

Non-Communicable Diseases



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Non-Communicable Diseases

Non-Communicable Diseases (NCDs) contribute significantly to adult mortality and morbidity and impose a heavy economic burden on individuals, societies and health systems within Pakistan. NCDs and Injuries are amongst the top ten causes of mortality and morbidity within the country,⁶⁶ and estimates indicate that they account for approximately 54.9% of the total deaths.⁶⁷

The surveillance of chronic diseases and reporting indicators to monitor them is inherently different from infectious disease surveillance. Complexities in the diagnosis of chronic diseases at the population level necessitate surveillance of risk factors rather than diseases; this is a valid approach from a practical perspective also, given that the timeline involved in the risk-exposure relationship also provides a window of opportunity to institute appropriate preventive interventions. In addition, more than reliance on 'acute' parameters primarily from facility sources, there is greater reliance on sequential population-based surveys powered to detect changes in the level of risk factors over time.⁶⁸

This document, therefore, reports key NCD risk factors. These include information on common lifestyle-related risks such as *tobacco use, fruit and vegetable intake, physical activity* on the one hand, and biological risks inclusive of *Diabetes, High Blood Pressure, Hypercholesterolaemia and Obesity*, on the other. In addition, data on *Coronary Artery Disease, Stroke, Chronic Bronchitis, Cancer and Renal Diseases* are also presented herewith.

These data suffer from several limitations. Firstly, incidence data is available for cancers only. Secondly, the nationally representative prevalence data for Diabetes, Renal Diseases and Chronic Bronchitis is more than 10 years old. Thirdly, there is the issue of representativeness; prevalence data for Coronary Artery Disease has been reported from the results of a survey conducted in one city (Karachi) of the country, whereas data on prevalence of Stroke come from a survey carried out on a particular ethnic community within that city only.^{69,70} Clearly, these data cannot be extrapolated to the rest of the country but are being included herewith

66. Hyder AA, Morrow RH. Lost Healthy Life Years in Pakistan in 1990. *Am J Public Health* 2000;90(8):1235-40

67. Federal Bureau of Statistics, Statistics Division. Pakistan Demographic Survey 2003. Islamabad, Pakistan: Government of Pakistan; 2003

68. Nishtar S, Bile KM, Ahmed A, Faruqi AMA, Mirza Z, Shera S, et al. Process, Rationale, and Interventions of Pakistan's National Action Plan on Chronic Diseases. *Prev Chronic Dis* 2006;3(1):A14. Epub 2005 Dec 15

69. Jafar TH, Jafary FH, Jessani S, Chaturvedi N. Heart Disease Epidemic in Pakistan: Women and Men at Equal Risk. *Am Heart J* 2005;150:221-6

70. Jafar TH. Blood Pressure, Diabetes, and Increased Dietary Salt Associated with Stroke – Results from a Community-based Study in Pakistan. *J Hum Hyperten* 2006;0:1-3

as these are the only prevalence data available at the moment. In addition to giving some indication about prevalence, these data also point to the need for instituting appropriate steps to bridge the current gaps in data collection in key areas.

Data from the National Health Survey conducted in 1994 was used to report *Hypertension* indicators in this document.⁷¹ Even though these data are almost 10 years old, they are the only nationally representative data available. For *Hypercholesterolaemia*, the National Health Survey 1994 was not used because it did not use fasting blood samples for biochemical analysis; conversely, data from a cross-sectional survey conducted in one city (Karachi) was used which, notwithstanding issues of representativeness, is the only available population-based data on *Hypercholesterolaemia*. For smoking, data included here with this from the NAP-NCD First Round of Surveillance because it allows the separation of 'smoking cigarettes' from the 'use of smokeless tobacco' and additionally, has data on passive smoking.⁷² In addition, data on diet, physical activity, central obesity and obesity have also been taken from the same source. The NAP-NCD First Round of Surveillance used a two-staged stratified sample design and at the time of publication of this document, these data were not in the public domain; however, the methodology of this survey has been published.⁷³

The public health response to Non-Communicable Diseases within the country has been organized by a tripartite public-private partnership collaboration within the framework of the National Action Plan for the Prevention and Control of Non-Communicable Diseases and Health Promotion in Pakistan;⁷⁴ though the programme has made steady progress over the last two years, its implementation has highlighted a number of operational challenges, which stem from lack of procedural clarity in relation to the manner in which the public and private sectors should interface in a participatory mode. These need to be bridged as a priority in order to orient the programme to the intended scale of response, given the huge burden of NCDs.⁷⁵ With respect to data-gathering on NCDs, the NAP-NCD First Round of Surveillance was limited to one district of the country (Rawalpindi: total population 3.37 million) due to resource constraints. In line with recent recommendations, there is a need to expand the scope of NCD surveillance to a national level. Furthermore, Non-Communicable Diseases and Injuries information must also be supported by other data systems.⁷⁶

71. Pakistan Medical Research Council. National Health Survey of Pakistan 1990-94, Islamabad, Pakistan: Pakistan Medical Research Council, Network Publication Service, 1998

