



Materials, Methods and Data Analysis of Diabetes Registers

The Diabetes Register of <GPMSSP, Hungary>

Attila Nagy

School of Public Health

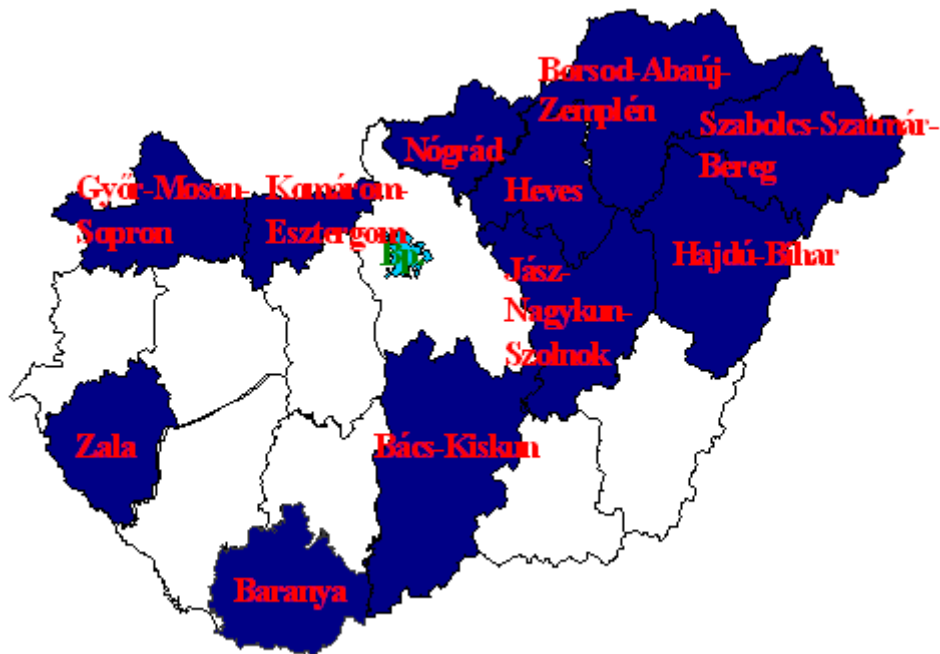
University of Debrecen, Medical and Health Science

Center Special BIRO Academy Meeting

“Coordinated Information Delivery from Diabetes Registers
to improve quality and outcomes in Europe”

Rome 4-5th June 2010

<GPMSSP, Hungary> Reference Population



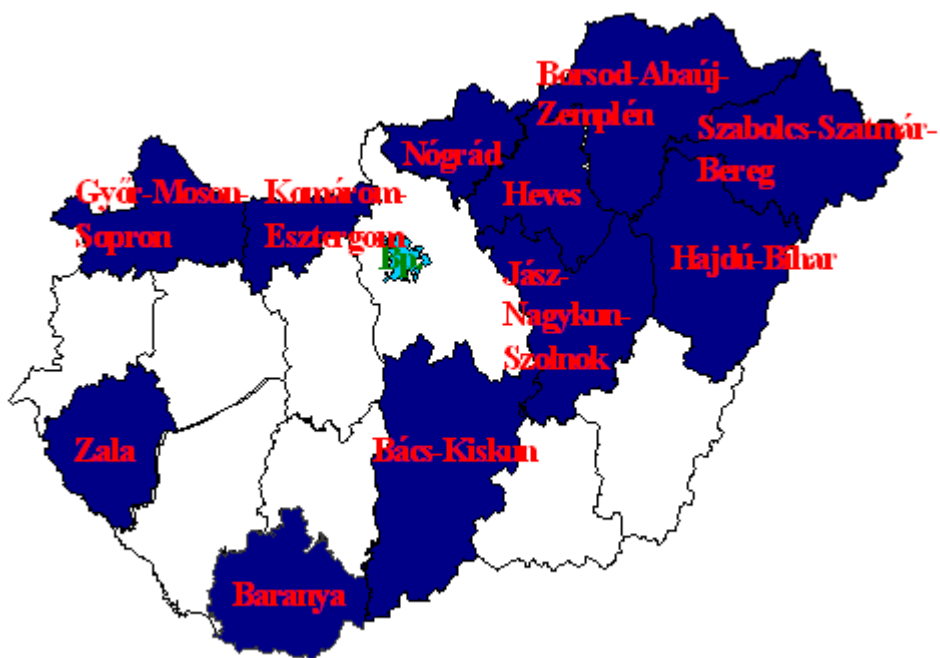
Country: Hungary
Region: GPMSSP
Total Population(>35years):
234154
Diabetes Prevalence(DM2):
9,3%
Type of Data Sources:
monitoring

