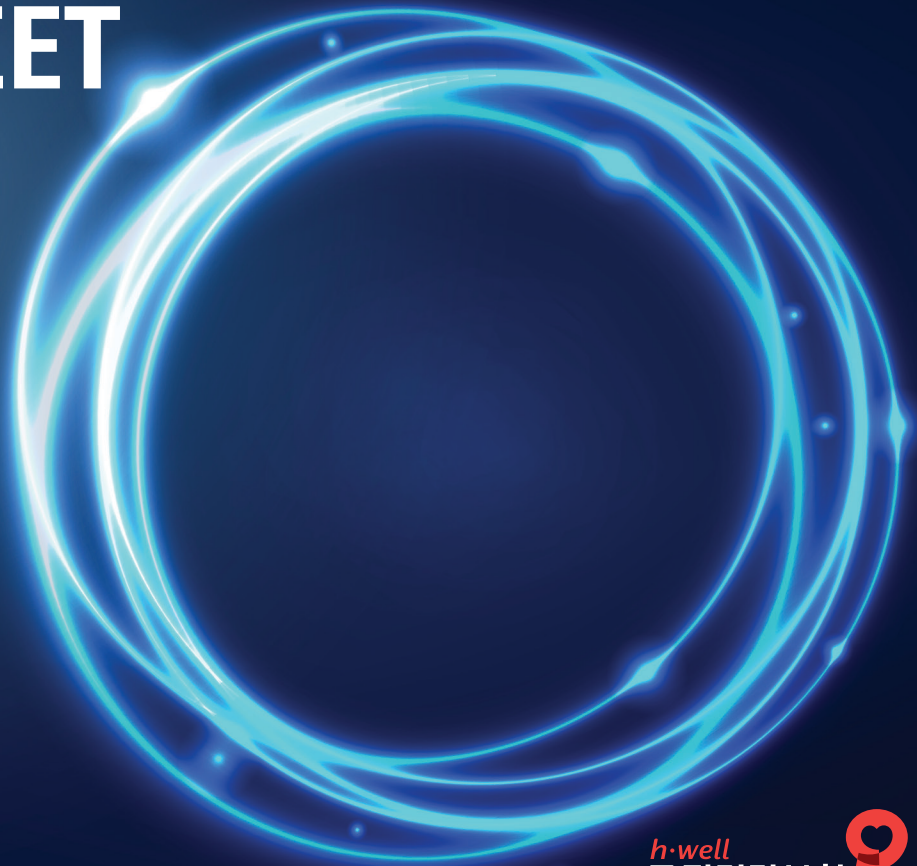


KOREAN DIABETES FACT SHEET 2015






Source of Data

The estimated percentages and the total number of people over the age of 30 with type 2 diabetes were determined using the information from the National Health Information Database from January 2002 through to December 2013 made by National Health Insurance Service (NHIS).

Definition of Diabetes

- › Diagnosis of diabetes was based on the disease-classification codes from the health insurance claim forms and database on Health Screening Service.
- › When the database on Health Screening Service was used, diabetes was diagnosed based on fasting glucose (≥ 126 mg/dL).
- › When the database on health insurance claim forms was used, type 2 diabetes was defined based on ICD-10 code (E11-E14) and prescription of antidiabetic medications.

Summary

- › About 2.7 million Korean people (8.03%) aged 30 years or older had type 2 diabetes in 2013. Based on fasting glucose level, 25.0% of adults had prediabetes (impaired fasting glucose).
 - › 62.5% of subjects with type 2 diabetes had hypertension and were being treated with antihypertensive medication, which was 3.7-fold higher compared with adults without diabetes in 2013.
- 

KOREAN DIABETES FACT SHEET 2015

- › 49.5% of subjects with type 2 diabetes had dyslipidemia and were being treated with lipid-lowering medication, which was 5-fold higher than non-diabetic adults in 2013.
- › The prevalence of type 2 diabetes in childhood and adolescence had been steadily increasing since 2006.
- › 40% of individuals with end-stage renal disease (ESRD) had type 2 diabetes, and 1.2% of subjects with type 2 diabetes had ESRD. The mortality was 2-fold higher in patients with type 2 diabetes and ESRD compared with those with ESRD but without type 2 diabetes.
- › 15.9% of patients with type 2 diabetes had diabetic retinopathy, and 6.1% of those patients with diabetic retinopathy had proliferative diabetic retinopathy (PDR).
- › The prevalence of metabolic syndrome was 3-fold higher in patients with type 2 diabetes than in those without diabetes.
- › Percutaneous coronary intervention (PCI) was performed 7-fold more frequently in subjects with type 2 diabetes than in non-diabetic adults.
- › Coronary artery bypass graft (CABG) has been remarkably decreased during the last 7 years, but it is still 10-fold higher in patients with type 2 diabetes than in those without diabetes.
- › The use of metformin increased up to 80% of total antidiabetic prescriptions in 2013. The prescription of dipeptidyl peptidase-4 (DPP-4) inhibitors increased dramatically since 2008, and comprised 3rd of the market share (38.4%) in 2013.
- › 60% of subjects with type 2 diabetes were treated with more than two classes of antidiabetic medication, but drug adherence rate was only 45% in 2013.
- › Cancers were more prevalent in individuals with type 2 diabetes than those without diabetes, especially in stomach, colorectum, liver, pancreas, and lung.

Prevalence of diabetes using anti-diabetic medications

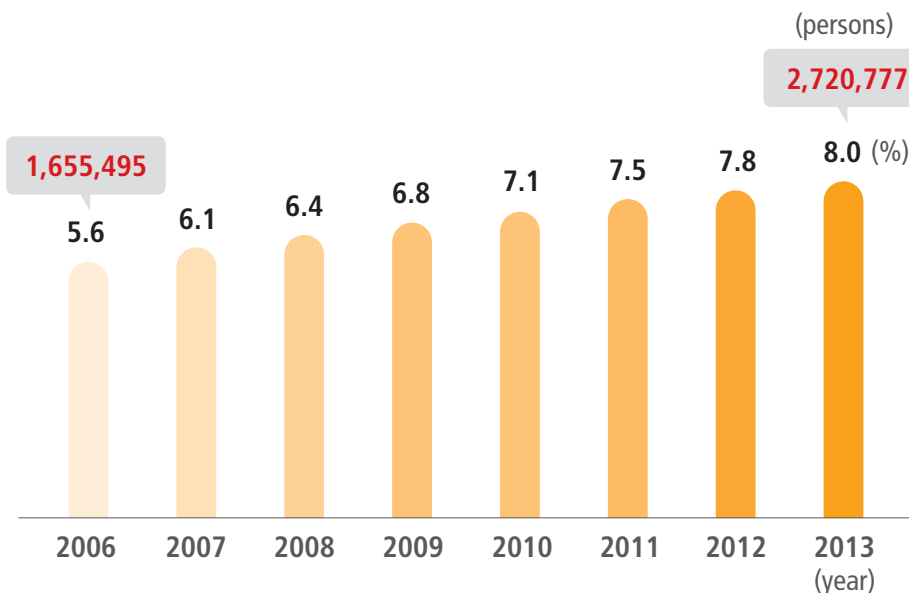
(≥ 30 yrs old)

The prevalence of diabetes using anti-diabetic medications steadily increased from 5.6% in 2006 to 8.0% in 2013.

Prevalence

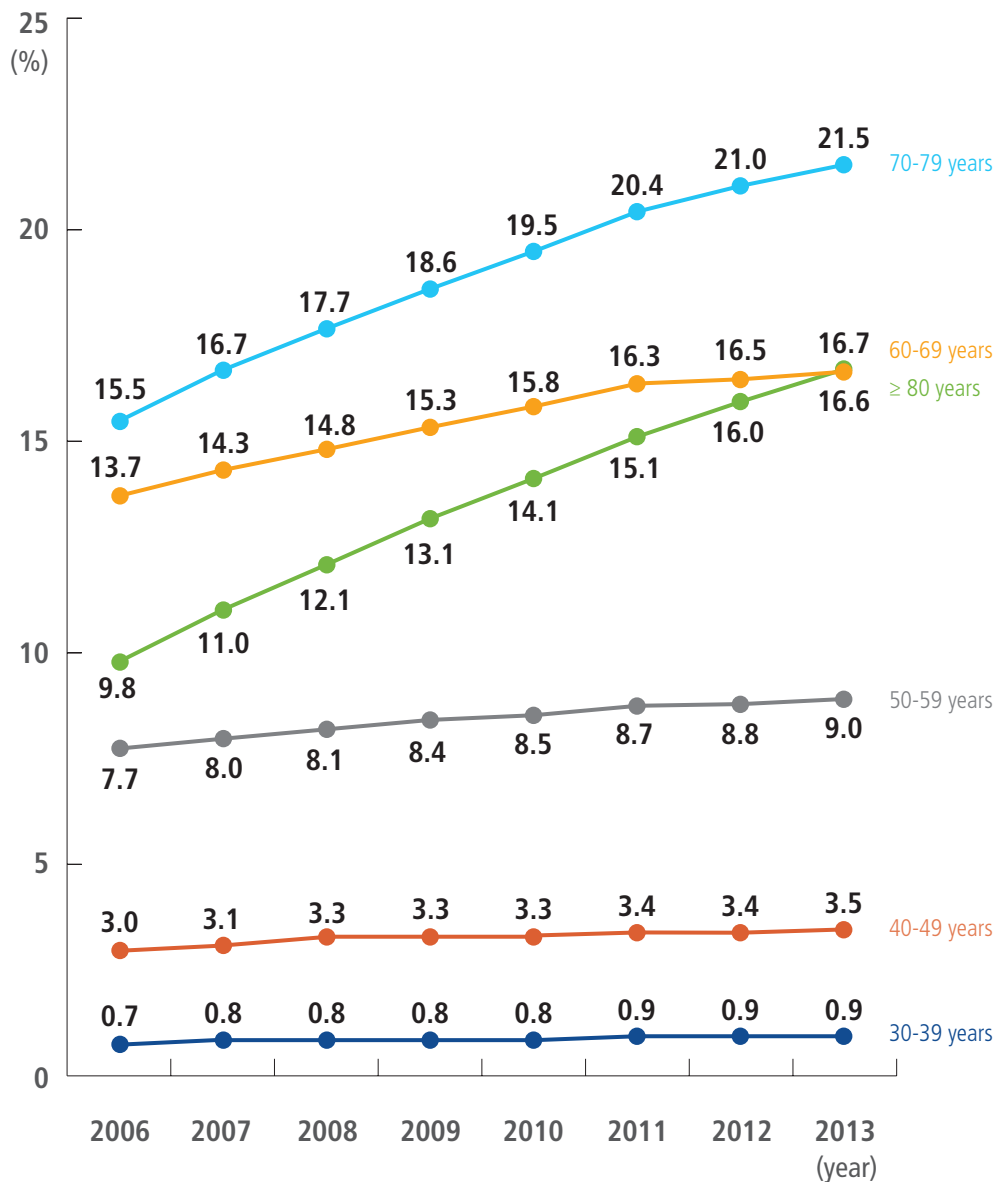
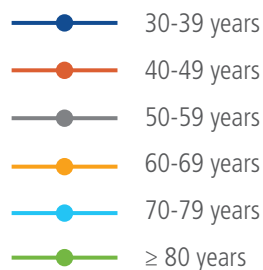
= [(Patients who had type 2 diabetes based on ICD-10 code and were being treated with anti-diabetic medications)/(total subjects visiting hospitals or clinics or having health security service in each year)] X 100 (%).