72. Nishtar S. Population-based Surveillance of Non-Communicable Diseases: 1st Round, 2005 Islamabad, Pakistan: Heartfile, Ministry of Health, Pakistan and WHO; 2006

73. Nishtar S, Bile KM, Ahmed A, Amjad S, Iqbal A. Integrated Population-based Surveillance of Non-Communicable Diseases – the Pakistan Model. *Am J Prev Med* 2005 29(5 Suppl 1):102-6

74. Nishtar S. Lessons in Tackling Chronic Diseases. *BMJ* 2006;333:820

75. Nishtar S. Prevention of Non-Communicable Diseases in Pakistan: an Integrated Partnership-based Model. *Health Res Policy Syst* 2004;2(1):7

76. The World Bank. Pakistan: Public Health Surveillance System – a Call for Action.

Islamabad, Pakistan: Ministry of Health, World Bank, Centers for Disease Control, WHO; 2005

Common Risks for NCDs



Image: courtesy of Ms. Shahina Macboob

Risks for Non-Communicable Diseases

Smoking

A number of surveys have been conducted at various points in time in Pakistan to determine the prevalence of tobacco use as stand-alone assessments or as part of other knowledge, attitude and practice and larger population-based assessments. However, due to varying definitions, differences in evaluation methodologies, instruments, and the geographic confines of the surveys, their results are not strictly comparable. For example, 10 years ago, the National Health Survey showed that tobacco was consumed by 54% men and 20% women.⁷⁷ However, the definition of tobacco included the use of all forms of tobacco. More recently, the NAP-NCD First Round of Surveillance has shown a prevalence of 33% in men and 4.7% in women. However, the definition does not include other forms of tobacco use and even if these are included, prevalence still stands lower at 41.1% in men and 6.9% in women.⁷⁸ Given that both these surveys used the same sampling technique, it could have been inferred that there has been a decline in smoking prevalence. However, stating that would be presumptuous, given the geographic differences in both surveys (the earlier one being national and the latter one being regional), methodological differences and subtle incomparabilities in the assessment tools and definitions.

Diet and physical activity

The NAP-NCD First Round of Surveillance was the first survey for collection of population-based data on diet and physical activity using validated instruments according to parameters useful for gauging chronic disease-related risk behaviours. The data presented here with show that more than 65% of the urban and 79% of the rural population takes less than one serving of fruit per day and that more than 90% of Pakistan's population consumes less than two servings of vegetables per day. These trends are clearly instructive for potential interventions in the area of NCD prevention in terms of behaviour modification on the one hand, and policy interventions to make fruits and vegetables more affordable and accessible, on the other.

The NAP-NCD First Round of Surveillance assessed levels of physical activity with the GPAQ instrument where an individual is labeled either as being *moderately active*, *vigorously active* or *inactive* according to a predetermined set of criteria in an instrument, which determines level of physical activity in three domains – during

77. Pakistan Medical Research Council. National Health Survey of Pakistan (1990-94). Islamabad, Pakistan: Ministry of Health, Government of Pakistan; 1994

78. Nishtar S. Population-based Surveillance of Non-Communicable Diseases: 1st Round, 2005. Islamabad, Pakistan: Heartfile, Ministry of Health, Pakistan and WHO; 2006

leisure, at work and during transport. Data presented herewith show a completely opposite trend compared to what is seen in the West. In the transport domain, more than 88% of the population in both the rural and urban areas was active. However, in the leisure domain, more than 90% of the population reported to be inactive. The latter flags a public health issue, which must be the focus of concerted action.

Obesity

The National Health Survey of Pakistan (1990-94) used the WHO criteria for defining Obesity in Pakistan; overweight in adults was defined as BMI ≥ 25 and Obesity was defined as a BMI ≥ 30 . While this is generally accepted internationally, the WHO Regional Office for the Western Pacific and the International Obesity Task Force recommend lower cut-off points for Asians; this is based on studies demonstrating increased risk of co-morbidities at lower BMIs in Asians, who tend to accumulate abdominal fat at lower BMIs. According to the Asian criteria, overweight is defined as a BMI ≥ 23 and Obesity as a BMI ≥ 25 . In view of this, it is now clear that the use of lower cut-off points in the National Health Survey of Pakistan would have reclassified a greater proportion of the Pakistani population as overweight.

Data on Obesity in this document come from the NAP-NCD First Round of Surveillance, according to which Obesity has been defined according to the WHO as well as the Asian criteria. According to the former, more than 28.4% of the urban population and 23.3% of the rural population in the district of Rawalpindi was labeled as being overweight whereas 17.4% and 7.9% in the rural and urban areas respectively, were found to be obese. Thus, a total of 45.8% in the urban and 31.2% in the rural areas were above the normal body weight. With the Asian criteria, figures were much higher: 62.6% urban and 48.6% rural population were labeled as being overweight.

