



Migrants' Work Environment in the Danish Construction Sector: a Scoping Study¹

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ABSTRACT

This study of existing research maps out what is known about the work environment of migrant workers employed in the construction sector in Denmark. Through the systematic approach offered by a scoping study and using two conceptual models identifying determinants of worker health and safety as analytical frameworks, we identify an overall paucity of research concerned specifically with the health and safety of migrants. A broader literature shows that migrants are vulnerable workers who are channeled into 3D jobs and face job insecurity. Migrants also face poor treatment and segregation. We conclude by identifying 10 gaps in the current literature, including a lack of valid evidence concerning accidents and risks.

KEYWORDS

Construction / migrants / occupational health and safety / scoping study / wellbeing / work environment

Introduction

The international literature agrees that migrant workers are among the most vulnerable members of society. They are often engaged in what are known as 3D jobs, that is, jobs that are dirty, dangerous, and demanding (sometimes also degrading or demeaning). This is the result of migrants being relegated to the most dangerous jobs and tasks (Ahonen et al. 2007; Isusi et al. 2020). They work for less pay, for longer hours, in insecure jobs, and in worse conditions than non-migrants, and are often subject to human rights violations, abuse, and violence (Andersen & Felbo-Kolding

¹ You can find this text and its DOI at <https://tidsskrift.dk/njwls/index>.

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Five appendices are available on request, including an annotated bibliography.



2013). In Denmark, many migrant workers work in the construction sector (Andersen & Felbo-Kolding 2013; Guldenmund et al. 2013), which is physically demanding and associated with a high risk of injuries and fatalities (Nielsen 2007). In fact, this sector is currently the most dangerous sector in which to work (Arbejdstilsynet 2020a).

Despite migrant workers making up a significant proportion of the workforce in the construction sector and despite the expected vulnerabilities of these workers, there is currently no comprehensive, peer-reviewed work detailing our knowledge of their health, safety, and wellbeing at work.

In response, this paper offers a comprehensive scoping study (Arksey & O'Malley 2005), detailing what we know about the work environment of migrants¹ working in construction in Denmark. We use the terminology 'work environment' to indicate that we are interested in occupational health and safety (OHS) in a narrow sense, as well as how work influences migrants in a broader sense. After introducing the scoping study methodology (Arksey & O'Malley 2005) and giving a brief introduction to the analytical framework developed by Sorensen and associates (Sorensen et al. 2016, 2021), we outline our findings. First, we detail the extent, range, and nature of research activity before turning to what we know about the topic. In accordance with the scoping study methodology, we conclude by systematically outlining current gaps in academic knowledge.

Migration to Denmark to work in a dangerous sector – the construction sector

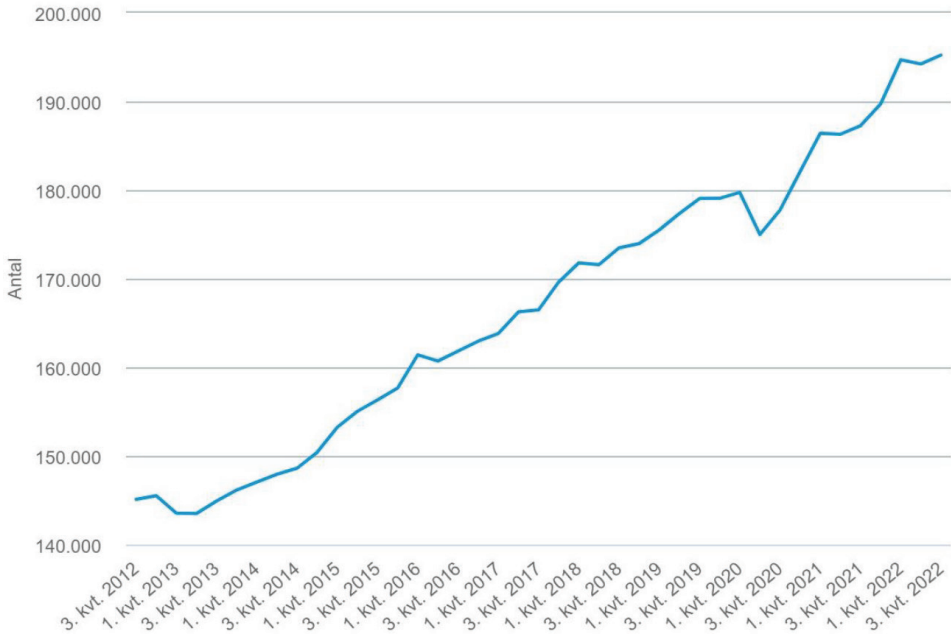
Mass migration to work is a relatively new phenomenon in the Danish context. Migrants who arrived during the 1980s and 1990s mostly entered due to family reunification or asylum. However, after a change of government in 2001, a new migration policy was introduced in Denmark, restricting family reunification and asylum immigration (Hviid et al. 2012). Furthermore, following the EU enlargement in 2004 and 2007, many new labor migrants arrived from the 10 new EU countries² (Hviid et al. 2012). The foundation of EU, that is, the free movement of labor, enables migrants to seek work in and move to other countries. Furthermore, foreign companies based in other EU countries can deliver services outside of the countries in which they are registered (Andersen & Felbo-Kolding 2013).

