Policy and practice

INEQUALITIES IN ENVIRONMENTAL EXPOSURE IN TWO KOSOVO* MUNICIPALITIES: INDICATIONS FOR INTERSECTORAL ACTION

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ABSTRACT

Exposure to environmental risks is a major cause of ill health. Depending on demographic, socioeconomic, ethnic and spatial determinants, exposure to environmental risk factors, as well as related health impacts, varies in different population groups. The objective of this study was to assess the impact of these determinants on environmental exposure and self-reported health in two Kosovo municipalities (Fushë Kosovë/Kosovo Polje and Obiliq/Obilić). The study analysed the Community Vulnerability Assessment Survey database provided by the United Nations Kosovo Team. The results showed marked inequalities in environmental risk exposure. The greatest inequalities were associated with socioeconomic determinants (especially low income and poor education) and ethnicity (Roma, Ashkali and Egyptian groups being most disadvantaged) but demographic and spatial determinants also played a role. Self-reported health was most strongly affected by socioeconomic and demographic determinants, but also showed inequalities in relation to some environmental variables. Ethnicity was not associated with variations in self-reported health. The findings illustrate the magnitude and distribution of environmental inequality within the local population and thereby help to identify potential target groups and priority areas for intersectoral action. Based on the survey results, specific conclusions were drawn on local interventions with a social and environmental focus.

Keywords: ENVIRONMENTAL RISK, HEALTH EQUITY, INTERSECTORAL ACTION, SOCIAL DETERMINANTS OF HEALTH

INTRODUCTION

ENVIRONMENTAL INEQUALITIES AND INTERSECTORAL ACTION: GLOBAL CONTEXT

In 2008, the final report of the WHO Commission on Social Determinants of Health *(1)* concluded that inequalities in health are a major challenge for development and overall progress in countries. Such inequalities also exist with respect to the exposure to environmental health determinants; in almost all countries, some population groups are at greater risk of experiencing harmful environmental conditions than others. Socioeconomic variables such as income, employment or occupation, and education are found to be especially strong determinants of environmental health risks, but demographic variables such as age and sex, ethnicity, and spatial aspects (e.g. urban versus rural) can also affect environmental risk directly or modify the relationship between socioeconomic status, environment and health *(2)*.

The importance of equity for sustainable development has been recently reflected by the Sustainable

* For the purposes of this publication, all references, including in the reference list, to "Kosovo" should be understood/read as "Kosovo (in accordance with Security Council resolution 1244 (1999))" (http://www.nato.int/kosovo/docu/u990610a.htm).

Development Goals (SDGs) *(3)*, which have prioritized the reduction of inequalities in general (SDG 10) but also aim to end poverty (SDG 1) and gender inequity (SDG 5) and call for better education (SDG 4) and employment options (SDG 8), as well as inclusive, safe, resilient and sustainable cities (SDG 11). The WHO Regional Office for Europe has also strongly embraced the importance of reducing health inequalities and positioned it as a central component of the WHO European framework for health and well-being (Health 2020) *(4, 5)*. In line with global priorities *(6)*, the WHO Regional Office for Europe has also prioritized intersectoral action as a most suitable approach to address health inequalities and tackle the complex, multifaceted health challenges associated with social determinants of health *(7, 8)*.

The European Environment and Health Process (EHP), coordinated by the WHO Regional Office for Europe, represents one of the longstanding examples of intersectoral work, based on the partnership of health and environment sectors in the Member States of the WHO European Region. The reduction of inequalities in exposure to environmental risk was one of the priorities addressed at the 5th Ministerial Conference on Environment and Health *(9)* and led to a first WHO assessment report on environmental inequalities in the European Region *(2)*.

