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SexWork.DK: a comparative study of citizenship and working hours among sex workers in Denmark

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ABSTRACT

Sex workers in Europe are increasingly of nonnational origin. The Schengen cooperation allows internal migration within the European Union, but many migrant sex workers originate from outside the EU. While sex workers are already in precarious positions, nonnationals risk deportation, dependent on their citizenship status, and may have debts to smugglers. Consequently, they may be more likely to work longer hours to increase short-term profits. Using a dataset of sex work advertisements from one Danish website ($n = 2{,}594$), we estimate the association between inferred citizenship status and a) advertised hours on shift using ordinary least squares regression, and b) the probability of advertising 24/7 availability using a linear probability model. Compared to Danish sex workers, we find migrants advertise almost twice as many hours on shift and are more likely to advertise 24/7 availability. These results shed light on the inequalities that persist between national and nonnational sex workers.

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Sex work; prostitution; Denmark; quality of work; labor migration

1. Introduction

Two forms of migration currently characterise sex work[1] in the Global North. One is a geographic migration in which sex workers are increasingly not citizens of the countries in which they work (Hubbard et al., 2008; Vuolajärvi, 2019). The other is a technological migration where sex workers establish contact with clients online, rather than through traditional forms of contact such as classified ads and street solicitation (Azam et al., 2021; Cunningham & Kendall, 2011; Pajnik et al., 2016; Sanders et al., 2016). In this paper, we examine whether working conditions differ across citizenship categories, using data from one of the Danish online platforms for sex work. This allows us to examine two specific indicators of working conditions: hours on shift and 24/7 availability.

Migrant workers generally have less attractive and more dangerous jobs than nationals and are marginalised in the labour market (Refslund, 2016; Wonders & Michalowski, 2001). Similar patterns are reported among migrant workers who sell sexual services

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(Adriaenssens et al., 2016; Agustin, 2006). The available evidence suggests that migrant sex workers in Denmark are more likely to be victims of trafficking (Mildwater et al., 2021), to suffer exploitative working conditions, and some also face the added threat of deportation (Henriksen et al., 2021; Vuolajärvi, 2019). Migrant sex workers are often financially dependent on the income from sex work (Henriksen et al., 2021), and may have financial obligations to family or hold significant debts (Plambech, 2022). The confluence of these factors may compel migrant sex workers to work more hours and/or under poorer conditions than nationals, either voluntarily, by need, or by coercion, in order to maximise income.

Our study is situated at the intersection of distinct strands of research concerning sex work, migration and inequality, and research on illicit online markets. First, we follow a sex-as-work approach (Shaver, 2005), but focus on inequality and migration. Within this context, we address a research gap highlighted by Damsa and Franko (2023), p. 194), who argue that research on inequality *'has yet to systematically recognize the importance of citizenship status for the mutual shaping of inequalities'*. Empirically, we use methods developed within the emerging body of research on illicit online markets (Holt, 2017) that have recently been used in research on trafficking for the purpose of sexwork (Giommoni & Ikwu, 2024; Kjellgren, 2024). Specifically, we address the importance of citizenship status and migrant categories in shaping markets for sexual services and the inequalities among their participants.

The paper proceeds as follows: First, we describe the legal context of sex work and review the literature on migrant sex workers and their working conditions with an emphasis on Denmark, the location of the study, and the Nordic countries. Building on this, we hypothesise that migrant sex workers are more likely to accept poorer working conditions. We then use a large sample of online advertisements to compare working conditions between different citizenship categories using OLS and linear probability models. Finally, we conclude by discussing our findings in relation to past research on the working conditions of sex workers, migrant sex workers, and the legal regulation of sex work. We further suggest some avenues for future research.

2. Literature review

Research on sex work is extensive and focuses on how sex work is associated with various forms of harm, such as violence, coercion, exploitation (Dalla, 2000; Hoigard & Finstad, 1992; Moran, 2015), sexually transmitted diseases (Koken et al., 2004), stigma (Hulusjö, 2013), psychological problems (Farley et al., 1998), and a paucity of legal rights (Weitzer, 2005). In the following sections, we review the literature on the legal regulation of sex work, migrant sex workers and the organisation of sex work.

2.1. The legal context and regulation of sex work

Legal regulation of sex work varies across European countries and their policies have changed considerably over time (Skilbrei & Holmström, 2011). Crowhurst et al. (2012, p. 189) argue that *'while prostitution in 1970 was defined as a problem with and for individuals, with time, prostitution has increasingly been defined as a social problem in need of targeted interventions'*. Overall, national policies on sex work span the continuum

from criminalisation, over decriminalisation to legalisation (for a review, see for instance Phoenix, 2009).

The so-called 'Nordic model' occupies a unique position in this continuum, combining elements of both criminalisation and decriminalisation. The underlying principle of the 'Nordic model' is rooted in a neo-abolitionist approach that seeks to eliminate sex work by targeting only the purchase, not the sale, thus portraying sex workers as victims in need of protection rather than criminals. Sweden was the first to implement the model in 1999, followed by Norway in 2008 and Iceland in 2009. Finland implemented the model in part in 2007 as they only criminalised the buying of sexual services from victims of trafficking or persons under the organisation of pimps (Skilbrei & Holmström, 2011). Several countries outside Scandinavia, such as France, have also implemented similar policies.