Many of these foreign nationals are attracted by a booming Danish construction sector. Figure 1 shows a substantial increase in the total number of Danish and foreign employees in the industry since 2012.

This growing need for more hands to manage the boom is partly achieved by employing growing numbers of migrants. The Danish Union, 3F, estimates that around 16% of employees were migrants in 2019 (pers. comm. 2022). The CEO for then Dansk Byggeri (now, the Danish The Danish Construction Federation), Lars Storr-Hansen, has been cited to put the number of migrant workers in the construction sector at a similar percentage, 17%, while also estimating an increase of 150% in seven years (BygTek 2019).

Focusing on some recent numbers, a total of 31,227 migrants received a salary in the construction sector in Denmark in May 2022 according to jobindsats.dk (a database maintained by the Danish Agency for Labour Market and Recruitment).³ Migrants

Figure 1 Employees in construction, total (Danish and foreign workers), 2012–2022, with seasonal adjustment.



from certain new EU countries dominate, with Polish (11,073), Romanian (3714), and Lithuanian workers (2645) in the lead (jobindsats.dk, August 2021). People from countries outside the EU/The European Economic Area/EFTA make up a small but not insignificant number of the workforce (4875 in total in May 2022).

As previously mentioned, construction work is dangerous. In fact, it is one of the most dangerous sectors in the labor market (Nielsen 2007). For five years in a row (2015–2019), the construction sector had the highest number of work-related accidents, with an average of 9425 accidents reported in the mandatory reporting system during that period (Arbejdstilsynet 2020a). When comparing work-related injuries per 10,000 people during that same time period, 319 injuries were reported in the construction sector against only 151 in the labor market as a whole. The rate of accidents is therefore more than double that of the workforce in general. The most common accidents in the sector are vertical falls (21%), acute physical overload (19%), contact with sharp or pointed objects (17%), and being hit by an object or person (17%) (Arbejdstilsynet 2020b). Not all occupations within the construction sector are equally dangerous. Carpentry work and construction-related woodwork come with the highest-risk jobs in the sector. Carpenters and woodworkers suffered 25% of all recorded accidents, while electricians and plumbers suffered 10% and 12%, respectively (Arbejdstilsynet 2020b).

Even comparing to our neighbor, Sweden, there are more risks associated with working in Denmark (Grill et al. 2015; Nielsen et al. 2017). It has long been known



that Denmark fares worse than Sweden in terms of safety, and substantial effort has therefore been directed at identifying the factors responsible for the differences (Spangenberg *et al.* 2003). One study has pointed to differences in education and experience, training and learning, and attitudes (Spangenberg *et al.* 2003). Another very comprehensive study of mechanisms points to the ways in which power and participation are managed and distributed within the construction industry. In particular, the results indicate that the formal and informal structures in the Swedish construction industry promote cooperation both horizontally and vertically across the hierarchical levels, which enables individuals at the lower levels to take an active part in the planning of work (Nielsen *et al.* 2017).

Not all employees are equally at risk in this high-risk sector. Younger employees and people with shorter employment periods have more accidents than others. People under 30 account for almost one-third of the accidents in the sector, while they make up only a quarter of the workforce (Arbejdstilsynet 2020b). People employed for less than two years also have a much higher risk of injury than others. Half of all injuries occur among people who have been employed for less than two years, and almost two-thirds of all injuries happen within the first three years of employment (Arbejdstilsynet 2020b).

Occupational health and safety regulations are based on the law (Jørgensen 2014). According to the main legislation governing this area (In Danish: Arbejdsmiljøloven, lovbekendtgørelse nr. 2062), the employer is responsible for ensuring a safe and healthy work environment, particularly in terms of organizing jobs and tasks, and the use of machines, technical aids, and dangerous substances. Employers are responsible for ensuring that jobs are performed safely, informing about hazards, and providing necessary training and instruction. Employees must participate in cooperative measures aimed at improving OHS, including formalized efforts.

The Danish Working Environment Authority is the central public entity that determines whether acts and rules related to health and safety at work are observed. This is achieved primarily through inspection visits and guidance for the enterprises and their safety organizations (Arbejdstilsynet *n/d*). At present, the Danish Working Environment Authority operates on the principle of dialog (personal communication with employees), with the aim of empowering enterprises to solve their own issues in relation to health and safety at the workplace. The Danish Working Environment Authority particularly focuses on enterprises with poor health and safety conditions and no explicit policy in relation to working environment issues (Arbejdstilsynet *n/d*). As such, it has had a particular focus on the construction sector (Biering *et al.* 2017) and foreign companies (Arbejdstilsynet *n/d*), driven by a political concern for social dumping (Arbejdstilsynet *n/d*), which has seen increased cooperation with The Danish Tax Agency and the police.

Scoping study methodology

Our study follows the six discrete steps of scoping study methodology developed by Arksey and O'Malley (2005). Scoping study methodology shares characteristics with other forms of literature review methodologies (*i.e.*, systematic reviews), in that it collects, evaluates, and presents the available research evidence (Arksey & O'Malley 2005).

