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Emerging Risks Initiative

Major Trends and Emerging Risk Radar

2022 Update

Executive Summary

We are pleased to present the 2022 update of our Emerging Risk Radar.

Emerging Risks are risks which may newly develop or which already exist and are continuously evolving. They are characterized by a high degree of uncertainty in terms of impacts and likelihood and have a substantial potential impact on Insurance business lines, investment classes and/or operations.

The Radar is a summary of emerging risks and associated major trends that could affect the insurance sector over the next five years and beyond. Risks are classified low, medium or high according to their perceived materiality. Both the list of risks and the assessment of impact and timing are based on the expert opinion of the Emerging Risk Initiative (ERI) working group of the CRO Forum.

The main trends have been assessed and updated as part of working group sessions. The “Consumer Behavior Digitization” is merged to “Demographic and Social Change”. The “Urbanization and Social Change” is merged into the “Technological Developments & Impacts on Society”

Some new risks have been also added to the radar beside the thorough review of description of all risks in the radar:

- Climate Engineering (incl. Carbon Capture Storage): Climate engineering, also known as “geo-engineering” is the international large-scale intervention in the Earth’s climate system to counter climate change. Currently, those techniques can be divided into two categories: 1) Carbon dioxide removal techniques (CDR) and 2) Solar geoengineering or “solar radiation management” (SRM)
- Space Risk in Lower Earth Orbit: Lower Earth Orbit (LEO) is a critical space resource on which many aspects of our current way of life depends. Global communications systems - including satellite broadband coverage, Earth observation systems including satellite imagery and weather forecasting, and global positioning systems all rely on satellite infrastructure in LEO.

We hope you find the report useful and welcome your comments and feedback.

Emerging Risk Radar 2022

Trends

- Ageing and Health Concerns
- Economic Instability
- Environment and Climate
- Environmental, Social, Governance (ESG) Issues
- Shifting Geopolitical Landscape
- Technological Developments & Impacts on Society
- Demographic and Social Change

Key

Impact Assessment:

Bullet colour corresponds to potential impact of risk

- Risk category: High
- Risk category: Medium
- Risk category: Small

Time Horizon:

- Significant impacts already seen on the insurance sector
- First significant potential impacts on the insurance sector expected within 1-5 years
- First significant potential impacts on the insurance sector expected within 5-10 years

* New risk in 2022

Major Trend Descriptions

Ageing and Health Concerns

Although Covid has resulted in a spike in mortality, wider medical advances in diagnostics and treatments continue, with developed countries seeing populations increasingly exposed to age related risks such as neurodegenerative diseases and chronic conditions associated with aging. There are, however, a number of factors that may off set the improvements in life span achieved through medical advances. In particular, lifestyle patterns (including sedentary habits, unhealthy diets, sleep disorders, and substance abuse), are contributing to the rise in chronic diseases in younger populations. Physical health is also closely linked to mental health. Small particles and hazardous chemicals, such as endocrine disruptors and microplastic, may also pose risks that are not yet fully revealed for instance, and climate related factors such as the increasingly prevalence of heatwaves poses a threat to elderly populations. It remains unclear whether medical advances will counter-balance the impacts on morbidity and mortality of these developments.

Economic Instability

Post the financial crisis, lower income groups are still to see a return to income growth with stagnant standards of living persisting for many. This rising inequality compounds instability in economic systems, and politically these factors fuel the rise in populism and a reaction against multinational institutions, leading to nationalism and fragmented regulation. Long-term low yields and the stimulus tool of massive quantitative easing may also stoke inflation risks and create asset bubbles.

Environment and Climate

Environmental issues are firmly in the spotlight, dominated by climate change, resource scarcity, biodiversity loss and pollution of the biosphere. There is growing concern about the consequences of unchecked emissions of greenhouse gases driving climate change, with the more frequent occurrence of extreme weather events. The pressure placed on the planet from a growing human population is causing resource scarcity, driven by unsustainable practices in mineral extraction, food and energy production. Anthropogenic activities are also polluting the land, rivers and sea with non-biodegradable waste such as plastics, and the air with particulate and gaseous pollutants. All forms of pollution are becoming ubiquitous, with harmful consequences for life on Earth including decline in biodiversity, with the potential to disrupt entire ecosystems.

