This is to certify that the
dissertation entitled

PUBLIC CONCERNS AND PERCEPTIONS ABOUT ENVIRONMENT AND HEALTH IN POST-COMMUNIST MUSLIM SOCIETIES

presented by

IVAN DIMOV IVANOV

has been accepted towards fulfillment
of the requirements for the

Ph.D. degree in Sociology

Angela J. Mertig Henry Pabst

Major Professor's Signature

August 5, 2004

Date

DATE DUE	DATE DUE	DATE DUE

PUBLIC CONCERNS AND PERCEPTIONS ABOUT ENVIRONMENT AND HEALTH IN POST-COMMUNIST MUSLIM SOCIETIES

By

Ivan Dimov Ivanov

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Sociology

2004

PUBL

Th

environme

communis

environme

people wo

argue that

environme

concern t

these the

post-com

Th

Albania,

data were

through s

Th

has affec

showed t

environm

protectio

ABSTRACT

PUBLIC CONCERNS AND PERCEPTIONS ABOUT ENVIRONMENT AND HEALTH IN POST-COMMUNIST MUSLIM SOCIETIES

By

Ivan Dimov Ivanov

This study investigates biophysical and social components of environmental concern and their socio-demographic predictors in five post-communist Muslim countries from the Balkans and Central Asia. The theories of environmental concern developed in the Western affluent societies hold that poor people would be less concerned about the environment. Some theories also argue that environmental concern stems from a person's direct exposure to environmental problems, while another set of theories attributes environmental concern to socio-demographic and cultural factors. The study examines whether these theories, developed in Western affluent societies, will hold true in poorer post-communist societies dominated by Muslim culture.

The study used data from the WHO/Gallup public opinion survey in Albania, Bosnia and Herzegovina, Azerbaijan, Tajikistan and Turkmenistan. The data were collected via face-to-face interviews with 4498 individuals selected through stratified cluster probability sampling.

The first research question was whether the legacy of the Soviet Union has affected the attitudes toward environment and health issues. The analysis showed that people in the Balkan countries were more concerned about the environment and expressed higher levels of political demand for environmental protection than those from the former Soviet republics in Central Asia. Other

research
of enviro
causing
populatio
environm
lay people
However,
of environ
This dema
and less f
model of e
structural
environme
logical, str
political de
environme
diseases.
perceived
concerns a

The
Central As
providing f
public parti

research questions addressed cultural and temporal differences in the perception of environmental risks and lay beliefs about the role of the environment in causing certain diseases. The analysis found significant differences at the population level between Christian and Muslim subsamples in the selection of environmental risks as major causes of diseases and a widespread belief among lay people that the environment causes diseases, particularly in children. However, Muslim culture did not significantly influence the perceived seriousness of environmental problems and political demand for environmental protection. This demand stems mainly from perceived exposure to environmental problems, and less from socio-demographic factors. Finally, the study aimed to fit a causal model of environmental concern. This model was developed and tested with structural equation modelling (SEM). The SEM analysis revealed that environmental and health attitudes in the Balkans and Central Asia represent a logical, structured and constrained belief system comprised of four factors: (1) political demand for environmental protection; (2) perceived quality of the environment; (3) perceived ill health; and (4) lay belief in environmental causes of diseases. Political demand for environmental protection depends primarily on perceived quality of the environment and indirectly on the level of personal concerns about environmental effects on health.

These results suggest that environmental protection in the Balkans and Central Asia can be improved by considering the health aspects of pollution, and providing for better public information, special attention to rural areas and wider public participation in international projects.

To PGregg,

for all your love and support

in this journey.

I

Perlstad

every st

public op

teaching

these tw

I w

for bringi

challenge

ideas and

Dr. Brian

PGregg T

The

Europe of

like also t

and to the

of field int

Fin

me their s

ACKNOWLEDGMENTS

I would like to thank my major professors, Dr. Angela Mertig and Dr. Harry Perlstadt, for providing me with endless encouragement and insight throughout every stage of this research. I am indebted to Dr. Mertig for introducing me to public opinion research in environmental sociology, and to Dr. Perlstadt for teaching me a sociological understanding of health and illness. The interaction of these two areas has been the core of this research.

I would like also to thank my Ph.D. committee members: Dr. Craig Harris for bringing me to the world of environmental sociology and for his stimulating challenge and support throughout my studies, and Dr. Toby TenEyck for his ideas and advice in conceiving this research. I also acknowledge the advice of Dr. Brian Silver on the political aspects of this dissertation, and the assistance of PGregg Thompson (LUT) in editing all versions of the manuscript.

The data for this research were kindly provided by the Regional Office for Europe of the World Health Organization, for which I am mostly grateful. I would like also to extend thanks to Gallup International for organizing the data collection and to the numerous interviewers and survey leaders who carried out thousands of field interviews in the harsh winter of 2001/2002.

Finally, I am thankful to my personal and professional friends who gave me their support and encouragement.

TABLE OF CONTENTS

LIST OF TABLES

Figure

Figure 2

Figure 3

Figure 4
pro

Figure 5

Figure 6
fact

Figure 7
prot

Figure 8
prot

LIST OF FIGURES

CHAPT

environ

collapse

Europe

cleanup

environ

Individu

econom

at leas

1995).

been c

The b

ethnic

econo

disint

tensio

forme

anoth

EU n

instit

west

CHAPTER 1. INTRODUCTION AND STATEMENT OF THE PROBLEM

In the late 1980s, many countries of the former Eastern block were environmental disaster areas. The paralyzing financial crisis and economic collapse that followed the end of totalitarian regimes in Central and Eastern Europe had both positive and negative effects on the progress of environmental cleanup. On the negative side there have been insufficient funds for environmental cleanup and investment in less-polluting efficient technologies. Individuals and institutions have diverted their attention from environmental to economic concerns. On the other side, the dirtiest industries have shut down or at least curtailed their operations because of the economic collapse (Yarnal, 1995).

Now, almost fifteen years after the collapse of communism, there have been dramatic changes in the socio-political map of the former Eastern Block. The break down of the Federal Republic of Yugoslavia was accompanied by ethnic conflicts and military interventions and has negatively affected the socio-economic status of most of the former communist countries in the Balkans. The disintegration of the Soviet Union has also led to economic hardships, ethnic tensions and political instability in some of the successor countries. In 2004, eight former communist countries became members of the European Union and another two are scheduled to achieve membership in 2007. The preparations for EU membership brought stable financial growth, established democratic institutions and market economies in these countries. However, the nations in the western Balkans and most of the former Soviet Union republics are still struggling

with po

betwee

Europe

regimes

solution

Webste

the colla

democra

inherited

attractive

when so

when un

enthusia

the perip

took pos

of time,

M

environr

changed

commun

the USS

pollution

with poverty, unemployment and ethnic conflicts. In other words, the gap between the nations from the former Eastern Block is increasing (UNDP 2002c).

Environmental movements were part of the democratic reforms in Eastern Europe. Environmental problems were viewed as a challenge to totalitarian regimes, which proved incapable of dealing with environmental protection. The solutions to these problems required a change in the social order (Jancar-Webster 1993). The environmental movement that emerged immediately after the collapse of communism was part of the more general political movement for democracy and a Western style socio-economic model. The ecological problems inherited from the past became a matter of intensive public debate and an attractive issue for the newly established free media (Lavigne 2000). Later on, when socio-economic reforms proved to be not as easy as initially expected, and when unemployment, inflation, crime, and military conflicts replaced the initial enthusiasm of the velvet revolutions, environmental issues gradually slipped into the periphery of the public mind (Dimova 1995). Many environmental activists took posts in the new governmental departments, and thus, for a certain amount of time, the environmental movement lost a sense of direction (Botcheva 1996).

Mirovitskaya (1998) has demonstrated that the expression of environmental interests in the post-communist period has fundamentally changed. Whereas the main focus of the environmental movement during communism was on nature conservation, a few years after the disintegration of the USSR the focus of attention had shifted toward the effects of environmental pollution on health in densely populated industrial centres. Two main types of

nongovernmental organizations concerned with the environment and health are emerging. The organizations from the first type ("grassroots") usually have a small number of members and operate at the level of communities and neighbourhoods. These organizations directly involve citizens, have pragmatic goals and most often seek to halt the building of hazardous facilities in their communities. In this way they resemble the not-in-my backyard (NIMBY) movements in the US The second type ("elite" organizations) define their goals more broadly, often including specialist professionals and are equipped and financed by various domestic and international ecological funds and international non-governmental organizations (Mirovitskaya 1998). Similar patterns have been described in the US where the environmental movement was split into grassroots and elite (mainstream) organizations (Freudenberg and Steinsapir 1992; Mertig, Dunlap and Morrison 2002).

The tactics of non-governmental organizations have also changed in the post-Soviet period. At the beginning of political reforms, ecological interests were given public expression chiefly by means of protests, picketing, strikes and petitions. Presently, non-governmental organizations use less direct and less confrontational methods, such as education, dissemination of information and campaigning (Botcheva 1996).

1.1. The problem

In Western societies, concern about the environment has resulted in greater public support for environmental protection measures and, in some cases, in higher levels of activism to solve environmental problems. It has been

demon

about e

environ

until rec

environ

about e

far belo

M

comes fr

Dunlap a

environm

The scar

block cor

which are

2001; Lar

less deve

Th

communis

effects, ho

health, an

factors. Th

concern ar

less develo

demonstrated that the level of knowledge determines whether people will worry about environmental risks (Slovic 1997). Yet, in the former communist countries environmental problems were systematically hidden from the public and, at least until recently, there was no public debate about human heath risks of environmental degradation. Presently, the level of public access to information about environmental risks in some less developed post-communist countries is far below that in the Western world (French 1991; Lang 2000).

Most of the research on environmental concern and risk perceptions comes from Western societies (Dunlap 1992; Dunlap, Gallup and Gallup 1993b; Dunlap and Scarce 1991; Mertig and Dunlap 2001). Little is known about environmental concern and risk perceptions in the former communist societies. The scarce data on environmental attitudes and behaviour in the former Eastern block come mainly from relatively more affluent and mostly Christian countries, which are now joining the European Union (Dimova 1995; Gooch 1995; Ivanov 2001; Lang 2000; Lee and Norris 2000). Very little data are available about the less developed Muslim countries from the Balkans and Central Asia.

Therefore, this dissertation aims to shed light on how people in post-communist Muslim societies perceive environmental risks and their health effects, how perceptions are related to attitudes toward environmental issues and health, and how these perceptions and attitudes vary by socio-demographic factors. This dissertation will also test some of the theories of environmental concern and risk perception established in Western societies by applying them to less developed countries from the former Eastern block.

environ
than th
Marxist
industri
obstacl
develop
opinion,
of comr
similarit
commu
Weste
individu

cultura
culture
Young
Weste
realizin
vital ro
can be
way dif

There are several reasons to suspect that the characteristics of environmental concern in post-communist Muslim societies would be different than those established in the West. The first reason is the legacy of communism. Marxist ideology that underpinned communist rule emphasized economic growth, industrialization and technical progress. In this worldview, nature was seen as an obstacle to technical progress, to be overcome through scientific and technical development. During communism, public dissent and the formation of public opinion, critical of the status quo were ruled out by party control over the means of communication (Baker and Jehlicka 1998). Although there are some similarities between the dominant social paradigm (DSP) in the West and the communist social paradigm, there are several substantial differences. While the Western DSP emphasised the free initiative of individuals, the belief in individualism has not been part of the communist social paradigm (Gooch 1995).

The second reason is culture. Douglas and Wildavsky (1982) argue that cultural factors determine which risks people choose to worry about. Islamic cultures are very reluctant to accept Western views (Lewis 2002). Hope and Young (1994) have found that Muslims see environmentalism as a form of Western control intended to keep Islam from developing and Muslims from realizing their economic potential. Religious laws and cultural traditions play a vital role in the everyday life of Muslim societies (Assenova 2000). Therefore, it can be expected that Muslim societies would perceive environmental risks in a way different from Christian societies.

not the

commu

societie

in the W

For

and hea

Herzeg

the data

2002 in

environ

lay hea

and pub

demogr

1.2. The

Peninsu

populat

indepen

Republi

two enti

Muslim,

A third reason is that the social structure of post-communist societies is not the same as in the West. Contrary to what has been believed, the post-communist societies are not homogeneous (Fuller 2000). Even more, such societies are more seriously divided by ethnic and religious cleavages than those in the West (Jehlicka and Kostelecky 1995).

For these reasons, I chose to examine public attitudes toward environment and health in five post-communist Muslim nations - Albania, Bosnia and Herzegovina, Azerbaijan, Tajikistan and Turkmenistan. In particular, I will analyse the data from the WHO/Gallup International public opinion study carried out in 2002 in these five countries. This survey asked questions about health and environmental trade-offs, ratings of environmental quality, personal health and lay health beliefs, perception of environmental risks, as well as political attitudes and public activism. Additionally, the survey included standard socio-demographic variables.

1.2. The nations in the study

Albania and Bosnia and Herzegovina are located on the Balkan Peninsula. Albania is the only country in Europe with a predominantly Muslim population. It was independent during the socialist period and had relative independence from Moscow. Bosnia and Herzegovina was part of the Federal Republic of Yugoslavia and gained independence in 1995. Now it is divided into two entities – Federation of Bosnia and Herzegovina, which is predominantly Muslim, and Republic of Srpska, which is Christian. The other three countries,

Azerbaijan, Tajikistan and Turkmenistan were part of the Soviet Union until 1991. Azerbaijan is located in the Sub-Caucasian region, while Tajikistan and Turkmenistan form part of Central Asia. The majority of the population in these three countries is also Muslim.

1.2.1. Social characteristics

All five countries are classified as having medium human development (UNDP 2002c), with GDP per capita between 3,956 US$ in Turkmenistan and 1,152US$ in neighbouring Tajikistan. The population below national poverty lines is 19.1% in Bosnia and Herzegovina (UNDP 2002b), and 46.6% in Albania (UNDP 2002a), and between 58 and 83% in the former Soviet Union republics (UNDP 2002c),

The level of social inequality is another important feature of these societies. The World Bank measures social inequality by the Gini index, which represents the extent to which the distribution of income among individuals and households within an economy deviates from a perfectly equal distribution. Thus, a Gini index of zero represents perfect equality, while an index of 100 implies perfect inequality. Data on the Gini index are available only for the former Soviet republics. The level of social inequality in Turkmenistan (Gini index 40.8) is the same as that in the United States (Gini index 40.8). Azerbaijan (Gini index 36.0) and Tajikistan (Gini index 34.7) are slightly more egalitarian than the United States (40.8). However, compared to the countries in Western Europe (Gini index

24.7- 32.7) there is much more social inequality in the former Soviet republics (World Bank 2002b).

Gender inequality can be assessed by the United Nations using the gender-related development index (GDI) value. GDI is a composite index measuring average achievement in the three basic dimensions captured in the human development index—a long and healthy life, knowledge and a decent standard of living—adjusted to account for inequalities between men and women. The value of GDI in Albania is .732 (ranked 73rd in the world), in Azerbaijan .715, and in Tajikistan it is .673 (92nd in the world), while the United States ranks 5th in the world with GDI .935 (UNDP 2003b). In Bosnia and Herzegovina, the social position of women is also much lower than men. In this country, the female share of the labour market is only 34% - the lowest in all countries of South East Europe (UNDP 2003a). In all five countries, gender inequality leads to unequal opportunity for earning incomes, different position in the family and different labour force participation (Emigh, Fodor and Szelényi 2001; UNDP 2000).

With regard to ethnic groups, the countries are also different. Albania has the lowest percentage of an ethnic minority population (5%), followed by Azerbaijan (10%), Turkmenistan (28%), and Tajikistan (35%) (CIA 2003). Another way to assess the ethnic composition of the countries is the ethnic diversity score (EDS), which is based on the number of ethnic groups in a country weighted by the fraction of the population each group represents. EDS is measured on a nine point scale, with 1 being "low diversity" and 9 being "high diversity". Albania is the least ethnically divided country, with an ethnic diversity

score of 2, followed by Azerbaijan (EDS=3). The ethnic divide in the other countries is much more pronounced. It is highest in Bosnia and Herzegovina (EDS=8), followed by Tajikistan (EDS=6) and Turkmenistan (EDS=5). In comparison, the ethnic diversity score for the United States is 4 (NPSIA 2004).

The predominant religion in the five countries is Islam. The Muslim population represents 93.5% of the total population in Azerbaijan, 85% in Tajikistan, 89% in Turkmenistan, 70% in Albania and 40% in Bosnia and Herzegovina (both entities) (CIA 2003). The Religious Diversity Score (RDS) allows for comparing countries based on the number of religious groups in a country weighted by the fraction of the population each group represents. RDS ranges from 1 to 9, where 1 is "low diversity" and 9 is "high diversity". Thus, Azerbaijan has the lowest religious diversity (RDS=3), followed by Turkmenistan (RDS=4). Bosnia and Herzegovina is the most religiously divided country (RDS=9), followed by Albania (RDS=6), and Tajikistan (RDS=5). In comparison the religious diversity in the United States is also high (RDS=8) (NPSIA 2004).

During the communist rule, religious activity was suppressed. However, after the collapse of the communist regimes in the Balkans and the disintegration of the Soviet Union, religious activities started to revive. In Albania, and Bosnia and Herzegovina -- countries surrounded by Christian neighbours -- people started to view Islam as part of their national identity (Bugajski 2000). Islamic identity was also a powerful factor during the ethnic war in Bosnia and Herzegovina, which resulted in the segregation of the country into two ethnic and religious entities.

Soviet
countri
giving p
charact
The Ce
countrie
national
Turkme

It
were on
little or
subject
under t
manife
Albani
large c
Balkar
value

show
score
defin

In Central Asia, in spite of the considerable changes that occurred in the Soviet period, Islam continues to influence the society strongly. In these countries, Muslim culture underlines deeply rooted features of society, such as giving priority to collective over individual interests, and the authoritarian character of state power, which ensures the community's interests and stability. The Central Asian republics have a much lower level of secularisation than the countries in the Balkans. This is exemplified by heads of state who become national spiritual fathers, such as Saparmurat Niyazov, the president of Turkmenistan (Malashenko 1998).

It should also be noted that while Muslims in Bosnia and Herzegovina were once part of the Austro-Hungarian empire, the peoples of Central Asia had little or no acquaintance with Western democratic institutions when they became subjects of the Russian empire. They were further deprived of that opportunity under the communist system with its 'iron curtain' and full immunity from any manifestation of democracy. In contrast, during the communist rule, many Albanians and Bosnians were able to travel and work abroad and currently have large diasporas in the Western countries. In other words, the Muslims in the Balkans and in Central Asia have been exposed to a different extent to Western values and democracy (Waardenburg 1998).

The level of democracy in the countries of this study is also different as shown by the global rank based index (nine-point scale) of the overall Polity score, where 1 is "strongly democratic" and 9 is "strongly autocratic." In the definition of this index, democracy is conceived as three essential interdependent

elemer

citizens

Second

by the

lives ar

terms o

form, au

Their ch

political

constrai

8, and T

Herzego

nations

formal c

the inde

F

sustain

foreign

levels c

values.

capita a

Herzeg

Turkme

elements. One is the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders. Second is the existence of institutionalised constraints on the exercise of power by the executive. Third is the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation. Autocracy is defined operationally in terms of the presence of a distinctive set of political characteristics. In mature form, autocracies sharply restrict or suppress competitive political participation. Their chief executives are chosen in a regularized process of selection within the political elite, and once in office they exercise power with few institutional constraints. In Albania the value of this index is 4, in Tajikistan – 6, Azerbaijan - 8, and Turkmenistan – 9 (no estimates were available for Bosnia and Herzegovina). According to this index, Albania is the most democratic among the nations from this study, while Turkmenistan, with its dictatorship and lack of formal opposition, is the most authoritarian nation. In comparison, the value of the index for the United States is 1 (NPSIA 2004).

Foreign direct investment is considered to be the lead driver for sustainable development (Gardiner 2000). In the Balkans and Central Asia foreign direct investment comes mainly from Western Europe, and therefore its levels could be used as a proxy for the exposure of the country to Western values. According to World Bank data, the rates of foreign direct investment per capita are higher in the countries from the Balkans (Albania $42, Bosnia and Herzegovina $71.5), compared to the former Soviet republics (Azerbaijan $27.6, Turkmenistan $20.8, and Tajikistan $1.38) (World Bank 2002a).

In sum, the information presented above about the social characteristics of these five countries demonstrates that these nations are not homogeneous with regard to their social structure. There are differences between the nations in terms of gender and income. Also, most of these nations are relatively heterogeneous in terms of ethnicity and religion. Major differences exist between the countries in the Balkans and the republics in Central Asia. The countries in the Balkans have lower levels of poverty, more religious diversity and higher levels of democracy than the former Soviet Republics. In addition, people in the Balkans have been relatively more exposed to Western values and currently have higher rates of foreign direct investment than their counterparts in Central Asia.

1.2.2. Environment and health

The environmental situation in these countries is characterized by a number of environmental risks, some of them inherited from communist rule, some of them emerging as a result of socio-economic transformation.

In all countries air emissions have decreased considerably in the last decade as a result of the closure of many polluting industries. However, air emissions from transport sharply increased reflecting the overall increase in car ownership and traffic density, particularly in big cities. In addition, the decline in overall income of the population forced households to shift from central heating to burning solid fuels in the homes, which has adversely affected the quality of indoor and ambient air in residential areas. The air emissions of nitrogen oxides

are highest in Turkmenistan and Azerbaijan, countries with oil and gas extraction industries.

Drinking water can be a problem both in terms of quality and quantity. Microbiological contamination occurs because of the poor condition of drinking water pipelines and failures in the disinfection process. The worst situation is in Tajikistan and Turkmenistan, where 50% and 34% respectively, of the samples from tap drinking water do not comply with microbiological standards. In 1994, Albania experienced a water related cholera outbreak and drastic measures were taken in high-risk areas. The access of the population to safe water is also different. The percentage of the population which have connection to piped water is highest in Albania (97%) and lowest in Tajikistan and Turkmenistan (60%). In comparison, 100% of the population in the countries from the European Union (prior to May 1st, 2004) are supplied with piped drinking water.

Contamination of food products becomes more and more a problem in these countries. The major sources of risks are foods sold by street vendors without proper conditions, home canned food, as well as food grown in areas contaminated with pesticides, heavy metals and radionucleids. The incidence of reported food-borne diseases varies between the countries. It is the highest in Bosnia and Herzegovina, followed by Tajikistan and Turkmenistan. In general, the incidence of food-borne diseases in the five countries is lower than the average for the EU (Ivanov, Licari and Bertollini 2004). This may be due to insufficient registration and different definitions and therefore does not indicate that the food is safer.

The risks from the working environment overall have been reduced due to the decline in the output of heavy industry. The incidence of fatal accidents at the workplaces has generally decreased in all five countries and is three to four times lower than in the EU (Ivanov, Licari and Bertollini 2004).

The major problems with regard to chemicals and toxic waste arise from the stockpiles of obsolete pesticides accumulated as a result of the chemical intensive agricultural methods used during communism. Toxic waste is also accumulated in industrial sites and in their vicinities.

Radiation is a problem only in some countries. In Tajikistan, the uranium extraction and processing industry has caused some concerns about the health and safety of the workforce and population in the vicinity of the mines and plants. The contamination with depleted uranium (as a result of the civil war) is a concern in Bosnia and Herzegovina. However, none of the five countries were affected seriously by the Chernobyl disaster and there are no nuclear power plants on their territories or in the vicinity (Ivanov, Licari and Bertollini 2004).

To cope with these problems, the five nations receive substantial international assistance. Currently, several international organizations, such as the World Bank, the European Commission, the United Nations Development Programme and the World Health Organization are providing a total of $204.63 million in financial assistance to the five countries in the area of environment and health. The amount of this financial assistance is higher in the countries in the Balkans, compared to the former Soviet republics. Implementing projects to improve environment and health may lead to imposing the values and

percep

percep

popula

may be

interna

1.3. Co

about t

health,

establis

people

provide

implen

conce

perceptions of the donor on the recipient country. However, the values and perceptions of donors from Western societies may differ from those of the local population. The failure to understand what local people think, value and believe may be substantial impediments for the successful implementation of international assistance programmes (Gostling and Edwards 1995).

1.3. Contribution of the dissertation

In this introduction, I argued that there is a gap in international knowledge about the attitudes of post-communist Muslim societies toward environment and health, and that the patterns of these attitudes may be different from those established in the West. In addition, knowing more about what worries these people, how they perceive and act upon environmental and health issues, would provide an evidence base for socially and culturally sensitive planning and implementation of international assistance projects in these countries.

The dissertation will contribute to the knowledge on environmental concern by:

1. establishing the role of Soviet legacy, Muslim identity and socio-demographic factors in influencing environmental concern,
2. determining the role of personal health attitudes and lay health beliefs in environmental concern,
3. developing a causal model to predict political demand for environmental protection from environmental, health and socio-demographic factors.

Next, I will review the theoretical basis of environmental concern, health beliefs and perceptions of environmental risks and diseases, and how these constructs relate to post-communist societies. This will allow for formulating the research hypotheses, which will be tested through quantitative analysis of pre-existing data from the WHO/Gallup International survey on the relationships between environmental attitudes, risk perceptions and health attitudes and their socio-demographic basis in the five post-communist Muslim nations.

CHAPTER 2. THEORETICAL BASIS AND PREVIOUS RESEARCH

This chapter will provide a review of the theoretical and empirical basis of the dissertation. It will explore the theories about environmental concern, health beliefs and perception of environmental risks and diseases. Since this dissertation focuses on environmental and health attitudes in former communist countries, I will also review the previous available research in these domains carried out in former communist countries. The research questions which emerge from the literature review will be presented at the end of the chapter.

2.1. Environmental concern

A growing body of research on social attitudes toward environmental issues is commonly referred to in the literature as *environmental concern*. According to Dunlap and Jones (2002) "environmental concern refers to the degree to which people are aware of problems regarding the environment and support efforts to solve them and/or indicate a willingness to contribute personally to their solution." (p.485). They further argue that environmental concern is a multidimensional construct, which includes two major components, "environment" and "concern" components.

The "environmental component" represents a set of attitudes toward biophysical aspects of the environment; for example, attitudes toward acid rain and pollution. Dunlap and Jones organized the environmental component into different facets, each with a set of corresponding attitudinal objects. Thus, the biophysical environment can be regarded in terms of different environmental

objects, such as air, water, plants, animals, etc. Another facet distinguishes among different functions of the biophysical environment, such as the supply of natural resources, waste disposal, and living space. The effects of human activities on the environment, e.g., resource depletion vs. conservation, pollution generation vs. abatement, and development vs. preservation, constitute a third facet. Environmental issues could also be organized along a generality specificity continuum, for example, pollution in general vs. air/water pollution vs. specific forms of pollution (acid rain). The spatial facet includes the neighborhood, community, regional, national, and global level. And finally, the temporal facet looks at the environment from the perspective of time, i.e., past, present and future.

The second component of environmental concern, called by Dunlap and Jones (2002) the "concern component," represents people's expressions of concern about environmental issues, e.g., attitudes, beliefs, intentions and behaviors. Two major approaches are used to conceptualize and measure this component – a policy and a theoretical approach. The policy approach measures the aspects of environmental concern that are relevant to public policy. Examples of the policy approach include studies of social phenomena, such as opinions about the major causes of environmental problems, who should have primary responsibility for environmental protection, support for various solutions, and self-reports of pro-environmental behavior.

The theoretical approach is based on attitude theory and conceptualizes environmental concern as an "attitude" consisting of affective, cognitive, and

conative dimensions (Blake 2001; Dunlap and Jones 2002). The affective dimension involves emotive and evaluative elements, such as good vs. bad, and like vs. dislike etc. Basically, the affective dimension of environmental concerns is related to the value that individuals attribute to the biophysical environment. The cognitive dimension consists of individual's beliefs and knowledge about environmental issues and their causes and solutions. The conative dimension refers to the willingness to take action or to support actions that can affect the environment. In the theoretical approach, Dunlap and Jones (2002) also include the behavioral expressions of environmental concern, for example personal environmental behavior or public environmental activism. They conclude that the studies of environmental concern based on the theoretical (attitude) approach emphasize the role of the individuals and their behavior in creating and solving environmental problems, i.e., at micro or individual level, while the policy-relevant studies deal with the role of social institutions, policies and collective action in degrading and protecting the environment at the macro or structural level.