Vuolajärvi (2019) conceptualises the policy of client criminalisation as *'punitivist humanitarianism'*, highlighting the paradoxical nature of a model that combines punitive measures against buyers with a humanitarian concern for sellers. Furthermore, Vuolajärvi and other scholars argue that client criminalisation de facto criminalises the sale of sex and increases risks of violent victimisation for sex workers as it hampers sex workers' safety practices and might force them to take greater risks (Finn & Stalans, 2016; Hubbard et al., 2008; Levy & Jakobsson, 2014; Vanwesenbeeck, 2017; Vuolajärvi, 2022). Thus, the punitive measures intended to protect sex workers can inadvertently increase their vulnerability and victimisation (Vuolajärvi, 2022).

Danish policy on sex work shares the humanitarian aims of the Nordic model but attempts to achieve these within the context of an overall legalised market. It has been legal to sell and buy sexual services in Denmark since 1999 if the seller is 18 years or older. However, it remains illegal to profit from others' sex work, and to procure or induce it. Procuring includes pimping and coercing others into sex work. It is also illegal to knowingly rent out a hotel room, apartment, or similar for sex work and to manage brothels (Henriksen et al., 2021).

Sellers of sexual services must register as self-employed and pay taxes on their income. Despite being required to register and pay taxes, sex work is not recognised as a legal occupation in Denmark. Consequently, sex workers do not enjoy the guarantees and regulations of the traditional labour market, including unionisation, unemployment benefits and insurance, or compensated sick leave. While these benefits, and other labour protections are not standard for sex workers in many countries,[2] they are standard for other Danish workers in traditional employment sectors.

Research on the 1999 legal reform in Denmark shows that while the legal reform aims to protect sex workers against exploitation by legalising the sale and purchase of sex, significant issues remain. According to Henriksen and Järvinen (2023), current legislation is criticised for forcing sex workers to work under semi-legal conditions that isolate the individual seller and put them at risk of exploitation. This critique is used to argue for the recognition of sex work as a profession. In contrast, advocates of a more prohibitionist approach state that Denmark should follow the other Scandinavian countries and implement policies focusing on diminishing or eradicating sex work; for instance, by criminalising the buying of sexual services.

2.2. Migration and sex work

Migrant workers are increasingly important for European labour markets. Within the European Union, there is free movement across borders for labour, and this entails a pattern where workers from the East live temporarily or permanently in the West (Cook et al., 2011; Favell, 2008). Many of these migrant workers are women (Agustin, 2003). Generally, working conditions among migrant workers are below the standards of working conditions for national citizens. Migrants more often work beneath their professional qualifications and in '3D' jobs that are *dirty*, *dangerous*, and *dull* (Cook et al., 2011; Favell, 2008). Hansen and Hansen (2009) found that Polish migrant workers in Denmark experienced high demands for flexibility but received lower wages, after correcting for educational background. Furthermore, 38% had been denied their wages, 32% had been threatened with termination of employment, and 17% had been threatened with violence in their job. Other European studies have found similar patterns (Favell, 2008; Rodríguez, 2007).

The migration of workers in Europe has coincided with a diversification of sex workers in the European Union (Weitzer, 2005). More than half of all sex workers in European countries are estimated to be migrants (Hubbard et al., 2008; Scambler, 2007; Skilbrei, 2001), but in the Nordic region this number increases to 70% to 80% of people who sell sex (Vuolajärvi, 2019). Stricter regulation of outdoor sex work, i.e. street sex work, has been associated with an increasingly nonnational population of sex workers who are often conceived of as victims of human trafficking and global inequality (Hubbard et al., 2008; Skilbrei & Holmström, 2011).

Migrant sex workers may face a particular set of challenges compared to nationals. Migrant sex workers, along with sex workers with substance use disorders and transgender workers, are particularly vulnerable to violent victimisation (Brown & Sanders, 2017; Deering et al., 2014; Vanwesenbeeck, 2017). Agustin (2006) found that migrant sex workers were required to show extreme flexibility in terms of working hours. Similarly, several studies show that many migrant sex workers arrive in Europe heavily indebted and document how the additional economic pressure, the presence of third parties, and the precarious legal status put them in vulnerable positions (Henriksen et al., 2021; Plambech, 2022; Plambech et al., 2022), where they may be exploited by organised crime groups for the purpose of sex work (Kjellgren, 2024).

Sex workers who are not nationals must also contend with immigration and work policies. In Denmark, non-EU citizens need visas and permission to work or take up residency. Some non-EU citizens can stay for 3 months on a tourist visa but cannot hold a job. Both groups can be deported if they break the law (Aradau et al., 2010; Vuolajärvi, 2019). There are no work permits for sex workers and thus people coming from outside the EU or EEA (third-country nationals) can be deported if they sell sexual services. This might result in them returning to their home countries still indebted (Plambech, 2022).

Migrant workers thus constitute an increasing share of the labour market in Europe, and the situation is similar in the market for sexual services. While conditions vary among migrant sex workers, often contingent on their citizenship, they are generally found in precarious economic and social positions.

