THE GLOBAL BURDEN OF DIABETES

World Health Organization

Geneva

Switzerland

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Definition, Diagnosis and Classification of Diabetes Mellitus and its Complications

Report of a WHO Consultation

Part 1: Diagnosis and Classification of Diabetes Mellitus

World Health Organization
Department of Noncommunicable Disease Surveillance
Geneva

Values for diagnosis of diabetes mellitus and other categories of hyperglycaemia (WHO, 1999)

	Venous plasma glucose concentration, mmol/l
Diabetes mellitus:	
Fasting ***or***	**>= 7.0 (126 mg/dl)**
2-h post 75g glucose load	**>= 11.1 (200 mg/dl)**
Impaired Glucose Tolerance (IGT):	
Fasting (if measured) ***and***	**< 7.0 (126 mg/dl)**
2-h post 75g glucose load	**>= 7.8 and < 11.1 (140 mg/dl and 200 mg/dl)**
Impaired Fasting Glycaemia (IFG):	
Fasting	
and (if measured)	**>= 6.1 and < 7.0 (110 mg/dl and 126 mg/dl)**
2-h post 75 glucose load	
	< 7.8 (140 mg/dl)

Differences in diagnostic criteria of glucose intolerance

American Diabetes Association 1997	World Health Organization 1999
Only fasting glucose	Retains OGTT
IFG replaces IGT	IFG & IGT are two distinct categories
Plasma glucose	Whole blood and plasma glucose

HOW MANY PERSONS WITH DIABETES ARE THERE?

- Number of people with diabetes in 2000:

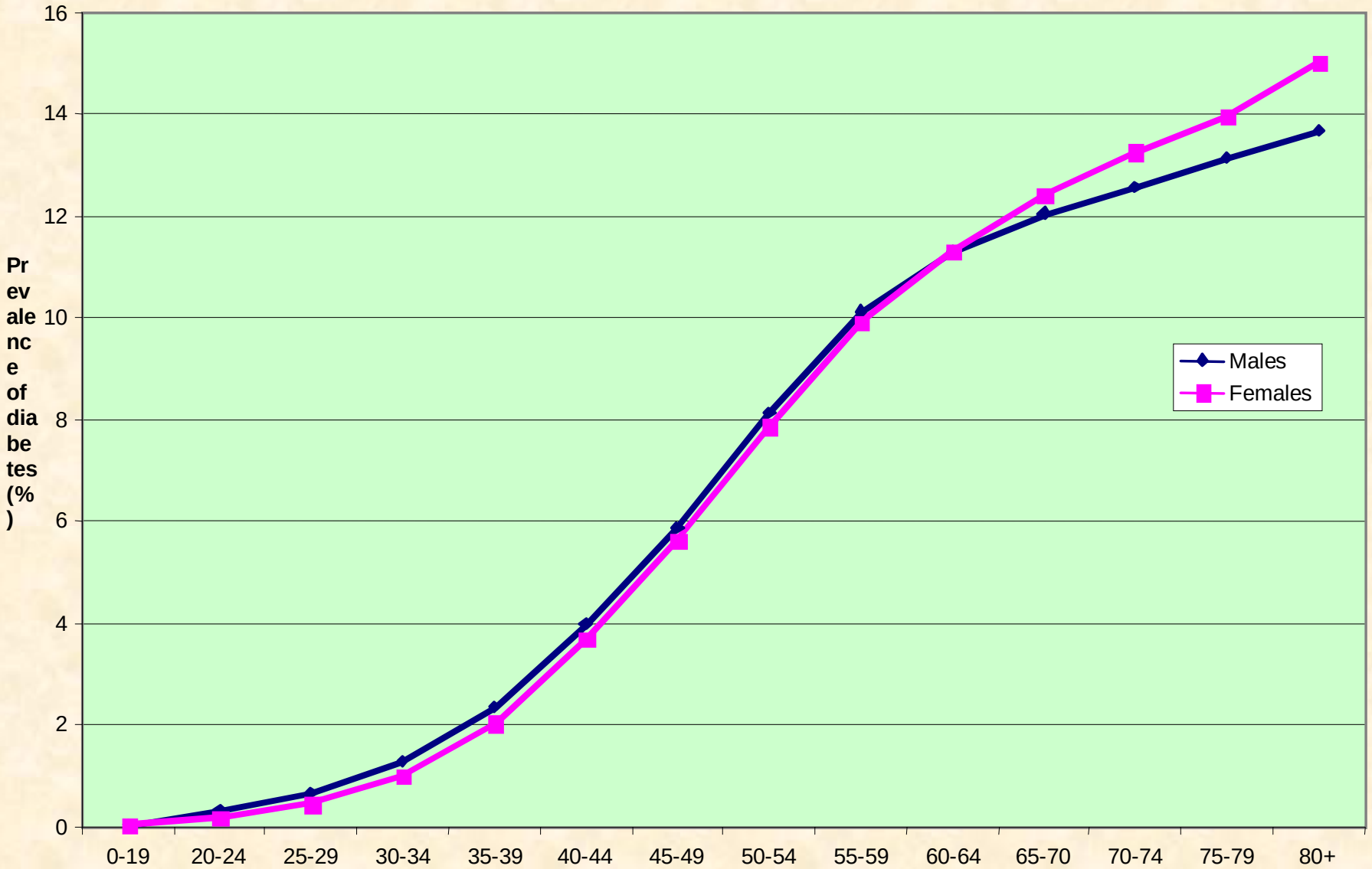
~171 million

- Two thirds of all persons with diabetes live in the developing world

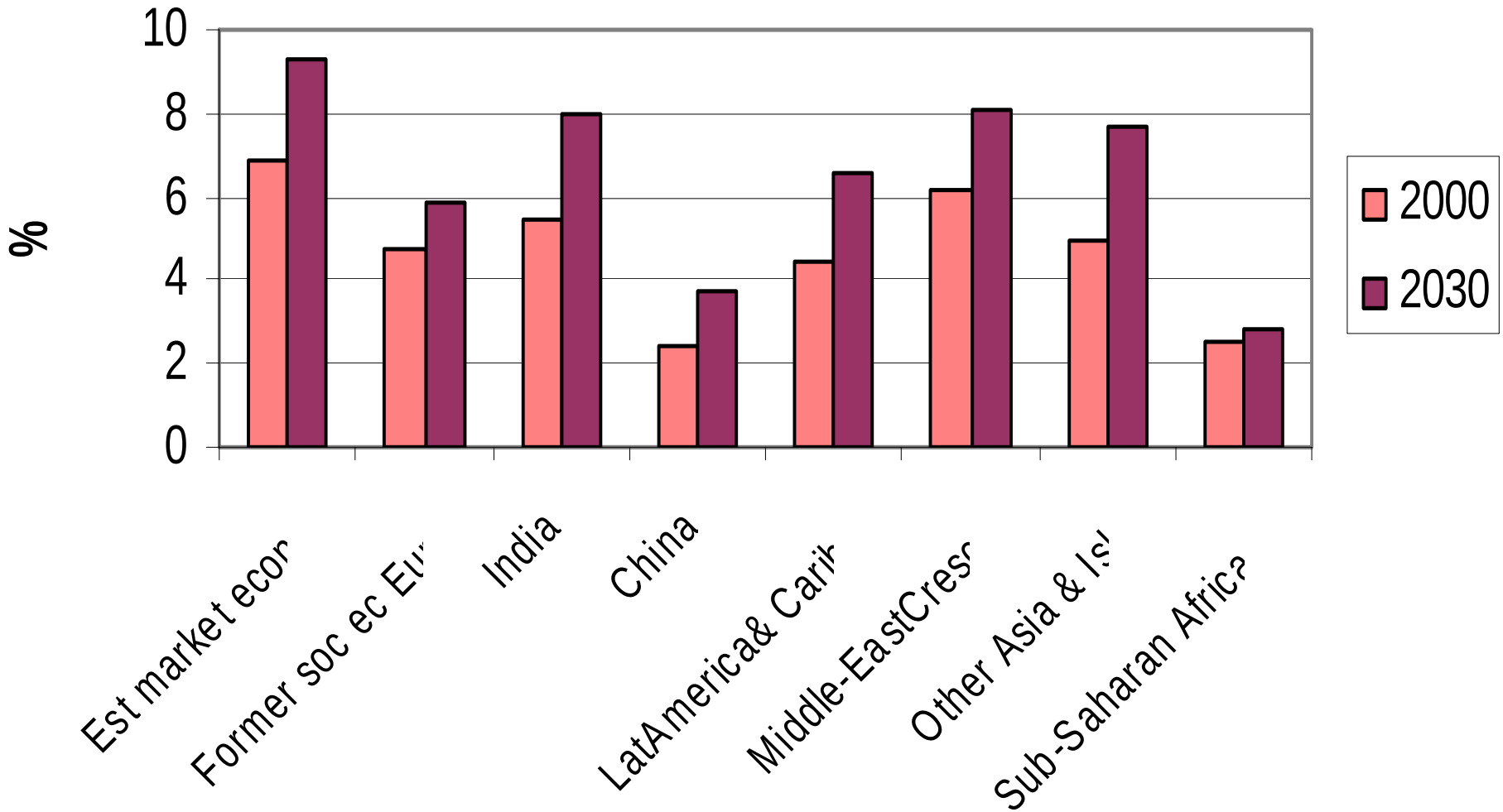
- In these countries, most of those who have diabetes are in economically active age groups.