2.1.1. Models of environmental concern

It follows from the above description that environmental concern is a broad concept consisting of different components. Some researchers have attempted to achieve such broad coverage by creating several measures of environmental concern, while others measured this concept with a single scale (Dunlap and Jones 2002). This leads to the question "what is the appropriate approach toward measuring environmental concern"; is it a single construct or it is inherently multidimensional?

The new environmental paradigm (NEP) scale developed originally by Catton and Dunlap (1978) has been the most widely used tool to measure environmental concern and was recently modified (Dunlap et al. 2000). Though the NEP is a single scale, the authors applying it in empirical research differ in their opinion on whether the concept it measures is a one-dimensional construct (Guber 1996). Confirmatory factor analysis (CFA) has been used in several studies to answer the question about the dimensionality of environmental concern. According to Dunlap and Jones (2002) this technique allows for assessing the dimensionality of environmental concern, only if it is coupled with careful conceptualization of the constructs along the above mentioned facet theory.

Guber (1996) applied CFA to investigate the dimensionality of environmental concern using data from Gallup surveys in the US. She posited three crucial aspects of environmental concern: perceived seriousness of environmental problems; (self-reported) pro-environmental behaviors; and self identification as an environmentalist. In Guber's CFA model each of these three aspects was treated as a latent construct: the first was measured with multi-item scales tapping perceived "general pollution" and perceived "global environmental problems"; the second - with three multi-item scales tapping environmental activism, conservation behavior, and green consumerism; and the third - with a single self-identification item. The resulting CFA model showed that these three dimensions are highly correlated, leading to the conclusion that environmental concern is a reasonably coherent and empirically meaningful construct. This

model has been criticized for failing to distinguish between environmental topics and expressions of concern and for ignoring policy-relevant items (Dunlap and Jones 2002).

Another model of environmental concern which has included policy measures has been developed by Carman (1998) using the University of Michigan's National Election Survey data. Carman identified three key dimensions of environmental policy support: an economic dimension reflecting the willingness to give environmental protection priority over economic growth; an environmental regulation dimension reflecting support for such regulation; and an environmental quality dimension reflecting the perceived seriousness of environmental problems. Carman used both exploratory and confirmatory factor analysis to assess the dimensionality of environmental concern and found that the support for environmental policy is a hierarchical attitude comprised of three subdimensions, economic concern, regulatory concern and qualitative assessment.

Since this dissertation will attempt to build a causal model of environmental concern, I will briefly review the causal model of environmental belief and behavior proposed by Stern, Dietz and Guagnano (Stern, Dietz and Guagnano 1995);(Dietz, Stern and Guagnano 1998). This model is based on theory derived from social psychology relating environmental values to social structure, environmental beliefs, attitudes and behavior. In this environmental concern model, generalized environmental beliefs or worldviews are positioned within a causal relationship where social structural variables are a precursor of

such beliefs. In turn, beliefs and attitudes about the environment are predictors of environmental behavior. Figure 1 shows the original model developed by Stern, Dietz and Guagnano.

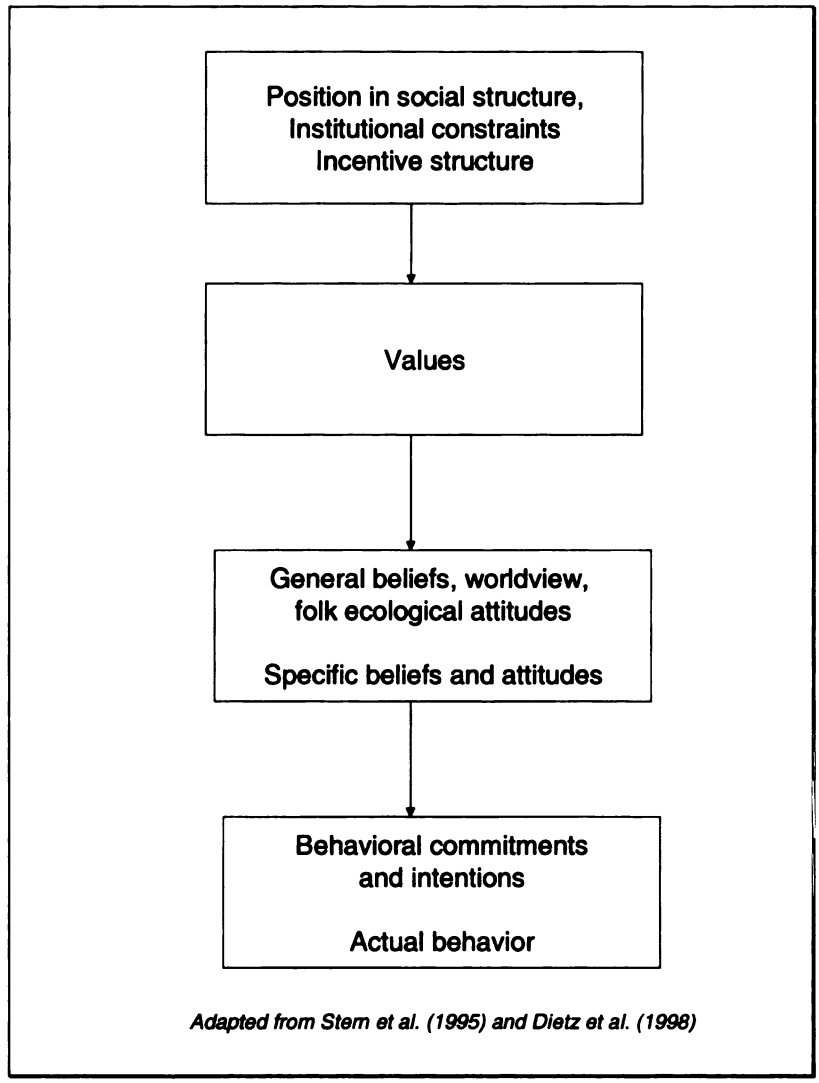

Figure 1. A schematic causal model of environmental concern

The model contains four basic parts: social structural variables; unspecified life values; both generalized and specific environmental beliefs; and environmental behavior. The first level contains social structural factors that are

largely inflexible, such as ethnicity, age, and gender. The next level includes general life values that undergird one's life, for example religious and political ideas. The third level includes environmental worldview, or general beliefs regarding the environment, such as human-nature relationship and the values of nature. Next are attitudes toward specific environmental issues, for example perception of different environmental risks or attitudes toward environmental performance of the government. The fourth level is behavioral commitment and intention followed by actual behavior. Central to the model is the environmental worldview, which is operationalized by the NEP (Catton and Dunlap 1978). The authors of the model argued that NEP measures a folk ecology or lay person's view of relationships in the natural world.

A similar model of environmental concern has been developed by Lee and Norris (2000) using data from five East European countries. The first level in this model is social structural variables - age, education, gender, occupation and residence. Values, such as postmaterialism and involvement in politics constitute the second level. The third level includes political cynism (criticism toward governmental performance) and an index measuring attitudes toward specific aspects of environmental protection. The fourth level in this model was protest potential, both intention and actual participation in protest activities regarding the environment.

The above mentioned models demonstrate that environmental concern is a complex construct including different attitudes, latent concepts and complicated interrelationships between them, which are directly or indirectly influenced by

socio-demographic variables. Such models provide theoretical and empirical bases for developing the models of environmental concern and political demand for environmental protection in this dissertation.

2.1.2. Health aspects of environmental concern

Studies of trends in environmental concern show that levels of public concern about the quality of the environment and support for environmental activism have increased over the years (Anderson 1997; Bloom 1995; Dunlap 1992; Dunlap 1995; Dunlap, Gallup and Gallup 1993b; Dunlap and Jones 2002; Greenbaum 1995; Guber 2003; Mertig and Dunlap 1995). However, questionnaire items regarding the perceived influence of the environment on human health have been included in fewer public opinion surveys, compared to the large number of studies on the attitudes toward the environment *per se*. Most of the studies dealing with health aspects of the environment measure the degree of threat to personal health and safety posed by environmental problems (Guber 2003). Why have environmental sociologists paid relatively little attention to the attitudes about environmental impact on human health?

Environmental sociology has been focused on how the "dominant social paradigm" in modern society has led to environmental degradation. This dominant worldview, sometimes referred to as the Human Exemptionalism Paradigm (HEP) posits that people have distinct characteristics, which place them above nature, that they can choose their goals and there are no limits to achieve them through scientific and technological progress in a world of vast resources. Environmental sociology has challenged this worldview arguing that a

shift is occurring toward a "new environmental paradigm" (NEP). This paradigm implies that people are part of the web of nature and should have compassion for the natural environment on which they depend, that scientific and technological progress creates not only social benefits but also environmental problems, and that the world has limited space and resources (Catton & Dunlap 1978, Catton & Dunlap 1980). Similarly, Dunlap (1995) distinguishes between the "ecocentric" perspective, i.e., placing value on the natural environment for its own sake, and the "homocentric" perspective, which considers a healthy environment crucial to human welfare.

The HEP perspective leads to a view that the environment is to be controlled by human beings for their own needs, such as protecting human health from environmental risks. In contrast, the adherents of the NEP view the natural environment as essential context for human social life, potentially fragile and with limited resources. Dunlap argues that environmental sociologists have shifted toward the NEP (Dunlap, Michelson and Stalker 2002). This shift could be one possible explanation for the relatively little interest of environmental sociologists in the health aspects of environmental problems, which are viewed by them as part of the HEP perspective.

Another explanation could be that concern about health effects of environmental risks is a relatively new phenomenon (Dunlap 1995). One of the first public opinion studies dealing with health aspects of environmental problems was carried out in 1987 and 1989 in the USA. It used the Cambridge set of items which measures the extent to which respondents think that different

environmental problems threaten their personal health and safety. The items included local and global threats such as air pollution, pollution of rivers, acid rain, the greenhouse effect, hazardous waste, using chemicals in food production, contamination of underground water supplies and depletion of the ozone layer. This study demonstrated a marked increase in the perceived threat to personal health from just 1987 to 1989 (Dunlap and Scarce 1991).

The first international public opinion survey which included questions on health aspects of environmental problems was the 1989 cross-national study on environmental attitudes administered by Harris and Associates in sixteen countries. It asked respondents whether they were concerned about unhealthy air, water, food, radiation and chemicals However, the question items in this study were worded in a non-neutral way and therefore the results were compromised (Guber 2003).

The 1992 Health of the Planet (HoP) survey conducted by the Gallup International Institute in 24 countries (Dunlap, Gallup and Gallup 1993b) added a time dimension to measuring the effect of the environment on health by asking the respondents whether they believe environmental problems "now" affect their health, have affected their health "in the past -- say 10 years ago", and whether they will affect the health of "our children their children and grandchildren – say over the next 25 years". In contrast to the Harris survey, which measured health threats from specific environmental problems the HoP study asked about the impact of environmental problems in general. The results showed a strong increase in reported health effects over time, with majorities in 16 nations

reporting present health effects. Furthermore, the majorities in all 24 nations expressed concerns that environmental problems will affect the health of their children and grand children.

The study also found that residents in the poorer nations which suffer from poor quality of air and water were more likely to perceive their health as affected by environmental problems. These findings led the authors to argue that environmental problems are not only a matter of quality of life, and thus a concern for postmaterialists, but that they represent a threat to human health and survival, particularly in poor nations where people are dependent on the immediate environment.

2.1.3. Environmental concern in Eastern Europe

Are people living in the post-communist nations of Eastern Europe and the former Soviet Union concerned about the environment? Although there was some prior diversity among the former Eastern block countries, their ideological systems have been dominated by Soviet ideas. Ziegler (1985) argued that the socialist environmental paradigm was characterized by the belief that economic growth shall continue; that environmental problems can be solved through better central planning, more science and technology and establishment of environmental agencies; and that the communist party, with the help of experts, shall make decisions about the environment.

In the Soviet Union, the most prevalent image of the environment was the official image. Therefore, public opinion data on perceptions of the environment were not systematically collected, or at least the results were not disseminated.

Perso

a sma

underg

of envi

breakd

Rusins

Gorbac

situatio

collaps

informa

planned

S

concern

included

1994; D

study wa

these co

of the re

the envi

Europea

environm

considere

Personal opinions could be expressed through letters to the press, which printed a small and non-representative sample of such letters, or through illegal underground (*samizdat*) literature (Ziegler 1985).

However, evidence suggests that people in these countries became aware of environmental problems long before the fall of the Berlin Wall and the breakdown of the Soviet Union (Feshbach and Friendly Jr. 1992; French 1991; Rusinski 1991; Singleton 1986). Towards the end of the socialist period, Gorbachev's *perestroyka* and *glasnost* removed the veil of the environmental situation and allowed for some expression of environmental interests. The collapse of the communist regimes led to declassification of environmental information and revealed the damage to environment and health caused by the planned economy.

Several international studies provide some insight into the environmental concern of East Europeans. The before mentioned Health of the Planet survey included three eastern European nations – Hungary, Poland and Russia (Dunlap 1994; Dunlap, Gallup and Gallup 1993a; Dunlap, Gallup and Gallup 1993b). This study was carried out shortly after the collapse of communism, and found that in these countries environmental issues were rated as "very serious" by the majority of the respondents, although only few of them (between 1 and 9%) mentioned the environment as the most important problem in their nation. The three eastern European nations were on the top of the list with regard to their rating of environmental quality as very/fairly bad, with the national environment being considered of worse quality than the local environment. Environmental problems

in the

techn

of env

citizen

enviro

nation

levels

of thos

Howev

Easte

count

behav

then

93). T

conce

envir

and v

Euro

envi

part

majo

in the Eastern European nations were attributed mainly to business, industry and technology. In comparison for the citizens in Western Europe, the top two causes of environmental problems were business and waste by individuals. Russian citizens put much greater emphasis on the role of the government in environmental destruction than the citizens of the other two eastern European nations. In 1992, environmental activism in Eastern Europe was similar to the levels in the West. Between 3 and 9% of citizens in Eastern Europe and 3 to 10% of those in Western Europe reported being active in environmental groups. However, when it comes to avoiding using products that harm the environment, Eastern Europeans reported much lower levels (41-42%) than their Western counterparts (58-81%).

Lee and Norris (2000) have studied environmental concern and political behavior in five eastern European nations (Hungary, Slovenia, Bulgaria and the then East Germany and Czechoslovakia) using the World Values Survey (1990-93). This study addressed mainly the "concern component" of environmental concern, using variables such as attitudes toward environmental protection and environmental political behaviour. The study also compared the findings for East and West Europe. Lee and Norris have found that both East and West Europeans, albeit less for the former, were largely sympathetic toward environmental protection. Half of the respondents in Eastern Europe would give part of their income or pay higher taxes to prevent environmental pollution. The majority was also more likely to think that reduction of environmental pollution is

not s

is as

envir

the W

emplo

orient

enviro

previo

enviro

enviro

action

preoc

of un

out ir

Mac

trade

perf

env

tha

pro

en

not solely responsibility of the central government and that dealing with pollution is as urgent as addressing the other national problems.

Lee and Norris (2000) have found also that the basic social structure of environmental concern in Eastern Europe shows similar patterns to that found in the West, with the younger, the better educated, the wealthier and those employed in the non-manufacturing sectors, being more pro-environmentally oriented. However, the coefficients of most of the social predictors of environmental concern were low, which led Lee and Norris to the conclusion that previous studies have overemphasized the role of social factors in explaining environmental concern in Eastern Europe. Their study also revealed that environmental concern does not translate automatically into political distrust and action. The authors explain the low level of environmental activism with the preoccupation of Eastern Europeans in the early 1990s with the economic issues of unemployment and inflation.

The study by Lang et al. (2000) used newer data from interviews carried out in 2000 in Hungary, Romania and the Former Yugoslav Republic (FYR) of Macedonia. It included items measuring: awareness of environmental problems; tradeoffs between environment and economy; attitudes toward governmental performance, environmental policy, and environmental NGOs; perceptions of environmental risks; and environmentally friendly behaviour. The results showed that the respondents in these three countries were well aware of environmental problems, and ready to sacrifice their current living standards to support environmental protection for their children, and would partially accept job cuts, if

this would help the environment. Respondents also thought that industry should take more responsibility in environmental protection. The prevailing opinion was that the government was not concerned enough about the environment, did not spend sufficient funds for environmental protection, did not provide enough information, and that environmental legislation was weak.

These studies demonstrate that citizens in Eastern Europe are aware and concerned about environmental problems which they view more as a result of social organizations rather than personal behavior. The levels of environmental activism in Eastern Europe have been found to be similar to those in the West.

2.1.4. Social basis of environmental concern

Another aspect of the studies on environmental concern deals with the extent to which it is influenced by socio-demographic factors such as social class, education, age, residence, gender, ethnicity, and religion. In studying the social base of environmental concern, the question is why people come to perceive and be concerned about "environmental problems" in a different way (Greenbaum 1995). Greenbaum suggests three approaches for addressing this question. He situates these approaches along a continuum of possible explanations, with a "naïve environmental" position on one end, an interest-based position in the middle, and a social-constructivist position on the other end. The naïve environmental position explains environmental concern as an unmediated response to objective environmental risks. In contrast, the social-constructivist position focuses on the collective creation of ideas about the world

and emphasizes the ways in which the knowledge of environmental problems is mediated by the knower's attributes or is constructed by the knower.

"Environmental deprivation" theory" is an example of the "naïve environmental position". It relates public concern for environmental problems to actual levels of pollution and degradation. Thus, according to this theory people who are exposed to higher levels of environmental problems would be more concerned about the environment (Lowe and Pinhey 1982). However, Van Liere and Dunlap (1980) have alternatively argued that environmental deprivation is relative rather than absolute. People who lived a long time in a polluted environment have grown accustomed to their poor environmental situation as they have never experienced anything better. Thus, social groups that are more likely to live in relatively clean and aesthetic environments are more likely to perceive and become disturbed about environmental deterioration than are those who have grown up in poor environments. The empirical evidence from the literature appears to support the "absolute" rather than the "relative" deprivation argument (Mohai and Bryant 1998). The environmental deprivation theory has been used to explain differences in environmental concern with regard to several social factors such as social class, race/ethnicity and residence.

Intermediate between the environmental and social constructivist positions is the interest-based approach, which argues that concern about a particular environmental problem depends on where one stands with respect to the benefits and the costs of the risks (Greenbaum 1995). Murphy (1994) distinguishes several "environmental classes" based on whether their members

are chiefly beneficiaries, victims and beneficiaries at the same time, or only victims of environmental problems. To describe the different position of people in terms of environmental risks, Beck (1999) coined the term "risk position." To Beck, the social stratification of modern society is no longer based on wealth and power, but on unequal distribution of environmental risks. One's position in society is determined by the risks to which he/she is exposed. The relations between social groups become relations about risk, and in this way modern society becomes, what Beck calls, a 'risk society' (Beck 1992).

The cultural theory developed by Mary Douglas and Aaron Wildavski (1982) is an example of the social constructivist approach in explaining environmental concern. It posits that environmental risks are hidden, that people choose what to worry about, and that scientific assessment of risks is biased. Cultural theory suggests that the concern for the environment depends on whether a person is socially and culturally disposed to see pollution as a serious problem. In contrast, for the interest-based approach, a person thinks that industrial pollution is a serious problem if he or she is a victim. For the environmental deprivation theory, it matters whether a person is really exposed to environmental risks.

Social class

In addition to cultural theory, the postmaterialist thesis is another example of a social constructivist approach which explains environmental concern with social class. Advocates of "postmaterialism" posit that increases in environmental concern—as a "post" material concern—are directly related to increases in

affluence (Inglehart 1990). This theory draws on Maslow's theory of the hierarchy of needs which describes human needs as a hierarchy with basic survival and security needs on the bottom and the need for self-realization on the top. The higher level needs can be satisfied only after satisfaction of the lower level needs. From this point of view, a clean and aesthetic environment is seen as a higher order need or "luxury" (Inglehart 1990).

Therefore, the advocates of postmaterialism argue that the economic security enjoyed by members of the middle class during their formative years results in a shift-in-values away from economic and security concerns toward higher order needs, such as protection of the environment and quality of life. According to the post materialist thesis, environmental protection in advanced industrial societies is a postmaterialist concern. In the developing countries, where environmental pollution poses immediate problems to health, environmental protection is not a quality of life issue, but a matter of "survival" and would be therefore supported by both materialists and postmaterialists (Inglehart 1997). However, the empirical evidence shows that there are problems in extending the postmaterialist thesis about environmental concern to the attitudes toward the effect of the environment on human health. Some researchers have found a negative relationship between national affluence and national levels of environmental concern, maintaining that environmental and health concerns largely depend on people's direct experience with environmental problems (Dunlap and Mertig 1995; Dunlap and Mertig 1997).

more

"new

intelli

envir

soluti

that n

poorly

(SES)

conce

SES is

person

Ameri

occupa

that th

linear

environ

middle

of a we

the issu

homoge

Another explanation of the high levels of environmentalism among the more affluent social groups is offered by Eckersley (1989). He argues that the "new class" (e.g., middle class, professional, technical, administrative, intelligentsia) is getting involved in green politics because it is aware of environmental problems and feels that it is more likely to play a role in their solutions. In contrast, using international data, Mertig and Dunlap (2001) found that membership in the new class, along with other demographic variables, poorly predicts support for environmentalism.

Survey research on the relationship between socio-economic status (SES), as measured by income and occupational prestige, and environmental concern shows contradictory results. Greenbaum (1995) points out that higher SES is consistently related only to environmental activism and certain types of personal behavior. Furthermore, he notes the fact that the studies using American data fail to demonstrate a consistent relationship between income, occupational prestige and environmental concern. Greenbaum's explanation is that the relationship between income and environmental concern may not be a linear one: middle-income people may be more likely to express pro-environmental attitudes than either high- or low-income people.

Applying the theories linking environmental concern to membership in the middle class to the post-communist societies may be problematic due to the lack of a well-defined middle class in such nations. There are different positions on the issue of class in the former communist societies. According to the homogeneity paradigm, East and Central European societies are best regarded

as p

sam

How

soci

intel

thos

Furth

draw

intell

corre

comm

furthe

collap

which

Szelé

and s

of awa

Howe

than t

Educa

skills a

as places where virtually everyone, except a tiny political elite, belongs to the same sociologically faceless and nondescript assemblage (Fuller 2000). However, Fuller (2000) argued that there are substantial differences between the social attitudes of the working class and the intelligentsia. In these societies, intelligentsia has been defined as all those with college or university degrees and those with top and mid-level decision making and management posts. Furthermore, Lee and Norris (2000) suggested that a theoretical parallel may be drawn between the action potential of the Western new middle class and the intellectuals and dissidents in East Europe. They have found a positive correlation between higher income and pro-environmental attitudes in five former communist countries.

The problem of defining social class in the former communist societies is further complicated by the mass impoverishment of the population following the collapse of the communist regimes and the disintegration of the Soviet Union, which affected particularly women and ethnic minorities (Emigh, Fodor and Szelényi 2001). A study of environmental attitudes in three countries from central and south-eastern Europe found that income did not seem to determine the level of awareness about environmental problems in Hungary and FYR of Macedonia. However, in Romania, respondents with lower income showed more awareness than those with higher incomes (Lang 2000).

Education

Guber (2003) argued that higher levels of education increase cognitive skills and awareness on public issues which enable the individual to understand

environmental problems. The relationship between education and environmental action is not that straightforward. Some authors argue that education is not related to the level of personal behavior (Van Liere and Dunlap 1980), but other authors have found the opposite (Greenbaum 1995; Guber 2003; Jones and Dunlap 1992).

Greenbaum (1995) suggested that the effect of education on levels of environmental concern may not be a linear one, which explains the above mentioned inconsistency in the findings on the relationship between education and environmental concern. Studies in the US, Germany and the UK have found that both the "vanguard" (those who thought environmental problems were serious, who favoured social solutions, and who believed that there are limits to growth) and the "rearguard" (those who thought environmental problems were not serious, who favour technological solutions and who did not believe there are limits to growth) tended to be better educated than those subscribed to other permutations in their beliefs (Milbrath 1984). Studies using the NEP scale as a measure of environmental concern found that the proportion of those who fully rejected the HEP (faith in technology and support for human domination of nature), was the highest among the best educated (Olsen, Lodwick and Dunlap 1992). One explanation of this phenomenon is offered by Pierce et al. (1987), who argue that this polarization may be a manifestation of a more general tendency of the better educated to display greater ideological consistency in their beliefs toward the environment.

With regard to Eastern Europe, education has been found to be one of the strongest predictors of environmental concern and political activism, and this finding was similar to the findings for western European societies (Lee and Norris 2000). The study of Lang (2000) in central and south-eastern Europe also found that respondents with the highest education were much more likely to "accept if some people lose their jobs if this helped the environment" (p.39), as well as to put much more hope in the non-governmental organizations as the best structure for solving environmental problems.

Age

The "age" hypothesis assumes that younger people tend to be more concerned about the environment than are older people (Van Liere and Dunlap 1980). The explanation is that younger people are less integrated into the dominant social order, and since environmental solutions are often viewed as threatening the existing social order, it is logical to expect the young to accept pro-environmental ideologies more readily than their elders.

Another explanation for the higher level of environmental concern among younger people is offered by Mannheim's theory of generations. This theory suggests that "important historical events occurring at the crucial adolescent and young adulthood phase of the life cycle can permanently affect a cohort throughout its existence" (Van Liere and Dunlap, 1980, p. 183). According to this theory, the environmental movement after the first Earth Day would have affected the younger generations more. Based on U.S. data, Mohai and Twight (1989)

argu

rath

was

the l

the c

in its

envir

adole

youn

the f

grou

awa

Com

The

that

Seve

urba

expo

How

envir

argue that the age/environmental concern relationship reflects cohort differences, rather than aging effects.

In countries from the former Eastern block, collective environmental action was part of the democratic processes that overturned the communist regimes in the late 1980s (Baker and Jehlicka 1998). Therefore it could be expected that, if the cohort theory were true, the generation in these countries which was exposed in its adolescence to the political changes would have higher levels of environmental concern, compared to their elder counterparts who spent their adolescence under the communist rule. In the study of Lee and Norris (2000) younger age was consistently related to higher levels of environmentalism across the five Eastern European nations. In the study of Lang et al. (2000) younger age groups also showed higher levels of support for environmental NGOs, but awareness of environmental problems was positively related with older age.

Community size

Community size has also been related to levels of environmental concern. The main argument in the literature on residence and environmental concern is that urban residents are more pro-environmental than people living in rural areas. Several theories have been developed to explain these differences.

The environmental deprivation theory, described above, explains the urban-rural differences in the levels of environmental concern with the higher exposure of urbanites to environmental pollution (Lowe and Pinhey 1982). However, other researchers have found that urban-rural differences in environmental attitudes disappear when controlling for socio-economic status.

However, the differences in behavior still persist, which suggest a link to occupation (van Es and Brown 1974).

The theory of "nature exploitative occupations" suggests that the lower level of environmental concern in rural areas is rooted in the occupations of their inhabitants, such as farming, mining, and logging, which are based on exploitation of natural resources (Harry 1971). The low level of environmental concern in smaller communities has also been explained with their needs to develop at the expense of the local environment. Lowe and Pinhey (1982) tested the above-mentioned theories with empirical data and found no support for any of them. Similar conclusions have been reached by other authors who claim that environmental concern in rural areas is actually increasing because such communities are starting to experience environmental problems caused by economic development (McBeth 1996; McBeth and Bennett 1998). Other authors relate the increasing concern about the environment in rural areas to the migration of urban citizens (Jones, Fly and Cordell 1999).