2.3. The organization of sex work

Traditionally, sex work research distinguishes between the outdoor and indoor sectors. 'Outdoor sex work' typically refers to sex work conducted in public spaces where sex workers meet clients in public outdoor locations, while the sex act takes place in either a public or private setting (alley, car, park, hotel, etc.). In contrast, an 'indoor' sex worker operates in private or controlled environments, such as their own residence, brothels, or through escort services where clients are met in private locations (Büschi, 2014; Weitzer, 2005). Research has found important differences between the two, in terms of the diversity of activities, 'working circumstances' and worker experiences (Weitzer, 2009a). Much of this research highlights the dire conditions for outdoor sex workers, and their higher exposure to violence and stigmatisation (Monto, 2004, Sanders, 2004). Research that compares the sectors also finds that indoor sex workers are better positioned to screen out dangerous customers and control their working conditions (Finn & Stalans, 2016; Henriksen et al., 2021, Kinnell, 2008; Lever & Dolnick, 2000, Sanders & Campbell, 2007; Weitzer, 2009b). The prices for indoor sex work are higher, which attracts a different clientele, and a greater proportion of regular clients (Weitzer, 2005). Finally, migrants and nonnationals tend to be overrepresented among outdoor sex workers (Lever & Dolnick, 2000).

Digital technologies have changed the sex work industry, and boundaries between the two sectors are dissipating. Sex workers increasingly operate on their own and use digital technologies to advertise their services and facilitate contact with clients (Cunningham & Kendall, 2011). This technological migration has resulted in a decrease in street sex work (Sanders et al., 2016), and in Denmark, only a small number of outdoor sex workers are present in larger cities (Henriksen et al., 2021). Previous research suggests this migration towards internet-facilitated arrangements is a response to increased law enforcement, policy changes and a general trend towards digitalisation (e.g. Cunningham & Kendall, 2011; Sanders et al., 2018; Vuolajärvi, 2019). These online markets also comprise exploited individuals and organised sexual labour, which are often difficult to distinguish from sex workers (Kjellgren, 2024; Giommoni & Ikwu, 2024).

3. This study

Trends and changes in the Danish sex work industry are similar to what is observed in international scholarship: The population of sex workers is increasingly nonnational, their working conditions are worse than those of nationals, and the industry has moved online and off the street (Henriksen et al., 2021). In the Nordic context, there is a lack of empirical studies on migrants who sell sex (Skilbrei & Holmström, 2013; Vuolajärvi, 2019). Moreover, researchers have argued that indoor sex work (Sanders et al., 2016; Weitzer, 2005) and working conditions (Adriaenssens et al., 2016; Shaver, 2005) have received insufficient attention. From a theoretical point of view, Damsa and Franko (2023) have highlighted a tendency for intersectional analyses of inequality to neglect the precarious social positions that arise from citizenship status (e.g. non-EU citizens). To address these gaps, we study the intersection of migrant status and working conditions in the Danish sex work industry. Specifically, we examine whether the working conditions within the market for sexual services vary across categories of migrants and national citizens.

Online advertisements provide a novel way to study the indoor market for sexual services and avoid conventional problems of representativity and selection that limit studies of hidden populations (McCann et al., 2021). A growing body of research utilises digital traces in the form of reviews, forum posts, websites, and advertisements to estimate earnings, displacement, the number of sex workers (e.g. Cunningham & Kendall, 2011; Henriksen et al., 2021; Moffatt & Peters, 2004), exploitation and trafficking (Giommoni & Ikwu, 2024; Kjellgren, 2024), and the impact of COVID-19 on earnings (Azam et al., 2021). We build on this literature to examine working conditions by analysing ads from one of the largest websites in Denmark advertising sexual services.

The threat of deportation and losing their income makes migrants more economically motivated than nationals (Henriksen et al., 2021). This leads to the hypothesis that migrant sex workers in Denmark may accept poorer working conditions to increase short-term profits. To measure working conditions, we use two measures, *hours on shift* and *24/7 availability*. Both measures are reflective of the working conditions often experienced by migrant workers and sex workers, as well as informal sector workers in general (e.g. Agustin, 2006; Favell, 2008; Rodríguez, 2007). Following Damsa and Franko (2023), we emphasise migrant status above nationality when segmenting workers into categories because this is what restricts their ability to sell sex without risk of deportation.

3.1. Data

Several websites serve as platforms for advertising sexual services in Denmark. The number of advertisements per site varies, and most activity is concentrated in a few websites. Henriksen et al. (2021) use a sample of 16 websites, but many websites have less than a thousand active profiles, and sex workers often repost the same ad on multiple websites. These websites are generally similar in functionality and design as other *Adult Services Websites* (ASWs), described in previous research (L'Hoiry et al., 2021). Advertisements typically contain a means of contact (phone numbers or WhatsApp), photos, and an approximate location. Most advertisements display a list of services and prices ('menu cards'), and the hours of the day in which an advertiser is available. A profile text contains a description of physical attributes (e.g. eye colour, cup size and weight), states rules (e.g. no unprotected sex and only men above a certain age or of a certain ethnicity) and the nationality of the advertiser. For this study, we chose the largest website where the advertisements specify nationality, as well as days and hours on shift. We do not identify the website by name, but it is one of several in operation with little difference between them.

