

Doctor-certified sickness absence in first and second trimester of pregnancy among native and immigrant women in Norway.

Idunn Brekke

Institute for Social Research

Munthesgate 31, PO box 3233 Elisenberg, 0208 Oslo, Norway

Phone: + 47 23086163

John E. Berg

Oslo University College, Faculty of Health Sciences

PO box 4 St. Olavsplass, 0130 Oslo, Norway

Phone: +47 22452000

Line Sletner

Department of Endocrinology, Oslo University Hospital HF, Aker, PO Box 4959 Nydalen, N-0424 Oslo, Norway

Institute of Clinical Medicine, Faculty of Medicine, University of Oslo. Postboks 1130 Blindern 0318 OSLO, Norway

Department of Child and Adolescents Medicine, Akershus University Hospital, N-1478

Lørenskog, Norway

Phone: +47 90118392

Anne Karen Jenum

Oslo University College, Faculty of Health Sciences, PO box 4 St. Olavsplass, 0130 Oslo, Norway

Department of General Practice, Institute of Health and Society, Faculty of Medicine, University of Oslo, Postboks 1130 Blindern 0318 OSLO, Norway

Phone: +47 91181416

Correspondence: Idunn Brekke

Institute for Social Research. Munthesgate 31, PO box 3233 Elisenberg, 0208 Oslo, Norway

Phone: + 47 23086163, Fax: +47 23 08 61 01, e-mail: Idunn.brekke@samfunnsforskning.no

Abstract

Aims: The authors sought to estimate differences in doctor-certified sickness absence during pregnancy among immigrant and native women. **Methods:** Population-based cohort study of pregnant women attending three Child Health Clinics in Groruddalen, Oslo, and their offspring. Questionnaire data were collected at gestational weeks 10-20 and 28. The participation rate was 74 %. A multivariate Poisson regression was used to analyze differences in sickness absence in pregnancy between immigrant and native women. **Results:** A total of 573 women who were employed prior to their pregnancies were included, 51 % were immigrants. After adjusting for age, years of education, marital status, number of children, occupation, part-time/full-time work, health status, severe pregnancy-induced emesis and language proficiency, the immigrant/native differences in number of weeks with sickness absence, decreased from 2.0 to 1.2 weeks. Part-time/full-time work, health status, severe pregnancy-induced emesis and language proficiency were significant predictors of sickness absence. **Conclusion:** Immigrant women had higher sickness absence than native women during pregnancy. The difference in average number of weeks between native and immigrant women was partly explained by poorer *health* status prior to pregnancy, severe pregnancy-induced emesis and poorer proficiency in the Norwegian language among the immigrant women.

Keywords: Sickness absence, pregnancy, immigrant, women.

Introduction

Pregnant women account for a large part of sickness-related absenteeism among younger women in Norway [1]. The Norwegian health care system accepts sickness absence in pregnancy, also when the sickness or illness are medically poorly defined diagnoses. Six out of ten pregnant women take out sickness absence (full-day or part-time sick leave); however, many pregnant women continue to work. Sickness absence during pregnancy is a complex problem area; there is no single explanation why pregnant women take sickness absence. Many pregnant women who work have health problems and special needs [2]. To reduce sickness absence in pregnancy, adjustments at work are essential [3,4]. Pregnant immigrant women may be at high risk, as empirical evidence from Sweden, Norway and Germany indicate that non-western immigrants in general have higher sickness-related absence than natives [5,6,7,8].

There may be several reasons for these observed differences. Higher sickness absence among non-western immigrants might be related to the fact that many immigrants come from conflict-ridden areas that have negatively affected their health [6]. The migration process itself can be stressful and risky and also negatively affect their health [9]. Not surprisingly, several studies indicate that there is a strong relationship between health and sickness absence [8,10]. Therefore, there are reasons to expect higher sickness absence among immigrant women than among native women. Moreover, a Norwegian study [11] shows that immigrant women from some countries in Africa and Asia have a higher risk of developing hyperemesis in pregnancy compared with native women. This might increase the risk of sickness absence among women with such origin.