Environmental, Social, Governance (ESG) Issues

As well as responding to environmental challenges, the ESG agenda requires consideration of human rights violations, bribery, corruption, social divides and unethical corporate behaviour. How organisations respond to these factors is coming under increasing scrutiny from stakeholders such as investors, regulators and consumers, with the expectation that companies both manage the risks they are directly exposed to, as well as contributing to broader sustainable economic and social development goals. There is also an expectation that organisations engage wider societal groups in their stakeholder management. A failure to adequately respond can adversely impact brand and reputation. This trend includes all risks associated with ESG influences and threats from outside or inside a company, regardless of general environmental and climate aspects.

Major Trend Descriptions

Shifting Geopolitical Landscape

The recent period of Western-based liberalisation and globalisation is being challenged by a global trend towards polarization and more assertive political policies. Renewed protectionism and anti-global sentiment have e.g. contributed to Brexit. China is increasingly flexing its economic and political clout and the general shift of global economic power from the West to the East is increasing the complexity and instability of global power balances. Conflict escalation becomes more likely. This has recently been demonstrated by Russia's invasion of Ukraine. Heightened conflict risk is also visible in many other areas of the World, i.e. the Korean peninsula, South China Sea and Middle East tensions. Escalation into military conflict of global proportion and even use of nuclear weapons seems possible.

Technological Developments & Impacts on Society

Modern (disruptive) technologies, including big data and artificial intelligence (AI), digitisation, automation and robotics are boosting economic growth, performing repetitive tasks, and making processes and systems faster, cheaper and less prone to errors. Autonomous machines are increasingly being integrated into many areas of society and AI is also enabling a shift towards the automation of more value-added tasks. The integration of these new technologies into human societies comes with numerous benefits, including assisting people in their daily lives, for example by providing an improved customer experience (including greater product and provider choice, and speed of delivery); by improving healthcare; and by facilitating social interactions. However, there are many uncertain consequences of their adoption, including replacing jobs currently performed by people and creating the need for re-skilling of some sections of the working population. In addition, changes may be required to education systems over the longer term. The increased integration of technology into daily life also raises questions around the equal access of all sections of society to digital resources, data security and ethics relating to the use of AI algorithms.

Demographic and Social Change

Several demographic trends are changing the way that society functions. Among them is urban population growth with the development of urban infrastructure, affecting how people move, work and socialize. Social cohesion is reducing in many countries due to the adoption of societal values that put an emphasis on the individual. This trend has been boosted using digital media and services. Depending on the country, demographic and consequently social make-up is changing. For example, increasingly ageing populations in many developed countries, a rapidly increasing middle class in developing countries and mass-migrations of people both within and between countries fueled by a range of economic, climate and geopolitical factors. Although uncontrolled migration could translate into increased pressure on welfare systems and infrastructure, migration of skilled people is also crucial in the context of skills gaps created by retirement waves. These complex and interconnected phenomena have a range of consequences, including the potential for widening wealth gaps, societal and geopolitical conflicts and increasing environmental pressures.

Emerging Risk Descriptions

TOPIC	ASSOCIATED TRENDS	DESCRIPTION	IMPACT ASSESSMENT	ERI PUBLICATION
Antimicrobial Resistance		Drug resistance occurs when microorganisms such as bacteria, viruses, fungi and parasites change in ways that render certain medications ineffective. When microorganisms become resistant to most antimicrobials they are often referred to as “superbugs”. This is a major concern because a resistant infection may cause significant medical and financial costs.		
Artificial Intelligence		With progress in Artificial Intelligence (AI) and cognitive computing, machines may begin to make decision on behalf of humans. Decision transfer and lack of transparency or human oversight may result in unforeseen risks or unpredictable outcomes creating complex liability issues. Also ethical, social and market aspects linked to AI are getting more prominent. In the USA and Europe, the first trends can be observed with the aim of regulating AI. Among other things, the introduction of strict liability is being discussed.		2015
Autonomous Machines		Thanks to new developments in mechatronics, speed learning and artificial intelligence there has been rapid progress in the field of autonomous machines, affecting most industries, military and everyday life. Autonomous vehicles are particularly well publicised. This is likely to change the risk landscape for various lines of insurance business.		2017
Biodiversity Loss		All life on the planet depends on biodiversity, which is the variation in living organisms within species, between species and between ecosystems on Earth. Biodiversity provides a variety of ‘ecosystem services’ including climate regulation, air and water purification and supply regulation, nutrient cycling and the maintenance of fertile soils, provision of essential raw materials (e.g. food, fibres and medicines) and disease regulation services. Biodiversity also provides various cultural services, ranging from spiritual and aesthetic value, to recreation and ecotourism. Biodiversity continues to decline in every region on the planet, due to human population pressure that has resulted in changing land use (particularly conversion to agricultural land and increasing urbanisation), overuse of natural resources (overfishing, deforestation), introduction of invasive species, pollution and climate change. Current rapid declines in biodiversity accompanied by habitat degradation exposes human societies and the economy to sudden, unexpected shocks. Pandemics due to zoonotic diseases are one example. For insurance, these kinds of shocks can affect large regions, causing losses to business lines including business interruption, casualty, life & health, in addition to impacts on financial markets. Losses of key ecosystems such as mangroves, sand-dunes and coral reefs also increases exposure to natural catastrophes by reducing coastal flood protection.		

