Smoking during pregnancy and associated risk factors in a sample of Romanian women

Cristian I. Meghea1,2, Diana Rus2, Ioana A. Rus2, Jodi Summers Holtrop3, LeeAnne Roman1

1 Department of Obstetrics, Gynecology and Reproductive Biology, Institute for Health Care Studies, College of Human Medicine, Michigan State University, East Lansing, MI, USA
2 Center for Health Policy and Public Health, Institute for Social Research, Faculty of Political, Administrative and Communication Science, Babes-Bolyai University, Cluj-Napoca, Romania
3 Department of Family Medicine, College of Human Medicine, Michigan State University, East Lansing, MI, USA

Correspondence: Cristian I. Meghea, A134 East Fee Hall, Institute for Health Care Studies, Michigan State University, East Lansing, MI 48823, USA, tel: +1 517 432 8385, fax: +1 517 432 9977, e-mail: cristian.meghea@hc.msu.edu

Background: Smoking during pregnancy is one of the most modificable risk factor for poor birth outcomes. This study assesses the prevalence and correlates of smoking during pregnancy. Methods: A questionnaire was applied to pregnant women in two urban clinics in Romania to assess smoking prevalence, attitudes and knowledge about smoking, and other risks poorly documented in Romania, such as depressive symptoms, stress and social support. The response rate was >80% and the valid sample comprised of 916 women. Descriptive statistics and logistic regressions were used to estimate the prevalence of smoking and other risk factors and to identify correlates of smoking during pregnancy. Results: Approximately 15% of the women continued smoking during pregnancy, and 26% of all women said they smoked prior to pregnancy, but quit upon finding out they were pregnant. Depressive symptoms and stress were not associated with smoking during pregnancy. Women with no social support had higher odds of continued smoking vs. non-smoking (OR = 2.3, P < 0.01), and vs. quitting (OR = 2.3, P < 0.05). Roma women had 5.2 times the odds (P < 0.01) of continued smoking vs. non-smoking. Lack of awareness about the benefits of quitting smoking and about the risks of smoking light cigarettes were associated with continued smoking during pregnancy.

© The Author 2010. Published by Oxford University Press on behalf of the European Public Health Association. All rights reserved.

Risk factors of smoking during pregnancy
229

References
23 O’Connell KA, Schwartz JE, Shiffman S. Do resisted temptations during smoking cessation deplete or augment self-control resources? Psychol Addict Behav 2008;22:486–95.
Conclusions: Smoking was common in a sample of Romanian pregnant women. Smoking cessation programs in Romania should include components to raise the awareness about the risks of smoking during pregnancy and the benefits of quitting at any time during pregnancy. More targeted interventions are needed in Roma communities.

Introduction

Smoking is a leading cause of preventable death worldwide. Smoking during pregnancy is especially harmful, being one of the most modifiable risk factors for poor birth outcomes. It is a risk factor for ectopic pregnancy, pre-term birth and low birth weight. Maternal smoking during pregnancy is also linked to increased child mortality and offspring health problems including delayed growth, asthma, behavioral and neurodevelopmental problems. Efforts to reduce smoking during pregnancy are therefore critically important.

Smoking prevalence has increased through the 1990s in the former communist countries in Central and Eastern Europe, especially among women. For example, the overall smoking rate in Romania increased between 1989 and 2000 from 44 to 48% among men and from 11 to 25% among women. Smoking during pregnancy is a problem in the region. Based on the few existing reports, smoking prevalence during pregnancy continues to be high in Central and Eastern Europe, but most of the prior studies relied on small samples, and lack details such as depression, stress, alcohol use, social support or other risk factors known to be associated with smoking during pregnancy. A study conducted recently on 160 pregnant women confined to bed in three maternity clinics in Bucharest, Romania indicated that 24% of the women continued to smoke during pregnancy and all smokers were exposed to second-hand smoking. Another recent study on a large sample (n = 23 139) in Brasov, Romania, estimated a smoking rate during pregnancy of 24%. Another study conducted in Poland relied on a sample of 136 pregnant women and found a self-reported smoking rate during pregnancy of 25–30% and a smoking rate of 33–41% based on cotinine levels in saliva samples. By comparison, only 12% of pregnant women in the US smoked cigarettes in 2005.