We collected data using a webcrawler written in R. The webcrawler extracts links from each webpage, follows and downloads them. This process is repeated until every page on the website has been downloaded (see also DeVito et al., 2020). The relevant information is then 'scraped', stored in a database, and analysed. The website was crawled 48 times between 12 May 2022, and 24 June 2023, yielding 59,772 observations of 5,099 ads. We excluded all advertisements deemed to be inactive, and thus not reflective of working conditions, by excluding those without a phone number, and kept only the last observation of each ad. Next, we removed advertisements with unspecified services, keeping only those that advertised incall and/or outcall, excluding ads for, for example, massage parlours, rooms for rent, and virtual sex work. Finally, we restricted our analysis to

women and non-binary sex workers, since male sex workers were rare, reducing the sample to 4,223 advertisements, of which 2,594 advertised working hours. The final sample thus consists of women and non-binary sex workers, which specified incall and/or outcall services, advertised phone numbers, and listed working hours.

3.2. Variables

Each ad shows weekdays and hours of availability in which the sex worker will receive calls, text messages and clients. We generate two measures based on this information, a continuous measure of weekly hours on shift, and a dichotomous measure of advertised 24/7 availability (168 hours a week). Henriksen et al. (2021) find that the number of clients can vary greatly, with sex workers having none or few clients some days, and many other days. In a survey of 96 male and female Dutch indoor sex workers (Vanwesenbeeck, 2005) found an average of 21 clients and 37 work hours a week. We therefore stress that the measure does not equal a person performing sexual services for this number of hours. However, long shift lengths remain symptomatic of the extreme demands of flexibility put on migrant workers in general and poor working conditions in general (Agustin, 2006; Hansen & Hansen, 2009).

Our key independent variable, inferred migrant status, is based on data on sex workers' self-identified nationality. These data present two coding issues. First, 100 nationalities are represented in the data, but most groups are too small to include a categorical variable for each. Second, nationality is ambiguous and may be interpreted as ethnicity by the individual worker. For example, a person of Colombian origin who is a citizen of Spain may still identify as Colombian. We consider nationality a proxy for migrant status, assuming that most workers of self-described Colombian nationality are Colombian, and thus will not require a visa to enter Denmark, whereas those of Russian nationality require a visa. Thus, we code nationality into five categories: Danish, Schengen, visa exempt, visa required and unspecified nationality. The visa categories are based on the European Council (2024) visa agreements with non-EU countries. Non-EU citizens who are visa exempt, may enter the Schengen area for shorter periods without needing a visa. We acknowledge, however, that advertisements may misrepresent nationality with the intent of marketing a specific persona to the customer, or to evade detection from immigration authorities, or from law enforcement in the case of trafficking. Our measure is therefore best understood as inferred migrant status based on self-reported nationality.

We include several control variables. Age is the self-described age of a worker. Most advertisements are for women, but Weitzer (2009a) highlights an absence of research on transgender sex workers. We therefore include the self-described genders 'transsexual' and 'transgender' under the category of non-binary. Service type designates whether a worker operates as incall (i.e. receiving clients in the sex worker's own apartment or a clinic), outcall (i.e. escort) or both. Ads vary in quality and seriousness (e.g. quality of writing, degree of information, pictures), which may correlate with the services offered. We therefore include two indicators of this, photo verification and phone verification. These were functions on the website which allow a worker to verify the authenticity of their profile, for example, by submitting a photo of themselves holding a newspaper to the website.

A limitation to using advertisements as data is that sellers may choose to misreport information such as age, looks, and nationality. However, the existence of 'hobbyist' websites where reports of misinformation in ads are shared among users may deter this (Milrod & Monto, 2012). Moreover, a discrepancy between, for example, reported age and profile photos may also make a profile appear untrustworthy.

4. Analysis

In the following sections, we present our findings. We begin by providing a descriptive overview of the population stratified by inferred migrant status. Hereafter, we report the results of our regression analysis. Table 1 reports descriptive statistics of the sample stratified by inferred migrant status. Across the five categories, there are substantial differences in the outcome variable, with Danish sex workers reporting weekly shift lengths of 79.4 hours, versus 123.5, 128.4, 113.7, and 125.7 hours for the four categories of non-Danish workers. Similarly, only 8.8% of Danish sex workers advertise 24/7 availability as opposed to 21%, 34%, 18% and 23%.

The rates of photo verification vary, with Schengen (68%), visa exempt (68%), visa required (49%) and unspecified nations (66%) all exhibiting a higher rate than Danes (48%). For phone verification, we find that visa-exempt workers (82%) have the highest rate, followed by visa required (79%), Schengen (76%) unspecified (74%), and Danish (73%). These results suggest that although most ads are verified, nonnationals appear to use the verification system the most.

We find the mean age to be highest among Danes (33.6 years) followed by visa required (28.9), visa exempt (27.9), Schengen (26.9) and unspecified nationalities (26.3). The mean age among non-Danes ranges from 26.3 to 28.9 years, whereas Danes are above this range on average. In comparison, a survey ($n = 205$) by Henriksen et al. (2021) found a mean age of 41.3 in a sample of predominantly Danish origin (76,7%). We find that a minority of self-described non-binary identities (4.9%), which corresponds to observations by Henriksen et al. (2021), who find that 4.3% self-described as non-binary. For service types, we also find variation across migrant status but with a clear tendency across all groups to predominantly offer exclusively incall services or both incall and outcall. Only between 17% (visa exempt) and 28% (Danish) exclusively offer outcall services. Taken together, descriptive statistics thus illustrate large variation between the categories for migrant status, most notably regarding the number of hours on shift.

