

THE FUTURE OF THE (E-)RETAIL SECTOR FROM AN OCCUPATIONAL SAFETY AND HEALTH POINT OF VIEW

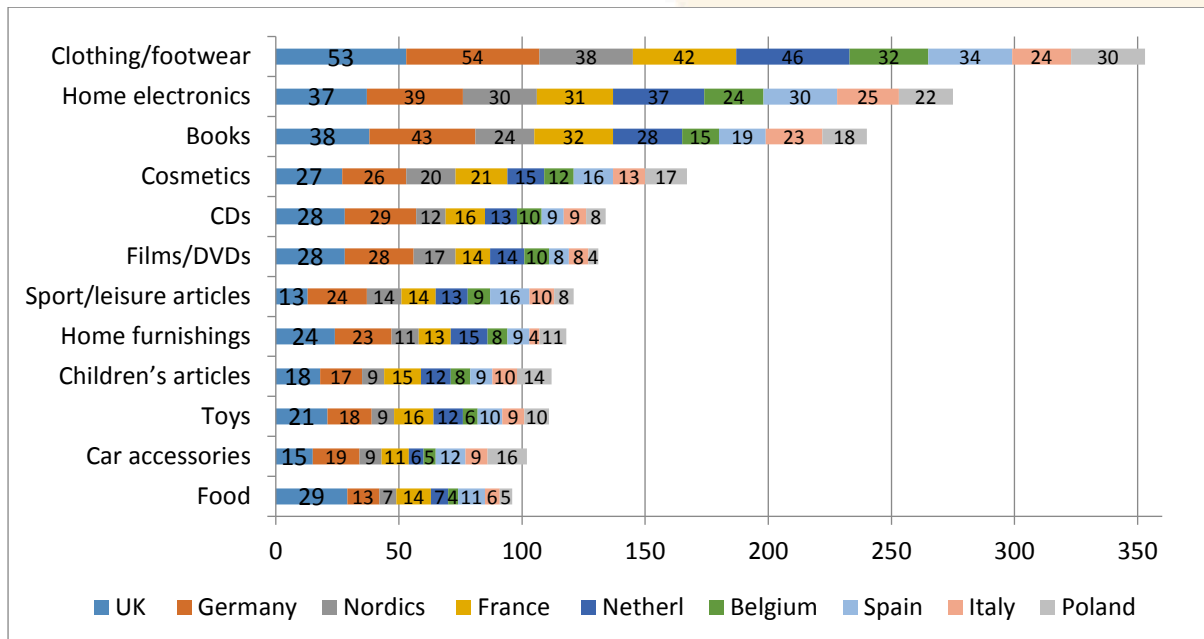
Introduction

E-retail is convenient, economical and empowering for the purchaser. For the seller, it presents numerous challenges, with additional logistics required to deliver goods directly to customers' doors, tight profit margins driven by easy access to online price comparisons, and the pressure to provide a positive customer experience. Despite the challenges, e-retail is an established success, consistently outstripping growth in 'high street' retail. In order to meet the challenging demands of customers, e-retailers are increasingly automating, using a 'gig economy' workforce and minimising costs throughout their businesses. The drive for efficiency can arguably compromise the working conditions of the workforce. Numerous mainstream media articles have exposed challenging working conditions associated with e-retail, including high picking rates and long walking distances in distribution centres; extended working hours; and compromises to worker health and wellbeing. This article discusses some of the possible occupational health implications for the e-retail workforce of the future.

What is e-retail?

There are many facets of e-retail, including purchasing event or travel tickets, holidays, insurance or fast food, gambling, and much more. This report considers a predominantly business-to-customer (B2C) focus of retail spending, involving internet-based product purchase by individuals. Across Europe, the most commonly e-purchased products are clothing and footwear, ahead of home electronics or books by a significant margin (Figure 1).¹

Figure 1 Number who bought various product categories online in the past year (2015) (millions of people)



Source: reproduced from PostNord, 'E-commerce in Europe 2015'.