Differences in sickness absence between immigrants and natives might also be caused by different work situations. Occupational stress and job strain might increase health problems and sickness-related absence [12]. Immigrants are often employed in jobs that are more physically

demanding than natives and where adjustment of inappropriate working conditions are more difficult to implement [13]. Higher use of disability pension among immigrants in Norway is largely explained by lower occupational status among the immigrants [14]. Moreover, previous research shows that health status is related to a person's educational level [15,16], and immigrants' educational credentials differ with country of origin [17]. Finally, poor language proficiency has also been found to be associated with poorer health outcome [18]. Many immigrants struggle with the national language, have poor living conditions and face problems when trying to integrate into their new country of residence [19]. A difficult integration process may affect their health that in turn increases the risk of sickness absence. Little is known about immigrant/native differences in sickness absence during pregnancy. To our knowledge, this is the first paper to report and explore predictors for differences in sickness absence between pregnant immigrant women and native women.

We hypothesize that immigrant women have more sickness absence during pregnancy than native women, due to poorer health prior to pregnancy, more health problems in pregnancy, demanding physical work, greater mismatch of work ability and work demands and hence may be in a more vulnerable position in the labour market.

Material and methods

This study draws on data from a population-based cohort study (STORK-Groruddalen study) that was set up at three public Child Health Clinics in Groruddalen, a district of Oslo, Norway, as antenatal care of normal pregnancies in Norway is mainly carried out in primary care.¹⁹ Groruddalen covers affluent as well as more deprived residential areas, and have a population with a diverse socioeconomic status. The study is described in detail elsewhere [19, 20]. In brief, the Child Health Clinics are attended for antenatal care by the majority (75-85%) of pregnant women residing in this area, and 1114 were invited to participate in the

study. From May 6th 2008 to May 15th 2010, 823 women were included, giving an overall participation rate of 74% (Europe/ North America: 82%, Asia: 71%, Middle East: 65%, Africa: 64% [19]. The interviews were conducted by midwives, and all information material and questionnaires were translated to Arabic, English, Sorani, Somali, Tamil, Turkish, Urdu and Vietnamese and quality controlled by bilingual health professionals. Women were eligible if they 1) lived in the districts, 2) planned to give birth at one of two study hospitals, 3) were less than 20 weeks pregnant, 4) could communicate in Norwegian or any of the above specified languages and 5) were able to give a written consent to participate. Women with pregestational diabetes or other diseases necessitating intensive hospital follow-up during pregnancy, were excluded. The women had a second visit at 28 weeks of gestation, and were followed through pregnancy until about three months postpartum.

Variables

The outcome variable was doctor-certified sickness absence during first and second trimester in pregnancy, measured as number of weeks exceeding two weeks with full sickness absence until 28 weeks of gestation. It is not possible to be sick-listed in the last part of the third trimester, as paid maternity leave then must be used. The participants attended the clinic several times during their pregnancies, reducing the risk of recall bias.

Origin was based on country of birth (or that of the participant's mother). Native origin was the reference category, and was defined as being born in Norway with a mother born in Norway or Europe [20, 21]. Immigrants originated from 65 different countries, 29 % were from South and East Asia, 12 % from the Middle East/Central Africa/North Africa, 4 % from Africa South of the Sahara, 6 % from Eastern Europe and 1 % from South and Central America. The majority had immigrated, but 44 respondents (7%) in the immigrant group are Norwegian born to immigrant parents ("second generation"), mainly Pakistani.

Independent variables: Age, years of education, marital status, number of children, occupation, self-reported health prior to pregnancy, severe pregnancy-induced emesis and language proficiency. Age ranged from 19 to 44 years. Marital status was coded 0) married/cohabiting (reference) and 1) other. Three variables measuring number of children in different age groups: 0-5 years, 6-11 years and 12-17 years. Occupation is in accordance with the International Standard Classification of Occupations (ISCO-08) [22] and represents a hierarchical variable. Occupation was categorized into 1) managers/professionals, 2) technicians and associate professionals 3) Clerical support workers/ service/sales workers (reference). Many in this category are employed with caring for children or the elderly. 4) Craft and related trades workers and machine operators 5) elementary occupations. Part-time/full-time work three months prior to pregnancy was categorized as 1) short part-time (10 to 50 %), 2) long part-time (51 to 80 %), 3) full-time (81-100 %) (reference). The participant's self-reported health status three months prior to pregnancy was reported as 1) poor 2) not good 3) good 4) very good (reference). The interviewing midwife at 28 weeks of gestation decided if the woman met criteria for having severe pregnancy-induced emesis, which was defined as severe pregnancy-related nausea, with much vomiting and large impact on daily function. The definition was based on the midwives' clinical experience and control questions, regarding impact and duration of symptoms and frequency of vomiting. No severe pregnancy-induced emesis was the reference category. This condition however is not the same as the medical diagnosis "hyperemesis", which has a stricter definition, and is a state where the pregnant woman is unable to hold almost any food down. Proficiency in the Norwegian language was reported by the women as 1) poor, 2) fair 3) intermediate, 4) good and 5) very good (reference). Women with native origin did not answer this question, but were given a score of five. For the variables health status, severe pregnancy-induced emesis and language proficiency, missing information was captured in the category missing information.