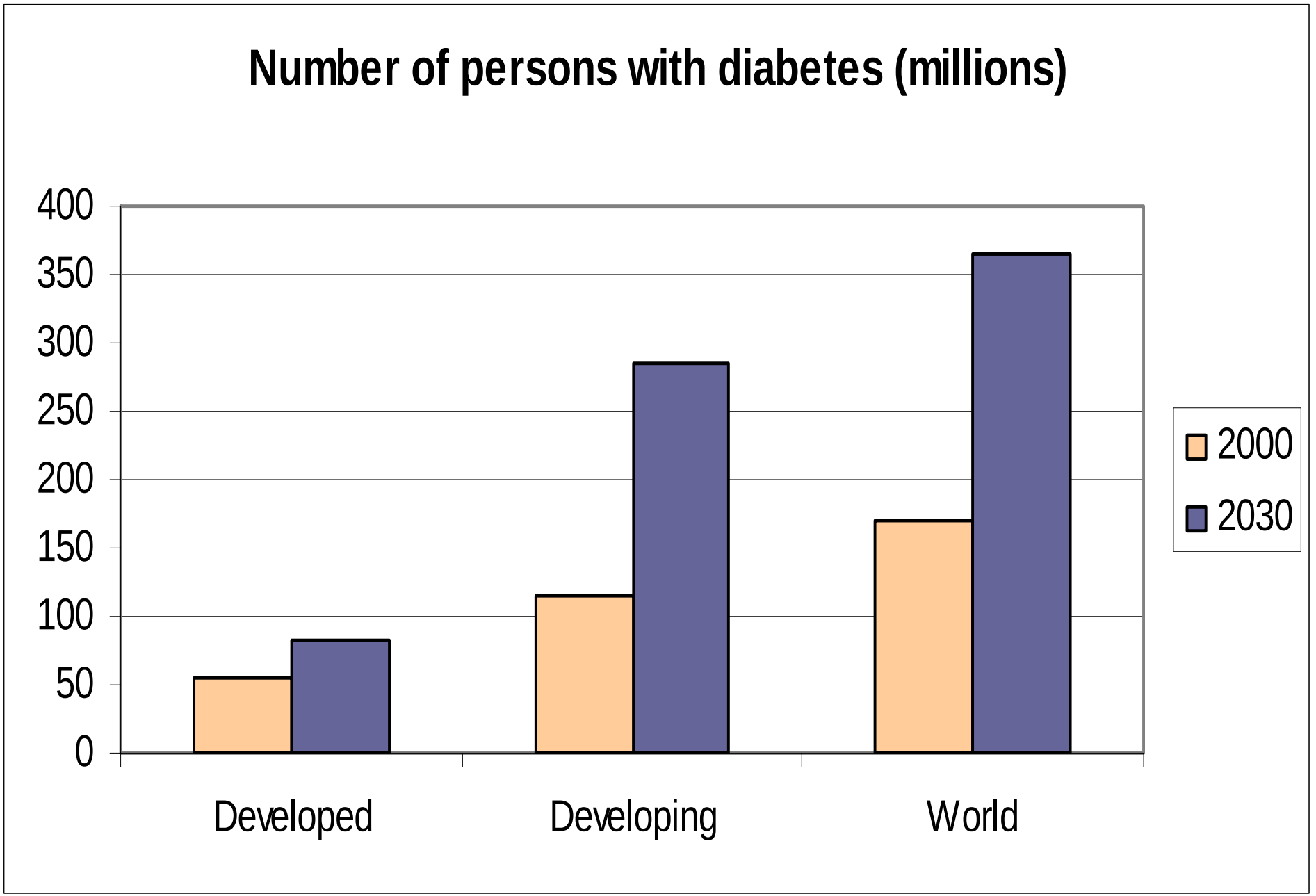
Source: Wild et al, 2004

Global diabetes prevalence by age and sex

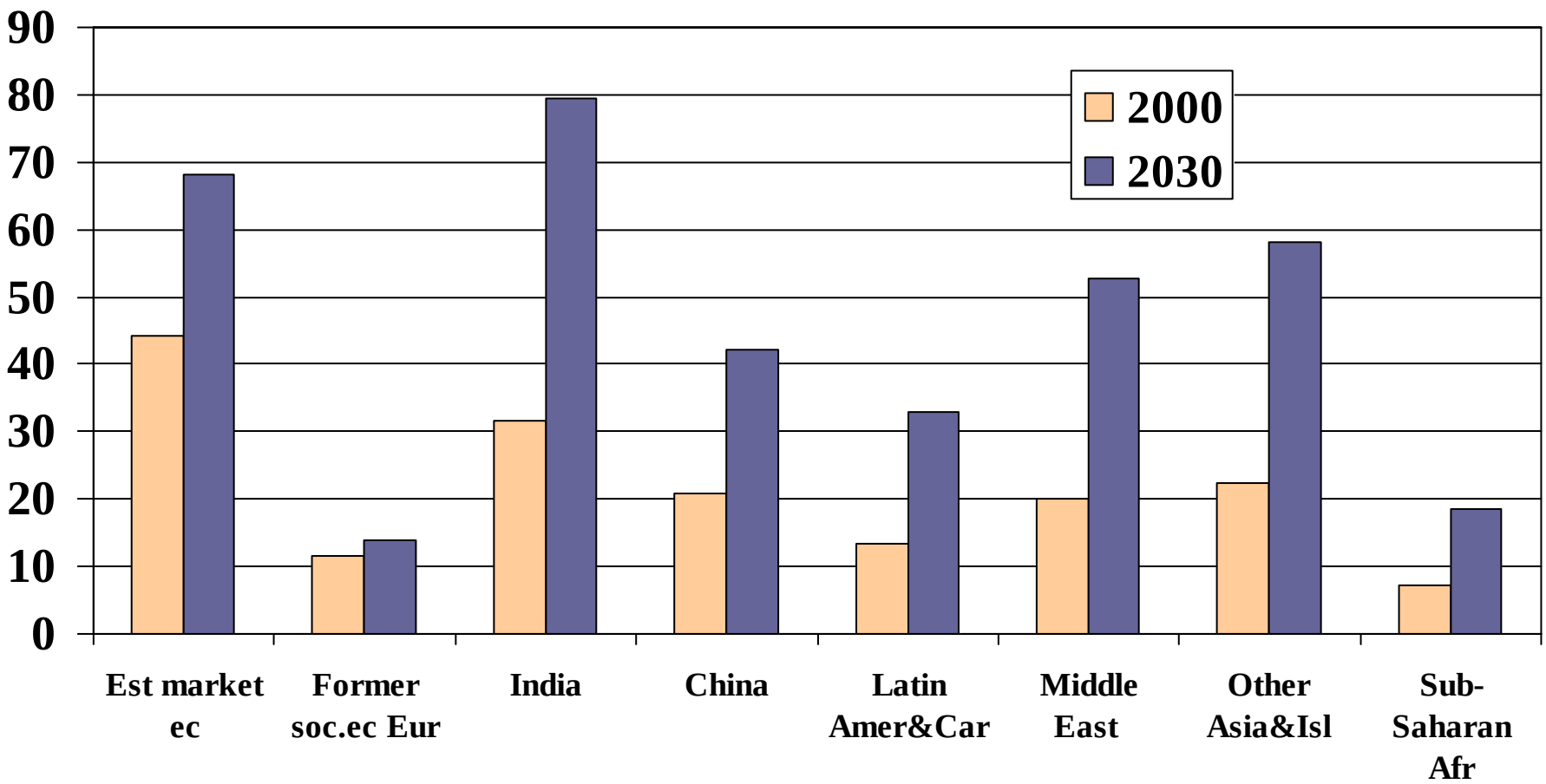


Prevalence of diabetes in adults 20+ (%)