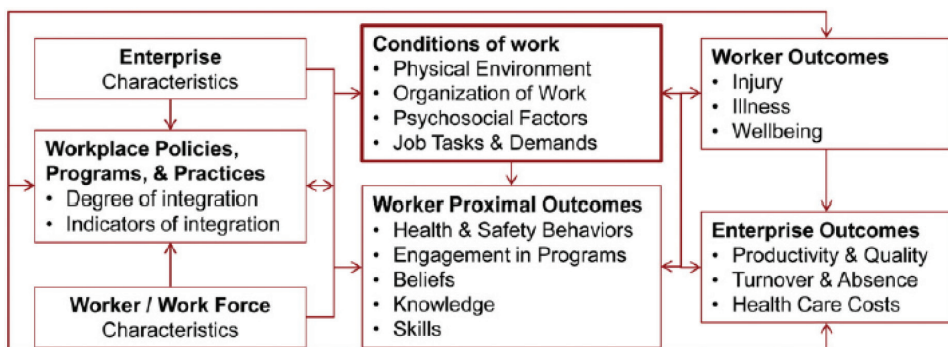
However, while a systematic review focuses on a well-defined question, where appropriate study designs are identified pre-review, a scoping study addresses broader topics without excluding specific study designs. Second, where a systematic review engages with a relatively narrow range of quality assessed studies, a scoping study allows broader research questions (Arksey & O'Malley 2005).

We opted for a scoping study because we wanted to neatly summarize and disseminate research findings (Arksey & O'Malley 2005: 21), allowing for a quick overview of current knowledge in the area. This is arguably the part of the scoping study that has most overlap with other forms of literature reviews. There is therefore nothing novel or unusual about this aim.

What sets a scoping study apart from a systematic review is that we pay particular attention to the extent, range, and nature of the research activity (but without excluding based on quality criteria) (Arksey & O'Malley 2005: 21). A scoping study thus allows readers to gauge who writes about the topic, how it has been studied, how much research exists, and how and where knowledge has been disseminated. A final important part of the scoping study is to identify gaps in the research. This particular form of scoping study therefore extends the process of dissemination by drawing conclusions from existing literature regarding the overall state of research activity (Arksey & O'Malley 2005: 21). Our scoping study therefore concludes by presenting gaps in current knowledge to help others understand where future efforts should be directed.

In each of the six steps, we have drawn on two conceptual models developed by the Center for Work, Health and Well-being at the Harvard T.H. Chan School of Public Health (Sorensen et al. 2016, 2019, 2021), which point to the multiple ways that people are influenced at work and by their work. The first conceptual model (Figure 2) focuses on the conditions of work, driven by organizational policies, programs, and practices within the context of enterprise, as well as worker characteristics (Sorensen et al. 2016).

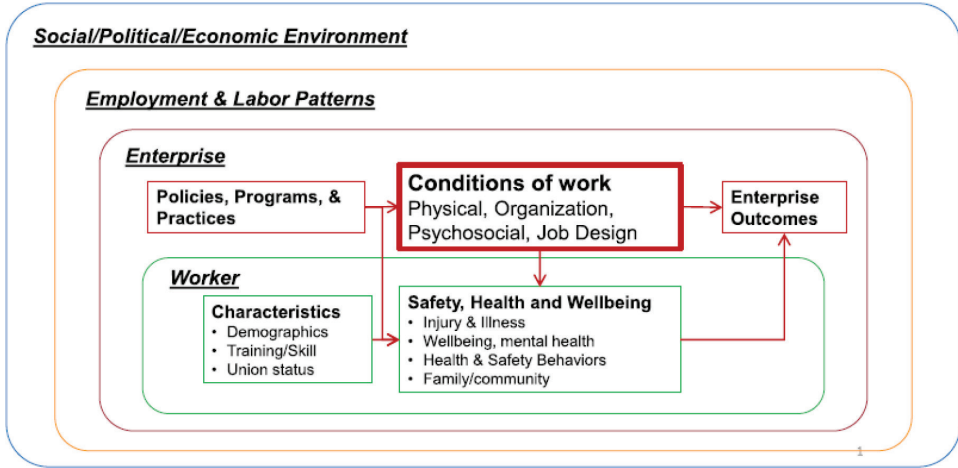
Figure 2 Conceptual model for integrated approaches to the protection and promotion of worker health and safety (Sorensen et al. 2016).



A second model (Figure 3) focuses even more explicitly on the broader context of the work, such as growing reliance on technology and globalization. It is beyond the scope of this paper to give full details of the models.



Figure 3 Expanded conceptual model (Sorensen et al. 2021).



The conceptual models have guided our scoping study, allowing us to systematically consider the various determinants of worker health and safety, as well as outcomes throughout the review process. In practical terms, the two models have helped us set research questions, guided our thematic analysis, informed the structure of our paper, and helped us identify gaps in the literature. For example, in setting the research questions, we opted for a broad definition that would allow us to engage with literature that would not always be classified as relating to OHS, such as salaries.

Stage I: Identifying the Research Questions

To guide our search, we asked one overall Research Question (RQ) of the literature as we searched, read, and coded:

- RQ1: What is known from existing literature about the work environment of migrants working in the construction sector in Denmark?

In accordance with scoping study methodology, we sought to address the topic in broad terms. The aim was therefore to include all literature that offers any insight about the *health, safety, or wellbeing* of migrants. The question is intentionally broad to show that no studies would be excluded based only on different terminology or a different original focus to ours. In accordance with scoping study methodology, that also means not excluding studies based on specific study designs. The question fits the analytical model outlined earlier, because the model also takes a broader perspective of OHS compared to traditional approaches (Sorensen et al. 2016, 2019, 2021).

