



**NYU**

**RORY MEYERS  
COLLEGE OF NURSING**

# GLOBAL BURDEN OF DIABETES



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# Diabetes is a Worldwide Epidemic

**2013 ~ 382 million people with diabetes.**

	2011	2030
<b>Total world population (billions)</b>	<b>7.0</b>	<b>8.3</b>
<b>Adult population (20–79 years, billions)</b>	<b>4.4</b>	<b>5.6</b>
<b>Diabetes</b>		
<b>Global prevalence (%)</b>	<b>8.3</b>	<b>9.9</b>
<b>Number of people with diabetes (millions)</b>	<b>366</b>	<b>552</b>

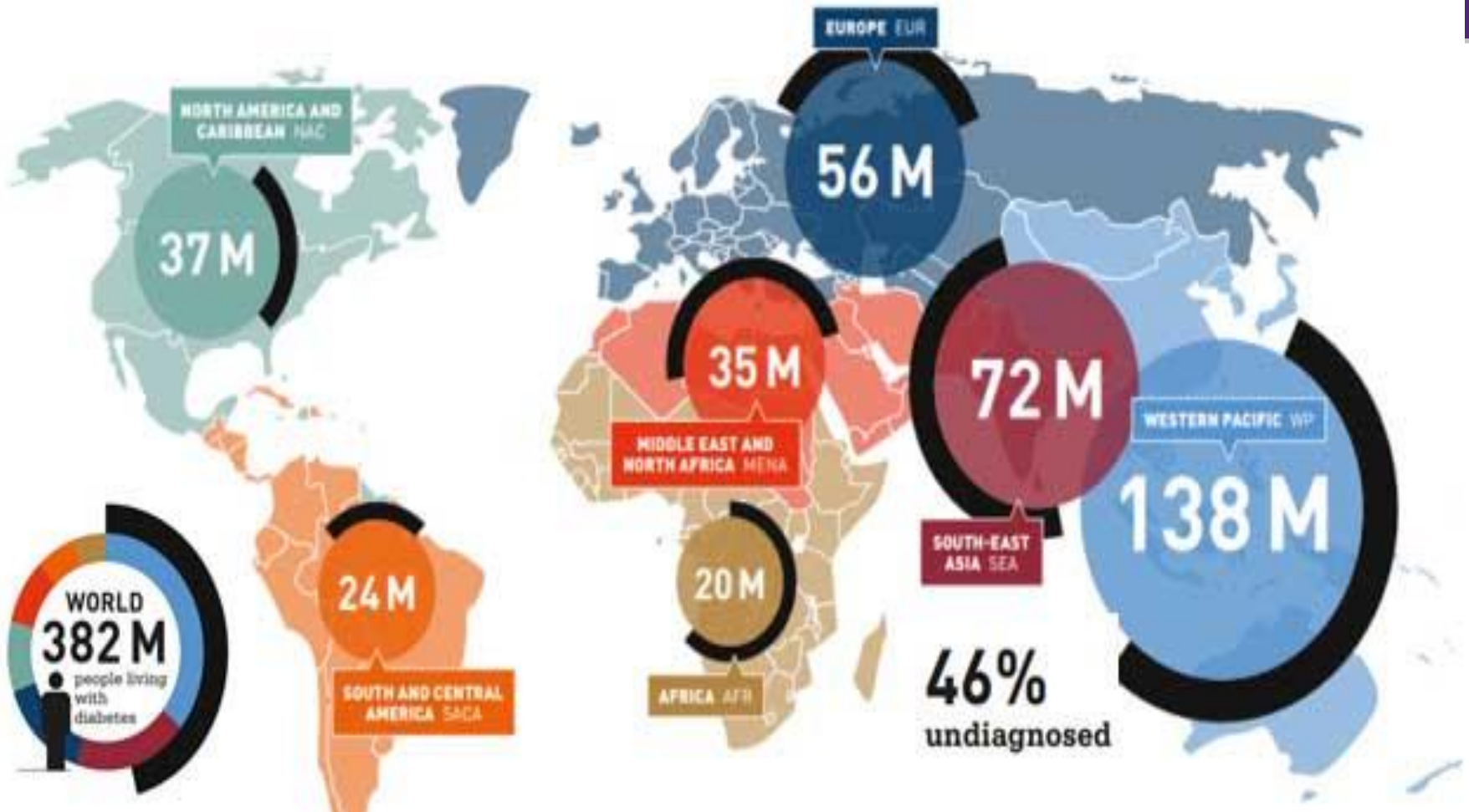
International Diabetes Federation. IDF Diabetes Atlas. Update 2012.

International Diabetes Federation. Global burden. IDF Diabetes Atlas. 5<sup>th</sup> edition 2011.

# Key Diabetes Statistics

- **2012 alone 1.5 million deaths.**
- **Direct annual global cost of diabetes > US\$ 827 billion.**
- **Losses in GDP worldwide estimated to be US\$ 1.7 trillion from 2010 to 2030.**

# Global Burden of Diabetes



# Number of people with diabetes (20-79 years), 2010 and 2030

COUNTRY/TERRITORY	2010 MILLIONS	COUNTRY/TERRITORY	2030 MILLIONS
1 India	50.8	1 India	87.0
2 China	43.2	2 China	62.6
3 United States of America	26.8	3 United States of America	36.0
4 Russian Federation	9.6	4 Pakistan	13.8
5 Brazil	7.6	5 Brazil	12.7
6 Germany	7.5	6 Indonesia	12.0
7 Pakistan	7.1	7 Mexico	11.9
8 Japan	7.1	8 Bangladesh	10.4
9 Indonesia	7.0	9 Russian Federation	10.3
10 Mexico	6.8	10 Egypt	8.6