These same sources also provided data for central obesity according to the criteria: waist circumference of ≥ 80 cm for females and ≥ 90 cm for males. According to this, 34.2% males and 60% females in the urban areas and 35.7% males and 55.5% females in the rural areas are reported to have central obesity. This is a grave trend since central obesity is a more important risk factor for coronary heart disease than total body adiposity, and is more closely associated with cardiovascular disease risk factors studied than overall adiposity as measured by BMI in studies on the Pakistani population.⁷⁹

79. Nishtar S, Wierzbicki AS, Lumb P, Hammill ML, Turner CN, Cook MA, et al. Low HDL and Waist Hip Ratio Predict the Risk of Coronary Artery Disease in Pakistanis. *Curr Med Res Opin* 2004;20(1):55-64

Hypercholesterolaemia

The National Health Survey of Pakistan (1990-94) defined high cholesterol as a random blood cholesterol of at least 200mg/dl and above; based on this definition, it reported high cholesterol in 20% of the population over 15 years of age. Although this is the only nationally representative data on cholesterol levels, it is not being used here because of its use of non-fasting blood samples. This document reports total cholesterol from a population-based cross-sectional survey on randomly selected adults aged over 40 years. The survey used fasting serum cholesterol greater than 200 mg/dl as the definition of hypercholesterolemia and based on this, overall, 34.7% of the population was labeled as hypercholesterolemic. Since biochemical analysis was not part of the NAP-NCD First Round of Surveillance due to resource constraints, therefore, a mechanism to report it on a nationally representative population sample should be determined for its periodic reporting. The inclusion of cholesterol profiles in the Second National Health Survey of Pakistan, which is currently in the planning phase, seems to be a viable option.

Hypertension

Data on Hypertension in this document come from the National Health Survey (1990-94) which used the older JNC 6 definition (≥ 140 and/or 90 mmHg) for labeling a person as being hypertensive. According to this survey, 17.9% of the population over the age of 15 years and 33% over the age of 45 years were labeled as hypertensive. A similar prevalence (15% over the age of 18 years and 36% over the age of 45 years) was reported by another survey conducted in the Northern Areas of Pakistan.⁸⁰ The more recent NAP-NCD First Round of Surveillance additionally reports high blood pressure according to the new JNC 7 criteria. Even using the stringent new criteria for blood pressure (normal blood pressure defined as systolic blood pressure of 120 and diastolic blood pressure of less than 80 mmHg), more than 24.3% of the population over the age of 18 years is reported to have high blood pressure in the district of Rawalpindi. High prevalence of high blood pressure is an important proxy indicator of the burden of NCDs in a population and reiterates the need to rethink the rationale for current resource allocation patterns in public health in Pakistan.

80. Shah SM, Luby S, Rahbar M, Khan AW, McCormick JB. Hypertension and its Determinants among Adults in High Mountain Villages of the Northern Areas of Pakistan. *J Hum Hypertens* 2001;15(2):107-12

Indicator:  **NCD 1. Prevalence of smoking**

Definition: Percentage of the population smoking tobacco (cigarettes, *beeri*, *hukka*) on a daily or occasional basis vis-à-vis those who smoked in the past and those who never smoked^a.

Chart NCD 1. Prevalence of smoking – by place of residence and gender^a

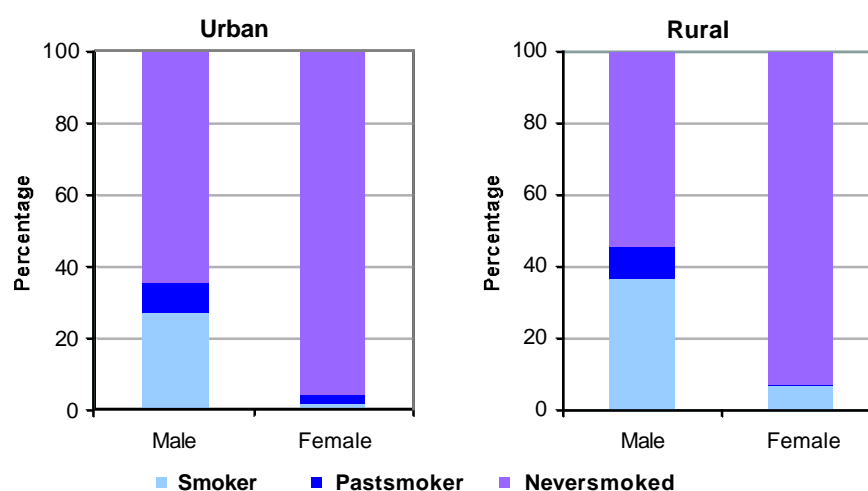


Table NCD 1. Prevalence of smoking – by place of residence and gender^a

SmokingStatus	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Smoker	27.3	1.7	11.8	36.6	6.5	19.7
Past Smoker	8.4	2.2	4.6	9.1	0.2	4.1
NeverSmoked	64.3	96.1	83.6	54.3	92.9	76.1

a. Heartfile. Population-based Surveillance of Non-Communicable Diseases 1st Round, 2005. Islamabad, Pakistan: Heartfile, Ministry of Health and World Health Organization; 2006.

Indicator:  **NCD 2. Prevalence of smokeless tobacco use**

Definition: Percentage of the population using smokeless tobacco (*naswar*) on a daily or occasional basis vis-à-vis those who used it in the past or those who never used it ^a.