In accordance with the methodology, answering the question also involves determining the extent, range, and nature of the research activity (RQ2), as well as identifying gaps in the research (RQ3) (Arksey & O'Malley 2005: 21).

Stage 2: Identifying Relevant Studies

The aim of this scoping study is to be as comprehensive as possible in identifying suitable material for answering the central research question (Arksey & O'Malley 2005). The searches were filtered to scope literature published after 2004, as this was the year that relevant migration changes were introduced, that is, the enlargement of the EU (Andersen & Arnholtz 2008).

To ensure comprehensiveness, literature was sourced using a systematic six-step process in November and December 2021. The first step was to identify the easy-to-find matches by searching for migrants in Denmark (in Danish and English) using Google and Google Scholar, before engaging in a more structured approach. The second step involved a comprehensive search using two library's search functions (MultiSearch and Primo) with relevant search terms.⁴ Well-known migration and Danish OHS scholar's university webpages were then searched for additional publications. Fourth, and following the advice of Arksey and O'Malley (2005), our research effort was then complemented by manually searching the reference list of all identified articles. Finally, we also set out to investigate whether a work had been cited after its publication (forward citation). A total of 104 articles were considered for this review.

Stage 3: Study selection

In stage 3, we decided *post hoc* on further inclusion and exclusion criteria. Initially, we assumed that it would be possible to learn about workers in Denmark by investigating studies from other countries similar to Denmark. However, a closer reading of the literature suggests that findings from other countries, even those we normally consider similar such as Norway and Sweden, give outcomes that are quite different to those of Denmark. In Norway, for example, collective agreements cover all those who work within the construction sector through legal extension mechanisms, which early evaluations suggest have consequences for the protection of workers (Kofoed-Diedrichsen & Weise 2017). Likewise, several studies have claimed that it is well known that Sweden can boast much better OHS in the construction sector, as mentioned earlier (Nielsen 2007, 2017; Spangenberg et al. 2003). Others have warned against assuming similarities due to the differences in migration patterns, migration policies, social security systems, and labor market policies (Helgesson et al. 2019). Overall, we concluded that we could not ensure findings from overseas studies would be applicable to workers in Denmark. Consequently, this study only includes migrant construction workers who work in Denmark, even though we assume that some insights from this scoping study will be relevant to migrant workers in other national contexts, including our Scandinavian neighbors.

We have not included studies of other high-risk sectors, such as industry and agriculture, but have instead indicated when other industries have been studied alongside construction (see Table 1). We also decided *post hoc* to only include output communicating original research, despite the existence of high-quality older (Ahonen et al. 2007) and newer (Sterud et al. 2018) international systematic reviews.

We excluded studies containing mixed cohorts of migrants and native workers in which migrant data could not be disaggregated, as well as studies that did not explicitly report migrant status (such as Nielsen 2007). We also excluded studies where we were



unable to identify construction workers from other sectors, with the exception of a study (Rambøll 2016) in which the majority (two-thirds) worked in construction, and another study (Biering et al. 2017) in which construction workers were part of 'high-risk' sectors collectively, due to the paucity of any other research detailing outcomes.

Stage 4: Charting the Data

When reviewing the findings, we coded for the pre-determined themes suggested and in the explanations of the conceptual model⁵ (Sorensen et al., 2016, 2021).

Stage 5: Collating, summarizing and reporting the data

The next stage involved three steps, one pertaining to the ways in which literature was produced, while the others related to the content of the literature. For the first step, our focus was on developing easy-to-access graphs and overviews of 'who, where and how'.

For the second step, we again utilized the conceptual models developed by Sorensen and associates (2016, 2019, 2021). The models were used to identify, analyze, and report on patterns (themes) within our data and organize them thematically (Braun & Clarke 2006). The presentation and clustering of what we know is therefore data driven, but continuously organized according to, compared against and informed by the two conceptual models (Sorensen et al. 2016, 2021).

In a third step to identify existing gaps, our findings from the existing literature were again compared to the conceptual models (Sorensen et al. 2016, 2021), as well as to the findings in international reviews (Ahonen et al. 2007; Hvid & Buch 2020; Mucci et al. 2019).

Stage 6: Consultation

An important component of Arksey and O'Malley's (2005) scoping study methodology – and what sets it apart from other review methodologies – is consultation with key experts within the field. We purposively selected and invited two experts. One had in-depth knowledge of the Danish and international literature on OHS, while the second had substantial knowledge of migrants working in the Danish construction sector. Both experts read and offered feedback on a draft of this article. We asked them to respond to the following questions about the article, borrowed from Ramsay and Baker (2019): i) Do you agree with our interpretations?; ii) Are there any parts you disagreed with?; iii) Can you see any obvious omissions in the literature we have included?; iv) Were you able to follow our methodology?; v) Are there any areas of future research that we have not included/considered? The experts overwhelmingly concurred with our work, and we integrated their comments where relevant.

