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Highlights

- It is crucial to understand and measure spillover effects at a global level for effective implementation of strategies for achieving the Sustainable Development Goals (SDGs), and for averting negative impacts of a country's actions on other countries.
- Multi-regional input-output analysis is a well-established technique for quantifying indirect supply chain impacts of consumption decisions, and this technique can be linked to social indicators. This study considers two indicators related to occupational health and safety: *fatal accidents* and *non-fatal accidents*. They correspond to SDG indicators 8.1.1 on occupational health and safety.
- Our assessment reveals that consumption of clothing, textiles and leather products by the European Union (EU) nations contributes to around 375 fatal accidents and 21,000 non-fatal accidents, annually in the textile supply chains.
- Italy, Germany, France, Spain, Poland, Belgium and Portugal are collectively responsible for about 80% of EU's total social spillover effects of fatal- and non-fatal accidents.
- The EU should address these negative spillovers. We identify three major priorities:
 - i. adopt a comprehensive EU textile strategy which includes some mandatory requirements on businesses to track and address negative social and human rights' impacts throughout the entire supply chain.
 - ii. play a stronger leadership role internationally to support progress in working conditions, decent salaries, social protection and working environments for all.
 - iii. strengthen the data ecosystem to monitor social spillovers at the national, industry, product and business level.

Abstract

The Sustainable Development Goals (SDGs), adopted by all United Nations (UN) member states in 2015, call on all nations to combine economic prosperity, social inclusion, and environmental sustainability. Spillover effects, in the form of positive or negative effects of a country's actions on other countries, can facilitate or hinder a country's SDG agenda. Here, we analyse such spillover effects, focussing specifically on *fatal accidents* and *non-fatal accidents* in the context of the textile supply chain. We assess textile products (including clothing, leather) that are sourced by the European Union (EU) from countries worldwide for meeting the demands of its citizens. To this end, we employ a well-established technique called multi-regional input-output analysis, featuring information on 15,000 sectors for 189 countries, to scan international supply chain routes that are linked to consumption of textile products by EU countries. Our findings suggest that Italy, Germany, France, Spain, Poland, Belgium and Portugal are collectively responsible for about 80% of both fatal- and non-fatal accidents that are attributed to the EU's consumption-based footprint. These findings not only call for a need for coherent SDG policies that consider spillover effects, but that these effects need to be included in EU's strategic instruments and policy-related tools.

1. Introduction

There has been a remarkable growth in international trade over the past two decades. Since 1913, global exports have increased by about 45 times (Fig. 1, (Federico and Tena-Junguito 2017)). This increase has brought about gains in the form of economic growth and prosperity in some of the low- and middle-income countries of the world. About two decades ago, the World Bank's Global Economic Prospects stated "A reduction in world barriers to trade could accelerate growth, provide stimulus to new forms of productivity-enhancing specialization, and lead to a more rapid pace of job creation and poverty reduction around the world. (The World Bank 2001)".

In addition to reported gains from trade liberalization, trade has also contributed to unintended negative consequences in supply chains, leading to biodiversity threats (Lenzen et al. 2012), inequality (Alsamawi et al. 2014b), outsourcing of emissions (Malik and Lan 2016) and air pollution (Kanemoto et al. 2014). There have been reported environmental and social effects embodied in international trade of commodities (Wiedmann and Lenzen 2018), with affluence (or consumption) demonstrated to be a key driver of these impacts (Wiedmann et al. 2020).

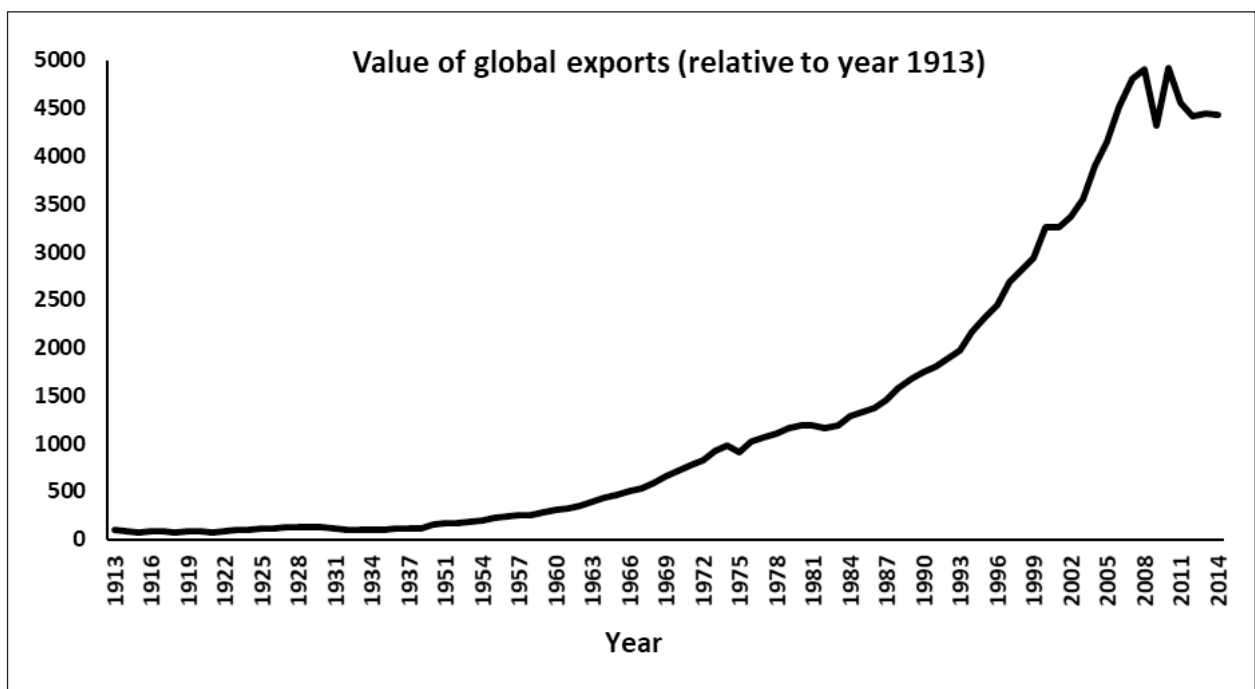


Fig. 1

Value of world exports for the period 1913 – 2014.

The data are presented in constant prices (indexed at 1913 values, (Federico and Tena-Junguito 2017)).

In 2018, the European Union (EU) countries were one of the top importing nations of the world (WITS 2020a). Trade is essential for EU economies, as the region imports a wide range of commodities from manufactured items, machinery, equipment, chemicals and vehicles (UNSD 2019a).

In recent years, there has been a surge in imports of textiles, clothing, and related products by the EU, from developing countries, after the lifting of the textile quotas (European

Commission 2004; EUROSTAT 2009). In 2019, the global textile market size was valued 961.5\$USbn in 2019; it is projected to grow by 4.3% (compound annual growth rate, without taking the effects of COVID-19 into consideration) by 2027 (InkWorld 2020). Textile imports from Bangladesh to the EU have trebled from 2008 to 2015 (European Commission 2020b), with positive reports of job gains especially for women working in the textile industry (Razzaque and Rahman 2019). At the back of these gains, reports of unsafe working conditions not only pose a threat to the fashion industries, but also undermine the gains achieved from trade liberalisation. The Rana Plaza factory – a site for the production of apparel by big fashion brands, such as Zara and Benetton (Wolf 2018) – collapsed in 2013, leading to the death of 1,132 workers, with more than 2,500 injured (ILO 2020a).

In this study, we seek to assess international social spillover effects embodied in textile supply chains of the EU. The term 'spillover' in the context of international trade refers to negative or positive impacts that take place elsewhere (i.e. other countries with unsafe production) for satisfying consumption needs of a nation. Here, we select a social indicator – occupational health and safety, further categorised into fatal-accidents and non-fatal accidents – and contextualise the findings in light of the Sustainable Development Goals (SDGs) and the EU's international commitments.

2. International spillovers and the Sustainable Development Goals

The SDGs, adopted by all UN member states in 2015, call on all nations to combine economic prosperity, social inclusion, and environmental sustainability (Sachs J. et al 2020a). Strategies to achieve the SDGs need to be implemented at various scales (Sachs J. et al. 2020b), without generating negative impacts on other countries (Sachs J. et al. 2020a). International spillovers occur when one country's actions generate benefits or impose costs on another country that are not reflected in market prices, and therefore are not *internalized* by the actions of consumers and producers (Sachs et al. 2017). These benefits or costs may be referred to as positive or negative externalities. Much economic work focuses on how these can be *internalized*, e.g., through cross-border taxes for commodities that come with significant environmental or socio-economic footprints or the widely proposed carbon tax to internalize the externality of CO₂-induced global warming. A review of emission trading systems is provided elsewhere (Narassimhan et al. 2018).

In an increasingly interdependent world, countries' actions can have positive or negative effects on other countries' ability to achieve the SDGs. Positive and negative spillovers must be understood, measured, and carefully managed since countries cannot achieve the SDGs if spillovers from other countries counteract their efforts (Schmidt-Traub et al. 2019). The SDGs broadly recognize the importance of international spillover effects with SDG 12 on 'Responsible Consumption and Production' requiring high-income countries to take the lead in tackling this issue. Some countries in the EU have begun to reflect spillovers in SDG implementation, such as Sweden's Generational Goal which aims to "*hand over to the next generation a society in which the major environmental problems in Sweden have been solved, without increasing environmental and health problems outside Sweden's borders*" (Weitz et

al. 2018). The German Sustainability Strategy defines SDG implementation by referring to actions taken “in, by and with Germany” (Bundesregierung 2018), in recognition of external impacts of its national activities and decision making.

2.1 Typology of international spillovers and connection with the SDGs

International spillovers can be classified in three broad categories (Schmidt-Traub et al. 2019), each of which impact the SDGs in different ways (Fig. 2).

Environmental and social spillovers cover international effects related to the use of natural resources, pollution and social impacts embodied into trade. Environmental spillovers, in particular, can be generated in two ways: i) through transboundary effects embodied in trade, and ii) through direct cross-border flows in air and water. Using tools such as multi-regional input–output (MRIO) databases, combined with databases on environmental (e.g. biodiversity) and social factors, we can estimate transboundary impacts embodied in consumption and trade. Generating better measures of cross-border flows (through air and water) for each country remains an important research agenda. Social spillovers include negative impacts such as child labour (Gómez Paredes et al. 2016), income inequality (Alsamawi et al. 2014b) and gender inequality (Simas et al. 2014) associated with international trade. Environmental and social spillovers have a direct impact on SDG8: Decent Work and Economic Growth, SDG12-15 related to responsible consumption, climate and biodiversity and SDG17: Partnerships for the Goals. They also indirectly affect all other SDGs.

Spillovers related to the economy, finance and governance cover international development finance (e.g., Official Development Assistance, ODA), unfair tax competition, corruption (Xiao et al. 2018), banking secrecy, and international labour standards. Spillovers related to the economy, finance and governance have a direct impact on SDG16: Peace, Security and Strong Institutions and SDG17: Partnerships for the Goals, and indirect impacts on all socio-economic SDGs, notably through ODA.

Security spillovers include negative externalities such as the trade in arms, particularly in small arms (Adeniyi 2017), and organized international crime – which can have a destabilizing impact on poor countries. Among the positive spillovers are investments in conflict-prevention and peacekeeping. Security spillovers have a direct impact on SDG16: Peace, Security and Strong Institutions and SDG17: Partnerships for the Goals, and indirect impacts on poverty, hunger and health as well as other socio-economic goals.

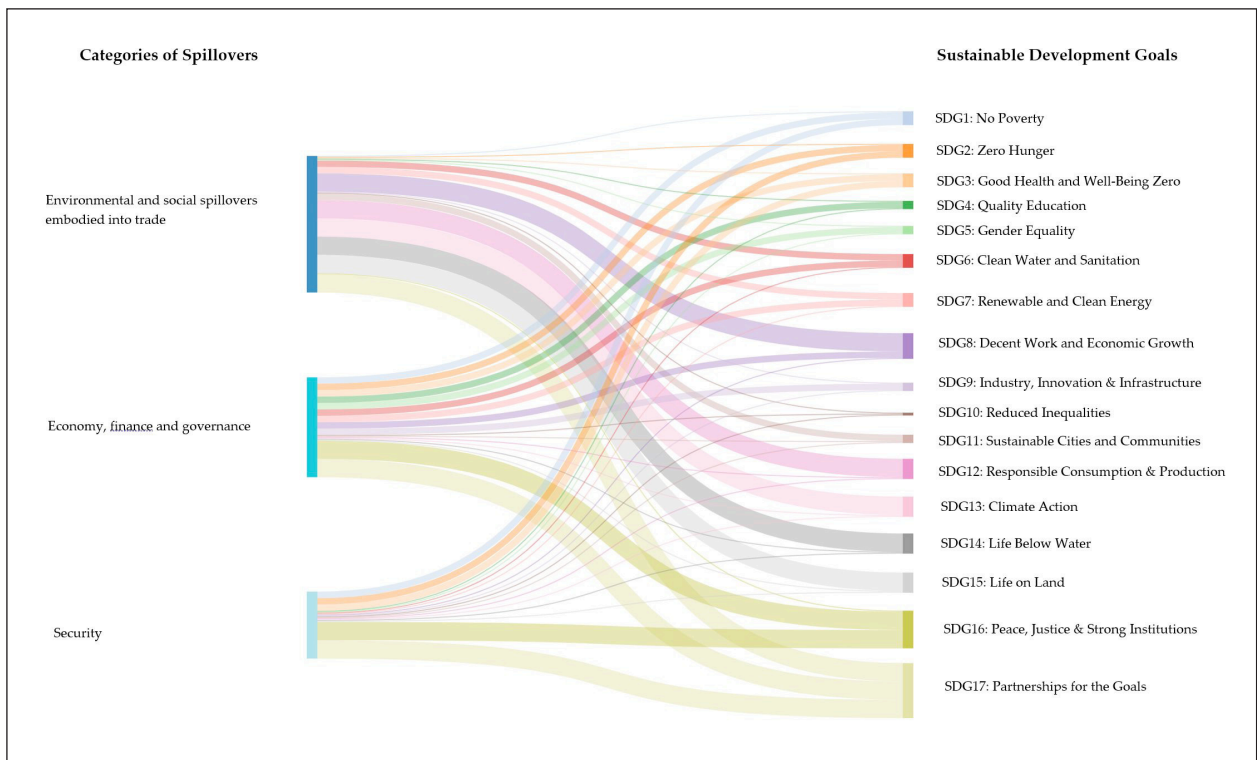


Fig. 2
 Link between the three categories of spillovers and the 17 SDGs (Source: Authors' illustration)

2.2 Performance of European countries on international spillovers

Every year, the Sustainable Development Solutions Network (SDSN) and Bertelsmann Stiftung measure the performance of all UN member states on the 17 SDGs (Sachs et al. 2016; Sachs et al. 2017; Sachs et al. 2018, 2019). The report includes an overall assessment of countries' performance on the SDGs, detailed results for each goal and an international spillover index. The international spillover index uses a subset of 12 indicators that cover all three categories of international spillovers. The list of indicators used to compile the spillover index is accessible in Table A1.

