

# Mental distress in subjects who did, or did not, move from rural Sami core areas to cities in Norway: The impact of Sami ethnicity

Astrid M.A. Eriksen, Marita Melhus,  
Bjarne K. Jacobsen, Ann-Ragnhild Broderstad

Astrid M.A. Eriksen, post doctor, Centre for Sami Health Research, Department of Community Medicine, UiT The Arctic University of Norway, Tromsø. Associate professor  
Faculty of Health Sciences, Oslo metropolitan University, Norway.

E-mail: [astrid.m.eriksen@uit.no](mailto:astrid.m.eriksen@uit.no).

Marita Melhus, senior engineer, Centre for Sami Health Research, Department of Community Medicine, UiT The Arctic University of Norway, Tromsø. E-mail: [marita.melhus@uit.no](mailto:marita.melhus@uit.no).

Bjarne K. Jacobsen, professor, Centre for Sami Health Research, Department of Community Medicine, UiT The Arctic University of Norway, Tromsø. E-mail: [Bjarne.koster.jacobsen@uit.no](mailto:Bjarne.koster.jacobsen@uit.no).

Ann-Ragnhild Broderstad, Dr.med., academic director and senior consultant, Centre for Sami Health Research, Department of Community Medicine, UiT The Arctic University of Norway,

Tromsø. E-mail: [ann.ragnhild.broderstad@uit.no](mailto:ann.ragnhild.broderstad@uit.no)

The aim of the study was to compare the level of mental distress of Sami and non-Sami residents in rural Sami core areas with that of people who have moved from these areas to cities in Norway. Previous research on mental health among the adult Sami population has mainly been conducted in rural areas, and there is a knowledge gap concerning the mental health of urban Sami. This study has a cross-sectional design and is based on self-administered questionnaires in two different surveys: the SAMINOR 2 Questionnaire Survey (2012) and the survey From Rural to Urban Living (2014). The total analytical sample consists of 5942 individuals: 3955 rural participants (SAMINOR 2) and 1987 urban participants (From Rural to Urban Living). Chi-square tests, two-sample t-tests, and Wilcoxon's rank sum tests were used for testing differences between the groups. Multiple linear regression analysis was applied to explore the association between place of residence and a continuous mental distress (HSCL-10) score. Logistic regression analysis was performed to explore the association between place of residence and the prevalence of mental distress, as defined as a HSCL-10 score of  $\geq 1.85$ . The analyses were stratified by gender and Sami and non-Sami ethnicity. The results show that when comparing people who have moved to a city with people living in rural areas, differences in mental distress were found among non-Sami women only, with a lower level of mental distress in urban non-Sami women. In men, regardless of ethnicity and in Sami women, living in rural or urban areas did not make a difference in their mental distress status.

## Introduction

Urbanization is a global trend, and most rural parts of Northern Norway, including the traditional Sami settlement regions, have for decades had a negative net migration (1-4).

The World Health Organization have identified mental health problems as one of the 10 most important contributors to the global burden of diseases (5). Migration is a complex process that may affect mental health in both positive and negative ways, and may be influenced by many motives (6). Job- and educational opportunities are known as significant factors for why people chose to move to a city (6,7). One supposition might therefore be that those who migrate to urban areas have a better mental health status than rural citizens as having a job and higher education reduces the prevalence of mental health problems (8). On the other hand, social relations and close friends are positively associated with mental health (9). When migrating from a rural to an urban area, these relations might be dissolved and even out the positive effect of migrating. In addition, access to mental health services is also more accessible in urban than rural areas.

A high prevalence of mental health problems has been reported in indigenous peoples (10-12). The indigenous Sami people have traditionally inhabited northern and central parts of Norway and Sweden, northern Finland, and the Kola Peninsula in Russia. Research on mental health among the adult Sami population in Norway has mostly been conducted in northern, mainly rural areas (13-16). These studies found higher prevalence of mental distress among Sami compared to non-Sami, although one of the studies found ethnic differences for men only (16).

