Hungary:

males: 162%

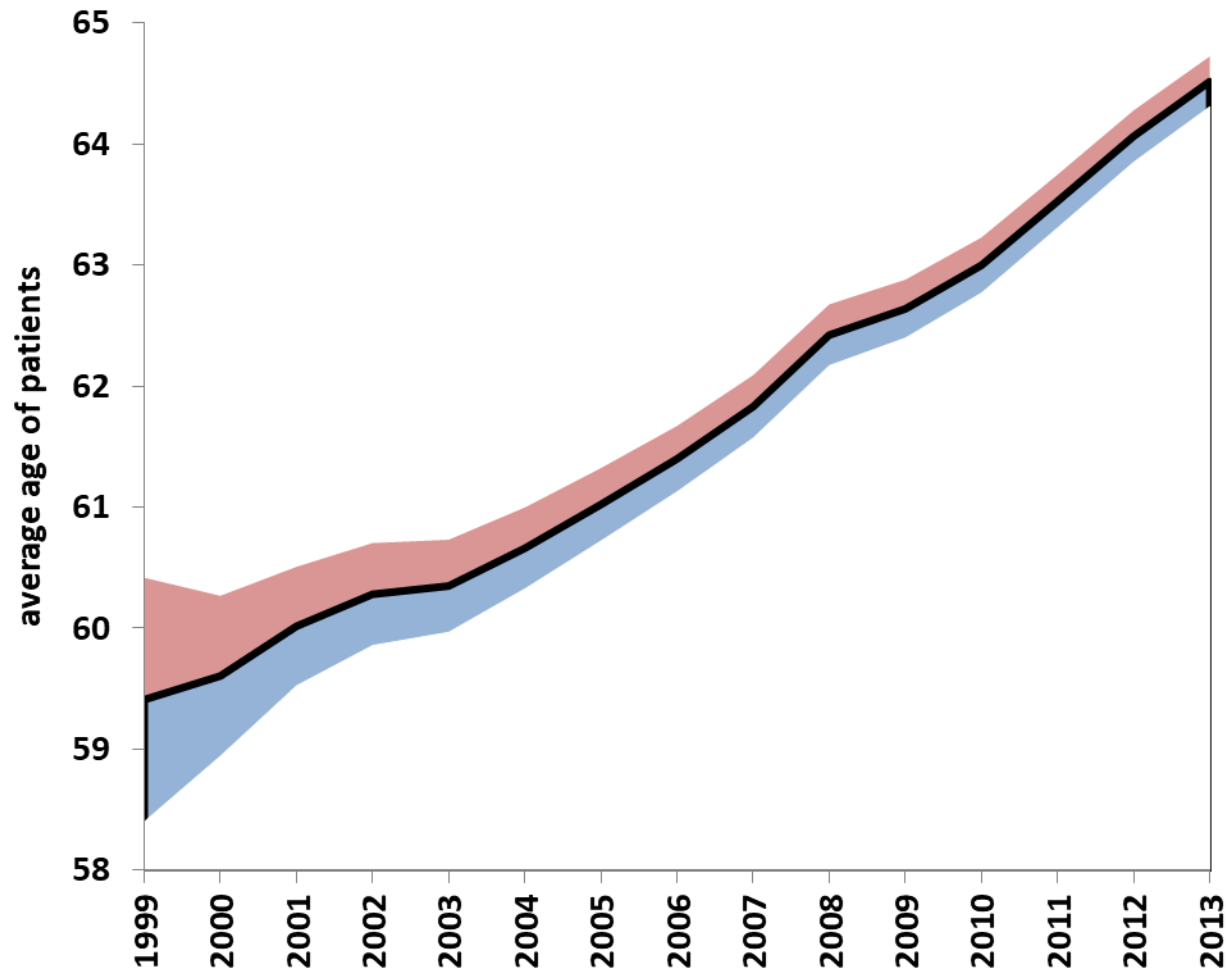
females: 131%

Standardized incidence ratio in 2015 for Hungary:

