Health And safety risk mapping in workers of micro, small, and medium enterprises in Sukahati Village, Citeureup Sub-district, West Java

Mufti Wirawan1*, Adrian B Yegiswara1, Aldrian Hanif1, Algavusada F Yemix1, Amanda S Yasmin1, Astuti1, Brian O Seik1, Diniyah I F Putri1, Mahannie T Sihombing1, Muhamad N Ghifari1, Nadhila Adani1, Rizqi Fatimah1, Salma P Habibah1 and Sarah1

1Department of Occupational Health and Safety, Faculty of Public Health, Universitas Indonesia, Depok, 16424, Indonesia

*mufti@ui.ac.id

Abstract. Informal sectors, especially Micro, Small and Medium Enterprises (MSME) play a significant role in the national economy's development and employment but lack of Health and Safety concerns regarding their works. This study aims to increase the informal sector's awareness towards occupational health and safety aspects by conducting occupational health and safety (OHS) risk mapping through an integrated platform in Sukahati Village, Citeureup, West Java. One of this study's outcomes is to create an integrated online database platform that contains occupational health and safety data from the sampled MSMEs called SiUMKM. This study was conducted with samples of MSMEs across Sukahati Village using questionnaire-based interviews. The highest proportion of work accidents within the population includes punctures, cuts, and scratches. In contrast, the highest occurring health issues in MSMEs in Sukahati are waist pain, back pain, and muscle stiffness. Many of the existing health issues cause are manual handling tasks and inadequate workstation arrangements (up to 91% contribution). In conclusion, the OHS problems surrounding MSMEs mainly resulted from the low comprehension of OHS in the workplace. Therefore, an integrated platform like SiUMKM can be a solution for comprehensive information regarding the health and safety aspects of MSMEs work environment.

1. Introduction

Informal sectors, especially Micro, Small, and Medium Enterprises (MSME) play a significant role in the national economy's development and employment. According to the International Labour Organization (ILO), micro, small, and medium enterprises are currently employing most of the workforce, with an average of 40% of the workforce from the industrial-heavy countries and 60% of the workforce from developing and newly industrialized countries [1]. As per February of 2019, around 74,08 million people of Indonesia work in informal sectors [2].

The typical characteristic of most informal sectors is the scale of the business, which is considered small and run by not more than five employees, managed by an owner with lower-level educational background, joins local distribution chains, and is unwilling to expand their business coverage. Also,
when compared to formal sectors, micro, small and medium enterprises tend to have lower productivity rates [3].

It has known that the informal sectors play a significant role in developing a country's economy [4]. A rally of support towards these enterprises is more and more resounding and catalysed by the government, one of which is establishing the Ministry of Cooperation and Small to Medium Business of the Republic of Indonesia. Several advancements have also been delivered in terms of micro, small and medium enterprises development. One example is the trend in online selling which provides ease of access and further development in this sector.

However, during the advancement of micro, small and medium enterprises, occupational health aspects still lack attention. For example, the concern of the informal sector in registering the membership of Badan Penyelenggara Jaminan Sosial (BPJS) or Social Security Administration Bodies is still 30.9 million or around 41% of the total data on the total number of people working in the informal sector as many as 74.08 million people [5]. The same thing also happened in other countries such as Thailand, as research conducted by Nilvarangkul et al. [6] showed that most informal workers work outside the protection of workers’ laws, transparent Occupational Health and Safety (OHS) regulations, and do not participate in supporting occupational health and safety program at work.

In developing countries, the informal sector accounts for most workers and makes a significant contribution to their national economies. However, regulations regarding OHS often do not apply in these workplaces. Where applicable, regulations are not sufficient and enforced. Workers do not have access to proper OHS training and often expose to their safety and health risks without adequate protection [7].

Previous studies have also shown that informal workers’ work environment still does not pay attention to the aspects of OHS. One of the studies conducted by Ramdan et al. [8], located in Samarinda, showed that many informal industrial welding workers in Samarinda have below standard knowledge of OHS, work more than 8 hours per day on average, and do not wear personal protective equipment. These substandard conditions resulted in 50% of workers suffering from eye injuries due to exposure to welding flame ultraviolet radiation. The same thing was found in the study of Hussain et al.[9] and Ahmed et al. [10] conducted in India and Pakistan were risk factors for musculoskeletal disorders found to be high in work, exposure to noise and heat that exceeds the standard, chemical, and ergonomic hazards lack attention, and lack of incidents reporting workplace.

