

# A survey of work, health and safety conditions in small-scale garment enterprises in Gaborone, Botswana

## ABSTRACT

**Small-scale enterprises (SSEs) are the fastest growing economic sectors globally and they contribute substantially to the economic growth of a country. Occupational health and safety (OHS) conditions in SSEs tend to be neglected and very poor. In Africa, there is paucity of data about the health and safety conditions of these businesses. This study was conducted to provide an understanding of the work environment and OHS conditions in small-scale clothing industries in the Gaborone area of Botswana.**

**A total of 36 garment producing small-scale enterprises employing 100 people were surveyed. Findings confirmed that working in small-scale garment manufacturing enterprises is unsafe, and the occupational health and safety conditions are poor thus predisposing workers to the risk of work-related injuries and diseases.**

**Key words:** occupational health and safety conditions, small-scale enterprise, garment industry, Botswana

## INTRODUCTION

In most developing countries small-scale enterprises (SSEs) and the informal sector constitute one of the fastest growing economic sectors and represent the most realistic form of employment creation.<sup>1</sup> The Government of Botswana has recognised the importance of SSEs in fostering economic growth and job creation through initiatives and policies, such as the Botswana Enterprise Development Programme and the financial assistance policy, in its effort towards poverty eradication<sup>4</sup> and encouraging manufacturing and self employment. These have contributed to the growth of SSEs in textiles, auto repairs, metal works and horticulture.

Various definitions of SSEs exist. Based on the number of persons employed, SSEs consist of more than six but less than 20 people and are distinguished from informal enterprises by virtue of registration with the national department of labour and inclusion under its labour legislation.<sup>2</sup> Alternatively, the number of employees, the annual turnover of the business and its location have been used jointly to exclude individuals who are employed in a domestic environment.<sup>3</sup> The Botswanan Government classifies micro enterprises as employing between 1 and 6.<sup>4</sup>

OHS conditions in SSEs tend to be neglected and very poor.<sup>9</sup> They have problems fulfilling legal requirements for the control of OHS due to their limited resources<sup>10-12</sup> and are inclined to be concerned with survival rather than improving OHS, resulting in high workplace health risks for the large number of people working in these enterprises. SSE workers have low awareness of OHS problems and the ways to improve their working conditions.<sup>13</sup> Frequently, little attention is accorded to OHS conditions in SSEs and their compliance with statutory safety requirements, due to shortages of factory inspectorate staff.<sup>5</sup> In Canada for example, small businesses

employed about 48% of the total labour force in the private sector in 2006 and accident fatalities were higher among them, raising questions regarding the OHS conditions in their workplaces.<sup>6</sup> Recognising similar needs, the Africa Joint Effort, between the International Labour Organization (ILO) and the World Health Organization, on occupational health and safety (OHS) among vulnerable groups of workers such as those in SSEs was signed in 2003. It emphasised the need to address health and safety issues associated with these workers.<sup>8</sup>

In Africa, a plethora of anecdotal information regarding OHS problems in SSEs exists, but accurate and quantitative information about them is seriously lacking.<sup>1</sup> This is a problem in Botswana. According to the Botswanan Factories Act, factory inspections should be conducted in order to ensure good working conditions, safeguard against occupational accidents, diseases and injuries and identify occupational hazards and related risks so as to enable control measures to be put in place.<sup>7</sup> However, although SSEs in Botswana are registered, there are no OHS reporting systems in place making it difficult to quantify and monitor accidents, injuries and the prevalence of work-related diseases that occur in these workplaces.

Therefore, protecting the health of this substantial portion of the working population becomes not only a public health challenge, but a problem which calls for more specialised studies to inform us about their OHS. To this end, a study was conducted to provide an understanding of the work environment and OHS conditions in small-scale clothing industries in the Gaborone area of Botswana.