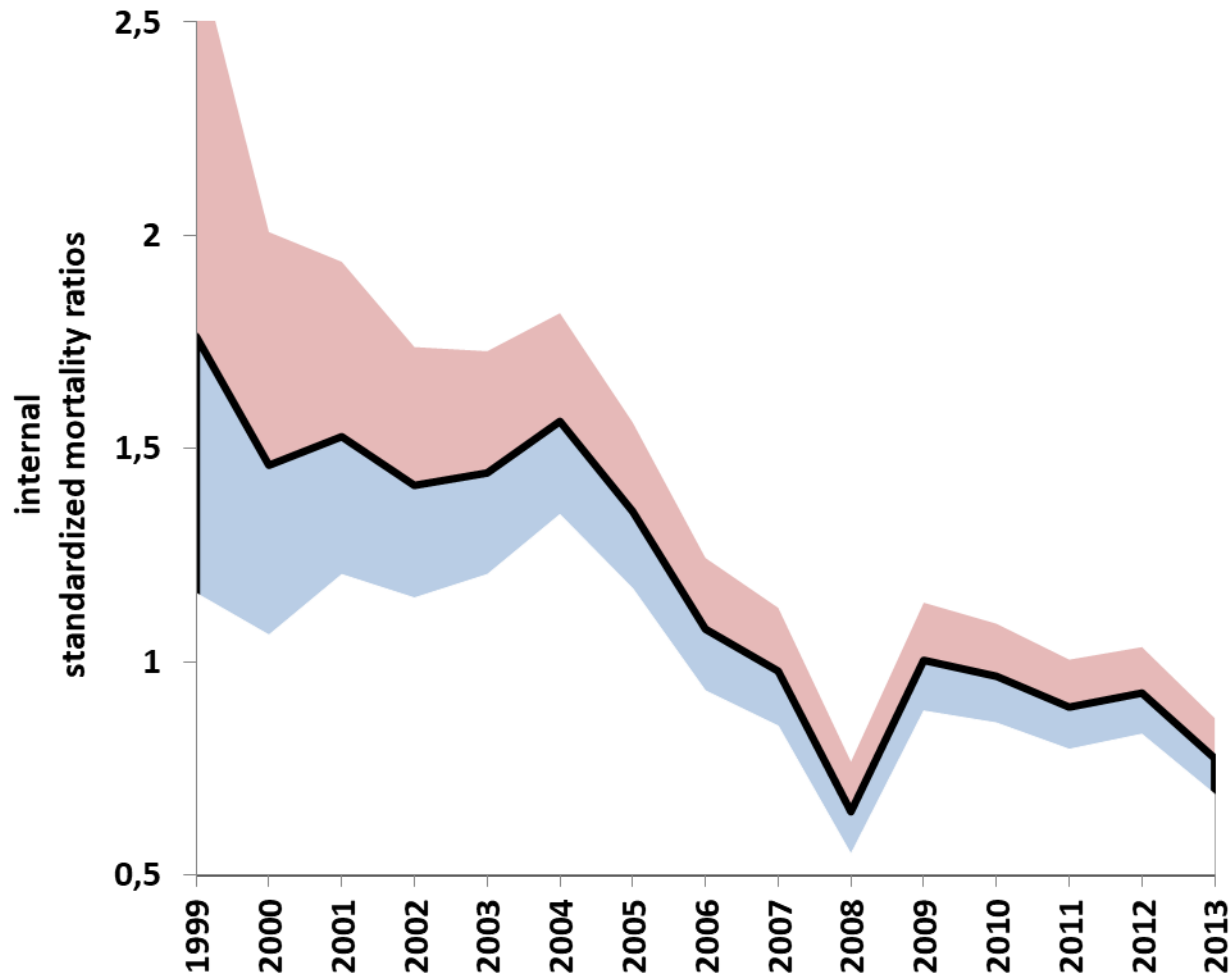
males: 94%

females: 94%

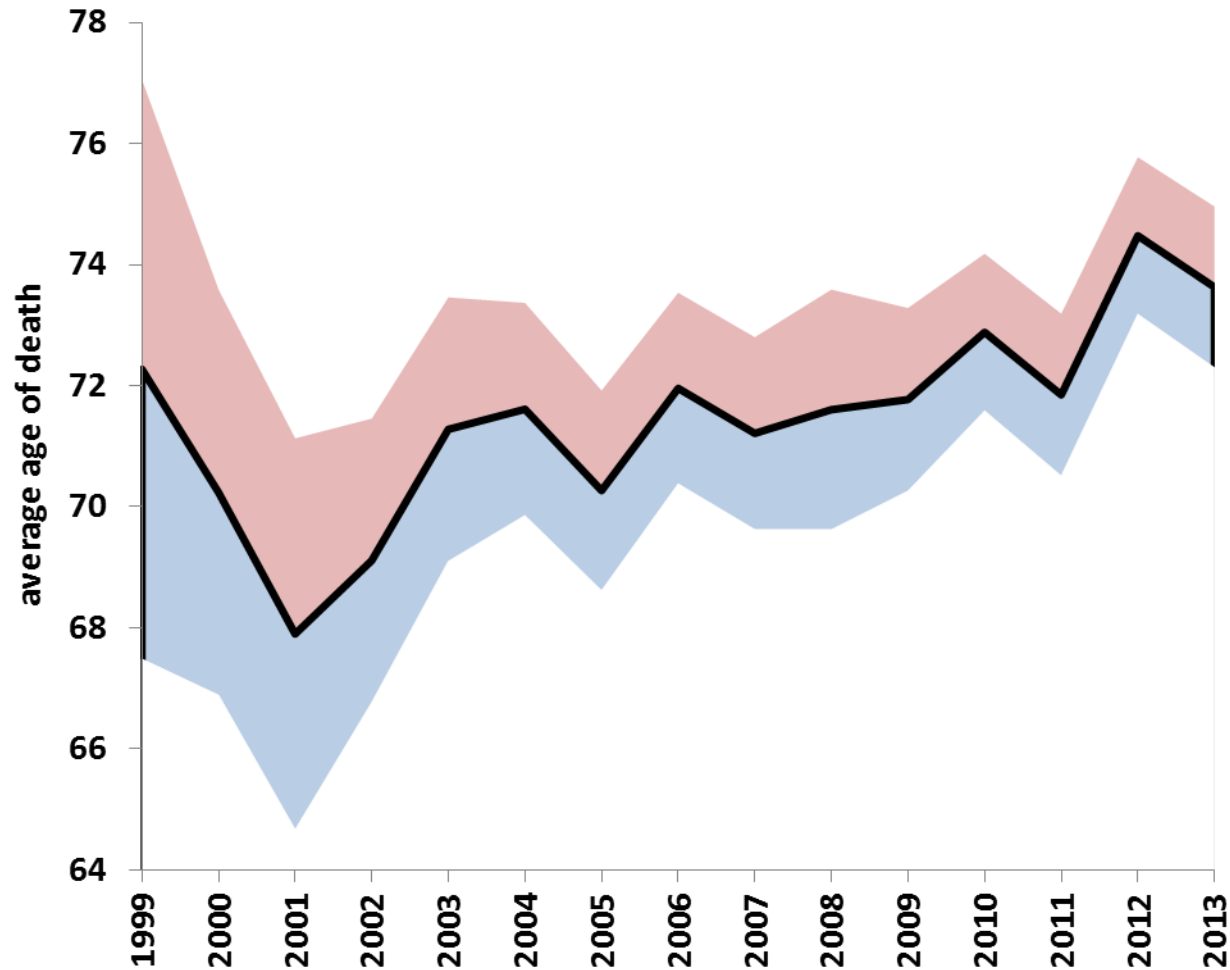
Average age [95%CI] of