Lack of oversight from the government also results in poor OHS performance in the informal sector. One example is research conducted by Amfo-Otu and Agyemang[11] in Ghana, which shows that many informal sector workers who have a low awareness of OHS in the workplace admit that they do not receive supervision or support that supports the OHS aspects of the workplace from the government.

Meanwhile, in producing quality and sustainable products, attention is needed for occupational health and safety. It has become a severe problem because the informal sector is engaged in overloaded and irregular work hours, but the wages received are still below standard [12]. With various irregularities in the work system, micro, small, and medium enterprises settings may risk poor occupational health.

Although research in the micro, small and medium enterprises sector is still minimal, there is a growing fact that those who work in micro, small and medium enterprises are more often exposed to dangerous situations and suffer more work-related injuries and illnesses than those who work in large businesses or companies [13]. A study conducted in Indonesia mentioned that informal sector workers reported many cases of injuries and accidents. The most common problems identified include back pain and rheumatism due to sitting or standing positions while working [14].

Workers in the micro, small and medium enterprises sector are affected by ergonomics-related injuries and diseases, including complaints of skeletal muscle disorders such as chronic back pain, pain in the neck and shoulders, eye strain and headaches [15]. Hiremath et al. (2014) stated that there are many work-related health complaints and occupational diseases on textile industry workers in India such as complaints of body and musculoskeletal aches (73%), eye disorders (48%), besides that there are needle stick wounds, burns, deafness, fatigue, difficulty sleeping and indigestion. This problem has also resulted from workers’ bad habits such as smoking, drinking alcohol, chewing tobacco, and drinking
intoxicating substances [16]. Therefore, it is necessary to develop health information and increase occupational health and safety in the informal sector, especially micro, small and medium enterprises that are still relatively lacking attention [16].

Sukahati is one of the villages in Citeureup, Bogor. The economy of Sukahati is mostly driven by MSMEs, which mainly produces handicraft made from stainless steel. Based on data collection conducted by the local government, there are 181 MSMEs scattered in Sukahati. In terms of health management, this village is under the Leuwinutug Public Health Center's scope, which location is 8 km from the Sukahati Village Office. Based on an interview with a midwife assigned to the village, the Leuwinutug Public Health Center does not yet have specific occupational health risk data for MSME workers in Sukahati.

SiUMKM is an innovative, location integrated database website and application that collects information regarding MSMEs' health and safety aspects. The purpose of creating this platform is to create an accessible MSMEs occupational health and safety database access for people, especially health officials, to map the health and safety aspects of the MSMEs workers community. With this platform, it will be easier for health officials to track the remaining health and safety problems in the MSMEs community to develop a suitable intervention.

This study focuses on data collection and mapping occupational health risks on MSMEs in Sukahati Village, Citeureup, and Bogor. This study aims to increase the informal sector's awareness towards occupational health and safety aspects by conducting an occupational health risk mapping through an integrated website platform as baseline data to develop interventions for managing occupational health aspects in the informal sector.

2. Method

The study method consists of data collection, data classification, data analysis, making conclusions, and compiling reports on the series of studies that have been carried out. In this study, Respondents were residents who owned micro, small, and medium enterprises from Rukun Warga (RW) or Citizens Association No. 01 to 07 who resides in Sukahati Village, Citeureup, Bogor, West Java. Data of the owners and MSMEs were obtained from the local government, which served as a basis for data collecting.

The data were collected using questionnaire-based survey methods. The enumerators filled the questionnaires using interview and observation techniques on each MSME and served as an instrument for answering a set of questions or written statements to respondents. This method has been used several times in research on occupational health in the informal sector, such as research conducted by Sapkota et al. [17], Balkhyour et al. [18], and Damalas [19]. The questionnaire is adopted from Asean - OSHNet with several changes according to research needs.

