

Non-Communicable Diseases

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 necessitates 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 provide a window of opportunity to institute appropriate preventive interventions. In addition, more than reliance on 'acute' parameters primarily from facility sources, there is a 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 Disease* 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 comes 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 these data are being included herewith as these are the only prevalence data available at the moment. In addition to giving some indication

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, Faruqui 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 T H, 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.

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 herewith is 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 has 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 the publication of this document, these data are not yet 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

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% 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 to collect 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 herewith show that more than 65% of the urban and 79% of the rural population take less than one serving of fruit a 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 pre-determined set of criteria in an instrument, which determines level of physical activity in three domains – during 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

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.

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.

The 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 200 mg/dl, and based on this definition, it reported high cholesterol in 20% of the population over 15 years of age. Although this is the only nationally represented 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 comes from the National Health Survey (1990-1994) 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 area 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

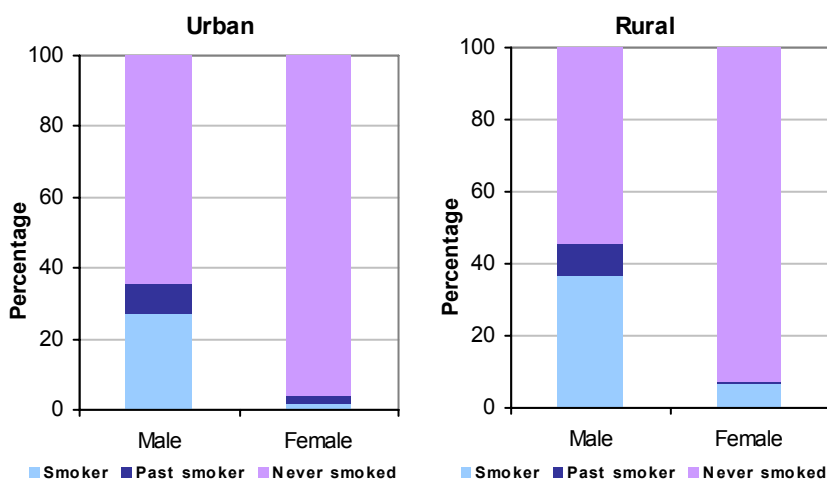


Table NCD 1. Prevalence of smoking – by place of residence and gender^a

Smoking Status	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Smoker	27.3	1.7	11.8	36.6	6.9	19.7
Past Smoker	8.4	2.2	4.6	9.1	0.2	4.1
Never Smoked	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

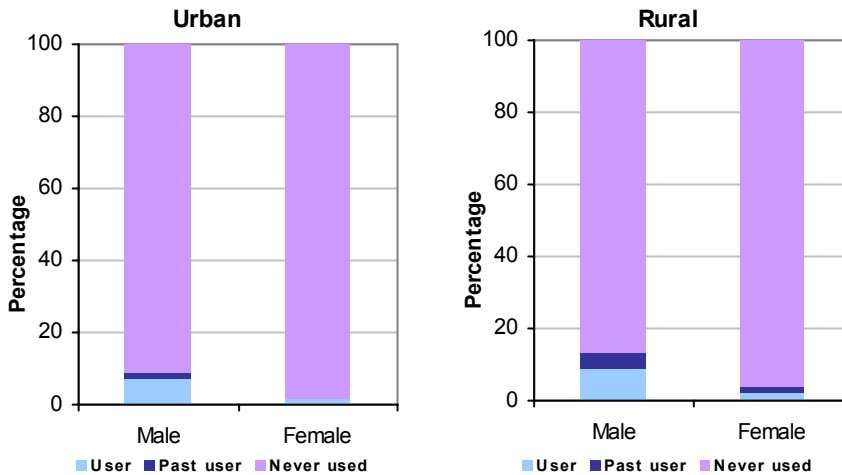


Table NCD 2. Prevalence of smokeless tobacco use – by place of residence and gender^a

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

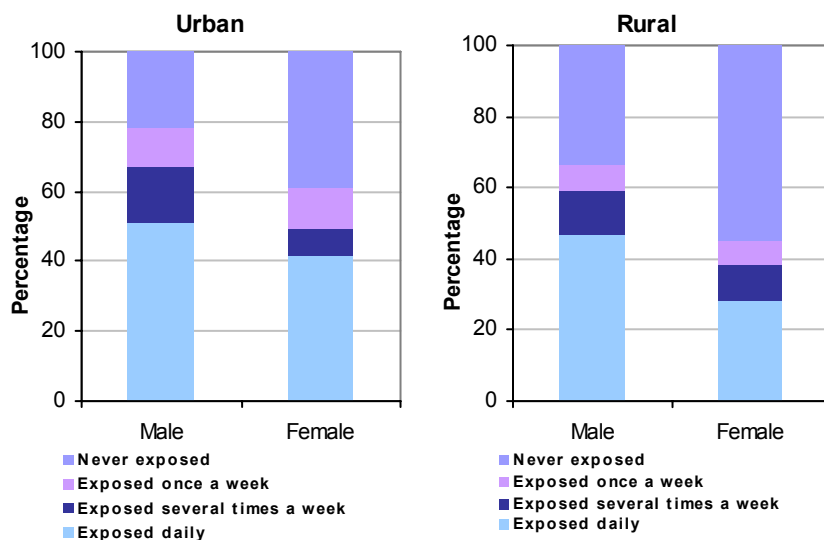


Table NCD 3. Prevalence of passive smoking – by place of residence and gender^a

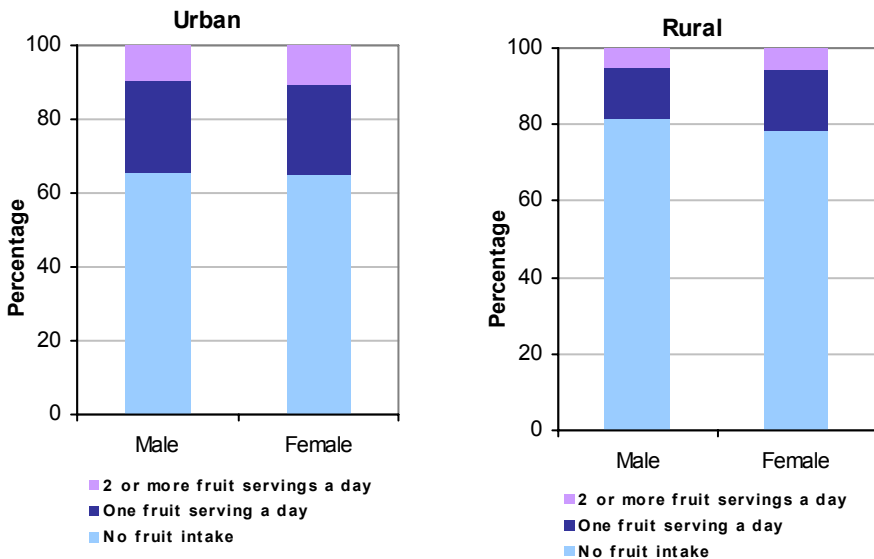
Exposure Status	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Exposed daily	50.9	41.5	45.5	46.6	28.1	36.6
Exposed several times a week	16.6	8.0	11.6	12.5	10.3	11.3
Exposed once a week	10.4	11.3	10.9	7.2	6.8	7.0
Never exposed	22.1	39.2	32.0	33.7	54.7	45.1

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 Sep 2006)

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

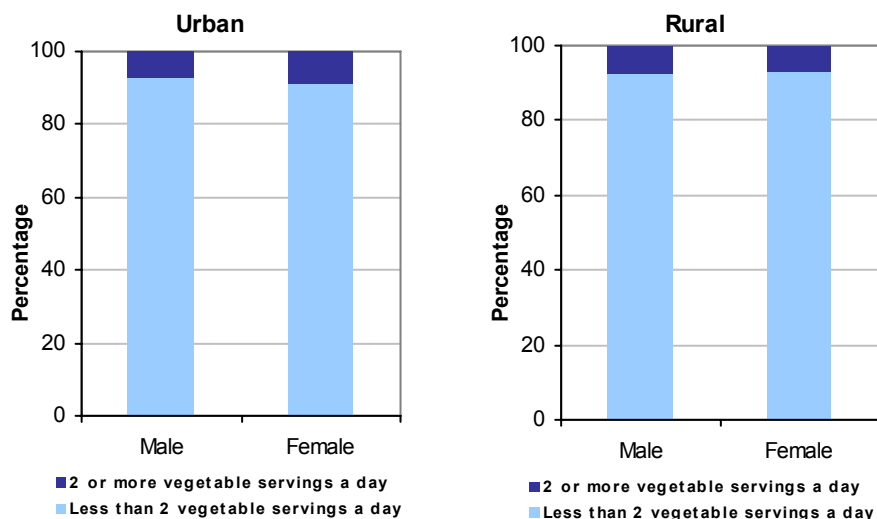


Table NCD 4a&b. Percentage of the population consuming various servings of fruits and vegetables per day – by place of residence and gender^a

Fruit Intake	Urban			Rural		
	Male	Female	Total	Male	Female	Total
No intake	65.3	65.1	65.2	81.6	78.6	79.9
One 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

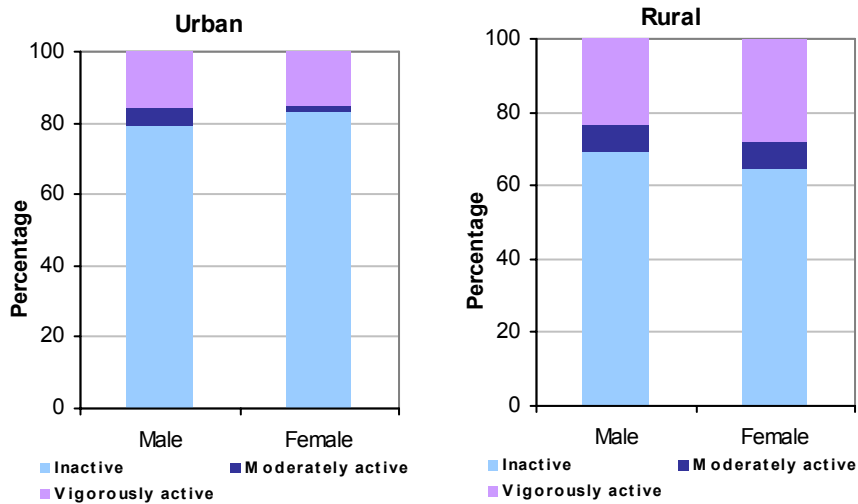


Table NCDs 5a. Level of physical activity during work, expressed in degree of activity i.e., inactive, moderate and vigorously active - by place of residence^a

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 Sep 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

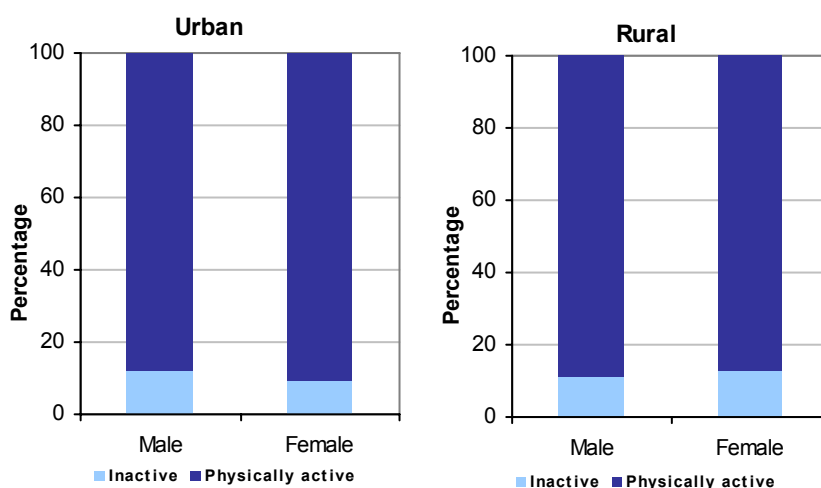


Table NCD 5b. Level of physical activity for transport, expressed in degree of activity i.e., inactive, and some walking/cycling– by place of residence^a