Overall, all top 10 countries on the SDG Index are European countries (Fig. 3, Panel A). Nine of them are EU member states. Yet, even these top performing countries face major challenges in achieving several SDGs and are not on track to achieve all 17 SDGs by 2030. Part of this is due to a poor performance on the spillover index. As presented in Fig. 3 (Panel B) European countries generate large, negative spillovers that impede other countries' ability to achieve the SDGs. On a per capita basis, small European countries with high trade intensity – such as Luxembourg or Switzerland – perform poorly on the international spillover index. Larger countries such as France, Germany and the United-Kingdom also perform relatively poorly. In absolute terms the EU generates more negative spillover effects than China, the Russian Federation or the United States (Sachs J. et al, 2020a, p. 47).

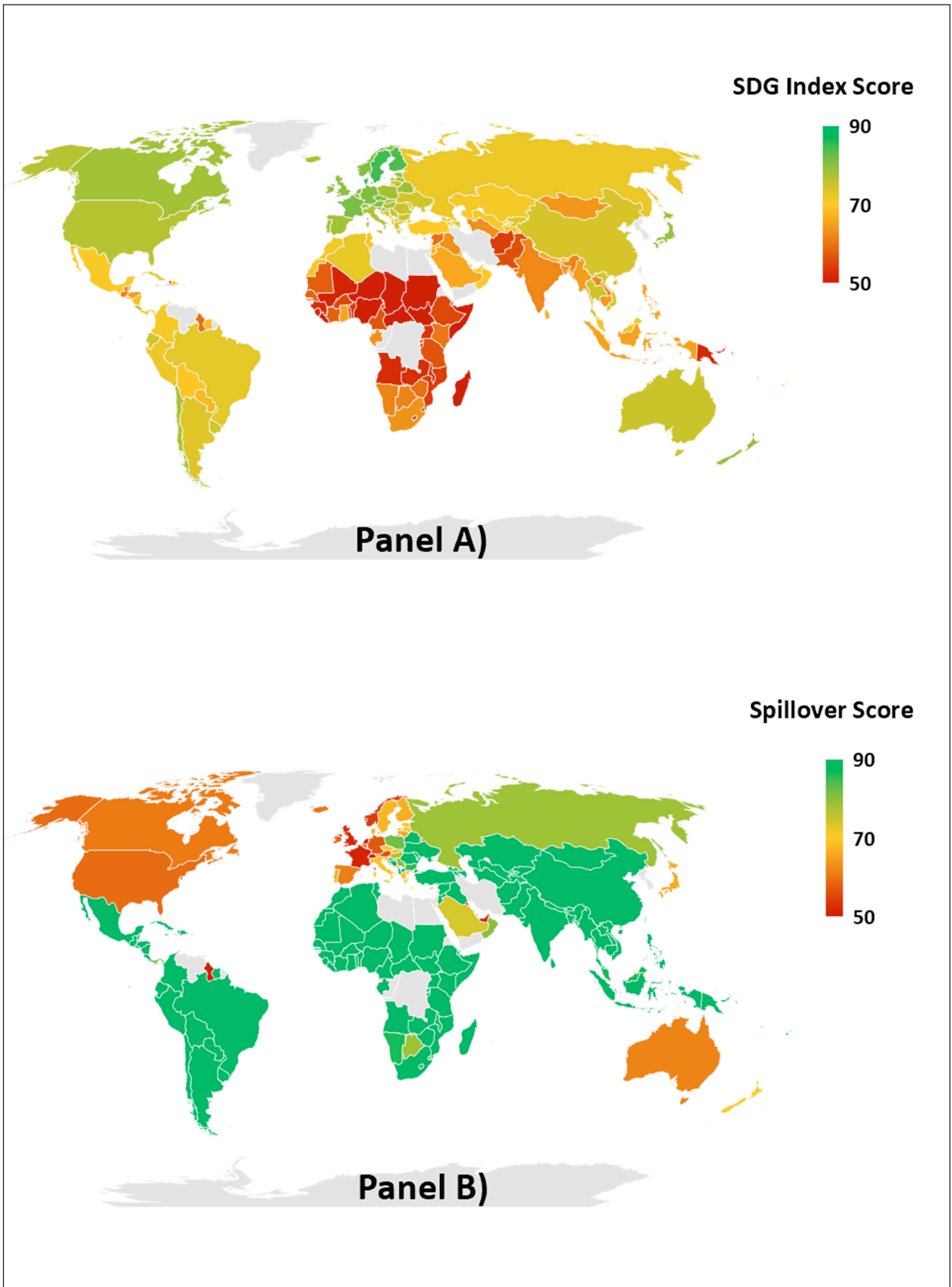


Fig. 3
SDG Index Scores (Panel A) and Spillover Index Score (Panel B), from 0 worst to 100 best (Sachs J. et al, 2020a). Grey indicates no data.

High-income countries generate the largest negative spillovers, which undermine other countries’ efforts to achieve the SDGs. This is to a large extent driven by negative environmental and social impacts embodied into trade. Fig. 4. presents the spillover index scores against GDP per capita. Small countries – such as Luxembourg, Singapore and Switzerland – tend to trade more than larger economies, and therefore generate high per-capita spillovers. Yet, there is a large variation in spillovers among countries with similar per-capita incomes. This suggests that countries can reduce their negative spillovers without reducing their per-capita incomes.

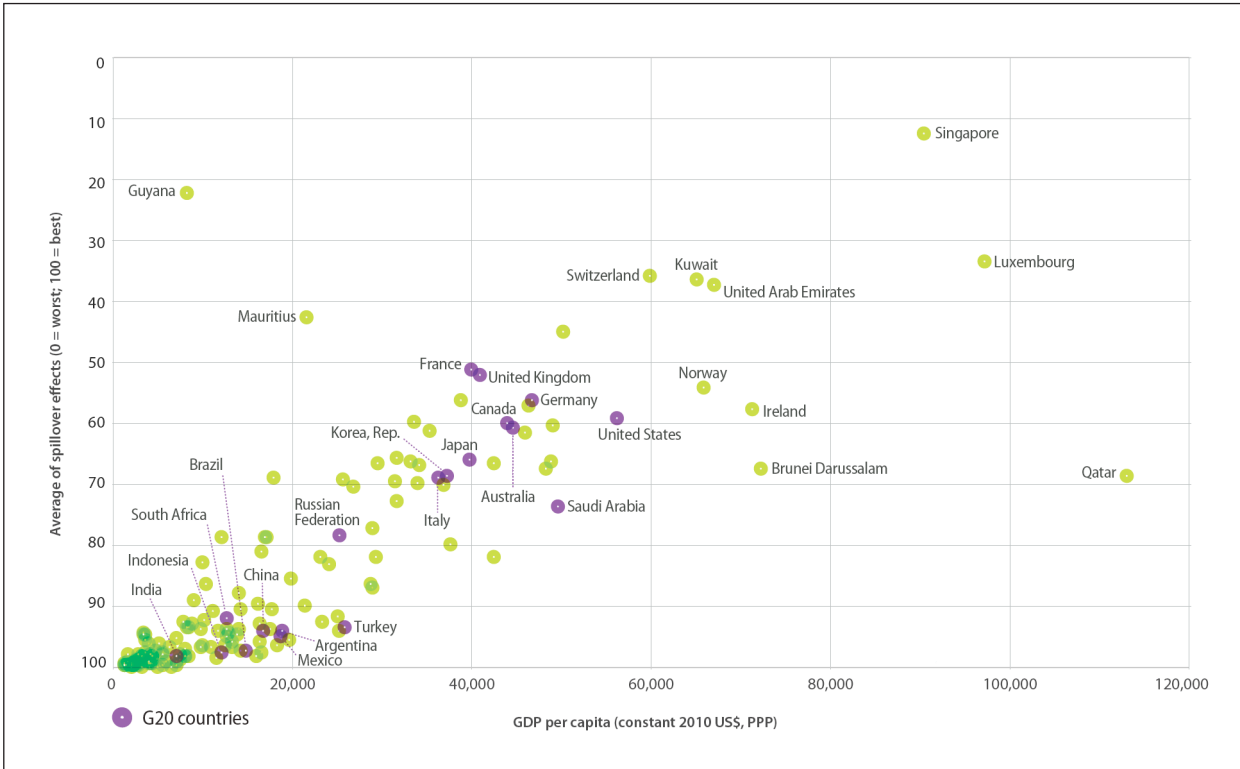


Fig. 4
Index of international spillover effects versus GDP per capita (Sachs J. et al, 2020a)

2.3. Understanding the impacts of specific supply chains in the context of the SDGs and the European Green Deal

The spillover index aggregates across all sectors and commodities. Yet, in the context of the SDGs and Paris Climate Agreement it is crucial to also disentangle the social and environmental impacts generated by specific supply chains for coming up with actionable insights and the right policy response (Schmidt-Traub et al. 2019). The policy response and stakeholders involved vary across sectors and commodities. Many international supply chains are unsustainable. The ability of individual companies to correct these failings can be limited, so industry- and supply-chain-wide approaches are needed. Several such industry initiatives exist, for example coffee, palm oil, cocoa, and many other products. So far, many of these studies have focused on environmental spillovers, including deforestation and greenhouse gas emissions. Due to the lack of robust datasets over the past decades, fewer studies have quantified impacts generated by individual countries on other countries, using tools like multi-regional input-output databases, to track socio-economic impacts embodied in supply chains.

The EU leadership recognizes the importance of trade policy and sustainable supply chains to achieve the SDGs and the European Green deal (EGD). In her Political Guidelines for the Next European Commission, the President of the European Commission stated that *“Trade is not an end in itself. It is a means to deliver prosperity at home and to export our values across the world. I will ensure that every new agreement concluded will have a dedicated sustainable development chapter”* (von der Leyen 2020, p. 17). The 2020 EU’s Annual Sustainable Growth Strategy and Recovery and Resilient Facility aims to *“guide and build a more sustainable, resilient and fairer Europe for the next generation in line with the United Nations Sustainable Development Goals”* (European Commission 2019a). Although very much focused on climate, the EGD recognizes the role of trade policies in supporting the transformation of the EU (European Commission 2019b). The EU’s Farm to Fork strategy for a fair, healthy and environmentally-friendly food system emphasizes extensively the issue of spillover effects (Massot Marti 2020). The European Trade Policy Review, launched in June 2020, aims to reform the next generation of EU trade policy to address the major global challenges facing Europe, including climate change and the COVID-19 pandemic (European Commission 2020d).

In this context, more data-driven conversations are needed to reform the governance of global supply chains. There is a crucial need to better integrate consumption-based accounting within monitoring and policy frameworks. Whilst production-based accounting rightfully emphasizes the principle of *“product liability,”* which states that producers are responsible for the quality and safety of their products, consumption-based accounting emphasizes the responsibility of consumers and international trade policies and agreements (Sachs J. et al. 2020a, p. 35).

2.4 Socio-economic impacts of the textile supply chain

Some studies have looked at socio-economic impacts embodied in the textile supply chain, including employment, income (Peters et al. 2020, submitted), which are also relevant to SDGs. In 2020, a study published by Anti-Slavery argued that *“25 million people are in forced labour across the world. Of them, over 60% are exploited in the private sector, likely linked to the supply chains of international businesses providing goods to the markets of the northern hemisphere, including the EU”* (antislavery 2020). Addressing child labour in EU’s trade policies is a top priority of the European Commission. The President of the European Commission pledges a *“zero tolerance”* policy on child labour (von der Leyen 2020). Around the world, 152 million children are estimated to be in child labour (European Commission 2020a), with many of them involved in the textile industry and other industries (Gómez Paredes et al. 2016). As one example of EU’s actions, the EU’s CLEAR Cotton project supports child labourers’ reintegration into school (ILO 2020c). During COVID-19 school closures, the project monitored the children’s situation to ensure they do not fall (back) into child labour and drop out of school completely.