The authors took data from 89 MSMEs which spread from Citizens Association No. 01 to 07. Data taken included general information including photos and coordinates of MSMEs, work schedules, wage systems, human resources, insurance, OHS activities, equipment used, materials used, existing workstations, OHS-related data, MSME consultants, health problems, hazards and the application of OHS, psychosocial aspects, and the Nordic body map.

3. Results and discussion

3.1. Demographics of MSMEs

Based on Table 1, most MSMEs found in Sukahati Village are the MSMEs that operate as a metal craftsman (96.6%). Products made of metal such as pan, baking sheet, oven, and others. Then, some of MSMEs engaged in services (2.2%) such as repair shops and machinery. The last, MSMEs engaged in creative businesses (1.2%) whose products include dolls, souvenirs, etc. The majority (52.8%) of MSMEs in Sukahati Village was established before 2000 since most of them are businesses passed down through generations. However, almost half of the MSMEs were established between 2000 to 2010 or later than 2010 (as shown in Table 2).
### Table 1. Type of MSMEs.

|                | Metal Craftsman | Services | Creative Businesses |
|----------------|-----------------|----------|--------------------|
|                | 96.6%           | 2.2%     | 1.2%               |

### Table 2. Establish Year of MSMEs.

|              | < 2000 | 2000 – 2010 | > 2010 |
|--------------|--------|-------------|--------|
|              | 52.8%  | 40.4%       | 6%     |

Based on Table 3, most MSMEs owners' education is the elementary school level (62.9%). There are also MSMEs owners who did not have formal education or no qualification of education (20.2%). The education level of MSMEs owners can influence awareness to implement occupational health and safety in the workplace to reduce safety and health aspects.

### Table 3. Educational level of MSMEs owner

|          | No Qualification | Elementary School | Junior High School | High School |
|----------|------------------|-------------------|--------------------|-------------|
|          | 20.2%            | 62.9%             | 10.1%              | 6.8%        |

3.2. Health and safety risk mapping

Based on the results of a questionnaire distributed to 89 MSMEs, the MSMEs in Sukahati Village can use necessary materials derived from thin and sharp metals. This material is due to the type of UMKM found in Sukahati Village is metal craftsmen (Table 1). As metal craftsmen, MSMEs workers do many work activities using manual equipment such as hammers, scissors, pliers, etc. Therefore, the most common safety risks (work-related injuries) are punctures, scratches, and cuts. In Table 4, the most common safety risk is punctured (72.8%), scratched (68.4%), cuts (59.6%) with a frequency of incidence from rarely - always.

### Table 4. Safety Risk of MSMEs Workers Throughout Sukahati Village

| Frequency per Year | Punctured | Stratched | Cuts |
|--------------------|-----------|-----------|------|
| Never (0)          | 27.2      | 31.6      | 40.4 |
| Rarely (1-2)       | 23.6      | 24.7      | 29.2 |
| Sometimes (3-4)    | 7.8       | 12.3      | 7.8  |
| Often (5-6)        | 13.4      | 11.2      | 8.9  |
| Always (>6)        | 28        | 20.2      | 13.7 |

Based on the results of field observations, the working area of MSMEs has not appropriately designed, causing an awkward posture. Also, repetitive manual activities can exacerbate health risks. From the results of questionnaires to 89 MSMEs, the most common health risks are muscle pains around
the waist, back, and other parts of the body. In Table 5, the health risk most complained about are aches (82%), waist pain (37.1%), and back pain (57.3%) with a frequency of incidence from rarely - always.

| Frequency per Year | Waist Pain | Back Pain | Aches |
|--------------------|------------|-----------|-------|
| Never (0)          | 37.1       | 42.7      | 18    |
| Rarely (1-2)       | 13.5       | 16.9      | 20.2  |
| Sometimes (3-4)    | 15.7       | 13.5      | 6.7   |
| Often (5-6)        | 10.1       | 6.7       | 22.5  |
| Always (>6)        | 23.6       | 20.2      | 32.6  |

Table 5. Health risk symptoms of MSMEs workers throughout Sukahati village.

