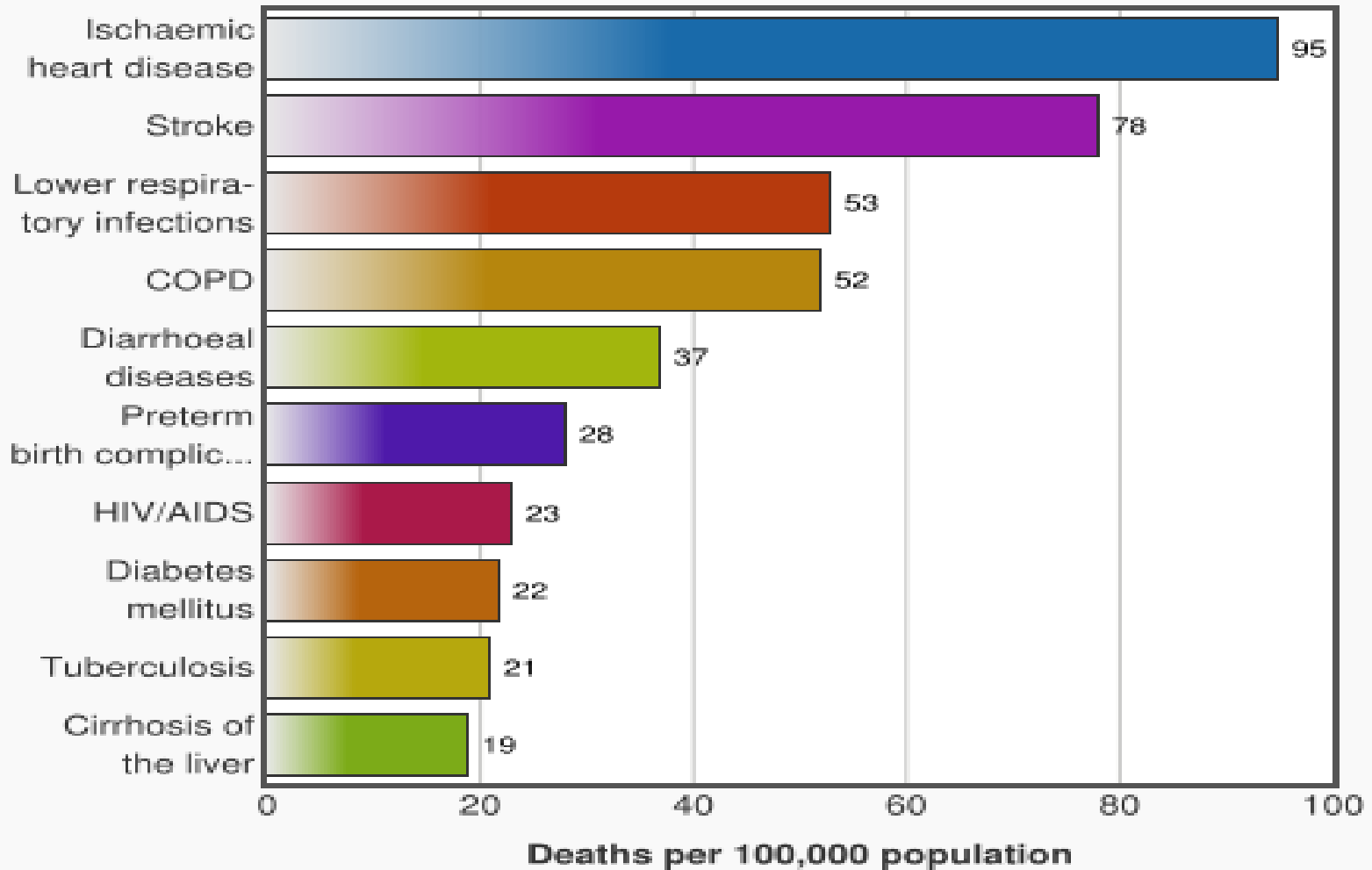# Cardiovascular Risk Prediction Using WHO/ISH Chart in Urban and Rural Subjects Attending Diabetes Screening Clinic: A Pilot Study

Dr. Rohit A, Dr Balu P S
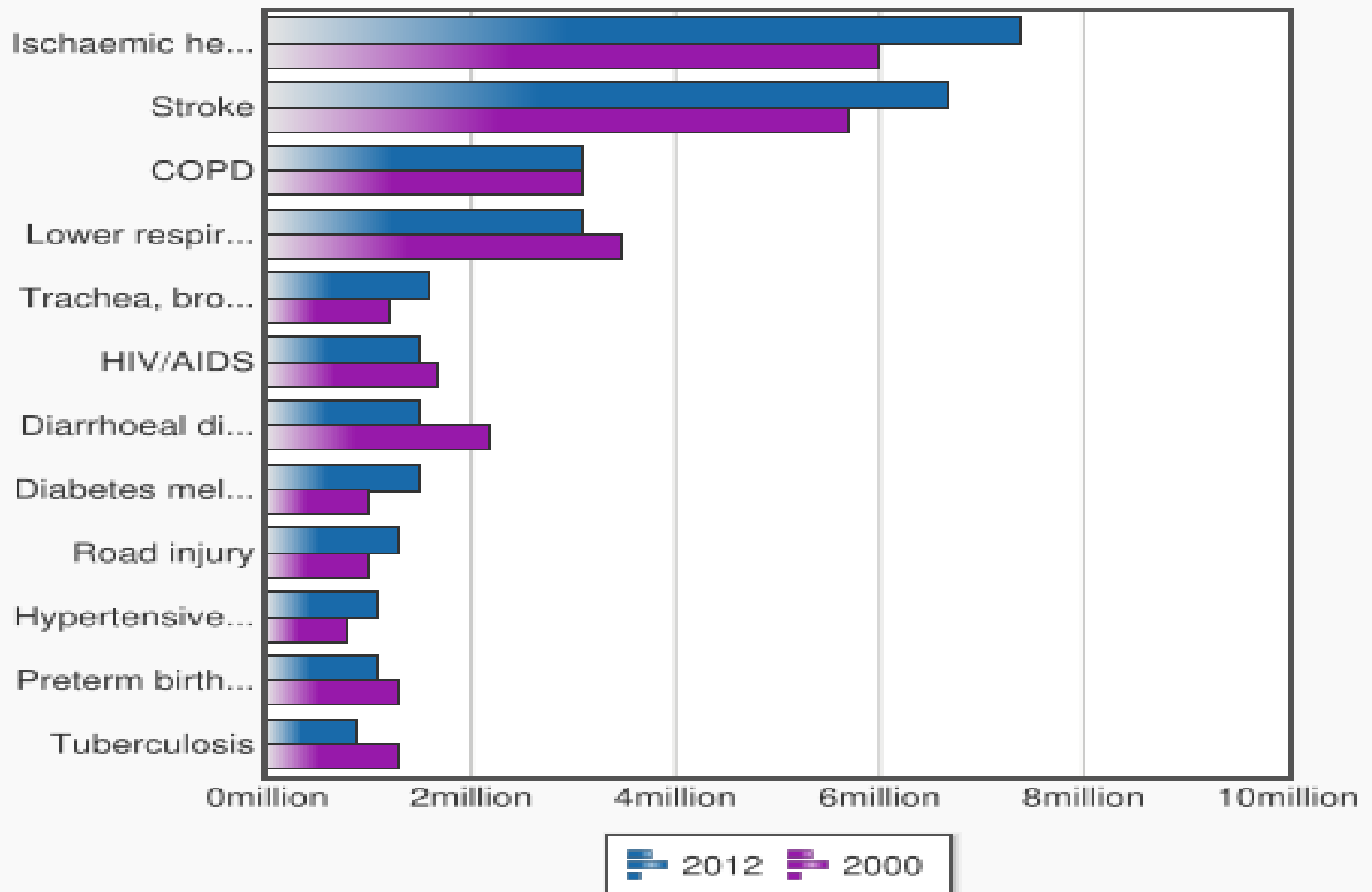
Public Health Specialist [NCD]