T2DM patients (GPMSSP)



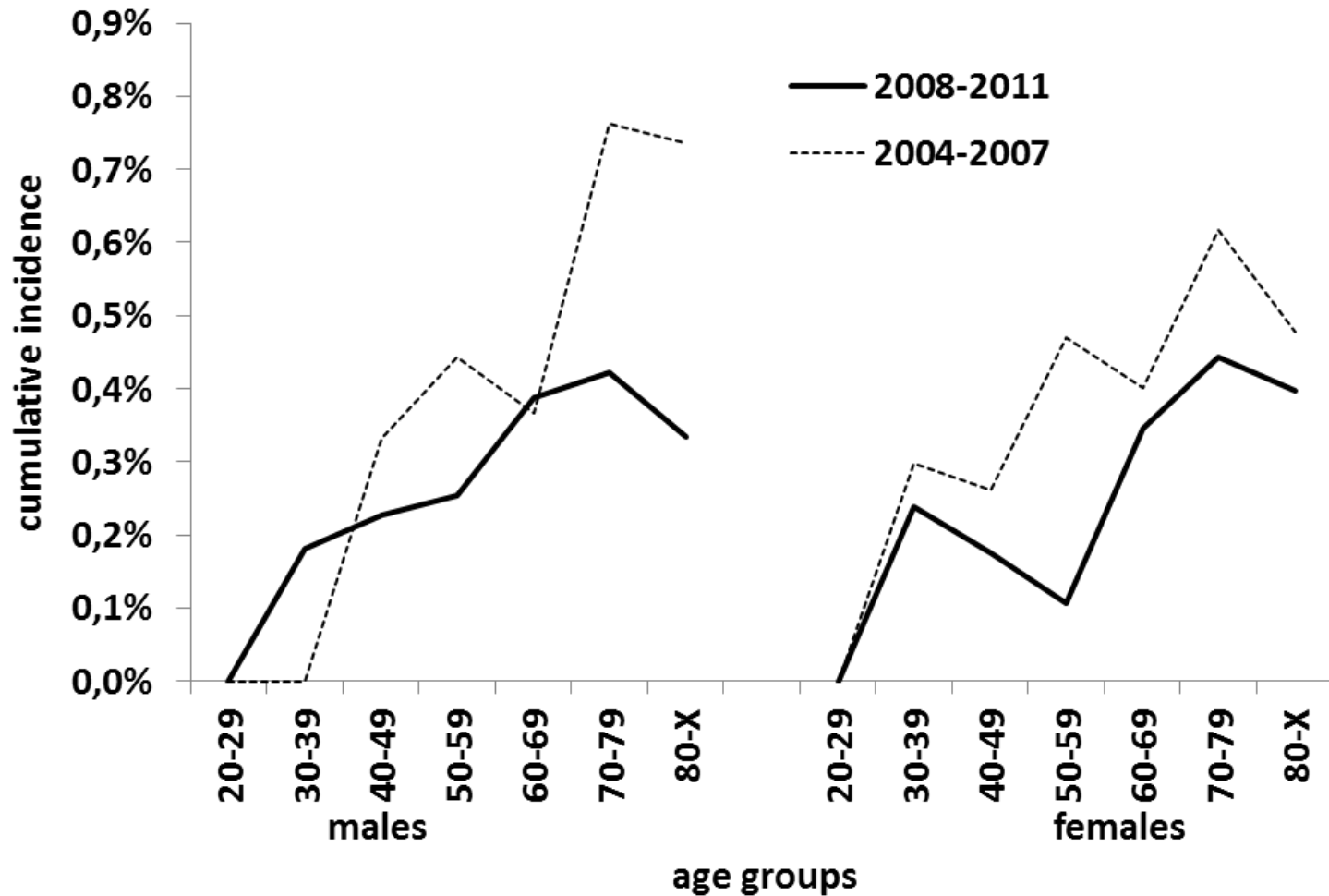
Standardized mortality ratios [95%CI] of T2DM patients (GPMSSP)