The mapping results show that in terms of safety, most of the MSMEs workers in Sukahati Village often experience work-related injuries such as stab wounds, cuts, or scratches, mostly metal craftsmen who have direct contact with sensitive materials. It is supported by a research conducted in Portugal on MSMEs in the waste management sector; workers were often doing risky work such as sorting various recycling materials manually, preparing trash bags and containers manually, as well as unloading equipment and vehicles that have run out of mechanical hazards (e.g., use of cutting and drilling equipment). It has caused an average of 80.03 injuries in the past two years[20]. Accidents mostly occurred to the workers were getting slashed by glass (44.4%) and wounds due to metal cuts (43.9%)[21].

Figure 1. The mapping layout of SiUMKM.id website which integrates the data collected from MSME workers throughout Sukahati Village regarding their OHS aspects with an online location pinning system.

Work accidents that often occur in MSMEs are one of the signs of the government's lack of attention to occupational health and safety, which happens in most countries. In a study conducted by Bonafede et al. [22] in 2016, there are several obstacles in managing the occupational health and safety aspects of MSMEs: too many laws or regulations, overly rigid labor surveillance, lack of resources (time, people, and money), lack of awareness about OHS, lack of experts, lack of support and guidance on
technicalities in the field, and lack of productive conversations between entrepreneurs and social parties in accommodating the aspirations of entrepreneurs [22].

Lack of resources has proven to be one of the main obstacles to OHS management in MSMEs [22]. One of the resources lacking in Sukahati Village MSMEs is funds to buy equipment to protect oneself from the risk of direct contact with sharp objects when doing menial work (e.g., cutting, cutting), resulting in injuries workers. This finding is in line with the research of Black et al. [21] which shows that most injuries suffered by informal workers in India are due to the lack of compliance with the use of PPE. Other research also states that not using PPE, low awareness and neglect of OHS can increase the risk of accidents and incidents during daily operations [23].

Unnikrishnan et al. [23] explains the possibility of increased risk in several OHS problems in MSMEs in India, which are aging employees, unattended machine size competition can cause minor incidents such as puncturing/scratching, unavailability of unique storage places for materials so that they do not scatter on the floor which could cause incidents and ergonomic problems. In terms of occupational health, most MSMEs workers in Sukahati Village had complaints about waist pain, back pain, and myalgia in the right arm, which is usually used for work. This result is quite different compared to the results of the study conducted by Zou et al.[24] on immigrant workers of Chinese MSMEs in the furniture industry (50%), electronics (40%), printing (7.8%) and jewelry (2.1%). The most commonly reported diseases in that study were respiratory disorders (69%), while 9.9%, 7.7% and 13% reported gastrointestinal, skin and other disorders.

Most MSME workers in Sukahati Village tend not to implement a safe working culture because they have worked in such manners for a long time ago. They also tend to ignore small hazards like punctures, scratches, and ergonomic issues such as muscle soreness and pains. According to Ohajinwa et al. [25], workers in Nigeria encountered this issue as well. Around 70% of workers in the informal sector did not express any health concern from their tasks. The majority of them (86% repairers, 88% dismantlers, 86% butchers) felt they are in a good health condition. Even though their work condition was hazardous, only around 4% of e-waste workers (7% repairers, 10% dismantlers) and 23% of butchers were worried about their health condition. This study also declares that around 90% of e-waste workers (95% repairers, 84% dismantlers) and 84% of butchers did not consider occupational injury as a serious matter to be concerned. Only about 17% of e-waste workers (14% repairers, 19% dismantlers) and 18% of butchers believed that the illnesses they experienced in the last 12 months could be a consequence of their task[25].

A significant change is needed, a shift is needed, but could be a challenge to do in such a small unit [6]. Moreover, the low usage of modern machinery could be a cause of OHS issues. The issues that hinder modern machinery’s use are the workers’ unwillingness, insensitivity of both entrepreneurs and government, and financial problems [6]. The lack of safety education for the workers may also cause OHS issues among MSME businesses.

The absence of mandatory obligation from the employers regarding the workers’ safety is a factor that could link informal jobs to health risks [20]. MSME workers are exposed to health risks from their working environment, minimum protection from income loss, and less protection from healthcare services due to employers’ lack of contribution and limited access[3]. They also do not have professionally-arranged tasks and generally have minimum funds, regulation, tools, and income[12].