In the context of Eastern Europe, the study of Lee and Norris (2000) did not find any significant influence of residence on the levels of environmentalism. To the contrary, the study of Lang (2000) in central and south-eastern Europe found that residents of highly industrialized regions showed higher degrees of awareness of environmental problems and support for environmental protection, even if this would cause the loss of jobs. However, in Romania, respondents who spent their childhood outside of Bucharest showed higher awareness than those who lived in Bucharest when they were children. Also in Romania, people living

in rural areas were more likely to perform environmentally friendly activities (Lang 2000).

Gender

Findings on the effect of gender on environmental concern are also mixed. There are three groups of theoretical approaches to gender differences in environmental concern. The "biological view" holds that the ascription of women to the natural realm results in higher levels of concern about environmental problems (Davidson and Freudenburg 1996). In this view, the experience of gestation gives mothers an embodied sense of connection to future generations and menstruation gives women a similar sense of connection to the cyclicity of nature, while male bodily experiences lack intrinsic connection to natural processes (Grey 1979). It follows from such a view that women would be more concerned about environmental issues, and about future generations, and that this difference would hold across different cultures, classes and contexts.

Stern, Dietz and Kalof (1993) offer a social-psychological explanation of the relationship between gender and environmental concern. They argue that women are more accepting than men of messages that link environmental conditions to potential harm to themselves, others, and other species, or the biosphere. In patriarchal cultures, masculine identity is bound up with ideals of mastery, domination, and detachment, while feminine identity is characterized by connection and an ethic of care (Greenbaum 1995). Therefore, adherents to this view argue that women tend to be more concerned than men about environmental issues involving suffering or harm inflicted on human and non-

hur

cor

knc

the

me

and

199

tha

reg

acc

atti

four

oth

whi

leve

peri

Sect

privi

shor

trans

human others, but less concerned about environmental issues that are harder to conceive in such terms.

The social approach attributes gender differences in environmental knowledge, beliefs and attitudes to the different positions of men and women in the social division of productive and reproductive labor. The different attitudes of men and women would reflect the different experiences, competencies, interests and dispositions that come from performing these different roles (Mies and Shiva 1993). This approach gives relatively greater emphasis to socio-economic factors than the previous two. Therefore, as these factors vary from one nation and region to another, so gender differences in environmental concern would vary accordingly.

Mohai (1991) argues that gender makes a difference not in environmental attitudes but in environmental behaviors, i.e., environmental activism. He has found that environmental activism of women appears to be constrained by factors other than those constraining general political activity. However, other studies, which have measured specific risks, have found some effects of gender on the level of concern about different risks. (Bord and O'Connor 1997).

Women in Eastern Europe were discriminated against during the socialist period (Emigh, Fodor and Szelényi 2001). They were locked into the unprivileged sectors of the socialist economy and were excluded from the path to power and privilege. Thus, Eastern European women frequently compensated for this shortage of political capital with higher levels of education. During the market transition higher education allowed women to move upwards and to take

reasonably high positions. It is not, therefore, surprising that Lee and Norris (2000) did not find any gender differences in environmentalism in their study in Eastern Europe. In the study of Lang (2000) Hungarian females were more aware of environmental problems than males, which could also be related to their higher level of education.

Ethnicity

Several theoretical approaches have been applied to explain potential differences in environmental concern between ethnic groups. Environmental justice literature in the United States has provided evidence that environmental risks are unequally distributed in the population with the poor and ethnic minority communities bearing a disproportionate burden of environmental pollution (Bullard 2000; Mohai and Bryant 1992). Therefore, interest based theories, such as Murphy's (1994) would predict that since ethnic minorities are disproportionate victims of environmental contamination, they would be more concerned than others about environmental issues which affect the health of victimized communities.

Cultural theory ascribes the differences in environmental concern between the various ethnic groups to cultural factors. In this theory beliefs and values are viewed as a critical part of culture – a group of people who think and act in a common way. Thus, beliefs, values, and attitudes distinguish the group from other parts of the society. In the case of dominant and minority cultures within one society, ethnic groups are viewed as subcultures, which maintain certain belief systems and behavioural characteristics that set them off from the society's

mainstream culture (Parker and McDonough 1999). Differences in cultural backgrounds and experiences may lead to different attitudes toward the environment (Mohai and Bryant 1998). In contrast, according to the environmental deprivation theory, if ethnic minorities are disproportionably burdened by pollution, it would be logical to expect that they are at least as concerned about environmental risks as the ethnic majority.

The "barriers" theory has been developed to explain the lower level of environmental activism of African Americans compared to Euro-Americans. This theory suggests that these two ethnic groups have similar environmental attitudes, but due to the differences in participation styles, barriers to joining environmental groups and feelings of disenfranchisement and powerlessness, African Americans are less likely to act on their environmental concerns. The barriers to participation in environmental action are attributed to historical oppression, current practices of discrimination, and exclusion of issues of environmental racism from mainstream environmental groups (Parker and McDonough 1999).

In North American empirical studies, race has been found to be a significant predictor for those environmental items which make economic costs explicit and salient. Ethnic minorities were generally less likely to express pro-environmental attitudes which involve increased costs. However, no ethnic differences have been found in assessment of local pollution and environmental health hazards (Greenbaum 1995). Others (Jones and Carter 1994) point out that black Americans display strong environmental concern, some times

exceeding that shown by whites. This is supported by Mohai (1990), who argued that although blacks' environmental concern equals that of whites, the rates of environmental participation are much lower for blacks than for whites, even after controlling for differences in type of environmental concern and socio-economic status. Parker and McDonough (1999) have also found that although the levels of environmental concern of African Americans were similar to the Euro-Americans, the feeling of powerlessness provided barriers to many environmental actions for African Americans.

It is unclear how these perspectives developed in North America would apply to the European context. There are very few scholarly publications on environmental inequalities related to ethnicity in Europe (Johnson 2001; Stephens and Bullock 2002). These publications document the inequitable distribution of landfills and heavy polluting facilities as well as disparities in enforcement and hazardous waste cleanup rates. In the United Kingdom, it was found that major accident hazards sites are usually located in lower income communities and impact Asian communities more heavily than other ethnic groups (Walker, Mooney and Pratts 2000).

In Eastern Europe, national minorities are primarily products of political and governmental changes in the last century where millions of people suddenly found themselves living in a different country while still in their own homes. Such residents frequently became second class citizens in their new state (Magyari et al. 2001). Some studies suggest that hazardous sites and activities are

disproportionably located with high concentration in the areas and communities of ethnic minorities (Varga, Kiss and Ember 2002).

Religious affiliation

Religion has also been related to environmental concern. Some authors, for example White, argue that the historic roots of the modern environmental crisis can be traced to Judeo-Christian religion (Kanagy and Nelsen 1995). This is explained with the literal interpretation of the book of Genesis in which God gives Adam dominion over non-human creatures and orders him to subdue the Earth.

Controlling for other factors, some studies in the West have found that people who believe the Bible to be literally true are more likely to have lower levels of concern about the environment (Greenbaum 1995). Higher church attendance and general religious conservatism have also been found to be negatively associated with environmental concern (Olsen, Lodwick and Dunlap 1992). Hand and Van Liere (Hand and Van Liere 1984) have demonstrated empirically that Judeo-Christians are generally more committed to a mastery-over-nature orientation than non-Judeo-Christians, but that commitment varies considerably among denominations.

In contrast, a number of scholars argue against literal interpretation of the Bible, especially when it comes to the environment (Barolomeus, Herzberg and Khalid 1998; Black 1997; Kanagy and Nelsen 1995). They posit that the same passages of the book of Genesis mean that humans should take care of other creatures and the Earth; they should be stewards rather than masters of nature.

This concept, which is supported by theologists from the three Abrahamic religions -- Christianity, Judaism and Islam -- places the focus on the responsibility of humanity to save God's creation and that nature is divine and should be protected as such. According to this idea, one can not expect major differences in environmental concern between the different Abrahamic religions (Barolomeus, Herzberg and Khalid 1998). However, this argument has never been tested empirically.

A parallel can be drawn between the HEP/NEP arguments and the religious positions about the environment. Thus, similar to HEP biblical literalism maintains human mastery over nature, while the stewardship concept resembles the NEP views of humans as part of nature.

Although the three Abrahamic religions share the same concepts of God's creation, they differ substantially in terms of cultural background and the followers of these religions would differ in their concerns about specific environmental risks. For example, a study in Bosnia and Herzegovina has emphasized the role of water for life and culture in Muslim society, as well as the role of culture with regard to the beliefs about the relation between natural and artificial elements of the environment (Zagora 1997).

Religious affiliation has not been used commonly as a predictor in the studies on environmental concern in Eastern Europe. During communism religious activity was suppressed, though in the recent years there is trend to revive the role of religion. However, the general level of religiosity of Eastern Europeans is relatively low compared to the United States (Swatos 1994). In the

study by Lang et al (2000) in three nations in central and south-eastern Europe, only in the Former Yugoslav Republic (FYR) of Macedonia was religious affiliation related to differences in the level of awareness of environmental problems, with the Christian Orthodox respondents having slightly greater awareness than Muslim respondents.

Islam and the environment

Since this dissertation deals with Muslim countries, it would be useful to review briefly the literature on environmental attitudes in Islam and Muslim culture, which have developed distinct ways of dealing with the environment.

Islam has established its own environmental paradigm to explain the current environmental crisis, although it has not been studied so intensely as the NEP. In the Islamic view environmental destruction is characterized merely as a symptom of social injustice and is rooted in "moral deprivation" (Zaidi 1981). It is argued that the problem is not that humans as species are destroying the balance of nature, but rather that some humans are taking more than their share (Foltz 2000). Therefore, the adherents of Islam hold that if, in accordance with the Qur'anic prohibition of interest taking, the interest-based global banking system is eliminated, then there will be no more environmentally destructive development projects, and there will be plenty of resources for all (Dutton 1998). Overpopulation is dismissed as a cause of environmental crisis. The problem is said to be the restriction of movement; if visa restrictions are eliminated, then people will simply migrate from overpopulated areas to underpopulated ones (Maghrebi 1998).

Islamic scientists argue that the solution to environmental crisis is in following the prescription of the Qur'an. For example, Islam based occupational safety is a set of rules which require operating a Muslim owned company according to the principles of Islam. In this approach, occupational injuries are regarded as consequences of non-compliance with Islam (Cultural Safety Intervention 2003).

Islam also affects the individual's values and beliefs concerning health and the environment. It places emphasis on cleanliness, purification and ablution, and in particular cleanliness of the body, the hands, clothes, food, residence and water sources. Islamic dietary requirements include forbidden food, timing and quantifying meals and prescribed ways of preparing food (Al-Fangary 2003; Salleh 2001). The Islamic Medical Association of South Africa has published a special book which outlines the Islamic approaches toward several environmental health issues, such as protecting people, animals, land, air, water and reduction of noise. These approaches are deeply rooted in the Islamic religion and emphasize environmental health protection as a duty of every Muslim (Abu-Sway and Sachedina 1999).

The term "Islamic" is commonly used for issues derived from the canonical sources of Islam, as opposed to the activities or attitudes of Muslims, which may or may not be directly motivated by those sources. Therefore, there is a distinction between Islamic environmentalism – that is, an environmentalism that can be demonstrably enjoined by the textual sources of Islam – and Muslim environmentalism, which may draw its inspiration from a variety of sources

possibly including but not limited to religion. For example, Islamic legal traditions deal with the environment, such as forbidding cruelty to animals, regulating water distribution and establishing undeveloped zones (*himas*) for the protection of watersheds. However, as Foltz (2000) argues, it would be anachronistic to attribute to such traditions an environmental ethic in the contemporary sense.

Empirical studies carried out by Hope and Young (1994) have found that although many Muslims are familiar with these broad Qur'anic principles, few see any need to move an ecological ethic to the center of their awareness. The authors further argue that the average Muslim citizen is only vaguely aware of the extent of environmental destruction and that Muslim political and educational leaders perceive only few of the problems, and those in isolation.

The attitude of Islam and Muslim political culture to the European variant of democracy has generally been negative (Lewis 2002). Malashenko (1998) argues that Islamic political thought combined with Muslim people's national traditions, are not conductive to the spread of democratic (in Western understanding) traditions and standards of social and political behavior. Environmentalism is perceived by Muslims as part of the Western culture and many of them advance the common argument that "when we catch up with the technological superiority of the West, then we can begin to focus on this issue" (Hope and Young 1994). Hope and Young have also found that many Muslims see environmentalism as still another form of Western control, intended to keep Islam from developing and Muslims from realizing their economic potential.

In sum, the literature on environmental concern shows that it is a multidimensional, though coherent, construct which includes attitudes toward the biophysical environment and toward social and political aspects of the environment. These attitudes are explained by either direct experience with environmental pollution, being a victim of environmental problems, or as a result of demographic, social and cultural factors.

2.2. Health beliefs

Ideas about health in Western societies are dominated by the medical model. As described by Freund and McGuire (1999), this model assumes mind-body dualism and posits that diseases are located solely within the body. It excludes social, psychological and behavioural dimensions of illness and holds that each disease is caused by a specific potentially identifiable agent for which there is a medical solution. The biomedical model argues that health problems can be solved with the advance of medical science and technology. In this view, the human body is regarded as a complex biochemical machine; disease is a malfunctioning of some machine parts, which the physician can repair in isolation from the rest. Thus, the body is a regime of control and it is solely the individual's responsibility to maintain and restore health (Freund and McGuire 1999).

In contrast, sociologists of health and illness regard health as socially constructed. They emphasize that both scientific and non-scientific ideas about health, illness and the body vary between societies. Thus, sociology of health and illness provides a critique of the medical model. It argues that social factors

are important causes of disease and highlights the responsibility of society for health. Some authors even argue that social causes are 'fundamental' causes of disease (Link and Phelan 1995; Link and Phelan 2000). In addition, Parsons (1951) suggested that an individual's experience of diseases should be given consideration. Diseases should be treated in connection with the web of social, environmental, psychological and behavioural factors (Freund and McGuire 1999; Parsons 1970). Sociology of health also posits that a monocausal approach is too simplistic to explain the complex causes of chronic diseases and that medical knowledge and technology have limitations in solving health problems (Bird, Conrad and Fremont 2000; Freund and McGuire 1999).

These views about social and environmental explanations of disease are reflected in the studies on the global burden of disease carried out by the World Health Organization (WHO). WHO has found that only up to 20% of the global burden of diseases is determined by genetic factors, the remaining 80% are determined by different social and environmental factors. (WHO 2002) This concept has been embodied in the WHO definition of health which stipulates that "health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"(1948).

The fact that the biggest proportion of diseases is attributable to factors for which there are preventive measures, has attracted the interest of scholars to study the relationship between curative and preventive approaches in medicine. These approaches parallel the HEP and NEP approaches in the studies on environmental concern. The curative approach, which is rooted in the bio-medical

model, argues that health problems can be solved through applying better medical science and technology, while the preventive approach posits that health is socially constructed and therefore public measures are needed to protect health and to prevent disease and disability. The curative approach therefore resembles the HEP belief in solving environmental problems through science and technology, while the preventive approach is similar to the NEP which emphasizes preserving the delicate balance of nature.

However, there is little empirical evidence regarding attitudes toward preventive and curative approaches in public health. A national US opinion poll in 2001 asked respondents which one is more important - public health or curative medicine. According to this study, 46% of Americans said that public health is more important than medicine; 29% gave preference to medicine and 22% said that both are important (The Pew Environmental Health Commission and John Hopkins School of Public Health 2001).

2.2.1. Lay conceptions of health and illness

How do lay people think about health, illness and what causes illness? Many people think of health as simply the absence of disease. People from the working class emphasize health as a tool in their everyday life, while those from the middle class think of health in a broader, more positive way and emphasize the ability to cope well and to be in control of one's life. Persons raised in different ethnic and religious cultures learn their group's ideas about health and illness. Therefore, there are differences in lay conceptions of health between cultures, ethnicities, and religions (Freund and McGuire 1999).

People also employ lay conceptions to explain the nature and causes of illnesses. For example a study in one English community has found that illnesses were thought of in terms of "hot" or "cold" and certain maladies were linked especially with damp, cold weather or house environment (Helman 1978). In another study, the categories of cause which were favored were infection, heredity and family susceptibility and agents in the environment (Blaxter 1983). Lay people use several explanatory logics with regard to the causes of illnesses: (1) invasion, in which an outside agent is believed to come into the body to cause illness; (2) degeneration, which attributes illness to the breakdown of the body from exhaustion; (3) mechanical models, in which illness is a result of misalignment of body structures; and (4) the notion of equilibrium, which explains illness with failure to maintain harmony (Freund and McGuire 1999).

2.2.2. Perceived health

Since this study will employ health variables, it is interesting to review briefly how health is dealt with in survey research and what are its socio-economic correlates. In public opinion studies, personal health is usually measured as self-rated or perceived health. Some argue that despite its subjective nature, perceived health can be used as a proxy for more 'objective' health ratings (Moum 1992). Self assessments of health play an important role in determining an individual's readiness to take curative or preventive action (Becker 1974; Moum 1992; Rosenstock 2001). Perceived health is also regarded as an intervening variable between objective health problems and subjective well being or the quality of life (de Bruin, Picavet and Nossikov 1996; Power 2003).

There is a substantial body of literature on the relationship between health and socio-demographic variables (Bird, Conrad and Fremont 2000; Kawachi 2000; Link and Phelan 2000; Lynch and Kaplan 2000; Marmot, Kogevinas and Elston 1987; Mirowsky, Ross and Reynolds 2000; Robert and House 2000; Smaje 2000; Wilkinson 2002). Consequently, perceived health has also been related to socio-demographic factors. In Western literature, social class has been found to be one of the most powerful variables in explaining variance in perceived health (Marmot, Kogevinas and Elston 1987; McEwen, Hunt and McKenna 1987). Higher education has also been found to positively affect levels of perceived health (Vannoni et al. 1999). Studies in Western Europe show no differences between ethnic groups in terms of perceived health (Karlsen, Nazroo and Stephenson 2002). The effect of gender has also been found to be minimal (de Bruin, Picavet and Nossikov 1996; Moum 1992).

Research on perceived health in Eastern Europe confirms most of the patterns established in the West. Material well-being and higher education have been found to be the best predictors of perceived health in Bulgaria (Balabanova and McKee 2002), and Ukraine (Gilmore, McKee and Rose 2002). However, in Russia, the correlation between perceived health and education was found to be negative, which shows that education is a less consistent and less universal determinant of health in Eastern Europe than in western societies (Bobak et al. 1998). Gender differences in perceived health have been found only in rural areas in the former Eastern block (Gilmore, McKee and Rose 2002).

2.2.3. The health belief model

Similar to the models of environmental concern described earlier, sociology of health has developed a conceptual framework to study the causal relations between health attitudes. The health belief model (HBM) has been the most widely used model to conceptualize such relationships. This model explains why certain individuals engage in health-protective behavior while others do not.

The HBM is based on the well-established body of psychological and behavioral theory, and particularly on the Lewin's theory of reasoned action (Becker 1974). This theory posits that people's life space is composed of regions with both positive and negative valences (values). The regions with negative valence push people toward regions of positive valences, unless that would cause entering a region with even higher negative valence. Human behavior depends on the value that a person places on an individual outcome and the belief that the given action will result in this outcome.

The HBM rests on the assumption that disease has a negative valence and that a person will seek regions of more attractive valences. The model posits that individuals take disease preventive action when they believe that this behavior will lead to a valued and achievable outcome. The original model was used to improve participation in preventive programs and services such as immunizations and screening for tuberculosis (Fitzpatrick and LaGory 2000). Then, it was expanded to illness behavior (to seek help when one feels ill), and to sick role behavior (activities by persons who consider themselves ill in order to

get better) (Becker & Rosenstock 1989b). Figure 2 depicts the disease prevention version of the model.

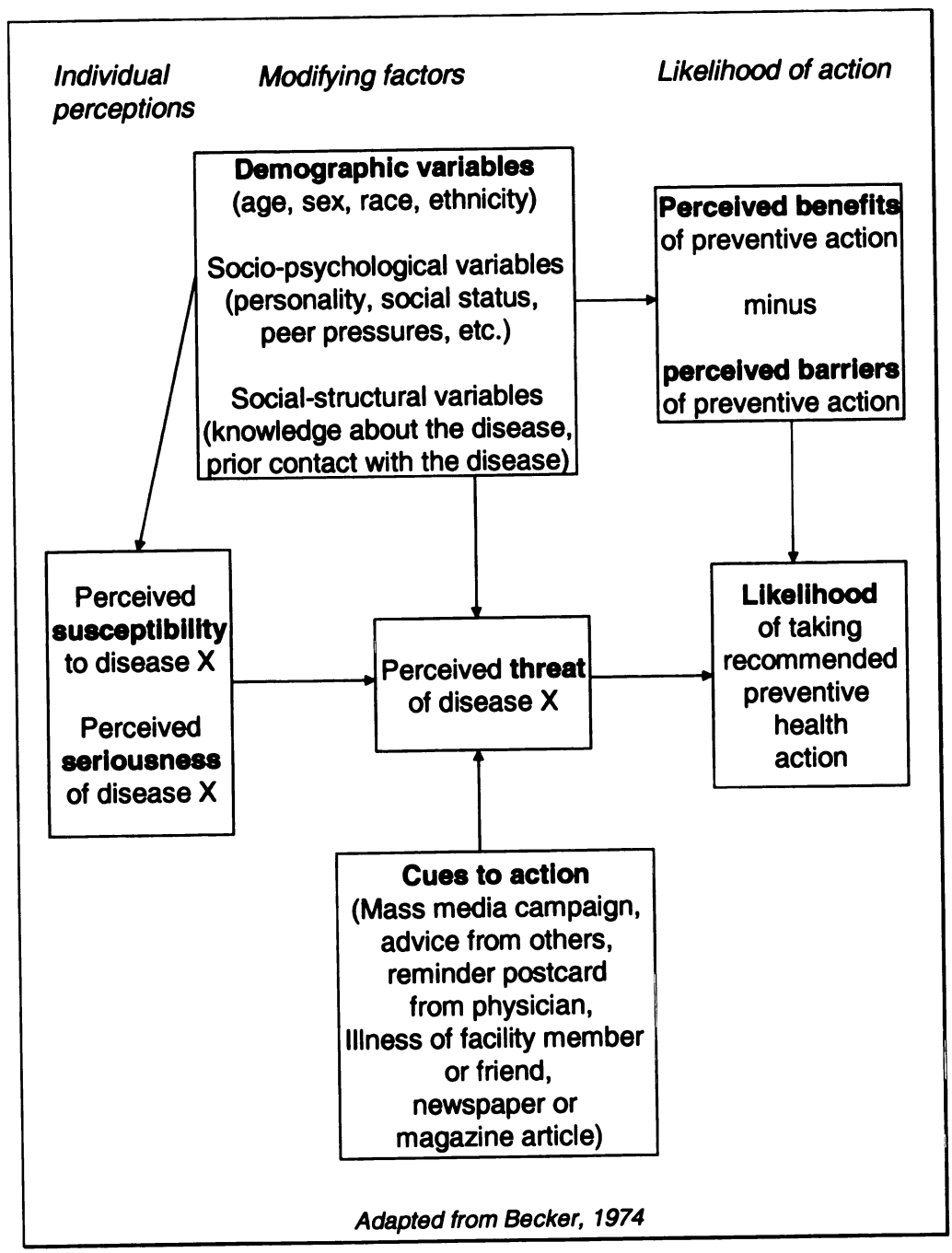

Figure 2. The health belief model of disease prevention

According to the original HBM there are four conditions for disease prevention behavior. First, individuals must believe that they can be personally affected by a particular disease (susceptibility). Second, they must believe that contracting such a disease would have at least moderate consequences (severity) to their overall life, both organic and social.

Third, the individuals must assume that taking particular action would reduce their susceptibility to the condition, or the severity of the disease (benefits), and that these actions should weigh the perceptions of physical, psychological, financial, social and other costs (barriers). Fourth, individuals' perception of the disease's threat and the likelihood that they will take some form of preventive actions are modified by demographic, psycho-social and structural variables and are triggered by some cues to action (Becker and Rosenstock 1989; Fitzpatrick and LaGory 2000; Rosenstock 2001). Thus, the HBM suggests that the perceptions of the individuals about disease can be manipulated to increase the likelihood of taking some recommended preventive action in order to improve their health (Fitzpatrick and LaGory 2000).

According to Rosenstock (2001), the perception of personal susceptibility to disease varies from person-to-person. Some people consider themselves immune from a given disease. Others may admit that although statistically it is possible to contract the disease it is not likely to happen. Yet, a third group may feel that they are really in danger of contracting the disease or the condition. The perception of the seriousness of a given health problem also varies. Rosenstock suggests that the degree of seriousness can be judged by the level of emotional

arousal created when a person thinks about a disease and the kind of difficulties a given health condition will create for him or her. This emotional arousal may reflect medical or clinical consequences, such as the possibility of death or permanent disability, or the broader implications of the disease on a person's job, family life and social relations (Rosenstock 2001). The perceptions of susceptibility and severity are usually correlated and are at least partially dependent on knowledge. They both form the "health threat" variable (Becker and Rosenstock 1989).

The health threat forces the individual to act; however, it does not define the particular course of action. Action is determined by the relation between the benefits and the barriers to a particular action and its alternatives. Action can ensue if the individual has at least one direction that is seen as both possible and related to reduction of the susceptibility or severity of the health condition.

The course of action is determined by the person's beliefs about the availability and effectiveness of various options, and not by the objective facts about the effectiveness of the action. The beliefs about the possible course of action are influenced by the norms and pressures of a person's social groups. For example, in the case of cancer, despite the strong feelings of personal susceptibility and the severity of disease, the person may be convinced that there are no efficacious methods of prevention and control.

Even if the individual believes that the given action is effective in reducing the health threat, there might be barriers to him or her to take this action. Furthermore, the particular action may be too expensive, inconvenient,

unpleasant, humiliating, etc. The action will occur when the readiness to act is high and the negative aspects are seen as weak. If the motivation to act is high, but the barrier to the particular course of action is also high, the individual may choose an alternative action. If an alternative action is not available, then the person may psychologically escape from the conflict situation and engage in other activities, which do not really diminish the threat. Another option might be a marked increase in fear or anxiety (Rosenstock 2001).

The health threat is modified by the cues to action. The health threat and the perception of benefits provide a preferred path of action. However, an overt action may not result unless some instigating event, such as a symptom, interaction with another person or communication message, sets the process in motion. The intensity of the cue required to start the process depends on the levels of susceptibility and severity (Fitzpatrick and LaGory 2000; Rosenstock 2001). The demographic (age, sex, race, ethnicity, etc.), personal (personality, social class, peer pressure etc.), and structural (knowledge and prior contact with the disease) variables are not considered direct causes of health actions. These variables influence the model's belief dimensions, which in turn determine health behavior.

The HBM has disease avoidance orientation; diseases are regarded as negatively valent regions to be avoided (Becker et al 1997, Rosenstock 2001). The original HBM does not account for positive health motivation and for the fact that people may engage in actions having health implications for reasons unrelated to health. Therefore, the category "health motivation" was introduced to

the model to represent the differences in the degree of concern about health matters. Also, more general measures of vulnerability to and worry about illnesses were created to tap the broader perceptions of a health threat, such as "feeling of control over health matters," "faith in doctors and medical care," and "intentions to comply".

A merit of HBM is identifying the role that a person's subjective health assessment plays in the decision to engage in disease prevention behavior. The model has the highest predictive power for the decisions to seek health services (Fitzpatrick & LaGory 2000).

The criticism of HBM centers on the ability of factors in the model to actually predict health behavior. The argument is that it is impossible to measure the causal effect of a person's perceptions on behavior and the role of circumstances that are out of an individual's control. The general critique of approaches relying on the relationship between attitudes and behavior applies also to HBM. It is not clear whether this relationship is a real one or the attitudes merely offer a chance for the individual to provide after-the-fact explanations for personal habits that proceed with little rationale or calculation (Mueller 1986). Another criticism is that HBM accounts for behavior by relying simply on attitudes and beliefs and ignores important structural or environmental factors, such as culture, accessibility of services, transportation and other organizational arrangements (Fitzpatrick and LaGory 2000).