In 2013



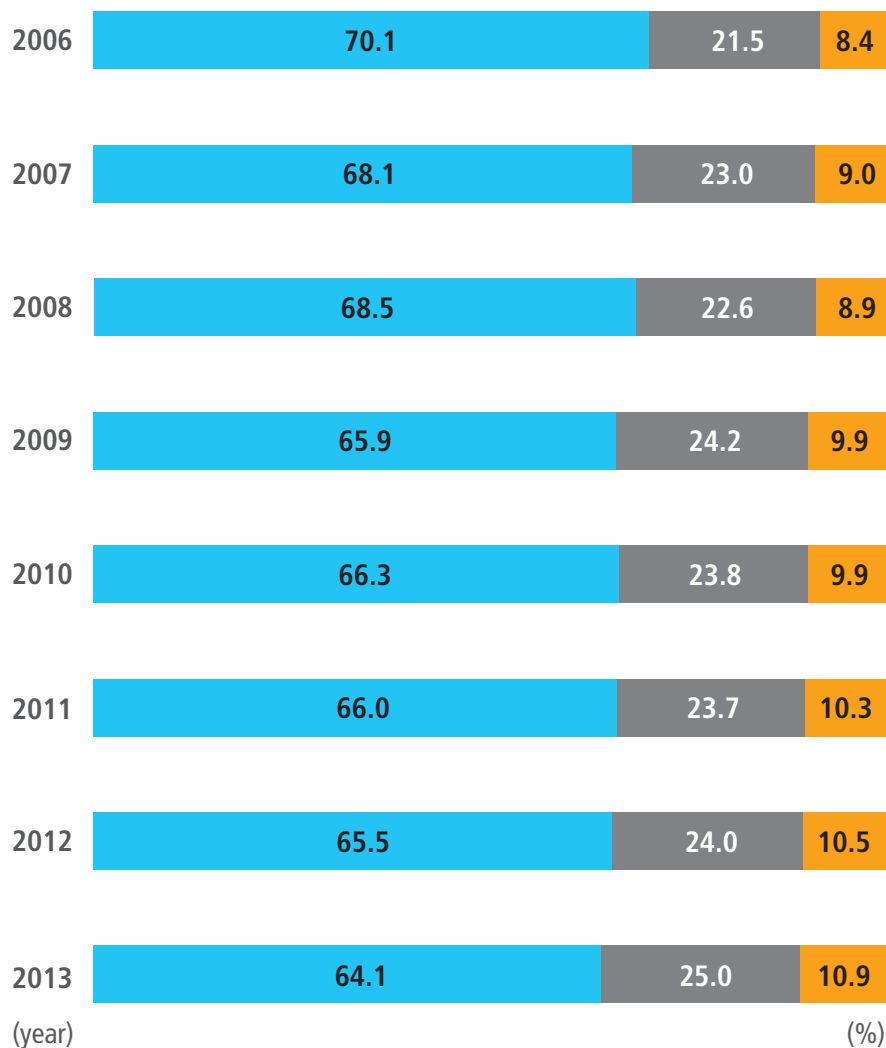
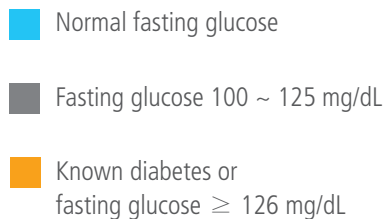
Prevalence of diabetes according to age

The prevalence has steadily increased in aged 60 years or older.



Prevalence of diabetes and prediabetes

Confined to participants in National Health Screening Service

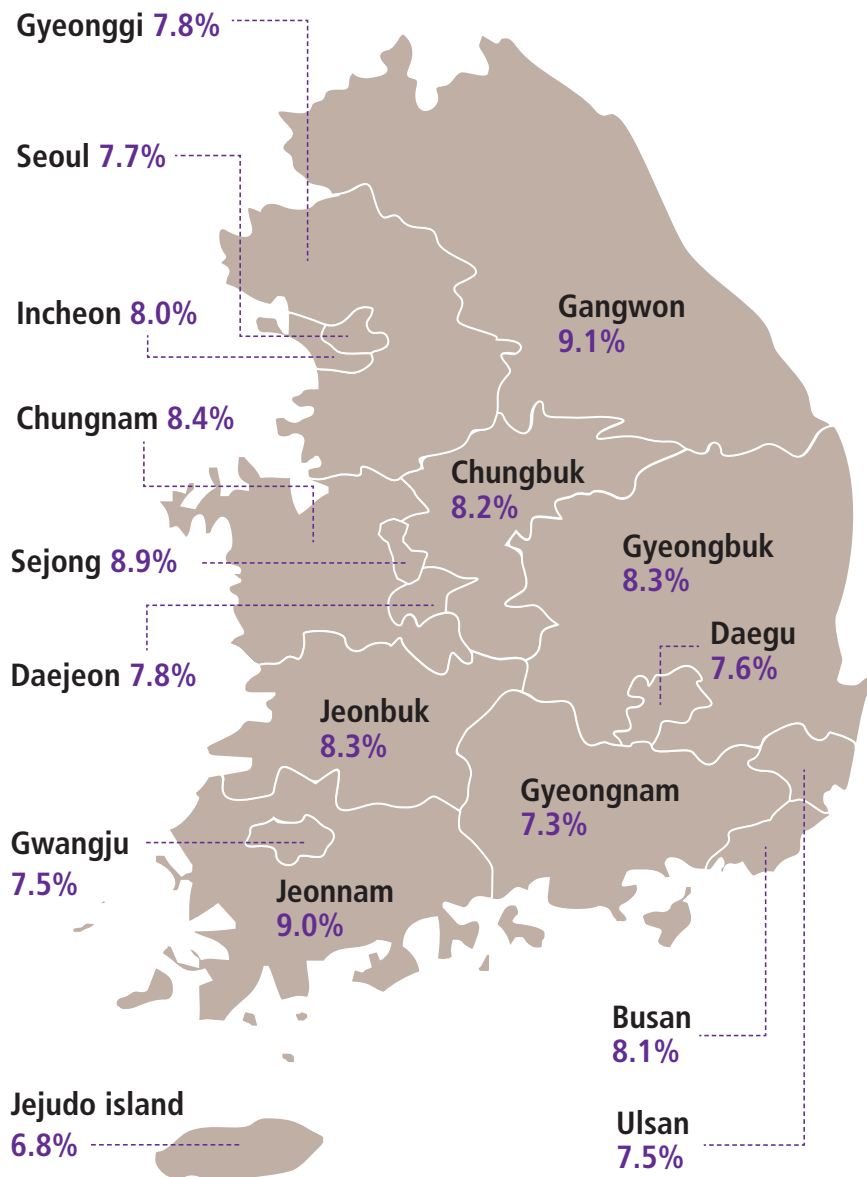


Regional difference of diabetes prevalence

The highest diabetes prevalence rates were found in Jeonnam, Gangwon, and Sejong City.

The lowest prevalence was found in Jeju island.