THE PROJECT CONTEXT AND KOSOVO-SPECIFIC CHALLENGES

Assessment of the magnitude of inequalities in exposure to environmental risk, and identification of the most disadvantaged population groups, is paramount for enabling national and local policy-makers to tackle inequalities through adequate and effective measures. This paper presents the results of a local assessment of environmental inequality and vulnerability *(10)* that was carried out in the context of the United Nations Kosovo Team (UNKT) project *Building a better future for citizens of Fushë Kosovë/ Kosovo Polje and Obiliq/Obilić: participation, protection and multi-ethnic partnerships for improved education, health and sustainable livelihoods (11)*. The project targeted two of the least developed municipalities (Fushë Kosovë/Kosovo Polje and Obiliq/Obilić), and aimed to develop multisectoral interventions to improve living conditions and decrease the vulnerability and risks to human security. While these two municipalities share typical Kosovo-wide human security issues, there are specific local challenges, owing to their multiethnic composition of Albanians, Serbs and ethnic minorities such as Roma, Ashkali and Egyptians (RAE). The activities of the UNKT project thus addressed intersectoral action, bringing together the following domains of human security:

- *socioeconomic inequity* – mitigating persistent poverty, long-term unemployment, low education levels, and ethnic and gender discrimination to identify immediate work opportunities and improve the employability of younger generations;
- *health* – improving the basic health standards of municipal residents with low economic and social power or low levels of awareness for making informed health choices; and
- *environment* – promoting environmental mitigation strategies in the municipalities, while diminishing the environmental impact of lifestyle choices made by individuals.

METHODS

DESCRIPTION OF SAMPLE DATA

To identify the specific needs of disadvantaged population groups and ethnic minorities, the United Nations Development Programme (UNDP) commissioned and coordinated a community vulnerability assessment (CVA) survey. This primary data collection was based on face-to-face interviews carried out in 2013 to determine entry points for interventions in areas such as employment, education, social protection, environmental management and health. Reflecting the domains of human security, the CVA collected data on the social, environmental and economic conditions in Fushë Kosovë/Kosovo Polje and Obiliq/Obilić, as well as data on self-reported health status and a range of health outcomes and diseases. A descriptive report of the CVA survey, including sampling information and the questionnaire used, is available *(12)*.

The survey used a quota sample approach, i.e. it inflated the proportion of survey participants from minority groups (e.g. low-income groups or ethnic minorities) that would otherwise only account for a small share of the sample. This approach ensures that sufficient cases of marginalized population groups are included to allow meaningful analysis, but also

means that population data obtained from the survey are not representative of the ethnic and socioeconomic population features of the two municipalities. For example, the sample population reflects well the age and gender structure of the local populations, but includes larger proportions of vulnerable groups such as RAE households or unemployed persons (detailed data on the differences between the local population and the sample population are provided by the relevant WHO report *(10)*). The final database used for analysis by WHO contains self-reported information on 1998 households with 9495 non-identifiable individuals.

DATA ANALYSIS

This paper presents findings of a secondary data analysis with a focus on environmental equity dimensions, carried out by the WHO Regional Office for Europe. Data analysis was based on cross-tabulations and logistic regression models, and was structured in four steps (for details, see reference *(10)*):

1. priorities of environmental disadvantage;
2. impact of individual social determinants on environmental risk disparities;
3. combined impacts of social determinants on environmental risk disparities; and
4. health impacts of environmental and social determinants.

Variables used for the environmental vulnerability analysis were stratified into four categories of environmental determinants: three were related to traditional sources of exposure (inadequate water, hygiene and sanitation; inadequate housing conditions; inadequate environmental conditions) and one focused on inadequate affordability of services (see Box 1). The social determinants considered for the vulnerability analysis were in line with the recommendations of the Commission on Social Determinants of Health *(1)* and included socioeconomic, demographic, ethnic and spatial determinants known to affect living conditions as well as health (see Box 1). On health information, the analysis focused on self-reported health data for regression analysis but also used selected health outcomes for bivariate analysis.

BOX 1. VARIABLES APPLIED FOR ANALYSIS

Determinants of environmental disadvantage

Inadequate water/hygiene/sanitation, defined as three or more of the following:
- lack of a toilet in the dwelling
- lack of a bath or shower in the dwelling
- lack of a sewage system connection
- non-piped water source
- perception of inadequate quality of water
- perception of inadequate quantity of water.

