B.I.R.O.

Best Information through Regional Outcomes

A Public Health Project funded by the European Commission, DG-SANCO 2005

WP7: REPORTS TEMPLATE

DOCUMENT V1.1

July 2007

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1 Background/objectives

Rationale behind templates
Definition: "A "template" is a document or file having a preset format, used as a starting point for a particular application so that the format does not have to be recreated each time it is used."

WP7 will define a structure for diabetes health reports that could be used across international regions. WP7 strongly relates to WP2 Clinical review, WP3 Common dataset and WP3 Data dictionary. These WPs constitute the backbone of WP7 and provide the structure and starting point for build-up of the template.

The Reports template will be continuously updated according to the update of the other workpackages and the development of future WPs. The final deliverable is due July 31st 2008

2 BIRO users

2.1 Classes

The report templates should satisfy the need for different types of audience, reflecting the full scope of the project. When making the choice "Diabetes reports" or "Diabetes overview Europe" on the BIRO web-page the user should be prompted to proceed according to the following categories:

- Governance
    - European Union
    - Commission, parliament, directorates
    - National and regional governments
    - Local health care authorities (Management clinical networks)
    - Other local authorities
    - Payers
    - Social /Private Insurance
    - Non-governmental organizations (NGOs)
    - WHO, OECD, IDF, national and local diabetes associations (Diabetes Atlas)

- Health care and research
    - Primary care, practices and societies
    - Diabetes care units
    - Health care professional associations
    - Quality management associations
    - Industry
    - EU DG-Research, DG-INFSO
    - Scientific organizations, e.g. national and international scientific organizations (EASD, ESF)
    - Research institutions, e.g. universities, foundations, statistical departments of local governments
    - Research areas, e.g. epidemiology, health policy, public health, clinical medicine

- People with diabetes and citizens
    - Consumer organizations
    - Patients organizations
    - People with diabetes and their families

Reporting templates will to try to maintain these three profiles through the reports.

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2.2 Types of information to be distributed

The chapter describes the different types of diabetes information data to be distributed for the three chosen audiences

2.3 Index of the reports

2.3.1 Governance
- o General information
- o Demographic characteristics
- o Clinical characteristics
  - -Diabetes status
  - -Risk factors
  - -Complications
- o Health system
- o Population
- o Risk adjusted indicators

2.3.2 Health care and research
- o General information
- o Demographic characteristics
- o Clinical characteristics
  - -Diabetes status
  - -Risk factors
  - -Complications
- o Health system
- o Population
- o Risk adjusted indicators

2.3.3 People with diabetes and citizens
- o General information
- o Demographic characteristics
- o Clinical characteristics
  - -Diabetes status
  - -Risk factors
  - -Complications
- o Health system
- o Risk adjusted indicators

3 List of target measures/outputs/indicators

3.1 Assigned priority and feasibility for each indicator.

Priority: "How important is it to include the selected data item"

Priority scale: subjective, consensus based
1=High, 2=Intermediate, 3=Low

Feasibility: "How feasible is it to collect the selected data item"

Feasibility Scale: subjective, consensus based
A=High, B=Intermediate, C=Low

Strata: "Indicates whether or not the data item should be stratified for output"

Descriptive data items for diabetes population:

1) Demographic characteristics	Priority Level	Feasibility	Strata
a) Age (Classes)	1	A	X
b) Gender	1	A	X
c) Ethnicity	2	C	
d) Education	2	C	
e) Employment status	2	C	
2) Clinical characteristics			

		1	A	X
a) Diabetes status				
	1. Type of diabetes	1	A	X
	2. Duration of diabetes	1	A	X
b) Risk factors				
	1. Obesity			
	a. Weight	1	A	X
	b. Height	1	A	X
	c. BMI	1	A	X
	d. Waist circumference	2	B	
	2. Lifestyle			
	a. Smoking status	1	A	X
	b. Cigarettes per day	2	B	
	c. Alcohol intake	2	B	
	3. Clinical measurements			
	a. Systolic BP	1	A	X
	b. Diastolic BP	1	A	X
	c. Total cholesterol	1	A	X
	d. HDL-cholesterol	1	A	X
	e. Triglycerides	1	B	
	f. Microalbumin	1	B	
	g. Creatinine	1	A	X
	h. HbA1c	1	A	X
	4. Comorbidities			
	a. History of stroke	1	B	
	b. History of myocardial infarction	1	B	
	c. History of hypertension	1	B	
c) Diabetes complications				
	1. Retinopathy	1	A	X
	2. Maculopathy	2	C	
	3. Blindness	2	B	
	4. End stage renal failure	1	A	X
	5. Foot ulcer	1	A	X
	6. Amputation	1	A	X
	7. Stroke	1	A	X
	8. Myocardal infarction	1	A	X
	9. Hypertension	1	A	X

3) Health system			
a) Structure (provider level)			
1. Type of provider	1	A	X
2. Average diabetes population per center	1	A	X
3. Average number of doctors per patient	1	B	
4. Average number of nurses per patient	1	B	
5. Structured disease management program	1	B	
b) Structural quality			
1. Hospital beds per 100,000 population	1	A	X
2. Physicians employed per 100,000 population	1	A	X
3. Number of diabetologists per 100,000	1	C	
4. Number of doctors who regularly take care of diabetic patients in diabetes clinics in primary or secondary care per 100,000	1	B	
5. Number of diabetes nurses employed per 100,000	1	B	
6. Number of structured Disease Management Programmes	1	B	
7.			
c) Processes (individual level)			
1. Foot examination			
a. Done	1	A	X
b. Foot pulse	2	B	
c. Skin sensation	2	B	
2. Eye examination			
a. Done	1	A	X
3. Laser treatment	1	B	
4. Measurements Done			
a. BP	1	A	X
b. Lipids	1	A	X
c. Microalbumin	1	A	X
d. HbA1c	1	A	X
5. Treatment			
a. Anthypertensive medication	1	A	X
b. Lipid lowering treatment	1	A	X
c. ASA treatment (Aspirin)	1	A	X
d. Glucose lowering therapy			
i. Diet only	1	A	X
ii. Tablets (1. Sulphonyfureas, 2. Biguanides, 3. Glucosidase	1	A	X

Inhibitors, 4. Glitazones, 5. Glinides)				
iii. Insulin only	1	A	X	
iv. Insulin and tablets	1	A	X	
v. Inhaled insulin	2	A		
vi. Insulin pump	1	A	X	
vii. Number of insulin injections	1	B		
6. Management				
a. Self-monitoring	1	A	X	
b. Structured diabetes education	1	B		
c. Visit frequency	1	A	X	
4) Population (Area level)				
a) Total population				
1. By age and gender	1	A	X	
2. Life expectancy	1	A	X	
3. Socio-economic indicators	2	A		
4. Mortality data	1	A	X	
5) Risk adjusted indicators				
a) Epidemiology				
1. Annual Incidence of Type 1 Diabetes in children between 0-14 years of age at diagnosis (clinical) per 100,000 children	1	B		
2. Prevalence of diabetes mellitus per 1,000.	1	A	X	
3. Age at diagnosis by 10 year age bands (incidence)	1	A	X	
b) Process quality				
1. Percentage of patients with one or more HbA1c tests during the last 12 months	1	A	X	
2. Percentage of patients with one or more Total cholesterol/HDL tests during the last 12 months	1	B		
3. Percentage of patients with at least one test for microalbuminuria during the last 12 months	1	A	X	
4. Percentage of diabetes patients who received a dilated eye examination or evaluation of retinal photography by a trained caregiver within the last 12 months	1	A	X	
5. Percentage of diabetes patients receiving at least one foot examination within the last 12 months	1	A	X	
6. Percentage of diabetes patients whose smoking status was ascertained and documented within the last 12 months	1	A	X	