Other background and demographic factors are associated with smoking during pregnancy, including older age, unmarried status and low education. Recent research in the USA found psychological and psychosocial risk factors, including stress, depression and lack of social support to be associated with continued smoking during pregnancy, especially in lower-income populations. In the Netherlands, a very recent study found that, after adjustment for sociodemographic and smoking-related covariates, pregnancy-related anxiety, exposure to physical/sexual violence and high job strain were significantly associated with continued smoking during pregnancy. Pregnancy risk factors, specifically in relation with smoking during pregnancy, are poorly documented in Central and Eastern Europe.

Our team had the opportunity to describe and analyze some of these risk factors in a sample of pregnant women in Romania and to determine whether they were consistently associated with continued smoking during pregnancy in this different economic and cultural environment, or whether there were dissimilarities compared to other populations. The purpose of our study was to examine factors associated with smoking in pregnancy in order to inform the larger literature on how to approach smoking cessation and to facilitate potential efforts in Romania in particular. The specific objectives of this study are: to fill the gap in Central and Eastern Europe assessing smoking during pregnancy, maternal characteristics and prenatal risk factors relying on a relatively large sample of women in Romania; and to analyze the associations of maternal characteristics and prenatal risk factors with smoking during pregnancy.

Methods

This study is part of the 2-year Smoking during Pregnancy in Romania (SPRO) research project financed by the Romanian Ministry of Education and Research. Approval for the study was obtained from the Institutional Review Board 01Public Health, Babes Bolyai University, Center for Health Policy and Public Health. The complete SPRO data and additional project details were described elsewhere.

Setting and population

Pregnant women 18 or older who sought antenatal care or were confined in bed in the largest two obstetrics-gynecology clinics in Cluj-Napoca, Romania, between November 2008 and August 2009 were invited to participate in the study. The refusal rate was <20% at both sites. The cross-sectional study is based on a convenience sample of 916 pregnant women who accepted to enroll in the SPRO study. Cluj-Napoca is one of Romania’s largest cities, and an important university center. The two clinics serve mainly the city population, but also the rural areas in the proximity of the city. The vast majority of the Romanian health care system is state-owned. By law, Romanian pregnant women receive free medical care in the state-owned institutions even if they never contributed to the state-administered health insurance. The two clinics are state-owned and therefore serve the full socio-economic spectrum of pregnant women. Our sample was more urban, older age at conception, and higher household income compared to the overall Romanian population. Pregnant women confined to bed were over-represented in our sample. To maximize sample size, the study recruited approximately one third of the sample among pregnant women who were having a difficult pregnancy or were close to delivery and their physician recommended bed confinement. The other pregnant women in the sample were interviewed during one of their prenatal visits.

Data collection

Data were collected with the use of a questionnaire that assessed multiple risk factors during pregnancy applied by trained research assistants under the supervision of qualified staff and medical personnel. The SPRO questionnaire was based on questions translated and adapted from the risk screener developed by the Michigan Families Medicaid Project (MFMP). Additional smoking related questions from a 2004 Romanian survey were included. The participant’s name, contact information, and consent to be re-contacted were solicited in order to obtain follow-up information on birth outcomes and smoking behavior after the delivery date. All interviewers received rigorous training and were instructed to emphasize the fact that participation is voluntary, and declining participation in the survey would not affect participants’ receiving of health care. This information was also included in the signed consent form, along with the fact that participation in the study may improve the understanding of smoking during pregnancy and related factors, and may lead to more efficient smoking cessation programs.

Outcome variables

Smoking status (continuous smoker, quitter and non-smoker) was defined relying on the multiple choice question ‘Do you currently smoke cigarettes?’ The first answer option was ‘Yes,’ the second ‘I do not smoke now and did not before pregnancy’, and two options for quitting: ‘I quit since learning I was pregnant and I intend to stay smoke free’ and ‘quit since learning I was pregnant and I will probably smoke again after delivery’. The questions was initially developed by Mullen et al., and was previously used in the research literature. We adapted it to assess relapse intentions of self-reported quitters.