Inadequate housing conditions, defined as two or more of the following:
- lack of a fridge
- lack of a stove
- lack of a bed for each person
- lack of electricity supply in the dwelling.

Inadequate environmental conditions, defined as four or more of the following:
- dilapidated or unhealthy housing
- crowding
- solid fuel use for both cooking and heating
- perception of bad air quality
- perception of bad soil quality
- assumed presence of toxic substances.

Inadequate affordability, defined as three or more of the following:
- problem affording food
- problem affording water
- problem affording energy
- inability to afford medicine
- disease due to lack of food.

Determinants of social disadvantage

Socioeconomic determinants:
- education
- income quintiles
- employment
- financial situation.

Demographic determinants:
- sex
- age
- household with children
- household size.

Ethnic determinant:
- ethnicity (Albanian; Serbian; RAE).

Spatial determinants:
- municipality
- urban versus rural.

RESULTS

PRIORITIES OF ENVIRONMENTAL DISADVANTAGE IDENTIFIED BY THE SURVEY

The proportion of the total sample that was exposed to a certain environmental disadvantage was highly variable, ranging from a very small part of the population (e.g. 3% of the sampled population lacked an electricity supply in their dwelling) to environmental problems affecting about half or more of the sample. Such general challenges especially relate to drinking water, energy sources, environmental pollution and the cost of environmental services (see Fig. 1).

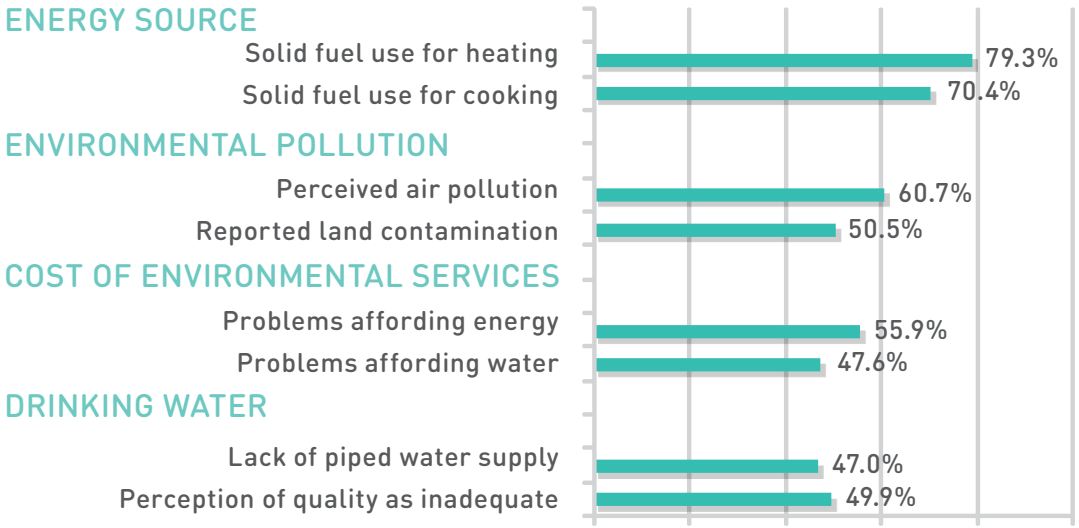
IMPACT OF INDIVIDUAL SOCIAL DETERMINANTS ON ENVIRONMENTAL RISK DISPARITIES

For specific population groups or spatial settings, environmental disadvantages may occur much more frequently. This causes inequalities in exposure to environmental risk and is referred to as the exposure differential, which needs to be distinguished from the vulnerability differential that indicates which specific population groups (e.g. elderly, children or poor individuals) may be more vulnerable to the effects of exposure to environmental risk *(2)*.

Inequalities in exposure associated with social determinants were found for all four categories of environmental disadvantage in the two municipalities. The impact of the social determinants on environmental disadvantage varied in relation to the environmental category considered.