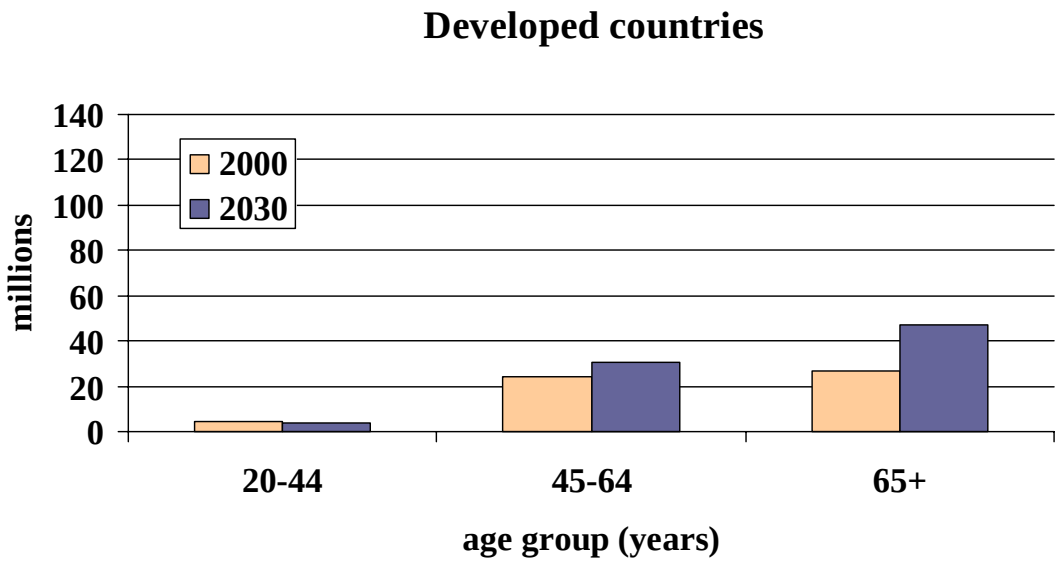


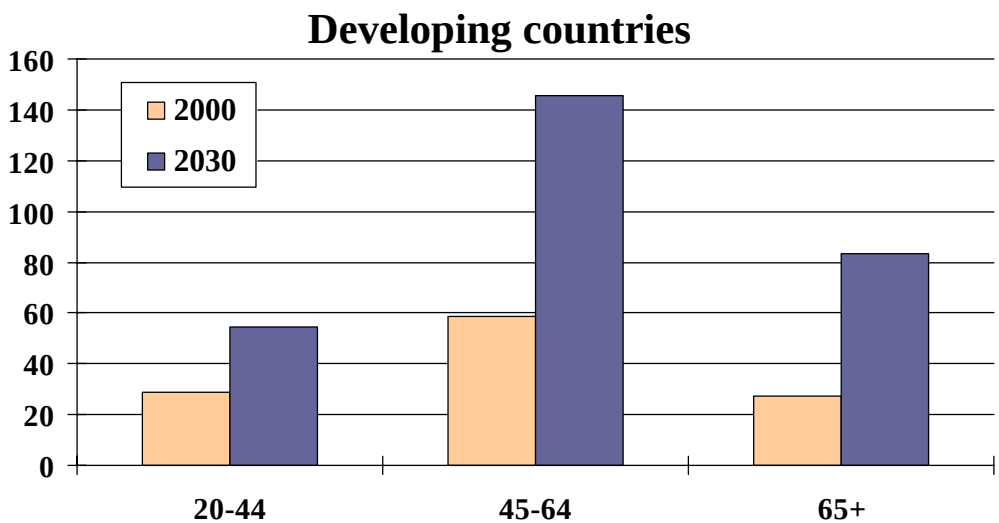

Number of persons with diabetes (millions)
400
350
300
250
200
150
100
50
0
Developed
Developing
World
2000
2030

Number of persons with diabetes (millions)