There is limited information concerning mental health among urban Sami, and a lack of research addressing the mental health of people who have relocated from rural to urban areas. Sami migrating to a city might hold cultural traits that are not common in the urban and Norwegian context (17), making the migration process more difficult than for non-Sami.

This study has an explorative and descriptive design and aims to compare the level of mental distress among Sami and non-Sami subjects who have migrated from rural Sami core areas to cities in Norway with corresponding groups living in rural Sami core areas. The research question is as follows: "Do those who moved and those who stayed behind have different levels of mental distress, and does ethnicity have any impact on the possible difference?"

## Materials and methods

### *Study design*

In this cross-sectional study, and data were collected through self-administered questionnaires in two different surveys: the “SAMINOR 2 Questionnaire Survey”, conducted in 2012, and the survey “From Rural to Urban Living”, conducted in 2014. Data collection of both surveys was planned and carried out by the Center for Sami Health Research at UiT The Arctic University of Norway. The SAMINOR 2 Questionnaire Survey (hereafter referred to as SAMINOR 2) was a part of the second wave of the Population-based Study on Health and Living Conditions in Regions with Sami and Norwegian Populations - the SAMINOR Study - and was conducted in mainly rural places in Mid- and Northern Norway. Details regarding the survey are given elsewhere (18). From Rural to Urban Living was a questionnaire-based survey among inhabitants in selected cities in Norway who originated from rural Sami core areas. The survey is described in a recent paper (19).

### *Sample*

In SAMINOR 2, all inhabitants aged 18–69 (at the beginning of 2012) in 25 selected municipalities in Mid- and Northern Norway were invited to participate (a full list of the municipalities may be found in Brustad et al. (18)). Out of 43 245 persons eligible for the survey, a total of 11 600 subjects (27%) returned a completed questionnaire. To achieve a purely rural sample, we excluded two municipalities, Alta and Sør-Varanger ( $n=4967$ ), as they include the cities Alta and Kirkenes, respectively, and four participants who did not provide any information about their municipality. Furthermore, participants in the age group 18–37 and 64–69 were excluded ( $n=2480$ ) to match the age span in the survey From Rural to Urban Living (age group 38–63, see below). Finally, 186 participants were excluded due to three or more missing answers to the 10 questions measuring mental distress (HSCL-10) and eight due to missing information on ethnicity, leaving a final sample of 3955 respondents living in rural places.

The survey From Rural to Urban Living invited everyone born 1950–1975 (aged 38–63 at the beginning of 2014) who, when they turned 15, lived in one out of 23 preselected rural municipalities and by the time of invitation lived in one of the 51 preselected cities in Norway. A list of included cities and rural municipalities may be found in Melhus et al. (19). Twenty of the rural municipalities were also included in SAMINOR 2. Out of an eligible sample of 6033 individuals, 2058 (34%) responded. Participants who did not provide information about gender ( $n=9$ ) or birth year ( $n=2$ ) or reported a birth year outside the selected range ( $n=1$ ) were excluded from the analyses. Furthermore, 54 individuals were

excluded due to three or more missing answers to the questions measuring mental distress and five participants were excluded due to missing ethnicity information, leaving 1987 participants in the final sample from urban areas.

In summary, the total analytical sample consists of 5942 individuals; 3955 rural participants (SAMINOR 2) and 1987 urban participants (From Rural to Urban Living). The sample includes 3360 (56.6%) women and 2582 men.

### *Mental distress (HSCL-10)*

Mental distress was measured by a 10-item version of the Hopkins Symptom Checklist (HSCL-10), which addresses respondents' experiences of symptoms of anxiety and depression during the previous four weeks. Each item was rated on a four-point scale, from "Not at all bothered" to "Extremely bothered" and scored 1-4. For respondents with one or two missing items, those missing values were replaced with the sample mean value for each item, as suggested by Strand et al. (20). There were 146 (2.4%) participants with one missing item and 23 (0.4%) with two missing items.