This study focuses on the textile industry and aims to map out negative socio-economic impacts generated by EU member states by importing from countries with often poorer labour standards and unsafe working conditions. It focuses on fatal- and non-fatal accidents at work caused by EU consumption. This is an official SDG indicator (8.1.1) and one of many indicators used in the 2020 international spillover index. To our knowledge, this is the first study that specifically quantifies by EU countries and across supply chains the impacts

generated through trade on accidents at work. This work builds on a prior global study on fatal- and non-fatal accidents (Alsamawi et al. 2017).

3. Tracking socio-economic spillovers embodied in textile supply chains

A technique called input-output analysis (IOA) has been widely used for sustainability supply chain assessments (Leontief 1936). The developer of IOA, Wassily Leontief, received a Nobel Prize in 1973 for his contributions to economics. IOA relies on input-output (IO) tables that document the flow of money between various sectors in an economy. These tables can either be at a national scale (i.e. snapshot of a national economy) or on a global scale encompassing information on a range of countries. IO tables can also be constructed at a regional level (Lenzen et al. 2014). Tables that feature more than one region/country are called multi-regional input-output (MRIO) tables. A special issue in the journal *Economic Systems Research* (Tukker and Dietzenbacher 2013) summarises the various global MRIO databases that have been used for quantifying environmental and social impacts embodied in international supply chains (Wiedmann and Lenzen 2018).

MRIO databases are typically expressed in monetary units, with information about intra-industry and inter-industry trade. When coupled with physical accounts (such as emissions, energy use, biodiversity threats, employment, income, occupational hazards), this information yields a so-called production account for economies, which measures impacts according to the place where goods and services are produced. The environmentally- and socially-extended MRIO system with physical accounts can be subjected to an IO calculus for quantifying impacts according to a consumption-based perspective (i.e. quantification and allocation of emissions according to final consumers. In other words, accounting of emissions along the life-cycle from production to final consumption). These consumption-based assessments have been carried out for understanding the environmental and social impacts of consumption (Lenzen et al. 2012; Kanemoto et al. 2014; Oita et al. 2016; Alsamawi et al. 2017; Alsamawi et al. 2014b; Lenzen et al. 2013b).

More recently, the significance of the role of input-output analysis in tracking the SDGs is starting to be recognised (Gómez-Paredes and Malik 2018; Xiao et al. 2017). Socially-extended MRIO databases can be linked to indicators that refer to specific SDGs and their targets, which can then be used for tracking transboundary spillover effects. Relevant social indicators that are compatible with MRIO databases, and further link with SDGs, include: child labour (Gómez Paredes et al. 2016), employment (Alsamawi et al. 2014a), inequality (Alsamawi et al. 2014b), corruption (Xiao et al. 2018) and occupational hazards (Alsamawi et al. 2017).

Here, we select an indicator on occupational health and safety (ILO 2020b), categorised into fatal- and non-fatal accidents, for providing a case study of social spillover effects along global value chains. We further focus on the consumption-based impact of the EU along international textile supply chains. Our selection of the textile supply chain for tracking socio-economic spillovers is motivated by the documented rise in textile imports to the EU

in recent years (European Commission 2020b), and thus the urgent need to assess negative spillover effects that EU countries exert on their trading partners. We specifically focus on social spillover effects (Fatal- and Non-Fatal accidents) that directly affect workers and their communities, as opposed to certain environmental impacts (such as emissions) that have indirect flow-on effects on humans, for example health effects resulting from a rise in air pollution.

3.1. Uncovering textile supply chains

We use multi-regional input-output analysis for tracking social spillover effects in textile supply chains. To this end, we use the Eora MRIO database that is the most detailed global database to date, featuring unprecedented detail on more than 15,000 sectors in 189 countries (Lenzen et al. 2013a). We isolate textile-related sectors from the full sector list for 27 member countries of the EU (Europa EU 2020): Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden. We follow an approach outlined in Peters et al. (2020, submitted) to include sectors that are specific to the textile supply chain, such as textiles, wearing apparel, leather and leather products (full list provided in Annex 1). This selection of sectors is followed by the construction of customised final demand vectors for EU and two focus EU countries – Germany and Italy. The data for these final demand vectors are sourced from the Eora database (Lenzen et al. 2013a), World Bank (World Bank 2017), and the United Nations Statistical Division (UNSD 2019b).

3.2. Spillover assessment

For assessing social spillover effects embodied in EU's textile supply chains, we subject the socially-extended Eora MRIO database featuring data on fatal- and non-fatal accidents, and the final demand of textile-related sectors to a footprint calculation, as described below. Let \mathbf{x} be the total output of the MRIO system, obtained by summing the $N \times N$ intermediate demand matrix (\mathbf{T}) and the $N \times K$ final demand matrix (\mathbf{y}) to get $\mathbf{x} = \mathbf{T}\mathbf{1}^T + \mathbf{y}\mathbf{1}^y$, where \mathbf{T} captures information on interdependencies between industry sectors (such as the transactions between Germany's textiles sector and Bangladesh's agriculture sector), N is the number of sectors in the intermediate demand matrix, K are the number of final demand categories, the vector $\mathbf{1} = \{1, 1, \dots, 1\}$ is a summation operator, \mathbf{y} represents information on final demand (i.e. by either EU countries, or two focus countries – Germany and Italy) and the vector is a summation operator. The matrix of direct requirements or direct coefficients \mathbf{A} can then be derived by post-multiplying the intermediate demand matrix with the inverse of a diagonal matrix for total output, as denoted with a hat symbol: $\mathbf{A} = \mathbf{T}\hat{\mathbf{x}}^{-1}$. The matrix \mathbf{A} can be further used for deriving the fundamental Leontief input-output equation to obtain $\mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1} \mathbf{y}$, where \mathbf{I} is the identity matrix and $(\mathbf{I} - \mathbf{A})^{-1}$ is the famous Leontief inverse \mathbf{L} . The Leontief inverse captures all direct and indirect supply chain links between economic sectors, such as links between textile sectors of EU with sectors in South Asian countries. The monetary MRIO database is socially-extended by integrating data on fatal- and non-fatal accidents (units: 'cases') by sector and country (Alsamawi et al. 2017) in the form of a satellite account matrix \mathbf{Q} . Whilst direct intensities $\mathbf{q} = \mathbf{Q}\hat{\mathbf{x}}^{-1}$ represent 1st round impacts, multipliers $\mathbf{m} = \mathbf{q}\mathbf{L}$ capture impacts across the entire supply chain.

For assessing the contributions of upstream production layers (supply chains) to the total footprint, a so-called production layer decomposition can be carried out by unravelling the Leontief inverse L into upstream layers: $L = (I-A)^{-1} = I + A + A^2 + A^3 + A^4 + \dots$.

A production layer decomposition analysis proceeds as follows:

$qL\tilde{y} = q(I-A)^{-1}\tilde{y} = q(I + A + A^2 + A^3 + A^4 + \dots)\tilde{y}$. Here, we consider the first layer to be $q\tilde{y}$, the second layer ($qA\tilde{y}$) as the suppliers of the textile sectors, the third layer ($qA^2\tilde{y}$) as the suppliers' of suppliers, and so on.

We undertake the assessment for year 2015 to provide a snapshot of the key trading partners that face spillover effects due to imports of textile products by EU countries. The data on fatal- and non-fatal accidents are based on the most-comprehensive methodology to date (Alsamawi et al. 2017) for the latest year 2010. Alsamawi et al. (2017) write that the data are based on information from "International Labour Office, ASEAN Occupational Safety and Health Network (ASEAN-OSHNET) and State Administration of Work Safety (SAWS) databases, and from various local agencies and papers that report on work safety where data are unavailable from the previously mentioned sources." Whilst our search for more recent data on fatal- and non-fatal occupational injuries shows that the International Labour Organisation has produced some updated figures for these indicators, however the sectoral resolution for the data are poor (ILO 2020b). For example, the International Labour Organisation (ILO) data do not include Bangladesh, a major textile trading partner of the EU, or data on any sectors other than the mining and quarrying for India. We therefore use the most updated version of data published by Alsamawi et al. 2017, which is for year 2010, and estimate the data for year 2015 using linear regression. Our choice of year 2015 is based on the availability of the most recent data for the Eora MRIO database used in this study (2015, worldmrio.com).

3.3. Results

3.3.1 Overview of EU member states

The European Union relies heavily on imports of clothing and textile products from Asian countries for meeting the final demand of its citizens (WITS 2020b), contributing to around 375 fatal and 21,000 non-fatal occupational injuries in the supply chains of import partners. EU's final demand for textile products results in spillover effects within EU and in various Asian and African nations (Figs. 5, 6). Out of the EU member states, Italy and Germany stand out in particular, with both countries collectively responsible for almost half of EU's social spillover effects for fatal and non-fatal accidents (Fig. 7).

Italy and Germany are fashion hubs of the EU, with both countries importing clothing, textiles and leather products from primarily Asian countries (Fig. 7). These EU nations have the largest final demand consumption of textile-related commodities, majority of the demand being met from imports. Germany imports leather footwear, T-shirts, suits, pants, linen, footwear, activewear and woollen clothing from India. In 2018, out of a total of \$8.92 billion imports from India, \$2.19 billion were textile imports (see ATLAS (2020) for trade statistics). Interestingly, a whopping 98% of imports from Bangladesh in 2018 were textile imports. Similar statistics are observed for Italy's imports from India and Bangladesh. China

is also an important trading partner of Italy and Germany, with traded goods comprising of knitted fabrics, seats and textile parts of furniture. Almost one-fourth of textile exports from Pakistan to Italy and Germany include bed linen, table linen, toilet and kitchen linen, and those from Sri Lanka are undergarments. Madagascar, features a booming textile and apparel industry that is one of the biggest formal employers outside of Agriculture, prompting calls for the implementation of improved health and safety in the island's textile industry – an ILO Flagship program currently underway. A recent report published by the ILO lays out vulnerability profiles for agricultural workers (e.g. exposure to insecticides, high temperatures), factory workers (e.g. repetitive hand movements, incorrect postures, exposure to dust and fine-particles from cotton and synthetic fibres, exposure to chemicals, and injuries from unsafe use of equipment and cutting weaving tools) (ILO 2020d). One of the key outputs of the textile industries of African countries is cotton, which is either sold directly to EU countries, or transformed into textile products.

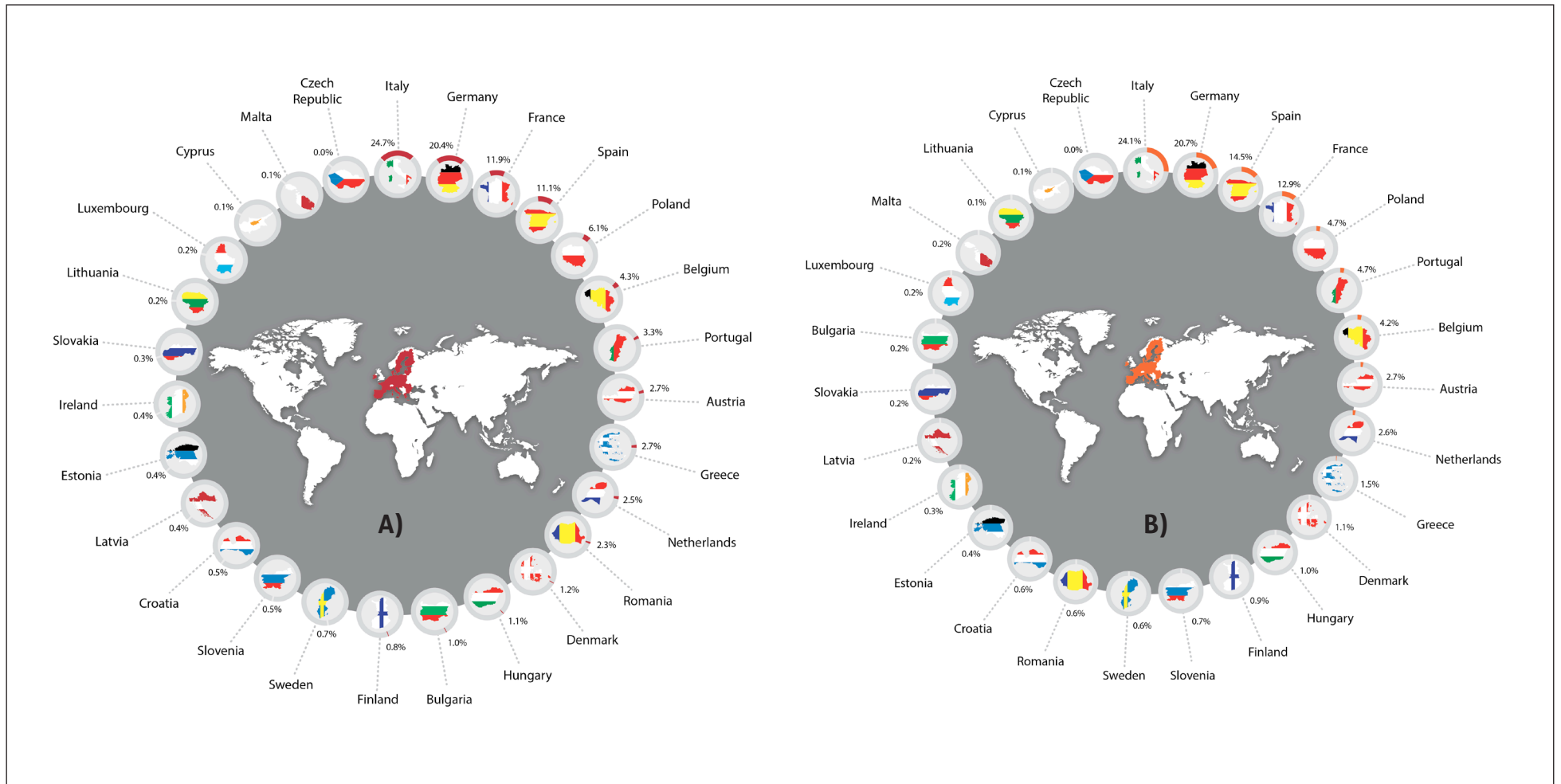


Fig. 5
 Social spillover effects embodied in EU supply chains, shown as a % for each of the 27 EU states (adding up to 100%), for the indicators: fatal accidents (Panel A) and non-fatal accidents (Panel B). For example, Italy's final consumption of textile-related imports from other countries is responsible for about 24% of EU's total social spillover footprint (Source: Authors' illustration).

