Relationships between Waste Collection Systems and MSD’s

Presentation to IOSH Branch Meeting Glasgow
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28th January 2016
Industry Problem

Entranched views

- Historic Problem – Wheeled bins v Boxes
- Chere – Research
- Better quality of recycling when hand sorted than MRFs
  - Modern MRFs can produce high quality material
  - HSL Studies and Academic Research
Industry Headlines

• RoSPA – Work related Accidents & Ill health cost £20- £30b
• Work Foundation – Over 40 million workers in Europe are affected by MSDs attributable with work
• PWC – absenteeism costs UK business £32bn pa
• HSL- Considering W&R sector as a whole, levels of sickness absence are approx. 30% higher than those of other comparable sectors
Aim

• “Investigate common domestic waste kerbside collection and recycling practices in the UK to establish their relationship with operative’s health around musculoskeletal (MSD) injuries as a contribution to the risk assessment decision making process”.
Consider Ergonomic Intervention

Dependent Variable

Intervention

Time

GCU
Glasgow Caledonian University
School of the Built & Natural Environment
The work of McGill (1)
The work of McGill (2)

- After DASH

![Graph showing the relationship between load, repetitive work, tolerance level, and time, with a note indicating that tolerance diminishes as fatigue increases.](image-url)
The work of McGill (3)
The work of McGill (4)
Other Parts of the Body
Not just the back - Consider:
• Shoulder
• Knee
• Lower Leg
• Wrist
Literature Review

• Extended search carried out
• HSE /HSL Research Reports
• Peer Reviewed information from university data bases
• Grey literature from local authorities…

• Global – providing in the English Language
Why we are doing this

Intermittent and/or occasional discomfort experienced by employee if untreated leads to ....

Prolongued pain experienced by the employee, conditioning worsening if untreated leads to ....

Pain levels become above individual thresholds - employees stay home if untreated can lead to termination of employment

Adapted from Thomas (2012)
System Risk Assessment

Collecting, transfer, treatment and processing household waste and recyclables

Assessment of the occupational health and safety risks of systems to provide HSE, local authorities, waste/recycling companies and others with data that will assist in the selection of the most appropriate system whilst meeting environmental targets.

Prepared by the Health and Safety Laboratory for the Health and Safety Executive 2008.

Shane Turner, Jane Hopkinson, Laraine Oxley, Sandra Gadd, Nicola Healey & Peter Marlow
Health and Safety Laboratory
Harpur Hill
Buxton
SK17 9JN
Methods Followed

Waste collection method → MSD pain count → MSD absence rate

Intervening factors
- Absence management regime
- Lost income if absent

Triangulation
- Expect ‘high’ correlation
- Expect ‘medium’ correlation

HSE Risk Tool for waste Ind. Risk Rating
Key Contacts

• 65 LA’s contacted
• 20 provided information
• 15 sets was useable
• 5 authorities – followed up work
• AVDC in effect a case study

• Direct contact, FOI of limited use
Some Findings

Average no of days off per authority (Backs and MSD's)

Collection systems used by authorities

- W heeled bins with boxes
- W heeled bins
- W heeled bins plus sacks
Body Mapping – What is it?
How do you measure Performance?

Adapted from Thomas (2012)
What is APC (APC=P/E)

• APC = Average Pain Count
• APC = No. of Pain Markers (P)/number of employees (E)
• Epidemiological
  – Simple process utilising amount of pain experienced within a work group
  – Is a very useful comparator of pain being experienced by different work groups
Worked Examples

1. Comparison of pain amongst refuse collectors carrying out waste collection using different methods

2. Identification of pain experienced by office based staff at AVDC
Workstream 1 Example – Loader recycling Boxes

Adapted from Thomas (2012)
Example – Drivers

Adapted from Thomas (2012)
Example – All Service – Wheeled Bins

Adapted from Thomas (2012)
HSE’s Risk Comparator Tool

![Graph showing ratings per household for different authorities and waste types.

