Int J Public Health (2010) 55:401–411
DOI 10.1007/s00038-010-0156-1

ORIGINAL ARTICLE

The self-reported health of legal and illegal/irregular immigrants in the Czech Republic

Hynek Pikhart · Dusan Drbohlav · Dagmar Dzurova

Received: 3 November 2009 / Revised: 11 May 2010 / Accepted: 13 May 2010 / Published online: 16 June 2010

Abstract
Objectives To test whether immigrants with illegal/irregular status have higher odds of poor self-rated health (SRH) than immigrants with legal status, and whether different demographic, socioeconomic and psychosocial factors affect SRH among legal and illegal/irregular immigrants.
Methods Analysis is based on data from two questionnaire surveys of 285 Post-Soviet and Vietnamese immigrants (126 legal and 159 illegal/irregular) living and working in the Czech Republic, which were conducted between 2003 and 2006. The risk of poor SRH was estimated by ordered polytomous regression, the dependent variable was SRH, and selected demographic, socioeconomic and psychosocial characteristics entered the analysis as explanatory variables.
Results Odds of poor SRH among illegal immigrants were not statistically significantly higher than among legal migrants in fully adjusted analysis. Females and older immigrants had poorer SRH. Satisfaction with work, and, partly, with housing were found to have a significant role. Educational level and 'social communication' variables did not have an important role in predicting SRH.
Conclusions Inequalities in SRH among legal and illegal immigrants were largely explained by socioeconomic and psychosocial factors in this study. These results should stimulate further research activities that might improve health policy and planning related to immigrants' health in this and other countries in Europe.

Keywords Self-rated health · Illegal/irregular and legal immigrants · Post-Soviets · Vietnamese · Czech Republic

Introduction

Immigrants are exposed to a number of risks that burden their lives in new host societies. At the micro-level of the individual, psychological risks come into the play, namely the stress resulting from the migration process and integration (or possibly non-integration), including the rupture of existing social ties and adjusting to life in a new cultural and social environment (Drbohlav and Lachmanová 2008). Furthermore, illegal migrants very often have to cope with stress stemming from the illegal nature of their arrival, residence, or work, fear of being detained, and possibly being punished by state authorities. These migrants are under permanent stress, they feel permanent uncertainty if not danger. Generally, immigrants may very often be either occasionally or permanently exposed to psychological risks that arise from being subjected to anti-migrant feelings, which are typically shared by some social and political groups within the majority society. Immigrants arriving in

This paper belongs to the special issue "Health of ethnic minorities in Europe".

H. Pikhart (✉)
University College London,
International Institute for Society and Health,
1-19 Torrington Place, London, UK
e-mail: h.pikhart@ucl.ac.uk

D. Drbohlav · D. Dzurova
Department of Social Geography and Regional Development,
Faculty of Science, Charles University in Prague, Albertov 6,
Prague 2 128 43, Czech Republic

D. Drbohlav
e-mail: drbohlav@natur.cuni.cz

D. Dzurova
e-mail: dzurova@natur.cuni.cz

more developed countries often escape from under-developed, poor societies with rather weak or even non-existent social and health systems. Both the morbidity and mortality rates in the original countries of these migrants are often substantially higher than of the local populations of destination countries. Given that immigrants often take very unattractive, demanding, dangerous and "dirty" jobs in the new country that may even worsen their health, their situation as such calls for attention. Despite these facts, it has been repeatedly reported that immigrants in Europe and North America have lower or similar mortality than domestic population (Landman and Cruickshank 2001; Darmon and Khlat 2001; MacKay et al. 2003; Mladovsky 2007; Gushulak 2007). So-called "healthy migrant effect" of selective migration has been suggested (Fennelly 2007; Mackenbach et al. 2005), but there is also evidence that health of migrants can deteriorate some time after settling in their new host country (Razum et al. 2000; Harris 1999).

Health of migrants is becoming very important in the Czech Republic, a country with very limited experience in dealing with immigrants in general and with immigrants' health in particular. The Czech Republic has quickly become an immigration country, recently recording one of the largest net migrations in the entire European Union (for 2007 and 2008 it was 83,945 and 71,790 respectively; see: http://www.czso.cz/csu/redakce.nsf/i/obyvatelstvo_hu). As of 31 December 2008, 438,301 immigrants officially lived in the country—which makes it, by far, the most attractive country for foreigners in the whole "Post-Communist" Central European region. In relative terms, immigrants represented 4.2% of the whole population. The share of foreigners in the working population of the country was 6.4% (Horáková 2009a). In addition, estimates of illegal/irregular migrants who stay and work in the Czech Republic differ significantly and range between very small figures and more than 200,000 (Drbohlav and Lachmanová 2008).

During the communist era (1948–1989), Czechoslovakia (including the current Czech Republic) had no "classical immigrants" as we know them from other non-communist parts of the world (e.g. Drbohlav 2004). The communist regime was characterized by a very restricted migration policy limiting free movement of its citizens across the borders. Thus, international migration movement occurred mostly between communist countries. In addition, trainees and students from several non-European developing communist countries (within so-called international aid programmes), namely Vietnam, Cuba, Angola, Laos, and Mongolia, migrated for longer, although limited period to the Czech Republic to gain professional experience, and, on the other hand, to help the Czech economy to support some industries. A new era came with the "Velvet Revolution" and the overall collapse of communism throughout Central and Eastern Europe. As a result of the political, social and economic transition processes that started as early as in the beginning of the 1990s, the Czech Republic transformed quickly from an emigration to a transit and an immigration country—as is now apparent at the end of the first decade of the 2000s.