7. Percent with serum creatinine tested in last 12 months	1	A	X
8. Percentage of patients with diabetes and one or more blood pressure measurements within the last 12 months	1	A	X
9. Percentage of patients with hypertension who receive antihypertensive medication	1	A	X
10. Percentage of patients with diabetes specific education at least once before	1	B	
11. Type of oral therapy (distribution of agents) in patients with diabetes type 2	1	A	X
12. Portion of patients treated with insulin among patients with diabetes	1	A	X
13. Portion of patients teated with insulin in combination with OADs among patients with diabetes	1	A	X
14. Percentage of insulin treated patients with pump therapy	1	A	X
15. Average number of insulin injections per day in insulin treated patients	2	B	
16. Portion of diabetes patients with anti hypertensive treatment	1	A	X
17. Portion of diabetes patients with lipid lowering treatment	1	A	X
18. Portion of diabetes patients with ASA treatment	1	A	X
19. Percent of patients with diabetes performing self-monitoring of blood glucose testing	1	A	X
c) Outcome quality – intermediate outcomes			
1. Percentage of patients with most recent HbA1c level >9.0% (poor control)	1	A	X
2. Percentage of patients with most recent HbA1c level >7,5%	1	A	X
3. Percentage of patients with Total-Chol / HDL-Chol < 4.5	1	B	
4. Percentage of patients with most recent blood pressure <140/90 mmHg	1	A	X
5. Percentage of patients with BMI ≥ 30	1	A	X
6. Percentage of patients with waist circumference above IDF cut-offs	2	B	
7. Percentage of persons with diabetes mellitus with a fundus inspection in the last 12 m, who have proliferate retinopathy and/or maculopathy	1	B	
8. Percentage of patients with eye laser treatment ever	1	B	
9. Percentage with microalbuminuria in last 12 months (among those who have been tested)	1	A	X
10. Rate of current smokers among diabetes patients	1	A	X
11. Rate of patients with current alcohol abuse/dependence	2	B	
12. Former or current foot ulceration	1	A	X

d) Outcome Quality – Terminal outcomes			
1. Annual incidence of blindness in patients with diabetes (among those visited during the last 12 months)	1	B	
2. Annual incidence of dialysis and/or transplantation (renal replacement therapy in patients with diabetes	1	A	X
3. ESRD in Persons with Diabetes	1	A	X
4. Annual incidence of amputations above the ankle	1	B	
5. Annual incidence of stroke in patients with diabetes	1	B	
6. Annual Incidence of myocardial infarction in patients with diabetes	1	B	
7. Annual death rate per 100,000 populations in the general population from all causes, adjusted for standard European population. Annual death rate per 100,000 populations in patients, who have as primary or secondary cause of death, diabetes mellitus, adjusted for standard European population.	1	A	X

3.2 Stratification factors for each indicator

Strata: "Indicates whether or not the data item should be stratified for output"

This table focuses on measures/outputs/indicators with high priority and high feasibility (1A) from the table in 3.1.

1. Demographic characteristics	Strata
1.1. Age (Classes)	Gender
1.2. Gender	Age
2. Clinical characteristics	
2.1. Diabetes status	
2.1.1. Type of diabetes	Age
2.1.2. Duration of diabetes (Classes)	Type of diabetes, Gender, Hba1c
2.2. Risk factors	
2.2.1. Obesity	
2.2.1.1. Weight	(Gender x Age x Type of diabetes)
2.2.1.2. BMI	(Gender x Age x Type of diabetes)
2.2.2. Lifestyle	
2.2.2.1. Smoking status	(Gender x Age x Type of diabetes)
2.2.3. Clinical measurements	
2.2.3.1. Systolic BP	(Gender x Age x Type of diabetes)
2.2.3.2. Diastolic BP	(Gender x Age x Type of diabetes)
2.2.3.3. Total cholesterol	(Gender x Age x Type of diabetes)
2.2.3.4. HDL-cholesterol	(Gender x Age x Type of diabetes)
2.2.3.5. Creatinine	(Gender x Age x Type of diabetes)
2.2.3.6. HbA1c	(Gender x Age x Type of diabetes)
2.3. Diabetes complications	
2.3.1. Retinopathy	Diabetes duration
2.3.2. End stage renal failure	Diabetes duration
2.3.3. Foot ulcer	Diabetes duration
2.3.4. Amputation	Diabetes duration
2.3.5. Stroke	Diabetes duration
2.3.6. Myocardal infarction	Diabetes duration
2.3.7. Hypertension	Diabetes duration

3. Health system	
3.1. Structure (provider level)	
3.1.1. Type of provider	
3.1.2. Average diabetes population per center*** ***Specify definition of center (size, nature)	(Gender x Age x Type of diabetes)
3.2. Structural quality	
3.2.1. Hospital beds per 100,000 population	Region
3.2.2. Physicians employed per 100,000 population	Region
3.3. Processes (individual level)	
3.3.1. Foot examination	
3.3.1.1. Done	(Age x Type of diabetes)
3.3.2. Eye examination	
3.3.2.1. Done	(Age x Type of diabetes)
3.3.3. Measurements done	
3.3.3.1. BP	(Age x Type of diabetes)
3.3.3.2. Lipids	(Age x Type of diabetes)
3.3.3.3. Microalbumin	(Age x Type of diabetes)
3.3.3.4. HbA1c	(Age x Type of diabetes)
3.3.4. Treatment	
3.3.4.1. Anthypertensive medication	(Age x Type of diabetes)
3.3.4.2. Lipid lowering treatment	(Age x Type of diabetes)
3.3.4.3. ASA treatment (Aspirin)	(Age x Type of diabetes)
3.3.4.4. Glucose lowering therapy	
3.3.4.4.1. Diet only	(Age x Type of diabetes)
3.3.4.4.2. Tablets (1. Sulphonyureas, 2. Biguanides, 3. Glucosidase Inhibitors, 4. Glitazones, 5. Glinides)	(Age x Type of diabetes)
3.3.4.4.3. Insulin only	(Age x Type of diabetes)
3.3.4.4.4. Insulin and tablets	(Age x Type of diabetes)
3.3.4.4.5. Insulin pump	(Age x Type of diabetes)
3.3.5. Management	
3.3.5.1. Self-monitoring	(Age x Type of diabetes)
3.3.5.2. Visit frequency	(Age x Type of diabetes)
4. Population (Area level)	
4.1. General population	
4.1.1. Total population	(Age x Gender)
4.1.2. Life expectancy	(Age x Gender)

4.1.3. Mortality data	(Age x Gender)
5. Risk adjusted indicators	
5.1. Epidemiology	
5.1.1. Prevalence of diabetes mellitus per 1,000.	Region, Type of diabetes
5.1.2. Age at diagnosis by 10 year age bands (incidence)	Region, Type of diabetes
5.2. Process quality	
5.2.1. Percentage of patients with one or more HbA1c tests during the last 12 months	Region, (Gender x Age x Type of diabetes)
5.2.2. Percentage of patients with at least one test for microalbuminuria during the last 12 months	Region, (Gender x Age x Type of diabetes)
5.2.3. Percentage of diabetes patients who received a dilated eye examination or evaluation of retinal photography by a trained caregiver within the last 12 months	Region, (Gender x Age x Type of diabetes)
5.2.4. Percentage of diabetes patients receiving at least one foot examination within the last 12 months	Region, (Gender x Age x Type of diabetes)
5.2.5. Percentage of diabetes patients whose smoking status was ascertained and documented within the last 12 months	Region, (Gender x Age x Type of diabetes)
5.2.6. Percent with serum creatinine tested in last 12 months	Region, (Gender x Age x Type of diabetes)
5.2.7. Percentage of patients with diabetes and one or more blood pressure measurements within the last 12 months	Region, (Gender x Age x Type of diabetes)
5.2.8. Percentage of patients with hypertension who receive antihypertensive medication	Region, (Gender x Age x Type of diabetes)
5.2.9. Type of oral therapy (distribution of agents) in patients with diabetes type 2	Country, (Gender x Age)
5.2.10. Portion of patients treated with insulin among patients with diabetes	Region, (Gender x Age x Type of diabetes)
5.2.11. Portion of patients treated with insulin in combination with OADs among patients with diabetes	Country, (Gender x Age)
5.2.12. Percentage of insulin treated patients with pump therapy	Region, (Gender x Age x Type of diabetes)
5.2.13. Portion of diabetes patients with anti hypertensive treatment	Region, (Gender x Age x Type of diabetes)
5.2.14. Portion of diabetes patients with lipid lowering treatment	Region, (Gender x Age x Type of diabetes)
5.2.15. Portion of diabetes patients with ASA treatment	Region, (Gender x Age x Type of diabetes)
5.2.16. Percent of patients with diabetes performing self-monitoring of blood glucose testing	Region, (Gender x Age x Type of diabetes)
5.3. Outcome quality – intermediate outcomes	

5.3.1. Percentage of patients with most recent HbA1c level >9.0% (poor control)	Region, (Gender x Age x Type of diabetes)
5.3.2. Percentage of patients with most recent HbA1c level >7,5%	Region, (Gender x Age x Type of diabetes)
5.3.3. Percentage of patients with most recent blood pressure <140/90 mmHg	Region, (Gender x Age x Type of diabetes)
5.3.4. Percentage of patients with BMI ≥ 30	Region, (Gender x Age x Type of diabetes)
5.3.5. Percentage with microalbuminuria in last 12 months (among those who have been tested)	Region, (Gender x Age x Type of diabetes)
5.3.6. Rate of current smokers among diabetes patients	Region, (Gender x Age x Type of diabetes)
5.3.7. Former or current foot ulceration	Region, (Gender x Age x Type of diabetes)
5.4. Outcome Quality – Terminal outcomes	
5.4.1. Annual incidence of dialysis and/or transplantation (renal replacement therapy in patients with diabetes	Region, (Gender x Age x Type of diabetes)
5.4.2. ESRD in Persons with diabetes	Region, (Gender x Age x Type of diabetes)
5.4.3. Annual death rate per 100,000 populations in the general population from all causes, adjusted for standard European population. Annual death rate per 100,000 populations in patients, who have as primary or secondary cause of death, diabetes mellitus, adjusted for standard European population.	Region

3.3 Defined criteria for data quality

The reports should indicate the level of data quality. This can be done in at least two ways.