In sum, HBM has been useful in predicting individual behavior concerning disease prevention and help seeking behavior. The center of this model is the

health threat. In the definition of disease prevention, health threats are considered to be disease or environmental hazards (Becker and Rosenstock 1989).

The HBM has never been applied to environmental perceptions, hazards and diseases, though there might be potential to do so. Environmental behavior involves two major types; one is focused on individual responsibility and the other on political action. The HBM assumes that the individual action can lead to desirable outcomes. Therefore, HBM can be applied to individual self-protecting behavior related to environmental hazards but not to collective actions to protect the environment and health.

In the framework of HBM, exposure to environmental hazards and environmental disease can be considered a region of a negative valence which people will avoid unless this pushes them to another region with a higher negative valence. For example, a person may accept hazardous exposure at the workplace instead of quitting the job and being unemployed. Thus, the perception of environmental risks would tap into the notion of susceptibility and severity. Risk coping behavior may also depend on whether a person has positive motivation to protect his or her health. The health motives tap general attitudes about personal health as well as specific positive attitudes related to the risk protection behavior; e.g., the desire of a woman to have beautiful hands will stimulate her to use protective gloves when handling chemical preparations.

Knowledge about the hazards, routes of exposure, possible health effects and measures for personal safety can be considered cues to actions that can

also influence the perceived level of control. Other cues to action could be risk communication campaigns, training, news media messages, symptoms or revealed exposure data. In addition to weighing the benefits and barriers of one's individual action, the possible course of action in terms of risks may also be determined by weighing the risks versus the benefits. In this framework, a person may choose a behavior without risk, or to compare all feasible options and select the one with the lowest risk level. In another case the risks and benefits of the option are assessed. If the risks are greater than the benefits, then the option is rejected or the option with the lowest risk and the greatest benefit is selected.

Therefore, I will next review the concepts related to perceptions of environmental risks and diseases.

2.3. Perception of environmental risks and illnesses

How does health relate to environmental concern? The perception of environmental risks and illnesses forms the linkage between environment and health in the public mind. (Vaughan 1993). Risk perception reflects the belief that an environmental factor may be dangerous to human health as well as the belief about the magnitude of this danger (Wiedemann 1998). The risk perception perspective deals also with the questions of why some risks are more feared than others, and why people differ in their perception of the same risks.

There are two major theoretical explanations for these differences. The first one, the psychometric approach, explains the perception of risks with certain psychological factors. The perception of one's susceptibility can be different and

depends on the time scale of the health effects (Kraus, Malmfors and Slovic 2000). For instance, it has been found that farm workers are more concerned about immediate effects of pesticides-- acute poisoning and rashes--and less about long-terms effects such as cancer and birth defects (Arcury, Quandt and Russell 2002). In addition, people use inferential rules (*heuristics*) to estimate or evaluate risks in the absence of precise statistics. Availability refers to the influence on a person's risk perception of how easily an instance of a particular event can be recalled. Overconfidence refers to the fact that people have difficulty evaluating the degree of uncertainty in their risk estimates. People often display a belief in their own personal vulnerability in the face of a risk (Wiedemann 1998).

Risks that are taken voluntarily are seen as being smaller than those imposed by others. Some health problems, such as cancer and birth defects are more dreaded than other disabling and even fatal conditions such as emphysema. Risks are also perceived as more serious when they involve lack of control and unfair distribution of risks and benefits. Other factors are: level of uncertainty; ordinary vs. memorable risks; familiar vs. unfamiliar risks; morally acceptable vs. unacceptable; and trustworthiness of the risk information source (Blake 1995; Wiedemann 1998).

The role of the perception of an individual's level of control is considered an important predictor of self-protective behavior (Vaughan 1993). For example, people who perceive little control over exposure to chemicals and their negative effects are more likely to fail to use protective devices to prevent or reduce risks

(Arcury, Quandt and Russell 2002). In the case of environmental health risks, the level of control is the proximate cause of self-protective behavior and modifies the effect of risk perception.

Both risk perception and the level of personal control are influenced by individual demographic and psychosocial factors. It has been demonstrated that people in better economic circumstances are more likely to perceive themselves as having control over exposure (Vaughan 1993). Younger individuals tend to underestimate risks because they feel immune to them (Whalen et al. 1994). Slovic (1998) points out that the perception of risks depends also on the level of trust in the government and the institutions producing and dealing with risks. Trust is fragile, and once lost it takes a lot of time to restore. Therefore, Slovic argues for new approaches and more emphasis on the role of the political process in risk management.

In contrast to the psychometric approach, social constructivist theories attribute the differences in risk perception mainly to social and cultural factors. The cultural theory implies that risks are socially constructed; namely, people choose what to fear and how to fear it to sustain their preferred pattern of social relations (Douglas and Wildavsky 1982). Cultural theory accounts for the social construction of risk in terms of three interlinked domains: (a) the form of social relationships people maintain; (b) cultural biases, such as shared values and beliefs including views on human nature, views on society, risk perceptions, and biases toward environmental risks; and (c) preferred behavioural strategies

(Douglas and Wildavsky 1982). It is assumed that social relations generate values, beliefs, perceptions, and policy preferences that sustain those relations.

In cultural theory, people are classified according to their views and values into four groups: fatalists, hierarchists, individualists, and egalitarians. Such views and values are supposed to influence people's risk perceptions and preferences for risk management strategies. Thus, technological and environmental dangers appear to be most worrisome for egalitarians, threats to authority are most feared by hierachists, while certain kinds of market failures evoke the most concern for individualists (Steg and Sievers 2000). In addition, egalitarianism was found to be positively correlated with environmentalism, while people with higher levels of individualism showed lower levels of environmentalism (Ellis and Thompson 1997).

Empirical research on attitudes toward inequalities has found that people in central and eastern Europe express substantially more 'egalitarian' attitudes than those in the West, even after 10 years of economic adjustment to a market economy (Redmond, Schepf and Suhrcke 2002). Therefore, cultural theory would predict that people in these societies would be more concerned about technological and environmental dangers.

Environmental illnesses are another example of the interaction between the environment and human health. Such illnesses are highly contested by medical authority (Balshelm 2000; Kroll-Smith, Brown and Gunter 2000a; Kroll-Smith, Brown and Gunter 2000b; Kroll-Smith and Floyd 2000), because of their link to the patterns of production and consumption (Brown, Kroll-Smith and

Gunter 2000). The subjective experience of environmental illnesses represents a dispute over the ways of knowing and what counts as rational explanation of the relationship between the human body and the environment (Kroll-Smith and Floyd 1997). Multiple chemical sensitivity, for example, makes people change their behaviour and forces them to create a new social world that suits their condition (Lawson 2000). Patients with such a disease feel victim to polluters who "put the toxins in their bodies". This raises again the question about voluntary vs. involuntary risks. Environmental illnesses can be seen as an example of involuntary risks to which people are more sensitive as compared to risks over which they have control.

MacGregor and Fleming (MacGregor and Fleming 1996) argue that illness perception associated with environmental risks is explained by the way in which people understand and interpret physical experiences and events and derive meaning from the world around them. These authors have proposed a model that portrays the relationship between the set of factors that lead to perception and interpretation of illness. In this model, illness perception and interpretation includes both a determination by an individual that they are ill, as well as an explanatory framework that includes a causal model for illness. Thus, illness perceptions result from somatic change, which can be in the form of symptoms or other perceived bodily conditions that signal a departure from a personalized norm of physical functioning. The somatic change can be due to illness, or to sensory cues, such as taste and olfaction. MacGregor and Fleming posit that in the case of environmental illnesses, the perception of somatic change is

influenced also by the perception of environmental risks. The influence of risk perception may be a direct one, or mediated by emotion and stress, as demonstrated in the cases of mass psychogenic illnesses. However, from a sociological point of view, this model is insufficient as it ignored the influence of social structural variables, which have been shown to influence both risk perception and lay conceptions about the causes of illnesses.

Children are increasingly recognized as being more vulnerable than adults to the health effects of environmental risks in biophysical and social terms. A WHO/Gallup survey on the attitudes of the major stakeholders in environmental health action in Europe found that both experts and members of non-governmental organization are aware that children are more sensitive than adults to environmental risks (Perlstadt and Ivanov 2004). The survey also found that the majority of the respondents thought that the current standards of environmental and health protection do not provide sufficient levels of protection for children's health. The social vulnerability of children arises from their lack of control over their environment and the barriers in children's participation in making decisions about the environment and health (Tamburlini, von Ehrenstein and Bertollini 2002).

Only few publications in English can be found on the perception of environmental risks in Eastern Europe and the former Soviet Union. The study of Lang (2000) in Hungary, Romania and FYR Macedonia, found that air pollution and bad drinking water are perceived as the main environmental risks to human health in these countries. Another study in Albania (Bello 1997), which used both

psycho-metric and cultural theory approaches, found that socio-economic hardship does not suppress the perception of risks, including environmental ones. Personal risk perception levels were close to societal levels. Catastrophic potential, involuntary acceptance of risk, and uncontrollability were the three major risk determinants for Albanians. This study also found that risk perception in Albania was shaped by both psychological and socio-cultural factors. There was a lack of conformity between the expressed concern (risk perception) and the real anxiety (the driving force for practical action), which was attributed to differences between what people say and what they are trying to deal with in their everyday life.

2.4. Research questions

This review of theoretical perspectives and previous research shows that, in survey research, attitudes toward the environment and health have been addressed in several ways. One body of literature deals with environmental concern as a set of attitudes toward the environment and toward social relations about the environment. The previous studies of the dimensionality of environmental concern focused only on the question of whether it is a one or multi-dimensional construct. Such studies using confirmatory factor analysis did not consider the causal relationships between the different components of environmental concern. The literature on environmental concern also shows that environmental concern is influenced by direct exposure to environmental problems, or by different socio-demographic and cultural factors. Another major body of survey research is on health attitudes and their social base. It shows that

the perception of one's health is also modified by socio-demographic factors. A third body of literature deals with how people perceive environmental risks and which factors determine their worries about the different risks. The psychometric perspective on risk perception emphasizes the role of different psychological factors, while the cultural theory highlights the role of social and cultural factors which modify the perception of environmental risks and diseases. This review leads to the following research questions:

1. Does the Soviet legacy influence perceptions of the seriousness of environmental problems and the political attitudes toward environmental protection?
2. Do people perceive the risks to which they are exposed to now differently from the risks which may affect future generations?
3. Do people perceive children as being more sensitive to environmental impacts on their health than adults?
4. What is the influence of Muslim culture and Muslim identity on perceptions of environmental risks?
5. Which factors explain political demand for environmental protection in these societies? Which explanation works better in such societies – socio-demographic factors or environmental deprivation?
6. Is environmental concern in post-communist Muslim societies a coherent meaningful construct and if so, which causal model best

predicts the relationship between the different components of environmental concern, such as beliefs, concerns about biophysical aspects and about political aspects of the environment?

A set of research hypotheses will be formulated to answer the questions with the empirical data of this study. Since this is a study based on existing data, the formulation of testable research hypotheses would best be described after the description of the data to be used. Therefore the research hypotheses are presented at the end of the next chapter which deals with the data and the measurement of the variables.

CHAPTER 3. DATA, MEASUREMENT AND RESEARCH HYPOTHESES

This chapter will describe the data which have been used to answer the research questions. It will also present the measurement of the variables, the research hypotheses and the methods which will be used to test them.

3.1. Data

The data for this dissertation come from the 2002 international study on environment and health attitudes in Albania, Azerbaijan, Bosnia and Herzegovina, Tajikistan and Turkmenistan, organized by the Regional Office for Europe of the World Health Organization and executed by Gallup International. The questionnaire was translated by Gallup national affiliates into the appropriate language(s) for each nation. WHO environmental health experts who are natives of the countries in the study checked the national questionnaires to ensure the accuracy of the translation into the respective languages. In Azerbaijan, Tajikistan, and Turkmenistan -- countries with a Russian minority population -- the questionnaire was also translated into Russian and interviewing in Russian was offered in addition to the local language. All questionnaires were "back-translated" into English to ensure comparability. The survey instrument is shown in the Appendix.

The surveys were conducted via face-to-face, in-home interviews between November 2001 and February 2002. Nationally representative multistage cluster probability samples of adults (older than 15 years) were used in all countries but Turkmenistan where rural areas were underrepresented (and

thus caution must be used in generalizing the results to the nation as a whole). Achieved sample sizes were as follows: Albania, 1000; Azerbaijan 1000; Bosnia and Herzegovina 1000; Tajikistan 1000; and Turkmenistan 498. The characteristics of the achieved national samples are comparable to the socio-demographic characteristics (age and gender) of the general population of the individual countries and yield results that should have margins of error of approximately 3% for all countries except Turkmenistan, where the margin of error is 4%. The data are combined into a pooled sample and were adjusted to the population size using standard weights provided by Gallup International.

At the beginning of the interviews, the respondents were informed by the interviewers that participation in the survey was completely voluntary and that they could refuse to participate or to answer individual questions. Respondents were also assured that the questionnaires would be treated in a way that would not link the answers with their identifying information.

3.2. Variables

This section will introduce the variables and the corresponding questionnaire items, from which they were derived. The dependent and intervening variables (x) consisted of measures of the different attitudes toward environment and health. The socio-demographic variables (d) were used as predictors of environment and health attitudes. The numbers of the variables reflect their ordering in the original data file from the survey. Some variables (single-item) were derived from the individual questionnaire items, while others

(political demand for environmental protection) were composite variables derived from several items

3.2.1. Single-item dependent and intervening variables

Cure/prevention trade-off (x36)

Question wording: "Q1. Technically, medicine focuses primarily on the treatment of people who are sick, while public health focuses primarily on protecting the population from disease. Having that in mind, which do you think is more important, -- public health, i.e. protecting people from diseases or medicine, i.e. treatment of sick people, or both are equally important?"

Coded as: 1=medicine, 2=both equally important, 3=public health.

Health/nature trade-off (x37)

Question wording: "Q2. Nature protection deals primarily with preserving wildlife, forests, rivers and seas, while environmental health deals with the protection of human health from environmental pollution. Which one is more important to you, -- protecting nature or protecting human health, or both are equally important?"

Coded as: 1=protecting health, 2=both equally important, 3=protecting nature.

Perceived quality of national environment (x1)

Question wording: "Q3. How would you evaluate the quality of the environment as a whole in <this country> according to this scale?"

Coded as: 1=extremely good, 2=very good, 3=somewhat good, 4=not bad not good, 5=somewhat bad, 6=very bad, 7=extremely bad.

Perceived quality of local environment (x2)

Question wording: "Q11. How would you evaluate the quality of the environment in your city/village according to this scale?"

Coded as: 1=extremely good, 2=very good, 3=somewhat good, 4=not bad not good, 5=somewhat bad, 6=very bad, 7=extremely bad.

Satisfaction with governmental performance on environmental health protection (x38)

Question wording: "Q7. In your opinion has the government done too little, too much or the right amount to address the health problems caused by environmental pollution in this country?"

Coded as: 1=too much, 2=the right amount, 3=too little.

Governmental spending on environmental health protection (x40)

Question wording: "Q8. Do you think <this country> should spend more, less or the same amount of money than currently to protect health from environmental hazards?"

Coded as:, 1=less, 2=same, 3=more.

Satisfaction with performance of environmental health services (x39)

Question wording: "Q10. How good a job is the regional public health department [spell out the country specific name] doing to protect human health from environmental hazards, such as air, drinking water, waste, radiation, foods, working conditions?"

Coded as: 1=very good, 2=somewhat good, 3=somewhat bad, 4=very bad.

Public participation in environmental health decision-making (x41)

Question wording: "Q12. In your opinion, to what extent do citizens in your municipality have a say when decisions about environmental health are made?"

Coded as: 1=big deal, 2=a certain extent, 3=not at all.

Political activism about environmental health protection (x42)

Question wording: "Q13. In the last five years, did you ever participate in any public events related to health concerns about environmental pollution, --like meetings, protests or petitions?"

Coded as: 0=no, 1=yes.

Perception of environmental risks (x4-x5)

Question wording: "Q4. I am going to read some of the risks from the environment that are generally believed to cause diseases and health problems. Which one of these do you think is the major cause of diseases and health problems in this country?"

Respondents were offered a list of eight environmental health risks: air pollution; contaminated drinking water; contaminated food; chemicals in products; toxic waste; occupational risks; noise; and radiation. Respondents were asked to select only one risk as major cause of diseases for people living now (x4), and, separately for the future generation ("our children and grand children, say 25 years from now") (x5).

Coded as nominal variable: 1=air pollution; 2=contaminated drinking water; 3=contaminated food; 4=chemicals in products; 5=toxic waste; 6=occupational risks; 7=noise; 8=radiation: 9=don't know

Beliefs about environmental causes of diseases (x20-x35)

> Question wording: "Q5. I am going to read some diseases and health problems. For each, tell me, please, to what extent you think the environment plays a role in causing that health problem."

The following diseases and health problems were included: allergies, asthma, colds and flu, cancer, birth defects, infertility, learning disability, mental disorders. The question was asked separately for adults (x20-x27) and for children (x28-x35). The answers were coded as: 1=not at all, 2=a certain extent, 3=big deal.

Perceived impact of the environment on one's health (x3)

> Question wording: "Q6. Now, if you have to evaluate according to this scale the effect of environment on your own health, where you will put yourself?"

Coded as: 1=extremely good, 2=very good, 3=somewhat good, 4=not bad not good, 5=somewhat bad, 6=very bad, 7=extremely bad.

Perceived health (x43)

Perceived health was measured as self-assessment of personal health, using a standard item from health surveys (de Bruin, Picavet and Nossikov 1996; Power 2003).

> Question wording: "Q14. If you have to evaluate your own health according to this scale, where would you put yourself?"
>
> Coded as: 1=extremely good, 2=very good, 3=somewhat good, 4=not bad not good, 5=somewhat bad, 6=very bad, 7=extremely bad.

3.2.2. Socio-demographic predictors

Age (d7)

> Question wording: "Q15. What was your age at your last birthday?
>
> Coded as interval - number of years

Education (d4)

Question wording: "Q16. What educational degree or degrees did you receive?"

Coded as: 1=no education at all, 2=primary education, 3=high school, 4=university, 5=academic degree (masters or PhD).

Family income (d5)

> Question wording: "Q18. Would you please tell me how much on average was your total monthly family income after taxes? This should include wages and salaries, net income from business or farm, pensions, rent and any other money received by all those people in the household who are related to you."

Coded as interval. The results were converted into the equivalent US dollars according to the exchange rate of the local currency during the month of the interview.

Ethnic minority (d2)

> Question wording: "Q19. How you would define your ethnicity? Would you say you are...?"

Respondents were given a list of ethnicities in their country and asked to choose among these. Option "other" was also offered. The responses were *recoded* into dummy variable 0=ethnic majority, 1=ethnic minorities. Ethnic majorities and minorities were defined according to the World Fact Book (CIA, 2002).

Religious affiliation (Muslim identity) (d11)

Question wording: "Q20. What is the religion of your kin?"

Respondents were given a list of religions in their country and asked to choose among these. Option "other" was also offered. Religions were defined according the World Fact Book (CIA 2002). Recoded into dummy variable: 0=Christianity, 1=Islam.

Gender (d6)

Coded by the interviewer as 0=male, 1=female.

Size of one' community of residence (residence) (d10)

Number of people living in respondent's settlement coded by the interviewer: 1=up to 2,000; 2=2,001 to 10,000; 3=10,001-50,000; 4=50,001-100,000; 5=100,001-200,000; 6=more than 200,001.

3.2.3. Data reduction

For the purpose of developing a linear regression model of political demand for environmental protection, exploratory factor analysis was performed with the variables measuring the attitudes toward governmental performance (x38), environmental health services (x39), spending (x40), and citizen's participation in decision making (x41). The principle component method extracted one common factor underlying these four variables which accounts for 48% percent of the variance. The loadings of the individual variables on this factor are shown in table 1.

Table 1. Political demand for environmental protection. Factor loadings

variables	Component* 1
satisfaction with governmental performance	.786
public participation	.741
satisfaction with environmental health services	.696
governmental spending	.582

Extraction Method: Principal Component Analysis.
* 1 component extracted.

The factor score obtained with this analysis was saved and was used as a variable in the subsequent analysis of political attitudes (Cronbach´s α=0.713). This variable, called "political demand for environmental protection", could be interpreted as reflecting citizens' demand for political environmental health action. Since the four variables were coded in a way so that higher values reflect critical attitudes toward the current performance of public bodies to protect health from the environment, the higher values of the factor score would indicate citizens' demand for better performance of the government and the environmental health service, more budget for environmental health and more public participation in the decision-making process.

3.3. Research hypotheses

The research hypotheses were formulated according to the research questions. Two types of hypotheses were stated. The first were hypotheses which deal with bivariate and multivariate non-causal relationships (denoted as H) and the second type were those that deal with causal relationships between the variables (structural hypotheses – SH). This section presents the research hypotheses, the variables and the methods involved in their testing.

The first research question was whether the Soviet legacy affects the perception of the seriousness of environmental problems and the political attitudes toward environmental protection. If environmental concern and environmentalism are considered a Western value, then it would be expected that people in the former Soviet republics, which have been more influenced by the Soviet values and less exposed to Western values than those in the Balkans,

would have lower levels of both the "environmental" and the "concern" components of environmental concern. In particular, compared to people in the Balkans, those living in Central Asia would be less likely to:

(H1) support preventive approaches to health (public health) as opposed to technological solutions to health problems (curative medicine) – x 36

(H2) support preventive approaches toward the environment (nature protection, such as preserving wildlife, forests, rivers and sees) as opposed to "end-of-the-pipe" environmental protection (environmental health) – x37

(H3) be concerned about the quality of their national environment – x1

(H4) be concerned about the quality of the local environment – x2

(H5) criticize the performance of the national government – x38

(H6) evaluate critically the performance of environmental health services – x39

(H7) support more governmental spending on environment and health – x40

(H8) view critically the extent to which citizens have a say in making environmental decisions in their country – x41

(H9) participate in public events about environment and health – x42.

These hypotheses will be tested by comparing the aggregate values of the corresponding variables across the two geographical regions and using

appropriate statistical tests: *z*-tests for difference in proportions, and ANOVA tests for difference in means.

The second research question asked whether people perceive risks to which they are exposed now differently from risks which may affect the future generation. The risk perception perspective argues that risks with unfavourable effects in the future would be perceived as less important than the risks with effects in the present. Therefore, long-term environmental pollution, such as chemicals, toxic waste and radiation would be perceived as a higher risk for the health of the future than for the current generation (H 10). This hypothesis will be tested by comparing the frequencies of the risks selected as major cause of diseases for people living now (x4) and the risks selected as major cause for the future generation (x5). Since these are related observations, the McNemar two-related sample tests for difference in proportions will be used for this analysis.

The third research question asked whether people believe that children are more susceptible than adults to environmental impact on their health. The special sensitivity explanation of intergenerational differences posits that children are particularly vulnerable, both physically and socially, to environmental pollution. Therefore, it can be expected that lay people would believe that the environment has a greater role in causing diseases in children than in adults (H11). This hypothesis will be tested by comparing the means of the variables measuring the belief about environmental causes of the different diseases in adults and children (x20 –x27 for adults, and x28-x35 for children). Wilcoxon

signed ranks test will be used to test the difference in means of two- related samples.

The fourth research question was whether Muslim culture and Muslim identity has an influence on the perception of environmental risks. Cultural theory posits that nations and regions with different cultures would perceive environmental risks differently. As shown in the literature review, Islam places emphasis on cleanliness, purification and ablution. Therefore, in this study, it can be expected that Muslim societies would be more concerned about risks related to contamination (contamination of drinking water, food products, chemicals in products, toxic waste), while Christian societies would be more concerned about risks related to technology (air pollution, occupational hazards, radiation) and that these differences would hold across the time (present and future) (H12). This hypothesis will be tested using a subsample from the two entities of Bosnia and Herzegovina – the Federation of Bosnia & Herzegovina (Muslim society) and Republic of Srpska (Christian society). The perception of risks will be compared using *z*-tests for difference in proportions between the two entities for risks selected as a major cause of disease for people now (x4) and for future generations (x5).

The fifth research question asked which explanation of environmental concern holds true in post-communist Muslim societies – socio-demographic factors or environmental deprivation. The environmental deprivation theory explains environmental concern with the direct exposure of individuals to environmental pollution, while the set of theories derived from the social-

constructivist approach attribute environmental concern to different social, demographic and cultural factors. As the literature suggests, people in less developed countries are more exposed to environmental threats to their health and safety and for them environmental protection is a matter of survival. Therefore, the set of variables measuring the perception of poor local environmental quality (x2), personal health status as poor (x43) and as affected by the environment (x3) will have higher predictive power on the levels of political demand for environmental protection (factor score) than the socio-demographic variables, such as income, education, age, residence, ethnicity and religious affiliation (H13). This hypothesis will be tested by fitting a hierarchical linear regression model predicting political demand (factor score), in which the independent variables will be entered in two blocks corresponding to the two explanations mentioned above.

The last research question was about which causal model best predicts the relationship between the components of environmental concern and the socio-demographic and cultural factors. As shown in the literature review, environmental concern in Western societies is a multifaceted but coherent construct. Environmental concern has biophysical and social components. Biophysical components deal with perceived seriousness of environmental pollution and its effects on human health, while the social (the concern) component deals with the social aspects of environmental concern; i.e. the responsibility of public bodies and the attitudes toward their performance to protect the environment and human health. Therefore, H14 predicts that

environmental and health attitudes in the Balkans and Central Asia represent a logically structured and constrained belief system, i.e. one common factor will underlie the biophysical (ill-health, environmental quality) and the social components (political demand) of environmental concern. This hypothesis will be tested using second-order confirmatory factor analysis. The model to be tested is shown in figure 3.

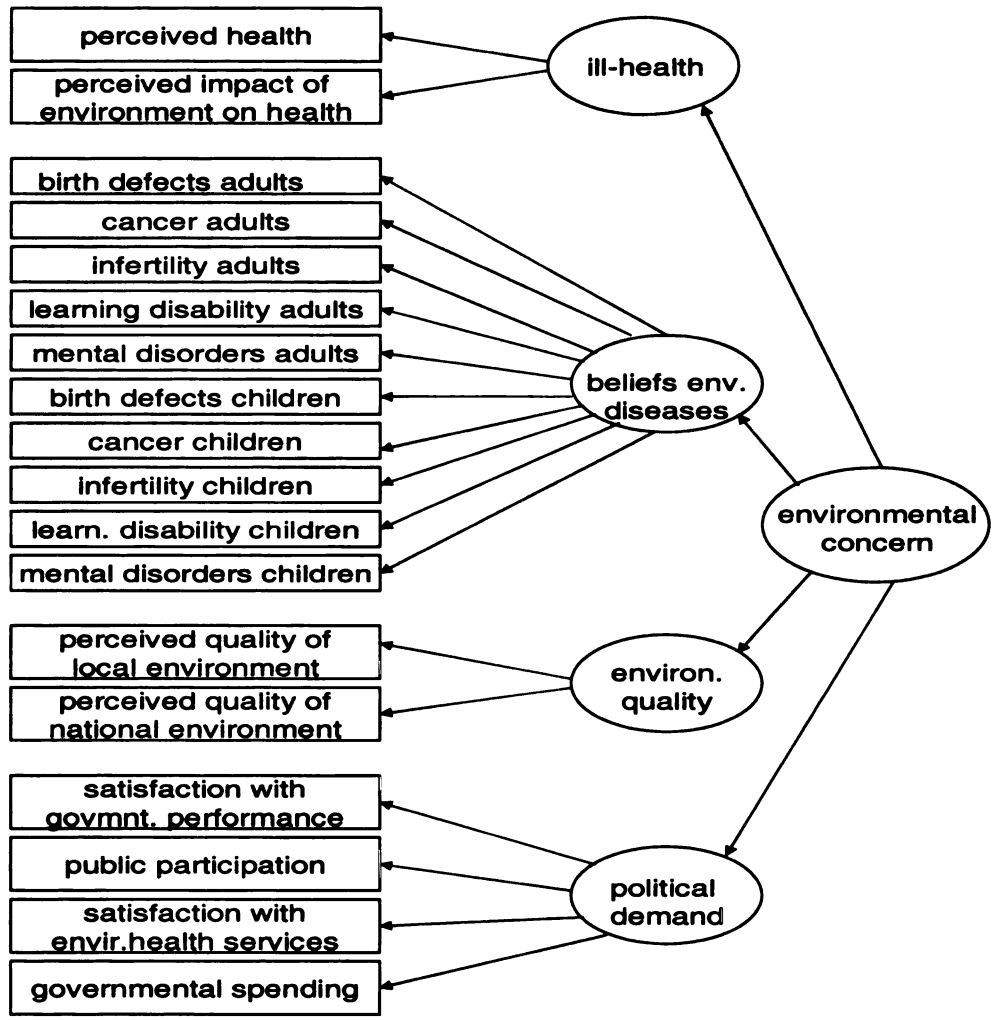

Figure 3. Postulated dimensional model of environmental concern

Furthermore, it was hypothesized that the causal relationship between the different components of environmental concern would be best explained based on the health belief model. This model would predict the political demand for environmental protection. The hypothesized model is shown in figure 4. According to this model, the somatic change (labelled "ill-health") would be an analogue of the original HBM's "perceived susceptibility and seriousness". Perceived health would influence the perception of environmental quality ("perceived threat" in HBM) and lay beliefs about environmental causes of diseases. The belief that the environment is causing diseases would serve as a "cue to action" (HBM), which will directly influence the perception of environmental quality and would lead to higher political demand for environmental protection. The perception of environmental quality would also directly explain the political demand for environmental protection. Finally, the constructs in the model would be influenced by social variables, such as residence, socio-economic status (SES) and religious affiliation.