There are several important factors behind this trend in the Czech Republic: the country's relatively good starting socioeconomic position (in comparison with other countries in transition) just before the transition processes were triggered, no catastrophic collapse of the economy during the ongoing transformation, a very liberal migration policy at the very beginning of the 1990s, a hunger for a new labor force in the growing economy with important inflows of direct foreign investments, and advantageous geographical position (having possible/factual "supply countries", offering cheap labor force nearby). The country's migratory attractiveness was not limited much even by the serious economic problems that arose at the end of the 1990s, or by the harmonization process that had to be fulfilled before joining the EU in 2004 and which, in some way, contributed to more strict policy orientation (Baršová and Barša 2005). As a corollary, the migration policy has become more systematic, restrictive and selective. Also, more pro-active approaches have appeared (Drbohlav et al. 2009). Surprisingly, and also against many "warnings", it seems that the current global economic crisis has so far not drastically affected the number of immigrants to the country. The overall number of legally resident immigrants even increased (though only minimally) during the first half of 2009—from 438,301 (as of 31 December 2008) to 442,506 (as of 30 June 2009—Horáková 2009b).

Unambiguously, the greatest impact of both legal and illegal immigration upon Czech society has continuously been seen in the economic sphere. The question of how to adequately regulate and manage economic immigration seems to be one of the most important challenges for the Czech administration. This is so even since the country joined the EU (May 2004) and the "Schengen area" (December 2007), because "economic migration matters" remain in fact in the hands of national governments. The health of immigrants is one of the social aspects that directly affect not just the lives of immigrants themselves but also the economy and the society of the destination country.

Although it has such an important role, immigrants' health status in the broadest sense of the word is *terra incognita* in the Czech Republic. Despite significantly growing numbers of immigrants, there are only limited pieces of information about immigrants' health and related problems, not to mention about the factors that influence the quality of immigrants' health (for example see http://mighealth.net/cz/index.php/2._Zdravotn%C3%AD_stav_migrant%C5%AF_a_etnick%C3%BDch_men%C5%A1in_a_jeho_determinanty). What does exist is the data on

the accessibility of health care for foreigners, namely, on how health insurance is used by foreigners (Foreigners in the Czech Republic 2008). It is possible to obtain objective information about inequalities and problems related to health-care accessibility from a limited number of research surveys (see http://mighealth.net/cz/index.php/Zdravotn%C3%AD_stav_migrant%C5%AF_ve_sv%C4%9Btle_v%C3%BDzkumn%C3%BDch_studi%C3%AD). A survey carried out as early as 1986–1989 in Czechoslovakia found that Vietnamese and Cuban immigrants ($N = 3{,}000$) had more parasitical infections and more psychosocial disorders as compared to the domestic population (Nesvadbová et al 1990). During 1990, several other surveys were conducted. First, they comprehensively mapped the health situation of Volhynian Czechs, who, after the Chernobyl catastrophe, immigrated back to the country of their ancestors (Nesvadbová and Rutsch 1995). Second, a study carried out between 1992 and 1998 in two Prague hospitals and one mental hospital revealed, among other facts, that the number of legal and illegal immigrants who needed health care significantly increased over time, many immigrants were not insured by their employers, there was not enough information reaching immigrants about how health care and health insurance is organized by the state. What was also found is that there were often no preventive examinations of immigrants, their working conditions were very bad, safety rules broken, thereby often leading to injuries or even casualties. Problems with alcohol consumption were also identified (Nesvadbová et al. 1998). During the 2000s research activities focused upon Ukrainian immigrants (e.g. Křečková-Tůmová et al. 2003). Studies confirmed that their income was much lower than that of the Czech population, their lifestyle in health terms was riskier than that of the domestic Czech population—Ukrainians consumed more alcohol and smoked more, too. Moreover, Ukrainian workers were more intensively exposed to an enormous work load without having adequate time to relax and recuperate. Despite this, their recorded morbidity rate was significantly lower than that of Czechs confirming "healthy migrants" theories. It was again found that Ukrainians did not make use of health-care insurance as often as one would expect and, indeed, the rules dictate. Somewhat surprisingly (but see also Ronellenfitsch and Razum 2004), Ukrainians (both males and females) reported—compared with Czechs—better self-rated (subjective) health, fewer chronic illnesses and fewer health problems (Křečková-Tůmová et al. 2003).

In fact, our knowledge of health of illegal/irregular immigrants in the Czech Republic is very limited. What we know is that in questionnaire surveys (conducted among 159 illegal/irregular migrants from "Post-Soviet" countries and Vietnam residing in the Czech Republic in 2005–2007) 12% of migrants reported very poor or poor health, 29% average and 56% good or excellent health (Drbohlav 2008). On the other hand, it was repeatedly shown that the objective working and living conditions of many illegal/irregular migrants operating in the Czech Republic are in many aspects very bad (see also Drbohlav and Janská 2009; Černík 2006).

Objectives and hypotheses

This study is based on the data from two questionnaire surveys conducted in the Czech Republic. The studied population consisted of 285 immigrants (126 legal and 159 illegal/irregular) who were living and working in the Czech Republic. We tested two basic hypotheses. First, we hypothesized that immigrants with illegal/irregular status would be more likely to report poor health than immigrants with legal working status. Second, we hypothesized that legal and illegal/irregular immigrants would have different determinants of poor health.

To our knowledge, this is one of the first studies in the region with sufficient data to investigate the effects of selected demographic, socioeconomic and psychosocial characteristics on the self-rated health (SRH) of immigrants from Post-Soviet countries and Vietnam.

Methods

Target populations and study design

The research targeted two important, but distinct groups of immigrants in the Czech Republic. The first and largest group was composed of citizens from the former USSR (particularly Ukrainians, but also Russians, Belarusians, Moldovans and Armenians). The second group was represented by immigrants from Vietnam.

Although Post-Soviets work in the Czech Republic usually as unqualified employees in various sectors of the economy (typically in construction), Vietnamese have tended to be small-scale market entrepreneurs, until recently exclusively specializing in buying and selling cheap food, clothes and electronics throughout the country (Drbohlav and Dzúrová 2007; Leontiyeva 2006; Kocourek 2006).

