

BURDEN OF DIABETES IN DEVELOPING COUNTRIES: THE CASE OF AFRICA

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Notes on the diseases met with in Uganda, Central Africa.

J Trop Med 1901;4:175-178



« ... diabetes is rather uncommon and very
fatal... »

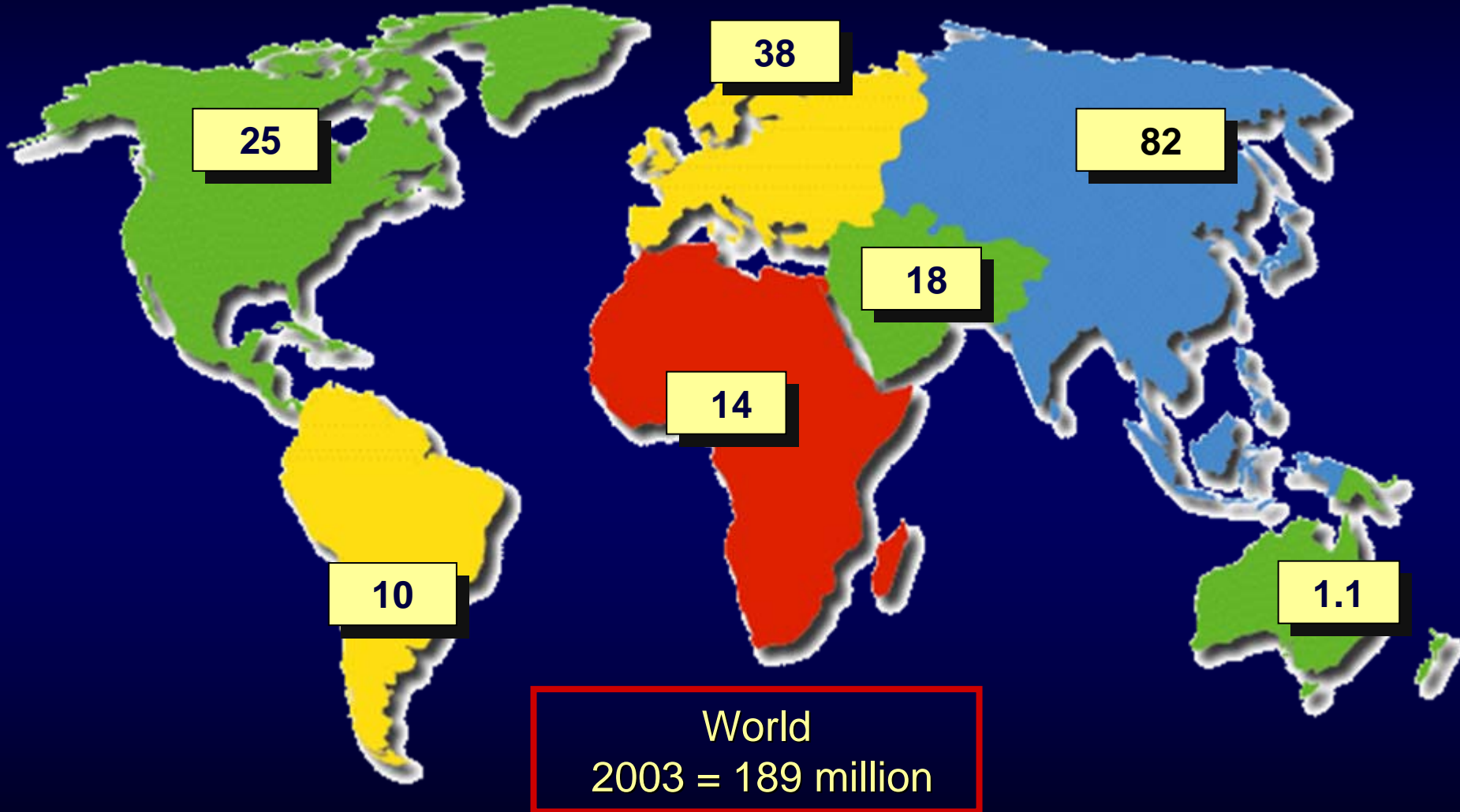


Dr. Albert Cook, 1901

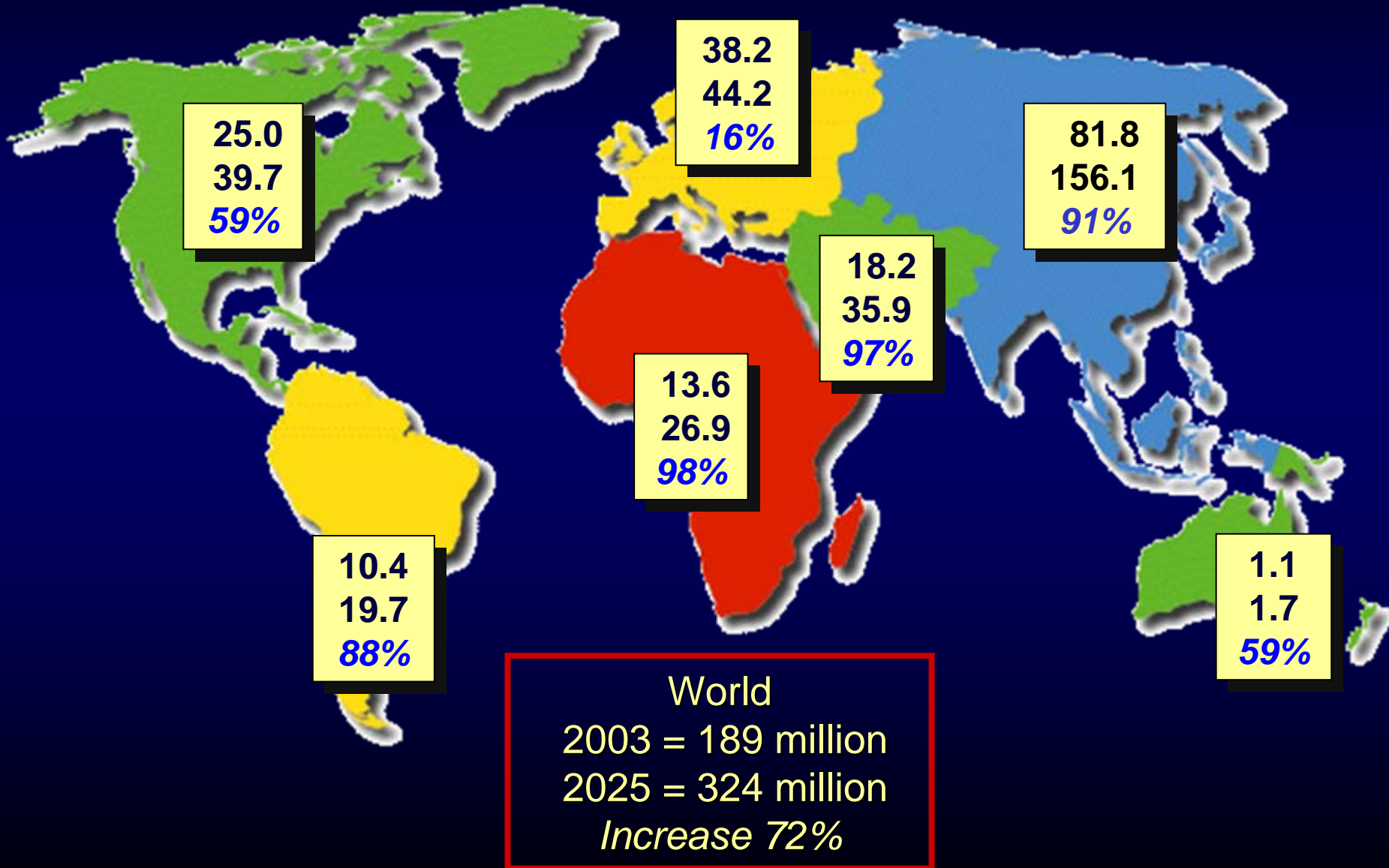
PREVALENCE OF TYPE 2 DIABETES

- Rural Sub Saharan Africa 0 – 1.1%
- Urban Sub Saharan Africa 2.2 – 5.7%
- Republic of South Africa 4.8 – 8.0%
- Maghrebian countries 6.3 – 9.3%
- Indian origin populations 8.6 – 13.3%
- Caribbean 11.0%
- Pop. of African descent in Europe and USA ~15%

GLOBAL PROJECTIONS FOR THE DIABETES EPIDEMIC: 2003 millions



GLOBAL PROJECTIONS FOR THE DIABETES EPIDEMIC: 2003-2025 (millions)



Age Structure of the Diabetic Population

Growth in the number of diabetic individuals worldwide will differ substantially by age group and region

Age Group

20-44 yrs

45-64 yrs

65+ yrs

Regions with substantial growth

SSA

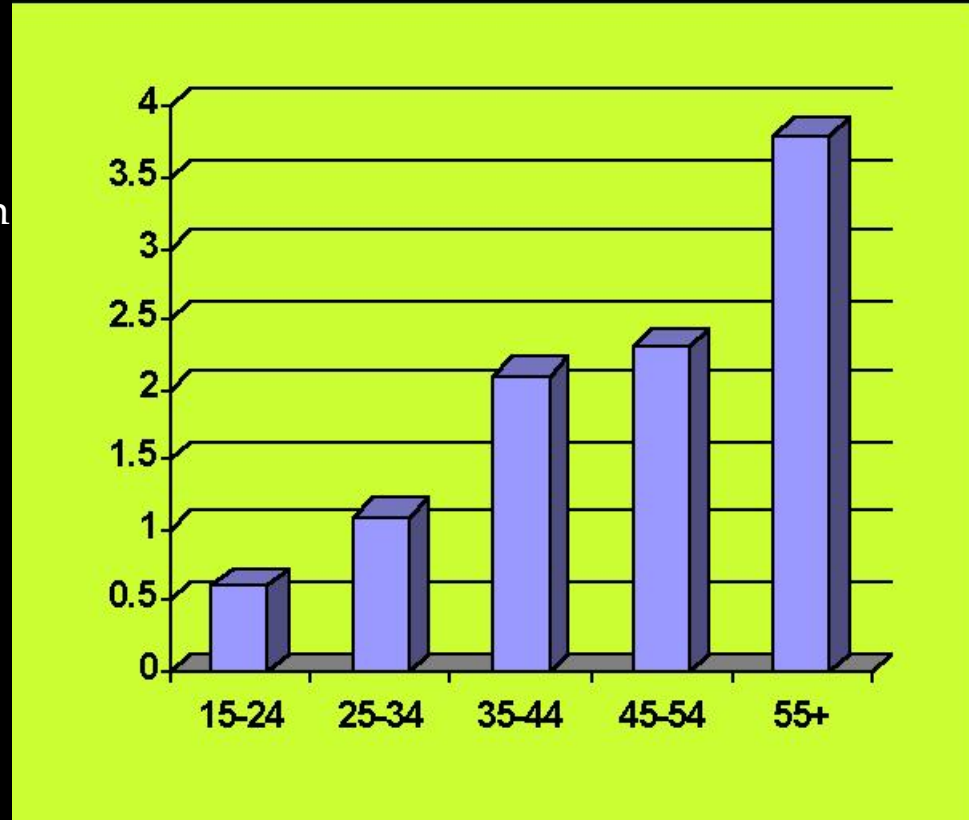
SSA, LAC, MEC, China, India, OAI

EME, FSE

RISK FACTORS

Age

The 1997-1998 Cameroon Study



Prevalence of diabetes by age group in a population of Cameroon

- **NON MODIFIABLE**

- Age
- Ethnicity/predisposition

- **MODIFIABLE**

- Obesity
- Urbanization
 - Physical inactivity
 - Change in dietary habits

RISK FACTORS

Prevalence / Ethnic Origin

- **NON MODIFIABLE**

- Age

- Predisposition

- **MODIFIABLE**

- Obesity

- Urbanization

- Physical inactivity

- Change in dietary habits

- South Africa

- Blacks 4.4-8.0%
(Erasmus 2001, Levitt 1993)

- Indians 13.0%
(Omar 1994)

- Tanzania

- Blacks 1.1 – 4.9%
(McLarty 1989, Aspray 2000)

- Indians 8.8 – 9.8%
(Swai 1990, Ramaiya 1991)