4.1. Regression analyses

We hypothesise that migrant sex workers are more likely to advertise longer weekly hours on shift and to offer 24/7 services. To assess the association between working conditions and migrant status, we use OLS for the continuous outcome *weekly hours on shift* and a linear probability model (LPM) for the dichotomous outcome *24/7 availability*. We favour the LPM model over a logit model, due to the interpretability and parsimony of coefficients (Wooldridge, 2002, p. 454). We control for age, gender, service type, phone verification, and photo verification.

Initial analyses and descriptive statistics suggested substantial differences between nationals and nonnationals with regard to working hours and age (see Table 1). We

Table 1. Descriptive statistics for population. For continuous variables mean and SD are shown, with count and percentage for categorical variables. For transparency, columns 1 and 2 show the full sample stratified by whether working hours are advertised. Columns 3–7 show the analytical sample, excluding ads without advertised working hours, stratified by inferred migrant status.

	Advertises working hours	No working hours advertised	Danish	Schengen	Visa exempt	Visa required	Unspecified nations
	N = 2,594	N = 1,629	N = 340	N = 1,058	N = 492	N = 160	N = 544
Weekly hours on shift	118.5 (42.70)		79.4 (53.34)	123.5 (34.16)	128.4 (39.90)	113.7 (41.97)	125.7 (39.37)
Available 24/7	570 (22%)		30 (8.8%)	220 (21%)	168 (34%)	29 (18%)	123 (23%)
Photo verification	1,655 (64%)	889 (55%)	163 (48%)	720 (68%)	333 (68%)	78 (49%)	361 (66%)
Phone verification	1,981 (76%)	1,253 (77%)	248 (73%)	804 (76%)	401 (82%)	127 (79%)	401 (74%)
Age	28.0 (6.40)	26.2 (5.11)	33.6 (9.93)	26.9 (5.01)	27.9 (5.31)	28.9 (5.25)	26.3 (5.19)
Gender							
Woman	2,467 (95%)	1,524 (94%)	330 (97%)	1,018 (96%)	433 (88%)	151 (94%)	535 (98%)
Non-binary	127 (4.9%)	105 (6.4%)	10 (2.9%)	40 (3.8%)	59 (12%)	9 (5.6%)	9 (1.7%)
Service type							
In Call	986 (38%)	541 (33%)	125 (37%)	359 (34%)	241 (49%)	71 (44%)	190 (35%)
In Call & Out Call	1,034 (40%)	678 (42%)	119 (35%)	439 (41%)	167 (34%)	58 (36%)	251 (46%)
Out Call	574 (22%)	410 (25%)	96 (28%)	260 (25%)	84 (17%)	31 (19%)	103 (19%)
Inferred migrant status							
Danish	340 (13%)	137 (8.4%)					
Schengen	1,058 (41%)	606 (37%)					
Visa exempt	492 (19%)	360 (22%)					
Visa required	160 (6.2%)	163 (10%)					
Unspecified nations	544 (21%)	363 (22%)					

Table 2. OLS and LPM with heteroskedasticity robust standard errors. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

	Log(hours on shift)	24/7 availability	Log(hours on shift)
Predictors			
Intercept	4.09***	0.10**	4.82***
	(3.94 – 4.23)	(0.03 – 0.17)	(4.51 – 5.14)
Log(Years older than 20)	−0.07***	−0.03**	−0.39***
	(−0.10 – −0.04)	(−0.05 – −0.01)	(−0.52 – −0.27)
Inferred migrant status (reference: Danish)			
Schengen	0.71***	0.09***	−0.14
	(0.60 – 0.82)	(0.05 – 0.13)	(−0.45 – 0.18)
Visa exempt	0.74***	0.22***	−0.18
	(0.62 – 0.85)	(0.17 – 0.27)	(−0.52 – 0.16)
Visa required	0.58***	0.08*	−0.67*
	(0.43 – 0.72)	(0.01 – 0.15)	(−1.25 – −0.08)
Unspecified nationality	0.70***	0.11***	−0.08
	(0.58 – 0.81)	(0.06 – 0.15)	(−0.41 – 0.25)
Non-binary	0.13**	0.13**	0.11**
	(0.04 – 0.21)	(0.05 – 0.22)	(0.03 – 0.19)
Verified picture	−0.04	0.05**	−0.02
	(−0.09 – 0.01)	(0.02 – 0.08)	(−0.07 – 0.03)
Verified phone number	0.04	0.02	0.04
	(−0.02 – 0.09)	(−0.02 – 0.06)	(−0.02 – 0.10)
Service type (reference: incall)			
Incall & outcall	0.11***	0.04*	0.11***
	(0.06 – 0.16)	(0.00 – 0.07)	(0.06 – 0.17)
Outcall	0.10**	0.04	0.11***
	(0.03 – 0.16)	(−0.01 – 0.08)	(0.05 – 0.17)
Log(Years older than 20) * Schengen			0.38***
			(0.25 – 0.51)
Log(Years older than 20) * Visa exempt			0.42***
			(0.27 – 0.56)
Log(Years older than 20) * Visa required			0.58***
			(0.32 – 0.83)
Log(Years older than 20) * Unspecified nationality			0.34***
			(0.20 – 0.48)
Observations	2594	2594	2594
R^2	0.177	0.045	0.210

therefore estimate an additional model which included an interaction term, allowing the association between age and hours on shift to vary across migrant status, to probe whether age could explain these differences. We report coefficients of the main OLS and LPM models without the interaction term, but return to this model when reporting results for migrant status and age.