Estimate the completeness of the data
Per Region: Number of patients with data available / number of diabetic patients in the region
Per Centre: Number of patients with data available in the centre / number of patients treated in the centre
Per Data Item: Number of patients with this item documented / number of patients with data available (any item)

Compare regional data with BIRO-definitions
Any data that is sent to BIRO must be clinically reviewed in line with the BIRO definitions and any discrepancies in local practice must be documented honestly. This is purely for information purpose and will allow BIRO to explain any variations in data collection etc. This means that each partner will send in data quality information for each indicator.

Example:

Indicator: Smoking status

Smoking Status – BIRO Definition:

Smoking status at date of contact
1 Current Smoker
2 Non-Smoker
3 Ex-Smoker

Overall Quality Score: High

Data Quality Information
Scotland: Patients who have never smoked will not be asked routinely to verify their smoking status
Norway: Unable to supply information (for example)

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4 Selecting statistical outputs possible for each indicator

4.1 Examples of types of variables for each statistical output

- S.1. Tables
  - Row: categorical variable (ex: age classes)
  - Column: categorical variable (ex: gender)
  - Third Dimension: max 3 levels categorical variable (ex: type of diabetes)

Table: Type of diabetes by age and gender

Age (year)	Male		Female	
	Type 1 (%)	Type 2 (%)	Type 1 (%)	Type 2(%)
0-9	0,1	0,1	0,1	0,1
10-19	0,2	0,2	0,2	0,2
20-29	1,3	0,3	1,3	0,3
30-39	1,6	1	1,6	1
40-49	2	3,1	2	3,1
50-59	2,3	4	2,3	4
60-69	3,4	5	3,4	5
70-89	3,6	7	3,6	7
>79	3,8	10	3,8	10

- S.2 Histograms
  - Y axis: Categorical variable (rate, percentage), Continuous Variable (Hba1c)
  - X axis: Categorical Variable (Smoking status)
  - Strata: max 3 levels categorical variable (ex: type of diabetes)

Figure 4: Most recent smoking status as a percentage of type 1 and type 2 diabetes (n= 13582)

	Current	Ex	Never	Unknown
Type 1	25.0%	13.9%	54.3%	6.9%
Type 2	17.6%	33.2%	46.0%	3.2%
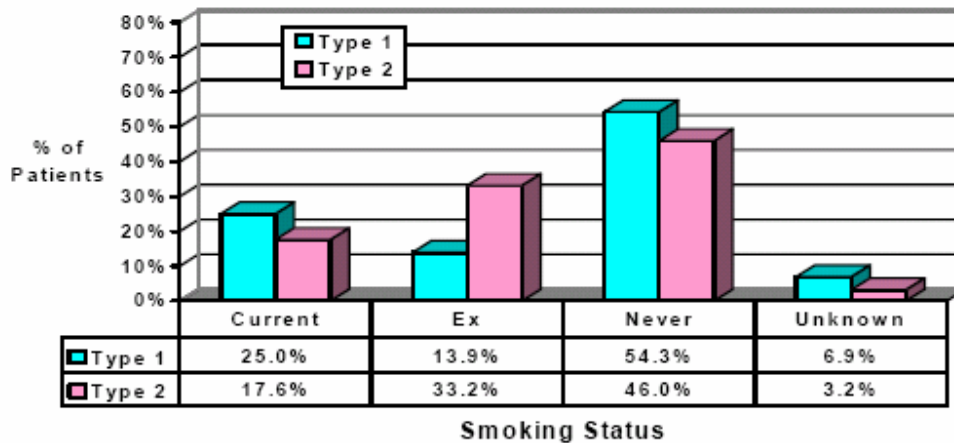
Smoking Status

When the categories are exclusive, also stacked bars or pie carts can be used.

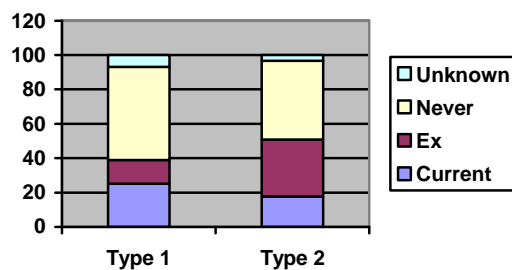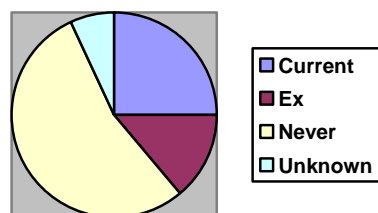Fig: Most recent smoking status as a percentage of type 1 and type 2 diabetes
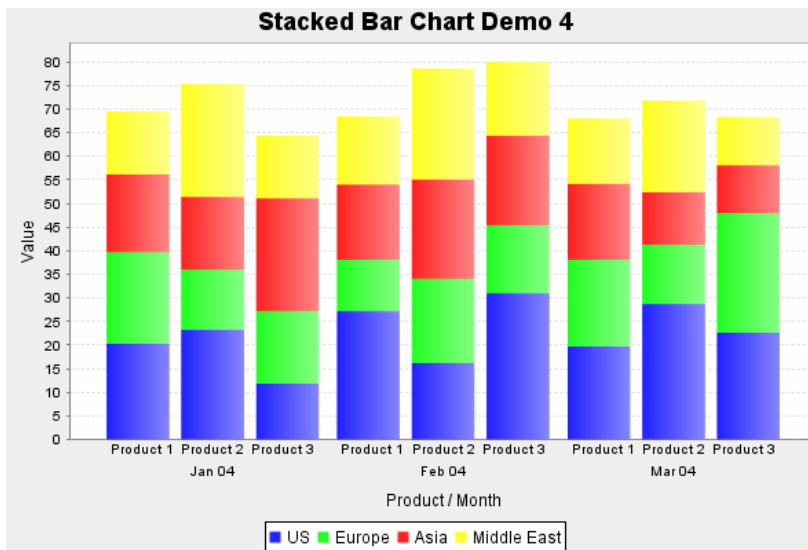

Fig: Most recent smoking status as a percentage of type 1 diabetes

- Example for a more complicated stacked bar chart:

Instead of Jan04, Feb 04, Mar 04 please imagine
- Foot examination done
- Eye examination done
- BP measurement done
- Lipids measurement done
- Microalbumin measurement done
- HbA1c measurement done