**\* CHINA now # 1 92.4**

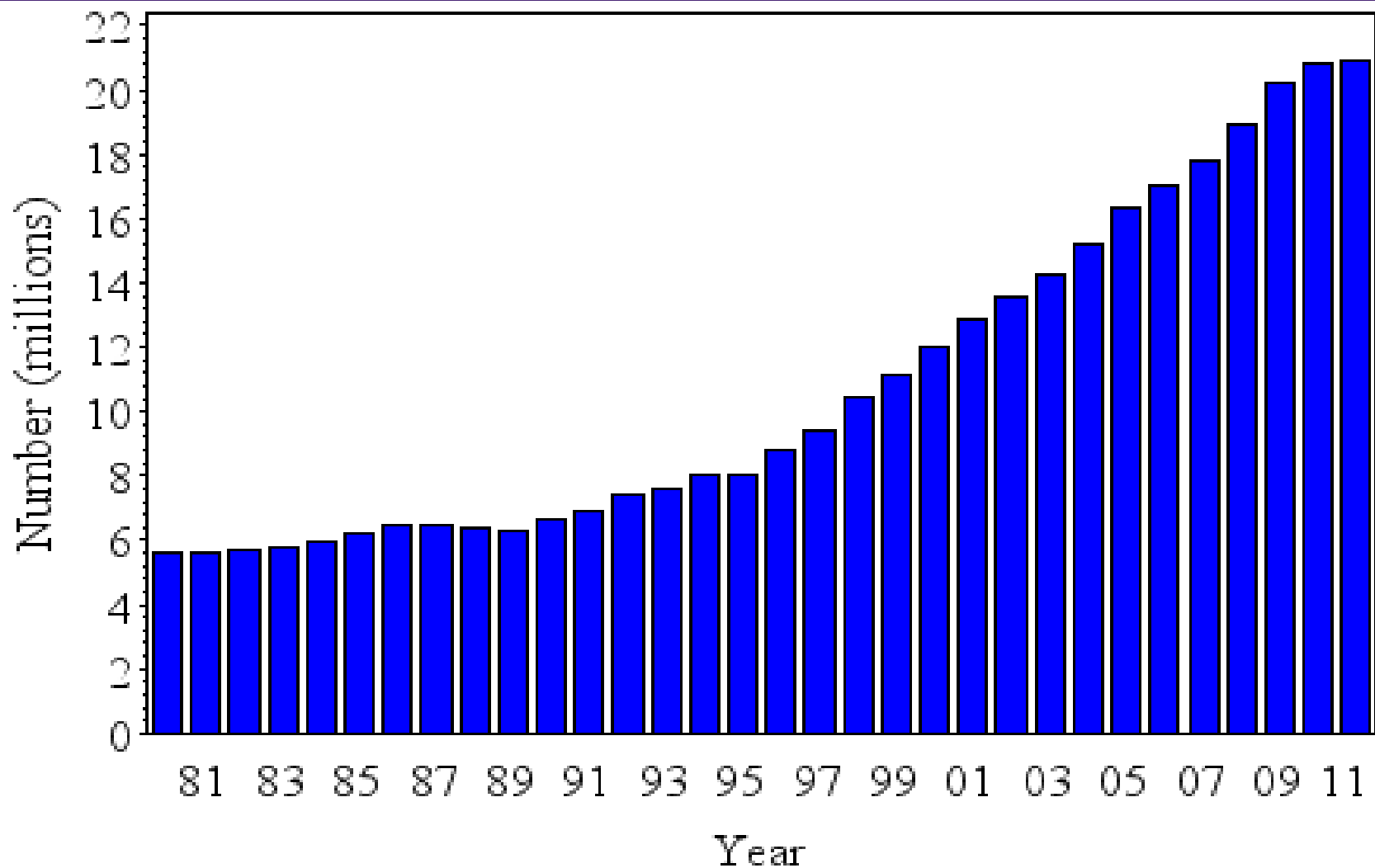
**Yang W., Lu J., Weng J. et al. (2010). N Engl J Med , 362:1090-110**

# U.S. Diabetes Statistics

- **25.8 million — 8.3% of the U.S. population**  
**1 of every 10 adults.**
- **7 million undiagnosed.**
- **2011 diabetes in 65–74yr. age group highest rates, 21.8%.**
- **215,000 youth < 20 yrs. has diabetes.**
- **~ 79 million adults  $\geq$  20 yrs. pre-diabetes.**