A mental distress score was then calculated as the mean of the ten items, producing a score ranging from one (not at all bothered) to four (extremely bothered with all 10 symptoms). In the final sample, the internal consistency of the score was high in both ethnic groups (Cronbach  $\alpha=0.91$  among non-Sami and  $\alpha=0.89$  among Sami). We included information about mental distress, both as the continuous mental distress score and as a dichotomous variable - that is, the prevalence of mental distress (i.e., HSCL-10 score  $\geq 1.85$  as suggested by Strand et al. (20)).

### *Variables*

#### *Ethnicity*

Ethnicity was categorized as Sami or non-Sami based on information collected from the questionnaires. A total of 11 questions regarding language and ethnic affiliation were posed identically in the two surveys. To be categorized as Sami, participants had to report that they considered themselves Sami or that their ethnic background was Sami, in addition to the more objective criterion of Sami linguistic affiliation (at least one grandparent, parent, or the participants themselves use(d) Sami as the home language). Other participants were categorized as non-Sami. This classification resulted in 1702 Sami (28.6%) and 4240 non-Sami (71.4%) individuals.

#### *Place of residence*

Participants of SAMINOR 2 were classified as rural inhabitants, and the participants of From Rural to Urban Living were classified as urban inhabitants. The

included rural municipalities are sparsely populated with 500–4000 inhabitants. Primary industry is still important in these municipalities and educational possibilities beyond secondary school are limited. Being a country of less than 5.5 million citizens, the cities in Norway are small. Only 20% of the cities in our study have more than 50 000 inhabitants and some has as few as 6000.

### Sociodemographic variables

In SAMINOR 2, year of birth and gender were retrieved from the National Population Registry, while From Rural to Urban Living collected this information from the questionnaire. Age was set to the participant's age at the beginning of the participation year and used as a continuous variable in the analyses. Educational level was used as a proxy for socioeconomic status. In SAMINOR 2, education was reported in the questionnaire as the total number of completed years of education. This was categorized into four groups, which roughly correspond to the educational levels mentioned in parentheses: 0–9 (primary school), 10–12 years (secondary school), 13–15 years (college/university, 1–3 years), and 16 years and above (college/university, four years or more). In From Rural to Urban Living, educational level was assessed by the following question: "What is your highest level of completed education?" with seven response options. These were categorized into the four education levels mentioned above.

### Ethics

The data collection and storage of both surveys were approved by the Norwegian Data Protection Authority (Datatilsynet). This study was approved by the Regional Committee for Medical and Health Research Ethics (REC South East), the SAMINOR Project Board, and the principal investigator of From Rural to Urban Living. Written informed consent was obtained from all participants.

### Statistical analysis

IBM SPSS Statistics for Windows Version 26.0 was used to conduct statistical analyses. All presented p-values are two-sided, and a p-value less than 0.05 was considered statistically significant. The analyses were stratified by gender and Sami/non-Sami ethnicity, due to a significant interaction between area of residence and ethnicity for women. In addition, gender specific overall analyses were performed, with the two ethnic groups combined. Stratified by gender, ethnicity, and urban/rural residency, the distribution of age is presented as the mean and standard deviation and the educational level as numbers and percentages. The Pearson's Chi-square test and the independent samples t-test were used for urban/rural comparisons of educational level and age, respectively. For

