Institut National de Recherche et de Sécurité

"IN WHAT WAYS WILL WORK EVOLVE IN THE NEXT FIVE YEARS?"

SYNTHESIS OF OCCUPATIONAL SAFETY AND HEALTH FACETS STEMMING FROM THE FUTURIBLES/INRS PROSPECTIVE EXERCISE

CONTENTS

Part 1: CONTEXT AND METHODOLOGY OF OSH FACETS STEMMING FROM THE FORESIGHT EXERCISE

The Covid-19 pandemic has disrupted society and the world of work in particular. Despite uncertainties about how the epidemic would evolve, as of June 2020, the Futuribles International association published several 18-month-ahead scenarios describing the possible outcomes of the pandemic in political, economic and social terms [1]. It then decided to extend this reflection to a five-year horizon, covering topics such as territories and ways of life, but also work. To assist with its reflection on work, Futuribles requested the participation of the Foresight and Horizon Scanning Unit of INRS. About a dozen businesses members of Futuribles International were associated with this reflection conducted in summer 2020 (four video conferences between June and September). Developments in the health situation were hardly more predictable in September compared to June, and were therefore included implicitly or explicitly in the drafting of the different scenarios.

The four scenarios and the main challenges identified during this reflection were published in INRS's HST journal in December 2020 [2] (that article is reproduced in part 5 of this document). For INRS, only half the distance was covered since, as was the case for previous foresight work done by the Institute (see for example [3-7]), it appeared essential to supplement this general reflection with a specific zoom on prevention of occupational risks.

Methodology

An ad hoc group was created, comprising 14 members of INRS (directors, division managers, experts and members of the Foresight and Horizon Scanning Unit), an expert from the French national agency for the improvement of working conditions (Anact), a representative of the occupational risk prevention directorate of social security, the regional engineer consultant of the Ile de France health insurance fund[1].

This work was conducted in three series of video conferences.

Prior to the first video conference, all of the material (variables sheets, scenarios, topics for reflection intended for businesses) for the study devoted to developments in work organisation by 2025 was made available to participants. Each participant was requested to reflect on, based on each scenario, the possible changes in occupational risks of a certain job or activity sector, or in the tasks of an occupational risk prevention player. The topic choice (job, sector) was left to participants. They were also free to provide to the group ahead of time a written report summarising the results of their reflection[2].

1. **The first series of video conferences** which brought together all of the participants was devoted to going over the principles of foresight, a presentation of the results of the first study and defining the principles of dialogue in the workshops of the second and third series of conferences: free, contradictory if necessary, no prohibitions including for comments deemed irrelevant, etc. by their authors.
2. **The second series of video conferences** was composed of three workshops with five to six participants. Each workshop had a representative of the Horizon Scanning and Foresight Unit and four or five experts. They were distributed randomly with the goal of having as much profile diversity as possible in each workshop: INRS and non-INRS, disciplines, hierarchy.

   During these workshops, each participant was required to give a 10- to 15-minute presentation of the topic selected and its development based on the four resulting scenarios. Discussion was then open.

[1] This document is the result of collective work by: Amandine Brugière from ANACT, Thierry Balannec from CNAM, François Blanchard de la CRAMIF and Agnès Aublet-Cuvelier, Anne-Sophie Valladeau, Aude Cuny, Bernard Siano, Jérôme Triolet, Louis Laurent, Marie-Anne Gautier, Nathalie Guillemy, Séverine Brunet, Stéphanie Boini, Marie Defrance, Pierre Canetto, Michel Héry, Marc Malenfer from INRS. As well as Judith Sebban from INRS for the layout.

[2] The fact that two participants chose the same topic was not an issue: there was no goal to cover all sectors and risks, and the confrontation of two reflections on identical topics was considered to be potentially productive.

On the basis of these contributions and discussions, it was considered that for five topics, the presentation(s) provided enough elements for the definitive drafting of a sheet which was submitted to all participants. These sheets are identified by an asterisk in the summary list.

For four other topics, it was considered that additional reflection would be useful.

3. The third series of video conferences therefore included four workshops among which the participants were distributed in agreement with the members of the Foresight Unit: 13 people participated each in a workshop; the two members of the Foresight Unit and two other people each took part in two workshops and contributed to drafting the final summary sheets, submitted to all of the participants.

These nine sheets are available in part 3 of this document. Four of them address prevention issues and five of them propose sector-based approaches:

- Sheet 1: Risk perception (through reflection on risks with delayed effects)
- Sheet 2: Prevention policy and its actors
- Sheet 3*: Monitoring workers' state of health
- Sheet 4: Remote work and psychosocial risks

Sector-based sheets:
- Sheet 5*: Secondary sector: industry and building and public works
- Sheet 6*: Airport activities
- Sheet 7*: Logistics and commerce, including last-mile delivery
- Sheet 8: Personal assistance and care
- Sheet 9*: Establishments accommodating dependent seniors

The four scenarios on which the reflection was based are presented in part 2. Seeing that when these scenarios were drafted, they were inevitably influenced by the atmosphere at the time, more timeless information elements are also provided in this part, identified under the title "topics for reflection". They correspond to the main issues, highlighted by the exercise, that companies will have to address over the next five years in terms of business policy and work organisation.

A summary of the main challenges identified in occupational safety and health is presented in part 4.

References of Part 1

[1] Futuribles (2020) Crise du Covid-19 : quels scénarios pour les 18 prochains mois ? Available at: https://www.futuribles.com/fr/document/synthese-crise-du-covid-19-quels-scenarios-pour-le/

[2] M. Malenfer, M. Héry, F. de Jouvenel, L. Grzesiak - Quelles évolutions des organisations de travail dans les cinq prochaines années ? *HST*, n°261, pp. 122-128, December 2020.

[3] M. Héry, M. Malenfer, S. Devel, C. Levert (2021) Evolution of working conditions under the impact of ICTs. Journal of Safety Research. DOI: 10.1016/j.jsr.2021.03.009.

[4] M. Héry, M. Malenfer (2020) Development of a circular economy and evolution of working conditions and occupational risks - A strategic foresight study. European Journal of Futures Studies. DOI: 10.1186/s40309-020-00168-7.

[5] M. Malenfer, M. Héry, C. Montagnon (2019) A circular economy in 2040. What impact on occupational safety and health? What prevention? Available at: https://www.researchgate.net/publication/335797802_A_circular_economy_in_2040_What_impact_on_occupational_safety_and_health_What_prevention

[6] M. Malenfer, M. Defrance, J. Leïchlé, M. Héry (2018) Preview: Platformisation. Available at: https://www.researchgate.net/publication/324257760_Preview_Platformisation_2027

[7] M. Héry, C. Levert (2017) Modes and methods of production in France in 2040. Available at: https://www.researchgate.net/publication/316243223_Modes_and_methods_of_production_in_France_in_2040

Part 2: THE FOUR SCENARIOS RESULTING FROM THE INITIAL EXERCISE "WHAT CHANGES WILL OCCUR IN WORK ORGANISATION IN THE NEXT FIVE YEARS"

Scenarios are often used in prospective exercises: they make it possible to present the results to the target audience in a more user-friendly form. However, they have the disadvantage of being too often influenced by the reality of the moment, and in that regard, they "do not age well". For this reason, after the scenarios drafted within the framework of the initial Futuribles/INRS exercise (which were used by the experts in the second phase of the exercise devoted to occupational risk prevention), we briefly present the topics for reflection proposed to businesses, of a more conceptual and timeless nature.

Four scenarios:

Scenario 1: all independent service providers in organisations operating in the short term

Businesses significantly modify their operating modes. Many jobs are destroyed at the high-point of the crisis. As businesses recover, the jobs are replaced either by more precarious jobs (short-term, temporary, independent work), or by automation. Indeed, businesses, but also other establishments seek to become as flexible and resilient as possible; this is what dictates all of their strategic choices.

Independent status and multi-activity (several jobs in parallel) become widespread, for all types of jobs. Businesses increasingly recruit on contract basis, without long-term commitments, and without geographical constraints. Remote working becomes extremely attractive especially to recruit international talent. Many professionals let off during the crisis, return to work for their former employers but in the form of service provision contracts that are renewable based on economic conditions and projects. Regulatory developments facilitate these forms of jobs by lifting restrictions on short-term contract renewals and by protecting businesses from the risk of a requalification of their independent workers; the trend is towards the progressive introduction of a single worker status. These project modes are managed mainly by artificial intelligence that hires teams and coordinates their work. New recruits are hired in this form and the expansion of remote work gradually causes global competition for service jobs that can be performed remotely.

For the least qualified jobs, the simplified micro-entrepreneur (self-employed) status in France develops massively and increasingly affects sectors where it allows work on-demand (mass retail, logistics, personal assistance, building and public works, etc.) which offers greater flexibility and lower prices than automation. Connection of clients with providers is handled by platforms, which are sometimes integrated into large companies.

In parallel, numerous tasks are automated if this implies a drop in total payroll, productivity gains (operation 7/7) and/or the removal of major constraints related to personnel management (recruitment difficulties, particularly hazardous or tedious tasks). This affects industry in particular, especially for the few production lines relocated following the health crisis.

While the productivity and agility[3] of businesses may have been strengthened and even enriched, many of them lose their identity, having a hard time maintaining their values and shoring workers' commitment and social cohesion. Many day-to-day tasks can be disrupted by the mobility of people who often change employers based on the opportunities that arise. The lifetime of small businesses has decreased, some of them are even designed from the start to be short-lived. At the same time, some businesses (often the largest ones) develop worker loyalty strategies to secure their availability. This involves, in particular, maintaining certain benefits (health insurance, compensation for telework) during inter-contract periods, but also privileged access to training enabling them to remain employable. Such benefits are not negligible for their beneficiaries, since, in the context of massive competition among individuals, each person is responsible for their own employability and must individually manage their training path in order to better meet companies' expectations.

[3] Definition by the Harvard Business Review: an agile company is one that can mobilise its collective intelligence to create value repeatedly and continuously, using as little means and energy as possible, and creating conditions under which its members can grow.

Elements that can accelerate this scenario:

- Long-lasting economic crisis and mass unemployment, with public policies softening the Labour code and encouraging self-employment.
- Multiplication of contingencies causing brutal fluctuations in economic activity.
- Acceleration of technological transformations.

Elements that can limit this scenario:

- Obstacle to technological developments (for example, increase in cybersecurity issues)
- Fast economic recovery
- Strict framework for work relationships

Possible consequences of this scenario:

- Exacerbation of inequalities in income, job status, and increase in precarity
- Possible reform of social protection with the introduction of a basic minimum income for all so that everyone can deal with fluctuations in activity.
- Decline in corporate values, loss of meaning, disengagement of a large portion of workers.
- In sectors where competition to attract workers is, or is once more becoming fierce, efforts are made to secure loyalty.
- Transformation of the role and work arrangements of managers, who are increasingly required to structure and manage short-lived work groups.
- Importance of technological investment choices (robotisation, information systems, etc.) in corporate strategy.
- Training system that is increasingly individualised and unified (towards rights also vested in self-employed workers?), but not very ambitious because of a lack of resources. More and more businesses are developing their own systems (when they have the means).

Scenario 2: heterogeneous work organisations and statutory inequalities

Amidst a persisting crisis, employees and public authorities aspire to organisational change. Older business and administrations resist this movement (and especially the work organisation transformations it implies) while new businesses adopt new forms of organisation.

Massive teleworking was a good experiment for businesses, which were able to test their ability to continue their activity during a crisis and mobilise their workers. But the effects of prolonged teleworking because of the recurrence of the epidemic waves in 2020 drive older businesses to return to traditional work modes as much as possible, on site. In terms of production organisation, day-to-day management of teams, relationships between different entities, teleworking did in fact often conflict with the culture and strategy of certain businesses.