 Ageing and Health Concerns

 Economic Instability

 Environment and Climate

 Environmental, Social, Governance (ESG) Issues

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TOPIC	ASSOCIATED TRENDS	DESCRIPTION	IMPACT ASSESSMENT	ERI PUBLICATION
Climate Change - Physical risk		Direct physical consequences of rising global temperatures include observed changes in the frequency and severity of extreme weather events. For example, the severity and frequency of flooding events associated with extreme precipitation events and tropical cyclones is predicted to increase with average global temperatures. Globally increasing sea levels in combination with stronger storm surges will amplify the risk in coastal areas over time. Heat-waves are likely to occur more frequently and last longer as average global temperatures increase, with impacts on both property and agriculture, (droughts, wildfire) but also on life/health insurance due to excess mortality (e.g. US, Canada and Europe in 2021). More expensive construction of properties, including interior fittings (e.g. smart home, thermal insulation, etc.) and continued concentration of exposures in coastal areas / on river flood plains further amplify loss costs. As the climate system is highly non-linear, the triggering of so called climate tipping points (e.g. thawing of Siberian permafrost or collapse of Gulf stream) can drastically accelerate the current trends towards more extreme weather, as well as having broader consequences on climate and ecosystems, as soon as critical thresholds are exceeded.		
Climate Change - Transition Risk		Transition risks arise as the world aims to reduce the emission of greenhouse gases and to shift to a global economy with net-zero emissions. On the liability side, this has implications for insurers in the product design and through emerging climate change liabilities. New policy and regulatory measures constraining actions that contribute to climate change may lead to liability issues associated with greenhouse gas emissions. Increasing litigation activities may come with large losses under environmental liability, product liability and D&O/professional liability. On the asset side, assets may become obsolete due to policy changes (e.g. coal sector, diesel vehicles) or due to carbon-pricing (e.g. surplus aircraft) and turn into so-called “stranded assets”.		2018
Climate Engineering (incl. Carbon Capture Storage) (New risk)		Climate engineering, also known as “geo-engineering” is the international large-scale intervention in the Earth’s climate system to counter climate change. Currently, those techniques can be divided into two categories: 1) Carbon dioxide removal techniques (CDR) refer to solutions that aim at reducing carbon emissions (e.g., reforestation, carbon capture and storage (CCS), ocean fertilization or artificial trees); and 2) Solar geoengineering or “solar radiation management” (SRM) refers to technologies proposed to rapidly cool down the Earth’s temperature (e.g., “marine cloud brightening” which consists in spraying tiny droplets of seawater into clouds to reflect more sunlight back out into space, or stratospheric sulfur injection that copies the natural cooling effect caused by major volcanic eruptions).		