In 2013



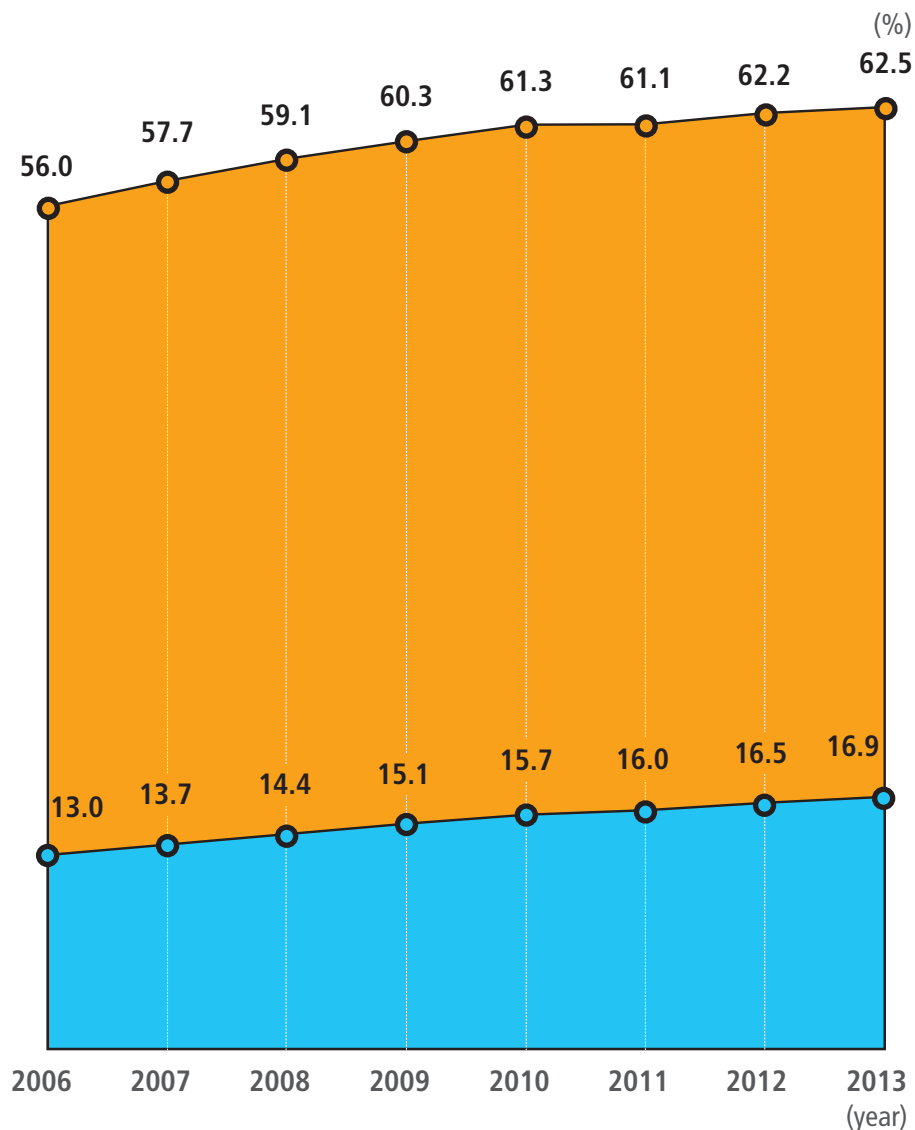
Treatment rate of hypertension

62.5% of subjects with type 2 diabetes had hypertension and were being treated with antihypertensive medication, which is 3.7-fold higher compared with those without diabetes in 2013.

■ Type 2 diabetes
■ Non-diabetes

DEFINITION OF HYPERTENSION:

ICD-10 code (I10) & use of antihypertensive medication.



Dyslipidemia

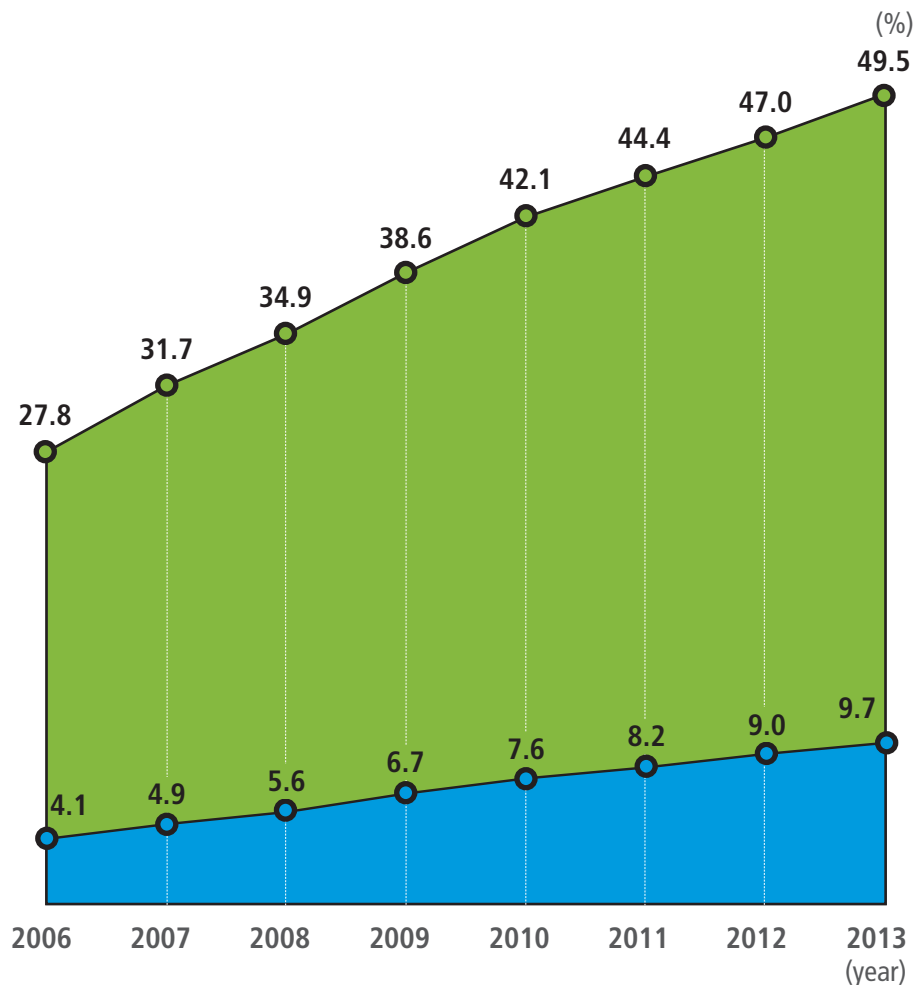
Type 2 diabetes accompanying dyslipidemia had steadily increased during the last 7 years. In 2013, about half of subjects with diabetes had dyslipidemia, which was about 5-fold higher compared with those without diabetes.

■ Type 2 diabetes

■ Non-diabetes

DEFINITION OF DYSLIPIDEMIA:

ICD-10 code (E78) and use of lipid-lowering medication.



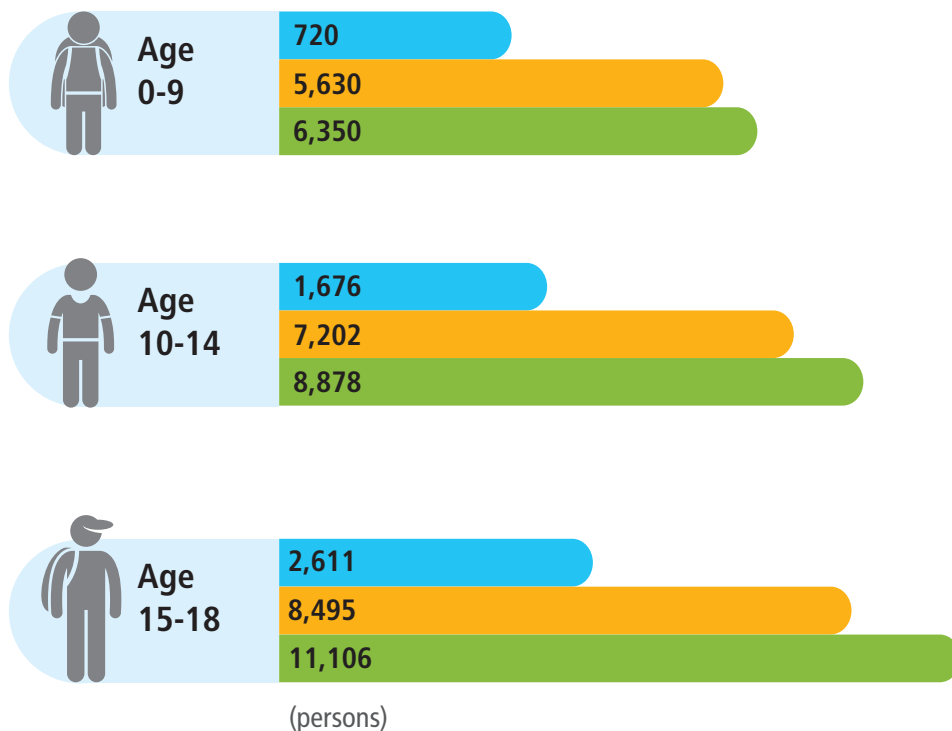
Childhood and adolescent diabetes

In 2013

Type 1 diabetes

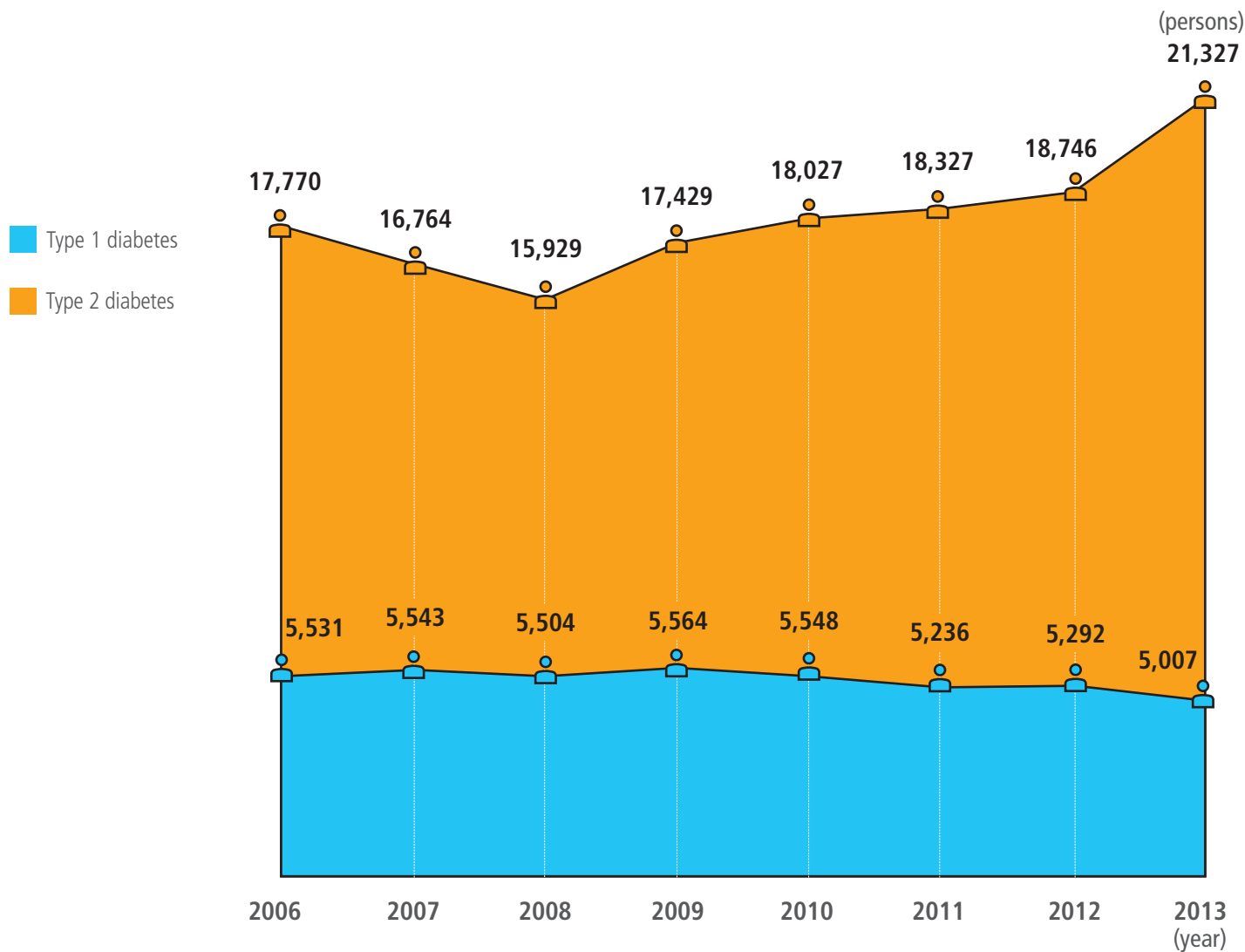
Type 2 diabetes

Total diabetes



DEFINITION OF DIABETES: subjects aged 18 years or younger with ICD-10 code (E10-E14).

