

# What Underlies Ukraine's Mortality Crisis?



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## EXECUTIVE SUMMARY

### ***With its working age population dying young, Ukraine faces a mortality crisis***

All health systems in the world face the challenge of the increasing burden of chronic diseases. This is the result of changing life expectancy patterns, i.e. greater longevity, unhealthy lifestyles and an increased exposure to chronic disease risk factors. Ukraine is different, as the most important concern is the early onset of such diseases compared with other European countries, not merely the increasing burden of chronic diseases. The result is premature deaths especially among working age males, changing both the age and gender structure of the Ukrainian population with significant economic and social consequences.

Recognizing this, the World Bank has prepared a series of reports under its “Health and Demography” program the objective of which is to understand “*how government and key stakeholders at the national and regional level, more effectively improve adult health outcomes thus, slowing down population decline in Ukraine in the medium and long term?*”

The first report in this series “An Avoidable Tragedy: Combating Ukraine’s Health Crisis – Lessons from Europe” showed that premature mortality among working age males is caused in part by modifiable behavioral risk-factors such as alcohol abuse and smoking that are avoidable and for which cost-effective targeted interventions exist. However, Ukraine’s health system designed for acute care episodic disease management is not equipped to deal with this and needs comprehensive reform. Recognizing the key role of lifestyle factors in pre-mature mortality, a second report “Prevalence and Determinants of Alcohol, Tobacco and Illicit Drug Use in Ukraine” used data from the Demographic Health Survey 2007, to identify the levels of substance use, the population sub-groups at high risk, and the social context for substance use. The report identified key interventions that could result in quick wins and key target groups at whom policies and interventions need to be targeted to achieve impact. Recognizing however that while some health reforms proposed in the first report have been outlined and even legislated in Ukraine, they have either not been implemented and if so, have not yielded expected results. The third report in this series “Local Multi-Sectoral Collaboration: Preventing Premature Mortality Among the Working Age Population in Ukraine”, focused on key stakeholders at the regional level and their level of collaboration in chronic disease prevention and management programs. It noted a lack of local involvement in the design of key programs and strategies, and proposed increased local involvement in the development of solutions and improved collaboration across sectors for reducing working-age mortality in Ukraine.

This is the fourth report in this series. Here data—from a new nationally and regionally representative household survey conducted in 2009 under the Ukraine Health and Demography program — presents an excellent opportunity to further strengthen the evidence base for policy making on how adult health outcomes can be improved. This report helps better understand the socio-economic determinants of adult health outcomes, their risk factors and health seeking behavior especially for certain chronic illnesses, including factors that underlie differences in health outcomes across regions, genders and socio-economic groups that explain the differing patterns in health outcomes. Combining self-reported health status with health assessments (using biomarkers), the prevalence of certain chronic conditions can be determined, as well as the extent of risk-factor prevalence and knowledge and understanding of healthy lifestyles in the study population. In particular, three broad questions are addressed:

- What are the key determinants of poor health adult outcomes and what socio-economic factors explain differences in adult health outcomes?
- What is the level of understanding of the population on chronic illnesses, impact of unhealthy lifestyles etc. on health outcomes?
- What are the patterns of health care utilization especially for select chronic conditions?

This study is unique in several ways and offers several benefits. First, it uses primary data from a recent nationally and regionally representative household survey that includes not only self-reported health status information but biomarkers as well. The information available allows for analyzing health

outcomes by socio-economic category and regions as well as for analyzing the determinants of health outcomes. Lifestyle-related causes, as well as health system related causes are considered in the analysis. Conducted at both the aggregate level and by sub-populations, the analysis allows for a more robust policy response and stronger targeting of interventions. This data also provides a baseline for policy makers to monitor impact of future policies.

***Pre-mature mortality risk among the Ukrainian population is high – nearly half of the adult Ukrainian population, many young, suffers from one or more chronic disease***

Over 25 percent of the adult Ukrainian population, 18 to 65 years of age, has a chronic disease or condition - around 7 percent have multiple (three or more) chronic diseases or conditions. Some striking results include:

- *Chronic disease is widespread in the general population as a whole and is not restricted to one or more regions in the country.* While chronic disease prevalence is highest in the West (40 percent), the intensity, as measured by people with multiple chronic conditions, is the highest in the East. Even where prevalence is lower, i.e. the South, nearly a quarter of the adult population suffer from a chronic disease.
- *More women suffer from chronic diseases but this is not surprising given women live longer in Ukraine while premature mortality is high among the male population.* Though women live longer in Ukraine, they spend more years and a greater proportion of their lives in states less than perfect health.
- *More and more young adults are getting inflicted with chronic diseases.* About one in three respondents with hypertension in the East are under 40 years old and even worse, 47.5 percent of hypertensives are under 40 years old in the West. About one in five, 18-29 year olds are hypertensive in Ukraine compared with 8.75 in Romania.
- *Chronic disease is not a disease of the rich – it affects rich and poor alike.* Hypertension prevalence is highest among women in the lowest two wealth quintiles. This is a rising equity concern since chronic diseases are expensive to treat and control and require medications which are paid out-of-pocket.

***Unhealthy lifestyles especially among young males put them at risk for chronic disease in the future***

Moreover, unhealthy lifestyles among the adult population indicate that many Ukrainians fail to grasp the seriousness of the risks they face. Lifestyle factors, such as smoking, heavy drinking, poor diet and physical activity underlie much of the disease burden.

- *Thirty six percent of the Ukrainian population are current smokers while 31 percent of them smoke daily.* More than 58 percent of men and nearly 7 percent of women are current smokers of which, nearly 52 percent of men and 12 percent of women respectively smoke daily. This is above the WHO European region average of 28.6 percent for the population 18 years and older.
- *Not only does smoking start early; the average starting age among daily smokers has been decreasing over time.* Now the average age at first smoking is 16 years among the <30 years olds while it was 19 years for those who are currently between 60 and 65 years of age.
- *A daily smoker smokes an average of 18 cigarettes per day, which is nearly one pack.* Men not only had higher prevalence of smoking, but they also smoked more on average (19 cigarettes) compared to women (13 cigarettes).
- *Twenty percent of Ukrainians indulge in heavy or binge drinking, having one or more days in the last month where they had more than five drinks that day.* Over 80 percent of heavy or binge drinkers are men and they account for a third of the adult male population. In comparison, only 7.4 percent of the adult female population falls in this category.

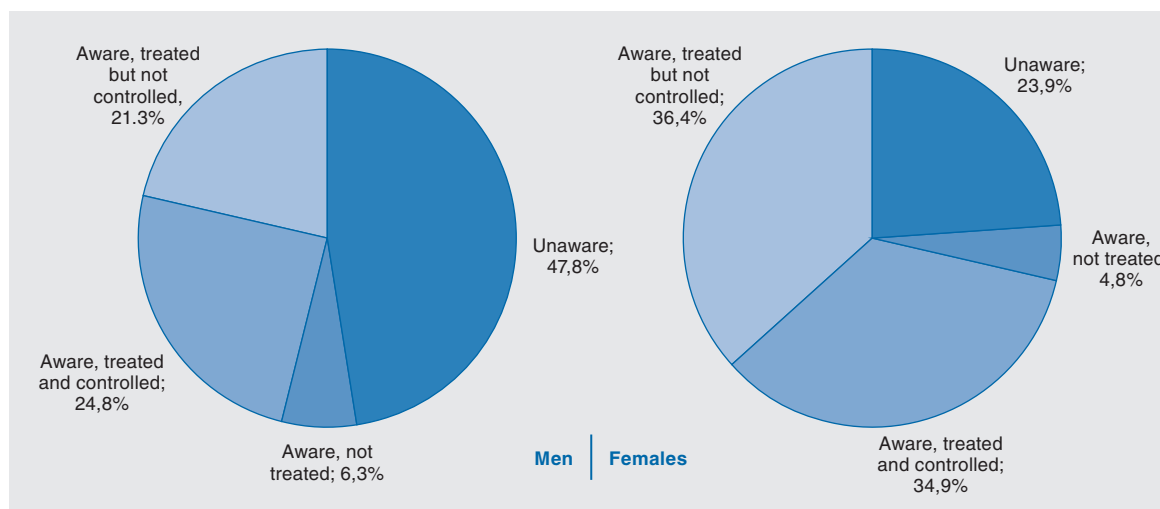


- *Heavy or binge drinking starts young and increases with age initially and peaks between 40-49 years after which it starts to decline, which also may be an indication of the low survival rates among heavy or binge drinkers in the older age groups, especially males. Among heavy or binge drinkers, the highest share was in the youngest age group studied; the 18-29 year olds (28.0 percent), followed by 40-49 year olds (26.7 percent). Among men, the highest share of heavy or binge drinkers was among the 18-29 year olds, but there is a higher concentration of non-heavy drinkers in this same age group (31.8 percent). Among females, the highest share of heavy or binge drinkers fell in the 40-49 year age range (35.8 percent).*
- About 10 percent of Ukrainians are sedentary while 6.3 percent has insufficient physical activity per week. Most surprising is the high rates of sedentary behavior among the 18-29 year olds. With 10.9 percent of 18-29 years olds being sedentary, this is perhaps one of the highest rates in the region – in comparison in Czech Republic, 3.7 percent of the same age group are sedentary, and in Hungary, it is high at 7.1 percent but still lower than Ukraine. Females are more likely to be sedentary than males. Sedentary behavior is also more prevalent among those residing in urban areas and increases with wealth.

**A failing health system and an unaware and sometimes indifferent population compounds the problem**

*Despite high chronic disease prevalence however, a majority of the Ukrainian adult population rate their health status as being satisfactory or better. Underlying this is both a low awareness of one's own health conditions, as well as an even lower awareness of the seriousness of the risk one faces.*

**Awareness of hypertension status and treatment status among hypertensives, by gender**



*One-third of those classified as hypertensive by the survey were unaware of their hypertensive status, with twice as many men being unaware compared to women. More hypertensive men were unaware of their status than hypertensive women – 48 percent of hypertensive men compared with 24 percent of hypertensive women. Of note, 61 percent of men and 74 percent of women unaware of their hypertensive status were classified as having stage II hypertension through survey measurements.*

*Since routine screening of adults for hypertension and obesity when visiting a facility is not always the norm, diseases sometime go undiagnosed. Measuring blood pressure levels and weight should be a routine procedure for any visit to the doctor. Among Ukrainians whose hypertension status was revealed through survey measurements, 14.1 percent had had a medical appointment in the last 30 days with 4.3 percent having visited a medical facility more than once. Of those who were classified as obese by survey measurements but were unaware of their obesity status, nearly a quarter had visited a health facility in past 30 days. Of these, 7.8 percent had made more than one visit to a facility.*

*Compliance to prescribed treatment is low - half of the population under treatment for key chronic conditions – hypertension; diabetes and high cholesterol do not take the medication or follow recommendations as*

*prescribed*. About a quarter do not take the drugs according the dosage and frequency prescribed, while the rest do not take their medication at all. Key reasons given for lack of compliance include forgetting to take medication and respondent's own view that they no longer need the medication. Therefore, it is not surprising as the data shows that one-fifth of hypertensive men and 36 percent of hypertensive women, while aware and being treated still have stage one or two level hypertension. Less than a quarter of those who are obese and diagnosed as such are following any program to lose weight.

### ***Without immediate action, Ukraine can lose the next generation to chronic disease***

*To protect the future, immediate action is necessary – and this can be achieved but would require a concentrated effort of all – the government, the private sector and most importantly the Ukrainian public.* As is known worldwide, chronic disease management and control is not merely within the control of the health sector. It requires involvement of the government, the private sector and more importantly, the adult Ukrainian population. Key to reducing the risk of chronic diseases is both preventing the underlying risk factors especially those that behavioral and are modifiable, as well as controlling and managing the disease through early detection, control and treatment. In both cases, the participation of the individual at risk is critical.

This report, therefore, suggests a two-pronged approach:

*First, is a concentrated focus on targeted primary prevention programs – involving the government, the community, businesses and most importantly, the Ukrainian public.* This would involve:

- Raising awareness especially among those who control Ukraine's future – namely the youth. Schools could be good place to target as much of these risky behaviors as is seen in this report start early.
- For young adults – programs and interventions that emphasize short and long term benefits of healthy lifestyles – using rewards and incentives where needed.
- Enforcement of existing regulations such as ban on sale of alcohol and tobacco to minors, ban of smoking in certain public areas.
- Use of taxes, tariffs, legislation and regulations to ensure comprehensiveness of existing measures to further reinforce healthy behaviors. Here, the key is not merely to regulate on paper but to enforce these regulations.

Primary to this is the development of a common strategy to prevent and control chronic diseases outlining priority areas, delineating roles of various sectors and levels of government thus encouraging the tackling of the issue in a comprehensive manner. As is seen, modifying lifestyle behaviors crucial to the chronic disease cannot be done by the health sector alone and will require participation of various sectors of the government, the private sector and non-government organizations.

*Second, would involve re-orienting the health system to help identify high risk cases, detect chronic conditions and diseases early and control their progress.* In the management of chronic disease, there are two important players – the health system and the patients. An earlier World Bank study (World Bank 2009), showed that that the health system in Ukraine is unprepared to deal with crisis as currently organized. The health system therefore needs to be re-organized. It has to move away from a model based on episodic care for acute illnesses to one that is more proactive and meets the needs of patients with chronic conditions. Early detection is the key to control of chronic illnesses. This can be achieved through:

- Strengthening of the primary care system. Health workers need to be trained to identify those at risk and inform them of the consequences, diagnose conditions early and treat them appropriately.
- Re-orienting health services to increase patient involvement in treatment decisions and support self-management of chronic diseases by the patient's themselves. As chronic disease is not always managed in a health setting, raising awareness of the patient, involving them in designing of their treatment plans will go a long way in ensuring compliance reducing the risk of premature death.

## CHAPTER I:

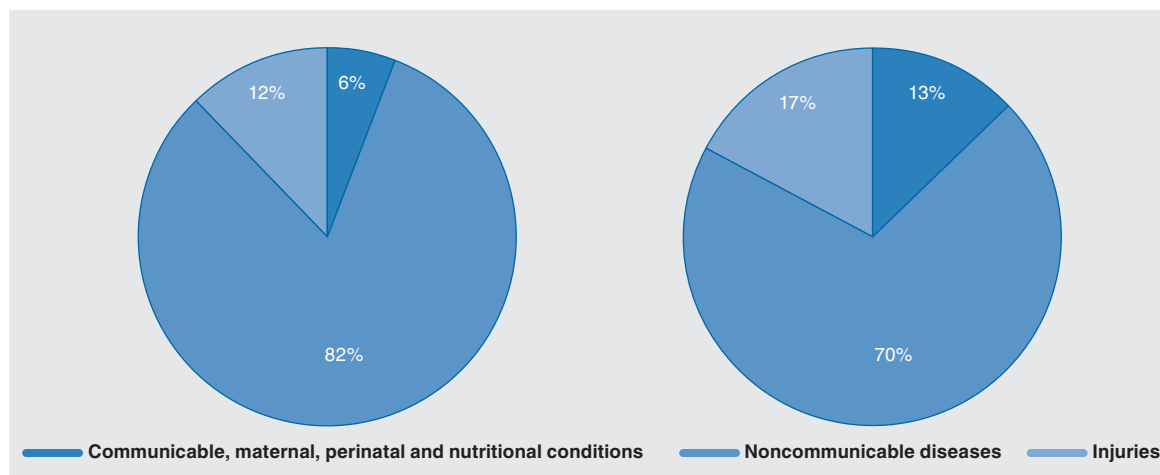
# INTRODUCTION

1. *Ukraine has the fastest de-population rate in Europe.* Here, declining fertility rates combined with high mortality is resulting in declining life expectancies. While there are indications of improvements in some health indicators (infant mortality, maternal mortality etc.), many health problems especially those pertaining to chronic illnesses persist and high mortality rates are now largely due to premature deaths from chronic illnesses among the adult population. Ukrainians, especially working age males, are not only dying younger but also have fewer years lived in full health relative to their European counterparts. These changes in the age and gender structure of the population have significant social and economic consequences.

2. *Non-communicable diseases (NCD) and chronic conditions comprise the bulk of mortality in Ukraine, especially among working age males.* Eighty two percent out of the about one million age-standardized deaths in 2004 were caused by NCD. This is followed by external causes (12 percent) and communicable, maternal, perinatal and nutritional conditions (6 percent). NCD are also characterized by a long time-lag between exposure and manifestation, and usually require life-long observation and treatment. Notwithstanding high shares in mortality rates, NCD also account for the bulk of disability (70 percent) in Ukraine of the 20 million disability-adjusted life-years in 2004.

**Disability-Adjusted Life-Years (DALY) is a health-gap measure summarising the number of years lost due to death and disease.**

**Figure 1: Deaths and DALYs by cause, 2004**



Source: WHO Global Burden of Disease (GBD) estimates, 2008.

3. *Many of the causes of premature-death and disease in Ukraine are linked to risk-factors which are largely modifiable and preventable.* Risk factors related to lifestyle such as smoking, alcohol and diet, as well as environmental conditions play key roles in many diseases, including poisonings, injuries and the biggest killer in Ukraine, circulatory system diseases such as ischemic heart disease and stroke. These causes of chronic diseases are expressed through common chronic conditions (or intermediate risk factors) such as high blood pressure, high blood glucose levels, high cholesterol and overweight/obesity.

4. *Meeting the health challenge of reducing premature mortality and morbidity is important and will require multi-sectoral coordination and a targeted approach.* Recent experience - in the region however, has shown that poor adult health outcomes are not immutable. Yet, achieving sustainable improvements requires multi-sectoral policy coordination, a deeper understanding of health seeking behavior and regional differences in health outcomes and underlying factors that explain risky behavior and improving the capacity of health services to detect, treat and monitor chronic illnesses at the appropriate level.

5. Yet, the specific determinants of key health outcomes and health seeking behavior that explain differences across regions, especially those related to chronic diseases, are not well understood. Moreover, timely utilization of health services in Ukraine which is crucial for prevention and control of chronic illnesses. This points to the need for continued efforts to ensure that a multi-pronged approach targeted to the specific population aimed at increasing the timely utilization of appropriate services (e.g. through health promotion, education measures, improvements in quality) etc., is implemented.