We log-transform continuous variables to improve model fit, aid interpretability, and because, for example, a linear relation between age and hours on shift is not a reasonable assumption (Gelman & Hill, 2007, p. 59). To ease interpretation of our models, we re-centre the age-variable to *years older than 20*. Consequently, the intercept of the OLS, for example, may be interpreted as the estimated hours on shift at an age of 20 years with all categorical variables at their reference level.

Regression models are shown in Table 2. We observe no multicollinearity, and the OLS models perform well with R^2 of 0.177 and 0.210. Since the outcome and continuous predictors are log-transformed in the OLS models, these coefficients may be interpreted so that roughly a 1% increase in age ($\beta = -0.07$, $p < 0.01$) is associated with a 0.07% decrease in weekly hours on shift. In turn, coefficients from the LPM model should be interpreted as percentage points. Thus, an intercept of 0.10 suggests a 10% baseline

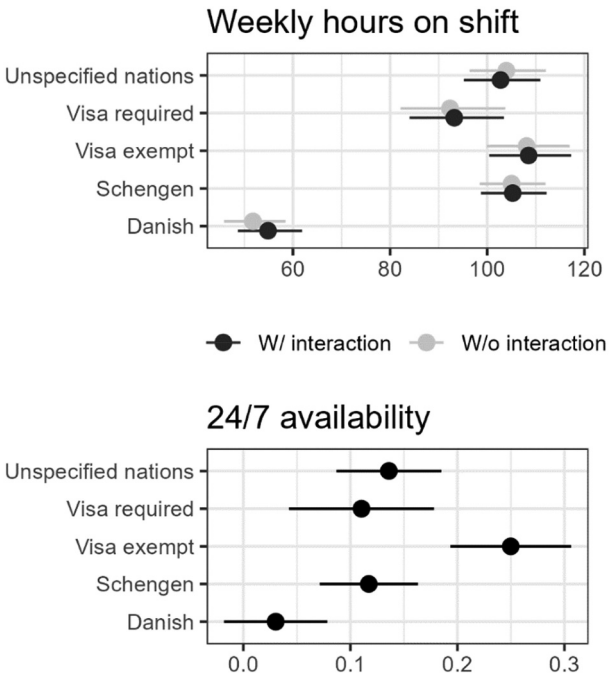

Figure 1. Predicted weekly advertised hours on shift, and probability of advertising 24/7 availability, across inferred migrant status. Covariates are held constant at mean or reference category.

probability of advertising 24/7 availability, increased by 9% points when the advertised sex worker is from the Schengen area ($\beta = 0.09$, $p < 0.01$).

Beginning with control variables, we find no significant association between weekly hours on shift and the verification of phone numbers ($\beta = 0.04$, $p > 0.05$) or photos ($\beta = -0.04$, $p > 0.05$), though there is an association between 24/7 availability and verification of photos ($\beta = 0.05$, $p < 0.05$) but not phone verification ($\beta = 0.02$, $p > 0.05$). Comparing service types, we find an association between hours on shift and ads exclusively both outcall and incall ($\beta = 0.11$, $p < 0.001$) or exclusively outcall services ($\beta = 0.10$, $p < 0.01$). The tendency is similar for 24/7 availability, though the difference is only significant for those offering incall and outcall ($\beta = 0.04$, $p < 0.05$). As for gender, we find that non-binary workers both advertise more hours on shift ($\beta = 0.13$, $p < 0.01$) and are more likely to offer 24/7 availability ($\beta = 0.13$, $p < 0.01$).

Moving on to inferred migrant status, our key explanatory variable, we find substantial variation in both outcomes. Compared to Danish sex workers, migrants advertise longer working hours and more frequently advertise 24/7 availability. This pattern is consistent for Schengen ($\beta = 0.71$, $p < 0.001$, $\beta = 0.09$, $p < 0.001$), visa exempt ($\beta = 0.74$, $p < 0.001$, $\beta = 0.22$, $p < 0.001$), visa required ($\beta = 0.58$, $p < 0.001$, $\beta = 0.08$, $p < 0.05$), and unspecified nationalities ($\beta = 0.70$, $p < 0.001$, $\beta = 0.11$, $p < 0.001$). Holding all covariates at their mean or reference category, Figure 1 shows the predicted hours on shift and probability of advertising 24/7 availability across the five groups. Danish sex workers are estimated to be available 51.74 hours per week, Schengen 105, visa exempt 108.11, visa required 92.32 and unspecified nationalities 103.93 based on the model without an interaction. That is,