The absence of mandatory obligation from the employers regarding the workers’ safety is a factor that could link informal jobs to health risks [20]. MSME workers are exposed to health risks from their working environment, minimum protection from income loss, and less protection from healthcare services due to employers’ lack of contribution and limited access[3]. They also do not have the professionally-arranged task and generally have the minimum fund, regulation, tools, and income[12].

Another study by Kumudini and Hasegawa[29] presented that MSME workers with heavy workload, awkward posture, monotonous and repetitive tasks, long work duration, and harmful working environment may have fatigue symptoms often leads to a significant impact on workers’ health. This condition also appears among MSME workers of Sukahati Village; signs of fatigue and health
complaints may be caused by improper working environment, traditional tools, and awkward positions while working for a prolonged time.

The majority of MSME workers in Sukahati Village are also working more than 40 hours per week. It may be caused by their small earnings, which force the workers to work longer to finish their orders to make ends meet[30]. Not only surpassing the standards regulated by Indonesian Act No. 13 of 2003 on Manpower, working more than 40 hours per week increases health and safety risks which resulted from fatigue [31]. The impact of working in prolonged hours results in the high consumption of caffeine and cigarettes, which are hazardous to long-term health. This point is in line with various studies regarding health which display adverse effects of prolonged and continuous working hours. The acute effects involve physiological responses such as escalating fatigue, stress, sleep disorder, and unhealthy lifestyles such as smoking, alcohol abuse, irregular eating pattern, and lack of physical activity. The long-term effects include increased risk of cardiovascular disease, digestive and reproductive disorder, musculoskeletal disorder, chronic infection, and increased risk of accident and injury[30].

Education, communication, and awareness-raising could be a stimulus to improve occupational health and safety[32]. An appropriate strategy is needed to reach and ensure all employers are involved and exposed to all the information. Therefore, the next thing to do after gathering information related to OHS complaints and issues is to input the data to the SiUMKM website, facilitating the local government to analyze MSMEs' conditions in Sukahati Village. Based on that analysis, a training program related to product conception, market analysis, product standardization, and marketing can start. Furthermore, the local health center will create a suitable program according to accident and health complaints reports from the workers. Hopefully, a sustainable system and program will be generated from this database.

The outcome of this study could help more researchers relate to the analysis of accident and disease risk factors in the MSME industry and economic studies related to productive and healthy workers. The established database will also be able to assist anyone who is looking for business partnerships. However, this study also has several limitations—first, a limited research period which only allows survey and interview methods. An extensive research period would allow researchers to observe the continuous improvement of the workers' comprehension of occupational health and safety. Second, the low education level of the respondents affects their awareness of health and safety. It took more time to introduce basic OHS concepts to the respondents before and during the interview. It is crucial to describe the questionnaire in the simplest way possible to avoid confusion and adapt to the respondents' particular characteristics. Third, some undiscussed topics in this study could be developed into other researches in the future, including the relationship between working schedule, workplace design, and perception of OHS and the rate of accident and illness in the MSME sector. Last, this study is preliminary research as an effort to build hazard and risk mapping and recording into a digital web database. Studies in the future would explore the topic from technology and application development aspects to support the mapping further and provide more information related to OHS risk and hazard in the MSME sector.