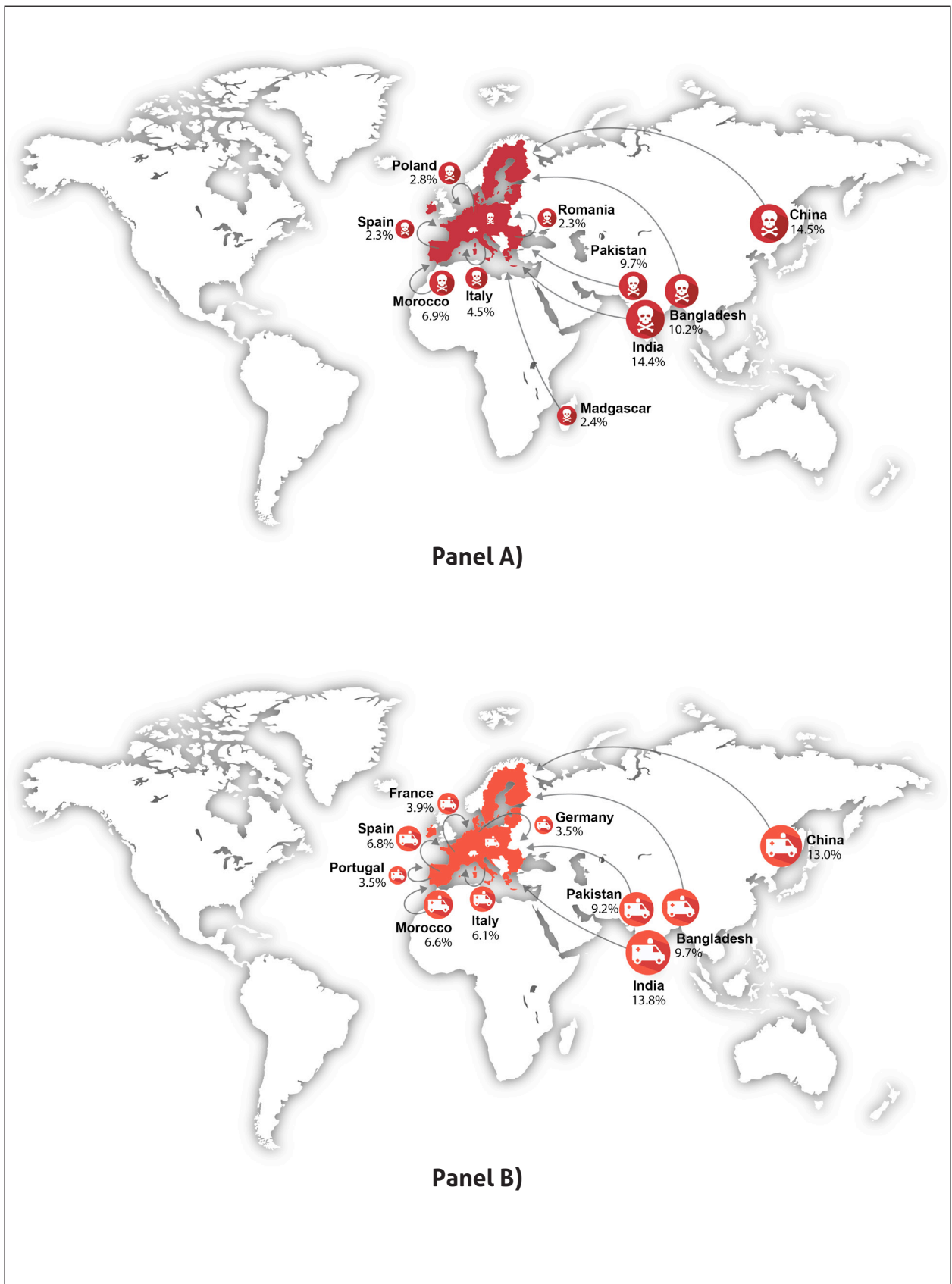


Fig. 6
 Breakdown of social spillover effects (indicator: fatal accidents, Panel A; non-fatal accidents, Panel B) at a global level for satisfying final demand of textile-related commodities by the European Union. (Source: Authors' illustration).

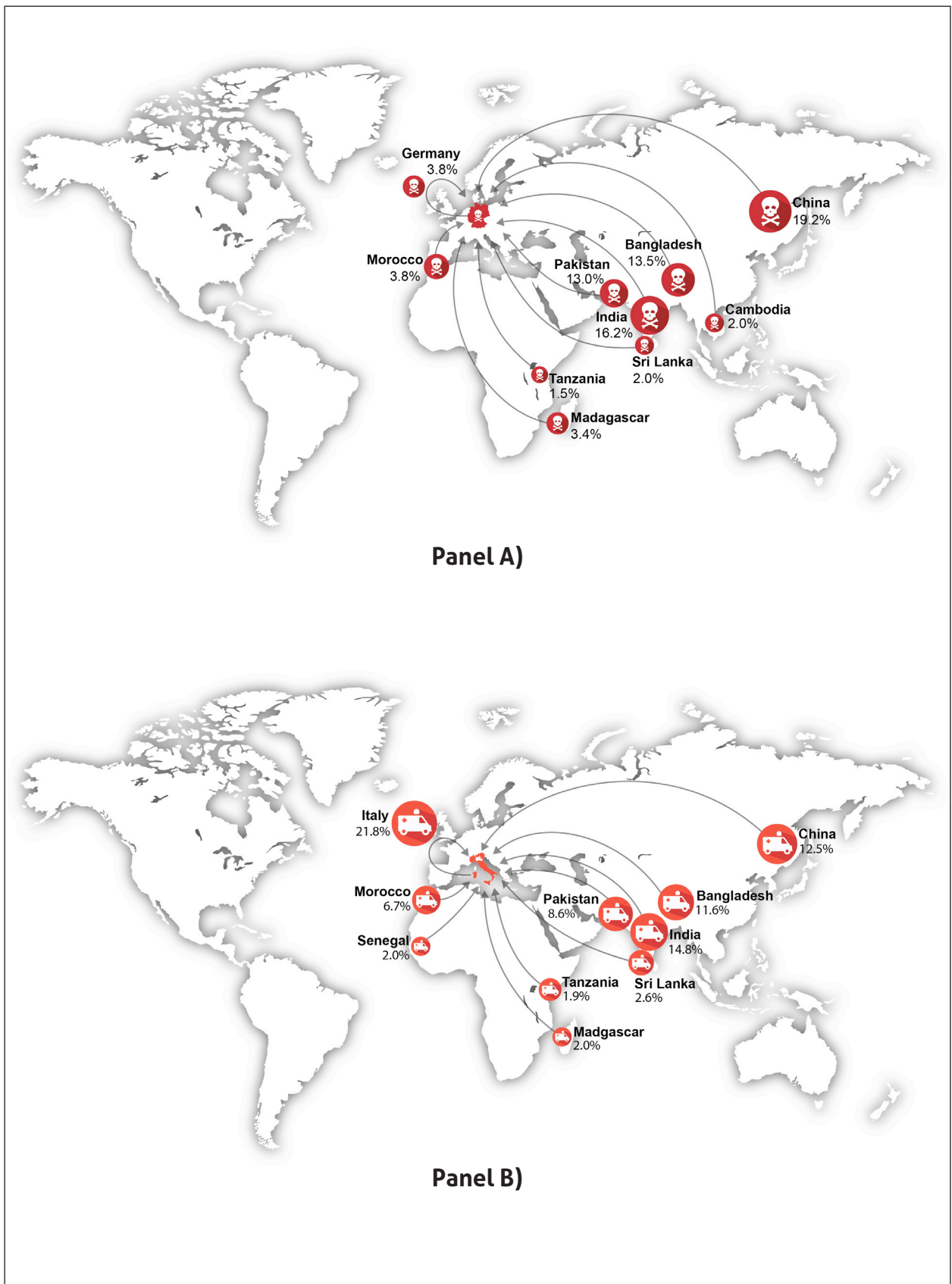


Fig. 7
 Breakdown of social spillover effects for Germany (indicator: fatal accidents, Panel A) and Italy (indicator: non-fatal accidents, Panel B). The arrow from Italy to Italy in Panel B refers to spillover effects due to domestic production and consumption. All other arrows show impacts according to international trade of commodities, i.e. imports into Germany and Italy (Source: Authors' illustration).

3.3.2 Top EU textile supply chain paths

The Eora MRIO database features detail on over 15,000 sectors in 189 countries. The database offers a sector coverage of a minimum of 26 sectors for small economies, such as Bangladesh, Senegal, Tanzania, Ethiopia and Madagascar, to more than 100 sectors for countries such as India, and about 400 sectors for large economies such as the USA. Because of this sector coverage, we see that a range of commodities traded from small economies to EU countries are aggregated into the category 'Agriculture', whilst detailed disaggregation is provided for sectors in the Indian (cotton, leather footwear) and Chinese (cotton textiles, wearing apparel, leather, furs etc.) economies (Fig. 8).

MRIO analysis allows for the scanning of upstream supply chains to identify specific sectors in exporting nations, which trade with the textile-related sectors of EU countries. We calculated disaggregated spillover effects by tracing impacts from producing country/sector pairs to final destination country/sectors, and ranked the contributions for seven selected EU economies: Italy, Germany, France, Spain, Poland, Belgium and Portugal. These countries collectively are responsible for about 80% of EU's total social spillover effects of fatal- and non-fatal accidents (Fig. 5). The rankings in Fig. 5 are based on all international trade supply chains that link to EU's textile, clothing and leather sectors (see Table A2 for the sector list), whilst Fig. 8 only presents the top-30 supply chains for seven selected countries. The findings show that commodities produced in the Asian economies, and to some extent African nations, make up a significant portion of EU's top exports of textile products.

3.3.3 Scanning upstream production layers

We use a technique called production layer decomposition (see Section 3.2) for quantifying impacts embodied in upstream supply chains of the EU (Figs. 9, 10), and for a selected country (Germany). The IO table of Germany has three relevant textile-related sectors: textiles, clothing, footwear and leather. The Eora MRIO database includes information about the direct and total requirements of these sectors. In other words, the direct and indirect inputs required by these sectors can be extracted by subjecting the MRIO database to input-output calculus (see Section 3.2). For example, Germany's clothing sector requires inputs from the manufacturing sector, which in turn requires inputs from the electricity sector, and in turn the input of coal, and so on. These complex interconnections at a global level are captured in various upstream production layers. Here, we unravel the total fatal- and non-fatal transboundary effects of the EU's and Germany's textiles, clothing, footwear and leather sectors to assess the hotspots of these impacts, by sector (Fig. 9) and region (Fig. 10).

A majority of fatal- and non-fatal spillover effects resulting from the EU and specifically German consumption happen in the agriculture sectors. These sectors are responsible for providing raw materials for production of textile products. Impacts also happen in the textile and wearing apparel, machinery and equipment sectors, with unsafe working conditions. These international spillover effects have consequences for achieving SDG8: Decent work and economic growth, which aims to promote economic growth under safe working conditions.

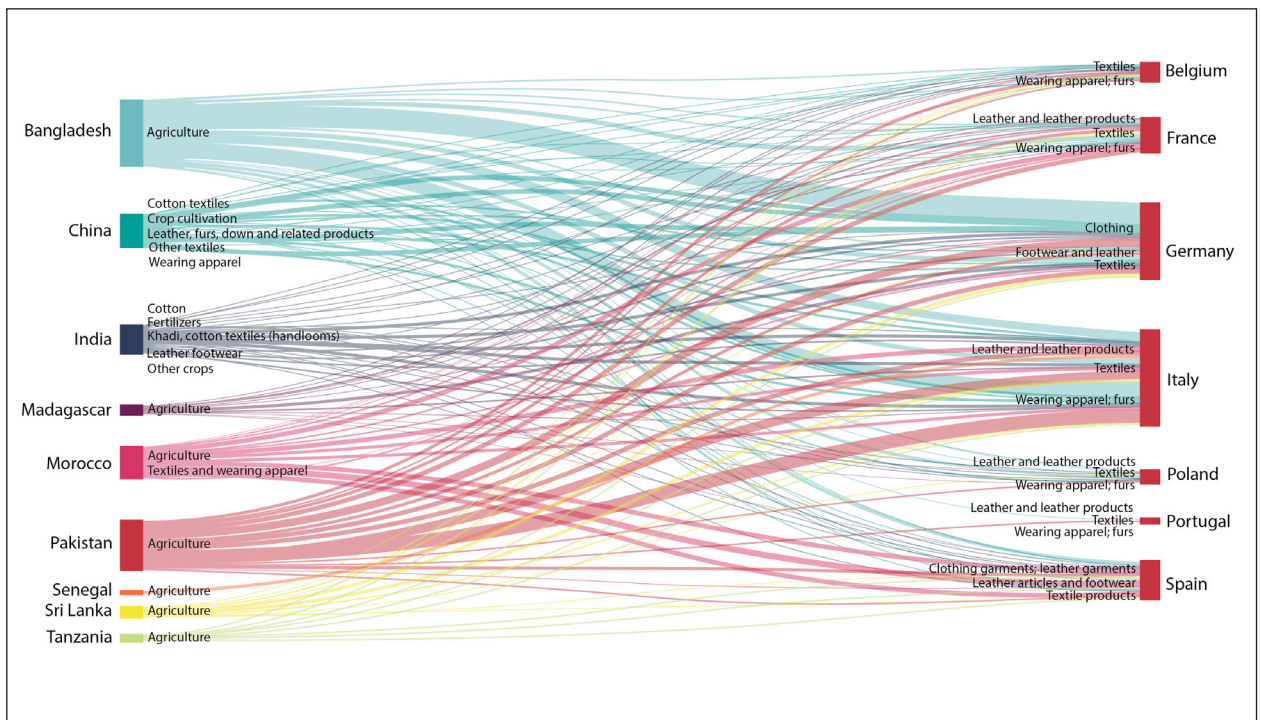


Fig. 8
 Non-fatal accidents embodied in top-30 textile supply chain paths from producing industry to sold product for top-7 EU countries, as per Fig. 5 (Source: Authors' illustration).