The quantitative analysis reported in this paper is based on two data samples that were collected by two different questionnaire surveys, one done with legal ("Data 1") and the other with illegal/irregular immigrants ("Data 2").

Data 1 (legal migrants)

The data we use were collected by the IOM Office in Prague and the Faculty of Science, Charles University in

Prague for the Ministry of Labour and Social Affairs of the Czech Republic in 2003 and 2004 (see more Drbohlav and Ezzeddine-Lukšíková 2004). Research on immigrants' integration as such was intended to contribute to the prevention of the social exclusion of foreigners in the Czech Republic. The main goal was to assist the development of ethnic organizational structures that in a long-term perspective could provide social and legal counseling for their newly arriving compatriots. The crucial task of the follow-up study (see Drbohlav and Dzúrová 2007) was to find out what mode of inclusion into Czech society is practiced by the given immigrants and how satisfied they are with their new lives in a new society.

The questionnaire survey focused upon three different communities of immigrants: Ukrainians, Vietnamese, and Armenians residing in the Czech Republic (mainly in Prague and in the surrounding Central Bohemia region). Respondents were selected using the "snowball" method. The respondents were contacted through both ethnic community associations and personal contacts. About one-half of the respondents were contacted in their mother tongue.

Some key criteria had to be fulfilled in order for a respondent to enter the survey: (1) older than 18 years; (2) a foreigner—not having Czech citizenship; (3) living legally in the Czech Republic between 1990 and 2002; (4) living in the Czech Republic (in Prague or its vicinity) legally for more than 1 year. Data were successfully collected from 126 immigrants. The data collection was done in the fall and winter of 2003/2004. The final survey sample included 51 Ukrainians, 45 Vietnamese, and 30 Armenians. Besides the assessment of immigrants' subjective health, the questionnaire brings rich insight into many aspects of the integration process of immigrants.

Data 2 (illegal/irregular migrants)

The data from the project of the Ministry of Labour and Social Affairs of the Czech Republic, titled "International Migration and Irregular Work Activities of Migrants in the Czech Republic in a Wider European Context" (carried out by a research team from Department of Social Geography and Regional Development, Faculty of Science, Charles University in Prague) serve as the second data source of this study. The project focused upon analyzing irregular economic activities of migrants in the Czech Republic using various quantitative and qualitative approaches, while also situating the whole issue in a broader European context. Data collection was again based on a questionnaire survey used within this project. Questionnaires were administered to a purposive sample of immigrants who work under irregular status (or illegally) in the Czech labor market. In this study, illegal activity is defined as work or residence that is prohibited under the Czech law. Two levels are defined in terms of the "seriousness" of the violation of this law:

Illegal economic activity of an immigrant is determined where an immigrant does not possess both a residence permit and a work permit or trade licence. Alternatively, he or she possesses a residence permit (e.g. tourist visa) but he or she does not have a work permit or a trade licence.

Quasi-legal economic activity of an immigrant is established where an immigrant possesses a residence permit as well as a work permit/trade licence but he/she strongly violates work-related laws. For example, he or she works in a different region, branch or profession or for a different employer than is stated in his or her work permit. Or, the individual smuggles goods or is employed, though he/she has a trade licence (Drbohlav et al. 2009).

For the purpose of this paper, however, these two groups were combined together while forming one "not-legal" (below so-called "illegal") group of immigrants.

The questionnaire survey was conducted into two parts. The first part was completed in Prague and the surrounding area between October 2005 and January 2006. The second part was carried out in selected regions throughout the Czech Republic (mainly the regions of Karlovy Vary, Plzeň, České Budějovice, Liberec, Náchod, Ostrava and Brno) from March to September 2007. The selection of respondents was done via selected interviewers (contact persons at NGOs and in the church and academic spheres—those with direct knowledge of particular immigrants' communities). These "field workers" contacted the immigrants, explained the task to them, guaranteed anonymity on behalf of the research team, and collected the questionnaires after they were completed. Both field workers and respondents (via the former) were paid for their time and endeavor. Like the legal migrants study, this questionnaire survey collected (via 118 questions and answers) extensive demographic, social, economic and geographical information about immigrants and their integration to the Czech society. The final dataset included 159 respondents (135 Post-Soviets and 24 Vietnamese were used in the analysis).

To sum up, the analyses were performed on a sample consisting of 285 respondents (126 legal and 159 illegal workers), 216 respondents were "Post-Soviets" (76%) and 69 respondents came from Vietnam (14%), 54% were males, and the mean age of our sample was 33.5 years (standard deviation 8.8 years).

The data from both surveys are not representative. It is not possible to generalize in statistical terms when interpreting these data. In fact, given the lack of data and necessary information for specifying the "basic/overall populations" of the studied communities, no adequate sampling method, like, for instance, representative or quota

sampling, could be applied. Indeed, nobody is able to design a representative survey for illegal immigrants. However, the methods used to select respondents in this study are often used elsewhere, and we are convinced that they provide useful and, indeed, important information (see e.g. Fawcett and Arnold 1987).

Variables

We used SRH as the outcome of interest. SRH was measured on a five-point scale ranging from very poor to excellent (the question being "How satisfied have you been recently, during approximately the last month, with your health?").

Among independent variables, we used the age, sex and ethnic origin of immigrants. Education was categorized as primary (or less) education or vocational training, completed secondary education, completed university education. In relation to marital status, people were classified as married/cohabiting, single, divorced, or widowed. Participants were asked to which band of income they currently belong, and then they were divided into the following groups: <10,000 CZK, 10,000–20,000 CZK, more than 20,000 CZK, and no answer to this question (in the first decade of October 2009, the exchange rate between the Czech crown (CZK) and the EUR fluctuated between 1:25 and 1:26).