Risk factors, other covariates

The Romanian translation of the Patient Health Questionnaire-2 (PHQ-2) screening tool was used to assess depressive symptoms. Another key risk factor was a stress score higher than the median sample value of 5 on the
Perceived Stress Scale-4 (PSS-4). An indicator for lack of social support was incorporated in the analyses measured using the questions ‘Do you rely on anybody for help during pregnancy and with the future baby—yes/no’ and as a confirmation question ‘If so, who will be those persons—baby’s father/partner, my parents, my other children, relatives, friends/neighbors, my priest, others’. Other risk factors included age 35 or older; education less than high school; rural living; unmarried; Roma ethnicity, also known as Gypsies, a sizeable minority in many European countries and second largest minority in Romania after Hungarians according to the 2002 Romanian Census; and an indicator for unwanted pregnancy defined based on the answers ‘I wanted to be pregnant earlier or at the conception time’ vs. ‘I wanted to be pregnant later or never;’ being a first pregnancy; alcohol consumption during pregnancy. Our questionnaire also asked knowledge questions to assess the potential harms of smoking during pregnancy. Two such indicators were included based on the answer ‘Disagree’ to the question ‘Do you agree/disagree that: Quitting at any moment during pregnancy may reduce such risks’; and ‘Agree’ to the question ‘Light cigarettes are not as harmful as regular cigarettes’. The natural logarithm of annual household income (in EURO at the February/2010 exchange rate) was also included as a control variable in the logistic regressions. We used the multiple imputation technique to estimate the 28% missing responses for income and the 22 and 33% missing responses in the two questions on knowledge about smoking.

Statistical analysis

Descriptive statistics (counts and percentages in table 1) were presented to assess smoking behavior during pregnancy and to explore unadjusted associations between various prenatal risk factors and maternal characteristics of pregnant women and their smoking status: continuous smoker, quitter or non-smoker. Logistic regression analyses were used to identify the independent effect of each risk factor considered, statistically adjusting for the effects of all other variables included in the analysis. The data were collected from two prenatal hospitals, so we employed a hierarchical model for the logistic regressions. To test the influence of nesting within locations, we ran logistic regressions both ignoring and then accounting for the hierarchical structure of the data. Accounting for nesting within locations did not change the results reported in meaningful ways and the results maintained their statistical significance. The non-nested logistic results are reported, including the odds ratios (OR) and the 95% confidence intervals.

To account for potential differences in characteristics, smoking patterns, and other risk factors between the pregnant women confined to bed and the other pregnant women, we performed logistic regressions both including and then excluding a ‘confined’ indicator. The results were similar in both iterations and the ‘confined’ indicator was far from reaching statistical significance. In order to use the largest sample size available—~4% of the sample had missing values for the ‘confined’ indicator—we decided to report results without controlling for the confined status. This study interviewed women at various stages in their pregnancy, a potential relevant factor in our analyses. To test this, we performed logistic analyses including and then excluding the week of pregnancy when interviewed. The ‘pregnancy week’ variable was not statistically significant, and the results did not change in meaningful ways. All data analyses were run using the SAS statistical software (SAS 9.1, SAS Institute Inc., Cary, NC, USA).

Results

Descriptive statistics and unadjusted associations

Table 1 presents descriptive statistics on the sample of pregnant women, overall and also by smoking status: continuous smokers, quitters and non-smokers. Approximately 15% of the women continued smoking during pregnancy, and 26% of all women said they smoked prior to pregnancy, but quit upon finding out they were pregnant. More than 75% of all pregnant women were living in urban areas, 12% were unmarried and 4% of Roma ethnicity (unreported results indicate that 85% of the women were Romanian while 11% were Hungarian). Average age was 29, almost 9% of the pregnant women were 35 or older and 12% of the women had less than high school education. The percentages of women with depressive symptoms were similar among continuing smokers, quitters and non-smokers (65–67%). There was a higher percentage of smokers with high perceived stress (61%) compared to quitters and non-smokers (52%). In addition, the percentage of women with no social support was higher among smokers (22%) than among quitters and non-smokers (11 and 10%). A much higher percentage of the smokers were of Roma ethnicity (16%) compared to the quitters (2%) and non-smokers (1%). A higher percentage of smokers believed that light cigarettes are not as harmful as regular cigarettes: 49% of smokers, 20% of quitters and 24% of the non-smokers.