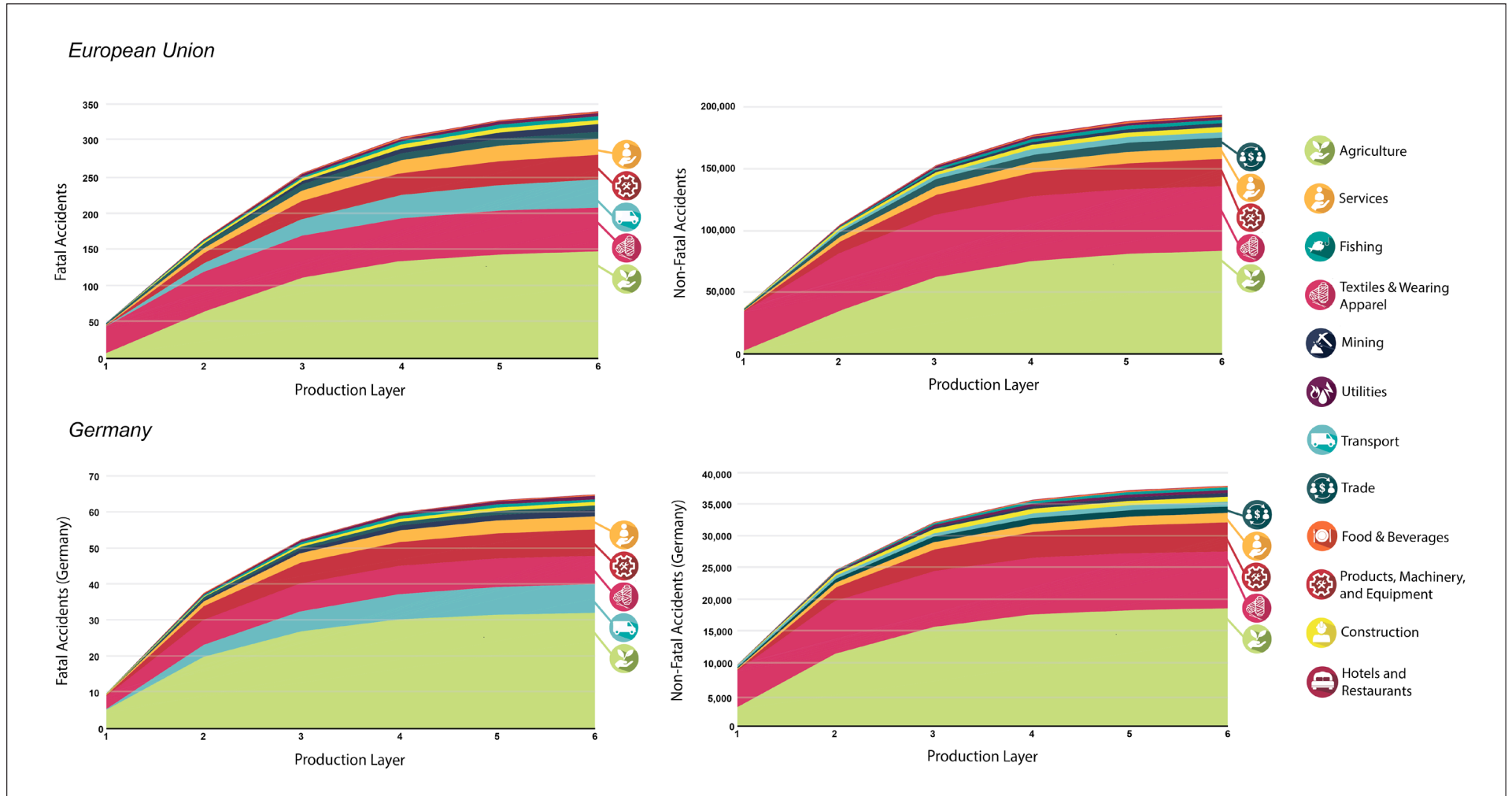


Fig. 9
 Production Layer Decomposition showing fatal- and non-fatal accidents caused in a range of primary, secondary and tertiary global sectors by European Union consumption (top-panels) and German consumption (bottom-panels) of textile-related products (Source: Authors' illustration).

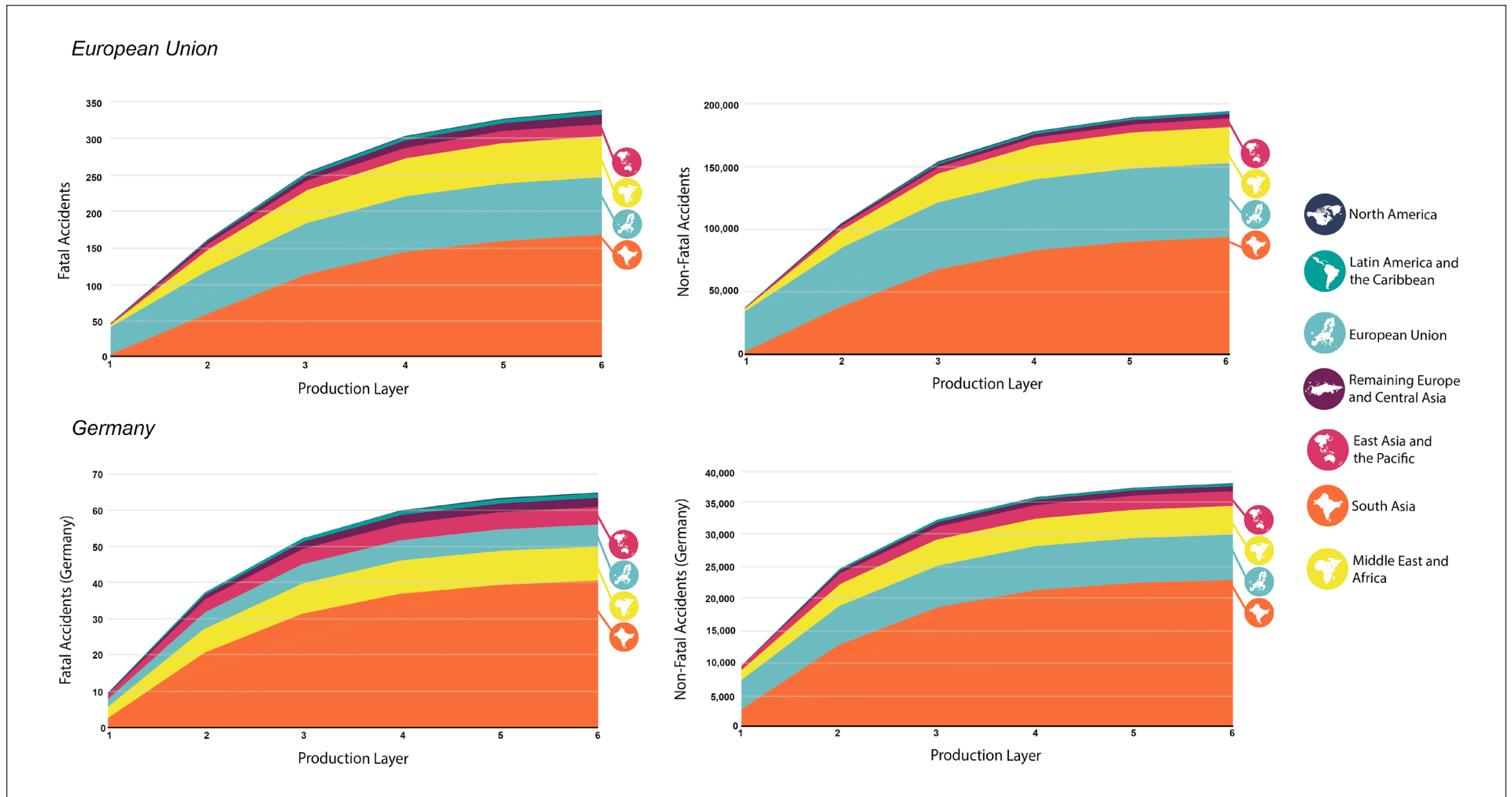


Fig. 10
 Production Layer Decomposition showing fatal- and non-fatal transboundary impacts caused by the EU consumption (top-panels) and German consumption (bottom-panels) of textile-related products. The impacts are categorised according to global regions that trade with the EU and specifically, Germany (Source: Authors' illustration).

4. Policy implications

The EU has played a key role in the adoption of the SDGs and has repeatedly committed to achieving them. The current President of the European Commission announced her intention to align the European Semester to the SDGs (von der Leyen 2020). The European Green Deal is the cornerstone for implementing the 2030 Agenda, the SDGs and the Paris Climate Agreement in the EU (European Union 2019b). This is also underlined in the 2020 Annual Sustainable Growth Strategy and Recovery and Resilient Facility which “*must guide and build a more sustainable, resilient and fairer Europe for the next generation in line with the United Nations Sustainable Development Goals*” (European Commission 2020c). The current President of the European Commission called for “*zero tolerance*” for child labour and for using trade to export European values across the world (von der Leyen 2020).

Achieving the SDGs and the Paris Climate Agreement in the EU requires addressing of the negative impacts generated through unsustainable supply chains. The SDGs being a global responsibility, the EU should ensure coherence between its domestic and international policies (SDSN and IEEP 2019). This is emphasized under SDG12: Responsible Consumption and Production which calls high income countries to take the lead in tackling international spillover effects (Schmidt-Traub et al, 2019). SDG8: Decent Work and Economic Growth promotes decent work for everyone, labour rights’ protection, safe working conditions and to eradicate forced labour and modern slavery. The SDGs are underpinned by the overall principle of Leave-No-One-Behind.

The textile supply chains generate significant and specific social and environmental impacts outside of the EU. The EU’s consumption of textiles generates jobs abroad but poor working conditions, including for women and children, leading to 375 fatal and 21,000 non-fatal accidents per year throughout the entire supply chain. The textile industry also emits large amounts of greenhouse gas emissions, pollution and generates a significant amount of waste. The textile supply chains (see Fig. A1) are fragmented and multi layered, lack transparency and are geographically dispersed (Fair & Sustainable Textiles 2020). The lack of vertical integration (outsourcing of multiple production steps) makes traceability and accountability for social, human rights and environmental governance requirements rather complex.

The Four Pillar Framework for Corporate Alignment to the SDGs, developed by the Fixing the Business of Food (FTBF) initiative (Sachs J. et al. 2020b) identifies four dimensions of business activity that impact society and the planet and provides a tool for businesses of all sectors to align with the SDGs and the Paris Climate Agreement. The Framework was adapted and applied for this study on the textile supply chains (Box 1). Originally developed for corporate reporting and actions, the framework might also be helpful to guide the actions of policymakers, investors, and civil society in addressing unsustainable textile supply chains.

Box 1. The Four-Pillar framework for Corporate Alignment to the SDGs and application to the textile sector

Pillar 1: Beneficial products and strategies. This pillar addresses the impact of companies' products, services, and strategies on human well-being and the planet's sustainability. *[For the textile sector, this pillar includes for example actions and efforts to protect humans and the environment from toxic chemicals in textiles and clothes].*

Pillar 2: Sustainable business operations and internal processes. This pillar considers the environmental and social impacts of business operations, including resource use (land, water, energy) and emissions, respect for human rights, diversity and inclusion, and decent work conditions that improve livelihoods of employees and their families. It also assesses whether companies encourage and reward conduct that strives to internalize externalities. *[For the textile sector, this includes for instance efforts to ensure environmental sustainability and occupational health and safety for workers, as well as the sustainable management of textile waste].*

Pillar 3: Sustainable supply and value chains. This pillar reflects the company's role in and responsibility for the broader ecosystem of which it is a part, including its interaction with its supply chain and value chain, producers, clients, consumers, and the industry in which it operates. This pillar focuses on whether the company supports realization of the SDGs through these interactions, and whether it collaborates to promote, incentivize, and ensure more sustainable practices and better livelihoods within its own value chain as well as within the relevant industries or sectors that its operations influence. *[For the textile sector, this includes for instance efforts to address environmental and social spillovers throughout the full supply chains, including suppliers and subsidiaries outside of the EU].*

Pillar 4: Good corporate citizenship. This pillar refers to how companies engage externally and how they seek to influence the rules that govern them. It assesses whether companies avoid strategies that would diminish social goods or societal well-being, and whether companies value and do not undermine the crafting and effective deployment of law and policy that advances sustainable development.