India

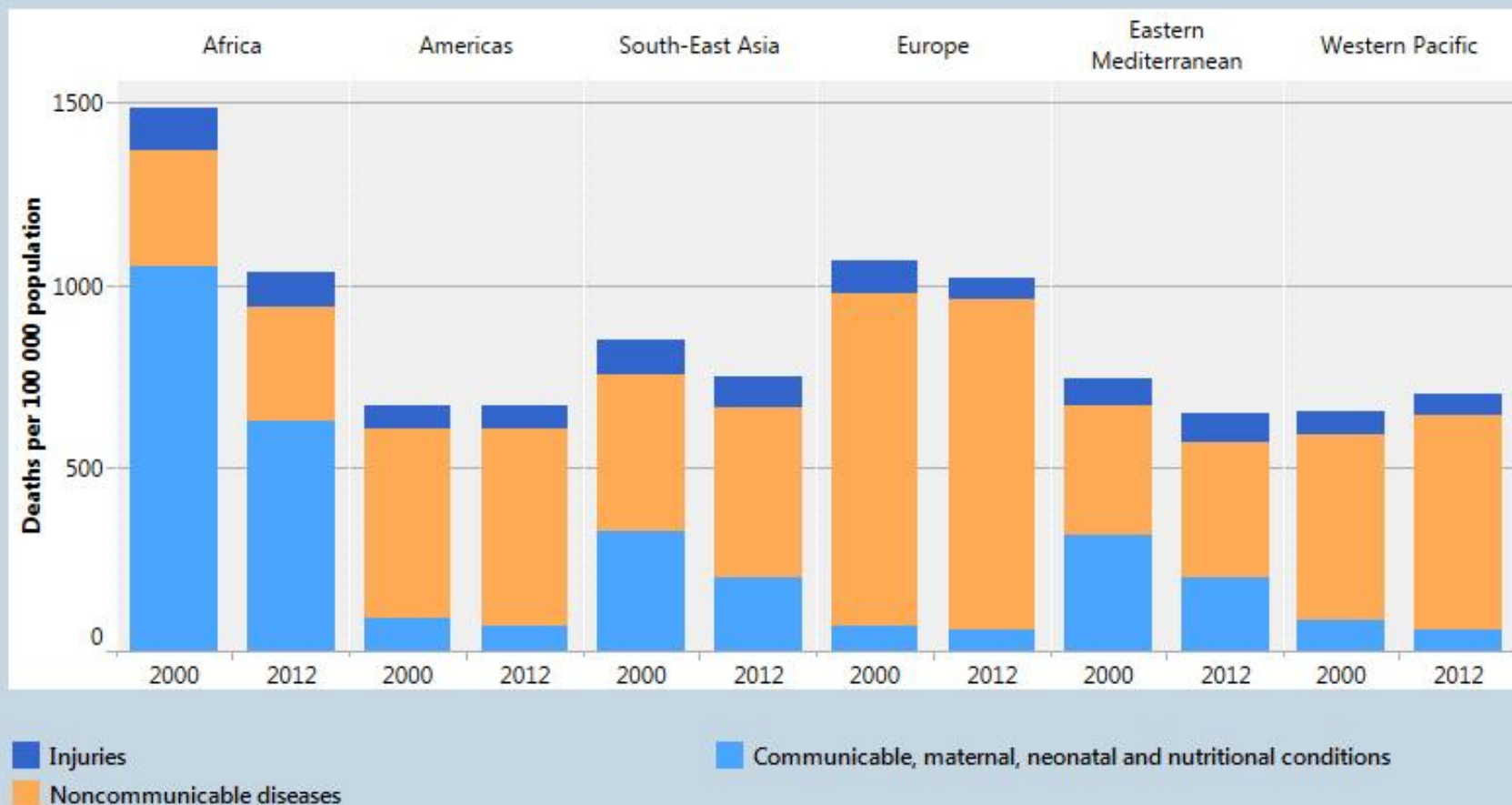# Top 10 causes of death in lower-middle income countries
2012

Cause	Deaths per 100,000 population
Ischaemic heart disease	95
Stroke	78
Lower respiratory infections	53
COPD	52
Diarrhoeal diseases	37
Preterm birth complic...	28
HIV/AIDS	23
Diabetes mellitus	22
Tuberculosis	21
Cirrhosis of the liver	19

Deaths per 100,000 population

Introduction

Comparison of leading causes of death over the past decade, 2000 and 2012

Introduction

Crude death rate by broad cause group, 2000 and 2012
By WHO region

Legend:
- Injuries
- Noncommunicable diseases
- Communicable, maternal, neonatal and nutritional conditions

Y-axis: Deaths per 100 000 population

Regions: Africa, Americas, South-East Asia, Europe, Eastern Mediterranean, Western Pacific (each shown for 2000 and 2012)

Introduction

Cardiovascular Risk and Diabetes

- Cardiovascular disease is responsible for between 50% and 80% of deaths in people with diabetes.

- Diabetes increases the risk of heart disease and stroke. In a multinational study, 50% of people with diabetes die of cardiovascular disease (primarily heart disease and stroke)

- WHO projects that diabetes will be the 7th leading cause of death in 2030

Community Based Approach

- Over three quarters of CVD deaths take place in low- and middle-income countries.
- People in low- and middle-income countries often do not have the benefit of integrated primary health care programmes for early detection and treatment of people with risk factors compared to people in high-income countries.
- NCDs already disproportionately affect low- and middle-income countries where nearly three quarters of NCD deaths

Objective

- To assess 10 year risk of a fatal or non-fatal cardiovascular event in adults attending diabetes screening clinic using WHO/ISH risk prediction chart

Material and Methods

- <u>Study design</u>: Cross sectional

- <u>Study setting</u>: Non Communicable Disease[Diabetes] screening Clinic of Davanagere district.

- <u>Location</u>:

  - Urban: 1 [District hospital]

  - Rural : 2 [Rural Primary health centres]

Material and Methods

- <u>Study population</u>: Adults aged more than 40 years

- <u>Inclusion criteria</u>: Age > 40 years

- <u>Exclusion criteria</u>:
  - Pre existing heart condition
  - Other major cardiac abnormality
  - Age more than 80 years

Material and Methods

- <u>Study instrument</u>: WHO/ISH Risk predictions charts to predict 10 year risk of a fatal or non-fatal cardiovascular event among the adults. [SEAR D]

- <u>Study period</u>: 27 July – 14 August 2015

- <u>Data entry</u>: Epidata3.1

- <u>Data analysis</u>: IBMSPSS20.0.