Aspiring to new forms of organisation giving them greater autonomy is important for employees. Teleworking is encouraged by public policies with the goal in particular to decongest cities and improve the environment, as well as to manage the recurring epidemic episodes. A legal framework attempts to encourage and facilitate its implementation. But this does not suffice to convince all organisations: employer responsibility, security of information systems, control by middle management, the drop seen in teams' creativity within the framework of teleworking, are arguments used daily by some of them to curb its deployment.

Differences are exacerbated between companies that adopt forms of organisation giving greater autonomy to workers (liberated companies, full remote companies, etc.), those that adapt their work organisations to maintain a teleworking/on-site balance and those, the large majority, that "limit" organisational changes as much as possible or whose activity is not really compatible or not compatible at all.

Faced with the risk of disappointing employees because of the reluctance of traditional organisations to evolve, businesses develop new ways to attract workers. The quality of workplaces and related services (business nurseries, business concierge services, etc.) as well as management of workers' presence at

the workplace that is more flexible and geared towards interactions become key factors of attractiveness particularly for companies seeking to retain their employees.

Therefore, despite a social and legal framework favourable to organisational transformations, there is great heterogeneity in businesses' responses, and a general resistance to the massive development of teleworking.

Indeed, differences in job status reveal quite clearly the differences in working conditions. Employees are mostly given a defined work time and workplace while independent work (endured or chosen) and outsourcing develop for tasks that do not appear key for companies.

This situation which is also reflected by the increase in multi-activity/accumulation of activities causes social tensions surrounding differences in status (civil service/employment/self-employment – entrepreneurship) with an underlying challenge to the most protective forms of employment (civil service and permanent contracts) and the idea that everyone will have to occupy different functions/jobs over the course of their career and it will be necessary to support/encourage this professional mobility. In this context, the creation of companies associating workers with governance (such as cooperatives) become more attractive and develops.

While all models continue to co-exist, training principles however evolve towards greater individual responsibility. Nevertheless, the largest companies attempt to retain their employees using continuous requalification systems, affirmation of the notion of strategic workforce planning and actions to support reconversions.

Elements that can accelerate this scenario:

- Regulation in favour of the development of independent status.
- Incentives for developing forms of companies that involve employees more in governance (coops, participation of employees in company board meetings).

Elements that can limit this scenario:

- Implementation of strict regulations for developing teleworking.

Possible consequences of this scenario:

- Teleworking becomes a major distinguishing feature of companies.
- Increase in disparities and inequalities in working conditions.
- Boom in independent work and outsourcing.
- Development of company creations with alternative forms.
- Low professional mobility or mobility between companies of the same "type" because of the skills management and training systems implemented particularly in large businesses.
- Mistrust of individuals towards traditional companies that do not follow their aspirations.

Scenario 3: flexicurity and flexibility of work organisations

The economy is engaged in a transformation that is supposed to last several decades, marked by the goal of ecological reconstruction. This implies a revision of work organisation: businesses are genuinely seeking post-Covid-19 feedback and putting work organisation up for debate within the framework of internal social dialogue, but by also taking into account their external stakeholders. The goal is to better understand the reality of work so as to gain resilience, capacity to adapt, acceleration of decisional processes…

Teleworking is an important part of large companies' resilience strategies. They make sure that their upper-level staff can telework more often, which enables them to adapt their property strategy. While a portion of the salaried jobs that were destroyed during the crisis is replaced by independent services recruited through platforms (sometimes inside large companies), with payment by task, the perspective of a medium- and long-term change in production is often reflected by hires that are set to be sustained. Some business creations are done in full remote mode, but under stable contracts.

This reconstruction is characterised by different phenomena such as the reconversion of certain mechanical industries (aeronautics, individual vehicles for example) towards the production of collective

transportation means, the adaptation of chemical facilities to new raw materials, etc. In general, it is a matter of reducing vulnerabilities and gaining sobriety: raw materials, energy. Robotisation is not at all called into question, but it must evolve and become more flexible and more adapted to shorter series. In that regard, it is cobotisation and certain niche installations that grow rather than heavy robotisation. In the services field, it is also lighter, more adaptable tools that are developing. This major transformation imposes the attentive management of human capital but also of the business' entire eco-system. Local authorities and large companies seek to develop local synergies by setting up mechanisms aimed at the development and maintenance of a network of small businesses. Outsourcing is no longer based on competition driving down prices but rather on the search for flexibility and innovation nearby. With regard to employment, nobody and no skill must be left behind. These choices are bolstered by public authorities who encourage more flexible, but also more inclusive and sustainable work organisations. At national level, the choice made is for flexicurity; the goal is to reach inclusivity through work in this transition. Public redistribution mechanisms are implemented throughout one's professional life to level out income regardless of job status, unemployment and training. Subsidised job-sharing mechanisms are set up, associated with training paths.

A unified service for training management is created and is characterised by a high level of flexibility. It aims to respond to companies' immediate needs and the logic of longer-term employment. In-house training developed heavily so that labour could quickly adapt to needs. Business training centres are on the rise, along with on-the-job training. Initial professional education tends to become more specialised to take into account upcoming changes in the organisation and nature of production. Territories become heavily involved in connecting the offer and supply of skills. But many companies have their own hiring and training systems.

Elements that can promote this scenario:

- A*Green New Deal* heavily directed towards the ecological transition and therefore the conversion of activities and their support (particularly social)
- The development of businesses's CSR policies
- Massive digital training efforts
- Reconstruction of harmonious social post-crisis dialogue
- A general aspiration towards the renewal of work arrangements
- Local investment in skill sharing and training mechanisms
- Local policies for mobility and time organisation to limit travel

Elements that can limit this scenario:

- States or companies that remain focused on short-term indicators or on safeguarding particular interests
- Dilution of work groups because of repeated health crises
- Hardening of social relationships preventing all coordination

Possible consequences of this scenario:

Macro scale:

- Fewer inequalities related to workers' status.
- Potential benefits for reducing greenhouse gas emissions.
- Progressive rebalancing of the territory.
- Work regulations to be adapted (time, workplace, working conditions): social dialogue and legislation.

Local scale:

- Local social dialogue to organise work time and travel.
- Less congestion of urban centres.
- Development of third places, and coworking spaces.
- Commercial revitalisation particularly for residential places (which become work places..

- At the same time, a drop in the use of tertiary work centres (decongestion, but also loss of activity for businesses and services).
- Development of company synergies (local industrial ecology).

Company and work group level:

- Development of labour sharing mechanisms at local level.
- Work organisation must be rethought based on teleworking: work groups, management, etc.
- Innovations to be developed to promote team cohesion and creativity.
- Major work at workplaces (the company, shared spaces, homes, etc.).

Scenario 4: businesses in survival mode and job insecurity

The health crisis continues, with the epidemic returning more or less locally, creating a major economic crisis, possibly the worst of the industrial era. Companies adopt circumstantial responses to withstand the immediate situation. Loss of job security is exacerbated in a conflictual social climate.

Against recurring health crises, economic activity suffers. The companies that better resist the crisis are those that supply basic equipment and services, securing production during epidemic crises. Faced with a widespread crisis and thanks to the use of information and communication technology, they take advantage of competition among workers to decrease their production costs. They can also resort to automation, which is chosen because of its advantageous cost price compared to that of labour, compounded by the benefits it can have during epidemics. As such, equipment (robots but also automats in departments) that distances workers is given priority. This could be the robotisation of a production line or the transformation of a workstation to enable a worker and a robot to work together. Regarding workers, they may be required to work from home or on the company's premises, from a formal workplace to a space adapted according to the context. The exceptional situation created by the pandemic allows a large variety of situations.

Faced with a heavy rise in layoffs and unemployment, an informal online economy and "platformisation" of white-collar jobs develop with global competition reflected in a major growth of independent work, often completely deregulated. A large portion of activity is informal, without social protection, while a very small portion of employment continues to protect workers (permanent contracts reserved for workers employed in strategic fields and civil servants performing sovereign functions). These phenomena occur against major social and sometimes violent conflict. Some workers recreate alternative work groups in an attempt to resist. This resistance can take place outside the strict framework of the company and traditional social conflicts.

Globally, there is a slump in salaries, mainly due to the sharp drop in very high and medium earnings of executives and heads of small companies.

The circular economy seed planted at local level results in major training needs since many businesses are (re)created. These training mechanisms are supported by local authorities, within their means, who make it a priority, in connection with the economic fabric of their constituency. But most often, workers have to learn on the job because of the lack of resources.

<u>Elements that can promote this scenario:</u>

- The succession of crises (health, economic, financial) and the perpetual sense of emergency.
- The continuously tight cashflow situation for businesses.
- A tense social and political climate and a government overwhelmed by the crisis situations.
- Perpetual improvisation in the responses provided.

<u>Elements that can limit this scenario:</u>

- The establishment of a Roosevelt type New Deal policy.
- The absence of new crises and recovery of activity.

Possible consequences of this scenario:

- The development of an informal economy and a drop in tax income.
- Job insecurity for a large part of society and a drop in consumption.
- Development of hybrids between legal work and informal work.
- A deflationary spiral driving companies so able, to turn to external markets.
- Increased territorialisation of activities, related, for example, to the development of a “defensive” circular economy based on the shortening of trade routes, but also on the development of informal activities for recovery of secondary material, repairs, service exchanges, etc.
- Training issues therefore take a back burner.

Four topics of reflection for companies:

Remote working

Hardly used before the pandemic, it seems to have become essential: because it is requested by certain employees who see an improvement in their living conditions, because it enables infrastructure savings (fewer travel) but also business property savings to be made. However, legal issues are raised and there will have to be negotiations between the State and social partners and within companies themselves. In the long term, it also raises problems for the functioning of teams, integration of new hires, and the company’s capacity to innovate, and generally for its culture.

Autonomy of workers and teams

Despite numerous references to agility, operation in project mode, etc., work organisation is still very rigid and based on hierarchy in many companies, subject to, among other things, the growing weight of numerous normative processes (quality, labels, etc.). The pandemic, especially in the beginning, forced some of them to lighten these work organisation constraints. The “return to normal” must take into account the need for autonomy clearly expressed by workers and must provide an opportunity to renew dialogue and the forms it may take.

Revise the perimeter of the strategy and the weight of social and environmental accountability

Over the last few decades, subcontracting and offshoring to low-cost countries have deeply remodelled the French economic landscape. Here too, the crisis has revealed the fragility of some supply chains and some business continuity plans. Similarly, certain jobs essential for the functioning of society are poorly recognised and valued. This reflection about resilience will probably lead to better consideration of suppliers, subcontractors and clients, for example within the framework of a revision of social and environmental accountability policies.

The evolution of workers’ skills

The crisis contributes to accelerating trends that have been underway for several decades such as automation. The recruitment problems encountered by certain companies for certain types of jobs could worsen especially if the economic crisis makes workers’ training and reconversion more difficult. Job and career management will probably be a major challenge in the upcoming years, particularly within the context described previously of a change in working modes and workers’ aspirations towards more autonomy.

Part 3: THEMATIC SHEETS

SHEET 1: RISK PERCEPTION WORKSHOP (THROUGH REFLECTION ON RISKS WITH DELAYED EFFECTS)

Contextual elements

In the area of occupational risk prevention, the category of risks whose effects (often or always) emerge through time are called “delayed effect risks”. In the framework of reflection carried out in this workshop, reflection was mainly organised around five of these types of risk:

- Musculoskeletal disorders (MSD), low back pain;
- Physical nuisances (noise, vibrations, radiation, etc.);
- Chemical risks;
- Carcinogenic, mutagenic, reprotoxic (CMR) risks, whether chemical, physical, biological, organisational [in particular untypical hours, including night work]),
- Psychosocial risks (PSRs).