## METHODOLOGY

A quantitative descriptive cross-sectional design was used, due to the volatility of small businesses and because it would

Lindiwe I Zungu,  
Department of Health  
Studies,  
University of  
South Africa

SG Gabe,  
University of Limpopo  
(Medunsa),  
School of Public  
Health

Corresponding author:  
Prof. Lindiwe I Zungu,  
Department of Health  
Studies,  
University of  
South Africa,  
PO Box 392,  
Pretoria  
0003.  
E-mail: zunguli@  
unisa.ac.za

be simple to carry out and inexpensive. A cross-sectional design was successfully used to investigate cotton fabric dust exposure in a Lesotho garment factory<sup>14</sup> and OHS conditions in small, medium-sized and informal sector enterprises in Vietnam.<sup>15</sup>

### Study setting

The study setting was Gaborone, which had SSEs manufacturing textile products like school uniforms, protective clothing, fashion garments, bedding and knitwear. They operated from designated industrial cluster zones and although required to be registered with the Department of Labour<sup>7</sup> their working arrangements and work processes remained informal and unorganised. This was mostly due to the owners being workers themselves and relatives often being employed to work in their businesses. The exact number of SSEs was unknown as no valid statistics were available. Most were concentrated in the cluster areas, and some in industrial zones and residential premises.

### Target population and sample

The target population included all SSEs engaged in manufacturing clothing in Gaborone. An SSE was defined as an enterprise employing from one to twenty persons and registration was not a criterion for recruitment. No reliable list of clothing manufacture SSEs existed from which to select a random sample. The City Council's rates payment register did not list names of the actual occupiers and business activities were not indicated. Most of the SSEs were not incorporated in terms of the Companies

**Table 1. Socio-demographic characteristics of employees (N=110)**

| Number of employees per SSE (n=36)   | Per enterprise (n) | (%)        |
|--------------------------------------|--------------------|------------|
| 1 – 2                                | 21                 | 58.3       |
| 3 – 4                                | 11                 | 30.6       |
| 5 – 6                                | 2                  | 5.6        |
| 7 – 8                                | 2                  | 5.6        |
| <b>Total</b>                         | <b>36</b>          | <b>100</b> |
| Gender of persons employed (n=110)   |                    |            |
| Females                              | 74                 | 67.2       |
| Males                                | 36                 | 32.7       |
| <b>Total</b>                         | <b>110</b>         | <b>100</b> |
| Age group of persons employed (n=36) |                    |            |
| 20 – 25                              | 20                 | 55.6       |
| 30 – 40                              | 12                 | 33.3       |
| 50 – 55                              | 4                  | 11.1       |
| <b>Total</b>                         | <b>36</b>          | <b>100</b> |

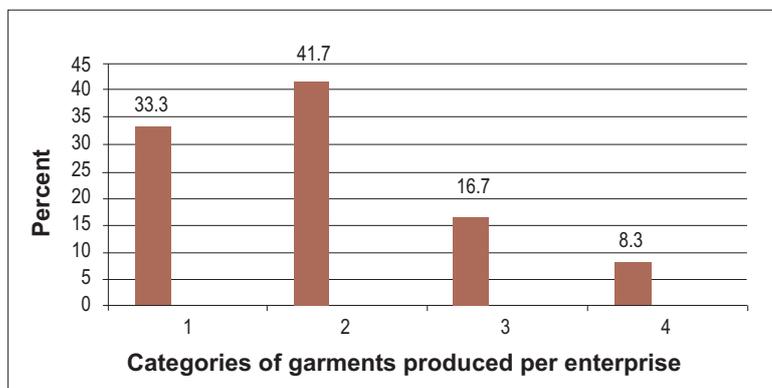
Act,<sup>4</sup> and those registered as factories as required by the Factories Act,<sup>7</sup> could not be accessed if they had moved or been liquidated. Using purposive sampling, the researchers identified 36 eligible SSEs in the designated City Council and industrial zones and in commercial areas of Tlokweng and Mogoditshane, as their concentration facilitated access. Consent to participate was given by all the owners/managers of these SSEs, thereby ensuring as large a sample as possible and reducing selection bias.

### Data collection

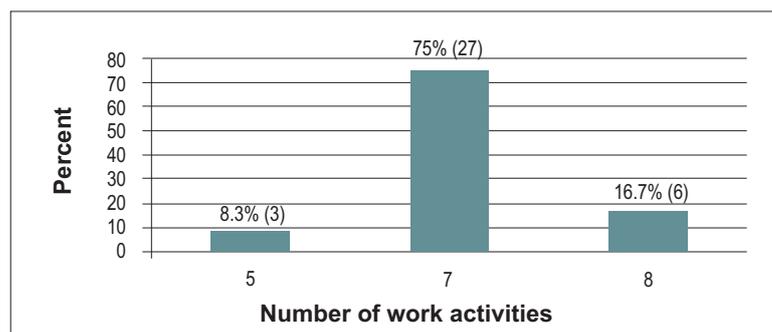
A standardised OHS checklist designed by the ILO's guidelines on Safety, Health and Working Conditions inspections<sup>16</sup> was used for inspecting each enterprise, which should have enhanced the reliability and validity of the instrument. The standardised checklist used was piloted using one enterprise and aspects that were not relevant were removed. A checklist is a practical instrument for investigating workplace health and safety<sup>17,18</sup> and ideal for identifying and determining compliance to set standards in OHS. There were six sections, namely general information of the enterprise, general workplace conditions, physical and environmental conditions, provision of personal protective clothing and equipment, compliance to OHS standards and ergonomic and psychosocial conditions; the latter will be presented in the next paper.

