

# Experiences of arrangements for health, safety and welfare in the global container terminal industry

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## Glossary

|         |                                                      |
|---------|------------------------------------------------------|
| CBA     | Collective Bargaining Agreement                      |
| CSR     | Corporate social responsibility                      |
| EU-OSHA | European Union Occupational Safety and Health Agency |
| EWCS    | European Working Conditions Survey                   |
| GNTs    | Global Network Terminals                             |
| HR      | Human Resources                                      |
| ILO     | International Labour Organisation                    |
| ITF     | The International Transport Workers' Federation      |
| KPI     | Key Performance Indicator                            |
| LTIFR   | Lost Time Injury frequency rate                      |
| LTIs    | Lost Time Injuries                                   |
| MSDs    | Musculoskeletal disorders                            |
| OHS     | Occupational Health and Safety                       |
| PPE     | Personal Protective Equipment                        |
| RTGC    | Rubber Tyred Gantry Crane                            |
| SD      | Standard deviation                                   |
| TARPs   | Trigger Action Response Plans                        |
| TEU     | Twenty-foot equivalent unit                          |
| TT      | Truck Trailers                                       |



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## Executive summary

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This report presents the findings of a study of the experience of health and safety in container terminals operated by national and global companies in several countries. It explores indications from a previous, preliminary study concerning workers' experiences and the effectiveness of the management systems to support their health, safety and welfare at work. It builds on the earlier findings with a more in-depth analysis, using both quantitative and qualitative research methods. It discusses the new findings in the context of an analysis of the relationship between corporate strategies for the governance and management of occupational health and safety (OHS) and the national regulatory and socio-economic contexts in which terminals operate and such strategies are implemented.

Altogether, we carried out case studies in 11 container terminals operated by six companies in four countries. The terminals were situated in two different parts of Europe and in two different areas of the Asia-Pacific region. They included terminals operated by four of the largest GNT companies and two national companies, one in Europe and one in Asia Pacific. Nine of the participating terminals were operated by GNTs, with the other two terminals run by national operators.

## Findings

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The findings of the research concerning governance and management of occupational health and safety in the companies and terminals we studied are based on analysis of company documentation and interviews with company and terminal management. Our respondents included senior company and terminal managers with responsibility for operations, for safety and health, and for advising on these matters at both corporate and terminal levels. They focus on the character of the arrangements for implementing company strategies on health and safety and the systems in place for its delivery and provide an account of their operation, as perceived by the company and terminal management. We also consider trends in the available company data concerning the health and safety outcomes of these arrangements and, as far as it is possible to do so, compare these trends with the findings of other research on health and safety outcomes in container terminals.

The findings on workers' experiences of these arrangements for the governance and management of health and safety were drawn from data gathered in a questionnaire-based worker survey. Overall, there were 1849 dockworker respondents to this survey, with an additional 120 completing a diary of their experiences in relation to selected indicators of health, safety and welfare. We analysed transcripts of new interviews with workers and their representatives in each terminal and re-analysed transcripts of similar interviews with workers and their representatives from our previous preliminary study (the two studies included many of the same terminals). Altogether 178 people took part in an interview, including 76 as part of the current project.

We outline below some of the key findings, first from the data obtained from managers and their OHS advisers, followed by that obtained from workers and their representatives.

### a) Company approaches to managing safety

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The findings confirm that approaches taken by most of the global and national terminal operators towards the governance and management of health and safety have several features in common. They aimed to address risks fairly systematically through undertaking risk assessment and introducing engineering or administrative controls in relation to both plant and processes consequent to this assessment. There were standard operating procedures taking account of safety issues in relation to most operational activities and maintenance of safety critical plant and equipment according to scheduled



specifications. Information, informal training, supervision and direct consultation with workers on risk management were provided through tool-box talks and similar activities at the start of shifts. More training was provided to new staff, and updated for continuing staff, by both formal and informal arrangements. In parallel with these routine job safety arrangements, the safety management systems in place in all the terminals contained various elements to ensure continuous improvement, including procedures for information collection and dissemination on safety issues, allowing both the monitoring of performance and timely interventions when required. The Safety (and Environment) Departments present in all of the terminals serviced these arrangements, as well as providing advice, training and in some cases participating in the surveillance of safety behaviours. Generally managers in the terminals believed these arrangements to be 'fit for purpose'.

Many of these features are widely considered to be good practice in current thinking on managing health and safety and are generally implemented to a greater or lesser extent in large organisations with arrangements in place for safety management. Among the drivers of corporate approaches to health and safety taken by the companies studied, a high-profile board-room level commitment to 'zero harm' was influential. It was transposed into operational practice through a mix of attention to an organisational 'vision' of achieving high performance and continuous improvement in health and safety outcomes; improvements in organisation safety culture, health and safety competencies, training and skills of personnel and measurable performance targets for health and safety. At the same time notions of accountability for safety and health were instilled among workers and managers alike. While there were some differences in the detail, most of the companies in the study followed this prescription at the corporate level and required adherence to it in the operational practices within their terminals. Equally influential were the effects of international and national voluntary standards on OHS management that helped to stimulate and support the adoption of a fairly similar management systems approach to health and safety by all the companies studied.

These zero harm corporate safety and health strategies are associated with a strongly behaviour-oriented approach to the operation of terminal level arrangements for health and safety management. In this respect our present study confirmed indications evident in the previous study. Terminal level arrangements emphasised the promotion of a 'safety culture' at the workplace, changed safety behaviours among workers and surveillance of the adherence to terminal safety rules, achieved through instruction, training and supervision on safe working procedures. In keeping with observations on behaviour-based approaches generally, while there was a widely held view among workers and managers alike that the health and safety management systems had improved in recent years, priority was afforded to *safety* as opposed to *health or welfare*.

Leadership from the corporate level on the objective of achieving 'zero harm' made a significant impact, evident, for example, in the ways in which managers in all terminals stressed the importance of aiming for zero lost time injuries and, as a step towards this, systematically reporting and investigating all incidents, regardless of severity. However, despite the emphasis on incident investigation, interviews confirmed other findings from the previous study indicating that it was rare for investigations of routine injuries and unsafe incidents to go beyond their proximal causes, focusing on individual human error or unsafe behaviours rather than possible underlying organisational or situational causes. This seemed to be a consequence of the universal management conviction that following the requirements of the safety management system closely would mean that accidents simply could not occur – a conviction supported by their behavioural foundation and reflecting the widely held belief that all accidents were the result of workers failing to follow such procedures – a belief which in turn was reinforced by the corporate focus on changing workers' behaviours to improve safety culture.

The other significant feature of behaviour-based systems for health and safety which is widely discussed in the literature and was also clearly in evidence in the present study was that such systems tend to ignore or marginalise institutional arrangements for representation and consultation with workers on their health and safety. Our survey data demonstrated this very clearly some with 70% of respondents globally having no health and safety representative or difficulty accessing one.



Finally in terms of corporate OHS strategies, although there were few female workers among the operational staff of the terminals we studied, it is widely acknowledged that trends in the development of terminal work open the way for employment of an increased proportion of women in the future. Despite this, there was little evidence of strategies or action on OHS management in place to support likely needs created by such change.

### **b) Company approaches to measuring safety performance**

Performance was measured at corporate and terminal level through the collection of fatality and injury data. Consideration of this company data showed a mixed picture of performance but a generally improving trend was discernible. This finding has been anticipated by some industry observers who argue that the increased mechanisation in dock work, represented by container terminal activities, along with greater attention to health and safety management by operating companies, should result in an improving trend in injuries and fatalities. However, we think that limitations of reporting arrangements in different terminals in different parts of the world, as well as the exclusive focus of these arrangements on *safety* outcomes, mean some caution is warranted in the interpretation of this data as a measure of performance in relation to health and safety more generally.

### **c) Workers' experiences**

Such caution is further supported by the findings of the study's survey of workers' experiences. These indicate considerably higher levels of work-related harm than measured by company data, substantial dissatisfaction with the nature and operation of arrangements for managing health and safety. There was an equally strong sense that health and safety effects associated with the structure, organisation and pace of work in the terminals were missed by the systems in place for monitoring health and safety performance.

In Chapter 4 we give an account of these findings. We begin with a descriptive account largely drawn from the analysis of the survey. We then analyse these findings in more detail, to develop some composites of the variables examined, to enable us to show more clearly the variation between the experiences in terminals in different countries, in different jobs and between workers in different modes of employment. Key points that emerge from our analysis of the health and safety experiences of workers globally included: the finding that 70% of the respondents to the survey felt their safety was at high risk, 40% felt these risks were ineffectively managed and one third reported they had experienced some kind of injury at work in the previous year. Slightly fewer respondents felt they were at high risk of experiencing work-related harm to their health (60%), slightly more (48%) felt these risks were ineffectively managed, and levels of respondents reporting stress, mental fatigue and work-related illnesses were especially high (60%, 65% and 41% respectively). Overall the survey findings showed that workers experience a higher incidence of harm to their safety and health than recorded by company reporting procedures, that many of the more commonly experienced effects of the work involved in terminal operations on workers' health are not addressed adequately by the arrangements for health and safety management and further that the provisions made for workers' welfare are also limited and do not adequately provide for workers' needs. Moreover, as noted above, some 70 per cent of respondents had either no worker health and safety representative at all or difficulty in accessing one.

Both the survey and interviews with workers and their representatives indicate that in terminals in more advanced economies, where both regulatory requirements and trade union workplace organisation were better developed, consultative arrangements required by law were generally in place, but arrangements seldom went beyond such requirements. There was also a strong indication in many of the interviews with representatives that they experienced various degrees of hostility to their role from managers and supervisors.

The survey findings were corroborated by data from interviews in which worker participants expressed concerns about their safety, health and welfare and suggested that arrangements for managing health and



safety at their workplaces only partially addressed their concerns. Comparisons with survey data from other sources suggest that respondents' experiences were worse than the average for other sectors. Furthermore, there was a strong association between these negative health, safety and welfare effects and measures of poor work organisation, high work intensity and poor OHS management arrangements. These results were not uniform across all jobs, employment arrangements or geographical locations and the survey clearly identified a sub-group of respondents as being at particular risk. These were found among the indirectly employed workers doing jobs combining quayside and driving work in terminals situated in one of the areas in the Asia Pacific that was included in the study.

In short, the study's survey of workers' experiences of arrangements for managing their health, safety and welfare portrayed a rather different perception of the effectiveness of these arrangements to that presented by both corporate and terminal level managers and advisers with responsibility for OHS.

## Analysis

Making sense of the study findings involved examining evidence of dissonance between management OHS arrangements and the workers' experience in the light of the influence of:

- the character of wider organisational management strategies of the terminal companies and the place of OHS arrangements within them; and
- the influences of the economic, regulatory and labour relations contexts in which the terminals were situated

In keeping with observations on behaviourally-based approaches generally, this meant that while there was a widely held view among workers and managers alike that the health and safety management systems had improved in recent years, the priority of these systems was towards matters of *safety* as opposed to those of workers' *health or welfare*. This focus is best understood as symptomatic of zero harm corporate safety strategies more generally, where a connection can be seen between behaviourally-orientated arrangements for safety, the dominant discourse on 'safety culture' among managers and safety professionals alike at corporate and professional levels and the high profile espousal of 'zero harm' approaches in the board room. The attraction of these ways of conceptualising the governance of improvement in workplace health and safety for corporate leaders and managers is arguably related to the fact that focusing on changing workers' behaviour (although managers' behaviour may also be included), largely avoids questioning the implications for workers' health safety and welfare, of wider corporate or managerial decisions on finance, work organisation and other business or operational matters. It therefore fits well with modern management and business leadership strategies that are intended to maximise operational cost efficiencies and their profitability, despite growing evidence from many industries that these approaches may have a negative impact on workers' health, safety and welfare. We consider our evidence concerning the effects of this approach on workers' experiences below.

### a) The place of OHS in organisational and business management strategies

As we argue in some detail in Chapter 5, the business efficiencies associated with container terminal operation mean that success in this highly competitive industry is determined by the speed and cost efficiencies associated with cargo handling and throughput at terminals that, in turn, drive trends both in operational efficiency (including automation, manning levels, shift patterns and so on) and in corporate preferences for contracting out labour. Looking at the results of the survey of workers OHS experiences, it seems clear that it was the consequences of these practices which lay at the heart of both the dissonance between the workers' experiences and managers' perceptions of the effectiveness of their health and safety arrangements as well as differences observed in OHS experiences in terminals located in different parts of the world.



Since it seems likely that these prominent trends in business and organisational practices are set to continue, it is important that companies are aware of the consequences and are able to take the necessary steps to minimise their negative effects on the health, safety and welfare experiences of their workers. One strategy that might enable more preventive measures to be enacted could be through greater engagement in ensuring more robust feedback from workers concerning the effects of work organisation. There is a wealth of research that points to the positive role of institutional arrangements for worker representation on health and safety in contributing to achieving this. Yet, in our study, the terminals in which such arrangements were least implemented were the very ones in which the negative effects of these trends in business and organisational practice were most highly developed.

A second area in which companies might consider more systematic control is in relation to their requirements for the management of health and safety arrangements by contractors. While some good practices were identified among the terminals we studied, overall there was inconsistency in the approaches enacted by different terminals. Again, current research suggests that buyers in close and collaborative supply relations with their supplying contractors – such as were the relations typically found in container terminals – are in a strong position to influence not only the presence of OHS arrangements among contractors during the procurement process, but also to influence and improve the operation of these arrangements in the actual work carried on by contractors on-site. There was evidence in the present study that terminals and terminal operating companies more generally would benefit from greater attention to ensuring consistent best practice in these matters. In this respect there was considerable room for better information sharing globally within and between terminals and the organisations running them.

## **b) National economic, regulatory and labour relations contexts**

Whether companies are global or national, their corporate strategies on health, safety and welfare in the container terminals for which they are responsible are implemented in very different national contexts. We have argued in Chapter 6 that these contexts moderate both the nature and operation of corporate approaches. This is particularly so in relation to the effects of economic, regulatory and labour relations contexts on the approaches taken by terminal operating companies to managing safety, health and welfare and workers' consequent experiences of those approaches and their outcomes.

Elements of all three of these contextual determinants have an important impact not only on the arrangements that terminal operators make to organise work and manage health, safety and welfare – and in some cases whether arrangements are in place at all – but also their effectiveness and value in terms of the experience of workers. In short, our analysis clearly shows that where these contexts provide only a weak influence on the autonomy of company OHS practice, that is, where OHS is in the words of some GNTs, 'loosely regulated', workers report more negative experiences of OHS than where these factors are more strongly in evidence. For example, where outsourcing of labour is the economic 'norm', where regulatory frameworks and enforcement practices are not strong, and where labour relations histories have resulted in a weaker voice for labour, workers' experiences of health, safety and welfare arrangements are generally poorer than in contexts where the development and influence of such factors are stronger. In addition, where these combine with weaker national external supports for OHS generally (in terms, for example, of compensation, insurance and welfare systems), then workers' experiences are poorest. Such findings are in accord with those of socio-legal scholars who argue that the institutional (including regulatory) contexts within which modern global business operates are important determinants of both management practices and workers' welfare and, as other writers make clear, such contexts are critical in initiatives to influence the extent of compliance with labour standards.

In Chapter 6 we tried to capture the essence of this influence of context on experience by plotting a measure of workers' OHS experiences against one of context by creating composite 'performance' and 'context' scores for each terminal. This we point out was necessarily a crude approach but the graphical description it provides is a helpful representation of these effects (Figure 6.3). The important message it delivers demonstrates the impact of context – and suggests that without strong and effectively enforced



regulation and economic and labour relations conditions in which the balance of power between capital and labour is sufficiently evenly distributed to allow workers an effective voice, terminal operating companies will tend to favour productivity over the effective management of safety and, in particular, health and welfare. We have shown that these operators, and especially those working at a global level, have the capacity to put effective OHS strategies in place, but they generally do so only when the contexts in which their business units are situated oblige them to.

## Conclusions

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The dominant approaches to health and safety management used by the container terminal companies studied were elaborate behaviourally focused occupational safety management systems in which there were only limited worker involvement/feedback loops. These are incomplete models even in terms of addressing routine injury, but are particularly so in that they allow only low engagement with preventive occupational health matters and are relatively unresponsive to the consequences of significant changes in technology and work organisation in this respect. These approaches also contribute to a major disconnect/cognitive dissonance observed between management and worker perceptions concerning the effectiveness of actions on OHS.

This said, it is clear that in at least some of the GNTs studied there is evidence of awareness in corporate OHS advice and governance of the limited value of prevention strategies based solely on the reduction of routine injuries and more attention being paid to strategies that take account, for example, of low frequency/high impact incidents and integrated prevention strategies included in design/engineering, maintenance, risk assessment, TARPs (trigger action response plans) etc. These are relatively recent and as yet incomplete initiatives, and they would benefit from parallel further development and greater engagement with systems for worker representation and preventive occupational health measures both of which, as we have pointed out, are underdeveloped in most terminals and for which support from corporate rhetoric concerning the focus on 'zero harm' does not appear especially helpful.

While OHS arrangements in place in the terminals were significantly influenced by the national economic and regulatory contexts in which they were situated, the practice of regulatory inspection was itself either underdeveloped (and significantly so in poorer countries in the study) or, equally of concern, suggested by terminal workers to be less in evidence than previously in some richer countries in the study. This suggestion, which was to a large extent substantiated in interviews with regulatory agency personnel as well as by national enforcement data, is of some concern. Up to the present time, such inspection had clearly been an important part of the influence on compliance with national OHS requirements in the terminals situated in these countries and its reduction in relation to these workplaces where substantial and serious OHS risks still exist is disturbing.

In short, the conclusion from our analysis indicates that even where we found the conditions of context to be at their most conducive, there remains significant scope for improvement, particularly in relation to the management of workers' health and welfare, alongside their safety, and the more effective involvement of workers and their representatives in the arrangements in place to achieve this. In these scenarios, both company strategies for OHS governance and the surveillance of the ensuing arrangements for their delivery need to continue to be a priority in the support of safe and healthy work for all terminal workers.

## Recommendations

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The following recommendations are drawn from the conclusions of the study. They address issues of policy and practice on the governance and operation of arrangements to manage health, safety and welfare at work in container terminals. It is hoped they contribute to improving the relevance, operation and outcomes of these arrangements. They are made with regard to the tripartite nature of the interest in OHS in container terminals globally. That is, while they are addressed in the main to corporate and terminal level operation, others are aimed at national regulation and regulatory policy and at improving



global standards on OHS in container terminals. All also have implications for the strategy and policies of the trade unions that represent the interests of workers at both corporate and terminal levels.

When making recommendations it is customary for researchers to indicate a need for 'further research', since it is also normal for the findings of research investigations to lead to additional questions. The present study is no exception. However, the recommendations outlined below are confined to those that address policy and practice and are of relevance to employers, governments, international organisations and trade unions. They include the following:

- Since the research shows that there are significant differences in health, safety and welfare practice and outcomes between terminals operated by the same companies in different locations in the world, ***it is recommended*** that GNTs review the strategies they have in place for the corporate governance and management of OHS with a view to reducing these differences by learning from the experience of what constitutes good practice and what drives it. There may be a role here for the development of a Code of Practice by a global body such as the ILO, which could act as a suitable standard (see also later recommendations).
- Zero-harm strategies and behaviour-based safety (BBS) arrangements dominate the approaches taken to OHS at corporate level and in the terminals studied. While there are some benefits to such systems, they have several acknowledged weaknesses. These are in particular evident in relation to attention to safety over health and welfare and in relation to questions of communication and trust between workers, their representatives and management. ***It is recommended*** that efforts are made to ensure that such weaknesses are addressed in corporate OHS systems. This means especially ensuring that OHS systems in place address occupational health and welfare as well as safety, they pay greater attention to the *organisational* causes of harm experienced by workers and they further allow for improved communication between workers and managers. This includes improved arrangements for consultation and participation of *all* workers on OHS and it is further important that such systems help build trust between workers and their managers, rather than distrust.
- Corporate governance of OHS in the operation of container terminals increasingly emphasises an approach to its management in which greater attention is paid to understanding the causes of critical incidents. This emphasis is valuable and ***it is recommended*** that its further extension be supported. In particular, more attention could be paid to management strategies associated with the prevention of low frequency/high impact (LF/HI) events. Here terminals could improve monitoring arrangements for these incidents and the greater development of trigger action response plans (TARPs) in relation to them. Terminal operators might also consider adoption of most suitable OHS indicators as well as the establishment of databases whose analysis may contribute to the advance of knowledge in the development of more ergonomic solutions for workers in ports. OHS indicators currently used by container terminals are insufficient and mainly support a reactive rather than proactive approach to incidents. Consideration could be given to more proactive and preventive orientated approaches. Although some operators have made considerable progress with global communications in relation to OHS in terminal operation, greater use of IT in achieving data collection and dissemination in this respect should be encouraged and good practices shared.
- While continued reporting of LTIs is important, ***it is recommended*** that KPIs that are used to monitor safety management practice both at corporate and terminal level reflect the issues identified above.
- There is a strong body of research evidence supporting the contribution of formal arrangements to represent workers' interests to improving prevention outcomes. These arrangements are found in many high risk sectors such as mining, the petrochemical industry, construction and so on, but they are significantly underdeveloped in many of the terminals we studied and ***it is recommended*** that this be addressed in both corporate governance of OHS and in terminal level arrangements in the future.



- Many of the experiences of harm reported by workers in this study, but apparently not in routine company data, concern health and welfare. ***It is therefore recommended*** that corporate and terminal strategies are reviewed with a view to increasing their emphasis on these matters in the future.
- ***It is further recommended*** that investigation of OHS performance and outcomes takes greater account of the views of workers concerning organisational causes of commonly experienced forms of work related ill-health.
- The organisation of work and employment in the terminals reflects the increasing use of the outsourcing of labour through arrangements with contractors. There are well-established consequences for OHS arrangements and outcomes associated with these practices. Many were in evidence in the terminals studied. ***It is recommended*** that companies review their strategies for addressing these consequences and take actions reflecting best practice on OHS in relation to the use of contractors. These might include:
  - Review of the nature of supply chain relations between terminal operators and contractors in order to identify better means of incentivising improved OHS performance
  - Further review and revision of corporate guidelines on the extent to which OHS management requirements for contractors feature in arrangements for procurement and contract compliance
  - Greater engagement with monitoring to ensure compliance from contractors
  - Investigation of incentives for contractors to improve OHS arrangements and performance
  - Review and exploration of possible better arrangements for the welfare of the contractor workforce in some terminals
  - Better arrangements for adequate representation of the interests of the contractor workforce
- In terms of corporate and terminal level actions, we have noted in the report that younger male workers dominated employment in the container terminals we studied. This is not surprising, but given the widely anticipated changes in the organisation of terminal operation in the future, it is likely that the participation of women in the labour force will increase. This will have some implications for arrangements for health, safety and welfare. Currently there is little evidence of these being anticipated either by the corporate strategies for governance and management of OHS and welfare or in arrangements for these matters at the level of the terminals. ***It is recommended*** that these implications be explored at both corporate and terminal levels.
- Both national regulatory contexts and regulatory inspection practices were found to be important determinants of terminal level OHS practice. In advanced market economies there was a perception that the presence of specialist regulatory inspection had a positive impact on terminal level OHS practices. There is understandable concern that reduction in such presence caused by cuts in public spending and reorganised compliance strategies (commonly experienced in most of these countries) will result in negative outcomes and ***it is recommended*** that national authorities review their strategies in this area, and also take account of likely training needs for inspectors involved in the inspection of work in container terminals.
- In the one lower-middle-income country included in the study, both the regulations on dock work and the regulatory inspectorate stood at some distance from engagement with the OHS management arrangements employed within the terminals. ***It is recommended*** that, in this situation, national authorities take steps to close this gap by bringing regulation in line with the process-based regulatory measures for OHS now widely used globally, and by providing inspectors with training and powers to engage with OHS management practices within the terminals. There may be some scope for supporting this with the development of a Code of Good Practice at global level, perhaps through the agency of the ILO.





## 1. Introduction

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This report presents the findings of a study of the experience of health and safety in container terminals operated by a range of national and global companies in several different countries. It is a follow-up to a previous study undertaken in 2011 and it explores indications from that study concerning the effectiveness of the management systems to support workers' health, safety and wellbeing in place in these terminals (Walters and Wadsworth, 2012). It builds on the earlier findings with a more in-depth analysis using a quantitative, questionnaire based survey together with the qualitative methods used previously. It also undertakes a detailed analysis of the national regulatory and socio-economic contexts in which terminals operate in the different locations studied.

In this Introduction, we explain our rationale for the study. To do so, we begin by way of background with a brief outline of the development of current features of the operation of container terminals that can be observed globally and are widely held to contribute to the significance of their role in the global economy. We particularly focus on those features of their structure, organisation and operation that are most likely to influence OHS arrangements and outcomes and then outline the existing evidence concerning these arrangements and outcomes, including summarising relevant findings from the previous study. This provides a starting point for the present research which seeks to explore the relationship between organisational arrangements for health, safety and welfare in container terminals and their wider national, regulatory, business and labour relations contexts. The central question addressed in the present work concerns what determines the health and safety outcomes and experiences of workers in container terminals and what are effective managerial strategies to improve this experience.

### 1.1 Container terminals – patterns of growth and organisation

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The introduction of the shipping container transformed the operations involved in loading and unloading ships by allowing an increase in the mechanisation and automation of cargo handling (Levinson, 2006). This in turn stimulated the growth both of specialised vessels to carry containers and terminals whose sole function was to load and unload them, thus massively increasing the speed and efficiency in transferring containerised goods from ship to shore and vice versa. At the same time as this transformation was taking place globally, ports themselves were undergoing significant change in ownership, passing from public entities to partly or entirely privatised ones (Baird, 2002). In parallel and relatedly, as the manufacture and production of goods increasingly relocated to poorer countries, world trade increased and the role of shipping as the primary form of international bulk transportation of goods increased with it. The need for fast and efficient cargo operations grew globally, requiring new or enlarged terminals for the export of goods, often in the poorer parts of the world to which production had increasingly relocated, others for their transfer while en route, and others for the importation of the products in the containers into the markets of advanced economies.

These changes contributed to the development of a global network of specialised container terminals operated by a range of both national and global logistics companies, themselves often combining terminal ownership and operation with other transport and logistics interests, including interests in both land and sea transportation services. This development is well-known and has generated a large and detailed literature (see for example; Brooks and Cullinane, 2007a; Rodrigue and Notteboom, 2011; Bonacich and Wilson, 2008, and many others). Less well known, although in evidence in the specialised research literature, is the impact these changes have had on workers, with the transformation of longstanding work and employment practices as well as of equally well-established labour relations procedures and in some cases of the regulatory infrastructures within which these practices, institutions and procedures are embedded. The consequences of all these changes for workers' experience of safety, health and working conditions in container terminals have rarely been the subject of systematic study and it is with these



consequences and how they might be managed to support more positive outcomes for health, safety and welfare that the present research is concerned.

Container terminals act as 'hubs' at which transportation systems converge. Cost and delivery efficiencies in these 'hubs' are regarded as fundamental to the success of global trade. As a consequence further changes have occurred in their location, structure and organisation to allow, for example, larger and faster ships with reduced port-turnaround times to use them. Associated savings in operating costs have been achieved through increased automation and mechanisation, and through the outsourcing of dockside labour. Containerisation has dictated and encouraged the use of larger ships with smaller crews. It has helped to remove the need for a large workforce living near docks to load and unload – enabling docks to be re-located in less crowded port areas or new ports altogether. The road/rail network associated with containerships has also facilitated this, including removal of the need for large warehouses at or near docks – and a large workforce to service these. Such facilities are now often found in hubs at considerable distance from terminals. The use of 'just in time (JIT)' management techniques has also further reduced warehousing requirements.

The companies operating these terminals include a small number of organisations operating on a global scale, that, for the last decade, have controlled about half the world's total container port capacity (Drewry, 2007). These global network terminal (GNT) operating companies dominate container transport through their capacity to control not only the activities of many individual terminals but also by organising this activity into operational networks globally. The four largest of them currently control nearly 200 ports globally, each having annual throughput by equity (as measured by TEU levels for 2009) of between 31 and 45 million (Notteboom and Rodrigue, 2011). They are all large companies with multi-national interests. Each has a global head office from which business and management of the organisation is led and co-ordinated.

Because of the importance and widespread influence of these companies, in the present study, as in the previous one, we have been particularly interested in their approaches to managing the health, safety and welfare of their workers. To this end we examined management arrangements and strategies for health and safety in four of the largest of these organisations at both global and terminal levels in several different national contexts. At the same time many smaller national organisations also operate container terminals in most exporting and importing countries. They too follow broadly similar trends in relation to their business practice as well as in the structure and organisation of their terminals and in the employment practices they adopt (see Reveley and Tull (2008) for examples from the Asia Pacific and Brooks and Cullinane (2007b) for examples in Europe and North America). We have included examples of these companies and their terminals in some of the same national contexts in which we have also studied the activities of the global players.

As already noted, with the development of specialised terminals for container transportation in the name of economic and business efficiency, significant changes have taken place both in the way that work is carried out and in the way in which workers are employed to do it. This has been achieved through a mixture of technological change and new systems of work. In parallel, there has been a considerable reorganisation of contractual relationships in the employment of labour, with downsizing and outsourcing of work activities within ports, increased casualisation of labour and greater presence of contractor labour. In advanced market economies these changes have often been imposed upon older and well-established patterns of employment and work organisation resulting, among other things, in large-scale redundancy alongside substantial revision and redefinition of long-standing work practices (Turnbull, 2012). Such changes have not been without conflict and have often been the subject of long and bitter industrial disputes (Turnbull and Wass, 2007). The resulting structural and organisational arrangements for employment and terminal operation are, therefore, frequently consequences of compromises reached in the resolution of conflict between social organisation and economic growth and efficiency. In this sense they are influenced not only by the organisational and business priorities of the terminal companies involved, and the national economic and political strategies of the states in which they are located, but also by the strategies of organised labour in its efforts to protect jobs and work practices (Fairbrother and Gekara, 2013).



In poorer countries the changes from previous practices have been as comprehensive as those in high income countries, and the introduction of new forms of employment and work arrangements have led to the same consequences for traditional work and employment practices as those experienced elsewhere. Perhaps because labour organisation in these countries has been considerably less well established and therefore more limited in its influence than in some higher income countries, the disputed nature of these changes has been less conspicuous and the changes in employment practices, especially in relation to contract labour, have been more extreme. In other situations, in both high and low income countries, state-led privatisation policies, when applied to port activities, have assisted terminal operators to reduce embedded resistance to change by granting them more freedom to build and operate entirely new facilities in which they have succeeded in introducing new forms of work organisation and employment practices with less opposition from existing and embedded practices and their control by organised labour (Turnbull, 2012).

Organisational practices in container terminals are also influenced by national regulatory provisions and the systems in place to achieve compliance with them. By this we mean not only the wider state systems and strategies to achieve economic growth, but also those aimed at social protection, including those covering, for example, employment protection, labour administration and social welfare as well as those addressing safety and health more narrowly. Despite international requirements on dock work such as ILO Conventions 137 and 152, comparative research indicates there are likely to be major differences in the role of national contextual determinants of practices in dock work (see for example, Barton and Turnbull, 2002) – as there are in most other sectors. It can be also anticipated these will affect the content and operation of those made for OHS specifically (Walters and Wadsworth, 2014). Recent de-regulatory or re-regulatory trends in the governance of work and employment generally, as well as on OHS specifically, all of which have been introduced largely to stimulate economic growth, in many countries may have had further and continuing effects on the role of these national contextual influences.

Container terminals can be distinguished by their functions, which is to either serve: primarily as gateway ports acting as the interface between the hinterland of the countries in which they are located and the maritime routings of containerised cargo; or as transshipment ports for the transfer of cargoes from maritime routings (Notteboom and Yap, 2012). All the terminals in the present study were gateway ports of one sort or another. Those in the EU were in ports primarily concerned with the inward flow of containers, as were those in one of the Asia Pacific regions studied. The EU ports and terminals were further subject to the effects of EU-wide economic policies and plans concerning port and transport infrastructure development, while those in the first Asia Pacific region mentioned were located in a country administered federally with a high degree of devolved autonomy at state level. The terminals were situated in two different states and subject to the effects of both federal and state policies. Those in the second Asia Pacific region were fairly evenly balanced in terms of inward and outward movement of containers. There were different national (and state/provincial) economic structures and policies concerning port development in all of the countries in which the terminals were situated that influenced their operation. This said, the over-riding *motif* of the economic and operational activities in all the terminals and in the companies operating them was one of intense competition, to which they were all highly sensitive and which created strong and continuing pressures for increased productivity and operational efficiency.

As with the position in the port industry globally, the economic policies of the countries in which the terminals we studied were situated and state requirements concerning revenues and port development, influenced their activities and the nature and importance of competition with other ports nationally and internationally. While the general direction of economic policies in all the countries studied was towards greater liberalisation and the removal of restrictive state controls on capacity and throughput, current literature indicated that ports and terminals in some countries remained subject to significant restrictions in this respect (see for example; Hill, 2008). Increasingly demanding port security requirements contributed further operational challenges for the speed of the flow of containers in and out of all the terminals and ports.



There was considerable variation in the inland transport infrastructures to which the terminals were linked, which had implications for the operational flows of containers. Generally efforts to improve the efficiencies in terminal capacity and throughput lead to the relocation of terminals (or the commissioning of new ones) to new sites at some distance from the older ports and the port cities where they were previously situated. New road and rail links can then be designed and built to maximise efficiencies in the flow of goods to and from these relocated or new terminals. However, all the terminals in the present study were located in older ports. While some were increasingly in competition with more favourably located rivals, their activities were constrained by their physical location, sometimes in or very close to port cities, and shared transportation infrastructures. In particular, the terminals situated in the second Asia Pacific area were situated at the ends of extremely congested inland transport networks. There had been efforts by the state, the port authorities and the terminal companies to relieve congestion and some reorganisation of inland container storage and transfer had occurred in recent years (sometimes the GNTs had themselves invested in these improvements). Additionally, rail transportation supplemented the transport infrastructure for some terminals but road transport was the principal means of moving containers, and overall its infrastructure remained poor and was a source of considerable concern to the operations management of the terminals as well as a major issue for the working conditions of the external truck drivers and a contributory factor to poor health and safety outcomes experienced by drivers and exposed terminal staff, both outside and inside the terminals and at the interface between the two.

Patterns of employment and of work organisation in these establishments are therefore dynamic and subject to the influence of changing national and global contexts as well as to the business and organisational strategies of the companies involved. It follows that the nature of work hazards and risks to health and safety will also be influenced by the combined effect of all these factors and will change apace with developments within each of them. A major argument in the present report, is that because these combinations result in different effects in different contexts, it is important to take proper account of them in an evaluation of arrangements to prevent work-related harm. As we outline below, unfortunately with only rare exception, most of the limited literature on safety management in container ports has, to date, failed to do this.

## 1.2 Health and safety in container terminals – what we know from previous research

The structural and organisational changes that have taken place in dock work as a result of containerisation present some paradoxes for preventive health and safety. It might be anticipated that their introduction would lead to an overall reduction in injuries and cases of ill-health in the ports that handle containers. For those ports for which reliable information is available, at first sight this would appear to be the case at least as far as injuries are concerned (Sisson, 2012). The company level aggregate data on injuries that were available in our previous study on container terminals also appeared to support this notion and suggested a broadly downward trend in many regions. However, as we pointed out in that study, the limitations of this data were such that this, on its own, it could not be taken as robust evidence of an improving pattern overall (Walters and Wadsworth, 2012:14).

It is also not clear how much of this reduction is explained simply by there being fewer dockworkers employed and how much can be attributed to making their workplaces safer. A general trend towards reducing the need for heavy manual labour through increased mechanisation of tasks formerly conducted by workers might be expected to yield reduction in injuries. Additionally, the recent trend towards semi- or complete automation of container operations, along with the deployment of managerial strategies to improve safety, such as systems separating workers from the vicinity of dangerous processes like yard transport and lifting operations, might act to reduce them further. However, despite the acknowledged extent of change in the design and operation of dockside activities and the introduction of management systems for health and safety, to date there has been little independent, robust study of the OHS outcomes resulting from them. What exists, however, calls into question the widely held belief that they have necessarily resulted in improved OHS outcomes and, in particular, suggests that the employment and



organisational changes that accompany them may have given rise to new or increased risks of injury and ill-health for some of the current forms of work in container terminals (see for example, Fabiano et al., 2010; Darbra and Casal, 2004). Unfortunately these studies, which attempt to measure trends in reported injuries and at the same time take account of change in work organisation, are exceptional. Most published research on container terminal safety has tended to focus on technical and engineering design issues or mathematical modelling of techniques of risk analysis (see for example; Mabrouki et al., 2014; Shang and Tseng, 2010), which generally do not engage with the lived work experiences of the terminal workers. Other published research has focused on soft issues of safety culture and leadership (see for example Shang and Lu, 2009). This work tends to reflect a similar interest in behavioural approaches to safety that are predominant in the industry and pays scant attention to either their organisational contexts or outcomes.

The limited approaches to understanding the consequences for workers' health and safety of structural, organisational and employment changes in terminals is unfortunate in the light of the large body of evidence on the OHS consequences of these changes in other sectors. This research suggests that operating with a reduced and casualised workforce, with agency, contractor and directly employed workers engaged on the same worksite, is associated with increased vulnerability to accidents, injuries and ill-health (see Quinlan et al. (2001) and Quinlan and Bohle (2008) for reviews of the research evidence). Such changes present particular challenges to the delivery of best practice in OHS management because they undermine many of the preconditions for its success – such as arrangements for communications between management and *all* workers; co-ordination and control; and effective worker participation (Walters et al., 2013). There is a substantial body of research and writing on working conditions and labour relations in modern container terminals (see above) which provides *some circumstantial* evidence that the forms of work organisation and employment practices used by both global and national companies in terminal operation may not be the most supportive of scenarios in which to deliver effective strategies to improve safety or health outcomes for workers. But, with the exception of the research by Fabiano and his colleagues referred to above, there is little robust empirical study of the impact of these issues on the health and safety of terminal workers. It was with this observation in mind that we carried out our preliminary study of management arrangements for the health and safety of workers in globalised container terminals in different parts of the world in 2011 (Walters and Wadsworth, 2012). The following section briefly summarises the relevant findings from the previous study and notes their implications for the present research

### 1.3 Indicative findings from the preliminary study

Our previous study examined arrangements for managing health and safety in container terminals operated by four large Global Network Terminal (GNT) operators in two high-income countries in Europe and in one middle-income country in Asia. Its aims were to explore the extent to which these arrangements exemplified best practice and the perceptions of workers, their representatives and managers concerning their effectiveness. We sought to explore how the policies and practices adopted by the GNTs took account of the effects of the restructuring of work and employment on OHS. As noted above, the study was a preliminary one and the limitations of the time and resources available to undertake it meant that the data collection was limited to interviews with a small number (usually around 20) of workers, their representatives and managers in each of the (6) terminals studied, supported with documentary analysis of OHS arrangements and outcomes among the companies and in the terminals concerned, along with a small questionnaire-based global scoping study of trade union respondents. Despite its methodological limitations, the study produced indicative findings concerning perceptions of risks to health and safety and how they were managed at the global level and in the terminals in different locations, including arrangements for monitoring and feedback and those to facilitate worker representation and consultation.

Respondents identified risks to health arising from the physical environment, including safety risks associated with poor workplace infrastructure, and risks arising from inadequate information concerning the possible hazardous nature of the contents of containers. Perceptions of risks arising from the work



activities within terminals were also frequently articulated. That is, risks were perceived to be associated with the operational activities involved in loading and unloading ships and the storage and transportation of containers. Although the risks of heavy physical work were lessened by the mechanisation of loading and unloading operations, for some workers, such as lashers, they remained significant. There were risks seen to be involved in coming into contact with moving machinery and vehicles as well as those associated with falling objects and falls from height. Increased pace and intensity of work necessitated by the faster turn-around times in container ports was perceived by workers to increase the risks of accidents which, in some cases, they felt was exacerbated by manning levels being adequate only for 'normal' operational conditions. Risk of accidents was also raised by pressure to increase or maintain high productivity levels. Along with poor ergonomic design and long shift patterns, workers and their representatives believed this also increased the experience of musculoskeletal disorders (MSDs). Intensification of work was also associated with the risk of fatigue and in some cases with increased stress as well.

There were differences of quality and scale in the risks perceived to be significant by participants in terminals in high income countries compared with those in the lower-middle-income economy<sup>1</sup> we studied. For example, risks associated with poor workplace equipment and infrastructure were more commonly identified by workers in the latter country, who in addition generally experienced a greater level of risks common to both high and lower-middle-income economy terminals, such as those resulting from increased work intensity. The contractor workforce, which is generally proportionally quite large in terminals in poorer countries, was regarded as being more vulnerable to these risks than were directly employed workers - which is consistent with research on OHS and contractors more generally.

There appeared to be a broad similarity in the overall strategies for managing OHS in all the terminals studied, that were best characterised as behaviour-based approaches to achieving improved OHS performance. While they all displayed some features to suggest they had been adapted to local conditions, the companies determined the overall character of the safety management systems in place in each terminal globally. Features in common included overall responsibility for safety being vested in the terminal's senior management – with accountability to the company globally; a safety department in the terminal, charged with supporting the delivery of a system rolled out at global level and adapted to suit local conditions; strong emphasis on achieving improved 'safety culture' through behaviour change, the latter exemplified by emphasis on the issue and wearing of PPE, training packages emphasising rules concerning safe working procedures, especially those designed to separate workers from the hazards of moving vehicles and machinery on the terminal yards, systems for ensuring compliance through peer monitoring, supervision and so on; incident and accident investigation and reporting procedures; further procedures for identifying and communicating safety failures; and documented risk assessments, method statements and standard operating procedures.

At the global level the trade union respondents in the study welcomed the engagement of the GNTs with health and safety management. However, they were frequently critical of the systems introduced in terminals as a result, suggesting they represented superficial and limited ways of tackling the OHS consequences of drives to improve productivity performance and reform work organisation, that they believed constituted many of the underlying causes of the accidents and ill-health experienced at the terminals. They argued that the health and safety management arrangements in place did little to prevent workers feeling obliged to take risks to meet productivity expectations, that they had no impact on the work organisation issues causing fatigue, stress or musculoskeletal disorders, and that they were pernicious in the way they laid blame for safety failings on workers, whose employment was precarious and who tried to carry out activities in ways so as not to jeopardise their fragile employment security.

Workers and their representatives in the terminals shared these concerns. While most broadly approved of managerial initiatives to improve the 'safety culture' of the terminal organisation through behaviour change strategies and efforts to be more systematic with safety management, they conveyed their sense of the limitations of these approaches – especially with regard to their ability to reach the underlying

<sup>1</sup> As defined by the World Bank 2015: <http://data.worldbank.org/about/country-and-lending-groups>



causes of the work-related health risks. There was also a clear distinction, particularly in the terminals in the lower-middle-income country, between the effects of the approaches to health and safety management as experienced by the directly employed workforce and the effects of the same approaches for the contractor workforce. Reporting arrangements for accidents and incidents were often regarded as limited in their effectiveness by workers and their representatives and particularly with regard to those for contractors and their workers. Again, there were differences in the experiences of respondents in terminals located in high-income countries and those in the lower-middle-income country, with better-developed arrangements present in the terminals in the former countries.

The experience of arrangements for worker representation and consultation on health and safety was mixed. Again, there were marked differences between practices in terminals in high-income countries and those in the lower-middle-income country in the study, as well as differences between arrangements covering the directly employed workforce and those of contractors' workers. Those for directly employed workers in terminals in high income countries were the best developed, but even here they were at times somewhere short of the relevant requirements of national regulatory provisions. A critical difference between arrangements in these terminals and those in the lower-middle-income country studied was found in their depth and formality, which strongly affected both their functions and sustainability. In the terminals in the lower-middle-income economy we studied, for example, while there was a general allowance made by the management for workers' representation, in reality such representation was not consistent and the limited facilities to support it did not allow the representatives themselves opportunity for sustained engagement with investigation, inspection, involvement in risk assessments or with consultation on changes at work and other activities conventionally associated with good practice in worker representation and consultation on health and safety.

In each of the above areas of OHS management, participants pointed to issues implicit in the structure and organisation of work, which fell outside the arrangements to manage or be consulted on OHS, or were impervious to them. They also argued that in relation to outsourcing and contracting out especially, the same structural and organisational elements not only made OHS management more challenging, they also made regulatory enforcement more difficult. In each of these cases, the experience was different and felt to be more extreme in the terminals in the middle-income economy.

These findings throw some light on how workers and their representatives felt about the consequences for their health, safety and welfare of changes in the structure and organisation of work and employment experienced in container terminals. They are suggestive of what might be expected given what is known about the consequences of similar changes in other sectors and add weight to findings, such as those of Fabiano et al. (2010), which indicate that containerisation has not necessarily made these workplaces safer and healthier for everyone who works in them. They are, however, only indicative findings since, as we have made clear, the constraints of time and resources prevented a more robust study. For this reason in the present study we have chosen to revisit the terminals we studied previously, along with several additional terminals we did not study, in order to explore these indications in greater depth. We also broadened the scope of the study in some countries to include some terminals operated by national terminal operators, as well as those operated by the main GNTs.

## 1.4 The aims of the present study

Put simply, existing knowledge of the occupational health and safety consequences of work in container terminals is suggestive of trends in two opposite directions.

On the one hand, it seems clear that the changes wrought by containerisation mean that the heavy and dangerous physical work undertaken by dockworkers has been substantially reduced. The much reduced workforce within the terminals not only work in environments in which many of their work risks are reduced compared with previously, but the physical nature of these environments and the resources available to the large companies that operate them also contribute to the possibility of a greater degree of systematic management of the remaining risks to occupational health and safety in container terminals.



There would seem to be some evidence of this in the improving injury and fatality rates claimed by terminal operating companies, although the data here are acknowledged to be insufficiently robust.

On the other hand, at the same time, the over-riding concern for speed and cost-efficiency in the highly competitive business environment that characterises container transport has led to the adoption of work and employment practices that a host of research studies in other sectors have identified as contributing to poor health and safety outcomes – with disproportionately high levels of fatigue, stress and musculoskeletal disorders contributing both to poorer health outcomes and to increased risks of unsafe incidents and consequent injuries, as well as to reduction in welfare among workers in these sectors. Moreover, the business and employment practices adopted by many terminal operators for the same reasons of cost efficiency, seek to outsource work and lead to situations in which a large proportion of workers in some container terminals are contractor labour. While these practices are known to affect both the reporting and regulation of OHS outcomes, research in other sectors indicates these workers often experience poorer working conditions than those who are directly employed in the same worksite. At the same time it is further acknowledged that it is often more difficult to deliver effective arrangements for managing and monitoring workers' health and safety in the complex workplaces that are the result of these business and employment practices.

As the previous sections have made clear, indications of this paradoxical situation have been found in the limited research conducted on health and safety outcomes in container terminals (such as that of Fabiano et al., 2010). They were further evident in the results of our preliminary study. The aim of the present study, therefore, was to investigate these indications with more in-depth and systematic research. To achieve this we sought to address five main research questions:

- How and to what extent do the business strategies and management policies of major global and national container terminal operators take account of the OHS of workers involved in the transfer of containers?
- What are their specific strategies for addressing health and safety management in container terminals and how effective are they?
- What are dockworkers' OHS experiences of these strategies?
- How do these experiences compare in GNT terminals situated in different countries and in terminals that are operated by large national operators?
- What determines the features of the health and safety arrangements in place in these different situations and what are the implications of this for good practice in improving the health and safety experience for workers in container terminals globally?

To address these questions, the present study took as its central interest the operation in selected terminals of workplace health and safety policies, strategies and arrangements adopted by the four largest GNT operating companies. In addition to revisiting the same terminals as in the previous study, to broaden the reach of the study the number of these GNT terminals studied in the middle income country was increased, another terminal from a third high-income country was added, and two terminals operated by national companies in two of the high income countries were also included for comparative purposes. In all these terminals the present study explored the indications of the previous study further, with a broader and more in-depth analysis of the experience of health and safety arrangements using a mixed-method approach in which qualitative methods similar to those employed in the previous study were integrated with a quantitative questionnaire-based survey and a detailed analysis of the national regulatory and socio-economic contexts in which the terminals are situated and in which they operate. These instruments were used to gather data enabling further exploration of workers' health and safety experiences, the relationship of these experiences with the systems in place to manage their health and safety, as well as with the structure and organisation of work in the terminals in which these systems and



outcomes occur. The research additionally examined the moderating effects of different national and labour relations' contexts upon these systems, practices and outcomes in the terminals concerned.

In the present research, we have first sought to understand the strategies and systems in place for managing workers' health, safety and welfare through scrutiny of company documentation and qualitative interviews with senior personnel with responsibility for safety and health at company and terminal levels. We have further examined available company data concerning the health and safety outcomes at these levels.