4. Conclusion
In conclusion, based on the survey and mapping results, most MSME workers in Sukahati Village have a high risk of being pierced, cut, and scratched from the safety aspect. The most common problems are muscle stiffness and pains, mainly on the waist and back from the health aspect. It may result from using thin and sharp metals as a primary material of the product while using manual tools such as hammers, pliers, and scissors in a repetitive motion. The problem is further aggravated by not having proper work stations in the workshop, making the workers work in awkward positions for a prolonged time. From both health and safety aspects, those incidents occur since most MSMEs in Sukahati Village have low comprehension of occupational health and safety and low education level. Therefore, an integrated SiUMKM (Micro, Small, and Medium Enterprises information systems) platform can be utilized as a strategic Occupational Health and Safety (OHS) information system and problem-solving resource by involved parties. Including entrepreneurs, local health authorities, and local governments.
4.1. Recommendations
A strengthened empowerment program such as education and training for MSME entrepreneurs and workers in Sukahati Village is necessary. Small-scale businesses are looking for support, guidance, and insight to work in a healthy environment by networking with fellow entrepreneurs or occupational health service providers[33]. Financial assistance is a promising policy tool to promote OHS, mainly for MSMEs with limited investment resources. These incentives include providing working appliances such as hammers, cutting machines, or bending machines to ease the task, minimizing OHS risks and boosting productivity and providing personal protective equipment such as safety gloves[32]. Awards and recognitions given to each business region will also facilitate awareness of OHS in MSME. In the future, efforts can be focused on "establishing healthy life in healthy business" by encouraging decision-makers and educational institutions to participate in researches on occupational health and safety in micro, small, and medium enterprises [13].

Acknowledgements
Authors wishing to acknowledge assistance and encouragement from the Department of Occupational Health and Safety Universitas Indonesia, Faculty of Public Health Universitas Indonesia, Universitas Indonesia, Local Government of Sukahati Village, local government of Citeureup Sub-District, and Leuwinstonug Public Health Center for their support from the beginning until the accomplishment of this study.

References
[1] Jahangiri M, Rostamabadi A, Malekzadeh G, Sadi A, Hamzavi G, Rasooli J, Momeni Z and Ghaem H 2016 Occupational safety and health measures in micro-scale enterprises (MSEs) in Shiraz, Iran J. Occ. Health 58 201–8
[2] BPS February 2019 Tingkat Pengangguran Terbuka (TPT) sebesar 5,01 persen (Available at: https://www.bps.go.id/pressrelease/2019/05/06/1564/februari-2019--tingkat-pengangguran-terbuka--tpt--sebesar-5-01-persen.html)
[3] Rothenberg A, Gaduh A, Burger N, Chazali C, Tjandraningsih I, Radikun R, Sutera C and Weiland S 2016 Rethinking Indonesia’s Informal Sector (World Development vol 80) pp 96–113
[4] Islam T and J Alam 2019 The Relationship between Informal Economy and GDP Growth: A Study on South-Asian Developing Countries Canadian J. Bus. Info. Stu. 1 1–9
[5] BPJS Kes 2019 Peserta Program JKN (BPJS Kesehatan. Peserta Program JKN available at https://bpjs-kesehatan.go.id/bpjs)
[6] Nilvarangkul K, Arphorn S, Smith J, Phajan T, Kessomboon N and Thaewongiew K 2016 Developing primary care occupational health services for informal sector workers in Thailand (Action Research vol 14) p 113–31
[7] Mushi L 2019 Factors Affecting Adherence to Occupational Health and Safety Rules and Regulations in Improving Public Health in the Informal Sector Workers in Mabibo-Dar es Salaam Int. J. Ind. Psych. 7
[8] Ramdan I, Mursyidah S and Jubaedah S 2017 Photokeratocconjunctivitis Symptoms among Informal Welding Operators in North Samarinda, Indonesia (Global Medical & Health Communication (GMHC) vol 5) p 144
[9] Hussain M, Kumar K, Qutubuddin S and Hebbal S 2019 Occupational health and safety issues among workers in stone industries in North Karnataka Proc. Int. Conf. on Industrial Engineering and Operations Management (Bangkok: Thailand/IEOM International) p 3303-4.
[10] Ahmed I, Usman A, Nazir M and Shaukat M 2018 Safety practices in informal industrial segment of Pakistan (Safety Science) p 83–91
[11] Amfo-out R and Agyemang J 2016 Occupational Health Hazards and Safety Practices Among the Informal Sector Auto Mechanics J. Appl. Research 469 319–23
[12] Rustdjiajati R and Aman M 2015 *Model Perlindungan Kesehatan dan Keselamatan Tenaga Kerja Sektor Informal Melalui Kolaborasi Pos UKK dengan Bank Sampah Mandiri* Symp. Nasional Teknologi Terapan (SNTT)

[13] Legg S, Olsen K, Laird I and Hasle P 2015 *Managing safety in small and medium enterprises* (Safety Science vol 71) (PC) p 189–96

[14] Setyaningish Y, Dewanti S and Jayanti S 2018 *Health Status and Occupational Health Hazards Among Home-based Garment Workers in Semarang, Indonesia* (KnE Life Sciences vol 4) p 575

[15] Jerie S 2017 *an Assessment of the Application of Occupational Ergonomics Principles in the Informal Sector of Horare and Mutare in Zimbabwe* (Review of Social Sciences vol 2) p 1–6.