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

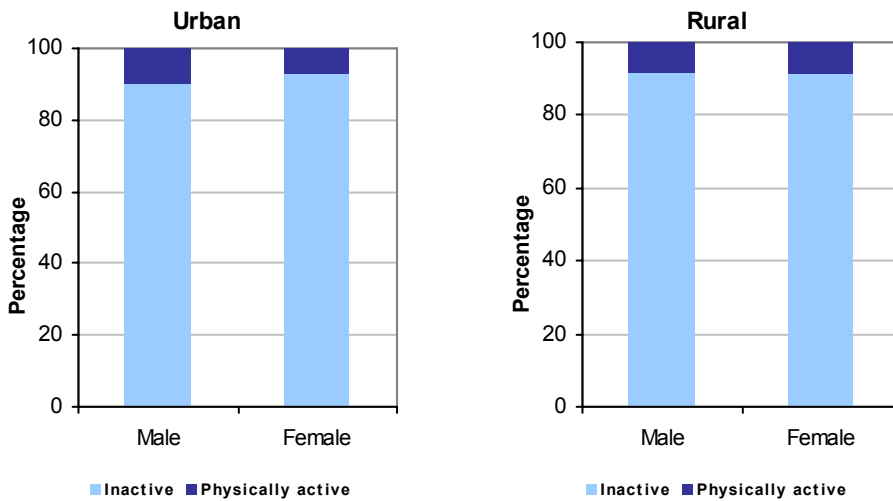


Table NCD 5c. Level of activity during leisure, expressed in degree of activity i.e., inactive, moderate and vigorously active – by place of residence^a

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

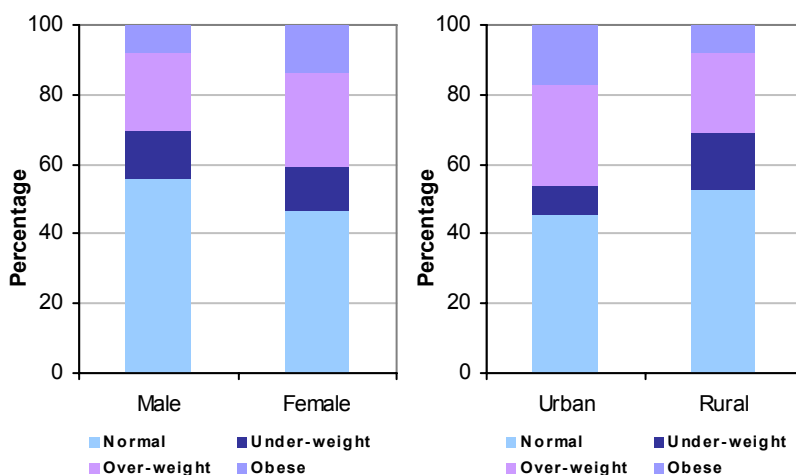
a. Heartfile. Population-based Surveillance of Non-Communicable Diseases: 1st round, 2005. Islamabad, Pakistan: Heartfile, Ministry of Health and World Health Organization; 2006.

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



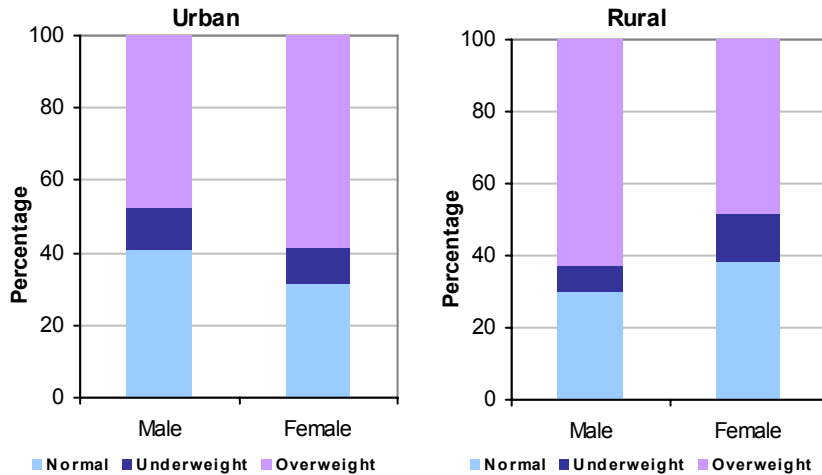
83. WHO. Physical status: the Use and Interpretation of Anthropometry. Report of a WHO Expert Committee. WHO Technical Report Series 854. Geneva: World Health Organization, 1995.

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

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

	Male	Urban Female	Total	Male	Rural 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	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 ≥ 90 cm for males.

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

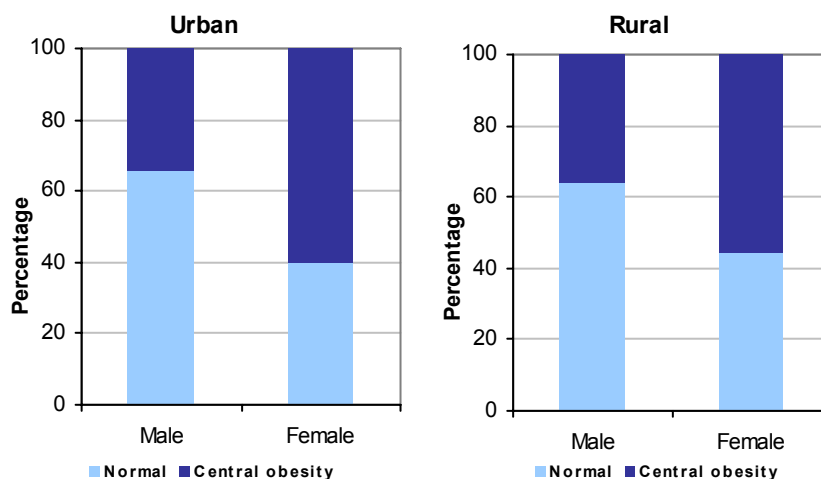


Table NCD 7. Percentage of adult population with central obesity^a

	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^a.

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, August 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

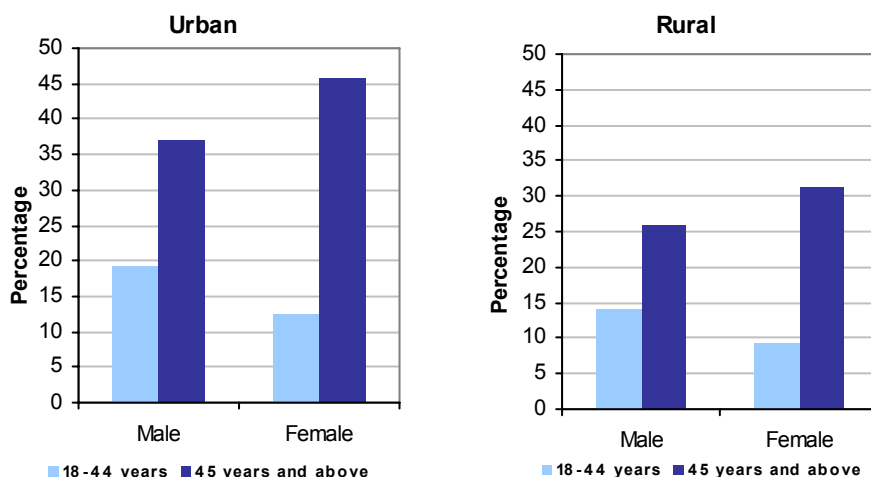


Table NCD 9. Percentage of the population with High Blood Pressure^a

	Urban			Rural		
	Male	Female	Total	Male	Female	Total
18-44 years	19.1	12.3	15.7	14	9.4	11.7
45 years and above	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.

Coronary Artery Disease and Stroke

Coronary Artery Disease

With reference to Coronary Artery Disease (CAD) morbidity, observational studies dating back to the early 1960s in Pakistan reported an increase in the number of patients hospitalized for manifestations of CAD.^{87,88} A more recently conducted population-based survey on individuals above the age of 40, defining CAD as the composite outcome of abnormalities indicative of definite or probable CAD based on Minnesota classification of ECG or past history of heart attack, has shown an overall prevalence of 26.9% in men and 30% in women. This indicates that one in four middle-aged adults in the city of Karachi in Pakistan has prevalent CAD, with the risk being uniformly high in the young, and in women.⁸⁹ Autopsy data also support high prevalence showing coronary artery involvement (of greater than 50% luminal diameter reduction) in more than 24% of those studied.⁹⁰ Currently, population-based data on CAD is available from one city of the country only. The feasibility of introducing a module into instruments such as the NAP-NCD First Round of Surveillance and the Second National Health Survey of Pakistan should be explored with careful attention to complexities in the diagnosis of CAD at the population level and the validity of existing instruments for the Pakistani population. Mortality data on CAD in this document come from the Pakistan Demographic Survey, details of which have been discussed on pg. 21.

Stroke

There are no nationally or regionally representative population-based data on Stroke in Pakistan. Data on Stroke in this document come from a cross-section survey conducted on one ethnic community within the city of Karachi as this is the only population-based data available; notwithstanding issues of representativeness, this does provide an insight into the existing burden of Stroke within an urban community, showing that 4.8% of the adult population over the age 40 years suffered from a Stroke, which represents a fairly high burden.⁹¹ With reference to ongoing data collection on Stroke, the two options include: using risk factor burden (raised blood pressure) as a proxy for the burden of Stroke or the setting up of population-based Stroke registries, which can enable the collection of mortality and morbidity data on Stroke in populations. Both should receive due attention.

87. Beg MA, Siddiqui KM, Abbasi AS, Ahmed N. Atherosclerosis in Karachi. *J Pak Med Assoc* 1967;17:236.

88. Raza M, Hashmi JA, Abassi AS, Beg MA, Ahmed NA, Siddiqui MK, et al. Epidemiological Study of Heart Disease in a Pakistani community. *J Pak Med Assoc* 1970;20:389.

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

90. Sattar AB, Khan B. Atherosclerosis in Karachi; a Study of an Unselected Autopsy Series. Part 1. *J Pak Med Assoc* 1967;17:245.

91. 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.

Indicator:  **CS 1. Prevalence of Coronary Artery Disease**

Definition: Coronary Artery Disease is defined as the composite outcome of abnormalities indicative of definite or probable CAD based on the Minnesota classification of ECG or past history of heart attack^a.

Table NCD 10. Percentage of the population with Coronary Artery Disease^a

Prevalence	Male	Female	Total
Coronary Artery Disease	23.7	30.0	26.9

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

Indicator:  **CS 2. Prevalence of Stroke**

Definition: Stroke is defined as an affirmative answer to the following ‘have you ever had a Stroke or Stroke-like illness in which part of your body was paralyzed for more than 24 hours?’ Respondents were explained that paralysis refers to sudden weakness or numbness in any part of the body^a.

Table NCD 11. Percentage of the population with Stroke^a

Stroke	Total
Stroke	4.8

a. 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.

Diabetes Mellitus

Diabetes Mellitus

Conducted in the mid-1990s, the National Diabetes Survey of Pakistan was a phased nationwide prevalence study of Diabetes; this survey documented prevalence of Diabetes and Impaired Glucose Tolerance (IGT) in four provinces of the country utilizing similar study protocols and standardized WHO definitions for diagnosis. Overall glucose intolerance (diabetes and IGT combined) was present in 22-25% of the subjects examined. However, some differences were observed across provinces; in the urban areas, prevalence of Diabetes ranged from 10.8 % in Balochistan to 16.5% in Sindh, whereas in the rural areas, prevalence ranged from 6.39% in Punjab to 13.9% in Sindh. The overall prevalence of IGT in these surveys ranged from 5.3% to 11.5%.^{92,93,94}

The results of these provincial surveys were recently amalgamated. Overall prevalence in women was found to be 3.5% in urban and 2.5% in the rural areas, whereas overall prevalence of Diabetes in men was 6% in urban and 3.3% in rural areas. IGT in urban versus rural areas was 6.3% in men and 14.2% in women against 6.9% in men and 10.9% in women, respectively. Overall glucose intolerance (DM +IGT) was 22.04% in urban and 17.15% in rural areas.⁹⁵

It is generally agreed that in relation to Diabetes prevalence, there is sufficient evidence at present and that with reference to resource allocations, it is more appropriate to invest in public health interventions rather than repeating surveys in the short term. Over the long term, however, the availability of data on an ongoing basis would be a prerequisite for effective public health planning.