N.Participating Centres: 11
county monitoring manager

General. Practitioners' Morbidity
Sentinel Stations Programme

<GPMSSP, Hungary>

Reference Diabetes Data



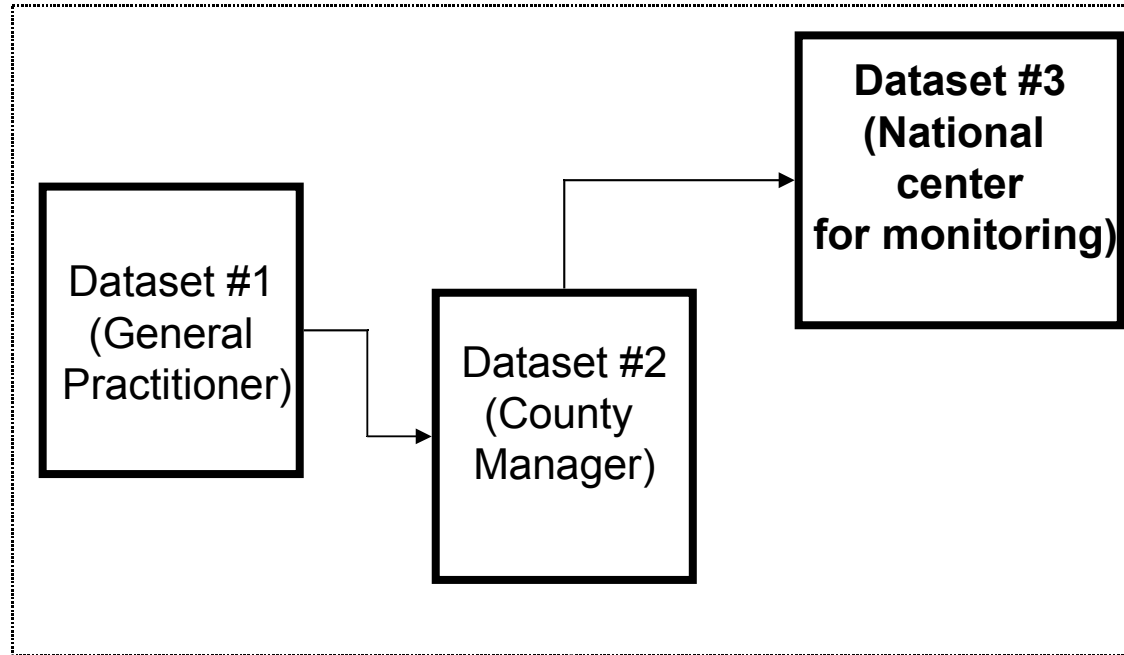
Year: **2008**

Region: 11

Total N. Subjects(DM2): 21901

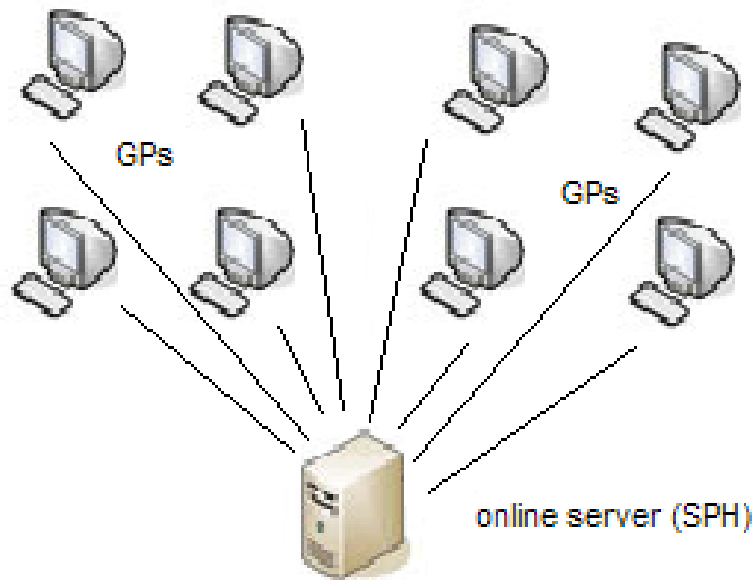
<GPMSSP, Hungary>

Local Database Structure



<GPMSSP, Hungary>

Local Database Structure: IT