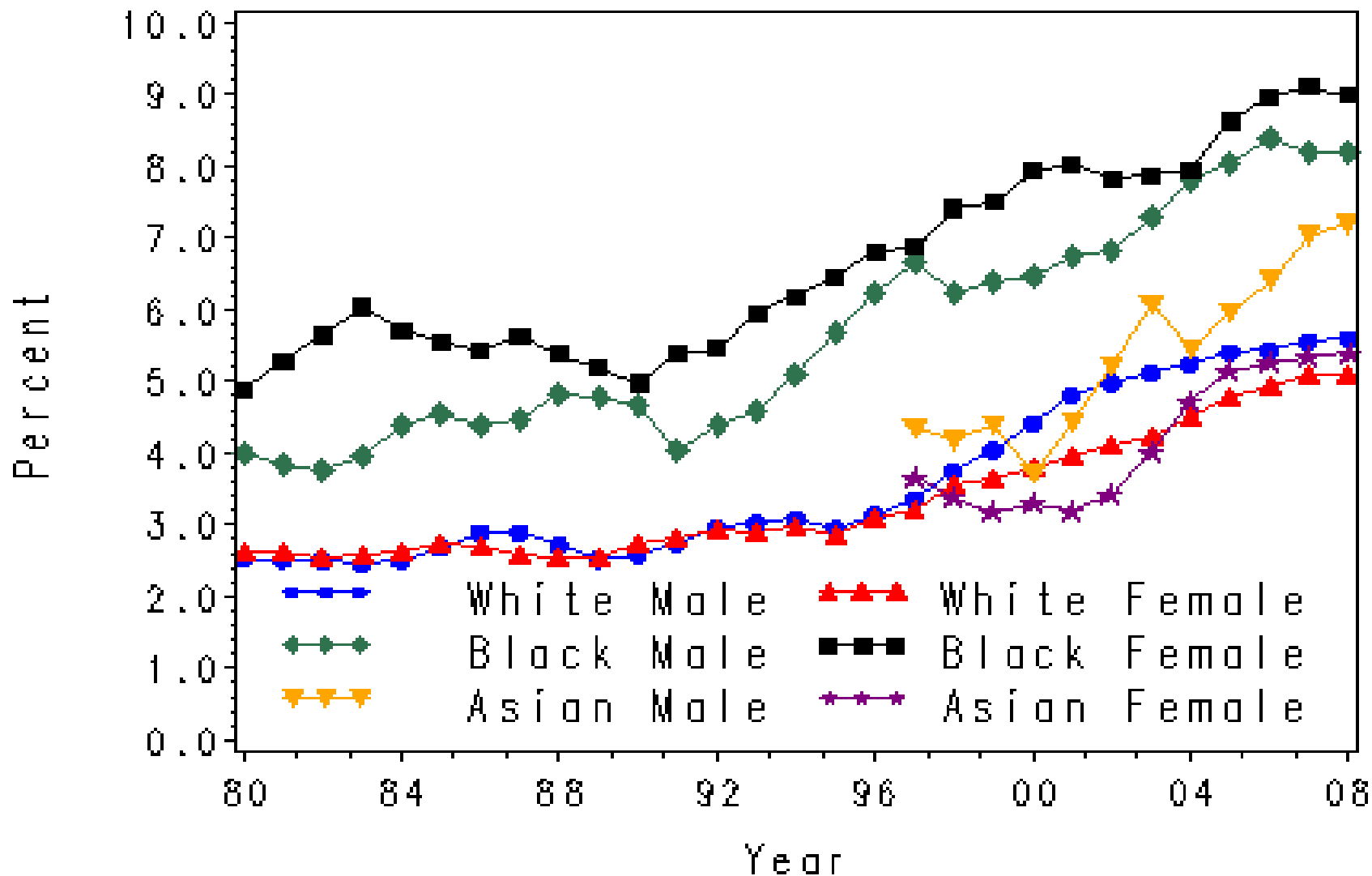
[www.cdc.gov/diabetes/statistics](http://www.cdc.gov/diabetes/statistics)

# Number (in Millions) of Civilian, Noninstitutionalized Persons with Diagnosed Diabetes, United States, 1980–2011





# Age-Adjusted Percentage of Population with Diagnosed Diabetes, by Race and Sex United States, 1980–2008



# Emerging Diabetes Projections (persons 20-79 years)

	<b>2010</b>	<b>2030</b>	
	<b>millions</b>	<b>millions</b>	<b>% increase</b>
<b>AFRICA</b>	<b>12.1</b>	<b>23.9</b>	<b>98</b>
<b>Middle East &amp; North Africa</b>	<b>26.6</b>	<b>51.7</b>	<b>94</b>
<b>Southeast Asia</b>	<b>58.7</b>	<b>101.0</b>	<b>72</b>

# AFRICA at a glance

**62.5%**  
undiagnosed

**22 M**  
people living  
with diabetes

PREVALENCE  
**5.1%**

Diabetes in Africa (20-79 years)	2014	2035
Total population (millions)	924	1,511
Adult population (millions)	425.5	775.5
Number of people with diabetes (millions)	21.5	41.5
Regional prevalence (%)	5.1	5.3
Comparative prevalence (%)	5.9	6
Undiagnosed cases (millions)	13.4	-
Total diabetes-related deaths (thousands)	480.9	-
Deaths under the age of 60 (%)	75.1	-
Total diabetes-related health expenditure (USD billions)	4.5	6.4

21.5 million people have diabetes - 1 in 20 adults

Lowest **prevalence** across regions

Highest percentage of **undiagnosed** people

Highest percentage of **deaths under the age of 60**

Lowest diabetes-related **expenditure** – 1% of worldwide total

# Definition of Diabetes Mellitus

- **Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both.**
- **The chronic hyperglycemia is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels.**

# Characteristics of Type 2 Diabetes

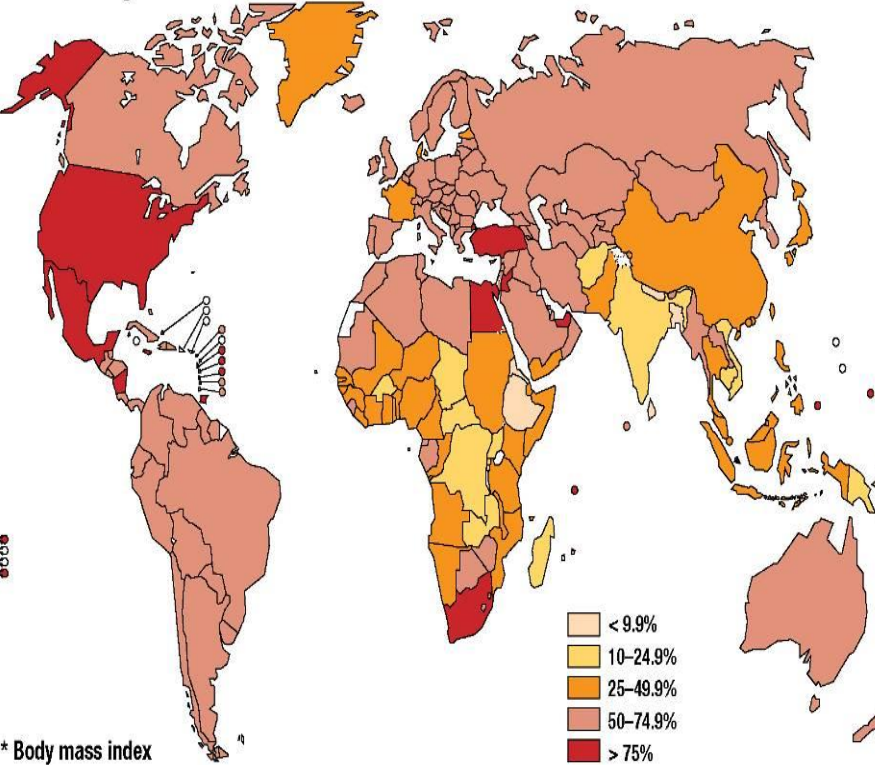
- **Obese or have a history of obesity**
- **Family history of disease is common**
- **Frequently goes undiagnosed for years**
- **Typically occurs in adulthood but increasing in youth**