6. Recognizing this, the World Bank has prepared a series of reports under its “Health and Demography” program the objective of which is to understand: *“How government and key stakeholders at the national and regional level can be more effective in improving adult health outcomes thus, slowing down the decline in population in Ukraine in the medium and long term?”*

7. The first report in this series “An Avoidable Tragedy: Combating Ukraine’s Health Crisis – Lessons from Europe” showed that premature mortality among the working age population, especially males, is caused in part by modifiable behavioral risk-factors such as alcohol and smoking. Despite the amenable nature of these deaths and evidence of cost-effective targeted interventions that could work, Ukraine’s health system designed for acute care episodic disease management is not equipped to deal with this mortality crisis and would need comprehensive reform. This contrasts with countries in Central Europe which had similar trends in adult mortality in the 1980’s, but these trends diverged in the 1990’s and beyond, leading to higher life expectancies. Integrated approaches to health reform while mobilizing and communicating with several other sectors of the government to improve chronic disease prevention and management, which were adopted by several Central European countries, appear to have in part helped in this transition and offers rich lessons for Ukraine.

8. As many of the causes of premature-death and disease in Ukraine are linked to risk-factors which are largely modifiable and preventable, a second report “Prevalence and Determinants of Alcohol, Tobacco and Illicit Drug Use in Ukraine” used data from the Demographic Health Survey 2007, to identify the levels of substance use, population subgroups at high risk, and the social context for substance use. The report identified a few key interventions that could result in quick wins and key risk groups to target policies and interventions in order to achieve impact.

9. Recognizing that several reforms have been proposed and some have even been legislated in Ukraine, most have not been implemented and if implemented, do not appear to yield expected results. The third report in this series “Local Multi-Sectoral Collaboration: Preventing Premature Mortality Among the Working Age Population in Ukraine”, focused on key stakeholders at the regional level and the level of collaboration between these stakeholders in the design and implementation of chronic disease prevention and management programs. It noted a lack of local involvement in the design of key programs and strategies and proposes increased local involvement in the development of solutions and improved collaboration across sectors for reducing working-age mortality in Ukraine.

10. In the fourth report, data—from a *new* nationally and regionally representative household survey conducted under the Ukraine Health and Demography program — presents a unique opportunity to considerably strengthen the evidence base for policy making on how adult health outcomes can be improved. The report helps better understand the socio-economic determinants of adult health outcomes, their risk factors and health seeking behavior especially for certain chronic illnesses including factors that underlie differences in health outcomes across regions, genders and socio-economic groups, as well as explain the differing patterns in health outcomes. Combining self-reported health status with health assessments (using biomarkers), the prevalence of certain chronic conditions can be determined, as well as the extent of risk-factor prevalence and knowledge and understanding of healthy lifestyles in the study population. In particular, three broad questions are addressed:

- *What are the key determinants of poor health adult outcomes and what socio-economic factors explain differences in adult health outcomes?*
- *What is the level of understanding of the population on chronic illnesses, impact of unhealthy lifestyles etc. on health outcomes?*
- *What are the patterns of health care utilization especially for select chronic conditions?*

## DATA AND STUDY METHODOLOGY

11. The study uses the Ukraine Household Survey on Chronic Conditions, Lifestyle Factors and Health Care Utilization, the first large population-based study of chronic diseases, risk factors and service utilization in Ukraine. The survey is representative at the national and regional level. Conducted between September and October 2009, the survey sampled individuals from households from eight oblasts of the Ukraine: Kyiv, Autonomous Republic of Crimea, Vinnytsia, Rivne, Lviv, Dnipropetrovsk, Luhansk, Odessa - representing four regions: West (Volyn, Transcarpathian, Ivano-Frankivsk, Ternopil, Chernivtsi, Lviv and Rivne), North and Center (city of Kyiv, Kyiv, Vinnytsya, Zhytomyr, Kirovohrad, Poltava, Sumy, Khmelnytskyi, Cherkasy, Chernihiv), South (Autonomous Republic of Crimea, Odessa, city of Savastopol, Kherson, Mykolayiv) and East (Dnipropetrovsk, Donetsk, Zaporizhya, Kharkiv and Luhansk). The survey followed a multi-stage stratified random sampling procedure where enumeration areas were first selected random (equal number of urban and rural enumeration areas except for Kyiv city), then streets within each enumeration areas were selected randomly and then households within each streets.

12. One thousand four hundred and eight household heads were identified and in each household, a household head or best informed person reported on household level information. Then, each household member between 18 and 65 years old within the household was asked to complete a detailed questionnaire about their general health, outpatient care utilization in the past 30 days, hospital utilization in the last 12 months, chronic disease prevalence, lifestyle factors (smoking, alcohol use, exercise, stress, and eating habits), and opinions about the Ukrainian health system. The total sample size was 3,430. In addition to the questionnaire, anthropometric and repeated blood pressure, measurements were taken for each household member between 18-65 years of age by trained medics.

13. This study is unique in several ways and offers several benefits. First, it uses primary data from this recently collected nationally and regionally representative household survey that includes not only self-reported health status information but biomarkers as well. Information available allows for understanding patterns in health outcomes by socio-economic category and regions, as well as for analyzing the determinants of health outcomes. Lifestyle-related causes as well as health system related causes are considered in the analysis. Conducted at both the aggregate level and by sub-populations, the analysis allows for a more robust policy response and stronger targeting of interventions. For instance, understanding the distribution of risk factors such as hypertension, smoking or alcohol use by socio-economic characteristics helps improve policy formulation, determination of treatment plans or interventions, and design of health education messages. Further, undiagnosed conditions reveal either under-utilization of preventive care or in cases where contacts occur with the health system, the inability of the system to identify those most at risk. This would emphasize a need for a focus on preventive care and the importance of screening to ensure secondary prevention. Another important element of chronic disease management is self-management by patients. For those diagnosed as being having chronic conditions such as diabetic, hypertension or high cholesterol levels, reviewing patient compliance to treatment methods helps better understand patient awareness and responsibility for their own health. Further, this data also provides a baseline for policy makers to monitor impact of future policies.

14. The report is organized as follows. The next chapter takes a closer look at the prevalence of chronic disease and conditions among adult Ukrainians through various lenses - to better understand inequalities in health outcomes. Here, health seeking behaviors are reviewed with a specific focus on barriers to seeking care. In Chapter 3, a special focus is on hypertension and obesity, two chronic conditions that underlie some of the leading causes of death and disability, i.e. ischemic heart disease and stroke where biomarkers were used to confirm diagnosis or identify new cases. Here, level of awareness of one's health status is reviewed as is treatment and compliance among those with chronic diseases who seek care. In Chapter 4, patterns of health behaviors are reviewed that place Ukrainians at risk for chronic diseases, such as smoking, heavy or binge drinking and physical inactivity, in order to identify differences health behavior, socio-economic characteristics associated with health behaviors and regional variation. The final chapter discusses policy options for increasing awareness of health risks related to unhealthy behaviors, as well as compliance to treatments when diagnosed with one, thus strengthening health outcomes.

## CHAPTER II:

# HEALTH INEQUALITIES AND CHRONIC DISEASE

### **Main findings:**

- Chronic disease prevalence in Ukraine is high and affects almost half the adult population, 18 years and older.
- Chronic disease is widespread in the general population as a whole and is not restricted to one or more regions in the country.
- More women suffer from chronic diseases while premature mortality is high among the male population.
- More and more young adults are getting inflicted with chronic diseases, a pattern that is different from those observed in most European countries.
- Chronic disease is not a disease of the rich – it affects rich and poor alike.

### **THE CONTEXT**

15. The patterns of life expectancy and levels of health in Ukraine can in part be explained by patterns of profile and prevalence of disease and external causes of death. As noted before, non-communicable diseases are the most prevalent causes of death and disease among the adult population. Aggregate data on burden of disease however do not indicate the disproportionate chronic disease burden experienced by different population groups.

16. In this Chapter, the prevalence of the following chronic diseases: stroke, diabetes, heart attack, cancer, and osteoporosis and chronic conditions (high blood pressure and high cholesterol) are examined through various lenses – age, gender, marital status, region, urban/rural, education status, employment status, and wealth levels – to better understand inequalities in health outcomes. It is important to note that each disease or condition studied here requires ongoing management by both the patient and the physician over a lifetime, hence the term “chronic”. Also, often chronic diseases are risk factors for other chronic diseases. For example, being diabetic can increase your risk of being hypertensive, having cancer, or having osteoporosis. Having high blood cholesterol is also a strong risk factor for hypertension, stroke and heart attacks. The complex interactions are not discussed in depth here but the distribution of disease is explored in the following sections.

17. The household survey was able to reveal the prevalence of common chronic diseases - stroke, diabetes, heart attack, cancer, and osteoporosis - and chronic conditions – high blood pressure and high cholesterol - through self-reported diagnosis of the condition by their medical provider. In addition, for high blood pressure, measurements were taken as part of the survey which confirmed diagnosis and identified new cases.

### **CHRONIC DISEASE PREVALENCE AND SOCIO ECONOMIC FACTORS**

18. *Almost one-fourth of the adult Ukrainian population has at least one chronic disease or condition and around 7 percent have multiple (three or more) chronic diseases or conditions. Angina Pectoris (or chest pain) was the most prevalent diagnosis (7.3 percent). High blood cholesterol (also known as hypercholesterolemia) was the next prevalent diagnosis among Ukrainians (3.8 percent), followed by 3.6 percent of the sample having diabetes or excess blood sugar levels (Appendix Table 1). Diagnosed prevalence of heart attack is 1.2 percent and stroke is 1.3 percent in the whole sample.*



Osteoporosis is also prevalent with 2.4 percent of the sample diagnosed with it. Cancer is not as common as other chronic diseases with 0.8 percent of the population having any form of cancer, and the West having the highest at 1.3 percent (Appendix Table 1). This may be due to the relatively short life expectancy, Ukrainians die from other causes and hence cancer has not manifested yet given the average age of cancer incidence is later in life (as supported by evidence in industrialized countries).

**Table 1: Percent of chronic disease prevalence by socio-economic characteristics**

	Prevalence of Chronic Diseases	Number of Chronic Diseases or Conditions				Number
		None	1	2	3 or more	
<b>Region</b>						
West	52.3	47.8	37.0	9.7	5.6	840
North and Center	38.7	61.2	23.3	10.1	5.3	814
South	34.9	65.0	21.8	7.8	5.3	815
East	43.7	56.3	23.6	10.8	9.3	845
<b>Gender</b>						
Male	36.9	63.2	24.4	7.5	5.0	1470
Female	47.6	52.5	27.3	12.1	8.2	1844
<b>Age</b>						
18-29 years	23.5	76.6	20.0	3.1	0.4	905
30-39 years	34.3	65.7	25.9	6.8	1.6	666
40-49 years	46.5	53.5	29.3	10.8	6.4	622
50-59 years	61.8	38.2	29.0	17.7	15.1	732
60-65 years	73.7	26.3	30.2	20.6	22.9%	389
<b>Marital Status</b>						
Single	26.8	73.2	19.8	4.5	2.5	538
Married/Cohabiting	44.2	55.7	27.2	10.2	6.8	2372
Separated/Divorced	42.4	57.6	26.1	11.4	4.9	204
Widowed	75.1	24.8	28.8	23.6	22.7	200
<b>Education</b>						
Primary education	46.9	53.1	25.8	15.2	5.9	134
Some high school	40.6	59.4	25.3	9.3	6.0	1974
Some college	44.7	55.2	27.2	10.4	7.1	1069
Some graduate school	46.7	53.3	24.2	9.6	12.9	137
<b>Residence</b>						
Urban	42.9	57.1	24.8	10.3	7.8	1705
Rural	41.5	58.4	28.1	9.1	4.3	1609
<b>Employment status</b>						
Has no paid work now	48.7	51.3	27.2	12.1	9.4	1381
Has paid work now	38.7	61.3	25.2	8.5	5.0	1933
<b>Wealth quintile</b>						
Lowest	39.0	60.9	27.5	8.7	2.8	660
Second	46.1	53.9	24.1	14.1	7.9	665
Middle	46.0	54.0	26.0	9.5	10.5	658
Fourth	42.2	57.8	22.3	11.6	8.3	662
Highest	41.4	58.5	28.3	7.3	5.8	669
<b>Total</b>	<b>42.5</b>	<b>57.5</b>	<b>25.9</b>	<b>9.9</b>	<b>6.7</b>	<b>3314</b>

19. *Chronic disease burden is high among adult Ukrainians nationwide but there is considerable regional variation in chronic disease prevalence with the highest prevalence being in the West.* Thirty seven percent of the adult Ukrainians residing in the West has only one chronic disease. In comparison, Ukrainians living in the South have the lowest chronic disease burden but even here, 22 percent have only one chronic disease or condition. Ukrainians in the East have the highest prevalence of diagnosed high blood cholesterol and sugar levels across the regions (5.1 percent and 4.3 percent respectively). Given that these two chronic diseases are also risk factors, it may not be surprising that the East also has the highest percentages of stroke (2.0 percent) and heart attack (1.9 percent) of all the regions. The likelihood of Ukrainians in the East having a combination of these diseases is high given that almost 20 percent of the East has two or more chronic diseases – this is most prevalent among men in this region (Table 1).

20. *Women have a higher prevalence of chronic illnesses and as would be expected, the number of chronic diseases increases with age.* This is not surprising as women have much longer life expectancies in Ukraine - the female-male gap in life expectancy is 12 years. As a result of chronic disease, women spent significant number of their life in states of ill-health.

21. Although descriptive and bi-variate analysis described above is useful, it can often be misleading because many factors which appear to be associated with chronic disease prevalence may be correlated themselves. To understand better who are most at risk of having a chronic disease, logistic regression models are used to control simultaneously for several background socioeconomic characteristics. Coefficients are reported as odds ratios and levels of significance are noted by asterisks (Table 2).

**Table 2: Logistic regression results for the probability of having one or more chronic diseases**

	Odds Ratio (baseline=no chronic disease) N=3314
<b>Region</b>	
North/Center	0.51***
South	0.43***
East	0.64***
Female	1.41***
<b>Age group</b>	
30-39 years	1.82***
40-49 years	2.98***
50-59 years	5.31***
60-65 years	8.37***
<b>Marital Status</b>	
Married/Cohabiting	1.08
Separated/Divorced	0.97
Widowed	1.83**
<b>Education</b>	
Some High School	0.99
Some college	1.22
Some graduate	1.36
Rural	0.95
Has paid work now	0.80**
<b>Wealth quintiles</b>	
Second lowest	1.15
Middle	1.17
Fourth	1.18
Highest	1.36**

Note: Baseline case - a single male Ukrainian living in the West between the ages of 18 to 29 years old with some primary education, in the lowest wealth quintile, and living in a city without paid work.

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001 –denotes significance at the 5% level or better.



22. The odds of having one or more chronic diseases increases as one ages, resides in the West, is female, widowed and unemployed. The baseline in Table 2 is a single male Ukrainian living in the West between the ages of 18 to 29 years old with some primary education, in the lowest wealth quintile, and living in a city without paid work. Living in the West significantly increased the odds of having one or more chronic diseases ( $p < 0.001$ ) compared with being in other regions. Ukrainian women are 1.41 times more likely have more chronic diseases than men ( $p < 0.001$ ). As the population ages, the odds of having a higher number of chronic diseases increases from 1.82 times for the 30-39 year old group to nearly 8.37 times for the 60-65 year olds compared with that of 18-29 year olds ( $p < 0.001$ ). The odds of having one or more chronic diseases increases by 1.36 time if one was in the highest quintile compared with the lowest wealth quintile. Being widowed versus being single increased the odds of having one or more chronic diseases by 1.8 times ( $p < 0.001$ ). People with paid work were 0.8 times less likely to have one or more chronic diseases ( $p < 0.05$ ).

### HEALTH CARE UTILIZATION, CHRONIC DISEASE AND COSTS

23. The survey asked each respondent if they had utilized medical services in the past 30 days. Nearly 16 percent of the adult population, 18-65 years of age, used health services. About a quarter of these visits were related to chronic diseases or injuries. A large percent, 60 percent of those who did use health services suffer from one or more chronic diseases.

**Table 3: Factors affecting demand for health services in Ukraine**

	Co-efficients	Standard Error
<b>Region</b>		
North/Center	-0.231	(0.141)
South	0.0285	(0.138)
East	-0.550***	(0.166)
Female	0.541***	(0.120)
<b>Age group</b>		
30-39 years	-0.0127	(0.175)
40-49 years	0.0523	(0.186)
50-59 years	0.310*	(0.171)
60-65 years	0.269	(0.217)
<b>Marital Status</b>		
Married/Cohabiting	0.233	(0.185)
Separated/Divorced	0.209	(0.268)
Widowed	0.195	(0.319)
<b>Education</b>		
Some High School	-0.336	(0.308)
Some college	-0.234	(0.318)
Some graduate	0.0698	(0.392)
Rural	0.0171	(0.128)
Has paid work now	-0.268**	(0.125)
<b>Wealth quintiles</b>		
Second lowest	0.176	(0.185)
Middle	0.202	(0.184)
Fourth	0.223	(0.182)
Highest	0.146	(0.197)
Constant	-1.797***	(0.376)

Note: Baseline case - a single male Ukrainian living in the West between the ages of 18 to 29 years old with some primary education, in the lowest wealth quintile, and living in a city without paid work.

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$  –denotes significance at the 5% level or better.

24. *Demand for outpatient health care services was higher among women and those residing in the West of Ukraine.* Logistic regression analysis was used to understand which factor affects the odds of utilization of medical services in the last 30 days. Females used health services more than men as did those living in the West compared with those in the East (both  $p < 0.001$ ). Having paid work decreased the odds of utilizing medical services ( $p < 0.05$ ). Age, marital status, education, rural versus urban residence and wealth levels did not significantly predict utilization of services.

25. *Out-of-pocket costs of seeking out-patient care are high especially for those with multiple chronic diseases; but this is largely driven by high costs of medicines.* On average, a Ukrainian pays out-of-pocket around 185 hryvna (US\$23 approximately) for a medical visit to an outpatient facility (Table 4). As can be seen, the costs almost double for patients with three or more chronic disease as the number of medications needed increase.

**Table 4: Average costs of a out-patient medical visit**

	Among those seeking outpatient care	No chronic disease	One chronic disease	Two chronic disease	Three or more chronic disease
Total costs	185.0	161.5	137.2	216.9	316.7
Gifts to medical personnel	17.6	22.0	12.8	4.9	29.3
Medicine costs	157.6	129.5	115.0	203.2	275.2
Transport costs	9.9	10.0	9.4	8.8	12.1

26. *Based on survey responses, informal payments to physicians are common in Ukraine though reported amounts do not appear to be significant at the lower levels of care.* Almost 7 percent of the sample always offers an informal gift during a medical visit. About a quarter sometime provides an informal gift and 12 percent often do. Over a third never gives an informal gift. Women are more likely to give an informal gift than men in all regions. The average payment per visit was about 18 hryvna, approximately US\$2. Informal payments do appear to affect the frequency of utilization of services. Among those who had a medical appointment or applied for medical assistance in the last 30 days, 39.8 percent noted they would go to the doctor more frequently if informal gifts were not needed while 60.2 percent noted they would go just as frequently. Among those who did not have a visit in the last 30 days, 30.5 percent said they would go more frequently if no informal gift was needed and 69.6 percent said they would go just as frequently.