Extent, range, and nature of research activity (RQ2)

Much of the literature is not primarily concerned with the health and safety of migrant workers, see Table 1. In fact, we were only able to identify four publications (Biering

Table 1 Overview of studies included in scoping study

Author	Publication Year	Denmark	Other countries, comparative	Migrants	Non-migrants	OHS primary concern	Construction	Agriculture	Industry	Cleaning	Quant.	Qual.	Journal	Report (R) Book (B)	Peer reviewed	Original research
Andersen and Arnholtz (2008)	2008	√	-	√	-	-	√	-	-	-	-	√	-	√	?	√
Andersen and Felbo-Kolding (2013)	2013	√	-	√	-	-	√	√	√	√	√	-	-	B	-	√
Arnholtz (2021)****	2021	√	-	√	-	-	√	-	-	-	√	√	√	-	√	√
Arnholtz and Andersen (2016)****	2016	√	-	√	-	-	√	-	-	-	√	√	-	B	-	√
Arnholtz and Hansen (2009)*	2009	√	-	√	-	-	√	-	√	√	√	-	-	R	-	√
Arnholtz and Hansen (2012)*	2012	√	-	√	√	-	√	-	√	√	√	-	√	-	√	√
Arnholtz and Refslund (2019)**	2019	√	-	√	-	-	√	-	-	-	-	√	√	-	√	√
Biering et al. (2017)***	2017	√	-	√	√	√	√	√	√	√	√	-	√	-	√	√
COWI (2012)	2012	√	-	√	-	√	√	√	-	-	-	√	-	R	-	√
COWI (2016)	2016	√	-	√	-	√	√	-	-	-	√	√	-	R	-	√
Guldenmund et al. (2013)	2013	√	√	√	√	√	√	√	√	-	√	√	√	-	√	√
Grillis and Dyreborg (2015)	2015	√	-	√	-	-	√	-	-	-	-	√	√	-	√	√
Nielsen and Sandberg (2014)	2014	√	-	√	-	-	√	-	-	-	-	√	√	-	√	√
Rambøll (2016)****	2016	√	-	√	-	-	√	-	√	√	√	√	-	R	-	√
Rasmussen et al. (2016)**	2016	√	-	√	-	-	√	-	√	√	√	√	-	R	-	√
Refslund (2021)**	2021	√	-	√	-	-	√	-	√	-	-	√	√	-	√	√
Refslund and Sippola (2020)**	2020	√	√	√	-	-	√	-	√	-	-	√	√	-	√	√
Simkunas and Thomsen (2018)	2018	√	-	√	-	-	√	-	-	√	-	√	√	-	√	√
Spanger and Hvalkof (2020)	2020	√	-	√	-	-	√	√	-	√	-	√	√	B	√	√

Notes.

* This study of 500 Polish workers is reported across different outputs.

** These outputs appear to at least partly draw on the same data sets.

*** In these studies, it is impossible to separate construction workers from other sectors.

**** This study of posted workers is reported across two outputs.

B = Book, BC = Book Chapter, R = Report.



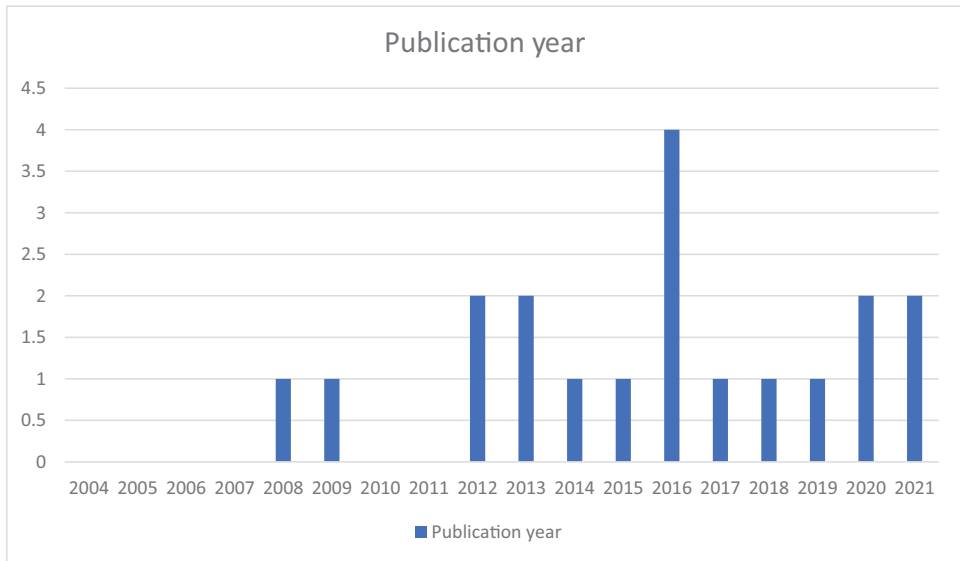
et al. 2017; COWI 2012, 2016; Guldenmund et al. 2013) that specifically set out to explore the OHS of migrants. The rest touch on work environment by extension only. Only about half of the publications were published as peer-reviewed articles. The most common publication vehicle was the journal *Economic and Industrial Democracy*.

Some studies are reported across more than one output. The actual number of studies is therefore smaller than the number of publications included.

Publications are overwhelmingly written by Danes, in Danish and for a Danish audience. In fact, we were not able to find a single article by academics in sending countries. Only a limited number of authors publish on this topic, with Jens Arnholtz being the most active. It is also worth noting that consultants, rather than independent academics, are the authors of some of the major works (COWI 2012, 2016; Rambøll 2016) in this area.