Chart NCD 2. Prevalence of smokeless tobacco use – by place of residence and gender ^a

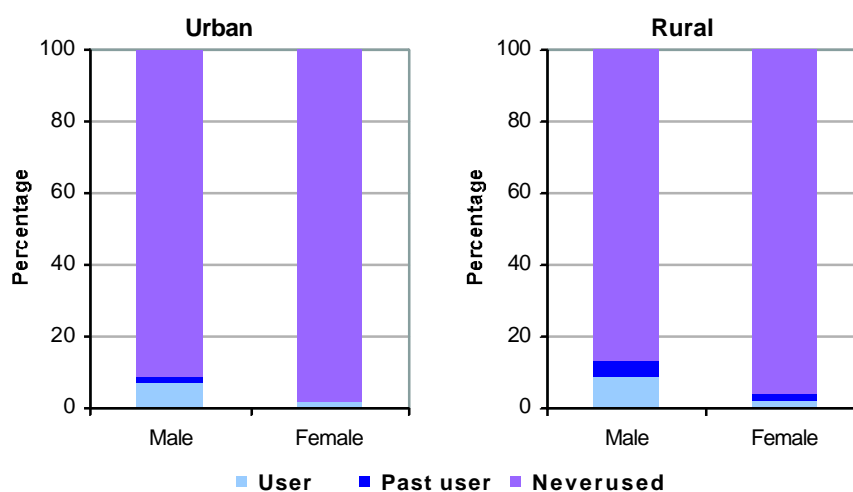


Table NCD 2. Prevalence of smokeless tobacco use – by place of residence and gender ^a

Smokeless Tobacco Use	Urban			Rural		
	Male	Female	Total	Male	Female	Total
User	7.3	1.4	3.7	8.9	2.4	5.2
Past User	1.5	0.5	0.9	4.3	1.7	2.8
Never Used	91.1	98.0	95.4	86.8	95.9	91.9

a. Heartfile. Population-based Surveillance of Non-Communicable Diseases: 1st Round, 2005. Islamabad, Pakistan: Heartfile, Ministry of Health and World Health Organization; 2006.

Indicator:  **NCD 3. Prevalence of passive smoking**

Definition: Percentage of the population exposed to passive smoking on a daily or occasional basis vis-à-vis those who are never exposed^a.

Chart NCD 3. Prevalence of passive smoking – by place of residence and gender^a

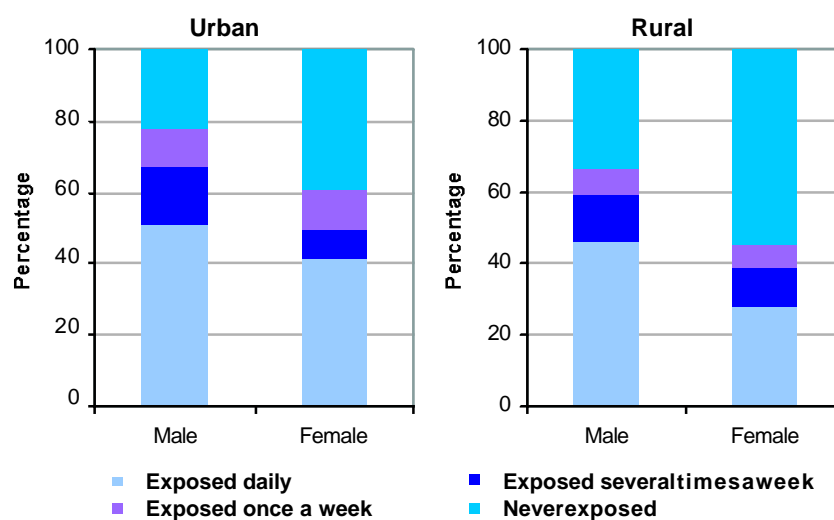


Table NCD 3. Prevalence of passive smoking – by place of residence and gender^a

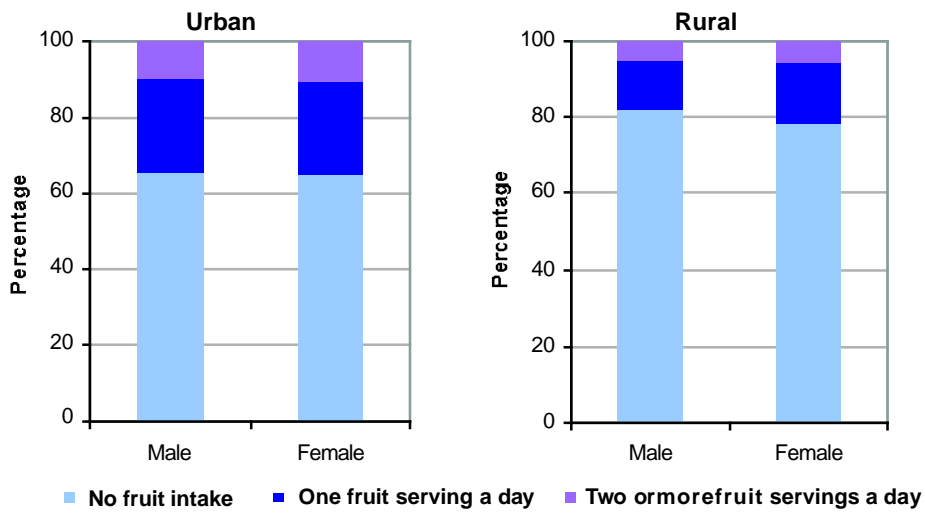
ExposureStatus	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Exposed daily	50.9	41.5	45.5	46.6	28.1	36.6
Exposed several times a week	16.6	8.0	11.6	12.5	10.3	11.3
Exposed once a week	10.4	11.3	10.9	7.2	6.8	7.0
Never exposed	22.1	39.2	32.0	33.7	54.7	45.1