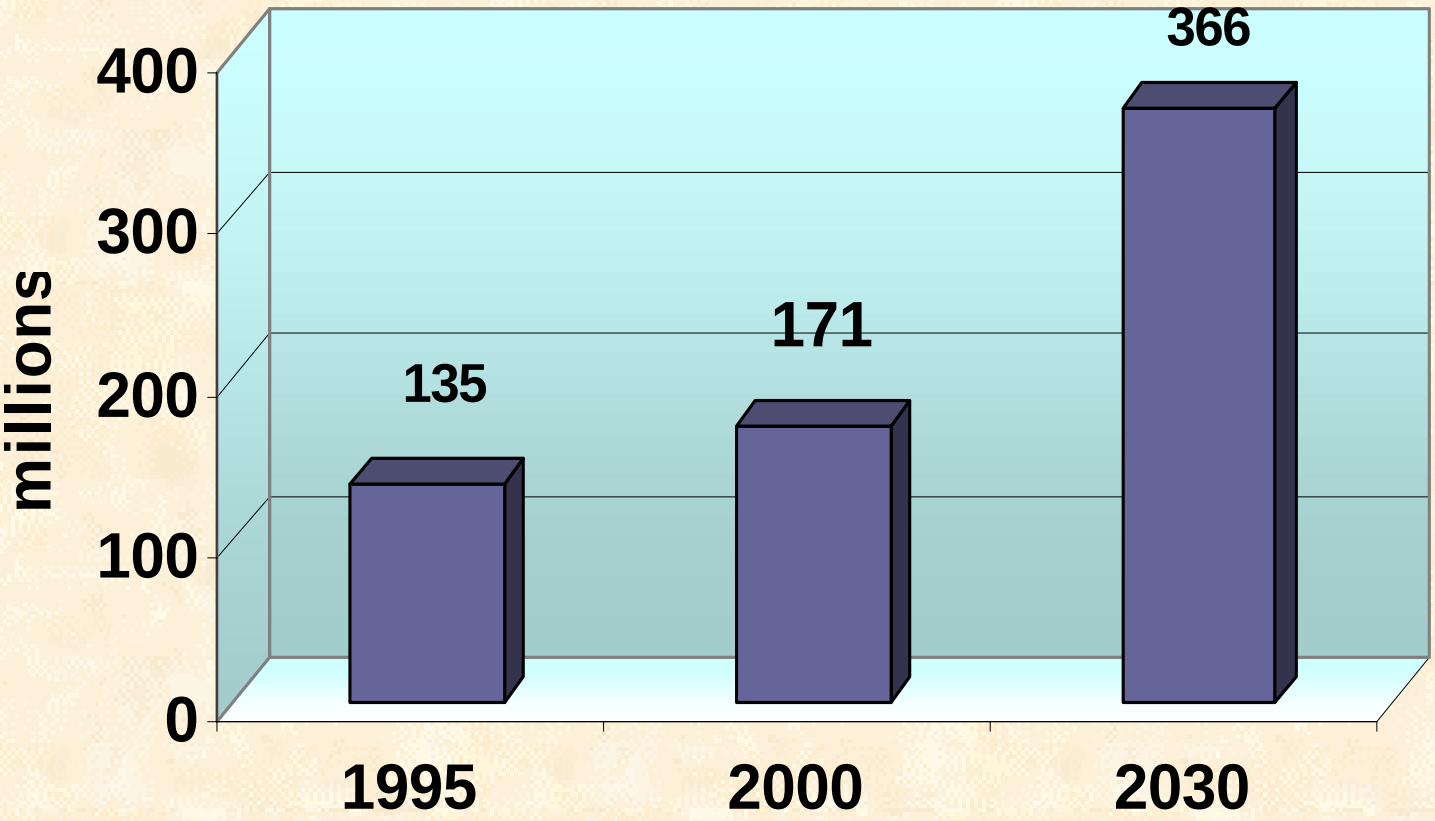


Number of persons with diabetes by age group, year and region





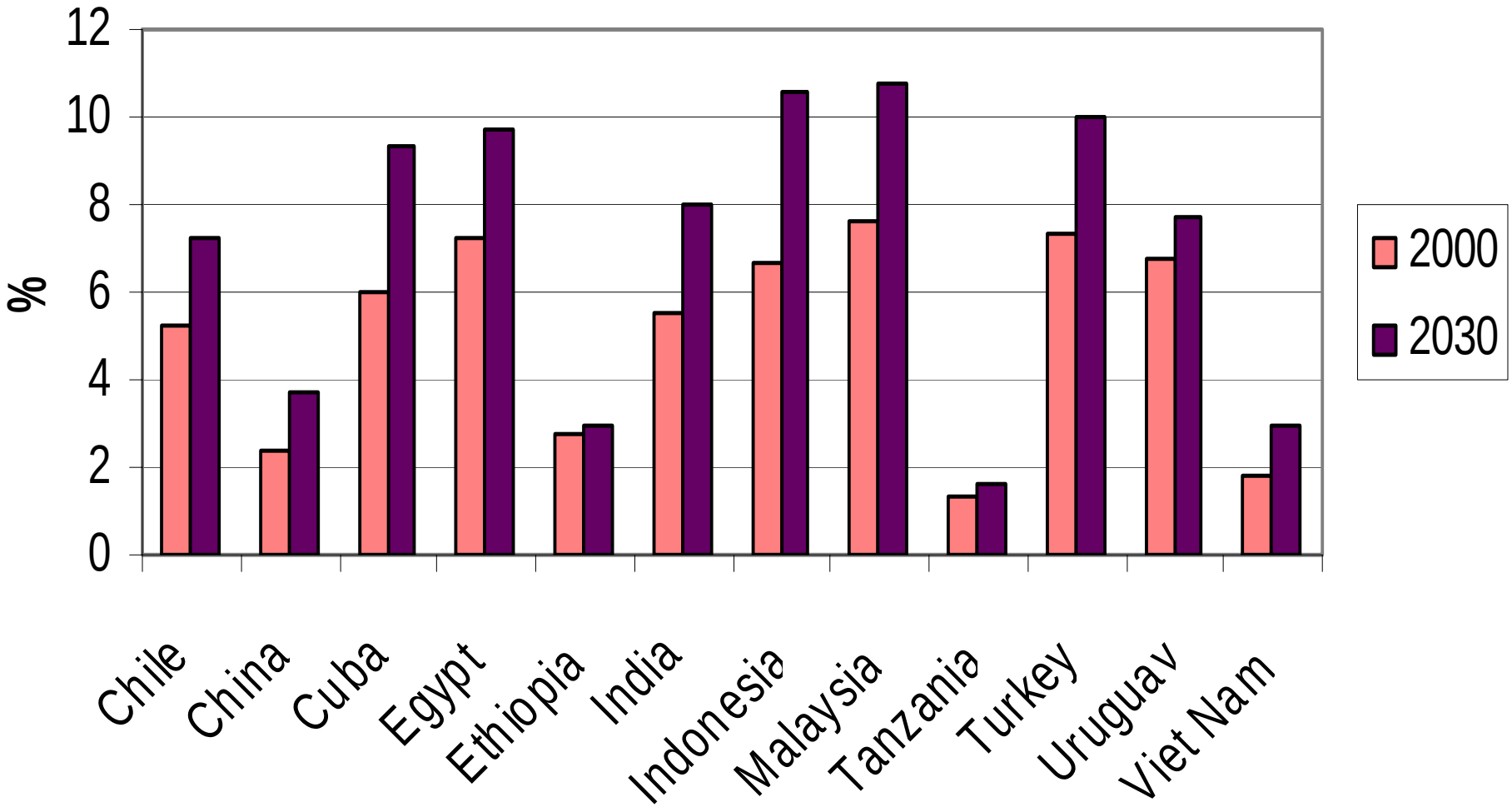
Increase in the number of persons with diabetes in the world, 1995-2030



Highest numbers of estimated cases of diabetes for 2000 and 2030

Ranking	2000		2030	
	Country	People with diabetes (millions)	Country	People with diabetes (millions)
1	India	31.7	India	79.4
2	China	20.8	China	42.3
3	United States of America	17.7	United States of America	30.3
4	Indonesia	8.4	Indonesia	21.3
5	Japan	6.8	Pakistan	13.9
6	Pakistan	5.2	Brazil	11.3
7	Russian Federation	4.6	Bangladesh	11.1
8	Brazil	4.6	Japan	8.9
9	Italy	4.3	Philippines	7.8
10	Bangladesh	3.2	Egypt	6.7

Prevalence of diabetes in adults 20+ (%)



Number of persons with diabetes (millions			
Country	Proxy	2000	2030
Chile	Brazil	0.5	1
China	own data	20.1	42.3
Cuba	Brazil	0.2	0.5
Egypt	Jordan	2.6	6.7
Ethiopia	Sudan	0.8	1.8
India	own data	31.7	79.4
Indonesia	Singapore	8.4	21.2
Malaysia	Singapore	0.9	2.5
Tanzania	own data	0.2	0.6
Turkey	own data	2.9	6.4

WHY THE INCREASE IN DIABETES PREVALENCE?

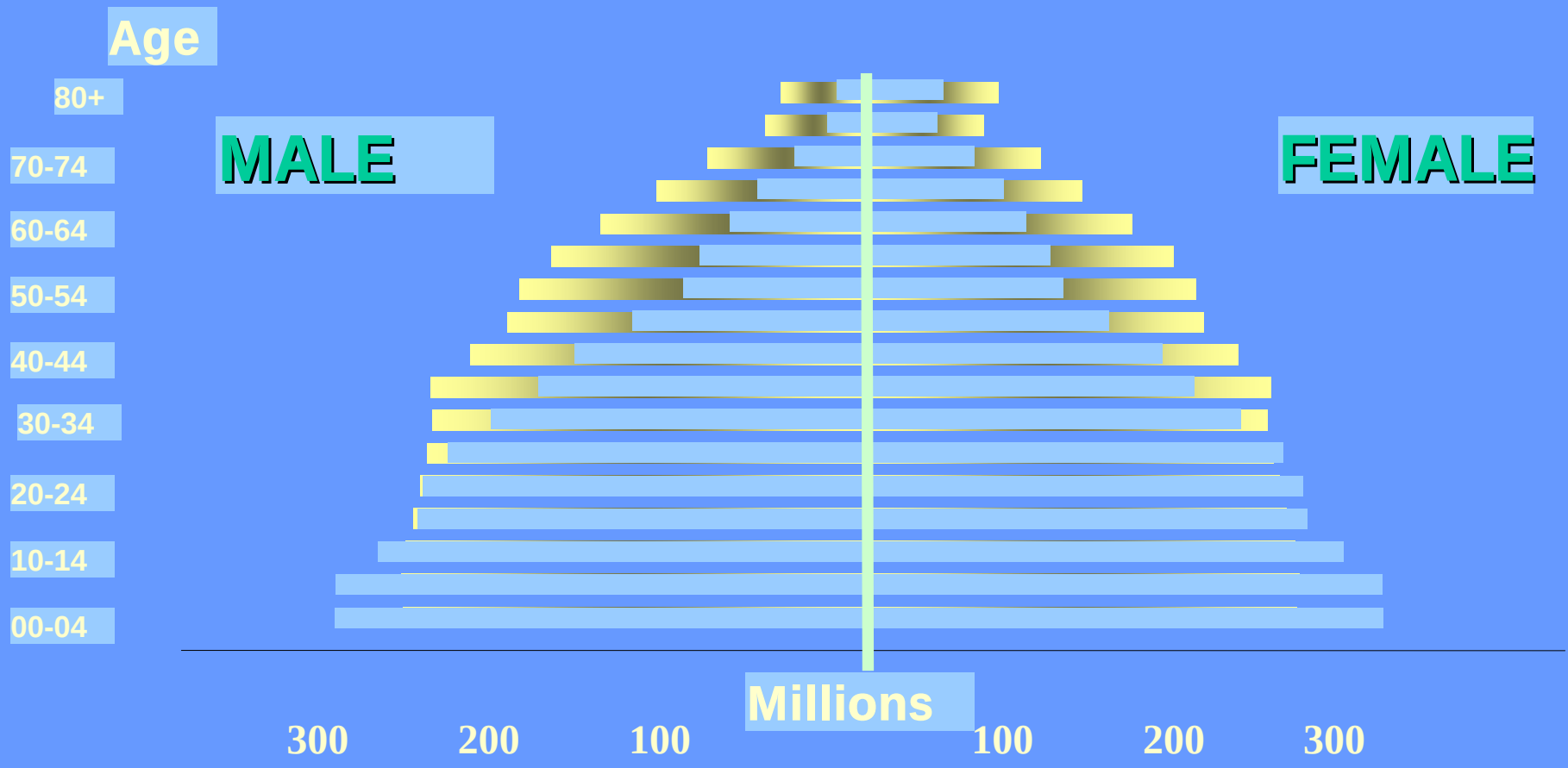
IMPROVED SURVIVAL OF PERSONS WITH DIABETES?