the mental distress score (HSCL-10 score), means, standard deviations, medians, 1st and 3rd quartiles, and the prevalence of mental distress (the proportion having HSCL-10 score  $\geq 1.85$ ) are presented. Comparing the mean of the mental distress scores of urban and rural residents was performed by an independent sample t-test. A non-parametric test (Wilcoxon) was also performed, comparing the HSCL-10 score distribution of urban and rural residents, in addition to a Chi-square test for the prevalence of mental distress (HSCL-10 score  $\geq 1.85$ ). Multiple linear regression analyses were conducted with continuous mental distress score as the dependent variable and place of residence as the main independent variable with rural respondents as the reference group. In each case, two models were applied. In model 1, age was included as a possible confounder, and in model 2, age and level of education were included. A possible non-linear relationship with age was investigated by adding a second-order term (age squared) in the models. This term was not significant in any of the models; hence, age was included as a linear variable. Results are presented as beta coefficients (i.e., the mean difference in the HSCL-10 score between urban and rural subjects with rural subjects as the reference group) and p-values. Similarly, logistic regression analyses were also conducted, with mental distress (HSCL-10 score  $\geq 1.85$ ) as the dependent variable. Results are presented as odds ratios (OR) and p-values.

## Results

Background sample characteristics are presented in Table 1 (women) and Table 2 (men). There was no overall significant difference in age between urban and rural women (mean age 50.8). However, urban Sami women were on average one year younger than rural Sami women (50.2 vs. 51.2 years,  $p=.037$ ). Urban men were younger than rural men (mean age 51.0 vs. 52.2, respectively,  $p < .001$ ). This was observed in both Sami and non-Sami men (Table 2). Urban respondents reported a higher educational level ( $p < .001$ ). This was the case for both non-Sami and Sami men and women (Table 1 and 2).

Table 1. Background characteristics of urban and rural women (n=3360). The SAMINOR 2 Questionnaire Survey (2012) (rural sample) and the survey From Rural to Urban Living (2014) (urban sample).

	All women n=3360			P	Sami (n=958)		P	Non-Sami (n=2402)		P
	Total (N=3360)	Urban (N=1216)	Rural (N=2144)		Urban (N=282)	Rural (N=676)		Urban (N=934)	Rural (N=1468)	
Age (years), mean (SD)	50.8 (7.4)	50.6 (7.4)	51.0 (7.4)	0.2	50.2 (7.5)	51.2 (7.4)	.037	50.8 (7.4)	50.9 (7.4)	0.9
Educational level*, % (N)				<.001			.020			<.001
Primary school	8.5 (282)	5.6 (68)	10.1 (214)		5.3 (15)	9.9 (66)		5.7 (53)	10.2 (148)	
Secondary school	28.8 (959)	28.3 (344)	29.0 (615)		23.4 (66)	21.6 (144)		29.8 (278)	32.4 (471)	
College/University 1-3 years	25.0 (834)	27.0 (328)	23.9 (506)		29.4 (83)	22.5 (150)		26.3 (245)	24.5 (356)	
College/University ≥4 years	37.8 (1260)	39.0 (474)	37.1 (786)		41.8 (118)	46.1 (308)		38.2 (356)	32.9 (478)	

Abbreviations: SD, standard deviation; N, number of respondents; P, p-value from comparing urban and rural respondents by Pearson's chi-squared test; \* missing values n=25

Table 2. Background characteristics of urban and rural men (n=2582). The SAMINOR 2 Questionnaire Survey (2012) (rural sample) and the survey From Rural to Urban Living (2014) (urban sample).

	All men n=2582			P	Sami (n=744)		P	Non-Sami (n=1838)		P
	Total (N=2582)	Urban (N=771)	Rural (N=1811)		Urban (N=174)	Rural (N=570)		Urban (N=597)	Rural (N=1241)	
Age (years), mean (SD)	51.9 (7.3)	51.0 (7.5)	52.2 (7.2)	<.001	51.1 (7.3)	52.4 (7.3)	.036	51.0 (7.6)	52.2 (7.2)	.001
Educational level*, % (N)				<.001			<.001			<.001
Primary school	14.1 (365)	5.8 (45)	17.9 (320)		2.3 (4)	20.1 (113)		6.9 (41)	16.8 (207)	
Secondary school	32.5 (841)	30.0 (231)	34.0 (610)		27.0 (47)	31.8 (179)		30.9 (184)	35.1 (431)	
College/University 1-3 years	27.5 (704)	30.9 (238)	26.0 (466)		31.0 (54)	24.5 (138)		30.9 (184)	26.7 (328)	
College/University ≥4 years	25.4 (652)	33.2 (256)	22.1 (396)		39.7 (69)	23.6 (133)		31.4 (187)	21.4 (263)	