The total number of patients with type 1 diabetes was not changed, but that of type 2 diabetes has been steadily increasing since 2006.



Type 2 diabetes and ESRD

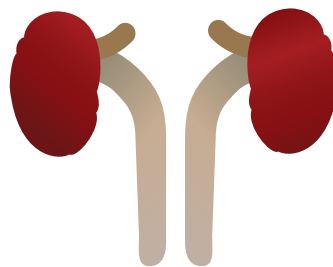
(end stage renal disease)

38.8% of subjects with ESRD
had type 2 diabetes, and 1.2% of
subjects with type 2 diabetes had
ESRD.

DEFINITION OF ESRD: ICD-10 code of renal
failure (N18, N19) or treated with renal
replacement therapy (hemodialysis, peritoneal
dialysis, or kidney transplantation).

In 2013

ESRD in diabetes



1.2%
32,312 persons

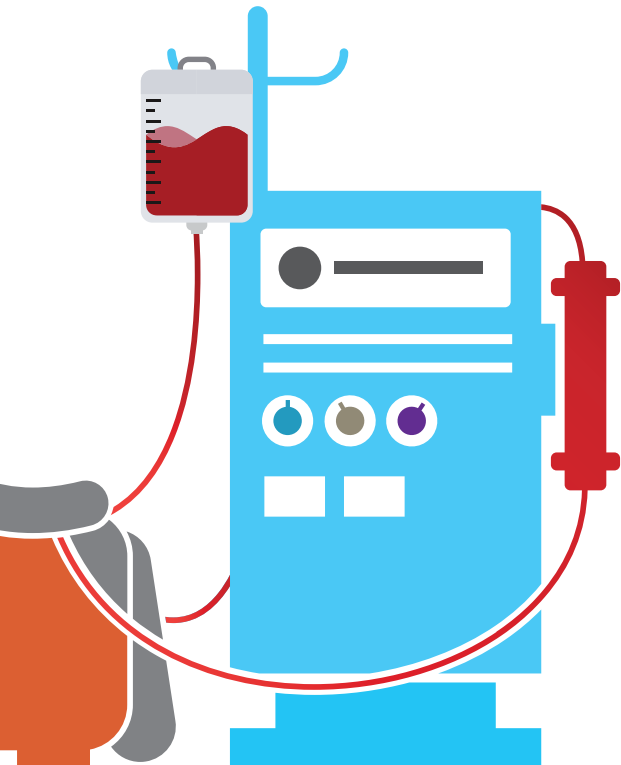
Diabetes in ESRD

38.8%
83,243 persons



Mortality rate in patients with ESRD

The mortality rate was about 2-fold higher in patients with type 2 diabetes and ESRD compared with those with ESRD but without diabetes.



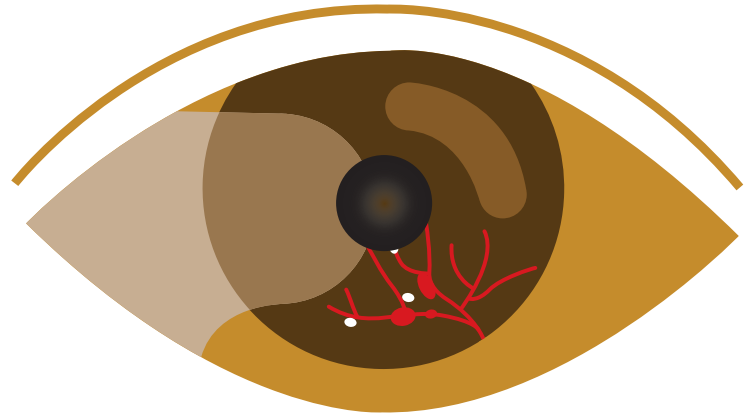
In 2013



Diabetic retinopathy

In 2013

- › Only 30% of patients with diabetes had comprehensive eye examination in 2013.
- › 15.9% of patients with type 2 diabetes had diabetic retinopathy.



15.9%

Diabetic Retinopathy
431,964 persons

Proliferative diabetic retinopathy (PDR)

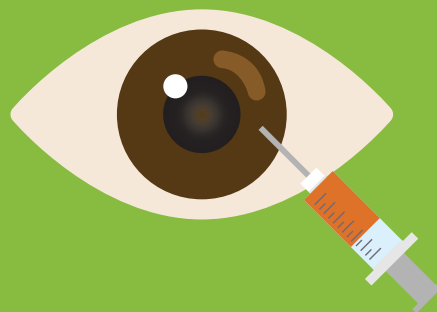
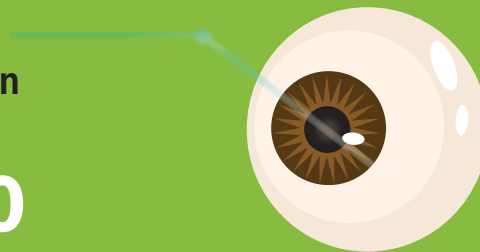
6.1% of patients with diabetic retinopathy had proliferative diabetic retinopathy (PDR) in 2013.

In 2013

(Rate among subjects with diabetic retinopathy)

Panretinal
Photocoagulation

1.4%



Intravitreal
Injection

1.4%

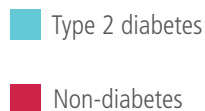
Pars Plana
Vitrectomy

1.7%



Metabolic syndrome

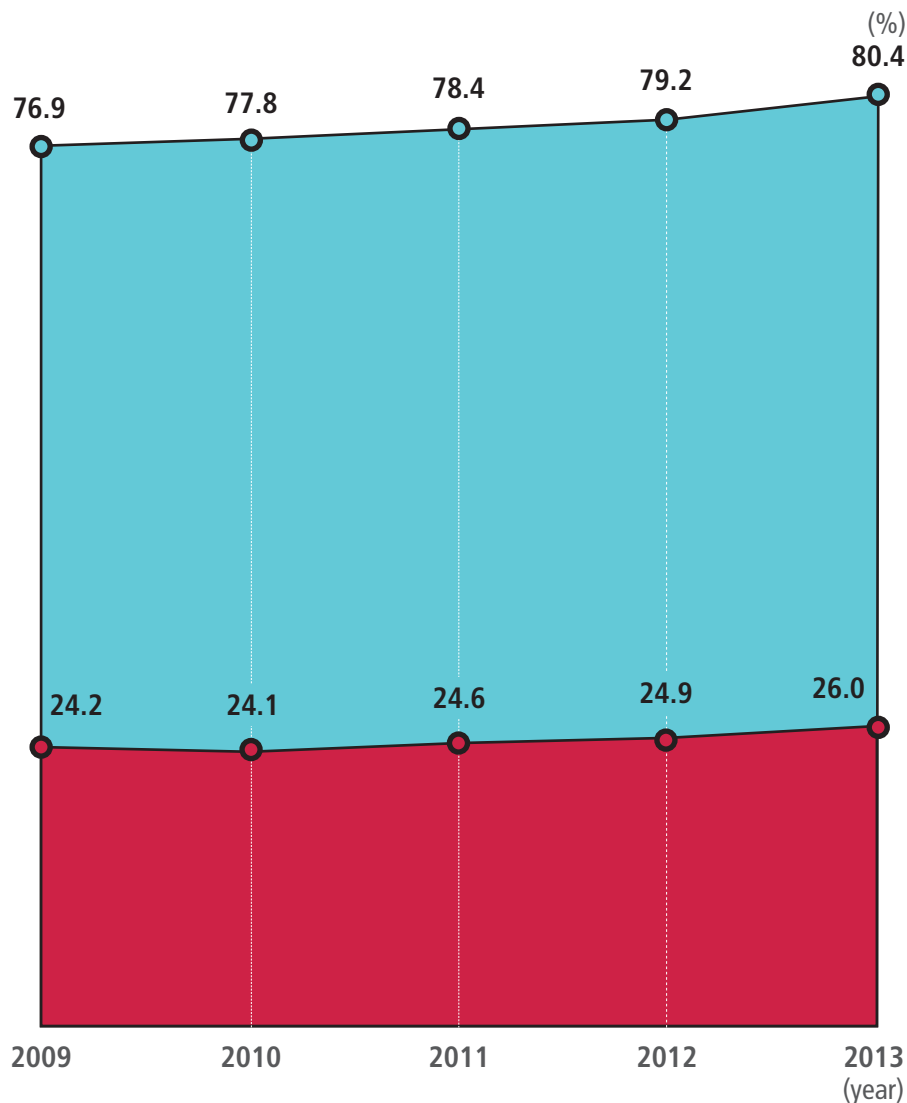
Confined to participants in National Health Screening Service.