## CONCLUSIONS

27. As shown above, chronic disease prevalence is high in Ukraine and about half the adult population suffer from one or more chronic disease. It is more prevalent among women, not surprisingly, as women live longer given the 12-year female-male gap in life expectancies in Ukraine. It is highest in the West but levels are nearly a quarter even in the South. Fifteen percent of the population, utilized health services in the past 30 days and utilization appears to be similar across all wealth levels. Informal payments, however, do appear to matter to at least a third of the adult population and could be a barrier to seeking care. In the next chapter, using survey measurements to complement self-reported diagnosis, hypertension and obesity are studied in more depth. Here, treatments prescribed and compliance to treatments is reviewed as is the involvement of patients in decisions related to management of their own disease.

## CHAPTER III:

# HYPERTENSION AND OBESITY – A SPECIAL FOCUS

### **Main findings:**

- One in three Ukrainians between ages 18 and 65 years of age have elevated blood pressure levels and about one-fifth of the adult population is obese.
- Ukrainian men tend to be overweight Ukrainian while women are more likely to be obese. Ukrainian women are more likely to be hypertensive than men.
- Prevalence of hypertension is growing among the younger generation, especially young men, particularly in the East and West. One in five 18-24 years olds are hypertensive.
- Among women, the highest share of hypertensives is in the lowest two wealth quintiles.
- One-third of those classified as hypertensive by the survey were unaware of their hypertensive status, with twice as many men being unaware compared to women. Half of those classified as obese were unaware of their obesity status.
- As routine screening of adults for hypertension and obesity when visiting a facility is not always the norm, diseases sometime go undiagnosed.
- Compliance to prescribed treatment is low - half of the population under treatment for key chronic conditions – hypertension, diabetes and high cholesterol do not take their medication or follow recommendations as prescribed.

### **Consequences:**

- Hypertension and obesity are key risk factors for cardiovascular diseases. In 2009, 67 percent of all deaths in Ukraine were due to cardiovascular diseases.
- Key to prevention and control of chronic diseases is early detection of chronic conditions and their treatment and control. Lack of awareness of one's hypertensive or obesity status and therefore not treating or controlling it, increases the risk of premature death. Cases undiagnosed even when the person encounters the health system further increases this risk.
- Key element to chronic disease prevention and control is self-management by those diagnosed with a chronic condition. Poor compliance levels may reflect a lack of trust in the advice provided or lack of understanding of the benefits of the medications and other recommendations or even perhaps yet again, a low understanding of the real risk. These too can lead to pre-mature deaths from preventable causes.

### **Policy areas for focus:**

- Targeted health promotion programs aimed at raising population awareness of the risks of chronic conditions and their susceptibility to them.
- Improved surveillance to identify and screen at risk population to help detect and treat cases early.
- Training of health personnel at the primary care level to identify cases.
- Re-orient health care services to promote increased patient involvement in their treatment plans.
- Continuous follow-up and improved information for patients to support self-management of chronic condition and thus improve treatment compliance.

## THE CONTEXT

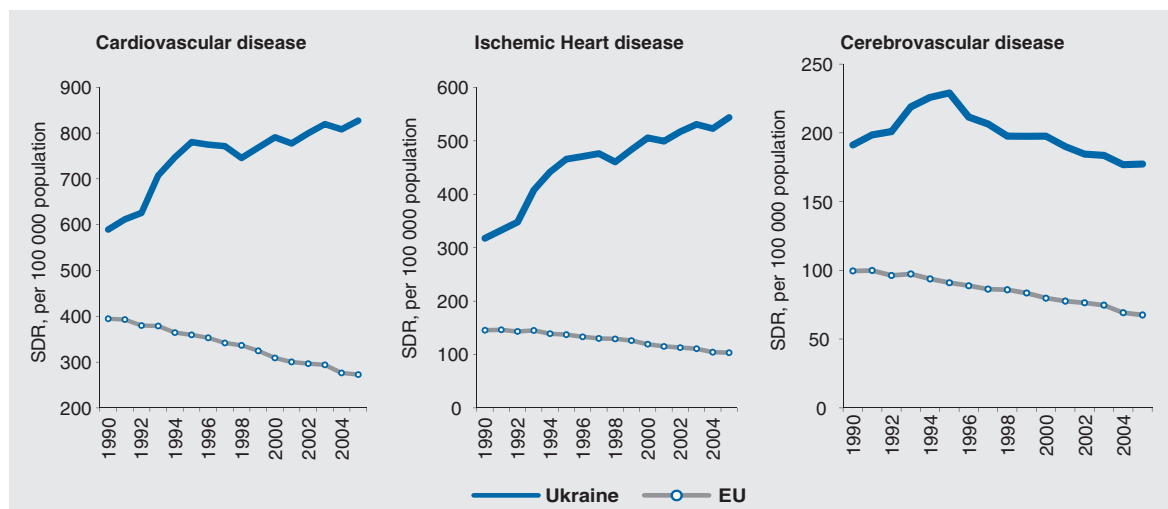
28. Cardiovascular diseases (CVD) are the leading causes of death in Ukraine. It includes Ischemic Heart Disease (IHD) and stroke, which together contribute to over 50 percent of the disease burden and a fifth of the disability burden in Ukraine (Table 5). In Ukraine, mortality from cardiovascular system diseases began to increase at precisely the same point in time when life expectancy began to shorten. From 1990 to 1995, there was a sharp increase in CVD prevalence followed by a slower increase from 1995 to present (Table 5).

**Table 5: Top twelve causes of death and disability in Ukraine, 2005**

Top twelve causes of death (%)		Top Twelve Causes of DALYs (%)	
Ischemic heart disease	39.6	Ischemic heart disease	15.2
Cerebrovascular disease (stroke)	12.9	Cerebrovascular disease (stroke)	5.4
Cirrhosis of the liver	3.0	Other unintentional injuries	1.8
Poisonings	2.9	Unipolar depressive disorders	4.1
Other unintentional injuries	2.6	HIV/AIDS	3.8
Self-inflicted injuries	2.1	Poisonings	2.9
Trachea, bronchus, lung cancers	2.1	Alcohol use disorders	3.3
HIV/AIDS	2.0	Cirrhosis of the liver	3.3
COPD	1.9	Congenital anomalies	2.8
Tuberculosis	1.9	Road traffic accidents	2.7
Road traffic accidents	1.6	Nutritional deficiencies	2.5
Stomach cancer	1.5	Tuberculosis	2.4

Source: WHO Global Burden of Disease (GBD) estimates, 2008.

**Figure 2: SDR for cardiovascular disease, IHD and cerebrovascular disease in Ukraine and EU, 1990-2005**



Source: MDB Database, 2008

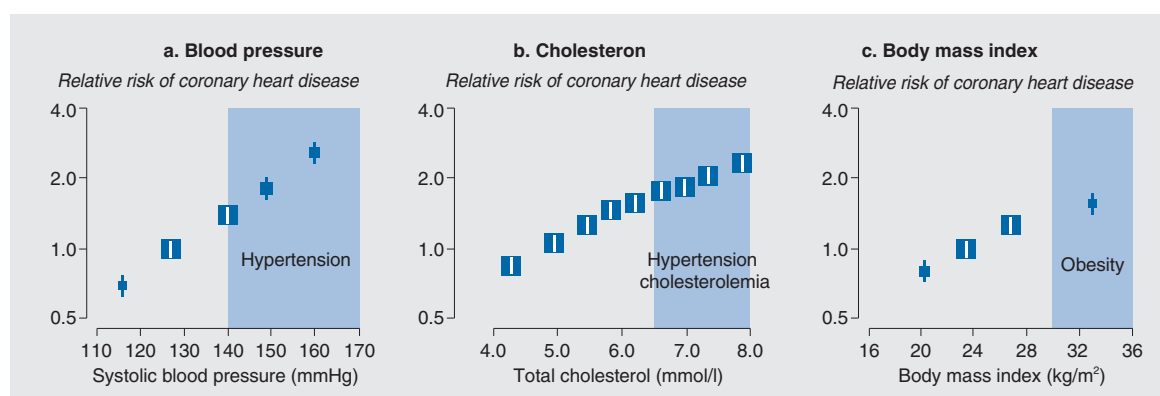
29. Ischemic Heart Disease (IHD) is the single biggest killer in Ukraine while deaths from stroke have declined slightly but remain at high levels. IHD is responsible for almost 40 percent of all deaths in 2005 (Table 5). From 1990-1995, mortality from cerebrovascular diseases (also known as stroke) was increasing in Ukraine. Beginning from 1995, mortality rates from stroke in Ukraine began to decrease but are still two to three times higher than in other Eastern European countries.

30. Prevalence of IHD is high and nearly a quarter of the adult population has been diagnosed with the disease. While there is little regional difference in IHD prevalence and incidence but within regions, some oblasts show a higher prevalence than others, e.g. Kyiv oblast. Here, the follow-up of diagnosed patients is also low as is the case in Volyn, Sevastopol and Ternopil.

**Table 6: Ischemic heart disease prevalence, incidence and medical follow-up in Ukraine, 2009**

Oblast	Prevalence per 100,000 population	% of population >18 years	Incidence per 100,000 population	% under regular medical surveillance	% of gap in follow-up
<b>Ukraine</b>	<b>22917.6</b>	<b>23</b>	<b>1721.1</b>	<b>17</b>	<b>6</b>
<b>West</b>	<b>20677.8</b>	<b>21</b>	<b>1796.631</b>	<b>15</b>	<b>6</b>
Volyn	21346.9	21	1429.1	12	9
Zakarpatt	27437.5	27	2913.5	24	3
Ivano-Frankivsk	20418.5	20	2069.1	16	4
Lviv	14165.3	14	1464.5	11	3
Rivne	20559.4	21	1600.3	16	5
Ternopil	25037.5	25	1480.6	14	11
Chernivetsi	24673.5	25	1876.2	19	6
<b>South</b>	<b>23393.5</b>	<b>23</b>	<b>1726.121</b>	<b>18</b>	<b>5</b>
Crimea AR	19026.3	19	1750.4	14	5
Mykolayiv	24067.9	24	2146.8	19	5
Odessa	22760.6	23	2113.2	18	5
Kherson	22458.1	22	1881.2	17	5
Sevastopol	23970.9	24	720.2	12	12
<b>East</b>	<b>23739.9</b>	<b>24</b>	<b>1684.775</b>	<b>19</b>	<b>5</b>
Dnipropetrovsk	23667.2	24	1682.5	18	6
Donetsk	20452.4	20	1777.4	18	2
Zaporizhyya	18931.9	19	864.5	17	2
Lugansk	27442.8	27	1148.6	25	2
Kharkiv	23406.4	23	2751.1	18	5
<b>North and Center</b>	<b>24873.7</b>	<b>25</b>	<b>1548.946</b>	<b>18</b>	<b>7</b>
Vinnitsyya	27067.6	27	2090.4	24	3
Zhytomyr	19589.8	20	917.6	15	5
Kyiv	32297.5	32	1652	16	16
Kirovograd	26726.4	27	1345.9	17	10
Poltava	24498.4	24	1449.4	20	4
Sumy	19334.1	19	1329.5	18	1
Khmelnyskyi	21599.6	22	1821.4	17	5
Cherkassy	24304	24	1812.8	20	4
Chernyhyv	22371.1	22	1550.1	17	5
Kyiv city	26705.7	27	1609.2	16	11

Source: MOH Statistics, 2009.

**Figure 3: Continuous risks of blood pressure, cholesterol, and body mass index and coronary heart disease risk**

Source: Disease Control Priorities, 2<sup>nd</sup> Edition, 2006.

31. Therefore, of particular concern in Ukraine is the very high prevalence of CVD risk factors—obesity, diabetes, raised total cholesterol, high blood pressure; risky behaviors such as tobacco use, heavy alcohol intake and behavioral patterns such as physical inactivity and poor diet - and the recent rate of increase in the prevalence of these factors. As shown in Figure 3, globally the associations between

blood pressure, cholesterol and body mass index (BMI) and CVD are direct and continuous from relatively low levels, indicating that optimal levels are about 115/75 millimeters of mercury (mmHg), 3.8 millimoles per liter (mmol/l), and 21 kilograms per square meter (kg/m<sup>2</sup>), respectively (DCP2, 2006).

### PREVALENCE OF HYPERTENSION AND OBESITY

32. In this study, for two of the most prevalent cardiovascular disease risk factors, hypertension and obesity, biomarkers were used to verify confirmed diagnosis or identify new cases. As noted above, people with elevated blood pressure have a considerable higher risk of stroke, ischemic heart disease, other cardiac diseases and renal failure. This risk in turn is related to unhealthy diets, especially high salt intake, insufficient physical exercise, excess body weight, smoking and risky alcohol use. Hypertensive rates also rise with increasing age. Adults who are overweight or obese (BMI<sup>1</sup>>30) are at risk for hypertension, diabetes, cardiovascular disease, psychosocial problems and certain types of cancer. The risks increase progressively with body mass index, with amplified relative risks in younger age groups and clear evidence of substantial reversibility on weight loss. The risk of diabetes increases up to 100-fold for the obese, and 80 percent of diabetes prevalence can be attributed to obesity and overweight. Obesity presents serious complications, is difficult and expensive to treat and reduces life expectancy by eight to ten years (WHO 2002).

33. For hypertension in the survey, three blood pressure readings were taken. Second and third systolic and diastolic measurements were averaged and based on this measurement; respondents were classified as being normal, pre-hypertensive, stage one hypertension and stage two hypertension using standard cut-off values for systolic and diastolic blood pressure according to Table 7. Hypertensive status was further compared with self-reported responses to check whether respondents had previously confirmed diagnosis of hypertension through the Ukrainian health system. Following internationally recommended guidelines, individuals were considered hypertensive if they had blood pressure reading <140/90 but were taking antihypertensive medications.

**Table 7: Classification of blood pressure levels**

Classification of Blood Pressure Levels	Systolic Blood Pressure mmHG		Diastolic Blood Pressure mmHg
Normal	<120	and	<80
Pre-hypertension	120-139	or	80-89
Stage One Hypertension	140-159	or	90-99
Stage Two Hypertension	>=160	or	>=100

34. Overweight and obesity status were determined based on the participant's body mass index (BMI) level which is a ratio of weight in kilograms and height in squared meters. Here, using height and weight measurements for survey participants, body mass index (BMI) was calculated and respondents were classified as being of normal weight, overweight or obese grade one through grade three (Table 8). Obesity, grade three is the worst health state while normal is the best health state. Each participant height and weight was measured three times. If all three weight and height measurements were taken, then the two closest height and two closest weights were averaged. If there were only two readings, then these two were averaged. If there was only one set of height and weight taken, this was used to calculate the BMI level. An adjustment of 1.5 kg was taken off the weight to account for the weight of the participant's clothes. Here again, respondents were questioned regarding diagnosis of obesity during previous contacts with the Ukrainian health system.

**Table 8: Classification of overweight and obesity**

Weight	BMI Levels
Underweight	<18.50 kg/m <sup>2</sup>
Normal	18.50-24.99 kg/m <sup>2</sup>
Overweight	25.00-29.99 kg/m <sup>2</sup>
Obesity, grade I	30.00-34.99 kg/m <sup>2</sup>
Obesity, grade II	35.00-39.99 kg/m <sup>2</sup>
Obesity, grade III	>=40.00 kg/m <sup>2</sup>

<sup>1</sup> Body mass index is the ratio of body weight in kilograms divided by the square of the height in meters.

35. As noted above in paragraph 28, pre-hypertensive and overweight population have higher than optimal blood pressure and BMI levels respectively and therefore are within the risk group for CVD and in the following sections pre-hypertensive status and overweight are also considered as risk factors.

36. *One in three Ukrainians between ages 18 and 65 years of age have elevated blood pressure levels (Table 9) and about one-fifth of the adult population are obese (Table 10).* Nearly half of the sample (47.5 percent) was identified as being on the cusp of being hypertensive, a stage referred to as pre-hypertensive and nearly a quarter have stage one or two hypertension; 10.3 percent are classified as being hypertensive but where hypertension is controlled by medication. Nearly 29 percent of the respondents are overweight and 20 percent are obese. Six percent of the adult population are both classified as obese and hypertensive by survey measurements.