There have been steady publications on this topic since 2008, with a spike in 2016 (see Figure 4), but there was little interest in the topic in the early years of the EU enlargement.

Figure 4 Stage 3 publications by year of publication.



What we know (RQ1)

The results have been organized with reference to the two conceptual models as outlined in full in the original work (Sorensen et al. 2016, 2021). We start by engaging with how worker characteristics influence outcomes. We then consider what we know about the influence of policies, practice, and processes aimed at improving worker outcomes. Third, we consider the organization of work, before turning to the conditions of work. We then outline what we know about outcomes. As we have found no literature relating to enterprise outcomes, the focus is on worker outcomes. We conclude by considering

the social, political, and economic environment but find little in the literature. If not otherwise explicitly stated, all findings relate to migrants working in the construction sector.

Migrant characteristics: Migrants lack some of the prerequisites to act appropriately

Language is an often repeated point of contention (COWI 2012; Guldenmund et al. 2013). Due to language barriers, migrants might not understand safety instructions and instead rely upon their experience and the standards in their country of origin (Guldenmund et al. 2013: 98). Andersen and Felbo-Kolding (2013) found that between 51% and 60% of employers agree that Eastern European workers lack safety knowledge due to language problems. Others, including Danish authorities monitoring OHS, suggest that such language problems can be overcome (COWI 2012). Migrant workers, too, do not perceive language to be a problem. This is due to migrants mainly working with other migrants. Migrant workers only perceive language to be a problem during meetings or take-overs (COWI 2012).

A general lack of education, knowledge, literacy, and skills are claimed as reasons for non-compliance in the public debate among Danish authorities and employers (COWI 2012; Rambøll 2016). However, an older study of Poles in Copenhagen (Arnholtz & Hansen 2009) found that they were educated to a higher level than the general population in both Poland and Denmark.

Low-skilled migrant workers are argued to be at risk. Migrant construction workers are sometimes described as ‘generalists’, without the specific sub-sector skills usually found in Denmark, with qualifications that are not directly comparable or without previous experience (COWI 2012; Guldenmund et al. 2013). However, migrant workers themselves argue that their skillsets are not significantly different to that of their Danish colleagues (COWI 2012). Furthermore, Arnholtz and Hansen (2009) found that the Poles working in construction have a high degree of skills match. When it comes to construction work, some have education credentials, others have experience, and many have both (Arnholtz & Hansen 2012). It is fair to conclude that the evidence is mixed.

There is agreement that migrants are willing to accept lower safety standards if there is sufficient economic benefit to be gained from it (Guldenmund et al. 2013), sometimes taking chances in order not to delay or stop work (COWI 2012). Others have found that migrants are mainly oriented to working conditions in their home country (Refslund & Sippola 2020). It follows that if safety is poor in those countries, migrants will bring those standards with them (COWI 2012). COWI (2012) reports on what they call a ‘Polish mentality’, which refers to a willingness to expose oneself to danger for potential benefit. Another interpretation is possible – one that points to low agency when faced with demands from employers and with linguistic barriers and little knowledge of labor markets (Refslund 2021).

Policies, programs, and practices: employer initiatives are mostly lacking and public protection is insufficient

Training, instruction, and upskilling initiatives at the organizational level are mostly found to be lacking. In the research by Andersen and Felbo-Kolding (2013), few



employers provided any language training or used translators to overcome barriers. Furthermore, when compared to other sectors, the construction sector does little to upskill migrants on the job. Employers are more likely to provide OHS training (70%) than other forms of training, but the rate is still lower than in any other sector (Andersen & Felbo-Kolding 2013). The lack of training means that migrants may not fully understand the dangers (COWI 2012). Furthermore, instructions on the job are largely lacking (COWI 2012), including instructions on how to safely carry out tasks.

Some specific public initiatives overseen by the Danish Working Environment Authority (WEA) include the introduction and monitoring of compliance with the Register of Foreign Service Providers (RUT) and inspections in the form of site visits (Grillis & Dyreborg 2015; Refslund & Arnholtz 2021). While these actions are thought to be effective to some degree (Biering et al. 2017), such protection has limited reach because many migrant workers distrust government agencies like the labor inspection, which is considered to be the strong arm of the law rather than a service to protect workers' rights (Guldenmund et al. 2013). In addition, it is a common perception that it is difficult to avoid problems surrounding migrant workers, partly because they are complacent in their own fate (COWI, 2012).

The organization of work: 3D jobs and insecurity

Much of the international literature documents how migrants are channeled into 3D jobs. Migrant workers in Denmark are similarly allocated jobs that are dirty and dangerous (Arnholtz & Hansen 2009; COWI 2012; Refslund 2021). This is evident from the construction industry, which includes the most dangerous jobs in Denmark. Within construction work, migrants are allocated the more dangerous tasks – the tasks that Danes do not want to take on, which migrants accept because they are scared to lose their jobs (COWI 2012).