With reference to ongoing data collection, the inclusion of Diabetes in the NAP-NCD First Round of Surveillance entailed adding information obtained from blood samples; this was not feasible in the short term due to resource constraints. As an alternative, physical measurement of waist circumference are used as a proxy for the risk of Diabetes. However, future efforts in upgrading the surveillance system will be structured to allow a more comprehensive assessment, expanding this approach to include laboratory assessments.

92. Shera A S, Rafique G, Khuwaja IA, Ara J, Baqai S, King H. Pakistan National Diabetes Survey: Prevalence of Glucose Intolerance and Associated Factors in Shikarpur, Sindh province. *Diabet Med* 1995;12(12):1116-21.

93. Shera A S, Rafique G, Khwaja IA, Baqai S, Khan IA, King H, et al. Pakistan National Health Survey: Prevalence of Glucose Intolerance and Associated Factors in North West Frontier Province (NWFP) of Pakistan. *J Pak Med Assoc* 1999;49(9):206-11.

94. Shera A S, Rafique G, Khawaja IA, Baqai I, King H. Pakistan National Diabetic Survey: Prevalence of Glucose Intolerance and Associated Factors in Balochistan province. *Diabetes Res Clin Pract* 1999;44(1):49-58.

95. Shera AS, Jawad F, Maqsood A, Prevalence of Diabetes in Pakistan: Diabetes Research and Clinical Practice, Elsevier (accepted for publication 2006).

Indicator:  **DM 1. Prevalence of Type II Diabetes**

Indicator:  **DM 2. Prevalence of Impaired Glucose Tolerance**

Definition: Prevalence of Diabetes and Impaired Glucose Tolerance in population over 25 years of age. Prevalence of Diabetes is defined as fasting glucose of ≥ 140 mg/dl or 2 hour post 75 g glucose load ≥ 200 mg/dl; Impaired Glucose Tolerance is defined as blood glucose level of ≥ 140 mg/dl and ≤ 199 mg/dl, two-hour post 75 gm glucose load⁹⁶.

Table DM 1. Percentage of the population with Diabetes and Impaired Glucose Tolerance^{a-e}

Province	Diabetes (%)		Impaired Glucose Tolerance (%)	
	Urban	Rural	Urban	Rural
Sindh ^a	16.5	13.9	10.4	11.2
Balochistan ^b	10.8	7.5	10.4	7.4
NWFP ^c	-	12.0		9.4
Punjab ^d	13.2	6.3	11.5	5.4
Overall prevalence (women) ^e	3.5	2.5	14.2	10.9
Overall prevalence (men) ^e	6.0	3.3	6.3	6.9

- a. Shera AS, Rafique G, Khawaja I A, Pakistan National Diabetic Survey: Prevalence of Glucose Intolerance and Associated Factors in Shikarpur, Sindh province. *Diabetic Med* 1995; 15:539-553
- b. Shera AS, Rafique G, Khawaja I A, Baqai S, King H, Pakistan National Diabetic Survey: Prevalence of Glucose Intolerance and Associated Factors in Balochistan province. *Diabetes Res Clin Pract* 1999; 44(1):49-58
- c. Shera A S, Rafique G, Khawaja I A, Baqai S, Khan I A, King H, et al. Pakistan National Health Survey: Prevalence of Glucose Intolerance and Associated Factors in North West Frontier Province(NWFP) of Pakistan. *J Pak Med Assoc* 1999; 49(9): 206-211
- d. Diabetic Association of Karachi and World Health Organization Surveys (1994-1998)
- e. Shera AS, Jawad F, Maqsood A, Prevalence of Diabetes in Pakistan: *Diabetes Research and Clinical Practice* (accepted for publication 2006)

96. Diabetic Association of Karachi and World Health Organization Surveys (1994-1998)

Cancer

Cancers

Amongst the non-communicable diseases addressed in this document, incidence data is available only for cancers. Data from the Karachi South Cancer Registry show that the Age Standardized Incidence Rates (ASIR) for all cancers, except those of the urinary bladder and skin, have increased as evidenced by ASIRs in 1998-2002 in comparison to data in 1995-97.⁹⁷

The commonest Cancer sites amongst males in Pakistan are lungs, oral cavity and larynx while the commonest Cancer sites amongst females are breast, oral cavity and gall bladder. Amongst children, Leukaemias are the most common group in both genders, followed by lymphomas in males and malignancies of the brain in females and vice versa for the third most common cancer. Malignancies of the bone are the fourth most common group in both genders.

Incidence rates of cancers of the breast and mouth in Karachi are one of the highest in Asia.⁹⁸ On the other hand, data on clinical and radiological screening for Breast Cancer show that a huge gap needs to be bridged since more than 98% women have not been radiologically screened for Breast Cancer and more than 90% have never had a clinical examination.

A continuous monitoring system with comparable data sources is a prerequisite for determining trends in Cancer incidence over time. It is conventional to set up cancer registries for this purpose. However, caution needs to be exercised as stimulating too many registries is neither feasible nor essential. It is better, by far, to have just a few that are good and conform to international standards than many that are not and better to extrapolate to comparable populations from a good registry than to draw inferences from a poor one on site. Within this context, support should be provided to mature cancer registries.

97 . Bhurgri Y, Bhurgri A, Hasan SH, Usman A, Hashmi KZ, Khurshid M, et al. Pakistan, South Karachi. In Parkin, DM, Whelan SL, Ferlay J, Teppo L, Thomas DB editors. Cancer Incidence in the Five Continents, Vol. VIII: IARC Scientific Publications No. 155; Lyon, France, 2003.

98 . Bhurgri Y, Bhurgri A, Hassan SH, Zaidi SHM, Sankaranarayanan R, Parkin DM. Cancer Incidence in Karachi, Pakistan: First Results from Karachi Cancer Registry. *Int J Cancer* 2000;85(3):325-9.

Indicator:  **C 1. Percentage of women clinically screened for Breast Cancer**

Indicator:  **C 2. Percentage of women radiologically screened for Breast Cancer**

Definition: Percentage of women over 18 years of age who have had a clinical or radiological examination of breasts in the past five years⁹⁹.

Chart C 1. Percentage of women clinically screened for Breast Cancer – by place of residence^a

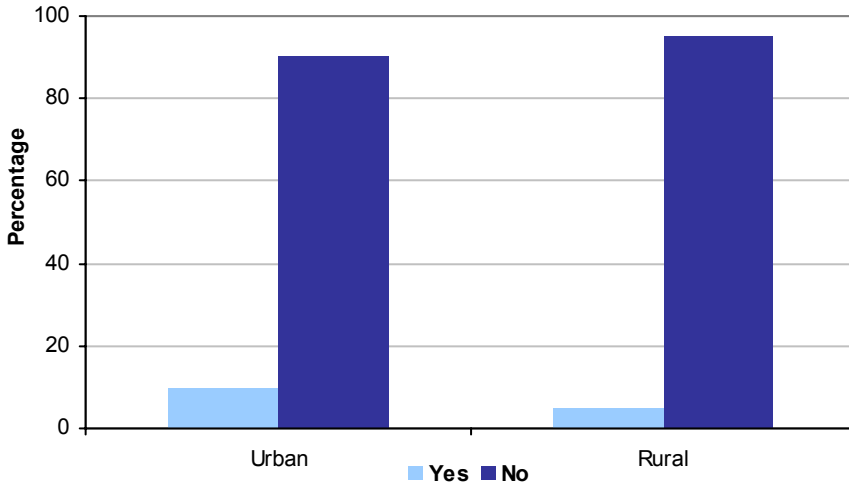
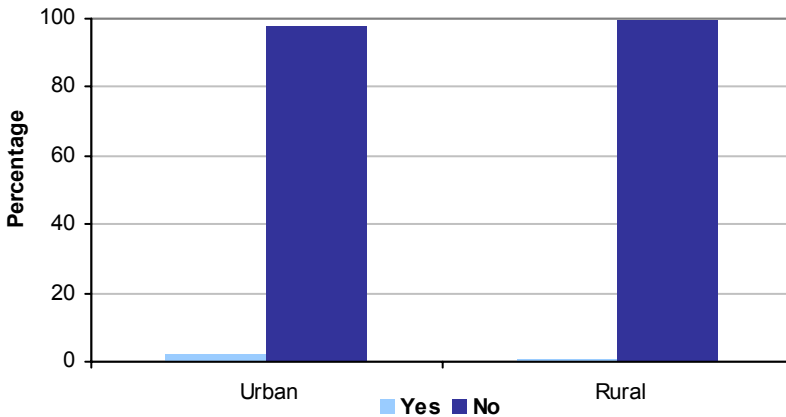


Chart C 2. Percentage of women who have had a mammogram in the past five years – by place of residence^a



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

Table C 1&2. Percentage of women clinically and radiologically screened for Breast Cancer – by place of residence ^a

Type of Examination	Urban		Rural	
	Yes	No	Yes	No
Clinical	9.5	90.5	4.8	95.2
Radiological	2.5	97.5	0.7	99.3

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

Indicator:  **C 3. Age Standardized Incidence Rate of Breast Cancer**

Definition: Incidence rates are calculated based on the 1998 census for Karachi and an annual growth rate of 1.94%. Standardized Incidence Rate was calculated with an external reference population, the *world* population with a given *standard* age distribution. The methodology applied was direct standardization, using 5-year age groups. The rates given are the annual incidence per 100,000 population, averaged over the number of years for which data are presented^a.

Chart C 3. Age Standardized Incidence Rate of Breast Cancer – by gender (1995-2002)^a

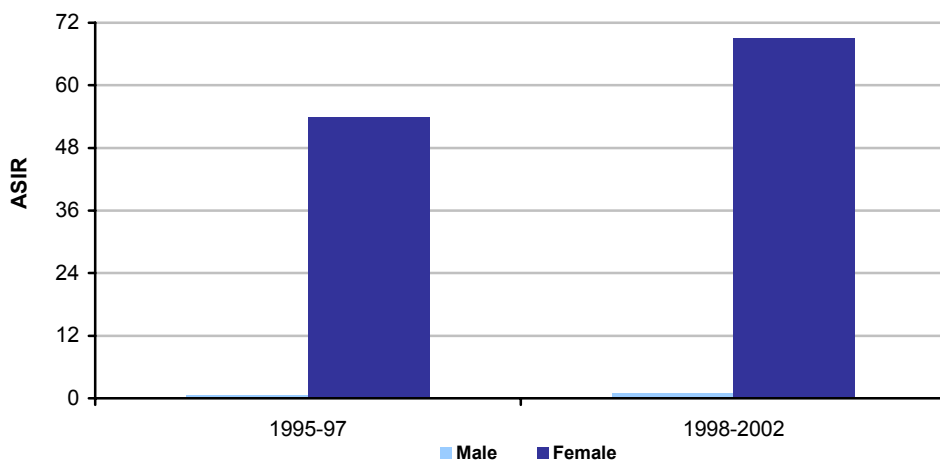


Table C 3. Age Standardized Incidence Rate of Breast Cancer – by gender (1995-2002)^a

	1995-97	1998-2002
Male	0.6	1.0
Female	53.8	69.1

a. Karachi South Cancer Registry & International Association for Research on Cancer. 2005

Indicator:  **C 4. Age Standardized Incidence Rate of Cancer of the Mouth**

Definition: Incidence rates are calculated based on the 1998 census for Karachi and an annual growth rate of 1.94%. Standardized Incidence Rate was calculated with an external reference population, the *world* population with a given *standard* age distribution. The methodology applied was direct standardization, using 5-year age groups. The rates given are the annual incidence per 100,000 population, averaged over the number of years for which data are presented^a.