Statistical methods

Differences in characteristics between groups were tested with *t*-tests for normally distributed continuous variables and chi square tests for categorical variables. A multivariate Poisson regression, which is a method to model the frequency of event counts or the event rate, by a set of covariates, was used to analyze differences in sickness absence in pregnancy between immigrant women and native women. Poisson regression is a special case of a generalized linear model (GLM) with a log link, also called a Log-Linear Model, and is often used for the analysis of rare events, and assumes that the outcome variable follows a Poisson distribution [23].

All analyses were carried out using STATA 12.0. We used the “margins” command to estimate the average marginal effects (AME), representing the difference in weeks of sickness absence. The standard errors were corrected for by using the “robust” command in STATA. We first fitted a base model showing the average marginal effects for immigrant women compared with native women (Model 1). Next, in model 2-5 we examined how adjusting for age, educational level, marital status and number of children (Model 2) occupation and part-time/full-time work (Model 3) and health status and severe pregnancy-induced emesis (Model 4) and language proficiency (Model 5) affected the differences in sickness absence between immigrant women and native women. Statistical significance level was set to $p < 0.05$.

Ethics

The Regional Ethics committee and The Norwegian Data Inspectorate approved the study protocol.

Results

Of the 823 included women in the STORK-Groruddalen cohort study, 18 (2%) women had an abortion or delivery prior to the visit at 28 weeks of gestation, and another 36 (4.6 %) women did not attend. Of the 769 (93.4%) who attended at 28 weeks of gestation, 175 (22.7 %) who were not employed three months prior to pregnancy and 21 (2.7%) immigrants from western countries, were excluded, giving a sickness absence study sample of 573, of which 293 (51.1%) were immigrants (Figure 1).

Figure 1 about here

Table 1 presents basic characteristics of employed women stratified as natives versus immigrants. All covariates were significantly different in the two groups, except marital status and number of children in the age group 0 to 5 years old and 6 to 11 years old. Immigrant women were on average 1.8 years younger than the native women, while native women had on average two more years of education.

Table 1 about here

More immigrant women were employed in elementary occupations compared with native women. Table 1 also shows that native women were more often employed in full-time positions compared with immigrant women. Among the employed, immigrant women more often reported poorer health and severe pregnancy-induced emesis compared with native women and great variations in language proficiency was found in the immigrant group.

Figure 2 shows the cumulative proportion of women with full time doctor-certified sickness absence exceeding two weeks among immigrant and native women during first and second trimester in pregnancy among women employed in short part-time, long part-time and full-time employment (unadjusted for confounders). In total 38.2% of immigrant women had doctor-certified sick leave, compared to 23.6 % of native women ($p < 0.001$) The crude

cumulative average number of weeks with sick leave above 2 weeks was 2.8 weeks for immigrant women compared with 1.0 ($p<0.001$) for natives.

Figure 2 about here

For the short part-time employed, 5 % of the immigrant women have reported sickness absence of more than two weeks in pregnancy, compared with 13 % for native women ($p>0.05$). Among the immigrant women in long part-time positions, 50 % had reported sickness absence of more than two weeks in pregnancy, compared with 23 % in native women ($p>0.05$). For the full-time employed 31 % of the immigrants and 24 % of natives have reported sickness absence of more than two weeks in pregnancy ($p<0.01$).

Table 2 reports AME of the Poisson regression for native women and immigrant women, adjusted for age, years of education, marital status, number of children in the household, occupation, part-time/full-time work, health status three months prior to pregnancy, information on severe pregnancy-induced emesis and skills in the Norwegian language. The dependent variable was number of weeks with sickness absence exceeding two weeks in pregnancy.

Model 1 shows that immigrant women were significantly more absent from work than native women, with 2.0 more weeks of sickness absence for immigrant than for native women before we included control variables. After adjusting for age, education, marital status and number of children (Model 2) the immigrant/native difference in number of weeks with sickness absence, was reduced to 1.9 weeks, with age and years of education as significant predictors. For each additional year of education the number of weeks with sickness absence decreased with 0.1 weeks.