Adjusted associations between outcomes and risk factors

Table 2 provides the results of logistic regressions on three binary outcomes: smoking vs. non-smoking; smoking vs. quitting; quitting vs. non-smoking. After adjusting for other covariates, depressive symptoms and stress were not differentiating factors between smokers, quitters and non-smokers. Logistic regressions indicated that women with no social support had higher odds ratios (ORs) of continued smoking vs. non-smoking (OR = 2.3, P < 0.01) and vs. quitting (OR = 2.3, P < 0.05). Roma women had 5.2 times the odds (P < 0.01) of continued smoking vs. non-smoking. Women with unwanted pregnancies had higher odds of smoking vs. quitting (OR = 2.3, P < 0.01). Confirming the univariate analysis, women who did not agree that quitting during pregnancy reduces the pregnancy and birth risks had higher odds of smoking vs.

Table 1 Characteristics of pregnant women by pregnancy smoking status

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All, n = 916</th>
<th>Smokers, n = 139</th>
<th>Quitters, n = 234</th>
<th>Non-smokers, n = 541</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression (PHQ-2 positive)</td>
<td>602 (66.3)</td>
<td>89 (65.4)</td>
<td>151 (64.5)</td>
<td>362 (67.4)</td>
</tr>
<tr>
<td>Stress (PSS-4 score ≥ 5)</td>
<td>466 (53.3)</td>
<td>80 (60.6)</td>
<td>117 (52.2)</td>
<td>267 (51.9)</td>
</tr>
<tr>
<td>No social support</td>
<td>108 (11.9)</td>
<td>30 (21.7)</td>
<td>25 (10.7)</td>
<td>53 (9.8)</td>
</tr>
<tr>
<td>Age &gt;35 years</td>
<td>80 (8.7)</td>
<td>9 (6.5)</td>
<td>22 (9.4)</td>
<td>49 (9.0)</td>
</tr>
<tr>
<td>Education less than high school</td>
<td>109 (11.9)</td>
<td>43 (30.9)</td>
<td>23 (9.8)</td>
<td>43 (7.9)</td>
</tr>
<tr>
<td>Live in rural area</td>
<td>220 (24.1)</td>
<td>57 (41.3)</td>
<td>48 (20.6)</td>
<td>115 (21.3)</td>
</tr>
<tr>
<td>Mean annual household income (USD)</td>
<td>9965</td>
<td>7220</td>
<td>10320</td>
<td>10388</td>
</tr>
<tr>
<td>Unmarried</td>
<td>109 (11.9)</td>
<td>42 (30.2)</td>
<td>25 (10.7)</td>
<td>42 (7.7)</td>
</tr>
<tr>
<td>Roma ethnicity</td>
<td>35 (3.6)</td>
<td>22 (15.8)</td>
<td>5 (2.1)</td>
<td>6 (1.1)</td>
</tr>
<tr>
<td>Unwanted pregnancy</td>
<td>180 (19.8)</td>
<td>42 (30.4)</td>
<td>37 (16.1)</td>
<td>101 (18.7)</td>
</tr>
<tr>
<td>First pregnancy</td>
<td>532 (58.5)</td>
<td>82 (59.4)</td>
<td>151 (64.5)</td>
<td>299 (55.6)</td>
</tr>
<tr>
<td>Alcohol use during pregnancy</td>
<td>92 (10.0)</td>
<td>16 (11.5)</td>
<td>26 (11.1)</td>
<td>50 (9.2)</td>
</tr>
<tr>
<td>Disagree: quitting during pregnancy reduces risks</td>
<td>63 (6.9)</td>
<td>15 (14.2)</td>
<td>12 (6.8)</td>
<td>36 (6.4)</td>
</tr>
<tr>
<td>Agree: light cigarettes are not as bad</td>
<td>165 (27.0)</td>
<td>54 (49.1)</td>
<td>37 (20.8)</td>
<td>74 (24.6)</td>
</tr>
</tbody>
</table>

Counts and percentages are calculated based on the valid, non-missing, responses.
non-smoking (OR = 3.4, \( P < 0.01 \)) and vs. quitting (OR = 3.5, \( P < 0.01 \)). In addition, women who believed that light cigarettes were not as harmful as regular cigarettes had higher odds of smoking both vs. non-smoking (OR = 2.8, \( P < 0.01 \)) and vs. quitting (OR = 2.9, \( P < 0.01 \)).