Source: Adapted from Sachs J. et al. 2020b.

The present study focuses mainly on pillars 2 (sustainable business operations and internal processes) and 3 (sustainable supply and value chains), but other initiatives, studies and regulations have looked at pillars 1 and 4 in more depth for the textile sector. For instance, related to pillar 1 (beneficial products), the European Commission adopted new restrictions in 2018 for the use of 33 substances known to cause cancer and reproductive health problems for their use in clothing, footwear and other textile articles (European Commission 2018). Concerning pillar 4 (corporate citizenship), as for other industries, corporate tax dodging and evasion in the clothing and textile industry (Oxfam 2016) should be addressed as they undermine the ability of governments to leverage resources that can be used to achieve the SDGs.

Inside the EU, the European Agency for Safety and Health at Work (EU-OSHA) is responsible for promoting decent work conditions. Article 153 of the Treaty on the Functioning of the European Union gives the EU the authority to adopt directives in the field of safety and health at work. Council Conclusions in December 2019 recognize that "workers in the European Union are to a large extent appropriately protected" although there are disparities across and within member states (European Union 2019a). The EU Strategic Framework on Health and Safety at Work 2014-2020 focuses on domestic actions and priorities for the EU.

We identify three key priorities for the EU to reduce the negative impacts generated by its consumption of textile especially on social and human rights issues. These priorities focus on EU's domestic actions and due diligence of businesses operating in the EU, on EU's foreign actions including development cooperation and bilateral partnerships and on strengthening the data ecosystem to track international spillovers at various levels (country, industry, business, product).

4.1 Towards a comprehensive EU textile strategy including mandatory requirements on human rights

In the Circular Economy Action Plan released in March 2020, the EU committed to launching an EU Strategy for Textiles (European Commission 2020f, p. 13). The EU needs a comprehensive strategic approach to textiles which covers the issues of recycling and waste and which also aims to align the textile supply chain with all the SDGs, including those related to safe working conditions and human rights. At the EU level, a coherent and ambitious commission-wide approach is still lacking to sustainable textile supply chains (Ashraf and van Seters 2019, p. 2). Overall, new policy tools and mechanisms should aim to cut out least sustainable textile products, drive the existing market towards greater sustainability and encourage the development of new, more sustainable products (D'Cunha 2015).

On the supply side, a due diligence law can support further integration of sustainable development, including social and human rights spillovers, into business practices. The 2019 EGD Communication calls to further embed sustainability into corporate governance (European Union 2019b). The United Nations' Guiding Principles on Business and Human Rights (UNGPs) define due diligence as a process that aims at operationalising corporate responsibility to respect human rights (Bonnitcha and McCorquodale 2017). The principles established in the UNGPs were reinforced in the OECD Due Diligence Guidance for Responsible Business Conduct which covers issues related to human rights and employment and industrial relations (OECD 2020). The OECD also has specific Guidance for Responsible Supply Chains in the Garment and Footwear Sector (OECD 2017). The World Business Council on Sustainable Development (WBCSD) released in 2019 a CEO guide to Human Rights (WBCSD 2019). It recognizes that *"the world has entered a game-changing period with regards to corporate respect for human rights"*. At the EU level, the Timber Regulation (EUTR) and EU Conflict Minerals Regulation include requirements for businesses to exercise due diligence in their supply chains.

The new EU due diligence law should include some mandatory requirements on businesses since these are more likely to have positive and significant impacts on business conduct. Mandatory requirements should push businesses to embed due diligence into policies and management systems, to develop and implement a due diligence plan and to regularly publish implementation reports. These requirements should be accompanied by sound monitoring and accountability mechanisms. As the leading regulatory zone in the world, EU standards for sustainable value chains promise to have positive impacts on other major import markets as well.

There are at least three reasons that push in favour of including mandatory requirements. First, voluntary requirements have largely failed so far to create a momentum for systematic monitoring and vigilance regarding social and environmental spillovers. According to a study published in 2020 covering a diverse range of businesses operating across the EU, just over one-third of businesses indicate that they undertake due diligence taking into account all human rights and environmental impacts (Smit et al. 2020). In addition, few of the businesses surveyed conduct due diligence for the downstream value chain (Smit et al. 2020).

Second, many businesses themselves (Smit et al. 2020, p. 17) as well as civil society organizations (WFTO Europe 2020) are asking for mandatory requirements. This can help generate a “*level playing field*” whereby businesses operating in and from the EU that undertake the effort to prevent and mitigate human rights’ violations are no longer penalized by those businesses which seek comparative advantage through the exploitation of workers. Yet, there is no agreement on the form of liability and enforcement mechanisms.

Third, there are good examples of legally binding legislative provisions on due diligence adopted recently at the EU level and across EU member states. The EU Non-Financial Reporting Directive, adopted in 2014, requires large public interest companies to report on non-financial matters, including its principal risks and due diligence processes. Recently, Human Rights Due Diligence laws including some mandatory requirements have been adopted in France, the Netherlands and the United Kingdom. The French Corporate Duty of Vigilance Law is a pioneering legislation which establishes a relationship between the parent company of a multinational corporation and its subsidiaries and subcontractors in the event of human or environmental rights violations. Germany is discussing since 2019 a supply chain law.

The EU’s new textile strategy and due diligence law need to be supported by robust monitoring and enforcement mechanisms in case of noncompliance. Recent studies have proposed several options regarding oversight and enforcement mechanisms, including through judicial and non-judicial remedies (Smit et al, 2020). Further investments are needed on data systems to track spillover effects at various levels (country, industry, business, product) for effective enforcement of the new strategy and regulations on textiles (see Section 4.3).

Recently, the Trade Commissioner Valdis Dombrovskis has indicated his support for a parliamentary initiative for mandatory implementation of human rights and environmental due diligence for companies and their supply chains. This would have implications for European brands whose supply chains use forced labour for production of goods, and the brands would be held responsible for abuses committed by their suppliers (European Parliament 2020).

The EU can also leverage policy tools and public management practices and procedures to act on the demand side, including for instance public procurement. Public authorities in the EU spend around 14% of GDP (around €2 trillion per year) on the purchase of services,

works and supplies (European Commission 2020e). It is estimated that around €8.6 billion is spent on public sector textile and workwear procurement (ECAP 2017). The EU sets out minimum harmonised public procurement rules across EU member states, including environmental and social criteria. Yet, the uptake of these rules varies across member states and there may be untapped potential when it comes to leveraging public procurement to strengthen human rights (Ashraf and van Seters 2019). Best practices across the EU and internationally should be identified and further training and guidance to procurement authorities may help change behaviour. A textiles specific procurement network of procurement authorities across the EU could help share experiences. One possibility could also be to extend the due diligence requirements, including on human rights, to public buyers in their public procurement activities (Martin-Ortega and Methven O'Brien 2019).

Government backed labels can also be leveraged to act specifically on consumers' behaviour. EU Textiles Regulation makes labelling of textile products mandatory, but the information is limited to fibre name and composition with washing instructions. Textile products can also carry the EU Ecolabel if they fulfil certain criteria. There is no obligation to include the country of origin. Results of an experiment on the purchase of socks produced under good working conditions, which were labelled accordingly, indicate that even people with "*modest means and education*" choose for "*conscious consumption*" (Kimeldorf et al. 2006). The textile supply chain being highly fragmented and globalized it might be difficult to define and pin down the social "*footprint*" of textiles and clothes product. Yet, the European Commission could explore various options to increase the information made available to consumers when purchasing clothes and textiles. The mandatory Energy Labelling Directive and its success so far could be used for inspiration. As for any labels the trade-off between its potential benefits and the resources required to monitor and enforce the policy need to be carefully assessed.

4.2 International cooperation and bilateral partnerships

Through international diplomacy and cooperation, the EU can support political leadership in partner countries for strengthening labour rights, civic space and decent salaries and working conditions. The European Consensus on Development signed in May 2017, reinforces the commitment of the EU and EU members to support responsible business conduct and responsible management of supply chains that respect international human rights standards. The EU also adopted in 2017 a cooperation package for sustainable garment value chains. Various instruments are leveraged through development cooperation at bilateral, regional, and global level including the European Development Fund (EDF) and the Development Cooperation Instrument (DCI). Yet, the lack of mechanisms to follow through on warnings released by the EU to trade partners, for instance as part of the Sustainability Compact with Bangladesh (Clean Clothes Campaign 2020), combined with the lack of good data and traceability leave space for strengthening the EU's international leadership on the issue of international spillovers.

The year 2021 will provide many opportunities for the EU to increase political leadership on international spillovers generated through trade, including social and environmental spillovers. These include for instance the Fifteenth session of the United Nations Conference

on Trade and Development (UNCTAD 15), the United Nations Climate Change Conference (COP26) or the UN Biodiversity Conference (CBD COP 15). In addition, the EU should play a leading role in streamlining these issues in other regular events and conferences including the High-Level-Political-Forum, G20 meetings and the United Nations General Assembly week.

In addition, as the world's largest market, the EU plays a critical role in the multilateral trade system and through bilateral trade agreements. Market power of the EU can be leveraged to encourage more sustainable production processes (Ashraf and van Seters, 2019, p. 2). The European Commission launched in July 2020 a major review of its trade policy seeking inputs from the European Parliament, member states, stakeholders and civil society. The EU's trade agreements need to address spillovers more explicitly. In particular, model-based assessments can help identify and quantify spillovers that might be generated through increased trade, so that these can be mitigated in each trade agreement. Hence, to promote policy coherence vis-à-vis the SDGs, the European Commission needs to subject trade agreements to an "SDG test" to ensure they do not generate negative spillovers that might undermine progress towards the goals (SDSN & IEEP, 2019).

As part of a strategy to tackle such international spillovers, the EU and its member states must work with partner countries to mobilise predictable long-term financing for strengthening social protection systems, safe working environments and civic space and help develop monitoring and accountability frameworks. More than 500 billion dollars a year is needed to ensure basic levels of social protection worldwide (ILO 2019). The EU should also support international efforts to safeguards other "public goods" including the global commons but also investment to protect the Amazon or rainforests in Africa and South-East Asia.

To ensure international legitimacy, the EU's diplomacy and sustainable development cooperation must be coherent with its internal ambitions. This will require addressing negative international spillovers, including those related to workers' rights and conditions. The combination of strong EU diplomacy coupled with finding solutions for the long-term financing of social protection systems and global public goods will ensure legitimacy and avoid the trap of being perceived as "protectionist".

4.3. Beef up monitoring instruments and data and increase transparency

More data-driven conversations are needed to reform the governance of global supply chains and to address their negative social and human rights' impacts. Creating data systems that are fit for purpose should be an important priority of the EU at the national level, industry level and business level. To ensure up-take by the business and policy communities, the data should be made freely accessible and presented in a format that is easy-to-digest.

National level data on cross-border spillover effects tends to be sparse and incomplete. The increasing length and complexity of supply chains complicates efforts to assess trade-related spillovers. National and international databases are often inconsistent, and national statistical offices tend not to be mandated to measure or report on international spillovers. There is also limited integration of spillover data into SDG monitoring

frameworks. The official SDG monitoring report in the EU, produced annually by Eurostat, covers only partially the issue of spillovers (Eurostat 2020). This explains to some extent differences in results obtained with other SDG monitoring instruments, including SDSN's SDG Index and Dashboards (Lafortune et al. 2020).

Further investments are needed to improve the quality of data on international spillovers, including social spillovers. These should aim to address three major challenges. First, significant time lags in results based on MRIO analyses. MRIO databases are compiled by bringing together data on national input-output tables that are not produced on a yearly basis by many countries due to a lack of resources. This significantly impedes timely assessments of environmental and social issues. Second, the lack of available time-series data to track progress over time on social and environmental spillovers. For example, international data on child labour are scarce, are often not provided at a sector-level, and thus a comprehensive study of child labour embodied in global supply chain is still missing (Gómez-Paredes et al. 2016). Third, expand MRIO analyses to a broader range of social impacts. This study focused on fatal and non-fatal work-related accidents. Future studies should focus on analysing other forms of social impacts (such as forced labour, modern slavery) in supply chains. This would require details on cases of modern slavery by sector and country for integrating with a MRIO database. Efforts aimed at making improvements in data quality and availability might require further investments into statistical work of the European Commission, including work conducted by Eurostat and the Joint-Research Centre.

In the context of fatal and non-fatal accidents, the data produced by the ILO have reasonable temporal resolution (see Table A3 for a snapshot) for high-income countries, however data at a temporal- and sector-level are scarce particularly for low- and middle-income countries. For example, ILO data only provide 'Total' estimates of accidents at work for certain countries where incidentally most such cases happen, rather than estimates at a sector level for integration with a MRIO database. Further efforts aimed at enhancing the sector resolution of data provided by ILO and other statistical organisations would greatly improve the results of MRIO assessments. Data for Bangladesh, for example, are not available for year 2000 onward, and the existing ILO data only cover the aggregated category 'Manufacturing' and 'Transport, Storage and Communication' (ILO 2020b). Similarly, for India, data on fatal accidents are only available for the 'Mining and quarrying' category and 'Total' estimates for the whole economy. The rapid growth in Life Cycle Assessment (LCA) approaches offers tremendous potential for quantifying and providing high-resolution data on international supply chains and their spillover effects. Beyond national aggregates, more efforts are needed to assess in a comprehensive way the social and environmental impacts of specific industries and products. These would include comprehensive assessments of the contribution to the SDGs of specific industries (textile, electronics, food) and products (cocoa, coffee, palm oil), as illustrated in a policy brief by the Stockholm Environment Institute (Hoff et al. 2019) on soybeans. There are comparability challenges that need to be addressed but recent improvements in international databases and case studies can help strengthen the robustness of industry and product specific spillover analyses.