We probed workers' experiences of these strategies and systems with a more systematic and robust investigation facilitated by the use of a questionnaire-based survey of a sample of workers involved with key operations in each terminal, in combination with further qualitative interviews with workers and their representatives. This approach helped elicit a more robust understanding of the work-related health and safety experiences of dockworkers in container terminals globally. For example, the questionnaire contained a section on the experience of work safety in which we sought information concerning respondents' experiences in relation to perceived work risks, personal injuries and incidents that might have led to injury, as well as the consequences of such injuries or incidents in terms of reporting them and taking time off. Another section dealt with experiences of work-related ill-health. As well as seeking information concerning its nature and occurrence in the container terminals it also asked about taking time off as a consequence of work-related ill-health. In a further section we asked a series of questions designed to elicit information concerning particular forms of ill-health experienced by workers, such as fatigue and stress, as well as about the work patterns and work intensity that might contribute to such outcomes. In this way our questionnaire was aimed at generating information to enable us to inquire further into indicative findings on these matters in the previous study and gain a more robust understanding of the occurrence and causes of the health effects highlighted in the interviews in the previous study.

It will be recalled that, in the previous study, participants among the workers and workers' representatives we interviewed told us of their concerns with management strategies on manning levels, work intensity, shift patterns and so on, that they felt contributed to poor safety and health outcomes in a variety of operational situations. In addition, workers and their representatives, especially from the terminals in the lower-middle-income country we studied, identified the precariousness of their employment and that of others as among the reasons for poor safety and health outcomes. They especially pointed to the differences between the work conditions experienced by directly employed workers and those employed by contractors. In the present, study we designed our sampling, survey instruments and interview schedules to explore these matters more fully. For example, the questionnaire solicited details of the organisation of respondents' employment and work, including, employer, job type, shift patterns, breaks, work intensity, payment systems and staffing levels. We were thus able to compare a range of experiences of health and safety management; experiences of arrangements for work organisation and their health and safety consequences; and we were able to do these things for workers doing different jobs, in different terminals and among those who were directly and indirectly employed.

Turning to management arrangements for health and safety in the terminals in a little more detail, the findings from the previous study suggested that these arrangements were essentially behaviour-based. Although overall they were regarded favourably by managers and workers alike, there were suggestions that they were limited in several respects. These included, the extent to which they addressed health and safety concerns associated with work organisation issues and those where corrective action might require significant financial investment. They also exhibited considerable variation in the extent to which they supported participative approaches to health and safety management. Here again a more comprehensive and robust picture of the perceived strengths and weaknesses of these arrangements has been undertaken in the present study through the use and analysis of the worker survey in all of the terminals studied. The questionnaire addressed the workers' experiences of these arrangements with a series of questions concerning the provision of health and safety information and training, access to, and knowledge of, the systems and arrangements in place for managing health and safety, assessing risk and monitoring outcomes as well as questions concerning the experience of consultation and representation



on all these matters. Data gathered from the survey have been analysed taking account of that obtained on the same matters from qualitative interviews with workers and their representatives in all the terminals. This allowed us to compare the outcome of this process with that derived from company and terminal management sources concerning the arrangements in place. Thus a robust assessment has been made of the nature and operation of these health and safety management arrangements as well as their strengths and limitations in practice.

While it was not the intention of the study to compare performances between terminals or between companies directly, in terms of understanding the reasons for variation in the experience of OHS arrangements, we have found it instructive to be able to compare these experiences in different locations, between different work groups and between workers with different contractual arrangements for their employment. For example, as the previous section made clear, our preliminary study indicated there were considerable differences between the perception of workplace health and safety arrangements and outcomes among directly employed workers and among contract workers – especially in terminals in poorer countries. Our extended data collection in the present study – particularly the use of the worker survey on samples of operational workers in all the terminals we studied – allowed more comprehensive and reliable comparative analysis of these matters. This in turn enabled some reflection on the role of outsourcing and the use of contractors in the structure and organisation of work in container terminals and their consequences for health and safety arrangements, practices and their outcomes. It also allowed us to compare more effectively the experiences of different categories of workers (such as lashers, crane operators, truck drivers and so on) in the same and different terminals. It further allowed us to discuss, in later Chapters of the report, the extent to which the companies involved in this study have been able to use management strategies adopted in other sectors to increase leverage on contractors and minimise the harmful effects of these practices on the health, safety and welfare of their workers.

Our methods also mean we have been able to explore reasons for possible gaps between the aims of safety management systems in place both globally and within terminals and the reported experiences and expectations of workers in a comparative way, because in addition to data collection *inside* the terminals, in the present study we have also used data from *outside* the terminals. There are two main sources. On the one hand, we have obtained documentary material on company OHS strategies from three of the four GNT companies in the study and undertaken secondary analysis of OHS performance data they provided. We have enhanced this analysis with that of detailed qualitative interviews with senior company personnel with responsibility for health, safety and the environment carried out at the global Head Offices of three GNT companies and two of the national companies in the study. On the other hand, in each of the countries in which the terminals we studied are located, we have carried out interviews with the main regulatory agencies responsible for ensuring that terminal operations are in compliance with national regulatory requirements on health and safety in dock-work and other relevant national labour standards on dock-work.

Through this approach we were able to examine the relationship between company strategies and those of national regulatory contexts. We have further developed this comparative approach with a review of the relevant literature on regulation and labour relations in dock-work in each country and where necessary we have undertaken further interviews with key informants including trade union officials and others with relevant contextual information. In this way we have explored some of the contextual determinants of the variations we observed in both the previous and the present study in management and work practices in terminals situated in different countries. This approach allowed us to return to addressing the first of our research questions concerning the relationship between the management policies of major global and national container terminal operators and the occupational safety, health and welfare of their workers and it provided a better understanding of the importance of situational and contextual influences on OHS management and its outcomes.



## 1.5 Outline of the report

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Chapter 2 of this report provides a detailed description of the methods we used to undertake our research. It includes a further elaboration of the rationale for the mixed-method approach used, an outline of our quantitative, qualitative and contextual methods, including our approach to reviewing the literature and using documentary data from companies and other sources, our field research instruments, the terminals and countries selected, our approach to sampling and administration of the worker survey, and the qualitative interviews used in the study. We further describe the methods we used for both quantitative and qualitative data analysis and outline the procedures we adopted to ensure the study met the code of research ethics required by Cardiff University.

Chapters 3 and 4 provide an account of our findings. In Chapter 3 we start with the governance and management of occupational health and safety in the companies and terminals we studied based on our analysis of company documentation and interviews with company and terminal management and supervisors. Our respondents included senior company and terminal management with responsibility for operations and for safety and health, as well as supervisors. We outline the character of the arrangements for implementing company strategies on health and safety and the systems in place for its delivery and provide an account of their operation, as perceived by the company and terminal management. We also consider trends in the available company data concerning the health and safety outcomes of these arrangements and, as far as it is possible to do so, compare these trends with the findings of other research on health and safety outcomes in container terminals.

In Chapter 4 we give an account of the findings from our questionnaire survey in the terminals we have studied. We begin with a descriptive account of our findings largely drawn from the analysis of the survey. We go on to analyse these findings in further detail, to develop some composites of our variables to enable us to show more clearly the variation between the experiences in terminals in different countries, in different jobs and between workers in different modes of employment. We use our qualitative interviews to explore the detail of these differences in more depth.

Chapters 3 and 4 therefore provide empirical material for further discussion in Chapter 5. In this chapter we seek to explore, in the ways we have described above, the experience of work and its management in the terminals and evaluate the extent to which the evidence of the present study corroborates or qualifies the disconnects between safety management and workers' health and safety experiences suggested in our previous study. We evaluate the extent to which the present study is able to throw further light on the supports and constraints of effective preventive health and safety in container terminals generally. This leads to the final substantive chapter in the report in which, in the light of our findings, we discuss what determines the health and safety outcomes and experiences of workers in container terminals. To do this, we place our national findings within their wider economic, labour relations and regulatory contexts. We evaluate the impact of these contexts on the health and safety experiences we have observed.

We end with conclusions concerning our findings overall and suggest some areas in which further improvements in arrangements for the health, safety and wellbeing of workers employed in the operation of container terminals worldwide might be considered.



## 2. Research Methods

This section describes the methods and instruments used in collecting the data for this project and the approaches taken to its analysis. As the research builds on and extends the methodological approach taken in our preliminary project, (Walters and Wadsworth, 2012), we summarise the methods with which we conducted the earlier work.

### 2.1 Summary of the preliminary project's methodological approach

The aim of the preliminary study was to explore both qualitative and quantitative indicators of good practice in participative approaches to managing OHS in GNT-operated container terminals. We used a mixed-methods approach to carry out a two-level investigation. First, at the global level, we carried out both a questionnaire survey of trade union representatives and a set of semi-structured interviews with a sub-group of those representatives. We sought information on health and safety policies, strategies and performance from the headquarters of three of the four largest GNTs<sup>2</sup>. Second, at the workplace level, we carried out six case studies in terminals operated by the four largest GNTs. In each case study we interviewed key members of the management team, as well as workers and their representatives. In addition, we requested terminal level information on OHS strategies and performance.

The preliminary project, therefore, collected quantitative and qualitative data globally and at the terminal level. The questionnaire data were used indicatively and in conjunction with the global level interviews to describe trade union representatives' perceptions of the presence and effectiveness of participative OHS management practices and prevailing working and employment conditions in GNT-operated terminals generally. This, coupled with the global level OHS performance data<sup>3</sup>, provided a backdrop to the detailed profiles of the six case study terminals. Their inclusion of both management and workers' perspectives, and coverage of high and middle income economies, allowed the preliminary study to consider how and at what level OHS management in the case study terminals was determined, how it was put into practice and how it was experienced by those it was intended to safeguard, as well as to make some comparisons between GNT-run terminals operating in different economic and labour relations contexts and circumstances.

### 2.2 Data collection and literature review

We undertook a comprehensive review of the research literature on health and safety arrangements in container terminals, regulatory provisions in the countries studied and the economic and labour relations contexts in which the terminals we studied were situated. In so doing, we considered trends in the development of container terminals as one element in the reorganisation and restructuring of dock work globally in recent decades.

In terms of data collection, the current study used a similar mixed-methods approach to build on the findings of our preliminary project. Our intention was to extend the scope of the research by carrying out case studies in more terminals and including two terminals run by national operators rather than GNTs as well as a further two middle income economy GNT-run terminals. We increased the reach and depth of the research by carrying out surveys of workers in all the participating terminals – including those we studied in the preliminary project and those that were new to the current study.

<sup>2</sup> GNTs were initially approached through the ITF, which had established working relationships with the leaders of these companies. No such relationship existed with the fourth GNT at the time of either the preliminary or the current project.

<sup>3</sup> These data, in practice, were limited and difficult to compare so were used purely descriptively.



Data were collected at three levels. At the global or corporate level, we approached the safety departments in the headquarters of the three GNTs that provided data to the preliminary study<sup>4</sup> and requested further and updated information about OSH performance (globally or corporately, regionally and for the participating terminals) and about their strategic approaches to OHS management and governance, and the business level headquarters of one of the national operators<sup>5</sup>. To support and gain increased understanding of these documentary and quantitative data and their provenance, we conducted semi-structured interviews with those responsible for occupational health and safety at the corporate level wherever possible. For all six companies operating the case study terminals, we obtained publicly available material on these areas. At the national level, we carried out further semi-structured interviews with key informants, such as representatives of relevant inspectorates and port authorities. These interviews were designed to provide data on the national legislative, labour relations, socio-economic and other relevant contexts in which the terminals were operating. Lastly at the terminal level, data collection was approached in two ways. Within the six terminals that participated in the preliminary project, we carried out surveys of the workforce but only carried out interviews if there were key personnel who, because of time restrictions, had been unable to take part in the preliminary study. In the terminals that were new to the project, in addition to the workforce surveys, semi-structured interviews were carried out with managers, workers and their representatives, to provide full datasets on all the case study terminals.

### 2.2.1 Research instruments

The survey schedules, interview guides, participant information sheets, consent forms and project flyers used in the study were drafted and designed in accordance with the rigorous ethical standards required by Cardiff University and using the research team's substantial previous experience and particularly that gained in the preliminary project. The ITF and union officials from a number of the participating terminals commented on and tested the survey schedules with volunteers, and their comments, advice and recommendations were taken into account in the final instruments.

The surveys and interview guides covered: OHS performance, outcomes and experiences in terms of both safety and health; OHS management, including safety practices and working arrangements; and worker representation, consultation and involvement (see Appendix). For the interview guides, the detail and coverage of these areas were altered to fit the respondent's background and position (e.g. focusing on management practices among representatives of terminals' management teams, on individual experiences of OHS and its management among workers, and on national requirements, monitoring and enforcement arrangements in relation to, for example, participation among national level key informants).

### 2.2.2 Global and national level data collection

Approaches to terminal operating companies were made at the headquarters level. All such approaches, as well as those to key informants at the national level, were made directly by the research team and wherever possible through contacts established by the research team during the preliminary project. Interviews were carried out face-to-face.

### 2.2.3 Terminal level data collection – the case studies

For each of the participating terminals, regardless of whether or not they had been involved in the preliminary project, consent for the case study was sought from the headquarters of the company operating the terminal (the GNT or the national operator), from the most senior manager at the terminal and from the union officials within the terminals where unions were active. Members of the research

<sup>4</sup> The fourth GNT was also approached at the corporate level but did not respond.

<sup>5</sup> The other national operator was approached but declined.



team spent several days in each participating terminal carrying out the fieldwork. This involved both interviewing and running and/or facilitating the surveys.

In each terminal, a questionnaire survey of the operational workforce was carried out. The number of workers targeted in each terminal varied for pragmatic reasons, but we aimed to achieve a completed questionnaire from between 15% and 50% of the workforce in each terminal. Our ideal approach to questionnaire distribution was for the terminal's management and union officials to agree to allow research team members to administer the questionnaire to groups of workers during a break or at the start or end of a shift. This was not always possible or permitted, so various other approaches were also used including: administration to individuals by research team members and/or workers' representatives in rest areas on the terminals on an *ad hoc* basis; and administration to groups of workers by research team members and/or union officials outside the terminals and outside working hours by arrangement with the union officials.

In some terminals, we were also able to carry out a diary survey of limited groups of workers. These surveys were intended to collect workers' experiences over a normal set of shifts to give an indication of day-to-day workplace health and safety. This involved workers completing a brief set of measures before the start of each one of their normal set of shifts. We aimed to collect 10 diaries from each of two groups of workers (by job type) from each terminal in which the diary surveys were carried out. Where possible, members of the research team introduced the diary survey to participants at the start of their working week and collected the schedules back from them at the end of their working week. Where this was not possible, for a variety of reasons, research team members briefed workers' representatives or union officials in the diary survey administration.

All the case study interviews and surveys used the appropriate language for the area and account was taken of local terminology and arrangements in the guides and schedules.

#### 2.2.4 Ethical approval

Ethical approval for the design and methods used in the project was obtained from the Cardiff University School of Social Sciences Research Ethics committee. After participants' informed consent had been obtained, interviews were carried out face-to-face and were recorded wherever possible. The recordings were transcribed and the transcriptions anonymised. Questionnaire and diary data were collected anonymously (no identifying data were requested) and serial numbers were given to questionnaires and diaries after they were returned to the research team. All data (qualitative and quantitative) were stored in accordance with the rigorous standards required by Cardiff University.

### 2.3 Data analysis

Qualitative data were coded using a thematic framework and analysed in NVIVO software. Quantitative survey data were analysed using bivariate and multivariate techniques in SPSS software. In each case, the analyses were designed to consider and explore OHS management and performance experiences, to make comparisons between regions and economies and between workers grouped according to their job and employment types. Quantitative OHS performance data have again been used purely descriptively because of their relatively limited nature and problems of comparability.

### 2.4 Participants

In total, case studies were carried out in 11 terminals. Tables 2.1 and 2.2 give details of the survey participants and the interview participants respectively. Overall, 1849 dockworkers completed a questionnaire and 120 completed a diary (Table 2.1). In addition, 178 people took part in an interview,



including 76 as part of the current project<sup>6</sup>. This includes the case study and key informant interviewees detailed in Table 2.2, and the 8 global level interviewees representing the safety teams of GNTs 1 (N=1), 2 (N=1) and 3 (N=6).

Our survey sampling strategy was intended to achieve representative numbers of respondents in key operational positions in each terminal. Ideally it aimed for 50% of the operational workforce. In practice, however, this was only practical and possible in the terminals with fewer workers, so targets varied from 15-50%. As shown in Table 2.1, returns came close to these targets in most cases and significantly exceeded them in two cases. In one terminal in which returns fell substantially short of our target, this was the result of limited co-operation from the terminal management.

*Table 2.1: Questionnaire and diary survey respondents*

| AREA         | TERMINAL | QUESTIONNAIRES | % OF TARGET | % OF WORKFORCE | DIARIES |
|--------------|----------|----------------|-------------|----------------|---------|
| ASIA PACIFIC | AP2T2    | 420            | 140         | 39             | 34      |
|              | AP2T1    | 57             | 29          | 8              | 30      |
|              | AP2T3    | 102            | 68          | 18             | NA      |
|              | AP2T4    | 196            | 196         | 37             | 4       |
|              | AP1T1    | 221            | 67          | 34             | 25      |
|              | AP1T2    | 169            | 91          | 46             | 9       |
| EUROPE       | EU1T1    | 363            | 97          | 48             | NA      |
|              | EU1T2    | 13             | 65          | 65             | NA      |
|              | EU2T1    | 60             | 46          | 12             | NA      |
|              | EU2T2    | 185            | 62          | 9              | 18      |
|              | EU2T3    | 75             | 81          | 41             | NA      |
| TOTAL        |          | 1849*          | 85          | 25             | 120     |

\*Includes 2 questionnaires from the Europe area 1 for which the terminal the respondent worked at could not be identified.

<sup>6</sup> There was less than two years between the interviews for the current study and those carried out during the preliminary project, with current study interviewees asked about any changes that had taken place between the two projects. As our findings show, there was generally little change during this period and the more recent interviews corroborated all the main findings of those carried out as part of the preliminary project.



*Table 2.2: Interview participants (General information)*

| INTERVIEWS     | PRELIMINARY | CURRENT |
|----------------|-------------|---------|
| MANAGEMENT     | 44          | 17      |
| WORKERS        | 50          | 34      |
| KEY INFORMANTS | 8           | 25      |
| TOTAL          | 102         | 76      |
| OVERALL        | 178         |         |



Table 2.3: Interview participants (Detailed Information)

|              |                | AREA              | ASIA PACIFIC                                                                                                                      |                                                                    |                                                                     |                                                                   |                                                                                                                                                                    |                                                                                                                                                                                                                                             |
|--------------|----------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                | TERMINALS         | AP2T1                                                                                                                             | AP2T2                                                              | AP2T3                                                               | AP2T4                                                             | AP1T1                                                                                                                                                              | AP1T2                                                                                                                                                                                                                                       |
| INTERVIEWEES | MANAGEMENT     | CURRENT PROJECT   |                                                                                                                                   |                                                                    | 3 representing safety and human resources departments               | 4 representing the operations, engineering and safety departments | 2 representing the operations and safety departments                                                                                                               | 1 representing the safety department                                                                                                                                                                                                        |
|              |                | PRELIMINARY STUDY | 5 representing the operations, engineering and safety departments                                                                 | 11 representing the operations, engineering and safety departments | N/A                                                                 | N/A                                                               | N/A                                                                                                                                                                | N/A                                                                                                                                                                                                                                         |
|              | WORKERS        | CURRENT PROJECT   |                                                                                                                                   |                                                                    |                                                                     | 5 including 2 crane drivers, 2 lashers and 1 truck trailer driver | 19 including 9 stevedores, 4 technicians, 2 gantry crane operators, 2 safety facilitators, 1 fork lift driver and 1 trainer (6 were also safety committee members) | 9 including 4 straddle carrier drivers, 3 stevedores, 1 safety facilitator and 1 tower clerk (3 were also safety committee members, 3 were also union H&S representatives, 2 were also union delegates and 2 were also safety facilitators) |
|              |                | PRELIMINARY STUDY | 9 including 5 contract truck trailer drivers, 3 crane drivers and a gantry crane operator                                         | 8 including 5 contract truck trailer drivers and 3 crane drivers   | N/A                                                                 | N/A                                                               | N/A                                                                                                                                                                | N/A                                                                                                                                                                                                                                         |
|              | KEY INFORMANTS | CURRENT PROJECT   | 5 including 3 representing the dock inspectorate, 1 representing the port safety department and 1 representing the harbour master |                                                                    | 2 including 1 union official and 1 dock inspectorate representative |                                                                   | 7 including 5 union officials and 2 inspectorate representatives                                                                                                   | 8 including 1 union official and 7 inspectorate representatives                                                                                                                                                                             |
|              |                | PRELIMINARY STUDY | N/A                                                                                                                               |                                                                    | N/A                                                                 |                                                                   | N/A                                                                                                                                                                | N/A                                                                                                                                                                                                                                         |
|              | TOTAL          |                   | 14                                                                                                                                | 24                                                                 | 5                                                                   | 9                                                                 | 28                                                                                                                                                                 | 18                                                                                                                                                                                                                                          |



|              |                |                   | AREA                                                                                                                                              | EUROPE                                                                           |                                                                                                                |                                                                                                                 |                                                      |                                                                              |
|--------------|----------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------------|
|              |                |                   | TERMINALS                                                                                                                                         | EU1T1                                                                            | EU1T2                                                                                                          | EU2T1                                                                                                           | EU2T2                                                | EU2T3                                                                        |
| INTERVIEWEES | MANAGEMENT     | CURRENT PROJECT   |                                                                                                                                                   |                                                                                  |                                                                                                                |                                                                                                                 | 1 representing the safety and operations departments | 6 representing the safety and the contract operations and safety departments |
|              |                | PRELIMINARY STUDY | 7 representing the safety, operations, engineering and human resources departments                                                                | 12 representing the safety, operations, engineering, planning and IT departments | 9 representing the safety, operations, engineering and human resources departments                             |                                                                                                                 | N/A                                                  |                                                                              |
|              | WORKERS        | CURRENT PROJECT   |                                                                                                                                                   |                                                                                  | 1 contract stevedore and union delegate                                                                        |                                                                                                                 |                                                      |                                                                              |
|              |                | PRELIMINARY STUDY | 12 stevedores (2 were also union delegates and 10 were also union activists)                                                                      | 6 including 2 foremen, 2 lashers and 2 straddle carrier drivers                  | 8 including 7 stevedores and 1 technician (4 were also union delegates and 2 were also safety representatives) | 7 including 3 tug drivers and 4 stevedores (2 were also union delegates and 4 were also safety representatives) | N/A                                                  |                                                                              |
|              | KEY INFORMANTS | CURRENT PROJECT   | 2 including 1 inspectorate representative and 1 management representative, who is also a safety expert on the joint OHS committee for the port    | 1 inspectorate representative                                                    |                                                                                                                |                                                                                                                 |                                                      |                                                                              |
|              |                | PRELIMINARY STUDY | 5 including 3 union official, a union appointed employment agency safety training and a representative of the employment agency safety department | 2 union officials                                                                |                                                                                                                | 1 union official                                                                                                | N/A                                                  |                                                                              |
|              |                |                   | TOTAL                                                                                                                                             | 26                                                                               | 21                                                                                                             | 18                                                                                                              | 9                                                    | 6                                                                            |



### 3. Managing health and safety in container terminals – company and terminal arrangements

This Chapter presents our findings on the strategies and arrangements for the governance and management of occupational health and safety as they were explained to us in interviews with representatives of management and OHS support services in the companies operating the container terminals we studied. We carried out case studies in 11 container terminals operated by 6 companies in 4 countries (Table 3.1). The terminals were situated in two different parts of Europe and in two different areas of the Asia-Pacific region. They included terminals operated by four of the largest GNT companies and two national companies, one in Europe and one in Asia Pacific. Nine of the participating terminals were operated by GNTs (5 by GNT 1, 2 by GNT 2, 2 by GNT 3 and 1 by GNT 4), with the other 2 terminals run by national operators (Table 3.1).

*Table 3.1: The case study terminals, their regions and operators*

| REGION       | NATIONAL AREA | TERMINAL OPERATOR | TERMINAL |
|--------------|---------------|-------------------|----------|
| EUROPE       | EU1           | GNT 2             | EU1T1    |
|              |               | GNT 3             | EU1T2    |
|              | EU2           | GNT 1             | EU2T1    |
|              |               | GNT 4             | EU2T2    |
|              |               | National 2        | EU2T3    |
| ASIA PACIFIC | AP1           | GNT 1             | AP1T1    |
|              |               | National 1        | AP1T2    |
|              | AP2           | GNT 1             | AP2T1    |
|              |               | GNT 3             | AP2T2    |
|              |               | GNT 1             | AP2T3    |
|              |               | GNT 2             | AP2T4    |

The aim in this Chapter is to present a descriptive analysis of the strategic positions taken by the companies operating container terminals and to show how this strategy is turned into operational arrangements for health and safety within the terminals themselves – that is, at the level of the workplace. Additionally we analyse company information concerning health and safety outcomes, based on data they have gathered on reported injuries and fatalities among workers in their terminals in recent years.

Using documentary sources and the transcripts of interviews conducted at company Head Offices, we begin with a profile of each of the companies we have studied and the policies and arrangements made at the company level for the governance and management of the health, safety and welfare of workers in the terminals under their control. We follow this with a description of the available data on health and safety performance – which, broadly speaking, we find to be indicative, not so much of the performance itself, but of the limitations in what this data can reliably tell us concerning performance. Focusing on the terminals, we provide a brief description of the main features of each before exploring their arrangements for the implementation and operation of company policies and procedures for health and safety management. Based on interviews with the operational and health and safety management and supervisors in each of the terminals, we consider the general character of the management systems and arrangements for health and safety that are in place in the terminals and their main objectives, before



examining them in more detail. Here we have taken the opportunity to explore, in more detail, aspects of OHS management where there appeared to be some level of disconnect between arrangements described by managers and the experiences of them as described by workers and their representatives. In the final section of the chapter we summarise our findings and draw some broad conclusions concerning the character of the arrangements we found.

### 3.1 Features of governance and management of OHS in global and national container terminal companies

Three of the four GNT companies had clear centralised arrangements in place for the governance and management of safety, health and environment matters at the global corporate level, while the fourth was rather more decentralised in its approach. Policies and arrangements for health and safety in place at the corporate level shared a number of common features. For example, generally, at Board level, a commitment was claimed to ensuring the health, safety and welfare of the workforce, including striving to improve health and safety outcomes to help to achieve this. In some cases, overall responsibility for OHS was stated to rest with named individuals at this level and systems were in place to ensure that regular corporate reporting of health and safety matters to these individuals occurred. Each of the three global companies with these more centralised arrangements included a special corporate unit devoted to safety, health and environment matters, with expertise that could be used to monitor and advise on the development and operation of global company strategies within the terminals. At the same time, there were further systems to ensure communication of OHS messages from this level to that of individual business units and, in most cases, vice versa. Generally there seems to have been some movement in developing and refining approaches at this level in the relatively recent past in several of the companies in the study – and while there was a willingness among interviewees at the corporate level in these companies to explain the need for such change, at the same time they also felt it was perhaps too soon to comment extensively on the effectiveness of these changes.

A key issue for all the GNT companies concerned how they managed relations between the company's global corporate strategies and the capacity of the terminals they operated to be responsive to local conditions that affected their business. Policy and management arrangements for safety and health reflected this tension in a number of ways and each of the four GNT companies determined for themselves the ways in which they found a suitable balance. Three were similar in the general character of their approach in this respect, while the fourth appeared considerably more decentralised.

Broadly speaking, the two national companies had defined responsibilities, procedures and arrangements for corporate governance and management of OHS at the company level as well as arrangements to implement OHS management systems in the terminals we studied.

In the following sections we explore in further detail the ways in which these responsibilities for the governance and management of OHS were delivered at the corporate and terminal levels.

The four GNT companies in the study were among the largest involved in the container terminal business. Each had a portfolio of interests in container terminals and related logistics activities – as well as other business activities. Collectively they are estimated to be responsible for almost half of global container terminal business. The growth of these companies and the main features of their governance, structure, operation and business have been analysed in the recent literature summarised in the previous Chapter. Our investigations and discussions with managers at the global level in these companies suggested no significant departures from the features already presented in this literature (see for example: Bichou and Bell, 2007; Parola and Musso, 2007; Notteboom and Rodrique, 2012) concerning their character, business, growth and governance. In general, the rise to prominence of these GNT companies has been both comparatively recent and rapid. Consequently all the companies concerned are relatively new to the business of global networks of container terminals. Each developed from more localised business interests either in stevedoring, or as offshoots of shipping companies with interests in ports, or from financial holdings companies initially investing in ports for revenue generation, which subsequently



developed business interests in the operation and direct management of their container terminal assets globally.

The companies have all grown in size and business largely by taking advantage of opportunities presented by port privatisation schemes and as a result of container carrier companies seeking to improve the support for their core business. Mergers and acquisitions have taken place alongside the expansion of container terminals into new locations, and they have also been driven by the efforts of the larger maritime shipping companies to gain even bigger shares of the market for carrying containers, with a resultant increasingly powerful role for these companies. This in turn has helped shape the business of the terminals and contributed to stevedoring companies seeking alliances or acquisitions in the business of shipping, leading to a development of global networks of increasingly aligned terminals and shipping lines in a highly competitive market that has served to facilitate the emergent dominance of a relatively small number of large and powerful players such as are exemplified by the GNTs in the present study.

As noted above, three of the four GNTs studied had arrangements for leadership on OHS at Board level. They aimed to ensure the delivery of this leadership through measures with which the corporate governance of OHS could be implemented in relation to the business units (terminals) of the companies. They all acknowledged that exercising governance over the delivery of their commitments was more straightforward in the terminals over which they held operational control and far less so in those (smaller numbers of) terminals in which they held a business interest but did not have overall operational control<sup>7</sup>. There were several similar approaches that were shared by these three of the four GNTs studied. In summary they include:

- Clear statements of corporate leadership, responsibility and commitment from Board and CEO level – for example there was usually a strong public declaration of commitment to prioritising safety for terminal workers from the Board Chairperson or CEO that, in at least one case, claimed prioritisation of safety and health of *all* workers on the terminal regardless of whether they were there as employees of the company or part of the contractor workforce that is a significant presence in many terminals operated by these companies.
- Leadership commitment was usually supported with a set of global standards through which the corporate goals were to be achieved. Typically they consisted of a set of simple statements widely promulgated to all terminals and company employees – often displayed in the terminals' offices, corridors, canteens and rest facilities.
- Arrangements were in place at corporate level to ensure appropriate expertise was available to monitor and advise on the company performance of health and safety across the activities of all the business units. Typically this consisted of a small group of specialist staff (on average 3-4), based in the corporate offices, with responsibility for co-ordination, monitoring and advising on the corporate system for OHS at the terminals.
- The structures through which OHS was governed and managed between the corporate office and the business units varied. In one GNT there was a regional structure into which terminals in different regions were grouped and within which further expertise was available to support as well as monitor OHS activities at the level of the terminals and provide feedback to the corporate level. Others performed similar activities but through direct links between the business units and the specialist personnel at Head Office.

All the companies had sets of procedures in place to ensure the collection of data on safety performance and its reporting to corporate level. Usually specialists employed at corporate level processed this data, before its key elements were circulated more widely among the business units. Other procedures required the reporting of serious incidents or those with a high potential of severity and in most cases

<sup>7</sup> In all of the terminals we studied, the organisation operating the terminal had overall operational control.



some means of communicating useful information concerning the future prevention of such incidents was used to convey 'lessons learned' to all the terminal operators. These data had been used globally to set terminal level performance targets on accidents and injuries.

As far as company strategies concerning OHS governance overall were concerned there were a number of distinctive features shared to a greater or lesser extent by three of the four GNTs studied. As has been the case in a number of sectors in which there is a relatively high incidence of serious and fatal injuries, such as mining and construction, acknowledgement of the need to address the risks that lead to such incidents has been coupled with an awareness that they cannot be simply predicted from the analysis and interpretation of trends in lost time injury data. The result has been that recent revisions of corporate strategies have placed greater emphasis on achieving 'zero harm' in the terminals which, as is usually the case with such strategies, is coupled with movement away from a traditional concentration on interpreting and monitoring trends in lost time injuries to paying more attention to the investigation and analysis of low frequency high potential incidents. We return to a further discussion of the implications of such 'zero harm' strategies and the way in which the terminal companies operate them later. First we consider arrangements for governance and management in each of the companies in more detail, with some of the measures of performance outcomes made available by the companies.

### 3.1.1 GNT 1

GNT 1 employs over 30,000 people and operates over 60 terminals globally. It handles more than 60 million TEUs annually, and at the time of the study was planning to develop and extend its network and capacity substantially in the next few years. Its safety strategy is globally driven. As part of this corporate approach, the company's headquarters rolls out management systems with specific processes and procedures and runs regular campaigns and benchmarking exercises to measure its standing against global standards and industry best practice. The global safety and environment department leads in these activities and is supported by a series of regional safety departments, through which safety strategies, approaches and systems are cascaded to the terminals and OHS performance information is returned for central analysis and monitoring. The company currently has global targets of zero fatalities and a 20% reduction in lost time injury frequency rate (LTIFR) which it describes as having fallen by 37% since 2009). One of its ways of aiming to meet these targets across all its terminals has been to issue a set of global standards in relation to seven areas identified as high accident potential work activities: pedestrian safety, handling loads, working at height, mobile equipment, vessel safety, engineering and isolation. Each standard contains minimum control measures to mitigate the potential for accidents. Over the eight years prior to the study, GNT 1 had 67 fatalities globally, all of which were in one of these areas. GNT 1 also sets global standards for 'human capital' global engagement programmes for risk management and it periodically conducts global surveys of employees on matters such as 'engagement' which are further supported by subsequent discussion seminars. The organisation describes its policies as meeting or exceeding national health and safety legislation wherever it operates, complying with all aspects of the OHSAS 18001 international certification system, and includes a requirement for all staff and contractors to meet health and safety requirements and participate in comprehensive training. Its approach includes: health, safety and environment programmes to improve understanding and strengthen the safety culture at all terminals; safety and environment assessments; and the delivery of accident investigation training to all terminals to enhance the quality of investigations and improve risk management. There is also a global commitment to creating a safe culture across all operations and regularly monitoring the implementation of the safety strategy including employee training, regular audits and management objectives in relation to safety. GNT 1 draws attention to its zero tolerance of conditions and behaviours contributing to workplace incidents. Its view is that operational, safety and security risks are decreasing through rigorous and continuous monitoring by management and by having review processes, policies, guidance documents and operational procedures in place.

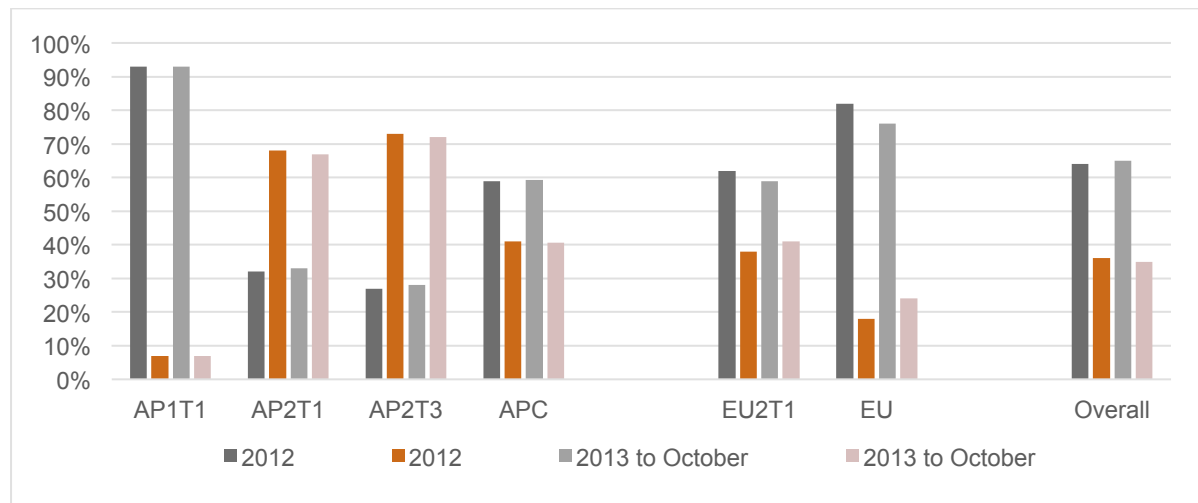
Overall, a recent annual report indicated that 52% of GNT 1's employees have worked for the company for more than five years. The GNT describes itself as adhering to local labour regulations and statutes but emphasises that it is a single organisation with common goals, reinforced with common approaches to



reward, performance management and succession planning. An example of this is its requirement that at the terminal level that at least one of the objectives that earns a bonus must be linked to a safety measure.

In total, about two thirds of the company's person hours are worked by direct employees and one third by contractors. However, as Figure 3.1 shows, rates for their Asia Pacific and European terminals, as well as for the case study terminals in each of those regions, varied substantially. Partial year figures for 2013 suggest an increase in the proportion of hours worked by indirectly employed workers in Europe and the case study terminal EU2T1.

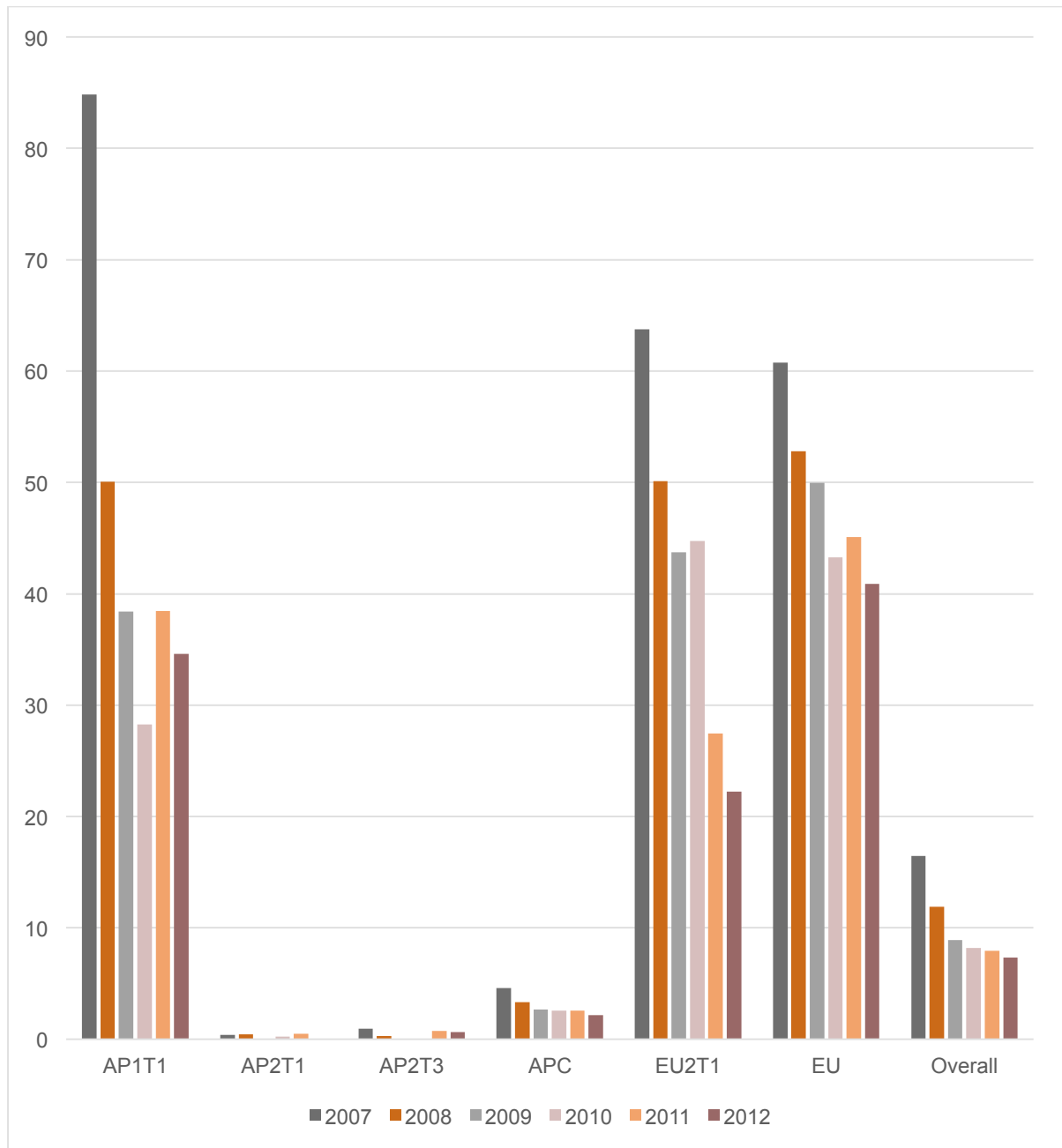
*Figure 3.1: Employee and contractor hours (%) for the Asia Pacific and Europe regions and the case study terminals for GNT 1*



Company data on lost time injury frequency rates for GNT 1 show a decline between 2007 and 2012 from 16.5 to 7.3 per million hours worked. A recent annual report suggests that this has continued, with LTIFR falling by 12% to 6.4 in 2013. Behind these rates are an increase in hours worked (from over 85 million in 2007 to approaching 100 million in 2012) and a drop in absolute numbers of lost time injuries (from nearly 1500 to under 500). These trends were broadly mirrored in the regional and terminal level data. However, there were also large differences in rates between the regions and terminals – ranging from a rate of 84.8 lost time injuries per million hours worked in terminal AP1T1 to one of 0 in AP2T1 in 2009 and 2012 and in AP2T3 in 2009 and 2010. In addition, the AP1T1 rates were closer to those of terminal EU2T1 and Europe as a whole, suggesting a difference by economic income area rather than by region (Figure 3.2). A difference of this scale calls into question the accuracy of the data, raising the possibility of incomplete reporting and/or different reporting ‘thresholds’ in terminals by economic income area. It is also significant because of the numbers of workers involved. GNT 1, for example, employs over 3000 people in the second Asia Pacific area alone (i.e. not the Asia Pacific region as a whole),



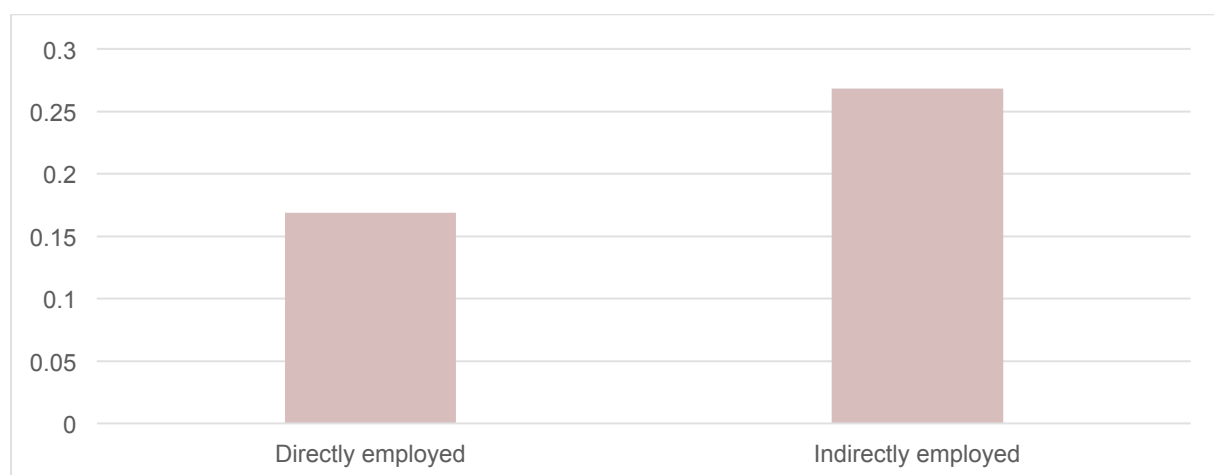
*Figure 3.2: Lost time injury frequency rates per million hours worked for 2007 to 2012 for the Asia Pacific and Europe regions and the case study terminals for GNT 1*



Limited data were available on lost time injury frequency rates to enable comparisons to be made between directly and indirectly employed workers. These comparisons should therefore be approached with great caution, but they suggest a higher LTIFR among those who were indirectly employed (Figure 3.3).



*Figure 3.3: Lost time injury frequency rates for directly and indirectly employed GNT 1 workers for 2013 to October*

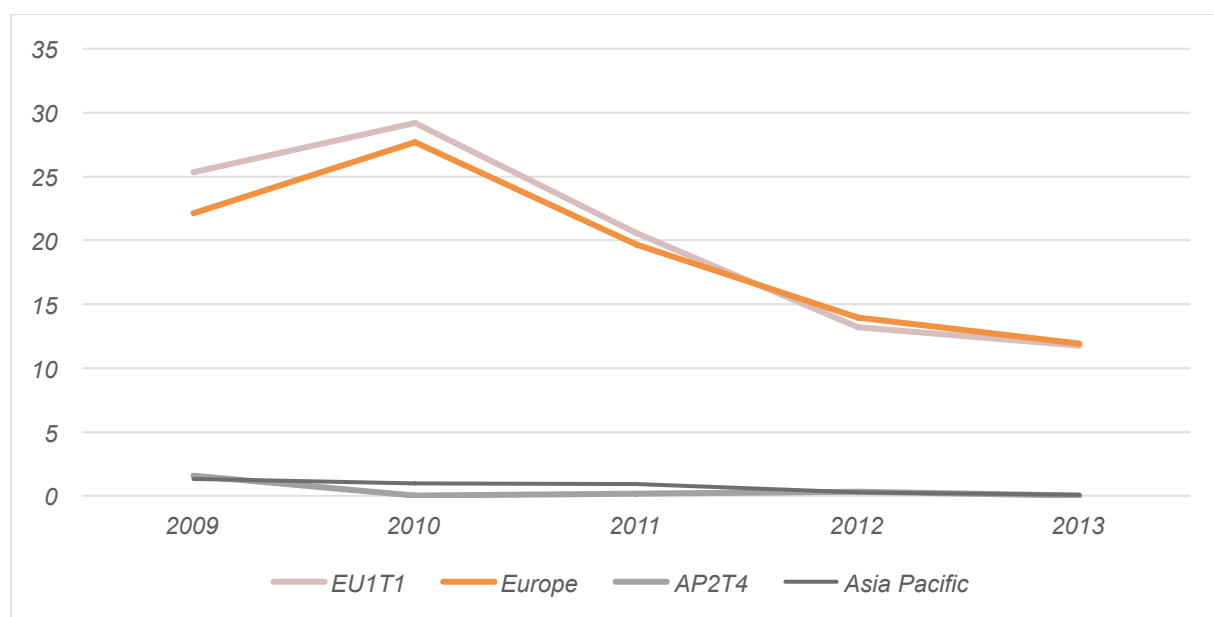


### 3.1.2 GNT 2

GNT 2 handles over 60 million TEUs annually, increasing its throughput by nearly 3% in 2013. Like GNT 1, it has a strategic approach to health and safety globally. This included rolling out its safety, security and environment management system framework to all of its terminals and recently holding an organisation-wide safety week.

Considering lost time injury frequency rates per 100 workers for GNT 2 showed similar patterns to those seen in the GNT 1 data in terms of both the downward trend in rates generally and the difference between rates by region, as well as indicating that both the GNT's case study terminals' trends were very similar to those for the regions in which they were situated (Figure 3.4).

*Figure 3.4: Lost time injury frequency rates per 100 workers worked for 2009 to 2013 for the Asia Pacific and Europe regions and the case study terminals for GNT 2*

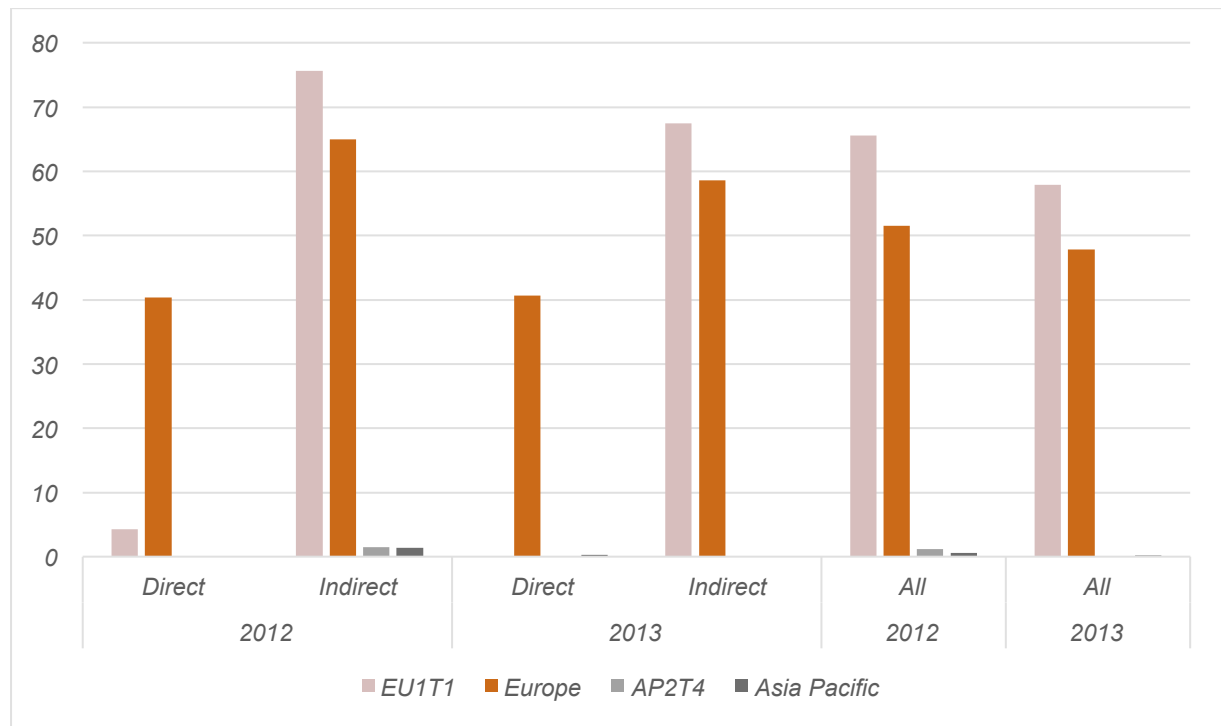


Some limited data also allowed comparisons between directly and indirectly employed workers. Again these showed substantially higher lost time injury frequency rates per million hours worked among



indirectly employed workers compared to those who were directly employed within Europe as a whole and in terminal EU1T1 (Figure 3.5). This lends some weight to the suggestion from the GNT 1 data of poorer OHS outcomes for indirectly employed workers. Here again, however, the numbers involved were very small in the Asia Pacific region, adding to the concerns raised above about data accuracy and comparability between regions and income economy types.