Instead of Product 1, Product 2, … please imagine
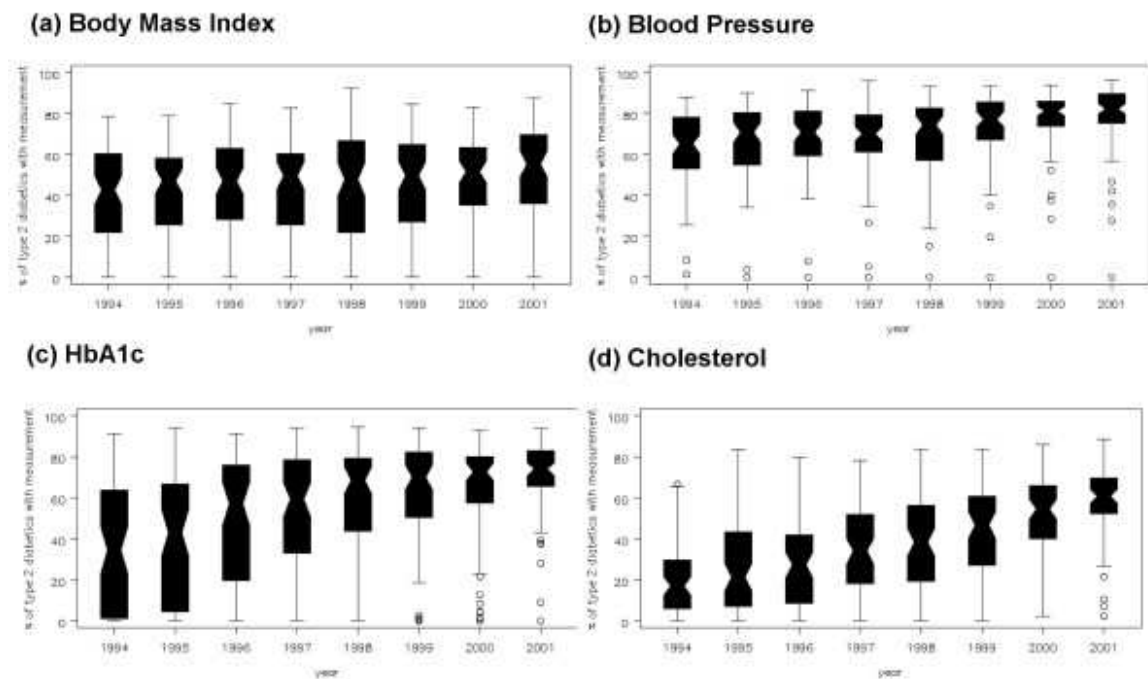- Diabetes duration <5 years
- Diabetes duration <5-15 years
- Diabetes duration <15-30 years
- Diabetes duration >30 years

Instead of US, Europe Asia, Middle East imagine
- Measurement/examination done
- Unknown

- S.3 Boxplot
    - Y-axis: continuous variable (measurement of BMI, BP, Hba1c, cholesterol)
    - X-axis: categorical variable (year)
   - Strata: max 3 levels categorical variable (ex: type of diabetes)

Distribution of the practice percentage of diabetics with a risk factor measured by year

(a) Body Mass Index
(b) Blood Pressure
(c) HbA1c
(d) Cholesterol

S.4 Lines
  - o Y-axis: categorical variable (rate, percentage), continuous variable (Hba1c)
  - o X-axis: continuous (time)
  - o Strata: categorical variable (process quality)

Figure 2.4. Adults age 18 and over with diagnosed diabetes who received HbA1c test, retinal exam, foot exam, and all three tests, 2000-2002
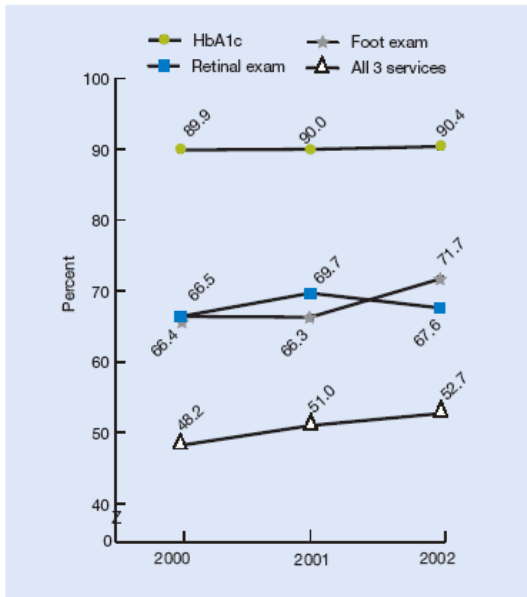

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2000-2002.

- S.5 Performance meter
  - Level: categorical variable (rates), continuous Variable (rates)
 - Scale: cutoffs (standards, historical comparisons)

What Is Alabama's Overall Health Care Quality Performance Compared to All States and How Has it Changed?

The State's performance across all NHQR Quality Measures (up to 99) is shown below *compared to all States* in the **most recent data year (solid line)** and in a **preceding data year (dashed line).**
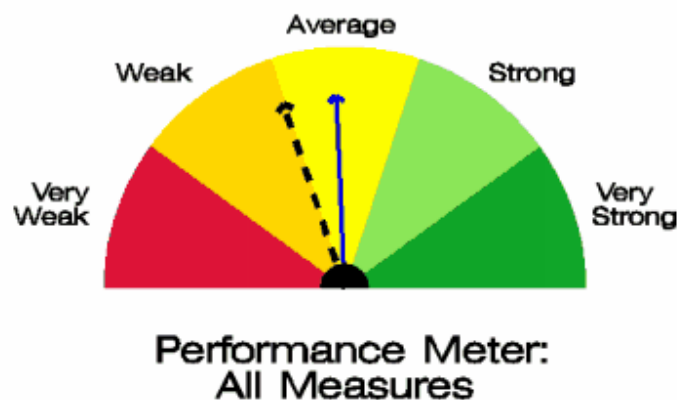
An arrow pointing to "very weak" means all or nearly all included measures for a State are worse than average within a given data year. Conversely, an arrow pointing to "very strong" indicates that all or nearly all available measures for a State are better than average within a given data year. The other categories scale from weak to strong performance and represent the State's balance of worse than average, average, and better than average measures. To examine all the measures behind this performance, click on the meter. For more information on how these measures are translated into a performance meter, select Methods, or to view additional information about this State, make a selection from the menu on the left.

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- S.6 Starplots
  - o Ray: Multiple Categorical variable (rate, percentage), Continuous Variable (Hba1c, Cholesterol, Creatinine)
  - o Strata: Categorical Variable (max 2 classes)
  - o Object: Benchmarking target (centre, region, country)
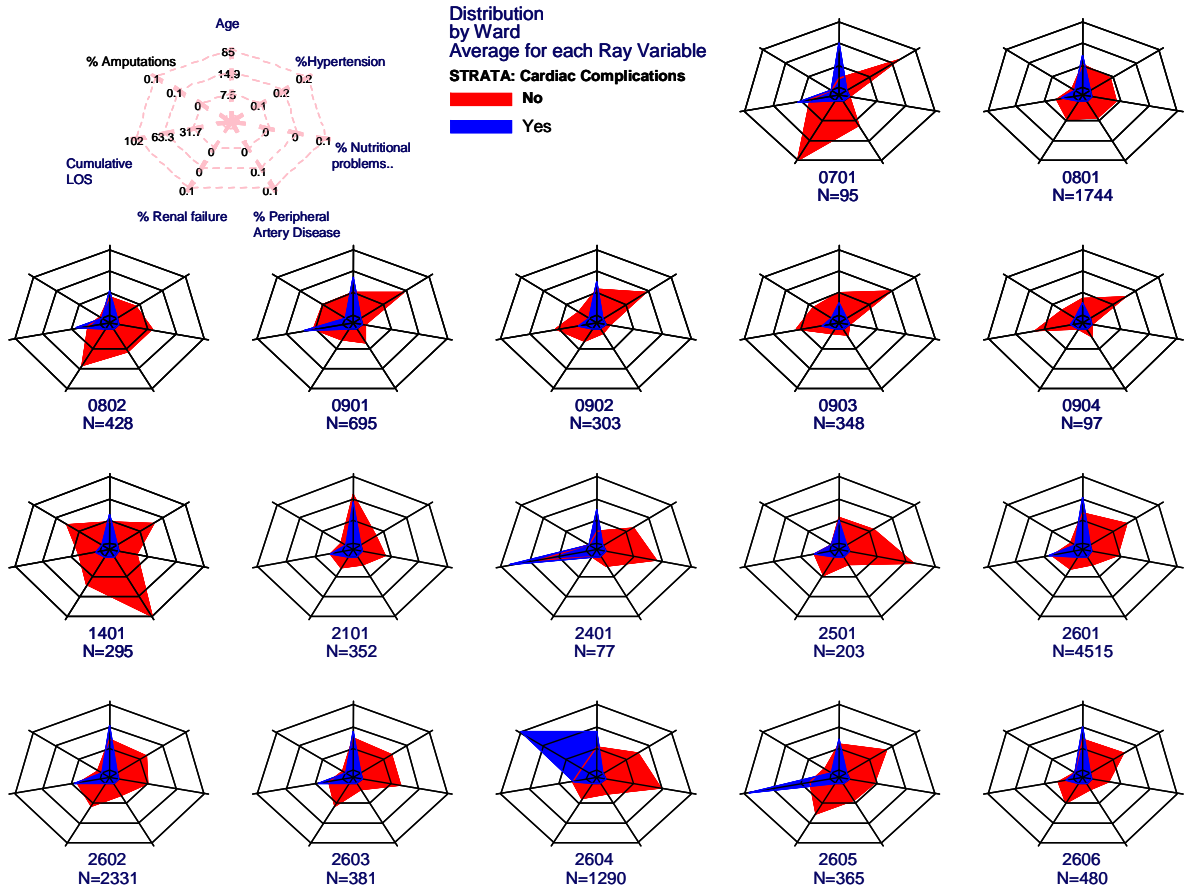
S.7 Maps
- o Color: Categorical Variable (Frequency Rate) or Continuous Variable (Level, ex: Average HbA1c (%))
- o Object: Geographical data (polygons)
- o Sequence of maps (map "movie")