- *Inadequate water/hygiene/sanitation* (7.4% of the total sample) is mostly influenced by ethnicity and socioeconomic determinants. The subgroups most affected were RAE (20.7%), individuals with no education (19.9%) and within the lowest income quintile (18.5%), and those with a severe financial situation (18.7%). Spatial determinants played a role for inequalities of individual variables (e.g. non-piped water supply was more frequent in rural areas), while demographic determinants played a minor role.
- *Inadequate housing conditions* (affecting 12.7% of the total sample) are mostly influenced by ethnicity and socioeconomic determinants. The most disadvantaged groups were RAE (35.1% reported living in inadequate housing) and individuals with no education (34.2%) or within the lowest income quintile (29.4%). A less strong but still significant impact was found for age (children were disadvantaged) and household composition (households with children were disadvantaged).
- *Inadequate environmental conditions* (26.3% of the total sample) were affected by a wider range of determinants (socioeconomic, demographic and spatial determinants, as well as ethnicity) but the differentials in exposure were less marked than

FIG. 1. MAIN ENVIRONMENTAL CHALLENGES IN THE MUNICIPALITIES



for inadequate housing conditions. The highest levels of inadequate environmental exposure were reported by individuals within the lowest income quintile (37% reporting inadequate environmental conditions) and with financial problems (36.8%), large households with seven or more persons (36.6%), RAE (36.4%), and residents in rural areas (34.4%).

- *Inadequate affordability* (26.6% of the total sample) is almost exclusively driven by socioeconomic determinants and ethnicity. The highest inequalities were reported for individuals with financial problems (65.1%), RAE (57.5%), and individuals within the lowest income quintile (54%) and no education (49.4%). Urban–rural variations played virtually no part in variations of affordability.

COMBINED SOCIAL-DETERMINANT IMPACT ON ENVIRONMENTAL RISK DISPARITIES

In real life, social disadvantage tends to be clustered, and socially vulnerable population groups are usually simultaneously affected by various socioeconomic, demographic or other challenges. Such multiple social deprivation is reflected by a continuous increase in exposure to environmental risk, and therefore stronger inequalities. Taking the example of inadequate water, hygiene and sanitation conditions, the merging of only three social determinants was associated with a more than fivefold and statistically significant increase in exposure: from 7.4% in the total sample to 20.7% for all RAE, 34.3% for rural RAE and 41% for rural RAE within the lowest income quintile. Table 1 shows the magnitude of inequality in environmental exposure of RAE residents in situations of multiple social deprivation for all four environmental categories, presenting the data in two scenarios.