*Figure 3.5: Lost time injury frequency rates per million hours worked for 2012 and 2013 for Europe and the case study terminals for GNT 2*



For the years 2009 to 2013, there were six fatalities in the Europe and Asia Pacific regions, including one in the Asia Pacific case study terminal. There were three in each region. Two occurred in the years for which data showing directly and indirectly employed workers separately were available. Of these, both were in Europe in 2013, with one directly employed and one indirectly employed worker killed.

### 3.1.3 GNT 3

GNT 3 employs over 20,000 people globally, operating over 70 terminals in more than 60 countries. It handles over 30 million TEUs annually. It has a global approach to safety, with a recently appointed headquarters level safety team and new additional resources for training, measurements and behaviour change. It identifies risk management, leadership, technological innovation and learning as the core elements of its strategic approach to safety, describing its approach as one of zero tolerance for unsafe acts in which everyone is expected to intervene. With perhaps the most well-developed strategic approach to governance and management among the GNTs, GNT 3 characterises its approach as focusing on improving safety, productivity and efficiency by ensuring that employees build skills, capabilities and performance while ensuring that their rights are upheld through the organisation's global labour standards. One of these covers employee working hours, which are now described as successfully managed, and another is aimed at ensuring that wages meet basic needs. A further such standard covers worker representation, and here GNT 3 states that 70% of terminals have a workplace committee, with participating employee-elected representatives, intended to improve workplace health and safety and promote company-employee co-operation. The latest annual report says that the organisation will continue to work to achieve greater global consistency and alignment to labour standards in all locations,



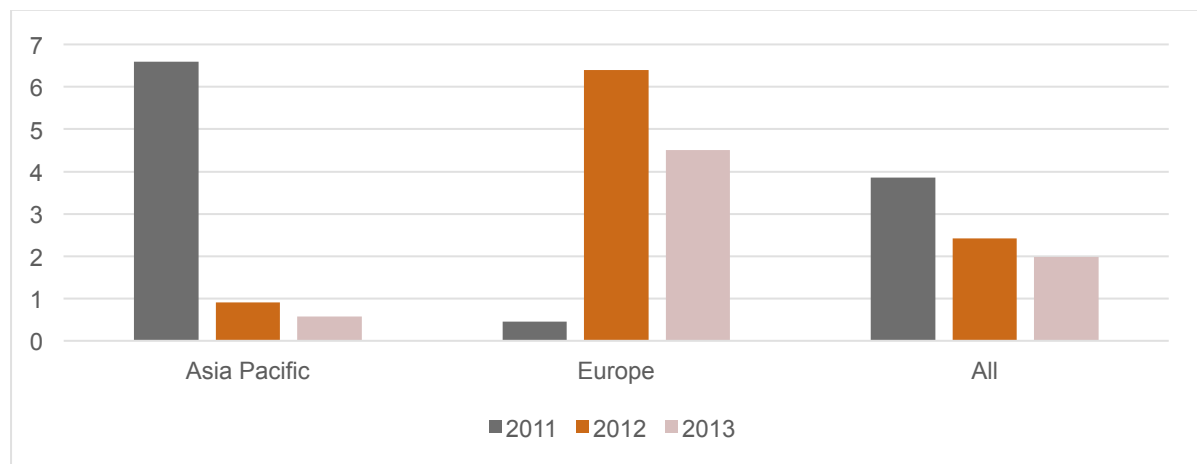
focusing on improving communications between the company and its global workforce as well as building local capacity and working to integrate the standards more effectively into local processes.

The GNT's goal is zero fatalities, and deaths have come down from 10 in 2011 and five in 2012 to three in 2013. Its 'materiality matrix' puts safety at the highest level of importance to both the business and its stakeholders, close to issues such as emergency / spills response. The main safety risks are categorised into four areas – traffic, working at height, falling objects and stored energy. These are addressed by the organisation's global minimum requirements for safety with which all terminals must comply. Numbers of safety inspections and reviews have been increased, and new standards in relation to work permits and machinery have recently been implemented. The GNT's own employee engagement survey suggests its efforts are regarded favourably within the workforce, with 81% of operations staff responses to a question on company commitment to employee safety described as favourable.

In relation to contractor organisations, GNT 3 describes them as actively involved in safety and lists supply chain partners as contributing to safety improvement. Its recent global safety culture survey was made available to all employees, contractors and third parties.

Data for 2011 to 2013 (to August) suggest, like those for GNTs 1 and 2, a downward trend in lost time injury frequency rates per million hours worked. However, it is important to note here that the substantial regional (income economy type) differences in the GNT 1 and 2 data are not apparent in the GNT 3 data (Figure 3.6), suggesting that, in this case, more comparable reporting practices and/or performance in the two regions.

*Figure 3.6: Lost time injury frequency rates per million hours worked for 2012 and 2013 for Europe, Asia Pacific and overall for GNT 3*



### 3.1.4 GNT 4

GNT 4 operates globally, employing over 30,000 people and running over 50 terminals in more than 20 countries. It currently has an overall capacity of nearly 80 million TEUs annually and in this respect often features as the market leader in terms of throughput volumes and number of terminals in comparisons of economic and business profiles among GNTs (see for example Notteboom and Rodrigue, 2012). However, it functions rather differently to the other GNTs and does not appear to have a well-developed corporate level OHS strategy, preferring to leave the management of health and safety to individual terminals. At the global level it states that it observes international labour standards and laws in the areas in which its terminals are situated, and that there are dedicated workplace safety teams within the terminal business units.



This said, there were perhaps some indications of change in this approach. For example, a relatively recent innovation was a regional (European) safety committee that met at least every six months. This was seen by the chair of the committee as a move towards more ‘global thinking’, with parallels in other aspects of the business such as the engineering and commercial sides. The committee recently developed a set of minimum safety standards, most of which were based on regional and international (OHSAS 18001) standards and what the chair described as ‘general best practice’. These were to be circulated to terminals in the region that would self-assess by using them, before individual business units began to audit each other. An audit tool for this purpose was in development, again based on international standards (OHSAS 18001). The committee also feeds information on areas such as OHS performance and best practice back to a global level committee. This move towards a more corporate approach, at least at the regional level, was seen as a positive change, though GNT4 continues to differ from its competitors by not having a global head of safety or a corporate strategic approach. Rather, regional co-ordinators were ‘left to support, administer and advise at the regional level’ – which meant that the regional committees had to act as the driving force for change or improvement on OHS.

In contrast to the other GNT operators in this study, discussion of health and safety governance and management in its published company literature is almost non-existent and performance data were not made available to the research team by the organisation.

### **3.1.5 Features of governance and management of OHS in national companies**

Broadly speaking the two national companies had in place systems of governance and management for safety and health that mirrored those of the GNTs, albeit on a smaller and less formalised scale.

#### **3.1.5.1 National operator 1**

National operator 1 has an annual capacity approaching 4 million TEUs. Like GNTs 1 to 3, it has an organisational level strategic approach to safety in which it describes the involvement of employees, as well as training, competence and effective safety standards, as essential. This includes a company-wide set of health and safety management standards. Key safety policies and lead initiatives are developed at headquarters level on a regular basis. For example its recent critical safety essentials programme aimed at improving management of the most critical safety risks and a new OHS system for improved tracking, notification and management of safety incidents. A programme aimed at reshaping safety culture and a safety leadership training programme is also planned. A recent focus has also been on improving employees’ engagement and the implementation of OHS strategic plans around a common framework with associated action plans that are tracked and reviewed at the divisional and headquarters’ levels. National 1 has six strategic safety objectives relating to: leadership and management capability; safety management systems; risk management capability; employee engagement; safety culture; and verification.

The organisation has an executive safety committee which meets monthly to discuss safety performance and incidents, drive improvement initiatives and make policy decisions. About 15% of executives’ pay is linked to improvements in safety (recordable injury frequency rate).

National 1’s LTIFR for 2013 fell by 70% from 2011, an improvement of over 30% on the previous year.

#### **3.1.5.2 National operator 2**

National 2 operates a network of seven ports. It currently has a less well developed corporate approach to health and safety than National 1, but is undergoing a period of change. At the time of writing elements of OHS management were standardised. These included, for example, hazard observations, risk assessments and permits to work. Day-to-day operational safe work systems, though, were developed at the terminal level. However, an objective for the coming year was to begin to standardise more elements of operations, training, safety awareness and so on, first regionally and then across the whole organisation, with a view to standardising as much as possible and working towards a set of minimum standards, which managers expected to save time and money.



The human resource strategy of National 2 was to contract out its operational workforce. To do so it had in place various requirements covering competitive tendering in which specification of OHS arrangements by contractors were included. Managers claimed that tenders had been refused on the grounds that tenderers had not met these requirements. As pointed out elsewhere in this report, the low levels of unionisation in the ports operated by the company had meant there had been only limited resistance to the company's human resource strategies.

In operational practice, therefore, as detailed in section 3.3.5, the overall governance of health and safety matters remained the responsibility and role of National 2, and contractors worked to its safety management system requirements for OHS policies and procedures, safe working practices and safe systems of work as well as risk assessments, but the day-to-day supervision of these systems was undertaken by the contractor, under the general oversight of National 2.

### 3.2 The character of arrangements for OHS in the terminals

Arrangements to deliver the corporate strategies of the companies included in the study towards governance and management of health and safety at the level of the terminals are explored in the following section. Since container terminals are situated in different parts of the world, some variation in local conditions and national contexts can be anticipated. How GNTs manage operational practices within these differently situated terminals and also how national companies in different countries do so is therefore important in determining how successful they are in achieving their objectives. We begin with a brief overview of the common features of these arrangements across the differently situated terminals, as managers and OHS advisers described them to us during our visits to these sites.

From these accounts it was clear that arrangements for OHS were founded on strongly behaviour-based approaches to health and safety. In general, the most senior Terminal Manager held overall responsibility for the health and safety of workers and there was a Safety Department in each of the GNT terminals as well as in the nationally operated terminals and it played a pivotal role in the development, implementation, monitoring and review of their health and safety management systems and arrangements. Written policy statements on health and safety were in evidence and were generally prominently displayed or made available to workers. In some of the terminals they were supplemented with simple messages concerning key safety objectives, standards and so forth that were widely displayed. There was evidence of locally produced posters and slogans in the terminals, together with heavy emphasis within the safety management systems themselves on achieving behaviour change towards safer working practices among the workforce and inculcating a 'safety culture' at all levels within the organisation of the terminals. These were especially in evidence in the terminals in the middle-income country studied, where there were also indications that the idea of influencing safety behaviours included attempts to extend such influence beyond the terminal and into the communities in which workers live. A similar strategy was adopted by some of these terminals in relation to influencing the behaviour of external truck drivers outside the terminal by focusing safety awareness activities on the depots and truck stops where these drivers were likely to congregate.

As well as advising on OHS and administering the procedures of the safety management systems in the terminals, Safety Departments were also the formal link between the terminals and their parent GNTs in relation to safety both regionally and globally, which in the case of three of the four GNTs (GNTs 1 to 3), as described in the previous section, constituted a fairly close and occasionally quite directive relationship, while in the fourth (GNT 4) the connection was considerably looser. The relationship was intended as a two-way process. Safety Departments implemented policies and procedures from the GNT and in addition they acted as a hub for information by inputting, downloading and distributing, safety performance information to and from the global intranet. Senior management in each of the GNT terminals were in close contact with the global company in the three GNTs in which the company took a strong co-ordinating and leadership role. In one of these, contact was via the regional arrangements the global company had made, while in the other two it was a more direct connection to the head office. In all



cases, there was little doubt among senior management that they were likely to be held accountable for serious incidents at the terminals they managed and that there were systems in place to effect two-way communication on such matters between the terminal and the company HQ.

Within the health and safety management systems, in general all operational activity was intended to be covered by risk assessment and risk assessment formed the basis for the identification of the areas, operations and processes that required attention in the terminals' safety procedures and systems. Risk assessments were normally reviewed following an incident or any change in operational procedure, while in some terminals procedures were in place to keep all risk assessments updated through a more systematic and planned review process.

Management and supervisory interviewees from all terminals also referred to many specific safety practices and measures within various broad groupings aimed at managing risks. These included, for example: technical measures, such as the provision of cages and harnesses for those working on top of containers; procedural measures, such as always carrying out lashing in pairs; measures relating to environmental conditions, for example, stopping work at specified high wind speeds; and infrastructural measures, including maintenance of terminal surfaces and the provision of ergonomic equipment. Several of the management interviewees stressed that a number of these measures involved significant cost, in terms of financial outlay but also, in some cases, in relation to reduced work speed and consequent productivity – something that was considered worthwhile for the sake of safety – and emphasised that their company globally had no limits on their safety budget.

In keeping with perceptions of the most significant risks, in all of the terminals a hierarchy of safe working strategies had been identified in which the risks associated with the operation of machinery and with man-machine interfaces were recognised as among the most important and for which standard approaches to risk minimisation were applied (i.e. avoidance, for example, introducing pedestrian free zones, carrying out repairs in the workshop rather than in-situ and/or stopping work completely around the repair site; and, where avoidance was not possible, risk reduction, for example job rotation, regular maintenance inspection and adherence to PPE requirements).

Again behaviour-based strategies tended to dominate these approaches and management interviewees were generally of the opinion that all the possible structural and engineering controls had been implemented, leaving a strong focus on behaviour safety, and the view that the behaviour-orientated procedures and systems in place in the terminals were such that if everybody followed them there would not be any harmful incidents.

Systems for recording and investigating incidents, injuries and near misses were also described and played a major role in the activities of the safety and health departments in each of the terminals. These data were added to both local and global databases.

In each terminal, training of two kinds supported these health and safety management arrangements: induction training and on-going or refresher training. In general, induction training was relatively structured and systematically administered. Where workers were directly employed, training was generally provided by the terminals' Safety Departments and by the joint employment bodies in Europe area 1. For indirectly employed workers training was mainly the responsibility of the contractor organisation employing them. Again there was a significant difference in this regard between the terminals in high and middle income economies. In the terminals situated in the former, contractors delivered training programmes developed by the terminal operating organisations and for the most part were also used for their own employees. Oversight, prescription and, in some cases, awareness of content of training for indirectly employed workers were significantly lower in the terminals operating in the middle income country. This pattern of differences by region of operation and employment type was also apparent in relation to other areas, such as PPE provision and replacement. On-going training varied significantly from terminal to terminal - for some it was formally applied to the whole workforce with refresher training every two or three years, whereas elsewhere on-going training was said to be provided



through the dissemination of safety practice information (for example during toolbox talks and pre-shift briefings) on specific risks and solutions as necessary.

At each of the case study terminals, there was a widespread confidence in the arrangements' effective coverage of key risks faced by workers and managers were vocal about, and committed to, delivering the zero tolerance approach to injuries that was the stated aim of the safety policies of their global parent companies. This helped reinforce the sense of the strong emphasis of OHS arrangements on *safety* as opposed to *health*.

There were also systems in place for undertaking documented risk assessments, writing methods statements and producing standard operating procedures, all of which were held at managerial (or in some cases supervisory) levels and thought to be accessible or available as required by those needing them. There were accident and incident reporting systems in all these terminals as well as targets for reported injuries and it was reported that regular meetings in relation to health and safety took place at various levels, from work groups to terminal levels. While the preference for the structuring and operation of the terminal level provision for OHS management in the GNT-run terminals was clearly the company model developed at global level, these arrangements were also influenced by wider requirements made in the ports where the terminals were situated. In most cases such requirements had only a limited effect on the company's structuring and operation of OHS, but in one of the European areas studied, its national port employment and labour relations' arrangements did have more of an impact. In the case of Terminal EU1T1 in particular, this meant that the port employment body played a significant role in OHS management arrangements by producing mandatory health and safety management policies and detailed risk management plans, as well as safety rules for specific areas and jobs across the whole port, which the GNT-run terminal was obliged to follow.

Beyond the arrangements for engaging workers individually through a range of work group and terminal level meetings concerning safety and health, there were other arrangements for consultation with workers representatives on health and safety. Generally, in all the GNT and national company terminals in high income countries, the formal set up of these followed, at least to a minimal level, that mandated by national (or state) regulation. Most commonly they involved the election or selection of worker health and safety representatives and the constitution of a joint health and safety committee at the establishment level. Representatives performed functions such as undertaking inspections, requesting information, making representations to managers on behalf of workers, but generally at a level somewhere below the entitlements in the relevant legislation. There were few cases where these arrangements built on, and went beyond, what was provided for by regulation. There were some variations in this pattern of appointment and functions observed in different terminals, such as the differences in arrangements for safety representatives/champions between the two GNT-run terminals in Asia Pacific area 2, that were essentially made possible by historical differences in the legislative requirements involved.

There was a significant difference between these formal arrangements in high income countries and those in the terminal in the middle income country we studied. In the latter case, generally there were no specifically elected or selected health and safety representatives from among the workforce, nor did the health and safety committee function in a consultative way. Where such representatives were said to exist, they were far less well-established or continuous and with far fewer functions or facilities than their counterparts in the high income country terminals. In particular, they were far less likely to have been elected by workers, provided with any training for their health and safety role, or given the time and facilities to carry it out – including being freed from duties to attend meetings and afforded the provision needed for consulting with those they were said to represent.

In the report of the previous study we noted that from the perspective of the workers and their representatives, the concerns of management for speed and cost-efficiency in terminal operation which dominated the highly competitive business environment of container transport coloured workers' experiences of the arrangements made for their occupational health, safety and welfare at work. In their view, this influence contributed to poor health and safety outcomes, especially in relation to issues such



as fatigue, stress and musculoskeletal disorders, and it served to increase risks of unsafe incidents and consequent injuries, as well as reducing welfare, among workers – and this happened *despite* there being arrangements in place for managing safety. Moreover, there was a further view that the outsourcing of work in some terminals, which had occurred for the same reasons of cost efficiency, contributed to the experience of poorer working conditions and the ineffective delivery of arrangements for managing and monitoring workers' health and safety in such situations. Therefore, as we detailed in Chapter 1, the principal aims of the present study were to further explore this apparent gap between the company arrangements for health and safety and workers' experiences.

Having outlined the common features of the systems in place to deliver arrangements for the governance and management of OHS as they were explained to us from the perspectives of the managers and OHS advisers charged with this task, in the remainder of this chapter we deliver the aims of the study by giving more detailed consideration to the understandings of managers and their advisers concerning their approaches in relation to a few key areas that were indicative of the possible gap between arrangements and experiences identified in the previous study. To do so our examination takes particular account of what managers and their advisers shared with us concerning the character and quality of their arrangements to ensure the protection of safety and health, including their experience of safety incidents and work-related health and welfare outcomes in relation to the arrangements they had made to manage prevention of harm and the protection of workers in their terminals. We examine these two areas with a consideration of managers' views concerning key elements of the systems in place to manage OHS especially in relation to job type, employment organisation and terminal location. We take a similar approach in examining managers' perspectives concerning the relationship between the organisation of work and working conditions and explore managers' understandings concerning the relationship of these matters with OHS outcomes and OHS management, again in relation to different jobs, employment organisation and terminal locations. This approach allows us also to set the scene for a further examination of the same issues from the perspective of the respondents to the terminal worker survey analysed in Chapter 4.

### 3.3 Translating company policies into terminal level arrangements

All of the case study terminals are significant players in the business of the sector. Though they vary in size and capacity, all are among the leading terminals for the regions where they are situated. They also all operate within contexts influenced by national legislative, regulatory and labour relations' arrangements. Those in the first and second European areas are subject to regional legislation; those in the first European and second Asia Pacific areas operate under port level legislative and regulatory arrangements that, in the case of the first European area, also extend to labour relations arrangements; while those in the first Asia Pacific area operate under different federal legislative and regulatory jurisdictions. Before turning to managers' perspectives on their arrangements for health and safety, it is important to note some of the more significant elements of these varying contexts in which such arrangements operate within the different terminals. This we do below in Section 3.3.1.

#### 3.3.1 The broader contexts of operational management arrangements in the case study terminals

In Europe area 1 all ports are required to set up the joint bodies that employ dockworkers on a day-hire basis. Employers hire most of their dockworkers by the shift from a port-level pool, though some terminal operators, including GNTs 2 and 3 which operate terminals EU1T1 and EU1T2 respectively, are increasingly employing dockworkers more permanently, by booking them for at least 80 per cent of their monthly shifts (although formally, they are still employed by the joint port authority). This applies particularly for dockworkers with the greatest levels of training and experience. Such arrangements are allowed for under the complex laws governing port labour. National laws also mean that dock work can only be carried out by registered dockworkers trained to appropriate levels by these joint employment



bodies<sup>8</sup>. As a result of these arrangements, it is generally only foremen and supervisors (and maintenance workers, who are directly employed) who have direct contact with terminal operating company managers. The joint employment bodies also operate training agencies and may be active in OHS policy development and monitoring – although especially the latter varies in extent. The employment body in the port in which EU1T2 operates has a much lesser role than that in the port in which EU1T1 operates.

By contrast, in Europe area 2 the lack of port authority influences on the case study terminals is the result of privatisation of ports in the area that began in the 1980s. The country in which the terminals are situated was in the vanguard of port privatisation. Following a period of bitterly contested industrial disputes several decades ago, there was a substantial decline in the dock labour force along with a general decline in trade union presence and power in many ports. In the docks where trade unions managed to retain their organising role, membership remains high and union representation is the normal form of worker representation for wider collective bargaining as well as health and safety issues. The two GNT operated terminals here (EU2T1 and EU2T2) are among those with these types of labour relations arrangements, while the port operated by the national operator in which EU2T3 is situated represents an example of the former kind, in which trade unions are no longer a major presence at the workplace level.

All five European terminals are also subject to European legislation. Of particular relevance to the research are the requirements relation to the minimum protection level and systematic, participatory health and safety management based on risk assessment.

Although subject to the same federal level legislation, the terminals in Asia Pacific area 1 are covered by different state legislatures and labour inspectorates. Health and safety regulation is mainly made at state level and historically there have been differences of detail in provisions between different states. This was true for the different jurisdictions in which the two terminals studied are located. However, recent reforms at federal level have resulted in a significant level of harmonisation of the statutory measures in the two states and currently the legislative requirements for health and safety arrangements in the terminals are similar. Nevertheless, variations in practice still result from the small but significant historical differences in regulatory requirements, some of which are particularly relevant to our research. For example, although OHS legislation has been moving towards a national uniform model, provisions relating to safety committees and the election of health and safety representatives and their powers are newer to the area in which terminal AP1T1 operates than to the area in which terminal AP1T2 operates. This has an impact on the arrangements for worker representation in the terminals<sup>9</sup>.

Lastly, the four terminals in the second Asia Pacific area operate in a country with a middle-income economy under the same national legislation and labour inspectorate monitoring. The terminals are located in two of the country's 11 major ports. Overall container terminal growth has been rapid during the last fifteen years and data suggests that, from 2000, container handling in the major ports of this area grew from around 2.22 million to 7.5 million TEUs annually in 2014.

Case study terminals AP2T1 and AP2T2 (operated by GNT 1 and GNT 3 respectively) are situated in a major port that has been prominent in privatised port development since the mid-1990s following the opening up of the national economy to inward foreign investment. Terminals AP2T3 and AP2T4 (operated by GNT 1 and GNT 2) are in another port some 1300 kilometres away in which GNTs have also invested for some considerable time. There is some evidence to suggest that the productivity of these and container terminals in other major ports in the country has been achieved largely through downsizing of the labour force (De, 2006).

Each port is operated by a Trust, which has some influence over health and safety arrangements in our case study terminals. However, the extent of influence of these Trusts varies, with that covering AP2T1

<sup>8</sup> Though employers can hire other workers for unskilled jobs if there are not enough registered dockworkers available.

<sup>9</sup> At the time of the case study, health and safety representatives had yet to be elected in AP1T1, where the legislation was newer, but were in place in AP1T2.



and AP2T2 being the greater – for example, extending to regular workplace inspections in the terminals by the on-site port trust inspectors.

The poor development of transport infrastructure around the ports in the country generally, especially in those connecting to the main rail and road arteries, is a feature that has been noted to contribute to their limited economic performance (Van Marle, 2012). For example, most of the case study terminals in other countries had efficient automated systems through which truck drivers were able to co-ordinate their terminal visits and consequently most were relatively short. By contrast, in the terminals in this area large numbers of loaded trucks and trailers very frequently waited for extended periods of time at the roadside with minimal rest and welfare facilities available to their drivers. This situation significantly exacerbated the likelihood of the occurrence of serious health and safety incidents, both outside and inside the terminal gates, involving trucks and pedestrian workers and, in at least one of the terminals, had resulted in fatalities. These are areas that we return to in later Chapters, but their influence on shaping the systems and procedures managers in the case study terminals described are important to bear in mind.

### 3.3.2 Health and safety outcomes and performance

In general, managers in all of the case study terminals felt that OHS performance was good and that the management arrangements they had put in place to achieve this were at the very least adequate, with many seeing their terminal as exemplary in the sector. There was also a widespread view among managers that incidents and injuries were almost exclusively the result of workers not following procedures, and a corresponding view that compliance monitoring, coupled with moves to minimise man-machine interfaces, have been particularly significant in bringing about improving OHS performance. For example, the head of health and safety at EU2T2 saw people – their losses of concentration, negligence, failure to follow procedures and lack of supervision – as the biggest safety risk at the terminal. Like their counterparts in most of the other case study terminals, managers here stressed their no blame culture, making it clear that as long as workers had not been negligent then they would be helped to improve, usually through retraining. Similarly, managers at AP2T2 felt that under-reporting had significantly reduced following the introduction of a reporting scheme and their emphasis on not blaming individuals.

Managers at AP2T4 explained that there had been two recent fatal and one serious disability incident, all of which they had concluded were the result of non-compliance with safety procedures. At this terminal, managers felt that monitoring compliance and safety behaviour was pivotal to safety and explained that they hoped to install CCTV in the near future, suggesting that ‘constant surveillance or patrolling’ might further improve safety. Similarly, the operations managers at AP1T2 regarded the interface between people and machines as the most significant risk the terminal’s OHS management system was intended to address. Managers here felt that the use of CCTV and a new system for recording all radio traffic had significantly improved incident and near miss investigations. Their view was that the industry generally was a tough one, with some injuries inevitable and a limited time that people could work in certain areas because they ‘wear out’. The feeling was that the terminal had gone as far as was possible, without becoming automated, in terms of minimising safety problems.

*“...one of the big things that’s helped, that’s really helped in the incident investigations is the cameras. Cameras don’t lie. You know, you talk to three people, you’ll get three different interpretations of an event, but the cameras have been fantastic. And also we’ve got a new radio system where it records all the conversations which is fantastic too, people forget you know, heat of the moment, things like that...”*

[Safety Manager, AP1T2]

Managers in all of the case study terminals also talked about the investigation of incidents, including high potential near miss incidents, and the analysis of their causes, at the terminal level. In addition, safety department managers in each terminal took part in their terminal operating organisations’ arrangements for sharing this information. There were, however, variations in how all of this took place, reflecting both



the contexts in which terminals were operating and their operating organisations' strategic approaches. For example, the employment bodies in the ports in which each Europe area 1 terminal operated had a significant role in the collection of performance data and in incident investigations.

In EU2T1, reports were made to the GNT globally and, depending on incident severity, also to the national labour inspectorate. Here managers suggested that the inspectorate took matters seriously, including concerns reported by workers, visiting fairly regularly – something they felt was not necessarily the case elsewhere in the world. This reflected a view held by managers in both European areas and in Asia Pacific area 1. For instance, managers at AP1T2 explained that the terminal complied with national requirements for reporting incidents of a certain severity, following which the inspectorate would investigate, with the investigation involving a health and safety representative. In addition, health and safety representatives were able to issue a notice to stop work they saw as dangerous (again resulting in an inspectorate investigation), with workers also able to contact the inspectorate directly about their concerns.

In some cases, for example AP1T1 and AP2T1, both of which were operated by GNT 1, corporately shared information on incidents and was also made available to workers. Data sharing extended to areas such as managers' safety interactions with workers, PPE compliance, handrail compliance, near miss reporting and close-out of incidents, that were further linked into KPIs.

Managers in EU2T1 explained that they encouraged all those on the terminal to report all incidents and near misses and were confident that most did so, suggesting further that workers were comfortable about letting them know about any issues or concerns generally. This was a view that managers in all of the case study terminals in both Europe and Asia Pacific shared.

In many terminals, managers had been given corporate level guidance on incident investigation. For example, at AP2T2 managers explained that investigations followed a standard format put in place by GNT 3, that had starting creating 'simulated incidents' displayed on screens in the terminal for all workers to see. However, there were some approaches to trying to reduce incidents and injuries that were specific to individual terminals. For example, the operations manager at EU2T2 described a radical approach to trying to reduce vehicle incidents in the terminal that he felt had been persistently high for some time. In addition to fitting some vehicles with speed limiters, this involved putting vehicles that had been involved in an incident on a trailer 'blood and all' at the entrance to the terminal, for all external truck drivers, as well as workers, to see. Following this, incidents stopped, and vehicle maintenance costs were substantially reduced. On the whole, this individuality reflected the degree of autonomy terminals and their management teams had in designing approaches to the operation of OHS management (as was the case for EU2T2, which was operated by GNT 4 which took a much more 'hands-off' approach than the other GNTs), or the extent of the freedom they had to adapt corporate approaches at the terminal level.

Where terminals' had a (partially) outsourced workforce, responsibility for incident investigation and management varied. For example, in terminal EU2T3, where all dock workers were indirectly employed, all incidents and accidents were reported to the contractor and then on to National 2. Although National 2 tracked and monitored this information, incident investigations were carried out by the contractor. Nevertheless, the safety manager stressed that in the event of any serious incident his department carried out an investigation:

*"...the investigation for general incidents will be done by the third-party labour providers. But at any point where the business – being (names company) – feels there's a risk to the business, or substantial enough to cause concern – that somebody's been seriously injured, or there might be some sort of liability on the business – my team will then carry out a fully detailed investigation. And obviously the contract gives us full authority to do so."*

**[National 2 Safety Manager, EU2T3]**

However, at the organisational level, information about incidents at National 2 terminals were shared regionally and nationally and in some cases where an industry interest was perceived also passed on to the national trade association. The area of outsourcing, and its implications for the arrangements



terminals' management teams made for managing OHS, is one we return to in greater detail in section 3.3.5.

### 3.3.2.1 Health outcomes

All the arrangements described above focus primarily on safety and in most cases managers felt that policies in this area rarely changed. However, the degree to which welfare and health were included in those arrangements, or acknowledged as being an area for future development, varied substantially between the case study terminals, as did their respective occupational health arrangements. In the main this reflected local contexts and traditions. So in Europe, for example, the terminals in Area 1 used external occupational health services in accordance with the legal requirement in place there, while those in Area 2, where there was no such requirement, used a mix of in-house and external provisions which varied in their arrangements, coverage and reach from terminal to terminal. A similarly mixed approach applied in Asia Pacific Area 1, while in Asia Pacific Area 2, terminals predominantly used external medical support for examinations and emergencies.

The greatest degree of awareness and progress in relation to extending systems to incorporate welfare and health were apparent in the terminals in Europe and those in Asia Pacific area 1. This generally reflected leadership and personal 'ownership' of the area at the terminal level rather than corporately led strategy or governance.

For example, at the time of our first visit to terminal EU2T1, which was led by a terminal manager who was strongly committed to leading on OHS himself (by chairing joint health and safety committee meetings), managers explained that a section on health had been added to the OHS policy relatively recently as part of the terminal's wider strategy of broadening its coverage of workers' health and welfare. They stressed that their medical standards (for example, for pre- and post-employment screening) were developed at the terminal rather than following a corporate approach. At that time, the terminal was in the process of producing a number of health-related policies, for example on MSDs (it had carried out a vibration study and was now including a musculo-skeletal function assessment in its pre-employment medical) and mental health (including stress and depression). The terminal had contracted an organisation which follows up employees on sickness absence. The aim was described as assisting the occupational health department to refer workers to a physiotherapist or psychologist as early as possible in any MSD or mental-health related absence. The department was preparing a booklet on health promotion and injury management and prevention to cover areas including fatigue and MSDs (again independent of the GNT globally). The HR manager described recently having written policies for areas including wellbeing and stress management, as well as a stress risk assessment (which was based on standards produced by the national labour inspectorate), explaining that these were produced in consultation with workers' representatives.

Elsewhere in these high-income area terminals, while most provided some on-site occupational health services, there was growing awareness among management of the need to do more in relation to health. For example, managers in EU2T2 felt that health-related issues, such as fatigue and stress, were covered in refresher and induction training to a much lesser degree than safety-related issues. Similarly, the safety manager at AP1T1 felt that there was insufficient emphasis on occupational health in the OHS management system, explaining that there was no fitness to work process. The focus of the health policy at the terminal was primarily on noise, eye safety and UV exposure. Managers referred to the recent involvement on the terminal of a national organisation focused on depression particularly among men that provided on-site mental health awareness programmes, while the terminal itself provided programmes for assisting workers with work and personal emotional and psychological problems.

The operations manager at AP1T2 regarded manual handling (among lashers) and MSDs (among drivers) as the second and third greatest risks risk the terminal's OHS management system was intended to address, explaining that the safe work instructions were designed to specify ways to minimise these risks. For instance, risks associated with lashing, which was identified as one of the most risky jobs, were



tackled through manual handling training, advice on pre-work stretches, toolbox talks and working in pairs, job rotation (between lashing and straddle driving), and the provision of on-site physiotherapy. They explained that drivers had set periods of driving and break time (90 minutes and 30 minutes respectively). These were areas that were included in the terminal's enterprise agreement with the union.

The port level agreement covering EU1T1 specified which categories of dock worker could do which jobs – something that managers were keen to change, preferring to have multi-skilled dock workers who can move from one job type to another. They argued that this would reduce MSD risks by being ergonomically better for dock workers.

Managers in the middle income terminals, often referred to awareness-raising campaigns, many of which extended beyond the terminal. For example, the safety department at AP2T1 was responsible for health campaigns (such as arranging for doctors to visit the terminal and give advice), as well as for safety, health and environmental awareness-raising campaigns aimed at truck drivers, workers' families and so on. They also referred to the ergonomic improvements made, for example, to crane chairs. In this regard, they stressed that crane drivers were trained on a simulator to use appropriate postures and that referrals were made for any drivers suffering from, for example, back problems.

Similarly, AP2T2 managers referred to offering eye, dental and health check-ups as well as to providing regular yoga sessions and a canteen, and there is, in preparation, a policy on violence in the workplace. However, while some managers at the terminal felt that fatigue was an issue as it 'just adds on to safety problems', others felt that it was not a problem as workers were given sufficient rest time and facilities, explaining that the terminal met national working time regulations. In addition, most managers felt that, with the introduction of ergonomic equipment and motivational and promotional sessions (such as yoga), the terminal had no MSD problems, explaining that there had been no serious cases of back pain in the five to six years prior to our preliminary study.

Likewise, AP2T4 managers felt that stress was lower in their terminal than in other terminals because of the provisions of relief, breaks and meals. MSDs were described as not being a problem at the terminal because the workforce was young – with very few workers over 30. The terminal also provided welfare (canteen) and recreational facilities (including chess and setting up cricket and volleyball teams to encourage team spirit). When asked about fatigue among crane drivers, the operations manager explained that workers were provided with ergonomically sound chairs and were encouraged to report tiredness to the supervisor. He said that staffing levels were arranged so that there were five or six 'spare' workers who could be rotated to reduce fatigue and stress levels, something that was possible because of the comparative cost of labour in the area:

*"Here the manpower cost is low so I can afford to have two additional men on the shift who will go around relieving people. ... the workforce here is very young. Most of my operators are in their early 20s..."*

[General Manager, AP2T4]

Owing to the current under-utilisation of AP2T3, the managers' view was that operations such as those involving cranes and truck-trailers in loading and unloading were not excessively demanding. Generally in this terminal, (as with AP2T4), the directly employed workforce was comparatively young and well-educated, with tertiary level educational qualifications. According to management, this was a deliberate strategy aimed at recruitment of a better qualified workforce. A medical insurance scheme was available to the directly employed workers at the terminal that, in the view of the managers was a generous scheme.

In essence, the high-income terminals led the way on the extension of OHS arrangements to cover workers' health and welfare. In these terminals, this varied from relatively recent and fairly extensive attempts to include health and welfare in policies, to an awareness that this is an area in which there was still much work to be done. In the middle-income terminals, the reluctance to acknowledge possible health effects was relatively common, and even where they were acknowledged the emphasis tended to



be on awareness-raising as opposed to preventive policy or procedures. Importantly however, corporate leadership was not obvious in any of the initiatives, with the exception of AP1T2 where procedures and policies on areas including bullying and harassment were described as being led from the corporate level by National 1's HR department – though a number were linked to legislation or to other stakeholders such as the unions and most were aimed at tackling or preventing problems on an individual behaviour basis rather than on considering the often organisational sources of the problems.

### 3.3.3 Worker participation and consultation

Managers in all of the terminals described the various ways in which they disseminated information to workers. These usually included some combination of, for example, toolbox talks, posters, videos, newsletters, emails and access to electronic information, with variations tending to reflect terminal level differences in resources. The arrangements for representative worker participation and consultation that managers described, varied substantially. In the main, this reflected the different legislative and labour relations contexts within which the terminals were operating.

In Europe area 1, where the ports in which both EU1T1 and EU1T2 are situated were strongly unionised, with practically all dockworkers members of one of two or three main unions. Elected union representatives sat on the port-wide joint health and safety committees (although the one for EU1T2 had a narrow mandate, as most OHS issues were handled within each terminal, in which there are also local joint OHS committees) and the unions acted jointly in collective contract negotiations over working conditions. These arrangements reflect strong national and sectoral labour relations' traditions which are supported by European and national legislation. Nevertheless, some differences between the terminals remained because of the different levels of influence held by the two port employment bodies. In terminal EU1T1, where the employment body has a much broader mandate than that for EU1T2, while there was a joint health and safety committee at the port level chaired by the joint employment body which meets monthly, there was no terminal level joint health and safety committee. Managers at the terminal described consulting workers on safe work procedures but referred to some resistance to their introduction. They described regular six-monthly meetings with each category of dock worker but felt there was little interest in these meetings, with few workers attending, and expressed a preference for direct communication with workers, emphasising their policy of encouraging all workers to bring safety issues to management themselves.

Arrangements at EU1T2 are similar, though there was also a terminal level joint health and safety committee on which elected union representatives sit. Here the terminal's safety manager described his department's approach as more one of trying to reach agreements on safe working than formulating, issuing and enforcing procedures.

In Europe area 2, virtually all those involved in dock work in terminals EU2T1 and EU2T2 were members of a single union. In these terminals representation was again through elected union representatives who were members of the terminals' joint health and safety committees. At terminal EU2T1 this committee was chaired by the terminal's managing director and included representatives of other stakeholders such as the human resources and occupational health departments, the civil engineering contractor and the operations department of the contractor workforce. At EU2T2, which had a much larger workforce, each of the four shifts at the terminal had its own joint safety committee chaired by the shift manager. These committees fed information into a container division committee, which in turn fed into the executive committee, chaired by the head of operations. In turn, information was fed back down through these hierarchies, and here again all the committees included representatives of any other relevant bodies (such as the police force).

Managers at EU2T1 stressed that workers were encouraged to provide feedback and become involved wherever possible – for example in areas such as ongoing training. Senior managers talked about consulting workers during the development phase of new procedures and practices, as well as the purchase of new equipment (including, for example, sending small teams to other terminals elsewhere in



the organisation to see procedures or plant in use and discuss it with their counterparts). Their view is that this process, and in particular the provision of information on why certain decisions had been taken, had enhanced workers' 'ownership' and so acceptance of and compliance with new ways of working. They also referred to the introduction of systems for providing feedback to individual workers who, for example, reported a fault with equipment or a defect in the quayside surface.

The management view at both EU2T1 and EU2T2, where workers and their representatives were also described as being involved in areas such as risk assessment and incident investigation, was that workers felt very involved in all of the terminal's safety management arrangements.

In all of these European terminals in areas 1 and 2, workers' health and safety interests were represented by elected union representatives. These representatives were provided with time off from their duties not only to attend the joint health and safety committee meetings but also to prepare for those meetings.

At terminal EU2T3, where union membership was much lower and the whole workforce was indirectly employed, the arrangements described were similar, but the way they were explained as working was different. Here union representatives sat on the joint health and safety committee, as did any other workers who wished to attend, as well as representatives from National 2 and the port's police force. However, managers made it clear that reps' and workers' attendance depended on operations and, further, that the union representatives were tolerated rather than seen as contributing to OHS arrangements and management:

*"...we recognise a number of union safety reps – mainly 'cause we have to ... the problem is... they don't talk to each other. ... I think they could talk better. They'll say, when they come in, that no-one's listening to them, but unfortunately they don't understand how big business works, and I think they just think "there's a problem; let's throw a pile of money at it, it'll be done tomorrow" and life's just not like that; so you have to prioritise. And it's like... we encourage the shop floor to put hazard observations in, and then... but sometimes you need continuous hazard obs for the same hazard, for it to upscale and then become a greater priority; it depends on what it is..."*

**[Contractor Operations Manager, EU2T3]**

Nevertheless, managers felt that the committee did provide two-way communication. They also described an 'improvement group' which consisted of volunteer workers representing various groups (crane drivers, stevedores etc.) that was intended to pass on workers' concerns to managers. However, they felt, although they had tried to encourage it, that this group did not work very well. It was also clear that workers and their representatives had significantly less, if any, involvement in areas such as risk assessment and incident investigation than their counterparts in the other case study terminals in Europe area 2.

Turning to Asia Pacific area 1, in both case study terminals (where virtually all dockworkers were members of the same union), as in those in Europe area 1 and terminals EU2T1 and EU2T2 in area 2, regulatory requirements for terminal-level joint health and safety committees were met and representation on health and safety was increasingly by elected union officials.

At AP1T1, in the event of a proposed change to any part of the OHS management system, managers described a consultative process involving workers. For example, before a proposed change to a procedure, managers put together a team involving workers and a safety facilitator to consider the change and the work instruction modification. Tiered documentation from policy procedures to work instructions was provided, with work instructions providing basic task descriptions. When these were produced or changed, workers who use them were usually involved in their development and/or review. Workers were also involved in risk assessments and the terminal had a worker engagement programme designed to get workers involved – for example by putting together a team to work on the recent development of standards (in relation to mirrors, seat belts etc.) for the terminal's internal transport vehicles.



There was, however, clear tension between the terminal's management and the union at the time of our study. For example, the safety manager described compliance with PPE use as at about 99% and felt that the shortfall, which he regarded as larger than that for other safety critical industries such as mining, reflected dock work culture and union insistence that workers should not accept direct instructions from management. Similarly, the terminal manager felt that the union was trying to use its involvement in industrial relations meetings to buy in to health and safety discussions. Similar tensions were also apparent at AP1T2 at the time of our case study.

The operations manager at AP1T2 described a recent dramatic reduction in incidents across the organisation (National 1) following a significant change of focus at the highest level of the company. The number of health professionals in the organisation was substantially increased, which he felt had led to a cascading down of emphasis on the importance of proactivity and worker engagement. This in turn had prompted an increase in safety walks and talks with workers, as well as in consultation. His view was that this corporate change had been instigated for three reasons: first the change of the most senior managers; second a fatality at a sister terminal (which he felt had occurred because the worker was not following the safe work instructions); and third the legislative change making business owners liable for workplace incidents.

In Asia Pacific area 2, union density varied substantially, as did union independence (Table 3.2), since not only were independent dockworkers' unions not present in all of the terminals and party to negotiated Collective Bargaining Agreements only in some, but in most cases the companies had set up their own 'company unions,' making workers' representation more complex and led to a situation in which the majority of workers were either unrepresented, or represented by 'company unions'. This had an impact on arrangements for representation and consultation, though the management view was that these arrangements were effective and functioned well.

*Table 3.2: Employment and unionisation levels in the case study terminals in the second Asia Pacific area*

| TERMINAL AND GNT | TOTAL WORKFORCE SIZE | PROPORTION OF WORKFORCE INDIRECTLY EMPLOYED | UNION DENSITY      |                   |
|------------------|----------------------|---------------------------------------------|--------------------|-------------------|
|                  |                      |                                             | Management 'union' | Independent union |
| AP2T2, GNT 3     | 1083                 | 71%                                         | 23%                | 57%               |
| AP2T1, GNT 1     | 751                  | 54%                                         | 56%                | 7%                |
| AP2T3, GNT 1     | 560                  | 54%                                         | 20%                | 11%               |
| AP2T4, GNT 2     | 527                  | 72%                                         | NA                 | 14%               |

At AP2T1, for example, where under 10% of the workforce was represented by an independent union, managers explained that the joint health and safety committee meetings were attended by safety department managers, the CEO, the heads of all the other departments and representatives of the contractors and each group of directly employed workers by job type. Managers felt that representatives were willing to participate and provided useful feedback about the work. They explained that representatives were kept free from their duties to be able to attend the meetings and went on to say that workers were involved in any changes to procedures and equipment purchases.

Terminal AP2T2 had the highest proportion of independent union membership at over 50%. Here again there was a joint health and safety committee meeting attended by workers or their representatives as well as managers. Managers described these meetings as well attended and involving 'healthy discussion' and 'not fault finding' but 'fact finding' with a view to improving existing systems. They explained that workers were encouraged to come up with their own ideas, for which they were rewarded. They were hoping to re-institute the port level safety meetings that used to take place, but at the time of our preliminary study this had not happened. Workers or their representatives were involved in inspections (for example of electrical substations) and in PPE procurement by being given equipment to try and



provide feedback. The terminal had a system of life expectancy for PPE (which managers explained, in some instances, workers had challenged and reduced). The terminal's 'internal' union was described as being involved in the development of policies and practices on which it was asked to sign off – at which point they could make suggestions or raise safety issues, though managers said that this was rare.

AP2T4, however, had no joint health and safety committee. Managers explained that there had been one in the past that had involved workers' representatives, but it was no longer in place as workers had not supported it by attending meetings. Managers did refer to 'regular dialogue' which they felt covered safety issues. There was also a regular managers' safety committee meeting chaired by the terminal's general manager. The terminal had a suggestion box but no-one had made any suggestions. The system of duty safety inspectors, in which workers carried out inspection in rotation, was seen as more successful for two reasons. First, those involved in the inspections were more safety conscious during their normal work and second, they provided a further opportunity for feedback. Managers encouraged feedback and held monthly welfare meetings at which directly employed workers could air their views, particularly if the regular channels (reporting to a supervisor who reported to a manager) had not resolved the issue.

Overall, arrangements for representation and consultation appeared to be broadly similar in most terminals, but in practice their operation varied within the prevailing labour relations contexts. Nevertheless, managers generally thought that the systems in place in their terminal worked well. There was a tendency, in Asia Pacific area 2 in particular, to equate lack of engagement on the part of workers with lack of interest in, or perhaps even need for, communication – despite the fact that safety committee meetings (where they existed) tended to be arranged without reference to representatives' ability to attend.

### 3.3.4 Work organisation and arrangements for its management

In comparison with arrangements for managing safety, there were considerably fewer arrangements in place for managing the impact of work organisation. When asked about this area, there was a tendency among some managers to suggest that it was something over which they had relatively little control or ability to influence.

For example, the port level agreement covering EU1T1 specifies numbers of dock workers required in teams both on the quayside and on-board vessels, with employers liable for contractual fines if they do not follow the requirements. Here managers felt that while following these stipulations, they kept the numbers of dock workers to a minimum, at the same time ensuring that there were enough present for the work to be done safely. They suggested that work was often carried out at high speed at the instigation of workers who wanted to be able to finish early. Some did acknowledge that on occasion dock workers may take on 'economic responsibility' themselves (by working at high speed because of a perception that this was what management wanted, for example, to get a ship ready to leave with the incoming tide), but stressed that this was against their clear instructions on always putting safety first. They suggested that this conflict between safety and productivity was difficult for them to handle because of the long distance between management and the workforce.