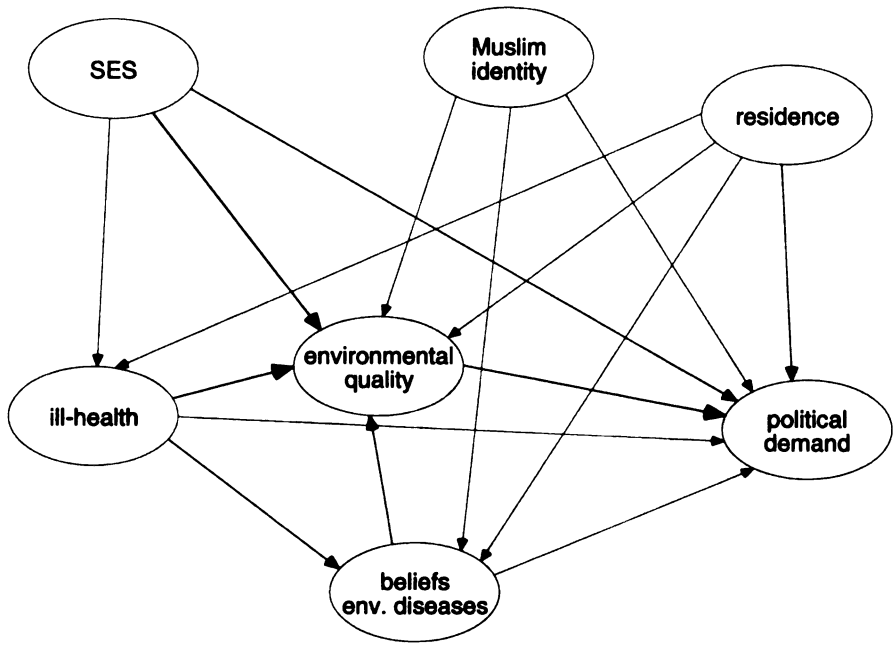

Figure 4. Postulated causal model of political demand for environmental protection

Based on the health belief model and review of the literature the following structural hypotheses (SH) can be formulated with regard to the causal structure in the hypothesized model predicting political demand for environmental protection:

SH1: The higher the perception of ill-health and the effects of the environment on it, the higher the concern about the quality of the environment.

SH2: The higher the perception of ill-health and the effects of the environment on it, the stronger the belief that the environment causes diseases.

SH3: The stronger the belief that the environment causes diseases, the higher the concern about the quality of the environment.

SH4: The stronger the belief that the environment causes diseases, the stronger the political demand for environmental protection

SH5: The higher the concern about the quality of the environment, the stronger the political demand for environmental protection.

The higher the SES of a person:

- the lower is his or her perception of ill-health (SH6);
- the stronger is his or her belief that the environment causes diseases (SH7);
- the higher the concern about the quality of the environment (SH8);
- the stronger is his or her political demand for environmental protection (SH9).

The bigger the community size of the respondent:

- the higher is his or her perception of ill-health (SH10);
- the stronger is his or her belief that the environment causes diseases (SH11);
- the higher is his or her tendency to worry about the quality of the environment (SH12);
- the stronger is his or her political demand for environmental protection (SH13).

Compared to a Christian, a person with Muslim identity would be more likely to:

- hold a stronger belief that the environment causes diseases (SH14);
- worry less about the quality of the environment (SH15);
- express lower levels of political demand for environmental protection (SH16).

This causal model of political demand for environmental protection will be tested using structural equation modelling.

CHAPTER 4. RESULTS

This chapter describes the results of the statistical analyses performed to test the research hypotheses stated in the previous chapter. Three groups of analyses were performed. The first group includes the descriptive analyses and the comparisons between the different groups – inter-regional, temporal, and inter-cultural comparisons. The second group of analyses employs multivariate regression techniques to test the hypotheses about the predictors of political demand for environmental protection. The third group consist of building a structural equation model and testing the hypothesized causal model of environmental concern.

The socio-demographic characteristics of the sample are presented in table 2.

Table 2. Socio-demographic characteristics of the sample

Characteristic	M	SD
Age	38.1	15.6
Monthly family income in US$	100.5	102.2
Education	3.4	.7
Size of community	3.2	1.9
	Percentage	
Gender (females)	53%	
Ethnic minorities	17%	
Muslims	78%	

4.1. Descriptive analysis and group comparisons

4.1.1. Health and environmental trade-offs

Hypothesis 1 stated that compared to people in the Balkans, those living in Central Asia would be less likely to support preventive approaches to health; i.e., they will give less preference to public health as opposed to medicine in solving health problems. Similarly, hypothesis 2 predicted that Central Asians would also be less likely than people in the Balkans to support nature protection, as opposed to protection of health from environmental risks.

To measure the trade-off between preventive and curative approaches in dealing with human health, respondents were asked which one is more important, public health or medicine (x36). The second trade-off item asked the respondents to indicate whether protection of nature and protection of health from environmental pollution is more important (x37). Both items also included the response category "both are equally important". Table 3 shows the percentages of respondents choosing each trade-off. Table 3 also compares the Balkans and Central Asia and shows the results of the *z*-tests for difference in proportions between geographical regions.

Table 3. Health and environmental trade offs. Percentages and inter-regional comparisons

Variables	All	Balkans	Central Asia	*z*	*p*
Cure/prevention trade-off *Which one is more important?*					
Public health	28%	20%	34%	.9.03	<.001
Both	53%	60%	48%	-7.20	<.001
Medicine	19%	20%	18%	-1.17	ns
Total	100% (n=4498)	100% (n=2000)	100% (n=2498)		
Health/nature trade-off *Which one is more important?*					
Protecting nature	14%	12%	16%	4.31	<.001
Both	61%	66%	57%	-6.42	<.001
Protecting health	25%	22%	27%	3.83	<.001
Total	100% (n=4498)	100% (n=2000)	100% (n=2498)		

More than one quarter (28%) of the respondents in all countries said that protecting people from diseases (public health) was more important than treatment of sick people (medicine). However, more than half of the respondents said that both public health and medicine are important. Support for public health was significantly lower in the Balkans than in Central Asia (z=9.03, p<.001) Support for protecting nature was less than support for protecting health from environmental risks, though the majority of the respondents said that both were important. Respondents in Central Asia were slightly less likely to choose the "both are equally important" response category for both tradeoffs. These results

do not support hypotheses 1 and 2 that people in Central Asia would be less supportive of preventive approaches to health and the environment.

4.1.2. Perception of environmental quality

Hypotheses 3 and 4 predicted that people in Central Asia would also be less likely than those in the Balkans to perceive the quality of their national environment (H3) and the environment in their cities and villages as poor (H4).

Perception of environmental quality was measured separately for the whole country (x1) and for the respondents' city or village (x2) on a scale from 1 to 7, with lower scores indicating good quality and the higher scores poor quality. The means of the variables measuring ratings of the quality of national and local environments are shown in table 4 for the whole sample and separately for the sub samples from the Balkans and from Central Asia.

Table 4. Perception of environmental quality. Descriptives and inter-regional comparisons

variables	All		Balkans		Central Asia	
	Mean	n	Mean	n	Mean	n
national environment	4.32	4449	4.75	2000	3.96	2449
local environment	4.16	4462	4.41	2000	3.96	2462

Overall, the respondents were concerned almost equally about the quality of the national and the local environment. However, there were inter-regional differences in the ratings of environmental quality. The respondents in the Balkans rated the quality of the national environment as slightly worse than the

quality of the environment in their settlements, while in Central Asia there was no difference between the ratings of the quality of national and local environments. The median for both variables was 4.00, which is equivalent to the "not bad, not good" response category. ANOVA was performed to assess the difference between the means of national and local environmental concern variables for the sub-samples from the Balkans and Central Asia. The test indicated significant differences between the two regions in their rating of environmental quality, both at national (F=384.37, df=1/4448, p<.001, eta=.28) and local levels (F=122.82, df=1/4461, p<.001, eta=.16). Compared to the Balkans, respondents in Central Asia were less likely to rate the quality of both national and local environments as worse, which supports hypotheses 3 and 4.

4.1.3. Political attitudes and behavior

The next cluster of hypotheses to be tested deals with the social components of environmental concern, i.e., political attitudes and behaviour toward environmental issues. Political attitudes and behaviour were assessed using four items measuring satisfaction with governmental performance (x38), satisfaction with the performance of the national system of environmental health services (x39), adequacy of governmental spending on environmental health (x40), extent to which citizens have a say in making decisions (x41), and political activism (participation in meetings, protests, etc.) with regard to environmental health issues (x42).

It was hypothesized that, compared to people in the Balkans, those in Central Asia would be <u>less</u> likely to: (1) criticize the performance of the national

government (H5); (2) evaluate critically the performance of environmental health services (H6); (3) support more governmental spending on environment and health (H7); (4) view critically the extent to which citizens have a say in environmental decision-making (H8); and (5) be publicly active with regard to the environment and health issues (H9). Table 5 shows the percentage breakdowns of the corresponding variables and the frequencies (absolute number of respondents choosing the category) for the whole sample and for the sub samples from the Balkans and Central Asia. Table 5 also shows the results of the *z*-tests of the difference in proportions between the two geographical regions.

The highest was the demand for more governmental spending on protection of the environment and health; 84% said that the government should spend more money on environmental health. Respondents in the Balkans were much more likely to advocate more governmental spending (91%) compared to Central Asia (77%), (z=-12.08, p<.001). The majority of the respondents were critical toward the work done by the government to deal with environmental health problems in their countries. On average, 74% said that the government is doing "too little" about environmental health. Respondents in the Balkans were again more critical toward governmental performance; 90% said that government is doing too little, compared to 62% in Central Asia (z=-20.11, p<.001).

Table 5. Political attitudes and behaviour. Percentages, frequencies and inter-regional comparisons

Variables	All	Balkans	Central Asia	*z*	*p*
Governmental spending (how much should the government spend?)					
"More"	84% (3405)	91% (1713)	77% (1692)	-12.08	<.001
Satisfaction with governmental performance (how much does the government do about environmental health?)					
"Too little"	74% (2944)	90% (1620)	62% (1324)	-20.11	<.001
Satisfaction with environmental health services (how good of a job they are doing?)					
Bad ("very bad" and "somewhat bad")	62% (2530)	64% (1252)	59% (1278)	-2.83	<.01
Environmental democracy (extent to which citizens have a say in making decisions)					
"Not at all"	49% (1855)	54% (937)	46% (918)	-5.01	<.001
Political activism (participation in public events)					
% who said to have participated	13% (564)	14% (251)	13% (313)	-.47	ns

Attitudes toward the performance of the national environmental health service were less critical. On average 62% said that it was "somewhat bad" or "very bad." The respondents in the Balkans were again more critical toward the performance of environmental health service with 64% of them rating it in the negative direction, compared to 59% in Central Asia (z=-2.83, p<.01).

Opinions about the extent to which the citizens have a say in making decisions by public bodies were split; less than half of the respondents (49%) thought that citizens can not influence the decision making process. This opinion was stronger in the Balkans where 54% of respondents said that citizens do not have a say at all in environmental decision-making, while in Central Asia this opinion was shared by only 46% of the respondents (z=-5.01, p<.001).

Just 13% of the whole sample were politically active with regard to environment and health issues, with no significant difference between the geographical regions (z=-.47, p>.05).

This analysis showed that there are differences between the Balkans and Central Asia with regards to all political variables, except political activism. This means that the respondents in the Balkans were more likely than their Central Asian counterparts to hold critical attitudes toward the political aspects of environmental protection. These results supported hypotheses 5-8 about less critical views toward the different political aspects of environmental protection in Central Asia. However, hypothesis 9 about less public activism in Central Asia was not supported.

4.1.4. Risk perception

Perception of environmental health risks was measured by asking respondents to select the environmental risk which they perceive to be the major cause of diseases in their country. A list of eight risks was offered: air pollution, contaminated drinking water, contaminated food, chemicals in products,

occupational risks, toxic waste, noise and radiation. Respondents could select only one risk for the current (x4) and one risk for future generations (x5).

Differences between current and future generations

Hypothesis 10 predicted that long-term environmental pollution, such as chemicals, toxic waste and radiation would be perceived as higher risk for the health of the future than for the current generation.

The percentages of respondents choosing the different environmental risks as the major cause of diseases for current and for future generations are shown in table 6. Table 6 also shows the results of significance tests (McNemar tests) performed to compare the perception of the individual risks for the different generations. McNemar tests the null hypothesis of no difference between responses which have been elicited twice, in this case once for the current and once for the future generation.

Table 6. Perception of environmental risks. Percentages and time comparisons

Risks	People now	People in the future	McNemar Test χ^2	p
Contaminated drinking water	28%	16%	205.7	<.001
Air pollution	27%	24%	11.1	<.001
Contaminated food	16%	10%	83.0	<.001
Chemical in products	13%	16%	19.5	<.001
Toxic waste	6%	11%	79.3	<.001
Radiation	4%	16%	364.1	<.001
Occupational hazards	3%	2%	1.2	ns
Noise	1%	2%	3.9	<.05
Don't know	2%	3%		
Total	100% (n=4498	100% (n=4498)		

The major risks for the health of people now selected by the respondents were contaminated drinking water (28%) and air pollution (27%), followed by contaminated food (16%) and chemicals in products (13%). Only a small percentage of respondents selected toxic waste (6%) and radiation (4%) as major causes of disease. Occupational hazards (3%) and noise (1%) were least likely to be perceived as the major cause of health problems.

When it comes to the effects of environmental risks on the health of people in the future (our children and grand children), the picture is somewhat different. Air pollution was again perceived as a major health threat (24.7%), but the second rank was shared between contaminated drinking water (16.6%),

chemicals in products (16.5%) and radiation (16.3%). Toxic waste (11.5%) and contaminated food (10.1%) occupied the third rank in causing health problems in the future. Similar to the results for people now, only a small percentage of respondents chose occupational hazards (2.4%) and noise (2.1%) as major causes of disease in the generations to come.

The McNemar tests revealed that there were significant differences in the perception of the individual environmental risks for the people now and in the future. The differences were highest (as shown by the values of chi-square) for the perception of risks from contaminated drinking water and radiation. The perception of contaminated drinking water as cause of diseases was higher for the current generation. Chemicals, toxic waste, radiation and noise were perceived as being higher risks for the future than for the people now, which is what was expected under hypothesis 10 (with the exception of noise).

Inter-cultural differences

Hypothesis 12 stated that Muslim societies, as a whole, would be more concerned about environmental risks from contamination (contaminated drinking water, contaminated food, chemicals in products and toxic waste), while Christian societies would be more concerned about technological risks, such as air pollution, occupational hazards, noise and radiation and these differences will persist across concern for different generations.

A sub-sample including only respondents from Bosnia and Herzegovina was used to test this hypothesis. This sub sample allows for analysis at the population level by comparing the two entities of Bosnia and Herzegovina which

are divided on the basis of ethnicity and religious affiliation. The Republic Srpska is predominantly Christian, while the majority of the other entity, the federation Bosnia & Herzegovina is Muslim. However, the two entities share the same Serbo-Croatian language and the interviews were carried out in this language. Table 7 presents the percentages of respondents in each entity of Bosnia and Herzegovina who have selected different environmental risks as the major cause of health problems for the current and future generations and the results of the tests of difference in proportions.

The difference in the percentages between the two entities of Bosnia and Herzegovina was tested using *z*-test for difference in proportions, which tests the null hypothesis of no difference between the percentages of two groups in the population. Since *z*-test is a symmetric measure, the negative sign indicates that the percentage in Republic Srpska is higher than in Federation Bosnia & Herzegovina.

The results (see table 7) show that out of four risks of contamination (water, food, chemicals and toxic waste), the perception of risks from contaminated food (z=2.64, p<.01), chemicals in products (z=3.79, p<.001) and toxic waste (z=2.83, p<.01) for the current generation and from chemicals (z=3.27, p<.001) and toxic waste (z=4.11, p<.001) for the future generations were significantly higher in Federation Bosnia & Herzegovina than in Republic Srpska. However, the perception of risks related to contamination of drinking water was not higher in Federation Bosnia and Herzegovina than in Republic Srpska, as predicted; in fact it was lower both for the current generation (z=-4.02,

$p<.001$), i.e., the opposite of what was expected. These results partially support hypothesis 12 that, at the population level, Muslim societies would be more concerned about risks from contamination. Technological risks, such as air pollution and radiation tended to be of more concern for the population in Republic Srpska than in the federation Bosnia and Herzegovina.

Table 7. Risk perception in Republic Srpska and Federation Bosnia & Herzegovina. Percentages and inter-generational comparisons

	Risks	Republic Srpska	Feder. B& H	*z*	*p*
RISKS OF CONTAMINATION	Contamin. drinking water now	20%	11%	-4.02	<.001
	Contamin. drinking water future	19%	17%	-.80	ns
	Contamin. food now	15%	22%	2.64	<.01
	Contamin. food future	13%	11%	-1.04	ns
	Toxic waste now	7%	13%	2.83	<.01
	Toxic waste future	10%	20%	4.11	<.001
	Chemical in products now	6%	14%	3.79	<.001
	Chemical in products future	7%	14%	3.27	<.001
TECHNOLOGICAL RISKS	Air pollution now	38%	30%	-2.73	<.01
	Air pollution future	25%	20%	-2.08	<.05
	Radiation now	10%	5%	-3.03	<.001
	Radiation future	21%	11%	-4.11	<.001
	Occupational hazards now	1%	1%	.26	ns
	Occupational hazards future	2%	1%	10.54	<.001
	Noise now	1%	1%	-.44	ns
	Noise future	1%	1%	.00	ns
	Don't know now	2%	3%	2.53	<.01
	Don't know future	2%	5%	3.53	<.001
	Total now	100% (400)	100% (600)		
	Total future	100% (400)	100% (600)		

4.1.5. Lay beliefs about environmental causes of diseases

Respondents were asked to indicate the extent to which the environment plays a role in causing certain diseases, such as asthma, allergies, colds/flu, birth defects, cancer, infertility, learning disability and mental disorders. Medicine has confirmed the role of the environment in causing all of these diseases (Smith, Corvalán and Kjellström 1999). Therefore, these items measured to what extent respondents believe that these diseases are caused by the environment. Responses were coded on a three point scale (1=not at all, 2= to certain extent, and 3=big deal). Belief about the relationship between the environment and diseases was measured separately for diseases in adults and children.

Table 8 shows the mean responses regarding beliefs in environmental causes of the different diseases in adults and children, and the results of the Wilcoxon's test performed to test hypothesis 11 about difference in the means of each of the eight pairs (adults - children) of disease variables. Wilcoxon's test tests the null hypothesis that the average belief scores for adults and for children would be the same.

The means of the variables show that belief in environmental causes was strongest with regard to allergies, asthma and colds/flues, both in adults and in children. Belief in environmental causes of cancer was also strong. Respondents were less convinced about the environmental causes of infertility (both in adults and in children), as well as learning disabilities and mental disorders in adults.

Table 8. Lay beliefs about environmental causes of diseases. Descriptives and inter-generational comparisons

Diseases	Adults	Children	Wilcoxon Signed Ranks Test	
	Mean*	Mean*	*Z*	*p*
Allergies	2.48	2.64	-16.42[a]	<.001
Asthma	2.46	2.51	-4.69[a]	<.001
Colds/flu	2.31	2.54	-21.43[a]	<.001
Cancer	2.25	2.20	-3.70[b]	<.001
Mental disorders	1.92	2.08	-12.64[a]	<.001
Birth defects	1.89	2.16	-20.87[a]	<.001
Infertility	1.81	1.74	-3.70[b]	<.001
Learning disability	1.79	2.05	-21.33[a]	<.001

* *min*=1; *max*=3, [a] based on negative ranks, [b] based on positive ranks

Hypothesis 11 predicted that people would believe that the environment has a greater role in causing diseases in children than in adults. Wilcoxon's signed ranks test showed significant differences between beliefs for both of the generations for all disease variables. Respondents were more likely to believe that the environment causes diseases in children than in adults. The only exceptions were cancer and infertility, which were thought to be caused by environmental risks more in adults than in children.

4.2. Predictors of political demand for environmental protection

Hypothesis 13 predicted that in the nations from this study the political demand for environmental protection would be explained better by perceived

direct exposure to environmental problems (environmental deprivation explanation), than by socio-demographic variables (social-constructivist explanation). This hypothesis was tested by fitting a hierarchical linear regression model. The dependent variable was "political demand for environmental protection" which is the factor score described in chapter 3. The independent variables were entered in the model in two blocks corresponding to the social-constructivist and environmental deprivation explanations. The first block included only socio-demographic variables as predictors: income, education, age, residence, gender (female), ethnicity (minority) and religious affiliation (Muslim).

At the second step, a block of another three independent variables was added to the model. These variables reflect individual's perceived exposure to environmental pollution: (1) perceived quality of local environment; (2) perceived health; and (3) perceived impact of the environment on one's health. In this way, the second block reflects the environmental deprivation explanation of environmental concern. The change of R^2 from model one to model two was used to test hypothesis 13 that perceived exposure to environmental pollution explains environmental concern better than only socio-demographic variables.

The R^2 of the reduced model was .039, which means that the socio-demographic variables by themselves poorly explain the variation of political demand for environmental protection. After adding the three independent variables measuring perceived exposure to environmental pollution, the R^2 rose to .224, more than a five-fold increase. The F-test of significance of R^2 change

rejected the null hypothesis of zero difference in the explanatory power of the reduced and the full model (F=348.723, df=3/4362, p<.001). This means that the full model explains political demand significantly better than the reduced model. This result provides support for hypothesis 13 which postulated that the set of variables measuring perceived exposure to environmental pollution would have greater predictive power than the socio-demographic variables in explaining the political demand for environmental protection.

The standardized regression coefficients of the individual predictors for the full model are shown in table 9. The tests of regression assumptions showed that the full model met the requirements for linearity, normality, constant variance, and independence of observations.

Examination of the standardized regression coefficients shows that, in the full model, the strongest predictor was perceived quality of the local environment (β=.316). This suggests that people who perceived their local environment as poor were more likely to express greater political demand for environmental protection. The second major predictor was perceived impact of the environment on one's health (β=.164), with those who perceive their health as negatively affected by the environment tending to have greater political demand for environmental protection. The magnitude the coefficients of these two predictors were substantially higher than that of the coefficients of the socio-demographic predictors. The predictor with the largest coefficient (in the full model) among the socio-demographic variables was income (β=.116). This was followed by residence, ethnic minority, Muslim identity and education.

Table 9. Predictors of political demand for environmental protection. Full model. Regression coefficients

Predictors	Standardized Coefficients	*t*	*p*
quality of local environment	.316	14.673	<.001
perceived impact of the environment on one's health	.164	-8.793	<.001
Income	.116	5.912	<.001
residence	-.082	-5.638	<.001
ethnic minority	-.077	-5.142	<.001
Muslim identity	-.071	-3.106	<.001
perceived health	.056	-1.079	<.01
education	.037	4.258	<.05
age	-.024	.676	NS
female gender	-.014	-1.110	NS

4.3. Structural equation model of environmental concern

One of the purposes of this dissertation was to develop a model of environmental concern within post-communist Muslim societies. The hypothesized model was described in Chapter 3 (figure 4). In particular, this model predicted that political demand for environmental protection will be explained by perceived quality of the environment, the belief that the environment causes diseases and the perception of one's health as poor as a result of environmental influences. Socio-demographic factors, such as socio-economic status, Muslim religious affiliation and size of one's community of residence

would impact the constructs in the model. The hierarchical linear regression model of political demand for environmental protection, described in the previous chapter, revealed that gender and age were non-significant predictors, and therefore they were not included in the structural equation model. The corresponding structural hypotheses to be tested with this model have been described in Chapter 3.

Before testing the hypothesised model, it would be useful to review briefly the principles of building and testing structural equation models.

In structural equation modelling (SEM), there are two types of variables – observed variables (indicators) and latent variables (constructs). Building structural equation models involves two major phases that emphasize the analysis of two conceptually distinct latent variable models: measurement and structural. The measurement model is that part of SEM which deals with the latent variables and their indicators. The structural model is a set of exogenous (independent) and endogenous (dependent and intervening) variables together with the causal structure of their relationships. It is necessary, first, to build and test the measurement model and proceed to the structural model only after reaching satisfactory solution of the measurement model (Schumacker and Lomax 1996).

Testing of the fit of structural equation models is not as straightforward as it is in other multivariate procedures. Such testing is based on a number of goodness-of-fit statistics. The chi-square test tests the null hypothesis that the model fits perfectly in the population. However, since chi-square depends on

sample size, testing SEM with big samples usually results in a statistically significant chi-square; i.e., rejection of the null hypothesis that the model fits perfectly in the population.

However, in empirical research, postulated models (no matter how good) can only fit real world data approximately and never exactly. Therefore, a number of fit indices have been developed to assess how well the model fits the data.

The goodness-of-fit index (GFI) is a measure of the relative variance and covariance in the unrestricted sample covariance matrix that is jointly explained by the restricted covariance matrix. It ranges from zero to 1.00, with values close to 1.00 being indicative of good fit (Byrne 2001).

The comparative fit index (CFI) takes into account sample size and compares the hypothesized model with the baseline model in which all variables are uncorrelated (independence model). CFI values >.90 (recently >.95) are considered representative of a well-fitting model (Byrne 2001)

Currently, the most commonly used goodness-of-fit index is the root mean squared error of approximation (RMSEA). It shows how well the model would, with unknown but optimally chosen parameter values, fit the population covariance matrix if it were available. RMSEA values less than .05 indicate good fit, values as high as .08 represent reasonable errors of approximation in the population, values ranging from .08 to .10 indicate mediocre fit and those greater than .10 indicate poor fit. The 90% confidence interval around the RMSEA value shows the precision of RMSEA estimates. The *p*-test (PCLOSE) for close fit

shows the probability that the population values of RMSEA are equal or lower than the .05 cutoff value (Byrne 2001).

There are three approaches to building structural equation models. In the strictly confirmatory approach, a model is tested using the above mentioned goodness-of-fit tests to determine if the pattern of variances and covariances in the data is consistent with the structural model specified by the researcher. In the alternative models approach, one may test two or more causal models to determine which has the best fit.

Most commonly used is the model development approach which is a combination of confirmatory and exploratory procedures. In this approach a model is tested, found to be deficient, and an alternative model is then tested based on the changes suggested by SEM modification indexes. The models confirmed in this manner are post-hoc ones which may not be stable. This problem can be overcome by applying a cross-validation strategy under which the model is developed using a calibration data sample and then confirmed using an independent validation sample (Garson 2004).