**Table 9: Hypertension prevalence by socio-economic characteristics**

Socio-economic characteristics	Prevalence of hypertension*	Blood pressure level					Number
		Normal (%)	Pre-hypertensive (%)	Stage1 Hypertensive (%)	Stage 2 hypertensive (%)	Nor/Pre-hypertensive but taking medication (%)	
<b>Region</b>							
<b>West</b>	44.00	16.70	39.30	8.60	25.40	10.00	840
North/Center	29.80	22.60	47.60	8.60	9.70	11.50	814
South	26.30	15.50	58.10	12.40	5.70	8.20	815
East	34.20	18.30	47.50	11.50	12.30	10.40	845
<b>Gender</b>							
Male	29.90	11.20	58.90	10.00	12.50	7.40	1470
Female	36.80	25.90	37.30	10.20	13.60	13.00	1844
<b>Age</b>							
18-29 years	16.70	31.80	51.50	2.30	11.50	2.90	905
30-39 years	24.70	21.60	53.80	4.90	12.10	7.70	666
40-49 years	34.40	15.10	50.60	11.70	10.80	11.90	622
50-59 years	52.80	8.50	38.70	19.20	15.00	18.60	732
60-65 years	67.60	2.60	29.70	25.30	23.40	18.90	389
<b>Marital status</b>							
Single	20.80	28.20	51.00	6.00	11.10	3.70	538
Married/Cohabiting	34.60	17.10	48.30	10.50	13.60	10.50	2372
Separated/Divorced	31.10	23.60	45.30	11.30	8.60	11.20	204
Widowed	68.30	7.00	24.80	18.20	18.20	31.90	200
<b>Education</b>							
Primary	40.50	20.20	39.20	12.00	15.90	12.60	134
Some high school	32.00	18.20	49.70	9.90	12.10	10.00	1974
Some college	35.00	20.30	44.70	10.30	14.60	10.10	1069
Some graduate	34.40	18.50	47.10	9.70	11.00	13.70	137
<b>Residence</b>							
Urban	33.20	19.50	47.30	9.70	12.70	10.80	1705
Rural	34.10	17.80	48.10	11.00	13.80	9.30	1609
<b>Employment</b>							
no paid work now	40.50	19.30	40.20	13.40	15.70	11.40	1381
has paid work now	29.30	18.70	52.00	8.10	11.50	9.70	1933
<b>Wealth quintiles</b>							
Lowest	33.60	15.90	50.50	9.50	14.40	9.70	660
Second	37.60	17.60	44.70	14.30	12.70	10.60	665
Middle	38.70	15.90	45.40	13.60	16.20	8.90	658
Fourth	33.60	21.20	45.20	8.60	12.60	12.40	662
Highest	28.00	22.30	49.70	7.40	10.80	9.80	669
<b>Total</b>	33.50	19.00	47.50	<b>10.10</b>	<b>13.10</b>	10.30	<b>3314</b>



**Table 10: Obesity prevalence by socio-economic characteristics**

Socio-economic characteristics	Obesity prevalence (%)	Body Mass Index							Number
		Underweight (%)	Normal (%)	Overweight (%)	Obese grade 1 (%)	Obese grade 2 (%)	Obese grade 3 (%)	Missing (%)	
<b>Region</b>									
<b>West</b>	14.70	3.10	35.70	23.50	8.50	4.30	1.90	23.00	840
North/Center	19.90	3.90	38.70	30.90	13.20	5.10	1.60	6.60	814
South	17.00	5.50	45.80	28.50	12.60	2.70	1.70	3.20	815
East	19.00	3.80	39.20	29.90	12.60	4.30	2.10	8.20	845
<b>Gender</b>									
Male	12.00	2.00	43.30	31.80	8.80	2.70	0.50	10.80	1470
Female	23.60	5.70	35.80	25.90	14.80	5.70	3.10	9.00	1844
<b>Age</b>									
18-29 years	6.50	9.60	56.20	15.30	4.80	1.60	0.10	12.30	905
30-39 years	11.50	3.70	43.00	30.30	9.50	1.20	0.80	11.50	666
40-49 years	20.00	1.00	37.60	33.10	13.80	4.30	1.90	8.30	622
50-59 years	31.20	1.10	22.40	38.30	17.90	9.20	4.10	7.00	732
60-65 years	38.80	0.20	16.40	36.00	24.60	9.40	4.80	8.60	389
<b>Marital status</b>									
Single	6.50	8.70	57.30	16.10	4.20	1.80	0.50	11.30	538
Married/Cohabiting	19.30	3.10	36.50	31.20	12.70	4.80	1.80	9.90	2372
Separated/Divorced	18.20	2.40	39.80	33.70	13.10	2.60	2.50	5.90	204
Widowed	43.00	1.60	15.80	30.60	27.70	8.10	7.20	9.00	200
<b>Education</b>									
Primary	23.40	1.70	36.50	29.50	13.90	7.20	2.30	8.90	134
Some high school	19.40	4.00	40.00	27.40	12.80	4.20	2.40	9.20	1974
Some college	16.00	3.70	39.00	30.00	11.20	3.80	1.00	11.30	1069
Some graduate	13.70	6.80	35.60	35.60	6.00	6.60	1.10	8.30	137
<b>Residence</b>									
Urban	18.00	4.30	38.90	29.10	11.80	4.10	2.10	9.70	1705
Rural	18.40	3.20	40.30	28.00	12.30	4.70	1.40	10.20	1609
<b>Employment</b>									
no paid work now	21.80	5.60	36.20	26.30	14.10	5.00	2.70	10.10	1381
has paid work now	15.90	3.00	41.30	30.10	10.70	3.90	1.30	9.70	1933
<b>Wealth quintiles</b>									
Lowest	13.70	4.00	42.40	28.70	10.00	3.00	0.70	11.20	660
Second	23.20	4.10	37.50	27.60	14.40	5.80	3.00	7.60	665
Middle	20.10	2.30	38.60	26.30	13.60	4.00	2.50	12.80	658
Fourth	17.80	3.50	41.50	28.60	10.60	5.20	2.00	8.50	662
Highest	18.00	5.10	36.60	30.80	12.30	4.00	1.70	9.50	669
<b>Total</b>	18.10	<b>4.00</b>	<b>39.40</b>	<b>28.70</b>	<b>12.00</b>	<b>4.30</b>	<b>1.80</b>	<b>9.90</b>	<b>3314</b>

37. *Significant variation exists by region for hypertension but obesity levels are quite consistent across regions.* About one-fourth of Ukrainians living in the West are in stage two hypertension - the most serious stage to be in. This is more than twice the percentage in the next highest region, the East. More generally, the West has the highest prevalence of hypertension of almost 44 percent. The South has the largest share of the sample in the pre-hypertensive phase with about two in five at risk for being hypertensive. In case of obesity, the distribution is fairly consistent across regions. A larger share of Ukrainians living in the North and Center is overweight or obese compared to other regions. Ukrainians living in the West are heavier, with a higher share of those falling in Grade two and three on the obesity scale.

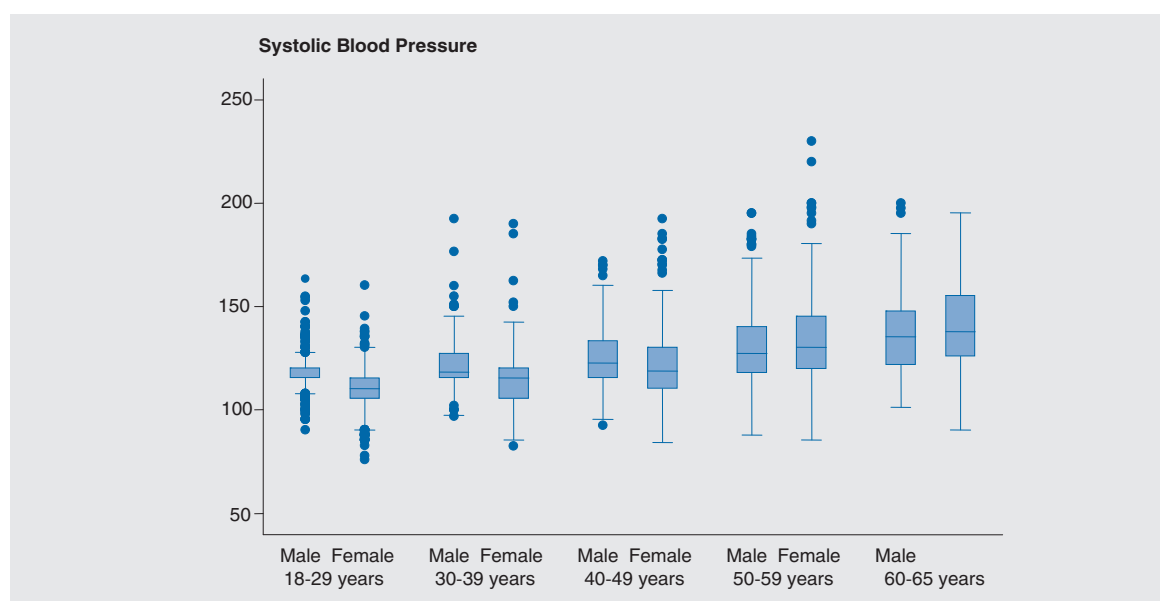


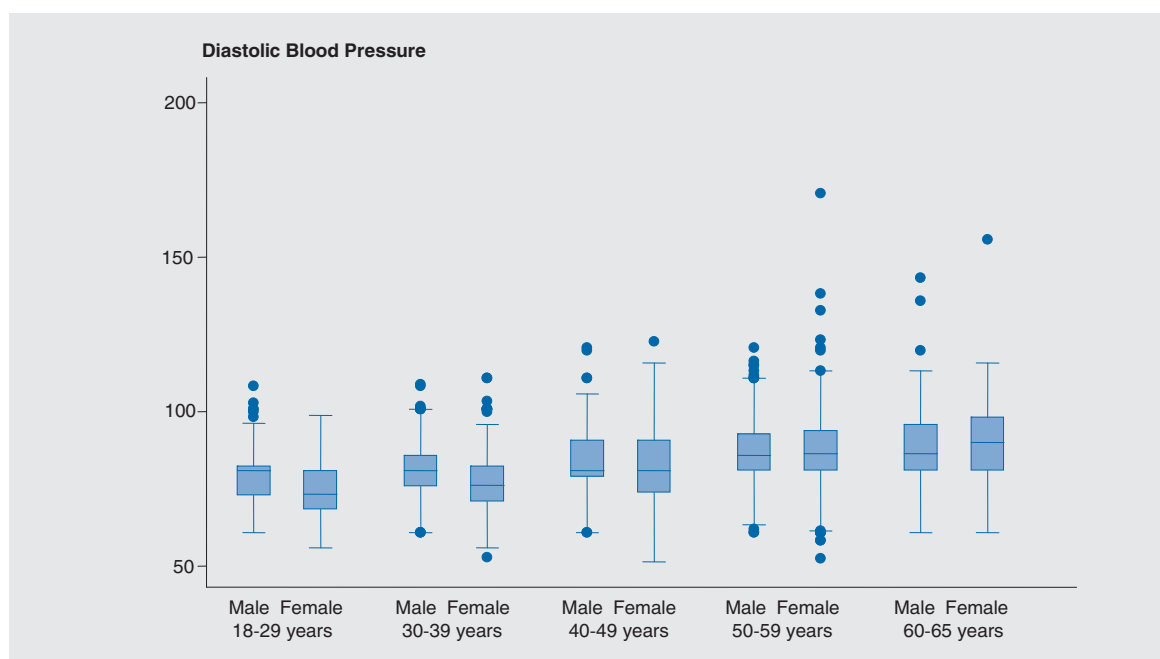
38. *Over half the adult Ukrainian population is overweight or obese with men tending to be overweight while women are more likely to be obese.* Almost one-fourth of the women are obese with another 28.7 percent overweight, while 13.5 percent of the men are obese and 36.1 percent are overweight. In comparison in Russian Federation, obesity prevalence among somewhat comparator age groups, i.e. > 15 years of age, was 9.6 percent among males and 23.6 percent among females while in Poland, it was 12.9 percent among males and 18.0 percent among females (WHO, Stepwise data). The distribution does not vary much by region, except that Ukrainians living in the Center had the highest share of obese, stage I respondents (11.2 percent) compared to the other regions. On the opposite end, the South had the lowest level of obese women.

39. *Ukrainian women are more likely to be hypertensive than men.* However, 23 percent of both men and women have stage one or two hypertension. This disparity between genders is because women are twice more likely to be both aware of their hypertensive status and taking medication to control it than men. Some regional differences exist such that more women in the East have hypertension and pre-hypertension readings while the North and Center has the fewest women with pre-hypertension or hypertension. Among men, the South has the highest share of pre-hypertensive and hypertensive readings while the East has the lowest share. Nearly three in four men in the South are pre-hypertensive. Ukrainians in the West are among the unhealthiest, with 28.1 percent of men and 23.0 percent of women having stage two hypertension.

40. *As would be expected, two out of three overweight/obese as well as hypertensive Ukrainians are over 40 years of age.* Among overweight/obese women, nearly 75 percent are over 40 years of age, but this percent is as high as 80.5 percent in the West. Similarly, more overweight/obese men are over 40 years of age (59.6 percent vs. 40.4 percent). The North and Center region has a higher share of overweight/obese Ukrainians who are over 40 years old (62.3 percent), and the West has the lowest share of older men who are overweight/obese (57.6 percent). Over two-thirds of the hypertensive (stage one and two) respondents are over 40 years of age. This is however not surprising, for as age increases, blood pressure levels rise, which increases the prevalence of hypertension (Figure 4 and Figure 5). There are considerable regional differences in hypertension prevalence by age though. About 85 percent of hypertensive Ukrainians in the Southern region are older than 40 years of age. The West is about even with regard to hypertension prevalence across two age groups – over and under 40 years.

**Figure 4: Average of second and third systolic blood pressure reading by age group**



**Figure 5: Average of second and third diastolic blood pressure reading by age group**

41. However, prevalence of hypertension is growing among the younger generation, especially young men, particularly in the East and West. About one in three respondents with hypertension in the East are under 40 years old and even worse, 47.5 percent of hypertensives are under 40 years old in the West. In looking at the combination of age and gender, hypertension is more common among younger men than younger women. The prevalence among younger age groups is much higher than in other neighboring Central European countries such as Romania (Dorobantu et al, 2010) (Table 11).

**Table 11: Hypertension prevalence by age groups, Ukraine and Romania**

Age	Romania	Ukraine
18-24 years	8.75	20.11
25-34 years	15	23.17
35-44 years	28.12	32.27
45-54 years	51.4	47.25
55-65 years	65.54	65.17

42. Despite the growing prevalence of hypertension among the younger generation and higher prevalence among men in general, older Ukrainian women remain an important target group. The majority of older women are hypertensive. Three out of four hypertensive women are above the age of 40 in all regions except the West where 44.8 percent of hypertensives are under 40 years old.

43. Hypertension status does not vary much by marital or educational status even across regions but overweight status appears to do so. Over 22 percent of overweight/obese Ukrainian women are widowed or separated, while 72.5 percent are married. Among overweight/obese men, 84.2 percent are married followed by 12.3 percent who are single and never married. The only slight note is that widowed women tended to have slightly higher levels of hypertension across all regions. The overweight/obese respondents have similar distribution of education as in the total population. The East has a slightly higher percentage of overweight women with some college education. Most overweight men have some high school level education (60.6 percent). Overweight/obese respondents in the Center tend to be more educated such that 40 percent with some college or graduate schooling. Overweight/obese Ukrainians in the South tend to be less educated such that 64.7 percent have only some high school.

44. *However, place of residence, employment and income levels appear to matter.* Ukrainians with pre-/hypertension tend to be more concentrated in the cities followed by villages (rather than in small urban settlements), both across regions and gender. About 47.2 percent of pre-/hypertensives do not have paid work. Ukrainians in the East with pre/hypertension are without paid work particularly men. Two-thirds of pre-hypertensive women in the East are without paid work, while only about half of pre-hypertensive women in the West are without paid work. Overweight/obese Ukrainians vary considerably in dwelling location, job status and wealth by gender and region. Thirty-seven percent of the overweight/obese Ukrainians live in cities followed by another 28.9 percent living in villages. Overweight/obese in the North and Center tend to be more concentrated in cities (54.0 percent) while those in the West tend to be concentrated in villages (48.6 percent).

45. *Overweight and obesity clusters among individuals in the highest and the second lowest quintiles* (48.8 percent and 50.8 percent, respectively). Almost two-thirds of women in the second lowest quintile are obese or overweight and 29.8 percent of them are hypertensive. The distribution of obese/overweight across asset quintiles by region is relatively similar but in the North and Center, a higher share of obese/overweight women fall in the fourth wealth quintile (26.4 percent) and in the East, the highest share falls in the highest wealth quintile (26.8 percent). The North and Center also has the highest share of obese/overweight women in the lowest wealth quintile (22.3 percent). Among obese/overweight men, about a third are in the highest wealth quintile and half of the men in this quintile are obese/overweight. In the West, largest share of obese/overweight men are in the lowest wealth quintile (29.9 percent), but within the highest quintile over half of the men are obese/overweight (57.8 percent)

46. *Women in the lowest two wealth quintiles are more likely to be hypertensive while men in the lowest and highest wealth quintiles are more likely to be hypertensive.* Overall, the distribution of pre-hypertensives is highest in the lowest asset quintile with fairly even distribution throughout the rest of the wealth quintiles. Pre-/hypertension prevalence varies quite a bit by region. Among the regions, the South has a heavier concentration of pre-hypertension among the highest two wealth quintiles (55.4 percent), while the East has the heaviest concentration of pre-/hypertensives in the lowest two wealth quintiles (50.0 percent). The South has the heaviest concentration among the highest wealth quintile while in the West, the heaviest concentration is in the lowest wealth quintile. Of note, among men and by region, the North and Center has almost two-thirds of hypertensive men in the top two wealth quintiles, while the West has the highest share (31.4 percent) of hypertensive men in the lowest wealth quintile. Among women and by region, about one-third of women living in the Center with hypertension fall into the second highest wealth quintile and in the East, hypertension is more heavily concentrated in the lowest wealth quintile.

## **SOCIO-ECONOMIC DETERMINANTS OF HYPERTENSION AND OBESITY**

47. Although descriptive and bi-variate analysis described above is useful, it can often be misleading because many factors that appear to be associated with hypertension or obesity status may be correlated themselves. For example, young age groups may also be individuals with lower education and household wealth. Thus, percentages of hypertensive or obese in any one of these categories may be in part picking up effects of another characteristic. To understand better who are most at risk of being hypertensive or obese, ordered logistic regression models which control simultaneously for background socioeconomic characteristics are used. Co-efficients are reported as odds ratios and levels of significance noted by asterisks (Table 12).

48. *The odds of being hypertensive is the highest for those living in the West, for those in the lowest quintiles versus those in the highest wealth quintile, for males and it increases with age.* As seen below in Table 12, in the baseline function of an ordered logistic regression of hypertension (normal, pre-hypertensive, hypertensive stage one and hypertensive stage two), if you are a single male Ukrainian living in the West between the ages of 18 to 29 years old with some primary education in the lowest wealth quintile, and living in a city without paid work, then the odds for being pre-hypertensive phase compared with having normal blood pressure levels is significantly low by 1.7 times. However, these same characteristics significantly increase the odds of being a stage one or stage two hypertensive from normal blood pressure levels by 1.2 and 1.9 times respectively. People living in other regions have lower odds of being pre-hypertensive or hypertensive than those in the West. Males are more likely to be pre-hypertensive or hypertensive than females ( $p < 0.001$ ). The odds of being pre-hyper-

tensive or having stage one or two hypertension also increase with age ( $p<0.001$ ). Compared to the highest asset level, Ukrainians in the lowest asset level have increased odds of being pre-hypertensive or hypertensive stages. Education, marital status, rural versus urban setting, and work status did not significantly predict the odds of being pre-hypertensive or hypertensive.

**Table 12: Ordered logistic results of the risk of hypertension and obesity**

	Hypertension Status (baseline=normal) N=3314	BMI Status (baseline=normal) N=2965
<b>Region</b>		
North/Center	0.47***	1.16
South	0.59***	0.85
East	0.64***	1.11
Female	0.55***	1.44***
<b>Age group</b>		
30-39 years	1.58***	2.02***
40-49 years	2.26***	2.98***
50-59 years	3.74***	6.14***
60-65 years	6.13***	8.35***
<b>Marital Status</b>		
Married/Cohabiting	1.03	1.64***
Separated/Divorced	0.86	1.44
Widowed	1.30	2.44***
<b>Education</b>		
Some High School	1.07	0.96
Some college	1.23	0.89
Some graduate	1.21	0.91
<b>Rural</b>	0.94	1.09
<b>Has paid work now</b>	0.90	0.96
<b>Wealth quintiles</b>		
Second lowest	0.94	1.31*
Middle	1.07	1.25
Fourth	0.80	1.33**
Highest	0.75***	1.81***

Note: Baseline case - a single male Ukrainian living in the West between the ages of 18 to 29 years old with some primary education, in the lowest wealth quintile, and living in a city without paid work.