Similarly, the EU2T2 head of health and safety acknowledged that the terminal's 12 hour shifts on a four on four off pattern might be a contributory factor in terms of incidents by creating fatigue, but stressed that the workforce liked this arrangement and would resist any change to it, and went on to describe training through which he felt that 'people are given the tools'. He explained that the terminal followed local working time regulations, and that the occupational health department carried out night worker assessments part of regular (five yearly) medical check-ups, while the safety department also carried out periodic assessments of working hours to prevent excessive overtime.

As was also common in many of the terminals, workers at AP1T1 could earn productivity bonuses, while managers had bonuses linked to their regional OHS KPI targets. The safety manager acknowledged some incentive for shortcut-taking associated with the productivity bonus, but felt that this had been



successfully addressed by management's emphasis on the importance of not taking short-cuts (illustrated by its recent 'don't die for a deadline' awareness-raising programme). He explained that he was currently trying to correlate safety performance and productivity for each team to check on this, with a view to possibly developing a reward scheme (probably in the form of vouchers) in relation to safety.

In AP2T1, where managers stressed that safety always came first in the balance between business and operations and that employees were made aware that safety should never be compromised, the safety department manager referred to a time management system for monitoring any instances of work over 12 hours. Similarly, AP2T4 managers explained that the terminal followed ILO guidelines on working time. This meant ensuring that workers did not do more than 48 hours per week, though on occasion workers might be asked to do more but that this never exceeded 62 hours.

Overall there was relatively little in what managers told us that focused on strategies for managing the impact of work organisation on workers' safety, health or welfare. This is perhaps summed up by the operations manager for the contractor at EU2T3:

*"It's just that things have changed; you used to be able to just climb on the container and you can't do that now; it's just stepping on that chair's "working at height" now ... a lot of that's down to the media ... "where there's a blame, there's a claim" and stuff like that. So safety has moved on – it's had to move on, rightly or wrongly. ... I think it can hold you up, but it is obviously there for the greater good. There's nothing wrong with Health and Safety, it's just having the right pragmatic approach, isn't it?"*

[Contractor Operations Managers, EU2T3]

### 3.3.5 Outsourcing

In seven of our case study terminals, those in Europe area 2 and Asia Pacific area 2, at least a proportion of the workforce was outsourced and this had implications for OHS and its management.

Turning first to Europe area 2, as described above both EU2T1 and EU2T2 have strong traditions of full direct employment among dock workers but each has experienced changes in this area in recent years. In EU2T1 approximately half the 400 strong workforce is directly employed by GNT 1. The rest of the workforce is supplied by a contractor which has been in place for many years. With the exception of crane driving, indirectly employed workers can carry out all the same duties as their directly employed counterparts, but they are more often used in work on-board vessels than directly employed workers. As a result, although most of the indirect workforce is multi-skilled, around 15-20% are only trained in padding and lashing.

In terminal EU2T2 at the time of the case study a trial had just begun of an indirectly employed workforce in addition to the over 2000 workers directly employed by GNT 4. The senior union official at the terminal explained that any indirect employment had been strongly resisted by the union for many years but that, in response to the opening of a new terminal run by a rival operator in the same area, a trial use of contract workers alongside the directly employed workforce was underway. Here managers explained that, in addition to more flexible contracts, some of these workers' conditions were different – for example they could drive for three hours continuously, rather than the two and a quarter hours allowable under the collective agreement that covered the main workforce. Managers also described these changes as a response to current competition in the region.

In both these terminals, health and safety management processes and arrangements were extended to cover indirectly employed workers and the terminals' management sought to influence contract organisations in terms of OHS. Despite these efforts, however, there were some differences in their working conditions and arrangements (for example in relation to shift patterns, time off and breaks), that in terminal EU2T1 had led to a view among these workers that they are given poorer quality jobs.



As described in section 3.3.1, the entire operational workforce at EU2T3 is outsourced. As in terminal EU2T1, the single contractor had been in place for some years, but in this case, as part of a competitive process, it periodically has to re-tender for the work. National 2 managers at the terminal felt that outsourcing labour provided job security because it reduced running and overhead costs. The National 2 safety manager explained that the contractor worked to National 2's safety management system requirements. This meant that policies and procedures, safe working practices and safe systems of work were driven by National 2, with day-to-day supervision of those systems by the contractor and an overseeing perspective from National 2 shift managers, supervisors and safety department staff. Information was disseminated via a two-tier system, with National 2 holding daily briefings with the contractor and the contractor then briefing their operational teams. This was described as a continuous loop of communication. National 2 also set the contractor a series of operations, finance, and health and safety KPIs, as well as including requirements in relation to capacity for safety management in its tender specifications. National 2 managers were able to stop work and dismiss workers immediately, although managers explained that they generally took a 'coaching' approach or simply notified supervisors of any minor issues.

The terminal operated a hazard observation system through which workers could report issues and near misses. This information was checked and actions assigned by National 2, and all information was available to both National 2 and the contractor managers. Contractor managers were confident that workers did make reports, particularly if they saw National 2 spending money on improvements. There was a view among the contractor managers that workers trusted that contractor managers did as much as they could to address concerns but that they were limited by what National 2 would do. This reflected tension between the contractor manager and National 2. For example, the contractor operations manager explained that National 2 notified him of its requirements for the following day between 13.00 and 15.00, with consequent difficulties for planning its guaranteed 40 hours per week of work for all operational staff. Managers explained that, as a result, though they tried to give workers sufficient time off between blocks of day and night shifts, and tried to ensure they had one day off in eight or two in 12, this was not always possible (though they stressed that national requirements on working times were met). These arrangements meant that workers called the contractor management team each afternoon to find out whether they were working the following day – meaning that managers dealt with around 200 calls each day on this issue alone and workers had very limited notice of their working arrangements. Management described communication with National 2 as 'a big problem' as the organisation assumed the contractor had lots of staff available to do anything at any time (for example, requesting extra staff above the standard hire maximum when they wanted to keep one of their clients happy). They stressed that this reflected the relationship with those middle managers setting requirements on a daily basis, whereas those at the more senior level were seen as being more understanding.

In Asia Pacific area 2, all the case study terminals in this region were operated by a mix of indirect and directly employed workers and in each case indirectly employed workers made up the majority of the total workforce (see Table 3.2). Generally, most of the contract labour was accounted for by a relatively small number of contractors (fewer than 10) that had a long-standing relationship with the terminals' management. So although some turnover is experienced among contractors, managers in these terminals felt that hiring contractors was stable. The general approach to contracted out work suggested by managers was that the terminal operational activities (i.e. management and administration, loading and unloading operations including crane operation, safety services, maintenance and engineering) remained under the control of directly employed workers. In fact, outsourcing was more extensive than this in all the terminals. In addition to catering, cleaning, building and repair, it also included truck-trailer and lashing operations and there was further outsourcing of rubber-tyre gantry crane operation and other specialised work.

In most of these terminals, managers referred to systems for specifying safety requirements contractually, against which organisations were monitored and if necessary, sanctioned. For example, AP2T1 safety managers explained that contracts included clauses covering aspects such as the requirement for annual medicals and a maximum shift length of 12 hours. Contract workers were issued with a card after induction training, which expired after a year – to ensure they received refresher



training. Managers stressed the importance of ensuring that contractors were aware that they had to work to AP2T1's standards. They described terminating the contract with one organisation which repeatedly allowed workers to work extra hours. Similarly, at AP2T2 contractor organisations were monitored to ensure that workers did not work excessive hours. Contracts included requirements in relation to health and safety (for example, pre-work medicals and subsequent regular medical reviews), and managers explained that they planned to include further mandatory requirements (for example covering training and the need to have their own safety programme) in the future. Contractors were also audited by AP2T2 managers, and required to have their own safety manager who acted as a contact point for the terminal management team, and were encouraged to use the same PPE procurement agencies as the terminal, to ensure consistency. At AP2T3 the procurement procedures also required specification of health and safety standards by tenderers. Managers indicated that they believed health and safety requirements on contractors had increased in number and rigour. There were special provisions to manage contractors and their workers and a manager with responsibility for the oversight of this and relations with contractors.

Performance was monitored and occasionally contracts terminated if performance is deemed unsatisfactory. Qualifications of contractor employees were checked and training provided to all, with satisfactory completion of training required. Management at AP2T4 sought to influence health and safety among contractor organisations by including non-negotiable terms in their contractors (for example, requiring contractor staff to undergo the terminal induction training to obtain a port pass as well as regular refresher training, and requiring each contractor organisation to have a safety officer. If this was not possible, having safety checks supervised by the terminal's management; and requiring the use of PPE and following of safety rules and procedures). In addition, contract workers at AP2T4 were subject to the same safety systems and procedures as directly employed workers, including being obliged to follow the same GNT 2 provided training and having their working hours monitored to prevent excess working, as well as being subject to safety rewards and penalties, with violations further linked to contractors' payments. Managers were clear that any health and safety problems experienced by contract workers were the contract organisation's responsibility.

Most terminal managers in the Asia Pacific area 2 case studies said that they could discipline individual contract workers for non-compliance. However, at AP2T2 managers explained that if they found individual contractor workers involved in unsafe work they went through the contractor rather than approaching the worker directly – except in the case of non-use of PPE. At AP2T4, in terms of monitoring safe behaviour, information was provided to all contract organisations concerning safe behaviour and the procedures for monitoring it. Incidences of unsafe behaviour were reported to the contract labour manager and an inquiry would be conducted with the supervisory staff of the contractor. There were follow-up procedures in place to address breaches of the safety system and a range of penalties could be applied from warnings through to suspensions and dismissal. Managers at AP2T4 had instigated a joint inspection system in which all contractors had to participate. This was described by managers as being a response to poor safety monitoring and supervision by contractor managers. It involved fining the contractor organisations for workers' breaches of regulations, such as non-use of PPE. If contractors were deemed to be at fault in an incident they could be required to pay for any costs incurred, and individual workers (direct or indirect) were issued with warning letters. Managers were clear that their current approach in relation to contractors was not participative:

*"...the other safety aspect is the behavioural aspects. That's where, for example, it's more characteristic here and some of it is more, I would say, punitive which I think eventually will become more participative. ....basically we do have dialogues with the contractors and then we discuss it and procedures that we are implementing but encouraging them to implement without forcing them is not workable at this point of time – here in[names area]. So we have to say you have to implement this ... At this point of time ... the people here are not ready to just adopt the safety practices voluntarily."*

**[General Manager, AP2T4]**



There was also considerable variation in relation to the facilities and conditions afforded to contract workers in these terminals. For instance, in AP2T1 the terminal's canteen was available to all - indirectly as well as directly employed workers. At terminal AP2T2, managers stressed that indirectly employed workers had access to terminal facilities (such as the canteen, free 24 hour paramedic service, on-site health centre, and eye, dental and health check-ups), as well as going through a similar induction process and the same terminal-provided refresher training. Similarly, at AP2T3 employees of contractors were eligible to be part of an employee providence fund and there were checks in place to ensure benefits were paid. Welfare facilities for contractors, however, were provided in containers dedicated for this purpose, and there were toilet facilities and drinking water located near them. Managers said that the terminal company was willing and able to provide canteen facilities but explained that this had not been done because contract workers did not wish to pay for it (though there was a suggestion that it would be included in future contracts). AP2T4 managers also acknowledged that direct workers had better conditions than indirect workers in terms, for example, of medical insurance but felt this was not something they could influence. They explained that while they would, for example, ask if a direct employee was OK if they looked tired during a toolbox talk, this kind of monitoring was not in place for contract workers.

Arrangements for participation and consultation also varied. For example, at AP2T1 managers stressed that representatives of the contractor organisations were included in joint health and safety committee meetings. However, contract workers had their own representatives and contractor organisations held their own health and safety committee meetings. At AP2T2, managers explained that the monthly contractor meetings were run by terminal managers and attended by senior contractor staff and representatives of their workforce. Managers discussed any unsafe acts and incidents involving contract workers, as well as passing on any other information, including from, for example, their monthly inspection of contractors' vehicles. At AP2T3 there were monthly meetings between contractors and their workers and the terminal management responsible for them during which they would be given information concerning new projects, actions concerns and expectations. There were opportunities to raise issues at these meetings, which were generally attended by some 50 to 60 contractors and their workers. Terminal managers stressed the importance of hearing the views of contractors.

In essence, while outsourcing of labour was present in the terminals in Europe area 2 and Asia Pacific area 2, there were differences between the regions in the way this was managed, reflecting national contexts and, in particular, prevailing conditions in relation to outsourcing more generally and labour relations arrangements. On the whole managers expressed the view that they operated safety management systems that cared for *all* workers, including those who were employed by contractors and they were doing as much as they could to minimise risk to their safety, health and welfare.

The subsections above that make up section 3.3 have used the views, perspectives and descriptions of *the managers* that took part in our research to outline how the policies of the organisations running the case study terminals were translated into terminal level arrangements, systems and procedures. From their point of view, as in the previous study, these terminal level arrangements were generally seen positively and described as being effective and sufficient.

### 3.4 But from the workers' perspective?

The foregoing account provides a rich description of health and safety governance and management at both corporate level and within the business units represented by the container terminals, as seen from the perspective of managers, supervisors and occupational safety and health advisers. In the main, they described a set of systems that appeared broadly similar (though there were often, in fact, differences in operation and practice, particularly in relation to worker participation) and which focused primarily on safety – with relatively little inclusion or coverage of health, welfare and work organisation. There was a general sense among these interviewees that the arrangements and systems in place in their terminals were effective – with, for example, safety performance seen as being good and arrangements for worker participations as working well. They were inclusive – such that, for instance, systems were described as



covering indirectly employed workers as far as was possible and they were sufficient – in that they covered all the areas over which management control was perceived.

Workers participating in the previous study who experienced the operation of these arrangements, as well as their trade union representatives, did not always share these perspectives. Indeed they were critical about the effectiveness of the provisions made. A similar view was shared in the interviews with workers and their representatives in the present study. In short, in our qualitative data, a gap was clearly evident between what the systems in place were intended to achieve in terms of the experience of a safe and healthy work environment as they were described by the managers and the safety advisers who were responsible for their operation and the ‘lived experience’ of this environment as presented to us by workers and their representatives. The latter experience led our respondents to comment on their terminals’ provision for OHS in two rather different ways.

On the one hand, while they acknowledged the existence of arrangements and systems in place to manage safety at the terminals, they questioned the effectiveness of these systems in terms of the extent of protection they offered to their *safety, health and welfare*. Essentially, they presented a less optimistic view of their effectiveness than that offered by managers and they were critical of other effects of these systems in relation to their behaviour monitoring and disciplinary elements. A further consequence of these elements was that workers and their representatives clearly felt that the opportunities these systems offered them to share more effectively their concerns and perspectives on health and safety at work with management were quite limited.

On the other hand, the concerns for their health, safety and welfare that emerged from interviews with workers and representatives were less a denial of the existence of the arrangements for governance and management of safety and health that managers had described to us, and more a comment on their applicability to the experience of work in the terminals. That is, they generally did not deny the existence of the arrangements described in the previous sections, nor doubt the visibility of the corporate commitment to its goals for safe behaviours within the terminals. They did, however, question their relevance to the effects of the primary aims of the businesses operating the terminals, which were to do so in increasingly productive and cost efficient ways. Many respondents in both the present and previous study expressed the view that these issues were the over-riding concerns that drove the culture of work within the terminals – and not that of the ‘safety culture’ promulgated as the aim of governance of safety. This, they told us repeatedly, had resulted in much of their daily experience of harm being entirely missed by the systems in place to prevent it.

It was to explore the extent of these perceptions further that we undertook the questionnaire-based survey of the experiences of workers and we turn to our analysis of its findings in the following Chapter.



## 4. Workers' OHS Experiences

This Chapter presents findings on dockworkers' experiences in relation to safety, health and wellbeing, as well as their experiences of the systems, procedures and arrangements in place in the terminals to manage their health and safety described, using the perspective of managers, in the previous Chapter. The evidence is drawn from our analysis of the findings of the questionnaire-based survey we used in each of the participating terminals. The aim of the Chapter is to present a sufficiently detailed account, based on quantitative evidence, of the experiences of workers in the terminals we have studied to inform the evaluation of company arrangements globally, described in the previous Chapter to address these matters. Our evaluation of these arrangements will be presented in subsequent Chapters – the objectives of the present Chapter being simply to present our analysis of this experience in relation to a set of issues of health safety and welfare – that arguably, such arrangements should address and on which there were indications in the previous report that there may be a gap (see Walters and Wadsworth, 2012: 81-92).

After giving some brief details about the survey respondents, we present descriptive accounts of the survey findings concerning their experiences of work-related safety, health and welfare, and of the way in which their health and safety was managed and their work arranged. This is followed by an analysis of the associations between workers' health, safety and welfare and their working conditions and OHS management experiences. The material obtained from the organisations running the case study terminals presented in the previous Chapter suggested that the approaches taken by the terminal operating companies to OHS governance and management are broadly similar, derived largely from strategies developed at a global level (at least as far as the GNTs were concerned); and further that OHS performance is generally improving, with terminals in developing economies showing the lowest incident rates. This implies that workers' experiences should be similar across the participating terminals, with relatively few experiencing incidents and potential incidents. This Chapter, therefore, assesses differences and similarities, in particular between respondents from the four different regions included in the study.

### 4.1 Survey respondents

Most of the respondents to the questionnaire survey worked in terminals operated by GNTs (1619, 88%) as opposed to companies operating at a national level (230, 12%). Findings presented in this Chapter are drawn from survey respondents working in GNT-operated terminals. However, section 4.7 considers how responses from those working in terminals run by national operators compare with those of the other respondents. Virtually all the respondents were male (1505, 98%), and most were aged between 20 and 50 (20<30: 458, 29%; 30<40: 420, 26%; 40<50: 420, 26%). It should be noted here that every effort was made to ensure that women were included in the surveys wherever possible, and further that, broadly speaking, this gender balance reflected that which our research teams observed during their case study visits to terminals. About two thirds (931, 60%) were directly employed, and most had been in their job for between one and 15 years (1<5 years: 411, 26%; 5<10 years: 453, 28%; 10<15 years: 313, 20%). Most worked in jobs involving crane and/or horizontal transport, followed by quayside and/or on vessel work and jobs combining both these sets of tasks (Table 4.1).

*Table 4.1: Questionnaire survey respondents jobs*

|                                                                      | N   | %  |
|----------------------------------------------------------------------|-----|----|
| A: Quayside or on the vessel (lashing and/or receiving and delivery) | 415 | 26 |
| B: Driving (crane operations and/or horizontal transport)            | 598 | 37 |
| C: Maintenance or other roles                                        | 181 | 11 |

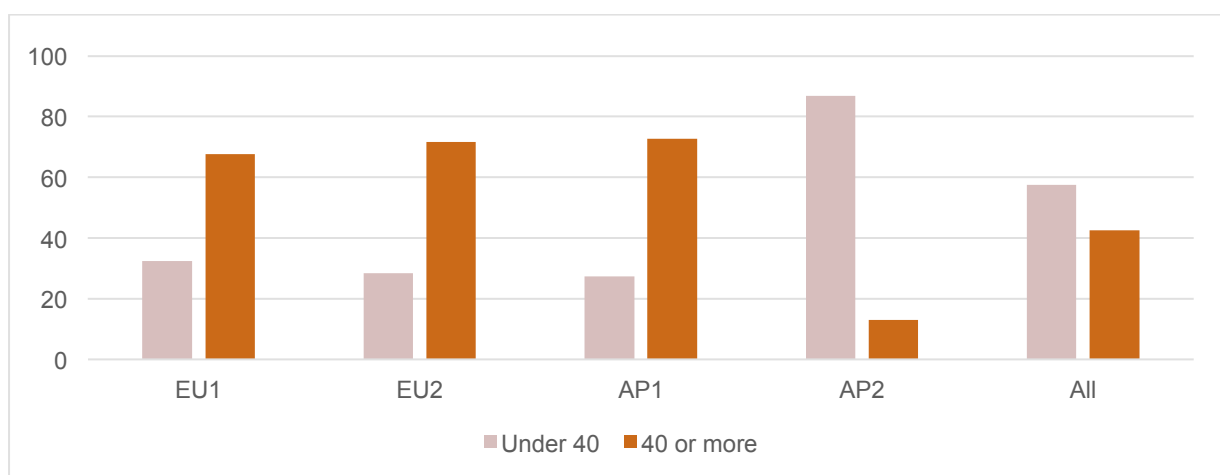


|                           |      |     |
|---------------------------|------|-----|
| D: Jobs combining A and B | 419  | 26  |
| TOTAL                     | 1613 | 100 |

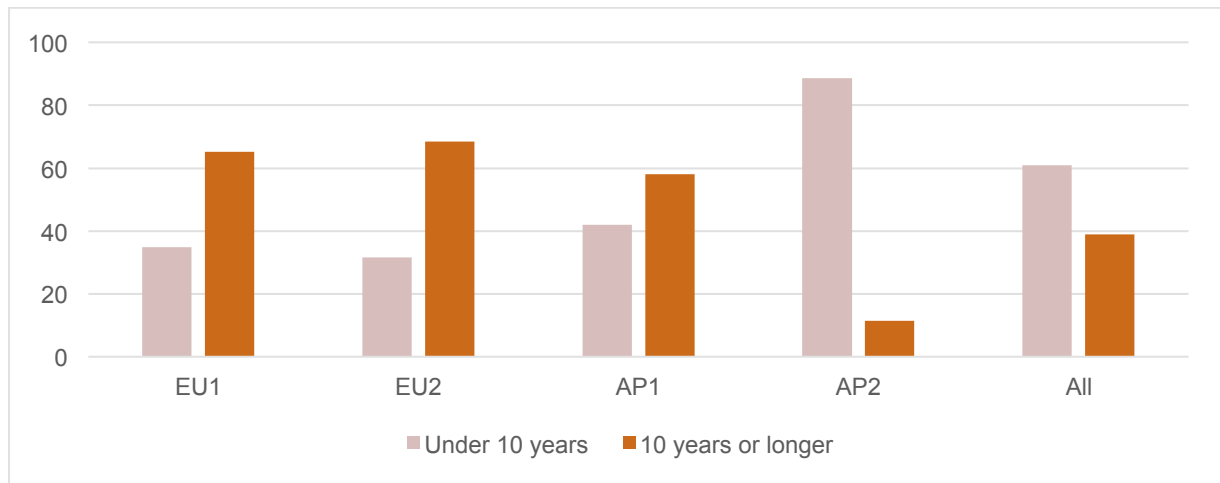
There were, however, significant differences in all these areas by region of employment. Of the 35 female respondents, two-thirds (23, 66%) worked in the terminals in the first European area (chi-square = 39.78, 3df,  $p < 0.0001$ ). This was consistent with our interviewees' reports of the numbers of women working in the case study terminals. Almost all those who were employed by a contractor or subcontractor (rather than by the GNT operating the terminal) worked in the second Asia Pacific area terminals (514, 99%). Ninety-six respondents, 27% of those working in the first European area terminals, were day hire workers. They have been included with indirectly employed workers for the purposes of the following analyses. Second Asia Pacific area terminal workers were also much more likely to be younger and to have less experience than their high income economy counterparts (chi-square = 530.15, 3df,  $p < 0.0001$  and 476.45, 3df,  $p < 0.0001$  respectively; see Figures 4.1 and 4.2). And as is clear from Figure 4.3, roles combining quayside and/or vessel work with driving were very uncommon in the Europe area 1 terminals and were most common in the first Asia Pacific area terminals (chi-square = 284.71, 9df,  $p < 0.0001$ ).

The sample therefore can be considered as having features typical of what might be anticipated for dockworkers in container terminals situated in the three continents studied. Its profile reflects the economic and regulatory contexts and labour relations traditions of the areas in which the terminals were operating (see for example Turnbull, 2012:517-548). The historical role played by organised labour in helping to determine patterns of employment in dock-work, alongside its resilience in at least some docks in the high income countries included in the study, combined with the regulatory frameworks within which it is embedded in these countries, have been influential in explaining differences in relation to gender mix, use of contract workers, age profiles and job demarcation patterns observed in the sample. The point to stress here is that this is the nature of the labour force employed by the container terminals companies to work in the terminals they operate. It is these features that the companies need to take into account when designing health and safety management strategies and arrangements to protect and promote health, safety and welfare among workers in the container terminals. We turn to the workers' experience of these matters next.

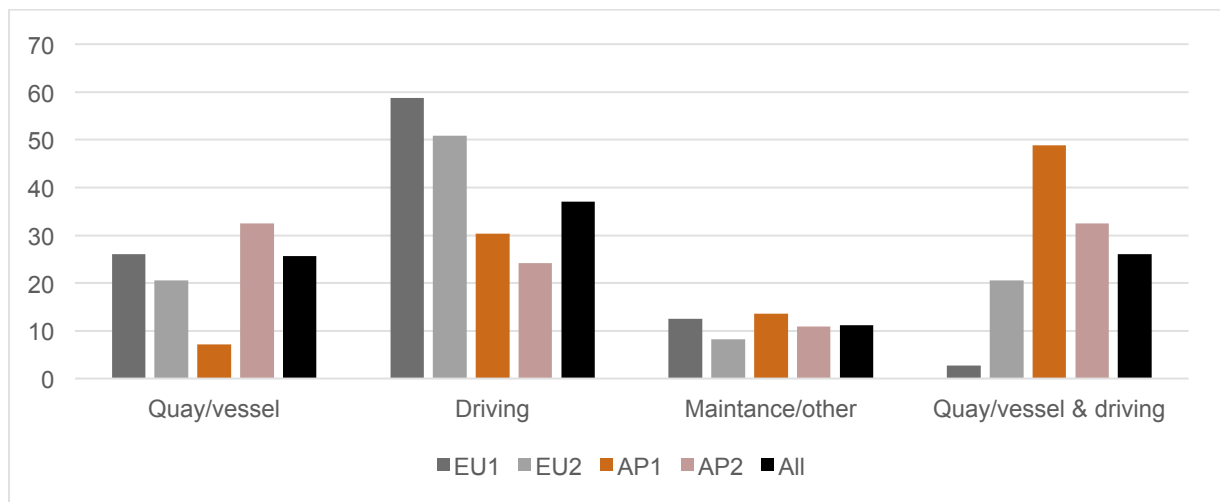
*Figure 4.1: Proportion (%) of respondents aged under 40 and aged 40 or older by area of employment*



*Figure 4.2: Proportion (%) of respondents with less than 10 years' experience and 10 years' experience or more by area of employment*



*Figure 4.3: Proportion (%) of respondents in each job type by area of employment*



## 4.2 Safety experiences

The questionnaire survey measured respondents' safety experiences in two ways. First, it collected their perceptions in relation to risks to their safety and second it focused on safety incidents.

### 4.2.1 Perceptions of safety risk

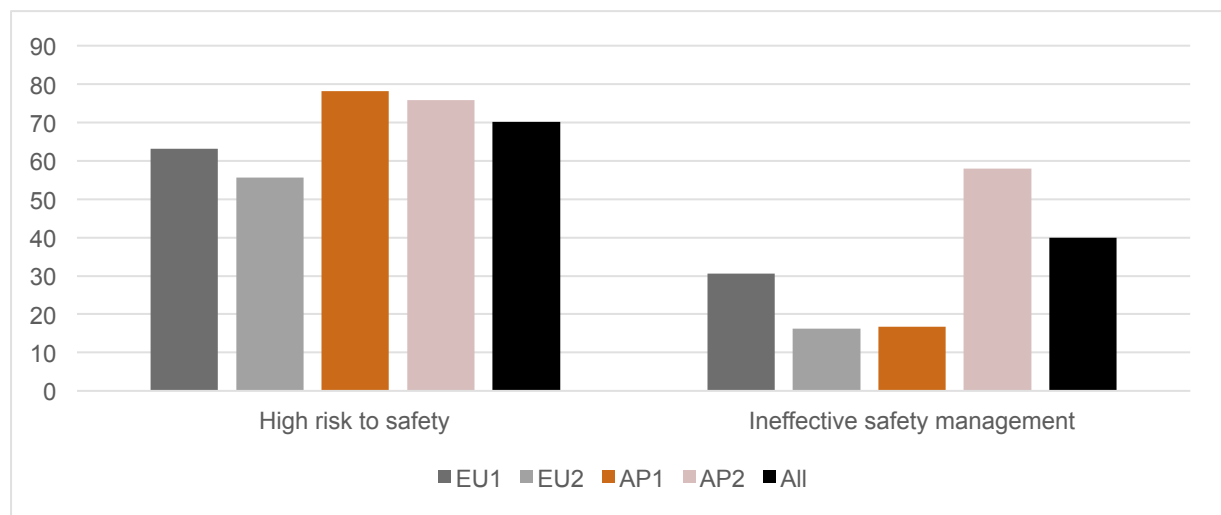
Perceptions of risk to safety were measured using two 5-point scales assessing:

- The extent to which respondents thought their safety was at risk because of their work
  - 1 = Not at all; 5 = Extremely
  - High risk to safety was defined as selecting 4 or 5 on this scale
- The effectiveness with which respondents felt the health and safety policies, procedures and practices covered the safety risks in their jobs
  - 1 = Not at all effectively; 5 = Very effectively
  - Ineffective safety management was defined as selecting 1 or 2 on this scale



Overall, 70% of respondents felt there was a high risk to their safety and 40% that the risks they faced to their safety were ineffectively covered by the OHS management arrangements. These proportions for the respondents as a whole group show high levels of concern among workers about their safety and the arrangements in place to protect it. Within each of these two areas, however, there were also significant differences by region of employment (chi-square = 51.46, 3df,  $p < 0.0001$ ; and chi-square = 213.77, 3df,  $p < 0.0001$  respectively; Figure 4.4). Perceptions of high risk to safety were most common in the first and second Asia Pacific areas (over 70% in each case – though it is important to note that over half of the respondents in the two European areas also felt their safety was at high risk, indicating generally high levels of perceived risk to safety among all groups). Concerns about ineffective safety management were most common in the second Asia Pacific area terminals – the rate for respondents from the terminals in this area was approximately double that of the respondents from the region with the next closest rate (Europe area 1).

*Figure 4.4: Proportions (%) of respondents reporting poor safety perceptions by area of employment*



#### 4.2.2 Safety incidents

The questionnaire asked respondents whether they have been involved in any incidents in which they were injured and in any near misses in the previous 12 months.

In total, one third of respondents (33%) reported having been injured in the previous year. Most common incidents were slip/trip/fall and body strains/manual handling (36% and 29% respectively of those injured) and most (83%) respondents reported them to their employer.

Nearly two-thirds (60%) of the respondents had been involved in a near miss and a little over a quarter of these (27%) had had five or more near misses in the previous year. These were most commonly vehicle collisions and slip/trip/fall (46% and 28% respectively of those reporting one or more near miss), and a little over half (57%) reported the most recent near miss to their employer.

These figures suggest that incidents resulting in or with the potential for injury are relatively common. This is further supported by data from the sub-set of our questionnaire respondents who completed diaries. Here, in four consecutive shifts, an average 6% of respondents per shift reported being involved in an incident in which they were injured and 27% in a near miss (ranges 4-9% and 20-32% respectively). However, the diary data must be considered with some caution because of the relatively small numbers involved.



The questionnaire survey data showed differences by region. Proportionately more respondents from the first European area terminals and fewer respondents from the second Asia Pacific area terminals reported having been injured in the previous 12 months (43% and 24% respectively compared to 38% in the first Asia Pacific area and 37% in Europe area 2; chi-square = 47.55, 3df,  $p < 0.0001$ ). Those in the second Asia Pacific area terminals were least likely to report these incidents (71% compared to 93% in Europe area 1, 89% in the first Asia Pacific area and 86% in Europe area 2; chi-square = 33.99, 3df,  $p < 0.0001$ ). Nevertheless, as we discuss below, the proportion of respondents from terminals in this region reporting injury was still substantially higher than the GNT supplied data described in the previous Chapter would lead us to expect.

Near misses were more common in respondents from the first Asia Pacific area and second Asia Pacific area terminals (67% and 65% respectively compared with 57% and 43% respectively in Europe areas 1 and 2; chi-square = 41.73, 3df,  $p < 0.0001$ ). In this case, those from the first European area terminals were least likely to report their near miss (46% compared to 54% in Europe area 2, 60% in the second Asia Pacific area and 62% in the first Asia Pacific area; chi-square = 10.44, 3df,  $p = 0.02$ ).

Reporting levels are important because they determine the accuracy, and therefore reliability and usefulness of official company incident data. Our survey suggests that such data may underestimate injury rates by a little over 15%, but that this underestimate varies by region from under 10% to nearly 30%. As would be expected, near miss or high potential incident data are likely to underestimate workers' experiences substantially. Our interview data suggest that these differences tend to reflect problems with reporting procedures and systems and/or concerns about the consequences of reporting incidents, which we will discuss further in the following Chapters. It is worth bearing in mind two important points. The first is that whatever model of health and safety management is adopted by a company – for example, whether it takes a traditional view of trying to reduce lost time accidents as an indicator of OHS improvement or whether it distinguishes from this a more concentrated attention on safety critical incidents. Successful outcomes from either approach depend upon the comprehensiveness and quality of the reporting. As shown in many other studies, workers and their representatives play a key role as the eyes and ears of the system in terms of gathering intelligence on the occurrence of accidents and incidents. While some of the difference between our results and those obtained by the terminal managements may reflect differences in what is *required to be reported* and what workers themselves regard as an injury or safety critical incident, the substantial difference between our findings and those presented by the companies in terms of the number of these events suggests a considerable degree of *under-reporting* of these incidents is the case for all the terminals and this should be a cause for concern at company level. This finding further suggests that in some of the terminals the issue of under-reporting may be more significant than in others. Data from the interviews with workers, their representatives and managers that we discuss in the next Chapter helped to identify some of the reasons why this might be so.

It is not possible to make direct comparisons between these survey figures and the OHS performance data supplied by the GNTs (see Chapter 3). However, using a crude estimate of 48 hours worked per week for 44 weeks per year, the survey LTIFR would be 154.1 per million hours worked. This is significantly higher than the top rate reported by the GNTs of 84.8 per million hours worked, suggesting that the official data may significantly underestimate workers' experiences of injuries. Of course these figures must be treated with extreme caution. For example, we can only estimate hours worked and, while the figures may be close to reality in Europe areas 1 and 2 and Asia Pacific area 1, they may underestimate hours worked in Asia Pacific area 2. Not all injuries may have resulted in officially lost time – though we would argue that they should still be counted as they represent workers' experience of injury – and some respondents may have been injured more than once in the previous year. Nevertheless, they serve to highlight the potential gap between company data and workers' experience. Furthermore, while the differences in proportions of our survey respondents reporting injury do indicate experience of higher proportions of work injuries among those in the European terminals as compared to those in the Asia Pacific ones, the differences are nowhere near what would be expected based on the lost time injury data provided by GNTs 1 and 2 in particular, and to a lesser extent that provided by GNT 3 (see Chapter 3). Our findings suggest it is those from the second Asia Pacific area in particular with the lowest proportion (24%), with those from the first Asia Pacific area (38%) closer to the European proportions. This may



reflect the difference in awareness of the experience of work-related injuries between those in high and lower-middle-income economies. It also implies that the differences may be more complex than simply regional, with economy type also being significant.

### 4.2.3 Safety outcomes

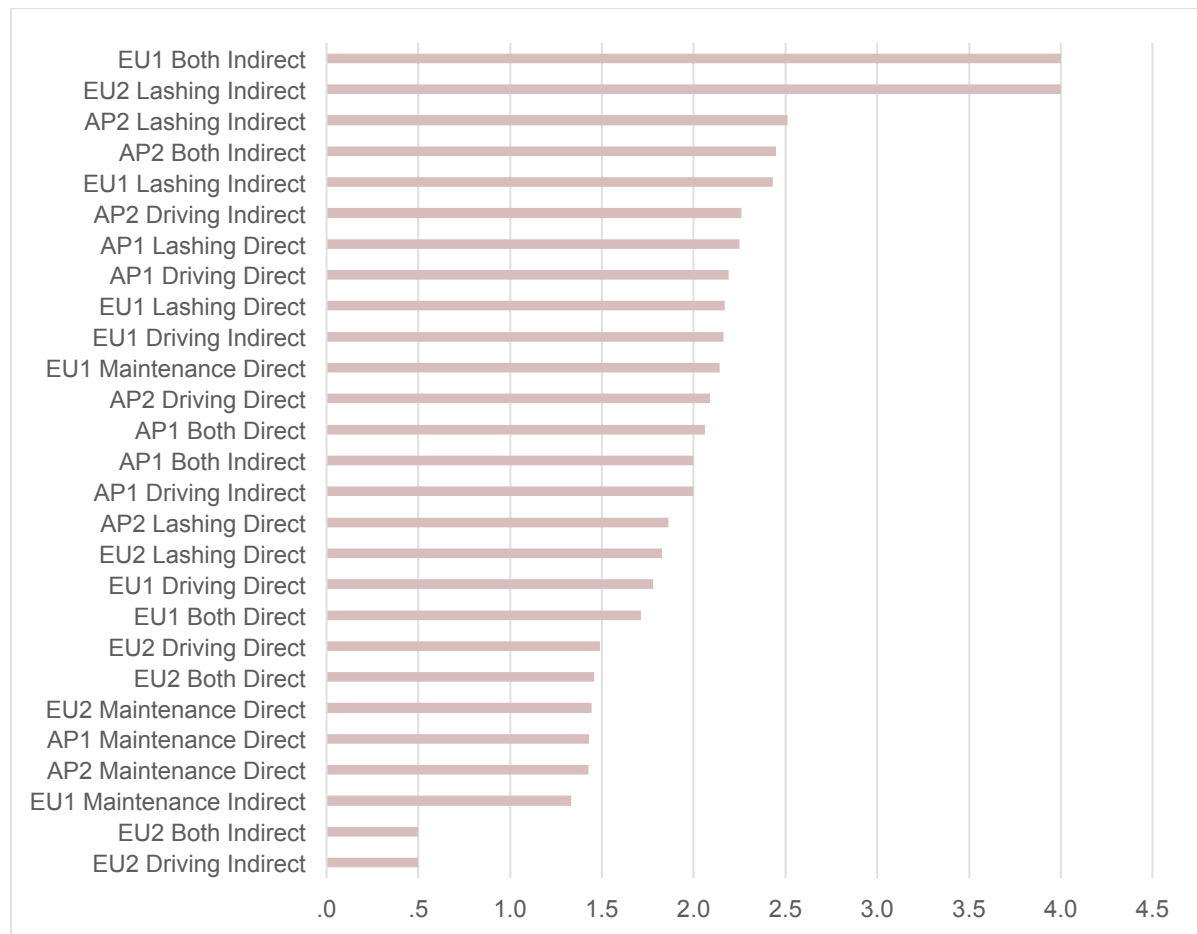
A composite safety measure was created to allow comparisons along a continuum of safety outcome experiences. This technique which is designed to reflect real word experience by taking a holistic view, has been used extensively in occupational research to give a truer, more realistic representation of workplace situations (see, for example, van Stolk et al., 2012a and b, Wadsworth et al., 2003, Smith et al., 2001, and Johnson et al., 1989). Here it has been applied to allow us to combine scores for several different measures derived from responses to different questions to create a composite measure of the issue of interest. In this case we were seeking to derive an overall measure of respondents' perception of the level of the safety they experienced in the terminals in which they worked. We therefore gave reporting: 'high risk to safety', 'ineffective coverage of safety risks', 'injury in the previous 12 months' and 'one or more near miss in the previous 12 months'; each a score of 1 before summing them to produce a single measure ranging from 0 to 4. Overall, the mean score was 2.06 (SD=1.14), with 138 respondents scoring 0 and 157 scoring 4. Again, there were significant differences by area of employment, and also by both job type and employment type ( $F=23.33$  (3df)  $p<0.0001$ ,  $F=20.61$  (3df)  $p<0.0001$  and  $F=92.24$  (1df)  $p<0.0001$  respectively), with those in indirect employment, jobs involving lashing and/or receiving and delivery work and in the second Asia Pacific area terminals having the highest scores (Table 4.2 and Figure 4.5).

*Table 4.2: Mean (SD) safety outcome score by area of work, job type and employment type*

|                 |                                                                                      | SAFETY OUTCOMES |      |
|-----------------|--------------------------------------------------------------------------------------|-----------------|------|
|                 |                                                                                      | MEAN            | SD   |
| AREA OF WORK    | Asia Pacific area 2                                                                  | 2.25            | 1.07 |
|                 | Asia Pacific area 1                                                                  | 2.04            | 1.05 |
|                 | Europe area 1                                                                        | 1.98            | 1.21 |
|                 | Europe area 2                                                                        | 1.54            | 1.14 |
| JOB TYPE        | Lashing and/or receiving and delivery with crane and/or horizontal transport driving | 2.25            | 1.03 |
|                 | Lashing and/or receiving and delivery                                                | 2.29            | 1.18 |
|                 | Crane and/or horizontal transport driving                                            | 1.89            | 1.16 |
|                 | Maintenance and/or other                                                             | 1.64            | 1.01 |
| EMPLOYMENT TYPE | Indirect                                                                             | 2.41            | 1.05 |
|                 | Direct                                                                               | 1.83            | 1.12 |



*Figure 4.5: Mean safety outcomes scores by area of work, job type and employment type*



Binary backward stepwise logistic regression was then used to consider these associations further. The safety outcome measure was split at the median to indicate high or low levels of adverse safety outcomes. This showed independent associations between high levels of poor safety outcomes and area of employment, job type and employment type, after controlling for age and experience (these variables were controlled for in the analyses because of the differences in age and experience between the terminals' workforces – with those in the Asia Pacific Area 2 terminals younger and less experienced than their counterparts elsewhere (see section 4.1)). Specifically, high levels of adverse safety outcomes were more common among: those in terminals outside Europe Area 2; those in jobs other than maintenance; and those who were indirectly employed (Table 4.3).

Repeating these analyses for each area of employment separately<sup>10</sup> showed no significant association between high levels of adverse safety outcomes and job type anywhere except in the Asia Pacific area 2 terminals. In order to explore this further, and given the close connection between job type and employment type in this region, these variables were combined to give a six level measure (Table 4.4). This was strongly independently associated with high levels of adverse safety outcomes. In addition, it showed that those in driving jobs were about three times more likely than those in maintenance or other roles (virtually all of whom were directly employed) to have high levels of adverse safety outcomes regardless of their employment type, as were those in lashing and/or receiving and delivery roles who were also directly employed. It is important to note that direct employment was much more common among those in driving roles (63%) and much less common among those in lashing and/or receiving and delivery roles (18%). However, those in lashing and/or receiving and delivery roles who were also

<sup>10</sup> The safety outcomes variable was split at the median separately for each region; employment type was only included in the models for Europe area 1 and the second Asia Pacific area; and jobs combining lashing and driving were included with lashing jobs in the model for Europe area 1.



indirectly employed were about six times more likely than those in maintenance or other roles to have high levels of adverse safety outcomes – a level very similar to those in roles combining lashing and/or receiving and delivery with driving, virtually all of whom were indirectly employed. While these odds ratios are not significantly different from each other, probably because of the relatively small numbers in some categories, they suggest there is a group that is particularly vulnerable to adverse safety outcomes: those involved in lashing and/or receiving and delivery – roles acknowledged within the industry and identified by our interviewees as being the most dangerous – who are also indirectly employed. This particularly risky combination is one that only arises for respondents in the second Asia Pacific area terminals in our study. As managers and workers frequently told us:

*“...the most likely ... accident is collision between two vehicles leading to injuries ... second is on the lashers while working on the vessel...”*

**[HSSE Manager, Terminal AP2T2]**



*Table 4.3: Associations between high levels of adverse safety outcomes and area of employment, job type and employment type*

|                    |                                                 | ODDS RATIO | CONFIDENCE LIMITS | DF, P      |
|--------------------|-------------------------------------------------|------------|-------------------|------------|
| AREA OF EMPLOYMENT | Europe area 1                                   | 1.00       |                   | 3, 0.001   |
|                    | Asia Pacific area 1                             | 1.08       | 0.69-1.69         |            |
|                    | Europe area 2                                   | 0.46       | 0.30-0.72         |            |
|                    | Asia Pacific area 2                             | 1.06       | 0.74-1.50         |            |
| JOB TYPE           | Maintenance/other                               | 1.00       |                   | 3, <0.0001 |
|                    | Driving                                         | 1.78       | 1.13-2.80         |            |
|                    | Lashing and/or receiving and delivery           | 2.92       | 1.80-4.71         |            |
|                    | Both driving and lashing/receiving and delivery | 2.59       | 1.58-4.24         |            |
| EMPLOYMENT TYPE    | Direct                                          | 1.00       |                   | 1, 0.008   |
|                    | Indirect                                        | 1.55       | 1.12-2.14         |            |

*Table 4.4: Associations between high levels of adverse safety outcomes and job type and employment type in the second Asia Pacific area terminals*

|                         |                                                                                | ODDS RATIO | CONFIDENCE LIMITS | DF, P      |
|-------------------------|--------------------------------------------------------------------------------|------------|-------------------|------------|
| JOB AND EMPLOYMENT TYPE | Maintenance or other (virtually all directly employed)                         | 1.00       |                   | 5, <0.0001 |
|                         | Driving and direct employment                                                  | 3.13       | 1.48-6.61         |            |
|                         | Driving and indirect employment                                                | 3.01       | 1.30-6.98         |            |
|                         | Lashing and/or receiving and delivery and direct employment                    | 3.09       | 1.21-7.92         |            |
|                         | Lashing and/or receiving and delivery and indirect employment                  | 6.05       | 3.01-12.16        |            |
|                         | Both lashing and/or receiving and delivery (virtually all indirectly employed) | 6.08       | 3.06-12.08        |            |

The analysis of the data from the questionnaire survey indicates that respondents felt they experienced a substantial level of poor safety outcomes that was considerably greater than might be anticipated from both the company evidence on OHS outcomes and the arrangements made for OHS management at these terminals described in the previous Chapter. It further shows that there is variation in the experience of safety outcomes that appears to be the result of both job type and the form of contractual employment arrangements. These findings corroborate those indicated in the preliminary study and we will return to a discussion of their implications in following Chapters.

### 4.3 Work-related health and welfare

Turning to respondents' work-related health and welfare, our survey again collected data on perceptions of risks to health and on personal health and welfare.

#### 4.3.1 Perceptions of health risk

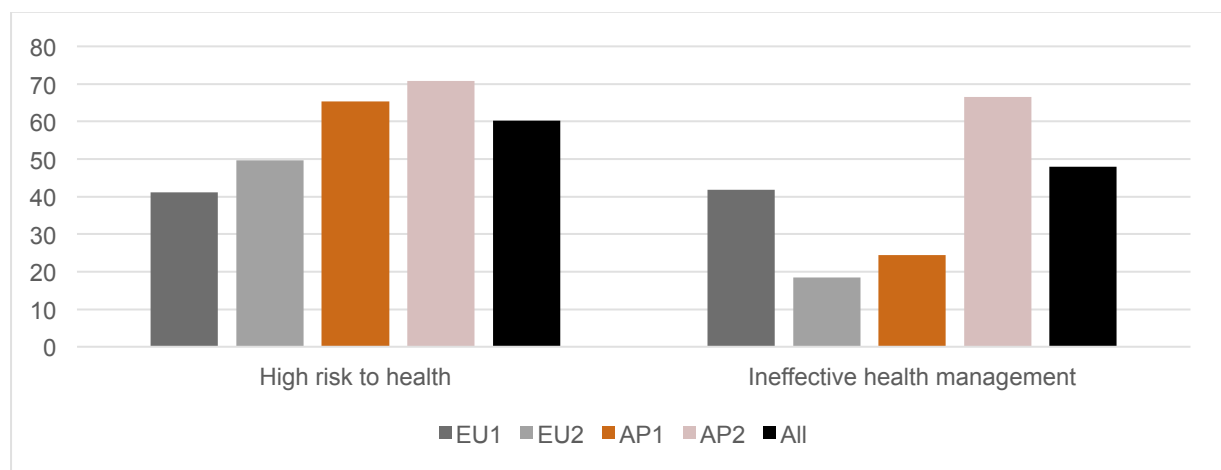
Perceptions of risk to health were measured using two 5-point scales similar to those assessing risk to safety:



- The extent to which respondents thought their health was at risk because of their work
  - 1 = Not at all; 5 = Extremely
  - High risk to health was defined as selecting 4 or 5 on this scale
- The effectiveness with which respondents felt the health and safety policies, procedures and practices covered the health risks in their jobs
  - 1 = Not at all effectively; 5 = Very effectively
  - Ineffective health management was defined as selecting 1 or 2 on this scale

Overall 60% fell into the high risk to health category and 48% into the ineffective health management category, and again there were significant differences by area of employment (chi-square = 103.41, 3df,  $p < 0.0001$  and chi-square = 232.62, 3df,  $p < 0.0001$  respectively). As Figure 4.6 shows, proportions reporting high risk to health and ineffective health management were highest among respondents in the second Asia Pacific area terminals.