a. Heartfile. Population-based Surveillance of Non-Communicable Diseases: 1st Round, 2005. Islamabad, Pakistan: Heartfile, Ministry of Health and World Health Organization; 2006.

Indicator:  **NCD 4. Number of fruit and vegetable servings consumed per day**

Definition: Percentage of the population consuming different portions of fruits and vegetables per day. Portions for fruits were calculated based on the STEPS nutrition module, in which the number of servings per day was calculated using the following: total fruits per week multiplied by the number of fruits in a serving and then dividing it by 7 (number of days in a week). Portions for vegetables were also calculated similarly⁸¹.

Chart NCD 4a. Number of fruit servings consumed per day – by place of residence and gender ^a



81. World Health Organization. STEPS Instruments for NCD Risk Factors (Version 1.4). Geneva, Switzerland: 2003. http://www.who.int/ncd_surveillance (accessed Sept. 2006)

Chart NCD 4b. Number of vegetable servings consumed per day – by place of residence and gender^a

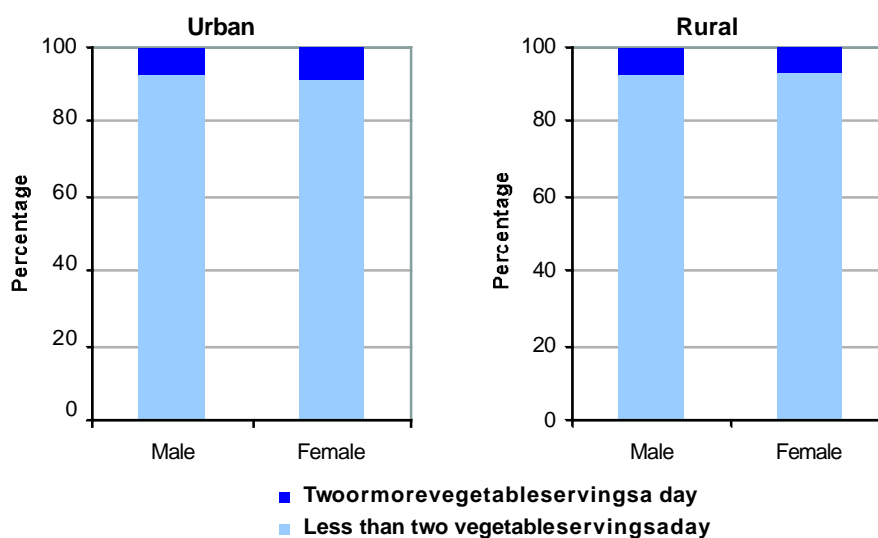


Table NCD 4a&b. Percentage of the population consuming various servings of fruits and vegetables per day – by place of residence and gender^a

Fruit Intake	Urban			Rural		
	Male	Female	Total	Male	Female	Total
No intake	65.3	65.1	65.2	81.6	78.6	79.9
1 serving a day	25.1	24.1	24.5	13.3	15.7	14.6
2 or more servings a day	9.6	10.8	10.3	5.1	5.7	5.4
Vegetable Intake						
Less than 2 servings a day	93.1	91.1	91.9	92.6	92.8	92.7
2 or more servings a day	6.9	8.9	8.1	7.4	7.2	7.3

a. Heartfile. Population-based surveillance of non-communicable diseases: 1st round, 2005. Islamabad, Pakistan: Heartfile, Ministry of Health and World Health Organization; 2006.

Indicator:  NCD 5. Percentage of physically active population

5a. Physically active during work

Definition: Percentage of the population physically active during work, based on the GPAQ STEPS module⁸².

Chart NCD 5a. Level of physical activity during work – by place of residence^a

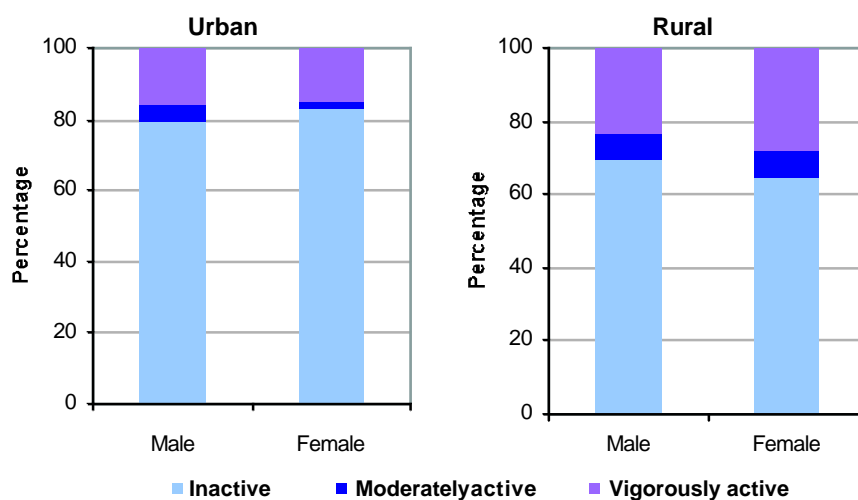


Table NCDs 5a. Level of physical activity during work, expressed in degree of activity i.e., inactive, moderate and vigorously active – by place of residence^a