- AVDC 2010
- AWCS
- CDC
- GBC
- SNC
- AVDC 2012

Waste types included:
- Food waste - mini bins
- Garden waste Separate Sack Collection
- Boxes and Baskets Slave Bins
- Boxes and Baskets Recycling
- Wheeled bin Recycling
- Sidewaste and bags refuse
- Wheeled Bin Refuse]
Comparison of APC v RR

R² Linear = 0.776

Average Pain Count (Excluding Lower Legs, ankles, feet and headaches)

Service Risk Rating
## Sustainability – age comparisons

<table>
<thead>
<tr>
<th>Authority</th>
<th>No of Participants indicating an age</th>
<th>Mean Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVDC 2013</td>
<td>48</td>
<td>38.25</td>
</tr>
<tr>
<td>AVDC 2010</td>
<td>62</td>
<td>39.42</td>
</tr>
<tr>
<td>AWCS</td>
<td>49</td>
<td>42.22</td>
</tr>
<tr>
<td>CDC</td>
<td>60</td>
<td>39.42</td>
</tr>
<tr>
<td>GBC</td>
<td>31</td>
<td>41.74</td>
</tr>
<tr>
<td>SNC</td>
<td>21</td>
<td>31.76</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>271</strong></td>
<td><strong>39.16</strong></td>
</tr>
</tbody>
</table>
Sustainability Rio Declaration

The 1992 Rio Declaration on Environment and Development

No 1 -

• People are entitled to a healthy and productive life in harmony with nature.

• Raising the retirement age- issues?
Recommendations

- Further Study 6
- Waste Industry 7
- Use of Body Mapping 5
- Others 2

- Sustainability Commentary
From WYG Consultants
Follow up work

• Third study at AVDC
• Obtained more information on age and length of service
• New service nearly 2 years old
• Effects of food waste collection?
### Comparison

<table>
<thead>
<tr>
<th>Part of the body marked</th>
<th>APC 2010</th>
<th>APC 2013</th>
<th>APC 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm including elbow</td>
<td>0.54</td>
<td>0.24</td>
<td>0.17</td>
</tr>
<tr>
<td>Shoulder including neck</td>
<td>0.91</td>
<td>0.19</td>
<td>0.51</td>
</tr>
<tr>
<td>Forearm including wrist</td>
<td>0.14</td>
<td>0.26</td>
<td>0.12</td>
</tr>
<tr>
<td>Back (mainly lower)</td>
<td>0.86</td>
<td>0.33</td>
<td>0.64</td>
</tr>
<tr>
<td>Hand and Fingers</td>
<td>0.20</td>
<td>0.13</td>
<td>0.06</td>
</tr>
<tr>
<td>Upper Leg</td>
<td>0.17</td>
<td>0.11</td>
<td>0.25</td>
</tr>
<tr>
<td>Knee</td>
<td>0.61</td>
<td>0.43</td>
<td>0.56</td>
</tr>
<tr>
<td>Lower Leg and Ankle</td>
<td>0.49</td>
<td>0.22</td>
<td>0.45</td>
</tr>
<tr>
<td>Total</td>
<td>4.46</td>
<td>2.31</td>
<td>3.00</td>
</tr>
<tr>
<td>Total less foot, toes and head</td>
<td>4.02</td>
<td>2.07</td>
<td>2.35</td>
</tr>
<tr>
<td>Percentage Response Rate</td>
<td>96</td>
<td>71</td>
<td>95</td>
</tr>
<tr>
<td>Average Age (years) by those declaring</td>
<td>38.42</td>
<td>38.25</td>
<td>38.63</td>
</tr>
<tr>
<td>Average length of Service by those declaring</td>
<td>6.20</td>
<td>5.88</td>
<td>8.03</td>
</tr>
</tbody>
</table>
## 2014 APC

<table>
<thead>
<tr>
<th>Activity</th>
<th>APC (Total less foot, lower leg toes and head)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loader All Activity, including Wheeled Bins/Food waste - Trade Waste</td>
<td>1.96</td>
</tr>
<tr>
<td>Loaders- Those identifying as predominantly Food waste collectors</td>
<td>2.73</td>
</tr>
<tr>
<td>Loaders - Wheeled Bins Only</td>
<td>2.33</td>
</tr>
<tr>
<td>Mixed Activity –Loaders &amp; Drivers</td>
<td>2.33</td>
</tr>
<tr>
<td>Driving all activity</td>
<td>2.67</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2.35</strong></td>
</tr>
</tbody>
</table>
Comparison of APC with Age

![Bar chart showing APC by age group]

- 16-19
- 20-29
- 30-39
- 40-49
- 50-59
- 60 and over
Comparison of APC with Length of Service

- 0-2 years
- 3-5 years
- 6-10 years
- 11-15 years
- Over 16 years

APC

Length of Service
On-going Challenge

Campaigner threatens councils over commingled collections

19 June 2014 | By Chiara Francavilla
Way Forward? For Scotland?
Summary

• Literature review suggests relationship
• Absence ill health data suggests a relationship but limited statistically significant data
• Body mapping shows a relationship
• RR 609 developed from literature
• Weakness in traditional H&S advice
• Co incidence???
A world of work which is safe, healthy and sustainable