# Global Diabetes Complications

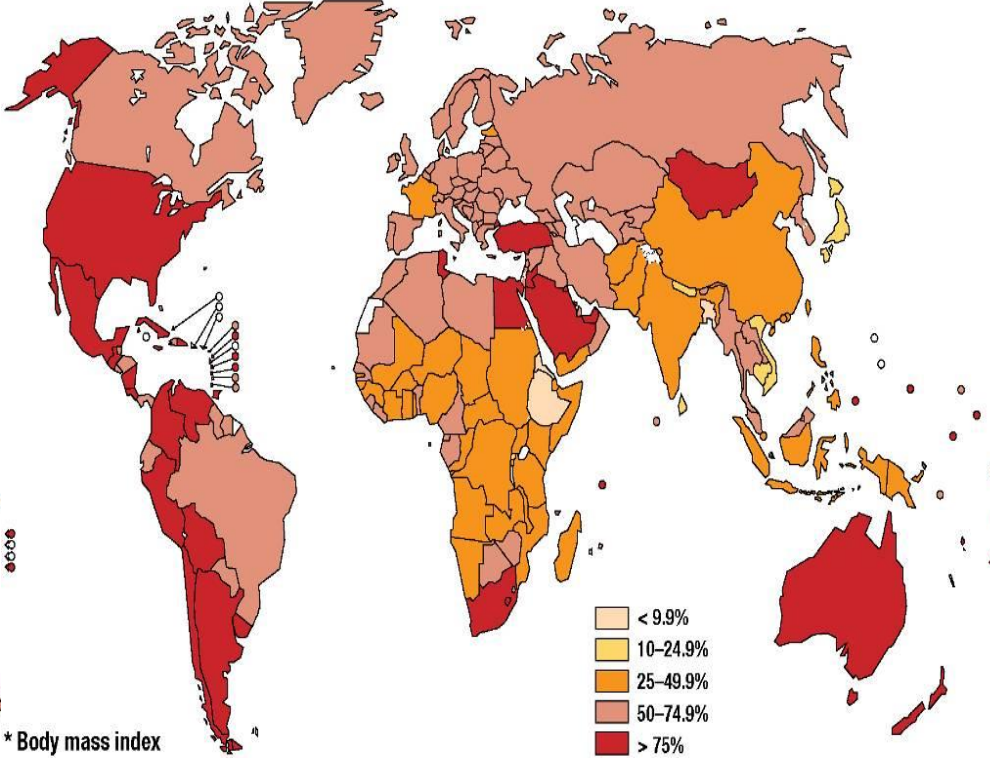
- **Three-to fourfold increase in End Stage Renal Disease (ESRD), diabetes the single leading cause of ESRD in most countries**
- **171 million with vision loss or impairment due to diabetes**
- **1 million limb amputations yearly — one every 30 seconds; 85% preventable**

# Overweight Risks Are Increasing

Projected prevalence of overweight (BMI\*  $\geq 25$  kg/m<sup>2</sup>), women aged 30 and above, 2005