Hardware (server):
Intel Xeon dual-core 2Ghz
2GB RAM
450GB HDD
10Gbit/s optical fiber

Software:
Windows 2003 Server
VMWare(Ubuntu)
MySQL 5.0
Apache 2.0

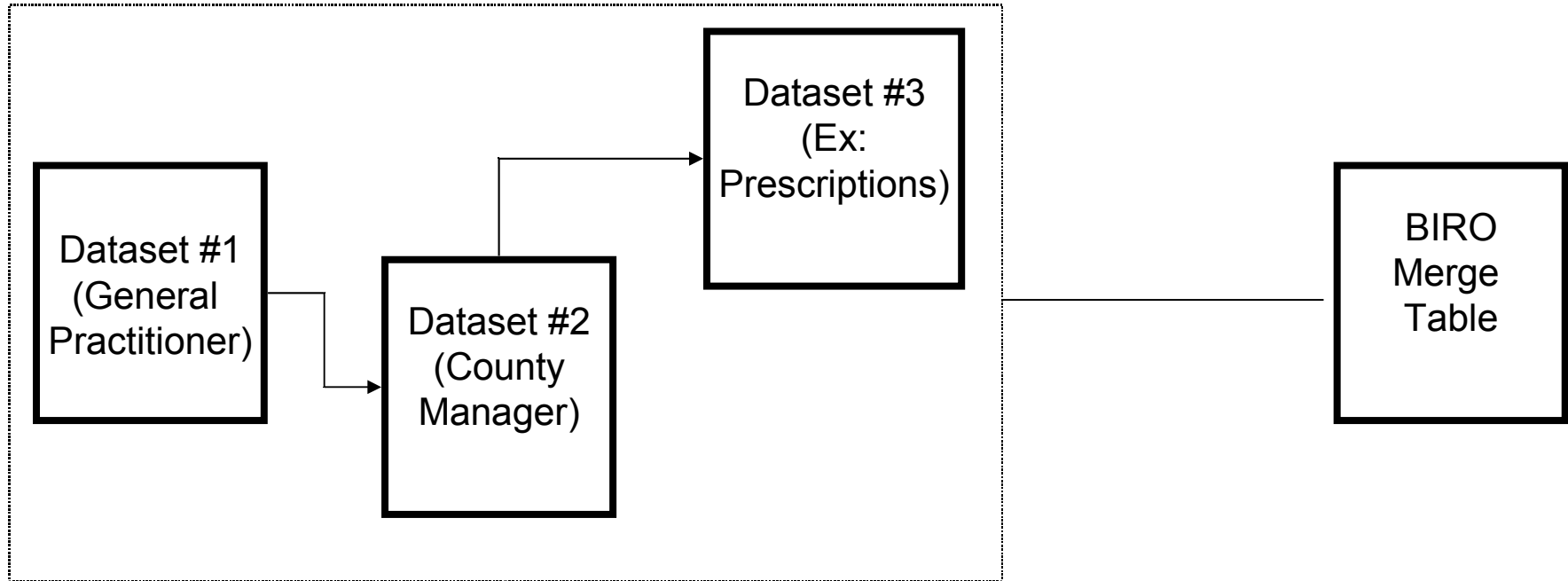
We use ID numbers (practice and patient) in our database. (We link datasets through ID numbers)

Persons cannot be identified neither directly nor indirectly. (Only GP can identify his/her patients.)