Discussion

The pre-pregnancy smoking rate was high (41%) in this Romanian, predominantly urban, sample of women of childbearing age, including 26% who quit upon finding out they were pregnant and 15% who continued to smoke. To put our results in perspective, a nationally representative study of the Romanian population found a smoking rate of 27% in 2003 among women aged 15–44. Overall, the smoking rate in Romania declined in recent years from 35% in 2003 to ~30% in 2007. The smoking rate among women rose sharply in the 1990s (stage two of a smoking epidemic model) from 11% in 1990 to 25% in 2000 and recent studies suggest that it has reached a plateau (24% in 2003 and 27% in 2007) consistent with the third stage of a smoking epidemic model.

The 63% of women who were smoking before pregnancy but reported quitting upon finding out about the pregnancy is similar to the self-reported 62% quit rate in a Dutch sample and higher than the quitting upon finding out about the pregnancy is similar to the self-reported 62% quit rate in a Dutch sample and higher than the statement that quitting at any time during pregnancy may reduce their relationship to smoking during pregnancy. Two thirds of the pregnant women screened positive on the PHQ-2 depression screening. Another original finding is the very high rate of pre-pregnancy (82%) and continuous smoking (67%) among Roma pregnant women. This is in line with other studies that found this ethnic group in worse health compared to other populations.

Consistent with other studies analyzing pregnant women in industrialized countries we found that, after controlling for other factors, continued smoking during pregnancy was associated with the lack of social support among pregnant women in this Romanian sample. We also found that being unmarried, low education and carrying an unwanted pregnancy were associated with continued smoking during pregnancy. In contrast to studies other populations, maternal age and alcohol consumption were not related to continue smoking during pregnancy. Women living in rural settings and presenting for prenatal care in urban clinics, as sampled by our study, are not representative for the Romanian rural population. This is a potential explanation for our finding that rural living was associated with smoking during pregnancy, opposite to other studies including on Romanian populations. In particular, the majority of Roma women in our study lived in rural areas and had a very high smoking rate, partly explaining the results.

As a contribution to the research literature in the region, this study found that continued smoking is not associated with high perceived stress and depressive symptoms in our sample of Romanian pregnant women. A recent US study reported no association between current depressive symptoms and smoking during pregnancy and found that stress only differentiated smokers from non-smokers, but not from quitters. Others have found both current depression and stress to be associated with smoking during pregnancy,6,7 consistent with other studies that found this ethnic group in worse health compared to other populations.

As another novelty in the region, this study investigated the associations between knowledge about smoking and smoking behavior during pregnancy. We found that the agreement to the statement that light cigarettes are not as harmful as regular ones was significantly associated with smoking during pregnancy. We also found that disagreement with the statement that quitting at any time during pregnancy may reduce