Figure 2.6. State variation in rates of adult receipt of annual HbA1c test, 2001-2003
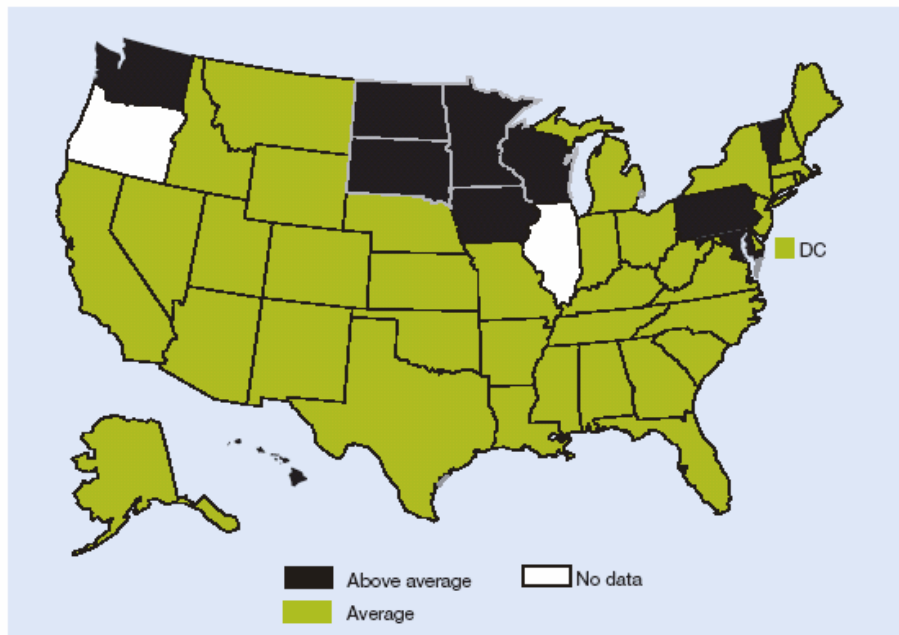
Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, 2001-2003.
Key: Above average = HbA1c testing is significantly above the all-States average in 2 of last 3 years (2001-2003).
Note: "All-States average" is the average of all responding States, which is a separate figure from the national average.

There will be new examples in the update.

5 Report Structure

5.1 Basic facts about diabetes

What is Diabetes

Diabetes is a disease in which the body does not produce or properly use insulin. Insulin is a hormone that is needed to convert sugar, starches and other food into energy needed for daily life. When insulin-production in the pancreas gland is insufficient or the effect of produced insulin is reduced, this will result in an elevation of the blood glucose level.

Diagnostic criteria for diabetes mellitus are solely based on the glucose level.

Diagnostic criteria:

1. Symptoms of diabetes and a casual plasma glucose ⩾200 mg/dl (11.1 mmol/l). Casual is defined as any time of day without regard to time since last meal. The classic symptoms of diabetes include polyuria, polydipsia, and unexplained weight loss.

<div align="center">OR</div>

2. Fasting Plasma Glucose ⩾126 mg/dl (7.0 mmol/l). Fasting is defined as no caloric intake for at least 8 h.

<div align="center">OR</div>

3. 2-h plasma glucose ⩾200 mg/dl (11.1 mmol/l) during an Oral Glucose Tolerance Test. The test should be performed as described by the World Health Organization, using a glucose load containing the equivalent of 75-g anhydrous glucose dissolved in water.

Types of Diabetes

Type 1 diabetes is caused by destruction of the ß-cells in the pancreas, usually leading to absolute insulin deficiency. (Immune-mediated diabetes).

This form of diabetes, accounts for 5–10% of those with diabetes. It results from a cellular-mediated autoimmune destruction of the ß-cells of the pancreas. Markers of the immune destruction of the ß-cell include islet cell autoantibodies, autoantibodies to insulin, autoantibodies to glutamic acid decarboxylase (GAD_{65}), and autoantibodies to the tyrosine phosphatases IA-2 and IA-2ß. The rate of ß-cell destruction is quite variable, being rapid in some individuals (mainly infants

and children) and slow in others (mainly adults). Some patients may present with severe ketoacidosis as the first manifestation of the disease. Others have modest fasting hyperglycemia that can rapidly change to severe hyperglycemia and/or ketoacidosis in the presence of infection or other stress.

Autoimmune destruction of ß-cells has multiple possible genetic predispositions and can also be related to environmental factors that are still poorly defined.

Type 2 diabetes (from predominantly insulin resistance with relative insulin deficiency to predominantly an insulin secretory defect with insulin resistance)

Type 2 diabetes accounts for ~90–95% of those with diabetes and includes individuals who have insulin resistance and usually have relative (rather than absolute) insulin deficiency. These individuals usually do not need insulin treatment to survive. There are probably many different causes of this form of diabetes, some are linked to lifestyle. Specific etiologies are not known and autoimmune destruction of ß-cells (type 1) does not occur

Many patients with this form of diabetes are obese, and obesity itself causes some degree of insulin resistance. Ketoacidosis seldom occurs spontaneously in this type of diabetes; when seen, it usually arises in association with the stress of another illness such as infection. Type 2 diabetes frequently goes undiagnosed for many years because the hyperglycemia develops gradually and at earlier stages is often not severe enough for the patient to notice any of the classic symptoms of diabetes. The genetics of this form of diabetes are complex and not clearly defined.

Gestational diabetes mellitus (GDM)
GDM is defined as any degree of glucose intolerance with onset or first recognition during pregnancy. The definition applies regardless of treatment with insulin or only diet modification or whether the condition persists after pregnancy. Deterioration of the glucose tolerance occurs normally during pregnancy, particularly in the 3rd trimester.

Complications from diabetes

Living with diabetes includes an increased risk of late complications. The frequency of complications is strongly related to disease duration. They can be divided into microvascular and macrovascular complications. Microvascular complications encompasses damage to small blood vessels, typically in the retina (retinopathy), the kidneys (nephropathy) and the peripheral nerves (neuropathy) and can occur in all patients. Macrovascular complications includes cardiovascular disease like myocardial infarction, stroke and peripheral vascular disease. These conditions are also common in the general population, but more prevalent in people living with diabetes. All diabetes complications are related to

blood glucose levels, but other factors like lipid status and blood pressure also strongly interplay.

Treatment

Treatment of all types of diabetes aims at reducing complications to a minimum and at the same time ensure the best possible quality of life for people with diabetes. Extensive treatment options and guidelines are not offered at this web-site. We recommend the use of European guidelines issued by the European Association for the Study of Diabetes EASD (http://www.easd.org), guidelines issued by the International Diabetes Federation IDF (http://www.idf.org/home/index.cfm?node=1449) or the American Diabetes Association ADA (http://care.diabetesjournals.org/content/vol30/suppl_1/) or guidelines issued for a number of individual countries.

Impact of diabetes in Europe (Source: www.IDF.org)

The global diabetes epidemic has a devastating human, social and economic impact. The largest costs of diabetes worldwide are its devastating effects on families and national economies.

It was estimated that in 2005 more than 25 million people in the EU were living with diabetes. The reported EU average prevalence rate is 7.5% among adults aged 20 or over. Prevalence rates in the new member states lie around 9% and beyond. Furthermore, it is estimated that up to 50 % of people with diabetes are undiagnosed or are unaware of their condition.

Today Europe finds itself in the midst of a diabetes epidemic. In Germany for instance, the prevalence of people with diabetes under medical treatment grew in the years 1988 to 2001 by 43%. In the next 20 years, the number of cases of diabetes is expected to increase by 71% worldwide, by 21% in the European Region according to the World Health Organisation (WHO), and by 16% across the European Union according to the IDF Atlas. This increase will be largely driven by the growing prevalence of Type 2 diabetes.