Our anonymisation procedure is compliant with international technical standards.

<GPMSSP, Hungary>

Local Database Structure and the BIRO Merge Table



<GPMSSP, Hungary>

Using BIRO



- Problems/Weaknesses
 - Design of figures
 - OS independent software(bootable)
 - Statistical tests („One or more cells have less than 2 obs“)
- Strengths
 - EU standard
 - Comparative results

<GPMSSP, Hungary>

Mapping to BIRO European Standard



- Problems/Weaknesses
 - Not 100% match (75,5%)
- Strengths
 - Easy to handle
 - General format (.csv)

<GPMSSP, Hungary>

Merge Table Contents



Patient ID			
Data Source ID			
Type Of Diabetes			
Sex			
Date of Birth			
Date of Diagnosis			
Episode Date			
Smoking Status			
Cigarettes per day			
Alcohol Intake			
Weight			
Height			
Body Mass Index			
Systolic Blood Pressure			
Diastolic Blood Pressure			
HbA1c			
Creatinine			
Microalbumin			
	Total Cholesterol		
	HDL		
	Triglycerides		
	Eye Examination		
	Retinopathy Status		
	Maculopathy Status		
	Foot Examination		
	Foot Pulses		
	Foot Sensation		
	Nasal Therapy		
	Average Injections		
	Self Monitoring		
	Diabetes Specific Education		
	Lipid Lowering Therapy		
	Anti-platelet Therapy		
	Patient Enrolment in DMP		
			End Stage Renal Therapy
			Renal Dialysis
			Renal Transplant
			Stroke
			Active Foot Ulcer
			Myocardial Infarction
			Laser
			Hypertension
			Blindness
			Amputation
			Antihypertensive Medication
			Hypoglycemic Drug Therapy
			Oral Drug Therapy
			Pump Therapy

<GPMSSP, Hungary>

Additional Data



Activity Table:

Patient ID, date of diagnosis, date of co-morbidity

Population Table:

As required.

Diabetic Population Table:

As required.

<GPMSSP, Hungary>

Statistical Report: General Characteristics



1.1. Age (Classes)

Reference Date: 31/12/2008

Age Classes	Female(%)	Male(%)		
0-34				
35-54	97(14.20)	127(19.66)		224
55-74	419(61.35)	425(65.79)		844
75+	167(24.45)	94(14.55)		261
	683(51.39)	646(48.60)		1329
missing record(s):	1			

Age Classes (by Gender)