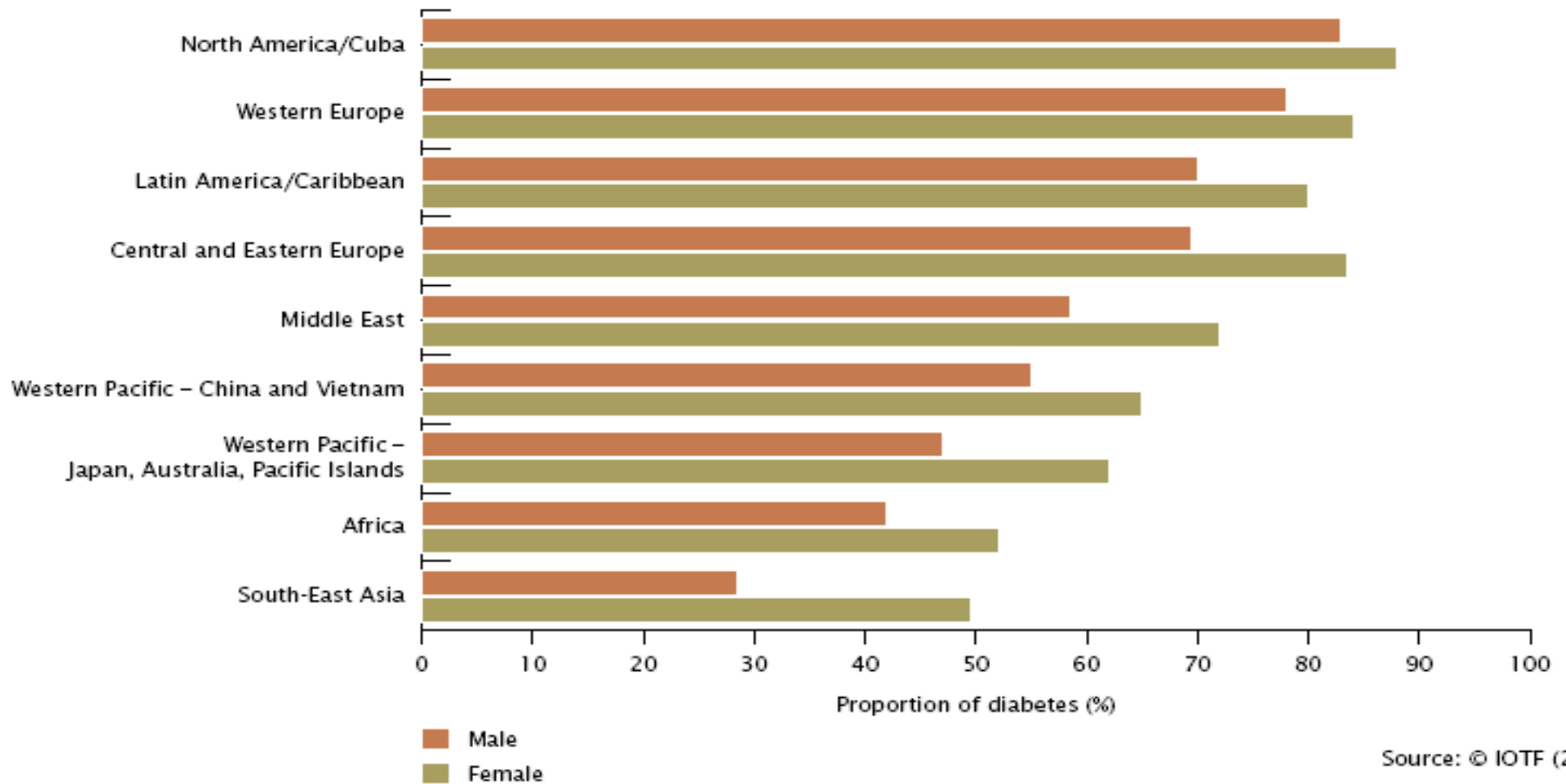


Projected prevalence of overweight (BMI\*  $\geq 25$  kg/m<sup>2</sup>), women aged 30 and above, 2015