The total cost of diabetes across the EU is estimated to account for 2.5% – 15% of total healthcare spending (over half of member states have reported estimates of their spending on diabetes). Evidence of the dramatic costs of treating diabetes and its complications are found in the CODE-2 study, which estimated the total direct costs of Type 2 diabetes to be 29 billion Euros in 1998 for 10 million people with Type 2 diabetes in eight EU countries (Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden and the UK).

The largest single item of diabetes expenditure is hospital admissions for the treatment of long-term complications such as heart disease, stroke, kidney

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failure and foot problems. Many of these complications are potentially preventable given prompt diagnosis of diabetes, effective patient and professional education and comprehensive long term care of people with diabetes.

National diabetes registers (NDRs) of people with diagnosed diabetes help promote the effective delivery of diabetes care and monitor outcomes as outlined in the targets of the St Vincent Declaration (see www.idf.org). IDF finds that very few countries have developed NDRs. Furthermore, experts urge diabetologists and general practitioners to continue refining their data collection on these patients even in the absence of electronic record linkage or sophisticated monitoring facilities.

For more information relating to Diabetes in Europe or individual countries, check out:
http://www.idf.org/webdata/docs/idf-europe/DiabetesReport2005.pdf

5.2 Allocated statistical representation to each BIRO-user

- Governance
  Tables
  Histograms
  Lines
  Performance meter
  Maps

- Health care and research
  Tables
  Histograms
  Boxplot
  Lines
  Starplots
  Maps

- People with diabetes and citizens
  Tables
  Histograms
  Lines
  Performance meter
  Maps

5.3 List of indicators and statistical output for each BIRO-user

Each indicator is given an assigned statistical output. Even though it is listed up this way, there can be several indicators in each statistical output.

5.3.1 Governance

Indicator	Planned statistical outputs*	Strata
1. Demographic characteristics		
1.1 Age (Classes)	Table, histogram	Gender
1.2 Gender	Table, histogram	Age
2. Clinical characteristics		
2.1 Diabetes status		
2.1.1 Type of diabetes	Table, histogram	Age
2.1.2 Duration of diabetes	Table, histogram	Type of Diabetes, Gender, Hba1c
2.2 Risk factors		
2.2.1 Obesity		
2.2.1.1 Weight	Table, lines	(Gender x Age x Type of Diabetes)
2.2.1.2 BMI	Table, lines	(Gender x Age x Type of Diabetes)
2.2.2 Lifestyle		
2.2.2.1 Smoking status	Histogram, table	(Gender x Age x Type of Diabetes)
2.2.3 Clinical measurements:		
2.2.3.1 Systolic BP	Table, lines	(Gender x Age x Type of Diabetes)
2.2.3.2 Diastolic BP	Table, lines	(Gender x Age x Type of Diabetes)
2.2.3.3 Total cholesterol	Table, lines	(Gender x Age x Type of Diabetes)
2.2.3.4 HDL-cholesterol	Table, lines	(Gender x Age x Type of Diabetes)
2.2.3.5 Creatinine	Table, lines	(Gender x Age x Type of Diabetes)
2.2.3.6 HbA1c	Table, lines	(Gender x Age x Type of Diabetes)
2.3 Diabetes complications		
2.3.1 Retinopathy	Table, Histogram	(Diabetes Duration)
2.3.2 End stage renal failure	Table, Histogram	(Diabetes Duration)
2.3.3 Foot ulcer	Table, Histogram	(Diabetes Duration)
2.3.4 Amputation	Table, Histogram	(Diabetes Duration)

2.3.5 Stroke	Table, Histogram	(Diabetes Duration)
2.3.6 Myocardal infarction	Table, Histogram	(Diabetes Duration)
2.3.7 Hypertension	Table, Histogram	(Diabetes Duration)
3. Health system		
3.1 Structure (provider level)		
3.1.1 Type of provider	Table, Histogram	Region
3.1.2 Average diabetes population per center*** ***Specify definition of centre (size, nature)	Table, Histogram	(Gender x Age x Type of Diabetes)
3.2 Structural quality		
3.2.1 Hospital beds per 100,000 population	Maps, Table	Region
3.2.2 Physicians employed per 100,000 population	Maps, Table	Region
3.3 Processes		
3.3.1.1 Foot examination done	Table, Histogram	(Age x Type of Diabetes)
3.3.2.1 Eye examination done	Table, Histogram	(Age x Type of Diabetes)
3.3.3 Measurement done		
3.3.3.1 BP done	Table, Histogram	(Age x Type of Diabetes)
3.3.3.2 Lipids done	Table, Histogram	(Age x Type of Diabetes)
3.3.3.3 Microalbumin done	Table, Histogram	(Age x Type of Diabetes)
3.3.3.4 HbA1c done	Table, Histogram	(Age x Type of Diabetes)
3.3.4 Treatment		
3.3.4.1 Antihypertensive medication	Table, Histogram	(Age x Type of Diabetes)
3.3.4.2 Lipid lowering treatment	Table, Histogram	(Age x Type of Diabetes)
3.3.4.3 ASA treatment (Aspirin)	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4 Glucose lowering treatment		
3.3.4.4.1 Diet only	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.2 Tablets (1. Sulphonyureas, 2. Biguanides, 3. Glucosidase Inhibitors, 4. Glitazones, 5. Glinides)	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.3 Insulin only	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.4 Insulin and tablets	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.5 Insulin pump	Table, Histogram	(Age x Type of Diabetes)
3.3.5 Management		
3.3.5.1 Self-monitoring	Table, histogram	(Age x Type of Diabetes)
3.3.5.1 Visit frequency	Table, histogram	(Age x Type of Diabetes)
4. Population (Area level)		
4.1.1 Total population	Table	(Age x Gender)
4.1.2 Life expectancy	Table	(Age x Gender)

4.1.3 Mortality data	Table	(Age x Gender)
5. Risk adjusted indicators		
5.1 Epidemiology		
5.1.1 Prevalence of diabetes mellitus per 1,000.	Maps, Table	Region, Type of Diabetes
5.1.2 Age at diagnosis by 10 year age bands (incidence)	Maps, Histogram	Region, Type of Diabetes
5.2 Process quality		
5.2.1 Percentage of patients with one or more HbA1c tests during the last 12 months	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.2 Percentage of patients with at least one test for microalbuminuria during the last 12 months	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.3 Percentage of diabetes patients who received a dilated eye examination or evaluation of retinal photography by a trained caregiver within the last 12 months	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.4 Percentage of diabetes patients receiving at least one foot examination within the last 12 months	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.5 Percentage of diabetes patients whose smoking status was ascertained and documented within the last 12 months	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.6 Percent with serum creatinine tested in last 12 months	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.7 Percentage of patients with diabetes and one or more blood pressure measurements within the last 12 months	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.8 Percentage of patients with hypertension who receive antihypertensive medication	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.9 Type of oral therapy (distribution of agents) in patients with diabetes type 2	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.10 Portion of patients treated with insulin among patients with diabetes	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.11 Portion of patients treated with insulin in combination with OADs among patients with diabetes	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.12 Percentage of insulin treated patients with pump therapy	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.13 Portion of diabetes patients with anti hypertensive treatment	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.14 Portion of diabetes patients with lipid lowering treatment	Maps, tables, lines, histogram	Region (Gender x Age x Type of Diabetes)
5.2.15 Portion of diabetes patients with ASA treatment	Maps, tables, lines, histogram	Region (Gender x Age x Type of

		Diabetes)
5.2.16 Percent of patients with diabetes performing self-monitoring of blood glucose/ urine testing** Svein questions the urine at least in some countries	Maps, tables, lines, <u>histogram</u>	Region (Gender x Age x Type of Diabetes)
5.3 Outcome quality-intermediate outcomes		
5.3.1 Percentage of patients with most recent HbA1c level >9.0% (poor control)	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.3.2 Percentage of patients with most recent HbA1c level >7,5%	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.3.3 Percentage of patients with most recent blood pressure <140/90 mmHg	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.3.4 Percentage of patients with BMI ≥ 30	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.3.5 Percentage with microalbuminuria in last 12 months (among those who have been tested)	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.3.6 Rate of current smokers among diabetes patients	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.3.7 Former or current foot ulceration	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.4 Outcome Quality – Terminal outcomes		
5.4.1 Annual incidence of dialysis and/or transplantation (renal replacement therapy in patients with diabetes	<u>Table</u>, Map	Region, (Gender x Age x Type of Diabetes)
5.4.2 ESRD in Persons with Diabetes	<u>Table</u>, Map	Region, (Gender x Age x Type of Diabetes)
5.4.3 Annual death rate per 100,000 populations in the general population from all causes, adjusted for standard European population. Annual death rate per 100,000 populations in patients, who have as primary or secondary cause of death, diabetes mellitus, adjusted for standard European population.	Table, <u>Map</u>	Region

* The type of statistical output that is underlined is the one we suggest for the report.