*Figure 4.6: Proportions (%) of respondents with high risk to health and ineffective health management by area of employment*



#### 4.3.2 Health and welfare

Respondents' work-related health and wellbeing were measured on 5 scales:

- The extent to which respondents found their job stressful
  - 1 = Not at all stressful; 5 = Very stressful
  - High stress defined as selecting 4 or 5 on this scale
- Level of physical tiredness after a normal set of work days
  - 1 = Not at all tired; 5 = Very tired
  - High physical fatigue defined as selecting 4 or 5 on this scale
- Level of mental tiredness after a normal set of work days
  - 1 = Not at all tired; 5 = Very tired
  - High mental fatigue defined as selecting 4 or 5 on this scale
- Having experienced ache, pain or discomfort other than as a result of an accident that was caused or made worse by work in the previous 12 months
  - 1 or more instance defined as musculo-skeletal disorder (MSD)



- Suffering from an illness or physical or mental problem that was caused or made worse by work in the previous 12 months
  - 1 or more instance defined as work-related illness

Again there were clear differences by area of employment, with respondents from the second Asia Pacific area terminals having the highest rates of high stress and physical and mental fatigue, those from Asia Pacific area 2 and Europe area 2 the highest rates of MSD and respondents from Europe area 2 the highest rates of work-related illness (high stress: chi square = 258.40, 3df,  $p < 0.0001$ ; high physical fatigue: 173.12, 3df,  $p < 0.0001$ ; high mental fatigue: chi square = 78.57, 3df,  $p < 0.0001$ ; MSD: 11.23, 3df,  $p = 0.01$ ; work-related illness: 70.25, 3df,  $p < 0.0001$ ; Table 4.5).

*Table 4.5: Health and welfare by area of employment*

|                       | EUROPE<br>AREA 1 | EUROPE<br>AREA 2 | ASIA<br>PACIFIC<br>AREA 1 | ASIA PACIFIC<br>AREA 2 | ALL |
|-----------------------|------------------|------------------|---------------------------|------------------------|-----|
| High stress           | 48%              | 35%              | 39%                       | 81%                    | 60% |
| High physical fatigue | 48%              | 75%              | 73%                       | 85%                    | 73% |
| High mental fatigue   | 48%              | 65%              | 60%                       | 74%                    | 65% |
| MSD                   | 28%              | 31%              | 21%                       | 32%                    | 30% |
| Work-related illness  | 46%              | 61%              | 46%                       | 32%                    | 41% |

Among those reporting MSDs, most (88%) had had more than one instance in the previous year, with 23% having 20 or more. A little under half (45%) had reported the most recent instance to their employer. Similarly, among those reporting work-related illnesses, most (85%) had had more than one illness in the previous year, with 37% reporting 5 or more; and again 45% had reported the most recent illness to their employer. Most commonly reported work-related illnesses were muscle pain/ache (46%) and fatigue/tiredness (38%), followed by stress/anxiety/depression, stomach/gastric and cold/flu/respiratory (28%, 25% and 24% respectively).

Stomach/gastric work-related illnesses were most common among respondents from the second Asia Pacific area terminals (33% of those reporting a work-related illness, compared to 12% in Europe area 1, 11% in the first Asia Pacific area and 19% in Europe area 2), which bears out the findings from the interviews in our preliminary project in which respondents suggested that these illnesses were linked both to inadequate breaks and welfare facilities and to poor surface conditions and vehicle repair and use. Rates of fatigue were lowest among those in Europe area 2 (20% compared to 25% in Europe area 1 and 43% and 46% respectively in the first and second Asia Pacific areas), while stress/anxiety/depression was most common in the first Asia Pacific area (47% compared to 22% in Europe area 2, 29% in Asia Pacific area 2 and 16% in Europe area 1). Reporting MSDs and work-related illnesses varied from 35% and 24% respectively in the first Asia Pacific area to 51% in Asia Pacific area 2 and 55% in Europe area 2 respectively, again suggesting the likelihood that any official company figures would significantly understate workers' actual experiences.

### 4.3.3 Health outcomes

Using a similar approach to that applied to safety outcomes (see section 4.2.3), a composite health outcome score was created from the measures of high stress, high physical and mental fatigue, high risk to health, 1 or more MSD and 1 or more work-related illness in the previous 12 months and poor coverage of health risks. Total possible score was 7 and overall the mean score was 4.47 (SD=2.05), with 49 respondents scoring 0 and 265 scoring 7. Again there were significant differences by area of work, job type and employment type ( $F=75.87$  (3df)  $p < 0.0001$ ,  $F=39.23$  (3df)  $p < 0.0001$  and  $F=152.42$  (1df)  $p < 0.0001$  respectively; Table 4.6 and Figure 4.7). Highest health outcome scores, indicating greater numbers of adverse health outcomes, were found among respondents working in the second Asia Pacific



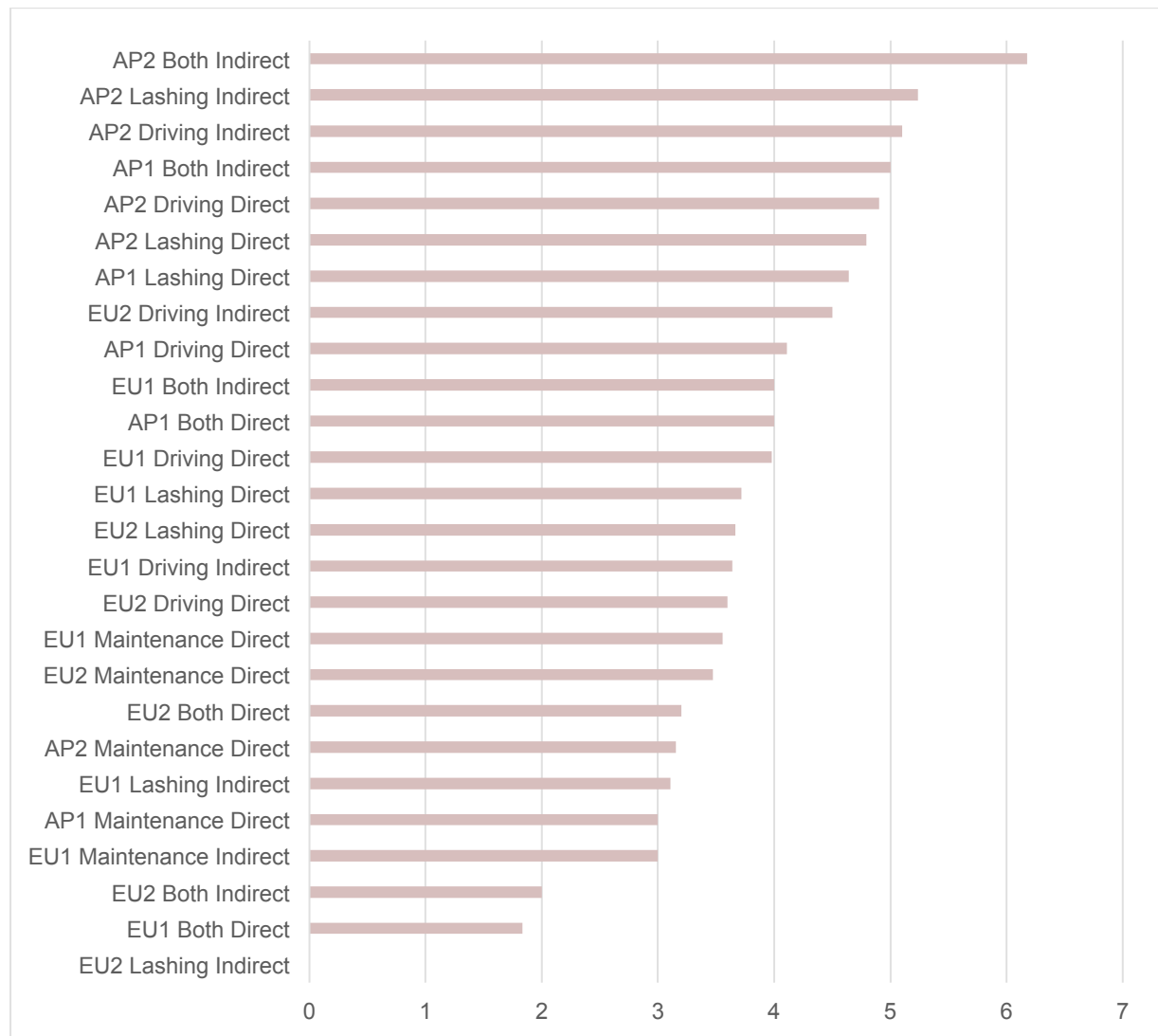
area terminals, those in jobs combining lashing and/or receiving and delivery with driving, and those in indirect employment.

*Table 4.6: Mean (SD) health outcome score by area of work, job type and employment type*

|                    |                                                                                      | HEALTH OUTCOMES |      |
|--------------------|--------------------------------------------------------------------------------------|-----------------|------|
|                    |                                                                                      | MEAN            | SD   |
| AREA OF EMPLOYMENT | Asia Pacific area 2                                                                  | 5.23            | 1.87 |
|                    | Asia Pacific area 1                                                                  | 4.02            | 1.87 |
|                    | Europe area 1                                                                        | 3.62            | 1.99 |
|                    | Europe area 2                                                                        | 3.54            | 1.87 |
| JOB TYPE           | Lashing and/or receiving and delivery with crane and/or horizontal transport driving | 5.30            | 1.80 |
|                    | Lashing and/or receiving and delivery                                                | 4.49            | 2.03 |
|                    | Crane and/or horizontal transport driving                                            | 4.21            | 2.04 |
|                    | Maintenance and/or other                                                             | 3.36            | 1.91 |
| EMPLOYMENT TYPE    | Indirect                                                                             | 5.29            | 1.84 |
|                    | Direct                                                                               | 3.94            | 2.00 |



*Figure 4.7: Mean health outcome scores by area of employment, job type and employment type*



Exploring these associations further using multivariate analyses showed that high levels of adverse health outcomes were independently associated with area of employment, job type and employment type after controlling for age, experience and general health (Table 4.7). Specifically, those working in terminals in Asia Pacific area 2 were more likely than those working elsewhere to have high levels of adverse health outcomes, as were those in jobs other than maintenance and those who were indirectly employed. As with the safety outcomes measure, models considering each region separately showed that there was no association between job type and high levels of adverse health outcomes in any of the areas except Asia Pacific 2. However, within the second Asia Pacific area respondent group, it was again those in indirect employment who were working in roles combining lashing and/or receiving and delivery with driving that were most likely to report having experienced high levels of adverse health outcomes (Table 4.8).



*Table 4.7: Associations between high levels of adverse health outcomes and area of employment, job type and employment type*

|                    |                                                 | ODDS RATIO | CONFIDENCE LIMITS | DF, P      |
|--------------------|-------------------------------------------------|------------|-------------------|------------|
| AREA OF EMPLOYMENT | Europe area 1                                   | 1.00       |                   | 3, <0.0001 |
|                    | Asia Pacific area 1                             | 1.25       | 0.79-1.97         |            |
|                    | Europe area 2                                   | 0.81       | 0.54-1.22         |            |
|                    | Asia Pacific area 2                             | 3.49       | 2.44-5.01         |            |
| JOB TYPE           | Maintenance/other                               | 1.00       |                   | 3, 0.0001  |
|                    | Driving                                         | 2.94       | 1.91-4.54         |            |
|                    | Lashing and/or receiving and delivery           | 2.62       | 1.63-4.21         |            |
|                    | Both driving and lashing/receiving and delivery | 4.66       | 2.82-7.68         |            |
| EMPLOYMENT TYPE    | Direct                                          | 1.00       |                   | 1, 0.003   |
|                    | Indirect                                        | 1.67       | 1.19-2.33         |            |
| GENERAL HEALTH     | Better                                          | 1.00       |                   | 1, 0.02    |
|                    | Poor                                            | 1.59       | 1.07-2.35         |            |
| EXPERIENCE         | Less than 10 years                              | 1.00       |                   | 1, 0.03    |
|                    | 10 years or more                                | 1.42       | 1.04-1.92         |            |

*Table 4.8: Associations between high levels of adverse health outcomes and job type and employment type in the second Asia Pacific area terminals*

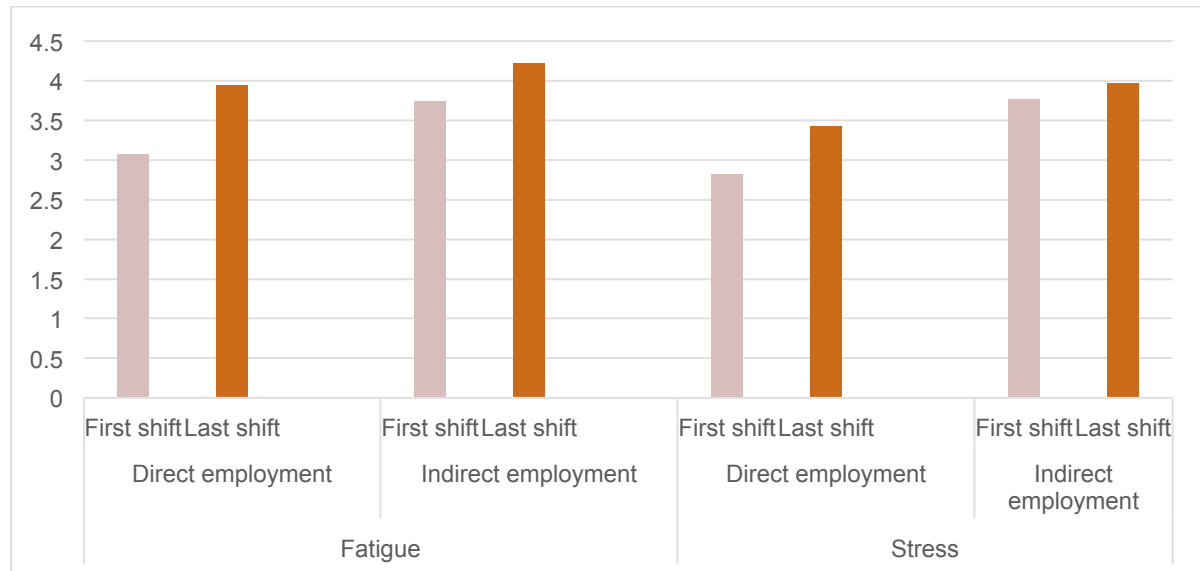
|                         |                                                                                | ODDS RATIO | CONFIDENCE LIMITS | DF, P      |
|-------------------------|--------------------------------------------------------------------------------|------------|-------------------|------------|
| JOB AND EMPLOYMENT TYPE | Maintenance or other (virtually all directly employed)                         | 1.00       |                   | 5, <0.0001 |
|                         | Driving and direct employment                                                  | 4.46       | 2.02-9.06         |            |
|                         | Driving and indirect employment                                                | 5.45       | 2.46-12.10        |            |
|                         | Lashing and/or receiving and delivery and direct employment                    | 2.98       | 1.17-7.56         |            |
|                         | Lashing and/or receiving and delivery and indirect employment                  | 5.01       | 2.53-9.89         |            |
|                         | Both lashing and/or receiving and delivery (virtually all indirectly employed) | 19.95      | 9.96-39.97        |            |
| HEALTH                  | Good                                                                           | 1.00       |                   | 1, 0.01    |
|                         | Poor                                                                           | 1.97       | 1.15-3.38         |            |
| AGE                     | Under 40                                                                       | 1.00       |                   | 1, 0.06    |
|                         | 40 or older                                                                    | 0.61       | 0.36-1.03         |            |

The diary survey also collected data on fatigue, stress and MSD. Comparing respondents' ratings of their levels of fatigue, stress and MSD before their first and last shifts in a block of shifts suggested increases in all three areas over the working week. Indirectly employed workers had higher levels of both pre-first and last shift fatigue and stress – and in the case of stress, indirectly employed workers' pre-first shift stress levels were higher than the pre-last shift stress levels of the directly employed workers, suggesting that, in terms of stress, these workers are *starting* their working week from a poorer position than that at which their directly employed counterparts are *finishing* their week (Figure 4.8). While these data must be considered with caution because of the relatively small numbers involved, they are nonetheless



supportive of our questionnaire survey findings suggesting poorer health outcomes for indirectly employed workers, and significant work-related fatigue and stress building up over a set of shifts for all workers.

*Figure 4.8: Fatigue and stress by employment type – comparing first and last shifts*



Taken together with the findings on safety outcomes reported in the previous section, this suggests high levels of adverse health and safety outcomes among all respondents. It is worth bearing in mind here that, while the companies all had in place systems for reporting measures of safety such as injuries and incidents, they did not have such well-developed systems for collecting data on the incidence of work-related ill-health. These high levels are therefore of particular concern, not least as the composite measures of adverse health and safety outcomes were correlated (Spearman's  $\rho = 0.48$ ,  $p < 0.0001$ ), indicating that higher levels of poor safety outcomes are likely to be accompanied by higher levels of poor health outcomes. In addition, the findings make it clear that some groups are at significantly greater risk than others, depending on where they work, their job types and the way in which they are employed. These are issues to which we will return in following Chapters when we consider the character of the arrangements for managing health and safety in the terminals and give some attention to the areas for improvement indicated by this study and its predecessor.

We turn next to respondents' experiences of arrangements for managing health and safety in the terminals.

#### 4.4 Experiences of OHS management

Respondents' experiences of the arrangements for managing risks to health and safety in the participating terminals were measured using a series of questions focusing on: health and safety training and the provision of personal protective equipment (PPE); written policies and procedures; risk assessment arrangements; and systems and practices related to worker consultation and representation. As already explained, these were designed to measure how closely respondents' experiences of the OHS management arrangements they worked under matched up to what is widely accepted as being a set of cross-sector best practices. Table 4.9 gives details of the responses on each measure by area of employment. There were significant differences on all 11 measures<sup>11</sup>. In most cases, the highest

<sup>11</sup> Staffing for safety: chi square = 116.69, 3df,  $p < 0.0001$ ; induction training: chi square = 24.53, 3df,  $p < 0.0001$ ; PPE: chi square = 203.73, 3df,  $p < 0.0001$ ; on-going training: chi square = 89.06, 3df,  $p < 0.0001$ ; access to written H&S policy: chi square = 382.22, 3df,  $p < 0.0001$ ; access to written H&S standard procedures: chi square = 468.74, 3df,  $p < 0.0001$ ; written long/irregular hours policy: chi square = 93.27, 3df,  $p < 0.0001$ ; written stress policy: chi square = 87.37, 3df,  $p < 0.0001$ ; risk assessment: chi square = 56.08, 3df,  $p < 0.0001$ ; consultation: chi square = 84.22, 3df,  $p < 0.0001$ ; health and safety committee: chi square = 573.78, 3df,  $p < 0.0001$ ; and health and safety representative: chi square = 292.49, 3df,  $p < 0.0001$ .



proportions reporting the lack of a good practice OHS management arrangement were those respondents working in the second Asia Pacific area and Europe area 1 terminals<sup>12</sup>.

*Table 4.9: OHS management experiences by area of employment*

|                                           |                                                                        | EUROPE<br>AREA 1 | EUROPE<br>AREA 2 | ASIA<br>PACIFIC<br>AREA 1 | ASIA<br>PACIFIC<br>AREA 2 | ALL |
|-------------------------------------------|------------------------------------------------------------------------|------------------|------------------|---------------------------|---------------------------|-----|
| STAFFING FOR SAFETY                       | Frequently insufficient                                                | 11%              | 28%              | 25%                       | 42%                       | 31% |
| INDUCTION TRAINING                        | None provided                                                          | 7%               | 0%               | 3%                        | 8%                        | 6%  |
| PPE                                       | Some or all replacement costs taken from wages                         | 11%              | 1%               | 1%                        | 33%                       | 19% |
| ONGOING TRAINING                          | None provided                                                          | 8%               | <1%              | 5%                        | 20%                       | 12% |
| ACCESS TO WRITTEN H&S POLICY              | None or don't know                                                     | 76%              | 10%              | 30%                       | 72%                       | 58% |
| ACCESS TO WRITTEN H&S STANDARD PROCEDURES | None or don't know                                                     | 75%              | 14%              | 36%                       | 83%                       | 64% |
| WRITTEN LONG/IRREGULAR HOURS POLICY       | None or don't know                                                     | 90%              | 59%              | 78%                       | 82%                       | 80% |
| WRITTEN STRESS POLICY                     | None or don't know                                                     | 94%              | 70%              | 83%                       | 90%                       | 87% |
| RISK ASSESSMENT                           | No risk assessment or no worker involvement in risk assessment         | 90%              | 66%              | 73%                       | 82%                       | 80% |
| CONSULTATION                              | None (new procedures introduced without warning or worker involvement) | 74%              | 53%              | 51%                       | 77%                       | 69% |
| HEALTH AND SAFETY COMMITTEE               | None or don't know                                                     | 62%              | 24%              | 8%                        | 86%                       | 60% |
| HEALTH AND SAFETY REPRESENTATIVE          | None or difficult to access                                            | 77%              | 37%              | 43%                       | 85%                       | 70% |

Following the approach used for safety and health outcomes (see sections 4.2.3 and 4.3.3), a composite variable indicting the number of poor OHS management arrangements was produced, comprising the measures in Table 4.9. Total possible combined OHS management score, indicating the poorest practice OHS management arrangements, was 12. Overall, the mean score was 6.31 (SD=2.85), with 27 respondents scoring 0 and 6 scoring 12. There were significant differences by area of work, job type and employment type ( $F=178.61$  (3df)  $p<0.0001$ ,  $F=44.09$  (3df)  $p<0.0001$  and  $F=414.60$  (1df)  $p<0.0001$  respectively; Table 4.10 and Figure 4.9). Again, those with the poorest OHS management arrangement experiences were those working in the Asia Pacific area 2 terminals, those working in lashing and/or receiving and delivery jobs and those in indirect employment.

These mean scores suggest that there is significant room for improvement in all the regions included in the project. Furthermore, some of the individual measures suggest particular areas of concern. For example, perceptions of staffing levels in relation to working safely are particularly high among the Asia

<sup>12</sup> This may be a reflection of the particular employment arrangements and practices in the terminals in this region (see Chapter 3), where arrangements made at terminal level elsewhere in our case studies are instead made at the port level. This may have resulted in respondents in this area interpreting questions differently to those elsewhere.



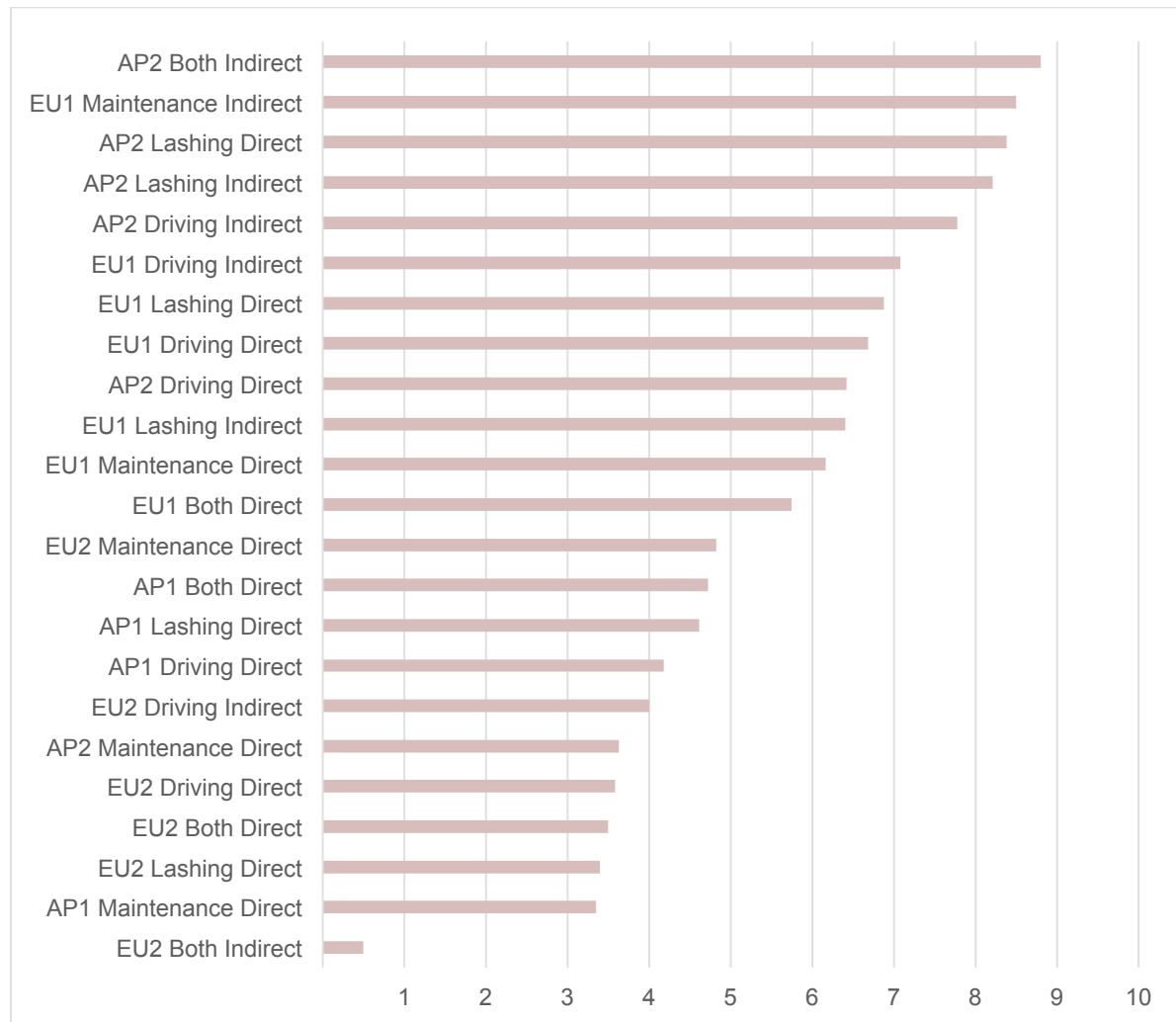
Pacific area 2 terminal respondents, for whom arrangements for consultation and representation are also particularly poor. Similarly, access to written health and safety policies and procedures is poor in particular in Europe area 1 and Asia. The relatively high proportions of respondents from all four regions reporting no access to policies on working hours and, in particular, stress management, also underline the under-representation of the management of health risks within terminal operators' health and safety management arrangements identified by our workforce interview participants. In fact, stress, followed by fatigue, were the second and third risks respondents most commonly cited as ones they faced at work (identified by 82% and 81% respectively), behind back, neck or shoulder problems (86%) and ahead of vehicle incidents, crush, fall and over-familiarity (79%, 78%, 77% and 61% respectively), adding further weight to the suggestion of a gap between workers' experiences and concerns in relation to risk and terminals' arrangements for managing it.

*Table 4.10: Mean (SD) combined score for OHS management arrangements by area of work, job type and employment type*

|                 |                                                                                      | OHS MANAGEMENT ARRANGEMENTS |      |
|-----------------|--------------------------------------------------------------------------------------|-----------------------------|------|
|                 |                                                                                      | MEAN                        | SD   |
| AREA OF WORK    | Asia Pacific area 2                                                                  | 7.52                        | 2.63 |
|                 | Asia Pacific area 1                                                                  | 4.35                        | 2.25 |
|                 | Europe area 2                                                                        | 3.63                        | 2.13 |
|                 | Europe area 1                                                                        | 6.67                        | 1.91 |
| JOB TYPE        | Lashing and/or receiving and delivery with crane and/or horizontal transport driving | 7.00                        | 2.74 |
|                 | Lashing and/or receiving and delivery                                                | 7.17                        | 2.73 |
|                 | Crane and/or horizontal transport driving                                            | 5.78                        | 2.70 |
|                 | Maintenance and/or other                                                             | 4.52                        | 2.65 |
| EMPLOYMENT TYPE | Direct                                                                               | 5.18                        | 2.74 |
|                 | Indirect                                                                             | 8.15                        | 1.96 |



*Figure 4.9: Mean (SD) combined score for OHS management arrangements by area of work, job type and employment type*



Using binary logistic regression to consider these associations in more detail (see section 4.2.3 for an explanation of the approach used) showed independent associations between high levels of poor OHS management arrangements and area of employment (with those in the Europe area 1 and second Asia Pacific area terminals more likely to report high levels of poor OHS management arrangements than those in the first Asia Pacific area and in Europe area 2 terminals), jobs other than maintenance and in particular those combining lashing and/or receiving and delivery, with driving, and with employment type (with those in indirect employment nearly three times as likely as their directly employed counterparts to experience high levels of poor OHS management arrangements) (Table 4.11). Considering each of the areas of employment separately again showed no association between job type and OHS management arrangements outside Asia Pacific area 2. Within the second Asia Pacific area 2 terminals, however, those in the group identified as most vulnerable to poor health and safety outcomes were again most likely to report high levels of poor OHS management arrangements (Table 4.12).



*Table 4.11: Associations between high levels of poor OHS management arrangements and area of employment, job type and employment type*

|                    |                                                 | ODDS RATIO | CONFIDENCE LIMITS | DF, P      |
|--------------------|-------------------------------------------------|------------|-------------------|------------|
| AREA OF EMPLOYMENT | Europe area 1                                   | 1.00       |                   | 3, <0.0001 |
|                    | Asia Pacific area 1                             | 0.10       | 0.05-0.18         |            |
|                    | Europe area 2                                   | 0.07       | 0.04-0.13         |            |
|                    | Asia Pacific area 2                             | 1.18       | 0.82-1.70         |            |
| JOB TYPE           | Maintenance/other                               | 1.00       |                   | 3, 0.001   |
|                    | Driving                                         | 3.16       | 1.96-5.10         |            |
|                    | Lashing and/or receiving and delivery           | 3.59       | 2.12-6.09         |            |
|                    | Both driving and lashing/receiving and delivery | 10.30      | 5.54-19.15        |            |
| EMPLOYMENT TYPE    | Direct                                          | 1.00       |                   | 1, <0.0001 |
|                    | Indirect                                        | 2.96       | 2.01-4.34         |            |

*Table 4.12: Associations between high levels of poor OHS management arrangements and job type and employment type in the second Asia Pacific area terminals*

|                         |                                                                                | ODDS RATIO | CONFIDENCE LIMITS | DF, P      |
|-------------------------|--------------------------------------------------------------------------------|------------|-------------------|------------|
| JOB AND EMPLOYMENT TYPE | Maintenance or other (virtually all directly employed)                         | 1.00       |                   | 5, <0.0001 |
|                         | Driving and direct employment                                                  | 3.86       | 1.67-8.89         |            |
|                         | Driving and indirect employment                                                | 3.75       | 1.48-9.49         |            |
|                         | Lashing and/or receiving and delivery and direct employment                    | 10.84      | 4.12-28.55        |            |
|                         | Lashing and/or receiving and delivery and indirect employment                  | 9.00       | 4.07-19.88        |            |
|                         | Both lashing and/or receiving and delivery (virtually all indirectly employed) | 18.84      | 8.49-41.85        |            |

In sum, the analysis of the survey data suggests that there is significant room for improvement in arrangements for managing health and safety in all of the regions included in the project. In the eyes of respondents their experience of these arrangements fall far short of that which might be anticipated from the company and terminal managers' descriptions presented in the previous Chapter. Moreover, there are particular areas of concern in relation to the extent of communication between terminal managements and workers concerning these health and safety arrangements, as well as the extent of participative approaches adopted in instituting them. Poor consultation/feedback is of particular concern because as is well established in the critical safety literature attests, such one-way systems are especially vulnerable to failure because problems are likely to not be reported let alone rectified (see for example, Le Coze 2008; Hopkins 2011).

The analysis further indicates that experiences are not even across the different terminals, with those situated in Asia Pacific area 2 reporting poorer experiences than elsewhere, both overall and in relation to particular forms of employment and job type. Again, this analysis raises a number of issues that we will return to in the discussion in subsequent Chapters concerning our overall assessment of the effectiveness of the terminal arrangements and ways in which they might be improved



## 4.5 Working conditions, work organisation and arrangements

The final substantive area of analysis of the survey data concerned working conditions experienced in the terminals. The questionnaire survey also collected data about respondents' working conditions and the way in which their work was organised and arranged. In all we included 13 relevant measures. As Table 4.13 shows, their scores on all of these measures varied according to area of employment<sup>13</sup>.

*Table 4.13: Working conditions' experiences by area of employment*

|                                      |                       | EUROPE<br>AREA 1 | ASIA<br>PACIFIC<br>AREA 1 | EUROPE<br>AREA 2 | ASIA<br>PACIFIC<br>AREA 2 | ALL |
|--------------------------------------|-----------------------|------------------|---------------------------|------------------|---------------------------|-----|
| SHIFT PATTERN                        | Irregular             | 12%              | 34%                       | 17%              | 6%                        | 13% |
| SPLIT SHIFTS                         | Occasional or regular | 6%               | 27%                       | 8%               | 13%                       | 12% |
| NIGHT-WORK                           | Occasional or regular | 15%              | 93%                       | 94%              | 90%                       | 76% |
| SHIFT LENGTH                         | 10 hours or longer    | 2%               | 9%                        | 99%              | 68%                       | 49% |
| BREAKS                               | None scheduled        | 12%              | 4%                        | 27%              | 71%                       | 42% |
| PAID HOLIDAY ENTITLEMENT             | None                  | 1%               | 1%                        | 0%               | 20%                       | 10% |
| WORKING HOURS FIT WITH COMMITMENTS   | Poor                  | 11%              | 48%                       | 21%              | 74%                       | 48% |
| JOB SECURITY                         | Poor                  | 16%              | 57%                       | 14%              | 66%                       | 45% |
| CONTENTMENT WITH BASIC PAY           | Low                   | 23%              | 18%                       | 18%              | 86%                       | 52% |
| STAFFING FOR TARGET                  | Poor                  | 12%              | 28%                       | 43%              | 46%                       | 35% |
| WORK INTENSITY                       | High                  | 64%              | 50%                       | 56%              | 68%                       | 63% |
| SATISFACTION WITH WORKING CONDITIONS | Low                   | 14%              | 50%                       | 27%              | 70%                       | 48% |
| SATISFACTION WITH WELFARE CONDITIONS | Low                   | 15%              | 32%                       | 41%              | 74%                       | 50% |

Combining these measures allowed us to create a single item working conditions score with a possible total of 13 to indicate the poorest conditions and 0 to indicate the best. Overall, the mean score was 5.58 (SD=3.08), with 39 respondents scoring 0 and 4 scoring 12 (none scored 13). Again, there were significant differences by area of work, job type and employment type (working conditions:  $F=427.89$  (3df)  $p<0.0001$ ,  $F=138.39$  (3df)  $p<0.0001$  and  $F=468.20$  (1df)  $p<0.0001$  respectively; with lashers in the Asia Pacific area 2 terminals indicating they were experiencing the worst conditions; Table 4.14, Figure 4.10).

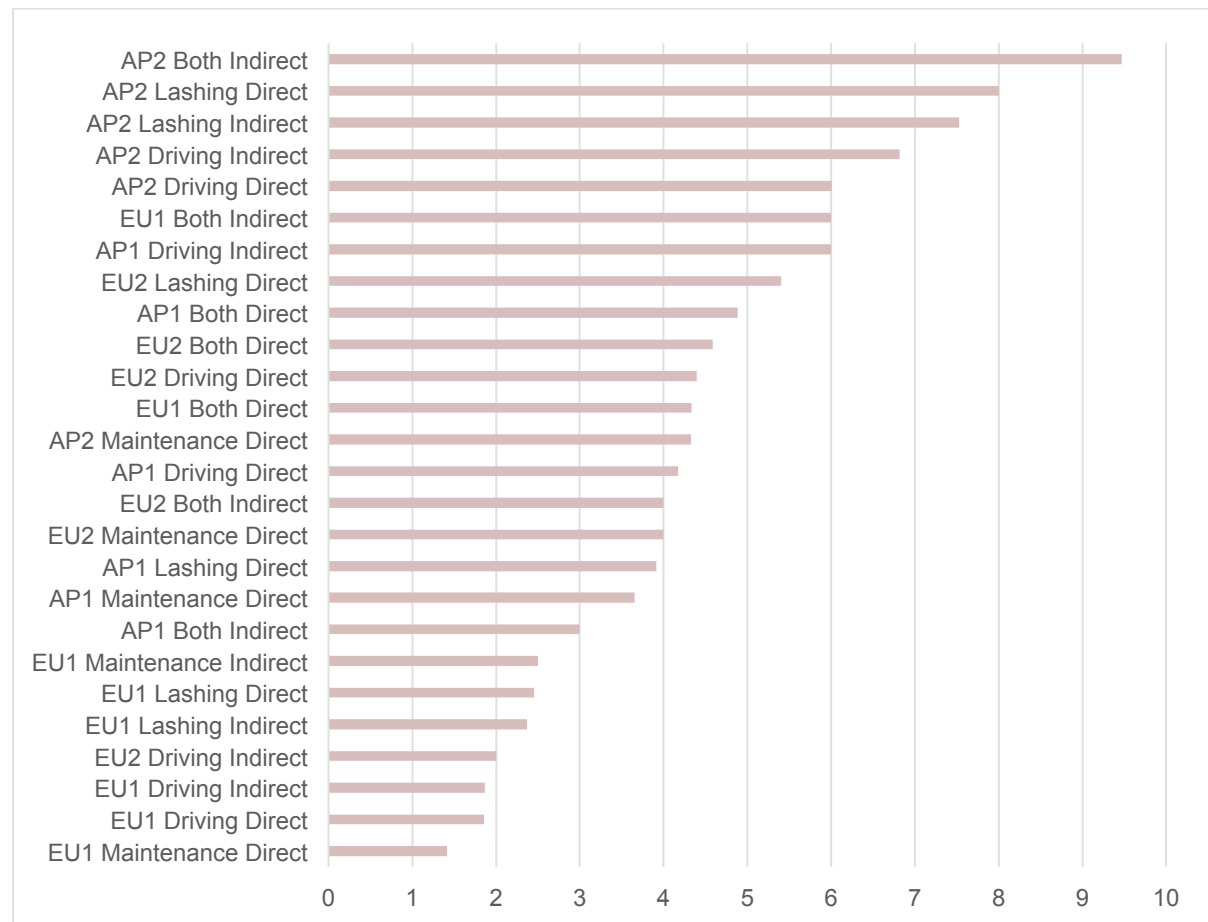
<sup>13</sup> Irregular shifts: chi-square = 115.66, 3df,  $p<0.0001$ ; split shift: chi-square = 61.91, 3df,  $p<0.0001$ ; night-work: chi-square = 786.92, 3df,  $p<0.0001$ ; shift length: chi-square = 814.71, 3df,  $p<0.0001$ ; breaks: chi-square = 558.38, 3df,  $p<0.0001$ ; paid holiday entitlement: chi-square = 164.83, 3df,  $p<0.0001$ ; working hours fit with commitments: chi-square = 480.31, 3df,  $p<0.0001$ ; job security: chi-square = 371.16, 3df,  $p<0.0001$ ; contentment with basic pay: chi-square = 697.24, 3df,  $p<0.0001$ ; staffing for targets: chi-square = 130.27, 3df,  $p<0.0001$ ; work intensity: chi-square = 31.10, 3df,  $p<0.0001$ ; satisfaction with working conditions: chi-square = 358.35, 3df,  $p<0.0001$ ; and satisfaction with working conditions: chi-square = 394.93, 3df,  $p<0.0001$ .



*Table 4.14: Mean (SD) combined score for working conditions by area of work, job type and employment type*

|                 |                                                                                      | WORKING CONDITIONS |      |
|-----------------|--------------------------------------------------------------------------------------|--------------------|------|
|                 |                                                                                      | MEAN               | SD   |
| AREA OF WORK    | Asia Pacific area 2                                                                  | 7.52               | 2.56 |
|                 | Asia Pacific area 1                                                                  | 4.52               | 2.06 |
|                 | Europe area 2                                                                        | 4.62               | 1.72 |
|                 | Europe area 1                                                                        | 2.02               | 1.60 |
| JOB TYPE        | Lashing and/or receiving and delivery with crane and/or horizontal transport driving | 7.61               | 2.81 |
|                 | Lashing and/or receiving and delivery                                                | 6.08               | 2.93 |
|                 | Crane and/or horizontal transport driving                                            | 4.30               | 2.57 |
|                 | Maintenance and/or other                                                             | 3.68               | 2.30 |
| EMPLOYMENT TYPE | Direct                                                                               | 7.56               | 2.88 |
|                 | Indirect <sup>14</sup>                                                               | 4.32               | 2.49 |

*Figure 4.10: Mean combined score for working conditions by area of work, job type and employment type*



<sup>14</sup> Includes Europe area 1 day hire



Considering the working conditions measures individually, it is clear that some of the ways in which work is organised are strongly linked to region. For example, long shifts are almost universal among the Europe area 1 respondents and very common among the second Asia Pacific area terminal respondents. These kinds of patterns likely reflect longstanding traditions in the areas concerned. However, the consistently high levels of respondents reporting high levels of work intensity in all four regions is of particular concern, and reflects a more general concern about rapidly increasing work intensity – with its recognised health and safety consequences (see, for example, Quinlan and Bohle, 2008) – apparent both in our qualitative findings and in the literature on the changes that have taken place in dock-work more generally (see, for example, Gekara and Fairbrother, 2013).

Multivariate analyses again showed significant independent associations between high levels of poor working conditions and area of employment, job type and employment type after controlling for age and experience levels (Table 4.15). As with the models for health and safety outcomes and for OHS management arrangements, when the regions were considered separately there were no associations between job type and working conditions except in the second Asia Pacific area terminals, where again those in indirect employment and in jobs combining lashing and/or receiving and delivery with driving were by far the most likely to report high levels of poor working conditions.

*Table 4.15: Associations between high levels of poor working conditions and area of employment, job type and employment type*

|                    |                                                 | ODDS RATIO | CONFIDENCE LIMITS | DF, P      |
|--------------------|-------------------------------------------------|------------|-------------------|------------|
| AREA OF EMPLOYMENT | Europe area 1                                   | 1.00       |                   | 3, <0.0001 |
|                    | Asia Pacific area 1                             | 12.16      | 5.34-27.71        |            |
|                    | Europe 2                                        | 11.70      | 5.33-25.69        |            |
|                    | Asia Pacific area 2                             | 93.69      | 44.49-197.29      |            |
| JOB TYPE           | Maintenance/other                               | 1.00       |                   | 3, <0.0001 |
|                    | Driving                                         | 3.69       | 2.17-6.27         |            |
|                    | Lashing and/or receiving and delivery           | 8.43       | 4.61-15.41        |            |
|                    | Both driving and lashing/receiving and delivery | 12.78      | 6.87-23.77        |            |
| EMPLOYMENT TYPE    | Direct                                          | 1.00       |                   | 1, <0.0001 |
|                    | Indirect                                        | 2.74       | 1.77-4.23         |            |
| EXPERIENCE         | Under 10 years                                  | 1.00       |                   | 0.03       |
|                    | 10 years or longer                              | 1.55       | 1.05-2.30         |            |



*Table 4.16: Associations between high levels of poor working conditions and job type and employment type in the second Asia Pacific area terminals*

|                         |                                                                                | ODDS RATIO | CONFIDENCE LIMITS | DF, P      |
|-------------------------|--------------------------------------------------------------------------------|------------|-------------------|------------|
| JOB AND EMPLOYMENT TYPE | Maintenance or other (virtually all directly employed)                         | 1.00       |                   | 5, <0.0001 |
|                         | Driving and direct employment                                                  | 2.74       | 1.31-5.75         |            |
|                         | Driving and indirect employment                                                | 4.71       | 2.11-10.53        |            |
|                         | Lashing and/or receiving and delivery and direct employment                    | 9.92       | 3.96-24.90        |            |
|                         | Lashing and/or receiving and delivery and indirect employment                  | 6.21       | 3.09-12.51        |            |
|                         | Both lashing and/or receiving and delivery (virtually all indirectly employed) | 65.85      | 30.03-144.42      |            |
| EXPERIENCE              | Under 10 years                                                                 | 1.00       |                   | 0.03       |
|                         | 10 years or longer                                                             | 1.92       | 1.07-3.45         |            |

## 4.6 Associations between OHS outcomes, working conditions and OHS management

The analyses in sections 4.2 to 4.5 above show that a substantial proportion of our survey respondents have experienced high levels of adverse safety and health outcomes, poor OHS management arrangements and poor working conditions. They have identified a sub-group of respondents that seem to be at particular risk in all four of these areas – indirectly employed dockworkers involved in jobs combining lashing and/or receiving and delivery with driving, the combination of which is unique to the second Asia Pacific area terminals in our dataset. This section brings the findings from the four areas together by considering whether poor working conditions are associated with poor OHS management arrangements and adverse outcomes are associated with both working conditions and OHS management arrangements. The same multivariate approach was used.

### 4.6.1 Associations between working conditions and OHS management

High levels of poor working conditions were strongly associated with poor OHS management arrangements independent of area of employment, job type, employment type, age, experience and general health (Table 4.17). Specifically, those who reported high levels of poor OHS management arrangements were over 10 times as likely as those with low levels of poor OHS management arrangements to report experiencing high levels of poor working conditions. Repeating these analyses for each area separately showed that this association was significant in the first Asia Pacific area, Europe area 2 and Asia Pacific area 2 (OR=2.74 (1.40-5.37), 1df, p=0.003; OR=1.89 (1.04-3.42), 1df, p=0.04; and OR=7.02 (4.45-11.06), 1df, p<0.0001) and approached significance in Europe area 1 (OR=1.73 (0.94-3.19), 1df, p=0.08).

*Table 4.17: Associations between high levels of poor working conditions and OHS management arrangements*

|                |      | ODDS RATIO | CONFIDENCE LIMITS | DF, P |
|----------------|------|------------|-------------------|-------|
| OHS MANAGEMENT | Good | 1.00       |                   | 1,    |



|                    |                                                 |        |              |               |
|--------------------|-------------------------------------------------|--------|--------------|---------------|
| ARRANGEMENTS       | Poor                                            | 10.14  | 6.66-15.44   | p<0.0001      |
| AREA OF EMPLOYMENT | Europe area 1                                   | 1.00   |              | 3,<br><0.0001 |
|                    | Asia Pacific area 1                             | 38.56  | 13.66-108.88 |               |
|                    | Europe area 2                                   | 54.27  | 20.30-145.06 |               |
|                    | Asia Pacific area 2                             | 136.74 | 55.58-336.41 |               |
| JOB TYPE           | Maintenance/other                               | 1.00   |              | 3,<br><0.0001 |
|                    | Driving                                         | 2.63   | 1.42-4.86    |               |
|                    | Lashing and/or receiving and delivery           | 8.83   | 4.56-17.10   |               |
|                    | Both driving and lashing/receiving and delivery | 7.53   | 3.80-14.90   |               |
| HEALTH             | Good                                            | 1.00   |              | 1, 0.01       |
|                    | Poor                                            | 2.29   | 1.22-4.30    |               |

#### 4.6.2 Associations between health and safety outcomes and both working conditions and OHS management arrangements

High levels of perceived poor safety outcomes were independently associated with both poor working conditions and poor OHS management arrangements after controlling for area of employment, job type, employment type, age, experience and general health (Table 4.18). When the regions were considered separately there were independent associations between adverse safety outcomes and:

- Poor working conditions in the terminals in: Europe area 1 (OR=2.58 (1.32-5.07), 1df, p=0.006); the first Asia Pacific area (OR=4.04 (1.88-8.68), 1df, p<0.0001); and Asia Pacific area 2 (OR=1.97 (1.24-3.14), 1df, p=0.004)
- Poor OHS management arrangements in the terminals in: Asia Pacific area 2 (OR=1.56 (1.03-2.37), 1df, p=0.04)

Similarly, high levels of poor health outcomes were independently associated with both poor working conditions and poor OHS management arrangements (Table 4.18). When the regions were considered separately there were independent associations between adverse health outcomes and:

- Poor working conditions in the terminals in: Europe area 1 (OR=3.15 (1.52-6.53), 1df, p=0.002); the first Asia Pacific area (OR=2.44 (1.16-5.13), 1df, p=0.02); Europe area 2 (OR=3.75 (1.90-7.40), 1df, p<0.0001); and Asia Pacific area 2 (OR=3.91 (2.49-6.16), 1df, p<0.0001)
- Poor OHS management arrangements in the terminals in: Europe area 2 (OR=2.04 (1.03-4.04), 1df, p=0.04); with a similar association suggested for Asia Pacific area 1, though this did not reach significance (OR=1.96 (0.93-4.13), 1df, p=0.08).

These analyses show that our composite measures of working conditions and OHS management arrangements, intended to reflect more closely workers' overall workplace experiences, are significantly associated with their OHS outcomes. This is worth drawing attention to for two reasons. First, it implies that changes to one or two arrangements or practices might have considerable knock-on effects. This is important, particularly in an environment in which, for example, some working conditions are less possible to improve than others (such as the necessity for night-work on the one hand and staffing levels on the other). Second, the findings also suggest that GNTs' relative emphasis on altering behaviour in order to raise OHS performance levels in comparison with that on altering work, management and employment practices is missing an opportunity to improve workers' OHS experiences.