Abbreviations: SD, standard deviation; N, number of respondents; P, p-value from comparing urban and rural respondents by Pearson's chi-squared test; \* missing values n=20

### Mental health problems

The mean mental distress (HSCL-10) score among all women was 1.35, and urban women reported a lower mean than rural women did (1.32 vs. 1.36 respectively, p=.013) (Table 3). The same pattern was found when comparing the prevalence of mental distress (HSCL-10 score ≥1.85) (8.9% vs.12.7%, p=.001) (Table 3). Stratified by ethnicity, urban non-Sami women reported a lower mean HSCL-10 score than rural non-Sami women (1.30 vs. 1.36, respectively, p<.001) and prevalence of mental distress (7.3% vs. 12.7%, p=.001) (Table 3). However, the median score was the same (1.20). In regression analyses, adjusting for age (model 1) as well as age and educational level (model 2), urban non-Sami women had a significantly lower mean HSCL-10 score (.055 in model 2, p=.003) and odds of having mental distress (OR=.59, p<.001) than rural non-Sami women (Table 4).

Table 3. Mental distress score (mean HSCL-10 score, SD, median, Q1-Q3) and prevalence of mental distress (HSCL-score ≥1.85) of urban and rural residents, by sex and Sami/non-Sami ethnicity (n=5942). The SAMINOR 2 Questionnaire Survey (2012) and the survey From Rural to Urban Living (2014).

HSCL-10 score	Women n=3360						Men n=2582					
	N	Mean	SD	Median	Q1-Q3	HSCL-10 score≥1.85, % (n)	N	Mean	SD	Median	Q1-Q3	HSCL-10 score≥1.85, % (n)
Total	3360	1.35	.456	1.20	1.0-1.5	11.3 (381)	2582	1.26	.412	1.10	1.0-1.3	8.2 (212)
Urban	1216	1.32	.430	1.20	1.0-1.5	8.9 (108)	771	1.24	.382	1.10	1.0-1.3	7.4 (57)
Rural	2144	1.36	.470	1.20	1.0-1.5	12.7 (273)	1811	1.27	.424	1.10	1.0-1.4	8.6 (155)
P-value		.013		.035		.001		.061		.031		0.3
Urban Non-Sami	934	1.30	.388	1.20	1.0-1.4	7.3 (68)	597	1.24	.385	1.10	1.1-1.3	7.7 (46)
Rural Non-Sami	1468	1.36	.472	1.20	1.0-1.5	12.7 (186)	1241	1.25	.400	1.10	1.1-1.3	8.1 (101)
P-value		<.001		.006		<.001		0.1		.144		0.9
Urban Sami	282	1.40	.541	1.20	1.0-1.5	14.2 (40)	174	1.26	.374	1.10	1.1-1.4	6.3 (11)
Rural Sami	676	1.36	.467	1.20	1.0-1.5	12.9 (87)	570	1.31	.468	1.20	1.0-1.4	9.5 (54)
P-value		0.2		0.5		0.6		0.1		0.2		0.2

Abbreviations: HSCL-10 score, Hopkins Symptom Checklist score of 10 questions; N, number of respondents; n, number having mental distress; SD, standard deviation; Q1, first quartile; Q3, third quartile. Notes: comparing means with independent samples t-test, comparing the distributions non-parametrically with Wilcoxon test, comparing prevalence of mental distress (HSCL-score ≥1.85) with Chi-square test.