Table 2 about here

In Model 3 we included occupation and part-time/full-time work in addition to origin, age, education, marital status and number of children. The difference in sickness absence between natives and immigrants was 1.7 weeks. Occupation was not independently related to sickness absence, whereas part-time/full-time work was significantly associated. This means that pregnant women working full-time the last three months prior to pregnancy reported 1.9 weeks more with sickness absence compared with women working short part-time.

In Model 4 we included health status the last three months prior to pregnancy and information on severe pregnancy-induced emesis in addition to all the other covariates. Health status and severe pregnancy-induced emesis significantly affected the number of weeks with sickness absence. The number of weeks with sickness absence was 1.5 weeks lower for those reporting very good health compared to those reporting poor health. Women reporting severe pregnancy-induced emesis had 1.1 weeks more sickness absence compared with women without this problem. After adjusting for health status and severe pregnancy-induced emesis, the native/immigrant difference in number of weeks with sickness absence decreased to 1.4 weeks ($p < 0.01$). Part-time/full-time work is still significant after adjusting for health status and severe pregnancy-induced emesis.

Finally, in Model 5 we included information on proficiency in the Norwegian language. The number of weeks with sickness absence is 1.9 weeks higher among women reporting poor language skills compared to women reporting very good language skills. After adjusting for age, years of education, marital status, number of children, occupation, part-time/full-time work, health status, severe pregnancy-induced emesis and language proficiency, the immigrant/native differences in number of weeks with sickness absence decreased from 2.0 weeks in model 1 to 1.2 weeks in model 5 ($p < 0.05$), a 40 % reduction.

In preliminary analyses we controlled for several variables such as length of residence in Norway and social network. As these variables were insignificant, they were removed from further analyses. We have also analyzed partial sick leave, but no significant difference between immigrant women and native women in partial sick leave was found.

Discussion

In this article we examine differences in doctor-certified sickness absence in first and second trimester of pregnancy among native and immigrant women, starting with a hypothesis that women with an immigrant origin have higher sickness absence than women with a native origin. In support of this hypothesis the results in this study show that at the end of the second trimester (28 weeks of gestation), more pregnant immigrant women than native have full-time doctor-certified sickness absence (38.2 vs. 23.6%), and on average two more weeks with sickness absence compared to native women.

Immigrant women are slightly younger, have less education and report poorer health than native women prior to pregnancy and more severe pregnancy-induced emesis during the two first trimesters of pregnancy. After adjusting for age, education, marital status, children, occupation, part-time/full-time work, health status, severe pregnancy-induced and language proficiency, the difference was reduced by 40 %, from 2.0 to 1.2 weeks. In the full model, part-time/full-time work, poor health prior to pregnancy, severe pregnancy-induced emesis and proficiency in the Norwegian language are significant predictors of sickness absence, in addition to immigrant origin.

The remaining difference in sickness absence is small, but could be due to too crude measures or residual confounding by factors not measured. We control for years of education, but type of education might also be an important predictor of sickness absence. Another reason for persistent immigrant/native differences in sickness absence might be difference in sense of

affiliation and job satisfaction at the work place between the two groups of women. Previous research shows that poor job satisfaction is associated with sickness absence [24, 25]. There are reasons to believe that immigrants more often than natives are employed in jobs with less autonomy, and that they feel a lower sense of affiliation at the workplace than that of the majority. Many immigrants find that their education and qualifications from their countries of origin are not formally accepted in Norway, and they are employed in jobs that they are overeducated for [26]. Therefore, a person with immigrant origin most likely has lower job satisfaction and is at higher risk of sickness absence than a person with native origin. Moreover, sickness absence and self-reported poor health may also reflect a mismatch between work ability and work demands among the pregnant women. However disease/illness and poor health must be the reason for reduced work ability for being eligible for sick-listing.

The finding of higher sickness absence among pregnant immigrant women than among pregnant native women is in line with previous research focusing on native/immigrant differences in general sickness absence [5,6,7,8]. Our results are also consistent with previous research showing that high education and good health reduce sickness absence [6,8,10]. Moreover, our results seem to be in line with levels of sickness absence reported in the national Sickness Statistics [1], considering that we only look at the doctor certified full-time sick leave in the present study.