Chart C 4. Age Standardized Incidence Rate of Cancer of the Mouth – by gender (1995-2002)^a

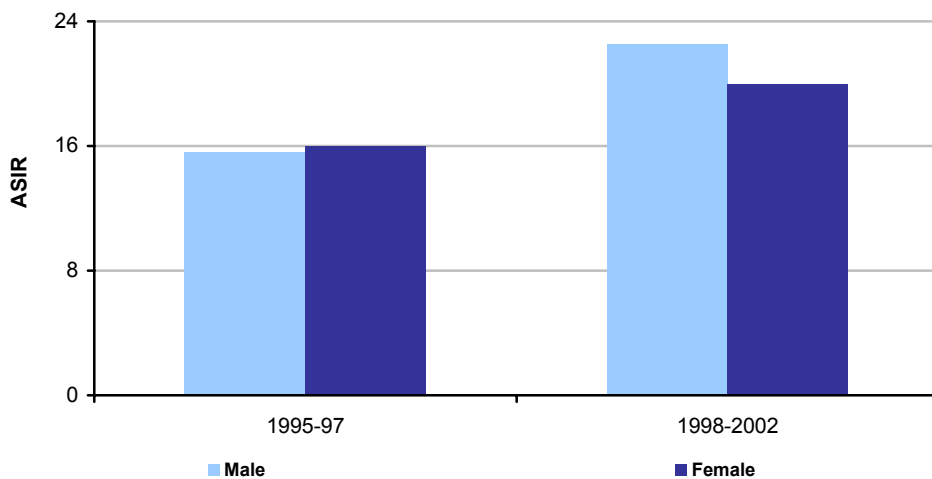


Table C 4. Age Standardized Incidence Rate of Cancer of the Mouth – by gender (1995-2002)^a

	1995-97	1998-2002
Male	15.6	22.5
Female	15.5	20.4

a. Karachi South Cancer Registry & International Association for Research on Cancer, 2005

Indicator:  **C 5. Age Standardized Incidence Rate of Lung Cancer**

Definition: Incidence rates are calculated based on the 1998 census for Karachi and an annual growth rate of 1.94%. Standardized Incidence Rate was calculated with an external reference population, the *world* population with a given *standard* age distribution. The methodology applied was direct standardization, using 5-year age groups. The rates given are the annual incidence per 100,000 population, averaged over the number of years for which data are presented^a.

Chart C 5. Age Standardized Incidence Rate of Lung Cancer – by gender(1995-2002)^a

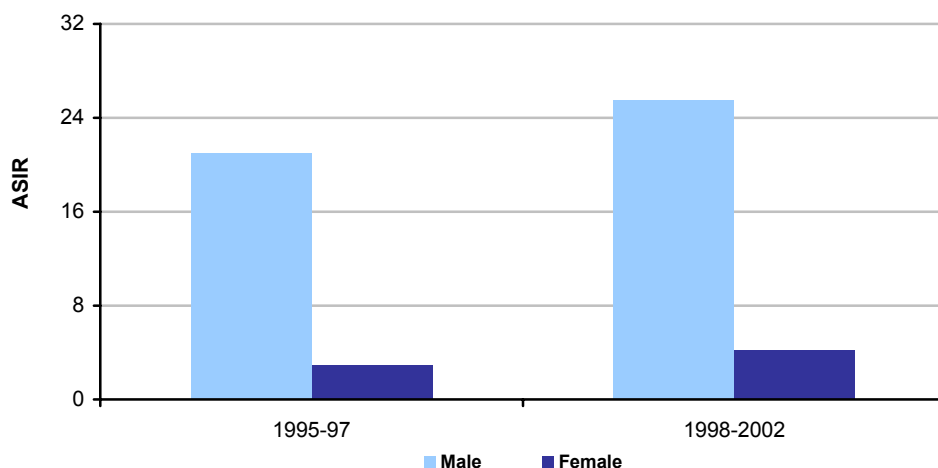


Table C 5. Age Standardized Incidence Rate of Lung Cancer – by gender (1995-2002)^a

	1995-97	1998-2002
Male	21.0	25.5
Female	2.9	4.2

a. Karachi South Cancer Registry & International Association for Research on Cancer, 2005

Indicator:  **C 6. Age Standardized Incidence Rate of Cancer of the Larynx**

Definition: Incidence rates are calculated based on the 1998 census for Karachi and an annual growth rate of 1.94%. Standardized Incidence Rate was calculated with an external reference population, the *world* population with a given *standard* age distribution. The methodology applied was direct standardization, using 5-year age groups. The rates given are the annual incidence per 100,000 population, averaged over the number of years for which data are presented^a.

Chart C 6. Age Standardized Incidence Rate of Cancer of the Larynx – by gender (1995-2002)^a

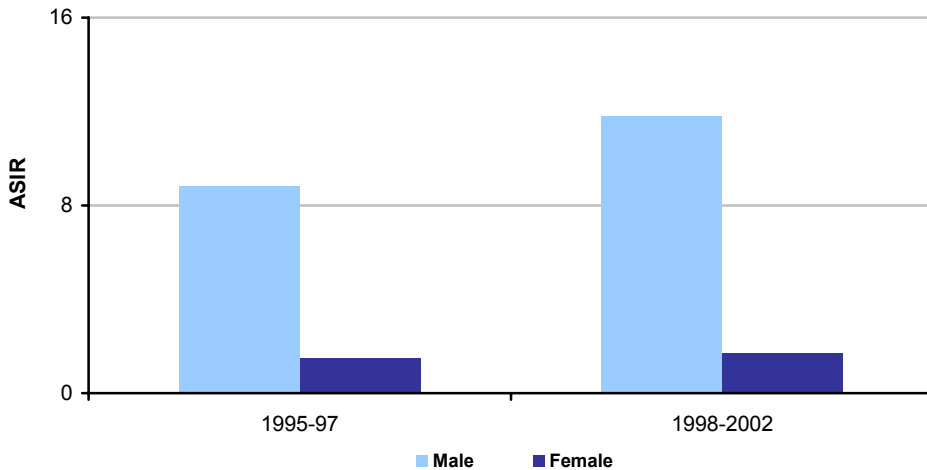


Table C 6. Age Standardized Incidence Rate of Cancer of the Larynx – by gender (1995-2002)^a

	1995-97	1998-2002
Male	8.8	11.8
Female	1.5	1.7

a. Karachi South Cancer Registry & International Association for Research on Cancer, 2005.

Indicator:  **C 7. Age Standardized Incidence Rate of Urinary Bladder Cancer**

Definition: Incidence rates are calculated based on the 1998 census for Karachi and an annual growth rate of 1.94%. Standardized Incidence Rate was calculated with an external reference population, the *world* population with a given *standard* age distribution. The methodology applied was direct standardization, using 5-year age groups. The rates given are the annual incidence per 100,000 population, averaged over the number of years for which data are presented^a.

Chart C 7. Age Standardized Incidence Rate of Urinary Bladder Cancer – by gender (1995-2002)^a

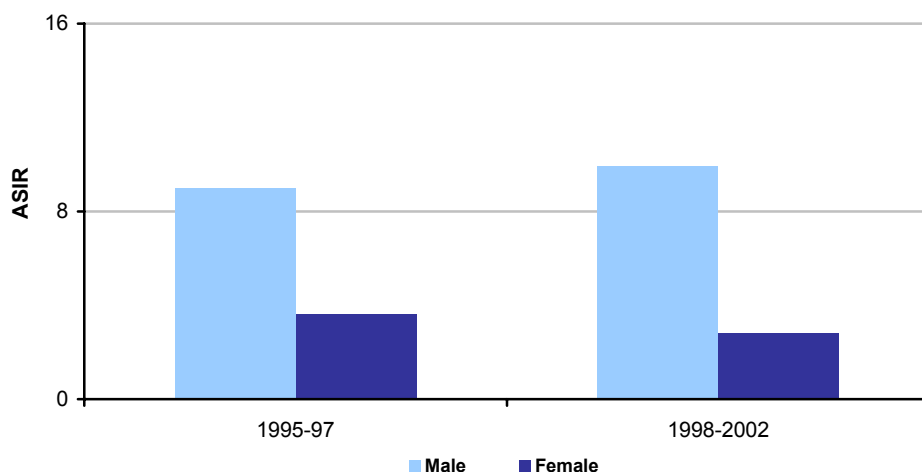


Table C 7. Age Standardized Incidence Rate of Urinary Bladder Cancer – by gender (1995-2002)^a

	1995-97	1998-2002
Male	9.0	9.9
Female	3.6	2.8

a. Karachi South Cancer Registry & International Association for Research on Cancer, 2005

Indicator:  **C 8. Age Standardized Incidence Rate of Skin Cancer**

Definition: Incidence rates are calculated based on the 1998 census for Karachi and an annual growth rate of 1.94%. Standardized Incidence Rate was calculated with an external reference population, the *world* population with a given *standard* age distribution. The methodology applied was direct standardization, using 5-year age groups. The rates given are the annual incidence per 100,000 population, averaged over the number of years for which data are presented^a.

Chart C 8. Age Standardized Incidence Rate of Skin Cancer – by gender (1995-2002)^a

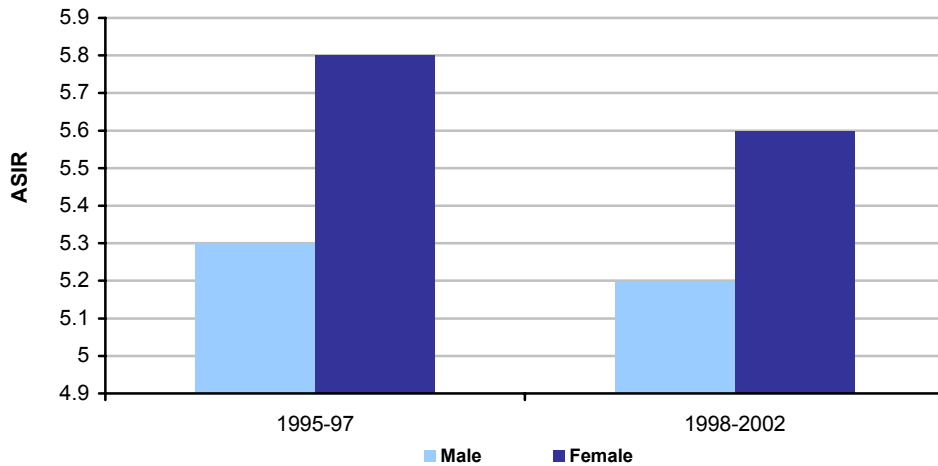


Table C 8. Age Standardized Incidence Rate of Skin Cancer – by gender (1995-2002)^a

	1995-97	1998-2002
Male	5.3	5.2
Female	5.8	5.6

a. Karachi South Cancer Registry & International Association for Research on Cancer, 2005

Indicator:  **C 9. Age Standardized Incidence Rate of Prostate Cancer**

Definition: Incidence rates are calculated based on the 1998 census for Karachi and an annual growth rate of 1.94%. Standardized Incidence Rate was calculated with an external reference population, the *world* population with a given *standard* age distribution. The methodology applied was direct standardization, using 5-year age groups. The rates given are the annual incidence per 100,000 population, averaged over the number of years for which data are presented^a.

Chart C 9. Age Standardized Incidence Rate of Prostate Cancer (1995-2002)^a

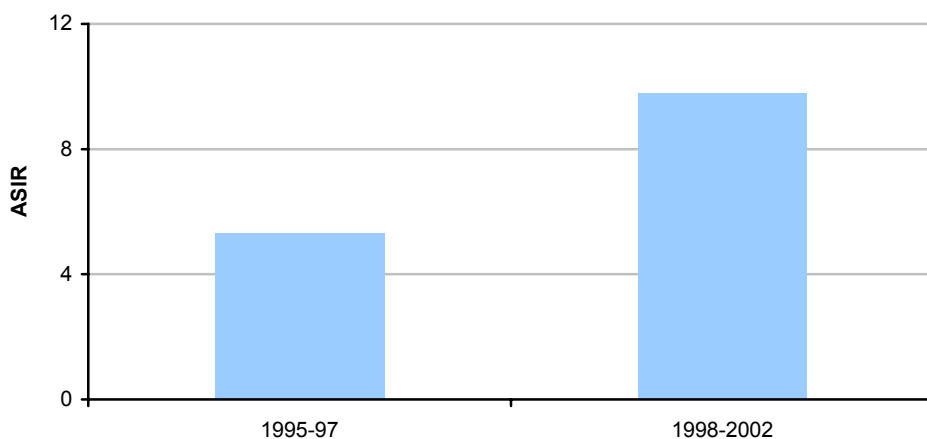


Table C 9. Age Standardized Incidence Rate of Prostate Cancer (1995-2002)^a

	1995-97	1998-2002
Male	5.3	9.8

a. Karachi South Cancer Registry & International Association for Research on Cancer, 2005

Indicator:  **C 10. Age Standardized Incidence Rate of Cancer of the Colorectum**

Definition: Incidence rates are calculated based on the 1998 census for Karachi and an annual growth rate of 1.94%. Standardized Incidence Rate was calculated with an external reference population, the *world* population with a given *standard* age distribution. The methodology applied was direct standardization, using 5-year age groups. The rates given are the annual incidence per 100,000 population, averaged over the number of years for which data are presented^a.