They were asked whether they are satisfied with the work they are doing and whether they are satisfied with their housing conditions. Further, they were asked how frequently they have contacts with their relatives, and whether (and how frequently) they are in contact with compatriots in their neighborhood.

Finally, they were asked four questions about their knowledge of the Czech language. If at least three questions were answered (they had five answers to choose from), the overall score was calculated (with a potential mean-based data imputation for one missing item). The total score (range 4–20) was then divided into four categories: 4–8 (poor), 9–12 (average), 13–16 (good), and 17–20 (very good).

Statistical analysis

We first cross-tabulated the data and conducted simple bivariate analyses. The outcome variable in the main analysis was the SRH measured on a five-point scale. To assess the association between SRH and other factors/characteristics available in the data, we used an ordered polytomous regression that allowed us to use a full scale of SRH. We estimated three models: first, we adjusted the effects of our main exposures for age, sex, and the indicator of area of origin (model 1); second, we added all demographic, socioeconomic and psychosocial characteristics into one model (model 2). Moreover, we present a final model with all the variables significantly associated with SRH. Our primary goal was to focus on the differences between legal and illegal immigrants. Therefore, we evaluated the associations between exposure to individual factors and SRH separately for both the groups of immigrants. We tested for interactions between legal status and exposures to formally assess the differences between both groups. The statistical analysis was conducted in Stata 10 statistical software (Stata Corp, TX, USA).

Results

Table 1 shows the basic demographic, socioeconomic and psychosocial characteristics of the immigrants. A total of 64% of legal immigrants and 85% of illegal immigrants in the sample are from Post-Soviet republics; 9.5% of legal and 12.0% of illegal immigrants reported their general health as poor or very poor; 11 individuals did not answer this question and thus had to be excluded from the regression analysis. There were 153 males and 130 females in the sample (gender was not coded for 2 individuals). In addition, 60% of legal and 58% of illegal immigrants were younger than 35 years, and 46% of legal and 17.6% of illegal immigrants had complete university education. More than half of the subjects were married (60% of legal and 52% of illegal immigrants). The highest income (>20,000 CZK per month) was reported by 14.3% of legal and 9.4% of illegal immigrants. One-fifth of legal immigrants, however, did not answer this question. A total of 65.1% of legal and 74.8% of illegal immigrants were satisfied with their work (although 23.8% of legal and 4.4% if illegal respondents did not answer the question). Satisfaction with housing was reported by 87.3% and 73.6%, respectively. Also, 57.1% of legal and 47.2% of illegal migrants claimed very good or good knowledge of the Czech language. Whereas 27.8% of legal immigrants had no compatriot families near their place of residence (within a 5-min walking distance), 2.4% knew more than 10 families within that area (one-quarter of respondents gave no response). The same figures for illegal immigrants were 37.7 and 10.7%, respectively. As far as legal migrants' contacts with relatives from their country of origin are concerned, 35.7% had them daily or at least once a week. The same was true for 65.4% of illegal migrants.

The results more or less reflect the expected differences between legal and illegal immigrants, or in other words between long-term/more stable and rather temporary/volatile (and also more "demanding") migratory types: thus, illegal immigrants seem to be less healthy compared to legal immigrants, and also less educated, poorer, more

Table 1 Descriptive characteristics of the sample

	Legal ($N = 126$)	Illegal ($N = 159$)
Self-rated health		
Very poor	3 (2.4%)	9 (5.7%)
Poor	9 (7.1%)	10 (6.3%)
Average	23 (18.3%)	46 (28.9%)
Good	47 (37.3%)	62 (39.0%)
Excellent	38 (30.2%)	27 (17.0%)
Missing	*6 (4.8%)*	*5 (3.1%)*
Sex		
Males	72 (57.1%)	81 (50.9%)
Females	52 (41.3%)	78 (49.1%)
Missing	*2 (1.6%)*	*0*
Age		
18–25	23 (18.3%)	22 (13.8%)
25–30	29 (23.0%)	36 (22.6%)
30–35	23 (18.3%)	34 (21.4%)
35–40	16 (12.7%)	27 (17.0%)
40–45	12 (9.5%)	22 (13.8%)
45+	22 (17.5%)	18 (11.3%)
Missing	*1 (0.8%)*	*0*
Education		
Primary or vocational	30 (23.8%)	92 (57.9%)
Secondary	37 (29.4%)	38 (23.9%)
University	58 (46.0%)	28 (17.6%)
Missing	*1 (0.8%)*	*1 (0.6%)*
Marital status		
Married/cohabiting	75 (59.5%)	83 (52.2%)
Single	38 (30.2%)	52 (32.7%)
Divorced	11 (8.7%)	21 (13.2%)
Widowed	2 (1.6%)	3 (1.9%)
Origin		
Post-Soviet	81 (64.3%)	135 (84.9%)
Vietnamese	45 (35.7%)	24 (15.1%)
Income		
<10,000 CZK	35 (27.8%)	33 (20.8%)
10,000–20,000	47 (37.3%)	111 (69.8%)
20,000+	18 (14.3%)	15 (9.4%)
Did not answer/missing	*26 (20.6%)*	*0*
Satisfaction with work		
Yes, very much	52 (41.3%)	54 (34.0%)
Yes, a little	30 (23.8%)	65 (40.8%)
No	14 (11.1%)	33 (20.8%)
Missing	*30 (23.8%)*	*7 (4.4%)*
Satisfaction with housing		
Yes, very much	69 (54.8%)	56 (35.2%)
Yes, a little	41 (32.5%)	61 (38.4%)
No	14 (11.1%)	35 (22.0%)
Missing	*2 (1.6%)*	*7 (4.4%)*
Knowledge of the (Czech) language		
Poor	25 (19.8%)	38 (23.9%)
Average	29 (23.0%)	40 (25.2%)
Good	45 (35.7%)	56 (35.2%)
Very good	27 (21.4%)	19 (12.0%)
Missing	*0*	*6 (3.8%)*
Compatriots in neighbourhood		
No families	35 (27.8%)	60 (37.7%)
1–10 families	56 (44.4%)	72 (45.3%)
>10 families	3 (2.4%)	17 (10.7%)
Don't know/missing	*32 (25.4%)*	*10 (6.3%)*
Contacts with relatives in country of origin		
Daily	10 (7.9%)	38 (23.9%)
At least once a week	35 (27.8%)	66 (41.5%)
Less frequently	36 (28.6%)	52 (32.7%)
Never	0	2 (1.3%)
Missing	*45 (35.7%)*	*1 (0.6%)*