DEFINITION OF METABOLIC SYNDROME:

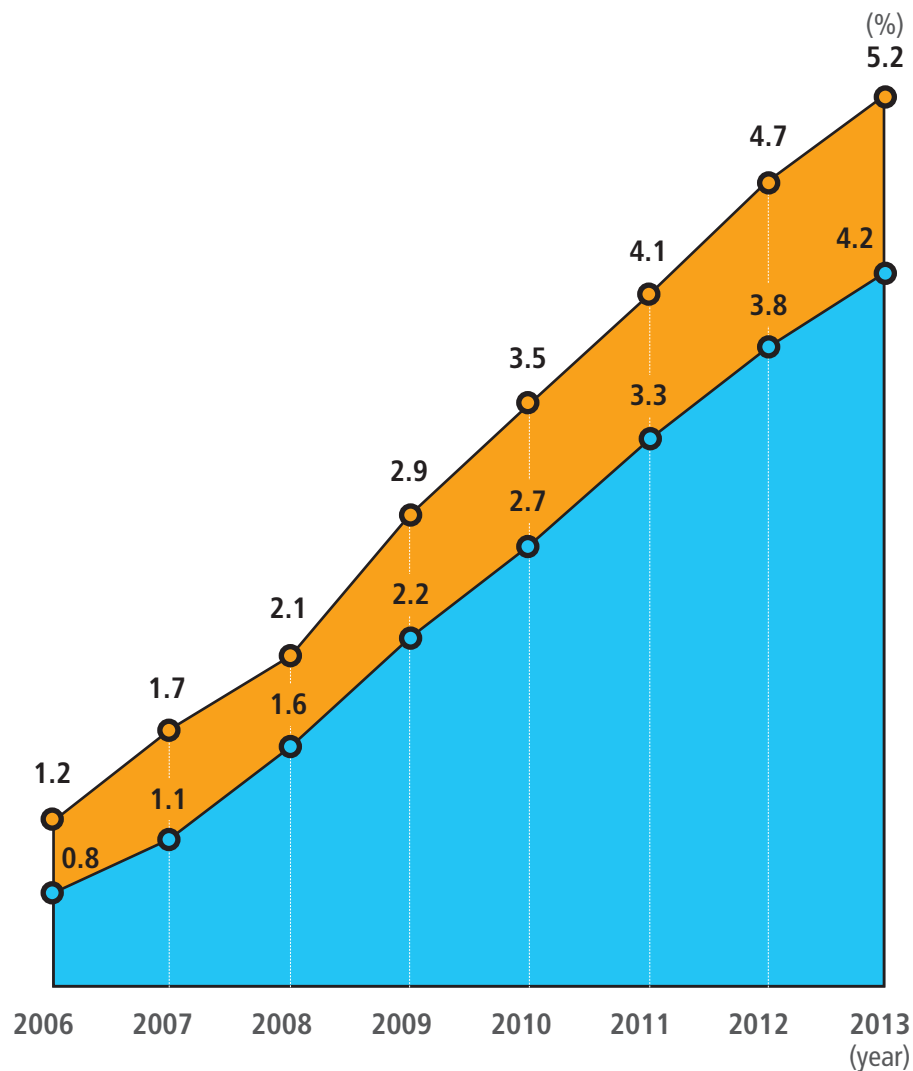
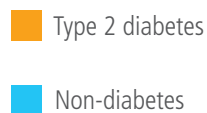
Defined in accordance with the updated National Cholesterol Education Program Adult Treatment Panel (NCEP-ATP) III criteria for Asia. The presence of three or more of the following criteria constituted a diagnosis of metabolic syndrome: (1) waist circumference ≥ 90 cm in men or ≥ 85 cm in women; (2) fasting triglyceride ≥ 150 mg/dL or medication use; (3) HDL-cholesterol < 40 mg/dL in men or < 50 mg/dL in women or medication use; (4) blood pressure $\geq 130/85$ mmHg or antihypertensive medication use; and (5) fasting glucose ≥ 100 mg/dL or current anti-diabetes medication.

The prevalence of metabolic syndrome was about 3-fold higher in patients with type 2 diabetes than in those without diabetes.



Dementia

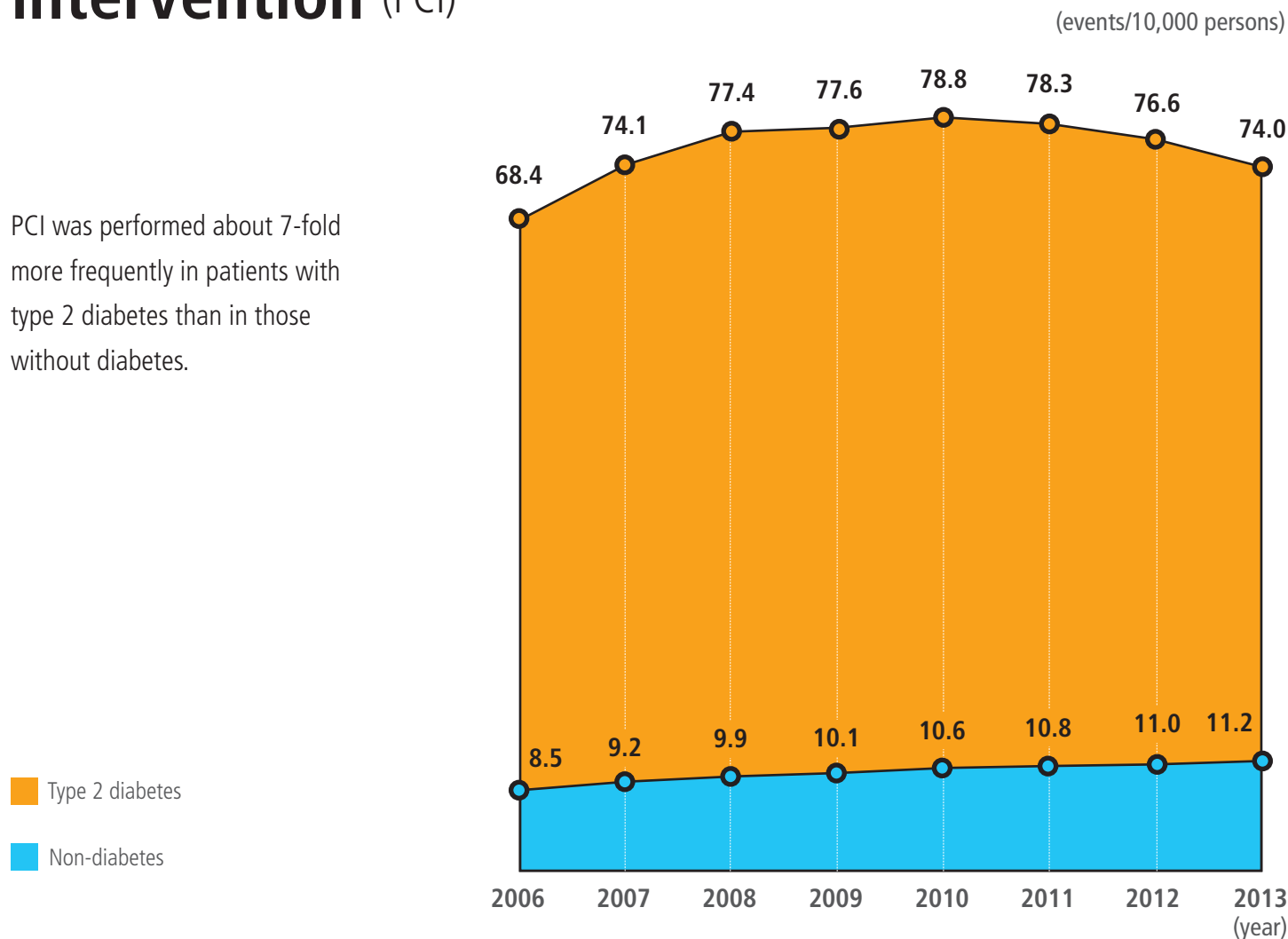
The prevalence of dementia has been steadily increasing both in patients with and without diabetes.



DEFINITION OF DEMENTIA: ICD-10 code of dementia (F00, F01, F02, F03), treated with medication, and aged more than 60 years.

Percutaneous coronary intervention (PCI)

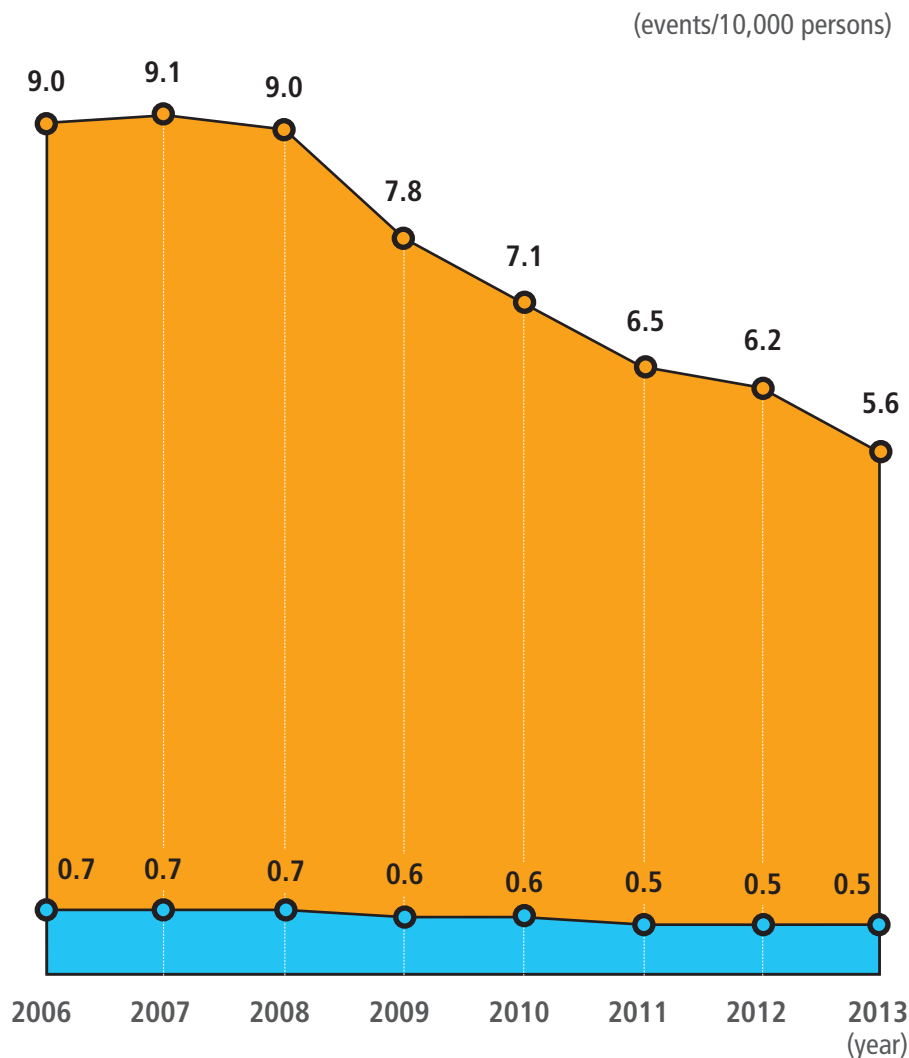
PCI was performed about 7-fold more frequently in patients with type 2 diabetes than in those without diabetes.