This reflection is organised as a function of four scenarios resulting from the common Futuribles / INRS exercise [1], but it also benefits from being crossed with works conducted in the workshop *Prevention policy and its actors*.

Scenario 1: all independent service providers in organisations operating in the short term

Given the importance of work in mission mode, companies mainly focus on the prevention of risks with immediate effect. Work interfaces are increasing, the segmentation of tasks and the mobility of jobs weaken prevention approaches by branch and sector of activity. It is very difficult for different actors in prevention to convince companies to invest in actions aimed at avoiding the occurrence of diseases liable to occur with delayed effect in relation to exposure over several years, and even several decades. Only active intervention by the State, in a rationale of upholding public social order, would ensure that the necessary prevention measures are taken. Occupational safety and health policy is moving from the area of prevention to that of repair, in a context in which occupational health is losing its specificity in relation to public health.

The turnover of successive jobs is a barrier to acquiring knowledge, especially epidemiological knowledge, making it possible to finally objectivise the causal relations between exposures and diseases: despite systems that systematically record data, the lack of resources dedicated to preventing occupational risks in the medium term and the disempowerment of actors supposed to declare exposures leads to the collection of few data. The weakening of labour unions is both an obstacle to establishing good knowledge of work actually carried out and to implementing efficient prevention: in a context of changes to the composition of work teams, priority is given to prescribed work and the prevention of occupational risks. The traceability of the itineraries of workers and their exposures is scarcely documented and the recognition of a possible occupational disease becomes more difficult, since less easily objectivised. A large part of care is transferred de facto to the general health insurance system. The share of occupational injuries and illnesses (OII) implicitly transferred to this branch is increasing.

Most delayed risks are made invisible in the context imagined in the workshop *Prevention policy and its actors* of the disappearance of OII pricing to the benefit of global pricing for personal risks. Also, the pooling of costs due to occupational accidents for the smallest companies does not provide an incentive for prevention. Without specific compensation, it is difficult to imagine “spontaneous” prevention.

Scenario 2: heterogeneous work organisations and statutory inequalities

Regarding companies that have chosen continuity, i.e., return to a work organisation slightly modified in comparison to the period before the health crisis, there is little difference in the prevention of risks with delayed effects. On the contrary, in companies qualified as untypical in the workshop *Prevention policy and its actors*, the dichotomy identified between those of the “normative” type and those of the “collective” type can also be applied for the prevention of risks with delayed effects. It is easier to imagine the latter (at least some of them) adopting collective reflection based on the analysis of real work to set up the efficient prevention of these risks: a model specific to each of them that adapts a common corpus proposed by occupational risk prevention institutions. However, the difficulty of getting immediate

measures to be taken into account and liable to prevent the eventual occurrence of diseases remains a challenge for young and often fragile companies.

The newness and fragility of these companies have as corollaries employment and working conditions that can turn out to be unfavourable: long working hours, multi-activity (several jobs in parallel), lack of work experience and prevention culture, which can make it difficult to adopt work methods that guarantee health and safety (occupational stress and wear, bypassing rules). But in both models of untypical company, since awareness of risks with delayed effects is not spontaneous, it is important that the rules of efficient public social order are maintained to take them into account, through conventions or precise regulations. This is particularly the case in a context where these companies are often intensive users of information and communication technologies whose uncontrolled utilisation can result in diseases linked to exposure to psychosocial risks. Modes of "liberated" and autonomous working lead to the development of teleworking, which can also favour psychosocial risks, as well as bringing about specific delayed risks linked to sedentary work at home (unsuitable workstation, seated posture without expending energy, risks of addiction). These risks can be out of the control of the employer, labour inspection, prevention institutions, etc. They can also lead to the aggravation of health inequalities observed as a function of living standards.

Scenario 3: flexicurity and flexibility of work organisations

This scenario wagers on flexicurity to reach the objective of ecological reconstruction. In particular, flexicurity provides a wide margin for training actions capable of inculcating the culture of prevention.

Nonetheless, for industry it entails the progressive but significant evolution of production performed in France via transformations of the productive fabric and relocations of activities sometimes performed for several decades in countries with low-cost labour. These relocations may bring workers into contact with certain carcinogenic products (metals or their salts and oxides, the active principles of drugs, chemical products, etc.), in activities whose knowhow has probably been diluted over decades or new activities whose challenges/impacts are not fully known. The installations themselves must be adapted, probably with greater robotisation: an interesting context, if well controlled, for avoiding the exposure of workers to certain risks. The local concentration of productions reduces travel and thus risks of road accidents. It can also be more favourable to a local and consistent prevention program enabled by better coordination of the supply chain and actors at the territorial level

However, for several decades, work organisation in industry has satisfied the desire of companies to refocus on their "core trade" with, as corollary, the outsourcing of activities considered subsidiary (maintenance, cleaning, packaging, etc.) to subcontracting companies, companies that must often absorb the impacts of production hazards. In the context of the evolution and relocation of the activities described above, both the prevention of immediate risks (for example, accidents) and risks with delayed effects must be regarded carefully: the memory of certain risks that have vanished since several decades ago (for example, primary and secondary metallurgy, certain repair activities).

More generally, any activity at the interface of two production systems must be given particular attention regarding occupational risks, especially when these systems are undergoing change. This example will be recurrent in the context of this scenario.

Scenario 4: companies in survival mode and job insecurity

Although this scenario does not provide very optimistic perspectives, sectors that ensure activities essential to the functioning of society can undergo significant technological innovations: given the health insecurity linked to Covid-19, the automation of installations is destined to increase. Well designed, it can reduce physiological stresses for workers and prevent the eventual occurrence of musculoskeletal disorders and low back pain (although examples to the contrary now exist, leading to the intensification of work for operators). The outsourcing of office tasks can lead to work being done abroad; due to its potential impacts on non-immediate work, cyber risk (hacking, blocking, blackmail, etc.) considerably increases PSRs for computer departments and administrative personnel. This context is also favourable for the occurrence of phenomena such as workers keeping quiet about their doubts, health problems, etc., for fear of losing their jobs, which in the end is unfavourable to prevention. Labour unions are diminished as bodies representing employees are weakened. Little information regarding work conditions is communicated upwards to management, in an already disorganised world of work, thus further weakening the assessment of risks and the traceability of occupational exposures. This results in accident prone situations which decrease the possibilities of organising prevention and acting in the short, medium and long terms.

On the other hand, in the informal sector, the reappearance of activities linked to resourcefulness is not very favourable. It can be synonymous with poor use of toxic products or their utilisation in an inappropriate environment. More generally, many workers are faced with working conditions in which prevention is not included.

The specific case of exposure to occupational carcinogens

Regarding chemical, biological and physical carcinogens, different types of work organisation should not change the perception of risk. On the contrary, unsurprisingly, in certain cases in which the status of work and work conditions are precarious (or in which subcontracting is practiced, especially "subcontracting risk" to small companies), the prevention and recording of exposures can become more difficult. More difficult monitoring of exposures can have impacts on the detection of new products and new carcinogenic processes.

Scenario 3, potentially the most "virtuous" in this area, is also the most contradictory. Indeed, changes made to the production system like the relocation of certain activities (in particular primary metallurgy or the production of the active principles of drugs) are liable to confront companies with insufficiently controlled risks, ether because they have never seen them before, or because their prevention is complicated to implement. But the situation will always be more positive than that of the "resourcefulness" activities described in scenario 4.

Regarding carcinogenic risks linked to work organisation (particularly night work), such as breast cancer (as well as non-cancerous diseases, sleep disorders, diabetes, obesity, cardiovascular diseases), it can be imagined that for scenarios with increased flexibility, prevention, rarely implemented at present, has not undergone much progress. It is made even more complicated in situations like those of scenario 2, with very long work times and multi-activity (several jobs in parallel).

SHEET 2: PREVENTION POLICY AND ITS ACTORS WORKSHOP

Scenario 1: all independent service providers in organisations operating in the short term

A large part of the capacity and legitimacy of the occupational risk branch of health insurance to act is linked to its role of insurer and its capacity to increase contributions in the case of persistent serious risks and failure to prevent them. This capacity goes beyond companies that contribute to this system since work regulations provide for the joint assessment of risks between user companies and external companies (including those employing seconded workers) or non-salaried workers in order to prevent risks linked to co-activity. The user company is therefore empowered vis-à-vis its subcontractors. In the case of the massive development of independent work, as described in scenario 1, the occupational risk branch of health insurance loses much of this power of influence and become limited to the role of expert. On the other hand, it is able to carry out a whole range of actions upstream directed, for example, at the client company or designers.

It can be imagined that this role of expertise is placed at the service of private insurance companies that supply their services to companies through the establishment of reference frameworks, in order to help them to develop prevention policies (with the insurance companies adjusting their prices depending on the number of accidents of their clients). The "service" and the contributions are therefore increasingly customised. Some companies – especially the smallest one – become "non-insurable" because the premiums become too high. To offset this weakness, certain "federating" organisations of companies may emerge, whose operation is similar to that of cooperatives and common interest groups.

More generally, in the context of scenario 1, the customisation of expertise and the levelling of contributions for the smallest companies can lead to the incorporation of occupational risks in a global insurance contract for personal risks. This hypothesis is consistent with the rationale of employment described in this scenario: the task mode, which is becoming preponderant, is not easy to fit with reflections on the evolutions of companies in the long-term and in particular reflections on the prevention of occupational risks associating workers. Thus, it is immediate damage to health that is considered: health cover aims at the individual target to the detriment of collective and organisational prevention measures. This "individual target" tends to favour a global approach to occupational / personal life.

Prevention is weakened: primary prevention is eluded, the traceability of the occupational itinerary of workers and their exposures becomes very difficult. The role of the bodies representing the personnel is also evolving and is limited almost exclusively to advice and the defence of workers case by case.

The main unknown remains the attitude of the State and its commitment to maintaining public social order. In particular, in the five-year timeframe of the scenario, it can be imagined that a minimum social framework is guaranteed. It could result in prescriptive measures notably in terms of the prevention of occupational risks that rely on centres of expertise such as those which exist at present in the health insurance system.

Scenario 2: heterogeneous work organisations and statutory inequalities

Regarding companies that have chosen continuity, or more exactly a return to conditions existing before the health crisis, there are few changes in terms of occupational risk prevention. Nonetheless, the organisational changes initiated before the pandemic (increased working flexibility, evolution of employment conditions, increased utilisation of new technologies, etc.) is continuing and modifies prevention practices. In a global context marked by the need to have clear and precise rules, and still marked by the upheavals linked to the health crisis, the trend towards prescription by the public authorities is strengthening. This is achieved by the dissemination of "good standardised practices" by trade, branch of activity, etc., in such a way as to offset the disorganisation of collective labour representation and affect the different forms of work and employment that co-exist, while satisfying the employer's obligation to provide means (henceforth accepted to the detriment of the obligation of performance), with the risk of prevention becoming decontextualised.

However, the health crisis and its economic impacts have led some companies, voluntarily or by necessity, to adopt methods of organisation qualified here as atypical. Decision-making processes are much more fragmented, and the empowerment of workers has increased. Some of these companies have had recourse to standard ISO 45001 on occupational safety and health management. Two main trends can be observed in these atypical companies:

- a rather normative trend that privileges the obligation of means rather than performance, through an individualised approach, incorporating occupational health with public health, notably by way of personalised prescriptions that help to better integrate work time in personal time;
- another trend emphasising, on the contrary, collective responsibility for the prevention of occupational risks that is much more cooperative and oriented towards the long-term existence of collective labour organisations.