<GPMSSP, Hungary>

Statistical Report: General Characteristics



2.1.2. Duration of diabetes (Classes)

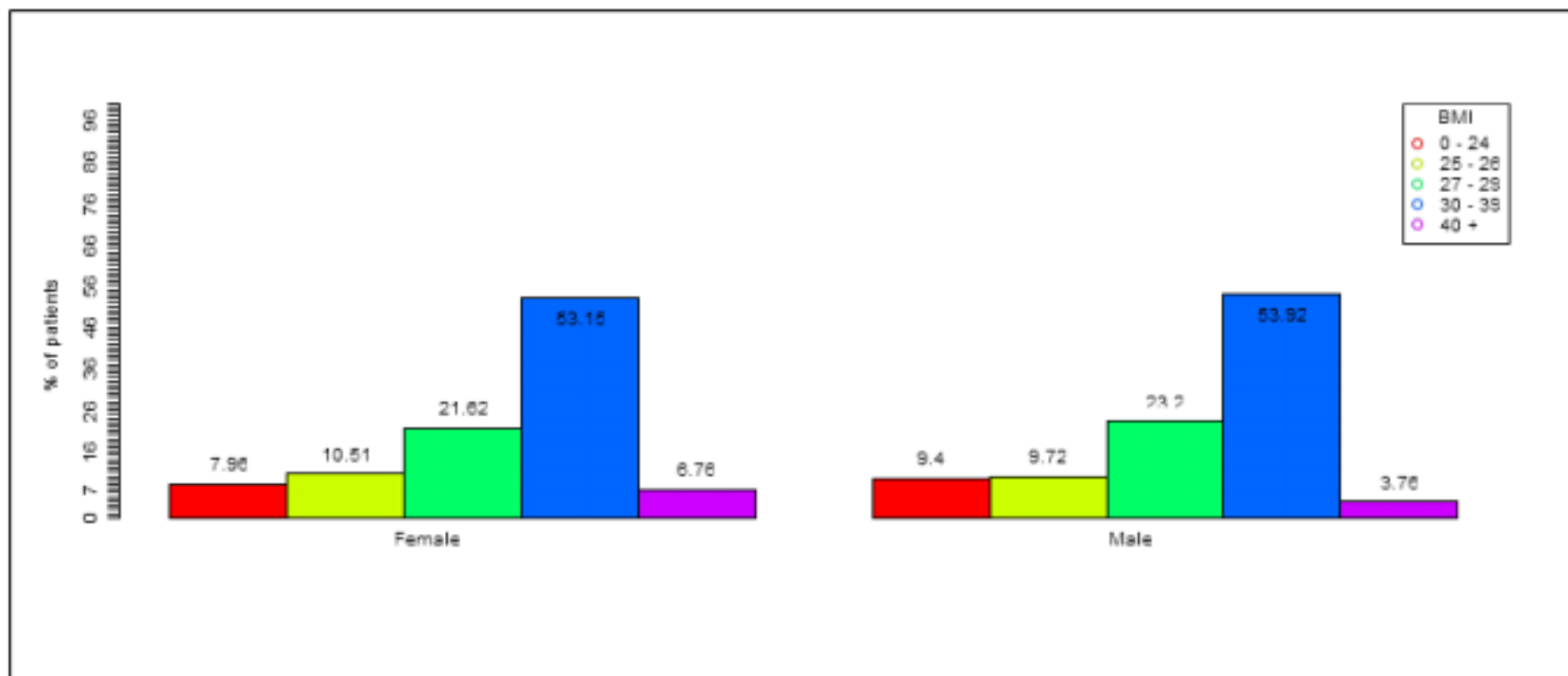
Reference Date: 31/12/2008

HbA1c done	Type 2							
	0 - 9		10 - 19		20 +			
	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)		
Yes	472 (98.54)	446 (98.67)	153 (96.84)	154 (96.25)	33 (100)	24 (100)	1282	
No	7 (1.46)	6 (1.33)	5 (3.16)	6 (3.75)	0 (0)	0 (0)	24	
	479 (36.68)	452 (34.61)	158 (12.1)	160 (12.25)	33 (2.53)	24 (1.84)	1306	

HbA1c done (by Type of Diabetes,Duration of Diabetes,Gender)

<GPMSSP, Hungary>

Statistical Report: General Characteristics



Barplot: BMI (by Gender)