### Table 2 Associations between smoking status, demographic characteristics, mental health and other behaviors

<table>
<thead>
<tr>
<th></th>
<th>Smoke (vs. not smoke)</th>
<th>Confidence intervals</th>
<th>Smoke (vs. quit)</th>
<th>Confidence intervals</th>
<th>Quit (vs. not smoke)</th>
<th>Confidence intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression (PHQ-2 positive)</td>
<td>1.0</td>
<td>0.6</td>
<td>1.4</td>
<td>0.9</td>
<td>0.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Stress (PSS-4 score ≥5)</td>
<td>1.0</td>
<td>0.6</td>
<td>1.6</td>
<td>1.0</td>
<td>0.6</td>
<td>1.7</td>
</tr>
<tr>
<td>No social support</td>
<td>2.3**</td>
<td>1.3</td>
<td>4.1</td>
<td>2.3*</td>
<td>1.1</td>
<td>4.5</td>
</tr>
<tr>
<td>Age &gt;35 years</td>
<td>0.8</td>
<td>0.3</td>
<td>2.1</td>
<td>0.6</td>
<td>0.2</td>
<td>1.8</td>
</tr>
<tr>
<td>Education less than high school</td>
<td>2.2**</td>
<td>1.1</td>
<td>4.2</td>
<td>1.3</td>
<td>0.6</td>
<td>2.8</td>
</tr>
<tr>
<td>Live in rural area</td>
<td>1.5</td>
<td>0.9</td>
<td>2.5</td>
<td>1.9*</td>
<td>1.0</td>
<td>3.3</td>
</tr>
<tr>
<td>Log annual household income</td>
<td>0.8</td>
<td>0.5</td>
<td>1.1</td>
<td>0.8</td>
<td>0.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Unmarried</td>
<td>2.5**</td>
<td>1.4</td>
<td>4.6</td>
<td>2.3**</td>
<td>1.1</td>
<td>4.6</td>
</tr>
<tr>
<td>Roma ethnicity</td>
<td>5.2**</td>
<td>1.8</td>
<td>15.3</td>
<td>3.0</td>
<td>0.9</td>
<td>9.7</td>
</tr>
<tr>
<td>Unwanted pregnancy</td>
<td>1.6</td>
<td>0.9</td>
<td>2.7</td>
<td>2.3**</td>
<td>1.3</td>
<td>4.3</td>
</tr>
<tr>
<td>First pregnancy</td>
<td>1.5</td>
<td>0.9</td>
<td>2.5</td>
<td>1.0</td>
<td>0.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Alcohol use during pregnancy</td>
<td>1.3</td>
<td>0.6</td>
<td>2.6</td>
<td>0.9</td>
<td>0.4</td>
<td>2.2</td>
</tr>
<tr>
<td>Disagree: quitting during pregnancy reduces risks</td>
<td>3.4**</td>
<td>1.7</td>
<td>6.9</td>
<td>3.5**</td>
<td>1.3</td>
<td>9.1</td>
</tr>
<tr>
<td>Agree: light cig. are not as bad</td>
<td>2.8**</td>
<td>1.6</td>
<td>4.7</td>
<td>2.9**</td>
<td>1.5</td>
<td>5.4</td>
</tr>
</tbody>
</table>

\* Multivariate logistic regression analysis
* and ** denote \( P \)-values <0.05 or 0.01
risks for baby and mother was significantly associated with smoking status.  
As this study relies on cross-sectional data, it cannot determine causal effects of various maternal characteristics and risk factors on smoking during pregnancy. An additional limitation is the fact that the data consists of a convenience sample, mostly urban, of pregnant women, not representative of the Romanian population of pregnant women or of the childbearing age female population in Romania. Similar to prior research, we also suspect that smoking is underestimated as we rely on self-reported information as opposed to biochemically verified smoking status. The percentage of missing answers to the smoking knowledge questions is of some concern. As a robustness check, we performed multivariate logistic regressions on the subsample of women with complete information and the key results were similar.

To conclude, this study found that smoking was common in a predominantly urban sample of Romanian pregnant women. Most pregnant women were likely to have depressive symptoms. Further and more detailed evaluations are needed to establish a clear diagnosis and to measure severity. Smoking cessation programs in Romania should include components to raise the awareness about the risks of smoking during pregnancy and the benefits of quitting at any time during pregnancy. The staggering pre-pregnancy smoking rate and continued smoking rate during pregnancy of Roma ethnicity point to the need for additional, more targeted interventions in Roma communities.

Acknowledgements
The authors thank Qi Zhu for assistance with data analysis, the interviewers and other research personnel who conducted the study and the study participants at all of the research sites. Parts of this work were presented at the 2009 European Public Health Association conference in Lodz, Poland and at the 2009 American Public Health Association conference in Philadelphia, USA.

Funding
Unitatea Executiva pentru Finantarea Invatamantului Superior si a Cercetarii Stiintifice Universitare (UEFISCSU) grant number 1/30.06.2008; Bucharest, Romania (to C.I.M.).

Conflicts of interest: None declared.

Key points
- The pre-pregnancy smoking rate was high in this predominantly urban sample of pregnant women and most reported quitting as they found out about the pregnancy. Fifteen percent of the pregnant women continued to smoke during pregnancy.
- Most pregnant women were likely to have depressive symptoms. Further and more detailed evaluations are needed to establish a clear diagnosis and to measure severity.
- Smoking cessation programs in Romania should include components to raise the awareness about the risks of smoking during pregnancy and the benefits of quitting at any time during pregnancy. More targeted interventions are needed in Roma communities.

References