HEALTH IMPACTS OF ENVIRONMENTAL AND SOCIAL DETERMINANTS

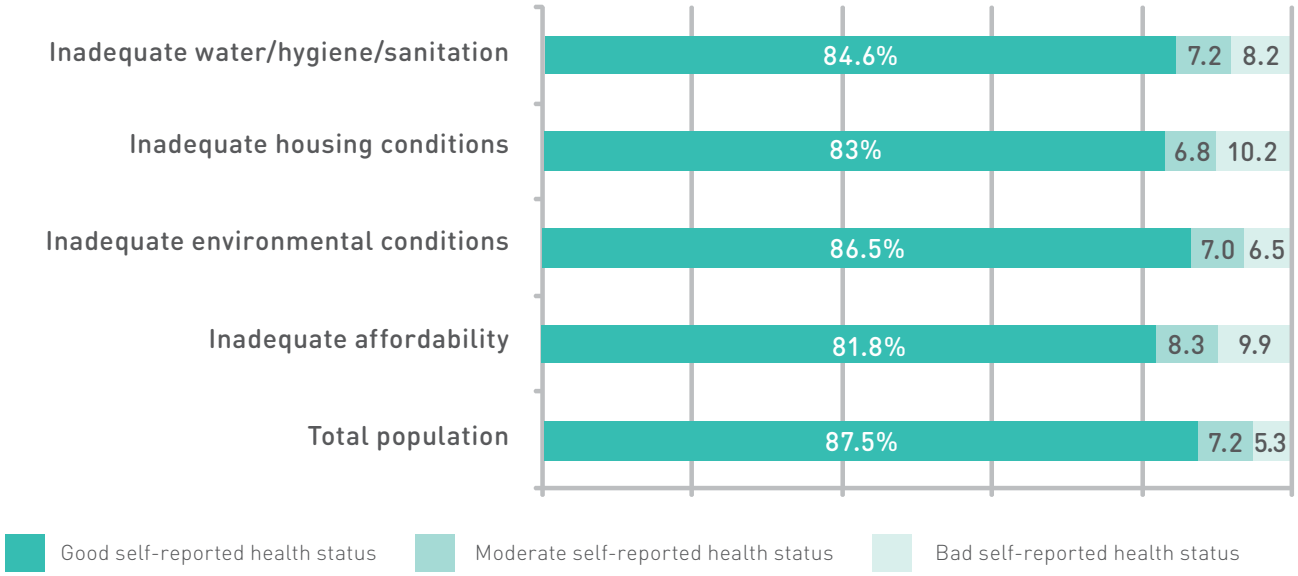
Households reporting various health-related outcomes and diseases (such as injuries and poisoning, bronchitis, pneumonia, or skin diseases) are more likely to also report inadequate conditions with respect to water/hygiene/sanitation, housing, environment and affordability. Whereas more than 80% of survey participants reported being in good health, an increase in bad self-reported health status was found for all individuals reporting inadequate environmental conditions. Inadequate housing conditions and inadequate affordability had the strongest impact and were associated with almost double the prevalence of bad self-reported health status compared with the total population (see Fig. 2). The findings indicate that actions to improve living and environmental conditions and to provide adequate and affordable services would yield co-benefits for population health.

The results of logistic regression confirm that inadequate water/hygiene/sanitation, housing conditions and affordability were significantly associated with higher levels of bad self-reported health status. Inadequate affordability had the strongest impact, increasing the odds for bad-self-reported health status by almost four times (odds ratio [OR] 3.8). However, in multiple regressions including social determinants, only inadequate affordability of services remained significant (OR 2.2; see Table 2). Within the social determinants, the strongest association of bad self-reported health status was with high age, followed by low education, financial

TABLE 1. INCREASE IN ENVIRONMENTAL EXPOSURE IN RELATION TO MULTIPLE SOCIAL DEPRIVATION

Scenario	Population with inadequate water/ hygiene/sanitation (%)	Population with inadequate housing conditions (%)	Population with inadequate environmental conditions (%)	Population with inadequate affordability (%)
Reference (total sample)	7.4	11.6	26.3	26.6
Poverty scenario (focus on low income and financial problems)	Rural RAE with low income and in severe financial situation: 43.3	Rural RAE with low income and large households: 82.0	Urban RAE with low income and large households: 69.4	Urban RAE with low income and in severe financial situation: 83.9
Limited-asset scenario (focus on lack of education and employment)	Urban unemployed RAE without education: 48.8	Rural unemployed RAE without education: 87.9	Rural unemployed RAE without education: 84.4	Urban unemployed RAE without education: 72.7

FIG. 2. VARIATIONS IN SELF-REPORTED HEALTH STATUS BY ENVIRONMENTAL CATEGORY



problems and rural residence, while ethnicity and sex were unrelated to variations in self-reported health. The results therefore suggest that there is a strong exposure differential for disadvantaged ethnic groups (such as RAE) but no vulnerability differential for those that are exposed.

DISCUSSION

DATA LIMITATIONS AND CONSTRAINTS

The database used in this study suffers from shortcomings that are often encountered in social and environmental surveys and limit the use of the results, especially in relation to the health impacts of social and environmental determinants.