Finally, businesses should systematically include spillover information related to their supply chains in annual sustainability and SDG reporting. Ideally, businesses would identify relevant indicators as well as time-bound targets for each of them. Spillover data and information also needs to be considered more systematically in standards and ratings for corporate social responsibility, as developed by the Global Reporting Initiative, the Science-Based Targets Networks, the World Benchmarking Alliance, and others. The four-pillar framework presented above can help align corporate reporting with the SDGs.

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ANNEX

Table A1:

List of indicators used in the Sustainable Development Report 2020 to compile the international spillover index (Source: Sachs J. et al. 2020a)

Environmental and social impacts embodied into trade	Economy, finance and governance	Security
Fatal work-related accidents embodied in imports (per 100,000 population)	Corporate Tax Haven Score (best 0-100 worst)	Exports of major conventional weapons (TIV constant million USD per 100,000 population)
Scarce water consumption embodied in imports (m ³ /capita)	Financial Secrecy Score (best 0-100 worst)	
SO ₂ emissions embodied in imports (kg/capita)	Shifted profits of multinationals (US\$ billion)	
Nitrogen emissions embodied in imports (kg/capita)	International concessional public finance, including official development assistance (% of GNI)	
CO ₂ emissions embodied in imports (tCO ₂ /capita)		
Marine biodiversity threats embodied in imports (per million population)		
Terrestrial and freshwater biodiversity threats embodied in imports (per million population)		

Table A2:

EU regions and sectors included in this study

EU Country	Sector
Austria	Textiles
Austria	Wearing apparel; furs
Austria	Leather and leather products
Belgium	Textiles
Belgium	Wearing apparel; furs
Belgium	Leather and leather products
Bulgaria	Textiles and Wearing Apparel

Croatia	Textiles and Wearing Apparel
Cyprus	Textiles and Wearing Apparel
Czech Republic	Textiles
Czech Republic	Wearing apparel; furs
Czech Republic	Leather and leather products
Denmark	Mfr. of textiles and textile products
Denmark	Mfr. of wearing apparel; dressing etc. of fur
Denmark	Re. sale of clothing, footwear etc.
Estonia	Textiles
Estonia	Wearing apparel; furs
Estonia	Leather and leather products
Finland	Textiles
Finland	Wearing apparel; furs
Finland	Leather and leather products
France	Textiles
France	Wearing apparel; furs
France	Leather and leather products
Germany	Textiles
Germany	Clothing
Germany	Footwear and leather
Greece	Textiles
Greece	Wearing apparel; furs
Greece	Leather and leather products
Hungary	Textiles
Hungary	Wearing apparel; furs
Hungary	Leather and leather products
Ireland	Textiles
Ireland	Wearing apparel; furs
Ireland	Leather and leather products
Italy	Textiles
Italy	Wearing apparel; furs
Italy	Leather and leather products
Latvia	Textiles
Latvia	Wearing apparel; furs
Latvia	Leather and leather products
Lithuania	Textiles
Lithuania	Wearing apparel; furs
Lithuania	Leather and leather products
Luxembourg	Textiles and Wearing Apparel
Malta	Textiles
Malta	Wearing apparel; furs
Malta	Leather and leather products
Netherlands	Textiles
Netherlands	Wearing apparel; furs
Netherlands	Leather and leather products

Poland	Textiles
Poland	Wearing apparel; furs
Poland	Leather and leather products
Portugal	Textiles
Portugal	Wearing apparel; furs
Portugal	Leather and leather products
Romania	Textiles
Romania	Wearing apparel; furs
Romania	Leather and leather products
Slovakia	Textiles
Slovakia	Wearing apparel; furs
Slovakia	Leather and leather products
Slovenia	Textiles
Slovenia	Wearing apparel; furs
Slovenia	Leather and leather products
Spain	Textile products
Spain	Clothing garments; leather garments
Spain	Tanned and dressed leather
Spain	Leather articles and footwear
Sweden	Textiles
Sweden	Wearing apparel; furs
Sweden	Leather and leather products

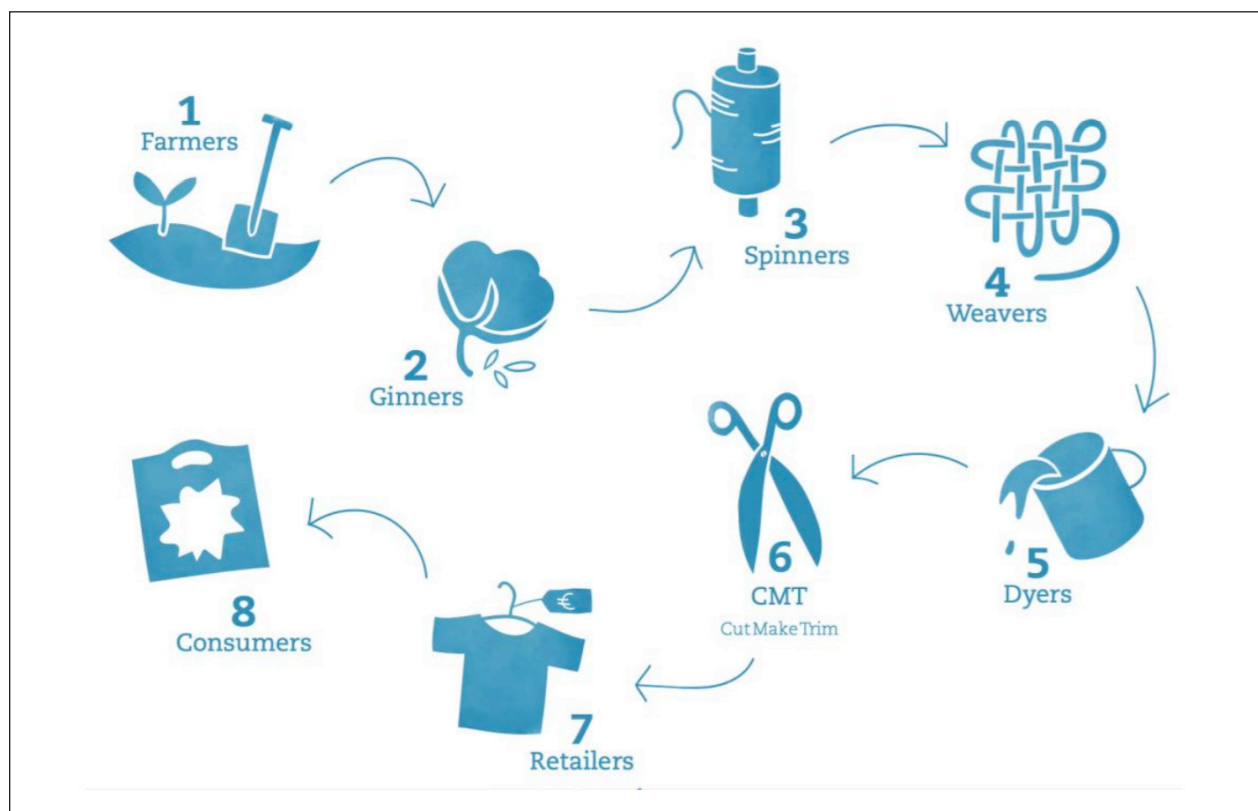


Fig. A1

Value chain for textiles. Source: Fair Trade Advocacy office, 2016

Table A3:**An overview of data resolution of fatal and non-fatal cases.****Source: International Labour Organisation**

The ILO produces data at a range of classifications – ECO_AGGREGATE, ECO_ISIC3 and ECO_ISIC4. The categorisation is presented below. In the tables that follow, we present an overview of data resolution for the various countries covered by the ILO database. The categorisation presents an overview of the temporal resolution of the data. N refers to No Data. A mention of year (e.g. 2000 for category ECO_ISIC3 indicates that data are available for one or more categories of the ECO_ISIC3 categorisation for year 2000).

ECO_AGGREGATE	ECO_ISIC3	ECO_ISIC4
Agriculture	Agriculture, hunting and forestry	Agriculture; forestry and fishing
Construction	Fishing	Mining and quarrying
Manufacturing	Mining and quarrying	Manufacturing
Mining and quarrying; Electricity, gas and water supply	Manufacturing	Electricity; gas, steam and air conditioning supply
Trade, Transportation, Accommodation and Food, and Business and Administrative Services	Electricity, gas and water supply	Water supply; sewerage, waste management and remediation activities
Public Administration, Community, Social and other Services and Activities	Construction	Construction
Total	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	Wholesale and retail trade; repair of motor vehicles and motorcycles
Not classified	Hotels and restaurants	Transportation and storage
	Transport, storage and communications	Accommodation and food service activities
	Financial intermediation	Information and communication
	Real estate, renting and business activities	Financial and insurance activities
	Public administration and defence; compulsory social security	Real estate activities
	Education	Professional, scientific and technical activities
	Health and social work	Administrative and support service activities
	Other community, social and personal service activities	Public administration and defence; compulsory social security
	Activities of private households as employers and undifferentiated production activities of private households	Education

Extraterritorial organizations and bodies	Human health and social work activities
Total	Arts, entertainment and recreation
Not elsewhere classified	Other service activities
	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
	Total
	Activities of extraterritorial organizations and bodies
	Not elsewhere classified

Fatal cases 1990-2019

UN Name	ECO_AGGREGATE	ECO_ISIC2	ECO-ISIC3
Andorra	N	N	N
Netherlands Antilles	N	N	1994;1995;1996;1997;1998;1999;
Argentina	2011;2012;2014;2015;2016;2017;2018	1997;1998;1999;2000;2002;2003;2004;2005;2006;2007;	N
Armenia	N	N	1990;1992;1993;1994;1995;1996;1997;1998;1999;2000;2001;2002;2003;2004;2005;2006;2007;2008;
Antigua and Barbuda	N	1992;1993;1994;1995;1996;1997;1998;2000;	N
Australia	N	N	1992;1993;1994;1995;1996;1997;1998;1999;2000;2001;2002;2003;2004;2005;2006;2007;2008;2009;2010;2011;2012;2013;2014;2015;2017;
Austria	N	1990;1991;1992;1993;1994;	1995;1996;1997;
Azerbaijan	N	1990;	1991;1992;1993;1994;1995;1996;1997;1998;1999;2000;2001;2002;2003;2004;2005;2006;2007;2008;
Belgium	N	1990;1991;	1993;1994;1995;1996;1997;1998;1999;2000;2001;2004;
Benin	N	N	1990;1991;1992;1993;1994;1995;1996;2003;2004;

Burkina Faso	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;	N
Bangladesh	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;	N
Bulgaria	N	1990;1991;1992;1993; 1994;1995;	1996;1997;1998;1999; 2000;2001;2002;2003; 2004;2005;2006;2007;
Bahrain	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;	2008;
Bosnia and Herzegovina	N	1990;1991;	N
Belarus	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;	1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;2009;2010; 2011;2012;2013;2014; 2015;
Belize	N	1990;1991;1992;1993; 1994;1995;1996;	N
Bermuda	N	1995;	1990;1991;1992;1993; 1994;1996;1997;
Bolivia	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;	N
Brazil	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;	2000;
Barbados	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;	1999;2001;2002;2013; 2014;
Botswana	N	1990;	1993;1994;1995;1996; 1997;1998;1999;2000; 2005;2006;2007;2008; 2010;2011;
Central African Republic	N	1990;1993;1994;	2005;2006;2007;2008;
Switzerland	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Chile	N	N	1997;1998;1999;2000; 2001;2002;2003;2004; 2011;2012;2013;2017; 2018;
China	N	1993;1994;1995;1996; 1997;1998;1999;2000; 2001;2002;	N

Colombia	N	1990;1991;1992;1993; 1994;	1995;
Costa Rica	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;	N
Cuba	N	N	1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;
Cyprus	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001;	2002;2003;2004;2005; 2006;2007;
Czech Republic	N	1991;1992;1993;	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Germany	N	1991;1992;1993;	1990;1994;1995;1996; 1997;1998;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;2008;
Dominica	N	1991;1992;1994;1995; 1996;	N
Denmark	N	1990;	1991;1992;1993;1994; 1995;1996;1997;1998; 1999;2000;2001;
Dominican Republic	N	1998;	2008;
Algeria	N	N	1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;
Ecuador	N	1990;1991;1992;1993; 1994;	N
Egypt	N	1990;1991;1992;1993; 1994;1995;1996;	1997;1998;1999;2000; 2001;2002;2003;
Eritrea	N	1994;1995;1996;	N
Spain	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;
Estonia	N	1990;1991;1992;1993; 1994;	1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;
Finland	N	1990;1991;1992;	1993;1994;1995;1996; 1997;1998;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;
Fiji	N	1990;1991;1992;1993;	N