Chart C 10. Age Standardized Incidence Rate of Cancer of the Colorectum – by gender (1995-2002)^a

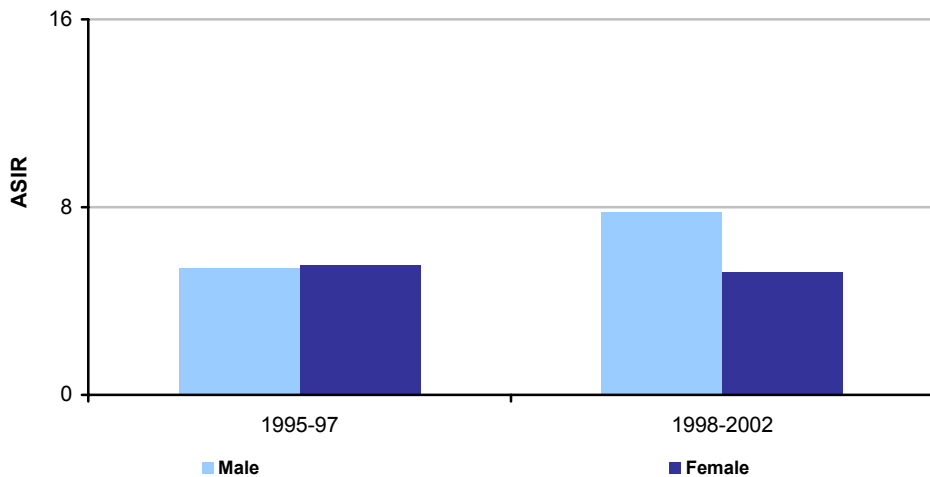


Table C 10. Age Standardized Incidence Rate of Cancer of the Colorectum – by gender (1995-2002)^a

	1995-97	1998-2002
Male	5.4	7.8
Female	5.5	5.2

a. Karachi South Cancer Registry & International Association for Research on Cancer, 2005

Indicator:  **C 11. Age Standardized Incidence Rate of Cancer of the Esophagus**

Definition: Incidence rates are calculated based on the 1998 census for Karachi and an annual growth rate of 1.94%. Standardized Incidence Rate was calculated with an external reference population, the *world* population with a given *standard* age distribution. The methodology applied was direct standardization, using 5-year age groups. The rates given are the annual incidence per 100,000 population, averaged over the number of years for which data are presented^a.

Chart C 11. Age Standardized Incidence Rate of Cancer of the Esophagus – by gender (1995-2002)^a

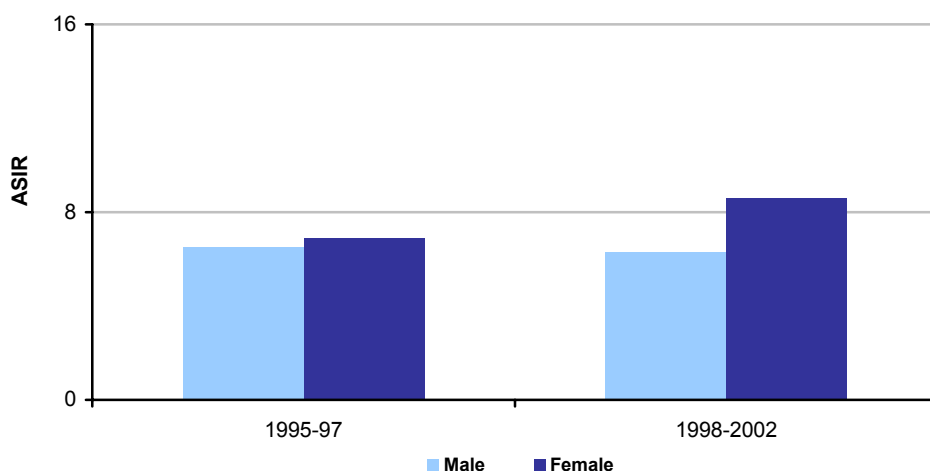


Table C 11. Age Standardized Incidence Rate of Cancer of the Esophagus – by gender (1995-2002)^a

	1995-97	1998-2002
Male	6.5	6.3
Female	6.9	8.6

a. Karachi South Cancer Registry & International Association for Research on Cancer, 2005

Indicator:  **C 12. Age Standardized Incidence Rate of Lymphoma**

Definition: Incidence rates are calculated based on the 1998 census for Karachi and an annual growth rate of 1.94%. Standardized Incidence Rate was calculated with an external reference population, the *world* population with a given *standard* age distribution. The methodology applied was direct standardization, using 5-year age groups. The rates given are the annual incidence per 100,000 population, averaged over the number of years for which data are presented^a.

Chart C 12. Age Standardized Incidence Rate of Lymphoma – by gender (1995-2002)^a

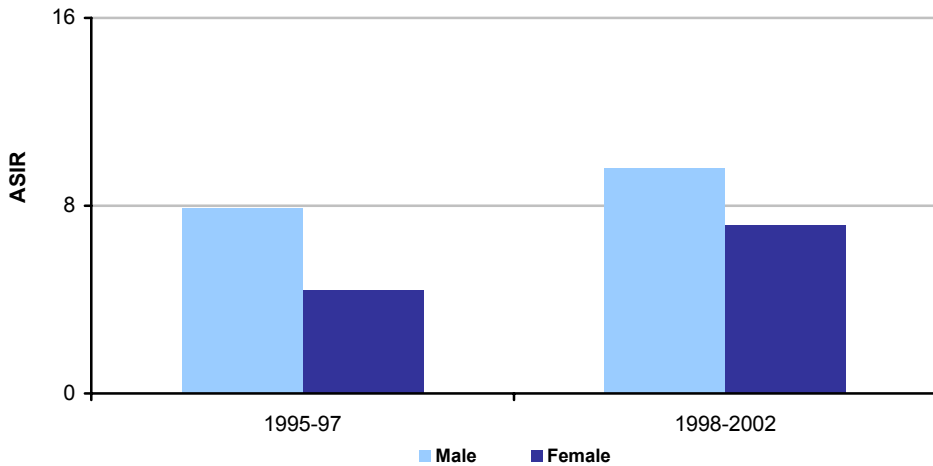


Table C 12. Age Standardized Incidence Rate of Lymphoma – by gender (1995-2002)^a

	1995-97	1998-2002
Male	7.9	9.6
Female	4.4	7.2

a. Karachi South Cancer Registry & International Association for Research on Cancer, 2005

Other Chronic Conditions

Other Chronic Conditions

Renal impairment: Population-based data on Renal Impairment in this document come from the National Health Survey of Pakistan, 1994. This document defines Renal Impairment as a combination of renal insufficiency and blood chemistry suggestive of renal problems. Renal insufficiency is a well-described clinical condition in which blood urea nitrogen is over 40 mg/dl and creatinine is over 1.2 mg/dl. Chemistry suggestive of renal problems is creatinine over 1.2 mg/dl. On a population basis, creatinine levels are a measure of the magnitude of kidney problems while not being a precise clinical definition. Based on this definition, 1% of the urban and 1.6% of the rural population suffers from chronic renal diseases. Chronic kidney problems in Pakistan are known to increase with age. Since the prevalence of renal diseases is less than 5% in the general population, very large sample sizes are needed to get prevalence estimates. For this reason, it may be feasible to gather population-based information on renal diseases only through the 10 yearly interview/examination survey recommended in this document.

Chronic Bronchitis: The National Health Survey of Pakistan 1994 estimated the burden of Chronic Bronchitis based on history-based criteria. Its findings showed that over the age of 45 years, 5.4% of the population in the urban and 6.7% of the population in the rural areas suffers from Chronic Bronchitis. Prevalence increased over the age of 65 years; in this age group, prevalence was estimated at 14% among rural females and 6% among rural males. It has been hypothesized that higher rates of Chronic Bronchitis observed in females in the rural areas is attributed to high levels of indoor air pollution due to cooking over smoking fires. However, there is a need to demonstrate such causal associations and their determinants so that precise targets for preventive interventions can be developed.

Several issues are involved in assessing the magnitude of the burden of Chronic Bronchitis in general and Chronic Obstructive Pulmonary Disease in particular, within populations. Mortality data under-represents Chronic Respiratory Disease (CRD) as it is under-diagnosed and often not listed either as a primary or a contributory cause of death. Few countries have good population-based data due to lack of a uniform set of diagnostic criteria. In addition, there are issues with estimating the prevalence of CRD accurately, for which measurement of airflow obstruction is necessary. These considerations explain the paucity of population-based data on CRD in Pakistan. Within this context, it is necessary to partner with global efforts to assist with the development of globally acceptable criteria for the diagnosis of CRDs and inexpensive methodologies to monitor COPD, suitable for use in the developing countries.¹⁰⁰

100. Nishtar S, et al. National Action Plan for Non-communicable disease prevention, control and health promotion in Pakistan. Islamabad, Pakistan: Heartfile, Ministry of Health and World Health Organization; 2003.

Indicator:  **RI. Prevalence of Renal Impairment**

Definition: Renal Impairment is defined as a creatinine level ≥ 1.2 mg/dl (measured in blood from a finger prick or vein) at a population level in individuals over 40 years of age^a.

Chart RI. Percentage of the population with Renal Impairment – by area of residence^a

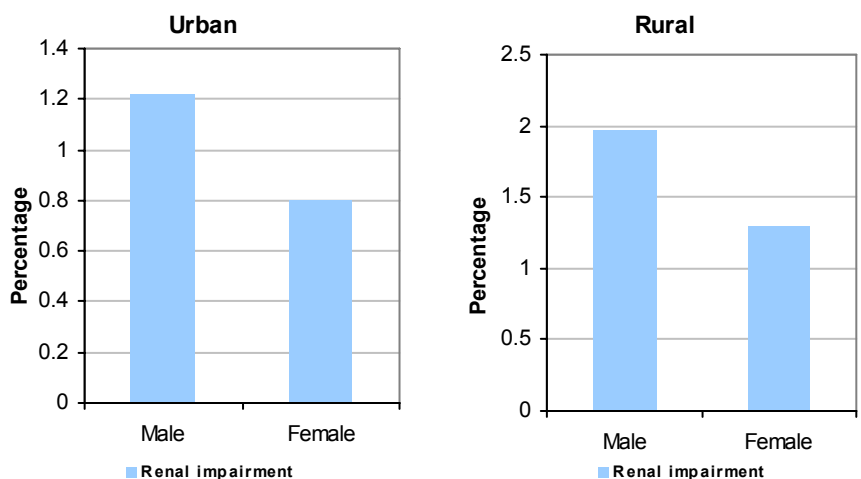


Table RI. Percentage of the population with Renal Impairment – by area of residence^a

	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Renal Impairment	1.22	0.82	1.0	1.96	1.29	1.60

a. Pakistan Medical Research Council. National Health Survey of Pakistan, 1990-94. Islamabad, Pakistan: Government of Pakistan, 1998.

Indicator:  **CB. Prevalence of Chronic Bronchitis**

Definition: Chronic Bronchitis is cough with phlegm for three months or more and for three years or more^a.