"individualistic" (without a partner), and less satisfied with their current housing conditions. Moreover, they seem to have a poorer knowledge of the Czech language, but, on the other hand, they have more contacts with their country of origin.

Table 2 displays the associations between SRH and the given selected characteristics. The analyses were performed for the whole sample of immigrants, and separately for legal and illegal immigrants**.** The age–sex region of origin adjusted odds ratios of poor SRH for all respondents were significantly higher among immigrants who expressed low satisfaction with work, as opposed to immigrants with higher satisfaction [adjusted OR and 95% CI = 4.55 (2.46–8.44)]. A multivariate analysis taking into account country of origin, educational level, marital status, income, knowledge of the Czech language, compatriots in the neighbourhood, and contacts with relatives in the country of origin did not alter these results (not shown in the tables). The SRH did not significantly differ between Post-Soviets and Vietnamese.

The final models are presented in Table 3. The model for all respondents found that the risk of reporting poor SRH was higher for females (fully adjusted OR = 2.32; compared with males), for oldest immigrants (fully adjusted OR = 4.07; compared with the 18–25 age group), and for those who are not satisfied with their work (fully adjusted OR = 3.93; compared with immigrants satisfied with work). The model for legal immigrants found that immigrants with poor satisfaction with their current work and housing reported the poorest health status (OR 3.93,

Table 2 The association between poor self-rated health and independent variables: age–sex region of origin adjusted OR (95% CI)

	All ($N = 285$)		Legal ($N = 126$)		Illegal ($N = 159$)	
	OR (95% CI)	*P* value	OR (95% CI)	*P* value	OR (95% CI)	*P* value
Legality						
Legal	1 (ref)		–		–	
Illegal	**2.07 (1.29–3.32)**	0.003				
Sex						
Males	1 (ref)		1 (ref)		1 (ref)	
Females	**2.15 (1.37–3.39)**	0.001	1.37 (0.68–2.76)	0.38	**2.85 (1.54–5.28)**	0.001
Age						
18–25	1 (ref)		1 (ref)		1 (ref)	
25–30	1.65 (0.80–3.39)	0.17	2.94 (0.99–8.68)	0.05	0.88 (0.33–2.37)	0.81
30–35	1.63 (0.78–3.43)	0.19	2.85 (0.93–8.71)	0.07	0.80 (0.29–2.24)	0.67
35–40	1.04 (0.47–2.30)	0.93	0.61 (0.17–2.25)	0.46	0.93 (0.33–2.63)	0.89
40–45	**3.32 (1.40–7.91)**	0.007	3.24 (0.74–14.11)	0.12	2.29 (0.75–6.96)	0.15
45+	**3.52 (1.55–7.98)**	0.003	**7.48 (2.39–23.37)**	0.001	1.53 (0.44–5.37)	0.51
Origin						
Post-Soviet	1 (ref)		1 (ref)		1 (ref)	
Asian	1.18 (0.70–1.97)	0.54	1.65 (0.78–3.51)	0.19	0.99 (0.41–2.39)	0.98
Education						
Primary/vocational	1 (ref)		1 (ref)		1 (ref)	
Secondary	0.91 (0.50–1.68)	0.77	1.80 (0.58–5.60)	0.31	1.01 (0.47–2.17)	0.98
University	0.67 (0.39–1.14)	0.14	1.62 (0.65–4.08)	0.30	0.64 (0.27–1.51)	0.31
Marital status						
Married/Cohabiting	1 (ref)		1 (ref)		1 (ref)	
Single	0.63 (0.34–1.18)	0.15	0.92 (0.33–2.55)	0.87	0.50 (0.22–1.15)	0.10
Divorced	0.83 (0.39–1.75)	0.62	0.25 (0.05–1.21)	0.09	1.10 (0.44–2.74)	0.84
Widowed	0.95 (0.19–4.84)	0.95	0.30 (0.03–3.24)	0.32	2.30 (0.25–21.13)	0.46
Income						
<10,000 CZK	0.93 (0.54–1.62)	0.81	1.28 (0.51–3.25)	0.60	1.20 (0.56–2.58)	0.64
10,000–20,000	1 (ref)		1 (ref)		1 (ref)	
20,000+	0.55 (0.25–1.20)	0.13	1.02 (0.33–3.22)	0.97	0.36 (0.11–1.15)	0.09
Satisfaction with work						
Yes	1 (ref)		1 (ref)		1 (ref)	
No	**4.55 (2.46–8.44)**	<0.001	**3.92 (1.26–12.18)**	0.02	**4.61 (2.12–10.02)**	<0.001
Satisfaction with housing						
Yes	1 (ref)		1 (ref)		1 (ref)	
No	**2.72 (1.47–5.04)**	0.001	**4.96 (1.48–16.62)**	0.01	2.00 (0.94–4.23)	0.07
Knowledge of the (Czech) language						
Poor	1 (ref)		1 (ref)		1 (ref)	
Average	0.91 (0.46–1.79)	0.79	1.07 (0.33–3.45)	0.91	1.00 (0.42–2.39)	1.00
Good	**0.51 (0.27–0.94)**	0.03	0.72 (0.23–2.21)	0.56	0.54 (0.25–1.19)	0.13
Very good	**0.41 (0.18–0.92)**	0.03	0.76 (0.19–3.10)	0.70	0.49 (0.16–1.51)	0.21
Compatriots in the neighbourhood						
No families	1 (ref)		1 (ref)		1 (ref)	
1–10 families	1.40 (0.84–2.32)	0.20	1.41 (0.59–3.34)	0.44	1.34 (0.69–2.60)	0.38
>10 families	0.72 (0.29–1.79)	0.48	1.40 (0.09–21.64)	0.81	0.55 (0.20–1.56)	0.26
Contacts with relatives in country of origin						
Daily	1 (ref)		1 (ref)		1 (ref)	
At least once a week	0.79 (0.40–1.55)	0.49	1.14 (0.22–5.82)	0.87	0.96 (0.44–2.09)	0.92
Less frequently	0.60 (0.30–1.20)	0.15	0.61 (0.12–3.03)	0.54	1.06 (0.47–2.43)	0.88
Never*	–		–		–	