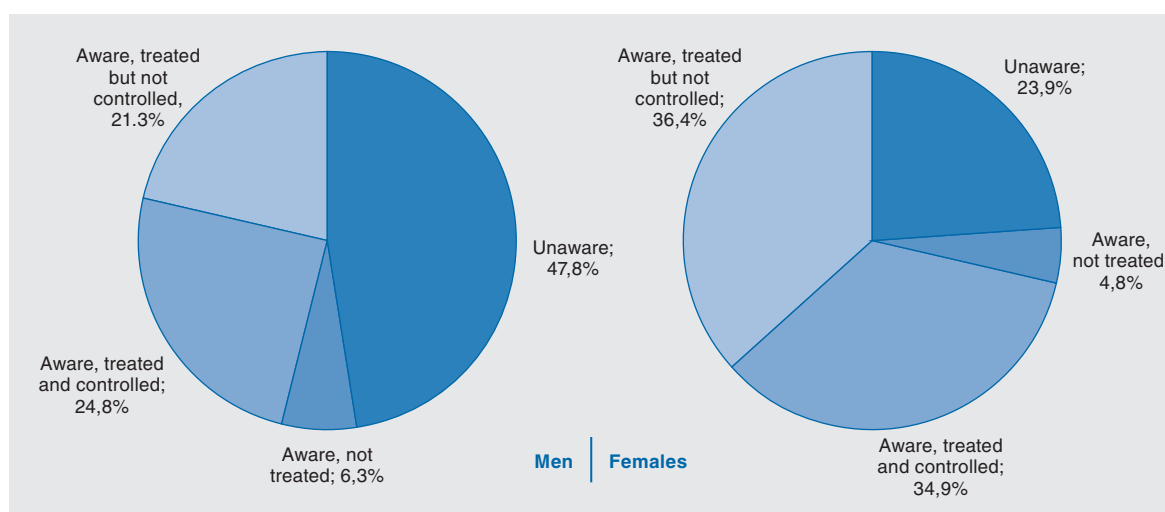
\*  $p<0.05$ , \*\*  $p<0.01$ , \*\*\*  $p<0.001$  –denotes significance at the 5 percent level or better.

49. The odds of being overweight or obese significantly increase with age, if you are female, married or widowed and are in the higher wealth quintiles. In an ordered logistic regression of body mass index categories (normal, overweight, obese stage one, obese stage two, obese stage three) as shown in Table 12, the baseline characteristics of a single male Ukrainian living in the West between the ages of 18 to 29 years old with some primary education, in the lowest wealth quintile and living in a city without paid work, significantly increased the odds of being overweight or obese by 1.7 times, 3.4 times, 4.7 times and 6.0 times respectively for the various levels of overweight, obesity grade one, obesity grade two and obesity grade three. Being female significantly increased the odds of being overweight or obese ( $p<0.001$ ). As one ages, the odds of being overweight or obese also increases. Being married ( $p<0.05$ ) or widowed ( $p<0.01$ ) significantly increased the odds of being overweight or obese. Compared to the lowest asset level, being in the highest asset level increased the odds of being overweight or obese by 1.81 times ( $p<0.001$ ). Region, education status, rural versus urban setting, and work status did not significantly predict the odds of being overweight/obese.

**AWARENESS OF HYPERTENSION OR OBESITY STATUS, TREATMENT AND COMPLIANCE**

50. *One-third of those classified as hypertensive by the survey were unaware of their hypertensive status with twice as many men being unaware compared to women.* Figure 6 shows the level of awareness and treatment status of hypertensive women and men. More hypertensive men were unaware of their status than hypertensive women – 48 percent of hypertensive men compared with 24 percent of hypertensive women. This did not vary much by region. Of note, 61 percent of men and 74 percent of women unaware of their hypertensive status were classified as having stage two hypertension through survey measurements. Adult Ukrainians in the East were more aware of their hypertension status than in other regions. The highest share of undiagnosed hypertension was in the West where 19.2 percent were determined by survey measurement as having stage two hypertension.

**Figure 6: Awareness of hypertension status and treatment status among hypertensives, by gender**



51. *About half the population measured as obese by the survey were aware of their obesity status and had been told so by a doctor.* Men were more unaware of their obesity status, 50.1 percent of obese men compared with 42.3 percent of obese women. Interestingly, the system is more likely to capture hypertension among those both risk factors (hypertensive and obese) (82 percent are known) than when a person has only one risk factor (67 percent).

52. *Odds of knowing one's hypertension status increased if female, living in all other regions compared with the West, not single and living in urban areas.* To understand which of the above socio-economic factors significantly affects the probability of a Ukrainian not knowing whether they have hypertension (but being classified as hypertensive by survey metrics) versus knowing (via diagnosis by physician) a logistic regression analysis was conducted and the results are in Table 13. As shown, people living in all other regions had significantly higher probability of knowing they had hypertension compared to those in the West. Females had increased odds of knowing their hypertensive status compared with males ( $p < 0.001$ ) reconfirming patterns observed. Married/cohabiting, widowed or divorced persons had more likelihood of knowing their hypertension status than single persons. Not surprisingly, the odds of knowing one's own hypertensive status increases with age. Living in a rural area too increased the odds of not knowing one's hypertensive status ( $p < 0.05$ ) perhaps reflecting lack of information or lack of access to quality services.

53. *Odds of knowing one's obesity status increased if female, wealthy, living in the South compared with the West, have higher education levels and living in urban areas.* Similarly as shown in Table 13, the odds of a Ukrainian knowing their obesity status versus not knowing increases by 1.45 times if they live in the South versus the West. Similar to hypertension, males are more likely to not be aware of their obesity status compared with females ( $p < 0.001$ ). The odds of knowing their status increases with education at the higher education levels. Living in a small urban settlement or village increased the odds of being unaware of one's obesity status. Except for those in middle wealth quintile, wealthier Ukrainians had increased odds of knowing one's obesity status.

**Table 13: Logistic regression results for odds of knowing one's hypertensive or obesity status**

	Known hypertension vs. unknown (N=1210)	Known overweight vs. unknown (N=1947)
<b>Region</b>		
North/Center	1.65**	0.89
South	1.67**	1.38
East	2.99***	1.28
Female	2.75***	2.28***
<b>Age group</b>		
30-39 years	2.64***	1.16
40-49 years	5.55**	1.42
50-59 years	7.48***	1.78***
60-65 years	7.94***	2.04***
<b>Marital Status</b>		
Married/Cohabiting	1.78*	0.94
Separated/Divorced	2.34*	0.76
Widowed	3.53***	0.94
<b>Education</b>		
Some High School	0.84	2.57**
Some college	0.72	2.48*
Some graduate	1.06	2.90**
<b>Rural</b>	0.64**	0.77*
<b>Has paid work now</b>	0.82	0.99
<b>Wealth quintiles</b>		
Second lowest	1.163	1.74**
Middle	0.93	1.47
Fourth	1.73*	2.06***
Highest	1.26	2.41***
<b>Constant</b>	2.15***	3.57***

Note: Baseline case - a single male Ukrainian living in the West between the ages of 18 to 29 years old with some primary education, in the lowest wealth quintile, and living in a city without paid work.

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$  – denotes significance at more than 5 percent level.

54. *Adults, who visit a health facility, are not routinely screened for hypertension and obesity; as such, some cases go undiagnosed.* Measuring blood pressure levels and weight should be a routine procedure for any visit to the doctor. The survey asked all respondents about whether they had used health services in the past 30 days. Among Ukrainians whose hypertension status was revealed through survey measurements, 14.1 percent had had a medical appointment in the last 30 days with 4.3 percent having visited a medical facility more than once. Of those who were classified as obese by survey measurements but were unaware of their obesity status, nearly a quarter had visited a health facility in past 30 days. Of these, 7.8 percent had made more than one visit to a facility.

55. *Compliance in taking hypertensive medication, among those prescribed with medication is low.* While nearly 80 percent of Ukrainians who those who knew of their hypertension status prior to the survey had been prescribed medication. Of these, about half those taking medication reported that they were being compliant in taking their medication. About a quarter were not taking the drugs according to the dosage and frequency prescribed, while the rest did not take their medication at all. Key reasons given for lack of compliance include forgetting to take medication and respondent's own view that they no longer are hypertensive. Therefore, it is not surprising as the data shows that one-fifth of hypertensive men and 36 percent of hypertensive women, while aware and being treated still had stage one or two level hypertension. Less than a quarter of those who were obese and diagnosed as such were following any program to lose weight. In addition, nearly 70 percent of those who were aware of their obesity status did less than 60 minutes of physical activity in a week.

56. *Similar to medication, diagnosed hypertensives more than often ignore or follow only partially any other recommendation given by physicians.* In addition, half were asked to reduce salt intake and stress while 37 percent were recommended to lose weight. What was surprising was only a fifth were asked to stop smoking despite the fact that twice that number of known hypertensives are current daily smokers. Here, nearly 45 percent followed the recommendations always, 40 percent of them followed some and occasionally while the rest 15 percent did not follow any of the additional recommendations. Among the reasons given for not following all of the recommendations of the physician, the most common was “life too stressful to follow recommendations” (38 percent), “difficult to change my eating habits/to eat less salty foods (37 percent)” followed by “too much trouble to change my lifestyle” (35 percent).

57. *Similar patterns of low compliance were also seen for those diagnosed with high cholesterol or blood glucose levels.* Of those with positive diagnosis from a physician of high blood cholesterol levels, 42.2 percent have had it checked in the last six months and 18.4 percent in the six to eleven months before the survey period. Nearly three out four among those diagnosed were prescribed medication. Of those prescribed medication, only a half take it in the correct dosage regularly, a fifth do so occasionally and nearly 30 percent do not take their medications at all. Top three reasons given for not taking their medications in the time and amount prescribed were “sometimes I forget to take them” followed by “I have too many medicines to take” and the third most common reason being “I can’t afford to buy them”.

58. In addition, three out of four were asked to go on a special diet, 40 percent were recommended to lose weight and 15 percent were offered no additional recommendations. Here, nearly 40 percent follow the recommendations always, half of them follow some and occasionally while the rest 10 percent do not follow any of the additional recommendations. Among the reasons given for not following all of the recommendations of the physician, the most common was “difficult to change my eating habits (nearly 60 percent)” followed by “cannot afford the foods in the prescribed diet” (35 percent).

59. *Involving patients in decision regarding their treatment is critical for improving patient compliance with treatment protocols.* Furthermore, as chronic disease management requires participation of patient in treatment decisions as these diseases by their nature are often managed outside a health facility setting namely at home. As such, control of the disease largely rests on the individual’s ability to follow prescribed recommendations. As it in Table 12: Ordered logistic results of the risk of hypertension and obesity, half of those diagnosed as having chronic diseases in the survey report that they were never involved in their treatment choices, decisions or setting of treatment goals. Health worker education on how to help patients self manage their chronic illnesses is an area where critical focus is needed in Ukraine.



## CONCLUSIONS

60. As shown above, a third of Ukrainian adult population (ages 18 to 65 years) are classified as hypertensive and one fifth are obese. These are key risk factors of cardiovascular disease which is the single largest cause of premature death among Ukrainians. The poor are more likely to be hypertensive while obesity is more prevalent among the wealthy. Hypertension prevalence as expected increases with age and is more common in the West.

61. Key to prevention and control of chronic diseases is early detection. As seen above, awareness of one's hypertensive or obesity status is low, especially among men. Therefore, the first area of focus would be improving awareness. This could be done through targeted health promotion campaigns to raise population awareness of the risks of chronic conditions and their susceptibility to them. Further disease surveillance systems need to be improved to identify and screen at risk population to help detect and treat cases early.

62. Also, even when people do use health services, it appears that hypertension and obesity sometimes go undiagnosed. Fifteen percent of respondents report that they have not had their blood pressure taken on their recent visit and a quarter of those obese are not diagnosed as such during a recent visit, is indicative of the inconsistencies in the preventive screening process in the Ukrainian health system. As a result, many Ukrainians are unaware of their health status thus increasing the risk of dying pre-maturely from a preventable disease. This would imply strengthening of the primary care system and training of health personnel to detect cases early.

63. Another key element to chronic disease prevention and control is self-management by those diagnosed with a chronic condition. Here too among those diagnosed and being treated for hypertension, high cholesterol or diabetes, half of the respondents report that they do not comply with doctors directions in taking prescribed medication and a quarter of these respondents do not take the medication at all. Similar patterns of non-compliance are seen with respect to other recommendations by doctors such as those related to changes in diet and more exercise. Here, poor compliance levels indicates lack of trust or understanding of the benefits of the medications and other recommendations or even perhaps a low understanding of the real risk, which again can lead to pre-mature deaths from preventable causes. Health care services need to be re-oriented towards one that is an increased partnership between providers and patients. Increased involvement of patients in their treatment decisions, support for self-management of chronic conditions including explaining the risk of non-compliance to recommended treatment procedures, as well as continuous follow up need to be key components of chronic disease management in Ukraine.

**Table 14: Patient involvement in treatment decisions**

	usually	sometimes	never	don't know
Asked for your ideas when your treatment plan was made?	27.6	27.4	47.5	2.5
Given choices about treatment to think about?	18	34.9	47.4	1.3
Asked to talk about any problems with medicines or their effects?	36.1	21.1	36	1.8
Given a written list of things you should do to improve your health?	29	19.6	48.3	3.1
Satisfied that your care was well organized?	22.4	33.4	8.2	11.1
Shown how the steps you did to take care of yourself influenced your condition?	18.8	24.6	49.7	7
Helped to set specific goals to improve your eating or exercise?	22.7	25.1	46.8	5.4
Given a copy of your treatment plan?	20.7	14.9	59.6	4.8
Helped to set a treatment plan that you could carry out in your daily life?	25.5	21.1	50	3.4
Asked how your chronic condition affects your life?	24.1	25.4	47.7	2.8
Contacted after your visit to see how things were going?	7.2	17.5	70.9	4.4



## CHAPTER IV:

# UNHEALTHY LIFESTYLES

### ***Main findings:***

- Lifestyle-related factors, such as smoking, heavy drinking, poor diet and physical activity underlie much of the chronic disease burden in Ukraine.
- Thirty-six percent of the Ukrainian population are current smokers while 31 percent of smoke daily. This is above the WHO European region average of 28.6 percent.
- Not only does smoking start early; the average starting age among daily smokers has been decreasing and is now 16 years.
- A daily smoker smokes an average of 18 cigarettes per day, which is nearly one pack.
- Twenty percent of Ukrainians indulge in heavy or binge drinking, having one or more days in the last month where they had more than five drinks that day. This is more prevalent among males.
- Heavy or binge drinking starts young and increases with age.
- Overall, one in ten Ukrainians are sedentary but most surprising is the high rates (11 percent) of sedentary behavior among the 18-29 year olds. This is perhaps one of the highest rates in the region.
- Awareness of the harmful effects of smoking or heavy drinking – especially on long term health - is high. Despite this there is a reluctance to make significant lifestyle changes.

### ***Consequences:***

As World Bank Study (2009) showed, 94 percent of mortality due to three major risk factors tobacco smoking, alcohol consumption and risks related to road safety, together comprising 17 percent of all deaths in 2004, could have been avoided with adequate prevention. Reduction of pre-mature mortality and morbidity in Ukraine would require significant behavioural changes. Raising awareness is the key but as is seen, it is not that Ukrainians are unaware of the harmful effects of risky behaviors. More importantly, despite the fact that long term health does matter to most Ukrainians, they are currently discounting the long-term consequences thus seeing the immediate benefits that such behaviours offer. Any awareness raising strategy should therefore consider this and focus on emphasizing both the short term and long term benefits of behaviour changes.

### ***Policy areas for focus:***

- Development of an integrated plan for NCDs prevention and control based on known and test cost-effective interventions that are comprehensive in nature, clearly prioritized, targeting key risk factors and involving multi-partners – government, civil society, private sector etc.
- Strict enforcement of existing laws and regulations that promote safe driving, prevent sale of alcohol and cigarettes to minors and comprehensive smoking bans.
- Specific focus on targeted awareness raising efforts:
  - Aimed at the youth – and in schools – to promote and encourage healthy lifestyles among the next generation
  - Aimed at young adult males - emphasizing the short and long term benefits of healthy lifestyles – including the use of rewards and incentives.

## THE CONTEXT

64. Many of the causes of premature-death and disease in Ukraine are linked to risk-factors which are largely modifiable and preventable. Risk factors related to lifestyle such as smoking, alcohol and diet, as well as environmental conditions play key roles in many diseases, including poisonings, injuries and the biggest killer in Ukraine, cardiovascular diseases such as ischemic heart disease and stroke.

65. Tobacco use is a growing problem especially among the youth in Ukraine (World Bank, 2010). According to HFA database in Ukraine, 56.8 percent of all causes of deaths are attributable to tobacco-related causes in 2005 (56.3 percent, 59.9 percent among males and females correspondingly). Drinking has traditionally been heavy in the Ukraine, especially for men. Diet is traditionally rich in fat - another factor leading to high levels of cardio-vascular disease. Heavy or binge drinking not only increases the risk of cardio-vascular disease, it is a rising cause of death from accidents and injuries. Another factor of lifestyle is the lack of exercise. More importantly as World Bank Study (2009) showed, 94 percent of mortality due to three major risk factors tobacco smoking, alcohol consumption and risks related to road safety, together comprising 17 percent of all deaths in 2004, could have been avoided with adequate prevention.

66. In this chapter, three of these four key behavioral risk factors which increase the probability of chronic disease are studied – smoking, heavy drinking and physical inactivity. These risk factors are associated with multiple diseases and, conversely, a single disease may be associated with many of these risk factors. As shown below, a high percent of daily or former smokers or heavy drinkers are hypertensive or at the cusp. Similarly, 50 percent of physically inactive population are overweight or obese.