Records were also observed during inspections and employees available in the departments provided information required for clarification purposes. The risk of bias was also minimised by validating the observed practices with employees who were present during the inspections.

Ethical approval was obtained from MEDUNSA Research and Ethics Committee prior to the execution of the study. Permission was obtained from the senior management of the study sites and management of the SSEs. Ethical principles were adhered to during the research.



**Figure 1. Number of categories of garments manufactured per enterprise**



**Figure 2. The number of work activities per enterprise**

## RESULTS

### Socio-demographics of employees

Table 1 shows the socio-demographics for the 110 persons employed in the 36 SSEs. The average number of employees was three.

### Description of products manufactured

Four categories of garments were manufactured: fashion garments; school uniforms and accessories; protective clothing; seat covers, pillows, bedding and curtains. Figure 1 shows the number of categories, i.e. product range.

### Nature of work processes involved in garments manufacturing

Activities in the production process were grouped into eight categories: pattern drafting, cutting, stitching, needle work, pillow and cushion stuffing, pressing, general finishing and delivery to customers. Most SSEs used seven activities (Figure 2).

The production process was sequential. Fabric was cut, stitched and finished and packaged for distribution. During cutting, fabric was laid on a table and either a paper pattern was placed on it, marked and then cut using hand-held shears or powered cutting knife or the tailor drew the pattern straight on

three (8.3%) allowed a 15 minute break in the morning. The number of days worked per week was not established.

### General workplace conditions of SSEs

The seven general workplace conditions evaluated are presented in Table 2. A "Yes" response indicated that the

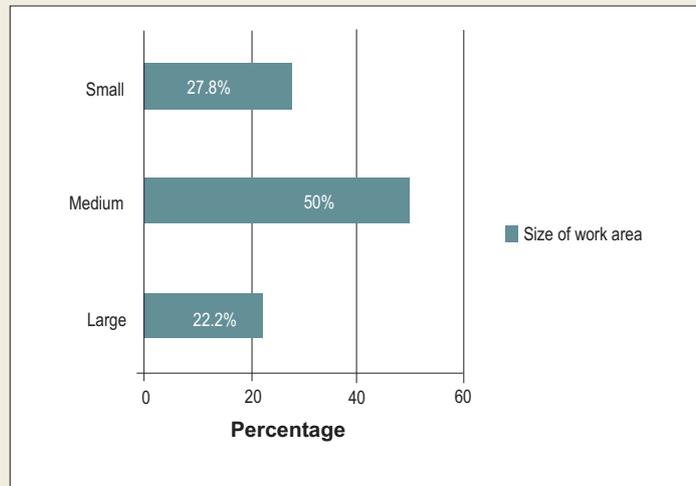


Figure 3. Distribution of enterprises according to size of work area

**“... a plethora of anecdotal information regarding OHS problems ... exists, but accurate and quantitative information ... is seriously lacking.”**

the fabric using chalk before cutting and bundling for sewing. Stitching involved a machinist sewing the pieces together and applying embroidery where required using high-speed electric sewing machines. During finishing, loose threads were removed with trimmers, or more commonly, small embroidery scissors, loose ends were hand-sewn and hemmed using needles. Garments were then ironed, packaged or hung-out for delivery. Domestic pressing irons and ironing boards were mostly used.

### Size of the work areas

Work areas were classified as small (10-19 m<sup>2</sup>), medium (20-39 m<sup>2</sup>) and large ones (40-60 m<sup>2</sup>) and the distribution is illustrated in Figure 3.