* Could not be estimated

Table 3 The association between poor self-rated health and independent variables in the final models: OR (95% CI)

	All ($N = 285$)		Legal ($N = 126$)		Illegal ($N = 159$)	
	OR (95% CI)	*P* value	OR (95% CI)	*P* value	OR (95% CI)	*P* value
Legality						
Legal	1 (ref)		–		–	
Illegal	1.50 (0.92–2.45)	0.10				
Sex						
Males	1 (ref)				1 (ref)	
Females	**2.32 (1.46–3.70)**	<0.001			**2.49 (1.36–4.56)**	0.003
Age						
18–25	1 (ref)					
25–30	1.65 (0.81–3.38)	0.70				
30–35	1.59 (0.75–3.38)	0.23				
35–40	1.05 (0.48–2.29)	0.91				
40–45	**3.70 (1.51–9.07)**	0.004				
45+	**4.07 (1.76–9.40)**	0.001				
Origin						
Post-Soviet						
Asian						
Education						
Primary/vocational						
Secondary						
University						
Marital status						
Married/Cohabiting			1 (ref)		1 (ref)	
Single			0.71 (0.32–1.57)	0.39	**0.48 (0.24–0.94)**	0.03
Divorced			**0.21 (0.05–0.93)**	0.04	1.34 (0.55–3.25)	0.52
Widowed			1.44 (0.14–14.77)	0.76	3.06 (0.33–28.49)	0.33
Income						
<10,000 CZK						
10,000–20,000						
20,000+						
Satisfaction with work						
Yes	1 (ref)		1 (ref)		1 (ref)	
No	**3.93 (2.10–7.38)**	<0.001	**4.08 (1.31–12.77)**	0.02	**4.17 (1.92–9.06)**	<0.001
Satisfaction with housing						
Yes	1 (ref)		1 (ref)			
No	1.72 (0.92–3.22)	0.09	**3.30 (1.04–10.44)**	0.04		
Knowledge of the (Czech) language						
Poor			1 (ref)			
Average			0.73 (0.26–2.09)	0.56		
Good			0.49 (0.18–1.34)	0.17		
Very good			0.39 (0.13–1.14)	0.08		
Compatriots in the neighbourhood						
No families					1 (ref)	
1–10 families					0.96 (0.50–1.84)	0.91
>10 families					0.42 (0.15–1.15)	0.09
Contacts with relatives in country of origin						
Daily						
At least once a week						
Less frequently						
Never*						

Variables with $P < 0.10$ in the final model

resp. 1.72; 95% CI 1.31–12.77, resp. 1.04–10.44). The model for illegal immigrants confirms that immigrants' low satisfaction with work goes hand in hand with poor health status (OR 3.93, resp. 1.72; 95% CI 1.31–12.77, resp. 1.04–10.44). The adjusted odds ratios of poor SRH were significantly higher for illegal females than males OR and 95% CI 2.49 (1.36–4.56).

The effect of legality was smaller in the full sample. The odds ratio was reduced from the age-sex-region of origin adjusted OR = 2.07 (95% CI 1.29–3.32) to the fully adjusted OR = 1.50 (95% CI 0.92–2.45) and was not significant.

Discussion

Our first hypothesis was confirmed only partially: we found that illegal/irregular immigrants have higher odds of poor self-reported health than legal immigrants although the difference was statistically significant only at original, age–sex region of origin adjusted, model. When fully adjusted, the effect of immigration status was reduced and was not significant any more. In agreement with what can also be found in other contexts and regions, it was shown that the SRH significantly differs by demographic factors, namely by sex and age—women and older immigrants usually have a poorer SRH (Lindström et al. 2001). It was found that particularly illegal foreign women have a poorer SRH as compared to foreign females with legal status. This may have to do with the former group's extremely heavy workload and the generally very difficult working conditions they are exposed to in their irregular jobs (Drbohlav 2008). Obviously, women may be more sensitive to and open about these issues than men. What it might be expected that educational level would to some extent influence SRH (Lindström et al 2001; Lahelma et al. 2004), this was not proved in our sample. We confirmed a close association between satisfaction with work (evident in the final model both for all immigrants and separately for legal and illegal immigrants) and SRH. Thus, the association between social and economic characteristics and SRH orientation was also supported by the existence of a relationship between satisfaction with housing and SRH in the case of legal migrants (see the significance of socio-economic indicators and their relationship to SHR in Lahelma et al. (2004), Lindström et al. (2001), Toselli and Gualdi-Russo (2008) and Wiking et al. (2004)). Logically, unlike illegal immigrants, who may view their housing in the new host country as something temporary and unimportant, legal immigrants pay attention to their housing, and so poor quality housing may negatively influence SRH parameters. In general, our second hypothesis—that different factors condition the SRH of legal versus illegal/irregular migrants—was more or less also confirmed. On the other hand, in contrast with possibly general expectations (Lindström et al. 2001; Kirkcaldy et al. 2005), no relationship was found between given "psychosocial characteristics" and the SRH. This is surprising because immigrants' social relations and activity, expressed in various forms, may generally contribute to higher satisfaction with their lives and, possibly, health.