Støvring et al, Lancet 2003

THE WORLD IS GETTING OLD

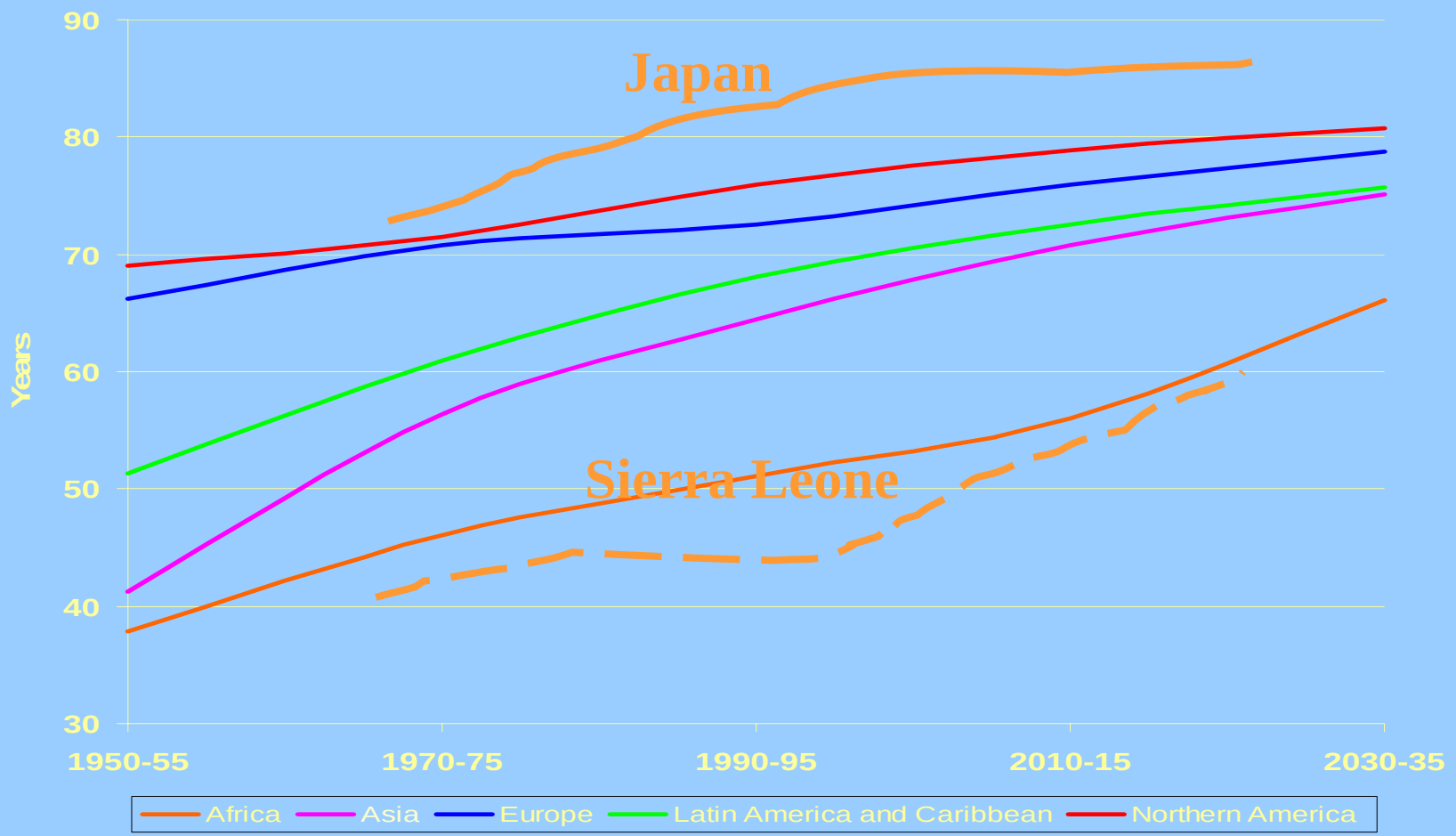
The world population is ageing

Population Pyramid in 1995 and 2025



UN Population Division, 1998 Revision

Life expectancy at birth is increasing in all regions



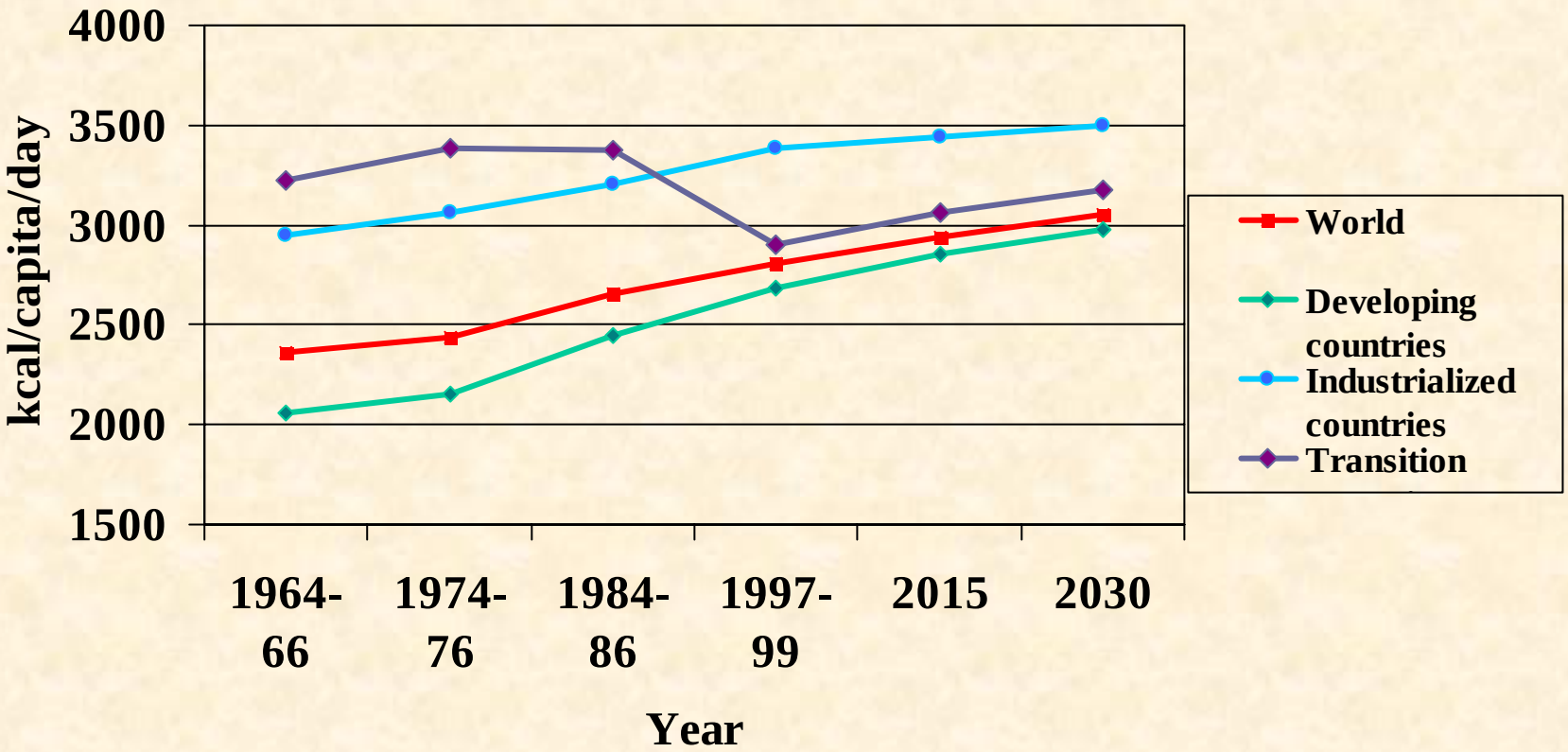
Source: UN Population Division, 1998 Revision