Coronary artery bypass graft (CABG)

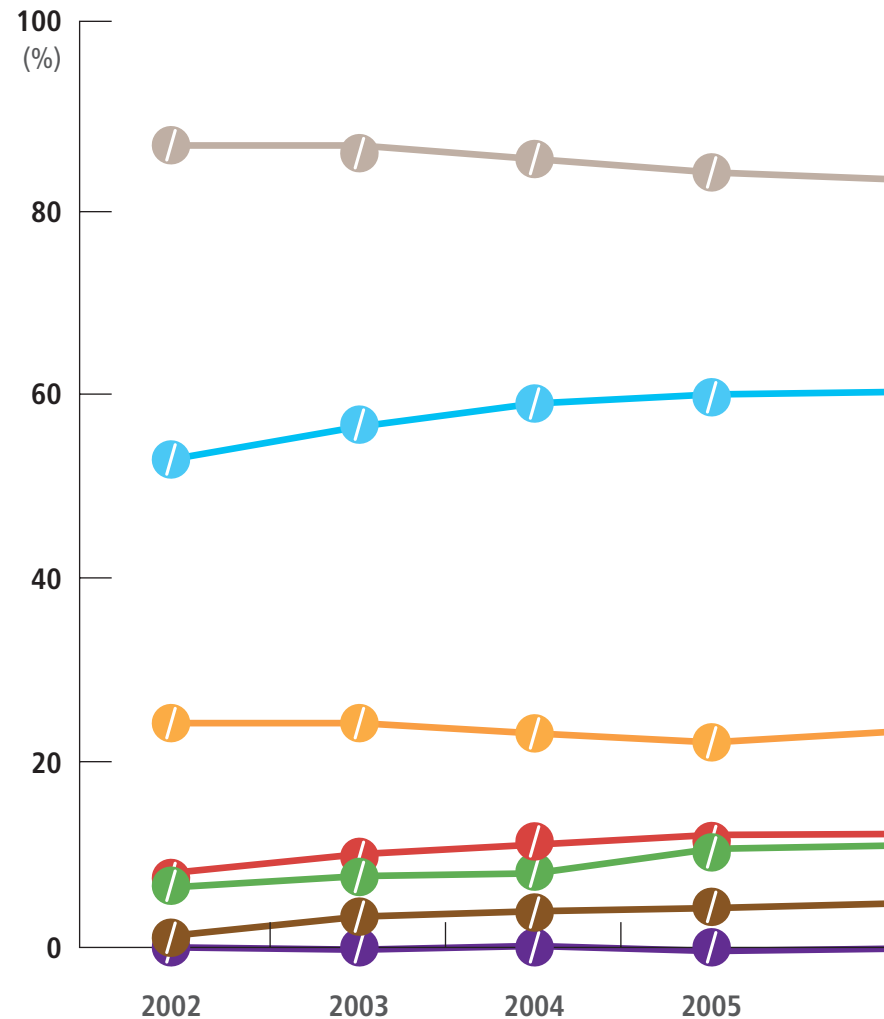
The number of cases with CABG was remarkably decreased during the last 7 years, but it was more than 10-fold higher in patients with type 2 diabetes than in those without diabetes.

■ Type 2 diabetes
■ Non-diabetes

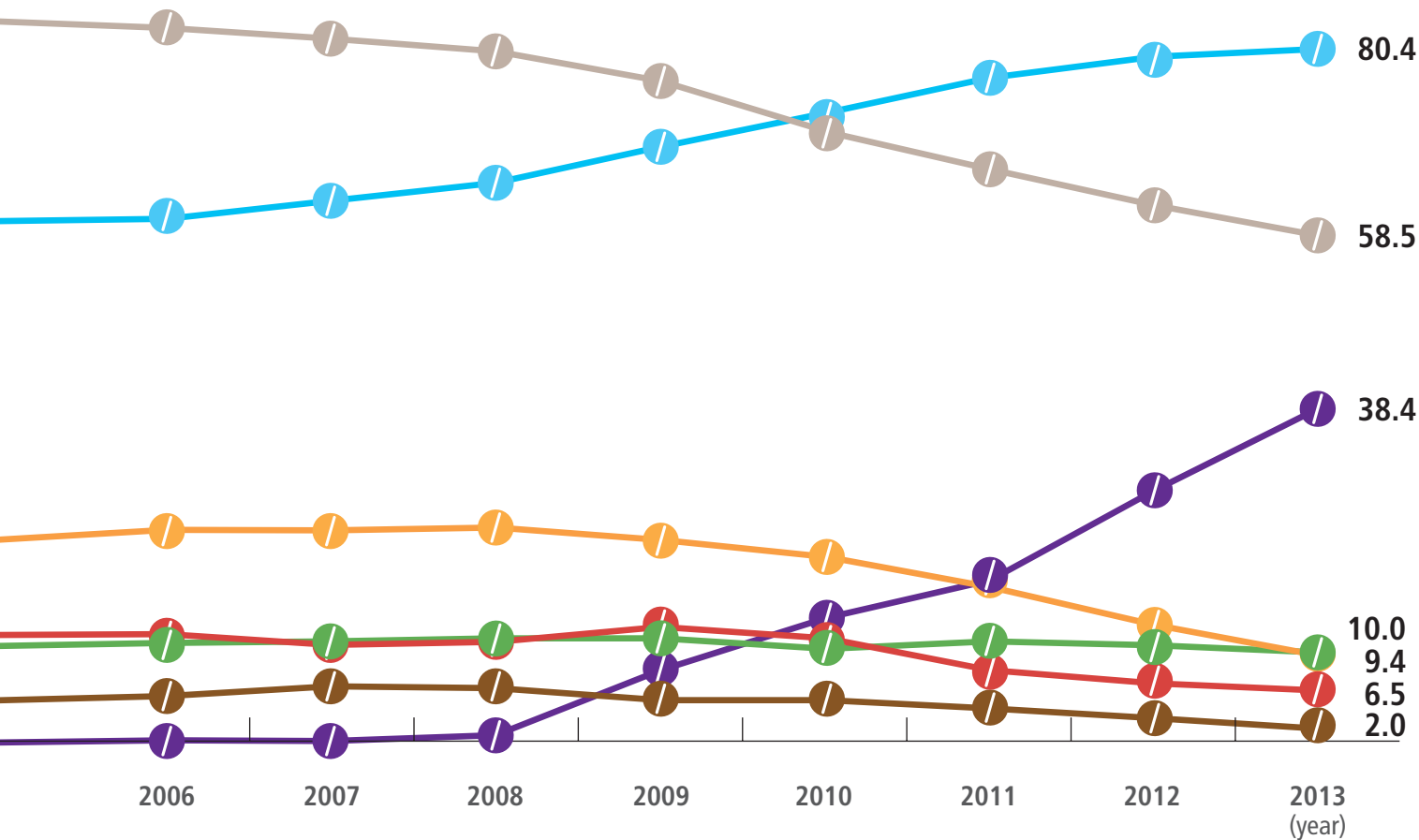


Treatment of diabetes

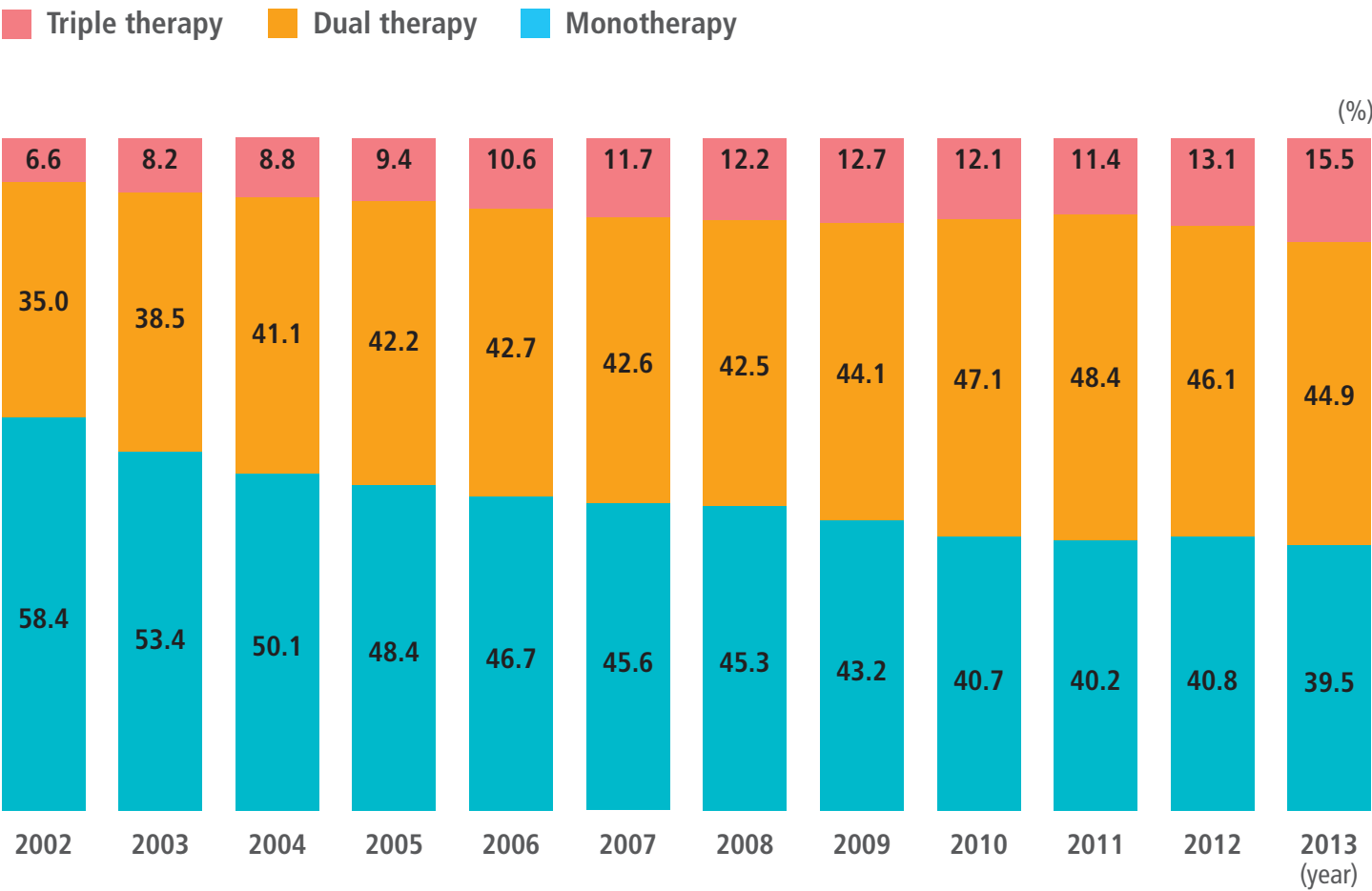
- › Only 10.0% of patients with type 2 diabetes were being treated with insulin in 2013. When included insulin use in the hospitalized patients, it goes up to 16.4%
- › The use of metformin increased up to 80.4% of total prescriptions by 2013.
- › The use of dipeptidyl peptidase-4 (DPP-4) inhibitor increased dramatically since 2008 and comprised 3rd of the market share (38.4%) in 2013.