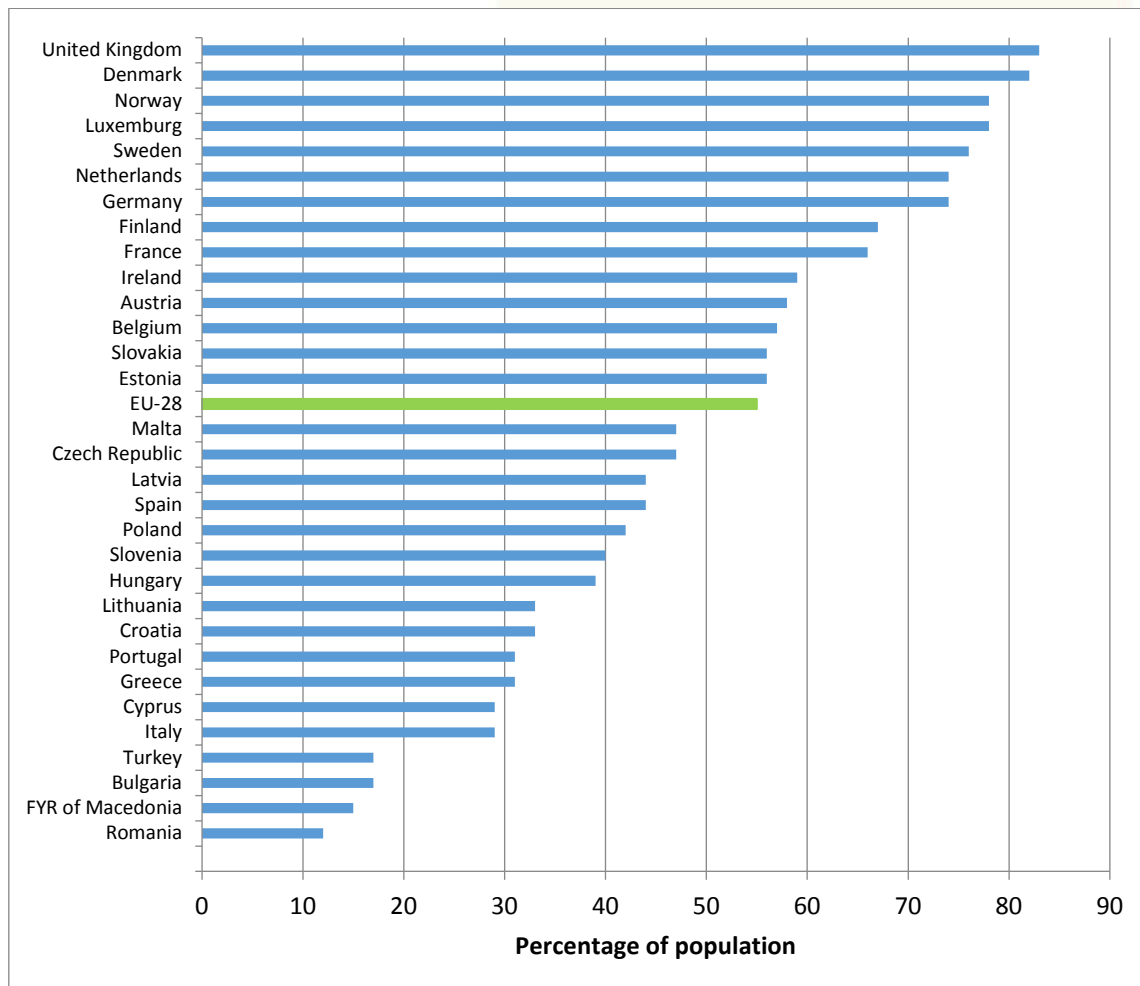
¹ PostNord, 'E-commerce in Europe 2015', <http://www.postnord.com/en/media/publications/e-commerce/e-commerce-in-europe-2015/> (accessed 9 June 2017).

The majority of these purchases involve individual product delivery, either directly to the purchaser, or using 'click and collect', whereby purchasers pick up their product from retail hubs (for example a large retail outlet) or local lockers (such as Amazon Locker).

The growth of e-retail

E-commerce is the fastest growing retail market in Europe and North America. Online sales in western Europe and Poland grew from EUR 201.33 billion in 2015 to EUR 232.60 billion in 2016 (+15.6 %). In 2017, a further rise of 14.2 % is expected and in 2018 sales are predicted to reach EUR 302.37 billion. This is at a time when annual growth in traditional 'bricks and mortar' retail is much more moderate, ranging from 1.5 % to 3.5 %.² A recent report on the UK market by ParcelHero, an online parcel delivery service, suggests that by 2030 e-retail will account for around 40 % of the total retail market and as many as half of the existing shop premises will have disappeared (in the UK).³ The UK, Germany and France dominate the online market in Europe and are together responsible for 81.5 % of European sales.⁴

Figure 2 Percentage of individuals who purchased online within the last 12 months (2016) by European country



Source: reproduced from PostNord, 'E-commerce in Europe 2015'.