This separation between classical and atypical companies is not black and white: thus, in classical companies (as is already the case today) there may be teams, entities or establishments that undergo the influence of atypical companies more or less strongly. The term "soft" company can be used, a company with a hybrid status that escapes classification, allowing a targeted approach to prevention and insurance.

The role of bodies representing the personnel is obviously very different in both cases, with a risk of assistance for change in the first configuration whereas change is coordinated in the second case.

Institutional prevention evolves little but, faced with more varied organisational models than before the crisis, it may in some cases come up against problems of communicating prevention messages that must be increasingly specific and adapted to context. The increased lability of atypical companies can be a barrier to genuine reflection on working conditions which requires time to be really productive. The positive side is that the multiplication and wealth of emerging organisations bring to light innovative experiments that can be popularised and spread to all companies.

Scenario 3: flexicurity and flexibility of work organisations

Even with a timeframe of five years and following a rationale of flexicurity, the policy of ecological reconstruction implemented could generate major changes in the organisation of production in companies and thus in occupational risks. The responsible nature of new corporate commitments and the development of cooperation in new work organisations favour the emergence and dissemination of good prevention policies. This can be offset by the fact that in certain sectors, it may be necessary to engage important changes in production at a pace that makes it difficult to take prevention into account with the necessary perspective in a context of new work organisations with little experience of prevention. The ability of organisations to evolve also leads to considerable volatility regarding employees. The challenge therefore is to implement in the company a sufficiently strong prevention

culture so that it impregnates its operation permanently. This culture is one of the drivers of change, and is adapted to every level of the company, in training activities and all the operations of design, production and associated activities (maintenance, cleaning, etc.). This holds for both the industrial and service sectors.

The trend towards the local grouping of activities increases the importance of territorial decision-makers, which does not facilitate the participation of national labour organisations (unions, etc.).

The role of institutional prevention officers becomes essential: as much for the adaption of general prevention principles for all the systems taken into account as for assistance in implementation. Given the economic difficulties and the urgency of certain changes, care must be taken not to ignore the hypothesis that flexicurity is essentially based on systems such as social support for changes via strong reliance on training, the establishment of a minimum wage, etc., and that it gives sufficient importance to working conditions. In view of this, the bodies representing the personnel have an obvious role in supporting workers to manage change. They must verify at the national level, and at that of the company, that the guarantees that they have negotiated at the national level are implemented. All the stakeholders must be mobilised to avoid a “dictated” safety rather than one built with everyone.

Support for health and safety at work can be desirable at the individual level: it may be necessary to avoid the de-integration of certain workers depending on professional categories, as well as a function of their age. This will amount to a genuine revolution in relation to current practices often implemented only for a limited number of cases and too late.

Scenario 4: companies in survival mode and job insecurity

In a context of collapsing production structures (with the exception of activities essential to the basic needs of society), the operationality of systems ensuring occupational risk prevention is considerably hindered. Only the status of an administration such as the labour inspectorate allows it to continue playing a role, probably with lowered social standards. Social security ensures its role of insurer by limiting encouragement for prevention to calculating only the rate of occupational accident and disease contributions. The interest of personalised advice on prevention to companies is limited by the results that can be expected (a non-priority subject for the company, no exemplarity of solutions for dissemination, etc.). It can be imagined that prevention organisations still produce general recommendations, but without having the means to control their concrete implementation.

However, actors such as local authorities (from the municipality to the region) can still play a role of economic coordination. This is the case in particular for all informational activities, more or less rooted in a parallel economy at the level of a territory. It may be the Social Security administration in relation with these local authorities, with the resources available to it, to support actions to prevent basic occupational risks in the framework of an activity of maintaining social order.

The scenario describes strong social tension, probably manifested by the emergence of more or less structured workers’ collectives in addition to traditional labour unions. Labour conflicts (including regarding safety and health at work) can occur, even in a context of severe economic difficulties (mass unemployment). These conflicts more likely concern a very high accident rate (occupational accidents, the use of products with immediate toxic effects) than diseases appearing the long-term.

SHEET 3*: THE ISSUE OF MONITORING WORKERS’ STATE OF HEALTH

The procedures for monitoring the state of health of workers will no doubt undergo change in the coming years with regard to several factors:

- The shortage of occupational physicians which will continue,
- The new possibilities of sharing and tracing medical information provided by ICTs, with the development of teleconsulting.
- The search for better coordination between urban and occupational medicine for a more global approach but more focused on the individual to the detriment of seeking more collective prevention at the workplace: a more or less pronounced drift from an occupational health approach to one of public health.

Some of these evolutions have begun but the answers may differ according to the scenarios considered.

Scenario 1: All independent service providers in organisations operating in the short term

The medical follow-up of workers is complex insofar as they frequently change employer, they can possibly have several jobs and the status of self-employed now in development tends to pose this question to the individual, who is responsible for preserving their health. This issue could involve the development of a large-scale technological system allowing precise medical follow-up throughout a career (a hypothesis already considered but not implemented to follow-up temporary workers). However, in this scenario this option would doubtless amount to a public health policy aimed at the state of health of the general population rather than to the development of prevention actions at the workplace: primary prevention is the major forgotten component of such a system.

Scenario 2: Heterogeneous work organisations and statutory inequalities

This scenario is propitious to treatments differentiated according to the professions and employers. Although monitoring in the most traditional companies may be maintained in a relatively classical form, especially in the framework of a strategy of encouraging employee loyalty, new managerial organisations that greatly rely on remote working could make monitoring more complex, unless the health of workers is also monitored remotely. Recourse to service providers who are independent and work remotely is also possible: in this case as well, primary prevention via direct action on working conditions is the poor relation of the system.

Scenario 3: Flexicurity and flexibility of work organisations

The attention given to the employability of workers, their health and the prevention of professional de-integration is fairly propitious to strengthening the medical follow-up of workers. ICTs will certainly be used in this direction and could permit a link with preventive actions at the workplace. Indeed, an efficient monitoring tool shared between operators could facilitate the early detection of harmful situations and trigger actions in the field in the companies concerned.

Scenario 4: Companies in survival mode and job insecurity

The medical follow-up of the growing number of platform workers is complex and requires impossible investments due to the economic crisis, without mentioning the fact that the most hazardous activities tend to move towards the informal economy, thus becoming a subject of public health.

SHEET 4: REMOTE WORK AND PSR WORKSHOP

1. Definition

“Remote work” covers organised teleworking, improvised teleworking, digital nomads/mobility work, work on third sites, on different sites of the company, and remotely controlled work. All these situations can be found in the same company.

2. Teleworking

The main risks associated with teleworking are:

- MSDs (linked in particular to poor workstation layout);
- Sedentarism linked to over-connection (prolonged work in front of a screen leads to a static situation and less expense of energy), effects on the general state of health (notably metabolic disorders, increased risk of cardiovascular diseases, etc.) and also ocular problems (dry eye and functional myopia), effect on the locomotor system (spinal pathologies, MSD of the upper and lower limbs, etc.);
- PSRs (6 families of risk factors);
- Imbalance between professional and personal life.

Risk-benefit balance and the prevention of occupational risks

The approaches taken by the public health authority, based on the risk-benefit balance were obviously frequently used for decision-making during the health crisis. Their implementation prevailed in the context of the pandemic insofar as it can be considered that there is no such thing as zero risk. The coronavirus crisis highlighted the fact that these approaches are unusual in occupational risk prevention, especially at the level of the workplace and regarding working conditions for which the first objective is the elimination of risks.

The choice of imposing teleworking on a maximum number of employees in view to slowing down the propagation of the virus is characteristic of these risk-benefit approaches, insofar as the negative impacts on the physical and mental health of people are known. Justified at the level of the general population, these measures can have major impacts on the scale of the company and that of the individual.

Several transversal remarks on remote working:

- Situations differ according to whether the people working remotely knew each other or not. Recent episodes of obligatory teleworking concerned groups that had been formed already but made more complex by the integration of new arrivals in them;
- Remote working undoubtedly leads to more problems in an ephemeral group, although it can function for certain activities. Some companies succeed in operating in full remote mode, with their activity often carried out by “freelancers” used to such practices and who find fulfilment in the development of freeware, creative work or consulting – contexts in which autonomy in work takes precedence.

Remote working is less adapted for certain people for whom work is a structural factor on the psychosocial level.

THE POSSIBLE EFFECTS OF THE 4 SCENARIOS ON THE PSR FACTORS OF REMOTE WORKERS

Families of PSR factors	Scenario 1 All independent workers	Scenario 2 Heterogeneity	Scenario 3 Flexicurity	Scenario 4 Crises
Intensity and work time	The hyper-connection induced can jeopardise the separation of personal and professional life. The right of disconnection does not appear applicable to independent remote workers. This scenario is propitious for long working hours and atypical hours. For managers: Intensification of workload linked in particular to the constraints of coordinating teams remotely.	None of the different organisational changes considered in this scenario appear capable of protecting against the risk of hyper-connection and the intensification of work.	Supervision of work time possible.	Intensification of long working hours, especially for multi-activity workers. Development of task-work/crowd-working, self-exploitation phenomena.
Emotional requirements	Situation of complicated relations with workers finding remote work difficult. Exposure to digital incivilities. Relational quality impeded. **For the managers**: temptation to "dig in" behind management tools for protection.	Certain new forms of organisation (cooperatives, "liberated" companies) can encourage some workers to hide their emotions to conform to the expectations of the group.	"Prescribed values", possible marginalisation of those who do not adhere to the project.	Overexposure in trades faced with the human effects of the crisis in a context of fewer resources.
Autonomy	Autonomy reduced due the development of management and control tools and rating systems. Some skilled independent workers enjoy strong autonomy. **For the manager**: the increased use of ICTs in team management (for "control" and coordination) also reduces their leeway.	Unequal access to types of remote working. Imposed / irreversible remote working situations. Rigidity of management by ICTs. The situation is more favourable in organisations where workers are able to influence work organisation.	Possibility of increased prescription, imposed framework. Duality between designers and operators. Collective innovations dictated by restrictive ecological standards. Efforts to train workers favour good adaptation between skills and activity.	Increase of work with robots and algorithms in an unfavourable configuration for workers.

Labour relations	Break-up of labour unions but establishment of alternative networks of membership and support possible. Isolation of those who are excluded from loops of communication or strategy of avoidance chosen. **For the manager**: They are isolated from their teams.	Labour relations are deteriorated in “amnesiac” companies. The situation is more favourable in new organisations where workers are more involved.	Possibility of lack of democracy or harmonious dialogue. Possibility of changing the scope of social dialogue (territorial). Solidarity and mutual assistance remain values at work and in society.	Deterioration of labour relations due to workers obliged to compete with each other. Possible rupture between generations.
Conflicts of values	Competition between workers and assessment systems can lead to conflicts over ethics. Trades in contact with the public, especially in the social sector are particularly exposed.	This risk is greatly reduced in organisations where deliberation is present.	Risk of loss of meaning and the adoption of passive positions. Transition imposed on the ideological level (ecological transition), Retraining recommended.	**For the manager**: very strong conflicts of values, especially if they are required to profit from the vulnerability of certain sectors of the public. Bridges between formal and informal economies can lead to ethical conflicts
Insecure work situations	Increased feeling of insecurity in work situations including for the manager. Rating systems and their possible impacts further increase this feeling of insecurity. Lack of visibility of future activity.	Situations highly variable depending on the sectors of activity and types of organisation.	The insecurity of work situations is unequal depending on the sectors of activity. Reorganisations increase it but investments in new activities and training and assistance for retraining can lessen it.	Extreme insecurity, task-work, day by day, no visibility. **For the manager**: reduction of supervisory staffing levels, their role is often reduced to monitoring and management sometimes transferrable to digital tools. Managerial precarity.
Regarding prevention	In this scenario of placing workers in competition with each other, some of them cannot be reached by classical actors and prevention systems. New paths of prevention must be imagined for remote workers.	The inclusion of health and safety at work is very unequal depending on the organisation. It can be well integrated in the most participatory types of organisation.	In this scenario, some trade-offs can be unfavourable for the physical and mental health of workers. Situations can differ considerably according to whether the workers adhere or not to the transformations underway and esteem that they are given the means to cope with them.	Prevention is almost impossible in this scenario. If it exists it can only be individual and minimal.