WHO/ISH Chart

- Categorizes individual subjects into cardiovascular risk
  - Age
  - Sex
  - Smoking
  - Diabetes status
  - Systolic blood pressure
  - Cholesterol level

Risk Level <10% 10% to <20% 20% to <30% 30% to <40% ≥40%

SEAR D People with Diabetes Mellitus

	Male		Female		
Age (years)	Non-smoker	Smoker	Non-smoker	Smoker	SBP (mm Hg)

Age 70 — 180, 160, 140, 120
Age 60 — 180, 160, 140, 120
Age 50 — 180, 160, 140, 120
Age 40 — 180, 160, 140, 120

SEAR D People without Diabetes Mellitus

	Male		Female		
Age (years)	Non-smoker	smoker	Non-smoker	smoker	SBP (mm Hg)

Age 70 — 180, 160, 140, 120
Age 60 — 180, 160, 140, 120
Age 50 — 180, 160, 140, 120
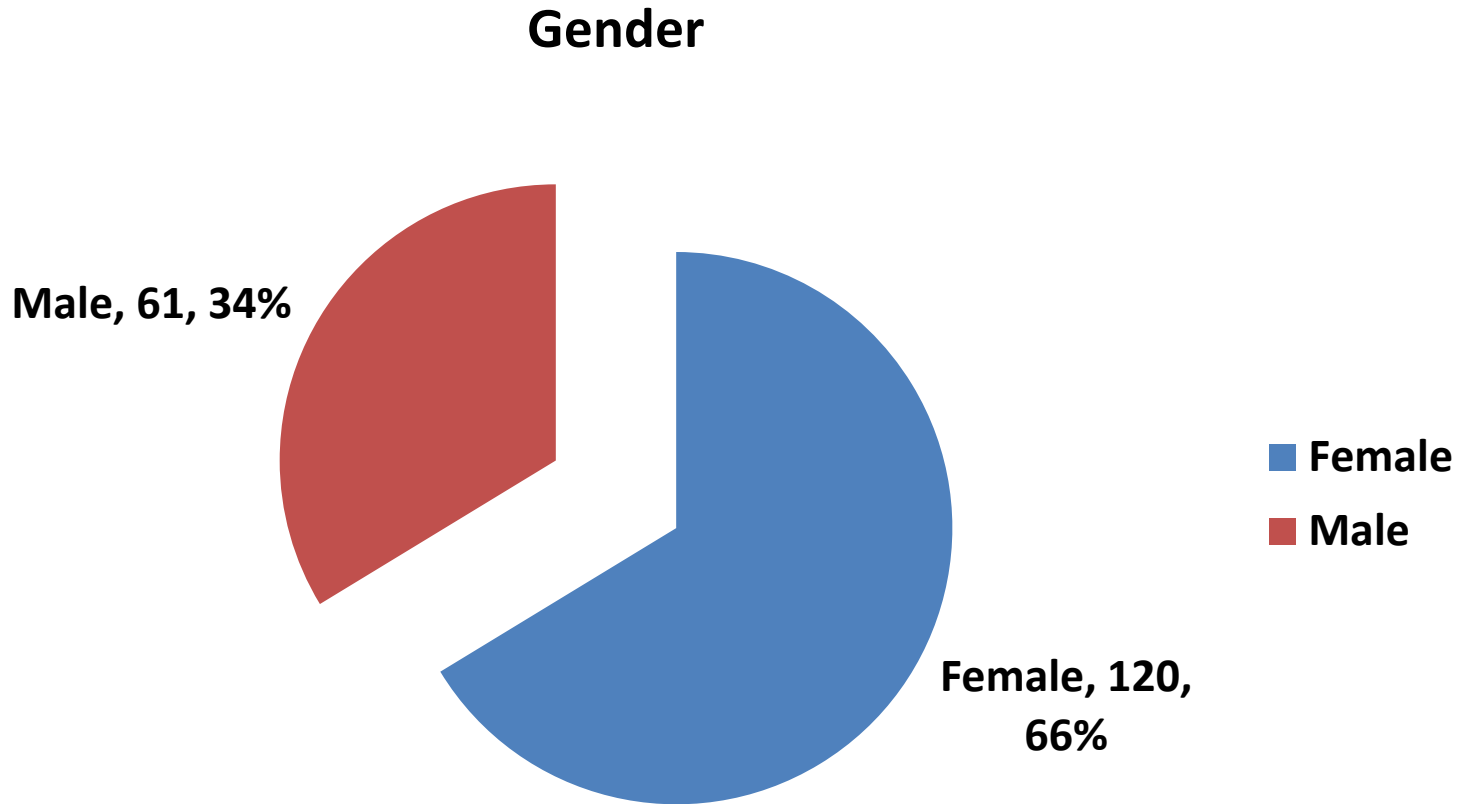Age 40 — 180, 160, 140, 120

Results

- General Observation
- In relation to cardiovascular risk prediction
  - Comparison Of Urban And Rural
  - Comparison Of Male And Female
  - Comparison Of Diabetics And Non Diabetics
 - Comparison in relation to tobacco and other

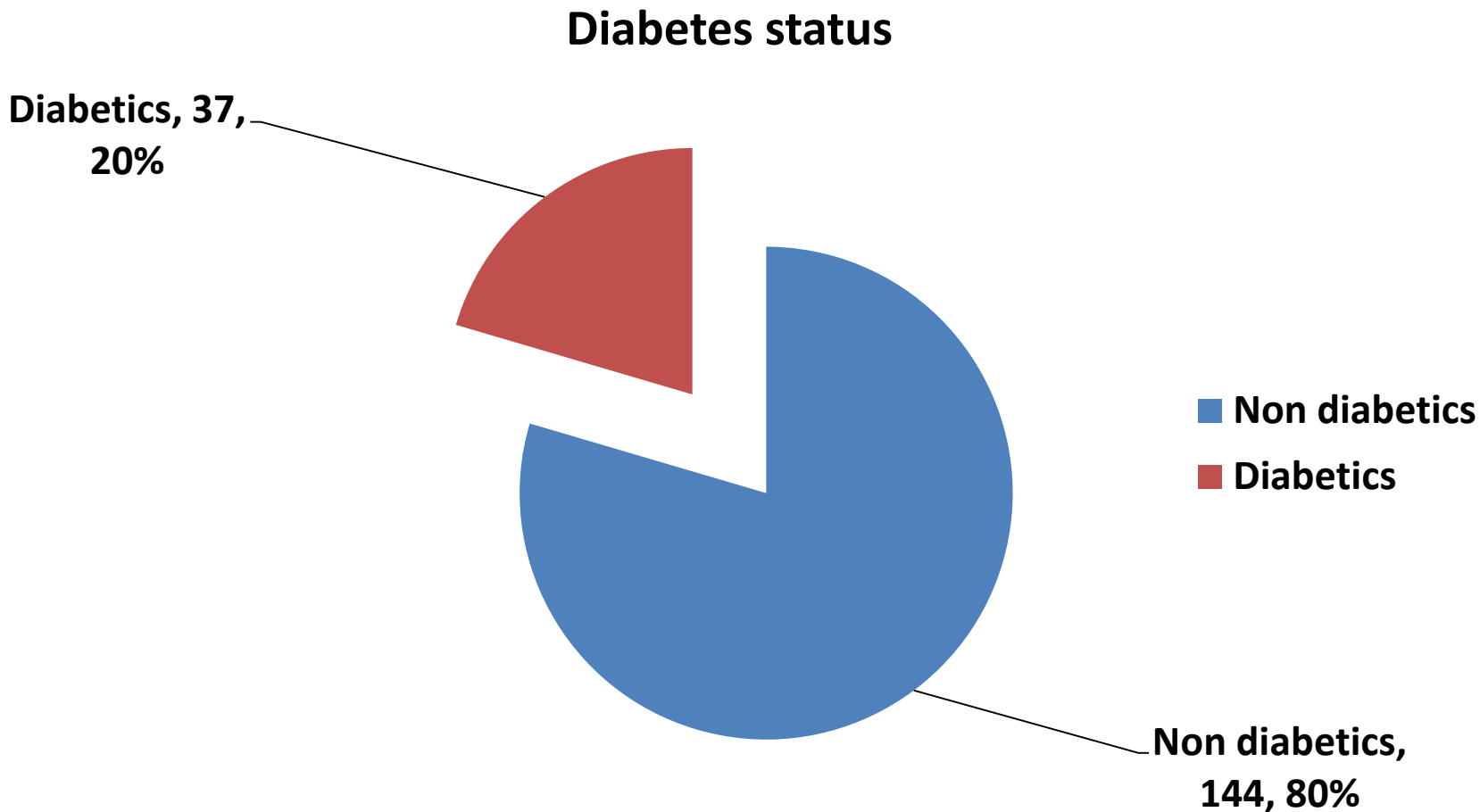Graph 1: Distribution Of Study Subjects Based On Location