RISK FACTORS

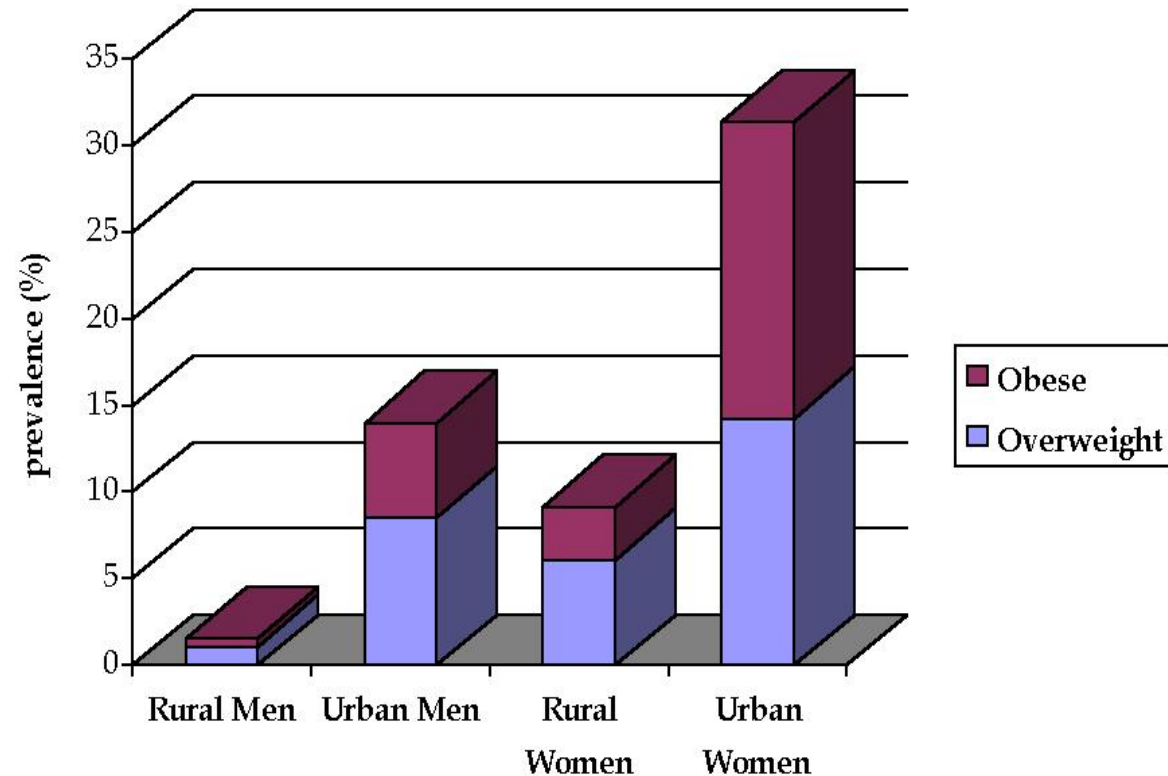
Obesity

- **NON MODIFIABLE**

- Age
- Predisposition

- **MODIFIABLE**

- Obesity
- Urbanization
 - Physical inactivity
 - Change in dietary habits



RISK FACTORS

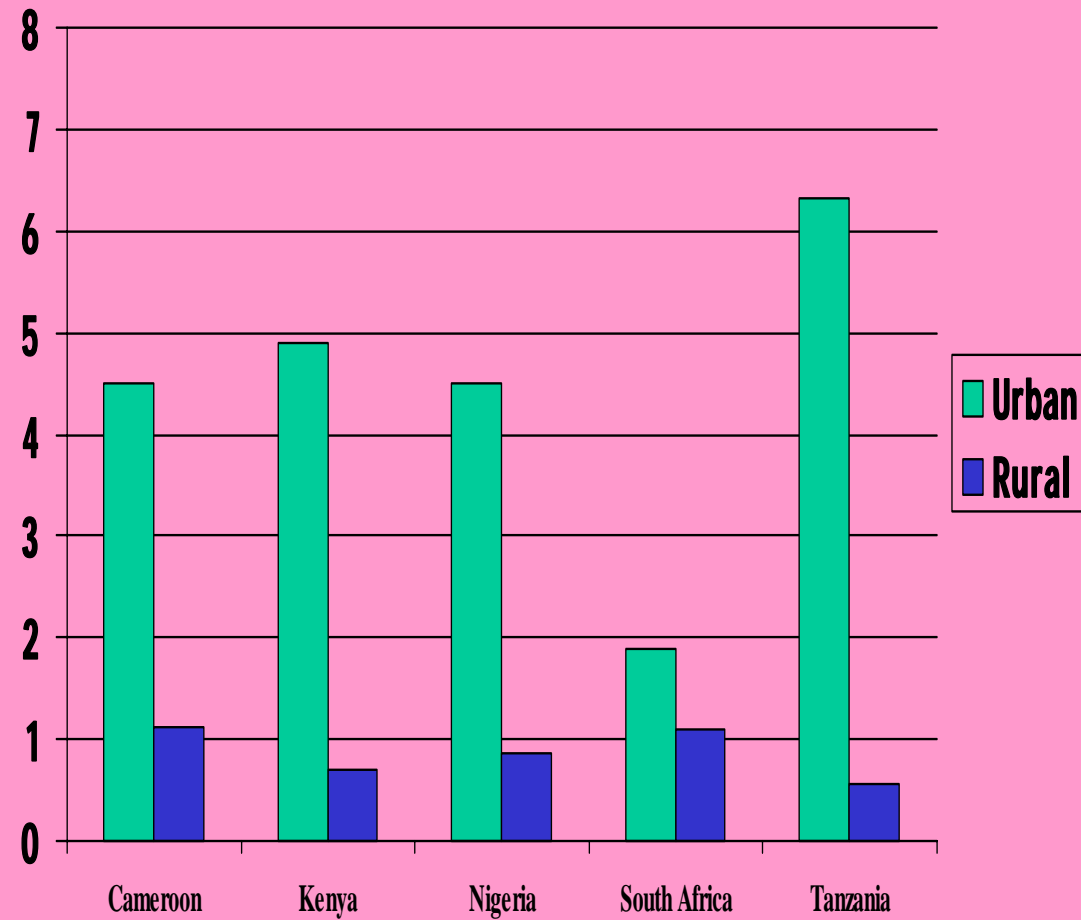
Average percentage annual increase in urban and rural populations, 1995-2000

- **NON MODIFIABLE**

- Age
- Predisposition

- **MODIFIABLE**

- Obesity
- Urbanization
- Physical Inactivity
- Change in dietary habits



RISK FACTORS

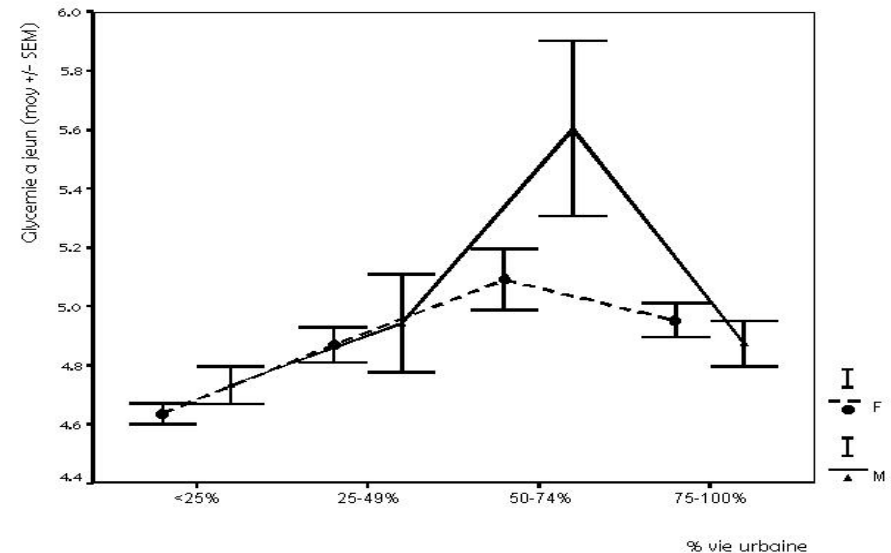
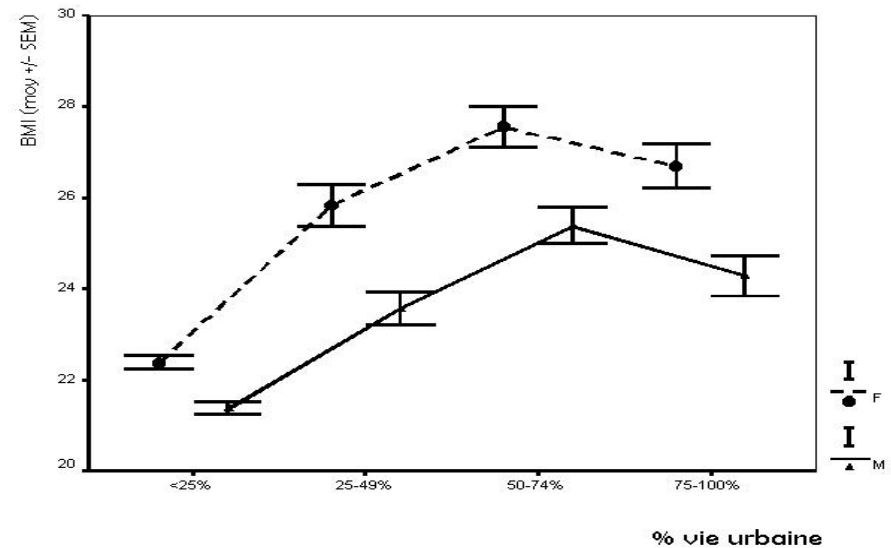
Lifetime exposure to urban environment (Mbanya et al 2003)

- **NON MODIFIABLE**

- Age
- Predisposition

- **MODIFIABLE**

- Obesity
- Urbanization
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- Change in dietary habits



RISK FACTORS

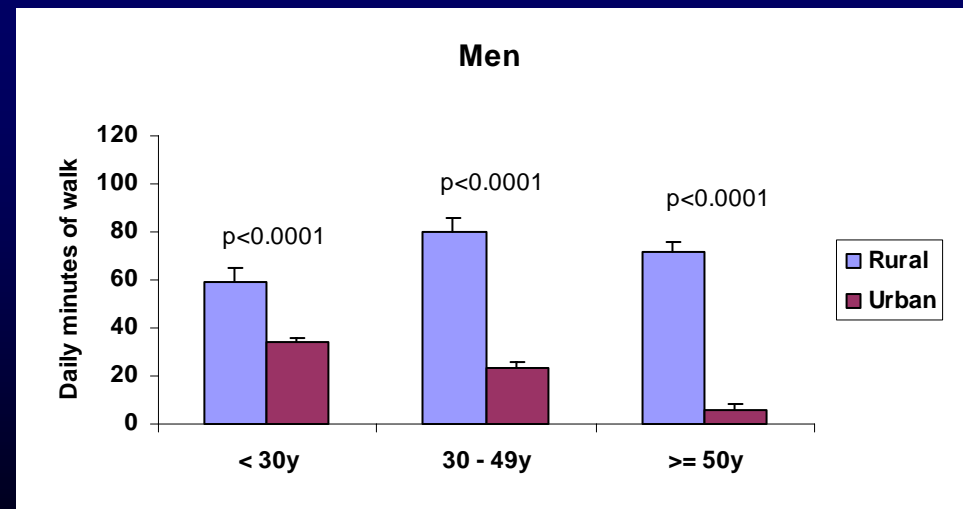
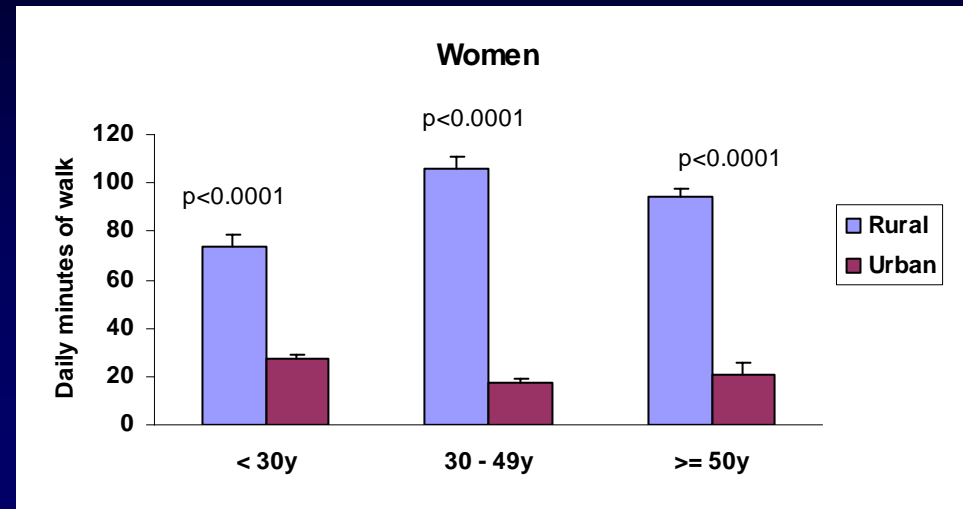
Physical Inactivity