² Centre for Retail Research, 'Online Retailing: Britain, Europe, US and Canada 2017', <http://www.retailresearch.org/onlineretailing.php> (accessed 9 June 2017).

³ Jinks, D., '2030: Dead End for the High Street', <https://www.parcelhero.com/blog/news-updates/2030-dead-end-for-the-high-street> (accessed 25 July 2017).

⁴ Twenga Solutions, 'E-commerce in Europe 2016', <https://www.twenga-solutions.com/en/insights/e-commerce-europe-2016-facts-figures/> (accessed 12 June 2017).

Inevitably this has given rise to significant changes in consumer shopping and supplier-delivery behaviours. Distribution centres traditionally provided storage, picking, and transportation services to other businesses, involving bulk orders shipped on pallets or in roll-cages. With the vast catalogue of different products now available online (for example 200-250 million products are available from Amazon in the UK, Germany or France⁵), and with single orders going to single addresses, order fulfilment has changed significantly, leading to a substantial growth in the demand for distribution fulfilment and logistics jobs.

Reportedly, in the five-year period leading up to 2020 approximately 200,000 new jobs will be created to meet the demand across Europe.⁶ While the increase in available jobs is a benefit to any marketplace, the sector response to consumer influences may lead to a number of compromises in the design of 'healthy jobs'.

Implications of the growth of e-retail

With so many potential providers offering e-retail services, differentiation between providers follows the desires of the customers very closely. When we look at products on the internet, the customer ratings, 'sort by price' functions and delivery times have a greater knock-on effect than is perhaps, at first, considered. While there are various ways for providers to differentiate and secure a transaction with a customer, two of the most influential are listed below.

- **Reduced delivery times.** This distinction is more important to some of us than to others. Market research shows that fast delivery (three days maximum) is 'very important' to Polish (54 %) and Italian (45 %) purchasers and less essential in Nordic countries (26 %).
- **Lowest price,** the importance of which also varies in different countries. It is reportedly considered 'very important' in Italy by 59 % of purchasers, and similarly by 54 % in Spain, but by only 36 % of purchasers in Germany.⁷

These two differentiators put pressure on the sector, and arguably lead to compromises in investment in 'healthy jobs'. 'Quick' and 'cheap' are factors that are not often complementary and, in order to deliver these services, costs must be controlled. This has an impact on jobs in three key areas of retail: (1) smaller 'high street' retail outlets; (2) increased product picking; and (3) increased driving for deliveries.

Smaller 'bricks and mortar' retail outlets

In order to compete, retailers are switching to multi-channel retail systems (two or three acquisition channels including shops and online options). Currently 29 % of European retailers sell through two or three acquisition channels, and 50 % sell through more than three channels.⁸ Two effects of this have been a reduction in investment in 'bricks and mortar' retail stores, and stores with reduced size. In extreme cases, such as temporary 'pop-up' stores, retail space can be minimised to a 3 m-by-3 m footprint. Smaller stores typically mean less storage space, which could lead to compromises in space and utilities for stock handling. This trend also results in leaner stock handling, and more frequent (but smaller) deliveries of stock.

EU-OSHA has previously reported⁹ that service and retail workers are particularly at risk from musculoskeletal disorders (MSDs), such as:

⁵ Grey, P., '(2015) How Many Products Does Amazon Sell?', <https://export-x.com/2015/12/11/how-many-products-does-amazon-sell-2015/> (accessed 9 September 2017).

⁶ Prologis, 'European E-commerce, E-fulfilment and Job Creation', <https://www.prologis.com/logistics-industry-research/european-e-commerce-e-fulfilment-and-job-creation> (accessed 9 June 2017).

⁷ PostNord, 'E-commerce in Europe 2015', https://www.postnord.com/globalassets/global/english/document/publications/2015/en_e-commerce_in_europe_20150902.pdf (accessed 9 June 2017).

⁸ Twenga Solutions, 'E-commerce in Europe 2016', <https://www.twenga-solutions.com/en/insights/e-commerce-europe-2016-facts-figures/> (accessed 12 June 2017).