<GPMSSP, Hungary>

Statistical Results: BIRO Indicators



3.3.4.1 Antihypertensive Medication (last episode in 12 months)

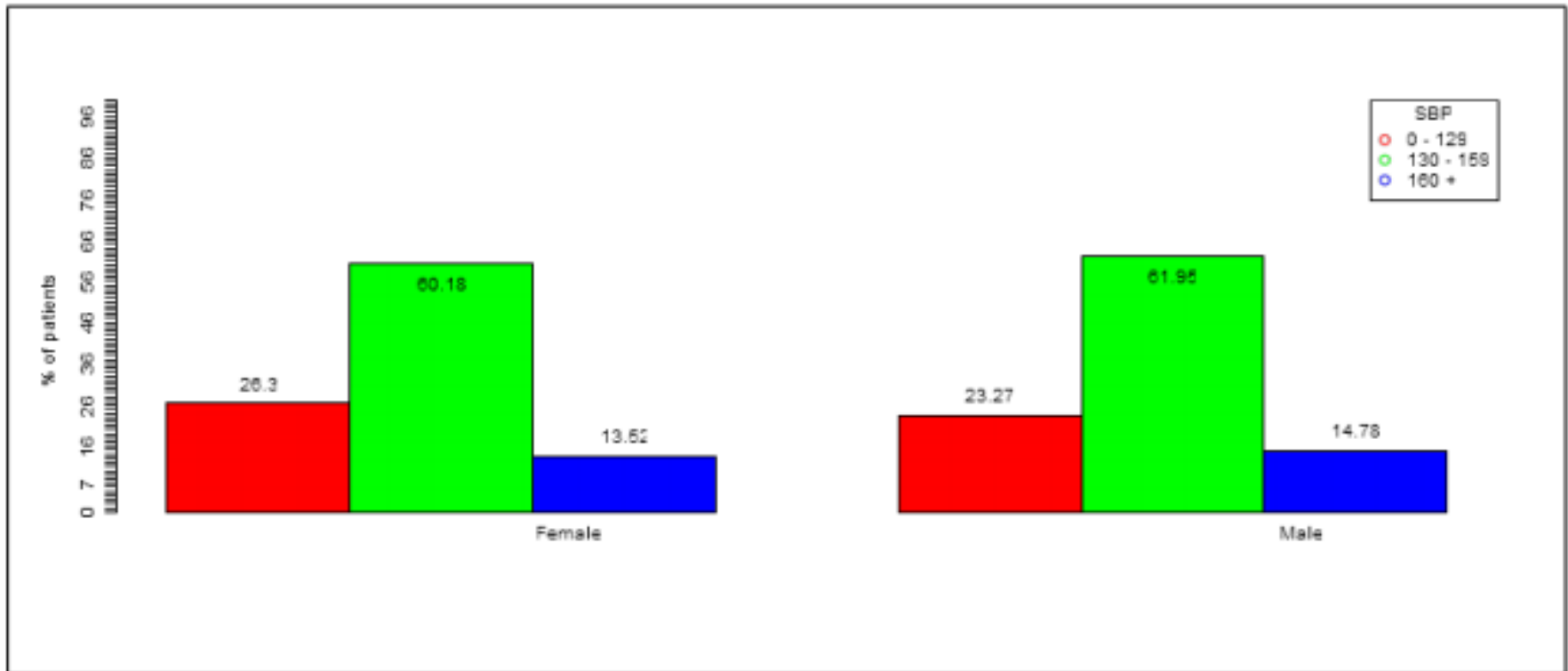
Reference Date: 31/12/2008

Antihypertensive Medication	Type 2				
	0-34(%)	35-54(%)	55-74(%)	75+(%)	
Yes		172(77.47)	747(89.67)	232(90.27)	1151
No		50(22.52)	86(10.32)	25(9.72)	161
		222(16.92)	833(63.49)	257(19.58)	1312
missing record(s):	18				

Antihypertensive Medication (by Age Classes, Type of Diabetes)

<GPMSSP, Hungary>

Statistical Report: BIRO Indicators



Barplot: SBP (by Gender)

<GPMSSP, Hungary>

Conclusions (1): Statistical Results



- Statistical tests („One or more cells have less than 2 obs“)
- Possible indicators:
 - Compliance
 - Family history
 - SES

<GPMSSP, Hungary>

Conclusions (2): Diabetes Care



- Useful information
- Diabetes status (local/comparative)

<GPMSSP, Hungary>

Conclusions (3):BIRO usage

- Problems/Weaknesses
 - OS independent software(bootable)
 - Statistical tests („One or more cells have less than 2 obs“)
- Strengths
 - EU standard
 - Comparative results
 - General format (csv)