Location

Rural, 54, 30%

Urban, 127, 70%

Urban

Rural
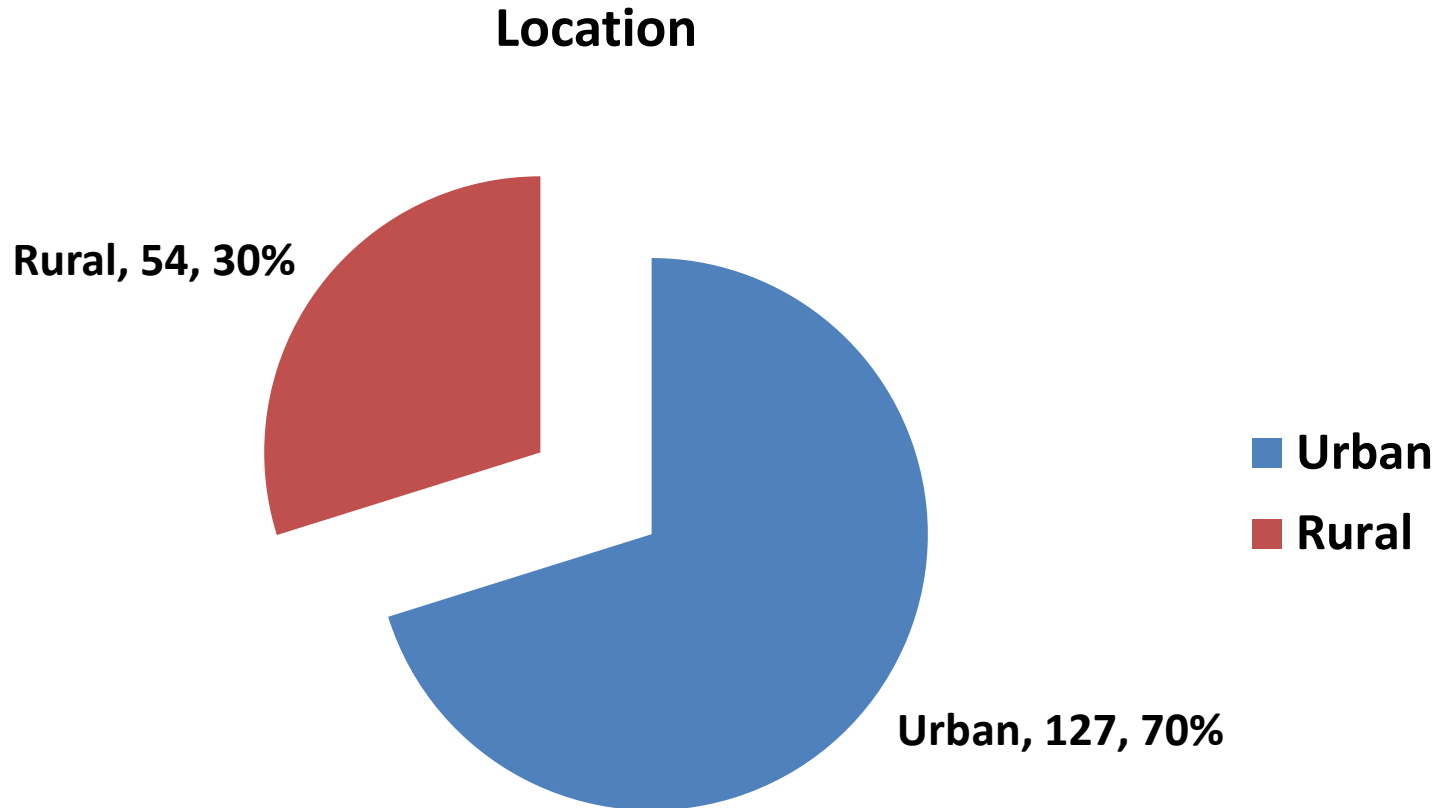
Graph 2: Distribution Of Study Subjects Based On Gender

Gender

Male, 61, 34%

Female, 120, 66%

■ Female
■ Male

Results

Graph 3: Distribution Of Study Subjects Based On Tobacco Consumption

Tobacco Consumption

Tobacco yes, 22, 12%

No Tobacco, 159, 88%

- **No Tobacco**
- **Tobacco yes**
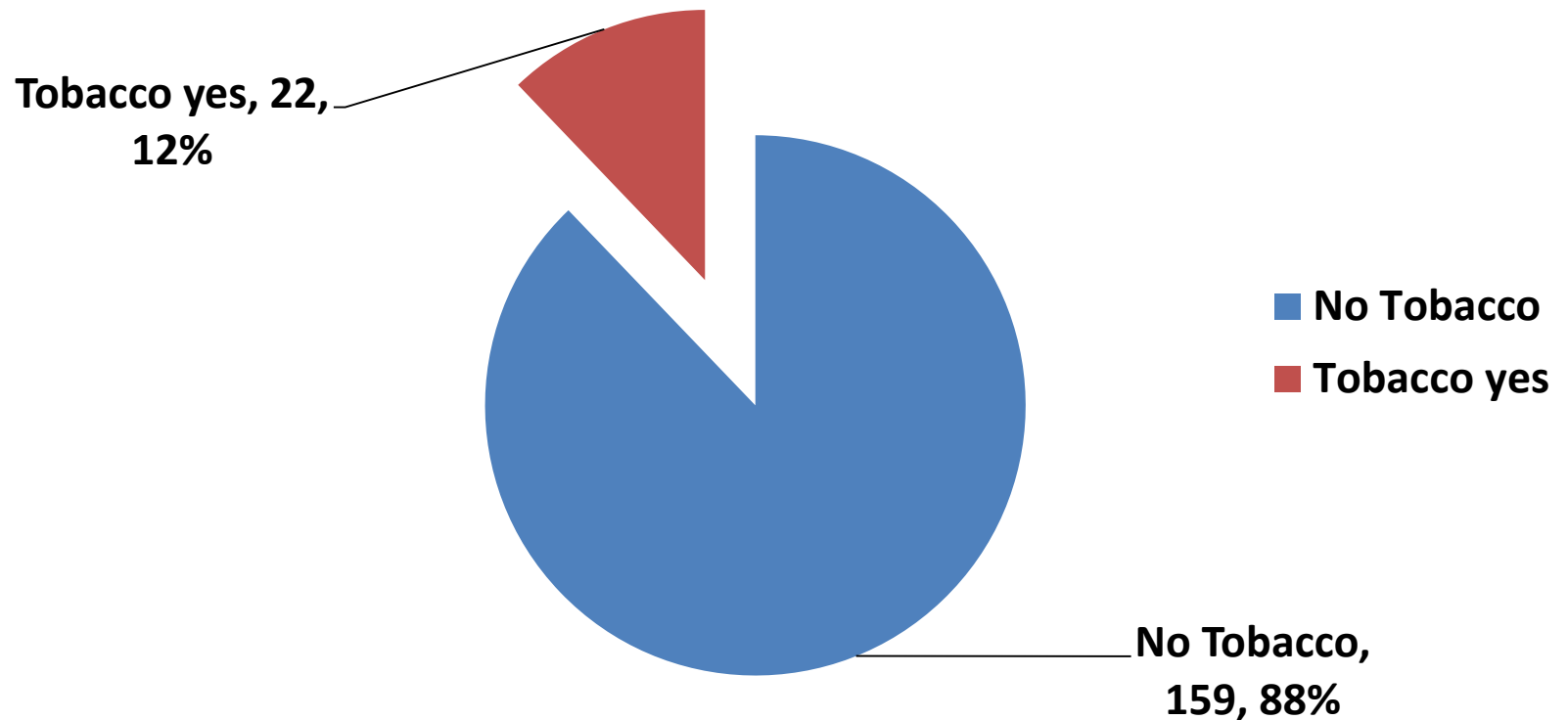
Graph 4: Distribution Of Study Subjects Based On Diabetes Status