⁹ EU-OSHA, 2007, 'E-fact 12: Work Related Musculoskeletal Disorders in the Service and Retail Sectors', <https://osha.europa.eu/en/publications/e-facts/efact12/view> (accessed 12 June 2017).

- muscle strains and back injuries;
- tendonitis;
- carpal tunnel syndrome; and
- rotator cuff injuries.

These issues are attributed to common MSD risk factors observed in retail:

- awkward and static postures:
 - bending or twisting torso while lifting or holding heavy items
 - lifting out of or putting objects into cramped spaces;
- heavy lifting:
 - heavy lifting done with one hand or without the assistance of mechanical devices
 - heavy lifting while bending over, reaching above shoulder height or twisting.

Large-scale retail operations generally tend to design out more of the risk. Large bulky deliveries that cannot be manually handled are transported directly into purpose-built stock areas and then mechanically handled into, and often throughout, the stores. Because of the scale of these operations, risks are generally well controlled. Purpose-built 'goods-in' and storage locations are designed to enable better postures during handling, and the storage and use of mechanical handling aids for use when required.

With smaller retail spaces, stock-handling areas are likely to be reduced or eliminated, and bulk deliveries will be replaced with smaller scale deliveries, which require more manual (and less mechanical) pushing/pulling and carrying of products. Stock stored in areas with narrow walkways with less convenient access is likely to result in compromised postures when lifting and transporting (carrying) that stock. This is the case when comparing deliveries to (and storage in) large supermarkets with those to smaller 'corner shop' grocery stores. While smaller shops understandably have much less product throughput, the number of available workers to assist with deliveries is also lower, so the quantity of handling per person may be comparable. This may introduce further risk, as deliveries are more likely to be handled by whoever is available in the store instead of a staff member who is selected for, and trained in, manual handling and managing the storage space.

A further potential issue related to the leaner 'pop-up' approach to retail is a reduction in the number of customer-facing retail jobs, possibly in long-term employment, and in the worker benefits these provide. As many as one-third of retail jobs are going to vanish by 2025, according to the British Retail Consortium.¹⁰ This prospective decrease in numbers of jobs and increase in short-term employment may undermine job security and add to the stress burden of retail work, as colleague relationships and support are potentially reduced while demands on the worker remain high.

Increased order fulfilment jobs

The increase in direct distribution to single customers has meant that workers are increasingly required to pick the purchased product directly from storage, transport it to packing and then ship it. Fulfilment distribution centres (DCs) are commonplace, and have already been through numerous evolutions that have improved efficiency and increased the throughput of product. Some of these have led to system efficiencies that challenge human capability. Efficient picking systems, such as pick by voice, by command through wrist-mounted radio (RF, radio frequency) units or by light (where lights indicate the location of the next pick) do increase efficiency, but potentially to the detriment of the workers' health if the risks are not managed. Keeping up with the pick rates, often set by non-pickers, can be a significant challenge, which some seldom meet. Media exposés have shown members of the DC picking workforce struggling to achieve demanding pick rates, while walking for 20 km each shift,¹¹ or have revealed the

¹⁰ O'Connor, S. and Vandeveld, M., 2016, *Financial Times*, 29 February, <https://www.ft.com/content/79172064-dcae-11e5-827d-4dfbe0213e07> (accessed 11 May 2018).

¹¹ BBC, 2013, 'Amazon: The Truth behind the Click', *Panorama*. <https://www.youtube.com/watch?v=UQATFbLVHk> (accessed 11 May 2018).

'enormous pressure' of keeping up with the time demands.¹² While the media reports are sensational, health and safety figures suggest that there are certainly issues related to warehousing. Statistics about the UK published by its Health and Safety Executive (HSE) show that lifting and handling injuries account for 38 % of non-fatal, lost time injuries in warehousing (followed by slip, trips and falls, 22 %; being struck by objects, 11 %; and falls from height, 7 %).¹³ The key risk factors for MSDs are well understood, and their presence in picking jobs includes:

- frequent repetitious picking; with
- rates imposed by a process;
- poor postures (handling from high or low shelving, for example, or by reaching forwards while bending at the lower back);
- prolonged pushing and pulling of trolleys or roll cages; and
- lifting heavy items.