- **NON MODIFIABLE**

- Age
- Predisposition

- **MODIFIABLE**

- Obesity
- Urbanization
- **Physical Inactivity**
- Change in dietary habits



Daily walking time in a sample of 2465 urban and rural Cameroonians (*Sobngwi E, et al Int J Obes 2002*)

RISK FACTORS

Dietary Habits

- **NON MODIFIABLE**

- Age
- Predisposition

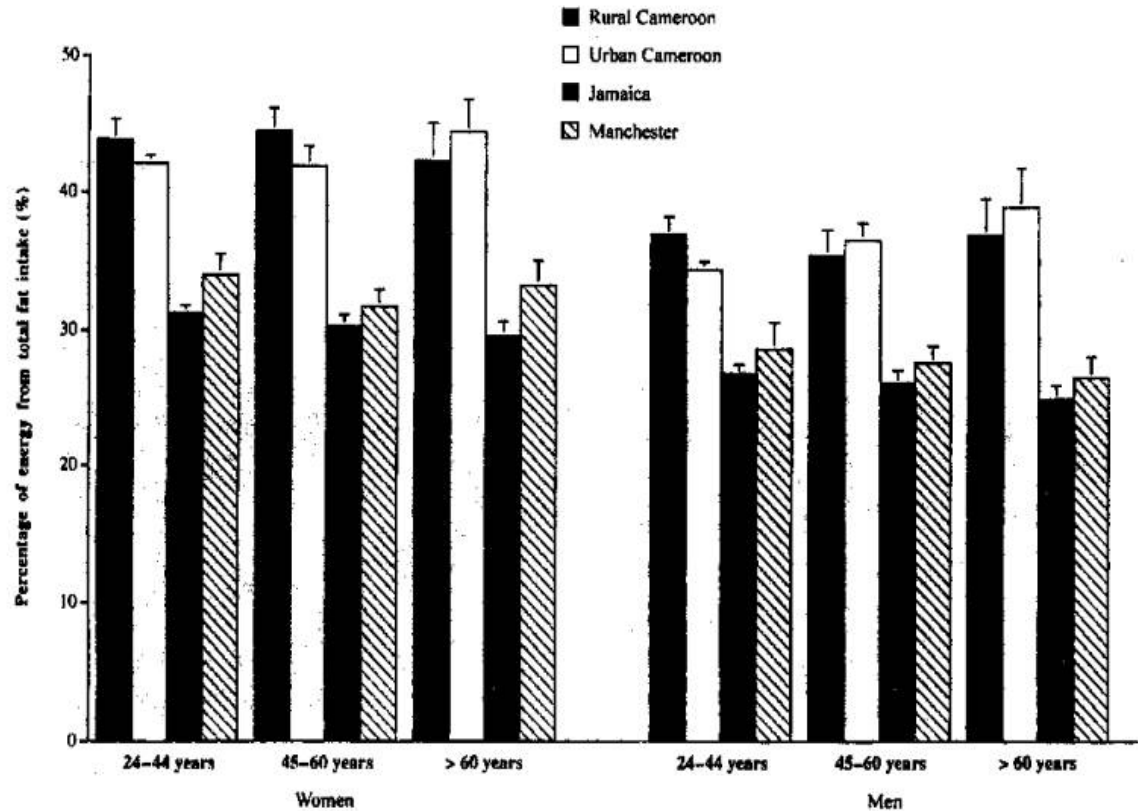
- **MODIFIABLE**

- Obesity
- Urbanization

- Physical inactivity

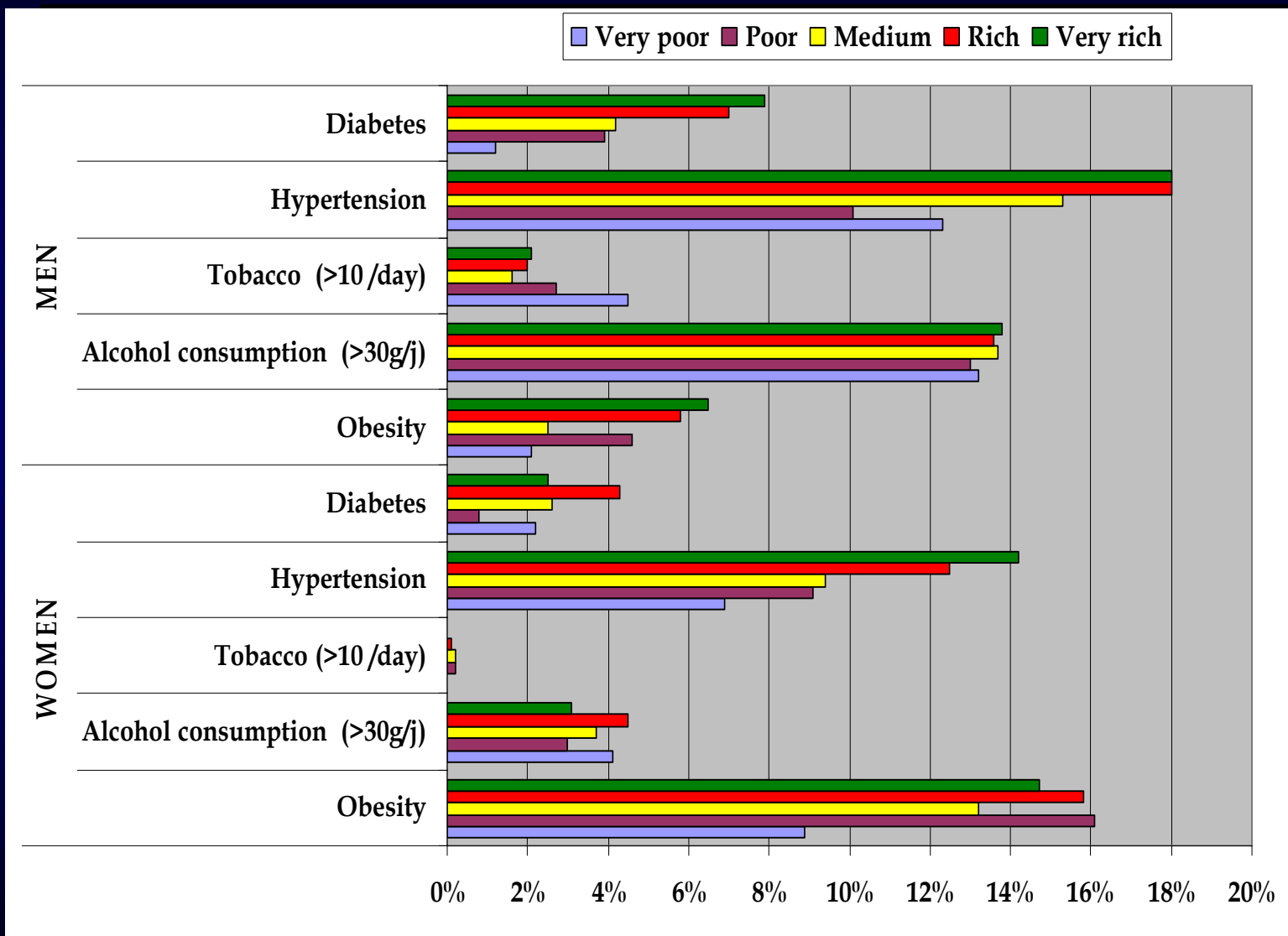


- Change in dietary habits



% of energy from total fat intake in rural and urban Cameroon, Jamaica and Manchester (UK)

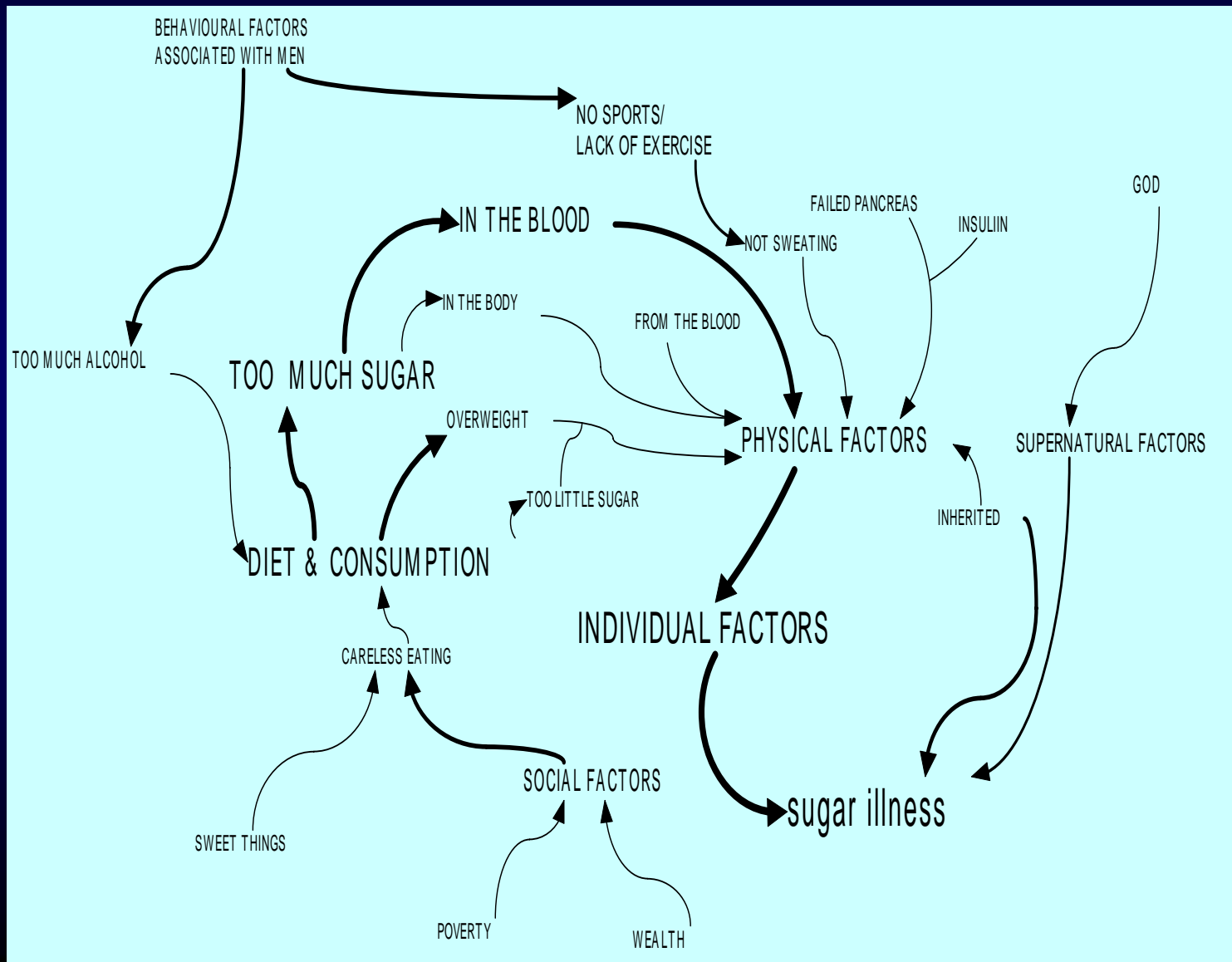
Household amenities, diabetes and selected risk factors





Clinical Specificities & Epidemiology of Complications

Strength of Belief in Cameroonian Causal Web for *Sugar Illness* (Diabetes)



CLINICAL SPECIFICITIES OF DIABETES IN DEVELOPING COUNTRY PATIENTS

- **> 70% unknown patients during epidemiological surveys**
- **Young age of onset (early 40s) of type 2 diabetes**
- **22% revealed by an infectious episode in Uganda** (*Nambuya, 1996*)
- **79% of patients in Ouagadougou had at least one infectious episode within a 6yr follow-up period** (*Drabo, 1996*)
- **Acute metabolic complications represent 28% of admissions**
- **Poor access to drugs and diabetes healthcare**

COMPLICATIONS

- High frequency of Microvascular Complications
 - **Retinopathy:** 15 – 55%; 21-25% at diagnosis
 - **Nephropathy:** 32 – 57%; 1/3 dialyzed patients diabetics
 - **Neuropathy:** 9.5 – 36.4%; 49% erectile dysfunction
- Emergence of Macrovascular Complications
- High Prevalence of Hypertension

- Due to
 - rapid **urbanization, westernization** of **lifestyle** and economic development
 - rapidly decreasing **physical activity**
 - changes in **dietary** habits
 - **ageing** of the population
- Developing countries are experiencing **one of the most rapid epidemiological transitions**
- **Over 70%** of the burden of diabetes will be in developing countries

- These developing countries have an **unfinished agenda of communicable diseases**
- They therefore have a **double or triple burden of disease**
- Very few developing countries have a **social insurance policy**
- Therefore having diabetes translates into a **great financial burden on the family**
- If family cannot pay for medication, this **can lead to premature death of the diabetic patient**



INSULIN IN DEVELOPING COUNTRIES: ACCESSIBILITY AND AVAILABILITY

A MAJOR PROBLEM



Case History

- Ms X 15 years old
- Diagnosed with type 1 diabetes at age 10
- Poor family background
- Cannot afford cost of insulin
- Supply by missionaries
- Died at age 17 after DKA



ACCESS TO INSULIN

- Many people in the world are still dying because of lack of access to insulin.
- This lack of access to insulin may be chronic or acute depending on the circumstances.