The population in developing countries is fast increasing - particularly the aged

Population (in billion)	2000	2025	2050
Total	6.0	7.8	8.9
More developed countries	1.2	1.2	1.2
Less developed countries	4.7	6.6	7.8
65+	0.4	0.8	1.5
More developed countries	0.2	0.3	0.3
Less developed countries	0.2	0.5	1.2

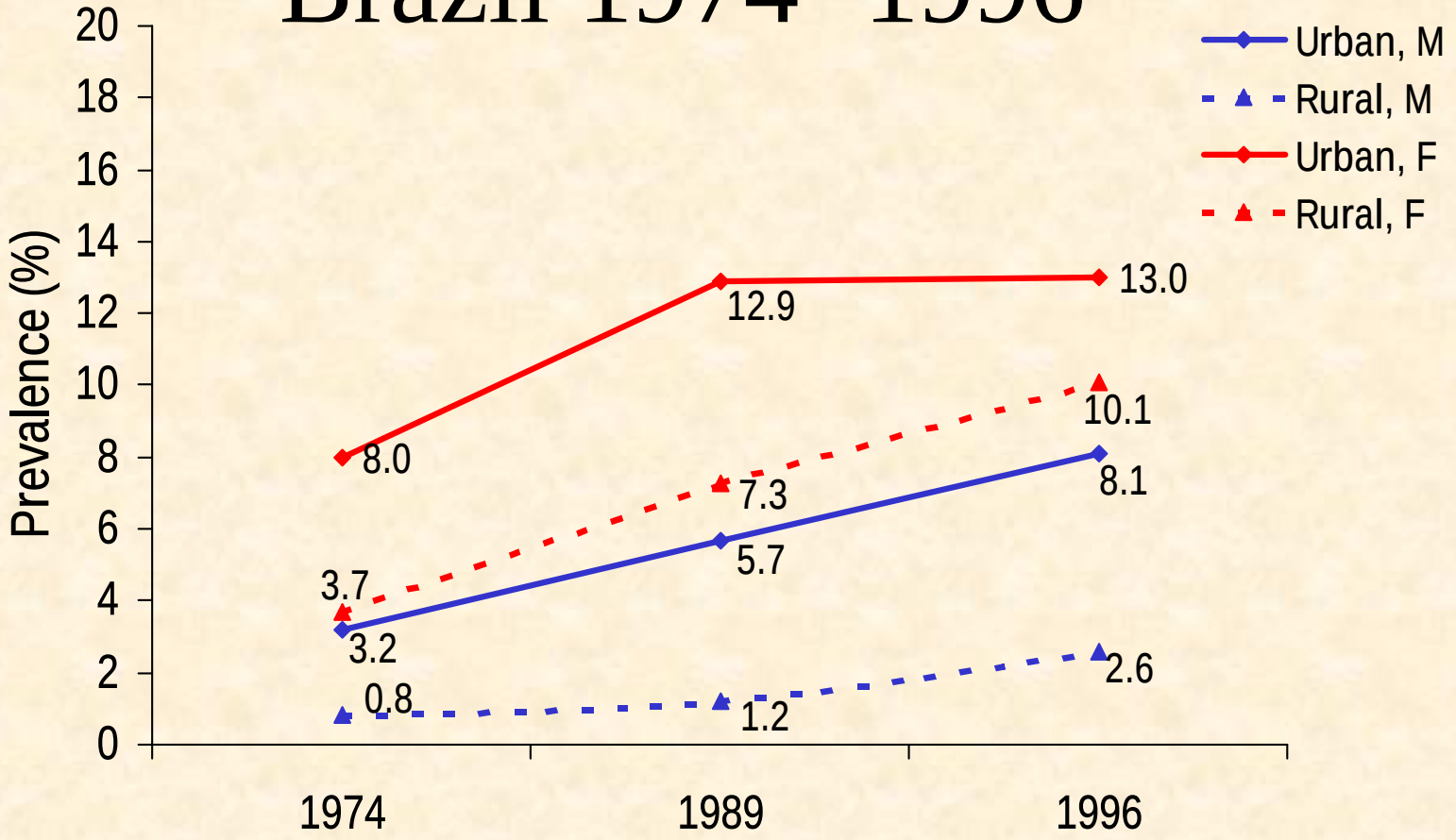
THE WORLD IS GETTING FAT

Per capita food consumption (kcal per capita per day)



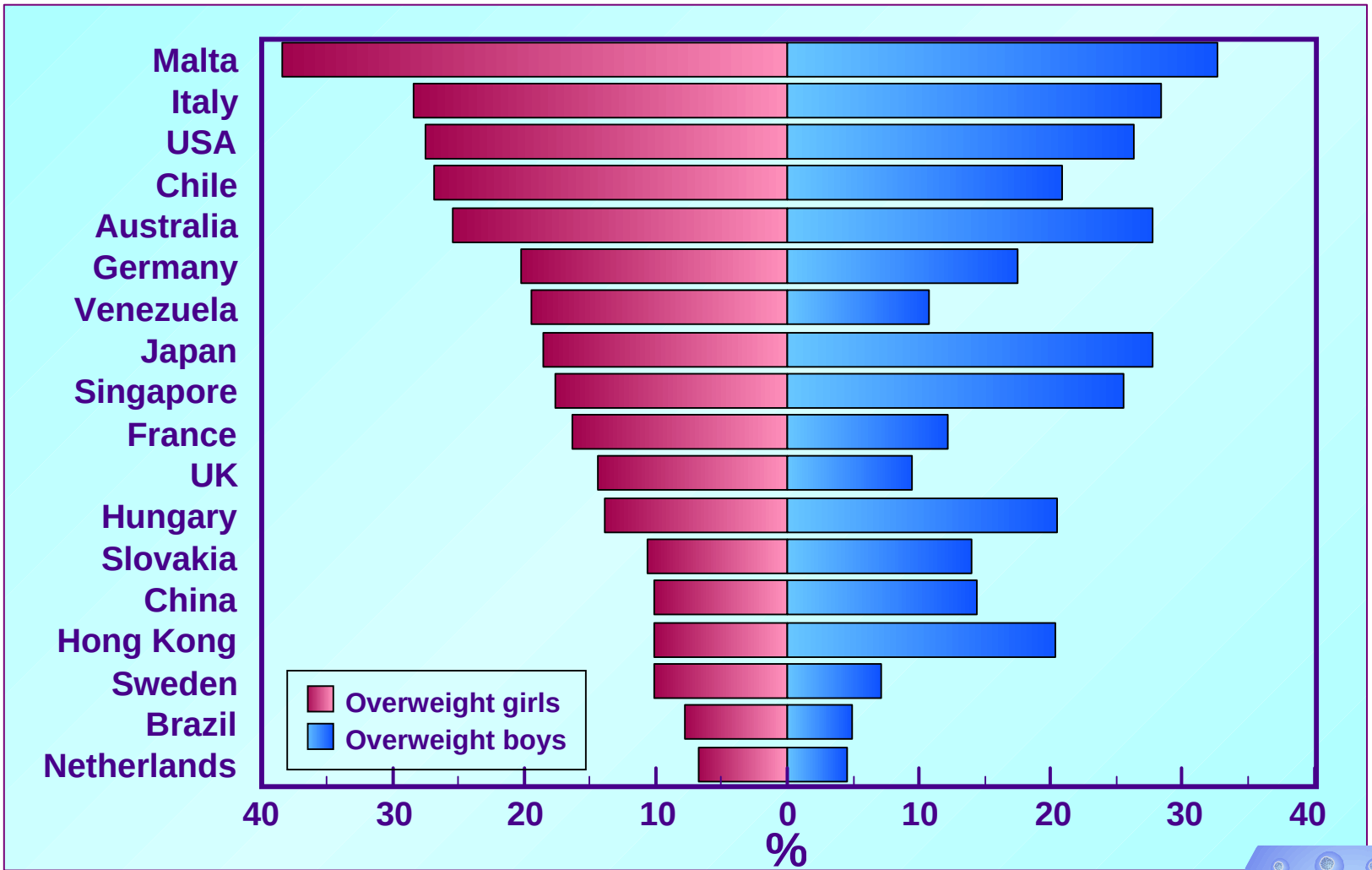
Adapted from "Diet, Nutrition and the prevention of Chronic Diseases", WHO TRS 916, Geneva 2003