5.3.2 Health care and Research

Indicator	Planned statistical outputs*	Strata
1. Demographic characteristics		
1.1 Age (Classes)	Table, histogram	Gender
1.2 Gender	Table, histogram	Age
2. Clinical characteristics		
2.1 Diabetes status		
2.1.1 Type of diabetes	Table, histogram	Age
2.1.2 Duration of diabetes	Table, histogram	Type of Diabetes, Gender, Hba1c
2.2 Risk factors		
2.2.1 Obesity		
2.2.1.1 Weight	Table, lines, starplot, boxplot	(Gender x Age x Type of Diabetes)
2.2.1.2 BMI	Table, lines, starplot, boxplot	(Gender x Age x Type of Diabetes)
2.2.2 Lifestyle		
2.2.2.1 Smoking status	Histogram, table	(Gender x Age x Type of Diabetes)
2.2.3 Clinical measurements:		
2.2.3.1 Systolic BP	Table, lines, starplot, boxplot	(Gender x Age x Type of Diabetes)
2.2.3.2 Diastolic BP	Table, lines, starplot, boxplot	(Gender x Age x Type of Diabetes)
2.2.3.3 Total cholesterol	Table, lines, starplot, boxplot	(Gender x Age x Type of Diabetes)
2.2.3.4 HDL-cholesterol	Table, lines, starplot, boxplot	(Gender x Age x Type of Diabetes)
2.2.3.5 Creatinine	Table, lines, starplot, boxplot	(Gender x Age x Type of Diabetes)
2.2.3.6 HbA1c	Table, lines, starplot, boxplot	(Gender x Age x Type of Diabetes)
2.3 Diabetes complications		
2.3.1 Retinopathy	Table, Histogram	(Diabetes Duration)
2.3.2 End stage renal failure	Table, Histogram	(Diabetes Duration)
2.3.3 Foot ulcer	Table, Histogram	(Diabetes Duration)
2.3.4 Amputation	Table, Histogram	(Diabetes Duration)
2.3.5 Stroke	Table, Histogram	(Diabetes Duration)
2.3.6 Myocardal infarction	Table, Histogram	(Diabetes Duration)
2.3.7 Hypertension	Table, Histogram	(Diabetes Duration)
3. Health system		
3.1 Structure (provider level)		
3.1.1 Type of provider	Table, Histogram	Region
3.1.2 Average diabetes population per center***	Table, Histogram	(Gender x Age x Type of Diabetes)

***Specify definition of centre (size, nature)		
3.2 Structural quality		
3.2.1 Hospital beds per 100,000 population	Maps, Table	Region
3.2.2 Physicians employed per 100,000 population	Maps, Table	Region
3.3 Processes		
3.3.1.1 Foot examination done	Table, Histogram	(Age x Type of Diabetes)
3.3.2.1 Eye examination done	Table, Histogram	(Age x Type of Diabetes)
3.3.3 Measurement done		
3.3.3.1 BP done	Table, Histogram	(Age x Type of Diabetes)
3.3.3.2 Lipids done	Table, Histogram	(Age x Type of Diabetes)
3.3.3.3 Microalbumin done	Table, Histogram	(Age x Type of Diabetes)
3.3.3.4 HbA1c done	Table, Histogram	(Age x Type of Diabetes)
3.3.4 Treatment		
3.3.4.1 Antihypertensive medication	Table, Histogram	(Age x Type of Diabetes)
3.3.4.2 Lipid lowering treatment	Table, Histogram	(Age x Type of Diabetes)
3.3.4.3 ASA treatment (Aspirin)	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4 Glucose lowering treatment		
3.3.4.4.1 Diet only	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.2 Tablets (1. Sulphonyureas, 2. Biguanides, 3. Glucosidase Inhibitors, 4. Glitazones, 5. Glinides)	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.3 Insulin only	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.4 Insulin and tablets	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.5 Insulin pump	Table, Histogram	(Age x Type of Diabetes)
3.3.5 Management		
3.3.5.1 Self-monitoring	Table, histogram	(Age x Type of Diabetes)
3.3.5.1 Visit frequency	Table, histogram	(Age x Type of Diabetes)
4. Population (Area level)		
4.1.1 Total population	Table	(Age x Gender)
4.1.2 Life expectancy	Table	(Age x Gender)
4.1.3 Mortality data	Table	(Age x Gender)
5. Risk adjusted indicators		
5.1 Epidemiology		
5.1.1 Prevalence of diabetes mellitus per 1,000.	Maps, Table	Region, Type of Diabetes
5.1.2 Age at diagnosis by 10 year age bands (incidence)	Maps, Histogram	Region, Type of Diabetes
5.2 Process quality		
5.2.1 Percentage of patients with one or more HbA1c tests	Maps, tables, lines, starplots,	Region (Gender x Age x Type of

during the last 12 months	boxplots, histograms	Diabetes)
5.2.2 Percentage of patients with at least one test for microalbuminuria during the last 12 months	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.3 Percentage of diabetes patients who received a dilated eye examination or evaluation of retinal photography by a trained caregiver within the last 12 months	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.4 Percentage of diabetes patients receiving at least one foot examination within the last 12 months	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.5 Percentage of diabetes patients whose smoking status was ascertained and documented within the last 12 months	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.6 Percent with serum creatinine tested in last 12 months	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.7 Percentage of patients with diabetes and one or more blood pressure measurements within the last 12 months	Maps, tables, lines, starplots, boxplots	Region (Gender x Age x Type of Diabetes)
5.2.8 Percentage of patients with hypertension who receive antihypertensive medication	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.9 Type of oral therapy (distribution of agents) in patients with diabetes type 2	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.10 Portion of patients treated with insulin among patients with diabetes	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.11 Portion of patients treated with insulin in combination with OADs among patients with diabetes	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.12 Percentage of insulin treated patients with pump therapy	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.13 Portion of diabetes patients with anti hypertensive treatment	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.14 Portion of diabetes patients with lipid lowering treatment	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.15 Portion of diabetes patients with ASA treatment	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.2.16 Percent of patients with diabetes performing self-monitoring of blood glucose/ urine testing** Svein questions the urine at least in some countries	Maps, tables, lines, starplots, boxplots, histograms	Region (Gender x Age x Type of Diabetes)
5.3 Outcome quality-intermediate outcomes		
5.3.1 Percentage of patients with most recent HbA1c level >9.0% (poor control)	Tables, maps, histograms, lines, starplots, boxplots	Region, (Gender x Age x Type of Diabetes)
5.3.2 Percentage of patients with most recent HbA1c level >7,5%	Tables, maps, histograms,	Region, (Gender x Age x Type of

	lines, starplots, boxplots	Diabetes)
5.3.3 Percentage of patients with most recent blood pressure <140/90 mmHg	Maps, tables, lines, starplots, boxplots, histograms	Region, (Gender x Age x Type of Diabetes)
5.3.4 Percentage of patients with BMI ≥ 30	Maps, tables, lines, starplots, boxplots, histograms	Region, (Gender x Age x Type of Diabetes)
5.3.5 Percentage with microalbuminuria in last 12 months (among those who have been tested)	Maps, tables, lines, starplots, boxplots, histograms	Region, (Gender x Age x Type of Diabetes)
5.3.6 Rate of current smokers among diabetes patients	Maps, tables, lines, starplots, boxplots, histograms	Region, (Gender x Age x Type of Diabetes)
5.3.7 Former or current foot ulceration	Maps, tables, lines, starplots, boxplots, histograms	Region, (Gender x Age x Type of Diabetes)
5.4 Outcome Quality – Terminal outcomes		
5.4.1 Annual incidence of dialysis and/or transplantation (renal replacement therapy in patients with diabetes	Table, Map	Region, (Gender x Age x Type of Diabetes)
5.4.2 ESRD in Persons with Diabetes	Table, Map	Region, (Gender x Age x Type of Diabetes)
5.4.3 Annual death rate per 100,000 populations in the general population from all causes, adjusted for standard European population. Annual death rate per 100,000 populations in patients, who have as primary or secondary cause of death, diabetes mellitus, adjusted for standard European population.	Table, Map	Region

* The type of statistical output that is underlined is the one we suggest for the report.