The first limitation is due to the fact that data were collected by face-to-face interviews and thus represent the subjective opinion of the responding household members. That may especially restrict the accuracy of information based on individual perception (for example, quality of drinking water or self-reported health). The second limitation relates to the disease data, which were collected at the household (rather than individual) level and therefore cannot provide valid estimates of disease prevalence.

While acknowledging these limitations, the results presented in this report should be considered as indications of social and environmental vulnerability and their potential associations with health in the two municipalities. Future work would be needed

TABLE 2. REGRESSION MODEL RESULTS FOR BAD SELF-REPORTED HEALTH STATUS

Category	OR (95% CI) for increase of bad self-reported health status		Social determinants associated with significant increase of bad self-reported health status	Social determinants not associated with significant increase of bad self-reported health status
	Model not adjusted for social determinants	Model adjusted for social determinants		
Inadequate housing conditions	2.8 (2.2–3.5)	1.0 (0.6–1.7)	• High age • Low education • Financial problems • Rural residence	• Sex • Ethnicity
Inadequate environmental conditions	1.2 (0.9–1.6)	0.8 (0.5–1.2)		
Inadequate water/hygiene/sanitation	1.7 (1.2–2.5)	0.8 (0.5–1.2)		
Inadequate affordability	3.8 (3.0–4.9)	2.2 (1.4–3.4)		

CI: confidence interval.

to confirm the magnitude and health consequences of social and environmental vulnerability and to assess whether the findings may be typical of other settlements within Kosovo as well.

SUMMARY AND POLICY RELEVANCE OF FINDINGS

The study found that environmental determinants with an impact on health and health care are also associated with social factors.

As the main environmental challenges in the two municipalities related to drinking water, energy sources, contamination and the cost of environmental services, preventive action is necessary in various sectors dealing with public service provision, social welfare, environmental management, energy and urban infrastructure. This is likely to improve the size of environmental problems affecting large parts of the local population.

Regarding inequalities in environmental risk exposure, the results indicated that different patterns of inequalities exist for different environmental outcomes: some are mostly affected by socioeconomic determinants, while for others, ethnic or spatial determinants were of relevance. The varying impact of social determinants on different environmental outcomes must be considered when target groups for intersectoral action are established, as it helps to identify the most suitable root causes to be tackled. This seems especially valid for interventions aiming at environmental and housing conditions and water supply, as these are partially affected by demographic and spatial determinants and may therefore require locally adapted approaches that may not necessarily work everywhere. However, the results also demonstrated that the highest levels of environmental vulnerability are related to multiple social deprivation combining various types of disadvantage, which calls for multisectoral interventions with social, infrastructural and spatial objectives.

The analysis of the health impact of both social and environmental determinants indicated that social conditions may affect health directly, but also indirectly, as mediated by environmental risk. Actions to ensure adequate environmental conditions can thus facilitate the reduction of health disparities independent of social determinants. However, intersectoral approaches combining both social and environmental intervention efforts could be the most promising for mitigating and preventing environmental health inequalities.

REFLECTION ON THE FINDINGS AND COMPARISON IN THE EUROPEAN CONTEXT

The study showed that social determinants affect environmental risk exposure, and that both environmental and social determinants contribute to inequalities in health. Although the methodological limitations restrict the validity of international comparison, this overall conclusion is in line with a range of WHO reports that have addressed health inequalities *(1, 2, 5, 6, 13–15)* and also reflects recent findings from other countries *(16–20)*. For self-reported health status, the findings show that the sample population reported a rather positive health status (87.5% with good self-reported health). This is in line with data provided by the European Quality of Life Survey *(21)*, which indicates that 83.4% of the Kosovo population reports good health, but shows a much lower percentage of good self-reported health status for all European countries on average (60.9%). The contrast between Kosovo and the European average may be largely explained by age differences, as the population in Kosovo is much younger than the European average.