As well as the physical demands, the psychological demands of picking activity can involve significant risk factors for stress (as well as MSD's). The demands in terms of high pick rates mean that pickers may be always chasing the next, repetitive target. Pick by voice and wrist-mounted RF units can be set to constantly monitor and show the picker in real time how they are performing against their targets, for some including a countdown to the next pick. This constant monitoring and high demand, in an environment where the worker has no influence over setting their pace of work, the route they take to the next item or in some cases their rest breaks, add to the possible stress risks.

As the distribution sector has evolved, semi-automated systems that require less manual handling or human activity have become more common. Many of the repetitive, time-consuming and heavy manual tasks can be mechanised or automated, eliminating the need to have operators walk kilometres while identifying and picking products from vast areas of storage racking. With semi-automation, human operators are allocated more dextrous (and difficult to automate) tasks, effectively 'filling the gaps' between the automated systems. Automated systems are highly efficient, for example at delivering goods to the person (GTP, Goods to Person), bringing the items to workers instead of workers travelling to the items. While the overall amount of human effort may be reduced, there can be an increase in repetitive handling of goods, from tote boxes into shipping cartons for example. More repetitive product manipulation means that the risk may be shifted from manual handling related risks towards upper limb disorder risks. Keeping pace with automated systems may result in greater levels of overall exposure to MSD risks unless this is managed, for example through task and equipment design, task rotation and sufficient time to recover.

The next expected development in distribution is the increased use of collaborative robots to perform the picking activities, directly filling tote boxes or shipping cartons with customers' orders. Ocado, an online-only grocery retailer, has begun building distribution centres that make use of robotics to provide almost all of the picking activities. While the challenges of robotic handling of soft items (such as fruit and vegetables) remain, there will still be a need for human operators to perform highly repetitive, dextrous and complex tasks, such as quality assessments, dealing with damaged goods, repackaging and dealing with waste wrapping. It may be that for the next few years, even with advances in robotics, the human operator's task becomes more limited, faster paced and repetitive while workers try to keep up with increasingly efficient automation. In such circumstances, the balance between the pace and duration of human work and human health and wellbeing must be set by designers with an understanding of human capabilities, not just robotics. Ensuring good ergonomic practice in system design will be of increasing importance for maintaining health and safety, as the numbers of manual human tasks in distribution centres diminish.

¹² Sky News, 'The "Enormous Pressure" of Working at Amazon', <https://www.youtube.com/watch?v=Vmc1KPD44Sg> (accessed 22 March 2018).

¹³ HSE: Statistics report for the Logistics industry (road haulage and warehousing), 2009/10 to 2013/14p (provisional) <http://www.hse.gov.uk/logistics/ports-logistics-sector.pdf> (accessed 11 May 2018)

Increased driving for deliveries

Customers of online retailers expect their purchases to arrive at their preferred delivery points, which include their homes (preferred by 80 % of shoppers) or workplaces (preferred by 16 %). Expectations of fast delivery vary across Europe and up to 54 % consider delivery within three days very important.¹⁴ However, willingness to pay additional charges for faster or specific delivery times has reduced significantly. In the UK (an established e-retail market), 72 % of shoppers were willing to pay more than GBP 2 for a specific delivery time slot in 2008-09, whereas in 2015-16 this had reduced to only 32 %.¹⁵

If purchasers are expecting faster deliveries and more accurate delivery times, but are not necessarily willing to pay for it, this is bound to impact on delivery driving in a number of ways.

Firstly, the increase in e-retail means that there are many more driving jobs, including 'gig economy' drivers who tend to use private cars to fulfil deliveries. The link between business driving and increased MSD rates (especially lower back pain) has been well established. Exposure to key risk factors, such as sedentary work, non-neutral constrained postures, prolonged sitting, seat vibration and manual handling, is cited as a possible reason for increased MSD prevalence, especially for those who drive for 20 hours or more per week.¹⁶ Possibly compounding this are other health risk factors for drivers, including:

- provision of less manual handling equipment;
- compromised employer terms and conditions related to 'gig economy' drivers, such as reduced pay and employer support, for example no paid holidays and no paid sickness absence;
- long working hours, often linked to performance-related pay ('pay per drop'), possibly resulting in driver fatigue and thereby contributing to increased road incidents;
- increased performance demands (linked to fast delivery and specific delivery times); and
- increased performance monitoring of drivers resulting in potential stress risk for some.