SULFONYLUREA METFORMIN A-GLUCOSIDASE INHIBITOR INSULIN TZD
MEGLITINIDE DPP-4 INHIBITOR



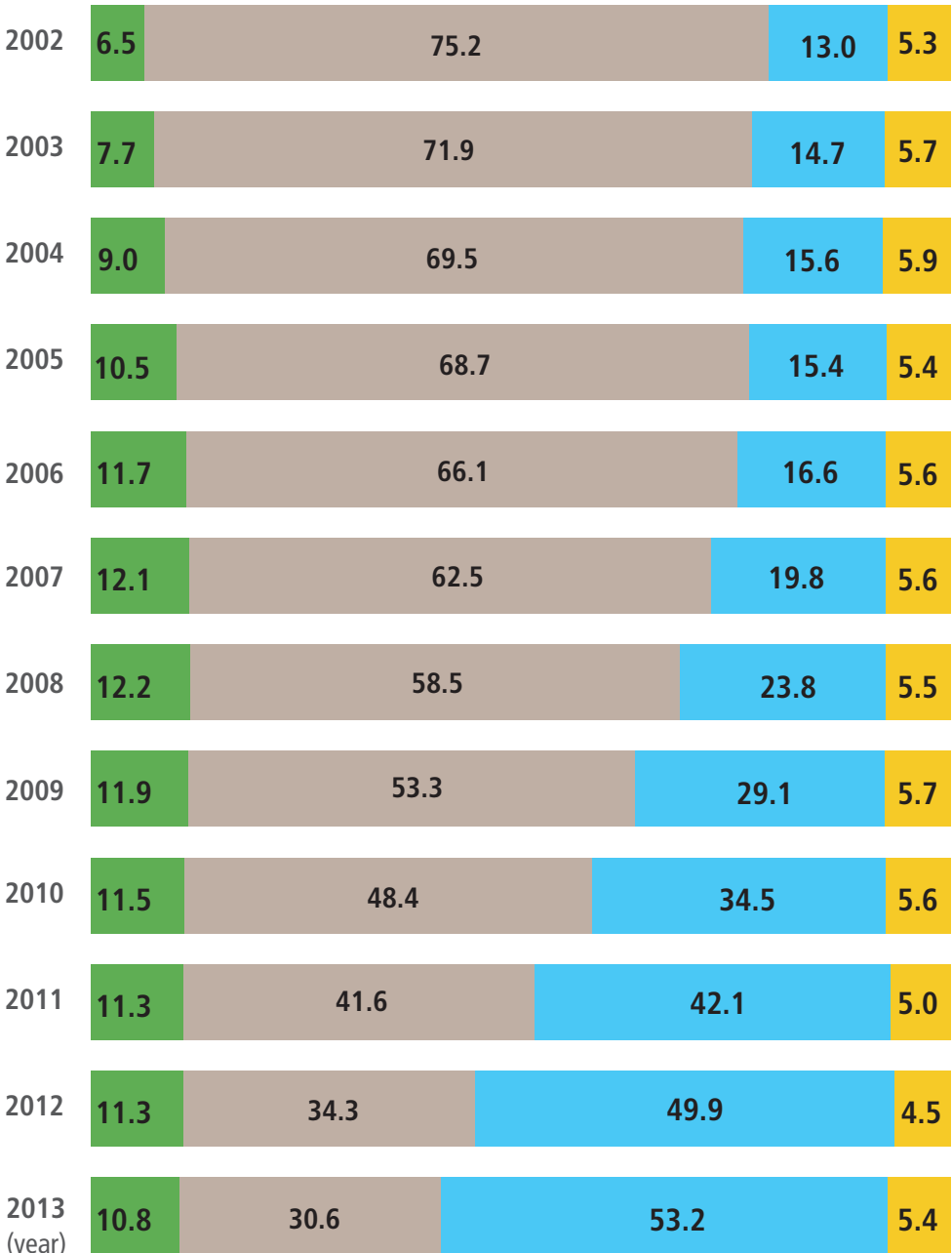
Percentage of people with diabetes receiving treatment with dual or triple therapy steadily increased from 35% and 6.6% in 2002 to 45% and 15.5% in 2013, respectively. Only 40% of people with type 2 diabetes are receiving treatment with a single oral medication.



Monotherapy

Among prescriptions for monotherapy, only 13.0% was metformin in 2002, but it increased up to 53.2% by 2013. In contrast, the use of sulfonylurea declined dramatically from 75.2% in 2002 to 30.6% in 2013 as monotherapy.

- INSULIN
- SULFONYLUREA
- METFORMIN
- Others



(%)