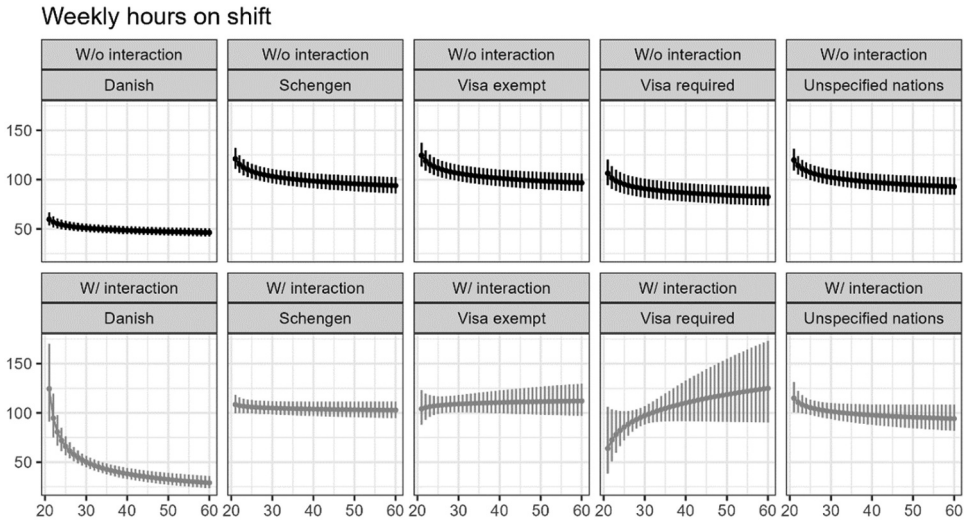

Figure 2. Predicted advertised hours as a function of age holding covariates at their mean or reference category.

holding all covariates at their mean or reference category, non-Danish sex workers are estimated to advertise weekly hours on shifts that are almost twice as long as Danish sex workers. Results are similar for 24/7 availability, wherein the predicted probability is 3% of a Danish sex worker offering it, versus 11% (Schengen), 25% (visa exempt), 11% (visa required) and 13% (unspecified nationality), when all covariates are constant or at their reference category.

Lastly, we find that both number of hours on shift ($\beta = -0.07$, $p < 0.001$) and the probability of offering 24/7 availability decrease with age ($\beta = -0.03$, $p < 0.01$). Since both age and inferred migrant status are associated with large changes in the advertised weekly hours on shift, we further estimated a model including an interaction between the two. Results are shown in both Table 2 and Figure 2, which suggest that the tendency for older workers to advertise less hours is predominantly a trend among nationals.

5. Concluding discussion

In this paper, we have responded to calls for research on sex work to focus on indoor sex work and migrant status (Adriaenssens et al., 2016; Sanders et al., 2016, Skilbrei & Holmström, 2013; Vuolajärvi, 2019; Weitzer, 2005). Several scholars have argued that sex work research is deficient in some important respects, in particular concerning working conditions – especially for migrant sex workers. Drawing on research into migration and working conditions, we hypothesised that migrant sex workers would be more likely to advertise longer weekly hours on shift and 24/7 availability in order to increase their earnings during their limited stay in Denmark, which immigration authorities can interrupt (Henriksen et al., 2021). Our results show that inequalities in working conditions within the market for sexual services are strongly associated with categories of citizenship.

We find support for our hypothesis, with substantial differences in reported hours on shift and 24/7 availability between sex workers who identify their origin as Danish and sex

workers who identify as non-Danish nationals. When controlling for age, gender, photo and phone verification, and service type, we find that migrant sex workers of different migrant statuses advertise being available almost twice as many hours as Danish sex workers. Similarly, they are between 9% and 13% points more likely to advertise their availability 24 hours 7 days a week. In contrast to past research, our findings on the hours on shift are well above past estimates of 37 hours or 63 hours from survey research (Vanwesenbeeck, 2005; 2001). However, we note that survey responses may not be immediately comparable to advertisements, and that legal contexts differ.

Adding an interaction term suggests that differences in reported working hours can be explained by the older Danish sex workers advertising shorter hours on shift in comparison to older nonnationals. That is, at 21 years the populations have roughly similar hours on shift, but at 30 Danes advertise roughly half as many hours on shift as nonnationals. In sum, our results suggest that differences in hours on shift may be driven by a tendency for older Danish sex workers to advertise shorter shifts, while migrant sex workers of all ages advertise long shifts. It is crucial, however, to note that our data is cross-sectional, and migrant sex workers often travel between countries (Agustin, 2005). Consequently, the older population of migrant sex workers that we observe may be different. To properly assess whether the difference is driven by individual sex workers advertising shorter hours with age, longitudinal monitoring is needed.

The primary distinction in working conditions, whether measured as weekly hours on shift or 24/7 availability, is between nationals and nonnationals. Within the categories of migrant sex workers, we only observe smaller differences. For example, when compared to the hours on shift for Schengen citizens, the category visa exempt advertises 3 hours more on shift when all else is constant, while the category visa required advertises 13 hours fewer on shift. The Schengen category does not risk deportation, but the latter two do without a work permit.

Given that the primary difference in our findings is between nationals and nonnationals, we suggest this is indicative of sex workers seeking to increase short-term profit during a potentially limited stay in Denmark. Within the group of migrant sex workers, it does not appear that those with a less precarious migrant status, those from the Schengen area, differ from those outside, suggesting that the threat of deportation may not drive shift lengths.

Generally, our findings on working hours are consistent with those of qualitative researchers who have drawn attention to the national/nonnational distinction as an important predictor of working conditions (Agustin, 2005; Oso, 2010). They have underscored that vulnerability to adverse working conditions frequently arises from the dual circumstances of engaging in sex work while holding an irregular migration status. However, we note that long working hours may also be indicative of human trafficking and exploitation (UNODC, 2009).