Degree of Physical Activity	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Inactive	79.2	83.0	81.5	69.4	64.3	66.5
Moderately active	5.0	2.0	3.2	7.0	8.0	7.6
Vigorously active	15.8	14.9	15.3	23.6	27.7	25.9

82. World Health Organization. STEPS Instruments for NCD Risk Factors (Version 1.4). Geneva, Switzerland: 2003. available at the URL http://www.who.int/ncd_surveillance (accessed Sept. 2006)

5b. Physically active for transport

Definition: Percentage of the population physically active for transport, based on the GPAQ STEPS module^a.

Chart NCD 5b. Level of physical activity for transport – by place of residence^a

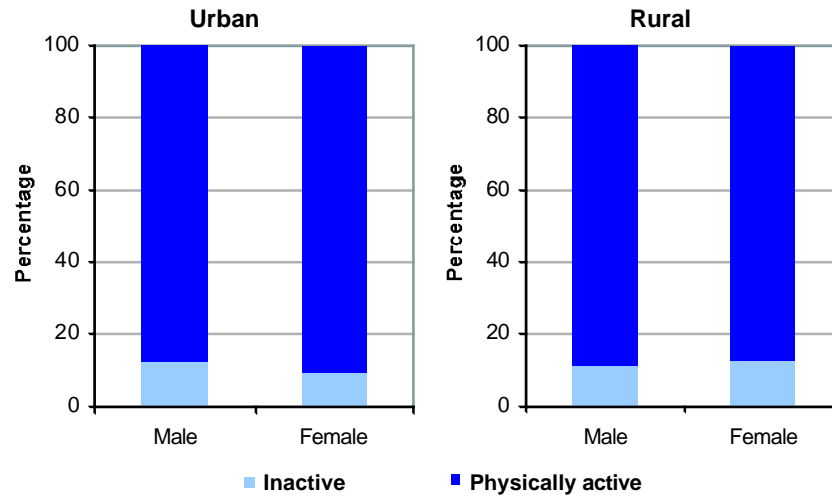


Table NCD 5b. Level of physical activity for transport, expressed in degree of activity i.e., inactive, and some walking/cycling – by place of residence^a

Degree of Physical Activity	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Inactive	12.3	9.7	10.7	11.1	12.6	11.9
Physically active	87.7	90.3	89.3	88.9	87.4	88.1

5c. Physically active during leisure

Definition: Percentage of the population physically active during leisure, based on the GPAQ STEPS module^a.

Chart NCD 5c. Level of activity during leisure – by place of residence^a

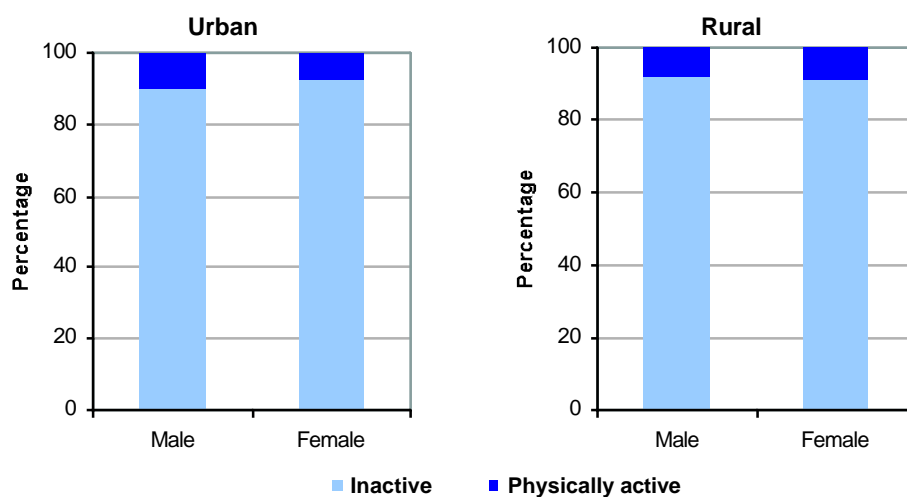


Table NCD 5c. Level of activity during leisure, expressed in degree of activity i.e., inactive, moderate and vigorously active – by place of residence^a

Degree of Physical Activity	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Inactive	90.2	92.6	91.6	91.8	91.1	91.4
Physically active	9.8	7.5	8.3	8.2	8.9	8.6