Among Sami women, there were no significant differences in mean score (1.40 vs. 1.36), median score (1.20 in both groups), or prevalence of mental distress (14.2% vs. 12.9%) between people living in urban or rural places (Table 3). Adjustment for age (model 1) and age and educational level (model 2) in linear and logistic regression analyses did not change these conclusions (Table 4). As indicated by the results in table 3 and 4, there was in women a statistically significant interaction between urban/rural place of residence and ethnicity regarding both mean score and the prevalence of mental distress (both p-values=.004).

The mean mental distress score in all men was 1.26 (Table 3). After adjustments for age and level of education, there were no differences in mean mental distress score or prevalence of mental distress between men living in urban or rural places. This was the case in both Sami and non-Sami men (Table 4).

Table 4. Association between mental distress and urban place of residence among women (n=3360) and men (n=2582). The SAMINOR 2 Questionnaire Survey (2012) and the survey From Rural to Urban Living (2014). Mean difference in mental distress score in urban living and the odds ratio of prevalent mental distress (HSCL-score  $\geq 1.85$ ) compared to rural living.

	Model A1 (mental distress score)			Model A2 (mental distress score)			Model B1 (prevalence of mental distress)		Model B2 (prevalence of mental distress)	
	N	B (urban)	P	N	B (urban)	P	OR	P	OR	P
<b>Women</b>										
All	3360	-.042	.011	3335	-.033	.045	.664	.001	.728	.009
Non-Sami	2402	-.066	<.001	2385	-.055	.003	.540	<.001	.590	<.001
Sami	958	.040	0.3	950	.041	0.2	1.11	0.6	1.20	0.3
<b>Men</b>										
All	2582	-.035	.051	2562	-.021	0.2	.852	0.3	.904	0.5
Non-Sami	1838	-.021	0.3	1825	-.014	0.5	.952	0.8	.990	0.9
Sami	744	-.059	0.1	737	-.023	0.6	.641	0.2	.890	0.7

Abbreviations: N, number of respondents; HSCL-10 score, Hopkins Symptom Checklist score of 10 questions; B, linear regression coefficient; P, p-value; OR, odds ratio. Notes: Reference group: rural place of residence. Model A; linear regression (continuous HSCL-10 score), Model B; logistic regression (HSCL-score  $\geq 1.85$ ). Model A1, B1: adjusted for age, Model A2, B2: adjusted for age and educational level.

## Discussion

This study compares the level of mental distress of Sami and non-Sami residents in rural, Sami core areas with that of people who have moved from these areas to cities in Norway. Information concerning the mental health of urban Sami represents a significant contribution to the literature on mental health among Sami people.

Regardless of ethnicity and place of residence, we found a higher mean mental distress score (HSCL-10) and prevalence of mental distress (HSCL-10 score  $\geq 1.85$ ) among women compared to men. This is in line with previous findings of a higher prevalence of mental health problems among women (5, 9).

When comparing people who have moved to a city with people still living in the rural areas, differences in mental distress were found among non-Sami wo-



men only. Urban non-Sami women had a statistically significantly lower mean score and a significant lower prevalence of mental distress (HSCCL-10 score  $\geq 1.85$ ) than rural non-Sami women did (7.3% vs. 12.7%). This means that a lower proportion of urban non-Sami women have significant symptoms of anxiety and depression than rural non-Sami women. The prevalence of mental distress among all women included in the study sample (11.3 %) is similar to the prevalence found in a national study among women in Norway (12.4%) (9). For Sami women and for men regardless of ethnicity, living in rural or urban areas did not make any difference regarding the level of mental distress status.

The reason why urban non-Sami women seem to enjoy a more favorable mental health status than rural non-Sami women, while the same is not seen in men nor in Sami women, is difficult to assess. Whether healthier persons migrate or whether some people migrate due to mental health problems has been debated (6, 21). It is, however, well known that mental health problems have a social gradient (9). As education and job seeking are major driving forces of migration (7, 21), rural-to-urban migrants are expected to have better socioeconomic status and possibly better mental health than rural subjects. Higher education levels were indeed observed among urban respondent in our study, regardless of gender and ethnicity. This may have improved the mental health of urban migrants. However, adjusting for education had little effect on our results. It is possible that the non-Sami women who migrated to a city came from better socioeconomic conditions, and therefore had a better mental health status before migrating. If successful in the city, their social conditions and mental health may have improved even further.