Strengths of this study are the prospective design, with a wide range of socioeconomic and health related information from pre-pregnancy and early pregnancy from a representative and large multi-ethnic sample of women living in Scandinavia to address sickness absence in pregnancy. The inclusion rate is high and the study cohort has been found to be fairly representative for the main ethnic groups [20, 21]. Information on health status prior to pregnancy and health problems related to pregnancy, are often lacking in register based studies.

The limitation of this study is that the numbers in several country groups are relatively small. Moreover, although hierarchical in relation to socioeconomic position, our occupational variable uses relatively broad occupational categories. Within these categories we have occupations with different occupational stress and job strain, and where the opportunities for adjustment of inappropriate working conditions at the workplace differ. This might be one reason why we find occupational status to be less important than what was found in a Norwegian study on disability pension [14]. We also lack data on the diagnoses leading to sickness absence and detailed information on health problems and illness during pregnancy. As pregnant women with diseases necessitating intensive hospital follow-up during pregnancy were excluded, the true proportion with sickness absence is probably underestimated.

Conclusion

More immigrant women report sickness absence than natives; but the difference in average number of weeks is small and is partly explained by poorer health status prior to pregnancy and severe pregnancy-induced emesis in pregnancy among the immigrants. Poor proficiency in the Norwegian language is also associated with higher sickness absence, which indicates that successful integration in the host society most likely would reduce the risk of sickness absence, although full-time work increased the risk of sick leave.

Acknowledgements

This study is part of the research project: On the margins - Sickness absence and labour market exclusion in high-risk groups. The case of Immigrants (IMMSICK) (project number 410.086) and Friends or foes? Understanding the role of firms and workplaces for worker health) (project number 410.078). We thank Pål Schøne at Institute for Social Research who provided useful

advice for the statistical analyses. Translations were performed by the City Services Department, The Interpreting and Translating Service in Oslo. We also thank collaborative partners in the city of Oslo, Stovner, Grorud and Bjerke administrative districts, not least Johan Torper, H S Hatlehol and other staff members at the Child Health Clinics for collecting the data. We thank H Skaaland, Oslo University Hospital, Aker, for organizing the database. Last but not least, the authors thank the study participants.

Funding

The Research Council of Norway supported this work under grant number (187928) and grant number (201534). The Research Council of Norway, the South-Eastern Norway Regional Health Authority and The Norwegian Directorate of Health funded the data collection.

Conflicts of interest: None declared.

References

- [1] NAV. Seks av ti gravide blir sykemeldt, <http://www.nav.no/Arbeid/Oppf%C3%B8lging+av+sykmeldte/Seks+av+ti+gravide+blir+sykemeldt.239446.cms>, (2010, accessed 10.5.2011).
- [2] Myklebø S. *Sykefravær og svangerskap*. Arbeid og velferd nr. 3 – 2007. Arbeids- og velferdsdirektoratet.
- [3] Kristensen P, Nordhagen R, Wergeland E, Bjerkedal T. Job adjustment and absence from work in mid-pregnancy in the Norwegian Mother and Child Cohort Study (MoBa). *Occup Environ Med* 2008; 65:560-566.

- [4] Strand K, Wergeland E, Bjerkedal T. Job adjustment as a means to reduce sickness absence during pregnancy. *Scand J Work Environ Health* 1997; 23: 378–384.
- [5] Bengtsson T, Scott K. Ethnic minority consumption of sickness benefits in Sweden, 1982-1991. *Journal of Socio-Economics* 2006; 35:440-457.
- [6] Dahl SÅ, Hansen. HT, Olsen, KM. Sickness absence among ethnic minoritys in Norway, 1992-2003. *Acta Sociologica* 2010; 53:35-52.
- [7] Ekhaugen, T. *Ethnic minorities on Welfare: Assimilation and Benefit Substitution*. 2005; Memorandum 18. Ragnar Frisch Centre for Economic Research.
- [8] Ziebarth NR, Karlsson M. A natural experiment on sick pay cuts, sickness absence, and labor costs. *Journal of Public Economics* 2010; 94:1108-1122.
- [9] Akhavan S, Bildt SO, Franzén EC, Warmala, S. Health in Relation to Unemployment and Sick Leave Among Immigrants in Sweden from a Gender Perspective. *Journal of Immigrant Health* 2004; 3:103-118.
- [10] Carneiro IG, Ortega A, Borg A, Høgh, A. Health and Sickness Absence in Denmark: A Study of Elderly-Care Ethnic minority Workers. *Journal Immigr Minor Health* 2010; 12:43–52.
- [11] Vikanes A. *Causes of hyperemesis gravidarum*. Phd thesis. 2010; University of OSLO
- [12] Amick, BC., Kawachi I, Coakley EH, Lerner D, Levine S, Colditz GA. Relationship of job strain and iso-strain to health status in a cohort of women in the U.S. *Scandinavian Journal of Work, Environment & Health* 1998; 24: 54-61.