There is a high degree of job insecurity. Even though migrant workers are offered some protection by working in a booming industry, they are a precarious group of workers within the sector (Spanger & Hvalkof 2020). Migrants report a fear of losing their jobs, alienation, and general precarity (Simkunas & Thomsen 2018). Compared to working in their own country, migrants feel less secure in their ability to keep their job (Arnholtz & Hansen 2009). Marginalized by their class and migrant status, migrants experience a lack of income security. This helps to explain why migrants are more prone to 'run for the money', engage in too much overtime, tolerate poor treatment, and perhaps also behaviors that risk not only themselves but others (Simkunas & Thomsen 2018). In addition, workers report feeling stuck in low-end jobs and being scared to claim their wages (Spanger & Hvalkof 2020), making them unable to leave unsafe working conditions.

Not all migrants are subject to the same degree of insecurity and poor conditions in 3D jobs. Some migrants work in the same way and under same conditions as Danes, often for the main contractor (COWI 2012). Those who work for subcontractors can expect more mixed work environments. A third group is subject to poor conditions, including poor safety. The 'arm and leg companies' (self-employed with no employees) and those who work for foreign companies are of

particular concern when it comes to this kind of sub-standard work environment (Arnholtz & Hansen 2009; COWI 2012). Migrants hired without a contract also face a particularly high level of insecurity in relation to accidents and sickness (COWI 2012).

Work conditions: poor treatment, segregation, and financial mistreatment

Poor treatment of migrant workers is a dominant theme and many of the reviewed works report on widespread discrimination and poor or differentiated treatment (Arnholtz & Hansen 2009; COWI 2012; Spangenberg et al. 2003). Around one-third of Polish workers in one study had been threatened with dismissal and almost one in five had been threatened violence in the workplace (Arnholtz & Hansen 2009). Employers can also take advantage of migrant workers by asking them to do dangerous work (Arnholtz & Hansen 2009). Mistreatment affects the wellbeing of large groups of workers when they are disregarded and mistreated at work.

Poor treatment also includes subjecting migrants to financial scams. Such scams include not paying the correct or agreed salary (COWI 2012), a practice that is rife and widespread (Arnholtz & Hansen 2009; Refslund 2021). Scams include providing false pay slips (Arnholtz 2021), unexplained wage deductions (Refslund 2021), and forcing migrants to work unpaid hours (Refslund & Arnholtz 2021). Some studies even report on debt bondage, threats, and human trafficking (Grillis & Dyreborg 2015). If they stand up for their rights, workers can find themselves being threatened with deportation, termination of work, and physical violence (Refslund 2021).

Many migrants do not mix with Danish workers and thus face segregation (COWI 2012; Refslund & Arnholtz 2021). Without a shared identity and shared experiences, workers are polarized into native and migrant workers. This segregation is sometimes actively imposed by employers to prevent the workers from interacting (Refslund & Sippola 2020). Polarizing affects wellbeing and it can be assumed to have consequences for safety (COWI 2012). Differentiated treatment includes not being paid the same salary as Danish workers for similar work. Being paid a lower salary clearly has the potential to affect wellbeing when salaries are perceived to reflect the country of origin rather than level of competence (Simkunas & Thomsen 2018).

It is generally accepted that labor migrants work long hours (Arnholtz & Andersen 2016) and may have an interest in doing so (Arnholtz & Hansen 2009; COWI 2012). However, long working days are a risk factor, and migrants are aware of this (COWI 2012). Some migrant workers feel the company's survival is 'their responsibility' and feel pressured to take on more overtime and weekend work in order to avoid being replaced, subcontracted, or dismissed (Simkunas & Thomsen 2018). A related aspect is the speed with which work is undertaken. Migrant workers report that they want to be seen as efficient (COWI 2012), and some migrant workers take risks while just hoping for the best (COWI 2012). Fetching adequate safety equipment may slow down the pace (COWI 2012). In addition, risk taking must be considered in relation to workers' employment insecurity, such as the fear of being made redundant (Simkunas & Thomsen 2018).



Worker outcomes: Work injuries as an indication of the scale of problems

To date, no study has focused on accidents suffered by migrants in the construction sector in isolation. A recent population-based study of work injuries among migrant workers in Denmark (Biering et al. 2017) is the closest we can come to an insight into outcomes. A study by Biering et al. (2017) considers the outcomes of high-risk sectors, including construction, transportation, and agriculture. The study used data on work injuries from an emergency department (ED) and reported injuries from the ED's catchment area to the Danish Working Environment Authority (DWEA) from 2003 to 2013.

The study found that *all* migrants under 30 and working in high-risk sectors had fewer work injuries compared to Danish workers. For workers over 30, those from the new EU countries were also found to have lower rates of accidents compared to Danish workers (0.74 IRR). For clarification and to avoid any assumption of a mistake in our description of the study, the study found that workers from the new EU countries are *less at risk* of work injuries than Danes. According to the study (Biering et al. 2017), young people from the new EU are particularly immune to work accidents, as they only have roughly one-third as many accidents as the comparison group.

These findings suggest something very different about this group of workers (young people and those from the new EU) to what we would expect based on the review so far. The results also indicate something very different to the majority of studies included in recent international reviews (Mucci et al. 2019; Sterud et al. 2018), with one international review concluding that 'the most robust result is the higher risk of work injuries in immigrant than in native workers' (Sterud et al. 2018).