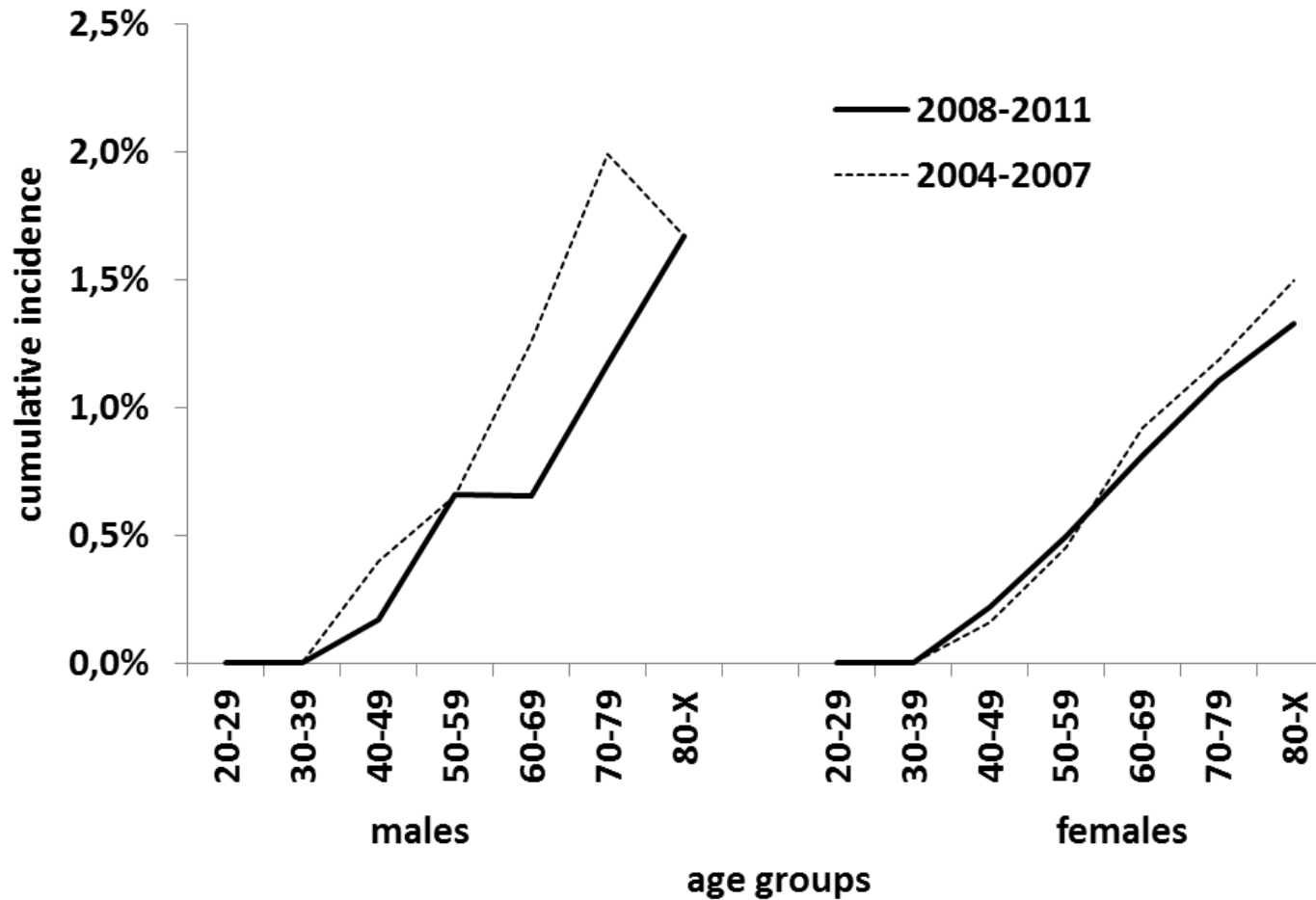
Average age [95%CI] at death of T2DM patients (GPMSSP)