However, the results from the two Kosovo municipalities are specific, as they represent inequality findings in an area affected by a wide range of environmental challenges (such as solid fuel use and air pollution) and provide detailed data that allows an assessment of the local interaction between social and environmental determinants in shaping health and related inequalities. The findings of this study therefore provide reliable grounds for planning local intersectoral action in Fushë Kosovë/Kosovo Polje and Obiliq/Obilić to improve environmental conditions and reduce health inequality.

SUGGESTED INTERVENTIONS FOR LOCAL INTERSECTORAL ACTION

The results confirm that social determinants strongly affect exposure to environmental risk, which is estimated to cause about 23% of the global burden of disease *(22)*. In the specific case of Fushë Kosovë/Kosovo Polje and Obiliq/Obilić, inadequate water

supply, low-quality housing conditions, solid fuel use, environmental contamination of air and soil, and the cost of supply services represent the most relevant environmental determinants of health *(10)*.

On the other hand, the findings show that social determinants have a significant direct influence on health in the two municipalities. This suggests that social policy interventions tackling poverty, income, education and employment may have a double impact, as they provide direct benefits for health and, in parallel, improve health-relevant environmental conditions in the municipalities. Based on local data, Fig. 3 provides one example of intersectoral effectiveness: the provision of employment as a single policy intervention and its impact on housing conditions. The results indicate that employment was associated with lower reporting of inadequate housing conditions, and that this effect was strongest within the target group where inadequate housing is a key challenge: the population with no or only basic education.

As this multiple benefit was found for various subpopulations (e.g. rural residents and RAE) and for all categories of environmental disadvantage except for inadequate environmental conditions (which are difficult for individuals to influence), the results suggest that social interventions such as employment can have environmental co-benefits through the modification of social status. Taking this argument further, Table 3 lists a variety of inequality interventions that can be operated by non-environmental sectors of local authorities but may nonetheless produce environmental co-benefits, as indicated in the survey report and the *United Nations Common Development Plan 2016–2020* for Kosovo *(10, 23)*.

The *United Nations Common Development Plan 2016–2020* for Kosovo represents a "whole-of-United Nations" approach that brings together various United Nations agencies working in different sectors *(23)*. Collaboration between education, labour, social welfare and health sectors (focusing on support to the individual) and environment, transport, housing and spatial planning sectors (focusing on the management of public settings) can cross-fertilize sectoral agendas and support whole-of-government and health-in-all-policies approaches. As the recently adopted *United Nations Common Development Plan* includes priority work areas on equity and social inclusion as well as environment and health, it will be ideally placed to take up the project conclusions on intersectoral action in Kosovo.

RELEVANCE OF ENVIRONMENTAL AND SOCIAL MONITORING SYSTEMS FOR INTERSECTORAL ACTION

As "tackling the determinants of health inequalities is about tackling the unequal distribution of health