**Table 15: Percent of smokers, heavy drinkers and sedentary population by hypertension status**

	Normal	Pre-hypertensive	Hypertensive
Former Smoker	11.6	51.2	37.2
Smokes daily	16.7	56.5	26.7
Heavy drinker	12.5	58.1	29.4
Sedentary	16.6	51.0	32.3

**Table 16: Percent of smokers, heavy drinkers and sedentary population by obesity levels**

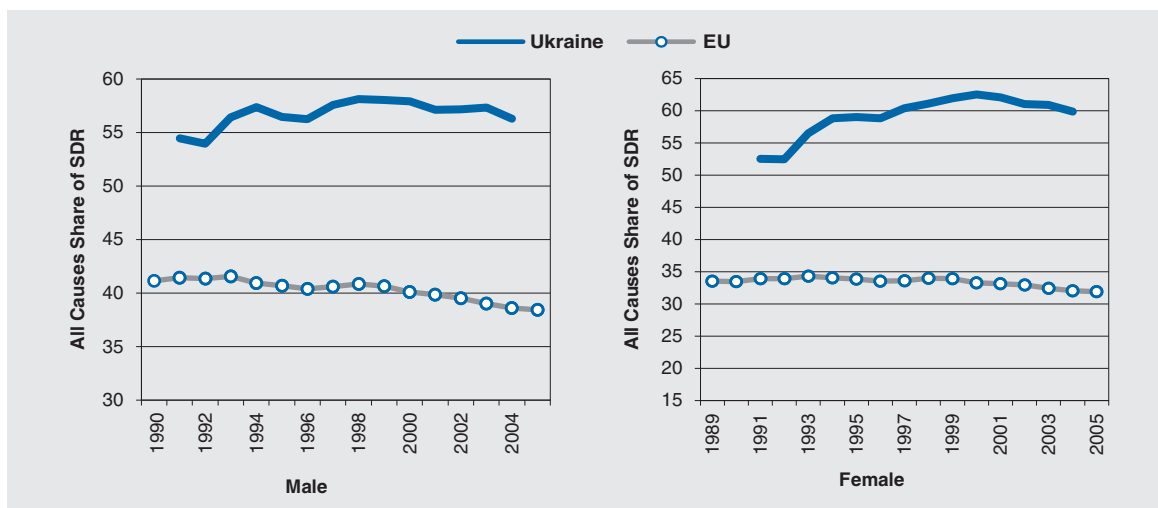
	Underweight	Normal	Overweight	Obese
Former smoker	1.7	37.2	37.4	23.7
Smokes daily	5.4	52.0	30.2	13.7
Heavy drinker	2.7	46.8	35.6	14.9
Sedentary	4.5	43.8	31.9	20.1

67. Several socio-economic factors explain differences in many of these behavioral risk factors and understanding these relationships can offer important opportunities to improve the population's health. Analysis by sub-population further helps in the design and targeting of policies and interventions that tackle these key risk factors and facilitates positive health outcomes in the population (WHO 2005). Each of these risk factors – smoking, heavy or binge alcohol use and physical inactivity is studied separately in the sections below.

## SMOKING

68. Tobacco is an important cause of a wide range of cancers and may furthermore act synergistically with other causes of cancer, such as exposure to asbestos and, in the case of cervical cancer, human papilloma virus. Smoking is a known risk factor for cardiovascular disease, causes lung and other forms of cancer, and contributes to the severity of pneumonia, emphysema, and chronic bronchitis. Lung cancer rates closely follow smoking rates with a time lag of some five to 15 years before positive (or negative) lifestyle changes begin to induce changes in disease prevalence. Ukraine has much higher death rates from smoking-related causes among both males and females than in the EU, and their levels have not changed significantly in last decade (Figure 7).

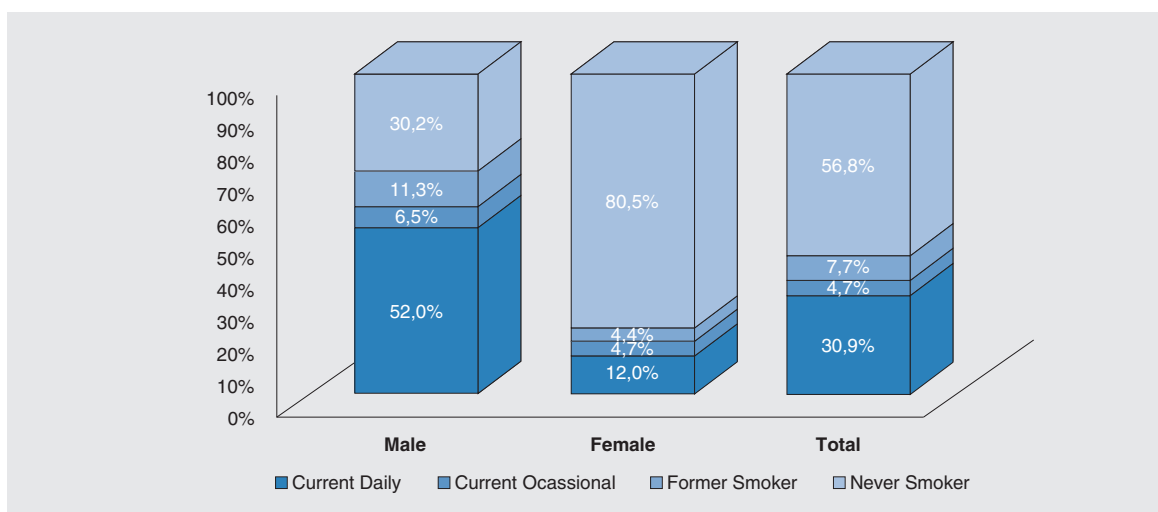
**Figure 7: Share of all causes SDR from smoking related causes in Ukraine and selected European countries, 1990-2005**



Source: HFA Database, 2008

69. Overall, the prevalence of smoking in Ukraine is high, 36 percent of the 18-65 year old population are current smokers while 31 percent of them smoke daily. This is above the average WHO European region estimated smoking prevalence of 28.6 percent for the population 18 years and older (WHO, 2007). Forty-three percent of the sampled population had smoked at least 100 cigarettes in their life time. Thirty-six percent are current smokers while nearly 8 percent report having been former smoker but have since quit smoking (Table 15: Percent of smokers, heavy drinkers and sedentary population by hypertension status). Of the current smokers, 85 percent smoke daily<sup>2</sup> while the rest smoke occasionally. There were some regional variation with the lowest daily smoking levels in the West (24.6 percent) and the highest rate in the East (34.0 percent).

**Figure 8: Smoking prevalence among Ukrainian males and females, 18-65 years of age**



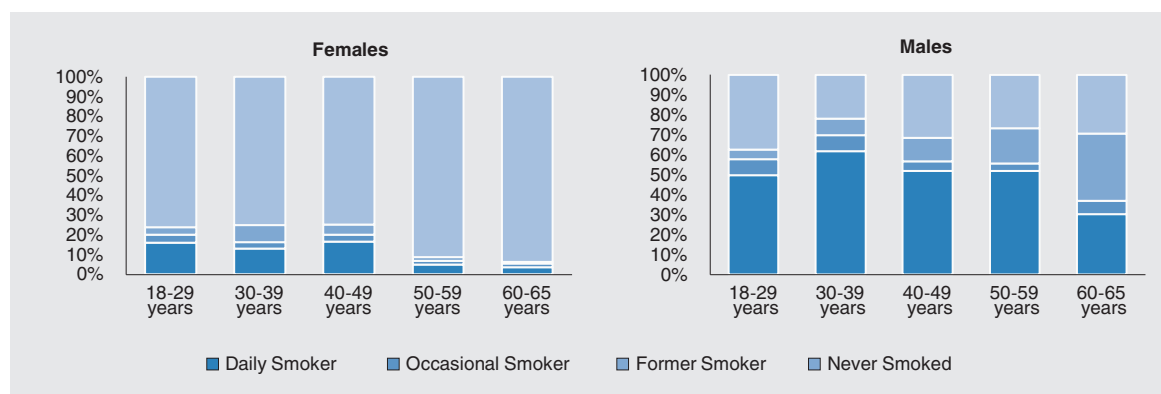
70. More men smoke daily than women - men comprise 80 percent of the daily smokers. More than 58 percent of men and nearly 17 percent of women are current smokers of which nearly 52 percent of men and 12 percent of women smoke daily. In comparison, in the WHO European region, smoking prevalence is 40 percent among makes and 18.2 percent among females. Among women, those who

<sup>2</sup> Daily smokers are those who are current smokers who report they smoke one or more cigarette per day.

lived in the North and Center region had the highest rate of daily smoking (14.3 percent). In comparison, men living in the East had the highest rate of daily smoking (51.9 percent).

71. *People in the younger age groups (<40 years of age) are more likely to be current and daily smokers.* This true for both men and women and across regions. Rates of current and ever smoking amongst women increase with decreasing age. The prevalence of current smoking amongst women in the youngest age group is over four times that amongst women in the oldest age group.

**Figure 9: Age-specific rates of smoking among males and females**



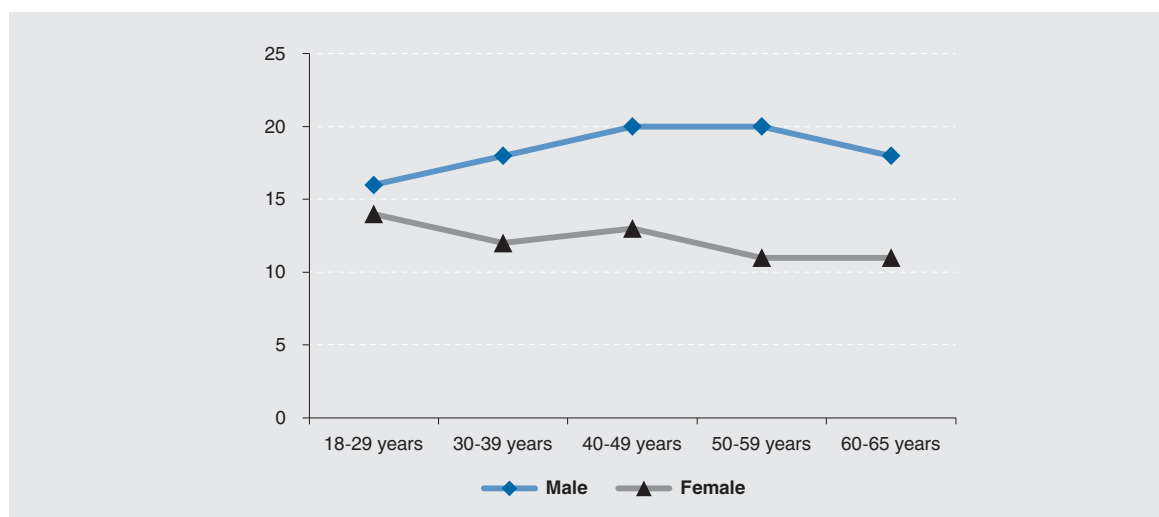
72. *There is considerable variation in smoking prevalence by education levels across genders.* Almost 70 percent of men with primary education smoke daily compared with 51 percent of those with graduate and 40 percent with college education. In contrast, 54.0 percent of former smokers have high school education and over a third had some college education (37.6 percent). In comparison, women with graduate education are more likely to smoke and be daily smokers that those with primary level education. Interestingly, women who are former smokers therefore tend to more educated than their male counterparts.

73. *Not only does smoking start early; the average starting age among daily smokers has been decreasing over time.* Now, the average age at first smoking is 16 years old among the <30 years olds while it was 19 years for those who are now between 60 and 65 years of age. Among the younger age groups (less than 40 years of age), former smokers started smoking later on average than daily smokers. However, among the older age group, former smokers started earlier on average than daily smokers. The interesting trend is that the average age at first smoking for former smokers has remained relatively consistent at 17 years over time except for the 30-39 year olds.

**Table 17: Age at first smoking, by age group**

	Daily Smoker	Former Smoker
18-29 years	16	17
30-39 years	17	18
40-49 years	18	17
50-59 years	18	17
60-65 years	19	17

74. *Cigarettes are the common form of tobacco use in Ukraine, and a daily smoker smokes an average of 18 cigarettes per day, which is nearly one pack.* Men not only had higher prevalence of smoking, but they also smoked more on average (19 cigarettes) compared to women (13 cigarettes). This was true across all age groups (Figure 10). Also, 13 percent of daily smokers, 15 percent of male daily smokers and 2.3 percent of female daily smokers smoke more than a pack daily and on average about 33 cigarettes a day.

**Figure 10: Average number of cigarettes smoked per day, by gender and age**

75. Male smokers are twice more likely to be highly nicotine dependent than women (66 percent compared with 34 percent). Nicotine dependence was measured by taking into account the time of the first cigarette of the day and the level of consumption. Here, smokers who smoke their first cigarette within the first hour of waking up and smoke more than 10 cigarettes per day were categorized as highly nicotine dependent. Nearly one in four (26 percent) smokers reported smoking their first cigarette just after waking up; 37 percent smoke within the first half hour; 15 percent within the next half hour; and the rest 21.6 percent later in the day. More men start smoking within the first half hour after waking up compared with women (79 percent versus 57 percent). Smoking during the first hour after waking up is associated with smoking more than 20 cigarettes on average daily, while smoking the first cigarette at a later time was associated with a lower level of smoking of about 11 cigarettes on average per day.

**Table 18: Prevalence of smoking by socio-economic characteristics**

	Never Smoker (%)	Former Smoker (%)	Current		Number
			Occasional (%)	Daily (%)	
<b>Region</b>					
West	61.7	8.1	5.4	24.6	837
North/Center	56.1	7.5	3.6%	32.7	809
South	59.5	7.0	6.1	27.4	809
East	53.1	7.7	4.7	4.7	842
<b>Gender</b>					
Male	30.2	11.3	6.5	52.0	1470
Female	80.5	4.4	4.7	12.0	1844
<b>Age group</b>					
18-29 years	56.7	4.3	6.1	32.9	905
30-39 years	49.0	8.4	5.5	5.5	666
40-49 years	54.5	8.3	4.2	4.2	622
50-59 years	63.4	8.7	2.8	2.8	732
60-65 years	67.5	14.0	3.7	14.4	389
<b>Marital status</b>					
Single	58.6	5.0	6.5	29.9	538
Married/Cohabiting	54.7	8.3	4.1	32.8	2372
Separated/Divorced	56.4	9.3	8.1	26.1	204
Widowed	84.3	5.1	2.1	8.5	200

	Never Smoker (%)	Former Smoker (%)	Current		Number
			Occasional (%)	Daily (%)	
<b>Education</b>					
Primary	55.7	8.1	3.6	30.6	134
Some High School	53.5	7.2	4.3	34.9	1974
Some college	62.4	8.5	5.3	23.5	1069
Some graduate	57.2	7.3	5.8	29.7	137
<b>Residence</b>					
Urban	52.5	8.7	5.3	33.5	1705
Rural	65.3	5.7	3.6	25.5	1609
<b>Employment</b>					
no paid work now	64.4	7.7	3.4	24.5	1381
has paid work now	52.3	7.6	5.5	34.6	1933
<b>Wealth quintiles</b>					
Lowest	57.5	5.4	3.8	33.2	660
Second	65.1	6.3	4.3	24.3	665
Middle	61.3	8.0	4.4	26.2	658
Fourth	52.8	9.9	5.7	31.6	662
Highest	51.7	8.5	5.1	34.7	669
<b>Total</b>	<b>56.8</b>	<b>7.7</b>	<b>4.7</b>	<b>30.9</b>	<b>3297</b>

76. *Odd of being a daily smoker compared to never smoking increases if one lives in the North and Center or East compared to the West, is male, younger than 50 years of age, married/co-habiting or separated/divorced and resides in urban areas.* To understand which of the above socio-economic factors significantly affects the probability of being a daily smoker as opposed to having never smoked, a regression analysis was conducted and the results are in Table 19. The odds of being a daily smoker versus never smoking increased by 0.47 for those living in the North or Center ( $p < 0.01$ ) and by 0.41 for those living in the East ( $p < 0.001$ ) versus the West. Being female decreased the odds of being a daily smoker by a factor of 2.2. Being 50 years or older decreased the odds of being a daily smoker ( $p < 0.001$ ). Being married/cohabiting or separated/divorced increased the odds of being a daily smoker ( $p < 0.001$ ). Having some college education versus primary education significantly decreased the odds of being a daily smoker ( $p < 0.01$ ). Living in a small city or village significantly decreased the odds of being a daily smoker. Wealth and work status were not significant predictors of daily smoking versus never smoking.

**Table 19: Logit results for odds the of being a daily smoker vs. never smoking and former smoker vs. daily smoker**

	Daily vs. Never Smoking	Former vs. Daily Smoking
	<i>N</i> =3289	<i>N</i> =1299
<b>Region</b>		
North/Center	1.60***	0.69
South	1.08	0.65
East	1.51**	0.74
<b>Female</b>	0.11***	1.73*
<b>Age group</b>		
30-39 years	1.02	1.97*
40-49 years	0.85	2.00*
50-59 years	0.55***	3.09***
60-65 years	0.27***	7.30***

	Daily vs. Never Smoking	Former vs. Daily Smoking
<b>Marital Status</b>		
Married/Cohabiting	1.81***	0.98
Separated/Divorced	2.57***	0.99
Widowed	01.20	1.18
<b>Education</b>		
Some High School	0.77	0.68
Some college	0.43**	1.06
Some graduate	0.60	0.64
<b>Rural</b>	0.58***	1.06
<b>Has paid work now</b>	0.98	0.81
<b>Wealth quintiles</b>		
Second lowest	0.83	1.29
Middle	1.05	1.46
Fourth	0.99	1.85*
Highest	0.91	1.65

Note: Baseline case - a single male Ukrainian living in the West between the ages of 18 to 29 years old with some primary education, in the lowest wealth quintile, and living in a city without paid work.

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$  – denotes significance at 5% level or better.

77. *One in every sixth current smoker is likely to quit smoking and this trend has persisted since 2005.* Lung cancer mortality may be reduced by smoking cessation. Also, the benefits of quitting at a young age are greater than waiting until one is middle aged to quit. Ex-cessation levels are a good measure of cessation at a population level. A nationally representative survey from 2005 revealed former smokers (those who used to smoke daily but currently do not smoke at all) constituted 9 percent of the adult population (14 percent of men and 4 percent of women), which was one fifth of the proportion of current smokers (40 percent). In this survey too, former smokers constitute about 8 percent or nearly one-fifth the proportion of current smokers. Thus, over the years every sixth smoker seems to have managed to stop smoking. What changed across the two surveys were the gender differences in quit rates. While in 2005, for both males and females, one in six was likely to quit now here women appear to be more likely to quit than men. This pattern is similar to that observed in Ukraine Demographic Health Survey (2007). Here, one in four women who are daily smokers is likely to quit smoking compared with one in six men who are daily smokers. Former smokers were more likely to be men rather than women but this may be because more men were smokers to begin with. Former male smokers were more likely to be 40 years or older (71.2 percent) while former female smokers women were more likely to be below 40 years of age (63.4 percent). Most former smokers had quit on average 12 years prior to the survey.