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Collective Redress		Collective redress is defined as a "procedural mechanism which allows, for reasons of procedural economy and/or efficiency of enforcement, many single claims (relating to the same case) to be bundled into a single court action". The development of collective redress mechanisms in Europe can create an inflation of claims as seen with Class Actions in North America.		
Critical Infrastructure Failures		In many regions of the world, there is a chronic failure to adequately invest in, upgrade and secure infrastructure networks such as electricity provision, water supply, or transport infrastructure. The lack of capacity or outages results in blackouts. This could lead to a higher than expected frequency and severity of large property and non-property losses (incl. BI/CBI). Additionally the risk of natural catastrophes, solar storms or cyber attacks could impact the infrastructure, (incl. satellites, GPS and communications systems). Also energy transition may impact stability of energy supply. A smoothly functioning digital infrastructure is becoming increasingly important, especially in times of remote home office working.		2008 & 2011
Cyber Risks		The volume and sophistication of malicious cyber activity has increased substantially, and there are growing concerns regarding the security of proprietary corporate data and critical industrial control systems. Cloud computing poses elevated risks due to increased concentration and accumulations. Operational risks exist for corporations and could also lead to large property losses with high and previously unknown accumulation potential if industrial facilities were simultaneously attacked. The growing request for personal identification and authentication, the use of biometric identifiers and the multiple uses of identifiers will likely increase the risk of identity fraud and even theft.		
Digital Currencies		Widespread adoption of cryptocurrencies and Decentralized finance (DeFi), a platform for banking functions leveraging the blockchain technology, has implications for data protection, anti-money laundering, financial stability, financial inclusion, cyber threats and climate risks (for instance, bitcoin "mining" still largely requires non-renewable energy sources). At the same time, it is unclear whether these decentralised cryptocurrencies can coexist with central bank digital currencies (CBDCs), which are being considered by central banks with multiple pilot projects and implementation programmes currently underway. As the digital financial ecosystem continue to evolve, extreme volatility and liquidity issues of cryptocurrencies may persist, and in the longer term there could be disintermediation risk if the widespread adoption of digital currencies allow users to obtain access to banking services without going through the banks.		

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Digital Misinformation		New digital abilities to manufacture faked contents (photos, videos, audio, text) are proliferating, and speed and effortlessness to produce and distribute sophisticated fakes are increasing. Deep fakes (e.g. AI-enabled simulated video) or fake news can be used for fraud, to harass individuals, defame social groups, blackmail organizations or destabilize political systems and markets. For insurance, social engineering/cyber and social unrest implications may be central, but there are also impacts on claims handling, and reputational risk. More generally, trust in objective evidence may be diminished.		
Emerging Infectious Diseases		Pathogens are constantly evolving, and the impacts of climate change, trade and travel networks, demographic factors as well as human agricultural and forestry practices are creating new opportunities for them. There are direct risks from new diseases for human morbidity and mortality including potential pandemics, especially for pathogens that poorly understood, highly contagious and difficult to treat and that interact with populations previously not exposed to them. Pandemics can also have a significant effect on the whole economic and financial landscape, but the large number of variables influencing the outcome, including non-medical interventions, supply-chain resilience, and political positions, is making it difficult for insurers to predict the severity of the next pandemic. Pathogens affecting major food crops (but also pests in a wider sense including e.g. insects) and diseases in farm animals are another emerging concern of growing importance		
Endocrine Disruptors		An endocrine disruptor (ED) is a substance that alters functions of the body's hormone messenger system in a way that causes adverse health effects. There are around 1000 potential EDs, found in for instance in cosmetics, pharmaceuticals, pesticides and plasticisers. Exposure is mainly via water and food, but also via air and skin contact, often continuous at low doses and over a long term. The high complexity of the subject makes it difficult to determine a safe use of EDs. Negative health impacts include developmental abnormalities and cancer as well as neurological and reproductive problems. While some legal action against certain substances has already been taken, liability claims may arise due to the legacy tail from the time when policies were underwritten prior to scientific links to human harm having been established, its mass litigation potential and high defense costs. EDs can have a long-term impact on morbidity and mortality claims. The indirect impacts, e.g. via the potential link to lower fertility, are difficult to predict.		2012
Environmental Pollution		Environmental pollution has major damaging impacts on the human population and the wider biodiversity of the planet thorough introduction of harmful materials into the environment. There are different types of pollution, resulting in varied level and type of harm, which include: Outdoor air pollution; Water Pollution; Noise pollution; Light pollution; Soil pollution. More recently there has been a focus on risks from pollution from plastic litter and debris of all kinds, including micro-plastic 'smog', which is now ubiquitously found on all surfaces of the planet and in the food chain, with implications for human health and liability claims.		2009