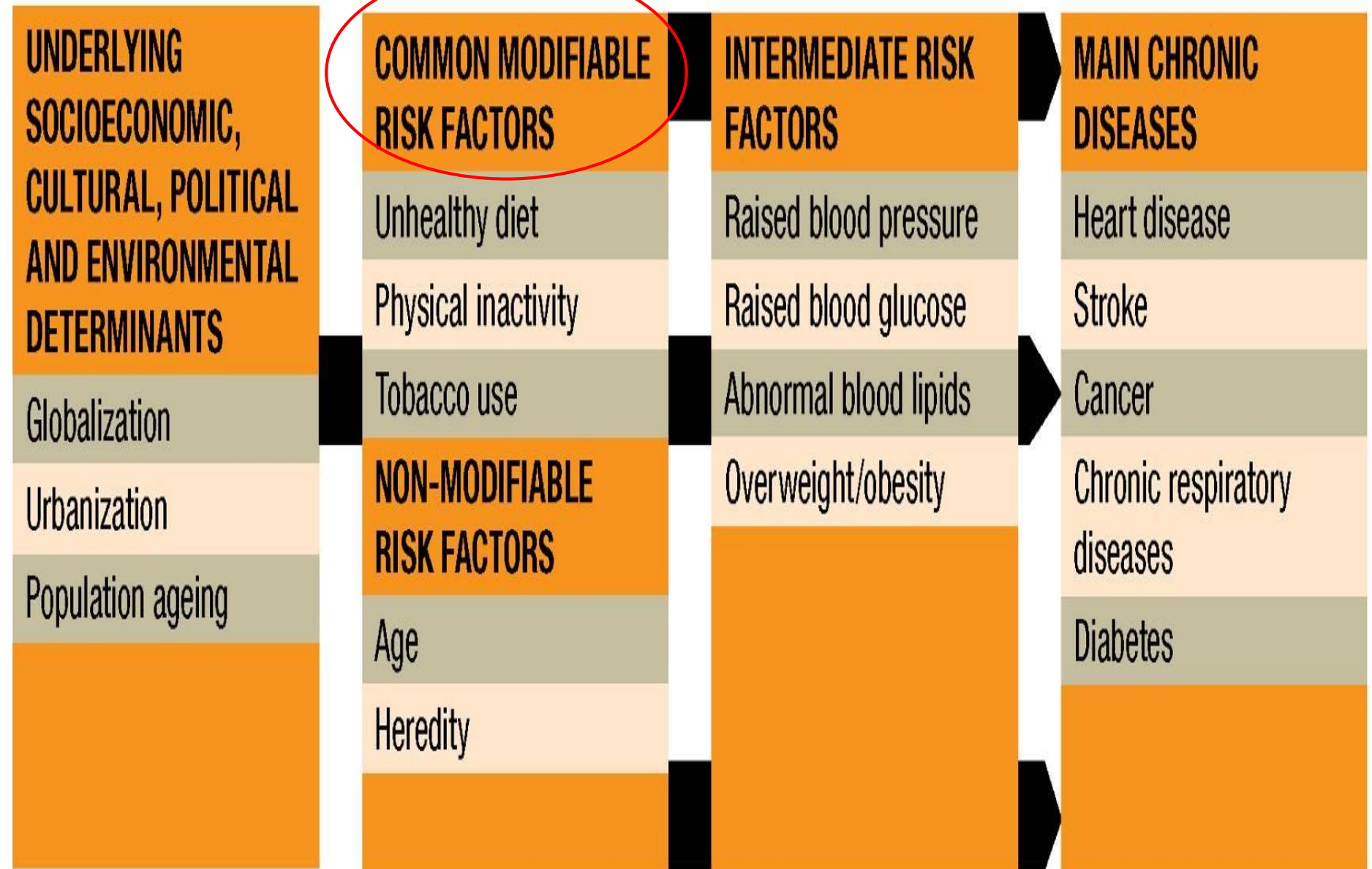
**Figure 3.2**

**Proportion of diabetes (%) attributable to weight gain by region (30+ years)**





# Causes of chronic diseases



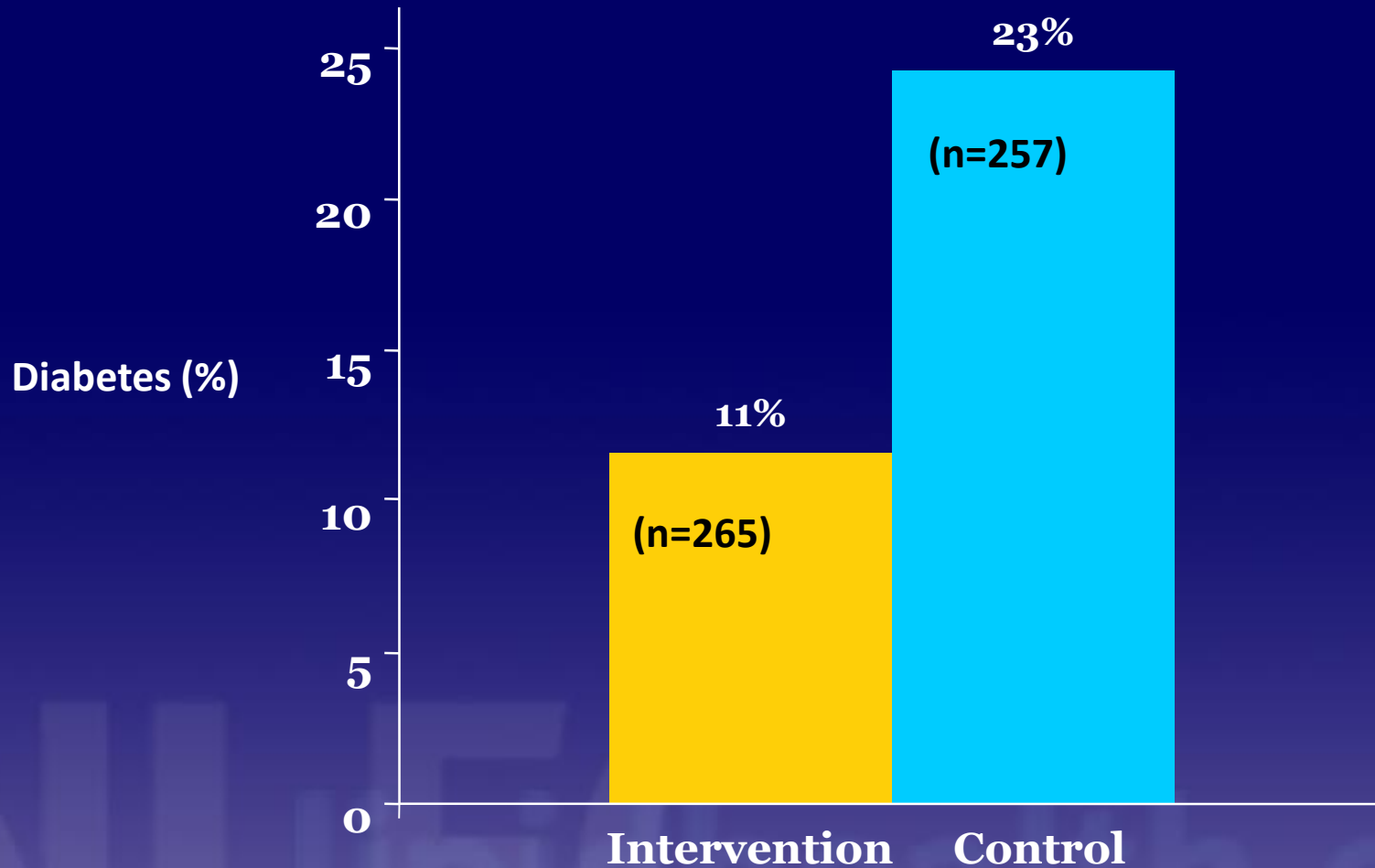
# Finnish Diabetes Prevention Program

- **522 patients with Impaired Glucose Tolerance**
- **Age: 40-65 years**
- **Mean BMI: 31 kg/m<sup>2</sup>**
- **Intervention: diet and exercise**
- **Mean duration of follow up: 3.2 years**

IGT = impaired glucose tolerance; BMI = body mass index.

Tuomilehto J et al. *N Engl J Med.* 2001;344:1343-1350.