### Hours of work

Twenty-nine (80.6%) worked the required daily eight hour shift, while five (13.9%) operated for nine hours and only two (5.6%) extended the daily hours of work to 10 hours, yielding a mean daily hours of production of 8.25 (SD = 0.554). All utilised a five-hour morning shift; generally from 8 am to 1 pm with a one-hour lunch break. Most (75%) worked three hours in the afternoon (2 to 5 pm), compared with seven (19.4%) and two (5.6%) that put in four and five hours respectively. None reported night shift work. Generally workers were not offered short breaks to stretch and rest their muscles. Only

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measure was in place, acceptable and in good working condition, "No" that it was not in place, was needed and required improvements, and "Not applicable" that it was not needed, not relevant or was a missing value.

### Physical and environmental conditions

Table 3 shows the results for the 13 variables used to assess the physical and environmental conditions in the workplaces inspected. Response categories were the same as for the previous section.

### Availability of emergency services

The results for emergency exits, emergency signs, fire extinguisher, first aid kits, a trained first aider or a trained health and safety representative available onsite are provided in Table 2.

### Protective clothing and equipment

Four measures provided data to evaluate the utilisation of personal protective clothing and equipment (PPE) to maintain and improve health and safety of workers in SSEs (Table 4).

**Table 2. Distribution of results for general workplace conditions (N=36)**

| General workplace conditions                                     | Yes<br>n (%) | No<br>n (%) | N/A<br>n (%) | Total<br>n (%) |
|--|--------------|-------------|--------------|----------------|
| Provided at least 2 emergency exits with visible emergency signs | 2 (5.6)      | 34 (94.4)   | –            | 36 (100)       |
| Escape ways are free of obstacles                                | 12 (33.3)    | 24 (66.7)   | –            | 36 (100)       |
| Adequate clearance to or accessibility for performing tasks      | 24 (66.7)    | 12 (33.3)   | –            | 36 (100)       |
| Floors and walk ways are even and not obstructed                 | 23 (63.9)    | 13 (36.1)   | –            | 36 (100)       |
| Ceiling adequately raised to reduce noise reflection             | 27 (75.0)    | 9 (25.0)    | –            | 36 (100)       |
| Provided enough appropriate fire extinguishers                   | 3 (8.3)      | 33 (91.7)   | –            | 36 (100)       |
| Provided first aid kit and first aiders                          | –            | 36 (100)    | –            | 36 (100)       |
| Trained health and safety representatives                        | –            | 36 (100)    | –            | 36 (100)       |

**Table 3. Distribution of results for physical and environmental conditions (N=36)**

| Physical and environmental conditions  | Yes<br>n (%) | No<br>n (%) | N/A<br>n (%) | Total<br>n (%) |
|--|--------------|-------------|--------------|----------------|
| Convenient storage for tools, raw materials and products provided                        | 25 (69.4)    | 11 (30.6)   | –            | 36 (100)       |
| Wastes and other unnecessary materials are cleared from workroom                         | 13 (36.1)    | 23 (63.9)   | –            | 36 (100)       |
| Adequate waste bins for different types of wastes are provided                           | 20 (55.6)    | 16 (44.4)   | –            | 36 (100)       |
| Proper drainage for waste water provided   | 26 (72.2)    | –           | 10 (27.8)    | 36 (100)       |
| Entangled electrical wiring connections prevented  | 13 (36.1)    | 23 (63.9)   | –            | 36 (100)       |
| Switch boxes are covered   | 35 (97.2)    | 1 (2.8)     | –            | 36 (100)       |
| Increased natural ventilation by having more windows or doors                            | 23 (63.9)    | 13 (36.1)   | –            | 36 (100)       |
| Provided artificial ventilators, electric fans, or air conditioners to have good airflow | 11 (30.6)    | 25 (69.4)   | –            | 36 (100)       |
| Properly located machines or skylight positions to improve daylight conditions           | 22 (61.1)    | 14 (38.9)   | –            | 36 (100)       |
| Improved general artificial lighting or provided spot lighting                           | 13 (36.1)    | 23 (63.9)   | –            | 36 (100)       |
| Maintain and adjust machines and tools to reduce noise                                   | 20 (55.6)    | 16 (44.4)   | –            | 36 (100)       |
| Control hazards from neighbouring sites  | 1 (2.8)      | 20 (55.6)   | 15 (41.7)    | 36 (100)       |
| Remove dust using local exhaust  | 16 (44.4)    | 20 (55.6)   | –            | 36 (100)       |