This study suffers from some limitations and shortcomings: it sheds light on only two immigrant groups by country/region of origin, the sample size is relatively small and the sampling method is not representative. Moreover, the groups of legal and illegal immigrants are not internally homogeneous groups (see also Carta et al. (2005)), but instead comprise representatives of different migratory behavioral models and strategies (see, e.g. the above-noted differences between so-called "illegal and quasi-legal migrants"). In this study we focused just on economically active foreigners while ignoring other populations. We made a sort of "transversal" analysis, where no dynamism or development over time is taken into account (see, e.g. "the rapidly deteriorating health status of immigrants from Eastern Europe in Germany, occurring independently of improvements in their socioeconomic status"—Ronellenfitsch and Razum (2004)), and a longitudinal approach rather than our cross-sectional approach would be very valuable in this respect. We applied only a quantitative approach, and did not apply any possible qualitative analytical methods (Resick 2008). Our study was cross-sectional, and thus we cannot make any causal inferences about the direction of the relationship between social, psychosocial and economic characteristics and SRH. Finally, while we compared legal and illegal migrants, we could not compare these two groups with local population. There are several existing and available Czech datasets with data on SRH but these datasets do not have some social and psychosocial measures used in this analysis. We can, however, compare prevalence of poor SRH in our analysis with those reported for middle age Czech population (Bobak et al. 2000; Pikhart et al. 2001; Szalavecz et al. 2010). Prevalence of poor SRH in these reports varies between 5 and 15% and is not different from those reported in this analysis.

Despite all these problems, by analyzing immigrants (according to their legal status) in relation to their SRH, we tried to open a window to new research issues in the Czech Republic. Doing such research does seem to make sense (Ronellenfitsch and Razum 2004; Chandola and Jenkinson 2000). Among others, Gushulak and MacPherson (2006) have argued that the dynamics of migration movements have been evolving so quickly that they have created new challenges for existing health policies and programmes. Gaining some knowledge about the low SRH of legal and illegal immigrants and the factors that lie behind this could form one of probably many other useful bases for developing and

improving health policy and planning. Indeed, this study offers a sort of a starting-point for future research on immigrants' health in the Czech Republic.

Acknowledgments This article was produced due to the support of the investigative plan of MSM 0021620831 financed by Ministry of Education, Youth and Physical Education of the Czech Republic. Also, we thank the following institutions for their support. The data used in this paper was collected within the following projects: Project of Ministry of Work and Social Affairs of the Czech Republic No.: 1J 057/05-DP1, project EUROCORES—ECRP, No. CRP/06/E001, and Project of Ministry of Work and Social Affairs of the Czech Republic on integration of foreigners in the Czech Republic conducted by the IOM Office in Prague and the Faculty of Science, Charles University in Prague.

References

Bobak M, Pikhart H, Rose R, Hertzman C, Marmot M (2000) Socioeconomic factors, material inequalities, and perceived control in self-rated health: cross-sectional data from seven post-communist countries. Soc Sci Med 51:1343–1350

Carta MG, Bernal M, Hardoy MC, Haro-Abad JM et al (2005) Migration and mental health in Europe (the state of the mental health in Europe working group). Clin Pract Epidemiol Ment Health 1:13

Černík J (2006) Of clients and chereps. The organizational structures of Ukrainian labour migration. In: Szczepaniková A, Čaněk M, Grill J (eds) Migration processes in Central and Eastern Europe: unpacking the diversity. Multikulturní centrum, Prague, pp 25–29

Chandola T, Jenkinson C (2000) Validating self-rated health in different ethnic groups. Ethn Health 5:151–159

Darmon N, Khlat M (2001) An overview of the health status of migrants in France, in relation to their dietary practices. Public Health Nutr 4:163–172

Drbohlav D (2004) Migration trends in selected EU applicant countries vol II—the Czech Republic. "The Times They are a-Changin" (European Commission Project: Sharing Experience: Migration Trends in Selected Applicant Countries and Lessons Learned From The New Countries of Immigration in the EU and Austria). International Organization for Migration, Vienna

Drbohlav D (ed) (2008) Nelegální ekonomické aktivity migrantů (Česko v evropském kontextu). Karolinum, Prague

Drbohlav D, Dzúrová D (2007) Where are they going? Immigrant inclusion in the Czech Republic (a case study on Ukrainians, Vietnamese, and Armenians in Prague). Int Migr 45:69–95. doi: 10.1111/j.1468-2435.2007.00404.x

Drbohlav D, Ezzeddine-Lukšíková P (2004) Integrace cizinců vČR. Studie arménské, vietamské a ukrajinské komunity v Praze a Středočeském kraji. IOM Prague Office, výzkumná zpráva pro MPSV ČR, Prague

Drbohlav D, Janská E (2009) Illegal economic and transit migration in the Czech Republic (intensive study of individual migrants′ behaviour). Eur Asia Stud 61:141–156

Drbohlav D, Lachmanová L (2008) Irregular activities of migrants in the Czech Republic: a Delphi study about adaptations in a globalising economy. In: Dostál P (ed) Evolution of geographical systems and risk processes in the global context. Charles University in Prague, Faculty of Science, P3K, Prague, pp 129–156