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Evolving Terrorism		The risk of terrorism has been evolving for the last two decades, making it difficult and subjective to assess. Its inventive and adaptive nature undermines probabilistic modelling inferred from the past. Therefore assessing the plausibility of a specific type of terrorist attack in the future largely relies on expert judgment. Potential threats are NBCR terrorist attacks (Nuclear, Biological, Chemical, Radiological) and other nonconventional terrorist attacks on computer systems and industrial installations (Cyber terrorism, Electro-Magnetic Pulse (EMP)).		2007
Genetic Engineering		Genetic Engineering is an umbrella term for the genetic modification of genetic material using traditional methods, gene therapy, CRISPR/Cas, synthetic biology and biohacking. What they all have in common is the modification of the genetic material. So far, claims has been seen mainly in gene therapy, in the field of gene foods, and in food mismatches with incompatibilities, ecological damage and various product recalls. There is not yet a sufficient claims history for CRISPR/Cas. Biohacking escapes general control. Overall, concerns were raised about possible environmental or health impacts, ethical issues and insufficient regulatory control of the new technologies.		
Geopolitical Conflict		Increasing bilateral or multilateral disputes between countries may result in trade wars and military conflicts, as demonstrated by the Ukraine war. This risk is compounded by nuclear proliferation and new military technology such as autonomous weapons. Geopolitical conflict threatens the stability of the world economy and particularly financial markets, which can also lead to a defragmentation of global markets and financial weaponization. Other potential areas of geopolitical tension include the Korean Peninsula, the South China Sea/ Taiwan and the Middle East. Political instability and violent social unrest may result from geopolitical conflicts, especially in the case of e.g. high food and energy prices, water scarcity, high unemployment, income inequality and degraded public services. The consequences include is impacts on financial markets and insurance losses under property schemes (incl. BI/CBI and SRCC (strike, riot, civil commotion), particularly in areas of high value concentration		
Growth of Leverage		Global debt has risen sharply over the past decade, from $120 trillion in June 2008 to $277 trillion at the end of 2020, according to the Institute of International Finance (IIF), equivalent to about 365% of the gross domestic product of the entire global economy. The increase has taken place across the government, corporate and household sectors driven by, variously, sluggish economic growth and the slow pace of fiscal consolidation since the Financial Crisis and loose monetary conditions, which has encouraged private sector borrowers to take on more debt. The increased indebtedness, however, leaves borrowers more vulnerable to changes in background conditions, such as a slowdown in economic growth, or higher interest; or to market shocks, for example, a further escalation of the trade war. This heightened credit stress could, in turn, have further negative consequences, including a spike in defaults (resulting in losses for banks and investors), or could lead to a period of forced deleveraging that would exacerbate any economic downturn.		

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Legal & Regulatory Uncertainty		Current regulatory trends have prompted companies to re-examine the effectiveness of their governance and oversight. The continued adoption of new or proposed regulations, capital standards or accounting changes (e.g. IFRS17) can lead to compliance challenges and to increasing regulatory complexity. Conduct regulation continues to gain prominence and is one key example of where this risk can emerge. Furthermore, 'non-regulation' has also been identified as a risk in some areas.		
Medical Advances		Significant advances have been made recently in several medical specialties that can bring potential benefits in prevention, diagnosis and treatment of illnesses and thus can improve health and longevity. However, information asymmetry between insurer and applicant may arise, with impacts on availability, pricing and claims. At the same time, these advances could increase the cost of some insurance products, such as health covers, and present new opportunities for other products such as life insurance covers. For predictive genetic testing in particular, while improvements in data processing algorithms and Artificial Intelligence are expected to increase their accuracy and reliability, the legal landscape and related ethical implications are complex and in constant evolution.		2019
Mental Health		Mental health is not just the absence of mental illnesses, but rather a complete mental ability and state of wellness. Accordingly, it is fundamental to be mentally healthy to be able to perform everyday activities. Yet, 20% of the world's population suffer from a mental illness at some point in their lives. Many mental health issues are not severe and lasting but mild to moderate short-lived mental health conditions such as depression, anxiety, stress, and burnout. Though most mental illnesses are treatable, it is estimated that two-thirds of those who suffer from mental health issues go unsupported. Furthermore, mental health risks are increasing worldwide. Mental stress and isolation caused by the Covid-19 pandemic outbreak will most likely exacerbate this trend. Consequently, an increase in claims related to mental health such as medical expenses for Health insurance, occupational Disability claims, Life insurance claims (because of higher suicide rates), and P&C claims (e.g. Worker's Compensation, Employers' Liability, Accident and Health, etc.) can be expected. This shift in insurance claims from somatic to mental health illnesses over the last years highlights the potential implications for insurers and their role in tackling the evolving risks related to mental health.		2021
Metabolic Syndrome		Metabolic syndrome is mainly understood as the combination of obesity, hypertension and diabetes in individual patients. It is associated with the risk of developing severe and chronic complications such as myocardial infarction, stroke or kidney and liver disease. About 20-25% of the world's adult population may be affected and the prevalence is predicted to increase in the future. Metabolic syndrome has a negative impact on life expectancy and healthcare costs, but also has a liability aspect.		