4.3.1. Measurement model

Testing the measurement part of SEM consists of a confirmatory factor analysis (CFA) which tests the extent to which the observed variables (indicators) measure the unobserved variables (underlying constructs). The indicators are two or more observed variables each depending on a common unobserved variable (construct) and on specific error terms. The observed variables in such a

pattern represent imperfect observable measures, or indicators of the common unobserved variables.

The candidates for measuring the health concept ("ill-health") were perceived health (x43) and perceived impact of the environment on one's health (x3), both measured on a 7-point scale. These two variables had moderate bivariate correlation (Pearson's r=.446). The concept of perceived environmental quality ("envir. quality") can be measured with two indicators – concern for the quality of the national environment (x1) and for the local environment (x2), both measured again on a 7 point scale (Pearson's r=.579). Separate CFA of latent variables measured with only two indicators are problematic because the models become over-identified and can not reach unique solution. However, high bivariate correlations suggest that it might be appropriate to use latent variables measured with two indicators in the measurement model (Schumacker and Lomax 1996).

The concept of lay beliefs about environmental causes of diseases ("beliefs envir. diseases") can be tapped by the disease variables (x20-x35). For the purpose of measuring this concept, it was necessary first to determine whether the observed diseases variables load on one or several factors. Following the recommendations of Garson (2004), exploratory factor analysis with principle axis factoring and Varimax rotation extracted three factors with Eigenvalues >1.0. The first factor was responsible for 23% of the variance and the following variables loaded high on this factor: birth defects adults, cancer adults, infertility adults, learning disability adults, mental disorders adults, birth

defects children, cancer children, infertility children, learning disability children, and mental disorders children (Cronbach's alpha for this set of items was .86). The second and third factor explained 9% and 7% of the variance in the rotated sum of squared loadings, which means that they are weak factors. Therefore, only the first factor was used in the measurement model.

The confirmatory factor analysis of the disease variables loading on the first factor showed that the initial model had unsatisfactory fit: χ^2=2663.35, *df*=35, *p*<.001, GFI=.90, CFI=.83, RMSEA=.13). The modification indices suggested that the fit of the model could be improved by adding covariances between the error terms of most of the observed variables. After doing this, the fit of the model substantially improved: χ^2=157.86, *df*=15, *p*<.001, GFI=.99, CFI=.99, RMSEA=.05 (CI90%=.04÷.05), PCLOSE=.83, suggesting that the fit of the data to the hypothesized model is adequate.

A similar procedure was repeated with the four observed variables measuring political demand ("political demand"): satisfaction with governmental performance (x38), satisfaction with environmental health services (x40), spending on environment and health (x39) and public participation in decision making (x41). As shown in chapter 3, the exploratory factor analysis of these four variables extracted only one common factor. The modification indices suggested adding a covariance term between the error terms of satisfaction with governmental performance (x38) and satisfaction with the performance of environmental health services (x40). The measurement model of political

demand had perfect fit. The chi-square test (χ^2=3.91, *df*=1, *p*=.05) failed to reject the null hypothesis that the model fits perfectly in the population.

The final measurement model combined the four latent constructs and their indicators into a confirmatory factor analysis (figure 5). The combined measurement model had adequate fit (χ^2=898.57, *df*=111, *p*<.001, GFI=.98, CFI=.97, RMSEA=.04, PCLOSE=1.00). This shows that the observed variables measure the latent constructs to a satisfactory level. With regard to discriminant validity it should be noted that the items related to each construct always correlated more highly with one another than with the items of other constructs.

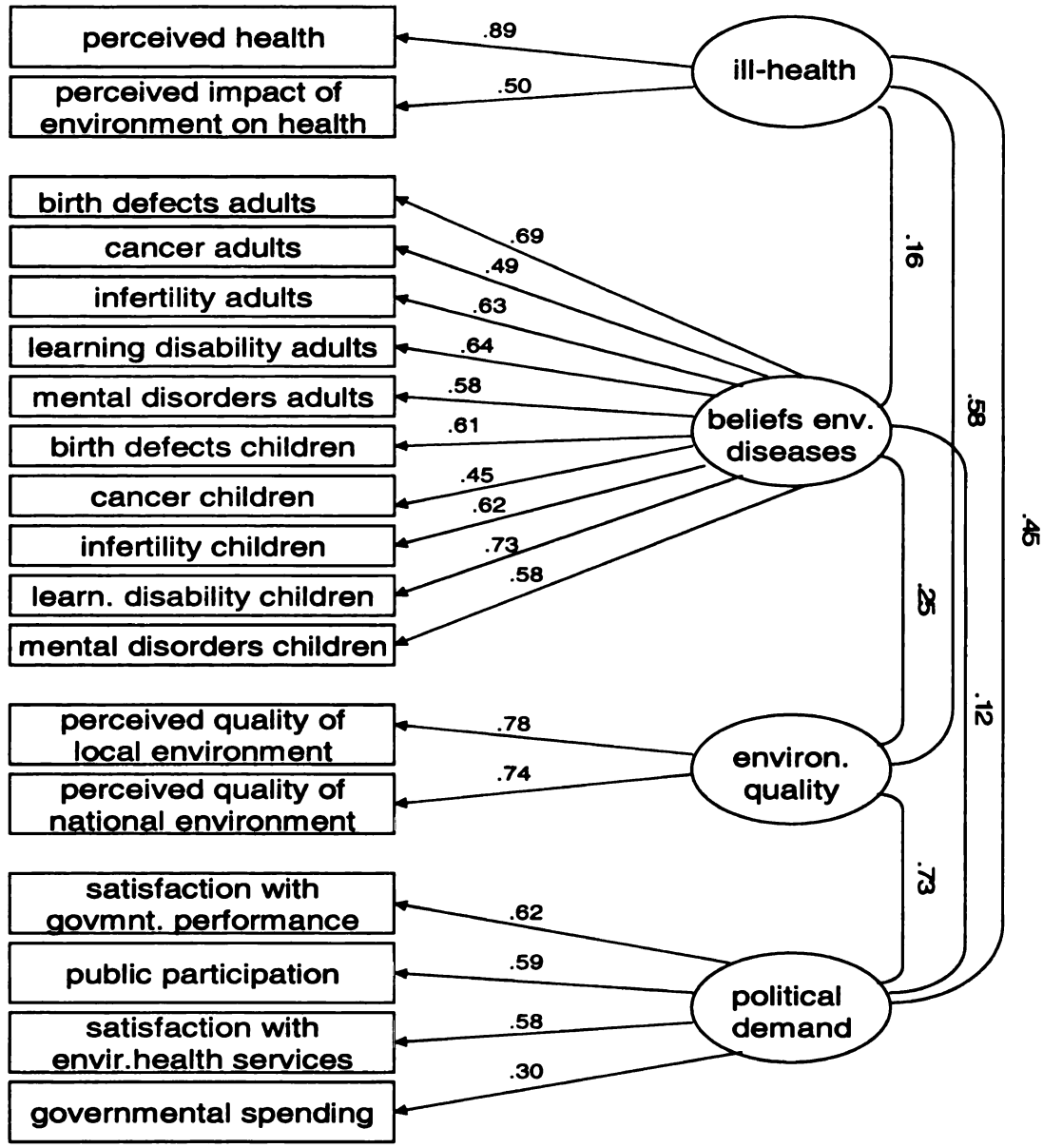

Figure 5. Measurement model. Confirmatory factor analysis

This measurement model demonstrated reasonable utility of the four factor structure model of environmental concern. The latent constructs were significantly inter-correlated. The values of the standardized covariance coefficients were between .12 and .73. In particular, the constructs reflecting the environmental component of environmental concern (perception of environmental

quality, ill-health attributable to the environment) were relatively well correlated with the concern component, which is represented by the attitudes toward political aspects of the environment (political demand for environmental protection). The standardized coefficients of the co-variances between political demand and environmental quality was .73, and between political demand and ill-health was .45.

4.3.2. Dimensionality of environmental concern

Hypothesis 14 predicted that the biophysical and social components of environmental concern will be ultimately explained by one common underlying construct. Therefore, the factorial validity of the scores from the measurement model was tested by a second-order CFA model. This CFA model hypothesized *a priori* that the responses to the environmental and health indicators could be explained by the four first order factors (ill-health, environmental quality, political demand and belief in environmental causes of diseases), found in the measurement model and one second order factor (environmental concern) and that the co-variation among the first-order factors would be explained fully by their regression on the second order factor. This model was tested using a maximum-likelihood estimation and the results are shown in figure 6.

The second-order CFA model of environmental concern demonstrated adequate fit (chi-square=913.85, df=113, p<.001, GFI=.98, CFI=.97, RMSEA=.04, PCLOSE=1.00). All modification indices had values below 10.00, which means that there is no need for additional substantial improvements of the model. Therefore, because this solution represents a substantively reasonable fit

to the data and there was little to no justification for freeing up parameters on the basis of the modification indices, this CFA model can be considered to best represent the structure of environmental concern in this study. The results of this CFA provide support to hypothesis 14 which predicted that environmental concern is a coherent construct that includes concern about biophysical and social aspects of the environment.

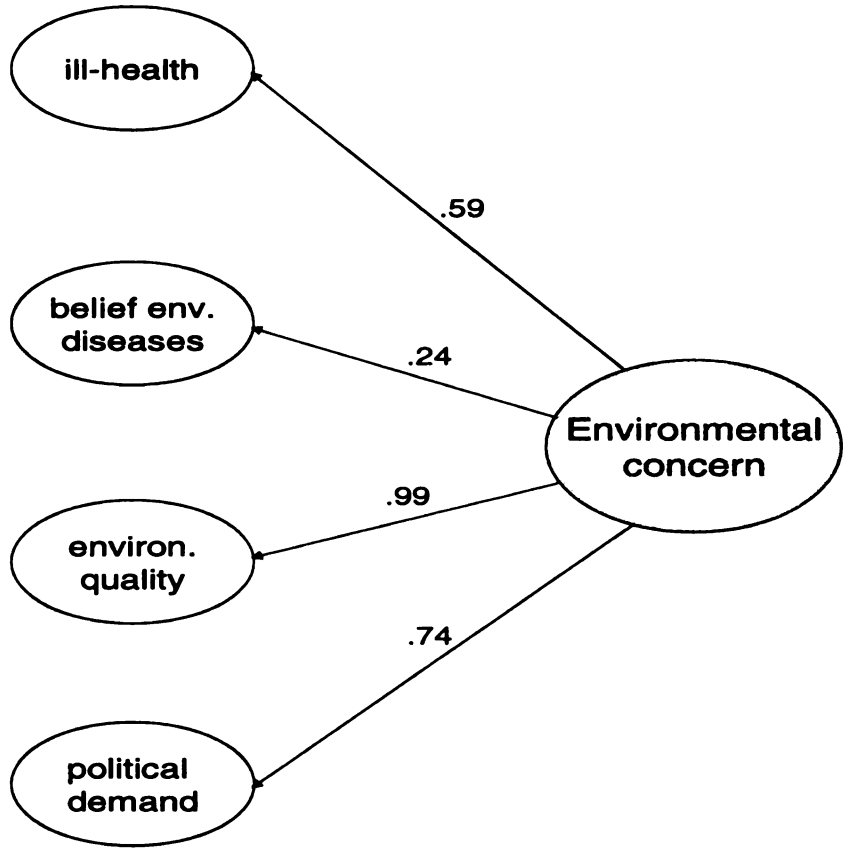

Figure 6. Dimensionality of environmental concern. Second-order confirmatory factor analysis

The loading of perceived quality of the environment on environmental concern was the highest among the first order factors. Its value (.99) suggests a

very strong correlation between environmental concern and the perceived quality of the environment. Political demand for environmental protection had the second highest loading (.74), followed by perceived ill-health. The loading of beliefs in environmental causes of disease was the lowest (.24) which means that environmental concern is moderately related to this factor.

4.3.3. Structural Equation Model

The model in Figure 5 already demonstrated the utility of the four-factor structure of environmental concern. Next, the three exogenous variables were added to the model. Two exogenous constructs, residence (d10) and Muslim religious affiliation (d11), were measured by single items. A construct measured with only one item can be included in a structural equation model if the error of the observed variable is constrained to zero, meaning that in the model, the observed variable is fixed to be measured without error (Garson, 2004). Therefore, the variances of the error terms of residence and Muslim religious affiliation were fixed to zero. The third exogenous construct, socio-economic status (SES), was measured with two items, education (d4) and income (d5) (Pearson's r=.355). Higher scores on the SES construct could be interpreted as reflecting a greater likelihood of being in the intelligentsia/elite in the post-communist societies (Fuller 2000). Covariances were added between the three exogenous variables "residence", "Muslim" and "SES" according to requirements for identification of SEM.

Next, a causal structure was posited among these exogenous latent variables and the endogenous constructs "ill-health", "beliefs env. diseases", "envir.quality" and "political demand". The paths were specified according to the hypothesized theoretical model predicting political demand for environmental protection. The postulated causal structure is shown in Figure 7.

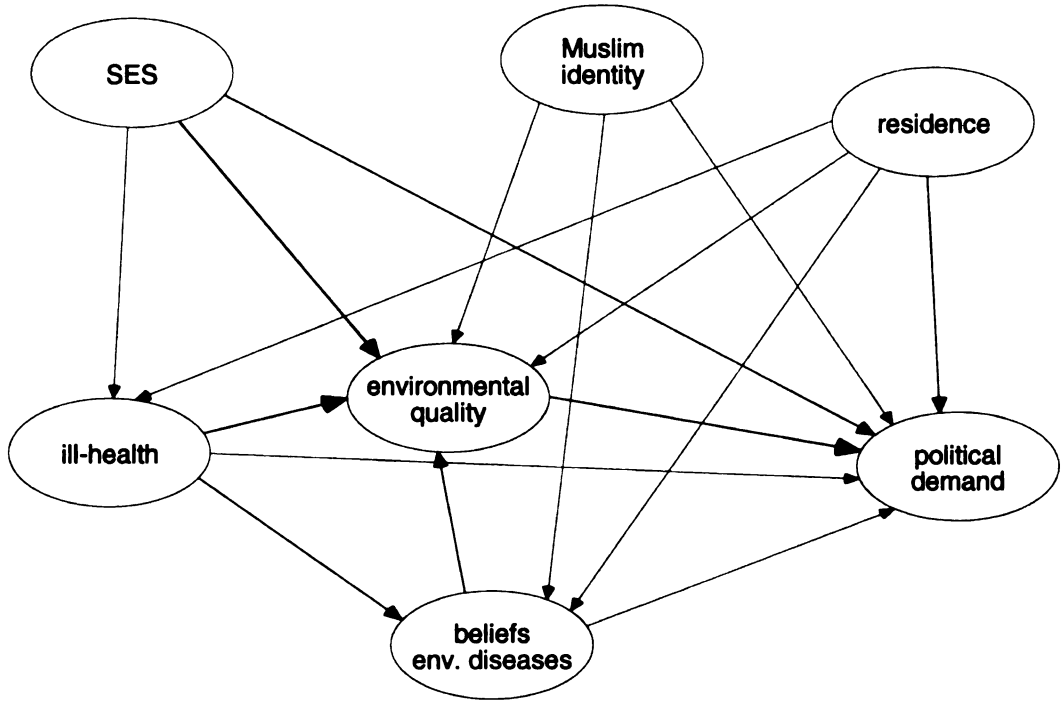

Figure 7. Structural equation model of political demand for environmental protection. Solution 1

The estimation of the hypothesized model showed adequate fit – chi-square=1633.23, *df*=172, *p*<.001, GFI=.97, *CFI*=.94, *RMSEA*=.04 ($CI_{90\%}$ .04÷ .05), *PCLOSE*=1.00. The test for observations farthest from the centroid (outliers) influential cases showed 100 cases with Mahalanobis d^2 distance between 47.17 and 87.66. To meet the assumptions of structural equation modelling these cases were deleted from subsequent analysis. Also, almost half of the indicator

variables did not meet the requirement of normality - the skewness was between -.003 and -2.56.

In structural equation modelling, the estimation of model parameters with non-normal data requires bootstrapping (Byrne, 2001). The bootstrap technique creates multiple subsamples from an original datafile and examines parameter distributions relative to each of these spawned samples. These distributions serve as a bootstrap sampling distribution which has its own mean and standard error. Therefore, in this study, the estimation of model parameters was done with bootstrapping.

The examination of the path coefficients of solution 1 showed that several of them were not significant at .05 level. In particular the coefficients of the paths leading from Muslim to each of the four endogenous latent variables were non-significant. This means that Muslim identity has no influence on the environment and health constructs in the model and was therefore deleted from the model. In addition, the following path coefficients were not significant: "residence→envir. quality", "residence→ill-health" and "SES→belif env.causes". In the interest of scientific parsimony, these paths were deleted from the model. The final structural equation model of political demand for environmental protection is shown in figure 8. Figure 8 also shows the estimated values of the path coefficients. The dashed lines represent the paths with coefficients below .10.

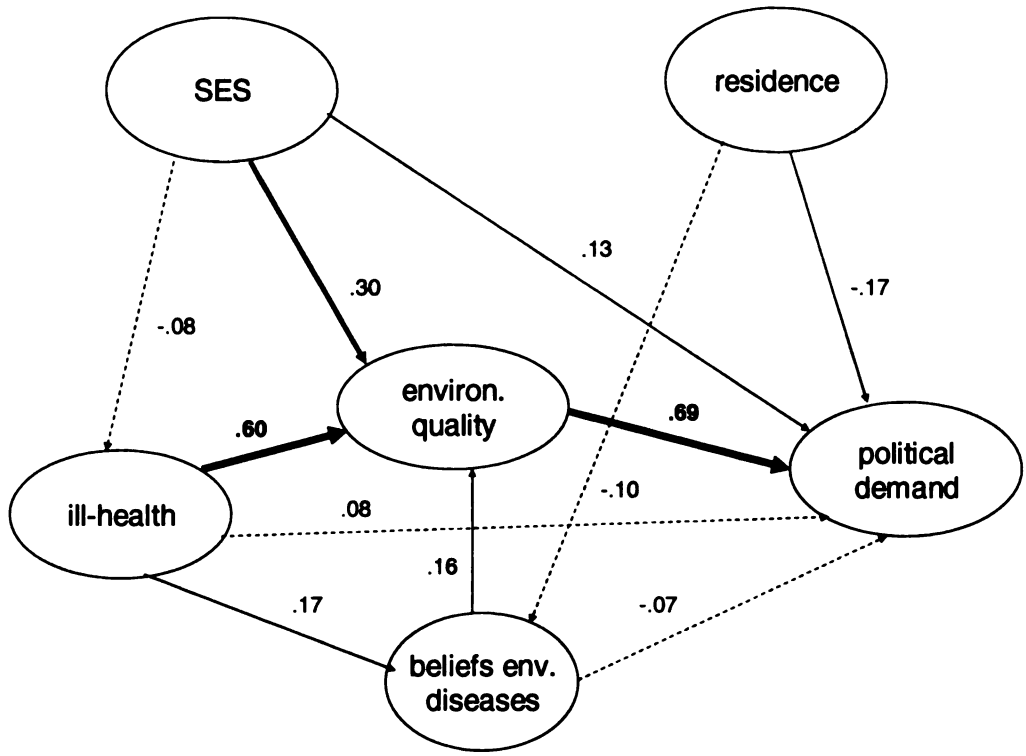

Figure 8. Structural equation model of political demand for environmental protection. Final Solution

The final solution had adequate fit, chi-square=1544.11, *df*=159, *p*<.001, GFI=.97, *CFI*=.95, *RMSEA*=.04 ($CI_{90\%}$ .04÷.05), *PCLOSE*=1.00. This model solution was validated by testing its invariance across calibration/validation samples. For the purposes of the validation procedure, the original sample was randomly split into two sub-samples. Sample A (*N*=2193) was used as the calibration group, and sample B (*N*=2194) as the validation group. The two group baseline model had chi-square=1776.79 with 318 degrees of freedom. In structural equations, testing for invariance of parameters across groups is accomplished by placing constraints on parameters; i.e., the parameters are specified as being invariant (equivalent) across groups (Byrne, 2001). The model

with constrained path coefficients between the latent variables had chi-square=1782.18, *df*=331. The comparison of this model with the baseline model yielded a chi-square difference of 5.39 with 13 degrees of freedom, which was not statistically significant at the .05 probability level, which means that the equality constraints hold across the validation and the calibration group.

Similar procedure was repeated with the subsamples from the Balkans and Central Asia, where the first one (n=2000) served as calibration, and the second one (n=4498) as validation sample. The chi-square difference between the baseline model and the model with constrained parameters was 20.11 with 13 degrees of freedom, which was not statistically significant at the .05 probability level. This allowed the conclusion that equality constraints hold across the regions as well, i.e. the model is the same in the Balkans and Central Asia..

The means and the standard errors of the standardized path coefficients produced with bootstrapping are shown in table 10.

Table 10 Structural equation model of political demand for environmental protection. Path coefficients

Paths			Standardized Coefficients		*p*
			Mean	SE	
envir.quality	→	political demand	0.69	0.03	<.001
ill-health	→	envir.quality	0.60	0.02	<.001
SES	→	envir.quality	0.30	0.03	<.001
ill-health	→	beliefs env.diseases	0.18	0.02	<.001
beliefs env.diseases	→	envir.quality	0.16	0.02	<.001
residence	→	political demand	-0.17	0.02	<.001
SES	→	political demand	0.13	0.03	<.001
residence	→	beliefs env.diseases	-0.10	0.02	<.001
SES	→	ill-health	-0.08	0.03	<0.01
beliefs env.diseases	→	political demand	-0.07	0.02	<.001
ill-health	→	political demand	0.08	0.03	<.05

The significance tests of the path coefficients tested the structural hypotheses (SH) formulated in Chapter 3. The results show strong support (path coefficients >.60) for the following structural hypotheses:

- SH5: The higher the concern about the quality of the environment, the stronger is the political demand for environmental protection (path coefficient .69).
- SH1: The higher the perception of ill-health and the effects of the environment on it, the higher is the concern about the quality of the environment (path coefficient .60).

The structural model showed a moderate support for SH8, which predicted that the higher the socio-economic status of a person, the higher is his or her concern about the quality of the environment (path coefficient .30).

The following hypotheses were weakly supported by this model (path coefficients between .10 and .30):

- SH2: The higher the perception of ill-health and the effects of the environment on it, the stronger the belief that the environment causes diseases (path coefficient .17),
- SH3: The stronger the belief that the environment causes diseases, the higher the concern about the quality of the environment (path coefficient .16),
- SH9: The higher the SES of a person the stronger is his or her political demand for environmental protection (path coefficient .13)

The hypotheses regarding the influence of residence on the environment and health constructs were also not supported, as people in larger communities would be not more aware of environmental causes of diseases (SH11) and did not demand higher levels of environmental protection (SH13). The negative signs of the path coefficients linking "residence" to "belief env.diseases" (-.10), and to "political demand (-.17) suggest that people living in smaller communities are more likely to believe that the environment causes diseases and to demand higher levels of environmental protection than their counterparts living in larger settlements.

Finally, the analysis showed that Muslim religious affiliation did not significantly influence any of the constructs in the model and therefore rendered no support for SH14-16.

The squared multiple correlations (R^2) show the variance of each construct explained by the other variables in the model (table 11). R^2 was highest for "political demand" (.57), followed by "environ.quality" (.49). R^2 was lowest for "belief env.diseases" (.04) and "ill-health" (.01).

In sum, the model worked well in predicting political demand. This demand for higher levels of environmental protection stems mainly from the perception of poor quality of the environment, which in turn is determined by the perception of ill-health, by beliefs that environment causes diseases and by higher socio-economic status. The effect of perceived ill-health on political demand is mediated by the perception of environmental quality. The size of one' community of residence seems to have small negative effects on both political demand for environmental protection and belief that diseases are caused by the environment.

CHAPTER 5. DISCUSSION AND CONCLUSIONS

This final chapter will provide a summary and discussion of the results of this study. Study findings are discussed according to the research questions: (a) the impact of Soviet legacy on environment and health attitudes; (b) differences in risk perception for adults and children; (c) lay beliefs about environmental causes of diseases; (d) influence of Muslim culture on perceptions of environmental risks; (e) explanations of political demand for environmental protection; (f) structural models of environmental concern and political demand for environmental protection. The conclusions, the policy implications and the limitations of this study are presented at the end of the chapter.

5.1. The Impact of Soviet legacy

The first research question asked whether perception of the seriousness of environmental problems and political attitudes toward environmental protection are influenced by the Soviet legacy. It was hypothesized that people from the former Soviet Union who have been more exposed to the Soviet environmental paradigm would be less concerned about the environment and would be less supportive of environmental protection than those living in the Balkans.

5.1.1. Prevention vs. cure

The first group of hypotheses (H1 and H2) aimed to answer this research question addressed the levels of support for preventive approaches (public health and nature protection) as opposed to technological solutions (curative

medicine and environmental health). It was expected that Central Asians would be less supportive of these approaches than people in the Balkans

The results show that, contrary to what was expected, the respondents in Central Asia were more supportive than those in the Balkans of preventive approaches to both health and environmental protection. This difference was much bigger with regard to preventive approaches to health protection than to environmental protection. Every fifth respondent in the Balkans and every third in Central Asia said that public health was more important than medicine. However, such levels of support for public health are much lower than those reported in the United States, where almost half of the respondents give preference to public health over medicine[1](The Pew Environmental Health Commission and John Hopkins School of Public Health 2001). Why are people in the former Soviet republics more oriented toward public health than in the Balkans?

Soviet health policy emphasised the priority of prevention over treatment of diseases. From the founding of the Soviet Union in the early 1920s, the new Bolshevik regime was committed to the maximum development of health services. Public health was one of the showcases of the regime and a certain number of achievements have been credited to this system, such as the prevention and control of transmittable diseases through preventive medicine and hygiene, improvement in nutrition, and maternal and infant protection. However, success in the area of environmental health was not so great (Revel 2004). The public health system of the former Soviet Union was much more

[1] The question wording in the Pew Environmental Commission survey was identical

widely available than in the other Eastern Block countries. Bosnia and Herzegovina and Albania have inherited a different system of public health, which was focused more on science and practical research rather than on practical actions. There have been no major public health reforms in both the Balkans and Central Asia after the collapse of communism, which may explain these attitudes. Other studies of attitudes toward health in the former communist countries have found that the predominant view is that population health is largely a product of medical (curative) services (MacArthur and Shevkun 2002; Tkatchenko, McKee and Tsouros 2000). Such studies, however, were based on reviews of official documents and interviews with key informants, who were usually public health officials and scientists, and thus represented experts' views. In contrast, the results of this study show that lay people, particularly in Central Asia give higher priority to prevention of diseases (public health) than to curative medicine.

Another interesting fact was that, when respondents were faced with the dilemma to choose which is more important, public health or medicine, and given also the opportunity to choose both, the majority of the respondents in the Balkans (59%) and Central Asia (48%) selected both. In the United States only 22% said that public health and medicine are equally important. This suggests that the opinions regarding approaches in health protection in the countries from this study are less defined than in the United States. Another explanation could be that when respondents were not sure which approach they prefer they

escaped psychologically from making the choice by selecting the "both are equally important" option.

Public health is a means of promoting health and preventing disease through organized efforts of society. It is by definition a social approach to health and illness, which places the responsibility for the burden of disease on society and recognizes the importance of social determinants of health. In contrast, curative medicine often treats diseases in isolation and tries to find technological, not social solutions to health problems. As such, this approach is similar to the bio-medical model developed in the literature on sociology of health and illness (Freund and McGuire 1999). While the majority of experts in the former Soviet Union ascribe to a curative (bio-medical) model of health, the results of this study showed that at least one third of lay people clearly declare their support for a social/preventive (public health) model of health and almost one half consider that public health and curative medicine are equally important.

Inter-regional differences in support of preventive approaches in environmental protection were similar, though not so great as compared with support of public health. A slightly higher percentage of respondents (66% in the Balkans, and 57% in Central Asia) chose the middle category that both protection of nature and protection of health from pollution are equally important.