Chart CB. Percentage of the population with Chronic Bronchitis – by area of residence^a

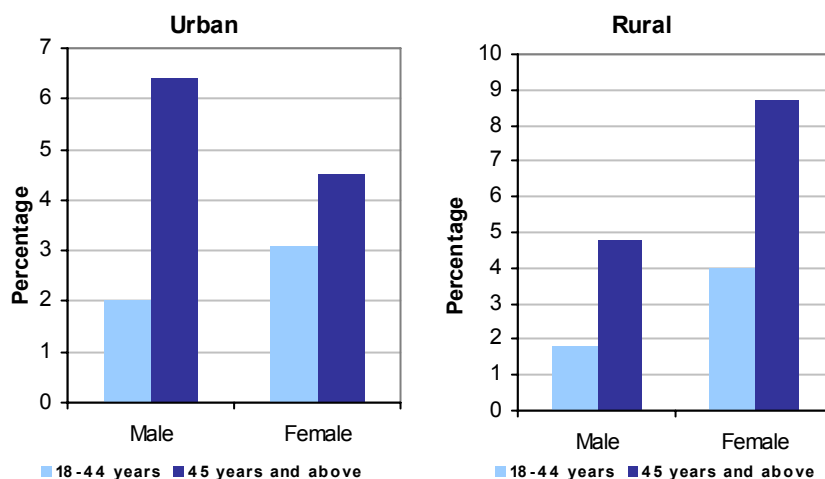


Table CB. Percentage of the population with Chronic Bronchitis – by area of residence^a

Age Categories	Urban			Rural		
	Male	Female	Total	Male	Female	Total
18 – 44 yrs	2	3.1	2.5	1.8	4.0	2.9
45 yrs and above	6.4	4.5	5.4	4.8	8.7	6.7

a. Pakistan Medical Research Council. National Health Survey of Pakistan, 1990-94. Islamabad, Pakistan: Government of Pakistan, 1998.

Mental Illnesses

Mental Illnesses

Prevalence data on mental illnesses in this document come from a meta-analysis of a series of community-based epidemiological surveys conducted in Pakistan.¹⁰¹ The surveys used a locally suited instrument – the Bradford Somatic Inventory, which was based on somatic symptoms reported by psychiatric patients as opposed to psychiatric symptoms in view of the understanding that patients in the Pakistani culture with minor mental illnesses express their stress as somatic symptoms. These surveys showed a 10-25% prevalence of common mental illnesses amongst men and 22-66% amongst women. However, what was unusual in these surveys was that women living in the rural areas experienced higher level of stress as compared to those in the urban areas.¹⁰² Classically, poor social conditions in the urban areas of developing countries are considered to be the underlying factor responsible for higher psychiatric morbidity observed in these settings.¹⁰³ The report has important implications, given that 66% of the population in Pakistan lives in the rural areas.¹⁰⁴ In all the aforementioned surveys, women were found to experience increased levels of stress compared with men - both in the urban and rural areas; this is in conformity with data from all over the world, where women are known to have increased psychiatric morbidity;¹⁰⁵ however, the gap appears wider in Pakistan. Factors relevant to women such as lack of control over their lives, low literacy rate, poverty, large family sizes, overcrowding and poor physical health have all been identified as risk factors.¹⁰⁶

In view of these data, mental health needs a strong public health focus. Pakistan was the first in the Eastern Mediterranean Region countries to set up pioneering public health interventions in demonstration settings. Subsequently, a National Mental Health Programme was launched; however, this is facing implementation challenges. The National Action Plan on NCDs includes a module on mental illnesses integrated with other NCDs and work is currently underway to build further on this. Given the burden of mental illnesses in Pakistan, mental health must be strongly featured on the public health agenda.

Data on substance abuse in this document have been gathered from the National Survey(s) on Drug Abuse (NSDA) and their estimations; the first NSDA was conducted

101. Mirza I, Jenkins R. Risk factors, prevalence and treatment of anxiety and depressive disorders in Pakistan: systematic review. *BMJ* 2004; 328: 794-06.

102. Mumford DB, Saeed K, Ahmad I, Latif S, Mubbashar MH. Stress and psychiatric disorders in rural Punjab: a community survey. *Br J Psychiatry* 1997;170:473-8.

103. Mari J. Psychiatric morbidity in three primary care clinics in Sao Paulo. *Social Psychiatry* 1997;22:129-38.

104. Population Census 1998; Statistics Division, Federal Bureau of Statistics. <http://www.statpak.gov.pk> (accessed Feb 10, 04).

105. Piccinelli M, Homen FG. Gender differences in the epidemiology of affective disorders and schizophrenia. Geneva, Switzerland: World Health Organization, 1997.

106. Gater R, Rehman CI. Mental health and service developments in the Rawalpindi Districts of Pakistan. *J Coll Physician Sur Pak* 2001;11(4):210-4.

in 1982 and subsequently, surveys have been conducted every two to five years. A comparison of the results of the 1988 and 1993 surveys indicates that the reported number of drug abusers in Pakistan has risen from 2.24 million in 1988 to 3.01 million in 1993, and 5 million in 2004-05 with an estimated growth rate of 7%. Almost half of the total drug users in Pakistan (49.7%) are known to be addicted to heroin. Surveys have also brought to light the fact that nearly 72% of the drug users are under 35 years of age, with the highest proportion being in the 26-30 age group.¹⁰⁷ In view of this high burden, there is a need to develop proactive intersectoral linkages with the state's institutional mechanisms for addressing the menace of drug abuse in order to target health outcomes in this connection.

107. Narcotics Control Board. National Survey for Drug Abuse 1993. Islamabad, Pakistan: Government of Pakistan, 1993.

Indicator:  MI 1. Prevalence of minor mental illnesses

Indicator:  MI 2. Prevalence of major mental illnesses

Definitions:

Minor mental illnesses in this document are categorized as mixed anxiety/depressive disorders.

Major mental illnesses in this document are categorized as schizophrenia, bipolar affective disorder and personality disorders.

Table MI 1&2. Population suffering from minor and major mental illnesses - by gender^{a,b}

Type of Mental Illness	Male	Female	Total
Mixed anxiety or depressive disorders ^a	10-33%	29-66%	34%
Schizophrenia ^b	8.1/10,000	6.1/10,000	7.5/10,000
Bipolar affective disorder ^b	13.5/10,000	14.5/10,000	14/10,000
Personality disorders ^b	1.5/10,000	1.4/10,000	1.35/10,000

a. Mirza I, Jenkins R. Risk factors, prevalence and treatment of anxiety and depressive disorders in Pakistan: systematic review. *BMJ* 2004; 328: 794-06.

b. International Consortium for Mental Health Policy and Services. Country Profile of Pakistan Mental Health. <http://193-164.179.95/imphd/downloads/Pakistan.pdf> (accessed Jan, 04).

Indicator:  MI 3. Total number of substance abusers

Table MI 3. Total number of substance abusers in Pakistan^{a, b, c}

Year	Numbers (in millions)
1988 ^a	2.24
1993 ^b	3.01
2004-05 ^c	5.00 ¹⁰⁸

a. Narcotics Control Board. National Survey on Drug Abuse 1988. Islamabad, Pakistan: Government of Pakistan, 1988

b. Narcotics Control Board. National Survey on Drug Abuse 1993. Islamabad, Pakistan: Government of Pakistan, 1993

c. Ministry of Narcotics Control, Yearly Digest 2004-05. Islamabad, Pakistan. Anti Narcotics Force, Ministry of Narcotics Control, Government of Pakistan. 2005

108. Estimated numbers based on 7% annual increase.

Injuries

Injuries

Prevalence data on injuries come from two sources in this document; the National Injury Survey of Pakistan,¹⁰⁹ and the NAP-NCD First Round of Surveillance.¹¹⁰

Conducted in 1997, the National Injury Survey of Pakistan was a retrospective survey based on self-reporting of injuries; it described injuries in terms of morbidity, mortality and disability.¹¹¹ The incidence of serious injuries was reported at 41.2 per 1,000 persons per year. Transport-related injuries were the most common cause (36%), followed by exposure to inanimate mechanical forces (28%), falls (23%), intentional self-harm, interpersonal violence, injuries due to smoke inhalation, burns, exposure to electrical current, and extreme ambient temperature as well as envenomation and injuries to patients due to medical/surgical errors. Exposure to inanimate mechanical forces was caused by agricultural machinery, non-powered hand tools and injuries as a result of situations in which a body part was caught, crushed or pinched between objects. Thirty-six percent of the total injuries were sustained on roads and roadsides, 34% had occurred at home, 7.3% at farming sites, 5% in playgrounds, 2.3% in schools, 4.7% at worksites, 4% in offices or shops and 6.7% in other places. Data showed that injuries not related to traffic accidents occurred mostly in homes. Falls also constituted a significant proportion of accidents at home. This highlights the need to promote safety prevention at home in order to decrease the occurrence of these accidents. Access of LHWs to females who are vulnerable to accidents occurring at home becomes crucial for delivering messages related to accident prevention.

Data presented herewith on road traffic crashes also highlight almost non-existent road safety practices among motor vehicle drivers and passengers. Eighty-eight percent drivers do not use seatbelts in the car and more than 86% motorcycle drivers do not wear helmets; this flags the need to intervene through appropriate behavioral change communication interventions.

Injury prevention is part of the National Plan of Action on NCDs in Pakistan and currently efforts are underway to expand its scope with the expectation that this effort will be institutionalized and adequately resourced.

109. Ghaffar A, Hyder AA, Masud TI. The burden of Road traffic injuries in developing countries: the First National Injury Survey of Pakistan. *Am J Public Health* 2004;118:211-7.

110. 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.

111. Ghaffar A, Siddiqui S, Shahab S, Hyder A. National Injury Survey of Pakistan 1997-99. Islamabad, Pakistan: Health Services Academy: Government of Pakistan, 1999.

Indicator:  **IJ 1. Incidence of Injuries**

Definition: Estimated incidence of injuries by a retrospective survey based on self-reporting of injuries among a representative sample of 1,539 households in Pakistan^a

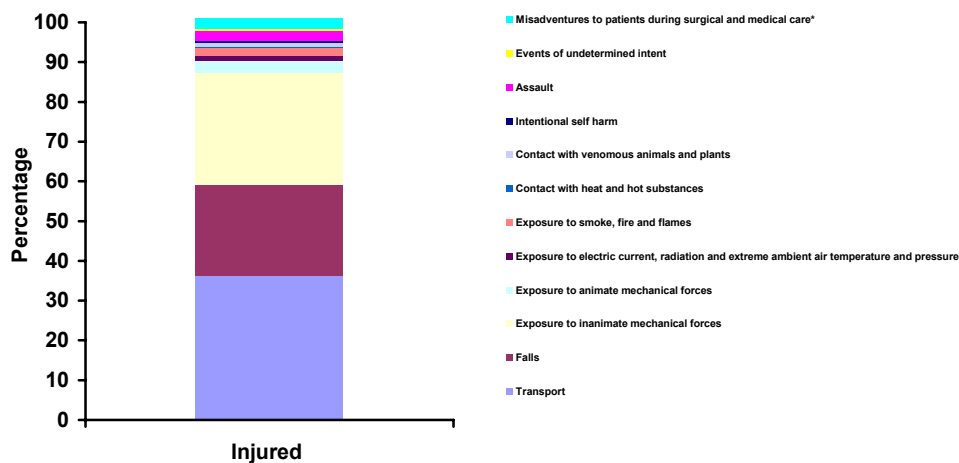
Chart IJ 1. Estimated incidence of injuries^{a, b}

Incidence	
Injuries	41.2 / 1000 persons per year

- a. Ghaffar A, Siddiqui S, Shahab S, Hyder A. National Injury Survey of Pakistan 1997-99. Islamabad, Pakistan: Health Services Academy: Government of Pakistan, 1999.
- b. Ghaffar A, Hyder A, Masud TI. The burden of road traffic injuries in developing countries: the first National Injury Survey of Paksitan. Am J Public Health 2004;118:211-7.

Indicator:  **IJ 2. Distribution of non-fatal Injuries by cause**

Definition: Distribution of non-fatal injuries by cause based on self-reporting in a retrospective survey of injuries among a representative sample of 1,539 households in Pakistan^a

Chart IJ 2. Distribution of non-fatal injuries -by cause^a

Table IJ 2. Percentage non-fatal injuries- by cause^a

Cause	Injured (%)
Transport	36.3
Falls	23.0
Exposure to inanimate mechanical forces	28.0
Exposure to animate mechanical forces	3.0
Exposure to electric current, and extreme ambient air temperature and pressure	1.3
Exposure to smoke, fire and flames	2.0
Contact with heat and hot substances	0.3
Contact with venomous animals and plants	1.0
Intentional self harm	0.6
Assault	2.3
Events of undetermined intent	0.6
Misadventures to patients during surgical and medical care*	2.6

* This included 3 circumcisions, 2 injection infections, 2 foreign bodies left in the abdomen and 1 post-surgical infection after appendectomy

a. Ghaffar A, Siddiqui S, Shahab S, Hyder A. National Injury Survey of Pakistan 1997-99. Islamabad, Pakistan: Health Services Academy: Government of Pakistan, 1999.