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Monetary Policies		Since last year the supply-demand conditions driving the monetary stance of central banks has fundamentally changed – from disinflation (due to declining consumption and investment as the Covid-19 crisis deepened, amplifying structurally low pre-crisis demand) to excess inflation (due to rising energy and commodities prices as well as continued supply chain disruptions propagated by the Covid-19 re-opening dynamics and the Ukraine war). For most of the last year, most central banks dismissed rising inflation as temporary. And since monetary policy influences inflation mainly via demand (through higher rates) rather than supply, they accepted that inflation might overshoot for a short period until supply constraints go away. However, the incipient fragmentation of the global system (with companies building more resilient but less efficient supply chains, geo-strategic on-shoring of technologies, and severe disruptions to the energy market) could result in a persistent cost-push shock. Thus, pursuing a strategy of "looking through" without losing credibility has become exceedingly difficult. So central banks are now caught between a rock and a hard place: if they tighten too aggressively they risk pushing the economy into recession. But if they act too slowly, inflation expectations could de-anchor and set in motion a self-fulfilling wage-price-spiral. This poses a variety of risks for insurers. While higher inflation increases premium income, it also increases claims and reserves for long-tail businesses. Higher interest rates reduce the net present value of liabilities. However, this effect is – at least in part – offset by the declining value of fixed income assets (which constitute the largest share of investments). A sudden increase in real interest rates could lead to higher credit risk of corporates and sovereigns and trigger cancelations of annuities (rising lapse rates).		
Passive Investments		The rising share of retail participation in capital markets has boosted passive investment management (where assets are not selected based on individual criteria but index attributes) which poses risks to the stability and functioning of markets. In particular, market volatility could increase and shareholder accountability decline (with negative implications for corporate governance). Competition could also be harmed as a result of the growing concentration of ownership of companies.		
Resource and Supply Management		All resources on which our life and global economy depend (incl. air, water, food and raw materials) can suffer from scarcity if not managed sustainably throughout the entire product value chain. As the global economy and the world population continue to grow - driven in large part by rapid medical advances, industrialisation and growth in developing countries - the world's needs for food, water and natural resources also increase, putting pressure on limited resources. The increasing shortages and scarcities impair life quality and spark geopolitical conflicts. On the other hand, the increasing demand for those resources leads to exploring previously unexplored areas (e.g. drilling in the Arctic). Complex technologies used in extreme environments lead to increased risks. For example, the development and extraction of unconventional oil and gas deposits such as fracking, oil sands or undersea methane hydrates requires procedures and technologies that differ significantly from those for conventional resources. With the expansion of these techniques, concerns about environmental impact and sustainability are also increasing.		