- [13] Shields MA, Price SW. Racial harassment, job satisfaction and intentions to quit: evidence from the British nursing profession. *Economica* 2002; 69:295–326.
- [14] Claussen, B. O.S. Dalgard. and D. Bruusgaard. Disability pensioning: Can ethnic divides be explained by occupation, income, mental distress, or health? *Scandinavian Journal of Public Health* 2009; 37: 395-400.
- [15] Elstad,JI. *Utdanning og helseulikheter. Problemstillinger og forskningsfunn*. 2008; IS-1573. Helsedirektoratet.
- [16] Ross, EC, Wu C. The Links Between Education and Health. *American Sociological Review*, 1995; 60:719-745.
- [17] Statistics Norway. Many non- western immigrants more educated than non-immigrants, http://www.ssb.no/english/subjects/04/01/utinnv_en, (2003, accessed 08.4.2011).
- [18] Pottie K, Ng E, Spitzer D, Mohammed A, Glazier R (2008). Language proficiency, gender and self-reported health: an analysis of the first two waves of the longitudinal survey of immigrants to Canada. *Can J Public Health*. 2008;99:505-10.
- [19] Heath A., Cheung SY (Eds.). *Unequal Chances: Ethnic Minorities in Western Labour Markets*; 2007 London: British Academy.
- [20] Jenum AK, Sletner, L, Voldner, N, Vangen S, Mørkrid K, Andersen LF, Nakstad B. The STORK Groruddalen Research Program: A population based cohort study of gestational diabetes, physical activity and obesity in pregnancy in a multiethnic population. Rationale, methods, study population and participation rates. *Scandinavian Journal of Public Health* 2011; 39:333.

- [21] Jenum, AK; Mørkrid K, Sletner L, Vangen S, Torper J, Nakstad B, Voldner N, et al. Gestational diabetes with the WHO and modified International Association of Diabetes and Pregnancy Study Groups criteria: Impact of ethnicity. A population-based cohort study. *European Journal of Endocrinology* 2012; 166: 317–324.
- [22] Statistics Norway. *Standard Classification of Occupations*. 1998; NOC C 521. Oslo
- [23] Cameron A, Trivedi P. *Microeconometrics using Stata*. 2009; Texas : Stata Press
- [24] Nakata A, Masaya T, Masahiro I, Tapas RA, Swanson NG. Job Satisfaction, Common Cold, and Sickness Absence among White-collar Employees: A Cross-sectional Survey. *Industrial health* 2011; 1:116-121.
- [25] Roelen CA, Koopmans PC, Notenbomer A, Groothoff JW. Job satisfaction and sickness absence: a questionnaire survey. *Occup Med (Lond)* 2008; 58:567-71.
- [26] Villund O. *Riktig yrke etter utdanning? En registerbasert undersøkelse om kompetanse og arbeidsoppgaver hos ansatte med innvandrerbakgrunn*. Report 2008/37. Statistics Norway. Oslo

Table 1: Distribution of background factors among employed pregnant women by origin. Presented as mean and SD or %.

	Native origin (n=280)		Immigrant origin (n=293)	
	Mean	SD	Mean	SD
Age (number of years)	30.4	4.4	28.6	4.6
Years of education (number of years)	14.8	2.5	12.7	2.9
Marital status				
married/ cohabitation (%)	95.7		93.1	
other (%)	4.3		6.8	
Children				
number of children 0-5 years old	0.4	0.6	0.5	0.7
number of children 6-11 years old	0.1	0.4	0.2	0.6
number of children 12-17 years old	0.0	0.2	0.1	0.3
Occupation				
managers/proffesionals (%)	27.9		6.9	
technicians and associate professionals (%)	36.4		19.8	
clerical support / service and sales (%)	33.6		50.9	
craft ,trades / plant and machine operators (%)	1.8		2.4	
elementary occupations (%)	0.4		20.1	
Part-time/full-time work				
short part-time (%)	7.5		14.7	
long part-time (%)	4.6		10.9	
full-time (%)	87.9		74.4	
Health status 3 months prior to pregnancy				
poor (%)	1.4		3.8	
not good (%)	4.0		11.5	
good (%)	45.3		52.1	
very good (%)	49.3		32.8	
missing information (%)	0.7		1.0	
Severe pregnancy-induced emesis				
yes (%)	7.5		25.6	
no (%)	90.7		72.7	
missing information (%)	1.8		1.7	
Skills in the Norwegian language				
poor (%)	-		3.7	
fair (%)	-		4.4	
intermediate (%)	-		13.9	
good (%)	-		29.0	
very good (%)	100.0		46.7	
missing information (%)	-		2.0	