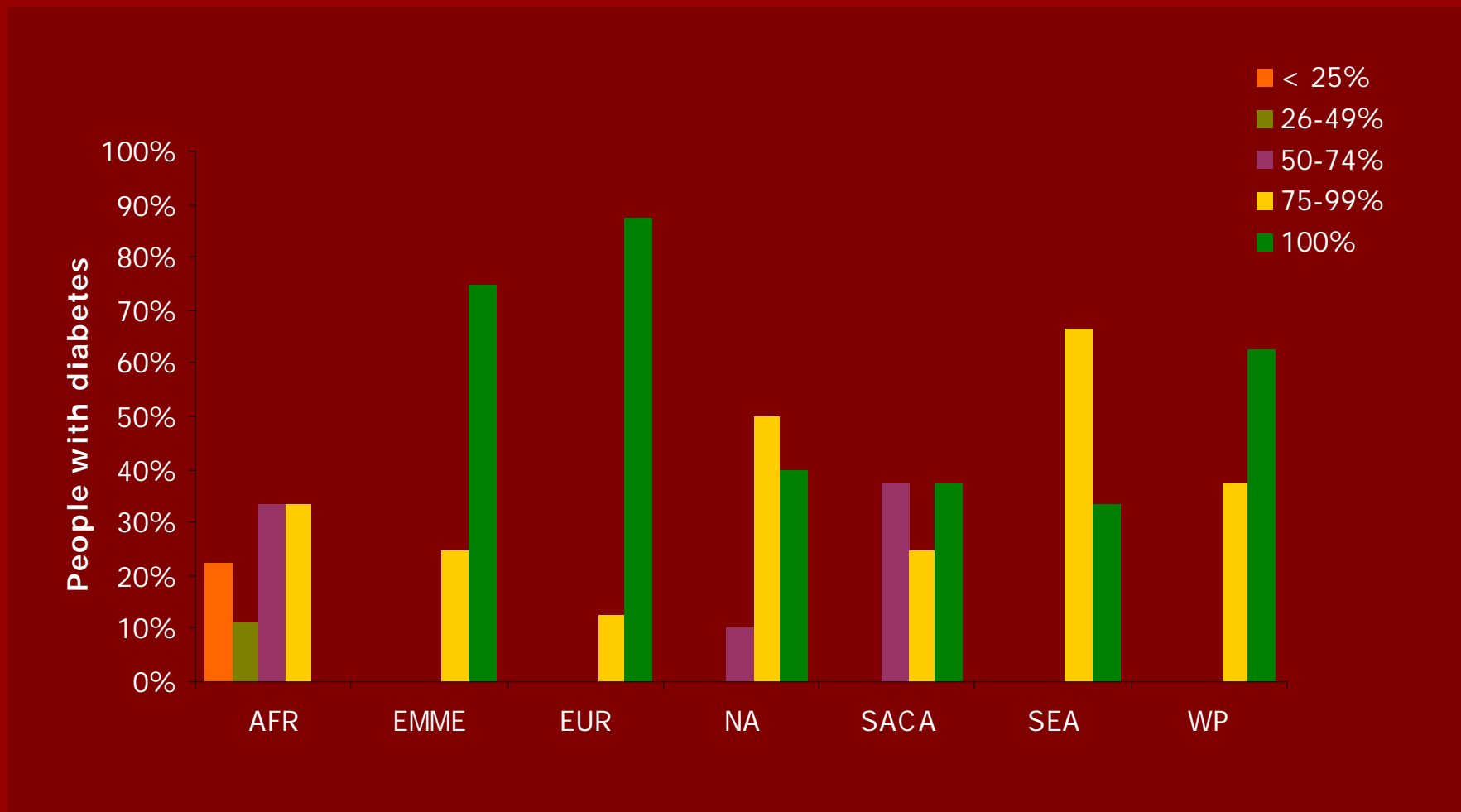


ACCESS TO INSULIN

- An acute lack of access to insulin may arise in an unpredictable manner because of sudden crisis be it:
 - Political upheaval (war in the Balkans)
 - Natural disasters (a flood in Venezuela, Honduras and Ecuador, Mozambique, earthquake in Goma, RDC)
 - Economic crisis. (Ecuador, Argentina).

