



HEALTH & SAFETY  
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# EUOSHA/2017/NE/LV/0028/T4 Review article on the future of the (e-)retail sector

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## EUOSHA/2017/NE/LV/0028/T4 Review article on the future of the (e-)retail work

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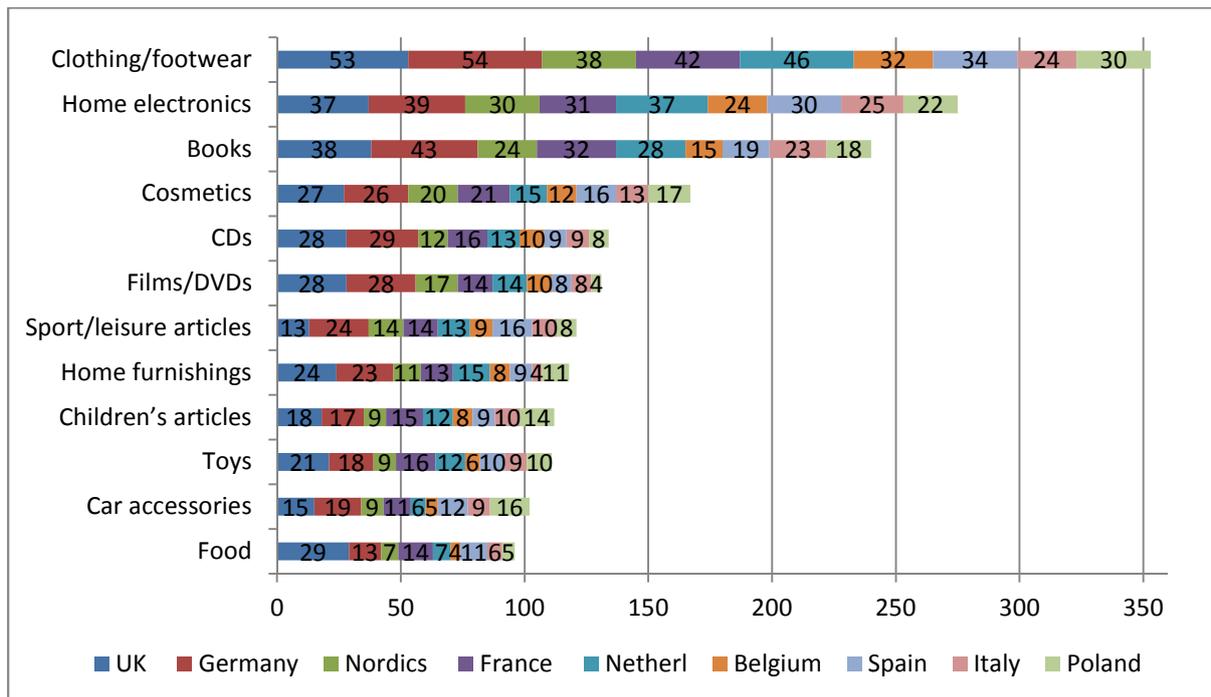
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# 1 INTRODUCTION

E-retail is convenient, economic and empowering for the purchaser. For the seller it presents numerous challenges with additional logistics required to deliver goods directly to our doors, tight profit margins driven by easy access to on-line 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. The drive for efficiency can arguably compromise the working conditions of the workforce. Numerous mainstream media articles expose challenging working conditions, high picking rates and long walking distances in distribution centres, extended working hours, and compromises to worker health and wellbeing associated with e-retail. This article discusses some of the possible occupational health implications for the e-retail workforce of the future.

# 2 WHAT IS E-RETAIL?

There are many facets of e-retail including purchasing event or travel tickets, holidays, insurance, gambling, fast-food, and much more. This article 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 include clothing and footwear, and by a significant margin over home electronics or books.<sup>1</sup>



**Figure 1:** Number who bought various product categories online in the past year (2015) (millions of people) (reproduced from E-Commerce in Europe 2015, PostNord)