5.3.3 People with diabetes and citizens

Indicator	Planned statistical outputs*	Strata
1. Demographic characteristics		
1.1 Age (Classes)	Table, histogram	Gender
1.2 Gender	Table, histogram	Age
2. Clinical characteristics		
2.1 Diabetes status		
2.1.1 Type of diabetes	Table, histogram	Age
2.2 Risk factors		
2.2.1 Obesity		
2.2.1.1 Weight	Table, lines	(Gender x Age x Type of Diabetes)
2.2.1.2 BMI	Table, lines	(Gender x Age x Type of Diabetes)
2.2.2 Lifestyle		
2.2.2.1 Smoking status	Histogram, table	(Gender x Age x Type of Diabetes)
2.2.3 Clinical measurements:		
2.2.3.1 Systolic BP	Table, lines	(Gender x Age x Type of Diabetes)
2.2.3.2 Diastolic BP	Table, lines	(Gender x Age x Type of Diabetes)
2.2.3.3 Total cholesterol	Table, lines	(Gender x Age x Type of Diabetes)
2.2.3.6 HbA1c	Table, lines	(Gender x Age x Type of Diabetes)
2.3 Diabetes complications		
2.3.1 Retinopathy	Table, Histogram	(Diabetes Duration)
2.3.2 End stage renal failure	Table, Histogram	(Diabetes Duration)
2.3.4 Amputation	Table, Histogram	(Diabetes Duration)
2.3.5 Stroke	Table, Histogram	(Diabetes Duration)
2.3.6 Myocardal infarction	Table, Histogram	(Diabetes Duration)
2.3.7 Hypertension	Table, Histogram	(Diabetes Duration)
3. Health system		
3.3 Processes		
3.3.1.1 Foot examination done	Table, Histogram	(Age x Type of Diabetes)
3.3.2.1 Eye examination done	Table, Histogram	(Age x Type of Diabetes)
3.3.3 Measurement done		
3.3.3.1 BP done	Table, Histogram	(Age x Type of Diabetes)
3.3.3.2 Lipids done	Table, Histogram	(Age x Type of Diabetes)
3.3.3.3 Microalbumin done	Table, Histogram	(Age x Type of Diabetes)

3.3.3.4 HbA1c done	Table, Histogram	(Age x Type of Diabetes)
3.3.4 Treatment		
3.3.4.1 Antihypertensive medication	Table, Histogram	(Age x Type of Diabetes)
3.3.4.2 Lipid lowering treatment	Table, Histogram	(Age x Type of Diabetes)
3.3.4.3 ASA treatment (Aspirin)	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4 Glucose lowering treatment		
3.3.4.4.1 Diet only	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.2 Tablets	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.3 Insulin only	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.4 Insulin and tablets	Table, Histogram	(Age x Type of Diabetes)
3.3.4.4.5 Insulin pump	Table, Histogram	(Age x Type of Diabetes)
3.3.5 Management		
3.3.5.1 Self-monitoring	Table, histogram	(Age x Type of Diabetes)
5. Risk adjusted indicators		
5.1 Epidemiology		
5.1.1 Prevalence of diabetes mellitus per 1,000.	Maps, Table	Region, Type of Diabetes
5.2 Process quality		
5.2.1 Percentage of patients with one or more HbA1c tests during the last 12 months	Maps, tables, lines, histograms	Region (Gender x Age x Type of Diabetes)
5.2.2 Percentage of patients with at least one test for microalbuminuria during the last 12 months	Maps, tables, lines, histograms	Region (Gender x Age x Type of Diabetes)
5.2.3 Percentage of diabetes patients who received a dilated eye examination or evaluation of retinal photography by a trained caregiver within the last 12 months	Maps, tables, lines, histograms	Region (Gender x Age x Type of Diabetes)
5.2.4 Percentage of diabetes patients receiving at least one foot examination within the last 12 months	Maps, tables, lines, histograms	Region (Gender x Age x Type of Diabetes)
5.2.5 Percentage of diabetes patients whose smoking status was ascertained and documented within the last 12 months	Maps, tables, lines, histograms	Region (Gender x Age x Type of Diabetes)
5.2.6 Percent with serum creatinine tested in last 12 months	Maps, tables, lines, histograms	Region (Gender x Age x Type of Diabetes)
5.2.7 Percentage of patients with diabetes and one or more blood pressure measurements within the last 12 months	Maps, tables, lines, histograms	Region (Gender x Age x Type of Diabetes)
5.2.8 Percentage of patients with hypertension who receive antihypertensive medication	Maps, tables, lines, histograms	Region (Gender x Age x Type of Diabetes)
5.2.10 Portion of patients treated with insulin among patients with diabetes	Maps, tables, lines, histograms	Region (Gender x Age x Type of Diabetes)

5.2.11 Portion of patients treated with insulin in combination with OADs among patients with diabetes	Maps, tables, lines, <u>histograms</u>	Region (Gender x Age x Type of Diabetes)
5.2.12 Percentage of insulin treated patients with pump therapy	Maps, tables, lines, <u>histograms</u>	Region (Gender x Age x Type of Diabetes)
5.2.13 Portion of diabetes patients with anti hypertensive treatment	Maps, tables, lines, <u>histograms</u>	Region (Gender x Age x Type of Diabetes)
5.2.14 Portion of diabetes patients with lipid lowering treatment	Maps, tables, lines, <u>histograms</u>	Region (Gender x Age x Type of Diabetes)
5.2.15 Portion of diabetes patients with ASA treatment	Maps, tables, lines, <u>histograms</u>	Region (Gender x Age x Type of Diabetes)
5.2.16 Percent of patients with diabetes performing self-monitoring of blood glucose/ urine testing	Maps, tables, lines, <u>histograms</u>	Region (Gender x Age x Type of Diabetes)
5.3 Outcome quality-intermediate outcomes		
5.3.1 Percentage of patients with most recent HbA1c level >9.0% (poor control)	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.3.2 Percentage of patients with most recent HbA1c level >7,5%	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.3.3 Percentage of patients with most recent blood pressure <140/90 mmHg	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.3.4 Percentage of patients with BMI ≥ 30	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.3.5 Percentage with microalbuminuria in last 12 months (among those who have been tested)	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)
5.3.6 Rate of current smokers among diabetes patients	Tables, maps, <u>histograms</u>, lines	Region, (Gender x Age x Type of Diabetes)

* The type of statistical output that is underlined is the one we suggest for the report.

5.4 An example in "web-format plan"

This is the firs page on the web. All items presented in the navigation bars in blue are 'clickable' i.e. they open new windows that elaborate on the feature. The first page also contains general information to all audience.

B.I.R.O.

Best Information through Regional Outcomes

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Language Options

Governance
Demographic characteristics
Diabetes status
Risk factors
Complications
Health system
Population
Risk adjusted indicators
Health care and reaserch
Demographic characteristics
Diabetes status
Risk factors
Complications
Health system
Population
Risk adjusted indicators
People with diabetes and citizens
Demographic characteristics
Diabetes status
Risk factors
Complications
Health system
Risk adjusted indicators

General Information

What is diabetes?

Types of diabetes
    Type 1
    Type 2
    Gestational

Complications from diabetes

Treatment

Impact of diabetes in Europe

Example: If you click on Risk factors under Governance on the first page, you will get a new page (see under). If you click on Lifestyle, Smoking status appears. Click on Smoking status and you get information about this. This way you can get all the information listed in 5.3.

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Risk factors
Obesity
Lifestyle
Smoking status
Clinical measurement

Smoking status

Figure 4: Most recent smoking status as a percentage of type 1 and type 2 diabetes (n= 13582)

Smoking Status	Current	Ex	Never	Unknown
Type 1	25.0%	13.9%	54.3%	6.9%
Type 2	17.6%	33.2%	46.0%	3.2%
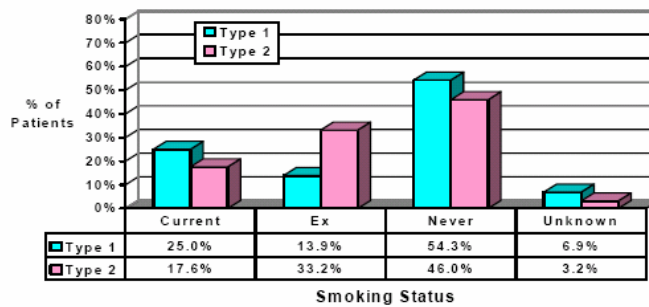
6 Technical specification (update)