Migrants are exposed to stress caused by having to leave family and friends, adapt to a new environment and culture and to be accepted by the new community. This may have had more impact on the Sami participants than the non-Sami. Non-Sami women may have had a more successful migration process to the city than Sami women and men in general. Outmigration may simply be more rewarding for some rural groups than others (21).

Most of the subjects who lived in urban areas were well established in the city, as 84% reported to have lived in their current city for more than 10 years. When it comes to mental distress, recent migrants may differ from people who have lived in a city for most of their adulthood, not to mention from people who have lived in a city their whole life. Due to a small number of recent migrants, it was not possible to investigate potential differences in mental distress between recent and more settled migrants.

The literature on internal migration and mental health among indigenous populations is sparse. Research on urban indigenous people in Canada indicate that they struggle due to problems with housing, discrimination, and homesick-

ness (22), but it is unlikely that these factors are important for Sami in Norway, who have a relatively high level of education (Table 1 and 2).

### **Strengths and limitations**

This is a unique dataset, which combines two different surveys with identical questions regarding ethnicity and mental distress. The outcome variable, HSCL-10, is widely used and considered a reliable and valid instrument to measure mental distress (20). A previous study confirmed that the items included in the HSCL-10 were interpreted similarly by Sami and non-Sami in rural Northern Norway (23). The high-quality migration records of the Norwegian National Population Register made sampling of urban citizens originating from rural, Sami core areas possible.

There are some limitations that need to be acknowledged, however. The results are based on two cross-sectional studies, and we have not studied longitudinally the change in mental distress in subjects who move from rural to urban areas, which makes it impossible to conclude regarding causality.

Potential misclassification within the Sami group is unlikely, as studies have found Sami self-identification to be relatively stable (24, 25), and it is unlikely that non-Sami would report Sami affiliation. However, misclassification of Sami into the non-Sami group is possible, and the association between ethnicity and mental health problems may be attenuated. Due to harsh assimilation policies, many Sami have abandoned or denied their Sami ethnicity and many Sami never learned to speak the Sami language. Our definition of Sami ethnicity required both self-identification and a connection to the Sami language at least on grandparent level. Those fulfilling only one of these requirements, were included in the non-Sami group. In addition, many Sami have multiethnic backgrounds, which was not taken into account in our study. We cannot rule out that the results would have been different with a different ethnic classification.

Due to the low participation rate in both surveys, selection bias is likely, and the results must be interpreted with caution. We have little information about non-participants other than participation rates were, as expected, lower among men than among women and were lowest in the youngest age groups (18, 19).

As no official register of Sami ethnicity exists in Norway, it is impossible to know whether the participation rates among Sami and non-Sami differ. Another limitation is that the survey From Rural to Urban Living mainly included cities that were awarded city status prior to 1996 (19) and did not include populous municipalities without city status, for example surrounding the capital Oslo. Also, the surveys were conducted in 2012 and 2014, and we cannot rule out that the relationship may have changed since that time until today.

Unmeasured confounders may have influenced our results. Known risk fac-

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tors associated with poor mental health, such as trauma (e.g., death of spouse, divorce, exposure to violence in child- and adulthood), were not available, which is a limitation. Furthermore, we cannot exclude that the finding of an urban/rural difference in mental distress in non-Sami women was a chance finding. There is a need for further studies with a high response rate.

## Conclusion

Urban non-Sami women who have migrated from rural Sami core areas stand out with a better mental health status compared to rural non-Sami women. Among men and among Sami women, we found no differences in mental distress between rural-to-urban migrants and rural citizens. Due to small numbers after stratification, the results are vague, and future research is necessary to confirm the results.

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