2-year cumulative incidence of AMI (2004-2007; 2008-2011) among T2DM patients above 50 (GPMSSP)



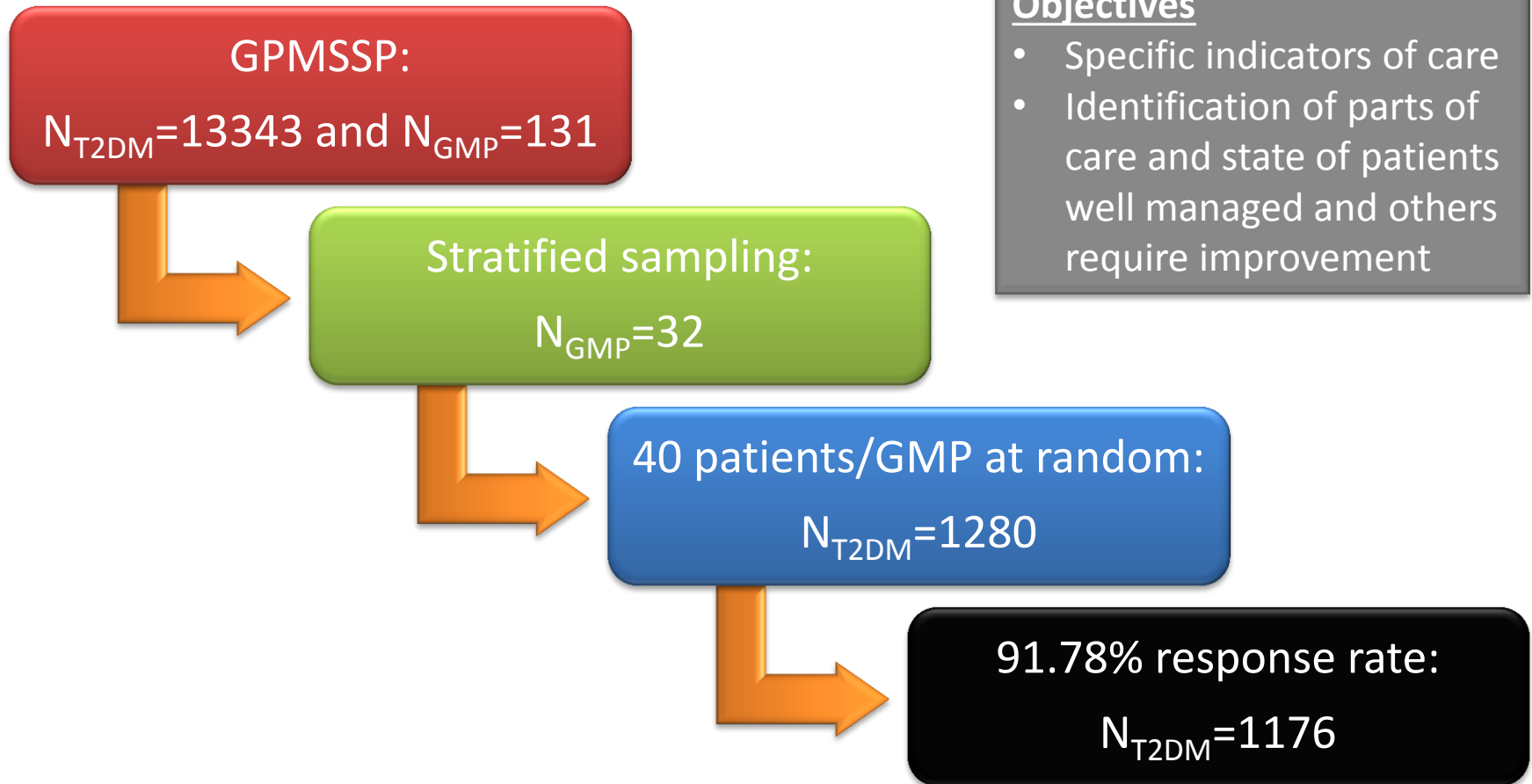
2-year cumulative incidence of stroke (2004-2007; 2008-2011) among T2DM patients above 50 (GPMSSP)