3. Major challenges

- Massive and prolonged remote work has a negative effect on work teams and favours the development of PSRs in different categories, especially in the case of scenarios that aggravate situations in which workers must compete with each other.
- Isolation can be a major factor of exclusion: the loss of links with the work team, loss of meaning of work, demotivation, etc.
- On the contrary, remote work can favour inclusion by permitting access to employment or the prevention of occupational de-integration of certain segments of the public (disabled persons or persons with chronic diseases for example). However, it can also contribute to excluding certain segments of the public ill at ease with computer tools (in particular situations of digital illiteracy[4]).
- The previous point naturally raises the question of the need to adapt skills to assist the boom of remote working. Regarding the prevention of PSRs, the challenge of training is very high for workers as well as for managers whose role is greatly changed.
- The development of using ICTs as a means of controlling workers remotely is prejudicial, whereas these same technologies can be utilised to develop tools that favour collaboration and mutual assistance.
- New organisational models must therefore be built and the involvement of workers and their representatives in these approaches will be decisive for impacts regarding PSRs.

Some complementary elements can be found in [2], [3] and [4]

SHEET 5*: SECONDARY SECTOR: INDUSTRY AND BUILDING AND PUBLIC WORKS

Scenario 1: all independent service providers in organisations operating in the short term

Job insecurity (multiplication of short-term employment contracts, recourse to independent workers, etc.) has different impacts according to the sector concerned:

- In processing industries, companies have reduced the volume of the personnel they employ directly, but given the need to ensure the stability of their processes, they above all turn towards external companies, including for engineering. The latter have a core of very well-trained employees, completed, when necessary, by temporary personnel. The loss of technological expertise weakens client companies since they become dependent on external companies. This can lead to dead-ends when knowhow relating to older obsolete technologies has vanished.
- In companies manufacturing durable consumer goods, subcontracting aimed at small companies has developed, as well as the direct employment of pieceworkers and recourse to piece working; the trade-off between employment and automation occurs as a function of cost prices.
- For the building and public works industry, the trade-off between automation (especially for the prefabrication of components) and jobs is done as a function of cost, which pushes in the direction of standardisation that has already begun; recourse to subcontracting and piecework was already standard practice and could possibly by strengthened.

The development of piecework can result in an increase in the risk of occupational accidents and that of delayed pathologies such as MSD and cancers. Independent workers are supposed to organise their own occupational risk prevention: obviously, in most cases it is the degree of involvement of the client that will or will not provide them with the means to ensure such prevention. Increased subcontracting in the processing industries can be efficiently controlled by user companies if they make the means available, but there is a risk of losing traceability to exposure, which increases when the turnover of personnel in external companies is high. In the building and public works industry, the types of organisations linked to this scenario can result in increasing risks linked to coactivity (already high due to job statuses, and to problems of understanding linked to language and culture)[5]. In all cases, the mental load of supervision is liable to become heavier, possibly leading to an increase in PSRs.

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[4] https://www.lesechos.fr/tech-medias/hightech/un-francais-sur-six-touche-par-lillettrisme-numerique-1144339

[5] *These phenomena exist already, but the context of generalised independent work is liable to increase their scope and impacts on different pathologies linked to work.*

Scenario 2: heterogeneous work organisations and statutory inequalities

In both processing companies and those manufacturing durable consumer goods, only services not directly involved in production can consider adopting types of organisation providing more autonomy to workers (companies or parts of companies termed “liberated” that give rise to organisations in which employees are free and responsible in the actions they judge right to carry out). Likewise for the construction industry which is not concerned by these types of alternative organisation except for intellectual services or certain worksite meetings (implementation of full remote mode).

Types of cooperative organisation (democratic or in the collective interest) already existed in certain consumer goods production companies and especially in the building and public works industry. The context of this scenario may provide favourable ground for the emergence of new companies of this type.

A priori, there have been no specific changes in terms of working conditions and occupational risks for companies which, following the health crisis, return to the types of organisation that prevailed before. The least secure workers of the three sectors of activity are faced with the working conditions of described in scenario 1 and to the corresponding risks.

In the case of the building and public works industry in which labour shortages are endemic for certain trades requiring very high technical skills (for example, in demotics) or for obviously very dangerous trades, types of cooperative organisation may develop. However, will it help to take better account of working conditions?

Scenario 3: flexicurity and flexibility of work organisations

The three sectors considered will undergo the beginnings of radical changes to more sustainable modes of production and consumption, implying the conversion of the existing production system and the development of new units.

In industrial sectors, the rationale of shortening supply chains can result in the occurrence of new risks (which had been exported in view to relocation), either in the companies themselves, or in the subcontractors in France. The increased power of the circular economy should result in the creation of businesses dedicated to dismantling, recycling and repair, which will involve preventing associated mechanical, physical, chemical, and biological risks, etc. The evolution of construction (and to a lesser extent public works) towards more environmentally friendly construction techniques (energy saving) has been in progress since the end of the last century and changes will be less substantial.

The evolution of the productive system will be progressive and remain rather limited to the timeframe of five years chosen for this prospective project. It will certainly occur with intensive robotisation in newly created or relocated industrial activities. This obviously means that OSH is incorporated in the design of new installations (or the revamping of the oldest ones), but also that the training effort integrated in the principle of flexicurity treats it as important. In all industrial and construction activities, great attention should be given to the use of cobots due to the risk of hacking and to false feelings of security: physical risks and PSRs for example.

Flexicurity can involve sharing labour and thus specific efforts for workers to adapt to new conditions and work in good conditions that ensure health and safety.

Scenario 4: companies in survival mode and job insecurity

The operation of many companies has deteriorated: no investment, little maintenance, fluctuating operation with a background of breaks in supply and difficulties in selling products. We are witnessing the development of the informal sector.

All occupational risks are exploding in the formal and informal sectors, in a context where most prevention organisations and tools encounter operational problems.

SHEET 6*: AIRPORT ACTIVITIES

1. Context

The air transport sector has undergone exceptional growth over the last twenty years, with a slight downturn due to the global financial crisis of 2008, contrary to the crisis caused by the aerial attacks of 2001 (total destruction of the Twin Towers of the World Trade Center in New-York, the partial destruction of the Pentagon), which radically changed the organisation of air transport with the implementation of considerable measures and resources to ensure the safety of flights: the creation of strictly controlled access areas for the personnel and goods, the installation of passenger control stations, hand baggage, baggage in holds, the development of biometric passports, etc.

The pandemic of 2020 put a sudden halt to airline and airport activities, with a drop of about 70%.

Massive investment projects were postponed indefinitely for both international airports and aerodromes. Massive redundancy plans appear inevitable immediately economic support measures are reduced or stopped. It should be remembered that almost 250,000 people work at Roissy CDG airport.

National and European public authorities support airline companies (national) and the aeronautical industry, provided they reduce the footprint of air transport relating to greenhouse gas emissions. Huge investments could lead to the appearance of hydrogen engines by 2030, aiming at progressive deployment in the following decades. In parallel, current airplanes are sold for breakup for the spare parts market.

Airport activities are strongly impacted by the economic crisis. Layoffs will primarily affect the least skilled workers (security personnel, baggage handlers, cleaning personnel), although other trades will not be spared.

The cost of labour is significant for runway assistance activities, given that competition between international airports is fierce. The activity of runway personnel alternates between intensely busy periods and waiting and rest periods. The immediate programming of these activities is subject to the hazards of air transport (delays due to technical problems, rudeness, meteorological conditions, etc.). For the personnel, the distances between each workstation are considerable and travel times long. Finally, effective production time is relatively low for certain trades.

Technological solutions have been developed and tested for several years, in view to reducing labour or at least reducing non-productive work periods. Thus, technical solutions exist to guide airplanes approaching their parking places, towing airplanes from and to the ends of runways, and deploying boarding ramps. The issue of the correct positioning of airport equipment in relation to airplane fuselages appears to have been solved by technical solutions made essential with the generalisation of fuselages made of composite materials. Developments are in progress to make the mobility of a large number of airport vehicles autonomous, especially trolleys, loaders, baggage conveyors, passenger escalators, shuttles.

2. Perspectives

Remote working (scenarios 2 and 4)

Technological evolutions will permit the remote control of certain items of airport equipment. However, some activities will continue to require labour on site (cleaning cabins, loading certain holds, catering supply, fuel supply, airplane maintenance, etc.).

On the contrary, passenger reception will be ensured by machines and sales relations by a remote platform (scenario 4).

Work collectives (scenario 2)

The considerable increase in unemployment in the sector and its duration will lead to a drastic change in the work organisation of airport assistance. Despite this, validating innovative technical solutions takes a long time, which initially favours maintaining a work organisation similar to that ensured previously, while taking advantage of the crisis to adapt.

Supervision of labour relations (scenario 2)

The job market is not completely self-regulating since conditions of access to airport areas are strictly regulated. Administrative authorisations for employers and agents are obligatory. Flight security is primordial; it cannot rely on companies that “have sprung up from nowhere”.

Automation (scenario 2)

A large number of systems already exist or are being developed. The financial support of governments allows speeding up innovations and their deployment, with a lead-time of 5 years for international airports.

Social utility (scenario 2)

Territorial authorities are no longer capable of ensuring the management of smaller airports. Multinational companies specialised in service activities grasp the opportunities open to them in the framework of concessions lasting several decades.

Training (scenario 2)

Regulatory training in the framework of authorisations given to activities are required for all airport employees. In addition, with the introduction of new technologies, new professions emerge to control the different items of equipment, and ensure maintenance and repairs. Training organisations are obliged to merge since the diversity of supply has to adapt to a reduction in the number of employees to be trained.

3. Conclusion

The perspectives in the medium term are above all covered by the scenario “Heterogeneous work organisations and statutory inequalities” and then by the scenario “Companies in survival mode and job insecurity”.

SHEET 7*: LOGISTICS AND COMMERCE, INCLUDING LAST-MILE DELIVERY

Scenario 1: all independent service providers in organisations operating in the short term

Job turnover increases due to the effect of “day-by-day” production rhythms. Precarious employment is growing: temporary work, short-term employment contracts, mission contracting. On the contrary, it is difficult to attract and instil loyalty among skilled workers. To overcome this, job training contracts are developing.

Work is “distributed” in compartmentalised units: independent workers or service providers (couriers, security guards, transporters, franchises, etc.). Some workers are “mobile”, neither assigned to a site nor a single customer.

This leads to the multiplication (in time and space) of work interfaces linked to the compartmentalisation of actions. The number of trips linked to work is increasing.

This “dissemination” of activities results in the fragmentation of work collectives; collective apprenticeship and corporate culture are weakened.

The coordination of work is considerably complexified.

The development of e-commerce and the need to supply consumers with certain products urgently (fresh products, health products, etc.) increases the requirement of product customisation / place of delivery. Deadlines are shortened, flows are strained throughout the supply-chain; transport is the link under the most stress.

The concentration of last mile delivery constraints, the disappearance of sales points generated by the development of e-commerce, lead to the development of adapted storage (skyscraper warehouses, etc.) and pickup (orders, click and collect, etc.) solutions. Fabrication as close as possible to the client is developing (3D printing, etc.) to reduce stocks. The need to adapt to the availability of clients extends working times.