Drbohlav D, Medová L, Čermák Z, Janská E, Čermáková D, Dzúrová D (2009) The Czech Republic. IDEA Working Paper, No. 11. Department of Social Geography and Regional Development, Faculty of Science, Charles University in Prague, Prague. http://www.idea6fp.uw.edu.pl/pliki/WP11_Czech_Republic.pdf

Fawcett JT, Arnold F (1987) The role of surveys in the study of international migration: an appraisal. Int Migr Rev 21:1524–1540

Fennelly K (2007) The "healthy migrant" effect. Minnesota Medicine. http://www.minnesotamedicine.com/PastIssues/March2007/FennellyClinicalMarch2007/tabid/1641/Default.aspx

Foreigners in the Czech Republic (2008) http://www2.czso.cz/csu/2006edicniplan.nsf/engpubl/1414-06-2006, Accessed 27 March 2009

Gushulak BD (2007) Healthier on arrival? Further insight into the "healthy immigrant effect". CMAJ 176:1439–1440

Gushulak BD, MacPherson DW (2006) The basic principles of migration health: population mobility and gaps in disease prevalence. Emerg Themes Epidemiol 3:3. doi:10.1186/1742-7622-3-3

Harris KM (1999) The health status and risk behaviors of adolescents in immigrant families. In: Hernandez DJ (ed) Children of immigrants. National Academies Press, Washington DC, pp 286–315

Horáková M (2009a) Mezinárodní pracovní migrace v ČR. Bulletin 22. Výzkumný ústav práce a sociálních věcí, Prague

Horáková M (2009b) Mezinárodní pracovní migrace v ČR. Bulletin 23. Výzkumný ústav práce a sociálních věcí, Prague

Kirkcaldy HBD, Siefen RG, Wittig U, Schüller A, Brähler E, Merbach M (2005) Health and emigration: subjective evaluation of health status and physical symptoms in Russian-speaking migrants. Stress Health 21:295–309

Kocourek J (2006) Vietnamci v ČR. In: Leontiyeva Y (ed) Menšinová problematika v ČR: komunitní život a reprezentace kolektivních zájmů (Slováci Ukrajinci, Vietnamci a Romové). Sociologický ústav Akademie věd ČR, Prague, pp 46–62

Křečková-Tůmová N, Dobiášová K, Šebek P, Nesvadbová L, Háva P (2003) Potřeba a spotřeba zdravotní péče Ukrajinci žijícími dlouhodobě nebo trvale v ČR. Závěrečná zpráva. Institut zdravotní politiky a ekonomiky. Kostelec nad Černými lesy

Lahelma PE, Martikainen P, Laaksonen M, Aittomäki A (2004) Pathways between socioeconomic determinants of health. J Epidemiol Commun Health 58:327–332

Landman J, Cruickshank JK (2001) A review of ethnicity, health and nutrition-related diseases in relation to migration in the United Kingdom. Public Health Nutr 4:647–657

Leontiyeva Y (2006) Ukrajinská menšina a migranti v ČR. In: Leontiyeva Y (ed) Menšinová problematika v ČR: komunitní život a reprezentace kolektivních zájmů (Slováci Vietnamci a Romové). Sociologický ústav Akademie věd ČR, Prague, pp 32–45

Lindström M, Sundquist J, Östergren PO (2001) Ethnic differences in self reported health in Malmö in southern Sweden. J Epidemiol Commun Health 55:97–103

MacKay L, Mcintyre S, Ellaway A (2003) Migration and health: a review of the international literature. MRC Social and Public Health Sciences Unit, Glasgow, Occasional Paper No. 12

Mackenbach JP, Bos V, Garssen MJ, Kunst AE (2005) Mortality among non-western migrants in the Netherlands. Ned Tijdschr Geneeskd 149:23–917

Mladovsky P (2007) Migration and health in the EU. Lond School Econ Pol Sci 1:55

Nesvadbová L et al (1990) Závěrečná zpráva o plnění úkolu P 12-335-807-34-03: Zdravotní a sociální problematika cizinců dlohodobě pracujících v ČSFR, Prague

Nesvadbová L, Rutsch J (1995) Health and Social Problems of a group ressetled people from Chernobyl area. In: Proceedings of international congress: children in Chernobyl, Minsk

Nesvadbová L, Rutsch J, Kroupa A, Vajnarová E, Sojka S (1998) Zdravotní, psychologické a sociální aspekty migrace, Prague

Pikhart H, Bobak M, Siegrist J, Pajak A, Rywik S, Kyshegyi J, Gostautas A, Skodova Z, Marmot M (2001) Psychosocial work characteristics and self-rated health in four post-communist countries. J Epidemiol Commun Health 55:624–630

Razum O, Zeeb H, Rohrmann S (2000) The 'healthy migrant effect'—not merely a fallacy of inaccurate denominator figures. Int J Epidemiol 29:2–191

Resick LK (2008) The meaning of health among midlife Russian-speaking women. J Nurs Sch 40(3):248–253

Ronellenfitsch U, Razum O (2004) Deteriorating health satisfaction among immigrants from Eastern Europe to Germany. Int J Equity Health 3:4. doi:10.1186/1475-9276-3-4

Szalavecz G, Chandola T, Pikhart H, Dragano N, Siegrist J, Jockel KH, Erbel R, Malyutina S, Pajak A, Kubinova R, Marmot M, Bobak M, Kopp M (2010) Work stress and poor health in Western European and in post-communist countries: an east-west comparison study. J Epidemiol Commun Health 64:57–62

Toselli S, Gualdi-Russo E (2008) Psychosocial indicators and distress in immigrants living in Italian reception centres. Stress Health 24:327–334

Wiking E, Johansson SE, Sundquist J (2004) Ethnicity, acculturation, and self reported health: a population based study among immigrants from Poland, Turkey, and Iran in Sweden. J Epidemiol Commun Health 58:574–582