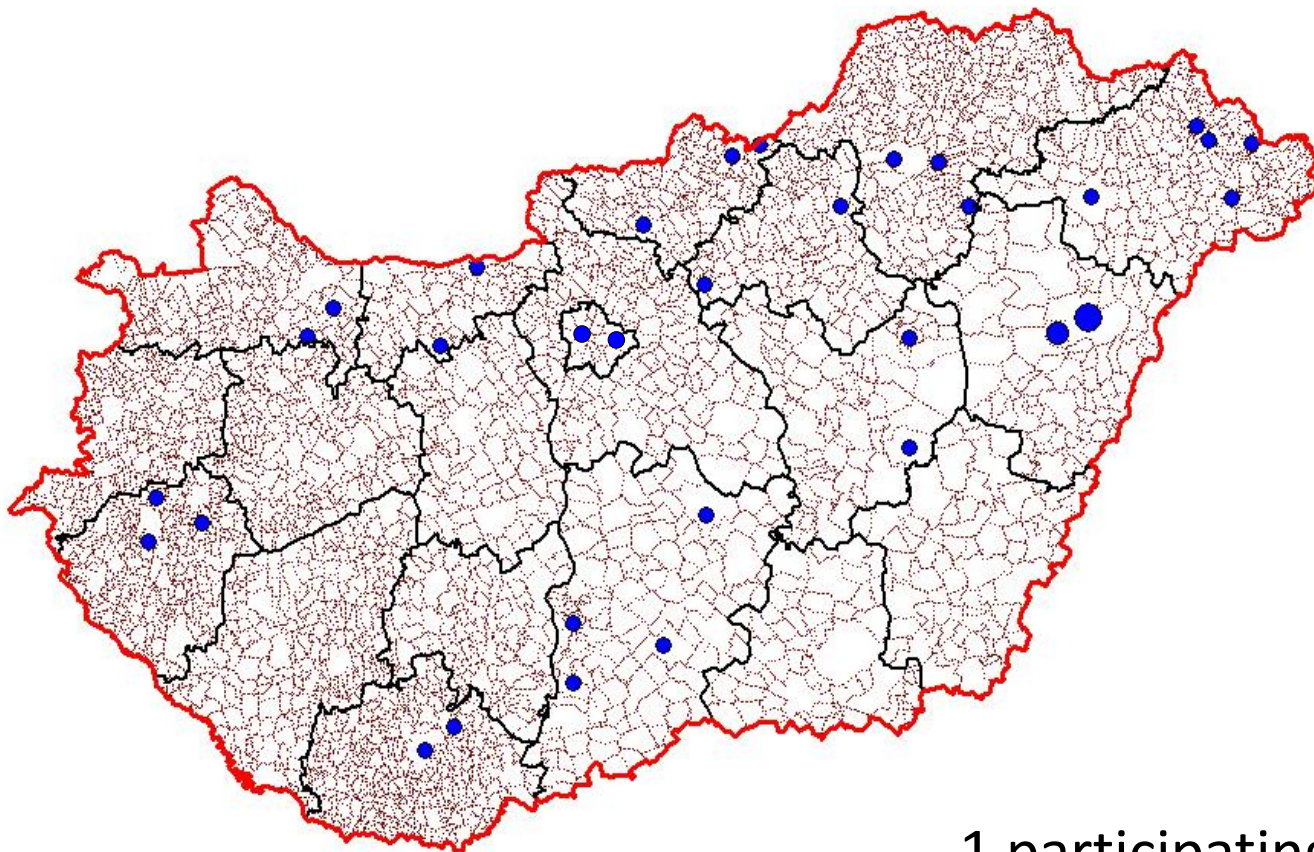
Change in 2-year cumulative incidence of AMI and stroke
(2008-2011 vs 2004-2007) among T2DM patients above 50
(GPMSSP)

ICD	gender	Standardized Incidence Ratio [95% CI]
AMI	male	68.13% [56.28%-79.98%]
AMI	female	68.84% [57.67%-80.00%]
AMI	total	68.51% [60.38%-76.63%]
STROKE	male	67.29% [59.67%-74.92%]
STROKE	female	92.53% [83.34%-101.71%]
STROKE	total	79.58% [73.64%-85.52%]

T2DM cohort (est. 2016)



T2DM cohort



- 1 participating GMP

T2DM cohort on-line data collection

- **At registration:**
 - Age
 - Sex
 - Level of education
 - Year of T2DM diagnosis
- **Year of diagnosis of accompanying disorders:**
 - Stroke
 - Hypertension
 - IHD
 - MI
 - Retinopathy
 - Amputation
 - Neuropathy
 - Nephropathy
 - Dialysis
- **Year of changes in therapy:**
 - Only life style
 - OAD by ATC subgroups
 - Insulin
- **Data collection once a year:**
 - BMI
 - SBP, DBP
 - HbA1c
 - eGFR
 - HDL cholesterol
 - LDL cholesterol
 - Total cholesterol
 - Triglyceride