Automation has developed to satisfy the requirements of just-in-time manufacturing and also to "relieve" posts deemed difficult to fill. Work is becoming more intense in unskilled jobs (freight handlers, etc.). The "liberation" of tasks brought about by automation (replacement or discharge of employees, handling of activities by the client, etc.) leads to the increased surveillance of activities.

The loss of corporate culture and collective apprenticeship increases the number of risks: risks linked to organisation are affected in particular (falls, MSDs, PSRs, cuts, crushing, impingements following the use of equipment, etc.). Urgent transport-handling increases the risk of MSD-low back pain, in particular for unskilled operators.

The number of employees working atypical hours is increasing.

In some cases (most frequently linked to dysfunctions occurring to any point in production and distribution chains), the delivery person, for example, can be subjected to incivilities by the client. These elements, associated with the "continuous" surveillance of employees, increases PSRs. They propagate throughout the supply chain via the stress of the flows.

Road risks are increased by the constraints of delivery times and by the increased number of trips generated by employees with multiple activities.

Scenario 2: heterogeneous organisations and statutory inequalities

Two types of corporate organisation have developed to meet the needs of flexibility of the sector of activity: capitalistic type groups, which, depending on the case, rely on self-employment, and cooperative type organisations (shared platforms, groups of neighbourhood shops, etc.). The latter pay more attention to the quality of life and working conditions, which generate "social competition" between the different organisations. Furthermore, a feeling of injustice is developing among some employees: the COVID crisis has led to strong productive pressure, and those who were not eligible for teleworking were particularly exposed to the virus (platforms, shops, transport, etc.). Many of them consider that their situation has not been justly recognised or valorised. Disengagement from work has developed as have labour disputes.

Automation and robotisation are accelerating. The coordination of the entire supply chain has been optimised by the development of artificial intelligence. The demand for skilled employees is increasing.

The loss of collective structures and productive pressure leads to the development of accidents such as falls on the same level or linked to manual handling. Disengagement results in an increase of PSRs. MSDs and low back pain are also present.
To attract and keep "skilled" workers, companies pay special attention to their working conditions.

Scenario 3: flexicurity and the flexibility of work organisations

"The urban exodus" is continuing. Needs (consumers, companies) no longer remain in cities and are now distributed over the territory. The reduction of the density of workers in cities frees space for urban "logistics sites"; multi-use buildings are developing (storage / commerce / offices).

Local economic fabric is enriched: neighbourhood shops are revalorised, recycling/repair activities are increasing, production lines are grouped, etc. Encouraged by local authorities, clusters of territorial skills are set up, making it possible to respond to requirements for flexibility and agility. They are enhanced by shared training schemes for employees.

The different actors of the supply chain organise coordination spaces to facilitate their collaboration, "negotiate" their respective demands and better distribute constraints. The performance of cross-disciplinary processes is improved by the increased use of new technologies (the Internet of Objects, artificial intelligence, big data).

By seeking a "green" image", the logistics sector is becoming a lever for transforming industrial policies and energy transition: there is a return to "green" infrastructures (river and rail transport), "green" energies are being developed (solar power on warehouse roofs, "green" fuels", etc.). The use of electric vehicles and bicycles is developing around last-mile delivery units. The sector is becoming more attractive.

The fragmentation of "large" production units and the recent grouping of activities at the local level leads to a loss of knowledge regarding issues of health and safety. The dominant risks of the sector remain

(MSDs, low back pain). They can be reduced when the different actors involved succeed in coordinating with each other and limiting the "blind" repercussion of the requirements of each interface.

In certain cases, prevention will be considered as a stake of performance due to its inclusion in societal responsibility policies.

Scenario 4: companies in survival mode and job insecurity

Consumption, confined to essential products, is decreasing considerably. "Inessential" shops are closing. Consequently, the global load of logistic activity is reduced. The decline of the sector's resources results in the deterioration of infrastructures, but flows remain stretched. Companies group together or disappear. The companies that "survive" adopt an "abnormal" mode of operation. Delivery personnel refuse to enter areas reputed to be contaminated by Covid. Transport, the weak link of the supply chain, is hit by a major crisis. Many jobs are lost. For the unemployed, work is organised through "informal" workshops (dismantling, recycling, repair).

Employees are subject to difficult working conditions: their jobs are precarious, the conditions are arduous (heavy loads, fast rhythms, stress, etc.), long working hours, atypical working hours are the rule. They have very little continuous training. The control of employees' activity by ICTs is increased.

The image of the sector is greatly tarnished, companies find it difficult to recruit, absenteeism is increased.

Due to a lack of resources, automation has slowed down or is impeded. Only applications responding to requirements linked to the health crisis are developed (handling assistance, automatic cash desks, etc.) to reduce contacts between people.

The number of persons with MSDs and low back pain is exploding. "Classical" risks are developing (physical, mechanical and chemical risks), especially in repair/recycling activities. The number of isolated workers is increasing due to the extension of working hours. PSRs are present but are not recognised or followed up.

SHEET 8: PERSONAL ASSISTANCE AND CARE

This scope covers care occupations, health establishments and general practitioners, and the carers of dependent people in old people's homes and at home. Personal assistance activities that do not pertain to the health and social sector (gardening, schooling support) are not dealt with here.

Scenario 1: all independent workers in organisations operating in the short term

In this scenario, the sector will be faced with a major human resources problem. Structures will have difficulties in stabilising workforces and will have a structural need to call on independent labour. Working conditions in chronically disorganised establishments and the rules for remunerating work make the status of independent (self-employed) worker more attractive than that of permanent employee for certain professions. This sector of independent labour will be divided into two main categories:

- "declared independents": skilled care personnel who have chosen this status in order to choose their employers, depending on opportunity and situation,
- "independents by default": a pool of various and low skilled personnel, sometimes shared between establishments, sometimes working from a platform.

This configuration will not favour prevention for several reasons:

- The "declared independents" will not become involved in discussions on working conditions, since their rationale is to change establishment when a situation no longer suits them rather than attempt to improve the situation collectively. However, their independence could also allow them to express criticisms and recommendations about work organisation in a fairly voluntary way. They could be heard by certain establishments having particular need for them.
- Permanent recourse to a large number of sometimes poorly qualified temporary personnel will lead the managers of establishments to ensure that prevention relies on instructions, control and reporting rather than on the reality of the work done.

- This scenario may also give rise to situations of self-exploitation of workers who choose to accumulate jobs for financial reasons, in an assumed or endured way.
- If the shortage of labour is especially severe, independents sure of always finding work could be subject to risky behaviours (long working hours, addictions, non-conformity with procedures, etc.).

Good working conditions can also constitute a competitive advantage to attract and maintain the loyalty of skilled personnel.

In this scenario, the medical follow-up of workers and the traceability of exposures will remain complicated or be non-existent for independent workers: different contexts of exposure, no employer or different employers, many different workplaces, etc.

Recourse to digital technology in the sector is intensifying in particular to offset the difficulties mentioned above. The trend will certainly be the intensified use of ICTs to control workers' compliance with instructions: video-monitoring, geolocation, recording and feedback of data, to ensure that workers conform to the procedures and instructions both in establishments and in the homes of the persons cared for. Telemedicine will also develop, including recourse to health professionals based in other countries.

The transfer of a certain number of medical procedures to paramedical personnel (or from skilled paramedical personnel to less skilled personnel) will accelerate to cope with the shortage of medical personnel. ICTs will be used to assist and supervise this transfer.

Lastly, in this scenario the evolution of personal assistance and care activities to a "classical" service will lead to an increase of MSDs and certain psychosocial risks: loss of meaning of work, impeded quality, little autonomy, etc. The development of rating systems and quantitative indicators will contribute in particular to degrading the recognition of work.

Scenario 2: heterogeneous work organisations and statutory inequalities

In this scenario, adaptations of the three types of corporate strategy mentioned can be found in the health and social sector in forms that differ according to the types of structure.

- Large care establishments will be incapable of changing their modes of operation and will see some of their personnel leaving them for other types of organisation.
- Old people's homes may be more capable of changing and attracting a share of the workers arriving from large care structures. The latter could work as independent workers. The trend towards stronger medicalisation of old people's homes is compatible with this evolution.
- General practitioners could develop new structures such as Territorial Professional Health Communities (CPTS in French) encouraged by the government and the Social Security system.
- Regarding assistance and care at home, new and very varied forms of organisation could emerge, ranging from highly participatory forms integrated in a territory or district (Buurtzorg[6] type) to very remote intermediation platforms (algorithmic work management).

Regarding health and safety at work, each of the organisations will have specific consequences. Here, we underline only those which appear to be the strongest.

In the first case, large care establishments continue to operate according to a managerial mode that allows setting up formal collective prevention but causes major damage regarding PSRs: hindered quality, lack of recognition, reduction of leeway, etc. It is therefore probable that in this scenario, many professionals leave these establishments for structures in which they will have a say in work organisation.

Old people's homes will likely be run according to the same managerial lines as the large establishments although some of them could also evolve towards more collective modes of organisation permitted by their smaller size. These forms could be more favourable to prevention, provided that all the functions are involved (from the caregivers to the cleaning personnel) in professional dialogue.

The Territorial Professional Health Communities (CPTS) could also favour the occupational health of professionals as they provide an alternative to isolated practice and their organisation is based on the professions of those working in them. The quality of professional practice will therefore be better taken

[6] *https://fr.wikipedia.org/wiki/Buurtzorg*

into account and strengthened by the multidisciplinary nature of these structures (better management of timetables, rest time, better follow-up of patients, etc.). Operating in collective mode could lead to the development of strategies to respond to institutional injunctions while preserving working conditions. Some functions could however be more exposed to PSRs, for example, medical assistants shared by several caregivers.

Regarding home help, new forms of organisation could have contrasting impacts regarding prevention. Buurtzorg type structures would favour virtuous practices: collective organisation, capacity to innovate, meaningful work, recognition, etc. On the contrary, platform type organisations appear to present an unfavourable environment for working conditions in which prevention would be almost impossible: algorithmic organisation disconnected from real work, care activities managed as services, strong control through ICTs, perverse effects of rating systems, etc.

Scenario 3: flexicurity and flexibility of work organisations

This scenario includes a certain number of aspects capable of improving working conditions throughout the sector.

This is expressed in particular by a “return to trade”, meaning greater involvement by caregivers in the organisation and governance of the care-system. The objective of care will in some way take precedence over the economic objective. The actors will benefit in terms of human resources and autonomy. Indeed, the public investments used to manage professional transitions will result in the training of workers undergoing job-retraining who aim to work in local care and assistance professions which cannot be relocated, which provide meaning, and generate jobs due to the ageing population. These trades will therefore be revalorised in every meaning of the word. Choices regarding technological tools will be guided by the advantage they provide to professional practice (diagnostic aid, patient handling aid, etc.).

Scenario 4: Companies in survival mode and job insecurity

In this scenario, the sector will be severely impacted by the effects of recurrent crises.

This will result in several phenomena unfavourable for prevention:

- A shortage of skilled labour in health establishments, placing the personnel present under constant pressure with deleterious effects on their own health;
- The emergence of low-cost offers with, for example, the deterioration of accommodation and care conditions in low rent old people’s homes, or the development of “dependency tourism”, meaning the placing of dependent persons in establishments located in countries with cheap labour (Portugal, East Europe, North Africa);
- The platforming of home care with impacts of the same type as those in scenario 2;
- In this case ICTs will be used only to offset shortcomings at minimal cost. This will result in particular in the development of telemedicine to keep the ill at home, without visits from skilled caregivers. Moreover, the latter could be located in other countries.