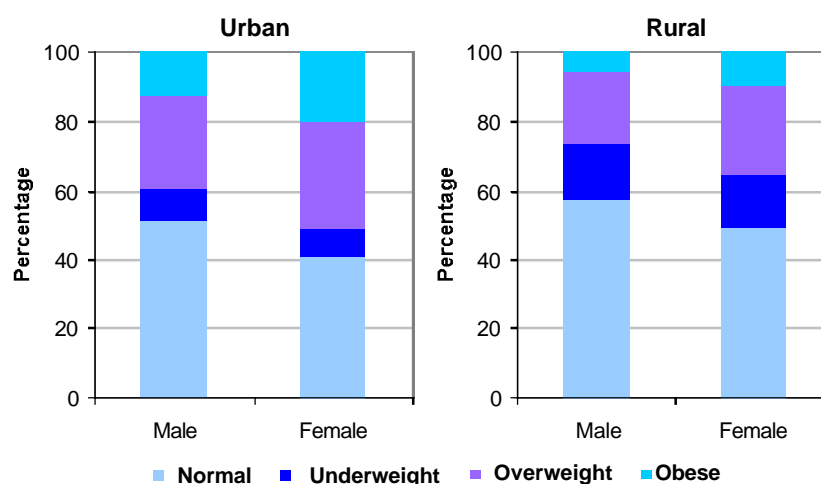
a. Heartfile. Population-based Surveillance of Non-Communicable Diseases 1st Round, 2005. Islamabad, Pakistan: Heartfile, Ministry of Health and World Health Organization; 2006.

Indicator:  **NCD 6. Percentage of adult population with normal BMI vis-à-vis underweight, overweight and obese**

Definition: Percentage of the adult population:

- *underweight* as defined by the WHO criteria^{83,84} of Body Mass Index (BMI) below 19 and the Asian criteria^{85,86} of BMI < 18.5;
- *with a normal* BMI as defined by the WHO criteria of BMI 19-24.9 and the Asian criteria of BMI 18.5-22.9;
- *overweight* as defined by the WHO criteria of BMI 25-29.9 and the Asian criteria of BMI 23-24.9;
- *obese* as defined by the WHO criteria of BMI 30 and above and Asian criteria of BMI 25 and above.

Chart NCD 6a. Percentage of adult population with normal BMI vis-à-vis underweight, overweight and obese – based on WHO criteria



83. WHO. Physical Status: the Use and Interpretation of Anthropometry. Report of a WHO Expert Committee. WHO Technical Report Series 854. Geneva: World Health Organization, 1995

84. WHO. Obesity: Preventing and Managing the Global Epidemic. Report of a WHO Consultation. WHO Technical Report Series 894. Geneva: World Health Organization; 2000

http://www.who.int/bmi/index.jsp?introPage=intro_3.html (accessed Jan. 07)

85. WHO/IASO/IOTF. The Asia-Pacific Perspective: Redefining Obesity and its Treatment. Health Communications Australia: Melbourne; 2000

86. James WPT, Chen C, Inoue S. Appropriate Asian Body Mass Indices. Obesity Review 2002;3:139

Chart NCD 6b Percentage of the adult population with normal BMI vis-à-vis underweight and overweight – based on Asian criteria

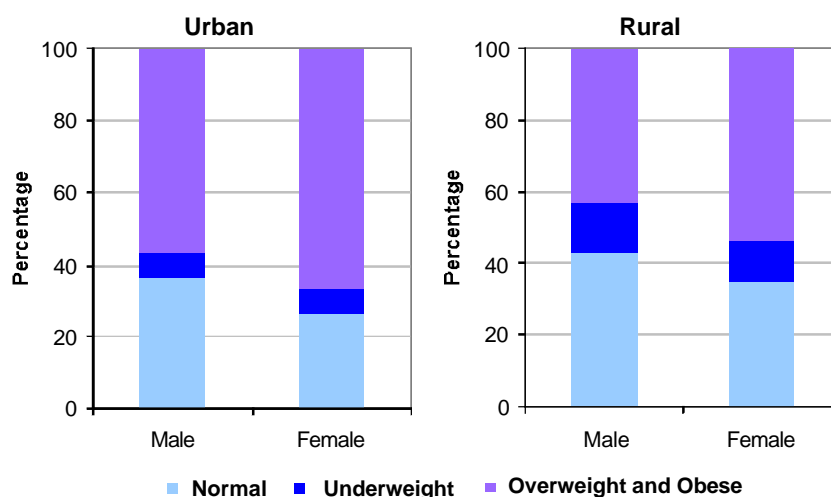


Table NCD 6a&b. Percentage of the adult population with normal BMI vis-à-vis underweight, overweight and obese – based on WHO and Asian criteria

	Urban			Rural		
	Male	Female	Total	Male	Female	Total
WHO Criteria						
Underweight	9.6	8.4	8.9	16.1	15.4	15.7
Normal	51.6	41.3	45.4	57.4	49.7	53.1
Overweight	26.0	29.9	28.4	20.6	25.4	23.3
Obese	12.8	20.3	17.4	5.9	9.5	7.9
Asian Criteria						
Underweight	7.7	7.4	7.5	13.9	12.2	13.0
Normal	36.0	25.9	29.9	43.2	34.6	38.4
Overweight & Obese	56.2	66.7	62.6	42.9	53.2	48.6

a. Heartfile. Population-based Surveillance of Non-Communicable Diseases 1st Round, 2005. Islamabad, Pakistan: Heartfile, Ministry of Health and World Health Organization; 2006.