*Table 4.18: Associations between high levels of adverse safety and health outcomes and both working conditions and OHS management arrangements*

|                              |                             |                                                 | ODDS RATIO | CONFIDENCE LIMITS | DF, P       |
|------------------------------|-----------------------------|-------------------------------------------------|------------|-------------------|-------------|
| HIGH ADVERSE SAFETY OUTCOMES | OHS MANAGEMENT ARRANGEMENTS | Good                                            | 1.00       |                   | 1, p<0.0001 |
|                              |                             | Poor                                            | 2.11       | 1.43-3.12         |             |
|                              | WORKING CONDITIONS          | Good                                            | 1.00       |                   | 1, p<0.0001 |
|                              |                             | Poor                                            | 3.51       | 2.28-5.40         |             |
|                              | AREA OF EMPLOYMENT          | Europe area 1                                   | 1.00       |                   | 1, p<0.0001 |
|                              |                             | Asia Pacific area 1                             | 0.98       | 0.54-1.78         |             |
|                              |                             | Europe area 2                                   | 0.38       | 0.20-0.70         |             |
|                              |                             | Asia Pacific area 2                             | 0.45       | 0.26-0.78         |             |
|                              | JOB TYPE                    | Maintenance/other                               | 1.00       |                   | 0.08        |
|                              |                             | Driving                                         | 1.71       | 0.96-3.04         |             |
|                              |                             | Lashing and/or receiving and delivery           | 2.18       | 1.20-3.96         |             |
|                              |                             | Both driving and lashing/receiving and delivery | 1.73       | 0.94-3.19         |             |
|                              | EXPERIENCE                  | Under 10 years                                  | 1.00       |                   | 0.09        |
|                              |                             | 10 years or longer                              | 1.37       | 0.95-1.99         |             |
| HIGH ADVERSE HEALTH OUTCOMES | OHS MANAGEMENT ARRANGEMENTS | Good                                            | 1.00       |                   | 1, p<0.0001 |
|                              |                             | Poor                                            | 2.80       | 2.01-3.90         |             |
|                              | WORKING CONDITIONS          | Good                                            | 1.00       |                   | 1, p<0.0001 |
|                              |                             | Poor                                            | 5.30       | 3.71-7.56         |             |
|                              | JOB TYPE                    | Maintenance/other                               | 1.00       |                   | 3, p=0.04   |
|                              |                             | Driving                                         | 1.96       | 1.18-3.24         |             |
|                              |                             | Lashing and/or receiving and delivery           | 1.32       | 0.76-2.30         |             |
|                              |                             | Both driving and lashing/receiving and delivery | 1.65       | 0.93-2.93         |             |

## 4.7 National terminal operators

All the analyses in the sections above are based on the data from the respondents working in terminals operated by GNTs only. Two further terminals run by national operators, one in the first Asia Pacific area and one in Europe area 2, participated in the project. It is important to remember here that, as described in Chapter 3, all dock-work in the Europe area 2 national operator run-terminal is carried out by indirectly employed workers.

Comparing the GNT- and national operator-run terminals univariately (i.e. without controlling for factors such as age and work experience), in the first Asia Pacific area respondents in the GNT-run terminals had significantly lower mean health outcomes, OHS management arrangements and working conditions scores ( $F=14.52$ , 1df,  $p<0.0001$ ;  $F=3.75$ , df,  $p=0.05$ ; and  $F=27.63$ , 1df,  $p<0.0001$  respectively; Figure 4.10) and were significantly less likely to have health outcomes, OHS management arrangements and working conditions scores above the median for the region as a whole (47% and 61%, chi-square = 6.09, 1df,  $p=0.01$ ; 49% and 71%, chi-square = 13.83, 1df,  $p<0.0001$ ; and 51% and 62%, chi-square = 4.35, 1df,

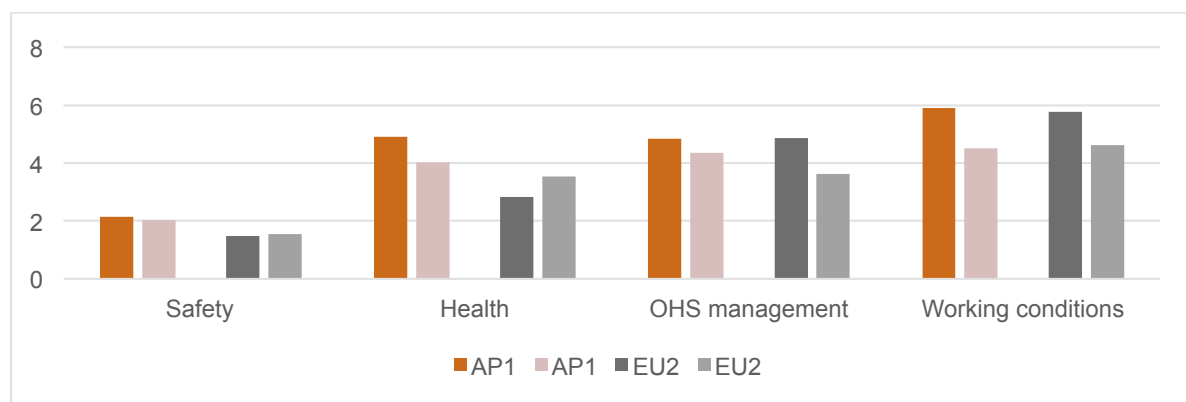


$p=0.04$  respectively). Among the Europe area 2 respondents, however, although the pattern of findings was the same for OHS management arrangements and working conditions ( $F=10.77$ , 1df,  $p=0.001$ ; and  $F=15.58$ ,  $p<0.0001$  respectively; Figure 4.11; and 50% and 71%, chi-square = 6.26, 1df,  $p=0.01$ ; and 48% and 65%, chi-square = 4.42, 1df,  $p=0.04$  respectively), the mean health outcomes score was significantly higher for the GNT-run terminals' respondents ( $F=3.79$ , 1df,  $p=0.05$ ; Figure 4.10) and the proportion above the median was also higher for GNT-run terminal respondents, though this did not reach significance (51% and 37%, chi-square = 2.14, 1df,  $p=0.14$ ).

Repeating the multivariate models for the first Asia Pacific area and Europe area 2 described in sections 4.2 to 4.6 above with the inclusion of a dummy variable for terminal operator type showed that most of these associations remained after controlling for other factors. In comparison with those from the GNT-run terminals, respondents from the terminals run by national operators were more likely to report high levels of poor OHS management arrangements in both the first Asia Pacific area and Europe area 2, more likely to report high levels of poor working conditions in the first Asia Pacific area, and less likely to report high levels of poor health outcomes in Europe area 2 (see Appendix, Table A.1). The latter is probably a reflection of the profile of the workforce in terminal EU2T3. These workers were all indirectly employed and were significantly younger and had less work experience<sup>15</sup> than their counterparts in the GNT-run terminals (EU2T1 and EU2T2), most of whom were directly employed.

Taken together, these findings suggest that the relationships between working conditions, OHS management and OHS outcomes are similar for GNT- and national operator-run terminals. However, they suggest that those working in national operator-run terminals generally experience higher levels of poor working conditions and OHS management arrangements.

*Figure 4.11: Mean safety and health outcomes, OHS management arrangement and working conditions scores by terminal operator for the first Asia Pacific area and Europe area 2*



## 4.8 Summary and conclusions

The findings in this Chapter suggest that substantial proportions of survey respondents have poor workplace health and safety experiences in container terminals – be those in relation to their personal safety and health, the management of the risks they face at work or the way in which their work is organised and arranged.

In terms of safety, 70% felt they were at high risk, 40% felt these risks were ineffectively managed and one third had been injured in the previous year. While for health, although slightly fewer respondents felt they were at high risk (60%), slightly more (48%) felt these risks were ineffectively managed, and levels

<sup>15</sup> In the national operator run terminal, 80% of respondents had less than 10 years' experience compared to 32% for the GNT run terminals ( $X^2 = 47.88$ , 1df,  $p<0.0001$ ) – and in fact 64% had less than 5 years' experience (compared to 12%). Similarly, 72% were under 40 compared to 28% of those in the GNT run terminals ( $X^2 = 38.67$ , 1df,  $p<0.0001$ ) – with 50% were under 30.



of respondents reporting stress, mental fatigue and work-related illnesses were high (60%, 65% and 41% respectively). These findings are corroborated by the qualitative data from our studies in which many of the worker participants expressed concerns about their safety and, in particular, their health, and the way in which these were managed. They also identified work-related impact on their health and welfare (for example in the form of stress and fatigue), that research from other sectors of industry has shown is associated with changes in the way in which work is organised and managed (such as increases in flexible or contingent work patterns and employment arrangements, increases in job insecurity and work pace and a decrease in control over work (see, for example; Quinlan et al., 2001; Quinlan and Bohle, 2008; Walters et al., 2011), as being increasingly common and inadequately addressed by arrangements for managing workplace risk. Comparisons with data from other sources suggest that respondents to our survey are worse off than others. For example, data from the 5<sup>th</sup> European Working Conditions Survey (EWCS) (EUROFOUND, 2010) show that, among male respondents in European workplaces generally, only 29% felt their health or safety and 18% their welfare were at risk because of work and just 26% said they experienced stress at work always or most of the time.

The survey also suggested that many respondents experience high levels of what they perceive to be poor OHS management arrangements and working conditions. In particular they felt that such arrangements failed to provide adequately for their voice to be heard. For example, over two-thirds of respondents said they were not consulted about the introduction of new procedures and 70% had no health and safety representative or had difficulty accessing one. In addition, they believed that the arrangements for their health, safety and welfare failed to address the issues of work organisation and welfare that were critical to health and welfare. For example, 63% had high levels of job intensity and half were dissatisfied with their workplace welfare conditions and arrangements. There seems to be therefore, substantial room for improvement in relation to health and safety management arrangements, including those relating to the representation and consultation of workers on these arrangements, as well as in work organisational issues that affect welfare (and may indirectly also affect safety). Relatedly, a substantial proportion of respondents (31%) felt staffing levels were frequently inadequate for work to be carried out safely and 35% of respondents felt that they were frequently inadequate for work to be completed according to targets, indicating considerable room for improvement here too.

Strong associations between all of these areas (that is, between working conditions and workplace arrangements for managing health and safety, as well as between OHS outcomes and both working conditions and OHS management arrangements) were, expected and were borne out by the survey findings. However, the same findings also suggested that increased emphasis on changing aspects of OHS management and workplace arrangements, as opposed to focusing mainly on changing workers' behaviour, has the potential to improve workers' OHS experiences overall as well as terminal level OHS performance – something we return to in the following Chapter.

Lastly, the findings clearly identified a sub-group of the respondents as being at particular risk. These were indirectly employed workers doing jobs which combined quayside and driving work – a combination that was only present in the Asia Pacific area 2 terminals in our survey. This finding suggests that global approaches by GNTs to OHS governance and management do not produce similar OHS conditions, arrangements and outcomes in different contexts. It also calls into question the company data identifying those in developing economy terminals as having better OHS performance – a reflection, perhaps at the widest end, of the more general gap our research has identified between these data and workers' day-to-day OHS experiences.

In the following Chapter we explore these issues further, discussing what helps to determine them, especially in relation to the national contexts in which they are experienced, and we further consider how the arrangements in place to support positive health and safety outcomes in the terminals might be improved in the light of the findings presented in this Chapter.



## 5. Addressing ‘the gap’

The major findings of this study indicate that while detailed strategies and arrangements to manage safety and health are adopted by most global and national container terminal operators, there remain major gaps between these approaches and the outcomes and everyday experiences of health, safety and welfare shared by workers in container terminals operated by these companies worldwide. They also confirm indications that the patterns of such experiences and outcomes are not consistent across terminals situated in different parts of the world.

Our previous study focused on many of the same terminals as those included in the present study and came to similar conclusions. The key difference between the two studies is found, not so much in their conclusions on these matters, but in the evidence we have obtained and analysed during the process of reaching them. The earlier study was based on interviews with managers, workers and their representatives in the terminals as well as on interviews with union officials globally. It therefore concerned the perceptions of a small number of key informants of health and safety in container terminals and of the arrangements made by companies to manage this experience. While the present study also includes such interviews with key informants, and seeks evidence of occupational health and safety and the arrangements to manage it, it does so by drawing in addition on the analysis of a survey of nearly two thousand respondents among the container terminals studied globally. It therefore adds substantial quantitative power to its analysis of the evidence on the experience of occupational health and safety issues in container terminals globally and the arrangements made to manage them.

There are three main areas in which factors that influence the outcomes we have observed are to be found. They are:

- the nature of the strategies adopted by the terminal companies for the governance and management of arrangements made for the safety, health and welfare of the workers in the terminals
- the position of these approaches within the wider strategies adopted by the same companies for managing the operation of their terminals
- the national contextual determinants of practices to support the health, safety and welfare of workers in container terminals located in different parts of the world – in particular in this latter respect, the regulatory and labour relations contexts of such practices.

In this Chapter we focus on discussing reasons for the first two of these groups of influencing factors, and will address the third in the following Chapter.

### 5.1 The character of arrangements made for the governance and management of OHS in container terminals

As we noted in Chapter 3, the approaches taken by most of the global and national terminal operators in our study towards the governance and management of health and safety have several features in common. They aimed to address risks fairly systematically through undertaking risk assessment and introducing engineering or administrative controls in relation to both plant and processes consequent to this assessment. There were standard operating procedures taking account of safety issues in relation to most operational activities and maintenance of safety critical plant and equipment according to scheduled specifications. Information, informal ‘training,’ supervision and direct consultation with workers on risk management was provided through tool-box talks and similar activities at the start of shifts. Other



training was provided to new staff and updated for continuing staff by both formal and informal arrangements. In parallel with these routine job safety arrangements, the safety management systems in place in all the terminals contained various elements to ensure continuous improvement, including procedures for information collection and dissemination on safety issues, allowing both the monitoring of performance and timely interventions when required. The Safety (and Environment) Departments that were present in all of the terminals serviced these arrangements, as well as providing advice, training and in some cases participating in the surveillance of safety behaviours. Generally managers in the terminals believed these arrangements to be 'fit for purpose'.

Many of these features are widely considered to be good practice in current thinking on managing health and safety and are generally implemented to a greater or lesser extent in large organisations with arrangements in place for safety management. However, as we detail in Chapter 4, the perception of the operation of these arrangements and the engagement of workers with them that was evident in the results of the survey of terminal workers was at variance with the views of managers. Overall there was a view that arrangements for OHS management were less than satisfactory and fell far short of the ideal described by terminal managers. For example, nearly one third of respondents described the level of staffing to support the effective operation of the arrangements in place to manage health and safety at their place of work as insufficient. The greatest proportion of respondents with this view was in Asia Pacific area 2 (42%). The survey data showed that experience was not uniform, with certain job types (like receiving and delivery work and lashing), types of employment (such as contract workers as opposed to directly employed workers) and regions (especially terminals in Asia Pacific Area 2) reporting poorer experiences than others. There was also a far higher incidence of work-related harm reported by respondents in the survey than was suggested by the company data. This was true for injuries (and near misses), but especially for work-related ill-health such as fatigue, stress and MSDs.

In characterising the drivers of corporate approaches to health and safety taken by the companies studied, it is notable from earlier chapters that most recently, a high-profile board-room level commitment to 'zero harm' has been particularly influential. As detailed in Chapter 3, this is transposed into operational practice through a mix of attention to mission statements in which the organisation's leadership makes clear its: 'vision' of achieving high performance and continuous improvement in health and safety outcomes; efforts to achieve on-going improvements in organisation safety culture; efforts to improve health and safety competencies, training and skills of personnel; and measurable performance targets for health and safety. At the same time notions of accountability for safety and health among workers and managers alike are instilled. While there were some differences in the details of exactly how they did so, three of the four global operators in the study followed this prescription at the corporate level and required adherence to it in the operational practices within their terminals. The two national companies did likewise, although less conspicuously.

Equally widespread and influential have been the effects of international and national voluntary standards on OHS management. These have helped to stimulate and support the widespread adoption of a management systems approach to health and safety that shares similar features as those summarised above and has been implemented widely, especially in larger organisations. The terminal companies all seem to have followed this trend.

Among the most emblematic of the procedures underpinning such systems were those for risk assessment, and managers and health and safety advisors interviewed in the terminals commented on the significance of these procedures in the workplaces for which they had responsibility. However, the respondents to the survey were far less convinced concerning its place or their engagement with it in the terminals in which they worked. Eighty per cent of them indicated that there was either no risk assessment present in relation to their work, or if it had been present, the assessment had not involved them. Analysis of the interviews in both the present and previous study suggests that a reason for this disturbing lack of awareness of risk assessment may have been related to the approach taken by the terminal management towards risk assessment rather than its complete absence from their health and safety management strategies. While managers believed they operated a participatory approach, this was not the experience of either the workers or their representatives who were quite clear that rarely were



they consulted or involved in the process of risk assessment at the terminals. As we will discuss, the behaviour-based character of arrangements in place for safety in all the terminals would tend to promote such perspectives.

Alongside the promotion of a 'zero harm' approach and concomitant interest in safety culture mentioned above, another feature of current strategy was a shift in emphasis in the monitoring of safety, away from the collection and collation of LTIs and the measurement of performance standards against them (although this still took place) and towards greater attention to taking account of incidents that had not necessarily resulted in harm but which had a high potential to cause serious harm:

*"...we need to be more proactive about ... and that is what we are now trying to drive towards so how do we get our terminals to see a potential incident before it happens, right so we are looking more at the near misses we are looking at the observations ... when people see something unsafe do they actually do something about it 'cause we have a history of people probably seeing a lot but not doing anything about it and we want to change that mind set so, so we have been doing a lot of communication campaigns and stuff..."*

[Global level safety adviser (1), GNT 3]

This reflects current practice elsewhere and especially in high-risk industries such as petro-chemicals, energy extraction and supply and construction, where safety management theory holds that there are significant differences between the causes of major incidents and those of more routine LTIs. Following from this, it is argued that concentration on measures of the reduction of LTIs will not lead to better prevention in relation to more serious incidents. Therefore it is thought to be important to concentrate on the recording and investigation of such events in order to promote organisational learning concerning their causes, and through this, their future prevention. This thinking was evident in several of the approaches to the governance of health and safety among the GNTs at corporate level that are discussed in Chapter 3 as well as in terminal level OHS information collection and dissemination.

*"...we have ... LTI calculated on the basis of that and then we have those special categories which are near misses with high potential so nothing happening could potentially have been a fatality, green incidents are less than LTIs so there was actual incidents, actual injury which could have been a high potential, LTIs with a high potential and fatalities and then we have some sort of frequency calculations for that specific... category which is the LTIs with high potential because this is one of the things we want to focus on a lot right now. Also seeing if, if an LTI could have led into a fatality so whether we could almost predict LTIs going down and the potentials going down ... and this is one of the important numbers for us so whether these numbers going down so the frequency .... of LTIs with high potential and globally ... and this is something we're looking for if that number from previous years and well the most reliable data we have started in 2012 so we are also comparing whether these numbers were reducing in a on a rolling frequency so a year to date but also on a monthly basis..."*

[Global level safety adviser (2), GNT 3]

A further feature of these strategies, also of recent origin (and a change that seems to have occurred since the previous study), was the greater emphasis attached to 'accountability' reported in interviews at the corporate level in the GNTs. In some cases the examples that were used to illustrate this change involved relations between terminal managers and the company head office concerning accountability of the former for poor OHS performance or serious incidents within their terminals.

In other interviews with managers and OHS advisers within terminals, as well as with workers and their representatives, it was clear that the same emphasis on accountability was applied to surveillance of unsafe acts or failure to follow safety procedures among terminal workers. It was clear from many of the interviews with workers and their representatives in both the present and previous study that such approaches substantially reduce workers' feelings of trust in the terminal management's commitment to their health, safety and welfare, despite the assurances concerning a 'no blame culture' being at the same time espoused in the terminal. In this respect, our findings confirm Hopkins' (2005) critique of behaviour-



based safety systems in which, as we detailed in the previous report (pages 85-87), he points out that 'where such distrust exists it is pointless for employers to introduce such programmes. The evidence is that they will fail'. Despite this conclusion, such systems were in widespread use and, as is evidenced by both survey and interview analyses, they were perceived by workers to be both hostile to their interest in job security and of only limited value in addressing their health and safety concerns.

*"They do safety observations which all managers have got to do, but that's to get their bonus to be honest, they're on a key performance indicator, as part of their KPI will be they have to do so many inspections a year or observations a year, but that's just going down and visiting the ship if it's a nice day, they won't come on the ship at 4 o'clock in the morning, in February.*

*They don't know how you work or what your safety is, they ask you as they're looking around.*

*They tend to check the photocopier on them days, and say yes that's running. ... some of the people that are doing it, they're not worth the paper they're written on, to be quite frank, because they don't know what they're looking for..."*

[Stewards/Dock workers, EU2T1]

The emphasis on changing 'safety culture' in the organisation that is the leitmotif of 'zero harm' strategies usually implies bringing about changes in attitudes and behaviours of the personnel working in the establishments in which these strategies are brought to bear once they are adopted at corporate level. Notions of 'performance standards' and 'accountability' for safety further imply monitoring safety-related behaviours – whether in the form of the appraisal of managers' achievement of performance targets on safety or through surveillance of workers' adherence to work safety rules. In other sectors where similar strategies are found, observers have noted that in combination, the 'zero harm' orientation of OHS governance and the management systems approach to its delivery produce a set of arrangements that are strongly behaviour-based in character (see for example Quinlan (2014) on mining; and Frick (2011) in other sectors). These effects were evident in many of the companies and terminals we studied. What was also apparent in these companies and terminals was that the focus of their attention to governance and management was weighted towards *safety* rather than *occupational safety, health and welfare* management. Other researchers have pointed to similar orientations elsewhere and have argued that they are a function of the corporate focus on behaviour-based approaches. To support this point, in the previous study we quoted Frick and Kempa (2011) who state that in such systems:

*"Safety is given much more attention than health, despite the fact that diseases cause far more ill-health than accidents do. The prevention described more often revolves around control of 'safe' procedures than the prescribed upstream prevention of eliminating risks at the design stage..."*

Quinlan (2014) makes the same point and suggests a connection between the focus on behaviourally-orientated arrangements for safety at work within establishments, the dominant discourse on 'safety culture' among managers and safety professionals alike and the high profile espousal of 'zero harm' approaches at board room level. He points to the attraction of these ways of conceptualising the governance of improvement in workplace health and safety for corporate leaders and managers. He argues that its focus on changing workers' behaviour (although managers' behaviour may also be included) does little to question the tenets of managerialist thinking, or involve examining corporate or managerial decisions on finance, work organisation and operation. It therefore fits very well within modern management leadership models, and he further points out that there is now evidence from many industries that these approaches may have a negative impact upon workers' health and safety.

This was essentially the situation in the terminals we studied. As already noted in both the present and previous study, a behaviour-based approach was seen to characterise the arrangements for safety and health in all of the terminals. In keeping with observations on behaviour-based approaches generally, this meant that while there was a widely held view among workers and managers alike that the health and safety management systems had improved in recent years, priority in the systems we examined was afforded to *safety* as opposed to *health or welfare*. Leadership from the corporate level on the objective of



achieving ‘zero harm’ had clearly made a significant impact, evident, for example, in the ways in which management interviewees from all the terminals stressed the importance of aiming for zero lost time injuries and, as a step towards this, systematically reporting and investigating all incidents, regardless of severity. However, despite the emphasis on incident investigation, interviews confirmed other findings from the previous study indicating that it was rare for investigations of routine injuries and unsafe incidents to go beyond proximal causes. That is, whilst investigations established who had done what and when, and whether any equipment failure had been involved, they did not generally look at systemic or deeper organisational causes or contributions to human error or unsafe behaviours on which they tended to focus. This seemed to be a consequence of the universal management conviction that following the requirements of the safety management system closely would mean that accidents simply could not occur – a conviction supported by their behavioural foundation and reflecting the widely held belief that all accidents were the result of workers failing to follow such procedures – a belief which in turn was reinforced by the corporate focus on changing workers’ behaviour to improve safety culture. But of course, as both our own survey and the company injury and incident data show, work-related injuries and fatalities, as well as ill-health, *did* occur in all the terminals we studied. One third of the respondents to the survey indicated that they had received a work-related injury during the previous year. And nearly two thirds had been involved in a near miss. There were considerable variations between terminals in different regions, but generally the figures analysed in Chapter 4 suggest both that the experience of injuries by workers may be considerably higher than that reported in the company data, and that the *routine* causes of work-related harm were to be found in issues that were not generally investigated and which were embedded in the way work was organised and the terminals operated.<sup>16</sup>

Despite this, managers believed that the health and safety management arrangements in place in their terminals covered the most significant risks faced by workers. They were proud of these systems and arrangements and committed to their continued improvement and the improvement of safety performance through systems such as inducting new workers into the safety culture of the terminal through training, then monitoring and supervising their adherence to its requirements. Workers and their representatives, who broadly agreed that the systems and arrangements were effective in addressing *safe behaviour* within the terminal, generally shared this pride and commitment but pointed out that the arrangements addressed only part of their concerns. In particular, as we discuss later in this Chapter, they did not address their experience of work-related ill-health.

In the report of the previous study we presented a critique of behaviour-based safety management strategies drawn from the literature. In summary, we suggested that the findings of research and critical literature indicate that there are several factors in common that help to explain failures of safety management systems adopting a behaviour-orientated approach. For example there is a consensus in published research (see for example Frick and Kempa’s (2011) review) that the application of these types of safety management systems within organisations often results in:

- Preoccupation with *safety* rather than with *safety, health and welfare*
- Focus on the behaviour of individuals rather than with organisational, operational or situational issues
- Approaches that over-emphasise strategies and practices of paper compliance
- Focus on top down instructive communication, with resulting inadequate feedback loops to managers from their subordinates, workers and their representatives

<sup>16</sup> Comparison between company data on LTIs and our survey data is somewhat unreliable because, given the many well-known social and economic determinants of injury reporting, we know we are not comparing like with like. Nevertheless our data suggest substantial under-reporting in company data. The company data are all *lost time* injuries. In our data, 35.4% of those injured did not stop work, 13.5% continued later the same day, 9.1% took 1 to 3 days off, 13.1% 4 to 7 days, 6.8% 8 to 14 days, 7.4% 15 to 28 days, and 14.7% 29 days or more. So overall, 21% of respondents were injured and took at least some time off, as opposed to the 33% who were injured per se.



- Inadequate attention to the health and safety consequences of work organisation and work processes and to that of changes within them

It is evident from the findings in Chapter 3 that all these features were present in the systems in place to manage health safety in the terminals and, moreover, they were the result of the requirements of company level health and safety governance. As we have seen, they were evident in the experiences of workers in the present study – both those reported by respondents who took part in the questionnaire survey and in the records of the more detailed discussion of these experiences with the researchers during interviews with workers and their representatives. The analysis in Chapter 4 corroborated the conclusions of the previous study in this respect and demonstrated the same significant gap between the perceptions of corporate leadership and management and those of terminal workers. Both the qualitative and quantitative evidence supports conclusions that features of the safety management systems in place in the terminals such as those above served to undermine the delivery of an experience of effective management of *health, safety and welfare* for workers. As already noted, there was a considerable level of worker dissatisfaction with the OHS management arrangements they experienced, which was even greater for those in certain high risk activities (such as lashing and/or receiving and delivery work in Asia Pacific Area 2). The overall score on the composite variable we constructed to indicate poor health and safety management in Chapter 4 confirmed this. This composite variable was made up of 12 measures of OHS management arrangements, with a higher score indicating poorer OHS management. The mean scores for the four study areas ranged from 3.63 in Europe Area 1 to 7.52 in Asia Pacific Area 2, with an overall mean of 6.31, indicating that, while there was substantial regional variation, respondents from all areas felt arrangements were lacking in a number of the areas included in our composite measure. Additionally, while good communication within organisations is often argued to be a key requisite of health and safety management systems (Seibold and Shea 2001, Conger and Kanungo 1998), it is notable that the evidence presented in Chapter 4 makes plain that many respondents had not experienced this. For example, on access to information concerning the preventive policies or procedures that underpinned the safety management systems in place in the terminals, between half and two thirds of respondents to the survey indicated they either had no access to these written safety policies or procedures, or simply did not know about them despite the repeated claim by managers that they were available to all.

The evidence indicates that the aim of corporate governance to effect improved health and safety in the terminals through focusing on zero harm strategies and changing safety culture is at best only partially effective. Arguably, two main features serve to undermine its aim. First, the approach is to a large extent self-limited by its focus on safety – as opposed to health, safety and welfare – and it therefore fails to address many of the workers' concerns that are articulated in both Chapter 4 of the present report as well as in the previous study. For example, nearly 90 per cent of respondents to the survey indicated that there was no terminal policy on work-related stress at their place of work, or if there was they were unaware of it. Yet a large proportion of operational workers in the same survey indicated stress to be a health outcome that they experienced as a consequence of their work.

Second, while there may be 'low hanging fruit' to be harvested in terms of safety improvements through using this approach, ultimately the lack of trust and the marginalisation of institutional arrangements for representative worker participation within such systems serve to undermine their credibility in the eyes of workers and their representatives, as both studies demonstrate. For example, in the present study, in contrast to what managers claimed concerning the widespread practice of consultation, 60 per cent of respondents to the survey had no health and safety committee (or did not know if there was a health and safety committee). With regard to institutional arrangements for the selection of and access to health and safety representatives, 42 per cent of respondents said they had no health and safety representative. Of those that did have a health and safety rep, nearly half (48 per cent) felt they were not easy to access and 18 per cent reported that they were not elected by workers. However, the patterns of these arrangements varied considerably between terminals and between regions, with those in advanced market economies in Europe and Asia Pacific considerably better provided for in this respect than the respondents in the Asia Pacific area 2 terminals. We will return to this comparative aspect later in this Chapter, but these differences appear to be related to a mixture of regulatory support for worker representation on health and safety and the resilience of the institutions of organised labour in different national contexts. These



observations were further borne out by comments made by workers and their representatives confirming the findings on the role of these institutional arrangements from the previous study.

*“What you’re describing suggests there’s ... a union strategy to increase how much workers are involved in the way that health and safety is managed.*

*Yes, absolutely, we’ve empowered, you know, the delegates and with the union backing to take on these issues. ... We’ve also got legislative, you know, support as well with the OH and S act ... so you’ve got that sort of additional backup.”*

[Delegate and Team leader, AP1T2]

*“What union? We just rely on the goodwill of the local agent of our contractor, even if he stops our salaries we have no one to turn to.”*

[Lasher, AP2T3]

Although the rhetoric of zero-harm approaches to OHS arrangements identifies OHS as a ‘core corporate value’ and indicates the necessity of its integration into the core aims and management functions of the business, in practice the same zero-harm approach served to moderate this in several important respects. A combination of focus solely on safety with a behaviour-based orientation towards achieving improvement, meant that much of the underlying business and organisational contribution to creating a poor working environment for some terminal workers fell outside the remit of the strategies for safety and health and was therefore ignored by them. We explore the extent of these effects next.

## 5.2 The position of arrangements for occupational health, safety and welfare within wider strategies for managing the business and operation of container terminals

There is a large body of research evidence drawn from a variety of sectors and countries that indicates that several now well-established trends in modern organisational management have features in common which lead to harmful effects for workers’ health, safety and welfare (see for example; Benach et al., 2007; Quinlan et al., 2001; Quinlan and Bohle, 2008; Underhill and Quinlan, 2011; Walters et al., 2013). They include the outsourcing of organisational activities to contractors on the grounds of cost and short-term business efficiency; the de-structuring of organisations with increasing devolution of authority away from centralised hierarchical structures to looser associations of business units arranged in flatter matrix style organisational structures; the increased emphasis on short-term business performance targets, their measurement and their influence on the career progression of managers; an increased prioritisation of value chain relationships and a resulting increased porosity in the boundaries between organisations. These have occurred alongside a parallel decline in the significance of the legal nexus surrounding the employment relationship and by extension, a decline in the influence of collective approaches to employment relations; and all have contributed to increased influence of considerations within *business relationships* upon *workplace practices*.

It is well known that these features lead to, *inter alia*, the reduction of employment security, greater focus on price and delivery outcomes and stronger pressure to increase work intensity, while at the same time presenting a host of challenges for conventional approaches to communicating and managing arrangements for occupational health and safety within organisations. Researchers have noted that the multi-employer worksites that result from contracting work out to contractors and subcontractors produces scenarios in which it is difficult to manage OHS and make arrangements to protect *all* workers at the worksite. This is especially true for those workers at the ends of the multi-layered contracting and subcontracting chains that may be present within such worksites. Such arrangements also often result in the presence of companies on site with fewer resources to address OHS management than the large companies to which they are contracted, and further to place these contractors under considerable pressure to deliver according to unrealistic price and time schedules which compromise health and safety



(see, for example, James and Lloyd, 2008). The devolving of organisational authority within large formally centralised and hierarchical organisations to flatter matrices of more loosely associated business units has been noted to contribute to serious problems of managerial authority on issues of OHS as well as to a reduction in resources for specialist OHS services which were formerly held centrally within these large organisations. Indeed there have been a number of accounts of the cause of major incidents identifying failures of communication and management and *disorganisation* resulting from such organisational structures as significant among the causes of these events (see: Le Coze, 2008; Hopkins, 2011; Hopkins, 2012; Woolfson, 2013).

Although we did not have sufficient access to the companies to study these features in detail, they were present in varying degrees in the companies included in the present study. It is likely that they contributed to the organisational position occupied by arrangements for the governance and management of OHS within these companies and that they helped explain the strategic approach taken towards the governance and management of OHS within the business units for which the companies held overall responsibility. For example, outsourcing of dock labour is a well-established pattern in terminal operation globally, driven by corporate strategies concerning cost efficiencies. It was adopted in all of the terminals in the study in which resistance from existing regulation and/or organised labour had been overcome. Devolved business autonomy for individual terminals – the business units of the companies, to use their corporate appellation – was also a clear strategy adopted to varying degrees by the GNTs in the study. In one of them, its progression was such that, as we noted in Chapter 3, there appeared to be no obvious corporate level infrastructure in place for the governance of terminal level OHS arrangements, while in the other three there were indications that the zero harm approach towards the governance of arrangements for safety management at the terminals was the way in which corporate governance attempted to exert its influence over otherwise semi-autonomous business units, but in so doing, as we have argued in the previous section, the meaning of ‘occupational health, safety and welfare’ was considerably narrowed to that of ‘safety’.

In Chapter 4 we observed that 60 per cent of terminal workers who took part in our survey believed there to be a high risk to their health from their work in the terminals, with stress and fatigue also being reported by over 60 per cent of respondents in the survey. High levels of adverse health outcomes were especially associated with work in the Asia Pacific area 2 terminals, with most operational jobs and with indirect employment. Experience of poor health outcomes was also associated with high levels of poor safety outcomes. This suggests several things. First, wider trends in organisational management that were evident in the terminals help to contextualise arrangements for the governance and management of OHS reported previously and help explain their results. Our survey findings show that respondents clearly regard their health to be at some risk, and especially so in relation to exposures that the arrangements for safety contribute very little to preventing. It is well established in the literature to which we have referred that work-related health outcomes reported in the survey, like high levels of stress and fatigue (as well as high levels of others such as musculoskeletal damage and gastrointestinal problems), are associated with features of work organisation, such as the pace of work, the extent of repetitive tasks and the degree of decision latitude allowed, as well as with issues of employment security and the like. These are matters that are dictated by the wider organisational and operational management of the terminal companies and are outside the influence of behaviour safety strategies – or indeed efforts to influence ‘safety culture’ within the terminals. It is also interesting to note that in the region in which these outcomes were most pronounced, trends in employment practices have been noted by others to mean that:

*“... workers are casual employees that come to the port for short periods...These workers are hired by private contractors who offer poor pay, poor safety conditions and no long term benefits.....there are considerable social costs associated with the process of port redevelopment, which are being borne by the workforce. The rationalisation of workforce numbers, increased casualization and de-unionisation of port labour are leading to worsening conditions of employment.”*  
(Hill, 2008: 164-165)

It is worth noting here that although there were few female workers among the operational staff of the terminals we studied, it is widely acknowledged that the trend towards greater automation of terminal



work and consequent removal of at least some of the heavy physical strains associated with dock work opens the way for employment of an increased proportion of women in the terminal labour force globally. This has implications for the OHS management strategies adopted by companies, not least in relation to those aimed at workers' welfare. However we saw little evidence of either strategies or actions taken to address these implications in any of the terminals. Rather, the implications of our interview survey were that in those terminals where women were employed, they felt generally well-accepted by their male peers but had had to struggle to achieve basic welfare provisions. As the example below shows, the intervention of (in this case male) union workers' representatives could be particularly significant.

*"...when I first started there I felt very, very welcomed and fitted in ... there's challenges as well ... that's just the way it is when there's only 16 of you in a male dominated workplace sometimes you go in and you feel a bit like you're on your own ... But, generally, people are pretty friendly and welcoming ... [Achieving appropriate facilities] was a real struggle ... they gave us these changing rooms and the ... what are they called, you know, menstruating ... all that sort of stuff, was really, really below par like disgusting actually ... I had to really argue with the company for quite a while to get them to upgrade it ... we had to have like a fight with the supervisor and drag him in and make him look at it and it was like kind of humiliating ... they ended up improving it a bit and ... at one point they put in quite cheap plumbing ... and it probably wasn't even up to regulation and of course it was a nightmare the women's toilets were flooding and I kept going to the management and they kept (...) actually accusing the women of being ... well I don't really want to use the words ... and again it became quite embarrassing cause it became really public instead of them just dealing with it and we ended up having a massive fight about it and actually the person who made the biggest difference was one of the guys on the OH&S committee, our guys, our elected guys ... if it hadn't been for our OH&S guys I wouldn't have, you know, been able to get anything done to be honest ... because I appealed to the managers, and I appealed to the HR department and they don't care, they're just so cheap, you know?"*

[Stevedore, AP1T1]

In Chapter 4 we analysed survey data on work organisation and working conditions that are determined by operational management strategies. To do so we asked survey respondents questions concerning shift patterns, rest breaks, paid holiday entitlements, working hours, job security, work intensity, and satisfaction with basic pay and both working and welfare conditions. The results demonstrate a high level of work intensity in all the terminals, with workers in Europe and Asia Pacific area 2 experiencing long shifts; a third of the respondents in Asia Pacific area 1 experiencing irregular shift patterns; as well as a large proportion of respondents in both Europe and Asia Pacific experiencing night work. Arguably, they are fundamental to the wider business and operational strategies that drive productivity in the terminals. However, they are all work experiences that have been associated with poor health outcomes such as stress, fatigue and MSDs in the literature. Significantly, they are all issues that are largely ignored by the safety management arrangements in place in the terminals. The lack of any conspicuous preventive strategies that take account of these matters is further reflected in our additional finding also reported in Chapter 4 that those who reported that they experienced high levels of poor OHS management arrangements at their place of work were ten times more likely to also report experiencing high levels of poor working conditions, suggesting that they perceived the arrangements for health and safety management at their workplace as failing to address their concerns about their workplace health issues.

The survey findings therefore confirmed the concerns expressed by workers and their representatives that were reported in the previous study, and again in the interviews with workers and their representatives in the present study. In both cases, the prevailing opinion of workers and representatives was that, while safety arrangements in the terminals were conspicuous and had some impact on the safe behaviour of workers, they did not prevent a range of negative effects on their health, safety and welfare that were the result of the way in which work was organised to maximise the productivity of the terminal operations. Since they believed that maximising productivity was the corporate priority, a belief that was reinforced by their everyday work experiences, it is perhaps not surprising that workers and their representatives looked somewhat askance at the companies' efforts to protect their health, safety and welfare through behaviour change techniques and monitoring their safe behaviour.



In our analysis in Chapter 4, we went on to create a combined score for our indicators of work organisation and working conditions and we considered associations between this combined score and the areas in which terminals were situated, the type of job held by respondents and whether they were directly employed by the terminal companies or employed by contractors in the terminals in which they worked. We confirmed findings that were indicated in the previous study, as well as by the interviews conducted with workers and their representatives in the present study. As is detailed in Chapter 4, multivariate analyses of these data showed significant independent associations between high levels of poor working conditions, job type, area of employment and employment type. Workers employed by contractors in Asia Pacific area 2 terminals in jobs combining lashing and/or receiving and delivery with driving were by far the most likely to report high levels of poor working conditions.

Jobs such as lashing and driving are widely acknowledged to be among the most physically demanding in container terminals and so, in many ways, these findings are not surprising. What is important is that where these activities were undertaken, it was in the main by workers employed by contractors, and the working conditions they experienced were amongst the poorest. Here again these findings corroborate the analysis of interviews with workers in these positions in both the present and previous study and suggest that the corporate strategies to outsource these activities to contractors has a strongly negative effect on their experience of the resulting working conditions. While the behaviour change techniques adopted by terminal managers to improve safety in these situations applied to the contract workers as well as the directly employed workers in the terminals, and indeed both managers and workers interviewed frequently cited examples of actions taken to address safety behaviours seen among the contract workers, these strategies did not address their health or their welfare with the same degree of scrutiny or support. The perception of workers in these terminals was that here again corporate priorities placed operational cost efficiencies and productivity over concern for the health or welfare of these workers. At its extreme, in these terminals many of the workers such as lashers, who were employed by contractors and who experienced the poorest conditions of safety, health and welfare, were also temporary migrant workers. They came to the terminals often in groups from the same villages located very far away in entirely different parts of the country. They often spoke a different language to that of the directly employed terminal workers and managers. At the same time the education and literacy levels among this group appeared to be quite mixed. They lived in overcrowded and poor housing conditions and were dependent on the middle-men who organised their economic migration for the provision of basic amenities and transport.

As such, like economic migrants generally, they felt themselves to be disempowered and their security of employment to be extremely vulnerable. Their health and safety concerns were among those that generally went unrepresented at work, but at the same time their feelings of vulnerability and the precariousness of their employment prevented them from seeking representation on such matters. There did not appear to be strategies in place in the terminals to address these matters. Managers were of course aware of the challenges of dealing with health and safety issues in relation to contractors and their workers. In the Asia Pacific area 2 terminals, where contractor employees formed the majority of the terminal workforce, they indicated that there were various strategies in place to ensure that contractors adhered to the management's OHS requirements. They included specifications on health and safety requirements within the contract itself, induction training on safety for all contract workers on arrival at the terminal and the extension of communication, monitoring and supervision of compliance with requirements on safety behaviours to all workers, including those of contractors. Workers found to be in breach of these requirements were referred to their employers for further training or discipline as appropriate. Managers also talked about regular meetings with contractors or their representatives during the course of the contracted work, at which safety issues were regularly raised and addressed.

We were unable to investigate the effectiveness of these arrangements systematically. However, interviews with workers, including those with contract workers, suggested that they were only partially effective, with many workers complaining about the excessive focus on surveillance of behaviour and much less attention being given to other elements of compliance. If the combined findings of the survey and interviews are taken into account, it is clear that contractorisation poses some major challenges for



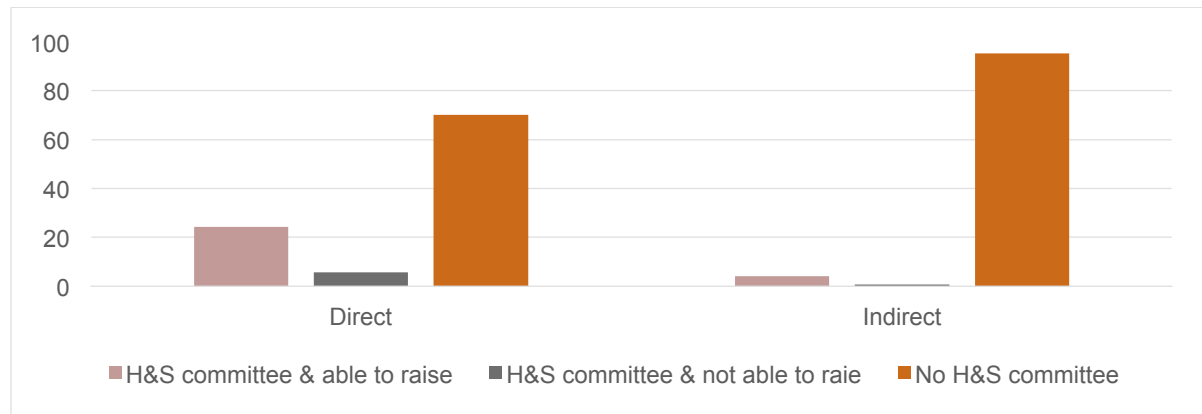
the achievement of improved working conditions for many workers and the strategies adopted by the terminal management to date fell somewhat short of overcoming these challenges. The research literature suggests that while a general worsening of employment conditions, including those for health and safety, are commonly experienced as a result of the contractorisation of labour in dock-work and elsewhere, there is also an emergent set of strategies that help to offset such deterioration. For example, as Walters and James (2011) identified, buyers of these types of services are often in strong positions to influence the conditions under which the service is delivered, especially when its delivery takes place in worksites under their control. They have further shown (see James et al., in press) that such influence has the potential to be most effective in value chain relationships that are relational rather than transactional. It was these types of relationships that were most typical of the ones found in the Asia Pacific area 2 terminals, where contractor procurement tended to engage relatively small numbers of contractors on a regular and renewed basis, establishing the long-term partnership style relational associations with labour suppliers that have been shown elsewhere to lend themselves to the kinds of more developed strategies to influence contractor compliance with health and safety requirements. This is the case for example in construction, food and transportation (see also; Walters et al., 2013; James et al., 2014; Sampson et al., 2014), and it would seem that terminal operators still have much to learn from these experiences.

In short, this is an area in which corporate governance of health and safety arrangements could become more engaged. Research in other sectors would suggest that substantial improvements in the working conditions of contract workers lie within the reach of such corporate influence. Greater attention could be applied to the development of corporate standards concerning these matters without necessarily risking excessive interference with the freedom of business units to manage their own affairs in relation to the financial and organisational aspects of their business relations with contractors. However, research also shows that the drivers of such engagement are not solely corporate ones but also come from the wider environment in which businesses are situated. This is an observation to which we will have cause to return in the following section.

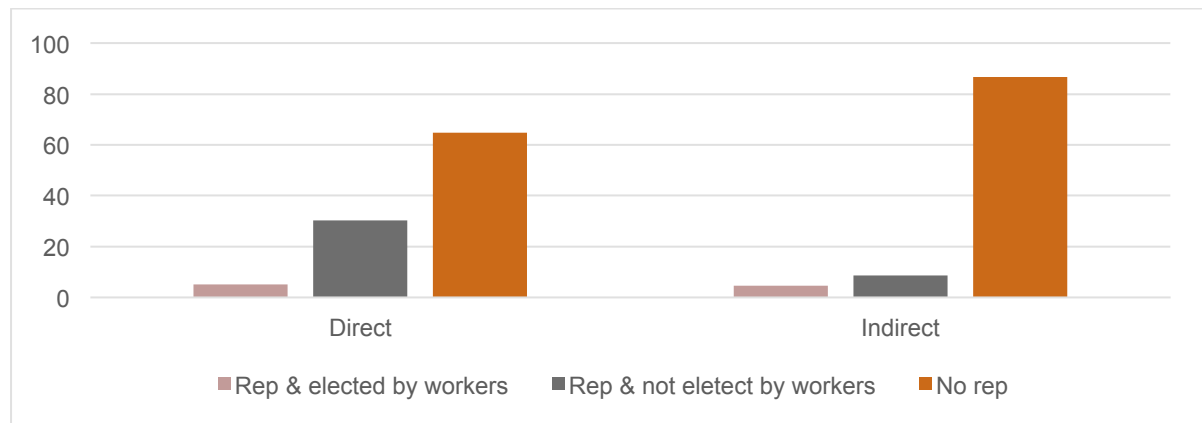
Another area that is quite strongly affected by contractorisation and which was also evident in the present and previous studies concerns the extent and quality of worker participation in health and safety. It is clear from our findings in Chapter 4 that the institutional arrangements for worker consultation on health and safety were least developed in the same terminals as those with high levels of indirectly employed workers (i.e. those employed by contractors) – all of which were in Asia Pacific area 2. Interviews with workers and their representatives in both studies indicated that these arrangements were almost non-existent among the workers of contractors in the terminals in this area. This is starkly illustrated in Figures 5.1 and 5.2, which represent a further analysis of our survey data and demonstrate that, while representation and consultation was generally poor in the terminals in the region, this was especially so for workers employed by contractors, where over 90 per cent had no safety committee and almost 90 per cent said they had no elected health and safety representative, despite the rather more positive portrayal given by managers.



*Figure 5.1 Ability to raise issues with a health and safety committee by employment type in AP2 (%)*



*Figure 5.2: Representation by an elected health and safety representative by employment type in AP2 (%)*



Even where workers were members of autonomous trade unions, they were not recognised by their employers and had no platform from which to make representations about health and safety matters that were of concern to them.

Consultation on health and safety, when it occurred in these contexts, was generally in the form of direct consultation between individual workers and their supervisors, managers or employers (depending on the size of the contracting organisation) or with supervisors or managers from the terminal company. In all these situations the quality of this so called 'consultation' was strongly affected by the power imbalance between the parties and generally the feelings of vulnerability and insecurity of the workers concerned meant that they did not feel able to offer observations, raise issues or offer opinions on health and safety matters they felt would contradict those held by the contractor or terminal management.