**Table 4. Distribution of results for personal protective clothing and equipment (N=36)**

| Personal protective clothing and equipment  | Yes<br>n (%) | No<br>n (%) | N/A<br>n (%) | Total<br>N |
|---|--------------|-------------|--------------|------------|
| Provided protective overcoats and aprons  | 2 (5.6)      | 34 (94.4)   | –            | 36 (100)   |
| Provided masks, ear plugs, thimble and gloves   | –            | 36 (100.0)  | –            | 36 (100)   |
| Maintained and replaced protective equipment regularly  | 2 (5.6)      | 34 (94.4)   | –            | 36 (100)   |
| Used built-in guards or other built-in hazard reduction controls wherever possible to replace personal protective equipment | 6 (16.7)     | 23 (63.9)   | 7 (19.4)     | 36 (100)   |

**“... workers in the garment cutting sector were exposed to fabric dust ... risk of accidents, injuries and bruises ... and MSDs ...”**

**DISCUSSION**

**Socio-demographic characteristics**

Small numbers were employed, ranging from 1 to 8 compared with the 1 to 20 stipulated in the study’s operational definition. The small size also indicates these SSEs lack the organisational characteristics of formally run enterprises, which could have implications for OHS issues.

The disproportionate gender distribution is consistent with the findings of the 2007 Informal Sector survey in which females owned 67.6% of informal businesses.<sup>19</sup> A positive finding was that child-labour, a common problem in Sub-Saharan Africa<sup>20</sup>, was not being used.

**Types of products and nature of work processes**

Most produced several products simultaneously or alternately depending on market conditions. Because of the small number of employees, most carried out all the activities required to produce a finished product. Combining a wide range of products and switching products requires constant changes in work organisation and can also mean that workers do not benefit from specialisation. Changes may imply new work processes accompanied with a heavier workload exposing workers to fatigue, stress, accidents and injuries and increased risk of musculoskeletal disorders (MSDs).<sup>21,22</sup> However, multiskilling can also benefit workers and businesses as it introduces flexibility allowing easier responses to absenteeism, increases or decreases in production and workers to develop more skills.<sup>23</sup>

A number of hazards are associated with the work processes used in these SSEs. A similar study found that workers in the garment cutting sector were exposed to fabric dust during laying of fabric and cutting, risk of accidents, injuries and bruises from handling shears or using powered cutting machines, and MSDs due to prolonged standing and bending especially when the cutting table was not of appropriate height.<sup>24</sup> Machinists were exposed to MSDs due to repetitive, labour-intensive work and they adopted poor postures due to inappropriate seating and table heights.<sup>24</sup> During steam ironing, workers were exposed to vapour from formaldehyde used in finishing fabrics, burns and MSDs due to prolonged standing and bending over low tables. The study findings

on hazards concur with similar South African studies among domestic, healthcare and office workers.<sup>25,26</sup>

**Size of work area**

The majority of SSEs operated in medium-sized work areas with an average of three employees per enterprise.

**Hours of work**

Workers operated for 8 to 10 hours, usually with only a one-hour lunch break, doing repetitive and high-paced work (based on observations of the work processes). This can lead to exhaustion and MSDs as highlighted in similar

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Deidre Guiló  
Tel: 011 559 6235  
Fax: 011 559 6932  
Email: deidres@uj.ac.za

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**Duration of the Course:**  
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**Entry Level:**  
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**Cost:**  
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**Description of the Course:**  
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studies conducted among machinists and other workers in the garment industry and other sectors.<sup>22,24,25</sup>

### **General workplace conditions and physical and environmental conditions**

Over a third had inadequate clearance to or accessibility for performing tasks, and uneven floors and unobstructed walkways, so did not provide conditions to prevent people from tripping, falling and sustaining injury. There were some positive efforts to provide acceptable physical and environmental conditions of OHS in the workplace. There was proper waste water drainage and good storage of tools, materials and finished products. Half ensured that machinery and equipment was properly maintained to reduce noise, and had adequate waste bins. There was proper housekeeping by cleaning and removing wastes from the workrooms in 64% of the SSEs.

However, other measures were poor. Few had artificial lighting, ventilators and local exhausts. While the majority used correct measures to improve daylight conditions, most did not have artificial lighting or spot lighting on sewing machines, which was problematic given that workers performed fine and detailed sewing tasks and hand needlework.