This scenario, which could harm the working conditions of professionals in the sector, will also have an indirect impact on all workers since it will oblige many families to keep dependent persons at home due to the higher costs of structures and a considerable fall in purchasing power. The family situations of car workers will therefore change, resulting in problems of reconciling personal and professional life and the accumulation of exposures to certain risks. For the employees concerned the risk of developing PSRs and MSDs, and professional isolation in the long-term will be high.

Transversal challenges about which care must be taken regarding health and safety at work:

Projection in these four scenarios leads to the emergence of several decisive challenges for occupational safety and health and in the home care and assistance sector in the next five years:

- Managerial or skill-related trend? According to the priorities set for personal assistance and care structures, the impacts on the health and safety of the workers concerned will not be the same. Put bluntly, if the first objective is to make savings, deteriorated work situations will increase (lack of autonomy for care professionals, disengagement through loss of meaning or overwork), whereas if

the quality of care is the main objective the context will be much more favourable (major role of professionals in organising care).

- What uses for ICTs? As in many other sectors, the choices made regarding digital technology will have a considerable impact on working conditions. Will the tools be chosen and used to help caregivers to perform their work or be used to instruct and control it, or replace certain caregivers?
- What of the balance between work, skills and salaries? The levels of investment in training to improve (or maintain) the skills of professionals in the sector and the evolution of salary levels in these trades will be factors having an impact on the health of workers in the sector (importance for the dimensions of recognition, autonomy and a feeling of doing meaningful work).

SHEET 9*: ESTABLISHMENTS ACCOMMODATING DEPENDENT SENIOR PERSONS

These establishments group different types of activity (care, assistance for daily life activities, catering, cleaning, activity coordination, administrative management, etc.) carried out by skilled professionals, with very different qualifications, salaries and job statuses (auxiliary personnel, caregivers, nurses, coordinating nurse, accountant, secretary, manager, maintenance agent, geriatric caregiver, well-being and activities coordinator).

The advanced age care sector was already undergoing change before the health crisis to face problems linked to the ageing population, the shortage of professionals, care quality and the health of professionals (Health Plan 2020, changeover to digital technology, the future law on advanced age). The pandemic aggravated these difficulties, while making them visible and highlighting (once again) the social utility of these structures and the professionals who work in them.

1. Hypotheses of the evolution of the key questions chosen in the scenarios

Supervision of labour relations

The increased shortage of labour and growing demands could strengthen recourse to independent (self employed) workers (authorised up to now but largely subject to regulation), for periods or for specific economic acts (context of residents suffering increasingly from multiple pathologies), notably for professionals whose activity does not necessarily justify their permanent presence such as nurses and paramedical personnel.

Faced with this shortage and to reduce costs (for example, increased automation of certain tasks, cf. automation, below), more and more establishments could also pool the services of nurses in particular. The generalisation of the status of independent worker recruited in mission mode, and the absence of commitment regarding the duration of contracts nonetheless appears less plausible for certain trades (especially auxiliary staff and caregivers) and even risky in a probable context of labour shortage coupled with the need for continuity in caregiving over time. Regarding these posts, which require physical presence, less precarious types of contract could remain the norm to favour the sector's attractiveness.

All this could favour and accentuate the existence of different job statuses in old people's homes and generate risks linked to the challenge of stronger coordination and issues relating to developing the collective organisation of working hours, for example. Questions could arise over the stronger coordination of care that such an organisation would require, especially in the hypothesis of remote management (cf. remote work, below). Regarding this, the accelerated development of digital technology in health could provide an argument in support of such an organisation (cf. digital part, below).

It should nonetheless be noted that during the health crisis, actions by "professionals practicing in urban surgeries" raised issues since they were particularly exposed to the risk of contamination. This could also create a paradox in the case of a new epidemic and a source of stress for permanent professionals.

Social utility

The crisis reiterated the considerable social utility of these professions, insufficiently recognised as much regarding the resources made available for work as that of salaries. Whereas the risk of MSDs or PSRs

may appear vague, the "reality" of the risk linked to Covid19 could have instilled the feeling among certain caregivers that the hazard for them when carrying out their work was exacerbated.

The Ségur round table[7] on health declared the revalorisation of salaries for professionals working in old people's homes. But will this be enough to provide the recognition expected? The pursuit of disconnection between social utility and the means of recognition would be dramatic for the professionals of the sector (feeling of insufficient recognition, disengagement, etc.) who remain at their posts, likewise regarding the care provided for persons of advanced age in our society. Moreover, recognition should be accorded through additional resources for work, protection and manpower, especially to limit the physical and psychological impacts on caregivers' health.

Remote work

The most plausible scenario appears to be that of limited and targeted flexibility, since it appears difficult to envisage an old people's home without its caregivers. However, in a context of labour shortages and tight finances on the one hand, and the development of digital technologies on the other, an increasing share of the activities could be performed remotely via connected data collection systems. This might lead to mixed forms alternating face to face/distance assistance (inside and outside the old people's home), with distance or remote assistance devoted to administrative tasks and data processing. The benefits expected could be to cope with the lack of personnel and to limit physical contact during pandemics. The risks of such remote intervention are the total reappraisal of what a caregiver is (value conflicts) and an increasingly technical or organic and dehumanised approach, leading to a loss of meaning and disengagement. Indeed, the rate of occupational diseases could remain high or increase (PSRs, MSDs). The residents could be faced with a loss of quality in the service they receive. This would also require adapting training. A difficult period of transition between "older" and "younger" workers can be imagined.

Remote work can be considered for management, administrative and accounting activities (which is already the case for the large companies). The challenge will be to organise this remote management, without loss of meaning for the supervisors, since that which gives meaning to the activity of local managers is often their capacity, among other things, to regulate the problems of their teams. It will also be necessary to consider spaces in which these criteria can be regulated and discussed to give them meaning and avoid the risk of work controlled by indicators that risk not being fully representative of the value of work (quantitative criteria versus qualitative criteria, for example). These criteria must at least be debated with the teams and flexibility will be needed to integrate the whole wealth of that which gives value to work and fosters development. Perhaps assessment procedures that are not only based on results but also on the processes implemented should be favoured.

It is also possible that the procedures governing how the residents meet their families will evolve. Distancing the public could be the cause of conflicts and suspicion with the families. Lastly, if the latter were given direct access to certain data (video-monitoring images, etc.), the risk would be that the professionals remaining on site would have to manage more and more contradictory injunctions between the resident, the family and work instructions.

Digital technology and the digitalisation of old people's homes

Digitalisation in the area of advanced age brings together several questions: telemedicine; the deployment of information systems in health aimed at facilitating the coordination of care (management, traceability and interoperability between the actors of life-course and care (shared medical file, etc.), and telehealth (connected objects). The challenges expected regarding the development of digital tools are many: better coordination of actors, lower costs, coping with the shortage of professionals. The pandemic strengthened still further the need to proceed towards digital technology, especially because it allows remote working and breaking isolation. Action no. 20 ESMS of the 2020 health plan aims at helping medico-social structures to take this digital direction. Budgets were revised upwards for this purpose. Nonetheless, the crisis highlighted the need as much as the difficulties (National Conference of Old People's Homes). Although not generalised, telemedicine was used more than before. However, its use was limited due to lack of time, lack of resources (Wi-Fi, adapted equipment), the reticence of

[7] *Name of a negotiation carried out at national level, involving the State and the different actors (employers and workers) of the care organisations.*

certain general practitioners (fear of dehumanisation) and the ergonomic design of telemedicine interfaces. The same observation holds for care software which should have favoured coordination between professionals, but training and equipment were lacking through want of time (shared equipment causing health problems).

The transition had already begun and the pandemic will certainly favour the different utilisations of digital technology still more strongly in professions whose cultures are possibly opposed to them. Some way must yet be travelled so it becomes useful and not an additional source of problems for teams. In addition, greater participation of digital technology requires assisting the personnel, training and modifying the activity. Too often unaccompanied, "managerial logic, forgetful of the inherent demands of caregiving[8]" will have a strong impact on the activities of those who dispense it. Therefore, this development of poorly assisted digital technology could occur in the coming years accompanied with higher workloads, the deterioration of collective structures, and a loss of meaning. Indeed, the consequences of introducing technologies are often considered from the standpoint of the residents rather than from that of the caregivers. Few scientific studies have focused on the way in which these technologies are understood by employees in the healthcare sector (supervisors and caregivers) and in what way they can more or less modify their work practices. However, in other sectors, research has revealed possible impacts of introducing ICTs on work organisation and the activities performed could have an impact on the health of employees.

Labour relations and representation

Labour relations and representation are currently undergoing difficulties. It is nonetheless possible that they have built up strong resources from managing the lockdown despite being constantly reconfigured (absences, volunteers). Lessons could be learned from these aspects.

If the crisis persists, if professionals become exhausted, and divisions are created between those who resist despite everything and those who remain at their posts (the occurrence of strong conflicts between professionals), and/or the configurations of teams become ephemeral due to a higher turnover of personnel or a larger number of contracts with independent workers, there is an even greater risk of dissolution of the labour relations and representation at the origin of tensions and conflicts, and mental and physical overload. Some people in the sector wonder if digital technologies could provide support for developing new types of labour representation.

Automation of tasks and robotisation

Automation can be considered for certain tasks although it has encountered little acceptance in the sector (fear of dehumanising care). However, its introduction could speed up in a context in which professionals are in short supply (the sector is less and less attractive), lowering costs (salaries and also the payment of the occupational risk insurance contributions of personnel greatly concerned by health/safety problems), for example, the preparation and distribution of drugs, nowadays increasingly outsourced to pharmacies, could be performed by robots.

Two main types of robots have been developed: those aimed at the activities of residents and those aimed at the personnel. The latter can assist the personnel or replace it to do one or more tasks. For some, robotisation in the advanced age sector provides the opportunity to improve care (automated monitoring of health parameters, for example, robot companion for residents or stimulator) and, for the personnel, the elimination of arduous activities (handling, carrying) and eliminating repetitive activities to allow caregivers more time for relations with the residents (delivering meals, equipment, robots). For others, the issue is that of coping with the shortage of personnel and reducing labour costs. According to the website of the Mutualité Française, for example, "Medical follow-up could be improved and be freed of the need for the physical presence of medical personnel".

The "well-thought" introduction of a type of automation for certain tasks could relieve the personnel on site, provided that assistance and appropriate training are given. Over-rapid developments and application that fail to take into account the culture of the workplace or which follow a rationale dedicated solely to eliminating tasks and time-saving may not have the effects expected. Many "technical" tasks

[8] *In: M. Raybois - La santé des soignants altérée par les relations. Revue Pistes. Available from: https://journals.openedition.org/pistes/4072*

also provide the opportunity for proximity between the caregivers and the residents. Eliminating them would amount to increasing isolation and radically changing the values of the professions involved.

Training

The challenges of training exist in a context of labour shortage. New modes of access can be considered such as apprenticeship, to which federations are currently turning.

Challenges also exist regarding career prospects, very limited at present, and which limit still further the attractiveness of the sector, and can be the cause of conflicts in structures where the responsibility for carrying out many tasks is poorly defined.

2. Consequences for the sector of deploying the 4 scenarios

Scenario 1: All independent service providers in organisations operating in the short term

The professions closest to the residents, and the management, maintain classical modes of working face-to-face with non-precarious employment contracts. The other paramedical and medical activities are still partially carried out in the form of independent work. The modes of organisation do not change and the difficulties of the sector continue and persist due to the effects of a lasting pandemic. Salaries are moderately improved, in particular to prevent the personnel from leaving.

Scenario 2: Heterogeneous work organisations and statutory inequalities

The professions closest to the residents maintain classical modes of working face-to-face with non-precarious employment contracts. The other activities, paramedical and medical, are mostly carried out by independent (self-employed) personnel.

Administrative and management activities can be performed remotely, at least partially.