Diabetes status

Diabetics, 37, 20%

Non diabetics, 144, 80%

■ Non diabetics
■ Diabetics

Results

Graph 5a: Distribution Of Study Subjects Based On Cardiovascular Risk

Cardiovascular risk

30 to 40 %, 3, 2%

> 40 %, 6, 3%

20 to 30 %, 14, 8%

10 to 20 %, 31, 17%

< 10 %, 127, 70%

- < 10 %
- 10 to 20 %
- 20 to 30 %
- 30 to 40 %
- > 40 %

Results
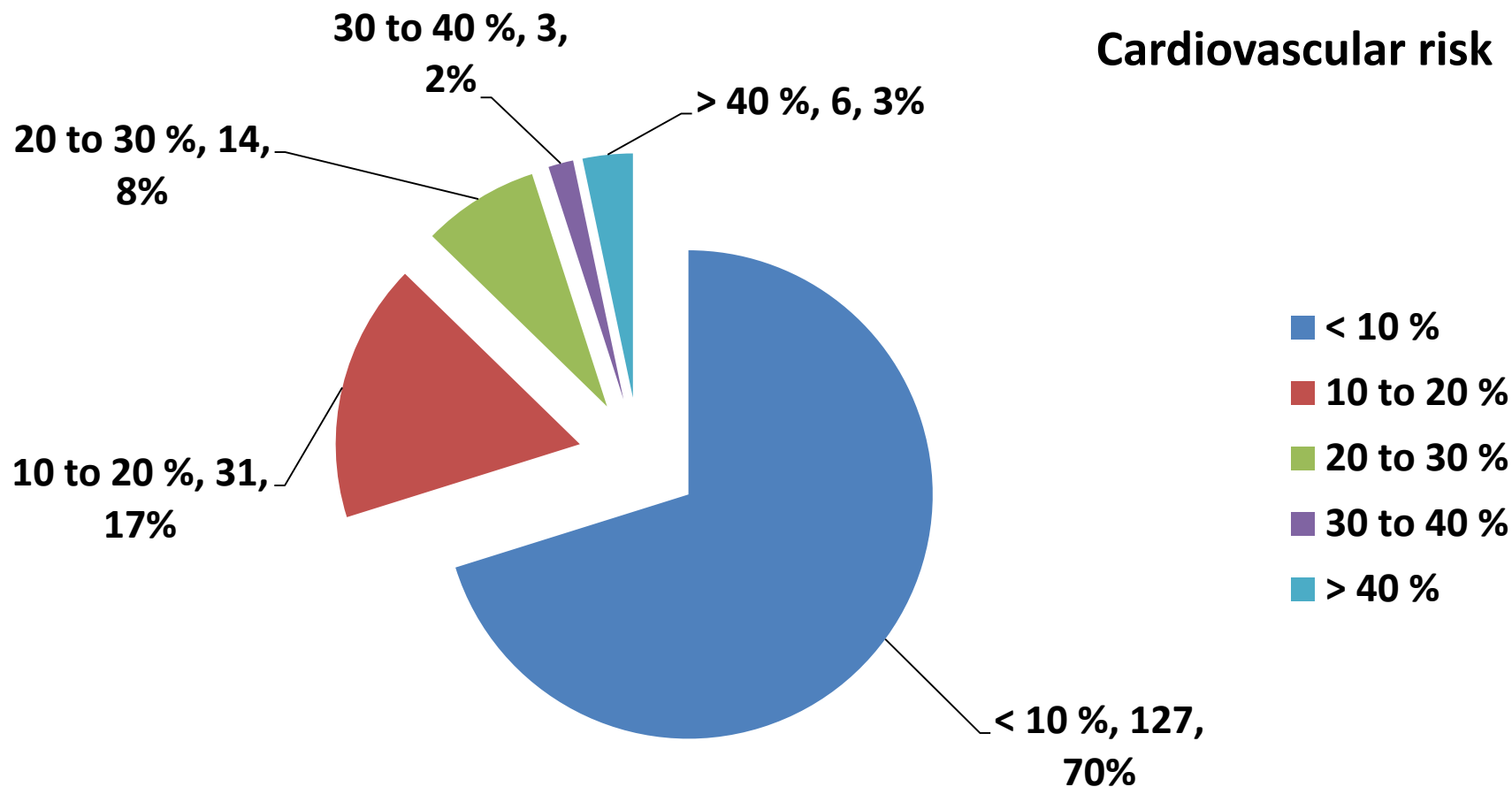
Graph 5b: Distribution Of Study Subjects Based On Cardiovascular Risk

Cardiovascular risk

Bar chart. Y-axis: 0 to 140 (increments of 20). X-axis categories with values:
- < 10 %, 127
- 10 to 20 %, 31
- 20 to 30 %, 14
- 30 to 40 %, 3
- > 40 %, 6
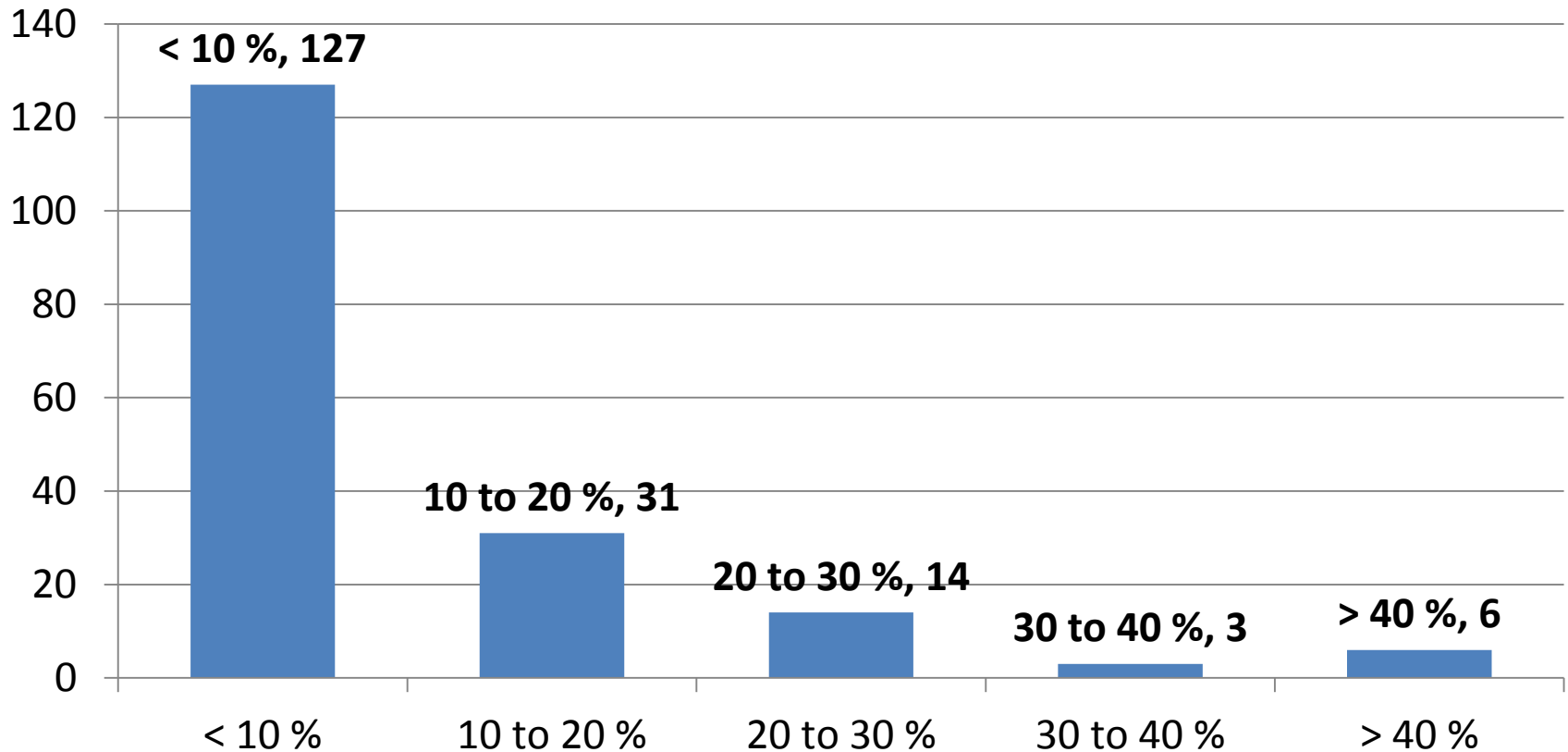
Graph 5c: Distribution Of Study Subjects Based On Cardiovascular Risk