Natural ventilation was inadequate in most, due to small sized windows and single doors, so air circulation was poor. Nor did they provide fans or air conditioners to mitigate excessive heat conditions in very tight and congested working environments. There was very little use of local exhaust to extract dusts produced by handling, cutting and sewing fabrics. All operations were undertaken in small and overcrowded single-room work areas. A study on respirable cotton fabric dust in a garment factory in Lesotho revealed that powered fabric cutters and sewing machines emit large amounts of fabric dust and dye residues which can cause workers serious respiratory problems including long-term lung disease, a situation that is exacerbated by poor air quality.<sup>14</sup> Given the use of power cutters and sewing machines together with the poor ventilation, the workers in this study were likely to be exposed to similar risks. The major OHS problems in the clothing industry are related to the general conditions in the work environment whereby businesses operate in poorly designed, inadequately ventilated and maintained buildings in which employees are exposed to excessive heat or cold and very poor lighting.<sup>27</sup> Similar conditions were found in these SSEs.

### **Emergency preparedness**

Emergency preparedness was very poor. In two thirds, the escape ways were not free of obstacles, only two had two emergency exits with visible emergency signs, few had a fire extinguisher, and none had a first aid kit or a first aider available. Fire, accident and injuries risk exist in these SSEs due to the use of flammable materials (e.g. fabrics and paper patterns) and electrical equipment (e.g. irons, powered cutting machines, kettles and stoves for cooking food). Cotton fabric wrapped about workers' fingers indicated the occurrence of injuries and the need for first aid.

Such injuries are common among workers in the garment manufacturing industry.<sup>22</sup>

The lack of emergency measures was also a concern since many were exposed to hazards from neighbouring sites and were unable to control them. These were wood dust from carpenters, lead exposure from battery charging and scrapped batteries, excessive noise levels from grinders cutting steel, welding fumes, flying particles of wood and metal chips, and sharp steel pieces abandoned in communal areas that could cause serious foot injury.

### **Use of personal protective clothing**

The use of PPE and equipment was poor. Skin contact with dye dusts produced by cutting and sewing machines can occur if PPE is not used<sup>14</sup> and these have been associated with an increased prevalence of eczema. The lack of overcoats and aprons meant that workers were in contact with such dusts during cutting, sewing and handling of textile wastes, predisposing them to health risks. A high proportion did not have built-in guards or other hazard reduction controls. Hand sewing using needles and pins was a major activity yet none of the workers used thimbles to protect against needle pricks, thereby exposing them to the risk of viral transmission of blood-borne diseases such as Hepatitis B and HIV. The ILO has consistently warned that due to the labour-intensive nature of their work and poor OHS standards,<sup>28</sup> workers in small businesses or informal economy remain more vulnerable to HIV infection than those in the formal sector. These findings show gaps in OHS preventive and control measures in SSEs.

## **CONCLUSIONS AND RECOMMENDATIONS**

Findings confirm the prevailing view that the work environment and OHS conditions in garment manufacturing SSEs in Gaborone are poor and unsafe, thus predisposing workers to the risk of work-related injuries and diseases. Recommendations from the survey follow.

- Basic training should empower SSEs to recognise the benefits of adopting OHS culture, and induce them to provide basic OHS needs such as first aid kits, fire-fighting equipment, PPE and supervision in their use, regularly maintain machinery and equipment, provide additional short rest breaks and fit spotlights on machine tables to facilitate detailed work.
- Given the predominance of women and that half were between 20 to 29 years old, measures in support of maternity protection as per the ILO Convention No. 183 of 2000 and C156 on workers with family responsibilities are needed.<sup>29,30</sup>
- The government of Botswana should play an active role in enforcing compliance with OHS good practices by conducting regular inspections in these SSEs and establishing a system of monitoring compliance thereof.
- Further studies to identify strategies for appropriate interventions and improvement of SSEs' OHS practices are of paramount importance.

## LESSONS LEARNED

- OHS conditions in these small-scale garment manufacturing enterprises were poor.
- The work in these SSEs was highly repetitive, labour-intensive and requires prolonged standing and bending.
- The nature of the work could expose these workers to a risk of fatigue, stress, accidents, cuts, burns, MSDs, respiratory problems due to inhalation of cotton dust, and skin problems due to contact with dyes and formaldehyde.
- Improvement of working environment and OHS conditions is required.

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