<GPMSSP, Hungary>

Future LOCAL Perspectives



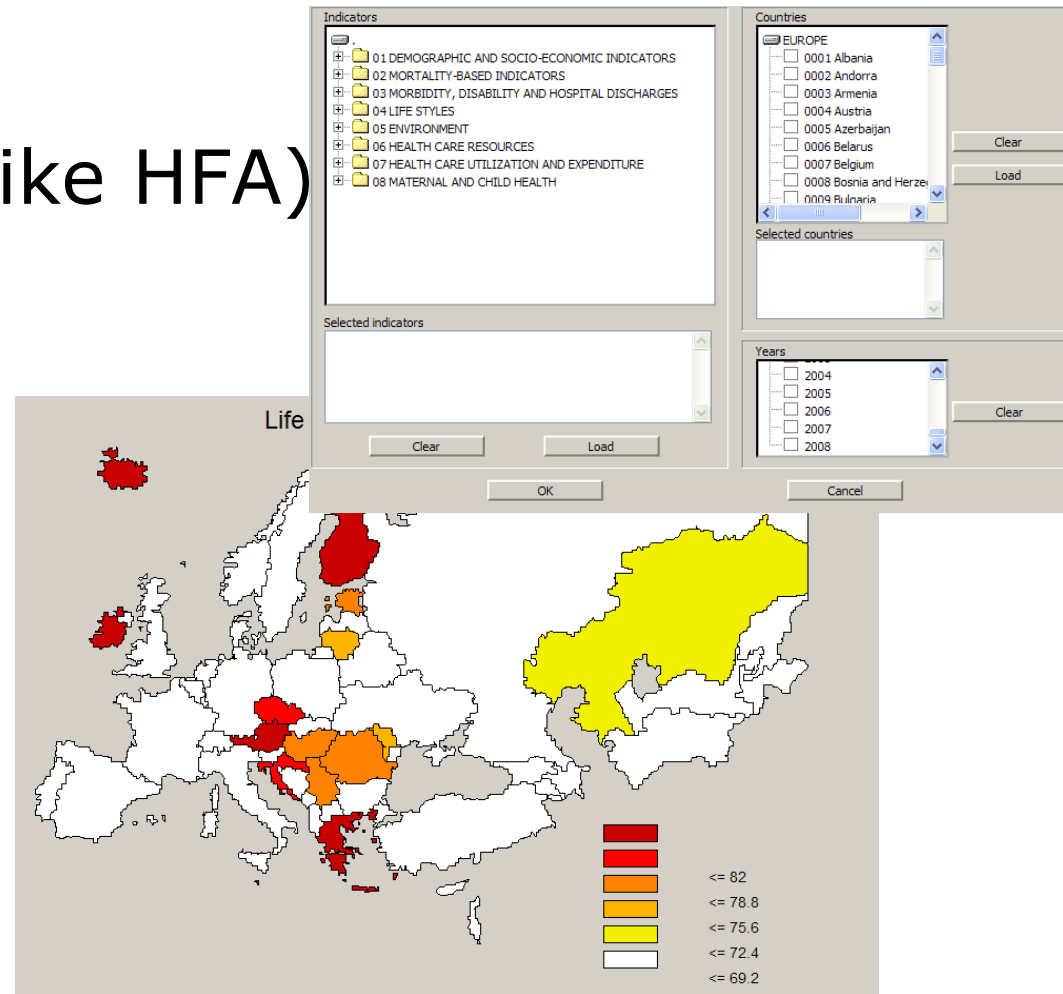
- Extend monitoring (from 11 counties to whole country)
- Hospital discharges
- Map to medicament database

<GPMSSP, Hungary>

Future BIRO Perspectives



- Online interface (like HFA)
- Indicators:
 - Compliance
 - Family history
 - SES



<GPMSSP, Hungary>



Thanks for the attention!