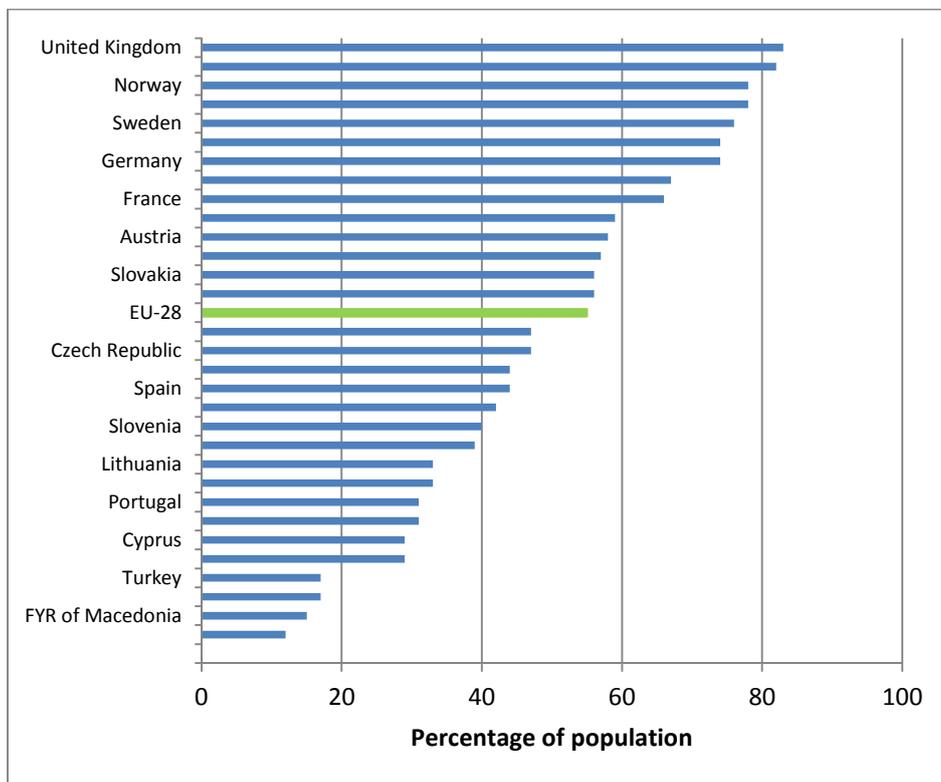
<sup>1</sup> E-commerce in Europe 2015, PostNord, <http://www.postnord.com/en/media/publications/e-commerce/e-commerce-in-europe-2015/> (accessed 09.06/17)

The majority of these purchases involve individual product delivery, either directly to the purchaser, or as ‘click and collect’ delivery where purchasers pick up their product from retail hubs (e.g. large retail outlet) or local lockers (e.g. Amazon locker).

### 3 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 €201.33 bn in 2015 to €232.60 bn in 2016 (+15.6%). In 2017, a further rise of 14.2% is expected and in 2018 sales are predicted to reach €302.37 bn. This is at a time where annual growth in traditional ‘bricks and mortar’ retail is much more moderate, ranging from 1.5% to 3.5%.<sup>2</sup> A recent report by ParcelHero, UK’s leading 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).<sup>3</sup>

The UK, Germany and France dominate the online market in Europe and are together responsible for 81.5% of European sales.<sup>4</sup>



**Figure 2:** Proportion (%) of individuals who purchased online within the last 12 months (2016) by European Country (reproduced from E-Commerce in Europe 2015, PostNord)

<sup>2</sup> Centre for retail Research; Online Retailing: Britain, Europe, US and Canada 2017; <http://www.retailresearch.org/onlinereetailing.php> (accessed 09/06/17)

<sup>3</sup> 2030: Dead End for the High Street, David Jinks <https://www.parcelhero.com/blog/news-updates/2030-dead-end-for-the-high-street> (accessed 25/07/17)

<sup>4</sup> E-Commerce in Europe 2016; Twenga Solutions; <https://www.twenga-solutions.com/en/insights/e-commerce-europe-2016-facts-figures/> (accessed 12/06/17)

The growth of e-retail is driven primarily by the consumer benefits that the sector offers. These vary depending on the type of product(s) being purchased but commonly include:

- access to a wider range of products from different suppliers;
- the convenience to buy goods from anywhere on mobile devices;
- cash savings due to immediate price comparisons and purchases direct from competing manufacturers;
- time saving – selection, buying and paying for a product online may take under 15 minutes; and,
- the increased product information available, as the internet allows customers to compare prices, browse product information and reviews before purchasing.

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 roll-cages. With the vast catalogue of different products now available online (e.g. 200 - 250 million products are available from Amazon in the UK, Germany or France<sup>5</sup>), 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 5 year period leading up to 2020 approximately 200,000 new jobs are being created to meet the demand across Europe.<sup>6</sup> 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'.