Less than 20 %, 158
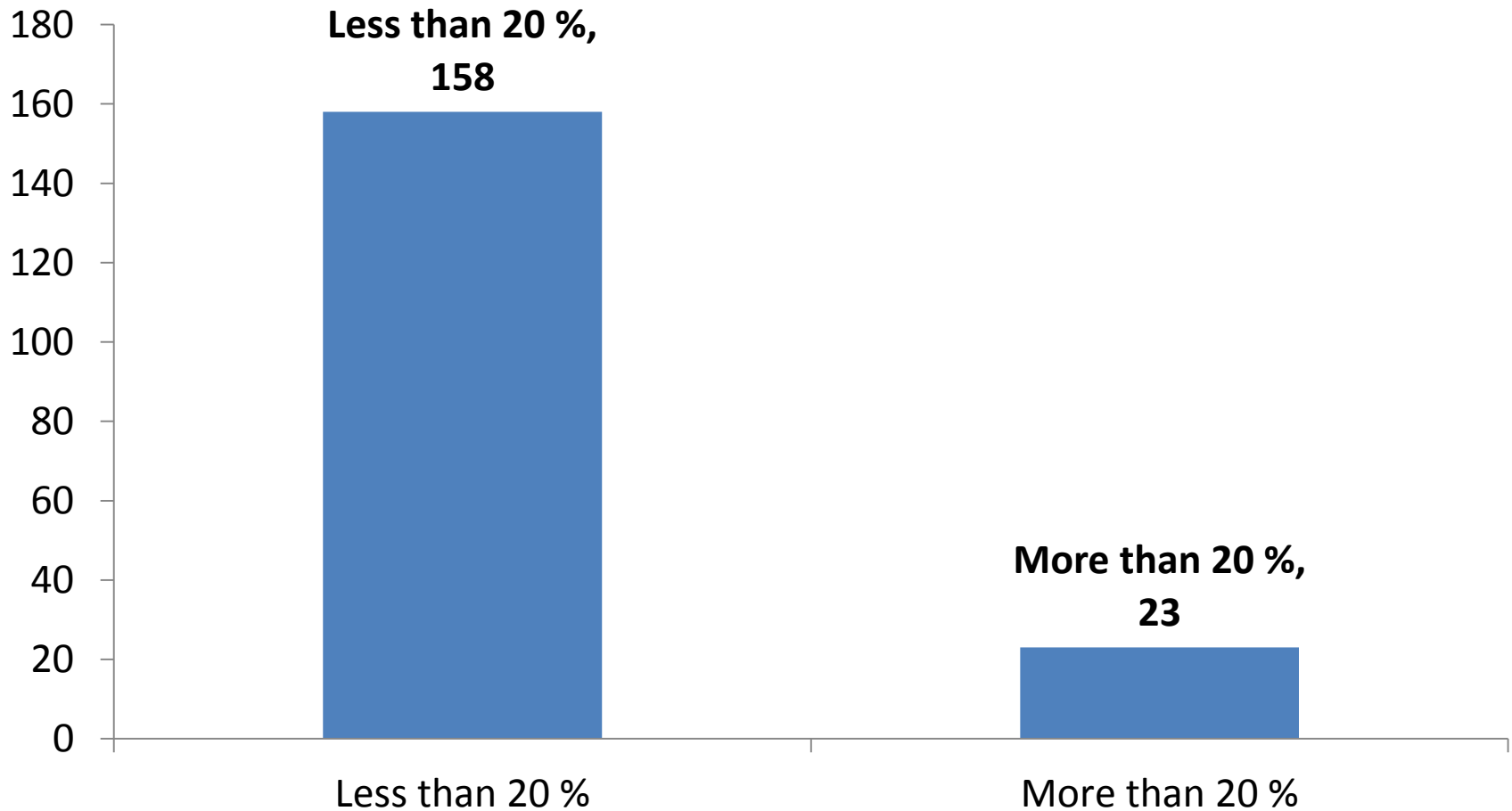
More than 20 %, 23

Graph 6: Urban-Rural Comparison Of Cardiovascular Risk
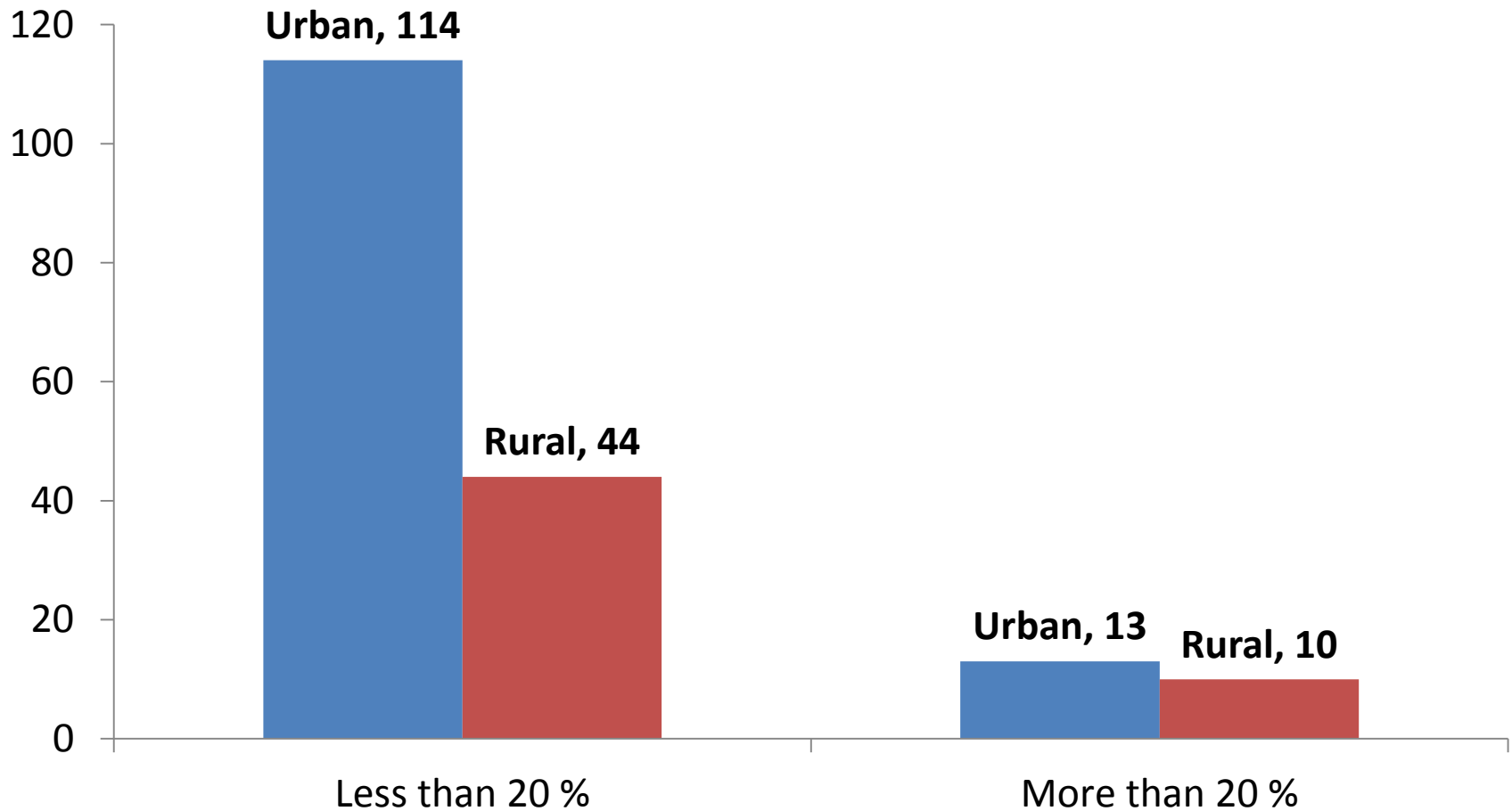
Table 1: Urban-Rural Comparison Of Cardiovascular Risk