Indicator:  **IJ 3. Distribution of Injuries by location**

Definition: Distribution of injuries by location based on self-reporting in a retrospective survey of injuries among a representative sample of 1,539 households in Pakistan^a.

Chart IJ 3. Percentage of non-fatal injuries – by location^a

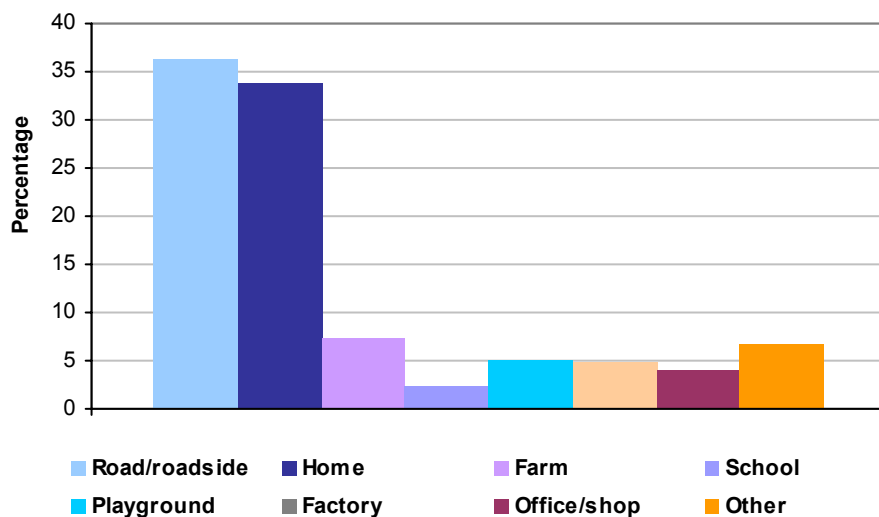


Table IJ 3. Percentage non-fatal injuries - by location^a

Place of Injury	Injured (%)
Road/roadside	36.3
Home	33.7
Farm	7.3
School	2.3
Playground	5.0
Factory	4.7
Office/shop	4.0
Other	6.7

a. Ghaffar A, Siddiqui S, Shahab S, Hyder A. National Injury Survey of Pakistan 1997-99. Islamabad, Pakistan: Health Services Academy: Government of Pakistan, 1999.

Indicator:  **IJ 4. Percentage of drivers/passengers wearing seatbelts**

Definition: Percentage of drivers/passengers who regularly worn seatbelts in the last 30 days^a.

Chart IJ 4. Percentage of drivers/passengers wearing seatbelts – by place of residence^a

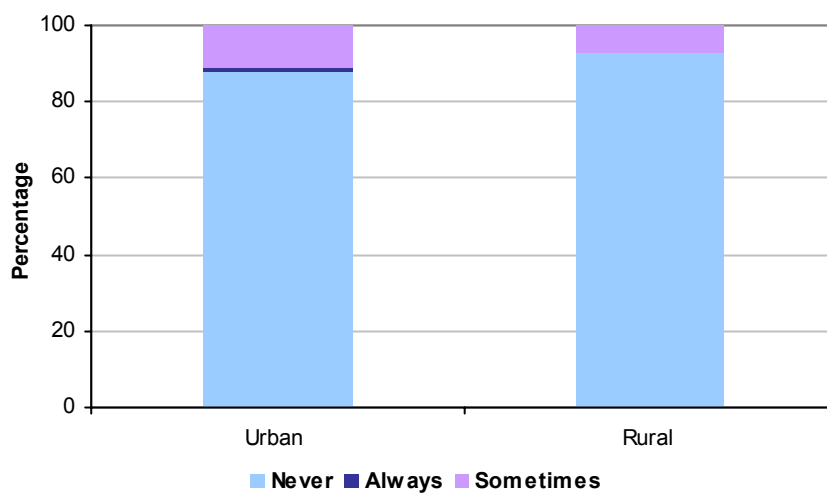


Table IJ 4. Percentage of drivers/passengers wearing seatbelts – by place of residence^a

Use of Seatbelt	Urban	Rural
Always	0.9	0.1
Sometimes	11.2	7.3
Never	88.0	92.7

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

Indicator:  **IJ 5. Percentage of motorbike drivers/passenger wearing helmets**

Definition: Percentage of drivers/passengers who regularly wore helmets while riding motorbikes in the last 30 days^a.

Chart IJ 5. Percentage of drivers/passengers wearing helmets – by place of residence^a

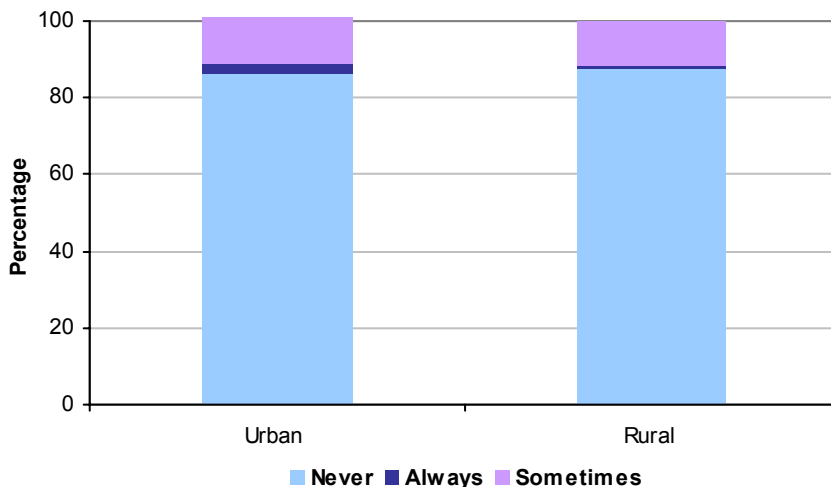


Table IJ 5. Percentage of drivers/passengers wearing helmets – by place of residence^a

Use of Helmet	Urban	Rural
Always	2.5	0.7
Sometimes	12.0	11.8
Never	86.4	87.6

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

Indicator:  **IJ 6. Percentage of bicycle riders wearing helmets**

Definition: Percentage of bicycle riders who regularly wore helmets in the last 30 days^a.

Chart IJ 6. Percentage of bicycle riders wearing helmets – by place of residence^a

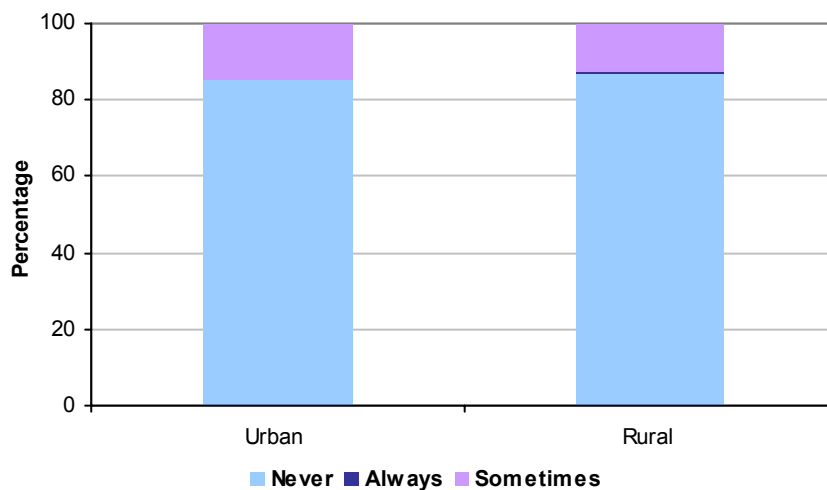


Table IJ 6. Percentage of bicycle riders wearing a helmet – by place of residence^a

Use of Helmet	Urban	Rural
Always	0.1	0.1
Sometimes	14.5	12.7
Never	85.3	87.1

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

Disabilities

Disabilities

A disability is any restriction or lack of ability (resulting from an impairment) to perform an activity in the manner and within the range considered normal for a human being. Impairment means any loss or abnormality of psychological, physiological or anatomical structure or function. There could be various ways of interpreting this. However, in this document, a person is classified as being disabled if any of the following are present: *physical disability, blindness, reported hearing difficulties* and *gross mental abnormalities*. It is important to appreciate that the total percentage of those with disabilities is not equal to the sum of the parts since an individual may have multiple disabilities.

Data on physical disabilities and mental retardation in this document come from the Population Census of 1998; although these data are more than eight years old, they are the only nationally representative data available. Similarly, data on hearing impairment comes from the National Health Survey of Pakistan 1994. However, blindness data is more recent.

The 1998 Population Census showed that overall, 2.54% of the total population of Pakistan could be labeled as being disabled. The nature of disability expressed as a percentage of the total disabled population is also shown based on data from the same source. However, for blindness and hearing impairment, additional data are also presented herewith.

In relation to Blindness, a recent national population-based survey conducted in 2002 - 2004 reported prevalence of blindness at 0.9%, albeit with provincial variation. This means that at least 1.4 million Pakistanis are blind in both eyes. Women have a 30% higher risk of becoming blind. According to this survey, 51.5% of the blindness cases were due to Cataract (a clouding of the lens in the eye), 11.8% were due to scarring of the cornea (clear part of the eye); 7.1% could be accounted for by Glaucoma (the nerve of the eye is affected by pressure in the eyeball), 2.7% were due to refractive errors (need for spectacles) whereas 2.1% were due to macular degeneration (disease of ageing that affects the light sensitive part of the eye). All these blinding diseases can either be avoided (i.e., they are either preventable or treatable) or can be helped with optical devices (spectacles or low-vision devices).¹¹² In recognition of these considerations, the National Programme for Prevention and Control of Blindness has been launched in 2005. This programme is in its initial stages of implementation; its success will depend on a number of factors and will have to be gauged by a set of programme-specific indicators.

112. Pakistan Institute of Community Ophthalmology. Preliminary results of National Blindness Survey 2002-2003: 2005. Bhurban, Pakistan: Pakistan Institute of Community Ophthalmology, Ministry of Health and National Steering Committee for Prevention of Blindness; 2005.

Data on hearing impairment in this document come from the National Health Survey of Pakistan (1990-94), according which hearing impairment was ascertained by the whisper test. Based on this criteria, less than 6% of the population below the age of 44 years had hearing impairment whereas on the other hand, in the above 45 years age category, 35.5% of the population in the urban and 31.1% of the population in the rural areas was reported to have hearing impairment. Hearing impairment is the most common disability among people over 65 years of age and is more common in the urban areas.

Indicator:  **DL 1. Prevalence of Physical and Mental Disability**

Definition: Any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner and within the range considered normal for a human being. Impairment means any loss or abnormality of psychological, physiological or anatomical structure or function^a.

Chart DL 1. Percentage of the population with Physical and Mental Disability – by gender and place of residence (1998)^a

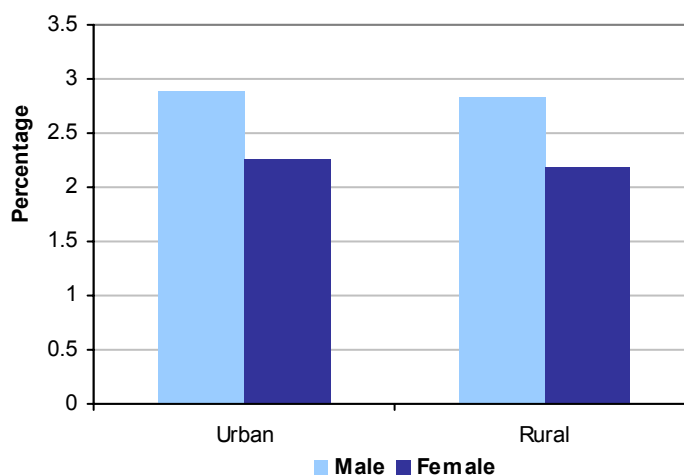


Table DL 1. Percentage of the population with Physical and Mental Disability – by gender and place of residence (1998)^a

	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Disabled	2.88	2.26	2.59	2.83	2.19	2.52

a. Government of Pakistan. Population Census 1998. Islamabad, Pakistan: Federal Bureau of Statistics, Statistics Division; 1998.