## 4 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 we perhaps consider. While there are various ways for providers to differentiate and earn our purchase, two of the most influential are:

- reduced delivery times. This distinction is more important to some of us than others. Market research shows that fast delivery (3 days maximum) is 'very important' to Polish (54%) and Italian (45%) purchasers and less essential for 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 only by 36% of purchasers in Germany.<sup>7</sup>

These two differentiators put pressure on the sector, and arguably lead to compromises in the investment in 'healthy jobs'. Quick and cheap are factors that are not often complimentary and in

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<sup>5</sup> <https://export-x.com/2015/12/11/how-many-products-does-amazon-sell-2015/> (accessed 09/09/17)

<sup>6</sup> European E-Commerce, E-Fulfilment and Job Creation, Prologis; <https://www.prologis.com/logistics-industry-research/european-e-commerce-e-fulfilment-and-job-creation> (accessed 09/06/17)

<sup>7</sup> E-commerce in Europe 2015, PostNord, <http://www.postnord.com/en/media/publications/e-commerce/e-commerce-in-europe-2015/> (accessed 09.06/17)

order to deliver these services, costs must be controlled. This has an impact on jobs in three key areas of retail; smaller 'high street' retail outlets, increased product picking and increased driving for deliveries.

#### **4.1 SMALLER 'BRICK AND MORTAR' RETAILS OUTLETS:**

In order to compete, retailers are switching to multichannel retail (retailers who have 2-3 acquisition channels including shops, and on-line options). Currently 29% of European retailers sell through 2 or 3 acquisition channels, and 50% sell through more than 3 channels.<sup>8</sup> An effect of this is less investment in 'bricks and mortar' retail stores, and stores with reduced size. In extreme cases, such as with temporary 'pop-up' stores, retail space can be minimised to a 3m by 3m footprint. Smaller stores typically mean less stock storage space, which in turn 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.

EUOSHA have previously reported<sup>9</sup> that service and retail workers are particularly at risk from musculoskeletal disorders (MSD), such as:

- muscle strains and back injuries,
- tendonitis,
- carpal tunnel syndrome,
- 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. Due to the scale, risks are generally well controlled. Purpose built unloading and storage locations are designed to enable to better postures during handling and the storage and use of mechanical handling aids 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 narrower walkways with less convenient access, is likely to result in compromised postures while lifting and carrying. This is the case when comparing deliveries to (and storage in) large supermarkets compared to more local, smaller 'corner shop' grocery stores. While smaller shops understandably have much less

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<sup>8</sup> E-Commerce in Europe 2016; Twenga Solutions; <https://www.twenga-solutions.com/en/insights/e-commerce-europe-2016-facts-figures/> (accessed 12/06/17)

<sup>9</sup> E-fact 12 - Work related musculoskeletal disorders in the service and retail sectors, EUOSHA, 2007; <https://osha.europa.eu/en/publications/e-facts/efact12/view> (accessed 12/06/17)

product throughput, the number of available workers to assist with deliveries is also less, 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 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 and possibly less long term employment and 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.<sup>10</sup> This prospective loss 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.

## **4.2 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 which improve efficiency and increase the throughput of product. Some of these have led to system efficiencies that challenge human capability. Efficient picking systems, such as pick by voice, or by command through wrist mounted radio (RF) units, or pick 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 for some is seldom met. Media exposés have run case-studies showing members of the DC picking workforce who struggle to achieve demanding pick rates, while walking for 20 km each shift<sup>11</sup> or the "enormous pressure" of keeping up with the time demands.<sup>12</sup> While the media reports are sensational, health and safety figures suggest that there are certainly issues related to warehousing. British statistics published by HSE show that lifting and handling injuries account for 38% of non-fatal, lost time injuries in warehousing in the UK (followed by slip, trips and falls (22%) and struck by objects (11%) and falls from height (7%))<sup>13</sup>. 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 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 MSDs). The high 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

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<sup>10</sup> Financial Times February 29, 2016 Sarah O'Connor and Mark Vandeveldel  
<https://www.ft.com/content/79172064-dcae-11e5-827d-4dfbe0213e07>

<sup>11</sup> BBC Panorama - Amazon The Truth Behind the Click BBC documentary behind amazon shopping, 2013

<sup>12</sup> The 'Enormous Pressure' Of Working At Amazon; Sky News 2015

<sup>13</sup> Statistics report for the Logistics industry (road haulage and warehousing), 2009/10 to 2013/14p (provisional); Health and Safety Executive. <http://www.hse.gov.uk/logistics/statistics.htm> (accessed 12/06/17)

can be set to constantly monitor and show the picker in real time and 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, adds to the possible stress risks.