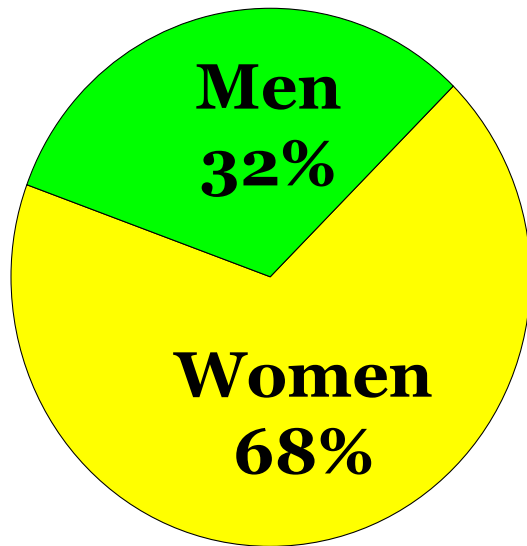
# Finnish Diabetes Prevention Study: Reduction in Risk for Diabetes\*



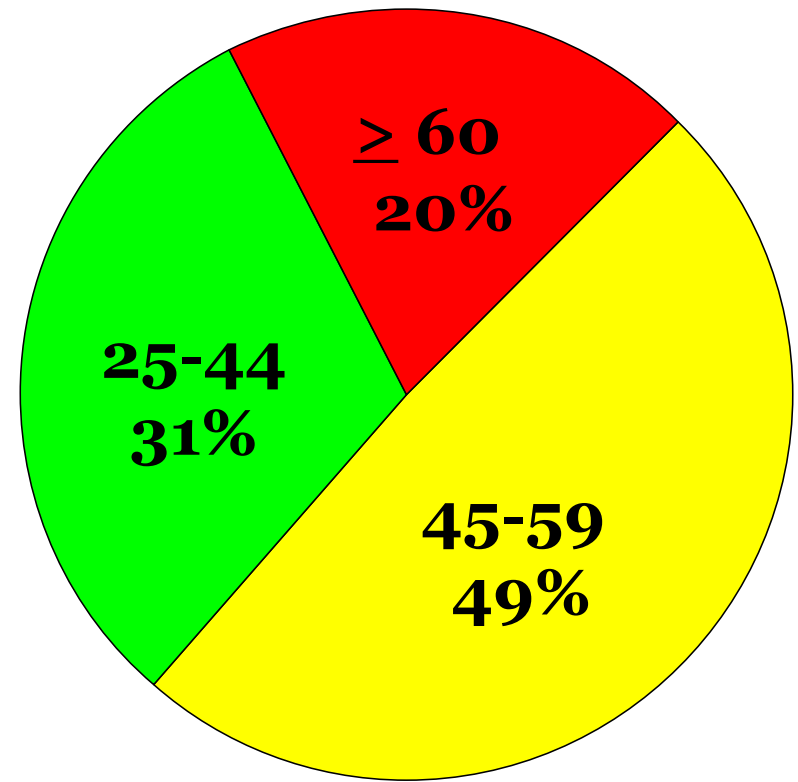
\* $P < 0.001$ ; 4-year results

# U.S. Diabetes Prevention Program (DPP) Population

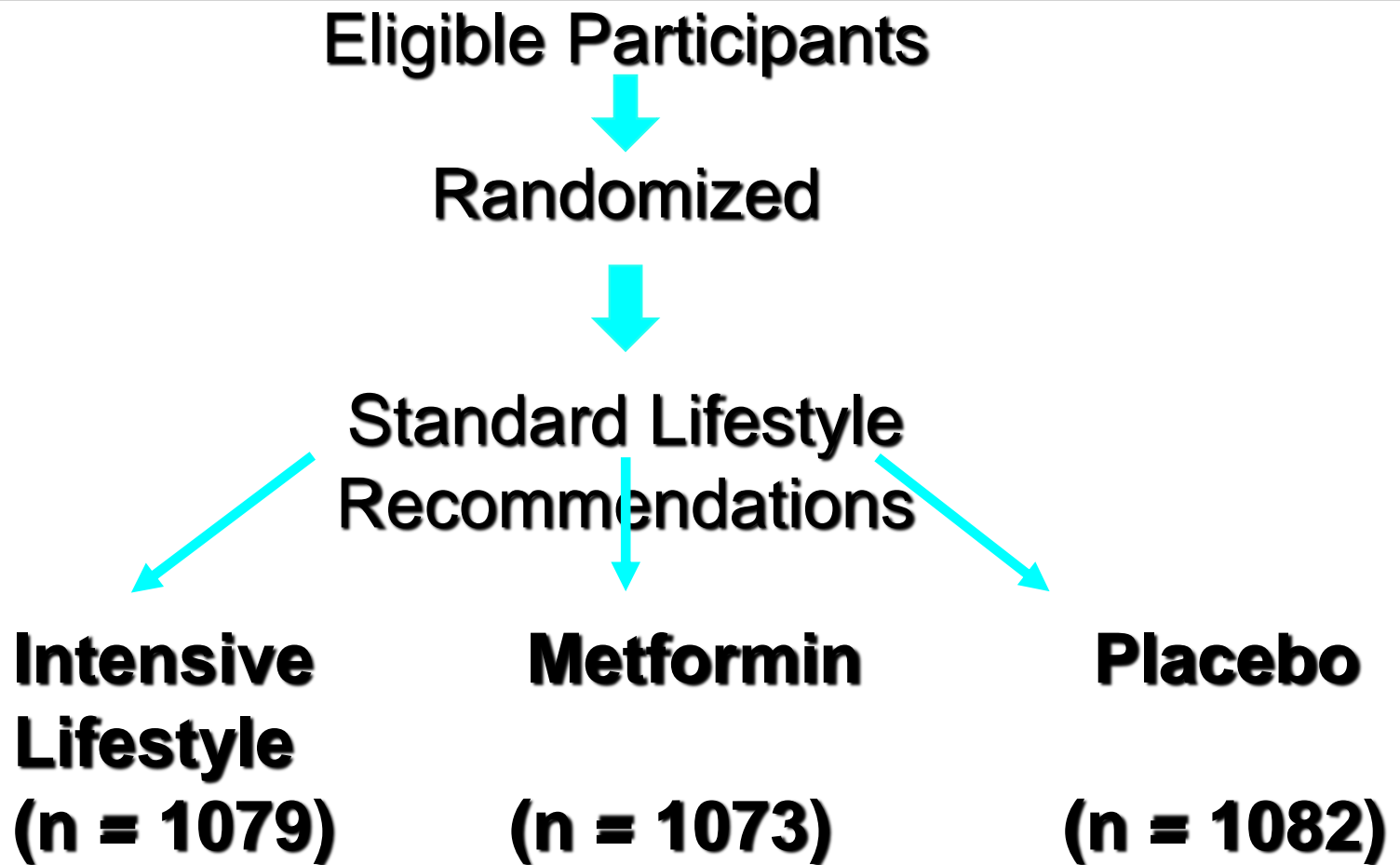
Gender Distribution



Age Distribution



# Study Interventions



# Incidence of Diabetes

— Placebo (n=1082)