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Skills Shortage and Reskilling		Skills shortages across different industries are difficult to identify and measure, resulting in the impact on insurance claims possibly going unnoticed and unattributed. Engineering and medical skill mismatches and shortages have been reported for decades and are now exacerbated by retirement waves and technological advances. In the absence of lifelong learning and adaptation to new technologies and work trends, more industries could see a growing skills gap. For Property and Casualty business, skills shortages may result in the inability to sustain risk prevention measures, longer business interruption periods and more product failures. Inappropriate decisions or mistakes made by inexperienced or overworked medical personnel, could lead to an increase in medical malpractice claims. For Life business, this could mean unanticipated deteriorations in mortality and morbidity. From an operational perspective, the insurance industry relies on highly skilled actuaries, loss adjusters, underwriters and asset managers. Mental health impacts on over-tired or under-skilled employees could be a longer-term consequence.		
Small Particles and Hazardous Chemicals		Various hazardous particles and substances can have a negative impact on human health. Among these are chemicals that act as endocrine disruptors, altering functions of the body's hormone messenger system in a way that may cause adverse health effects (e.g. cancer, neurological and reproductive problems). Many chemicals can be harmful to the environment or health if inhaled, ingested or absorbed through the skin. In particular, chemicals that are carcinogenic, bioaccumulative or have the character of "forever chemicals" pose a high risk. Another group are nanoparticles, where the inherent risks throughout the product life cycle are sometimes unclear, but sometimes clear enough to have already led to action (such as the EU banning nano titanium dioxide in food). Microplastics are a further concern due to their ubiquity paired with lack of scientific insights into their impacts on ecosystems and on health. For many substances, their widespread use, chemical stability and accumulation through the food chain and lifespan make them prone to serial and cumulative losses. There is the potential for long latent major losses in various insurance sectors including a long-term impact on morbidity and mortality claims. While some legal action against certain substances has already been taken, liability claims may arise due to the legacy tail from the time when policies were underwritten prior to scientific links to human harm having been established, its mass litigation potential and high defence costs		2010
Socio-economic Inequalities		The distributional impact of the Covid-19 crisis has increased income and wealth gaps within and across countries. In particular, the younger generation has been impacted by declining education, job prospects, or mental well-being, with possible negative consequences for their lifelong income and hence insurance demand. Now, the war in Ukraine is putting further strain on energy and food prices, which could spill over into social unrest, particularly in low- and lower-middle-income countries; this risk is aggravated by elevated debt levels and stretched social safety nets post Covid-19. This would impact financial markets, potential output as well as insurance demand.		

Ageing and Health Concerns · Economic Instability · Environment and Climate · Environmental, Social, Governance (ESG) Issues · Shifting Geopolitical Landscape · Technological Developments & Impacts on Society · Demographic and Social Change

TOPIC	ASSOCIATED TRENDS	DESCRIPTION	IMPACT ASSESSMENT	ERI PUBLICATION
Space Risk in Lower Earth Orbit (New risk)		Lower Earth Orbit (LEO) is a critical space resource on which many aspects of our current way of life depends. Global communications systems - including satellite broadband coverage, Earth observation systems including satellite imagery and weather forecasting, and global positioning systems all rely on satellite infrastructure in LEO. The current expansion in the deployment of satellite mega-constellations in Lower Earth Orbit (LEO) by commercial space companies such as Space X and OneWeb has the potential to significantly increase the number of objects in orbit around the Earth. Such new infrastructure is adding to existing space debris that has been accumulating from old space missions, such as rocket-debris and non-operational satellites, of which only a tiny proportion is large enough to be tracked. There are numerous risks to be aware of in this rapidly changing environment with potential impacts for re/insurers. The most obvious is that the risk of damage to operational systems due to collisions (with space debris, other operational systems or meteorites) is vastly increased as their numbers increase. Furthermore, current regulatory/risk governance frameworks are not designed to deal with the risks associated with potentially thousands of additional operational satellites in LEO. However, there are wider risks relating to the potential for cyber-attacks on connected satellite constellations impacting critical infrastructure on Earth, geopolitical tensions created as a small number of companies and countries dominate this critical and finite resource, and environmental impacts on Earth resulting from the greater number of rocket launches needed to develop mega-constellations and issues related to the regulations/practices adopted relating to the decommissioning of satellites and the consequences of space debris that falls to Earth.		
Substance Abuse		Currently the United States face a substantial “Opioid Crisis” with more than 2 million Americans suffering from an addiction to prescription opioids or heroin. Drug overdoses are the leading cause of death of Americans under 50. The numbers of death cases from drug overdoses are increasing year after year. Similar substance abuse crises may develop in other countries as well. Other substances at risk for abuse followed by severe health damage and even death are e.g. psychotropic drugs and alcohol.		
Supply Chain Complexity		The high degree of optimization and inter-connectivity makes global supply chains vulnerable to risk concentration and disruptions that may lead to higher-than-expected insured losses. Cyber-attacks are a further existential threat to digitalized networks. Non-economic disruptors like the COVID-19 pandemic, international sanctions, or the increased public scrutiny for adherence to ESG standards are gradually re-shaping supply chains globally. Near-shoring and regionalization, the build-up of strategic storage, and diligent sourcing of scarce resources are emerging trends that are leading to higher inflation but also, progressively, to more resilient supply chains.		