During the Soviet regime, one of the political imperatives was "Production regardless of the costs", whether economic, human and/or environmental (Revel 2004). Environmental protection was restricted to different conservation and preservation measures and environmental pollution was neglected. Reports on

the effects of environmental pollution on human health were often classified because such information would require measures that were seen to hamper economic development. The situation in the other former communist countries was more or less the same (French 1991). Therefore, among the various results of this "policy" were record pollution levels in certain regions, which have affected the health of populations. This could be one of the explanations for the higher preference for approaches to protecting human health from environmental risks, compared to the protection of the environment from pollution.

Social paradigms about the environment could offer another explanation. The New Environmental Paradigm (NEP) argues about protection of the environment for its own sake and not only for the sake of satisfying human needs. This paradigm views humans as part of the web of nature, which is fragile and with limited resources (ecocentric values). In contrast, the Human Exemptionalism Paradigm (HEP) in the West, and the similar Soviet Environmental Paradigm, emphasize mastery over nature and using nature to satisfy human needs; i.e. what Dunlap (1995) calls 'homocentric values'. Milbrath (1984) and Inglehart (1990) argued that there is a shift in mass environmental beliefs, which occurs mainly in the middle class of the Western Societies. HEP beliefs are being gradually replaced by NEP beliefs (Dunlap, Michelson and Stalker 2002; Olsen, Lodwick and Dunlap 1992). Therefore, the findings that, in the Balkans and Central Asia, more respondents chose homocentric approaches (satisfaction of human health needs) than eco-centric solutions (prevention of

environmental pollution) to environmental problems could an indicate incomplete shift to the new environmental paradigm in these societies.

5.1.2. Perceived seriousness of environmental problems

Analysis of the perception of environmental quality showed that as predicted by hypotheses 3 and 4, respondents in the Balkans were more likely than those in Central Asia to perceive the quality of their national and local environment as poor. Respondents in the Balkans were concerned more about the quality of the national than the local environment, while those in Central Asia were equally concerned about the quality of both the national and the local environment.

This does not mean that the environment is better in Central Asia. As shown in the introduction to this dissertation, there are serious environmental problems in Azerbaijan, Tajikistan and Turkmenistan, many of them inherited from the Soviet period. Concern for the environment is a relatively recent phenomenon and was not part of the Soviet environmental paradigm. According to the relative environmental deprivation theory, people who have not experienced anything better are less critical toward the quality of their own environment. People in central Asia are still relatively isolated from the cleaner and more prosperous Western Europe, as compared to their counterparts in the Balkans who have been interacting more intensively with their Western neighbours. Therefore, their lower lever of concern for the quality of their environment may be explained with relative environmental deprivation, i.e. that

Central Asians have not experienced a better environment with which they can compare their current situation.

5.1.3. Political attitudes and behavior

Comparison of attitudes toward governmental performance, spending on environmental protection, performance of national environmental health services and participation of citizens in environmental decision making also showed, as was expected, that people in the Balkans were more critical toward these aspects of environmental protection, than Central Asians. The difference in opinions was the largest with regard to satisfaction with national government. Respondents in the Balkan nations, which have higher levels of democracy than the republics in central Asia, were much more critical toward the performance of their governments to protect health from environmental risks. They were also much more likely to demand more governmental spending on environmental problems. Similar results have also been reported by Lang (2000) who found that citizens in South East Europe were largely dissatisfied with the performance of their governments on environmental issues.

The majority of respondents reported that they were not satisfied with the performance of the public health system to protect their health from environmental risks. Before 1990, public health services in these countries were organized more or less according to the Soviet model. Responsibility for public health and prevention laid with a heavily centralized system of Sanepid services in Central Asia and public health institutes in the Balkans. The failings of the old system were particularly related to the lack of power (for example, the Sanepid

services monitored air pollution, but often had no direct regulatory power). Nowadays, these systems suffer from poor funding, blurring of responsibilities and reduction in staff number. Public health is often low among the priorities of the national and local administrators, and funding cuts have affected public health agencies disproportionately (MacArthur and Shevkun 2002). Therefore it is not surprising that the majority of the respondents are not satisfied with their performance.

The level of public activism about environment and health was the same in the Balkans and Central Asia, i.e. the research hypothesis (H9) predicting higher activity in the Balkans was not supported. The levels of public activism in the countries from this study were similar to the levels found in other countries. For example, a 1999 opinion survey in Bulgaria found that 8% of the respondents were involved in protest actions to close down firms polluting the area where they live (Dimova 1995). A Eurobarometer survey carried out in 15 EU member countries in 2003 found that between 2% of the respondents in Finland and 15% in Luxembourg have participated in demonstrations against a project that could harm the environment (European Opinion Research Group 2003).

In sum, the first research question asked whether the Soviet legacy has influenced environmental attitudes. The answer to this question is a qualified yes; Soviet legacy has apparently influenced attitudes toward the environment and environmental health policy. People from the former Soviet republics were less concerned about the quality of their national and local environment, and less critical about the performance of public bodies to protect them from

environmental risks. The Soviet legacy has also affected values with regard to health and the environment. People in the former Soviet countries were much more likely to think that prevention is more important than cure for illness.

5.2. Differences in risks perception for current and future generations

The second research question was whether people perceive risks, to which they are exposed now differently from risks which may affect future generations. The answer to this question is clearly yes, as respondents do perceive risks differently depending on whether risks can affect them now or can affect generations to come. Air pollution, contaminated drinking water, and contaminated food were clearly perceived as more dangerous for people now, while chemicals, toxic waste and radiation were more of a concern for the future generations. The three risks of higher concern for people living now are risks which can be experienced in everyday life and are related to the necessary resources for life – air, water and food.

In the psychometric perspective to risk perception, the availability heuristic refers to personal experience of risks and how easy they can be recalled. People who have recently experienced polluted air, bad water or spoiled food are thus likely to blame these risks for the diseases and disabilities in their countries. Douglas and Wildavsky (1982) argue that people's perception of the temporal aspects of risks depends on the span of their attention and that the possibility of looking forward and backward is limited by social conditions. The individual's expectation of the future must be influenced by an assessment of how likely the

current set of social institutions is to endure. Douglas and Wildavsky further posit that a society that constructs itself toward long-term goals would be characterized by a particular selection of dangers and that each form of society shuts out perception of some dangers and highlights others.

Differences in risk perception found in this study suggest that people living in societies in transition (where social institutions are in a process of development) fail to project some risks to the future. Maybe, because the risks associated with air, water and food are familiar and common, people hope that appropriate solutions will be found to decrease the negative impact of these risks in the future.

5.3. Special sensitivity of children

The third research question asked whether children were perceived as more sensitive to environmental impacts than adults. The answer is, yes, for the most part they are perceived as more vulnerable. Comparison of the beliefs about environmental causes of diseases for adults and for children showed significant differences. In general, children were thought to be more susceptible to environmental impacts with regard to most mentioned diseases. The only exceptions were cancer and infertility, which were perceived as more related to the environment in adults than in children.

The findings about environmental causes of cancer were surprising. Medical science literature has documented very well the link between environmental risks and certain childhood cancers, such as leukaemia, caused

by electromagnetic fields and chemicals, and thyroid cancer caused by radionucleides (Tamburlini, von Ehrenstein and Bertollini 2002). However, lay people relate cancer to the environment more in adults than in children. One possible explanation for this would be that the above-mentioned types of childhood cancer are generally rare. Here, the availability heuristic from the psychometric perspective on risk perception may explain this difference. Since cancer prevalence is much higher in adults than in children, lay people can more easily recall cases of cancer in adults and would therefore tend to attribute them to the environment.

5.4. Cultural effects

The fourth research question asked about the influence of Muslim culture and Muslim identity on perceptions of environmental risks and on political attitudes toward the environment. Two groups of analyses provided an answer to this question.

The first group were the bivariate analyses of the influence of Muslim culture on the perception of environmental risks at population level. This was the comparison of risk perception between the Christian Republic Srpska and the Muslim federation of Bosnia and Herzegovina. As predicted, people in the Muslim entity were more concerned about risks from contamination, while those living in the Christian entity of Bosnia and Herzegovina were more concerned about technological risks.

These findings are in line with the cultural theory of risk perception. According to this theory, pollution, defilement, contagion, or impurity imply some harmful interference with natural processes. The technical ideas of pollution depend upon measures of change. However, in the selection of risks lay people are guided by non-technical ideas of pollution. Such ideas regard pollution as a contagious state, harmful, and caused by intervention from the outside, but mysterious in its origins. The dangerous impurity can be attributed to moral transgression and it is viewed as a penalty, plague or famine.

As shown in the literature review, Muslim cultures have developed distinct ways of dealing with environmental issues. The notion of purity, and cleanliness is very powerful in such cultures. The results of the analysis in Bosnia and Herzegovina have demonstrated that a Muslim society selects risks which carry with them the notion of contamination, impurity food and products, while a Christian society is more concerned about risks which are associated with modern technology (air pollution, radiation, occupational hazards).

The second group of multivariate analyses tested the effect of Muslim identity on political attitudes at the individual level. These were the linear regression model of political demand and the structural equation model of environmental concern. The linear regression model of political demand for environmental protection showed that Muslim identity was a significant predictor of political demand. The sign of the regression coefficient for Muslim identity was negative, which means that compared to Christians, Muslims were less likely to demand action by public bodies to protect the environment and health. However,

the value of the standardized regression coefficient was small (-.071), which means that the direct effect of Muslim identity on political demand is very small.

Muslim identity was also included as an exogenous variable in the structural equation model of environmental concern. It was hypothesized to have direct effects on perception of environmental quality, beliefs about environmental causes of diseases, and political demand. However, in the structural model, Muslim identity was not a significant predictor of any of these variables, and therefore had to be dropped from the final structural equation model of environmental concern.

It can be concluded from these results that Muslim culture does influence the perception of environmental risks, which is in line with the cultural theory of risk perception. However, Muslim identity does not have any meaningful effect on the "concern" component (political demand for environmental protection) and on the "environmental" component (perceived environmental quality and ill-health attributed to the environment) of environmental concern

5.5. Explanations of public demand for environmental protection

In the literature there are two major explanations of environmental concern. The first is that concern for the environment depends on social variables, such as age, gender, income, education, residence and religion. On the contrary, the environmental deprivation explanation posits that concern for environmental issues is determined by direct experience with environmental problems. The hierarchical regression model which tested these explanations

found that the predictive power of the variables measuring direct experience of environmental problems, such as perceived quality of the local environment, personal health status and its relation to the environment, was five times larger than the predictive power of the socio-demographic variables as a group. This result speaks strongly in favour of the environmental deprivation explanation of environmental concern.

Similarly, in the United States (Detroit area study) Mohai and Bryant (1998) found that variables measuring perceived environmental quality were the most influential predictors of environmental concern and that demographic variable had little influence. Using aggregate national level data from the Health of the Planet Survey, Dunlap and Mertig (1995) found that residents of poorer nations were more likely to feel that their health was negatively affected by the environment. Therefore, they argue that environmental problems should not be viewed only as matters of quality of life, but as a fundamental threat to human welfare. Dunlap and Mertig also found that residents of poorer nations perceive environmental problems as more serious and are more supportive of efforts to ameliorate them, compared to people living in the wealthier nations. According to them the high levels of environmental concern in poorer nations provide arguments against the hierarchy-of-needs and post-materialist explanation of environmental concern, which attribute concern about environmental issues to higher order needs and to concern of the middle class in affluent nations about quality of life.

5.6. Structure of environmental concern

The previous studies of the dimensionality of environmental concern focused only on the question of whether it is a uni- or multi-dimensional construct. Such studies have used confirmatory or exploratory factor analysis and have not considered causal relationships between the different components of environmental concern and the influence of social variables. Therefore the sixth research question was about which causal model best predicts environmental concern.

Confirmatory factor analysis of the data from the Balkans and central Asia showed that environmental concern can be conceived of as having four underlying factors comprised of three bio-physical components (ill-health, beliefs about environmental causes of diseases and perception of environmental quality) and one social component (political demand for environmental protection). These results confirm the findings of Guber (1996) that environmental concern in the United States is composed of several inter-correlated latent factors. Also, this analysis showed that environmental concern is almost identical to the perceived quality of the environment.

Confirmatory factor analysis allows for controlling both random and non-random sources of measurement error. Therefore the adequacy of the four factor structure of environmental and health attitudes which was demonstrated in this study raises important questions about the existence and sophistication of mass beliefs about environment and health in the Balkans and Central Asia. DeHaven-Smith (1988) suggested that multidimensionality should be viewed as lack of

constraint. However, the evidence of attitude stability across multiple measures suggests that public attitudes about environment and health in the Balkans and Central Asia represent a logical, structured and constrained belief system. Considerable care, however, should be taken in drawing conclusions about the quality and sophistication of those beliefs.

The results of modelling the causal structure of environmental concern (SEM) showed that political demand for environmental quality was directly predicted by concern for environmental quality. The latter mediated the effect of somatic change (ill-health) on political demand. The direct effect of lay beliefs about environmental causes of diseases was relatively small. The effect of this factor on political demand was also modified by concern for environmental quality.

The effect of social factors was relatively small. Of the three social factors postulated in the model, only socio-economic status position fared relatively well in predicting concern for environmental quality, and less in directly predicting political demand. It was not surprising to find that people with higher socio-economic status (higher income and higher education) were more likely to be concerned about the quality of the environment, and thus, to demand higher levels of environmental protection. This result is consistent with the findings of Lee and Norris (2000) that education and income are the strongest socio-demographic predictors of environmental concern in Eastern Europe.

The effect of residence on political demand was smaller and in the opposite direction from what was expected, i.e. residents in smaller villages were

more likely to express higher demands for environmental protection, and also stronger beliefs that the environment causes diseases, than urbanites. This result is interesting, given the compelling evidence in the literature that urban residents are much more concerned about environmental issues than their rural counterparts. One possible explanation for the higher demands of rural citizens for environmental protection would be that in the nations from this study the quality of the rural environment is worse than in the cities. However, such an explanation would not hold true given the fact that residence had no effect on the concern for environmental quality. Therefore, the roots of the higher political demand of rural citizens must be sought in the disparities in environmental policies between rural and urban populations.

The nations from this study, except Azerbaijan, have developed national environmental health action plans (NEHAPs) to address the most pressing environmental health threats. A recent evaluation of the NEHAPs in the European Region carried out by WHO demonstrated that such plans were primarily a governmental activity, concentrated at the central level, with little or no input from local authorities (Perlstadt and Ivanov 2004). The evaluation of the NEHAP of Albania showed that it was focused on activities which were perceived as a priority by central government experts (Ministry of Health, 2003). Albania has also developed local environmental health action plans but they were only for a few big cities and industrial agglomerations. None of the five countries has special policies and action plans addressing the specific needs of rural populations. Therefore, the finding of this study that rural populations have higher

levels of political demand could be explained by the lack of environmental health policies targeted at rural communities and the insufficient governmental action to protect health in rural areas from environmental risks.

5.7. Conclusions

In sum, the study of the attitudes and perceptions of environment and health in the Balkans and Central Asia showed that:

1. More than 10 years after the breakdown of the USSR, the Soviet legacy still has an influence on people's values, beliefs and attitudes. The Soviet legacy is associated with lower levels of concern for the environment and thus lower public demand for environmental protection. However, public health is one of the positive aspects of the Soviet legacy. The citizens of the former Soviet republics showed considerably higher levels of support for prevention than for curative approaches in health.

2. People living in societies in transition, with unstable social institutions, fail to project some risks into the future. Current risks are perceived differently from future risks. The perception of risks likely depends on how easily they can be recalled.

3. Children are biologically and socially susceptible to environmental effects on their health. This opinion was shared by the majority of people in the Balkans and Central Asia. However, some diseases with

higher prevalence in adults are perceived as more related to the environment in adults than in children.

4. Muslim culture has an effect on the selection of risks, but no effect on the components of environmental concern.
5. Political demand for environmental protection is explained better by people's perceived exposure to environmental problems, rather than by social and demographic variables
6. Environmental and health attitudes in the Balkans and Central Asia represent a logical, structured and constrained belief system comprised of four factors. Political demand for environmental protection depends primarily on level of concern for the quality of the environment and indirectly on the level of personal concerns about environmental effects on health.

5.8. Policy implications

The results of this study could have several implications for public policies on protecting health and the environment in the Balkans and Central Asia. The most important policy implications and recommendations are the following:

1. If one is interested in increasing popular demand for environmental protection then this study suggests providing more information about the quality of human environment and its linkages to health. This stems from the fact that:

a. perceived seriousness of environmental problem directly affects the level of public demand for environmental protection,

b. the effect of somatic change on the public demand for environmental protection is modified by the perceived seriousness of environmental problems,

c. lay beliefs about the linkages between environment and diseases increase the perceived seriousness of environmental problems

2. In organizing public participation campaigns, policy makers should take into account that:

   a. environmental problems are perceived by the elite as more serious,

   b. the elite has higher levels of political demand for environmental protection,

   c. the political demand for environmental protection of the elite is modified by its perception of the seriousness of environmental problems.

3. Past studies have suggested that rural residents are not interested or committed to environmental action. However, this study revealed that rural populations in post-communist Muslim societies express a

greater need for environmental protection, than the urbanites. This is supported by the findings that:

a. smaller communities have higher levels of political demand for environmental protection,

b. people in smaller communities are more likely to relate their diseases to the environment.

4. Groups wishing to promote environmental concern and action in post-communist Muslim societies should recognize that support for environmental protection is related to the penetration of Western values in such societies. In particular, this is suggested by the fact that people in the Balkans are more concerned about their environment and demand higher levels of environmental protection than Central Asians. Therefore, foreign direct investment and international financial assistance for environmental protection could affect public attitudes. When establishing priorities for such assistance, international donors need to take into account the cultural and temporal differences in the perception of environmental risks in the recipient countries

In sum, the results of this study suggest that environmental protection in the Balkans and central Asia can be improved by considering the health aspects of pollution, providing better public information, special attention to rural areas and wider public participation in international projects.

5.9. Limitations of the study

The limitations of this study arise from possible biases of the data. Such biases could stem from the respondents and the instrument.

In some circumstances, respondents may answer certain questionnaire items in a way that is socially desirable rather than say what they actually think. This depends of the general need for approval felt by an individual and the demands of the particular question (Nancarrow and Brace 2000). In this study several items measuring criticism toward government and public bodies may have evoked socially desirable answers. This might have been the case in highly authoritarian countries (Central Asia) where freedom of speech is suppressed. This problem was addressed by ensuring respondents of anonymity in analyzing their responses (see the Appendix). However, a potential social desirability bias should be taken into account in interpreting the findings that Central Asians are less critical of the performance of government and public bodies to protect health from environmental risks than people in the Balkans.

Also, the WHO/Gallup survey --the source of data for this study-- was carried out to serve policy needs for priority setting and planning of environmental health interventions at the national level, and not for a dissertation research. The questionnaire items were designed based on the policy approach to studying environmental concern and were not derived from attitudinal theory. Also, the author of this dissertation, who is a staff member of the WHO Regional Office for Europe, served as principle investigator of the WHO/Gallup survey.

APPENDIX

SURVEY INSTRUMENT

Hello! My name is.....

We are conducting a survey on the opinions and attitudes of people in this country on some important issues related to health and environment.

We suggest you to share your personal opinions and evaluations on the questions that we have included in this survey. Please answer carefully all the questions. Of course the interview is completely voluntary. If we come to a question you don't want to answer tell me please and we will move to the next question. You are free to withdraw from the interview at any time.
Your personal data and your answers to the questions are anonymous. After coding and processing the data all personal information from the questionnaires will be deleted.

If you have any questions about this survey you can contact us at....

Q 1. Technically, medicine focuses primarily on the treatment of people who are sick, while public health focuses primarily on protecting the population from disease. Having that in mind, which do you think is more important, -- public health, i.e. protecting people from diseases or medicine, i.e. treatment of sick people, or both are equally important? *[ROTATE]*

PUBLIC HEALTH
MEDICINE
BOTH EQUALLY IMPORTANT
DON'T KNOW/UNSURE
REFUSED

Q 2. Nature protection deals primarily with preserving wildlife, forests, rivers and seas, while environmental health deals with the protection of human health from environmental pollution. Which one is more important to you, -- protecting nature or protecting human health, or both are equally important? *[ROTATE]*

PROTECTING NATURE
PROTECTING HEALTH
BOTH EQUALLY IMPORTANT
DON'T KNOW /UNSURE
REFUSED

Q3. How would you evaluate the quality of the environment as a whole in this country according to this scale?

EXTRE-MELY BAD	VERY BAD	SOME-WHAT BAD	NOT BAD NOT GOOD	SOME-WHAT GOOD	VERY GOOD	EXTRE-MELY GOOD
1	2	3	4	5	6	7

Q 4. I am going to read some of the hazards from the environment that are generally believed to cause diseases and health problems. Which one of these do you think is the major cause of diseases and health problems in this country? (ROTATE, ONLY ONE CHOICE) *[First ask respondents to select major cause of diseases for the people now, and then for the future generation]*

AIR POLLUTION
CONTAMINATED DRINKING WATER
CONTAMINATED FOOD
CHEMICALS IN PRODUCTS
OCCUPATIONAL HAZARDS
TOXIC WASTE
NOISE
RADIATION
REFUSED

FOR PEOPLE LIVING NOW

FOR OUR CHILDREN AND GRAND CHILDREN, LET'S SAY 25 YEARS FROM NOW

Q5. I am going to read some diseases and health problems. For each one tell me please to what extent you think the environment plays a role in causing that health problem. *[Ask separately for adults and for children]*

	BIG DEAL	TO CERTAIN EXTENT	NOT AT ALL	
ALLERGIES				*FOR THE ADULTS*
ASTHMA				
COLDS/FLUES				
BIRTH DEFECTS				
CANCER				*FOR THE CHILDREN*
INFERTILITY				
LEARNING DISABILITY				
MENTAL DISORDERS				

REFUSED

Q6. Now if you have to evaluate the effect of the environment on your own health, where you will put yourself? *[show card]*

EXTRE-MELY BAD	VERY BAD	SOME-WHAT BAD	NOT BAD NOT GOOD	SOME-WHAT GOOD	VERY GOOD	EXTRE-MELY GOOD
1	2	3	4	5	6	7

Q 7. In your opinion, has the government done too little, too much or the right amount to address the health problems caused by environmental pollution in this country?

TOO LITTLE
TOO MUCH
THE RIGHT AMOUNT
DON'T KNOW
REFUSED

Q8. Do you think *[this country]* should spend more, less or the same amount of money than currently to protect health from environmental hazards? *[ROTATE]* [*only one choice*]

MORE
SAME
LESS
DON'T KNOW
REFUSED

Q 9. Protecting human health from environmental hazards is the responsibility of many different institutions. However, according to you, which one should have the overall responsibility in this country to protect health from environmental hazards such as air, drinking water, waste, radiation, food, working conditions? (ROTATE) [*only one choice*]

PUBLIC HEALTH INSPECTORATE *[in the country questionnaire replace with the country specific name of the regional/local institution dealing with public health issues and control*]
ENVIRONMENTAL INSPECTORATE *[in the country questionnaire replace with the country specific name of the regional/local institution dealing with protection of the environment and nature]*
BUSINESS AND INDUSTRY
NON-GOVERNMENTAL ORGANIZATIONS
LOCAL AUTHORITIES
DON'T KNOW/UNSURE
REFUSED

Q10. HOW GOOD A JOB is the regional public health [*country specific name, same as Q9*] doing to Protect human Health from environmental Hazards such as air, drinking water, waste, radiation, foods, working conditions?

VERY GOOD
SOMEWHAT GOOD
SOMEWHAT BAD
VERY BAD
DON'T KNOW/UNSURE
REFUSED

Q11. Now think about the environment in this city/village. How would you evaluate it according to this scale? *[show card]*

EXTRE-MELY BAD	VERY BAD	SOME-WHAT BAD	NOT BAD NOT GOOD	SOME-WHAT GOOD	VERY GOOD	EXTRE-MELY GOOD
1	2	3	4	5	6	7

Q 12. In your opinion, to what extent do citizens in your municipality have a say when decisions about environment and health are made by the local government, -- would you say a big deal, a certain extent, or not at all?

BIG DEAL
A CERTAIN EXTENT
NOT AT ALL
DON'T KNOW
REFUSED

Q 13. In the last five years, did you ever participate in any public events related to health concerns about environmental pollution, --like meetings, protests or petitions?

YES
NO
CAN'T REMEMBER/UNSURE
REFUSED

Q14. If you have to evaluate your own health according to this scale, where you would put yourself? *[show card]*

EXTRE-MELY BAD	VERY BAD	SOME-WHAT BAD	NOT BAD NOT GOOD	SOME-WHAT GOOD	VERY GOOD	EXTRE-MELY GOOD
1	2	3	4	5	6	7

Demographics

Q15. What was your age at your last birthday:
[Write number of years]

Q16. What educational degree or degrees did you receive?

NO EDUCATION AT ALL
PRIMARY EDUCATION
HIGH SCHOOL
COLLEGE
ACADEMIC DEGREE (MASTERS OR Ph.D)
REFUSED

Q17. Are your presently working full time, part time or are you self-employed, unemployed, student, retired, or looking after the house?

FULL TIME
PART TIME
UNEMPLOYED
STUDET
RETIRED
LOOKING AFTER THE HOUSE
REFUSED

Q18. Would you please tell me how much on average was your total monthly family income after taxes? This would include wages and salaries, net income from business or farm, pensions, rent and any other money received by all those people in the household who are related to you?
[Write exact amount in local currency]

Q19. How you define your ethnicity? Would you say you are a:

ALB	BIH	AZE	TJK	TKM
SHIPTAR	SERBIAN	AZERI	TAJIK	TURKMEN
GREEK	BOSNIAK	LESGUIN	UZBEK	RUSSIAN
	CROAT	KURD	RUSSIAN	UZBEK
	YUGOSLAV	TALYSH		TATAR
	OTHER	AVARI		JEW
		RUSSIAN		UKRAINIAN
		JEW		
		TATAR		
		OTHER		

OTHER
REFUSED

Q20. What is the religion of your kin?

ALB	BIH	AZE	TJK	TKM
ISLAM	ISLAM	ISLAM	ISLAM	ISLAM
CHRISTIAN	CHRISTIAN	CHRISTIAN	CHRISTIAN	CHRISTIAN
ORTHODOX	ORTHODOX	ORTHODOX		ORTHODOX
ROMAN	ROMAN	OTHER		OTHER
CATHOLIC	CATHOLIC	CHRISTIAN		CHRISTIAN
	PROTESTANT	JUDAISM		JUDAISM

OTHER
NOT RELIGIOUS
REFUSED

Interviewer please code:

Q21. Sex of the respondent:
MALE
FEMALE

Q22. How many people live in the settlement of the respondent?
200 001 and more
100 001 to 200 000
50 001 to 100 000
10 001 to 50 000
2 001 to 10 000
Up to 2 000

Q23. Entity (Only for Bosnia and Herzegovina)
Republic Srpska
Federation of Bosnia and Herzegovina

REFERENCES

1948. "Constitution of the World Health Organization."

Abu-Sway, Mustafa, and Abulaziz Sachedina. 1999. *Islam, the Environment & Health*: Islamic Medical Society of South Africa.

Al-Fangary, Ahmed Shawky. 2003. "The impact of Islam and its teachings on preservation of individual and public health."

Anderson, Alison. 1997. *Media, culture and the environment*. New Brunswick, NJ: Rutgers University Press.

Arcury, Thomas A., Sara A. Quandt, and Gregory B. Russell. 2002. "Pesticide safety among farm workers: perceived risk and perceived control as factors reflecting environmental justice." *Environmental Health Perspectives Supplements* 110:233-240.

Assenova, Margarita. 2000. "Islam in Bulgaria: Historical, Sociocultural, and Political Dimensions." *Briefing Notes on Islam, Society, and Politics* 3:4-8.