Note: Differences in characteristics between groups were tested with *t*-tests for normally distributed continuous variables and chi square tests for categorical variables, all the covariates were significantly different in the two groups, except marital status and number of children in the age group 0 to 5 years old and 7 to 12 years ol

Table 2. Estimated average marginal effects (AME) from Poisson regression analysis of the number of weeks with sickness absence exceeding two weeks, during first and second trimester in pregnancy for native and immigrant women. Adjusted for age, years of education, marital status, number of children, occupation, part-time/full-time work, health status prior to pregnancy, severe pregnancy-induced emesis and language skills in 5 models, (n=573).

	Model 1			Model 2			Model 3			Model 4			Model 5		
	AME	95 % CI	Sig	AME	95 % CI	Sig	AME	95 % CI	Sig	AME	95 % CI	Sig	AME	95 % CI	Sig
Immigrant women (ref:native women)	2.0	1.23-2.77	***	1.9	1.12-2.67	***	1.7	0.90-2.53	***	1.4	0.56-2.30	***	1.2	0.35-2.08	**
Age (number of years)				0.1	-0.01-0.13		0.1	-0.02-0.12		0.1	-0.02-0.13		0.0	-0.03-0.12	
Education in years				-0.1	-0.26--0.01	*	0.0	-0.20-0.11		-0.1	-0.20-0.10		0.0	-0.20-0.10	
Marital status (ref:married/ cohabitation)															
other				-1.2	-2.71-0.39		-1.1	-2.60-0.48		-1.3	-2.92-0.34		-1.3	-2.94-0.37	
Children															
number of children 0-5 years old				0.2	-0.37-0.69		0.1	-0.37-0.63		0.1	-0.43-0.59		0.1	-0.37-0.56	
number of children 6-11 years old				-0.5	-1.12-0.09		-0.3	-0.91-0.26		-0.4	-0.94-0.20		-0.4	-0.95-0.22	
number of children 12-17 years old				-0.9	-2.26-0.45		-0.9	-2.18-0.45		-0.9	-2.15-0.45		-0.8	-2.08-0.50	
Occupation (ref:clerical support / service and sales)															
managers/professionals							-0.7	-2.08-0.45		-0.6	-1.99-0.83		-0.6	-1.99-0.87	
technicians and associate professionals							-0.8	-1.61-0.01		-0.8	-1.57-0.07		-0.7	-1.58-0.09	
Craft, trades workers/ plant and machine operators							-0.5	-1.93-0.95		-0.6	-2.05-0.78		-1.6	-3.48-0.26	
elementary occupations							0.6	-0.22-1.50		0.4	-0.45-1.27		0.1	-0.74-0.99	
Part-time/full-time work (ref:fulltime)															
short part-time							-1.9	-3.19--0.55	**	-1.9	-3.20-0.53	**	-1.8	-3.18--0.49	**
long part-time							-0.1	-1.00-0.88		0.1	-0.92-1.04		0.1	-0.90-1.07	
Health status prior to pregnancy (ref:very good)															
poor										1.5	0.27-2.68	*	1.7	0.42-2.98	**
not good										0.5	-0.80-1.74		0.7	-0.59-1.97	
good										0.5	-0.18-1.21		0.6	-0.11-1.28	
Severe pregnancy-induced emesis (ref:no)										1.1	0.43-1.77	**	1.2	0.51-1.85	**
Skills in the Norwegian language (ref:very good)															
poor													1.9	0.37-3.33	*
fair													-0.1	-1.95-1.79	
intermediate													0.3	-0.84-1.43	
good													0.4	-5.13-1.13	

Note: * p<0.05; ** p<0.01; *** p<0.00