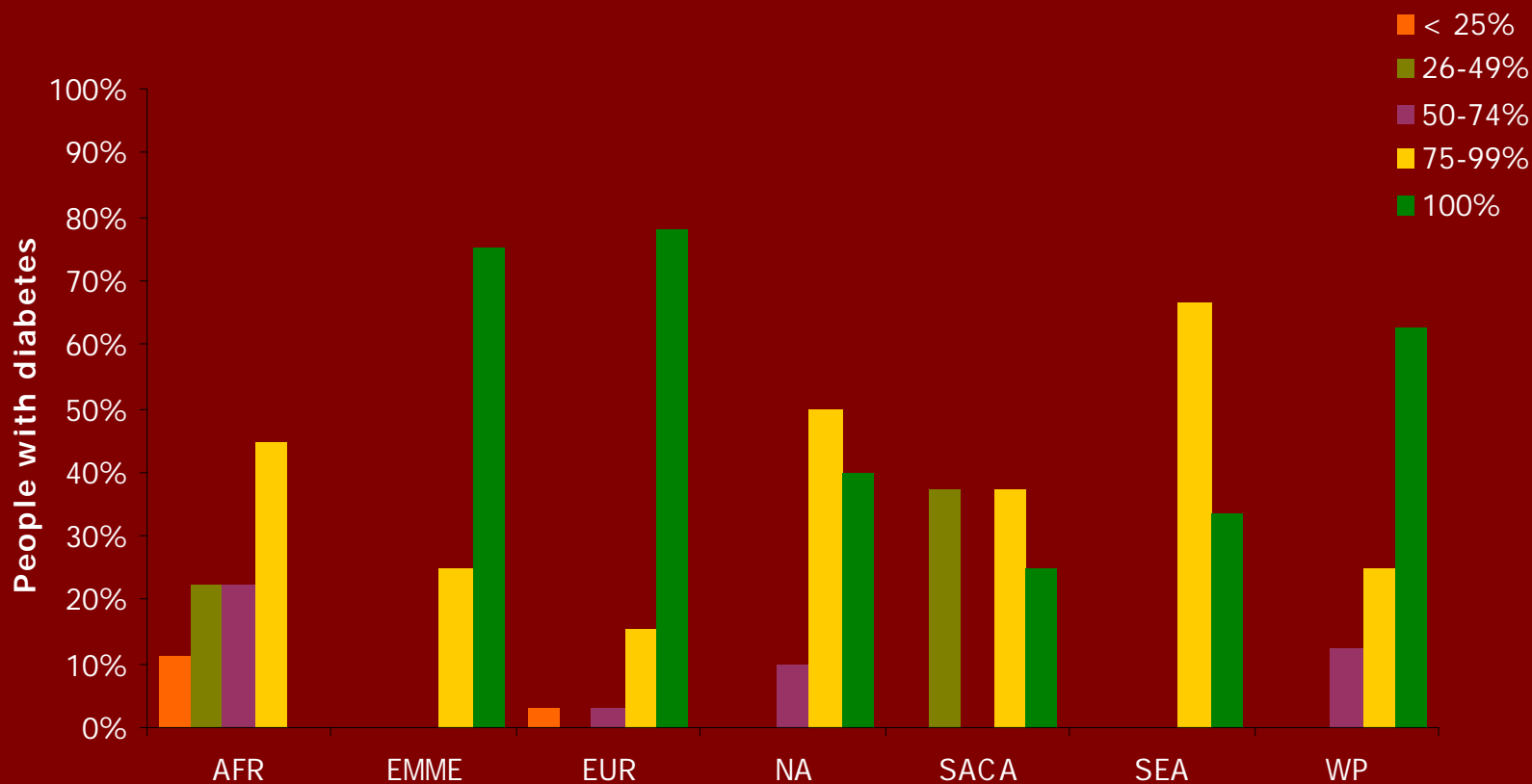


Global access to insulin for people with type 1 diabetes



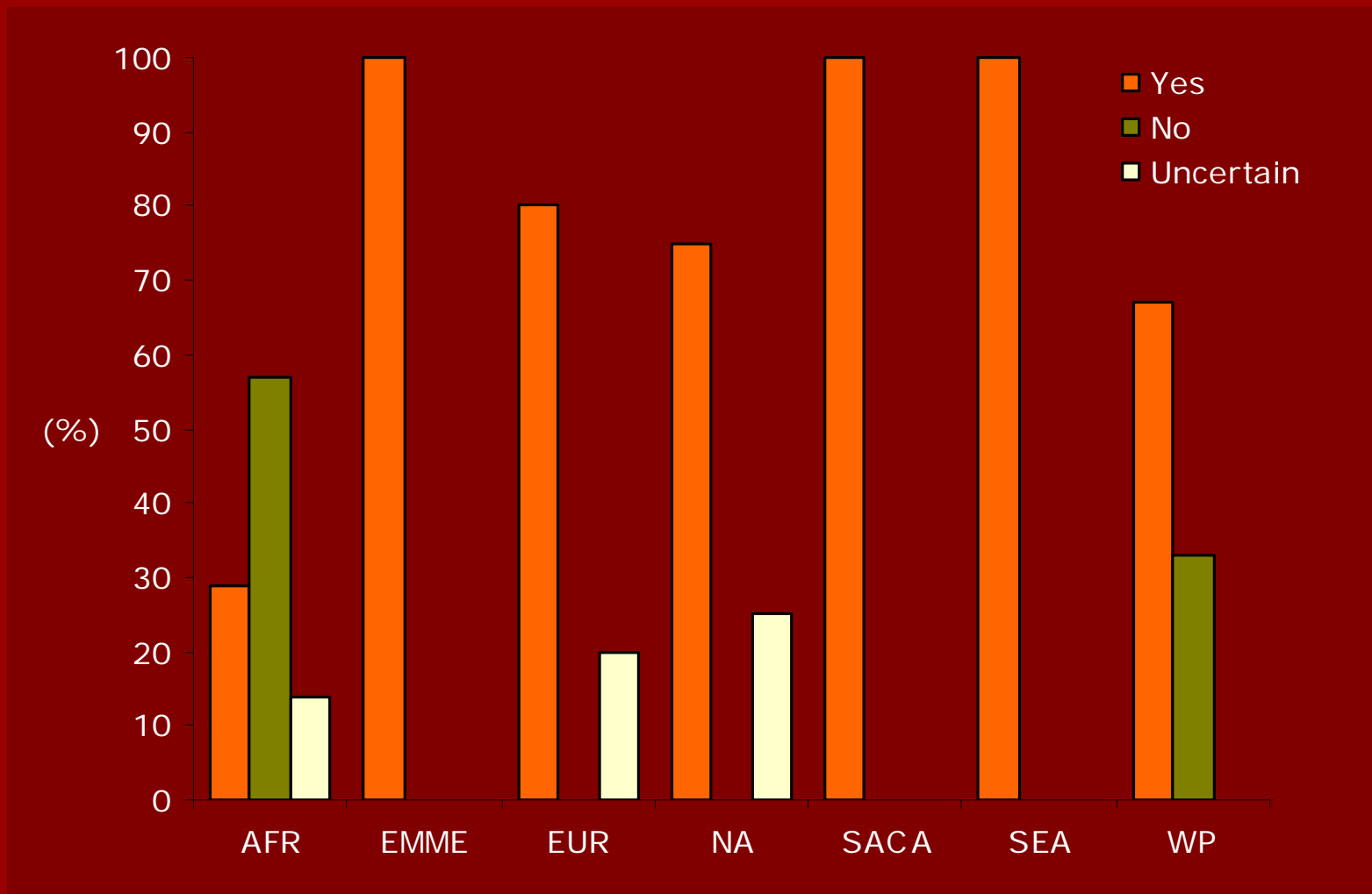


Global access to insulin for people with type 2 diabetes



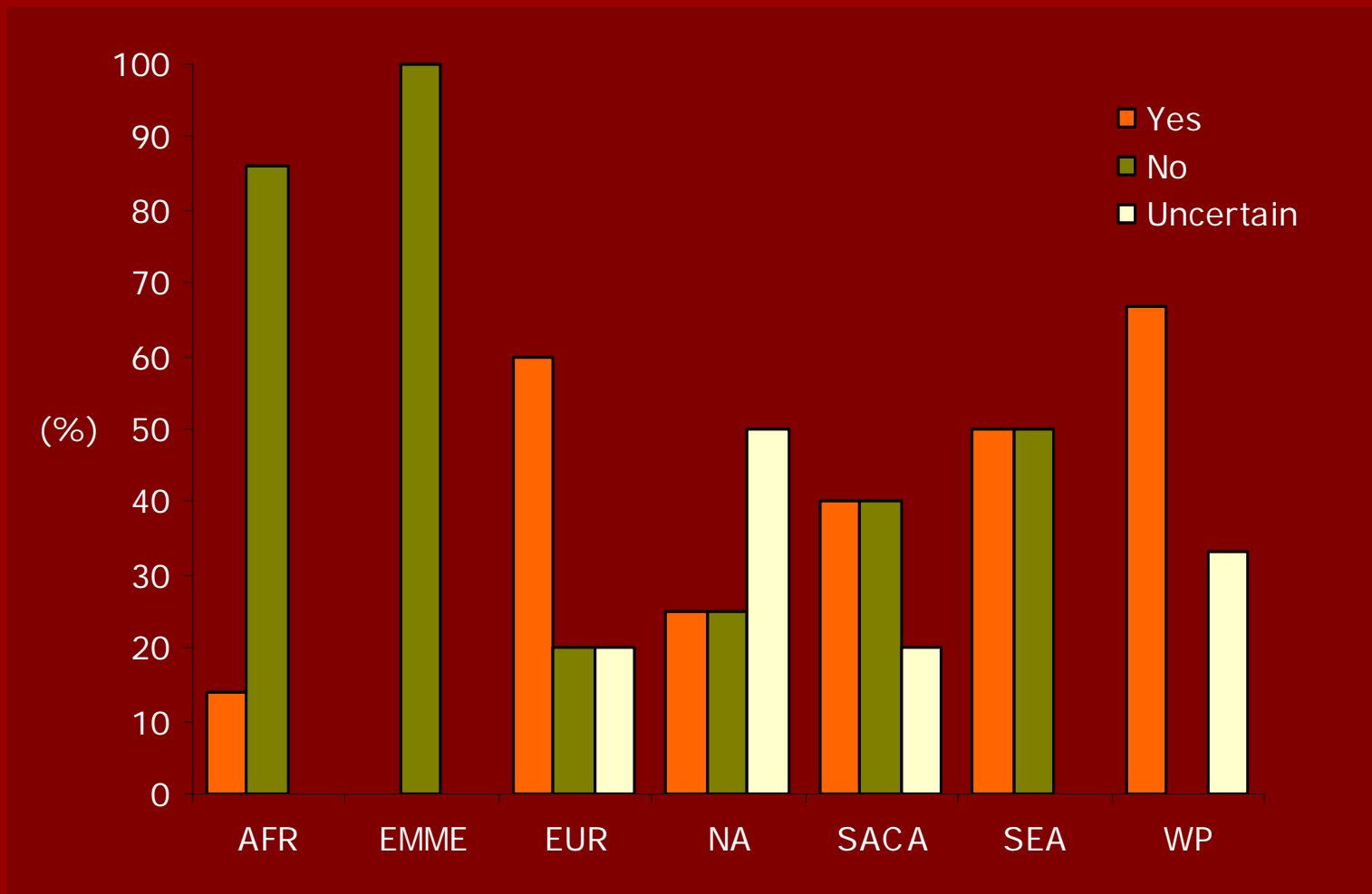


Availability of free insulin by region



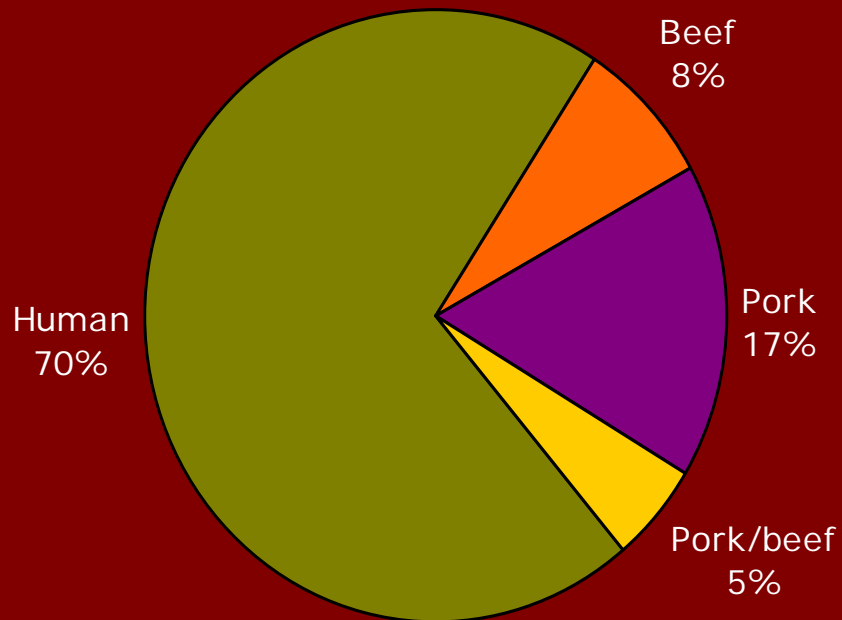


Availability of free insulin syringes by region



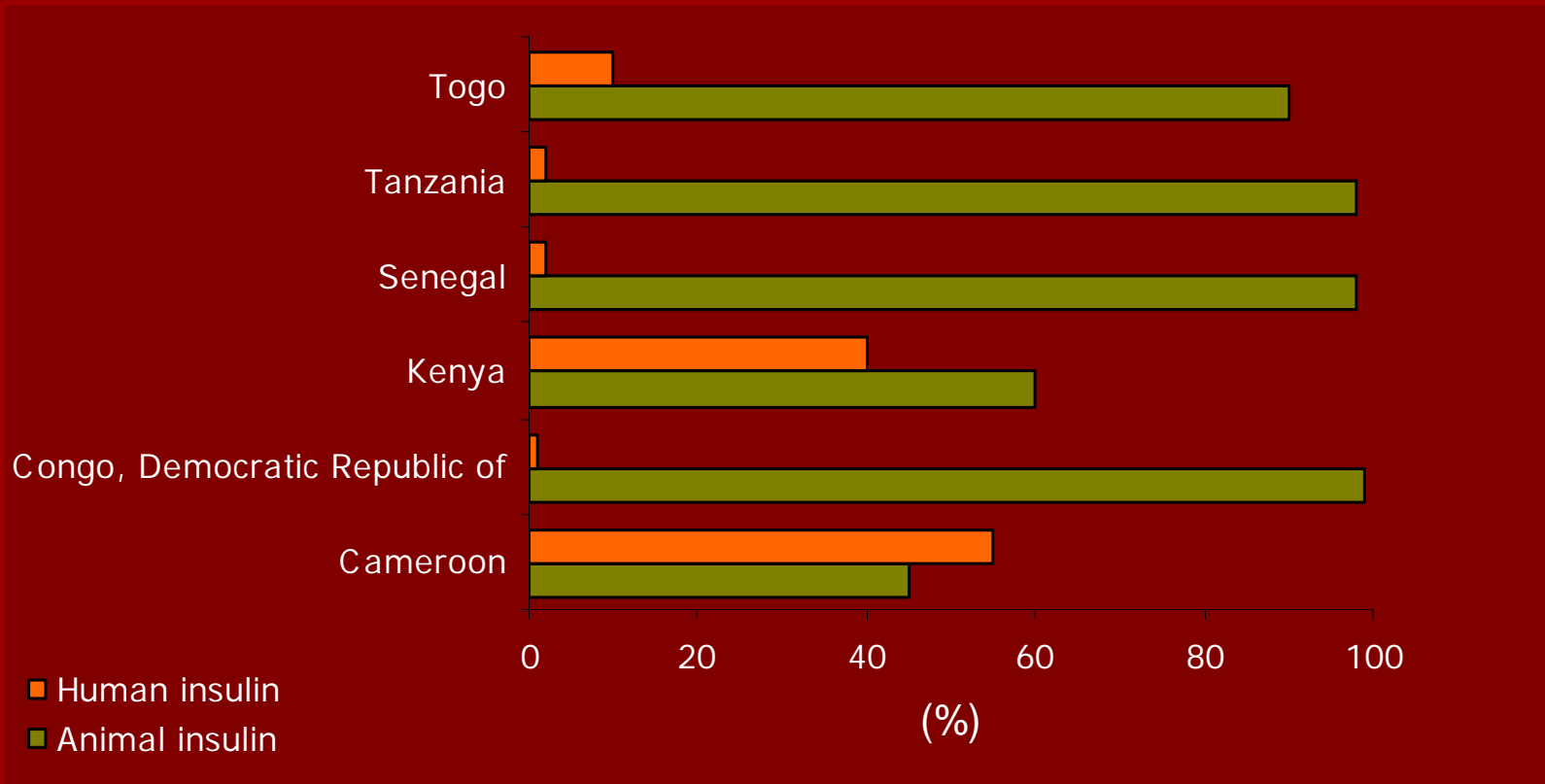


Types of insulin available around the world



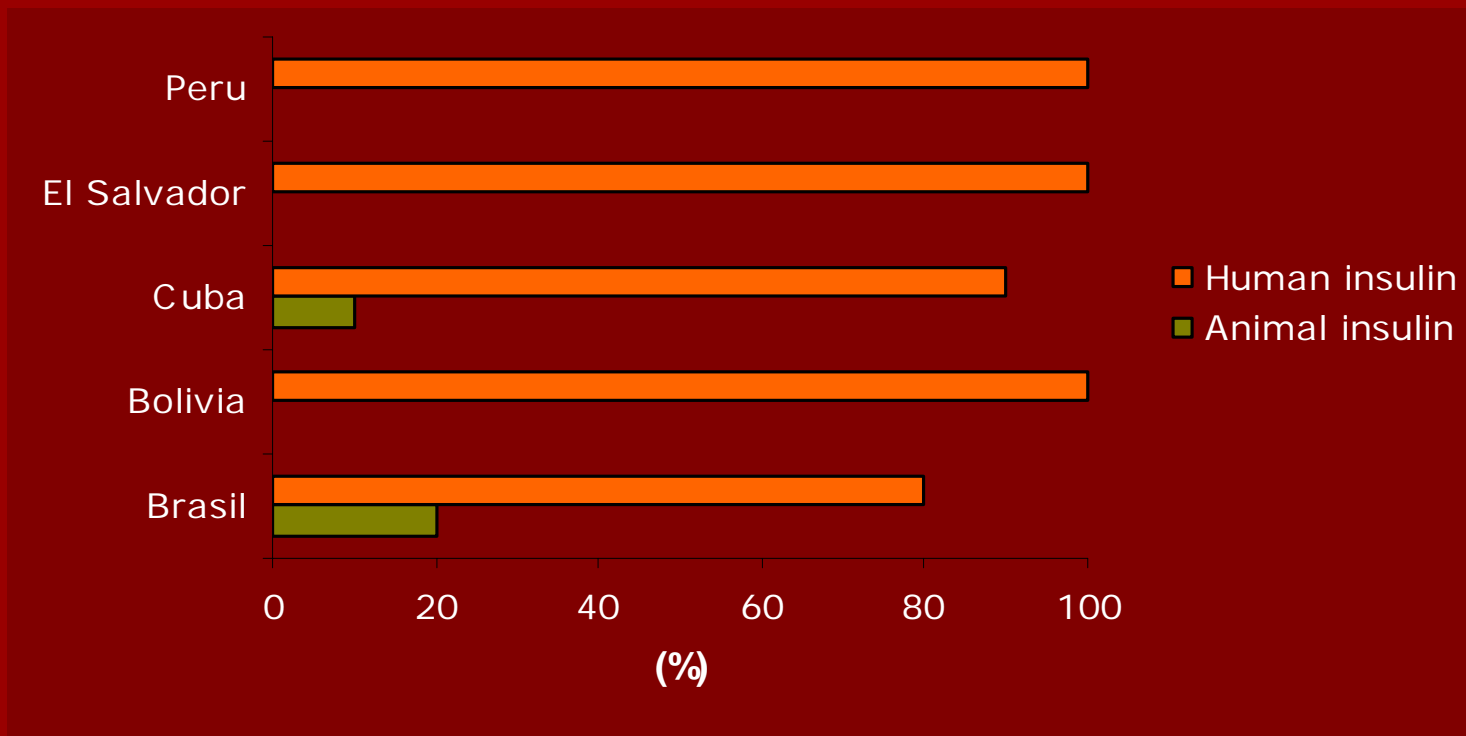


Types of insulin used in selected African countries



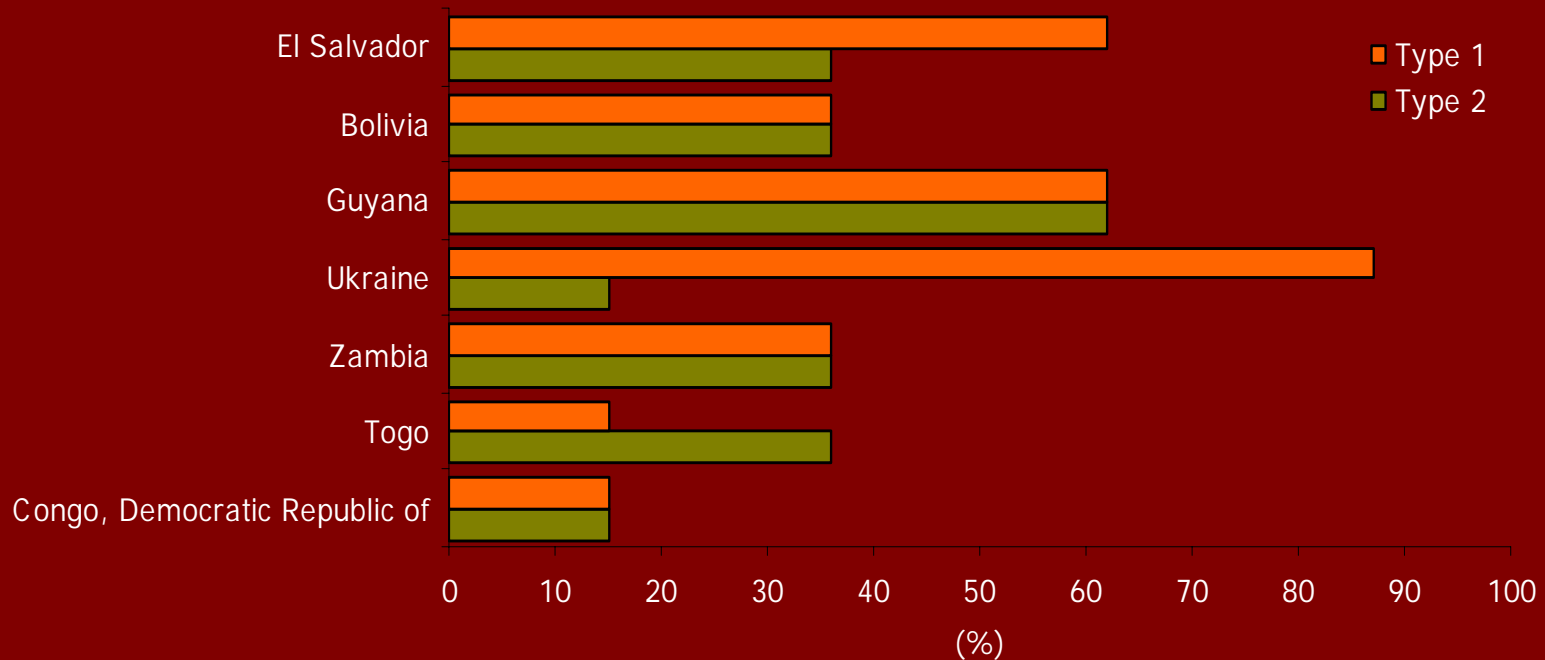


Types of insulin used in selected Latin American countries



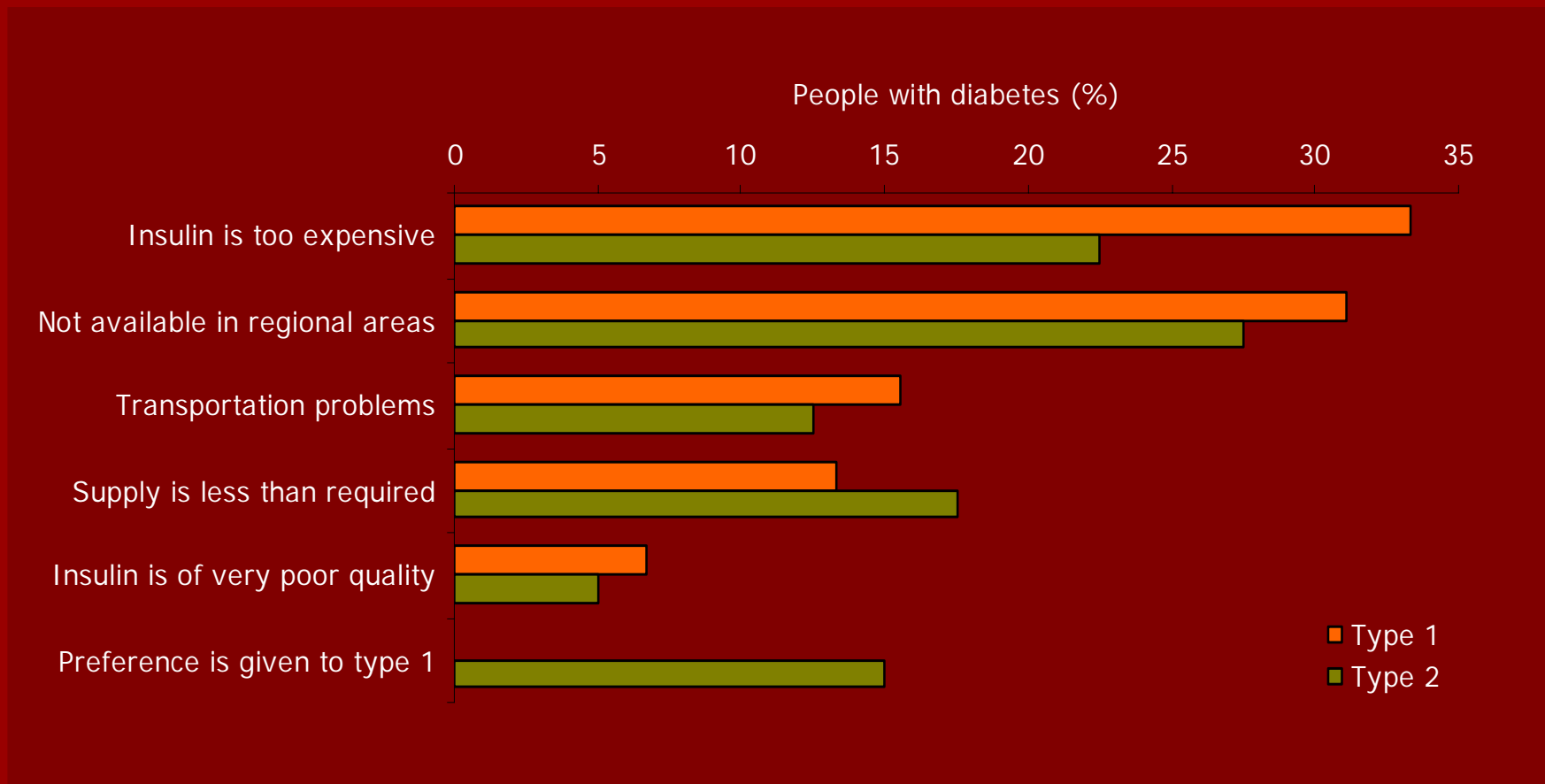


Access to insulin in selected developing countries





Causes of lack of access to insulin





Causes of lack of access to insulin in selected developing countries

	Insulin is too expensive	Not available in regional areas	Transportation problems	Supply is less than required	Insulin is of very poor quality
Congo, Democratic Republic of	✓				
Côte d'Ivoire	✓				
Kenya	✓		✓	✓	
Senegal	✓	✓			
Tanzania	✓	✓	✓		
Togo	✓				