*"You see I am a strong union follower. The [GNT A] managers don't like me as a result. Everyone knows me as the difficult one. So they are especially harsh on me. Even if I step out of my TT to check tyre condition and pressure they supervisor will shout 'Hey you go inside your vehicle at once'."*

[Truck Trailer Driver, AP2T2]

*Union representatives said that they had nothing to contribute in such meetings as in their view the H&S committee is a matter of management issue and nothing to do with them.*

[AP2T1]



Overall, the position occupied by corporate strategies for the governance and management of workers' occupational health, safety and welfare in relation to wider corporate strategies for managing the business and operation of container terminals limits their coverage to a rather narrow aspect of what might be considered the 'work environment' in a more holistic sense. Despite the rhetoric concerning the centrality of a commitment to preventive health and safety in the core corporate business values and practices, what has emerged in the organisations we studied has been the presence of an understanding of OHS which does not conflict with the principles of profit maximisation adopted at the corporate level and which is limited to a focus on arrangements for the governance and management of *safety* at the terminals, and to a particular form of such governance in which notions of developing 'safety culture' and behaviour modification predominate. This largely ignores a range of occupational health and welfare issues that are essentially the consequence of corporate business and operational strategies and practices aimed at increasing the productivity and profitability of the terminals. These issues are among those that workers regard as having an influence on their health and welfare as well as on their safety, but they lie beyond the reach of corporate approaches that are largely focused on achieving behaviour changes in relation to safety.

We found the impact of these strategies to be moderated by the national contexts in which they were enacted. We discuss this influence on the health, safety and welfare experience and the arrangements made to support it at the terminals we studied different parts of the world in the following Chapter.



## 6. Contextual determinants of practices – the role of the state, regulation and labour relations

Recent research findings have pointed to the wider contextual determinants of what occurs within workplace health and safety management practices. For example, in a recent large European survey addressing workplace OHS management practices in all EU member states conducted on behalf of the European Union Occupational Safety and Health Agency (EU-OSHA), it was observed that differences in the degree of implementation and operation of health and safety management measures required by EU Directives in workplaces in different EU member states remained, even after determinants such as size and sector had been taken into account (Walters et al., 2013). Further work commissioned by EU-OSHA demonstrated that there were several features of the national political, regulatory, economic policy and labour relations contexts in which these workplaces were situated that were especially significant in influencing the operation of process-orientated OHS regulation within workplaces (Walters and Wadsworth, 2014). This finding was further borne out in a series of papers analysing these contexts within several different EU states, including the UK (Wadsworth and Walters, 2014), Sweden, (Frick, 2014), Latvia (Woolfson and Vanadzins, 2014), Spain (Garcia and Benavides, 2014) and Cyprus (Boustras and Economides, 2014). In all cases, the complex interplay of economic, regulatory and labour relations styles and structures within EU member states was shown to help to determine the nature of the systems in place in these countries governing and supporting OHS, which in turn were prominent in influencing the extent of the uptake of supranational measures at the level of the workplace.

These findings have some salience in relation to the present study. The container terminals that were its focus were situated in four different countries. Each had different regulatory structures and arrangements for occupational health and safety, as well as different economic histories, policies and infrastructures. They also each had different policies, histories and current practices in relation to national patterns of labour relations generally, as well as for those in dock-work more specifically. Corporate strategies for health and safety governance and management in the companies were implemented within these different national contexts in the terminals we studied. Not surprisingly we found such contexts to be significant mediators of the outcomes of these approaches and important determinants of the differences we observed in the health and safety experiences of the workers thus affected.

In this chapter we outline the effects of these contexts on the health and safety practices and outcomes in the terminals we studied and we suggest a model we think is helpful in explaining the dynamic between these effects and those of corporate global governance of OHS pursued by most of the companies operating these terminals.

### 6.1 Economic contexts

As pointed out in Chapter 1, both the economy and the nature of the economic policies for port development of the countries in which the container terminals were situated have a significant contextual bearing on arrangements for their operation. The four countries in which the terminals were located were all large economies. Two were member states of the EU, but with quite different economic, regulatory and labour relations systems, one was an advanced market economy in Asia Pacific while the other was a large lower-middle-income country elsewhere in the Asia Pacific region. The economic contexts in which the terminals operated in all four countries were therefore quite different. These differences, as well as those in National economic strategies for port development, played a further role in determining terminal structure and operational practices. This was seen both in the arrangements for governance and management of health and safety and in the degree of latitude available to the terminal companies in implementing and operating corporate requirements in this respect.



The corporate operational strategies of the GNTs included in the study were global and often relational not only to local and regional competition but also to that of the global interests of the companies. Managers and workers alike were highly aware of the volatility of the market in relation to the container trade in which they were involved and, the changeable business position of the terminals in which they worked. This resulted in a substantial emphasis on issues of productivity and efficiency in terms of the capacity and throughput of containers in the terminals; an awareness that pervaded their approaches to health and safety.

We pointed out in Chapter 1 that there have been broad trends that characterise port development during the era of economic globalisation, of which the uptake of the transportation of goods in containers has itself been one. This has taken place in tandem with others, including a general movement from public to private ownership of ports, increased mechanisation and substantial downsizing of port labour, coupled with its outsourcing, all aimed at facilitating increased throughput and efficiencies, to enable the economies of their host countries to better engage with economic globalisation.

These trends have also helped facilitate the increased reach of investment in national port facilities by companies with a global corporate interest in the container trade, not only in the operation of national terminals but also that of global networks of terminals and their further involvement in the business of maritime and land transport too. As we also pointed out this has resulted in economic and business dominance by a small number of global operators in the industry, four of which were included in the present study. As the literature reviewed in Chapter 1 makes clear, national economic policies concerned with port efficiencies, inward investment and improving the capacity to export and import goods have, in various ways, helped to facilitate this development.

While these broad trends are observed globally, there are significant differences in the detail of the way in which they have been addressed in both national economic policies and their operational results. This situation influences the present position of the terminals included in our study and helps explain some of the differences between them that we observed in terms of the arrangements for OHS management and how workers perceived them. Overwhelmingly, the most significant of the economic influences to which they were subject was that of the intensity of competition for business that was a driver of the managerial concern with operational efficiencies and which, in turn, caused workers and their representatives to believe they needed to be responsive to demands for fast turnarounds in the loading and unloading of ships, that took primacy over work related health or safety issues:

*"For the first time ... we will have 60 sub-contractors on site ... and that's the first time we've gone and done that ... and we're also employed another 60 people on the even more flexible terms than the current floaters ... so again we are looking at greater flexibility because our challenge in the light of competition in [our country] ... so one of the considerations we have to have is bouncing the work hours and all the other criteria, we also have to make ourselves, so that we can compete with the price with our competitors who are ripping great big lumps out of us, from a price perspective ... [terminals in our and neighbouring countries] ... they're quite capable of taking major lines from us and leaving us with few vessels, you know, we have to be alert to all the challenges."*

**[Operations manager, EU2T2]**

As we saw in Chapter 3, managers felt they kept the numbers of dock workers to a minimum while ensuring that there were sufficient work to be done safely. Some also acknowledged that, on occasion, dockworkers may work at high speed because of a perception that this was what management wanted, but stressed that this would never be condoned or encouraged.

The possibility of further automation was another consequence of the drivers for greater economic efficiency. Although automation was not significantly present in any of the terminals in our study, managers were well aware of such developments in rival ports, and workers and their representatives perceived it as a potential threat to future job security and one reason for high work demands in their non-automated terminals. This was especially the case in the EU ports as well as in Asia Pacific area 1



where the automation of rival ports nearby was both advanced and well known. All four European GNT case study terminals and the one operated by a national company included in the study were situated in a region in which there was significant competition between terminals, including between the case study terminals, which gave rise to significant concern about individual job security and the future viability of the terminals among the workers employed in them. Similar scenarios were evident in the terminals in Asia Pacific area 1:

*"There's, at the moment there's a bit of concern and threat if you like, like some people were threatened, the talk of automation coming in. ... So I think that's, I think that's constantly on people's minds here."*

[Stores co-ordinator and delegate, AP1T1]

Differences in economic policy contexts observed in the national situations of the terminals included different strategies and speeds with which the move from public ownership to other forms of ownership had taken place in the countries concerned. Among the advanced economies in the study, these included the situation in Europe area 2 where the host country was in the vanguard of national economic strategies to liberalise its economy, and major reforms in the ownership and operation of its ports, including in some cases, outsourcing labour, had been supported in economic policies. For one of the terminals, the privatisation and complete re-organisation of the port by its national operating company had enabled the terminal to outsource all of its operational labour to a contractor. The relationship between the operator and the contractor was a stable one and had been in place for a number of years, but the practice of having to re-bid periodically for the work was regarded by managers as destabilising and kept pressure on them to ensure costs were minimised. In Chapter 4 we noted that while our survey measures on health and safety outcomes suggest a better performance in the terminal run by the national operator in comparison with those run by the GNTs, this may have been a consequence of the younger age range and more limited time spent in dock-work of the employees concerned. Measures on health and safety management suggested that arrangements were perceived to be poorer by the contracted workers in the terminal operated by the national operator than in those run by the GNTs. This could have been a reflection of the comparative remoteness of the contracted workers from these terminal level arrangements, caused by limited communication between the terminal operator OHS management team and the contracted workforce. As the OHS manager rather surprisingly confessed when asked about shift patterns:

*Interviewer: And what pattern of shifts do they do? How many days on and...*

*Respondent: I'm not entirely certain.*

[Safety Manager, EU2T3]

In contrast in Europe area 1, as detailed in Chapter 3, many of the traditional institutions of dock labour had adapted successfully to the efficiencies required to compete successfully in the new political economy and the impact of change had produced quite different port structures in which the terminal companies we studied were now embedded. As noted in Chapter 4, respondents to our survey generally reported a better experience of work environment, health and safety management and working conditions in the terminals in this country than elsewhere, and in Chapter 3 we detailed some of the operational reasons why this may have been so.

In Asia Pacific area 1, as we saw in Chapter 3, there were some differences between the two terminals we studied in terms of the ways in which OHS matters were addressed. However, while these differences may have been attributable to the influences of the different states in which they were located, it was regulatory rather than economic policies that were the main drivers of this variation. Reforms in port ownership had not initially led to the privatisation of either of the ports in which the terminals were located but to their corporatisation (although subsequent further commercialisation of the ports was helping to shift this process towards privatisation).

As a large lower-middle-income country, Asia Pacific area 2 has a very different economic profile to the others in the study. It is a large and complex economy with a very large population, a substantial part of



which continues to suffer considerable deprivation across the full range of social, economic and health indicators. It has at the same time undergone a relatively recent phase of rapid industrialisation, technological and economic growth and continues to strive to deepen its integration in the global economy. While there has been rapid economic growth, it has been uneven in its pace and location, resulting in huge differentials in wealth distribution and in the extent to which infrastructural and social development has matched this uneven economic growth. These macro-level issues have had an impact on the operation of container terminals in many ways. Public ownership of ports, and the institutional models for their governance and operation, were widely regarded as inefficient and a constraint on the ability of ports to compete effectively, limiting their flexibility and market responsiveness. Recent times have seen considerable consequent privatisation, liberalisation and efforts to commercialise existing ports, alongside the development of new private ports, joint ventures and other newly built port facilities situated away from cities and congested transport infrastructures. These policies have helped encourage investment from global operators as well as boosting the development of contractorisation and weakening the role of organised labour within the workplace. Considerable investment and operational roles in the process of port development have been played by the biggest GNTs, including those in the present study. Although the terminals we studied in this area were all located in older ports dating from the era of public ownership and the remnants of the institutional models for their governance still existed, they were all operated by GNTs with the freedom to manage their operations according to global corporate models.

This said, there has been much criticism of sclerosis within the economy and the consequent uneven pace of port modernisation in the country. As we have already mentioned, major problems are acknowledged in relation to the efficient operation of the transport infrastructures of which ports are a part. These are to some extent the result of the continuation of intransigent and out-dated port governance and revenue arrangements. They are also a consequence of underinvestment in transport infrastructures and the result of poor quality in the established services with which the terminals are obliged to interact. Within their terminals the GNT operators were able to adopt corporate management strategies largely unhindered by local contexts but the wider national economic environment and its interface with the terminal operations, was a major challenge for the companies and had an impact on both the operation of the terminals and their arrangements for managing health and safety within them in several important ways mentioned in Chapters 3 and 4. For example, the transport bottlenecks referred to previously were regarded as indirectly responsible for serious accidents and incidents involving both terminal operators and truck drivers. Lack of education and other poor economic, social and health indicators in the communities in which many truck drivers and operational staff lived were regarded by managers as being responsible for unsafe behaviours within the terminal as well as among external truck drivers visiting the terminals. The absence of effective occupational health services and widespread support for occupational safety outside the terminals were further contextual features.

Outreach work to effect change in this respect was attempted by some terminal managements as well as being advocated in the corporate social responsibility (CSR) agendas of the GNTs at corporate level. Some of the contract workers employed in the terminals, and especially those in relatively low skill manual tasks such as lashing, were economic migrants drawn to this work by the prospect of higher wages than were possible in the areas in which they lived, which were considerable distances away. This resulted in distinct groupings of workers in each of the terminals who not only undertook different tasks and were contractor employees but who often spoke a different language from the other workers and managers at the terminal – with consequent heightened levels of risk in relation to safety issues requiring good communication. As the results of the survey in Chapter 4 indicate, it was among this group of workers that the highest levels of work-related injury, ill-health and dissatisfaction with health and safety management arrangements were seen.

In short, therefore, although economic and economic policy contexts are perhaps difficult to measure in terms of their direct impact on health and safety arrangements and outcomes, there seems little doubt that these wider contexts do have an important impact. They are among the influences on differences observed in the operation of these arrangements and their outcomes in terminals situated in different parts of the world. As such it is necessary to take account of them when trying to understand the nature of



the experience of health, safety and welfare for workers in these different terminals, as well as acknowledging their implications for improving arrangements to prevent injuries and ill-health within these wider contexts.

## 6.2 Regulatory frameworks and enforcement practices

In as far as they apply directly to the arrangements for health and safety in the workplaces in the study, regulation and regulatory enforcement are in some respects more tangible measures of national determinants of OHS practice than are the economic policy contexts discussed the previous section. All of the countries included in the study had such measures in place, as well as regulatory inspectorates charged with ensuring duty holders' compliance with them. However there was variation both in the nature of these measures and in the role of regulatory inspection in achieving compliance. At the global level, the container terminal operators talked of their terminal operations being located either in 'heavily regulated' or 'lightly regulated' countries. In our study the former were represented by the high income advanced market economies of Europe and Asia Pacific area 1, while Asia Pacific area 2 represented the latter.

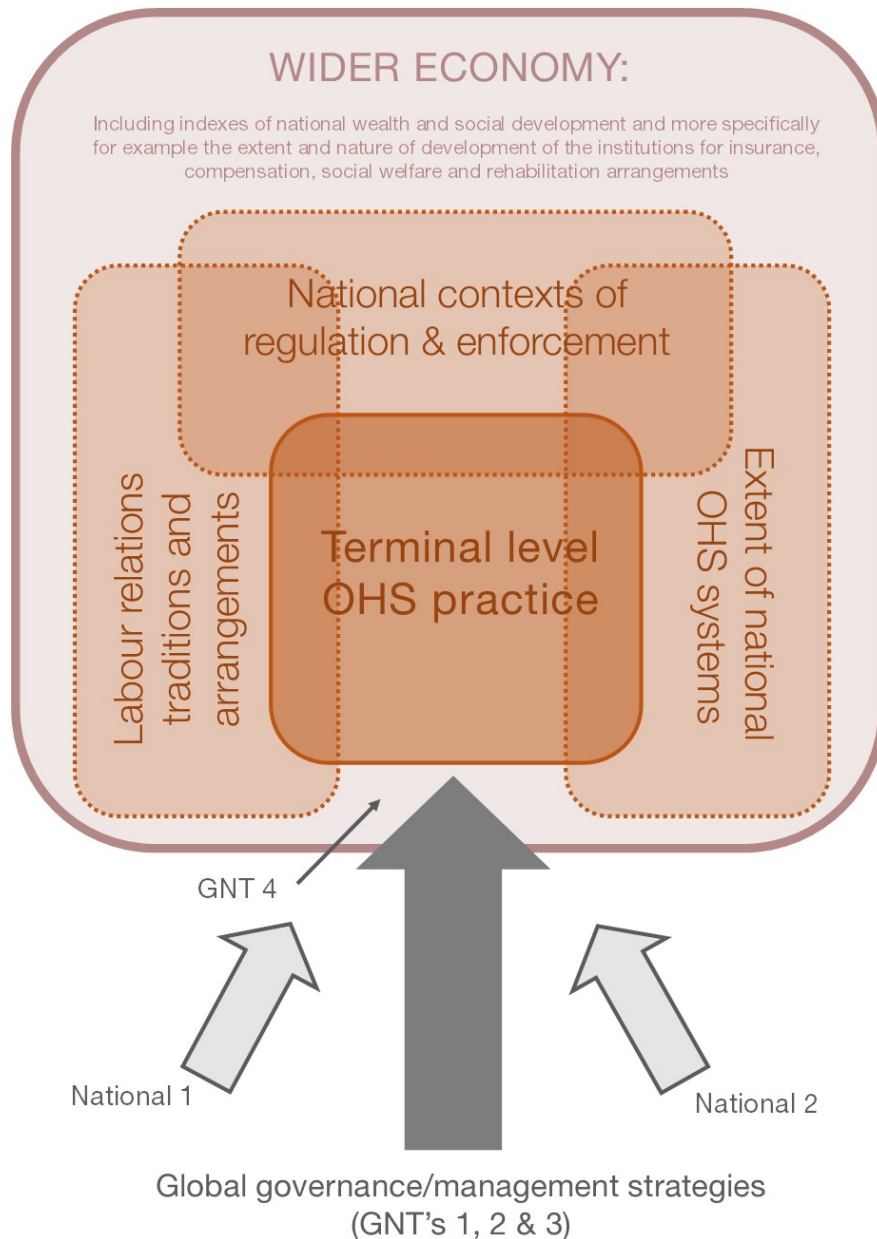
Regulatory measures on the health and safety arrangements for container terminals were essentially of two types. In all the advanced market economies in the study there were broadly similarly orientated provisions in place at national level that provided process-based requirements, normally on employers, to manage health and safety systematically, with competent advice, having regard to the nature of the risks of the establishment and the work undertaken there and to consult with their workers on these matters. These provisions were generally in keeping with international trends in OHS regulation in recent decades, in which the specification standards of prescriptive regulation that previously characterised most OHS statutes have given way to more 'goal setting', process-based measures addressing responsibilities for OHS management. In addition to these broad based provisions, a second type of regulatory measure still in evidence were those more specific regulations that applied to dock-work, found in delegated legislation, such as specific regulations on aspects of dock-work, some of which pre-dated the process-based regulation and which were more prescriptive in nature. Generally, the latter had been the subject of repeal and removal in recent regulatory reforms, as deregulatory strategies in keeping with neo-liberal economic policy reforms aimed at creating improved conditions for economic growth and competitiveness were more widely deployed. As pointed out in the previous section, there was some variation between countries in the extent to which this occurred. Finally there were Codes of Practice and regulatory guidance notes concerning some of the operational activities in the terminals. The latter had no legal status, although implementation was considered to be evidence of good practice. In the lower-middle-income country in the study, regulatory provisions appeared to be more of the prescriptive type, with a specific set of provisions for dock work which, as we note below, determined inspection activities and which inspectors did not feel empowered to go beyond.

A further point to note concerning regulatory influence is that this does not act in isolation. In each country it is one element of the wider national 'health and safety system', which influences the nature of workplace practices and their outcomes. Other elements of the system include: the support provided by national institutions for education, research, training and information dissemination in relation to OHS; occupational health and safety services, professional practitioners, their institutions and the like; the courts and legal services and compensation litigation; social security and social welfare systems addressing issues of compensation, rehabilitation and return to work. They further include employers' organisations and trade unions, and the services they provide for their members on health and safety matters; as well as those of insurance associations; public advice centres and information services; and so on. These in turn are embedded in and relate to the wider systems for economic, health and social welfare, including the roles of the main institutional actors such as employers' organisations, trade bodies, trade unions and the state apparatus for policy making and its delivery in relation to health and safety at work. We have represented these contexts in Figure 6.1, that for simplicity, positions workplace health and safety practice within the terminals at the centre of a constellation of influences in which that of corporate governance and management influences (represented by the arrows at the base of the



diagram) act directly upon the terminals in the ways we have described in this report, but their effects are mediated and moderated by a constellation of national influences (represented by the overlapping rectangles that surround the centrally placed square representing 'Terminal level practice'). Outcomes in relation to practice therefore vary by location according to the balance between these influences.

*Figure 6.1: The influence of context*



And, as we have argued previously, it is the differences in this 'system', including those in relation to regulation and regulatory inspection, which help determine the nature and extent of its workplace influence. There were several such differences evident in the present study. They were most obvious between what, at the corporate level, some GNTs referred to as the 'lightly' and 'heavily' regulated countries. In essence, while the three advanced market economies had elements of all of the support represented in Figure 6.1 present in their national systems, the lower-middle-income country did not. Moreover, such provision that it was able to make offered only limited help to workers and was equally (if not more) limited in its capacity to influence the practices of the terminal company managements. For example, the role of the courts, compensation, social welfare provision and so on, was underdeveloped and negligible in either the support offered to compensate injured workers or in influencing company



strategies for their prevention. The extent and influence of occupational health and safety services and the role professional practice on OHS external to the terminals in influencing practices within them was also negligible. While regulation made provision for occupational health services in ports and even specified preventive functions, there was little evidence of its presence or use beyond a role in determining fitness for work and emergency treatment. Similarly, neither insurance associations or employers' and trade bodies had much influence on activities in relation to health and safety within the terminals. Trade unions also lacked specific support services or information services for their members and, while they were active at various levels in attempting to represent the interests of the terminal workers, as we will discuss further in the next section their role was limited by their weak labour relations position. In such circumstances the combination of external pressures that current socio-legal scholars argue to be responsible for the effective application of regulation was a very weak influence indeed for the terminals situated in Asia Pacific area 2.

*"The union leader also pointed out that they were fully aware of the issues. Although they had brought many concerns to the attention of the management in 2008 nothing has changed since. Neither the contractor nor the terminal managers are willing to listen to the plights of the contract workers. No follow up from the government or the dock safety inspectors either."*

[AP2T2]

National arrangements for labour inspection in Asia Pacific area 2 divided the country into regions. The terminals in the study were located in two different regions and there was specialist inspection in both of these regions for OHS matters under the provisions of the relevant legislation, by which inspectors, interviewed during the study, felt their inspections were bound. That is, the specification standards found in the relevant regulations concerning plant and equipment in use within the terminals and safe working procedures, where they were also specified, were a significant focus for inspection, as were the written records concerning these things and other documentation that regulations obliged duty-holders to keep. Inspectors believed themselves less able to address matters that were not thus specified. This was particularly significant because they further indicated that such unspecified matters included the arrangements made by the terminal operators for OHS management.

Under regulatory prescription they were able to investigate incidents that had caused fatalities and injuries. Inspections could extend to matters on board ships if they were likely to be a risk to the safety of dockworkers. They investigated complaints, including those received from workers. They said both reactive and proactive visits were made but did not have a predetermined ratio for these. Nor did they appear to undertake targeted inspections. Visits to the terminals could be by arrangement with the terminal management or they might be unannounced. They did not make any special provision to meet representatives of workers, although in one region the interviewee indicated that the trade unions sometimes came to the offices of the labour inspectorate to discuss issues. However, the impression was given that such visits were not entirely welcomed by the inspector. Generally it was felt that even without making specific arrangements to do so, inspectors would be likely to meet workers as a matter of course during their visits, which they suggested were made two or three times a week on average.

They had the normal powers of labour inspectors to issue administrative notices that require remedial action, as well as powers to stop or prohibit dangerous work and, as a Labour Inspection Department, to prosecute serious violations. They kept records of all these actions and indicated that overall statistics concerning them were published in annual reports. However, such statistics were arrogated in ways that made it impossible to determine the extent of actions taken in relation to any of the case study terminals.

While the investigation of incidents leading to injuries and fatalities are clearly important, looking at the findings in Chapter 4 it appears that a significant role for inspection in relation to health and safety management would be useful in the Asia Pacific area 2 terminals. Yet the inspectors interviewed for the study indicated very little engagement in these matters. They seemed unaware of the extent of the health issues such as stress, fatigue, MSDs and gastrointestinal issues that were identified by a substantial proportion of respondents from these terminals or that the contract workers, who were a substantial proportion of the terminal workers, experienced a larger proportion of these than did workers who were



directly employed (or indeed, that a greater proportion of injuries were also experienced by contract workers). In one of the regions the inspectors said they believed that workers who worked for contractors at the terminals were actually more experienced than those that were directly employed and therefore more likely to work safely as a result.

Generally the inspectors suggested that they were happy with the terminal arrangements concerning health and safety management and supported the behaviour-orientated approach these arrangements adopted. Indeed, they seemed to regard the container terminals as exemplary in this respect. However, as noted above, they did not inspect the health and safety management systems within the terminals because, although they were aware that such systems existed, they believed them to be outside the remit of their inspection powers. Perhaps not surprisingly, given the prescriptive nature of what they believed to be these powers, there was no sign of their engagement with methods of inspection that would aid in the compliance behaviour of contractors and here too they appeared satisfied that the management systems adopted by the terminal management were fit for purpose in this respect.

Managers in the terminals reported a rather mixed experience of these inspections. For some, while there was an acknowledgement of the existence of both the docks inspectors and their inspection activities, as well as that of obligations on the company to co-operate with them, there was little suggestion that the outcomes of such inspection were of significant influence on the operation of their arrangements for health and safety at the terminals, not least because of a perception that any form of enforcement was very rare:

*Interviewer: ...has he shown any power or any authority lately to stop work, such as this is unsafe, don't do it?*

*Respondent: Oh no. ... They give advice on, improvement notice. ... But they don't just, they not stop ... And in the last twenty years none of the [Asia Pacific area 2] port has given notice to stop the work.*

**[Safety Manager, AP2T1]**

Others were more challenged by the interventions of inspectors, especially in relation to their role in the investigation of incidents that had caused injuries. Here there was a suggestion that inspectors were something of a hindrance to the effective functioning of incident investigation as well as claims concerning inappropriate activities on their part. Workers and their representatives were less mixed in their views of the role of inspection. In both the present and the previous study, they were unequivocal concerning both the limited presence and effectiveness of inspectors in influencing health and safety matters at the terminal.

*Interviewer: There seems to be a very cooperative working relationship between the inspectorate.*

*Respondent: Yes. ... They being an independent government body they've also got their own policies and it's our duty – it's only our duty to comply with what is their requirement. So we work very closely with them, yes, there is no conflict or nothing like this.*

**[Operations Manager, AP2T4]**

*Interviewer: when you have a visit from these inspectors do they do they give you instructions about how things have to be improved?*

*Respondent: no when they will take a visit to our terminal just they will give us information for the scope of the improvement after visit establishing what is the scope for the improvement*

**[Trainer, AP2T2]**

*Interviewer: have you ever seen the dock safety inspector wandering around doing his inspections?*

*Respondent: I don't.*

**[RTG Operator, AP2T1]**

A very different portrait of external regulatory influence is apparent at the terminals in advanced market economies. Firstly of course, the elements of the wider system supporting health and safety were far



more in evidence in these countries and regulation and regulatory inspection occurred within this wider context. Regulatory inspectorates had the conventional range of statutory powers, similar to those described above for the Asia Pacific area 2 regulators. They undertook both reactive and proactive visits to the terminals and investigation of complaints and incidents that had caused injury.

They also undertook inspection campaigns focussed on specific risks, based on evidence of particular problems. Historically there had been specialist inspectors or groups of inspectors for dock-work, in all of the areas in the study, although the current trend in some was towards more generalist approaches. Regulation was process-based and therefore embraced duty-holders' arrangements to manage the risks of work in the terminals. Inspectors were, in the main, able to use their powers in several ways that were more commensurate with inspecting the arrangements for managing health and safety within the container terminals within their jurisdiction. Moreover, the role of consultation with workers and their representatives was prominent in both the regulatory provision and in the arrangements made at the workplace and therefore also more likely to receive the benefit of inspectors' scrutiny.

This said, we found considerable variation in the extent to which these occurred in practice during inspection visits. Workers in both the previous and present studies indicated that health and safety within their workplaces would benefit from a greater engagement with inspectors.

Differences were seen between advanced market economies in the detailed nature of regulatory practices, their wider support and their influence. For example, since the terminals in Europe areas 1 and 2 operated within EU member states they were subject to European legislation and therefore were both bound by the requirements of EU Directives concerning health and safety – and in particular by the measures on systematic health and safety management that were found in the Framework Directive 89/391/EEC which is essentially the regulatory model for OHS management for the EU, and provides workers in all EU member states with a common minimum level of protection from work-related risks. Although the precise way in which its legislative provisions are translated into national legislation and workplace practice varies by country, industry sector, organisation size and so on, the Directive obliges all employers to take appropriate preventive measures to make work safer and healthier. Specifically, its key elements centre on the principle of risk assessment within a participative health and safety management system, which places responsibility upon employers to manage their health and safety arrangements in ways that are both competent and participative. There were, therefore, similarities in the prevailing arrangements for participation and representation in European areas 1 and 2, as we have seen previously, such as requirements for employers' responsibilities for health and safety plans and policies, risk assessment, worker representation on health and safety and so on, but also differences in the ways in which these systems and arrangements were managed. Each had further, more prescriptive, regulations specifying health and safety requirements specific to dock work.

The general character of the national health and safety systems in the two countries were very different and this resulted in a variety of differences evident in relation to regulatory inspection at the level of the terminals. For example, in European area 2 the dock-work regulations were among many regulatory standards that had been deemed no longer necessary and regulatory governance as 'high risk' no longer regarded dock-work as 'high risk'. Inspectorate numbers had been substantially reduced by public spending cuts and remaining inspectors were increasingly required to perform inspection activities in a more 'business friendly' manner. At the same time, fewer inspectors meant fewer inspections were possible and as a result for several years the regulatory agency has been exploring a range of additional means to improve workplace health and safety practices. Essentially these were more focused on extending the influence of the regulatory agency by providing leadership and co-ordination on good practice through advisory approaches and liaison with key organisational intermediaries. In this Area too, the level of port privatisation was well-advanced and the terminal studied had a high level of independence from other port institutions as a result. There was no evidence in our study to suggest that any of this contributed support for health and safety practices in the terminals studied and some that indicated it had led to feelings of poorer communication and a reduction of the trust that workers felt for regulatory inspectors:



*"... to be fair ... if the health and safety inspector is coming here, he would normally let me know. He would write to me, if he writes anything to the company, he copies me in. So he does give us the information ... But it's going to get worse because they're being cut, and they're starting to charge ... they won't be doing inspections any more. It will more reactive because they're only going to come in if there's a serious accident. So I don't think we'll be seeing as much of them, unless we call them in specifically or if there's a serious accident."*

[Senior Shop Steward, EU2T1]

*"Not very happy with the [labour inspectorate] ... because I believe they cosy up to management too much or to the company too much. With the workforce the size that we have, when the inspector comes down I would expect him to make a phone call and say, "We are going to be on the port. If you the union want to come and see us, please do" or, "Can we come and see you to have a 10 minute chat?" ... for them not to even have the manners to come and speak to us when they visit, I think is wrong. They visit our head of safety on a regular basis. They sit down have cups of tea, all that kind of stuff. ... And so maybe that is why they don't come and see me, because they are too close to our management."*

[Senior Shop Steward, EU2T2]

This contrasted with practice in Europe area 1 where national legislation transposed the Framework Directive in 1996, and as in other EU member states, gave its provisions widespread effect, but other older (though repeatedly revised) provisions also covered health and safety matters in dock-work. In addition, in this country, regulatory provisions relating to employment and employment conditions in dock-work supported the functioning of quite specific arrangements within the larger of the two ports we studied in this area. Port policy and legislation were devolved to regions within the country with their own parliaments and legislatures. Characteristic of the general arrangements for port labour was the establishment by a Port Labour Act of both national and local (in relation to larger ports) joint committees, with powers to make port labour regulations. Collective labour agreements existed at port level, concluded with the national or local joint committees, they had the force of law within the situation to which they applied and, significantly, only registered port workers may perform dock-work. In short, the position of port labour within this country is deeply embedded within both the national and local labour relations and regulatory traditions. It has proved quite resilient in the face of pressures for change that have transformed such arrangements elsewhere (as is the case, for example, in Europe area 2) and resulted in some rather different arrangements for the governance and operation of OHS, even in terminals operated by GNTs. Therefore, commercialisation of dock-work activities had taken a very different trajectory in this area and as a result port-wide institutions remained of central importance in the organisation of work, including in the arrangements made for health and safety.

*"It follows from the fact that the employer is responsible for employees. The dockers work under special regulations, which are very special indeed. Ultimately, they [the firms-employers] are responsible for the safety of their dockers. And in {name of terminal} that is a direct responsibility of each firm. The employer knows that he is responsible and that he must also have his own prevention service to care for his people."*

[EU1T2 inspector]

In this respect, there was far greater significance attached to the role of both external and internal prevention services as well as that of liaison between inspectors, trade union representatives, those of the prevention services, employers and regulatory inspectors at several levels of organisation from the terminal workplaces through establishment level and through to the level of the port overall. When it was effective, such liaison enabled information sharing between workers, their representatives and managers, giving feedback on OHS issues, with the input of specialist advice from OHS practitioners and inspectors and a participative approach towards the dissemination and monitoring of good practice. This clearly translated into closer contact between workers, their representatives and inspectors, contact that was generally regarded as beneficial in improving OHS practices. As one inspector put it:



*"If we do an inspection, we ask for them but they are not always available. There is shift-work and ... Actually, it's much more contact to upon their request, or at the level 2 meetings (i.e. joint safety meetings in the port). Or at level 1 meetings also, that happens. I have told them: if you have something you need me to check, just contact me. Mostly it is thus through them contacting me."*

[EU1T2 inspector]

In Asia Pacific area 1, as outlined previously, the two terminals were situated in different jurisdictions and subject to different laws and inspection authorities as a result. While there were some minor differences between their experiences of both regulation and inspection, overall the regulatory influence was similar to that in other advanced economies.

Given that the influence of regulatory context was a major determinant of health and safety practices and outcomes within the terminals it was of concern that representatives of the regulatory inspection agencies and the inspectors themselves, who were interviewed in all of the countries studied drew attention to limitations of the role of inspection. While the nature of the qualitative data thus gathered does not allow for systematic comparison, it was clear that these limitations were essentially of two kinds. In the advanced countries, while there were still strategies in place for the inspection of OHS arrangements and their management in place and inspections often undertaken by inspectors with experience and particular expertise in relation to dock-work, there were indications of varying degrees of change, both with regard to the use of more general inspection and inspectors, as well as reduction in the frequency and extent of inspection. As we have indicated, this was particularly evident in EU area 2 but it was also mentioned by regulatory inspectors elsewhere. The second kind of experience was found in the lower-middle-income country in the study where, as indicated above, the inspectors themselves did not engage with the OHS management arrangements in place in the terminals because they felt them to be beyond the scope of the prescriptive regulation that they were charged with enforcing.

Finally, one of the key differences between approaches advocated by the terminal companies at corporate level, and which also characterises the features of voluntary standards on OHS management generally, is the extent to which they adopt a behaviour orientated approach and, relatedly, the limited extent to which they provide for the institutional representation of workers' interests within this approach. In this they differ markedly from the regulatory requirements on systematic approaches to OHS management that apply in the advanced market economies in which most of the terminals we studied were situated, as well as from global standards in the form of ILO Conventions and its guidance on OHS management. In the report of the previous study we noted that, according to the ILO:

*"The ILO guidelines are quite clear that the occupational safety and health management system will not function properly without the existence of effective social dialogue, whether in the context of joint safety and health committees or other mechanisms such as collective bargaining arrangements. Workers and their representatives should be given the opportunity, through direct involvement and consultation, to fully participate in the management of OHS in the organization."*

We have shown in the present study that such dialogue is supported by specific regulatory requirements and the wider contexts in which the 'health and safety system' is embedded in the advanced market economies in the study. This is a significant determinant of both the character and outcomes of practices within the terminals. In this, the role of labour relations is important and it is to this contextual determinant of OHS activities and outcomes within the terminals that we turn to next.

### 6.3 Labour relations histories and their influences on current practice

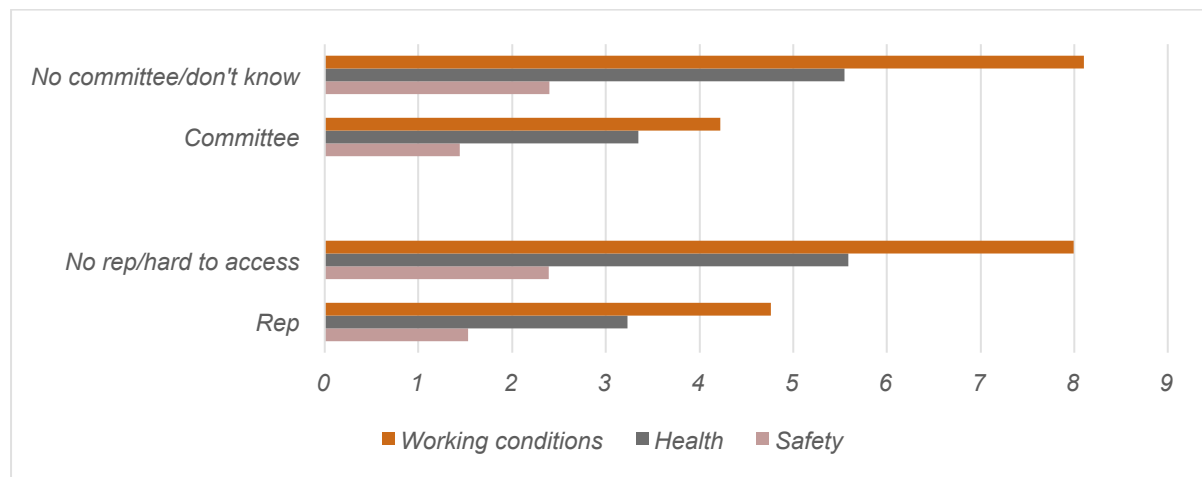
In the previous study we suggested that one of the key differences we found between terminals in advanced market economies and those in lower income countries was the extent of the arrangements they made for representing workers' interests in health and safety. We discussed the nature of these arrangements, the contribution they made to improving health and safety, the barriers to their development we had identified and some of the consequences for effective health and safety management



that resulted from this under-development or absence. In keeping with the key findings of research in other sectors, we found that where arrangements to represent and consult with workers were included in the systems for managing health and safety at the terminals and genuinely supported by managers, and where workers representatives were properly trained and given sufficient facility time to undertake representational functions, the consensus among our interviewees was that this contributed significantly to the effective operation of the systems in place for managing health and safety. They were further able to contribute an independent voice for workers' concerns, bringing a different perspective on the work environment to the attention of managers, and to represent workers' interests when there was conflict on health and safety matters. Here again, these findings were no more than those that would be anticipated from reading the research literature on worker representation in other sectors, which generally concludes that arrangements for managing OHS are more effective when they include those for worker representation and consultation, which in turn are supported by regulatory provisions, management commitment and appropriately trained and informed participants.

We have tried to explore these effects further by examining the extent of representation and consultation more empirically and considering its association with measures of good management practice in OHS. Among respondents working in GNT-run terminals, those who reported they have no health and safety representative or not having easy access to such a representative had significantly higher levels of poor safety outcomes, poor health outcomes and poor working conditions than those who reported having a health and safety representative<sup>17</sup>. Comparing those reporting having no health and safety committee or not knowing if there was a health and safety committee with those reporting having a health and safety committee showed a similar pattern, as is demonstrated by the results for Asia Pacific Area 2 shown in (Figure 6.2).

*Figure 6.2: Levels of poor health and safety outcomes and working conditions by arrangements for representation in Asia Pacific area 2*



These quantitative findings are entirely in keeping with the findings from the interviews conducted in the previous study, and are further corroborated by interviews in the present study. Both sets of interviews with workers indicated the importance the role of representation and consultation in addressing their concerns on health and safety in their workplaces. Moreover, as we saw in Chapter 5, opportunity for such representation and consultation to occur was further affected by the nature of the arrangements for employment at the terminals studied, with a major difference between the experience of directly employed workers and those who were employed by contractors, for whom access to elected health and safety representatives or ability to raise matters at joint health and safety committees was minimal.

<sup>17</sup> 2.23 compared with 1.67,  $F(1, 1395)=76.32$ ,  $p<0.0001$ ; 4.92 compared with 3.50,  $F(1, 1315)=148.39$ ,  $p<0.0001$ ; 6.26 compared with 4.12,  $F(1, 1303)=146.90$ ,  $p<0.0001$  respectively.



However, like the effectiveness of regulation and regulatory inspection, effective worker representation and consultation on health and safety conditions do not occur in a vacuum and the supportive context with which their effectiveness is associated is the result of a combination of factors that go beyond the mere provision for consultation at the workplace. This was amply illustrated in the terminals we studied, where we demonstrated in both this and the previous study that measures for worker consultation on health and safety matters were best developed in the terminals in those countries in which organised labour continued to play a significant role in determining pay and conditions of work more generally, and where they were supported in so doing by a regulatory framework, collective bargaining agreements and the wider economic and labour relations contexts in which their activities were embedded.

A brief digression into the history of port labour in the countries we studied confirms this. Capital intensified cargo handling activities that are typified by the development of container terminals have come about at the same time as a constellation of other reforms in the ownership, organisation and operation of ports that both drive, and have been driven by, the features of economic globalisation to which both capital and states have subscribed during the past several decades. Generally, efficiencies thus achieved in oiling the wheels of global trade have been made possible at the expense of the number of workers employed in these activities, which have steadily reduced at the same time as the mechanisation characteristic of containerisation has increased. But the constellations of change that are emblematic of these developments worldwide have not taken place in exactly the same ways, times or with the same results in every port in every country in which they have applied. The features of context such as the ones we have so far considered in this Chapter, as well as others such as the relative power of labour, the political complexion of the state at the time of change, questions of economic dependencies, the human resource strategies of global companies and so on, have influenced their outcomes. The broad result is a range of arrangements in which container terminals have different degrees of independence from the influence of the ports in which they are situated and a range of different kinds of relationship with organised labour, the latter applying even when the terminals have been purposefully constructed in entirely new and private sites outside the influence of the structures and procedures of established ports. This variation was evident in the range of terminals we studied, with different patterns of labour relations evident between countries and even between terminals within countries.

Among the advanced market economies in which the terminals were situated, it was clearly the case that trade unions had been a major historical presence in each of the ports in which the terminals we studied were situated. The different directions that port development has taken in these countries help to explain some of the current differences in the position and influence of trade unions on matters of labour relations within the terminals, including those on health and safety. For example, in Europe area 2, a period of bitterly fought industrial disputes resulting in major defeats for organised labour that helped define the future role of trade unions in the economy overall, has resulted in a disparate labour relations situation in the country's ports. In some, such as those operated by the GNTs, while workforce numbers had reduced substantially and with them, union power, the trade unions had managed to negotiate collective bargaining agreements that helped determine the pay and conditions of work for the remaining labour force. They continued to be recognised by their employers for the purpose of collective bargaining and were the principal source of representation for employees, including on matters of health and safety. In contrast in the terminal managed by the national operator, terminal labour was contracted out and union representation was relatively weak.

Very differently, in Europe area 1, in one of the GNT-operated terminals, as described in Chapter 3, the vestiges of the dock labour scheme prior to containerisation were still in evidence. While there were fewer workers currently than previously, overall the former schemes had been successfully adapted to the demands of commercialisation. Organised labour retained a strong position in the organisation of the port overall as well as in the terminal we studied. It was helped by the regulatory framework governing the work at the terminals and retained a strong presence in all the bipartite and tripartite structures and processes for the participative management of health and safety that were present in both the terminal and the wider port. In the second terminal in this area, essentially the same arrangements had also been maintained, albeit on a much smaller scale commensurate with the smaller size of both the terminal we studied and the port in which it was situated. There were differences in detail in the precise nature of the



arrangements in the two ports, but in as far as they affected the representation and consultation of workers on health and safety they resulted in the same overall effect and trade union representation on health and safety was well-integrated into all the bipartite and tripartite structures within the port and terminal, enabling the statutory measures on worker representation on health and safety to be more or less appropriately implemented.

The situation in the advanced economy in Asia Pacific area 1 contained elements of both the European experiences – the current position in the terminals was the result of previous bitterly contested and high profile disputes. Following these, the position of the trade unions in relation to the organisation of work in the ports in which the terminals were situated, as well as within the terminals themselves, had undergone considerable changes. This said, as described in Chapter 3, the workforce in both the terminals had remained highly unionised and the union had retained significant influence on human resource issues concerning the employment and roles of workers. Because the terminals were located in different state jurisdictions, until recently the statutory measures applying to worker representation to which they were subject had been slightly different, which resulted in slightly different approaches being applied in each terminal. However, at the time the study was undertaken, these measures had been harmonised and appropriate changes were in the process of being introduced within the terminals. Relations between the trade unions at the terminals and managers remained hostile and it was in this climate of labour relations that the arrangements for health and safety had been made. Suspicion felt towards the behaviour-based management arrangements implemented at the terminals was strongly evident in the interviews with workers and their representatives:

*"[National 1] were quite open and they said, 'here's a bloke from Dupont and he's going to roll out a new safety system'. Relatively obvious from that point on what the score is - rewards, reporting, giving people up in reporting, and them sort of things. Right from the very word go -... Just took a position that if there is any rewards, we burn them. We will rip them up, collectively, and no one will report, except to the delegate, and the delegate will put in every report, and you can effectively wipe out the capacity."*

[Union leader, AP1]

*"...a good investigation will go underneath these things to see why there might be a contributing factor ... surfaces, there's the shift work fatigue ... generally I think that most of the contributing factors are identified I don't think generally that they're all addressed properly ... the ones that are cheaper to address they get done. The ones that you can attribute blame and people the ones that are involved in accidents they're the ones retrained formal re-training ... frankly we got a HR that are very punitive and it seems they want to build up warning letters on people's files so they can dismiss as many people as possible so they don't have to pay redundancy payments..."*

[Safety facilitator and delegate AP1T1]

*Interviewer: But would an investigation get at that [underlying reasons for behaviour] or would it stop at that behaviour?*

*Respondent: Look, I don't have too much faith in investigations, because I've seen too many things. I think the investigator will come up with the reason and then try and justify it, you know, probably the reverse way of something, the way it should be, you know, but I don't think it's as objective as it should be let's say.*

[Electrician and deputy delegate AP1T1]

This may reflect the distrust that workers' representatives held for managerial initiatives more generally, which was a consequence of the long-standing climate of poor labour relations evident within the terminals. Despite (or perhaps because of) this however, occupational health and safety matters played a prominent role in trade union activities and there was significant involvement of union representatives at all levels of joint arrangements for health and safety within the terminals. Arguably, our data show they were effective in protecting the health and safety interests of workers in a hostile labour relations climate.



The situation in the Asia Pacific area 2 terminals was in stark contrast to that outlined for the terminals in advanced market economies. In all the terminals in Asia Pacific area 2, the trade union position was considerably weaker than that in any of the unionised terminals in Europe or Asia Pacific area 1. In many of these terminals the nationally acknowledged dockworkers trade union was not recognised and there was no Collective Bargain Agreement in place. Even where the union had been recognised, and a Collective Bargaining Agreement was in place, according to the trade union representatives and workers interviewed in both this and the previous study, this was no guarantee that its measures concerning health and safety matters were implemented in ways that they found satisfactory. Indeed, in the one case, identified in the previous study, of a terminal in which such an agreement was in place at the time of the fieldwork, trade union representatives for the terminal were able to furnish the study with a portfolio of documented complaints concerning health and safety matters that had not been addressed. At the time of the present study, this was still the case, but the Collective Bargaining Agreement had lapsed and a new one was not yet agreed. In most of these terminals there were no arrangements in place to enable representation of workers' interests on health and safety through elected representatives with time and support facilities to perform this function. Even where health and safety committees had a seat at the table for workers and/or their representatives, generally they were inconsistent, which often meant that if any workers attended at all, they were likely to be different persons at each meeting because they were given no facility or time to represent their colleagues. Their availability depended on down times and there was little possibility to use regular attendance at meetings to raise and follow through concerns about health and safety.

As we saw previously, there was also no recognised representation on health and safety matters among the contract workers that made up the majority of the workers in these terminals. Where individuals belonged to trade unions and were active in them, they were aware of their vulnerability to what they regarded as victimisation by management. As our data show, in these scenarios worker representation on health and safety matters made little impact on the operation of arrangements for its management. At the same time, it was in these workplaces where workers experienced the poorest working environments and the greatest incidence of self-reported harm. It was also where they felt least supported by the arrangements for managing health and safety conditions at their workplace.

What is important is that the wider labour relations situation affected not only the existence of arrangements for worker representation and consultation on health and safety in the terminals, but also the *quality of their operation*. Moreover it was the national contexts in which the terminals were situated that were the main determinant of both these matters. There was no evidence in the study that either the corporate governance policies for health and safety or the management strategies of the companies to implement and operate them would have included them in their provision for health and safety at the terminals in the absence of these contextual influences. Indeed, if the experience of the terminals in Asia Pacific area 2 is taken into account, there was a strong suggestion that without such a contextual influence, there was no place for such arrangements within corporate management strategies, and a more unilateral, top-down approach to the engagement of workers on health and safety matters was preferred.