Within a broader European context, we draw attention to the low number of Danish sex sellers in our indoor population. Previous European estimates found nationals to constitute 50% to 20% of the sex worker population (Hubbard et al., 2008; Vuolajärvi, 2019). However, only 8.4% of advertisements without working hours and 13% of ads with working hours were for sex workers of Danish origin. In our sample of indoor sex workers, who are more commonly of national origin, the proportion of nationals is thus lower than past estimates. The literature suggests various mechanisms that may explain the

changing composition of the population towards being increasingly nonnational: A decrease in drug use among the national population can reduce the economic incentives for sex work (Hulusjö, 2013). Similarly, a decrease in prices for sexual services over time and deteriorating working conditions for sex workers would also reduce national sex workers' incentives to carry out sex work relative to migrant sex workers from poor socioeconomic circumstances (Skilbrei & Holmström, 2013; Wonders & Michalowski, 2001).

Our study has some implications that should be considered when formulating and evaluating national policies on sex work. We specifically draw attention to the very low number of Danish sex workers in our sample, and the gap in working hours between groups, and how the two findings relate to the Danish model of legalisation. Prior studies have argued that the legalisation of sex work yields better working conditions and health conditions for sex workers (McCann et al., 2021). Of the five categories we divide sex workers into in our study, it is likely that only Danish and Schengen citizens can sell sex legally. Yet, when comparing these two groups, we observe stark differences in hours on shift. This suggests that even the Schengen category of migrant sex workers (whose sex work likely is carried out legally) appears to work considerably longer shifts than Danish sex workers. Our results therefore suggest that working conditions are worse for migrant sex workers than for Danish sex workers, even if the migrant sex workers work legally as sex workers. Moreover, our results indicate that nationals constitute a smaller part of the market than previous estimates. Without an adequate comparison, we cannot make conclusions about whether legalisation affects a) the gap in working hours, and b) the ratio of nationals to nonnationals. It remains, however, that there are substantial differences in working conditions between nationals and nonnationals, and that a minority of sex workers appear to be nationals. By shedding light on these inequalities, our study contributes to academic scholarship and provides a foundation for informed policy discussions aimed at improving the working conditions and protections for sex workers, particularly migrants.

For the purpose of this study, we used a novel dataset of online sex work advertisements. Digital methods for data collection have advantages in terms of lower costs and sample size (Enghoff & Aldridge, 2019) but are limited by data being observational. We note several limitations of the present study, namely with regard to the validity and representativity of online data. First, we stress that advertisements are documents written with intent. On the one hand, sex workers may seek to craft personas with characteristics that appeal to customers, but they may also try to avoid attention from authorities. Not reporting nationality, or reporting that one is a Schengen citizen, can possibly help sex workers avoid problems with immigration authorities. Traffickers posting advertisements of behalf of victims, which we cannot detect, may do the same to avoid detection. If so, there is likely a bias towards fewer reporting nationalities within non-Schengen categories. However, we note that the primary distinction is between national and nonnational sex workers, with little variation between the nonnational categories. Moreover, our dependent variable is availability listed in ads, something which customers may choose to ignore. Second, the organisational dynamics of the market itself make the unit of measurement challenging. We found that over time an ad may reference multiple workers, and one worker may use multiple ads. These limitations underline the necessity of complementing the quantitative method with a qualitative reading of the data to ensure

reliability. Third, our sample consists of only one website, while several exist. We highlight that apart from the small street-based market for sexual service almost all sex workers in Denmark advertise online (Henriksen et al., 2021). Even so, however, there may be differences between the population on different websites. We cannot assess the representativity of the sample, since no other websites include detailed information on nationality. Moreover, our analysis is limited to those who advertise working hours. Selection and representativity therefore limit our conclusions. These issues pertain broadly to the research that uses indicators from sex workers' online advertisements (Giommoni & Ikwu, 2024; Kjellgren, 2024).

In terms of future research, we suggest that the validity and representativity of online data is a key concern. Studies should seek to establish whether, and to what extent, advertisements correspond to reality with regard to the information presented in them, including age, and nationality. Moreover, whether working hours are even respected by customers is also worth examining. Netnographies of 'hobbyist' websites (Holt & Blevins, 2007), surveys, and interviews are ways of elucidating the limits and meaning of data that can be collected using online.

In summation, our findings suggest that there are substantial differences in the number of hours on shift and probability of offering 24/7 availability for sex workers with different migrant statuses. Our results further suggest that these differences may in part be explained by the tendency of older Danish sex workers to advertise fewer hours on shift. These results underline the centrality of legal categories and citizenship to the working conditions in the market for sexual services, even within a legalised market.

Notes

1. Throughout the paper, we use the terms sex work and sex workers over alternatives such as sex sellers or sellers of sexual services, which under some circumstances are considered to be more neutral terms when referring to the exchange commercial goods for sexual services (e.g. Järvinen & Henriksen, 2020; Henriksen et al., 2021, Kutz et al., 2004; Vuolajärvi, 2019). However, we recognise that an unknown proportion of our sample could be victims of human trafficking and can neither be considered sellers nor workers (Mildwater et al., 2021).
2. A notable exception is New Zealand, where the Prostitution Reform Act from 2003 made it possible for sex workers to work as either independent contractors or employees, affording them certain rights and protections similar to those of workers in other industries.

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Data availability statement

The study uses data collected by the corresponding author within settings approved by Aalborg University. Any sharing of data requires the approval of Aalborg University in accordance with GDPR regulations, and researchers may contact the corresponding author.

Research ethics statement

Data was collected from public websites in accordance with Danish legislation and GDPR. The Danish Data Protection Act exempts researchers from collecting informed consent when it is infeasible and requires the collection of more sensitive data.

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