Zambia	✓	✓		✓	
Kazakstan				✓	
Ukraine	✓				✓
Serbia and Montenegro		✓			
Guyana	✓			✓	
Jamaica		✓			
Bolivia	✓	✓			
El Salvador	✓	✓	✓	✓	
Bangladesh	✓	✓			
Sri Lanka		✓	✓		✓
Philippines	✓				
Thailand		✓	✓		



Gross national income (US\$) in selected low income economies

AFR		NA	
Congo, Democratic Republic of	80	Haiti	480
Burundi	100	Guyana	840
Ethiopia	100	SACA	
Liberia	140	Honduras	900
Eritrea	160	Bolivia	950
Guinea-Bissau	160	SEA	
Malawi	160	Nepal	250
EMME		Bangladesh	360
Sudan	340	India	460
Pakistan	420	Bhutan	640
Yemen	450	WP	
EUR		East Timor	170
Tajikistan	180	Cambodia	270
Kyrgyzstan	280	Lao People's Democratic Republic	300
Moldova	400	Mongolia	400
Uzbekistan	550	Vietnam	410
Georgia	590	Papua New Guinea	580

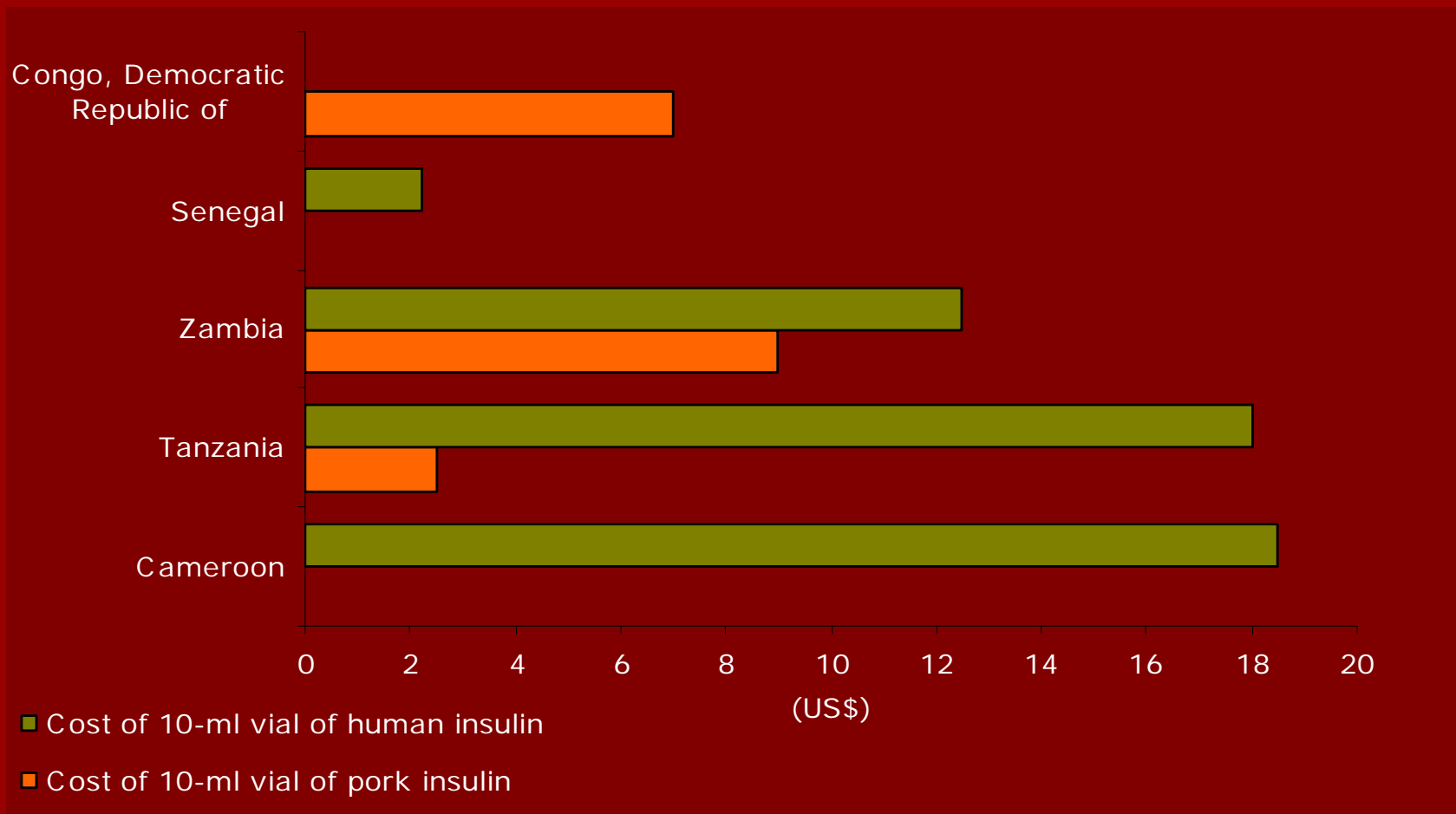


Perception of Cost of insulin

“The prices of insulin are very high. When you go to these pharmacies the prices are very high. You move from one to the other and you finally buy just a small quantity. Then you start going round and round again to look for money to buy the other. The thing makes my family to be unable to eat.”
(A 38 years old male patient on insulin)