## 6.4 Taking account of context

Following the lead of recent work highlighting the significance of the wider context in determining workplace health and safety management practice, this Chapter sought to consider the impact of economic, regulatory and labour relations contexts on the approaches taken by terminal operating companies to managing safety, health and welfare and workers' consequent experiences of those approaches and their outcomes.

Our findings make it clear that elements of all three of these contextual determinants have an important impact not only on the arrangements that terminal operators make to organise work and manage health, safety and welfare – and in some cases whether arrangements, are in place at all – but also their effectiveness and value in terms of the experience of workers. In short, the prevailing economic, regulatory and labour relations contexts associated with where terminals are situated moderate the



approach the organisations operating those terminals take to OHS management, and so also the health, safety and welfare of dock workers. Our analysis clearly shows that where these contexts provide only a weak influence on the autonomy of company OHS practice, that is where OHS, in the words of some GNTs, is 'loosely regulated', workers report more negative experiences of OHS than where these factors are more strongly in evidence. For example, where outsourcing of labour is the economic 'norm', where regulatory frameworks and enforcement practices are not strong, and where labour relations histories have resulted in a weaker voice for labour, workers' experiences of health, safety and welfare arrangements are generally poorer than in contexts where the development and influence of such factors are stronger. And further, where these combine with weaker national external supports for OHS generally (in terms, for example, of compensation, insurance and welfare systems) in the 'perfect storm', then workers' experiences are poorest. Such findings are in accord with those of socio-legal scholars who argue that the institutional (including regulatory) contexts within which modern global business operates are important determinants of both management practices and worker welfare (Short and Toffel, 2010). As Locke et al. (2013), and other writers make clear, such contexts are critical in initiatives to influence the extent of compliance with labour standards (see also; Riisgaard and Hammer, 2011; Locke et al., 2007).

We have tried to capture the essence of this influence of context on experience by plotting a measure of workers' OHS experiences against a measure of context. To do this, for each case study terminal we first summed our composite measures of workers' experiences of safety outcomes, health outcomes, working conditions and OHS management arrangements (derived in Chapter 4). We then summed four measures of context for each terminal. These were: the percentage of the workforce that was *not represented by an independent union*; the percentage of the workforce that was *indirectly employed*; a comparative estimate of the degree of devolution of port ownership along a 'continuum' from fully *privatised* to wholly in public ownership, with the former scoring highest; and a further comparative estimate of the maturity of national OHS governance systems, including the presence of prevention services, again along a 'continuum' with higher scores indicating greater *immaturity*. This gave composite 'performance' and 'context' scores for each terminal. Finally, scores on both these measures were created for each of the four areas of the study by averaging their respective terminal scores. This is, necessarily, a crude approach, with the context measure providing a very broad approximation of the context in which our case study terminals were operating. Nevertheless, though the results must be approached with appropriate caution, we think the graphical description of our findings that it provides is helpful (Figure 6.3). It suggests that the poorest conditions are experienced in terminals in Asia Pacific area 2. Those in Asia Pacific area 1 and Europe areas 1 and 2 are broadly similar. The important message, however, is not how terminals compare but rather the impact of context – suggesting that, without a strong and effectively enforced legislative steer and economic and labour relations conditions in which the balance of power between capital and labour approaches equality, terminal operating companies will tend to favour productivity over effective safety and, in particular health and welfare, management. Such organisations can put effective strategies in place, but they generally only do so under certain conditions. Furthermore, even where conditions are at their most conducive, there is still significant scope for improvement, particularly in relation to the management of workers' health and welfare, alongside their safety, as well as in terms of the way OHS outcomes and performance are measured.





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## 7. Conclusions

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This study of arrangements for the governance and management of health, safety and welfare at work in a globalised industry has explored the extent of the protection of workers' health and safety and support for their welfare in container terminals operated by several companies with global terminal operations (GNTs) as well as two others with national terminal operating interests. It used a mixed-methods approach to data collection and analysis in which data from respondents to a questionnaire-based survey were analysed alongside documentary evidence and detailed interviews with workers, their representatives, managers and other key informants. In this respect it built on an earlier study which focused on many of the same terminals as those included in the present study (Walters and Wadsworth, 2012). The key difference between the two studies is in nature and extent of the evidence they obtained and analysed. The first study was based on interviews with managers, workers and their representatives in the terminals and on information obtained from union officials globally. It concerned the perceptions of a relatively small number of key informants of health and safety in container terminals and of the arrangements made by companies to manage this experience. The present study included interviews with key informants and sought evidence of occupational health and safety and the arrangements to manage it, but it has done so in addition by drawing on the analysis of a survey of nearly two thousand workers in container terminals globally. This has added substantial quantitative power to the analysis of the evidence on the experience of occupational health and safety and the arrangements for its management.

The survey was administered to workers in each of the terminals included in the study and concerned their experiences of safety, health and welfare outcomes, OHS management arrangements, work organisation and working conditions. Managers in health and safety critical roles were interviewed in these terminals, as were a selection of workers and (where they were present) their representatives. At corporate level, documentation on company arrangements and outcomes for health and safety was obtained and key informants interviewed concerning corporate governance and management of OHS. Representatives of regulatory inspectorates in each of the countries in which the terminals studied were located, along with other key informants such as trade union officials, were interviewed to enable the investigation to be set within wider the national and global contexts framed by economic, regulatory and labour relations systems and practices on the one hand, and the global corporate management strategies of terminal operators on the other. Analysis of the large quantity of data collected was undertaken using appropriate quantitative and qualitative methods. The present Chapter summarises the findings of this analysis and our conclusions concerning its implications.

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### 7.1 The aims of the study and the questions addressed

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The study addressed five main research questions. As stated in the Introduction, they were:

- How and to what extent do the business strategies and management policies of major global and national container terminal operators take account of the occupational health and safety (OHS) of workers involved in the transfer of containers?
- What are their specific strategies for addressing health and safety management in container terminals and how effective are they?
- What are dockworkers' OHS experiences of these strategies?
- How do these experiences compare in GNT terminals situated in different countries and in terminals that are operated by large national operators?

- What determines the features of the health and safety arrangements in place in these different situations and what are the implications of this for good practice in improving the health and safety experience for workers in container terminals globally?

In summary, key points on the health and safety experiences of workers globally included: the finding that 70 per cent of the respondents to the survey felt their safety was at high risk, 40 per cent felt these risks were ineffectively managed and one third reported they had experienced some kind of injury at work in the previous year. Slightly fewer respondents felt they were at high risk of experiencing work-related harm to their health (60 per cent), slightly more (48 per cent) felt these risks were ineffectively managed, and levels of respondents reporting stress, mental fatigue and work-related illnesses were especially high (60 per cent 65 per cent and 41 per cent respectively). Overall the survey findings show that workers experience a higher incidence of harm to safety and health than recorded by company reporting procedures, that many of the more commonly experienced effects of the work involved in terminal operations on workers' health are not addressed adequately by the arrangements for health and safety management and that the provisions made for workers' welfare are limited and do not adequately provide for workers' needs. These findings were corroborated by data from interviews where worker participants expressed concerns about their safety, health and welfare and suggested that arrangements for managing health and safety at their workplaces only partially addressed their concerns. Comparisons with survey data from other sources suggest that respondents' experiences were comparatively worse than the average elsewhere. There was a strong association between these negative health, safety and welfare effects and measures of poor work organisation, high work intensity and poor OHS management arrangements. These results were not uniform across all jobs, employment arrangements or geographical locations and the survey clearly identified a sub-group of respondents as being at particular risk. These were found among the indirectly employed workers doing jobs combining quayside and driving work in the Asia Pacific area 2 terminals.

These findings help to inform the study's conclusions in relation to the research questions it set out to address, as briefly outlined in the following sections.

## **7.2 Business and management policies and occupational health and safety arrangements in container terminals**

While terminal operating companies have strategies in place for the governance and management of health, safety and welfare, workers and their representatives perceived these arrangements only partially addressing their experience of the effects of their work upon their health, safety and welfare. Most of the terminal operating companies had corporate strategies for zero harm OHS arrangements in place. They were especially evident among the larger GNT operators and they were disseminated across all their terminals. At the same time, these global approaches to OHS governance and management were accommodated within wider business and management priorities that strongly emphasised operational arrangements for productivity and cost efficiencies in the highly competitive business of terminal operation. As is clear from the detailed accounts given in Chapters 4 and 5, the arrangements for OHS did not fully engage with the consequences of these wider strategies for the work environment experienced by workers. This was especially so for health, safety and welfare consequences arising from the structure and organisation of work and employment, and was evident in the experiences of the respondents to the survey and in the detailed accounts given by the workers and their representatives who participated in interviews. It was seen, for example, in these experiences in relation to staffing levels, shift patterns, work intensity, rest breaks and welfare facilities, all of which were perceived by workers to have significant consequences for their health, safety and welfare. It was apparent that corporate safety strategies largely failed to address a range of occupational health and welfare issues that were essentially the consequence of corporate business and operational practices aimed at increasing the productivity and profitability of the terminals. These issues were among those that workers regarded as having an influence on their health and welfare as well as on their safety, but they lay beyond the reach of corporate approaches that were largely focused on achieving behaviour change in relation to safety.

This focus on behaviour-based safety strategies effectively limited the coverage of the arrangements derived from corporate zero harm strategies to a rather narrow interpretation of what might be considered the 'work environment' in a more holistic sense. Despite the rhetoric concerning the centrality of a commitment to preventive health and safety in the core corporate business values and practices, what emerged in the organisations we studied was the presence of an understanding of OHS which did not conflict with the principles of cost-efficiency, profit maximisation and competition adopted at the corporate level, because it was limited to a focus on arrangements for the governance and management of *safety* at the terminals, and to a particular form of such governance in which notions of developing a 'safety culture' largely through behaviour modification strategies aimed at workers predominated.

### 7.3 How effective were the strategies for addressing health and safety management in container terminals?

The consideration of the company data concerning safety outcomes presented in Chapter 3 shows a mixed picture of health and safety performance but a generally improving trend is discernible. As we noted in the Introduction, this is a finding anticipated by some industry observers who argue that the increased mechanisation in dock-work, represented by container terminal activities, along with greater attention to health and safety management by operating companies, together should result in an improving trend in injuries and fatalities. In contrast, the findings from the study's survey of workers' experiences indicate the existence of considerably higher levels of work-related harm than are measured by company data, substantial dissatisfaction with the nature and operation of arrangements for managing health and safety and an equally strong sense that health and safety effects associated with the structure, organisation and pace of work in the terminals were missed by the systems in place for monitoring health and safety performance.

Assessment of the effectiveness of corporate strategies for the governance and management of health and safety in the container terminals needs to take some account of the large gap between these two views of the performance of these strategies and the arrangements they engendered. The survey data strongly suggest that what is measured by company data is only one very narrow indicator of OHS performance and the effectiveness of company strategies. Even within this measure there are further questions that need to be asked concerning reliability since, as we point out in Chapter 3, the considerable inconsistencies in the available data indicate a preponderance of reporting effects which warrant caution in their interpretation.

Seen in the light of the findings from the survey of workers' experiences, and with the benefit of the qualitative analysis of material from the detailed interviews with workers and their representatives discussed in Chapter 5, the effectiveness of corporate strategies and arrangements for safety, *health and welfare* must be questioned, especially in relation to workers' experience of health and welfare. It seems clear from these findings that the company arrangements documented in Chapter 3 only partially addressed this experience. Moreover, if the findings from the survey and interviews with workers and their representatives are considered in the wider context of research concerning health and safety consequences of change in the structure and organisation of work in other sectors, they are consistent with the findings of wider literature. As we pointed out in the Introduction and again in Chapter 6, the overwhelming evidence from research points to the conclusion that the pattern of work structure, organisation and pace witnessed in the container terminals is consistent with that shown to contribute to increases in poor health and safety outcomes.

In the Introduction we indicated that there are few robust studies of health and safety outcomes in container terminals. This is mainly because the unreliability of the available data and the rapid changes that have taken place in the ownership, structure, organisation and operation of container terminals make it especially hard to undertake time series studies with reliable data that enable assessment of the effects of change. One exception is the work of Fabiano et al (2010) in which a detailed study of injury data that was unusually available from one port during a period of growth in containerisation showed a

relationship between increases in the frequency of incidents of injuries and that of change in work organisation and workforce characteristics.

There is a clear need for similar further detailed research to monitor health and safety outcomes in container terminals more accurately. However, the findings of the present study are sufficient to suggest that arrangements for health and safety management should take a more holistic account of workers' experiences. They further suggest that companies might find it helpful to make arrangements to listen and respond more effectively to workers' voice. One of the weakest elements of current arrangements for health and safety management that was identified in the present research concerns the extent to which the systems in place could be said to be truly participative and facilitate representation and consultation with workers concerning health and safety matters.

Such arrangements have been shown by research studies from many countries to have a positive effect on health and safety outcomes (see Walters et al. (2012) for a recent review of this literature). However, the worker survey in the present study confirmed the poor development of arrangements for the representation and consultation of workers on health and safety. Our survey indicated that many respondents felt that OHS arrangements failed to provide adequately for their voice to be heard, with 70 per cent of respondents globally having no health and safety representative or difficulty accessing one. Both the survey and interviews with workers and their representatives indicated that in terminals in more advanced economies, where both regulatory requirements and trade union workplace organisation were better developed, consultative arrangements required by law were generally in place, but these seldom went beyond such requirements. There was also a strong indication in many of the interviews with representatives that they experienced various degrees of hostility to their role from managers and supervisors and, while it was clear that they received strong support from their trade unions to undertake their representational roles, management did not always receive their representations on behalf of their colleagues constructively.

As we discussed in Chapter 5, it is also important to bear in mind here the implications for OHS management strategies of the potential increase in the number of female workers in operational roles which may result from the greater automation of container terminals. In our research we saw little evidence of strategies or action to meet the needs of those women currently working in the case study terminals, suggesting that there is as yet little awareness of the need to consider and address these implications.

Overall, the study confirmed the findings of the previous preliminary research we conducted on many of the same companies and terminals (see Walters and Wadsworth, 2012, especially pp 85-89) which indicated that behaviour-based safety systems characterised the arrangements for health and safety management in all of the terminals we studied, and were equally characteristic of the corporate OHS strategies of the companies operating them. Such arrangements have been shown in many previous studies to have some important limitations. These were amply demonstrated in our previous investigation and corroborated by our findings in the present study. Among them was the fact that these systems were largely antithetical to making adequate provision for worker representation and consultation. Instead, as is not uncommon with such systems, they favoured arrangements for direct consultation with workers, avoiding representational arrangements unless obliged to do otherwise by regulatory provisions and the presence of trade unions. As a result, even where such arrangements existed (as they did in most of the terminals in advanced economies), their success was generally proportional to the strength of organised labour at the terminal. In this situation in the terminals generally, the value of participative systems to provide feedback information on the nature of risks and the monitoring of arrangements to manage them – widely acknowledged in studies of these arrangements to be an important part of their contribution to improved OHS performance – was underdeveloped and undervalued in terms of its contribution to the OHS management systems in place.

## 7.4 How do workers' experiences of OHS strategies and arrangements compare between terminals situated in different countries?

Chapter 4 presented findings from the analysis of the worker survey showing independent associations between poor safety and health outcomes and area of employment, job type and employment type after controlling for age and experience among the respondents working in GNT-operated terminals. High levels of adverse safety outcomes were more commonly experienced in terminals in the first and second European areas and Asia Pacific area 2; those in jobs other than maintenance; and those who were indirectly employed (Chapter 4, Table 4.3). It is acknowledged in the industry that workers in jobs including the heavy physical work involved in lashing, receiving and delivery are more likely to suffer physical harm than those employed in other work within the terminals and this was borne out by our results. The survey results also show that these workers were more at risk when employed by contractors and, as we have already pointed out, there was a sub-group of respondents – workers employed by contractors, doing jobs combining quayside and driving work (a combination only found within the Asia Pacific area 2 terminals) – whose OHS experiences were especially poor.

In addition there were differences between GNT-operated terminals in relation to several of the measures of health and safety management in the survey, again with the respondents in the Asia Pacific area 2 terminals reporting more negatively concerning their experience of these measures than was generally the case elsewhere. This was especially true for measures concerning whether there were sufficient staffing levels for safe work, as well as on effective representation and consultation on health and safety. Again respondents in jobs involving lashing and receiving or delivering goods and undertaken by workers employed by contractors were more likely to report negatively on their experience of health and safety management measures than those in other jobs. The presence of poor working conditions associated with a combination of shift patterns, arrangements for rest breaks, long hours, job insecurity, work intensity, and so on (for the full combination see Chapter 4 Table 4.13), were also found to be more prevalent in some locations, for some job types and for indirect employment.

In short, the analysis of the study overall indicated a generally poor experience of OHS outcomes and of the effectiveness of OHS management arrangements to address these experiences. There was also variation between terminals, jobs types and forms of employment, but the most substantial differences in the extent and quality of this experience occurred between respondents working in terminals situated in higher income countries in Europe and Asia Pacific area 1 and those in terminals in a lower-middle-income country located in the Asia Pacific area 2. The data in Chapter 4 describes these differences in detail. They were found in most of the indicators of health and safety outcomes, in the respondents' experiences of representation and consultation, as well as in their appreciation of the effectiveness of the arrangements in place to manage their health, safety and wellbeing and provide for their welfare. There were further differences in experiences of work organisation and work intensity, that contributed to their poor experiences of health and safety, as well as in the arrangements for their employment – there was a far greater proportion of workers who were not employed by the terminal operator but by contractors working within the terminals among respondents from Asia Pacific 2 area, who fared less favourably in relation to all the above measures than did directly employed workers in the same terminals. It is important to account for these different experiences of the practice of OHS among workers in different jobs in terminals in different locations who are employed under different arrangements and doing different types of jobs since, as Chapter 3 indicates, there was relatively little difference in the overall corporate approach to governance and management in most of the companies studied.

## 7.5 Situational determinants of OHS practices in container terminals

In Chapters 5 and 6 we argued that there were three main sets of influences that helped explain the experiences summarised so far. They included the nature of the strategies for the governance and management of arrangements for the safety, health and welfare in the terminals that are adopted by the terminal companies operating them; the position of these approaches within the wider corporate business and management strategies employed by these companies to conduct the business of container

terminal operation; and a set of determinants provided by economic, regulatory and labour relations contexts, which varied in their effects according to where terminals were located. We have represented these in Figure 6.1. Starting with the company approaches, we have shown that although the GNT and national container companies implement a set of procedures and practices for safety management that are widely acknowledged as good practice, they are of a particular character. Their key features are a prominent display of rhetoric concerning 'safety leadership' at the corporate level, which promotes adoption of safety governance strategies that have the objective of achieving 'zero harm' in relation to company safety performance through accountability for the delivery of (largely behaviour orientated) safety management procedures and a 'safety culture' among the management and workforce of all the company's business units. Using the results of our analysis and situating them within the wider research on OHS, we have argued that this approach results in the adoption of a behaviour-orientated approach towards *safety* management, which generally overlooks work-related *health and welfare* issues, tends to assume a common interest in company values and relatedly, tends to provide only to a limited extent for the institutional representation of autonomous workers' interests. In these respects the approach differs markedly from the regulatory requirements on systematic approaches to OHS management applying in the advanced market economies in which most of the terminals we studied were situated, and also from global standards such as those adopted in ILO Conventions and guidance on OHS management.

In Chapter 5 we pointed out the attraction of these ways of conceptualising the governance of improvement in workplace health and safety for corporate leaders and managers. Their focus on changing behaviour does not question the tenets of managerialist thinking, or assumptions concerning the ubiquity of shared company values. Nor does it require critical examination of corporate or managerial decisions on finance, or on the structure, organisation and operation of work and the way in which business is conducted – nor does it accept a connection between these matters and the health, safety and welfare of workers. Yet, as we have pointed out in previous chapters, there is now a wealth of research that indicates that these structural, organisational and business features of modern corporate operation *do* have negative impacts upon workers' health and safety. They result in organisational structures and procedures that are arguably less able to deliver the necessary controls to prevent every day harm to workers caused by the way work is organised, as well as being implicated among the causes of more high profile events such as process safety disasters which result in major harm to workers, hardware, the public and the environment. OHS governance and management strategies that ignore this can therefore at best achieve only limited results in terms of the improvement of the health, safety and welfare of workers affected by the consequences of these wider corporate strategies.

This said, the corporate safety, business and organisational strategies are not applied in a vacuum and, as we detail in Chapter 6, as well as being affected by the dictates of the business environment in which container terminals operate, the corporate approaches to OHS management that are represented by the broad arrow at the base of Figure 6.1 are applied in terminals in countries characterised by their different economic, regulatory and labour relations contexts. Our argument, which is also supported by research in other sectors, suggests that it is the moderating effects of these contexts that help determine differences in the nature and experience of health and safety practice in the operation of container terminals situated in different parts of the world. By plotting our combined composite measures of health and safety experiences in the terminals against a contextual measure made up of scores describing prevailing conditions in relation to levels of outsourcing and unionisation, degree of devolution of port ownership and maturity of OHS governance systems, we are able to show the relationship between them in Figure 6.3. This effectively demonstrates what perhaps we might anticipate – that poorest OHS conditions are experienced in terminals in poorer countries, in which the effects of regulatory infrastructures are weak, as is the influence of organised labour, and the economy is relatively underdeveloped but politically supportive of both gaining investment and facilitating improvements in the logistics of the national role in global trade through hosting the operation of global container terminal interests. As Figure 6.3 shows, plotting the same relationships for the terminals located in advanced economies situates them in broadly similar positions, with far better OHS status achieved for workers. It is worth noting here that it is workers in terminal situated in the most highly regulated of the economies we studied, which is also the one with strongest forms of organised labour, who score most favourably in terms of the composite

scores for their health safety, welfare and their satisfaction with management arrangements for these things.

As we concluded in Chapter 6, the important message here is not how terminals compare, but rather the impact of context. This suggests that without strong and effectively enforced regulation and economic and labour relations conditions in which the balance of power between capital and labour is sufficiently evenly distributed to allow workers an effective voice, terminal operating companies will tend to favour productivity over effective the management of safety and, in particular, health and welfare.. We have shown that these operators, and especially those working at a global level, have the capacity to put effective OHS strategies in place, but they generally only do so when the contexts in which their business units are situated oblige them to.

While it is obviously important that attention is drawn to the gap between the experience of arrangements for OHS in terminals in countries with very different economic regulatory and labour relations cultures, practices and standing, it is also important not to lose sight of the finding that in none of the terminals included in the present study were the arrangements in place to prevent work-related deaths, injuries, or ill-health, or those designed to address workers welfare, seen to be ideal in the eyes of the workers that, after all, had the most direct experience of them. In this respect, there are some worrying trends evident in the way in which cost efficiencies drive patterns in the organisation of work and employment. As we discussed in Chapter 5, two main issues are of most concern. One is the devolution of organisational structures to loosely coordinated collections of business units with varying degrees of autonomy in the conduct of their activities. The concerns here are whether appropriate levels of control, monitoring, communication and feedback are available to manage the delivery of effective preventive strategy on health and safety at the level of the business units under these arrangements and whether appropriate advice to do so is retained within organisations adopting these structural approaches. We were unable to examine these arrangements sufficiently closely in the present study to draw firm conclusions, but we did notice substantial variation between different companies in these respects.

The second issue concerns the widespread practice of outsourcing terminal operational activities to contractors. This was a major trend in the organisation of work in the container terminals we studied. It is a practice that has been strongly and so far relatively successfully resisted by organised labour in some countries but it is clear that at a corporate level this approach is likely to continue to grow, and have increasing impact, at terminal levels too. The problems for health and safety management that stem from increased contractorisation, resulting in multi-employer worksites, subcontracting, poor management communication, price and delivery constraints and so on are now well-documented in many sectors and we have referred to this literature elsewhere in the report. Many of these problems were seen in the experiences we have discussed in the terminals we studied. Less ubiquitous, however, were effective means of addressing them – although there were examples of good practices among some terminal managements concerning, for instance, the inclusion of health and safety measures in contractor procurement processes and in monitoring arrangements for contract compliance. Examination of research findings concerning these practices elsewhere suggests that the container terminal industry may still have much to learn from other sectors. This applies not only to the strategies of management, but also to those of organised labour and regulatory inspectors. If practices of outsourcing and down-sizing of the directly employed workforce are set to continue – and there is every indication that in the container terminal industry, as elsewhere, this is likely to be the case – then it follows that the strategies of regulators and trade unions need to keep abreast of these developments. There was little sign of this in the container terminals we studied. However recent research literature indicates that such strategies have been implemented in other sectors and can be relatively effective (see, for example, James et al., 2014; Weil, 2014; Wright and Brown, 2013). There are therefore models of good practice that all key players in the container terminal industry could explore.

## 7.6 Recommendations

The following recommendations are drawn from the conclusions of the study. They address issues of policy and practice on the governance and operation of arrangements to manage health, safety and welfare at work in container terminals. It is hoped they contribute to improving the relevance, operation and outcomes of these arrangements. They are made having regard to the tripartite nature of the interest in OHS in container terminals globally. That is, while they are addressed in the main to corporate and terminal level operation, others are aimed at national regulation and regulatory policy and at improving global standards on OHS in container terminals. All also have implications for the strategy and policies of the trade unions that represent the interests of workers at both corporate and terminal levels.

When making recommendations it is customary for researchers to indicate a need for 'further research', since it is also normal for the findings of research investigations to lead to additional questions. The present study is no exception. However, the recommendations outlined below are confined to those that address policy and practice and are of relevance to employers, governments, international organisations and trade unions. They include the following:

- Since the research shows that there are significant differences in health, safety and welfare practice and outcomes between terminals operated by the same companies in different locations in the world, **it is recommended** that GNTs review the strategies they have in place for the corporate governance and management of OHS with a view to reducing these differences by learning from the experience of what constitutes good practice and what drives it. There may be a role here for the development of a Code of Practice by a global body such as the ILO, which could act as a suitable standard (see also later recommendations).
- Zero-harm strategies and behaviour-based safety (BBS) arrangements dominate the approaches taken to OHS at corporate level and in the terminals studied. While there are some benefits to such systems, they have several acknowledged weaknesses. These are in particular evident in relation to attention to safety over health and welfare and in relation to questions of communication and trust between workers, their representatives and management. **It is recommended** that efforts are made to ensure that such weaknesses are addressed in corporate OHS systems. This means especially ensuring that OHS systems in place address occupational health and welfare as well as safety, they pay greater attention to the *organisational* causes of harm experienced by workers and they further allow for improved communication between workers and managers. This includes improved arrangements for consultation and participation of *all* workers on OHS and it is further important that such systems help build trust between workers and their managers, rather than distrust.
- Corporate governance of OHS in the operation of container terminals increasingly emphasises an approach to its management in which greater attention is paid to understanding the causes of critical incidents. This emphasis is valuable and **it is recommended** that its further extension be supported. In particular, more attention could be paid to management strategies associated with the prevention of low frequency/high impact (LF/HI) events. Here terminals could improve monitoring arrangements for these incidents and the greater development of trigger action response plans (TARPs) in relation to them. Terminal operators might also consider adoption of most suitable OHS indicators as well as the establishment of databases whose analysis may contribute to the advance of knowledge in the development of more ergonomic solutions for workers in ports. OHS indicators currently used by container terminals are insufficient and mainly support a reactive rather than proactive approach to incidents. Consideration could be given to more proactive and preventive orientated approaches. Although some operators have made considerable progress with global communications in relation to OHS in terminal operation, greater use of IT in achieving data collection and dissemination in this respect should be encouraged and good practices shared.
- While continued reporting of LTIs is important, **it is recommended** that KPIs that are used to monitor safety management practice both at corporate and terminal level reflect the issues identified above.

- There is a strong body of research evidence supporting the contribution of formal arrangements to represent workers' interests to improving prevention outcomes. These arrangements are found in many high risk sectors such as mining, the petrochemical industry, construction and so on, but they are significantly underdeveloped in many of the terminals we studied and **it is recommended** that this be addressed in both corporate governance of OHS and in terminal level arrangements in the future.
- Many of the experiences of harm reported by workers in this study, but apparently not in routine company data, concern health and welfare. **It is therefore recommended** that corporate and terminal strategies are reviewed with a view to increasing their emphasis on these matters in the future.
- **It is further recommended** that investigation of OHS performance and outcomes takes greater account of the views of workers concerning organisational causes of commonly experienced forms of work related ill-health.
- The organisation of work and employment in the terminals reflects the increasing use of the outsourcing of labour through arrangements with contractors. There are well-established consequences for OHS arrangements and outcomes associated with these practices. Many were in evidence in the terminals studied. **It is recommended** that companies review their strategies for addressing these consequences and take actions reflecting best practice on OHS in relation to the use of contractors. These might include:
  - Review of the nature of supply chain relations between terminal operators and contractors in order to identify better means of incentivising improved OHS performance
  - Further review and revision of corporate guidelines on the extent to which OHS management requirements for contractors feature in arrangements for procurement and contract compliance
  - Greater engagement with monitoring to ensure compliance from contractors
  - Investigation of incentives for contractors to improve OHS arrangements and performance
  - Review and exploration of possible better arrangements for the welfare of the contractor workforce in some terminals
  - Better arrangements for adequate representation of the interests of the contractor workforce
- In terms of corporate and terminal level actions, we have noted in the report that younger male workers dominated employment in the container terminals we studied. This is not surprising, but given the widely anticipated changes in the organisation of terminal operation in the future, it is likely that the participation of women in the labour force will increase. This will have some implications for arrangements for health, safety and welfare. Currently there is little evidence of these being anticipated either by the corporate strategies for governance and management of OHS and welfare or in arrangements for these matters at the level of the terminals. **It is recommended** that these implications be explored at both corporate and terminal levels.
- Both national regulatory contexts and regulatory inspection practices were found to be important determinants of terminal level OHS practice. In advanced market economies there was a perception that the presence of specialist regulatory inspection had a positive impact on terminal level OHS practices. There is understandable concern that reduction in such presence caused by cuts in public spending and reorganised compliance strategies (commonly experienced in most of these countries) will result in negative outcomes and **it is recommended** that national authorities review their strategies in this area, and also take account of likely training needs for inspectors involved in the inspection of work in container terminals.
- In the one lower-middle-income country included in the study, both the regulations on dock work and the regulatory inspectorate stood at some distance from engagement with the OHS management

arrangements employed within the terminals. ***It is recommended*** that, in this situation, national authorities take steps to close this gap by bringing regulation in line with the process-based regulatory measures for OHS now widely used globally, and by providing inspectors with training and powers to engage with OHS management practices within the terminals. There may be some scope for supporting this with the development of a Code of Good Practice at global level, perhaps through the agency of the ILO.

## References

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- Baird, A.J. (2002). Privatization trends at the world's top-100 container ports. *Maritime Policy and Management*, 29(3):271-284.
- Barton, H. and Turnbull, P. (2002) Labour regulation and competitive performance in the port transport industry: the changing fortunes of three major European seaports. *European Journal of Industrial Relations*, 8(2):133-156.
- Benach, J., Muntaner, C. and Santana, V. (eds.) (2007) *Employment Conditions and Health Inequalities: Final Report to the WHO Commission on Social Determinants of Health (CSDK)*. WHO: Geneva
- Bichou, K. and Bell, M.G.H. (2007) Internationalization and consolidation of the container port industry: assessment of channel structure and relationships. *Maritime Economics & Logistics*, 9(1):35-51.
- Bonacich, E. and Wilson, J.B. (2008) *Getting the Goods: Ports, Labor, and the Logistics Revolution*. Cornell University Press: New York.
- Boustras, G. and Economides, A. (2014) Analysis of the determinants of workplace occupational safety and health practice in Cyprus. *Policy and Practice in Health and Safety*, 12(2):89-107.
- Brooks, M.R. and Cullinane, K. (2007a). Conclusions and Research Agenda, in Brooks, M.R. and Cullinane, K. (eds.), *Devolution, Port Performance and Port Governance*, Research in Transport Economics, 17:631-660.
- Brooks, M.R. and Cullinane, K. (2007b) Introduction (Chapter 1), in Brooks, M.R. and Cullinane, K. (eds.), *Devolution, Port Performance and Port Governance*, Research in Transport Economics, 17, 3-28.
- Conger, Jay A., and Rabindra N. Kanungo. *Charismatic leadership in organizations*. Sage Publications, 1998.
- Darbra, R-M. and Casal, J. (2004) Historical analysis of accidents in seaports. *Safety Science*, 42:85-98.
- De, P. (2006), Total factor productivity growth: Indian ports in the era of globalisation. *Maritime Economics & Logistics*, 8:366-386.
- Drewry (2007) *Annual review of global container terminal operators*. Drewry Shipping Consultants Limited: London.
- EUROFOUND (2010) *Fifth European Working Conditions survey – 2010*. Last accessed: 11/03/2015 <http://www.eurofound.europa.eu/surveys/2010/fifth-european-working-conditions-survey-2010>
- Fabiano, B., Currò, F., Reverberi, A.P. and Pastorino, R. (2010) Port safety and the container revolution: A statistical study on human factor and occupational accidents over the long period. *Safety Science*, 48:980-990.
- Fairbrother, P., Gekara, V. and MacIntosh, M. (2009) Globalisation, changing port ownership and implications for labour, in *The Future of Sociology, The Australian Sociological Association 2009 Annual Conference*. The Australia Sociological Association TASA.
- Frick, K. (2014) The 50/50 implementation of Sweden's mandatory systematic work environment management. *Policy and Practice in Health and Safety*, 12(2):23-46.
- Frick, K. (2011) Worker influence on voluntary OHS management systems – a review of its ends and

means. *Safety Science*, 40: 974-987.

Frick, K. and Kempa, V. (2011) *Occupational Health and Safety Management Systems – When are they good for your health?* (Report 119), European Trade Union Institute: Brussels.

Garcia, W. and Benavides, F.G. (2014) Determinants of workplace occupational safety and health practice in Spain. *Policy and Practice in Health and Safety*, 12(2):67-87.

Gekara, V. and Fairbrother, P. (2013) Managerial technologies and power relations: a study of the Australian waterfront. *New Technology, Work and Employment*, 28(1):51-65.

Hill, D.P. (2008) Developing India's Ports: Balancing Economic and Social Objectives, in Reveley, J. and Malcolm, T. (ed.) *Port Privatisation: The Asia-Pacific Experience*. Edward Elgar Publishing: Cheltenham.

Hopkins, A. (2012) *Disastrous Decisions: The Human and Organisational Causes of the Gulf of Mexico Blowout*. CCH: Sydney, Australia.

Hopkins, A. (2011) Risk management and rule-compliance: decision-making in hazardous industries. *Safety Science*, 49:110-120.

James, P., Walters, D., Sampson, H. and Wadsworth, E.J.K. (In press) Regulating the Employment dynamics of domestic supply chains. *Journal of Industrial Relations*, 57(4).

James, P., Walters, D., Sampson, H. and Wadsworth, E.J.K. (2014) Protecting workers through supply chains: Lessons from two construction case studies. *Economic and Industrial Democracy*,

James, S. and Lloyd, C. (2008) Too much pressure? Retailer power and occupational health and safety in the food processing industry. *Work Employment and Society*, 22(4):1-18.

Johnson, J.V., Hall, E.M. and Theorell, T. (1989) Combined effects of job strain and social isolation on cardiovascular disease morbidity and mortality in a random sample of the Swedish male working population. *Scandinavian Journal of Work, Environment & Health*, 15(4):271-279.

Le Coze, J. (2008) Disasters and organisations: from lessons learnt to theorising. *Safety Science*, 46:132-149.

Levinson, L. (2006) *The Box: How the Shipping Container Made the World Smaller and the World Economy Bigger*. Princeton University Press: New Jersey.

Locke, R., Fei Qin, F. and Brause, A. (2007) Does monitoring improve labor standards? Lessons from Nike. *Industrial and Labor Relations Review*, 61(1):3-31.

Locke, R., Rissing, B. and Timea, P. (2013) Complements or substitutes? Private codes, state regulation and the enforcement of labour standards in global supply chains. *British Journal of Industrial Relations*, 51(3):519-552.

Mabrouki, C., Bentaleb, F. and Mousrij, A. (2014) A decision support methodology for risk management within a port terminal, *Safety Science*, 63:124-132.

Notteboom, T. and Rodrigue, J-P. (2011) Global networks in the container terminal operating industry. Part 2: The future direction of terminal networks. *Port Technology International*, 50:13-16.

Notteboom, T. and Rodrigue, J-P. (2012) The corporate geography of global container terminal operators. *Maritime Policy and Management*, 39(3):249-279.

- Notteboom, T. and Yap, W.Y. (2012) Port Competition and Competitiveness, in Talley, W.K. (ed.), *The Blackwell Companion to Maritime Economics*. Wiley-Blackwell, Oxford, UK.
- Parola, F. and Musso, E. (2007) Market structures and competitive strategies: the carrier-stevedore arm-wrestling in Northern European ports. *Maritime Policy & Management*, 34(3):259-278.
- Quinlan, M. (2014) *Ten Pathways to Death and Disaster: Learning from Fatal Incidents in Mines and Other High Hazard Workplaces*. The Federation Press: Annandale, Australia.
- Quinlan, M. and Bohle, P. (2008) Under pressure, out of control or home alone? Reviewing research and policy debates on the OHS effects of outsourcing and home-based work. *International Journal of Health Services*, 38(3):489-525.
- Quinlan, M., Mayhew, C. and Bohle, P. (2001) The global expansion of precarious employment, work disorganisation, and consequences for occupational health: a review of recent research. *International Journal of Health Services*, 31(2):335-414.
- Reveley, J. and Tull, M. (2008) *Port Privatisation: The Asia-Pacific Experience*. Edward Elgar Publishing Ltd: Cheltenham.
- Riisgaard, L. and Hammer, N. (2011) Prospects for labour in global value chains: Labour standards in the cut flower and banana industries. *British Journal of Industrial Relations*, 49(1):68-190.
- Rodrigue, J-P. and Notteboom, T. (2011) Global networks in the container terminal operating industry. Part 1: How global are global operators, *Port Technology International*, 49:10-14.
- Sampson, H., Walters, D., James, P., Wadsworth, E.J.K. (2014) Making headway? Regulatory compliance in the shipping industry. *Social & Legal Studies*, 23(3):383-402.
- Seibold, D. R., and B. C. Shea. "Participation and decision making." *The new handbook of organizational communication: Advances in theory, research, and methods* (2001): 664-703.
- Shang, K-C. and Lu, C-S. (2009) Effects of safety climate on perceptions of safety performance in container terminal operations. *Transport reviews*, 29(1):1-19.
- Shang, K-C. and Tseng, W-J. (2010) A risk analysis of stevedoring operations in seaport container terminals. *Journal of Marine Science and Technology*, 18(2):201-210.
- Short, J.L. and Toffel, M.W. (2010) Making self-regulation more than merely symbolic: The critical role of the legal environment. *Administrative Science Quarterly*, 55(3):361-396.
- Sisson, M. (2012) Automation and safety on container terminals: Accidents and injuries on the quayside have reduced dramatically over the past 50 years, so how can we continue this trend into the future? *Port Technology International*, 47:70-73.
- Smith, A.P., Brice, C., Sivell, S., Wadsworth, E.J.K. and Wellens, B. (2001) The combined effects of occupational factors on objective measures of performance and health, in: Hanson, M. (ed.) *Contemporary Ergonomics 2001*. Taylor & Francis: London.
- Turnbull, P. (2012) Port Labour, in Talley, W. (ed.) *The Blackwell Companion to Maritime Economics*, Wiley-Blackwell: Oxford.
- Turnbull, P. and Wass, V. (2007) Defending dock-workers – globalization and labor relations in the world's ports. *Industrial Relations*, 46(3):582-612.

Van Marle, G. (2012) *Red tape hindering Indian port development*. Lloyd's list – 22 June 2012.

Van Stolk, C., Staetsky, L., Hassan, E. and Kim, C.W. (2012a) *Factors associated with effective management of occupational safety and health: An empirical analysis*. Research Report. European Agency for Safety and Health at Work: Bilbao.

Van Stolk, C., Staetsky, L., Hassan, E. and Kim, C.W. (2012b) *Factors associated with effective management of psychosocial risks: An empirical analysis*. Research Report. European Agency for Safety and Health at Work: Bilbao.

Underhill, E., and Quinlan, M. (2011) How precarious employment affects health and safety at work: the case of temporary agency worker. *Relations Industrielles*, 66:397-421.

Wadsworth, E.J.K. and Walters, D. (2014) The determinants of workplace health and safety practice in the UK. *Policy and Practice in Health and Safety*, 12(2):3-22.

Wadsworth, E.J.K., Simpson, S.A., Moss, S.C. and Smith, A.P. (2003) The Bristol Stress and Health Study: Accidents, minor injuries, and cognitive failures at work. *Occupational Medicine*, 53:6:392-397.

Walters, D. and James, P. (2011) What motivates employers to establish preventive management arrangements within supply chains? *Safety Science*, 49(7):988-994.

Walters, D. and Wadsworth, E.J.K. (2014) Contexts and determinants of the management of occupational safety and health in European workplaces. *Policy and Practice in Health and Safety*, 12(2):109-130.

Walters, D. and Wadsworth, E.J.K. (2012) *Managing the health and safety of workers in globalised container terminals: A preliminary analysis of the experience of health and safety arrangements and outcomes in container terminals operated by Global Network Terminal Operators*. Research Report. International Transport Workers' Federation: London.

Walters, D., Wadsworth, E., Marsh, K., Davies, H and Lloyd-Williams, H (2012) *Worker Representation and Consultation on health and safety: An analysis of the findings of the European Survey of Enterprises on New and Emerging Risks (ESENER) – a European Risk Observatory Report*. European Agency for Safety and Health Luxembourg.

Walters, D., Wadsworth, E.J.K. and Quinlan, M. (2013) *Analysis of the determinants of workplace occupational safety and health practice in a selection of EU Member States*. Research Report. European Agency for Safety and Health at Work.

Walters, D., Johnstone, R., Frick, K., Quinlan, M., Baril-Gingras, G. and Thebaud-Mony, A. (2011) *Regulating Workplace Risks: A Comparative Study of Inspection Regimes in Times of Change*. Cheltenham, UK: Edward Elgar.

Weil, D. (2014) *The Fissured Workplace: Why work became so bad for so many and what can be done to improve it*. Harvard University Press: Boston.

Woolfson, C. (2013) From Piper Alpha to Deepwater Horizon, in Nichols, T. and Walters, D. (eds.) *Safety or Profit? International Studies in Governance, Change and the Work Environment*. Baywood: New York.

Woolfson, W. and Vanadzins, I. (2014) Historical and contemporary challenges to occupational safety and health in Latvia. *Policy and Practice in Health and Safety*, 12(2):47-65.

Wright, C. and Brown, W. (2013) The effectiveness of socially sustainable sourcing mechanisms:

Assessing the prospects of a new form of joint regulation. *Industrial Relations Journal*, 44(1):20-37.

## Appendix

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1. Table A.1: Associations between the variables of interest and with terminal operator in the first Asia Pacific area and Europe area 2 multivariate models
2. Sample questionnaire
3. Sample diary

*Table A.1: Associations between the variables of interest and with terminal operator in the first Asia Pacific area and Europe area 2 multivariate models*

| MODEL                                     | AREA                | SECTION                         | ASSOCIATION                                |                                                       |                      |
|-------------------------------------------|---------------------|---------------------------------|--------------------------------------------|-------------------------------------------------------|----------------------|
| SAFETY OUTCOMES WITH JOB TYPES            | Asia Pacific area 1 | 4.2.3                           | Job type: 3df, p=0.02                      | Maintenance/other                                     | 1.00                 |
|                                           |                     |                                 |                                            | Driving                                               | 3.26<br>(1.30-8.16)  |
|                                           |                     |                                 |                                            | Lashing and/or receiving and delivery                 | 1.35<br>(0.48-3.82)  |
|                                           |                     |                                 |                                            | Both driving and lashing and/or receiving and deliver | 2.48<br>(1.00-6.21)  |
| OHS MANAGEMENT ARRANGEMENTS WITH JOB TYPE | Asia Pacific area 1 | 4.4                             | Job type: 3df, p=0.006                     | Maintenance/other                                     | 1.00                 |
|                                           |                     |                                 |                                            | Driving                                               | 3.50<br>(1.42-8.64)  |
|                                           |                     |                                 |                                            | Lashing and/or receiving and delivery                 | 6.55<br>(2.25-19.09) |
|                                           |                     |                                 |                                            | Both driving and lashing and/or receiving and deliver | 2.60<br>(1.06-6.41)  |
|                                           |                     | Terminal operator: 1df, p=0.009 |                                            | National                                              | 1.00                 |
|                                           |                     |                                 |                                            | GNT                                                   | 0.50<br>(0.30-0.84)  |
| OHS MANAGEMENT ARRANGEMENTS WITH JOB TYPE | Europe area 2       | 4.4                             | Terminal operator: 1df, p=0.02             | National                                              | 1.00                 |
|                                           |                     |                                 |                                            | GNT                                                   | 0.41<br>(0.20-0.84)  |
| WORKING CONDITIONS WITH JOB TYPE          | Asia Pacific area 1 | 4.5                             | Terminal operator: 1df, p=0.02             | National                                              | 1.00                 |
|                                           |                     |                                 |                                            | GNT                                                   | 0.59<br>(0.38-0.92)  |
| WORKING CONDITIONS WITH JOB TYPE          | Europe area 2       | 4.5                             | Job type: 3df, p=0.03                      | Maintenance/other                                     | 1.00                 |
|                                           |                     |                                 |                                            | Driving                                               | 1.21<br>(0.43-3.39)  |
|                                           |                     |                                 |                                            | Lashing and/or receiving and delivery                 | 2.74<br>(0.93-8.10)  |
|                                           |                     |                                 |                                            | Both driving and lashing and/or receiving and deliver | 1.08<br>(0.36-3.30)  |
| WORKING CONDITIONS WITH OHS MANAGEMENT    | Asia Pacific area 1 | 4.6.1                           | Terminal operator: 1df, p=0.05             | National                                              | 1.00                 |
|                                           |                     |                                 |                                            | GNT                                                   | 0.58<br>(0.33-1.01)  |
|                                           |                     |                                 | OHS management arrangements: 1df, p<0.0001 | Good                                                  | 1.00                 |
|                                           |                     |                                 |                                            | Poor                                                  | 5.18<br>(3.02-8.89)  |

| MODEL                                                      | AREA                | SECTION | ASSOCIATION                               |          |                   |
|------------------------------------------------------------|---------------------|---------|-------------------------------------------|----------|-------------------|
| WORKING CONDITIONS WITH OHS MANAGEMENT                     | Europe area 2       | 4.6.1   | OHS management arrangements: 1df, p=0.004 | Good     | 1.00              |
|                                                            |                     |         |                                           | Poor     | 2.24 (1.29-3.89)  |
| SAFETY OUTCOMES WITH OHS MANAGEMENT AND WORKING CONDITIONS | Asia Pacific area 1 | 4.6.2   | OHS management arrangements: 1df, p=0.04  | Good     | 1.00              |
|                                                            |                     |         |                                           | Poor     | 1.97 (1.04-3.71)  |
|                                                            |                     |         | Working conditions: 1df, p<0.0001         | Good     | 1.00              |
|                                                            |                     |         |                                           | Poor     | 4.59 (2.40-8.81)  |
| SAFETY OUTCOMES WITH OHS MANAGEMENT AND WORKING CONDITIONS | Europe area 2       | 4.6.2   | Working conditions: 1df, p=0.03           | Good     | 1.00              |
|                                                            |                     |         |                                           | Poor     | 1.91 (1.07-3.40)  |
| HEALTH OUTCOMES WITH OHS MANAGEMENT AND WORKING CONDITIONS | Asia Pacific area 1 | 4.6.2   | OHS management arrangements: 1df, p=0.007 | Good     | 1.00              |
|                                                            |                     |         |                                           | Poor     | 2.42 (1.27-4.62)  |
|                                                            |                     |         | Working conditions: 1df, p<0.0001         | Good     | 1.00              |
|                                                            |                     |         |                                           | Poor     | 4.04 (2.13-7.64)  |
|                                                            |                     |         | Terminal operator: 1df, p=0.05            | National | 1.00              |
|                                                            |                     |         |                                           | GNT      | 0.53 (0.29-1.00)  |
| HEALTH OUTCOMES WITH OHS MANAGEMENT AND WORKING CONDITIONS | Europe area 2       | 4.6.2   | OHS management arrangements: 1df, p=0.05  | Good     | 1.00              |
|                                                            |                     |         |                                           | Poor     | 1.96 (1.01-3.79)  |
|                                                            |                     |         | Working conditions: 1df, p<0.0001         | Good     | 1.00              |
|                                                            |                     |         |                                           | Poor     | 3.70 (1.92-7.12)  |
|                                                            |                     |         | Terminal operator: 1df, p=0.05            | National | 1.00              |
|                                                            |                     |         |                                           | GNT      | 3.33 (1.00-11.11) |

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