 - Date of last HbA1c check
 - Date of last ophthalmologic examination

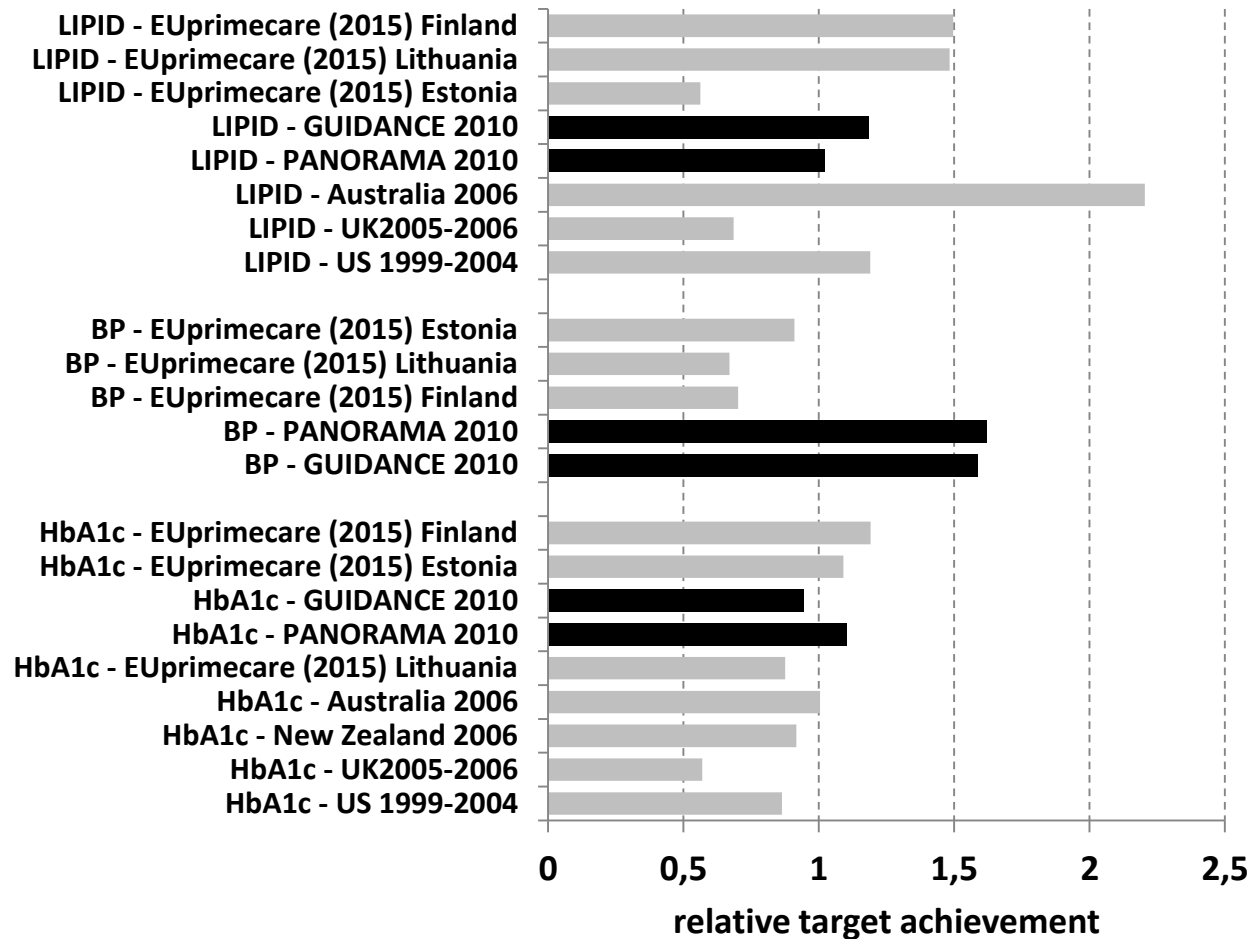
 - Treatment for lipid
 - Treatment of hypertension

T2DM cohort 2016

	proportion of investigated patients within 12 months	proportion of uncontrolled among investigated patients
fasting blood glucose	95.83% [94.53-96.9]	45.16% [42.25-48.07]
HbA1c	88.27% [86.29-90.05]	61.66% [58.70-64.62]
BMI	100% [99.69-100]	52.72% [49.87-55.57]
waist circumference	100% [99.69-100]	78.57% [76.23-80.92]
blood pressure	100% [99.69-100]	54.00% [51.15-56.85]
eGFR	80.10% [77.82-82.38]	87.37% [85.25-89.49]
TC	91.16% [89.39-92.72]	63.71% [60.83-66.59]
TG	90.9% [89.11-92.48]	49.02% [46.02-52.02]
LDL-C	57.4% [54.51-60.25]	53.48% [49.72-57.24]
HDL-C	75.94% [73.39-78.35]	30.8% [27.77-33.83]

T2DM cohort 2016

Relative target achievement in Hungary



Change in target achievements in the period of 2008-2016 among above 50 T2DM patients in Hungary