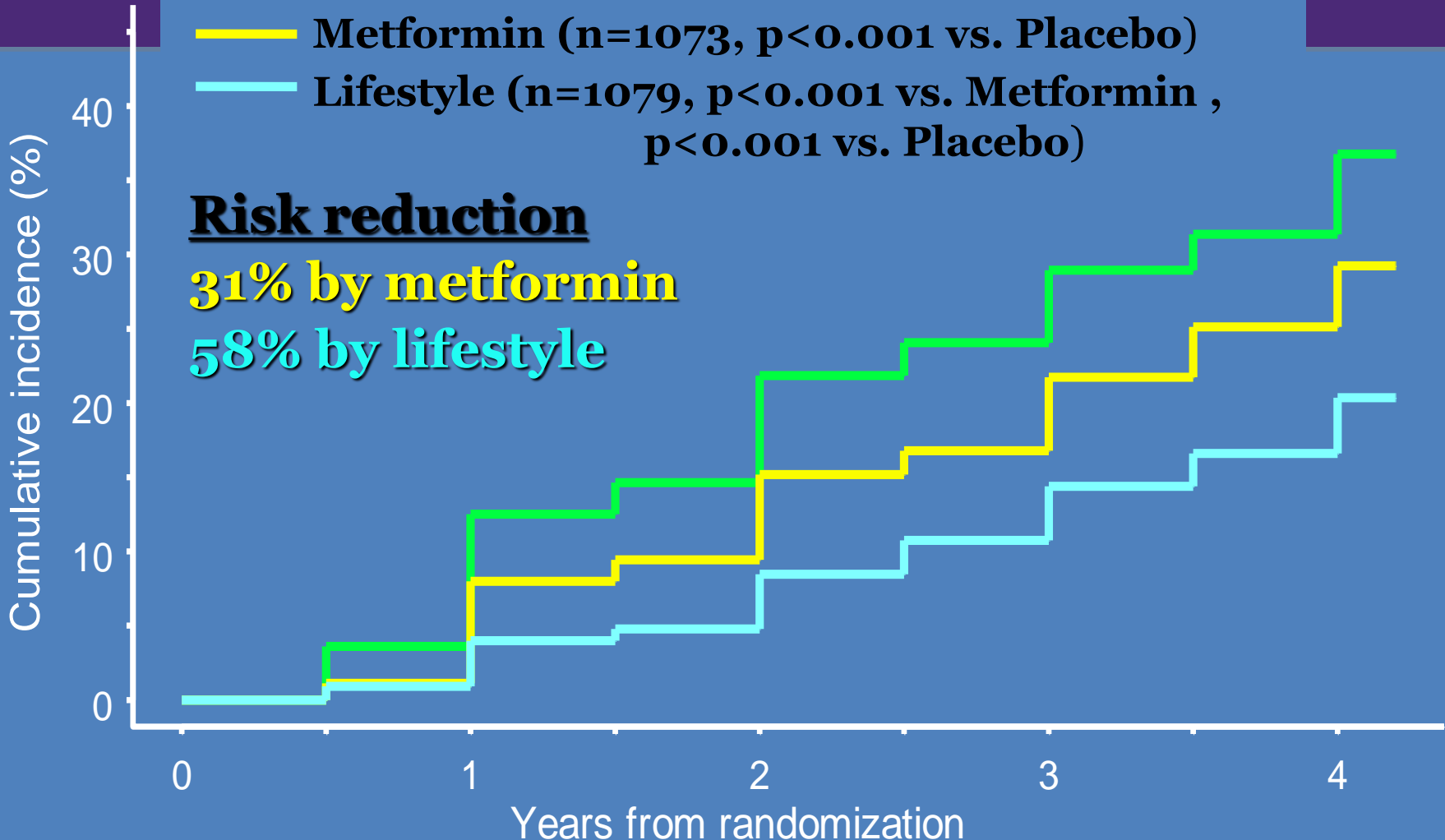
— Metformin (n=1073,  $p < 0.001$  vs. Placebo)

— Lifestyle (n=1079,  $p < 0.001$  vs. Metformin ,  
 $p < 0.001$  vs. Placebo)

## Risk reduction

**31% by metformin**

**58% by lifestyle**



# WHAT WE HAVE

- **Evidence that metabolic control works**
- **Evidence that prevention (lifestyle) works**
- **WHO Diabetes Guidelines**
- **IDF Clinical Practice Guidelines**
- **Global Epidemic of Type 2 Diabetes**

# WHAT WE NEED:

- **Global Community committed to comprehensive, integrated approach supported by policies & infrastructure**
- **Health care personnel trained in diabetes prevention & management**



# IDF World Diabetes Campaign



اليوم العالمي لمرض السكر  
نوفمبر 14



world diabetes day  
14 November



世界糖尿病日  
11月14日



세계 당뇨병의



día mundial de la diabetes  
14 noviembre



siku ya kisukari duniani  
tarehe 14 mwezi wa 11



Pasaules Diabēta Diena  
14. novembris



विश्व मधुमेह दिवस  
१४ नवंबर



روز جهانی دیابت  
14 آبان ماه