Dual therapy

In 2013

**METFORMIN +
DPP-4 INHIBITOR**

32.5%

**SULFONYLUREA +
METFORMIN**

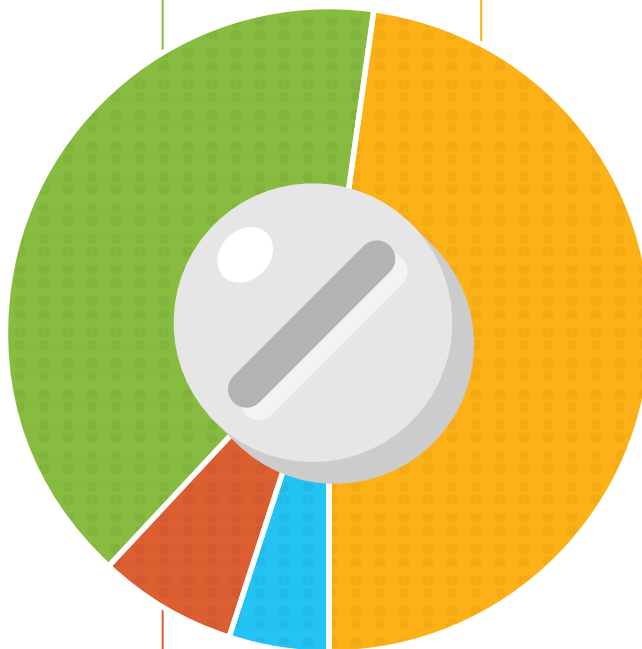
41.7%

**INSULIN +
METFORMIN**

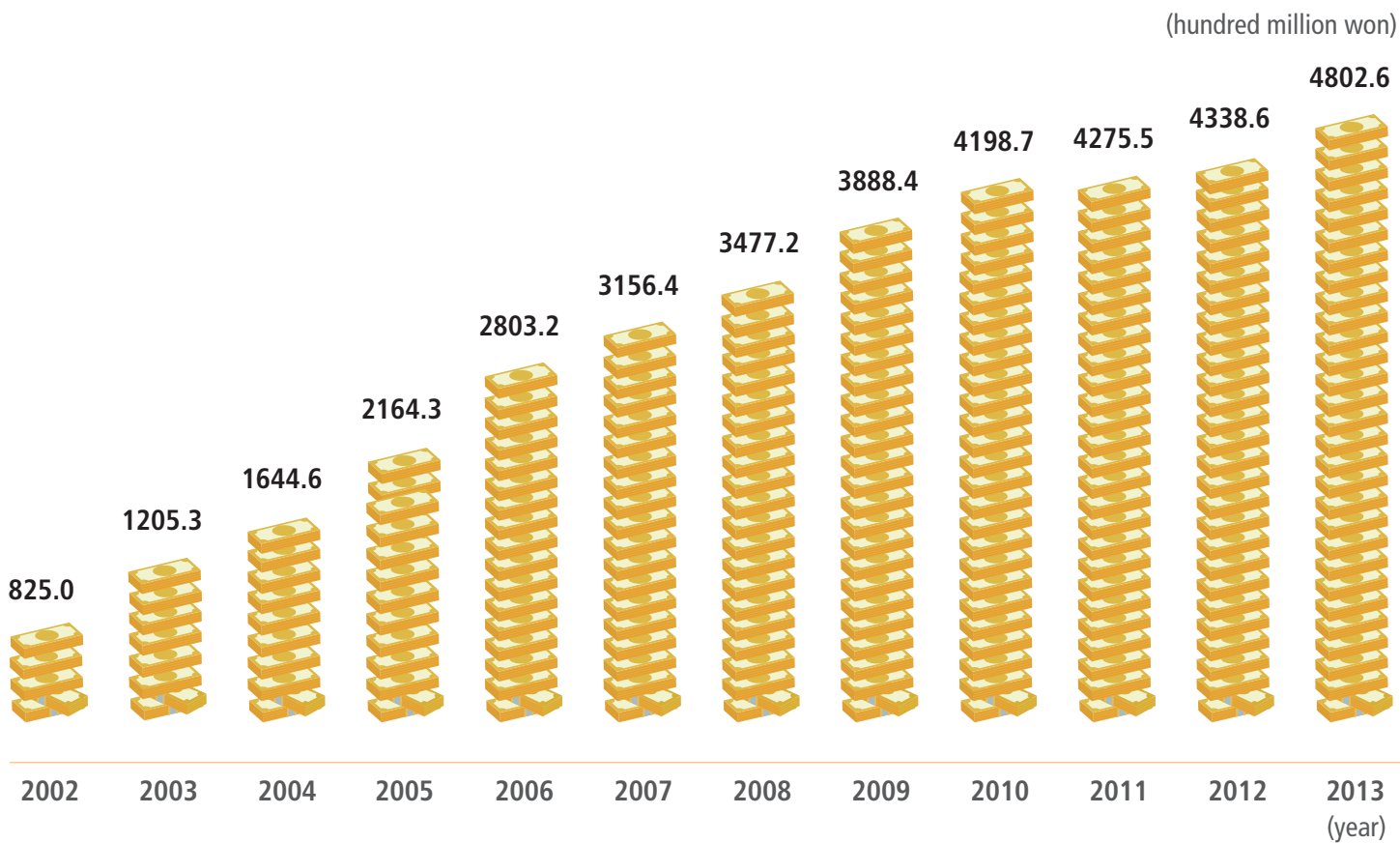
4.4%

**SULFONYLUREA +
DPP-4 INHIBITOR**

4.8%

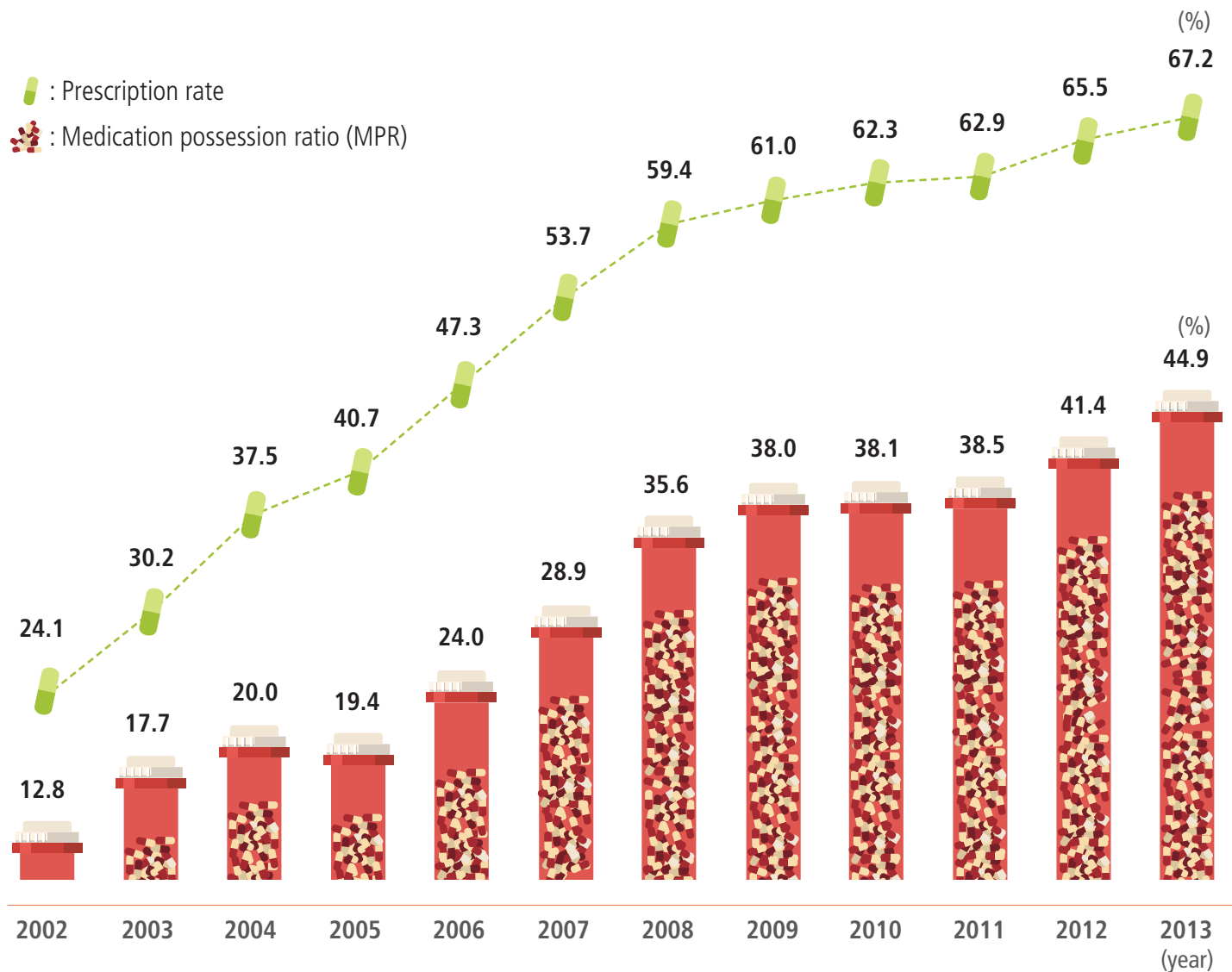


Medication cost



Medication adherence rate

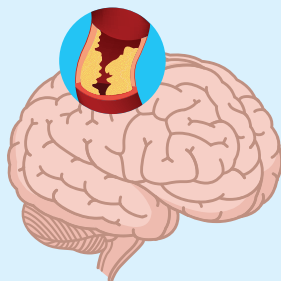
(more than > 80% (292 days) per year)



Cardiovascular events

In 2013

(events/10,000 persons)

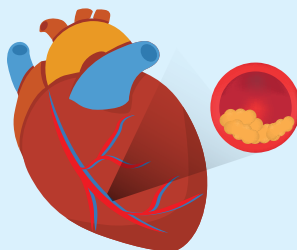


Ischemic Stroke

295 / **62**

Type 2 diabetes

Non-diabetes

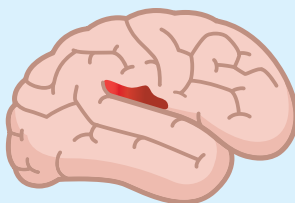


Ischemic heart disease

248 / **59**

Type 2 diabetes

Non-diabetes



Cerebral hemorrhage

41 / **17**

Type 2 diabetes

Non-diabetes

DEFINITION OF CARDIOVASCULAR EVENTS:

ICD-10 code and events-related hospitalization

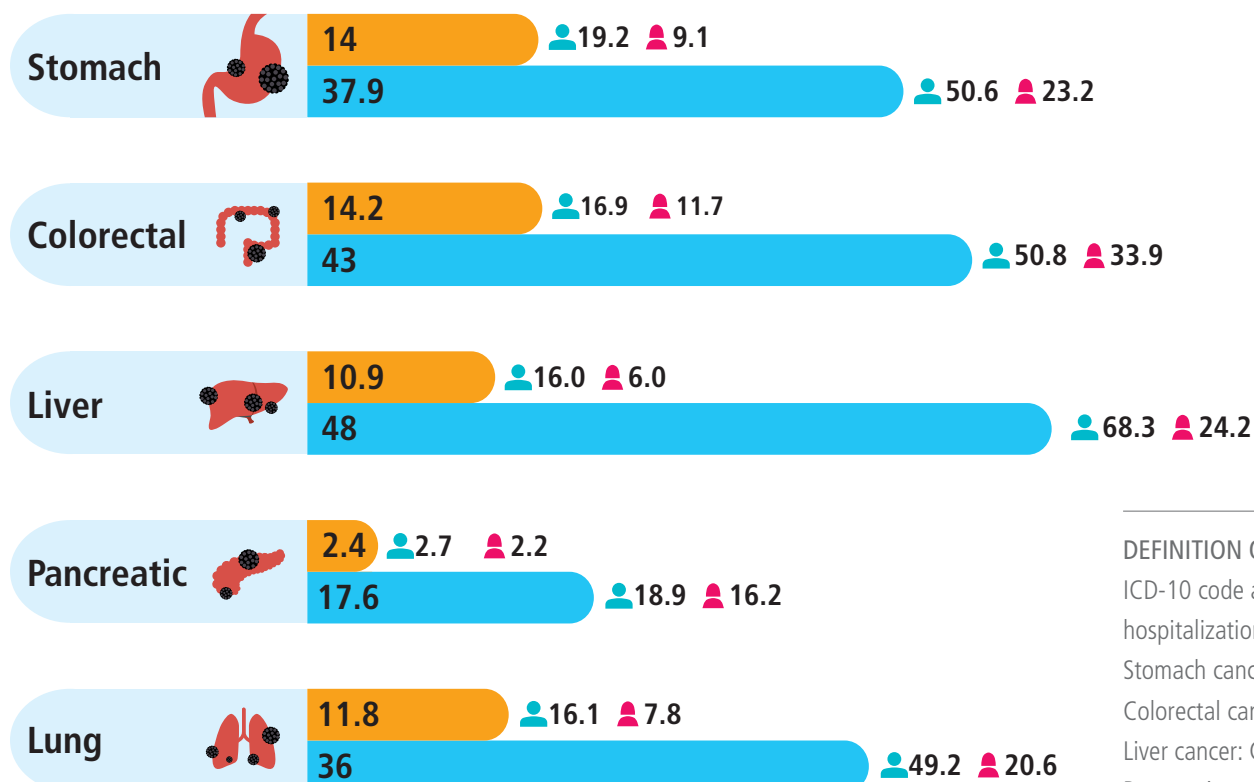
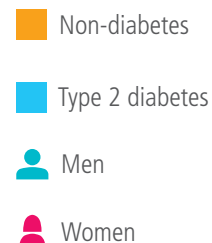
Ischemic stroke: I63, I64, I693, I694, G45

Ischemic heart disease: I20, I21, I22, I23, I24, I25

Cerebral hemorrhage: I61, I61, I62, I690, I692

Cancer-related hospitalization

In 2013



DEFINITION OF CANCER:

ICD-10 code and cancer-related hospitalization

Stomach cancer: C16

Colorectal cancer: C18, C19, C20

Liver cancer: C22

Pancreatic cancer: C25

Lung cancer: C33, C34

(events/10,000 persons)