Baker, Susan, and Jehlicka (Eds.). 1998. *Dilemmas of transition: the environment democracy and economic reform in East Central Europe*. London, Portland: Frank Cass.

Balabanova, D.C., and Martin McKee. 2002. "Self-reported health in Bulgaria: levels and determinants." *Scandinavian Journal of Public Health* 30:306-312.

Balshelm, Martha. 2000. "A cancer death." Pp. 308-332 in *Illness and the environment: a reader in contested medicine*, edited by Valerie J. Gunter. New York: New York University Press.

Barolomeus, Arthur Herzberg, and Fazlun Khalid. 1998. "Religion and nature: The Abrahamic faiths' concepts of creation." Pp. 30-41 in *Spirit of the Environment: Religion, Value and Environmental Concern*, edited by Joy A. Palmer. London: Routledge.

Beck, Ulrich. 1992. *Risk society: towards a new modernity*. London: sage.

—. 1999. *World Risk Society*: Polity.

Becker, Marshall H. 1974. "The health belief model." Pp. 92-95 in *The health belief model and personal health behavior*. San Francisco: Society for Public Health Education, Inc.

Becker, Marshall H., and Irwin M. Rosenstock. 1989. "Psychological aspects of health related behavior." Pp. 284-305 in *Handbook of Medical sociology*, edited by Howard E. Freeman, Sol Levine, and Leo G. Reeder. Englewood Cliffs, N.J.: Prentice-Hall.

Bello, Dhimiter. 1997. "Perceiving environmental risks in a stressful and unstable society: the case of Albania." in *Department of Environmental Sciences & Policy*. Budapest: Central European University.

Bird, Chloe E., Peter Conrad, and Allen Fremont. 2000. "Medical sociology at the millennium." Pp. 1-10 in *Handbook of medical sociology*, edited by Allen Fremont. Upper saddle River, NJ: Prentice Hall.

Black, Alan. 1997. "Religion and environmentally protective behavior in Australia." *Social compass* 44:401-412.

Blake, Donald E. 2001. "Contextual effects on environmental attitudes and behavior." *Environment and Behavior* 33:708-725.

Blake, Elinor R. 1995. "Understanding outrage: how scientists can help bridge the risk perception gap." *Environmental Health Perspectives* 103:123-125.

Blaxter, Mildred. 1983. "The causes of diseases: Women talking." *Social Science & Medicine* 17:59-69.

Bloom, David E. 1995. "International public onion on the environment." *Science* 269:354-362.

Bobak, Martin, Hynek Pikhart, Clyde Hertzman, Richard Rose, and Michael Marmot. 1998. "Socio-economic factors, perceived control and self-reported health in Russia. A cross-sectional survey." *Social Science and Medicine* 47:269-279.

Bord, Richard J., and Robert E. O'Connor. 1997. "The gender gap in environmental attitudes: the case of perceives vulnerability to risk." *Social Science Quarterly* 78:830-840.

Botcheva, Liliana. 1996. "Focus and effectiveness of environmental activism in Eastern Europe: a comparative study of environmental movements." *Journal of Environment and Education* 5:292-304.

Brown, Phil, Steve Kroll-Smith, and Valerie J. Gunter. 2000. "Knowledge, citizens, and organization: an overview of environments, diseases, and social conflict." Pp. 9-25 in *Illness and the environment: a reader in contested medicine*, edited by Valerie J. Gunter. New York: New York University Press.

Bugajski, Janusz. 2000. "Islam in the Balkans: Bridge or Barrier." *Briefing Notes on Islam, Society, and Politics* 3:1-4.

Bullard, Robert D. 2000. *Dumping in the Dixie: Race, class, and environmental quality*. Westview Press.

Byrne, Barbara M. 2001. *Structural Equation Modeling with AMOS: Basic Concepts, Applications and Programming*. Mahwah, NJ: Lawrence Erlbaum Ass. Pub.

Carman, Christopher Jan. 1998. "Dimensions of environmental policy support in the United States." *Social Science Quarterly* 79:717-733.

Catton, William R., and Riley E. Dunlap. 1978. "Environmental sociology - new paradigm." 13:41-49.

CIA. 2003. "World Fact Book."

Cultural Safety Intervention. 2003. "Islamic based safety."

Davidson, D.J., and W.R. Freudenburg. 1996. "Gender and environmental risk concerns." *Environment and Behavior* 28:302-339.

de Bruin, A., H.S.J. Picavet, and A. Nossikov. 1996. *Health interview surveys: Towards international harmonization of methods and instruments*. Copenhagen: WHO.

Dietz, Thomas, Paul C. Stern, and Gregory A. Guagnano. 1998. "Social structural and social psychological bases of environmental concern." *Environment and Behavior* 30.

Dimova, Lilia. 1995. "Bulgarians on environmental problems." Pp. 32. Sofia.

Douglas, Mary, and Aaron B. Wildavsky. 1982. *Risk and culture : an essay on the selection of technical and environmental dangers*. Berkeley: University of California Press.

Dunlap, Riley E. 1992. "Trends in public opinion toward environmental issues: 1965-1990." Pp. 89-116 in *American environmentalism: the U.S. environmental movement, 1970-1990*, edited by Angela G. Mertig. Philadelphia: Taylor & Francis.

—. 1994. "International attitudes toward environment and development." Pp. 115-126 in *Green Globe Yearbook of International Co-operation on Environment and Development*, edited by Helge Ole Bergesen and Georg Parmann. Oxford: Oxford University Press.

—. 1995. "Public opinion and environmental policy." Pp. 63-114 in *Environmental politics and policy: theories and evidence*, edited by James P. Lester. Durham: Duke University Press.

Dunlap, Riley E., George H. Jr. Gallup, and Alec M. Gallup. 1993a. "Health of the planet: results of a 1992 international environmental opinion survey of citizens in 24 nations." Princeton, NJ: The George H. Gallup International Institute.

—. 1993b. "Of global concern: results of the Health of the Planet Survey." *Environment* 35:6-19.

Dunlap, Riley E., and Robert Emmet Jones. 2002. "Environmental concern: Conceptual and measurement issues." Pp. 482-524 in *Handbook of environmental sociology*, edited by William Michelson. Wesport, CT: Greenwood Press.

Dunlap, Riley E., and Angela G. Mertig. 1995. "Global concern for the environment: is affluence a prerequisite?" *Journal of Social Issues* 51:121-137.

—. 1997. "Global environmental concern: An anomaly for postmaterialism." *Social Science Quarterly* 78:24-29.

Dunlap, Riley E., William Michelson, and Glenn Stalker. 2002. "Environmental Sociology: An Introduction." Pp. 1-32 in *Handbook of environmental sociology*, edited by Riley E. Dunlap and William Michelson. Wesport, CT: Greenwood Press.

Dunlap, Riley E., and Rik Scarce. 1991. "The polls - poll trends, environmental problems and protection." *Public Opinion Quarterly* 55:651-672.

Dunlap, Riley E., Kent D. Van Liere, Angela G. Mertig, and Robert Emmet Jones. 2000. "Measuring endorsement of the New Ecological Paradigm: a revised NEP scale." *Journal of Social Issues* 56:425-442.

Dutton, Yassin. 1998. "Islamic law and the environment." in *Conference on Islam and Ecology*. Harvard Center for World Religions.

Eckersley, Robyn. 1989. "Green politics and the new class: selfishness or virtue?" *Political studies* 37:205-223.

Ellis, R.J., and F. Thompson. 1997. "Culture and the environment in the Pacific Northwest." *American Political Science Review* 91:885-897.

Emigh, Rebecca Jean, Eva Fodor, and Iván Szelényi. 2001. "The racialization and feminization of poverty?" Pp. 1-32 in *Poverty, ethnicity, and gender in*

Eastern Europe during the market transition, edited by Rebecca Jean Emigh and Iván Szelényi. Westport, CT: Praeger Publishers.

European Opinion Research Group. 2003. "Smoking and the environment: actions and attitudes. Report of Special Eurobarometer 193/Wave 58.2." Brussels: European Commission.

Feshbach, Murray, and Alfred Friendly Jr. 1992. *Ecocide in the USSR: Health and Nature Under Siege*. New York: BasicBooks.

Fitzpatrick, Kevin, and Mark LaGory. 2000. *Unhealthy places: the ecology of risk in the urban landscape*. New York: Routledge.

Foltz, Richard. 2000. "Is there an Islamic environmentalism?" *Environmental Ethics* 22:63-72.

French, H.F. 1991. "Green revolutions: Environmental reconstruction in Eastern Europe and the Soviet Union." *The Columbia Journal of World Business* 26:28-51.

Freudenberg, Nicholas, and Carol Steinsapir. 1992. "Not in our backyards; the grassroots environmental movement." Pp. 27-38 in *American environmentalism: the U.S. environmental movement, 1970-1990*, edited by Angela G. Mertig. Philadelphia: Taylor & Francis.

Freund, Peter E.S., and Meredith B. McGuire. 1999. *Health, Illness and the Social Body: A Critical Sociology*. Upper Saddle River, NJ: Prentice Hall.

Fuller, Linda. 2000. "Socialism and the transition in East and Central Europe: the homogeneity paradigm, class and economic inefficiency." *Annual Review of Sociology*:585-609.

Gardiner, Rosalie. 2000. "Foreign Direct Investment: A Lead Driver for Sustainable Development?" Pp. 9. London: UNED Forum.

Garson, David G. 2004. "Structural equation modeling, in PA765 Statnotes: an online textbook."

Gilmore, Anna B.C., Martin McKee, and Richard Rose. 2002. "Determinants of and inequalities in self-perceived health in Ukraine." *Social Science and Medicine* 55:2177-2188.

Gooch, Geoffrey D. 1995. "Environmental beliefs and attitudes in Sweden and the Baltic States." *Environment and Behavior* 27:513-539.

Gostling, Louisa, and Mike Edwards. 1995. *Toolkits: a practical guide to assessment, monitoring, review and evaluation*: Save the Children.

Greenbaum, Allan. 1995. "Taking stock of two decades of research on the social bases of environmental concern." Pp. 125-152 in *Environmental Sociology: Theory and Practice*, edited by Eric Ouellet: Captus Press.

Grey, E.D. 1979. *Green paradise lost.* Wellesley, MA: Roundtable Press.

Guber, Deborah Lynn. 1996. "Environmental concern and the dimensionality problem: a new approach to an old predicament." *Social Science Quarterly* 77:644-662.

—. 2003. *The Grassroots of a Green Revolution.* Cambridge, MA: The MIT Press.

Hand, Carl. M., and Kent D. Van Liere. 1984. "Religion, Mastery-Over-Nature, and Environmental Concern." *Social Forces* 63:555-570.

Harry, J. 1971. "Work and leisure: situational attitudes." *Pacific sociological review* 14:301-309.

Helman, Cecil. 1978. "'Feed a cold, starve a fever' -- Folk models of infection in an English suburban community and their relation to medical treatment." *Culture, Medicine, and Psychiatry* 2:107-137.

Hope, Marjorie, and James Young. 1994. "Islam and Ecology." Cross Currents.

Inglehart, Ronald. 1990. *Culture shift in advanced industrial society.* Princeton, NJ: Princeton University Press.

—. 1997. *Modernization and Postmodernization.* Princeton, NJ: Princeton University Press.

Ivanov, Ivan D. 2001. "Free rider syndrome hits environmental health." *European Bulletin on Environmental Health* Spring.

Ivanov, Ivan D., Lucianne Licari, and R. Bertollini (Eds.). 2004. *Health and the Environment in the WHO European Region: Situation and Policy at the beginning of the 21st Century.* Copenhagen: WHO Regional Office for Europe.

Jancar-Webster, Barbara. 1993. "Introduction." in *Environmental action in Eastern Europe*, edited by Barbara Jancar-Webster. New York, London, England: M.E. Sharpe, Armonx.

Jehlicka, P., and T. Kostelecky. 1995. "Czechoslovakia: Greens in a post-communist society." Pp. 208-231 in *The Green Challenge: The Development of Green Parties in Europe*, edited by Chris Rootes. New York: Routledge.

Johnson, Stephen M. 2001. "Economics v. equity II: the European experience." *Washington and Lee Law review* 58:417-486.

Jones, Robert Emmet, and Lewis F. Carter. 1994. "Concern for the environment among black Americans: an assessment of common assumptions." *Social Science Quarterly* 75:560-579.

Jones, Robert Emmet, and Riley E. Dunlap. 1992. "The social bases of environmental concern: have they changed over time?" *Rural Sociology* 57:28-47.

Jones, Robert Emmet, J. Mark Fly, and H.Ken Cordell. 1999. "How green is my valley? Tackling rural and urban environmentalism in the Southern Appalachian Ecoregion." *Rural Sociology* 64:482-499.

Kanagy, Canrad L., and Hart M. Nelsen. 1995. "Religion and environmental concern: Challenging the dominant assumptions." *Review of religious research* 37:33-45.

Karlsen, Saffron, James Y. Nazroo, and Rob Stephenson. 2002. "Ethnicity, environment and health: putting ethnic inequalities in health in their place." *Social Science and Medicine* 55:1647-1661.

Kawachi, Ichiro. 2000. "Income inequality and health." Pp. 76-94 in *Social Epidemiology*, edited by Ichiro Kawachi: Oxford University Press.

Kraus, Nancy, Tornbjorn Malmfors, and Paul Slovic. 2000. "Intuitive toxicology: expert and lay judgment of chemical risks." Pp. 285-314 in *The perception of risk*, edited by Paul Slovic. Sterling, VA: Earthscan.

Kroll-Smith, Steve, Phil Brown, and Valerie J. Gunter. 2000a. "Environment and disease in the postnatural world." Pp. 1-5 in *Illness and the environment: a reader in contested medicine*, edited by Valerie J. Gunter. New York: New York University Press.

— (Eds.). 2000b. *Illness and Environment: A Reader in Contested Medicine*. New York: New York University Press.

Kroll-Smith, Steve, and H. Hugh Floyd. 1997. *Bodies in protest: Environmental illness and the struggle over medical knowledge*. New York: New York University Press.

—. 2000. "Environmental illness as a practical epistemology and a source of professional confusion." Pp. 72-91 in *Illness and the environment: a reader in contested medicine*, edited by Valerie J. Gunter. New York: New York University Press.

Lang, Stefanie. 2000. "Greener with accession: Comparative report on public perceptions of the EU accession process and the environment in Hungary, FYR Macedonia and Romania." Pp. 109. Szentendre: Regional Environmental Center.

Lavigne, Marie. 2000. "Ten years of transition: a review article." *Communist and Post-Communist Studies* 33:475-483.

Lawson, Lynn. 2000. "Notes from a human canary." Pp. 333-341 in *Illness and the environment: a reader in contested medicine*, edited by Valerie J. Gunter. New York: New York University Press.

Lee, Aie-Rie, and James A. Norris. 2000. "Attitudes toward environmental issues in East Europe." *International Journal of Public Opinion Research* 12:372-397.

Lewis, Bernard. 2002. *What Went Wrong?* London: Phoenix.

Link, Bruce G., and Jo Phelan. 1995. "Social conditions as fundamental cause of disease." *Journal of Health and Social Behavior* Extra issue:80-94.

—. 2000. "Evaluating the fundamental cause explanation for social disparities in health." Pp. 33-46 in *Handbook of medical sociology*, edited by Allen Fremont. Upper saddle River, NJ: Prentice Hall.

Lowe, George D., and Thomas K. Pinhey. 1982. "Rural-urban differences in support for environmental protection." *Rural Sociology* 47:114-128.

Lynch, John, and George Kaplan. 2000. "Socioeconomic position." Pp. 13-35 in *Social Epidemiology*, edited by Ichiro Kawachi: Oxford University Press.

MacArthur, Ian, and Elena Shevkun. 2002. "Restructuring public health services." in *Health care in central Asia*, edited by Martin McKee, Judith Healy, and Jane Falkingham. Buckingham: Open University Press.

MacGregor, Donald G., and Raymond Fleming. 1996. "Risk perception and symptom reporting." *Risk Analysis* 16:773-783.

Maghrebi, Nabil. 1998. "Environmental risks and financial returns: conflicts and compromises." in *Conference on Islam and ecology*. Harvard Center for World Religions.

Magyari, Nándor L., Enikö Magyiari-Vincze, Livia Popescu, and Troian Rotariu. 2001. "The social construction of Romanian poverty: The impact of ethnic and gender distinctions." Pp. 123-156 in *Poverty, ethnicity and gender in eastern Europe during the market transition*, edited by Rebecca Jean Emigh and Iván Szelényi. Westport, CT: Praeger Publishers.

Malashenko, Aleksei. 1998. "Central Asia: from Communism to Democracy and Islam?" Pp. 51-65 in *The Christian-Muslim Frontier: Chaos, Clash or Dialogue*, edited by Jorgen S. Nielsen. London: I.B.Tauris Publ.

Marmot, Michael, M. Kogevinas, and M.A. Elston. 1987. "Social/economic status and disease." *Archives of research in public health* 8:111-135.

McBeth, M.K. 1996. "The environment v. the economy: attitudes of state rural development officials." *Spectrum* Winter:17-27.

McBeth, Mark K., and Keith Bennett. 1998. "Local elected officials and environmental policy: does rural matter anymore?" *The Social Science Journal* 35:577-588.

McEwen, J., S.M. Hunt, and S.P. McKenna. 1987. "A measure of perceived health: the Nottingham health profile." Pp. 590-603 in *Measurement in health promotion and protection*, edited by Vera D.L. Carstairs. Copenhagen: WHO.

Mertig, Angela G., and Riley E. Dunlap. 1995. "Public approval of environmental protection and other new social movement goals in Western Europe and the United States." *International Journal of Public Opinion Research* 7:145-155.

—. 2001. "Environmentalism, new social movements, and the New Class: a cross-national investigation." *Rural Sociology* 66:113-136.

Mertig, Angela G., Riley E. Dunlap, and Denton E. Morrison. 2002. "The environmental movement in the United States." Pp. 448-481 in *Handbook of Environmental Sociology*, edited by William Michelson. Westport, CO: Greenwood Press.

Mies, M., and V. Shiva. 1993. *Ecofeminism*. Hallifax: Zed.

Milbrath, L. 1984. *Environmentalists: vanguard for a new society*. Albany: State University of New York Press.

Mirovitskaya, Natalia. 1998. "The environmental movement in the former Soviet Union." in *Environment and Society in Eastern Europe*, edited by Ian Welsh: Longman.

Mirowsky, John, Catherine E. Ross, and John Reynolds. 2000. "Links between social status and health status." Pp. 47-67 in *Handbook of medical sociology*, edited by Allen Fremont. Upper saddle River, NJ: Prentice Hall.

Mohai, Paul. 1990. "Black and white differences in environmental concern and activism: evidence from a national survey." in *Rural sociological society*.

—. 1991. "Gender differences in environmentalism: evidence from a national survey." Rural sociological society.

Mohai, Paul, and Bunyan Bryant. 1992. *Race and the incidence of environmental hazards: a time for discourse.* Boulder, CO: Westview Press.

—. 1998. "Is there a "race" effect on concern for environmental quality?" *Public Opinion Quarterly* 62:475-505.

Mohai, Paul, and Ben W Twight. 1989. "Age, social integration, and concern for the environment." in *Rural sociological society.* `.

Moum, Torbjorn. 1992. "Self-assessed health among Norwegian adults." *Social Science and Medicine* 35:935-945.

Mueller, Daniel. 1986. "Chapters 1, 2, 3, 7 and 8." Pp. 1-33, 57-96 in *Measuring social attitudes: A handbook for researchers and practitioners.* New York: Teachers College, Columbia University.

Murphy, Raymond. 1994. *Rationality and nature.* Boulder, Colorado: Westview Press.

Nancarrow, Clive, and Ian Brace. 2000. "Saying the "right thing": Coping with Social Desirability Bias in Marketing Research." *Bristol Business School Teaching and Research Review.*11.

NPSIA. 2004. "Country Indicators for Foreign Policy." Carleton University.

Olsen, Marvin E., Dora G. Lodwick, and Riley E. Dunlap. 1992. *Viewing the world ecologically.* San Francisco: Westview Press.

Parker, Julia Dawn, and Maureen H. McDonough. 1999. "Environmentalism of African Americans: An analysis of the subculture and barriers theories." *Environment and Behavior* 31:155-177.

Parsons, Talcott. 1951. *The social system.* New York: The Free Press.

—. 1970. "Social structure and dynamic process: the case of modern medical practice." Pp. 428-479 in *The Social System.* London: Routledge & Kegan.

Perlstadt, Harry, and Ivan D. Ivanov. 2004. "The Environment and Health Process in Europe: Evaluation." in *Health and the Environment in the WHO European region: Situation and Policy at the Beginning of the 21st Century [forthcoming]*, edited by Ivan D. Ivanov, Lucianne Licari, and Roberto Bertollini. Copenhagen: WHO Regional Office for Europe.

Pierce, John C., Nicholas P. Lovrich, Jr., Taketsugu Tsurutani, and Takematsu Abe. 1987. "Environmental belief systems among Japanese and American elites and public." *Political Behavior* 9:139-159.

Power, Mick. 2003. "Development of a common instrument for quality of life." Pp. 145-159 in *EUROHIS: developing Common Instruments for Health Surveys*, edited by Claire Gudex. Amsterdam: OIS Press.

Redmond, Gerry, Sylke Viola Schepf, and Marc Suhrcke. 2002. "Attitudes to inequality after ten years of transition." Pp. 24. Florence: UNICEF Innocenti Research Centre.

Revel, Jean-Pierre. 2004. "Health concerns in the ex-USSR." Pp. 8. Geneva: Health relief service, International Federation of the Red Cross and Red Crescent Societies.

Robert, Stephanie A., and James S. House. 2000. "Socio-economic inequalities in health: and enduring sociological problem." Pp. 79-97 in *Handbook of medical sociology*, edited by Allen Fremont. Upper saddle River, NJ: Prentice Hall.

Rosenstock, Irwin M. 2001. "Historical origins of the health belief model." Pp. 92-96 in *Readings in medical sociology*, edited by Duane A. Matcha. Boston: Allyn and Bacon.

Rusinski, M. 1991. "Environment." in *Poland in the 1990s: Economy and Society in transition*, edited by Riszard Rapacki. New York: St. Martin's Press.

Salleh, Shaikh Mohd. 2001. "Being healthy and eating permitted and quality food."

Schumacker, Randall E., and Richard G. Lomax. 1996. *A beginner's guide to structural equation modeling*. Mahwah, New Jersey: Lawrence Erlbaum Ass. Publ.

Singleton, F. 1986. "Eastern Europe: Do the greens threaten the reds." *The World Today* 42:159-162.

Slovic, Paul. 1997. "Public perception of risk." *Journal of Environmental Health* 59:22-23.

—. 1998. "Perceived risk, trust and democracy." Pp. 181-192 in *The Earthscan reader in risk and modern society*, edited by Lynn Frewer. London: Earthscan Publications Ltd.

Smaje, Chris. 2000. "Race, ethnicity and health." Pp. 114-128 in *Handbook of medical sociology*, edited by Allen Fremont. Upper saddle River, NJ: Prentice Hall.

Smith, Kirk R., Carlos F. Corvalán, and Tord Kjellström. 1999. "How much global ill health is attributable to environmental factors." *Epidemiology* 10:573-584.

Steg, Linda, and Inge Sievers. 2000. "Cultural theory and individual perceptions of environmental risks." *Environment and Behavior* 32:250-269.

Stephens, Carolyn, and Simon Bullock. 2002. "Environmental justice: an issue for the health of the children of Europe and the world." Pp. 190-198 in *Children's health and environment: a review of evidence*, edited by Georgio Tamburlini, Ondine von Ehrenstein, and Roberto Bertollini. Copenhagen: World Health Organization regional Office for Europe & European Environment Agency.

Stern, P.C., Thomas Dietz, and Linda Kalof. 1993. "Value orientation, gender and environmental concern." *Environment and Behavior* 25:322-348.

Stern, Paul C., Thomas Dietz, and Gregory A. Guagnano. 1995. "The new ecological paradigm in social-psychological context." *Environment and Behavior* 27:723-743.

Swatos, William H. Jr. 1994. *Politics and religion in central and eastern Europe: traditions and transitions*. Westport, CN: Praeger Publishers.

Tamburlini, Georgio, Ondine von Ehrenstein, and Roberto Bertollini (Eds.). 2002. *Children's health and environment: a review of evidence*. Luxembourg: Office for Official Publications of the European Commission.

The Pew Environmental Health Commission, and John Hopkins School of Public Health. 2001. "Transition Report to the New Administration: Strengthening our Public Health Defence Against Environmental Threats." Washington.

Tkatchenko, Elena, Martin McKee, and Agis D. Tsouros. 2000. "Public health in Russia: the view from the inside." *Health Policy and Planning* 15:164-169.

UNDP. 2000. "Azerbaijan Human Development Report 2000." Pp. 83. Baku: UNDP Azerbaijan.

—. 2002a. "The Albanian response to the Millennium Development Goals."

—. 2002b. "Bosnia and Herzegovina: Human Development Report for 2002."

—. 2002c. "Human development report 2002."

—. 2003a. "Bosnia and Herzegovina: Human development report / Millennium Development Goals." Pp. 140: UNDP Bosnia and Herzegovina.

—. 2003b. "Human development report 2003." UNDP.

van Es, J.C., and J.E. Brown, Jr. 1974. "The rural-urban variable once more: some individual level observations." *Rural Sociology* 39:373-391.

Van Liere, Kent D., and Riley E. Dunlap. 1980. "The social bases of environmental concern: a review of hypotheses, explanations and empirical evidence." *Public Opinion Quarterly* 44:181-197.

Vannoni, F., A. Burgio, L. Quattrociocchi, G. Costa, and F. Faggiano. 1999. "Social differences and indicators of perceived health, chronic diseases, disability and life style in the 1994 ISTAT national health interview survey." *Epidemiologia Preventiva* 23:215-229.

Varga, Csaba, Istvan Kiss, and Istvan Ember. 2002. "The lack of environmental justice in Central and Eastern Europe." *Environmental Health Perspectives* 110:A 662-663.

Vaughan, Elaine. 1993. "Chronic exposure to an environmental hazard: risk perceptions and self-protective behavior." *Health Psychology* 21:74-85.

Waardenburg, Jacques. 1998. "Encounters between European civilization and Islam in history." Pp. 143-151 in *The Christian-Muslim Frontier: Chaos, Clash or Dialogue*, edited by Jorgen S. Nielsen. London: I.B.Tauris Publ.

Walker, Gordon, John Mooney, and Derek Pratts. 2000. "The people and the hazard: the spacial context of major accident hazard management in Britain." *Applied Georgaphy* 20:119-135.

Whalen, Carol K., Barbara Henker, Robin O'Neil, Judy Hollingshead, Adison Holman, and Barbara Moore. 1994. "Optimism in Children's Judgments of Health and Environmental Risks." *Health Psychology* 13:319-325.

WHO. 2002. *The World Health Report 2002: Reducing Risks, Promoting Healthy Lifestyle*. Geneva: WHO.

Wiedemann, Peter M. 1998. "Understanding risk perception." Pp. 335-353 in *Communicating about risks to environment and health in Europe*, edited by Philip C.R. Gray, Richard M. Stern, and Marco Biocca. Dodrecht: Kluwer Academic Publishers.

Wilkinson, Richard G. 2002. "Socio-economic status and health." Pp. 13-27 in *Investment for health: a discussion of the role of economic and social determinants*, edited by Eraka Bath. Copenhagen: WHO Regional Office for Europe.

World Bank. 2002a. "Data by country." World bank.

—. 2002b. "Distribution of income and consumption." World Bank.

Zagora, H. 1997. "Voda je dusa grada. Kultura prostora islamske tradicije i kult vode u Bosnu [Water is the soul of the town. Environmental culture in the Islamic tradition and the cult of water in Bosnia]." *Medicinski arhiv* 51:67-69.

Zaidi, Iqtidar H. 1981. "On the ethics of man's interaction with the environment: an Islamic approach." *Environmental Ethics* 3:35-47.

Ziegler, Charles E. 1985. "Soviet Images of the Environment." *British Journal of Political Science* 15:365-380.