Trends in Obesity (BMI>30) Brazil 1974 -1996

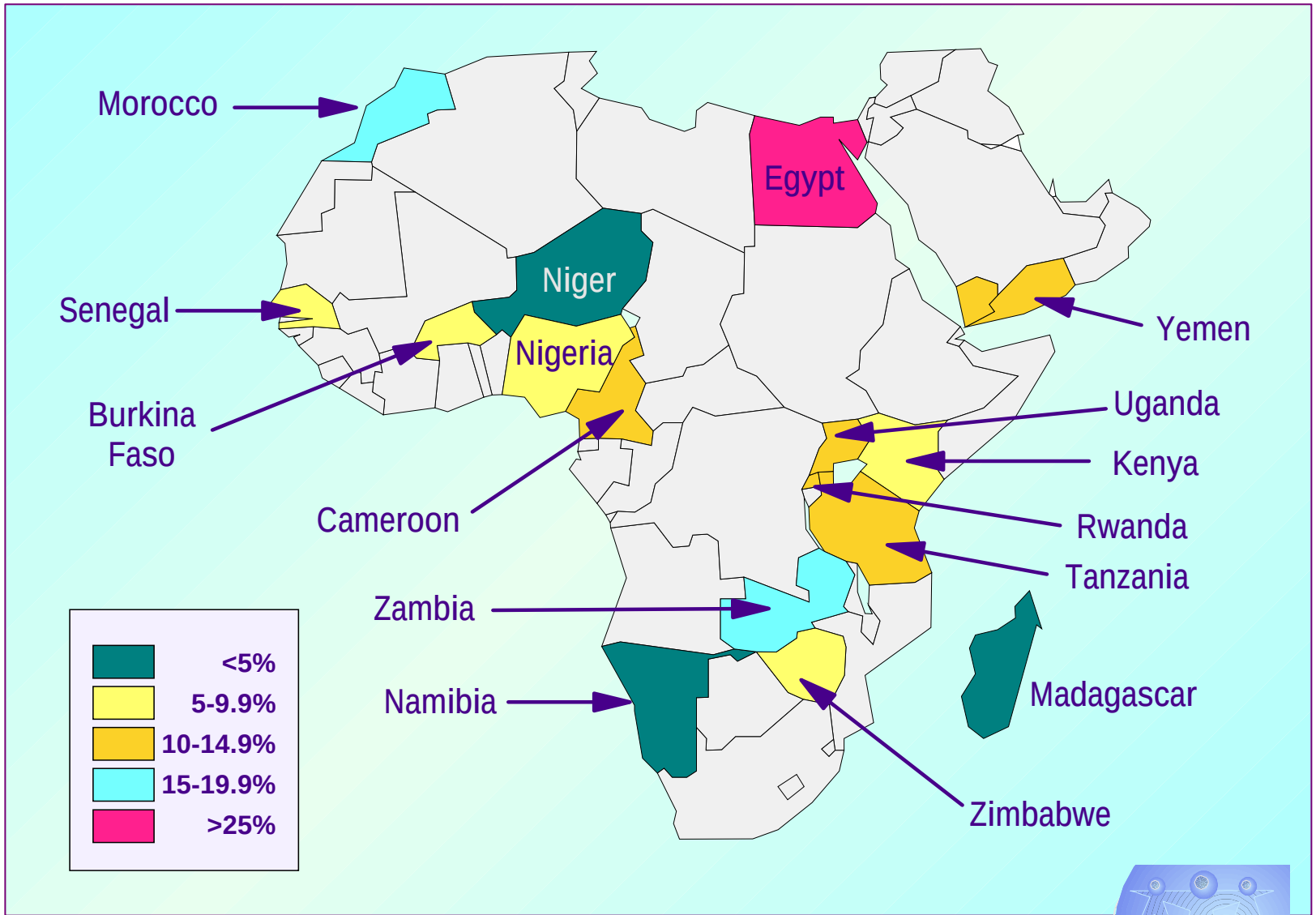


Source: WHO Global NCD Infobase

Prevalence of overweight and obesity in 10-year old girls and boys in selected countries.