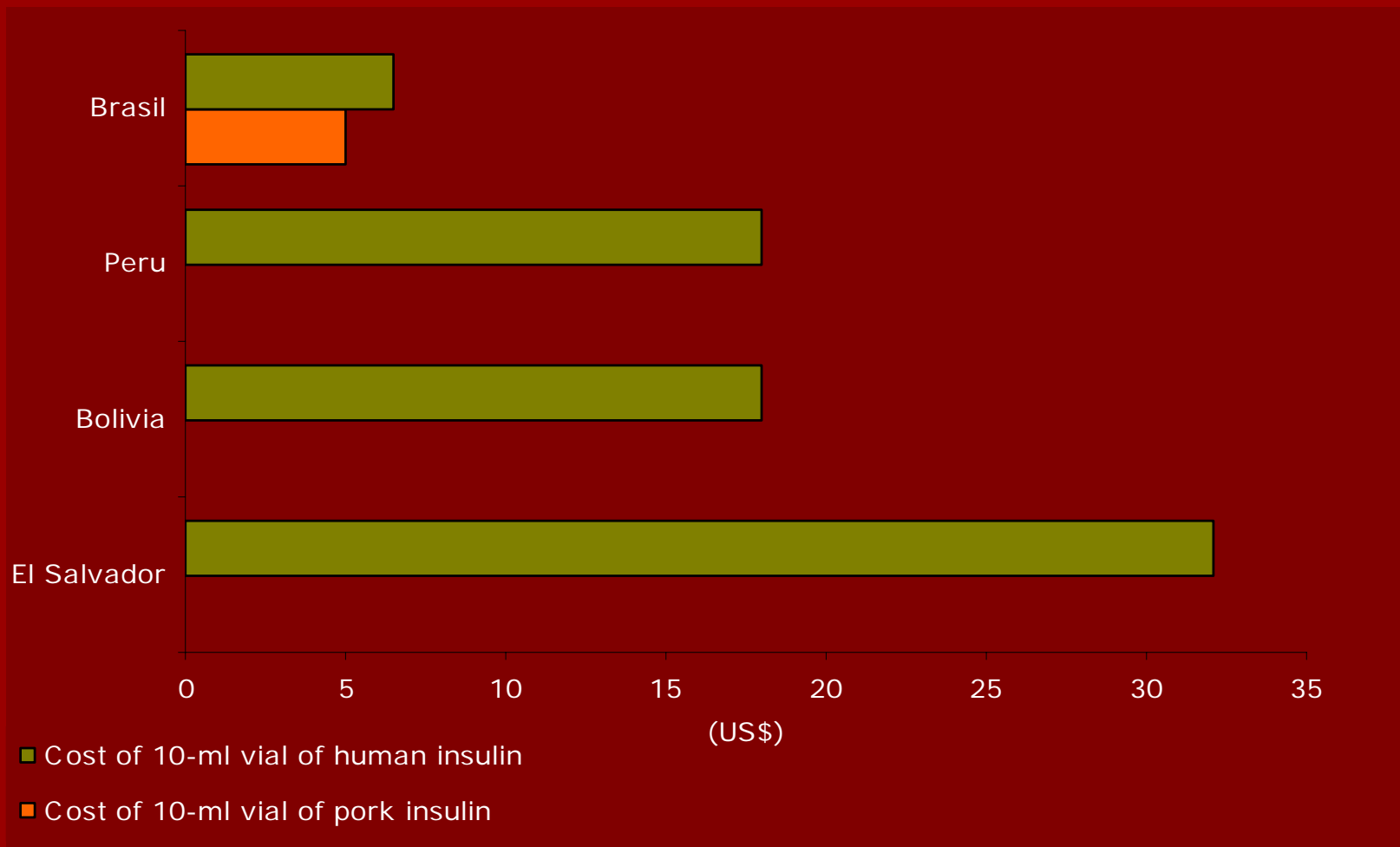


Cost of 10-ml vial insulin in selected African countries



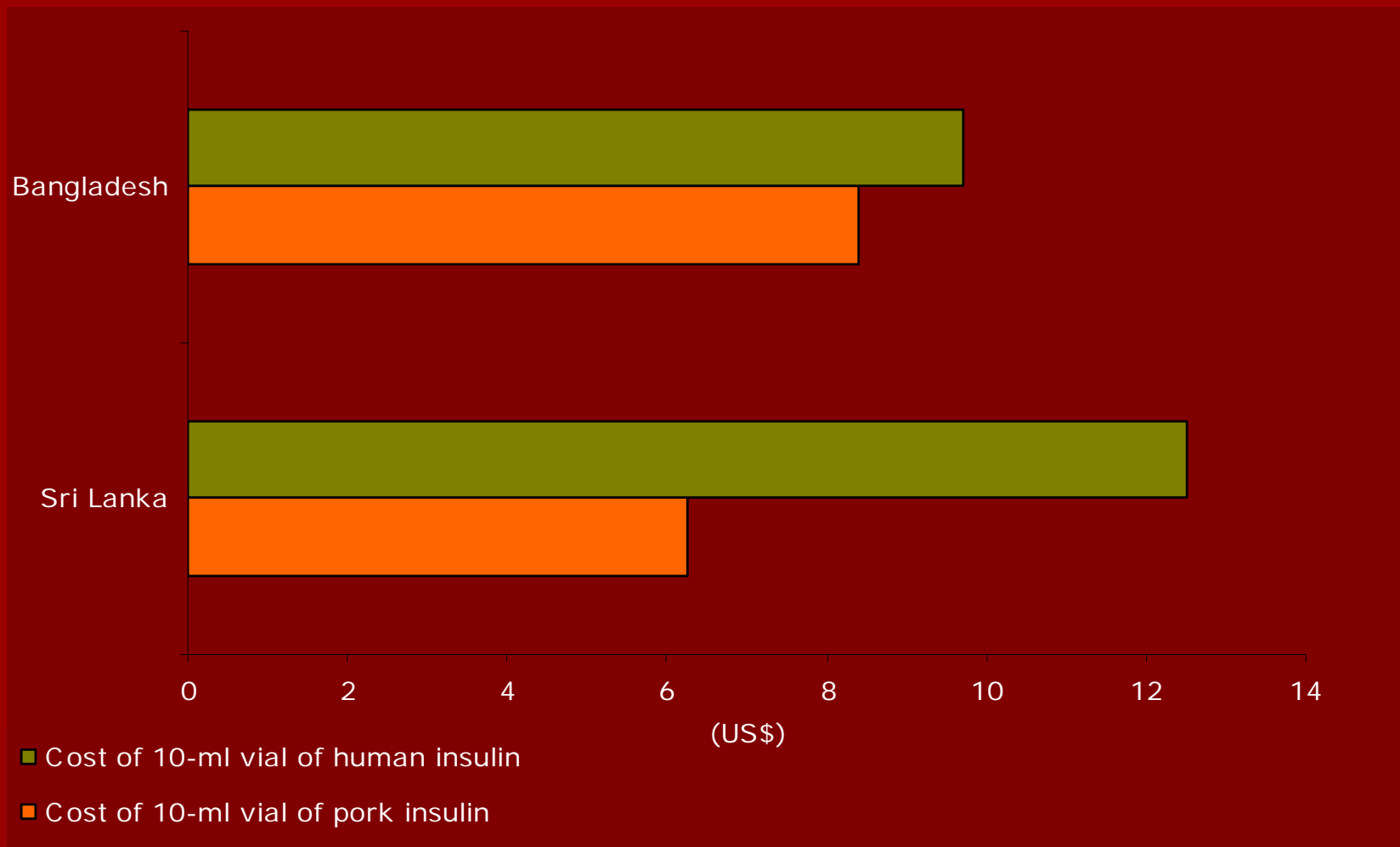


Cost of 10-ml vial insulin in selected South and Central American countries



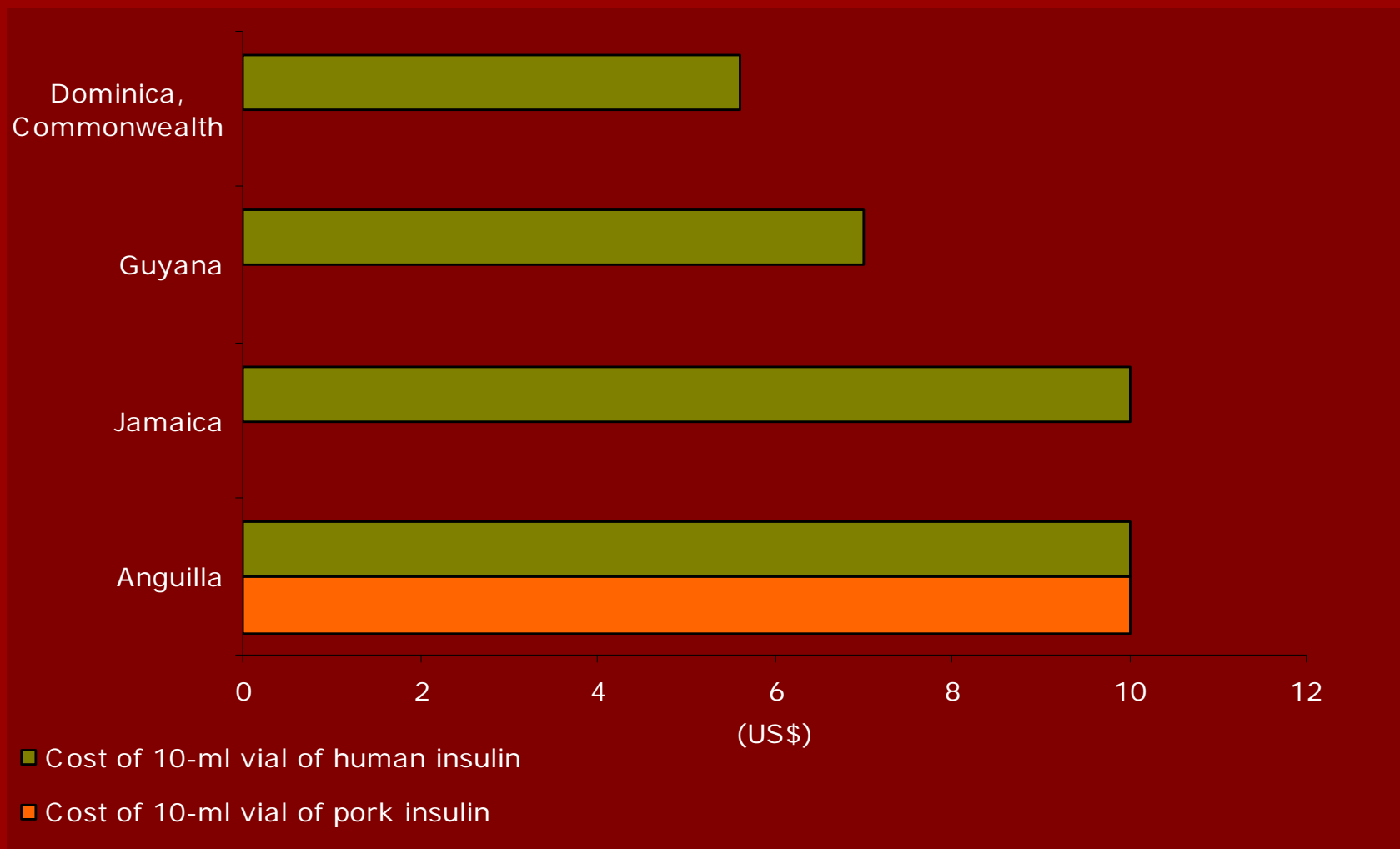


Cost of 10-ml vial insulin in selected South-East Asian countries



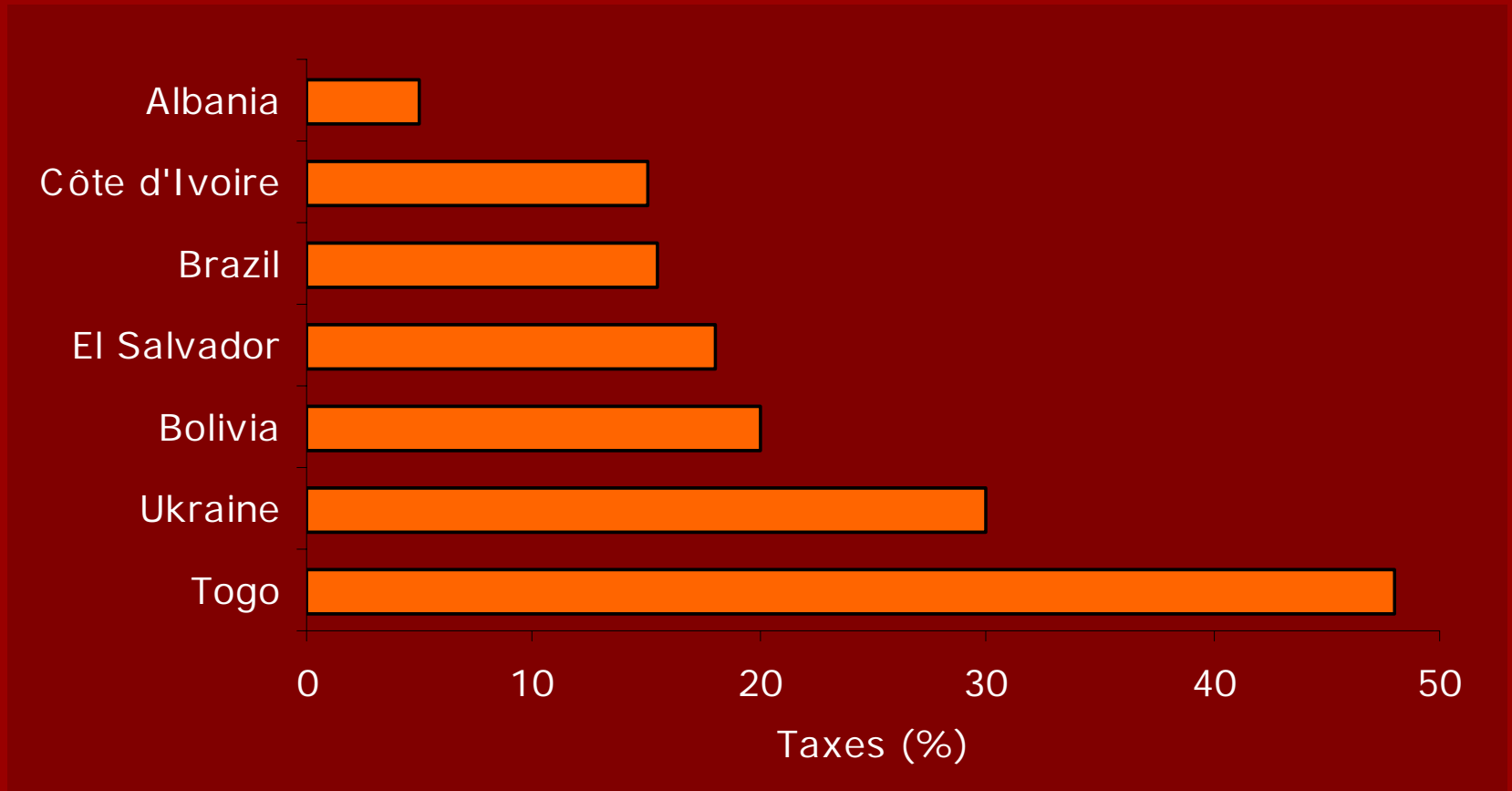


Cost of 10-ml vial insulin in selected North American countries



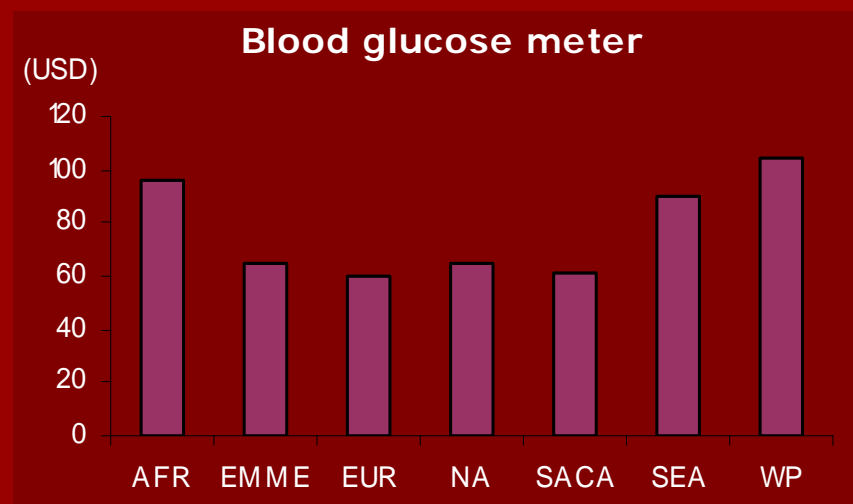
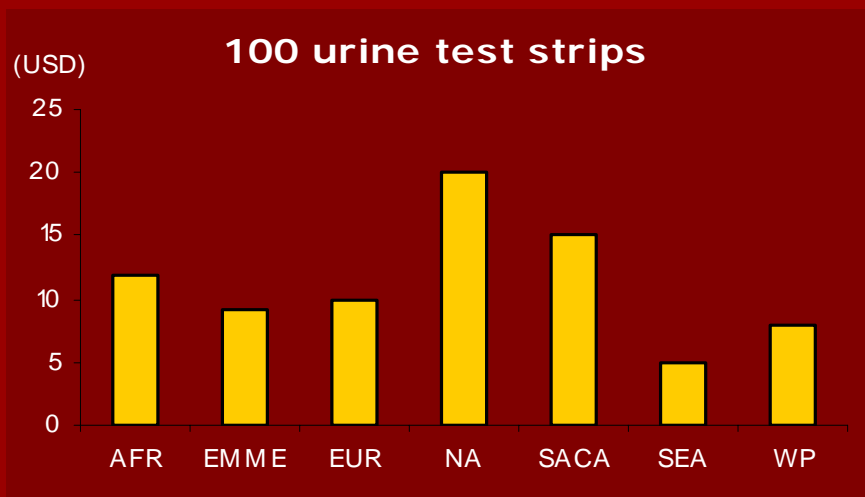
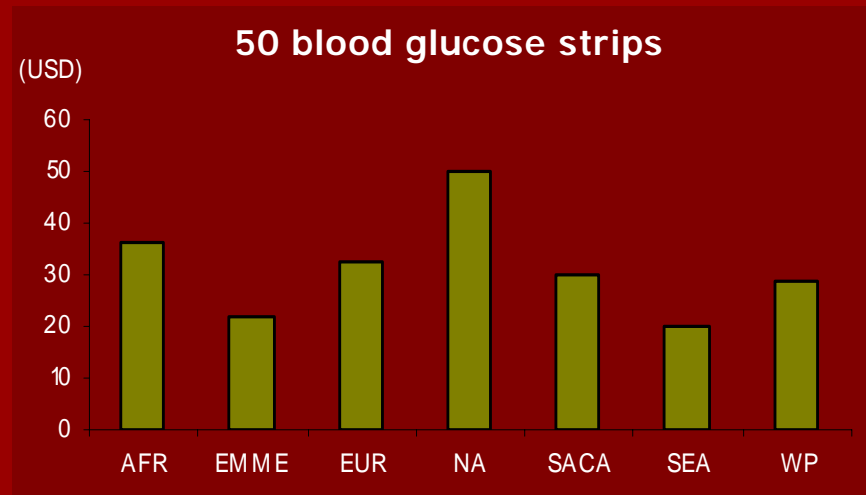
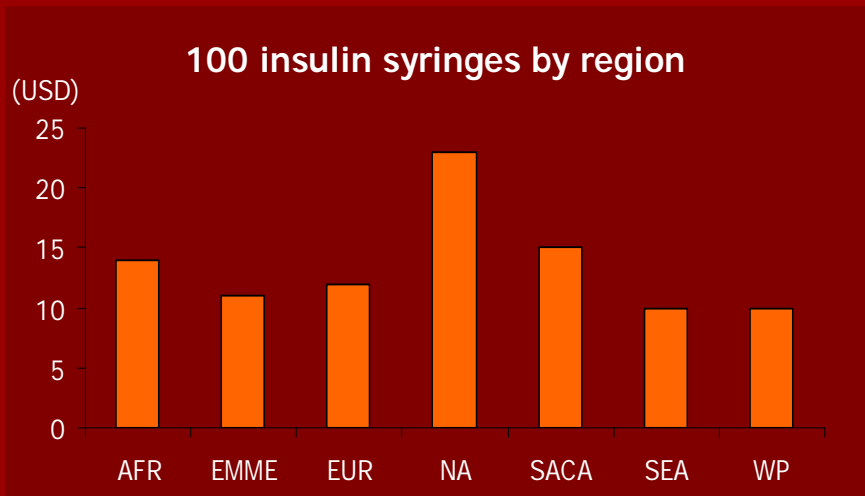


Taxes imposed on insulin in some low income countries





Average cost of diabetes supplies by region





THEREFORE

- **Access to insulin is limited by high cost of insulin**
- **Animal insulin is now considerably cheaper than human insulin**
- **Insulin in vial forms is significantly cheaper than the same type of insulin in pen-fill cartridge form**
- **Taxes are still a significant factor affecting the price of insulin**
- **Insulin is 3 to 26 times less affordable in Africa than in all other regions**

Notes on the diseases met with in Uganda, Central Africa.

J Trop Med 1901;4:175-178

Dr. Albert Cook, 1901



« ... diabetes is rather uncommon and very
fatal... »

Prof Jean-Claude Mbanya, 2004

« ... diabetes is rather **common** and **still**
very fatal... »





WHAT IS THE IDF DOING AND HOW CAN YOU HELP?



IDF- Task Force on Insulin, Test Strips and Other Diabetes Supplies

- Objectives
- Members
- Focus areas
- Key actions



Objectives

- To provide access to and information on diabetes products and supplies in IDF member countries