	Urban	Rural	Total	P value > 0.05 Chi Square= 2.234 dF 1
Less than 20 %	114	44	158	
More than 20 %	13	10	23	
	127	54	181	

Graph 7: Gender Wise Comparison Of Cardiovascular Risk
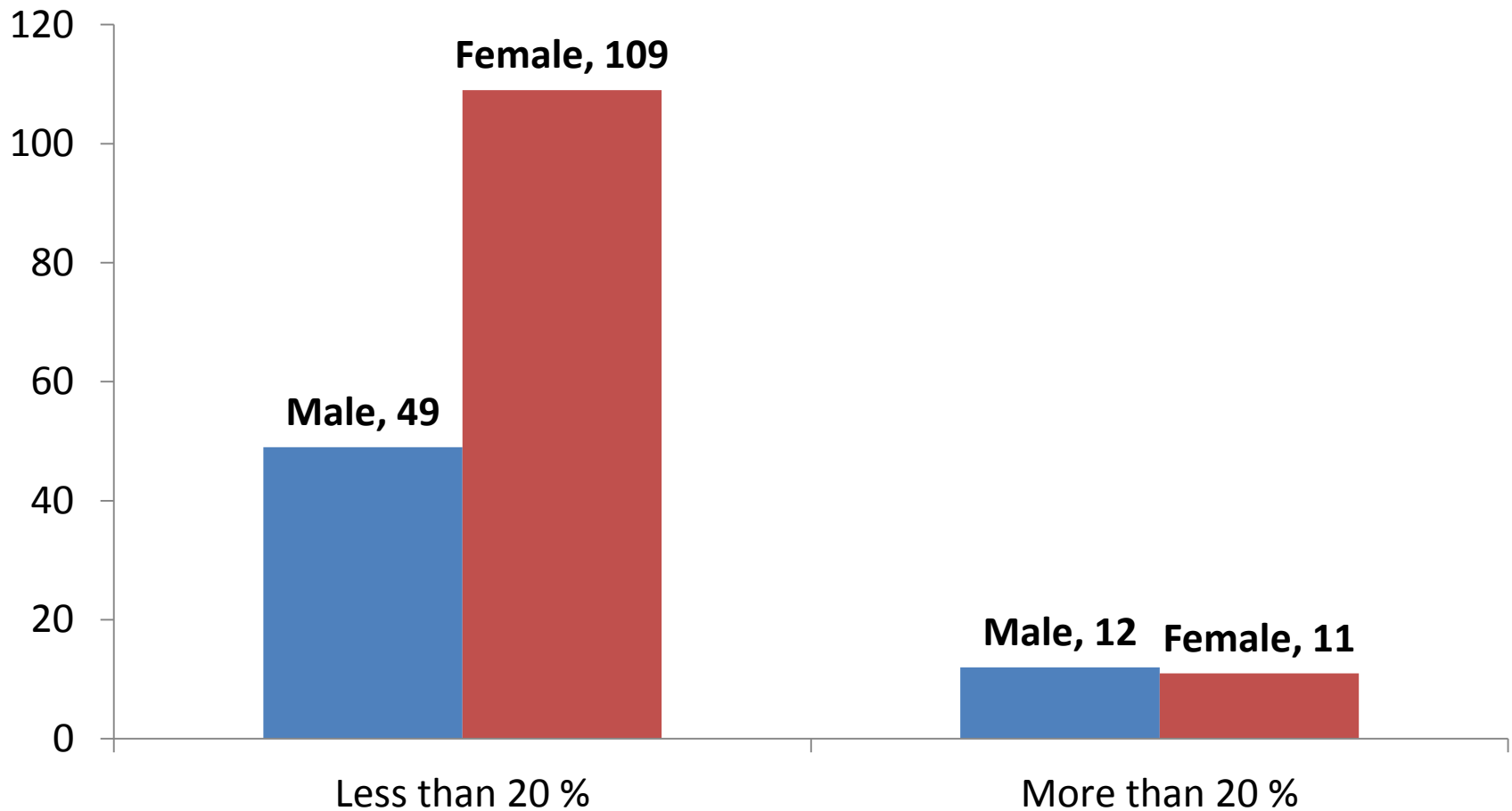
Table 2: Gender Wise Comparison Of Cardiovascular Risk

	Male	Female	Total	P value < 0.05 Chi Square= 4.024 dF 1
Less than 20 %	49	109	158	
More than 20 %	12	11	23	
	61	120	181	