78. *Likelihood of quitting smoking increases if one is female and as one ages.* To understand which of the above socio-economic factors significantly affects the odds of being a former smoker as opposed to being a daily smoker, a logistic regression analysis was conducted and the results are in Table 19. Being female increased the odds of being a former smoker versus a daily smoker by 0.55. As one ages, the odds of being a former smoker increases from a factor of 0.68 among 30-39 year olds up to a factor of 1.99 among 60 to 65 year olds ( $p < 0.0001$ ) versus that of 18 to 29 year olds. Wealth status only partly explains the odds of being a former smoker versus a daily smoker, with increased odds of being a former smoker if one belongs to the fourth wealth quintile compared with the lowest wealth quintile. Region, area of residence, education levels, marital status and work status did not significantly predict the odds of being a former smoker vs. a daily smoker.

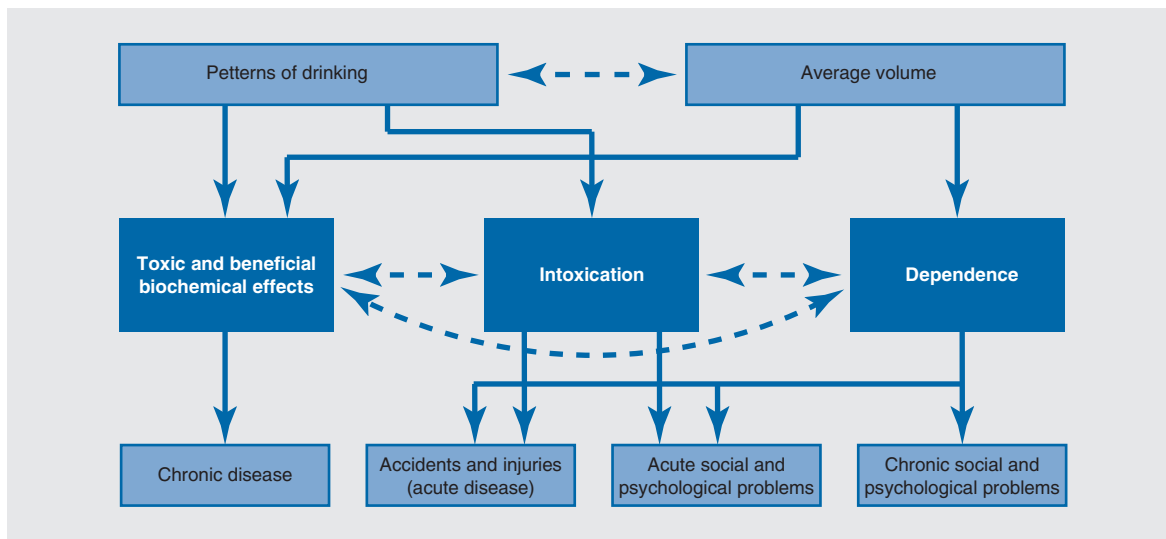
79. *Four out of five daily smokers had visited a health professional in the past 12 months but only 37 percent of them were advised to quit smoking.* However, 66 percent of the daily smokers, equal percentages across men and women, claim to have tried to quit smoking at least once in the past 12 months. Interestingly, a third of the people who tried to stop smoking answered they did not want to or were not sure if they wanted to quit smoking while about half of them answered they wanted to do so within the next month.

80. Awareness of the negative effects of smoking is high both among the general population and among smokers. Over 95 percent of those sampled were aware of the harmful effects of smoking on the smoker and those around them. While clearly awareness levels were nearly 100 percent among those who never smoked, the survey also confirmed that about 7 percent of the daily smokers did not know or were not sure of the harmful effects of smoking on those surrounding them. The high levels of awareness implies that risks associated with harmful behavior while known are not taken seriously, indicating a need for different approaches to awareness raising and more strict adherence to tobacco control regulations.

## ALCOHOL ABUSE

81. Drinking alcoholic beverages occasionally may not be bad for one's health, but excessive drinking can be harmful and lead to worsening health conditions. Moderate drinking can be beneficial for coronary artery through reduction of plaque deposits in arteries, protection against blood clot formation, and promotion of blood clot dissolution (Zakhari 1997). Acute and long term health and social consequences of alcohol consumption are illustrated in Figure 11. Harmful effects of alcohol consumption include increased risk for high blood pressure and for liver damage. Further alcohol intoxication (caused through binge drinking) can lead or cause to unintentional or intentional injuries or even death (road accidents are an example) and can have implication for chronic diseases. In addition, alcohol dependence which is determined both by number of drinks and frequency of drinking is usually classified as a clinical disorder.

**Figure 11: Model of alcohol consumption, intermediate outcomes and long-term consequences**



Source: DCP2 (2007).

82. The Centers for Disease Control defines heavy drinking as an average of more than two drinks per day for men. For women, heavy drinking is typically defined as consuming an average of more than one drink per day. At the same time, binge drinking is classified as drinking four or more drinks during a single occasion for women and five or more drinks during a single occasion for men. Excessive drinking includes heavy drinking, binge drinking or both. Excessive drinking both in the form of heavy drinking or binge drinking, is associated with numerous health problems, including but not limited to:

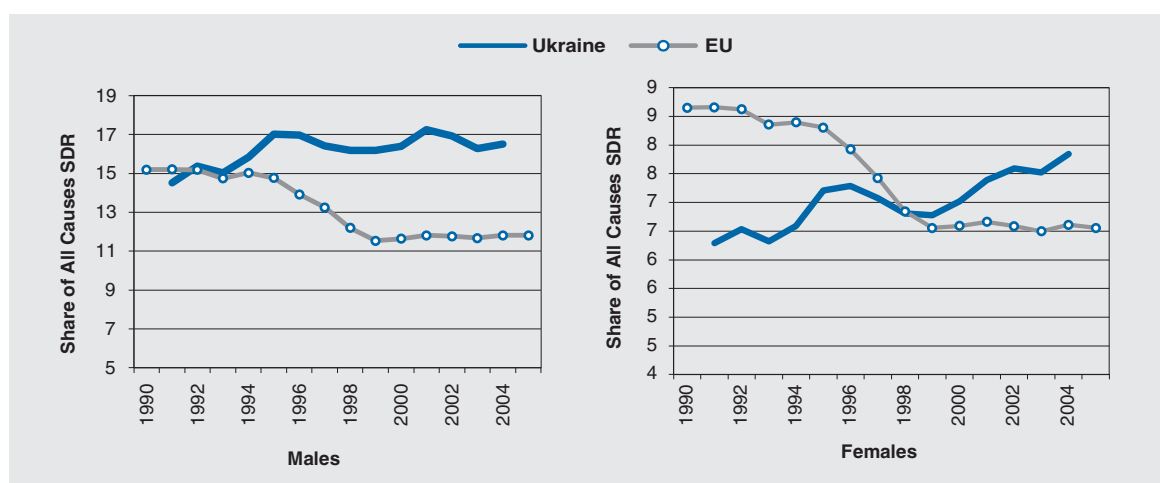
- Chronic diseases such as liver cirrhosis (damage to liver cells); pancreatitis (inflammation of the pancreas); various cancers, including liver, mouth, throat, larynx (the voice box), and esophagus; high blood pressure; and psychological disorders.
- Unintentional injuries, such as motor-vehicle traffic crashes, falls, drowning, burns and firearm injuries.
- Violence, such as child maltreatment, homicide and suicide.



- Harm to a developing fetus if a woman drinks while pregnant, such as fetal alcohol spectrum disorders.
- Sudden infant death syndrome (SIDS)
- Alcohol abuse or dependence.

83. Mortality from alcohol abuse (including alcohol psychosis) in 2004 in Ukraine was second highest across the entire WHO European Region, following Estonia. The standardized death rates from alcohol abuse in the EU in 2005 were half of Ukraine's level (Figure 12). Further, a sub-category of unintentional poisonings, death by alcohol abuse can occur when a healthy adult male of average weight consumes a half liter or more of a strong beverage (40 percent alcohol) without food in less than one hour (Marquez 2005).

**Figure 12: Share of all causes SDR from alcohol-related causes in Ukraine and selected European countries, 1990–2005**



Source: HFA Database, 2008.

84. In this study, as our interest is not merely alcoholism but heavy alcohol use, we focus on “heavy or binge drinkers”. Here heavy or binge drinkers are categorized as those persons who reported consume more than five alcoholic beverages in a day, at least one day, in the last four weeks. Here, an alcoholic beverage was defined as a can or bottle beer, a glass of wine, 50 ml of vodka or other spirits, or homemade vodka. Consumption of more than 250 ml of vodka or strong spirits at 40 percent alcohol content would imply greater than 100 ml of pure alcohol consumption in that day.

85. Drinking has traditionally been heavy in most countries of the former Soviet Union including Ukraine, especially among men. Drinking habits in Ukraine have usually tended towards more strong spirits such as vodka. Not surprisingly in the survey, as noted below, nearly 70 percent of heavy or binge drinkers reported that they usually consumed strong spirits such as vodka or cognac or a mix of strong spirits with wine or beer (Table 20).

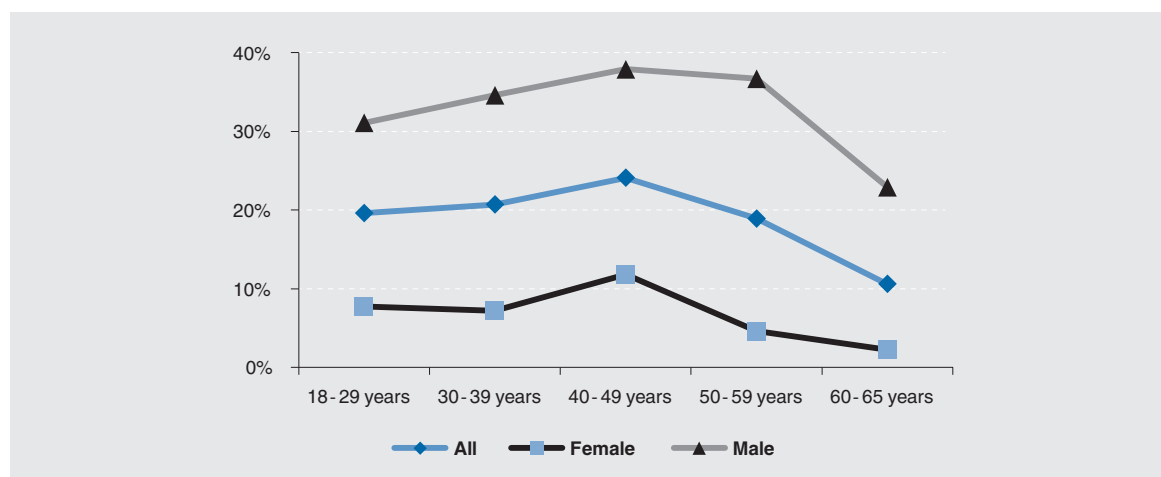
**Table 20: Type of alcoholic beverage usually consumed by heavy or binge drinkers**

Alcoholic beverage	Percent of heavy drinkers
Mild (beer, wine)	30.2
Strong (purchased vodka, cognac etc.)	35.1
Strong (homebrewed vodka)	8.3
Combination of mild and strong	26.4

86. *Twenty percent of Ukrainians indulge in heavy or binge drinking, having one or more days in the last month where they had more than five drinks that day.* Over 80 percent of heavy or binge drinkers are men and they account for a third of the adult male population. In comparison only 7.4 percent of the adult female population are heavy or binge drinkers. In terms of frequency of alcohol consumption, 30 percent drank more than five drinks one day in four weeks, 40 percent two-three days in four weeks, 20 percent at least one day a week and 10.5 percent at least two days in a week (of which half almost daily) respectively.

87. *Heavy or binge drinking starts young and increases with age initially and peaks between 40-49 years after which it starts to decline which also may be an indication of the low survival rates among heavy or binge drinkers in the older age groups, especially males.* This is true for both males and females (Figure 13). Among heavy or binge drinkers, the highest share was in the youngest age group studied; the 18-29 year olds (28.0 percent), followed by 40-49 year olds (26.7 percent). Among men, the highest share of heavy or binge drinkers was among the 18-29 year olds (31.8 percent). In comparison in the Europe and Central Asia region, while the age categories are slightly different, the prevalence of high-risk drinking among males 15-29 years is 20.8, 30-44 years is 18.7, 45-59 years is 21.4 and 60-69 years is 15.2; much lower than that in Ukraine. Among females, the highest share of heavy or binge drinkers fell into the 40-49 year age range (35.8 percent).

**Figure 13: Heavy or binge drinking by age and gender**



88. *Heavy or binge drinking varies by region - it is more prevalent in North and Center.* North and Center had 26.7 percent of the sample drinking heavily in the last month compared with 14.2 percent in the South. For both men and women, heavy or binge drinking varied considerably by region such that 42.5 percent of the men living in the North and Center were heavy drinkers as compared to 24.2 percent in the South. Women living in the North and Center were about three times more likely to be heavy or binge drinkers than in the other regions.

89. *Heavy or binge drinkers are mostly married or co-habiting and have high school or lower education levels.* The East had a large share of single heavy or binge drinkers (19.8 percent) as compared to only 4.5 percent who were single in the South. As with the other risk factors, more male heavy or binge drinkers tended to be married or cohabiting than women. Heavy or binge drinkers are not well-educated on the whole with two-thirds having only some high school education. Heavy or binge drinkers living in the Center region had a higher share of college educated than other regions. A higher share of women who are heavy or binge drinkers was college educated in comparison to men.

90. *Two-thirds of heavy or binge drinkers reside in populated urban areas, especially women.* In the West, heavy or binge drinking was more concentrated in the rural areas with over half of the heavy or binge drinkers living in rural areas; in the East, most of the heavy or binge drinkers (89.4 percent) lived in cities with over 20,000 people. Women who are heavy drinkers were more likely to live in urban areas than men.

**Table 21: Prevalence of heavy or binge drinking by socio-economic characteristics**

	Heavy Drinker (%)	Number
<b>Region</b>		
West	21.8	840
North/Center	26.9	814
South	14.3	815
East	14.8	845
<b>Gender</b>		
Male	33.9	1470
Female	7.6	1844
<b>Age group</b>		
18-29 years	19.4	905
30-39 years	20.5	666
40-49 years	24.3	622
50-59 years	19.2	732
60-65 years	10.5	389
<b>Marital status</b>		
Single	16.4	538
Married/Cohabiting	21.8	2372
Separated/Divorced	18.9	204
Widowed	5.5	200
<b>Education</b>		
Primary	24.2	134
Some High School	21.2	1974
Some college	17.5	1069
Some graduate	20.9	137
<b>Residence</b>		
Urban	20.5	1705
Rural	19.0	1609
<b>Employment</b>		
no paid work now	14.3	1381
has paid work now	23.5	1933
<b>Wealth quintiles</b>		
Lowest	19.8	660
Second	15.2	665
Middle	15.2	658
Fourth	20.9	662
Highest	25.1	669
<b>Total</b>	<b>20.0</b>	<b>3314</b>

91. About three out of four heavy or binge drinkers have paid work and one in two belong to the top two wealth quintiles. Over half of the sample of heavy or binge drinkers fell into the top two wealth quintiles, especially in the North and Center, South, and East. The West had a higher share of heavy or binge drinkers falling into the lowest quintile (over one-third). A higher share of women in this category fell into the highest two quintiles compared to men (two-thirds versus one-half).

92. One out of four heavy or binge drinkers and less one out of three very heavy drinkers (had >10 drinks in a day in the last four weeks) feel bad or guilty about their drinking habits. Only a quarter of those who are heavy or binge drinkers feel they should reduce the amount of alcohol intake; this is slightly higher (36 percent) among very heavy drinkers.

93. Males living in the North or Center, having primary education who are married/cohabiting or single/separated have higher odds of being heavy or binge drinkers. To understand which of the above socio-economic factors significantly affects the odds of being a heavy or binge drinker versus not, a logistic regression analysis was conducted and the results are in Table 22. The odds of being a heavy or binge drinker versus not were the higher in the North and Center but lower in the South and East as compared to the West. Being female significantly decreased the odds of being a heavy or binge drinker by a factor of 1.90 ( $p < 0.001$ ). Being 60 to 65 years old significantly decreased the odds of being a heavy or binge drinker versus a Ukrainian 18 to 29 years old. Being married or separated significantly increased the odds of being a heavy or binge drinker as compared to single Ukrainians. Having higher education levels significantly decreased the odds of being a heavy or binge drinker to a similar degree across education levels versus primary education. Rural versus urban, work status, and wealth levels did not significantly predict heavy or binge drinking levels.

**Table 22: Logistic regression results on the odds of being a heavy or binge drinker or being sedentary**

	Heavy or Binge Drinking	Sedentary Behavior
	<i>N</i> =3314	<i>N</i> =3314
<b>Region</b>		
North/Center	1.30*	1.25
South	0.51***	0.27***
East	0.52***	3.41***
<b>Female</b>	0.15***	1.20
<b>Age group</b>		
30-39 years	0.84	1.31
40-49 years	1.14	1.09
50-59 years	0.93	1.30
60-65 years	0.49**	2.37***
<b>Marital Status</b>		
Married/Cohabiting	1.70*	-0.55**
Separated/Divorced	2.62**	0.94
Widowed	1.02	0.77
<b>Education</b>		
Some High School	0.47*	0.76
Some college	0.37**	0.59
Some graduate	0.42*	0.29**
<b>Rural</b>	0.78	0.66**
<b>Has paid work now</b>	1.29	1.01
<b>Wealth quintiles</b>		
Second lowest	0.95	1.16
Middle	1.01	1.71*
Fourth	1.08	3.03***
Highest	1.30	5.39***

Note: Baseline case - a single male Ukrainian living in the West between the ages of 18 to 29 years old with some primary education, in the lowest wealth quintile, and living in a city without paid work.

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

## PHYSICAL ACTIVITY

94. A respondent was classified as being sedentary if their reported weekly physical activity was less than 60 minutes per week. Non-sedentary behavior were classified into insufficient and active (see table below), but collapsed into one category of more than 60 minutes of activity per week. Here, activities included walking; riding a bike, work in the house or yard, sports and other physical activities. Equal weights were given to each of these activities as it was difficult to measure intensity of activity.