[16] Hikmah Y, Suwandi T, Yusuf A and Qomariyatus S 2017 *Kependudian Aktif untuk K3 Sektor Informal* (Banjarmasin: PT Grafika Wangi Kalimantan)

[17] Sapkota S, Lee A, Karki J, Makai P, Adhikari S, Chaudhuri N and Fossier-Heckmann A 2020 *Risks and risk mitigation in waste-work: A qualitative study of informal waste workers in Nepal (Public Health in Practice)*

[18] Balkhyour M, Ahmad I and Rehan M 2019 *Assessment of personal protective equipment use and occupational exposures in small industries in Jeddah: Health implications for worker* Saudi J. Bio. Sci. 26 653–59

[19] Damalas C and Abdollahzadeh G 2016 *Farmers’ use of personal protective equipment during handling of plant protection products: Determinants of implementation. (Science of the Total Environment* p 730–36

[20] Rodrigues M, Sá A, Masi D, Oliveira A, Boustras G, Leka S and Guldenmund F 2020 *Occupational Health & Safety (OHS) management practices in micro- and small-sized enterprises: The case of the Portuguese waste management sector* (Safety Science)

[21] Black M, Karki J, Lee A, Makai P, Baral Y, Kritsotakis E and Fossier-Heckmann A 2019 *The health risks of informal waste workers in the Kathmandu Valley: a cross-sectional survey* (Public Health vol 166) p 10–18

[22] Bonafede M, Corfiati M, Gagliardi D, Boccuni F, Ronchetti M, Valenti A and Iavicoli S 2016 *OHS management and employers’ perception: Differences by firm size in a large Italian company survey* (Safety Science vol 89) p 11–18

[23] Unnikrishnan S, Iqbal R, Singh A and Nimkar I 2015 *Safety management practices in small and medium enterprises in India* (Safety and Health at Work vol 6) p 46–55

[24] Zou G, Zeng Z, Chen W and Ling L 2015 *Self-reported illnesses and service utilisation among migrants working in small-to medium sized enterprises in Guangdong, China* (Public Health vol 129) p 970–78

[25] Ohajinwa C, Van Bodegom P, Vijver M and Peijnenburg W 2017 *Health risks awareness of electronic waste workers in the informal sector in Nigeria* Int. J. Env. Research and Public Health 14

[26] Onyemaechi 2019 *Informal employment and work health risks: Evidence from Cambodia* Informal Employment and Work Health Risks: Evidence From Cambodia (Munich Personal RePEc Archive No. 92943)

[27] Taylor R 2015 *Approaches to Universal Health Coverage and Occupational Health and Safety for the Informal Workforce in Developing Countries*

[28] Duma K and Nuryanto M 2018 *Safety and Health Effort on Informal Sector Workers* Int. J. Nurs. Health and Medicine vol 1 p 14–9

[29] Kumudini G and Hasagawa T 2009 *Workload and Awkward Posture Problems Among Small-Scale Strawberry Farmers in Japan* J. Human Ergol vol 38 p 81-8

[30] ILO 2018 *Working Time and the Future of Work* (In Future of Work Research Paper Series)

[31] Messenger J 2018 *Working Time and the Future of Work* (In Future of Work Research Paper Series)

[32] ILO 2020 *Improving Safety and Health in Micro-, Small and Medium-Sized Enterprises: An overview of initiatives and delivery mechanisms*
[33] Vinberg S, Torsdatter-Markussen L and Landstad B 2017 *Cooperation Between Occupational Health Services and Small-Scale Enterprises in Norway and Sweden: A Provider Perspective.* *Workplace Health & Safety* Vol 65 355-364