FIG. 3. EFFECT OF EMPLOYMENT ON INADEQUATE HOUSING CONDITIONS IN EDUCATION SUBGROUPS

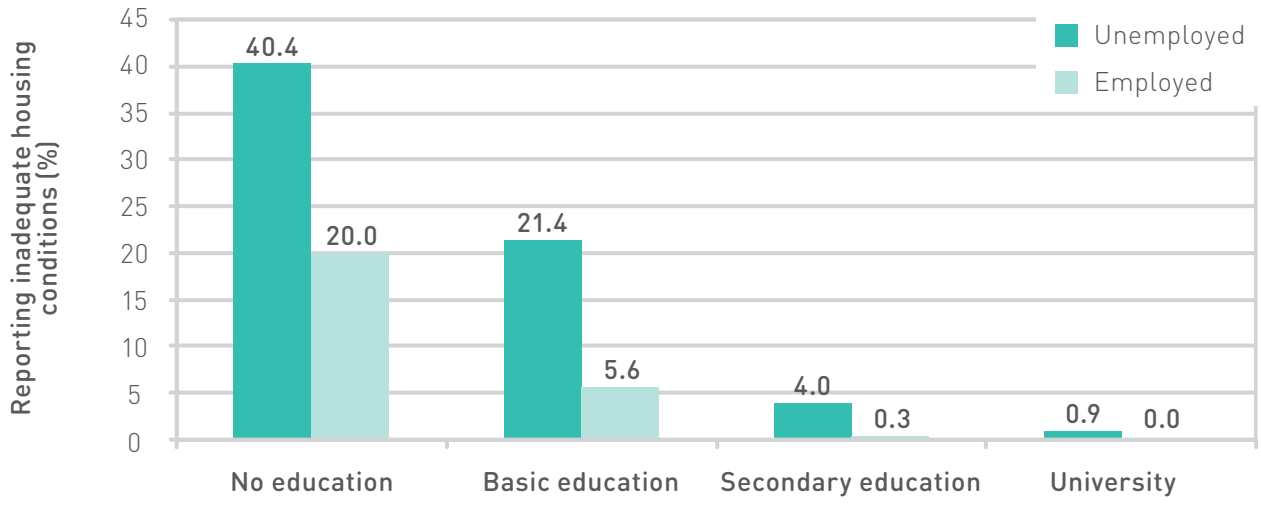


TABLE 3. INEQUALITY INTERVENTIONS WITH SOCIAL AND ENVIRONMENTAL FOCUS BY SECTOR

Sector	Interventions with social focus: investing in people and society	Interventions with environmental focus: investing in infrastructure and environmental protection
Education	Support for basic education and vocational training	Improvement in environmental education and awareness
Labour	Employment campaigns Support for low-income jobs	Support to the establishment of so-called green jobs (environmental protection, energy efficiency, etc.)
Social welfare	Social support schemes	Energy subsidies and energy-efficiency campaigns for clean fuel use Provision of social housing
Housing/ urban and spatial planning		Improvement of public services Rural development programmes Urban environmental management
Health	Improvement in health literacy Active outreach of health system services to risk groups/ universal health care Establishment of monitoring of social determinants of health	Establishment of monitoring of environmental determinants of health
Environment		Universal action on environmental management and improvement Targeted action on environmental priority problems and most affected areas

Sources: references (10, 23)

determinants" *(24)*, equity-sensitive surveillance systems are needed to detect social, environmental and health disparities produced by various sectors. This study has shown the opportunities for equity analysis when a wide range of social and environmental determinants can be linked and traced back to the responsibility of individual sectors. The results of this survey support the call made by the Commission on Social Determinants of Health *(1)*, requesting that health equity surveillance systems need to:

- include physical and social environment determinants of health (such as water and sanitation, housing, urban infrastructure, air quality and social capital/affordability); and
- stratify health data at least by sex, two social markers (such as education, income, occupation etc.), ethnicity or race, and one regional marker (e.g. urban/rural residence).

The results of this study support the relevance of such a wide coverage of health determinants related to various sectors to providing a solid base for the establishment of effective intersectoral action to tackle health inequalities.

POLICY IMPLICATIONS FOR INTERSECTORAL ACTION AND HEALTH-IN-ALL-POLICIES APPROACHES

Reliable assessment of individual health determinants across sectors enables decision-makers to identify the most prominent inequalities, the most affected target groups (or target areas) and the root causes of inequalities to be addressed in specific policy sectors *(25)*. The combined implementation of sectoral interventions and the establishment of intersectoral partnerships form a solid foundation to develop municipal whole-of-government and health-in-all-policies approaches, which would favour and support intersectoral action *(7)*.

Promising examples of intersectoral partnerships and institutionalized collaboration schemes facilitating such cross-cutting tasks are offered by the European EHP *(26)* or the Transport, Health and Environment Pan-European Programme *(27)*. Intersectoral action and partnerships are essential to coordinate the response of various sectors towards a common objective *(7, 28)*. Furthermore, they form a central component for implementation of the Health 2020 policy *(4)* and various SDGs related to environmental sustainability, equity, health and inclusion *(3)*. However, to implement these goals, local data are critical to guide targeted and effective intersectoral action and ensure that the most affected population groups are prioritized.

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