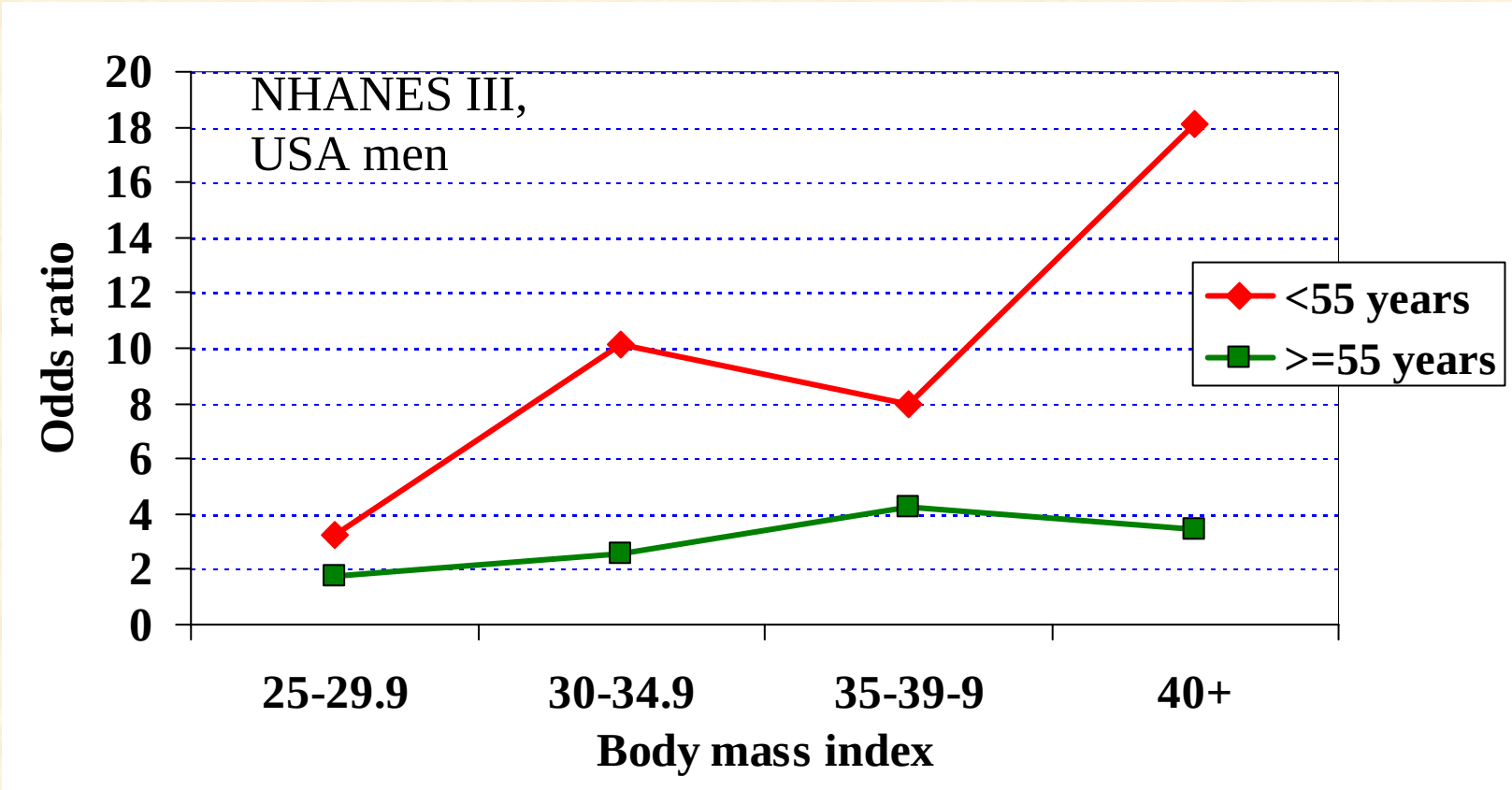


Africa & Middle East: 4 year olds

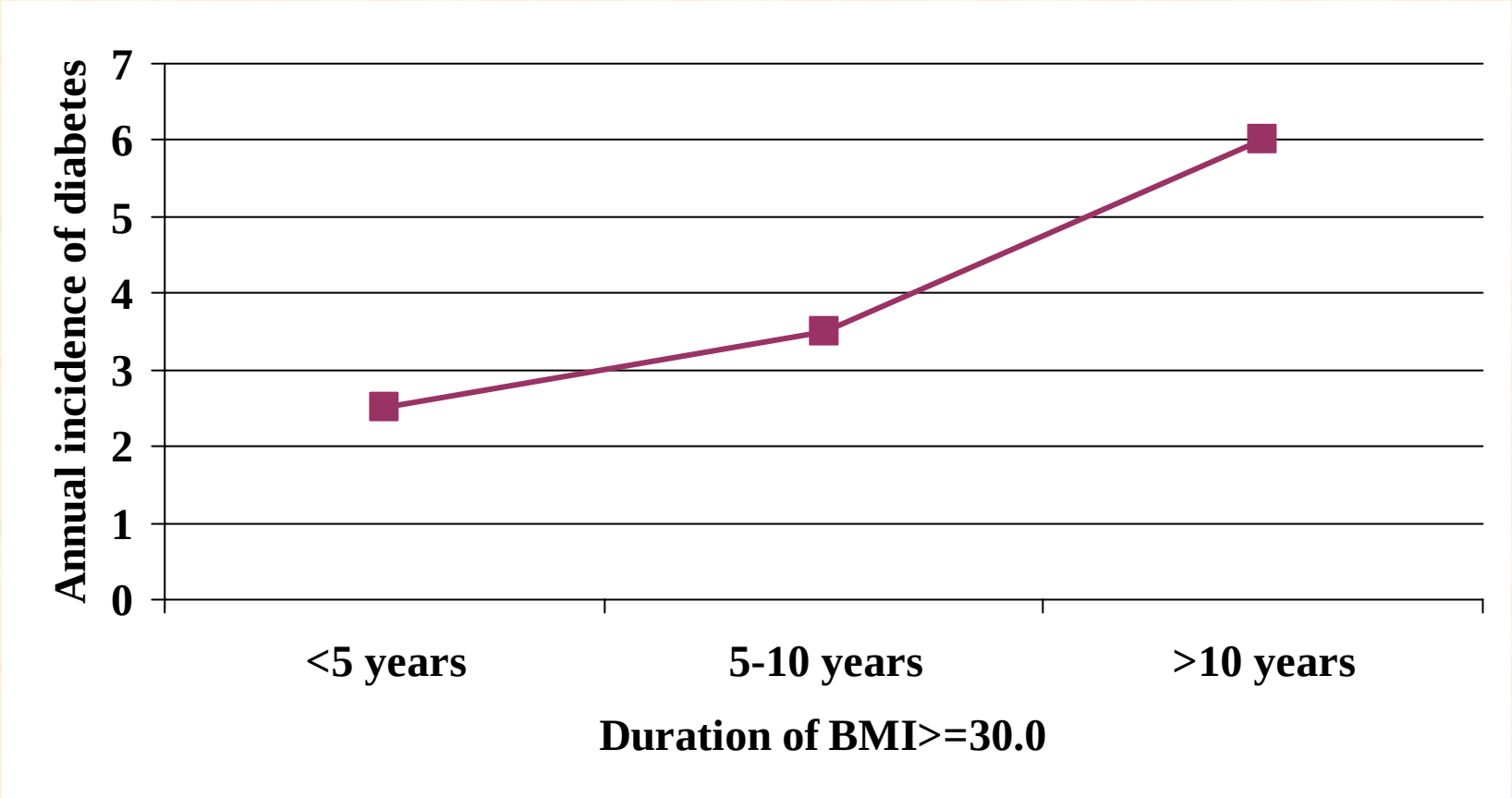


IOTF unpublished data

Odds ratios for diabetes with increasing weight (Must et al, 1999)

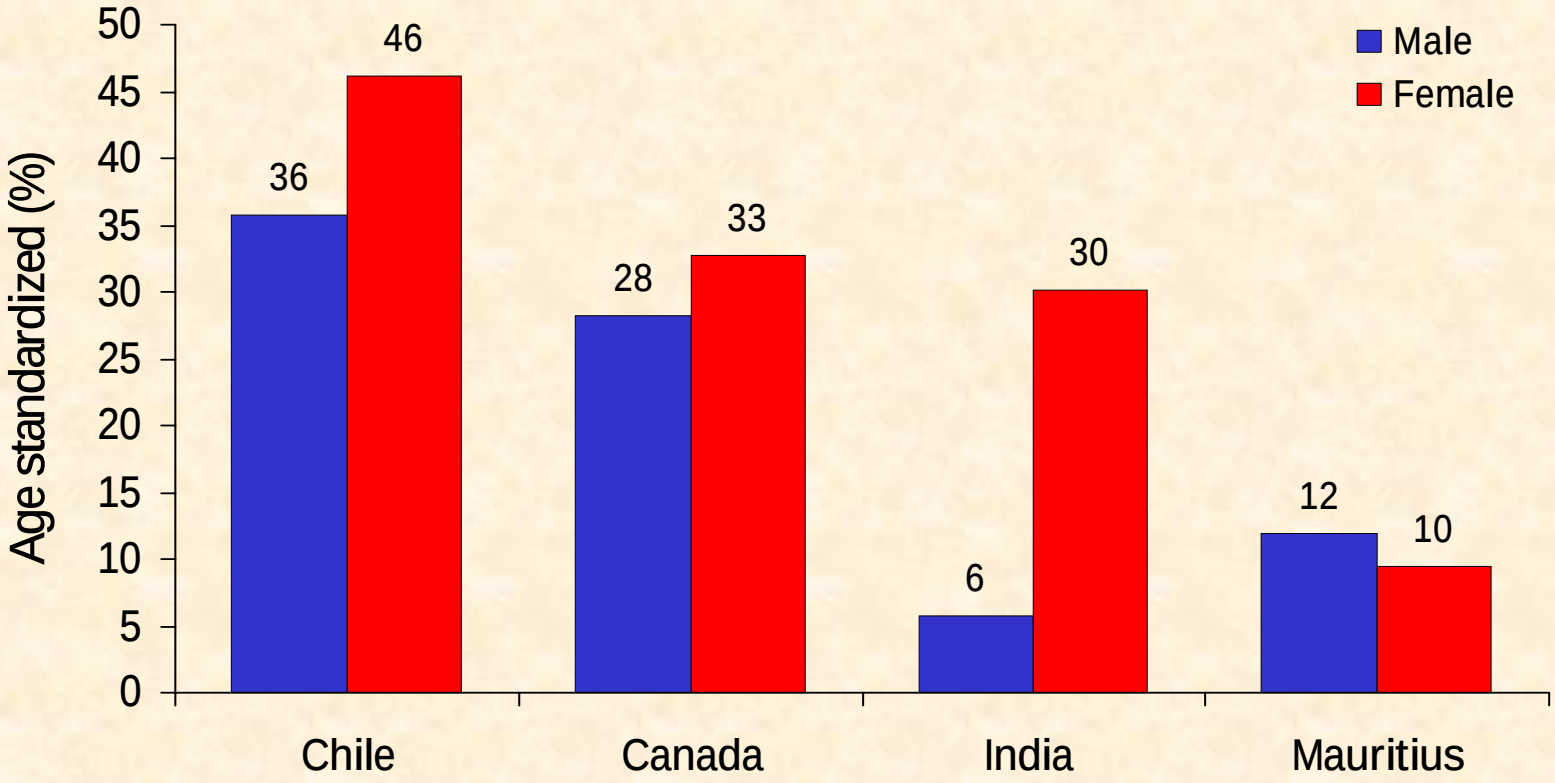


Duration of obesity and risk of Type 2 diabetes (Everhart al, 1992)



THE EARTH DOES NOT MOVE!

Physical inactivity in selected countries



Source: WHO Global NCD Infobase

Relative risk of Type 2 diabetes by different levels of occupational physical activity (from Hu et al, Diabetologia 2003)

Physical activity	Relative risk (95% CI)*
LIGHT	1.00 (reference category)
MODERATE	0.70 (0.52-0.96)
ACTIVE	0.74 (0.57-0.95)
P- value for trend	0.02

*** adjusted for age, sex, BMI, systolic BP, smoking, education, other physical activity (n= 6898 Men+7392 women, 35-64 years old)**

In the year 2000 there were 3.2 million deaths attributable to diabetes