These issues are avoidable. In some areas of e-retail, such as food and grocery delivery, substantial efforts are being made to improve the design of urban delivery vehicles to enable improved postures while handling tote boxes of products. Side doors on delivery vans enable easier access to products and space for an upright posture while lifting; shelving systems eliminate lifting from the vehicle floor; shelving rollers allow the driver to slide product towards them before lifting; and handling equipment such as barrows are provided. The improvements in manual handling also result in efficiencies including faster delivery times, enabling drivers to do more deliveries each day, providing a return on investment.

Driverless vehicles delivering directly to purchaser's homes are already undergoing trials in London. For example, the Ocado 'CargoPod' delivers small items in mobile accessible lockers which unlock when they arrive at the purchaser's door. These systems may become commonplace, eliminating the health risks along with many driving jobs, but current estimates suggest that such systems will appear on the roads only in 2025 to 2030.¹⁷

Seasonal demand

Even well-organised, well-supported jobs with adequate risk management will occasionally be challenged by the huge pressures of e-retail seasonal demands. The strain of increased demand from holiday purchasing (for example at Christmas time or around sales events such as Black Friday) can be seen in delivery performance. In the UK, up to 94 % of e-shoppers consistently report that their online orders are typically delivered at the first attempt within the promised delivery timescale. Around late November and December, increased demand due to Black Friday and Christmas reduced this

¹⁴ Twenga Solutions, 'E-commerce in Europe 2016', <https://www.twenga-solutions.com/en/insights/e-commerce-europe-2016-facts-figures/> (accessed 12 June 2017).

¹⁵ IMRG Blackbay, 'UK Consumer Home Delivery Review 2016', https://www.imrg.org/uploads/media/report_download/0001/01/85552752bc6e9605f3e060cc8e254c0330481a49.pdf?st (accessed 12 June 2017).

¹⁶ Porter, J. M. and Gyi, D. E., 2002, 'The prevalence of musculoskeletal troubles among car drivers', *Occupational Medicine*, 52(1): 4-12.

¹⁷ Driverless Car Market Watch, 'Forecasts', http://www.driverless-future.com/?page_id=384.

figure to less than 85 % (2014-15 figures).¹⁸ The effects of these seasonal demands are being addressed by the marketplace, and their impacts reduced, but the significant increase in deliveries (for example, Amazon UK reportedly sold 7.4 million items during Black Friday in 2015) means more temporary workers, with reduced training, experience, equipment (for example manual handling aids) and organisational support. The temporary nature of these jobs may mean that health effects are not captured or measured, as the workers move on to other employment after a short but intensive period of retail work.

Conclusions

The requirement for both fast and cheap e-retail fulfilment may inevitably create compromises in task design, and this in turn will result in increased exposure of the workforce to risk. The development of e-retail, and increased efficiencies, can result in humans 'filling the gaps' in automation by performing fast-paced, long-duration, high-risk jobs which could compromise workers' musculoskeletal and psychosocial wellbeing.

Thankfully, the message that managing good health is good for business is as true in e-retail as anywhere else. Recently, a large-scale retailer in the UK with over 500 stores looked at ways to manage the health of the workforce in its 25 distribution centres during a period when the product pick rates were being increased substantially. Delivering the increased pick rates required significant improvements in the ergonomic design of the picking activity. So manual handling risks were assessed and reduced, significant investment in training meant that job rotation improved, health monitoring and wellbeing surveys were used to identify and address higher risk areas, and worker engagement and involvement became a key driver for management and worker representatives. Some years on, the pick rate increase was successfully achieved and maintained without compromising the musculoskeletal wellbeing of the workforce, and with measurable improvements to workers' psychosocial wellbeing. Good ergonomic intervention resulted in reduced health risks and improved worker morale, while also delivering efficiencies in a sector driven by the requirement to be cheap and quick.

Proactive management of health and safety is an essential role in enabling the growth of e-retail, and should be accepted by, and promoted within, the e-retail sector. Thankfully, an increasing number of established toolkits and workplace risk assessment methods for stress, ergonomics and worker wellbeing are available across Europe. These should be used to inform and underpin the design of new retail tasks to ensure that worker health and safety are at the forefront of developments in e-retail.

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¹⁸ IMRG Blackbay, 'UK Consumer Home Delivery Review 2016' (accessed 11 May 2018).
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(accessed 22/03/18)