(T2DM patients >50)	age and sex adjusted OR* [95%CI]
hbA1c target achievement (7%)	1.56 [1.30 - 1.87]
LDL target achievement (2.8 mmol/L)	1.45 [1.18 - 1.78]
SBP target achievement (130 mmHg)	0.84 [0.68 - 1.03]
SBP target achievement (140 mmHg)	1.11 [0.93 - 1.329]

* 2016 (T2DM cohort) / 2008 (T2DM survey)

Next steps

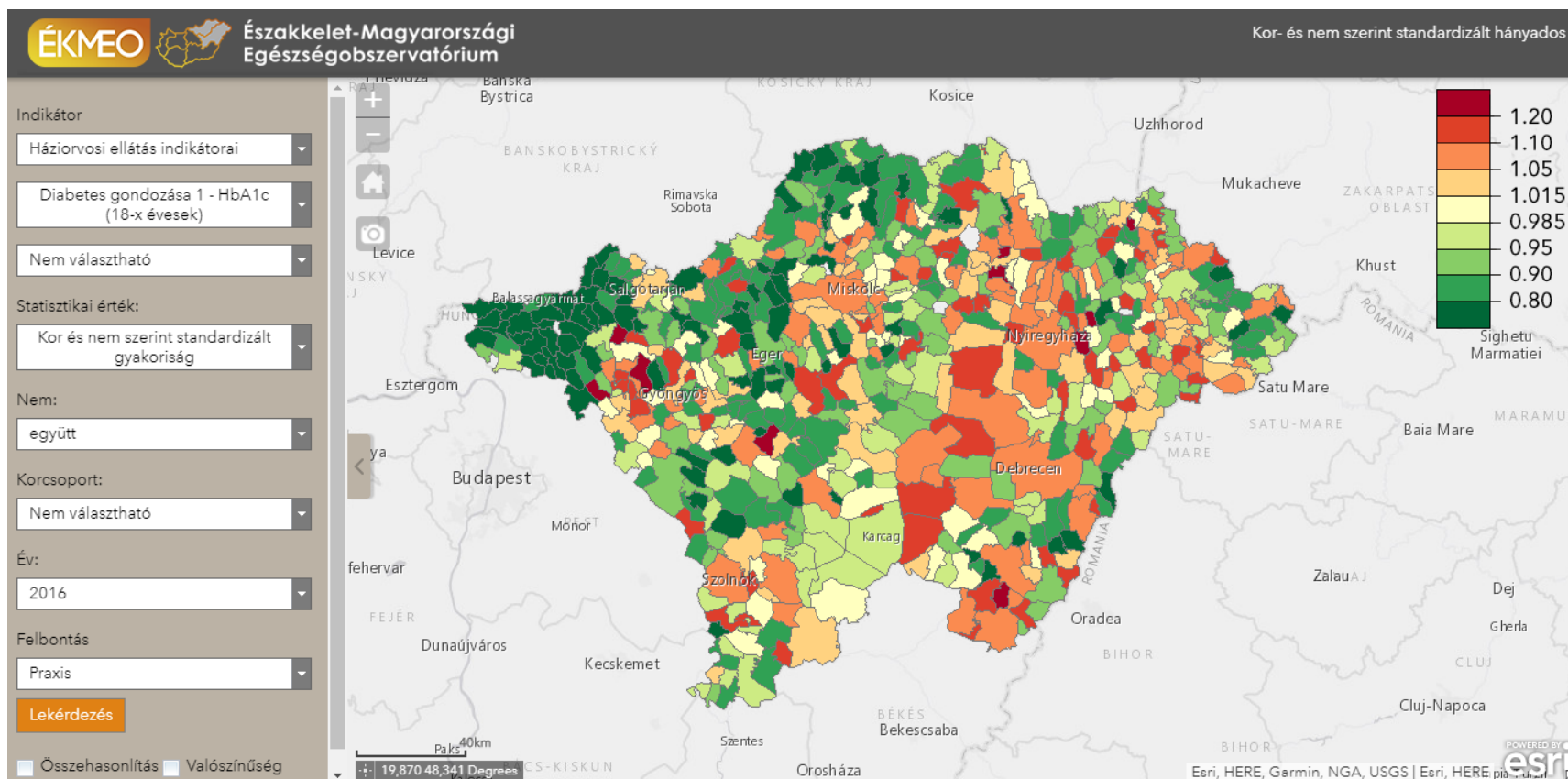
Going on

- Further standardization of T2DM indicators
- Extending indicator set
- Implementing follow-up data collection
- Regular feed-back (to GMP) and reporting (Hungary vs reference countries)

Preparing for

- Testing PHC level interventions
- Covering all patients in participating GMPs
- Enrolling new GMPs

T2DM indicators' geographical distribution (Regional Health Observatory)



Age and sex standardized relative frequency of HbA1c check by GMPs