As the distribution sector has evolved, semi-automated systems which require less manual handling or human activity have become more common. Many of the manual repetitive, time-consuming and forceful 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) where the items are brought to the worker instead of workers traveling to the items. While the overall amount of human effort may be reduced, there can be an increase in repetitive handling of goods, from totes 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 risk. 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 evolution in distribution is the increased use of collaborative robots to perform the picking activities, directly filling tote boxes or shipping cartons with our orders. Ocado, the world's largest online-only grocery retailer has begun building distribution centres which 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 etc. It may be the case that for the next few years, even with advances in robotics, the human operator's task becomes even more limited, faster-paced and repetitive while we try to keep up with increasingly efficient automation. In such circumstances, the balance between the pace and duration of human work and human health wellbeing must be set by designers with an understanding of human capabilities, not just robotics. Ensuring good ergonomics 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.

### **4.3 INCREASED DRIVING FOR DELIVERIES**

We expect our purchases to arrive at our preferred delivery points, which include our homes (preferred by 80% of shoppers) or to work (preferred by 16%). Our expectations for faster delivery vary across Europe and up to 54% consider delivery within 3 days as being very important).<sup>14</sup> Our willingness to pay additional charges for faster or specific delivery times has reduced significantly

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<sup>14</sup> E-Commerce in Europe 2016; Twenga Solutions; <https://www.twenga-solutions.com/en/insights/e-commerce-europe-2016-facts-figures/> (accessed 12/06/17)

though. In the UK (an established e-retail market), 72% of shoppers were willing to pay more than £2 for a specific time slot in delivery in 2008/9, whereas in 2015/16 this has reduced to only 32%.<sup>15</sup>

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 to business driving, increased MSD rates (especially lower back pain) has been well established. The exposure to key risk factors, such as sedentary work, non-neutral constrained postures, prolonged sitting, seat vibration and manual handling are all cited as possible reasons for increased MSD prevalence, especially for those who drive for 20 hours or more per week<sup>16</sup>. 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, e.g. no paid holiday, and no paid sickness absence;
- long working hours, often linked to performance related pay ('pay per drop'), possibly resulting in driver fatigue 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, however. In some areas of e-retail, such as food/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 product 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 to our door are already in the trial stage in London, with the Ocado "CargoPod" for example, delivering 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 only appear on our roads in 2025-2030<sup>17</sup>.

#### **4.4 SEASONAL DEMAND**

Even well organised, well supported jobs with adequate risk management will occasionally be challenged by the huge influences of e-retail seasonal demands. The strain of increased demand from holiday purchasing such as Christmas or sales events like Black Friday can be seen in delivery performance. In the UK, up to 94% of e-shoppers consistently report that their online orders are

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<sup>15</sup> IMRG Blackbay UK Consumer Home Delivery Review 2016  
<https://www.imrg.org/.../01/85552752bc6e9605f3e060cc8e254c0330481a49.pdf> (accessed 12/06/17)

<sup>16</sup> J. M. Porter, D. E. Gyi; The prevalence of musculoskeletal troubles among car drivers. *Occup Med (Lond)* 2002; 52 (1): 4-12. doi: 10.1093/occmed/52.1.4

<sup>17</sup> Driverless car market watch, Forecasts [http://www.driverless-future.com/?page\\_id=384](http://www.driverless-future.com/?page_id=384)

typically delivered at the first attempt within the promised delivery timescale. Around late November and December, the influence of increased demand due to Black Friday and Christmas result in up to as much as a 9% reduction in this figure (2014-15 figures).<sup>18</sup> The effects of these seasonal demands are being addressed by the market place, and their impacts reduced, but the significant increase in deliveries (e.g. Amazon UK reportedly sold 7.4 million items during Black Friday in 2015) means more temporary workers, with reduced training, experience, equipment (e.g. 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 onto other employment after a short but intense period of retail work.

## 5 CONCLUSIONS

The requirement for both fast and cheap e-retail fulfilment may always create compromises in task design, and this in turn will result in increased risk exposures to the workforce. The evolution 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 their 25 distribution centres during a period where 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 ergonomics intervention resulted in reduced health risks, improved worker morale and also delivered 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 in e-retail and should be accepted by, and promoted within the e-retail sector. Thankfully there are an increasing number of established toolkits and workplace risk assessment methods for stress, ergonomics and worker wellbeing 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 the retail evolution.

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<sup>18</sup> IMRG Blackbay UK Consumer Home Delivery Review 2016  
<https://www.imrg.org/.../01/85552752bc6e9605f3e060cc8e254c0330481a49.pdf> (accessed 12/06/17)



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