

## 5. DISCUSSION

### 5.1. MSD risk factors

The hazards that refuse collectors are exposed to vary depending on the type of collection round they are working on. The bags rounds present musculoskeletal risks associated with stooping to pick up bags, lifting and throwing bags and occasional lifting of bins to above shoulder height. Also much of the handling was asymmetric, with one-handed lifting and carrying, and trunk twisting and many of the loads themselves were asymmetric and with relatively poor grips. The trade round and the green wheelie bin round present risks associated with pushing and pulling bins up and down kerbs, steps and across thresholds, and exerting forces in awkward postures to manoeuvre bins. While the use of wheelie bins dramatically reduces the scale of manual handling, inevitably some bags are found on these rounds, so the associated risks are not completely removed. It also significantly reduces the risks from hazardous waste since it is enclosed in a solid bin rather than a flimsy plastic bag.

Tables 26 and 27 list the risk factors that need to be considered in a manual handling risk assessment under the 1992 Manual Handling Operations Regulations for wheelie bins and bags, respectively. In an approach based on the checklist of Appendix 1 of L23, the HSE guidance on the 1992 MHOR, (HSE, 1998), these tables indicate whether a risk factor is present, and if so, its frequency, its possible harmful consequences, and an estimate of the ease of eliminating the risk factor. Finally, possible solutions are listed, along with factors affecting the ease of implementing these possible solutions.

### 5.2. Bag handling

#### 5.2.1. Weights of bags

The filter in Appendix 1 of L23 (HSE, 1998) states that, for lifts at approximately knee height, which is typical for lifting and carrying black bags, a detailed risk assessment should be carried out if a male worker has to lift, infrequently, more than 10 kg (load between elbow and arm's length away) or 20 kg (load beyond elbow distance away). However, the lift rate on the bags round was over 6 lifts per minute. The guidance suggests that the filter values should be cut by 50% at this rate, which would give values of 5 and 10 kg per lift.

Most bags were lifted close to the feet so that the mean (6.2 kg) and modal bag weights (4.0 kg) came within this range. However, because a number of the bags exceed this weight range and because, in many cases, more than one bag is lifted at once in each hand, the actual weights handled are likely to be significantly in excess of the filter values. Thus, lifting two 4 kg bags in each hand would give a total load of 16 kg. Where bags have to be lifted, rather than thrown, into the truck, they have to be lifted to head height or above. The guideline value for infrequent lifts to head height are 10 kg and 5 kg for 'near' and 'far' lifts. Reducing these figures by 50% for the effect of frequency gives figures of 5 kg and 2.5 kg. Therefore, it can be concluded that such lifting is hazardous to at least some of the male working population.

**Table 26. Risk assessment for handling of bags**

Factors listed in Schedule 1 of the MHOR 1992	No		Yes		Possible harmful consequences of the risk?	Ease of eliminating the risk? (1= very easy; 5= very hard)	Possible solutions?	Factors affecting the suggested solution(s)?
			Rare	How frequently? Occasional				
<b>The tasks - do they involve:</b>								
<ul style="list-style-type: none"> <li>holding loads away from the trunk?</li> <li>twisting?</li> <li>stooping?</li> <li>reaching upwards?</li> <li>large vertical movement?</li> <li>long carrying distances?</li> <li>strenuous pushing or pulling?</li> <li>unpredictable movement of loads?</li> <li>repetitive handling?</li> <li>insufficient rest or recovery?</li> <li>a work rate imposed by a process?</li> </ul>	X			X	Low back pain Low back pain Low back pain WRULD WRULD Fatigue	5 5 5 3 3 3	Wheelite bins Wheelite bins Wheelite bins Wheelite bins Wheelite bins	Terrain, public antipathy " " " " "
<b>The loads - are they:</b>								
<ul style="list-style-type: none"> <li>heavy?</li> <li>bulky/unwieldy?</li> <li>difficult to grasp?</li> <li>unstable/unpredictable?</li> <li>intrinsically harmful (e.g., sharp/hot)?</li> </ul>			X	X	MSDs MSDs Loss of grip, MSDs Loss of control Contact injuries; infection	4 5 4 4 3	Educate public; weaker bags Smaller bags Educate public Gloves & Kevlar trousers	Weaker bags more likely to split More lifts Acceptability to users
<b>The working environment - are there:</b>								
<ul style="list-style-type: none"> <li>constraints on posture?</li> <li>poor floors?</li> <li>variations in levels?</li> <li>hot/cold/humid conditions?</li> <li>strong air movements?</li> <li>poor lighting conditions?</li> </ul>		X		X	MSDs Slips & trips Slips, trips and falls Fatigue Harder to handle large loads Various	4 4 5 5 5	New truck design Repave poor areas Only collect in fine weather Only collect in daylight	Cost, life span of vehicle Cost Not practical Not practical in winter
<b>Individual capability - does the job:</b>	No	Minor	Med	High				
<ul style="list-style-type: none"> <li>require unusual strength / height?</li> <li>hazard those with a health problem?</li> </ul>			X		Fatigue Infection / MSDs	4 5	Fitness testing Health screening / inoculations	Healthy worker effect
<ul style="list-style-type: none"> <li>hazard those who are pregnant?</li> <li>call for special information/training?</li> </ul>	X		X		Sharps / trapping accidents	2	Safe system of work and sharps handling policy	Exclusively male workforce
<b>Other factors:</b>			Yes					
Is movement or posture hindered by clothing or personal protective equipment?					Injuries due to non-use of PPE	4	Check suitability of PPE	Gloves worn only some of time