- Be an advocate for programmes and services for the underserved and disadvantaged
- To ensure delivery of supplies and support services to people affected by diabetes

▪ Objectives

▪ Members

▪ Focus areas

▪ Key actions



Focus areas

1. Insulin
2. Syringes
3. Meters and blood test strips
4. Urine test strips
5. Guidelines for supplies in times of emergencies and disasters
6. Partnerships with member associations, interested parties and other organizations
7. Education, communication and advocacy
8. Special projects/programmes such as the IDF-Rotary and Life for a Child programmes

▪ Objectives

▪ Members

▪ Focus areas

▪ Key actions



Focus areas

9. Collaboration with Insulin for Life and International Insulin Foundation
10. Rotary Italy/IDF/ Cameroon Insulin for 120 children with diabetes in Cameroon
11. Collaboration with similar projects in the world including *Progetto Albania* of AMD

- Objectives
- Members
- Focus areas
- Key actions



CONCLUSION -1

- **The 'opportunity cost' of keeping alive a resource-consuming person with diabetes is a valid if chilling question**
- **Four African countries reported an awareness of death due to lack of access to insulin in people with type 1 diabetes**



CONCLUSION - 2

- **Accidents of geography and colonial history still determines which patient with diabetes should live or die**
- **International economics still determines who should live or die, while we all watch on**
- **This is a challenge to the Associazione Medici Diabetologi (AMD) and the International Diabetes Community**
- **You are no longer ignorant of this fact**
- **We will be judged by what we do to alleviate this problem**



GRAZIE DELL' ATTENZIONE