Results

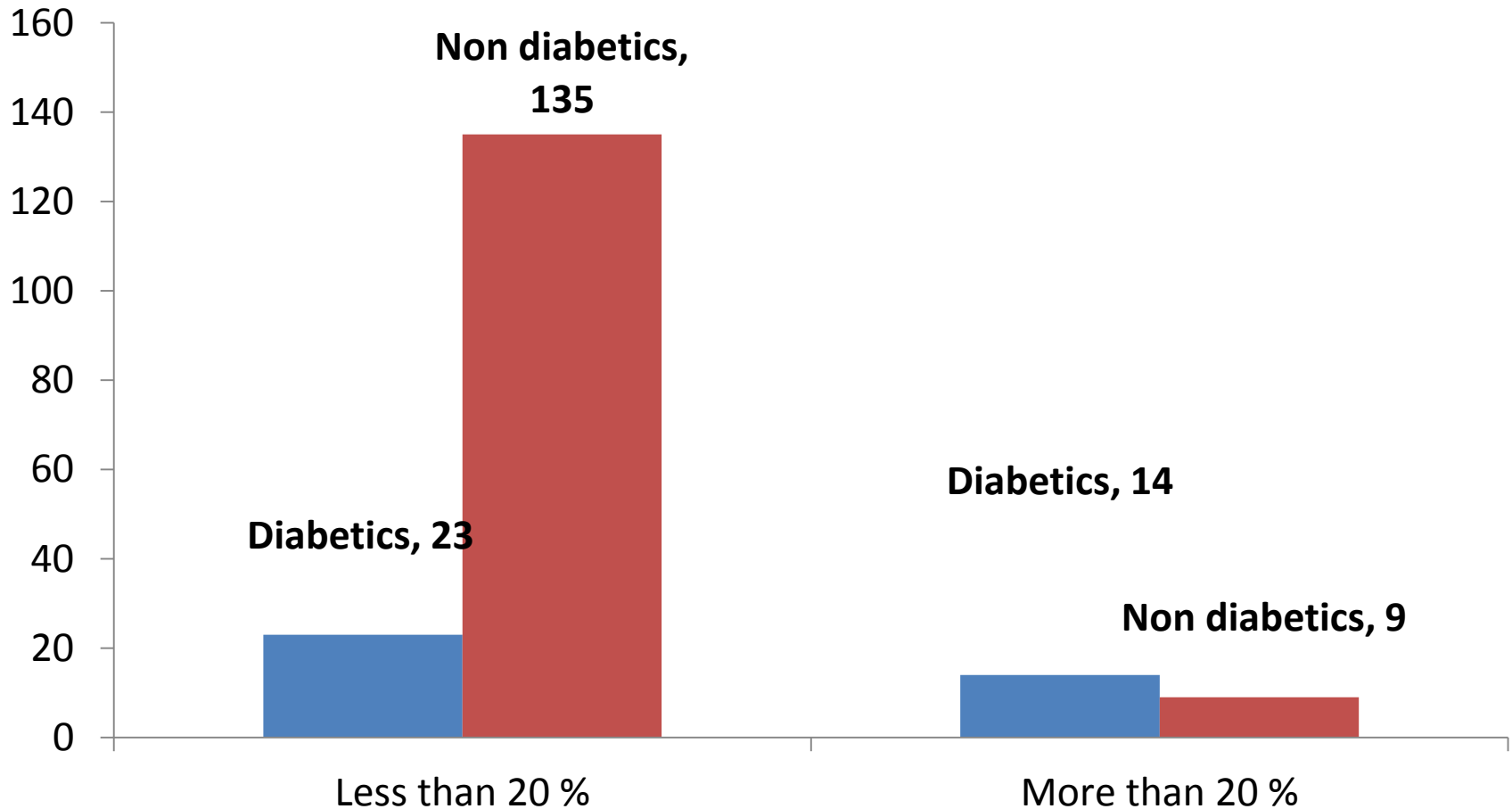# Graph 8: Comparison Of Cardiovascular Risk Based on Diabetes Status

Table 3: Comparison Of Cardiovascular Risk Based on Diabetes Status

	Diabetics	Non diabetics	Total	P value < 0.05 Chi Square= 26.479 dF 1
Less than 20 %	23	135	158	
More than 20 %	14	9	23	
	37	144	181	

Results

Graph 9: Comparison Of Cardiovascular Risk Based on Tobacco Consumption

No Tobacco, 145

Consume tobacco, 9

Consume tobacco, 13

No Tobacco, 14
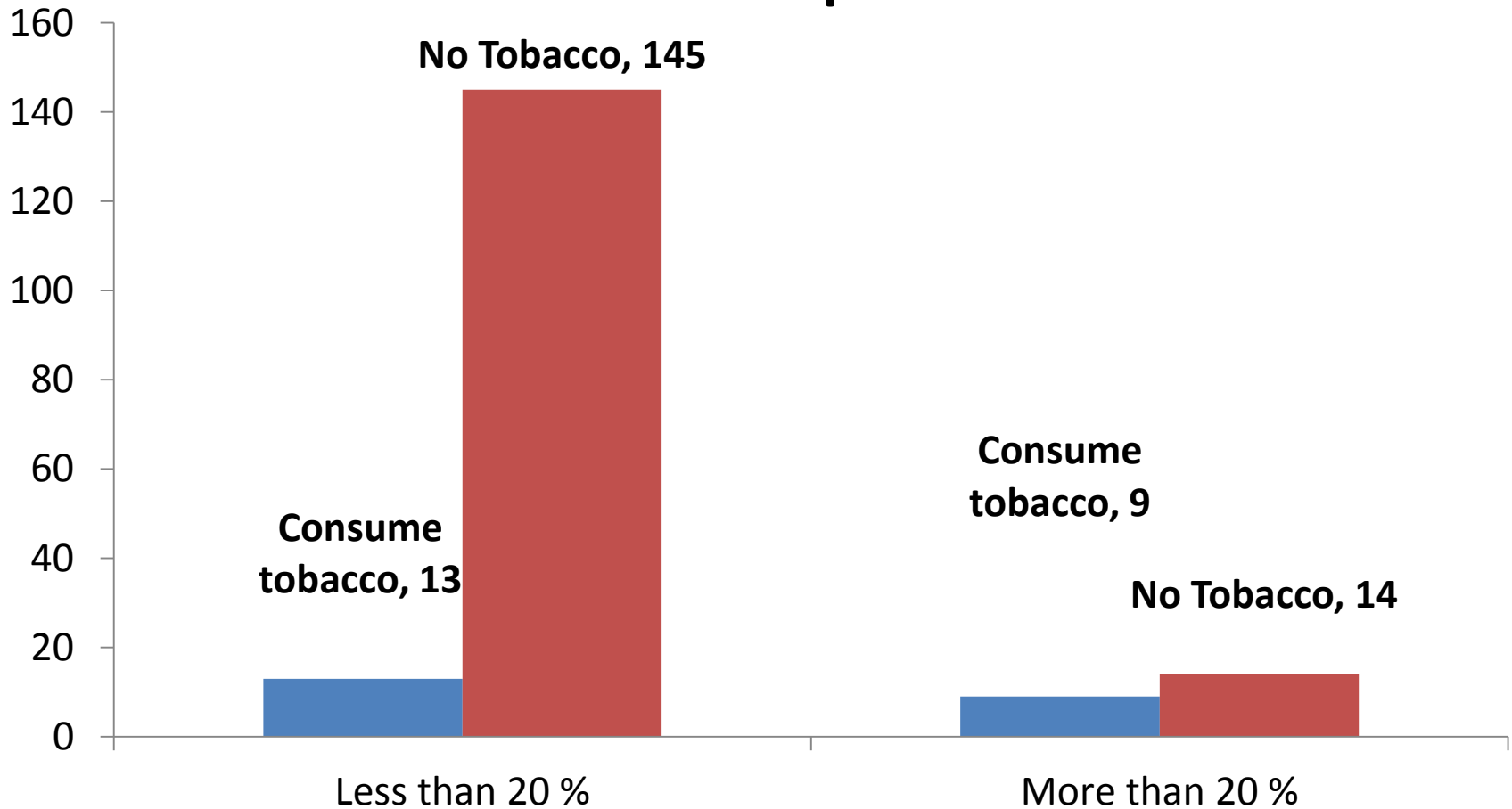
Less than 20 %

More than 20 %

Results

Table 4: Comparison Of Cardiovascular Risk Based on Tobacco Consumption

	Consume tobacco	No Tobacco	Total	P value < 0.05 Chi Square= 17.957 dF 1
Less than 20 %	13	145	158	
More than 20 %	9	14	23	
	22	159	181	

Discussion

- Risk of cardiovascular event increases
  - Age
  - Gender
  - Diabetes
  - Smoking
  - Waist Hip Ratio
  - Hypertension
  - Location

- Studies from India and Abroad

Conclusion

- Categorizing people as low (<10%)/moderate (10%-20%)/high (>20%) risk is one of the crucial steps to mitigate the magnitude of cardiovascular fatal/non-fatal outcome

- Risk increase is compounded by modifiable and non modifiable factor.

- Diabetes management- cardiovascular risk counselling.

Recommendations

- WHO/ISH Risk Prediction Chart
  - Evidence based
  - Simple tool
  - Used in community setting
  - Training
  - Counselling

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