Physical Activity	
Sedentary	<60 min/wk
Insufficient	60-149 min/wk
Active	>= 150 min/wk

95. About 10 percent of Ukrainians was sedentary while 6.3 percent has insufficient physical activity per week. 10.9 percent of 18-29 year olds in Ukraine were sedentary compared with 3.7 percent in the Czech Republic and 7.1 percent in Hungary (World Health Survey, 2003). Females are more likely to be sedentary than males. The North and Center region had the highest rate of sedentary population. Those with college education or more are less likely to be sedentary. Sedentary behavior is more prevalent among those residing in cities or areas with population greater than 20,000 and increases with wealth. 37 percent of sedentary persons walk at least one day a week, 35 percent does active housework once a week compared with 94 percent and 92.4 percent respectively of the physically active population.

**Table 23: Prevalence of sedentary behavior by socio-economic characteristics**

	Sedentary (%)	Number
<b>Region</b>		
West	5.70	840
North/Center	8.70	814
South	2.00	815
East	18.80	845
<b>Gender</b>		
Male	9.60	1470
Female	11.00	1844
<b>Age group</b>		
18-29 years	10.90	905
30-39 years	10.30	666
40-49 years	9.40	622
50-59 years	9.50	732
60-65 years	13.30	389
<b>Marital status</b>		
Single	14.20	538
Married/Cohabiting	9.00	2372
Separated/Divorced	13.70	204
Widowed	13.20	200
<b>Education</b>		
Primary	13.90	134
Some High School	10.20	1974
Some college	10.80	1069
Some graduate	6.20	137

	Sedentary (%)	Number
<b>Residence</b>		
Urban	13.40	1705
Rural	4.20	1609
<b>Employment</b>		
no paid work now	10.10	1381
has paid work now	10.50	1933
<b>Wealth quintiles</b>		
Lowest	4.80	660
Second	6.00	665
Middle	7.60	658
Fourth	11.30	662
Highest	18.60	669
<b>Total</b>	<b>10.30</b>	<b>3314</b>

96. To understand which of the above socio-economic factors significantly affects the probability of sedentary behavior, a logistic regression analysis was conducted and the results are in Table 22. The odds of being sedentary (less than 60 minutes per week) were significantly increased if living in the East and decreased if living in the South as compared to living the West. The odds of being sedentary was also significantly reduced if married/cohabiting ( $p < 0.001$ ), having some graduate level education or living in a small city or village ( $p < 0.01$ ). Higher wealth levels increased odds of sedentary behavior, especially in the two highest wealth quintiles.

## CONCLUSIONS

97. As shown above, smoking prevalence is high especially among the males and is starting early. Smoking prevalence is much higher than WHO European Region average. A fifth of the Ukrainian adult population has one or more occasions in a month where they consume more than five drinks and binge drinking starts young. Ten percent are sedentary another 6.3 percent have low levels of physical activity; Ukraine has amongst the highest rate of sedentary persons in the 18-29 years age group in the region.

98. Reduction of pre-mature mortality and morbidity in Ukraine would require significant behavioural changes which while difficult to achieve are nevertheless amenable to prevention and treatment. Impact of behavioural risk factors especially for non-communicable diseases could be reduced through targeted primary and secondary interventions.

99. Key cost-effective interventions that target these behavioral risk factors exist and are listed below (Table 24). Ukraine has implemented many of these interventions, but often not in a comprehensive manner, thus not get the full impact of the benefit (World Bank, 2009). Where regulations exist, enforcement of key regulations such as smoking bans or bans for sale of alcohol and tobacco to minors is weak.

100. Several risk factors cluster in a single individual, and therefore common strategies are needed that target specific sub-groups most at risk. A more effective approach is therefore for Ukraine to develop integrated plans for NCDs prevention and control, in which interventions are jointly prioritized and common activities—such as information, education and communication (IEC activities), taxes and tariffs, legislative and regulatory reforms, health worker training and the development of clinical guidelines, among others— that can be pursued in a coherent way.

**Table 24: Key cost-effective interventions for targeting behavioral risk factors**

Interventions	
<b>Tobacco control</b>	Comprehensive bans on advertising Increased tobacco taxes Prominent health warning labels with pictures Enforcement of comprehensive smoking bans and sales to minors School-based health education
<b>Alcohol control</b>	Counter-advertising Increased alcohol taxes Legislative interventions (mandatory warning labels, banning sales to minors, advertising bans, etc.) School-based health education Strict enforcement of drunk-driving laws with clearly legislated maximum BAC levels
<b>Road Safety</b>	Mandatory seat belts enforcement Strict enforcement of drunk-driving laws with clearly legislated maximum BAC levels Enforcement of speed limits Safe driving lessons for youth
<b>Dietary change</b>	School-based health education IEC on the dangers of obesity, and the benefits and elements of a healthy diet Involvement of NGOs, community groups etc. in activities promoting dietary change Health worker training—knowledge/skills to encourage dietary improvement Taxation of harmful dietary inputs—sugar, fatty foods, alcohol etc.
<b>Promotion of physical activity</b>	School-based health education IEC on physical activity/exercise Promotion of sporting activities and clubs, especially those targeted at age/gender groups with low levels of physical activity Health worker training—knowledge/skills to promote increased physical activity

101. Modifying lifestyles to reduce the risk is difficult to achieve and requires both an understanding of the extent of the risk and the awareness of the population of the seriousness of the problem. Clearly, Ukrainians discount the long-term harmful effects thus seeing higher immediate benefits from indulging in unhealthy behaviors. This is also a difficult area to pursue given the fact that several of the behaviors described above are presumed to be culturally acceptable. Community involvement, large-scale awareness raising programs especially aimed at the youth – and in schools - can help reduce the spread of such behaviors into the next generation. For the current generation, awareness raising programs should emphasize both short- and long-term benefits of healthy lifestyles and even where possible use rewards and incentives to encourage such behavior.



## CHAPTER V:

# THE ROAD AHEAD

102. *Ukraine is losing a generation to chronic disease.* Half of the adult population, 18-65 years of age, suffers from one or more chronic diseases. This combined with low life expectancies implies that much of Ukraine's adult population today is at risk of dying prematurely. Women live much longer than men – Ukraine has one of the largest female-male gaps in life expectancy of 12 years - but here too as shown women spent much of their adult lives in states of ill health. Underlying these chronic diseases are behaviors such as smoking, alcohol abuse, poor diet and physical inactivity. High prevalence of such unhealthy behaviors among young adult males in the population today puts them at risk for chronic disease in the near future.

103. *Ukraine's health crisis therefore calls for immediate action.* The task however is not easy. Chronic diseases are complex by nature and prevention requires behavior change which is difficult to achieve without complete participation of the Ukrainian population. As seen in this study, many of these risks are known to those who incur them but the seriousness of their actions are perhaps not internalized. It also needs a change in the way health services are provided. More patient involvement and self-management is required to control these diseases.

104. This report, therefore, suggests a two-pronged approach:

*First, is a concentrated focus on targeted primary prevention programs – involving the government, the community, businesses and most importantly, the Ukrainian public.* This would involve:

- Raising awareness especially among those who control Ukraine's future – namely the youth. Schools could be good place to target as much of these risky behaviors as is seen in this report start early.
- For young adults – programs and interventions that emphasize short and long term benefits of healthy lifestyles – using rewards and incentives where needed.
- Enforcement of existing regulations such as ban on sale of alcohol and tobacco to minors, ban of smoking in certain public areas.
- Use of taxes, tariffs, legislation and regulations to ensure comprehensiveness of existing measures to further reinforce healthy behaviors. Here the key is not merely to regulate on paper but to enforce these regulations.

Primary to this is the development of a common strategy to prevent and control chronic diseases outlining priority areas, delineating roles of various sectors and levels of government thus encouraging the tackling of the issue in a comprehensive manner. As is seen, modifying lifestyle behaviors crucial to the chronic disease cannot be done by the health sector alone and will require participation of various sectors of the government, the private sector and non-government organizations.

*Second, would involve re-orienting the health system to help identify high risk cases, detect chronic conditions and diseases early and control their progress.* In the management of chronic disease there are two important players – the health system and the patients. An earlier World Bank study (World Bank 2009), showed that that the health system in Ukraine is unprepared to deal with crisis as currently organized. The health system therefore needs to be re-organized. It has to move away from a model based on episodic care for acute illnesses to one that is more proactive and meets the needs of patients with chronic conditions. Early detection is the key to control of chronic illnesses. This can be achieved through:

- Strengthening of the primary care system. Health workers need to be trained to identify those at risk and inform them of the consequences, diagnose conditions early and treat them appropriately.
- Re-orienting health care services to increase patient involvement in treatment decisions and support self-management of chronic diseases by the patient's themselves. As chronic disease is not always managed in a health setting, raising awareness of the patient, involving them in designing of their treatment plans will go a long way in ensuring compliance reducing the risk of premature death.

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# APPENDIX 1:

## TABLES

**Table 1: Percent of chronic disease prevalence by socio-economic factors**

	Diabetes	High Blood Cholesterol	Heart Attack	Angina Pectoris	Stroke	Cancer	Osteoporosis	Number
<b>Region</b>								
West	2.80	2.80	1.00	4.50	0.60	1.30	2.60	840
North/Center	3.30	3.40	1.00	8.60	1.30	0.50	1.80	814
South	3.40	3.00	0.30	5.70	0.50	1.00	2.40	815
East	4.30	5.10	1.90	8.70	2.00	0.70	2.90	845
<b>Gender</b>								
Male	2.60	2.70	1.30	6.10	1.40	0.30	1.90	1470
Female	4.40	4.80	1.00	8.50	1.20	1.20	2.90	1844
<b>Age group</b>								
18-29 years	3.60	3.80	1.20	7.30	1.30	0.80	2.40	905
30-39 years	0.50	0.60	0.00	1.50	0.00	0.10	0.30	666
40-49 years	0.60	1.20	0.30	3.50	0.30	0.60	0.80	622
50-59 years	3.80	4.30	0.10	8.80	0.9	0.50	3.50	732
60-65 years	8.00	8.60	3.30	12.70	2.80	2.20	4.40	389
<b>Marital status</b>								
Single	1.00	2.60	0.30	3.20	0.50	0.40	0.70	538
Married/Co-habiting	3.60	3.70	1.10	7.60	1.40	0.90	2.70	2372
Separated/Divorced	4.50	3.20	0.40	9.00	1.00	0.00	1.20	204
Widowed	11.80	11.90	7.70	17.80	4.00	1.90	5.30	200
<b>Education</b>								
Primary	6.90	2.40	2.10	11.50	4.00	0.00	3.20	134
Some high school	3.30	3.00	0.90	6.60	1.40	0.70	2.10	1974
Some college	3.70	4.70	1.30	7.70	0.80	1.00	2.70	1069
Some graduate	2.40	9.00	2.80	10.80	0.90	1.00	4.10	137
<b>Residence</b>								
Urban	4.00	4.80	1.10	7.40	1.40	0.80	2.80	1705
Rural	2.60	1.80	1.30	7.30	1.20	0.70	1.60	1609
<b>Employment</b>								
no paid work now	4.80	3.70	2.10	10.70	2.50	1.20	3.10	1381
has paid work now	2.80	3.90	0.60	5.40	0.60	0.50	2.00	1933
<b>Wealth quintiles</b>								
Lowest	1.40	1.10	0.80	5.00	1.10	0.80	2.50	660
Second	5.40	3.70	1.90	8.60	2.30	0.80	2.40	665
Middle	5.50	4.70	1.70	11.40	1.30	0.40	0.80	658
Fourth	3.90	6.20	0.80	7.00	1.70	1.10	3.70	662
Highest	2.90	3.90	1.00	6.70	0.50	0.80	2.30	669
<b>Total</b>	<b>3.60</b>	<b>3.80</b>	<b>1.20</b>	<b>7.30</b>	<b>1.30</b>	<b>0.80</b>	<b>2.40</b>	<b>3314</b>

**Table 2: Percent of chronic disease prevalence by region and age groups, males and females**

	West	North/Center	South	East	
<b>Females</b>					
No chronic disease	33.90	36.30	46.90	33.80	
I Chronic disease	33.60	32.70	26.30	30.80	
2 or more Chronic Disease	32.50	31.00	26.80	35.40	
<b>Males</b>					
No chronic disease	33.30	39.10	46.50	39.80	
I Chronic disease	50.20	43.10	31.10	33.90	
2 or more Chronic Disease	16.40	17.80	22.40	26.40	
	18-29 years	30-39 years	40-49 years	50-59 years	60-65 years
<b>Females</b>					
No chronic disease	67.30	42.70	30.90	12.30	2.80
I Chronic disease	25.90	34.50	32.90	32.00	34.40
2 or more Chronic Disease	6.80	22.80	36.20	55.70	62.90
<b>Males</b>					
No chronic disease	58.90	41.40	31.70	22.20	15.20
I Chronic disease	31.80	46.90	42.40	41.90	37.20
2 or more Chronic Disease	9.40	11.70	25.90	35.90	47.60

**Table 3A: Percent of daily smoking prevalence by socio-economic factors by region**

<b>DAILY SMOKER</b>					
	West	North/Center	South	East	Total
Male(n=737)	87.90	77.00	73.40	81.20	79.80
Female (n=188)	12.10	23.00	26.60	18.80	20.20
<b>Age</b>					
18-29 years (n=265)	29.00	30.20	29.10	31.60	30.40
30-39 years (n=238)	29.80	25.80	22.40	24.90	25.60
40-49 years (n=198)	23.80	23.80	26.20	23.00	23.80
50-59 years (n=164)	14.40	16.30	18.90	17.40	16.80
60-65 years (n=60)	3.00	3.90	3.40	3.00	3.40
Single (n=146)	17.30	16.60	12.00	17.10	16.30
Married/Cohabiting (n=707)	78.50	76.50	79.50	75.80	77.00
Separated/Divorced (n=52)	3.80	5.80	6.50	5.80	5.60
Widowed (n=14)	0.30	1.10	2.00	1.30	1.20
<b>Education</b>					
Primary (n=36)	2.60	1.60	4.10	6.00%	3.70
Some High School (n=608)	70.20	61.00	68.30	68.20	66.10
Some college (n=235)	25.00	30.30	23.50	22.60	25.80
Some graduate (n=38)	2.20	7.00	4.10%	3.10	4.40
<b>Employed</b>					
No (n=289)	30.50	32.80	24.00	28.60	29.70
Yes (n=619)	69.50	67.20	76.00	71.40	70.30
<b>Wealth Quintiles</b>					
Lowest (n=204)	33.40	22.00	16.10	25.90	24.40
Second (n=144)	9.90	9.50	10.10	17.30	12.50
Middle (n=161)	15.10	8.00	13.00	14.50	12.20
Fourth (n=192)	20.20	24.00	29.00	16.90	21.50
Highest (n=224)	21.40	36.50	31.80	25.30	29.40



**Table 3B: Percent of former smoking prevalence by socio-economic factors by region**

FORMER SMOKER					
	West	North/Center	South	East	Total
Male (n=185)	93.60	71.70	58.40	58.30	69.90
Female (n=65)	6.40	28.30	41.60	41.70	30.10
<b>Age group</b>					
18-29 years (n=39)	16.00	19.70	17.00	14.70	16.90
30-39 years (n=54)	15.50	23.50	33.30	23.10	23.10
40-49 years (n=46)	24.40	24.10	16.20	24.90	23.30
50-59 years (n=58)	26.50	18.70	19.70	27.10	23.30
60-65 years (n=53)	17.50	14.00	13.80	10.20	13.40
<b>Marital status</b>					
Single (n=20)	6.70	6.90	9.00	18.50	11.00
Married/Cohabiting (n=203)	86.90	81.90	77.90	70.50	78.50
Separated/Divorced (n=17)	6.40	7.20	12.20	6.90	7.60
Widowed (n=7)	0.00	4.00	0.90	4.20	2.80
<b>Education categories</b>					
Primary (n=10)	2.90	2.80	4.10	4.90	3.70
Some High School (n=134)	55.90	59.20	42.60	52.80	54.00
Some college (n=94)	39.70	32.50	50.90	36.90	38.10
Some graduate (n=9)	1.60	5.50	2.30	5.40	4.20
<b>Employed</b>					
No (n=104)	33.50	29.90	39.10	46.00	37.40
Yes (n=143)	66.50	70.10	60.90	54.00	62.60
<b>Wealth quintiles</b>					
Lowest (n=41)	24.80	14.60	16.00	11.60	15.90
Second (n=35)	14.60	9.20	6.60	18.00	12.90
Middle (n=50)	15.10	13.40	19.10	14.20	14.90
Fourth (n=71)	22.50	37.00	35.20	17.00	27.00
Highest (n=53)	23.00	25.80	23.10	39.10	29.30

**Table 3C: Percent of heavy or binge drinking prevalence by socio-economic factors by region**

<b>HEAVY OR BINGE DRINKER</b>					
	West	North/Center	South	East	Total
Male (n=485)	87.50	75.70	80.60	83.70	80.70
Female (n=123)	12.50	24.30	19.40	16.30	19.30
Total (n=608)	100.00	100.00	100.00	100.00	100.00
<b>Age</b>					
18-29 years (n=159)	25.40	26.70	24.30	34.20	28.00
30-39 years (n=127)	22.00	24.50	17.30	19.40	21.90
40-49 years (n=150)	25.70	27.40	26.70	26.50	26.70
50-59 years (n=127)	22.00	16.70	28.50	17.90	19.40
60-65 years (n=44)	5.00	4.70	3.20	1.90	3.90
<b>Marital status</b>					
Single (n=79)	14.00	13.50	4.50	19.80	14.20
Married/Cohabiting (n=483)	81.70	79.80	88.00	69.00	78.50
Separated/Divorced (n=32)	3.90	5.30	5.90	10.00	6.20
Widowed (n=9)	0.30	1.40	1.60	1.20	1.10
<b>Education categories</b>					
Primary (n=23)	2.30	3.10	3.80	9.70	4.60
Some High School (n=383)	64.60	57.00	72.70	62.60	61.70
Some college (n=172)	30.80	31.50	21.80	26.70	29.10
Some graduate (n=25)	2.30	8.40	1.60	1.10	4.60
<b>Employed</b>					
No paid work now (n=175)	29.30	26.50	19.10	26.60	26.30
Has paid work now (n=422)	70.70	73.50	80.90	73.40	73.70
<b>Wealth Quintiles</b>					
Lowest (n=138)	36.70	15.90	20.70	22.20	22.50
Second (n=88)	12.90	10.60	14.40	12.00	11.90
Middle (n=87)	12.20	8.20	13.00	13.30	10.90
Fourth (n=134)	20.40	26.00	21.90	17.60	22.30
Highest (n=161)	17.70	39.20	30.10	34.90	32.50