Biering et al. (2017) suggest that the results are due to underreporting, healthy worker bias (migrants are healthier than the general population of the host destination), and increased attention from governing bodies. We agree with Biering and associates on the point of underreporting. We also assert that the results are so surprising that they cannot be accepted as an accurate depiction of the reality for migrant workers in the Danish construction sector.

Economic environment: Mobility between highly diverse labor markets cause problems

In the literature reviewed for this article, little attention is paid to how political, social, and economic environments influence migrants at work. The exception is how economic incentives motivate the individual worker (Andersen & Felbo-Kolding 2013; Arnholtz & Hansen 2009). Studies find that the disparity of wages is the main reason why migrants migrate to work (Andersen & Felbo-Kolding 2013; COWI 2012). The disparity of wages means that migrants risk more by standing up for their rights, including OHS, than Danish workers.

What we do not know yet, a conclusion (RQ3)

Some areas are well explored in the existing research, as outlined in detail above. Notably, problems with salaries (Arnholtz & Hansen 2009; Arnholtz 2021; Rasmussen

et al. 2016; Simkunas & Thomsen 2018), discrimination and mistreatment (Arnholtz & Andersen 2016; COWI 2012; Grillis & Dyreborg 2015; Refslund & Arnholtz 2021), and problems with working hours (Arnholtz & Andersen 2016; COWI 2012) are thoroughly covered. Certain actors have received more attention than others, such as foreign and posted workers (Arnholtz & Andersen 2016) and employers (Andersen & Felbo-Kolding 2013; Arnholtz & Andersen 2016).

However, when comparing our findings against the analytical frameworks and international reviews, we have found significant gaps in our knowledge. In accordance with the scoping study methodology, we finish this review by briefly outlining these gaps.

1. We lack research effort outcomes for migrants in the construction sector. While efforts have been made to assess safety and accidents in high-risk sectors (Biering et al. 2017) including construction, these efforts have been hindered by supposed underreporting.
2. There is little focus on psycho-social problems. While discrimination and mistreatment are widely covered in the literature, we do not know about the outcomes of being subject to such treatment. We can presume that workers who are excluded and discriminated against on a daily basis might develop depression, stress, various disorders, or substance abuse (Hargreaves et al. 2019). However, we have no information about this in the Danish context.
3. We lack any kind of information on the long-term physical outcomes of working long hours and at high speed, or outcomes related to chemical exposure and dangerous materials.
4. We lack any kind of research exploring sector-level outcomes, including the effects of OHS initiatives.
5. We have found no research focusing on those who are considering working in Denmark before making the actual move, including information about skills and knowledge.
6. Related to this, we have little information about how migrants' experiences and skills, etc., develop over time and what results targeted OHS programs, policies, and practices have on the outcomes. More specifically, what difference do career development initiatives, safety development initiatives, training programs, language initiatives, etc., have on outcomes [see Hvid and Buch (2020) for inspiration]?
7. We have identified a lack of research on specific groups of migrant workers, especially those who work illegally.
8. We have observed a shortcoming in the application of suitable research methodologies. In particular, our review points to the need for longitudinal and comparative studies. Specific problems relate to the official safety registers as accidents are underreported in those registers. We call for innovative methods to provide valid data.
9. It would also be of interest to study how market mechanisms can contribute to improving working conditions.
10. Besides the effect of unequal financial markets between the countries of origin and Denmark, we have found no studies that take into account the other wider influences advocated by Sorensen et al. (2021): technology, climate change, changing distribution of disease, demographic changes, and race.

The gaps we have identified suggest that many critical questions remain unaddressed. We invite others to help us fill these gaps in future research.



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Notes

¹In this article, we refer to the group of interest as migrants or migrant workers, irrespective of what terminology is used in the original research. The migrants we are interested in are people who were not born in Denmark, but are economically active in Denmark and working in construction.

²The Czech Republic, Hungary, Poland, Slovakia, Slovenia, Latvia, Lithuania, Estonia, Romania, and Bulgaria.

³This number includes wage earners and the self-employed without employees, who have performed work in Denmark for foreign companies registered in the foreign service providers register (RUT).

⁴A vocabulary sheet of search terms was created: Migrant (*Migra*), foreign worker, foreign-born worker, migrant workers, immigrant, CALD, non-Danes, ethnic minority, worker, transient, illegal migrant, labour migration, nomad, minority group, nationality, foreign worker, person(s) born abroad, nativity, citizen status, 'AND/OR' occupational disease, occupational health, occupational injury, occupational safety, work conditions, work-related accidents, work injuries, sick leave, industrial health, environmental health problems, work environment, psychosocial work environment, working conditions, communication, working relationships, social networks, language, precarious 'AND/OR' construction, building, high risk 'AND' Denmark, Danish. A similar list was created in Danish.

⁵Predetermined codes included Physical Working Conditions; Organisation of work: Job design; Psychosocial work environment; Health and safety climate; OHS policies, programmes and practices (e.g., training). Predetermined codes also included codes relating to the organisation of work: Distribution of jobs; Employment stability; Non-standard work arrangements; Worker protections; Worker voice; Enterprise characteristics (e.g., salaries). Finally, predetermined codes included wider influences: Globalisation; Technology; Climate change; Changing distribution of disease; Demographics, for example, race, exclusion; Social inequalities; Policy and regulatory environment (e.g., visa regulations and monitoring of workplaces).