France	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;
Gabon	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001;	N
United Kingdom of Great Britain and Northern Ireland	N	1990;	1991;1992;1993;1994; 1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006;
Georgia	N	N	N
Guinea	N	N	1990;1991;1992;1993; 1994;1995;1996;
Guinea-Bissau	N	1990;1991;	N
Greece	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;
Greenland	N	1990;1991;1992;	1993;1994;1995;1996; 1997;1998;1999;2000; 2001;
Guatemala	N	1990;1991;1992;	N
Guyana	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1999;2000;
Hong Kong Special Administrative Region of China	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;	N
Honduras	N	1990;1991;1992;1998; 1999;2000;	N
Croatia	N	1990;1991;1992;1993;	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Hungary	N	1990;1991;1992;1993;	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;
Indonesia	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;
India	N	1990;	1991;1992;1993;1994; 1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;

Ireland	N	1990;1991;1992;1993;	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Iceland	N	N	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;
Israel	N	1992;1993;1994;1995; 1996;1998;1999;	2000;2001;2002;2003; 2004;2005;2006;2007; 2008;2009;2010;2011;
Italy	N	1990;	1991;1992;1993;1994; 1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;
Jamaica	N	1990;1993;1994;1995; 1996;1997;	N
Jordan	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2001;2002; 2003;2004;2005;2006;
Japan	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Kazakhstan	N	1990;1991;1992;1993; 1994;1995;1996;	1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Kyrgyzstan	N	1990;1991;1992;1993; 1994;1995;1996;	1997;1998;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;2008;
Republic of Korea	N	1990;1991;1992;1993;	1999;2000;2001;2002; 2003;2004;2005;2006;
Sri Lanka	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Lithuania	N	1990;1991;	1992;1993;1994;1995; 1996;1997;1998;1999; 2000;2001;2002;2003; 2004;2005;2006;2007;
Luxembourg	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2008;
Latvia	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;

Macao Special Administrative Region of China	N	1990;1991;1992;1993; 1994;1995;1996;1997;	1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;2009; 2010;2011;2012;2013; 2014;2015;2016;
Morocco	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;
Republic of Moldova	N	1990;1991;1992;1993; 1995;1996;	1997;1998;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;2008; 2009;2010;2013;2014; 2015;
Mexico	N	1990;1991;1992;1993;	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Malta	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;	2001;2002;2003;2004; 2005;2006;2007;2008;
Myanmar	N	N	1990;1991;1992;1993; 1994;1995;1996;1999; 2000;2001;2002;2003; 2004;2005;2007;2008;
Mongolia	N	N	N
Mauritius	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;	1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;2018;
Malaysia	N	1990;1991;1992;1993; 1994;1995;	1996;1997;1998;1999; 2000;2001;2002;2011; 2012;2013;2015;2017;
Namibia	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001;
New Caledonia	N	N	N
Niger	N	1990;1991;1992;1993; 1994;	N
Nigeria	N	N	2004;2006;
Nicaragua	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;	1999;2000;2001;2002; 2003;
Netherlands	N	N	1997;1998;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;2008;
Norway	N	1990;1991;1992;1993; 1994;1995;1996;1997;	1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
New Zealand	N	1990;1991;1992;	1993;1994;1995;1996; 1997;1998;1999;

Pakistan	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;
Panama	N	1990;1991;1992;1993; 1994;1995;	1996;1997;1998;1999; 2000;2001;2002;2003; 2004;2005;2006;
Peru	N	1990;	2013;2014;2015;2016; 2017;2018;
Philippines	N	1996;	1990;1991;1992;1993; 1994;1995;2000;2002; 2003;2007;2009;
Papua New Guinea	N	N	2001;2002;2003;
Poland	N	1990;	1991;1992;1993;1994; 1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;
Puerto Rico	N	1990;1991;1993;	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2015;
Portugal	N	1990;1991;1992;1993; 1994;1995;	1996;1997;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;
Occupied Palestinian Territory	N	N	N
Romania	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;
Russian Federation	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;2009; 2010;2011;2012;2013; 2014;2015;2016;2017; 2018;
Rwanda	N	1990;1995;1996;1997; 1998;1999;2000;	N
Senegal	N	1991;1993;	N
Singapore	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;	1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;
El Salvador	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;	N
San Marino	N	1990;1991;1992;1993;	1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;

Suriname	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;	N
Slovakia	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Slovenia	N	1990;1991;1992;1993; 1994;1995;1996;	1997;1998;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;
Sweden	N	1990;1991;1992;	1993;1994;1995;1996; 1997;1998;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;
Swaziland	N	1990;1991;1992;1993; 1994;1995;1996;	N
Seychelles	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;	2015;
Syrian Arab Republic	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005;	N
Chad	N	1990;	N
Togo	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;	N
Thailand	N	1990;1991;1992;1993; 1994;	1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;
Tajikistan	N	N	1993;1994;1995;1996;
Trinidad and Tobago	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;	N
Tunisia	N	1990;1991;	1992;1993;1994;1995; 1996;1997;1998;1999; 2000;2001;2002;2003; 2004;
Turkey	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;	N
Taiwan	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005;	N

Ukraine	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;2009; 2010;2011;2012;
Uruguay	N	N	N
United States of America	2003;2004;2005;2006;2007;2008;2009;2010;2011;2012;2013;2014;2015;2016;2017;2018;	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;	N
Uzbekistan	N	N	N
Saint Vincent and the Grenadines	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;
Venezuela (Bolivarian Republic of)	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;	N
South Africa	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;
Zimbabwe	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2005;2006;2007;

Non-fatal cases 1990-2019

UN Name	ECO_AGGREGATE	ECO_ISIC2	ECO-ISIC3
Andorra	N	N	N
Netherlands Antilles	N	N	1994;1995;1996;1997; 1998;1999;
Argentina	2011;2012;2014;2015; 2016;2017;2018;	1997;1998;1999;2000; 2002;2003;2004;2005; 2006;2007;	N
Armenia	N	N	1990;1992;1993;1994; 1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;
Australia	N	N	1992;1993;1994;1995; 1996;1997;1998;1999; 2000;2001;2002;2003; 2004;2005;2006;2007; 2008;2009;2010;2011; 2012;2013;2014;2015; 2016;2017
Austria	N	N	N
Azerbaijan	N	1990;	1991;1992;1993;1994; 1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;

Belgium	N	1990;1991;	1993;1994;1995;1996; 1997;1998;1999;2000; 2001;2004;
Benin	N	1990;1991;	2003;2004;
Burkina Faso	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;	N
Bangladesh	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;	N
Bulgaria	N	1990;1991;1992;1993; 1994;1995;	1996;1997;1998;1999; 2000;2001;2002;2003; 2004;2005;2006;2007;
Bahrain	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;	2008;
Bosnia and Herzegovina	N	1990;1991;	N
Belarus	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;	1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;
Belize	N	1990;1991;1992;1993; 1994;1995;1996;	N
Bermuda	N	N	1990;1991;1992;1993; 1994;1996;1997;
Bolivia	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;	N
Brazil	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;	2000;
Barbados	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;2013;2014;	1999;2001;2002;
Botswana	N	1990;1993;1994;1995; 1996;1997;1998;1999; 2000;	2005;2006;2007;2008;
Central African Republic	N	1990;1993;1994;	2005;2006;2007;2008;
Switzerland	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Chile	2011;2012;2013;	N	1997;1998;1999;2000; 2001;2002;2003;2004; 2017;2018;
China	N	1993;1994;1995;1996; 1997;1998;1999;2000; 2001;2002;	N
Colombia	N	N	1995;
Costa Rica	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;	2015;
Cuba	N	N	1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;

Cyprus	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001;	2002;2003;2004;2005; 2006;2007;
Czech Republic	N	1991;1992;1993;	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Germany	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Dominica	N	1991;1992;1994;1995; 1996;	N
Denmark	N	1990;	1991;1992;1993;1994; 1995;1996;1997;1998; 1999;2000;2001;
Dominican Republic	N	1998;	2008;
Algeria	N	N	1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;
Ecuador	N	1990;1991;1992;1993; 1994;	N
Egypt	N	1990;1991;1992;1993; 1994;1995;1996;	1997;1998;1999;2000; 2001;2002;2003;
Eritrea	N	1994;1995;1996;	N
Spain	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;
Estonia	N	1990;1991;1992;1993; 1994;	1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;
Finland	N	1990;1991;1992;	1993;1994;1995;1996; 1997;1998;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;
France	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;
Gabon	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001;	N
United Kingdom of Great Britain and Northern Ireland	N	1990;	1991;1992;1993;1994; 1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006;
Georgia	N	N	N
Guinea	N	N	1990;1991;1992;1993; 1994;1995;1996;
Guinea-Bissau	N	1990;1991;	N
Greece	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;

Greenland	N	1990;1991;1992;	1993;1994;1995;1996; 1997;1998;1999;2000; 2001;
Guatemala	N	1991;1992;1993;1994; 1995;1996;1997;1998; 1999;	N
Guyana	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1999;2000;
Hong Kong Special Administrative Region of China	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;	N
Honduras	N	1990;1991;1992;1998; 1999;2000;	N
Croatia	N	1990;1991;1992;1993;	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Hungary	N	1990;1991;1992;1993;	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;
Indonesia	N	N	1990;1991;1992;1993; 1994;1995;1996;1997;
India	N	1990;	1991;1992;1993;1994; 1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;
Ireland	N	1990;1991;1992;1993;	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;
Iceland	N	N	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;
Israel	N	1991;1992;1993;1994; 1995;1996;1998;1999;	2000;2001;2002;2003; 2004;2005;2006;2007; 2008;2009;2010;2011;
Italy	N	1990;	1991;1992;1993;1994; 1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;
Jamaica	N	1990;1993;1994;1995; 1996;1997;	N
Jordan	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2001;2002; 2003;2004;2005;2006;
Japan	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Kazakhstan	N	1990;1991;1992;1993; 1994;1995;1996;	1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;

Kyrgyzstan	N	1990;1991;1992;1993; 1994;1995;1996;	1997;1998;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;2008;
Republic of Korea	N	1990;1991;1992;1993;	N
Sri Lanka	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Lithuania	N	1990;1991;	1992;1993;1994;1995; 1996;1997;1998;1999; 2000;2001;2002;2003; 2004;2005;2006;2007;
Luxembourg	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2008;
Latvia	N	N	N
Macao Special Administrative Region of China	N	1990;1991;1992;1993; 1994;1995;1996;1997;	1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;2009; 2010;2011;2012;2013; 2014;2015;2016;
Morocco	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;
Republic of Moldova	N	N	N
Mexico	2013;	1990;1991;1992;1993;	1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Malta	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;	2001;2002;2003;2004; 2005;2006;2007;2008;
Myanmar	N	N	1990;1991;1992;1993; 1994;1995;1996;1999; 2000;2001;2002;2003; 2004;2005;2007;
Mongolia	N	N	N
Mauritius	N	N	1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;2018;
Malaysia	N	1990;1991;1992;1993; 1994;1995;	1996;1997;1998;1999; 2000;2001;2002;2011; 2012;2013;2015;2017;
Namibia	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001;
New Caledonia	N	N	N
Niger	N	1990;1991;1992;1993; 1994;	N
Nigeria	N	N	2004;
Nicaragua	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;	1999;2000;2001;2002; 2003;
Netherlands	N	N	N
Norway	N	1990;1991;1992;1993; 1994;1995;1996;1997;	1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
New Zealand	N	1990;1991;1992;	1993;1994;1995;1996; 1997;1998;1999;

Pakistan	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;
Panama	N	N	N
Peru	N	1990;	2011;2012;2013;2014; 2015;2016;2017;2018;
Philippines	N	N	N
Papua New Guinea	N	N	2001;2002;2003;
Poland	N	N	N
Puerto Rico	N	1990;1991;	N
Portugal	N	1990;1991;1992;1993; 1994;1995;	1996;1997;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;
Occupied Palestinian Territory	N	N	N
Qatar	N	N	N
Romania	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;
Russian Federation	N	N	2007;2008;2009;2010; 2011;2012;2013;2014; 2015;2016;
Rwanda	N	1990;1995;1996;1997; 1998;1999;2000;	N
Senegal	N	1991;1993;	N
Singapore	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;	1999;2000;2001;2002; 2003;2004;2005;2006; 2007;2008;
El Salvador	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;	N
San Marino	N	1990;1991;1992;1993;	1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;
Suriname	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;	N
Slovakia	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Slovenia	N	1990;1991;1992;1993; 1994;1995;1996;	1997;1998;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;
Sweden	N	1990;1991;1992;	1993;1994;1995;1996; 1997;1998;1999;2000; 2001;2002;2003;2004; 2005;2006;2007;
Swaziland	N	1990;1991;1992;1993; 1994;1995;1996;	N
Seychelles	2011;2012;	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;	2015;

Syrian Arab Republic	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005;	N
Chad	N	1990;	N
Togo	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;	N
Thailand	N	1990;1991;1992;1993; 1994;	1995;1996;1997;1998; 1999;2000;2001;2002; 2003;2004;2005;2006; 2007;
Tajikistan	N	N	1993;1994;1995;1996;
Trinidad and Tobago	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;	N
Tunisia	N	1990;1991;	1992;1993;1994;1995; 1996;1997;1998;1999; 2000;2001;2002;2003; 2004;
Turkey	N	1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;	N
Taiwan	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005;	N
Ukraine	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;2008;
Uruguay	N	N	N
United States of America	2003;2004;2005;2006; 2007;2008;2009;2010; 2011;2012;2013;2014; 2015;2016;2017;2018;	N	N
Uzbekistan	N	N	N
Saint Vincent and the Grenadines	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;
Venezuela (Bolivarian Republic of)	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;	N
South Africa	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;
Zimbabwe	N	N	1990;1991;1992;1993; 1994;1995;1996;1997; 1998;1999;2000;2001; 2002;2003;2004;2005; 2006;2007;