Indicator:  **DL 2. Prevalence of the nature of Disability**

Definition: Nature of disabilities expressed as a percentage of the total disabled population. A disability is any restriction or lack (resulting from an impairment) of the ability to perform an activity in the manner and within the range considered normal for a human being. Impairment means any loss or abnormality of psychological, physiological or anatomical structure or function^a.

Chart DL 2. Nature of disabilities in Pakistan – by gender and place of residence (1998)^a

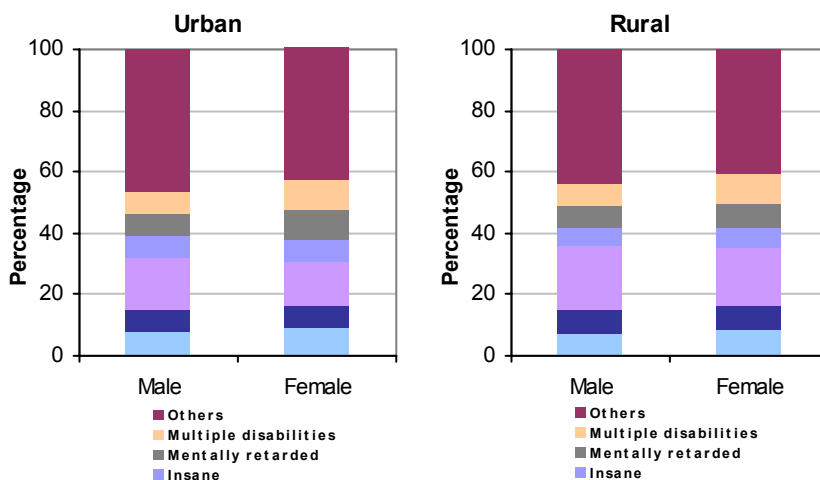


Table DL 2. Nature of disabilities in Pakistan – by gender and place of residence (1998)^a

Nature of disability	Urban			Rural		
	Male	Female	Total	Male	Female	Total
Blind	7.9	8.8	8.3	7.4	8.6	7.9
Deaf and mute	7.1	7.5	7.2	7.4	7.7	7.5
Crippled	16.8	14.3	15.8	21.4	19.3	20.5
Insane	7.9	7.4	7.2	5.7	6.2	5.9
Mentally retarded	7.5	9.6	8.1	6.8	8.1	7.3
Multiple disabilities	7.2	9.6	8.2	7.4	9.4	8.2
Others	46.3	43.1	44.9	43.9	40.7	42.5

a. Government of Pakistan. Population Census 1998. Islamabad, Pakistan: Federal Bureau of Statistics, Statistics Division; 1998.

Indicator:  **DL 3. Prevalence of Blindness**

Definition: Presenting visual acuity (i.e., with glasses for distance if normally worn, or unaided) of less than 3/60 (<20/400, log MAR>1.30) in the better eye¹¹³. The WHO categories of visual impairment were used for this study.

Table DL 3. Percentage of the population blind during 1990^a and 2004^{b-f}

Year	%
1990 ^a	1.78
2004 ^{b-f}	0.90

Indicator:  **DL 4. Number of people with Bilateral Blindness**
Table DL 4. Number of adults with Bilateral Blindness – by province^f

	Punjab	Sindh	NWFP	Balochistan	Total
Bilaterally blind	769,000	200,000	114,000	52,000	1,135,000

Indicator:  **DL 5. Prevalence of Functional Low Vision**

Definition: Presenting visual acuity of less than 6/18 (20/60, log MAR 0.5) but equal to or better than 3/60 in the better eye (comprising category 1 in ICD-10, moderate visual impairment (MVI), less than 6/18 to 6/60, as well as category 2, severe visual impairment (SVI), less than 6/60 to 3/60).

Table DL 5. Percentage of people with Functional Low Vision^f

	Percentage
Functional Low Vision ^f	0.8 [*]

*Prevalence obtained from using the ICD-10 classification definition was 14.4%. However, the prevalence of true low vision is obtained by using a functional definition. The low vision figure above has been defined using the WHO functional definition of low vision: A person with low vision is one who has impairment of visual functioning even after treatment and/or standard refractive correction, and has a visual acuity of less than 6/18 to light perception, or a visual field of less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for the planning and/or execution of a task.

- Memon, SM. Survey and causes of blindness in Pakistan. J Pak Med Assoc 1992;42(8): 196-8.
- Pakistan Institute of Community Ophthalmology. Preliminary results of National Blindness Survey 2002-2003. Islamabad, Pakistan: Pakistan Institute of Community Ophthalmology, 2005.
- Sightsavers International. National Programme for Prevention and Control of Blindness 2005-2010. Islamabad, Pakistan: Sightsavers International, 2005.

113. Resnikoff S, et al. Global data on visual impairment in the year 2002. Bull World Health Organ 82(11):844-851, 2004

- d. Jadoon Z, Dineen B, Bourne R, Shah SP, Khan A, Johnson GJ, Gilbert CE, Khan D. The Pakistan National Blindness and Visual impairment Survey. (In press: Investigative Ophthalmology and Visual Science for Publication 2006)
- e. Dineen B, Bourne RRA, Jadoon Z, Shah SP, MA Khan, Foster A, Gilbert CE, Khan MD. Prevalence of blindness and visual impairment in Pakistan: The Pakistan National Blindness and Visual impairment Survey. Invest Ophthalmol Vis Sci 2006;47:4749-55.
- f. Pakistan Institute of Community Ophthalmology. The epidemiology of visual loss in adults. Report of the Pakistan National Blindness and Visual Impairment Survey (2002 – 2003). Islamabad, Pakistan: Pakistan Institute of Community Ophthalmology, 2006.

Indicator:  **DL 6. Prevalence of Hearing Impairment**

Definition: Diminished hearing in both ears as measured by a whisper test ^a.

Chart DL 6. Percentage of the population with Impaired Hearing – by area of residence ^a

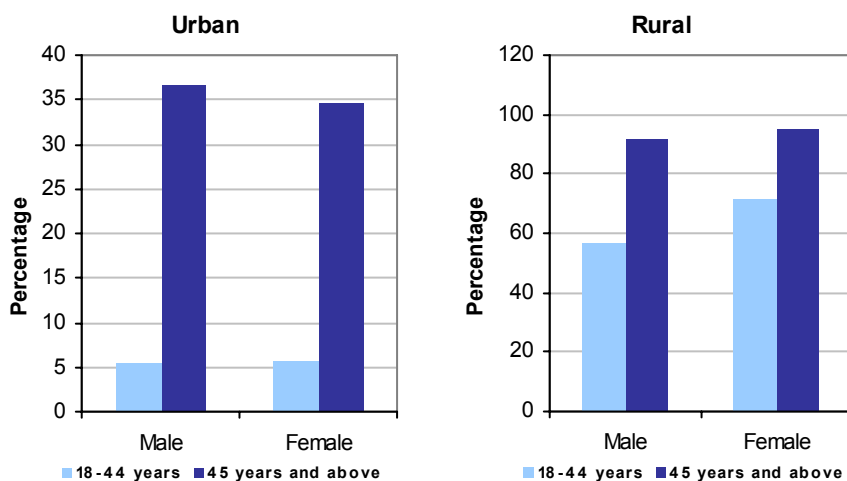


Table DI 6. Percentage of the population with Impaired Hearing – by area of residence ^a

Age categories	Urban			Rural		
	Male	Female	Total	Male	Female	Total
18 – 44 yrs	5.5	5.7	5.6	4.5	6.7	5.6
45 yrs and above	36.6	34.5	35.5	32.8	29.4	31.1

a. Pakistan Medical Research Council. National Health Survey of Pakistan, 1990-94: Health Profile of the People of Pakistan. Islamabad, Pakistan: Pakistan Medical Research Council and the Federal Bureau of Statistics, Government of Pakistan; 1994.

Dental Problems

Dental Problems

Data on dental diseases in this document come from the National Health Survey of Pakistan (1990-94), which used the standard measure of dental disease – counts of the number of teeth decayed or missing. Results showed that the total number of decayed or missing teeth rises with age. Males have slightly less decaying teeth than females. At ages 15-24 years, females have an average of 2.8 decayed or missing teeth compared with 1.2 for males. For the 65 years and above age group, this increases to 22.7 and 19.4, respectively. The data show that 61.7% of the urban and 64% of the rural population in the age range of 18-44 years suffered from poor dental health. These figures are much higher for the 45 years and above age group where more than 90% of the population was reported to have decaying or missing teeth.¹¹⁴

Dental diseases are among the most common ailments and are largely preventable. Pakistan is considered by WHO to have low levels of decaying and missing teeth. That notwithstanding, most adults in Pakistan show signs of poor periodontal and gingival diseases. A situational analysis on Oral Health in Pakistan published in 2004 showed that only 28% of the 12 year-olds have healthy gums and more than 93% of the 65 year-olds have some gum or periodontal disease.¹¹⁵ As opposed to this, the public health capacity for addressing oral health is limited and the infrastructure for oral health is insufficient to address the needs of the population; in addition, oral health does not feature on the public health priorities of the country. Public health interventions to promote dental health need to be part of the health agenda in Pakistan. These also need to be cognizant of the concern that the level of dental diseases may increase with urbanization and change in dietary patterns.

114. Pakistan Medical Research Council. National Health Survey of Pakistan, 1990-94: Health Profile of the People of Pakistan. Islamabad, Pakistan: Pakistan Medical Research Council and the Federal Bureau of Statistics, Government of Pakistan; 1994.

115. Government of Pakistan. Oral Health in Pakistan – a Situational Analysis. Islamabad, Pakistan: Ministry of Health and World Health Organization; 2004.

Indicator:  **DP. Prevalence of poor dental health**

Definition: Percentage of the population having missing or decayed teeth ^a.

Chart DP. Percentage of the population with poor dental health – by area of residence ^a

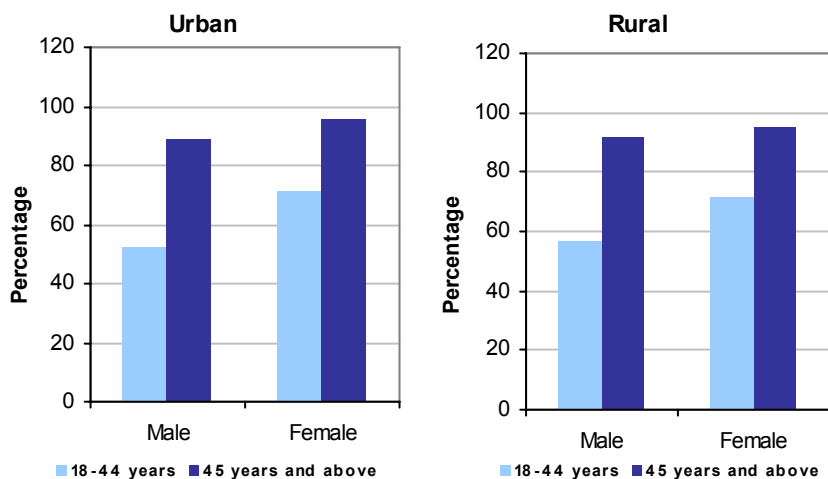


Table DP. Percentage of the population with poor dental health – by area of residence ^a

Age Categories	Urban			Rural		
	Male	Female	Total	Male	Female	Total
18 – 44 yrs	52.2	71.3	61.7	56.7	71.3	64.0
45 yrs and above	88.5	95.3	91.9	92.0	95.3	93.6

a. Pakistan Medical Research Council. National Health Survey of Pakistan, 1990-94: Health Profile of the People of Pakistan. Islamabad, Pakistan: Pakistan Medical Research Council and the Federal Bureau of Statistics, Government of Pakistan; 1994.