Indicator:  **NCD 7. Percentage of adult population with central obesity**

Definition: Waist circumference of ≥ 80 cm for females and ≥ 90 cm for males.

Chart NCD 7. Percentage of the adult population with central obesity^a

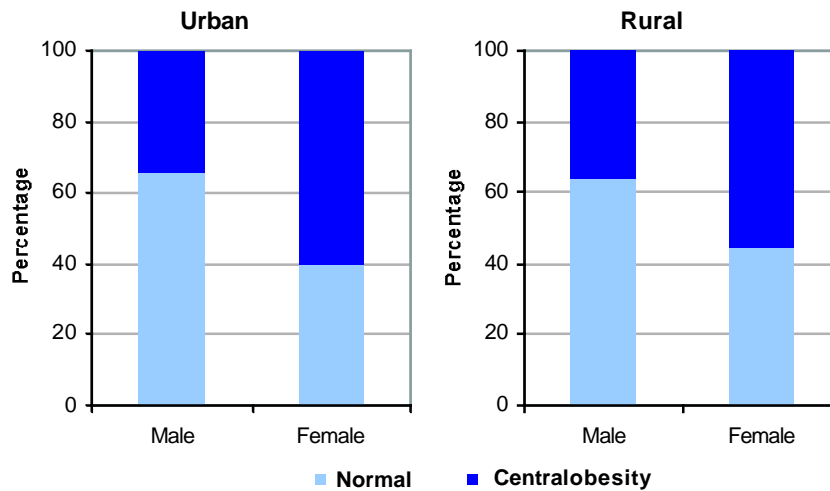


Table NCD 7. Percentage of the adult population with central obesity^a

	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Normal	65.8	39.8	50.1	64.3	44.5	53.2
Central obesity	34.2	60.2	49.9	35.7	55.5	46.8

a. Heartfile. Population-based Surveillance of Non-Communicable Diseases 1st Round, 2005. Islamabad, Pakistan: Heartfile, Ministry of Health and World Health Organization; 2006.

Indicator:  **NCD 8. Prevalence of Hyperlipidemia**

Definition: A fasting serum cholesterol level of ≥ 200 mg/dl among males and females over 40 years of age.

Table NCD 8. Percentage of the population with Hyperlipidemia^a

	Male	Female	Total
Cholesterol ≥ 200 mg/dl	31.3	38.1	34.7

a. Jafer TH, et al. Heart Disease Epidemic in Pakistan: Women and Men at Equal Risk. Am Heart J 2005;150:221-6.

Indicator:  **NCD 9. Prevalence of High Blood Pressure**

Definition: Blood pressure ≥ 140 mmHg systolic and/or 90 mmHg diastolic and/or taking anti-hypertensive medication ^a.

Chart NCD 9. Percentage of the population with High Blood Pressure ^a

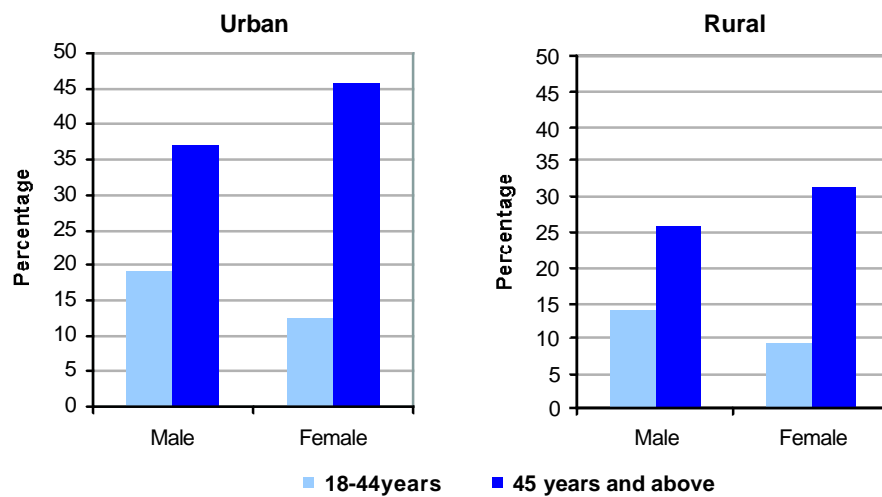


Table NCD 9. Percentage of the population with High Blood Pressure ^a

	Urban			Rural		
	Male	Female	Total	Male	Female	Total
18-44years	19.1	12.3	15.7	14	9.4	11.7
45years andabove	36.9	45.8	41.3	25.9	31.2	28.7

a. Pakistan Medical Research Council. National Health Survey of Pakistan-Health Profile of the People of Pakistan. Islamabad, Pakistan: Federal Bureau of Statistics and Pakistan Medical Research Council; 1994.