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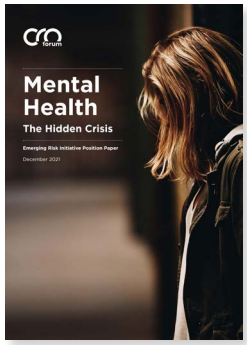
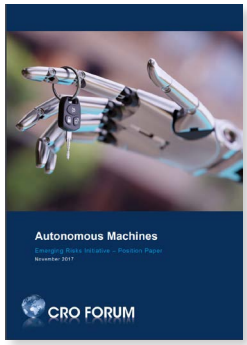
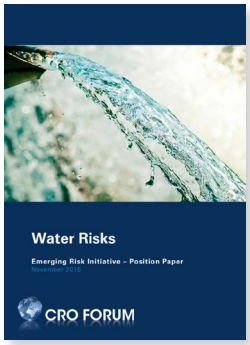
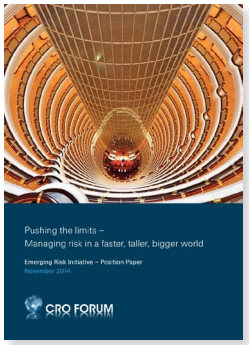
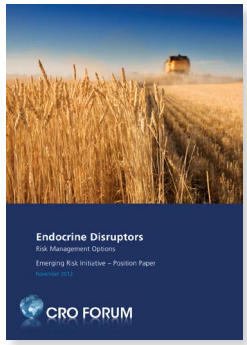
Emerging Risks Initiative Position Papers published by the CRO Forum

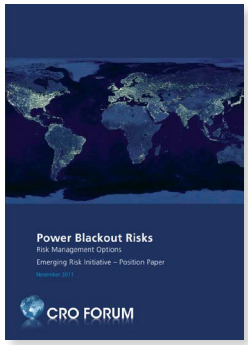


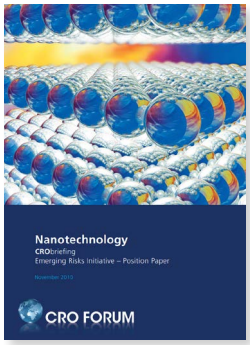


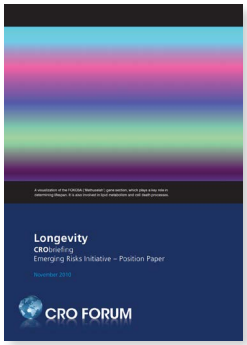


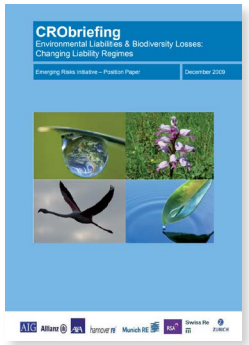


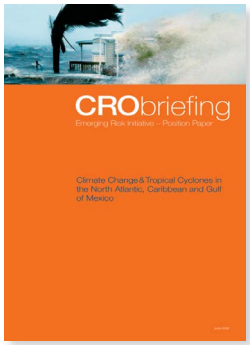












Title	Year
Mental Health – The Hidden Crisis	2021
Imagine all the people	2020
Medical Advances	2019
The Heat is on	2018
Autonomous Machines	2017
Water Risks	2016
The Smart Factory	2015
Pushing the Limits	2014
Food and its impact on the risk landscape	2013
Endocrine Disruptors	2012
Power Blackout Risks	2011
Nanotechnology	2010
Longevity	2010
Environmental Liabilities	2009
Critical Information Infrastructure	2008
Influenza Pandemics	2007
Terrorism	2007
Climate Change	2006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Legal & General
M&G
MAPFRE
Munich RE
NN
PRUDENTIAL
QBE
SCOR
The Art & Science of Risk
Swiss Re
Unipol
GRUPPO
UNIQA
ZURICH