Feedback from experience linked to Covid is organised and the modes of organisation of structures is adapted diversely according to their needs. Training is organised to assist these changes. Some initial training courses are reviewed and the modes of access to certain professions are also reviewed to favour the arrival of new caregivers.

Some tasks that are time-consuming, arduous, or for which the risks of biological contamination are high, are automated.

Labour organisations have difficulty in forming and becoming a resource for health.

Salaries are improved and advantages for the personnel are introduced.

Scenario 3: Flexicurity and flexibility of work organisations

Feedback on practices linked to Covid are organised with genuine debates on how to cope with tomorrow and the future, and on participatory democracy including the residents. Posts are created and filled in particular by increasing salaries. In parallel, investments are made in preventing dependence and alternative modes of accommodation are developed to relieve the pressure on old people's homes, on the one hand, and provide them with better medical resources on the other. This occurs with training given to teams and the development pf career prospects. Digital transition is assisted and takes into account the needs of users with a great deal of feedback to satisfy them. The development of automation can continue in collaboration with professionals, for example with tools that aid the actions of their users. However, their introduction does not result in a reduction of the workforce.

Scenario 4: Companies in survival mode and job insecurity

The continuation of the health crisis limits the capacity of old people's homes to cope. Posts are declared by not filled. The transition to digital technology cannot be carried out correctly under these conditions. Establishments turn to automation but its development and implementation are complicated in a totally disorganised system. The personnel in place are exhausted, absent or are considering changing

professions. To offset this, poorly trained personnel are requisitioned and many independent workers are hired, leading to conflicts, despite the search for alternative worker representation.

3. Conclusion

This crisis should provide the opportunity to rethink the place of our elderly population by better valorising the professionals working in the sector, or by rethinking new modes of accommodation for old people (for example, operation in small units to reduce dehumanisation and possible massive contaminations). However, this cannot be done without economic support in particular. Failing this, there is a risk of working conditions deteriorating even more, which will impact on the quality of the care provided.

References of Part 3

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Part 4: SYNTHESIS OF THE MAIN CHALLENGES IDENTIFIED IN OCCUPATIONAL HEALTH AND SAFETY

All the sheets resulting from the different workshops feature in the third part of this report. Here, we present a synthesis of them.

The works performed in the workshops show the existence of several determinants common to all the themes mentioned in the sheets, liable to have an influence on the evolution of occupational risks and their prevention in these scenarios. Monitoring them over time can provide elements useful to decision-makers. For a given theme (personal assistance and care, remote work and psychosocial risks for example), these determinants will have a different (even contradictory) impact according to the scenario. Nonetheless, these determinants are not strictly independent from each other: the evolution of some of them will have an influence on that of the others. Their linking is decisive for understanding the challenges for health.

Five determinants have been identified:

- the use of technologies as tools for communication, collective work and automating production (industry and services);
- the modes of work organisation, especially notions such as working hours, the procedures of specifying task instructions, and agility;
- the job statuses of employees;
- the capacity[9] of workers to collectively comprehend issues of work, in particular through the formation and preservation of work collectives-;
- the control of work interfaces multiplied by the compartmentalisation of tasks.

The explicitation of these determinants is complicated by a synthesis of reflection on the evolution of the regulatory context of occupational risk prevention, focused on the occupational risk branch of health insurance.

1. The utilisation of technologies as tools for communication, collective work and automating production (industry and services)

The Covid-19 pandemic accelerated transformations in work already in progress:

- teleworking was subject to strong growth facilitated by the development of videoconference tools and data management systems;
- e-commerce also developed considerably in very different ways (home deliveries, take-away from shops and lockers, drive through service[10], etc.),
- regarding health, teleconsultations reduced the risks of transmitting the Sars-CoV-2 virus;
- etc.

The work done in the workshops concluded on the pursuit of this trend and increased recourse to technologies in the coming years in most of the scenarios. In terms of occupational risks, the experts linked them to the possible development of:

- psychosocial risks (PSRs) linked to the dehumanisation of work relations, greater demands and intensification, the loss of the meaning of work, also for certain professional categories such as management, due to the obligation to manage modes of work for which it is neither prepared nor trained, and for which the tools and procedures available to it are not always adapted;
- accidents associated with the development of e-commerce in logistics with falls, crushing, mechanical risks, road risks, physical and verbal aggressions, etc., as well as musculoskeletal disorders (MSDs) of the limbs and back, all resulting from lack of control of the tools used (transport, manual or semi-automatic handling of parcels, etc.) or the production system (faulty

[9] *Or the possibility remaining to them in certain particularly fragmented or atomised work conditions.*
[10] *Drive-through service: commercial service offered to customers allowing them to stay in their car.*

organisation unable to control the interfaces between the different steps, generating risks linked to the tools used or delays) or the consequence of excessive work-rates (or, on the contrary, an increase of sedentary work and static work).

However, the experts share a diagnosis: this increase in exposure to risks does not respond to any fatality. The transparent utilisation of ICTs, placing human factors at the centre of reflection, adapted by each company as a function of its specificities, associating employees with its initial implementation and to its adaption through time (which permits including the dimension of real work) may prove positive for the health and safety of employees. The productivity gains expected may be greater in a context of sustainable utilisation.

Another phenomenon occurred during the pandemic: awareness of the excessive dependence of States on imports from abroad, following the relocation of the production of numerous goods. In the hypothesis according to which the post-pandemic period will see the relocation in France of a certain number of production activities previously moved to countries with low-cost labour and minimal environmental requirements, new technologies permitting the automation of work will reveal themselves to be essential tools of prevention. Indeed, to manage certain chemical, metallurgical and recycling processes, among others, with very high emission levels of various pollutants, remote work or control allowed by automation is an efficient means of reducing the exposure of employees.

Another use of ICTs is in the area of construction. BIM (Building Information Modelling) is capable of improving work conditions as much for construction as for later interventions of maintenance, transformation and dismantling. It can participate in the industrialised production of certain elements of construction, manufactured in workshops and assembled afterwards, with the potential improvement of occupational risk prevention, since the risks are more easily controlled in fixed installations than on construction sites. The usefulness of BIM for light work and in later maintenance phases is obvious, since it permits better preparation of interventions and managing joint activities between companies.

2. Modes of work organisation, especially notions such as working hours, the procedures of specifying task instructions, and agility

The adaptation of the scenarios in the different workshops highlighted parameters in work organisations that are potentially generators of occupational risks, in particular PSRs: according to case, atypical hours, obstacles to the genuine separation between professional and private life, the intensification of work, poor relational quality, limited leeway, incapacity to take into account demands objectively justified by higher management, increased competition between colleagues (which reduces the protective efficiency of labour unions), conflicts of values (in particular for managers, sometimes caught up in conflicts of loyalty). In addition, the positive role of social support provided by labour unions is considerably deteriorated by teleworking.

Some deleterious situations can give rise to self-exploitation phenomena or to hiding emotions that are difficult to sustain over time. They can also lead to a generational divide, since teleworking conditions are much more unfavourable to young workers, as much on the material level (poorly adapted accommodation) as on the professional one (isolation, lack of network and tutorship, etc.). It is also necessary to take into account the difficulties that older employees have in adapting to new technologies. Likewise, gender-specific approaches can be appropriate, for example for the education of children or the distribution of tasks. All this can lead to generating a feeling of insecurity and a mental load harmful for working conditions.

Over the last few decades, the role of ICTs has progressively become more important in work organisation and this importance has grown even more considerably since the beginning of the health crisis. They are very efficient tools for sharing information, collaborative work, and enriching tasks. It is nonetheless vital that work organisation takes account of the modifications that using ICTs generates so that they can be used to facilitate the activity of the employees who must be associated with their installation. The impacts in terms of OSH differ according to whether ICTs above all respond to a managerial rationale or, on the contrary, a more specific approach intended to favour the performance of work on a daily basis. Naturally, these two examples can be reconciled.

3. The job statuses of employees

Although it still concerns only a minority (slightly less than 10% of the working population), the trend towards creating or transforming jobs with independent status was the subject of much discussion before the pandemic. The lockdown periods showed the social utility of the trades concerned (home delivery, personal assistance, etc.) but also the fragility of the status of micro-entrepreneur, in particular in terms of social protection. In the initial exercise driven by *Futuribles* and INRS, the evolution of this issue of independent work was already present as a factor to be taken into account in scenarios but its importance increased in their adaptations regarding the impact on OSH in the different workshops devoted to the subject.

Apart from the issue of social protection, the impact of compartmentalisation of tasks inherent to work organisations having recourse to independent workers was dealt with, for example, through:

- the inevitable recourse to the increased proceduralization of personal care activities (and their traceability) and its corollaries of hindered quality, lack of recognition and the reduction of leeway, potentially harmful for the quality of the service (including in its relational aspects), and of the employee (PSRs);
- the question of work pace; in some sectors of industry (notably in agri-food) it is pieceworkers (employees of specialised service providers) who determine the work pace on production lines; in certain robotised activities, the employee, the supplier of situational intelligence and dexterity can be subordinated to the work pace determined by the machine; these situations generate accidents, MSDs, PSRs, etc.;
- the impossibility of taking into account the constraints of individual work situations in platform activities (for example, cycle couriers) where the worker has no autonomy and cannot express their opinion to algorithmic organisations, or organise their own occupational risk prevention for which they are theoretically responsible, with known consequences in terms of claims;
- competition for sometimes high-level activities when the independent worker (expert, consultant) teleworks in France and finds him/herself faced by the offer of services originating from countries with low-cost labour (or other experts who have relocated) and finds him/herself obliged to turn to self-exploitation[11], in addition to a sometimes partial vision of the files processed, with all the possible consequences in terms of mental (loss of meaning) and physical (exhaustion) health.

However, the status of independent in itself may attract workers concerned with balancing professional and private life and who, either because their high skills are in themselves protective, or because they consider such a status for a limited time in their career, are not handicapped in their integration in the world of work.

Cooperative experiments (Scic and Scop type[12]) are still rare, but could perhaps thrive in the near future. Indeed, instead of the defensive role (cooperatives created to save a company threatened with closure) to which they have been more or less confined in recent years, they are increasingly adopted spontaneously by groups of employees gathered for a common project. The question of work conditions therefore plays a significant role in the vision that these cooperatives have of their work.

4. The capacity of workers to collectively comprehend issues of work, in particular through the formation and preservation of labour unions

As was seen above, remote working, the fractioning of careers, employment with independent status, the desire of certain employers to replace direct and individual relations with intermediation via bodies representing the personnel, or to set up individualised professional objectives, have, among other things, an effect of attrition on labour unions. However, ICTs can also contribute to

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[11] See the video of Alexandre Milicourtois in which we learn that the significant shift of a large number of managers to independent work in the United Kingdom was accompanied with a reduction of sal aries in the region of 25%. https://www.xerficanal.com/economie/emission/Alexandre-Mirlicourtois-Le-teletravail-accelere-l-uberisation-des-cadres_3749114.html

[12] Scic: cooperative company in the interest of its employees.

Scop: cooperative company formed by its production employees.

creating solidarity on another scale: mention can be made of the role of social networks in building new collective organisations between the employees of platforms that enable them to share their experiences and stand united before their “employers”. Sometimes, certain companies encourage setting up forums in which personnel of the same trade but dispersed geographically can exchange views, in order to share their experiences and improve their practices.

The health crisis represented a major negative parameter in the integration of new recruits and more particularly young ones. The growing use of ICTs and the determination of some companies to individualise their relations with their employees can be obstacles to the integration of new arrivals in workforces. This will certainly be a significant challenge in the post-crisis period: labour unions have an important role to play in occupational risk prevention, including to avoid conflicts between generations.

In addition to questions of integrating new arrivals, there is also the issue of transmitting skills and knowhow between generations. In the context of the growing proceduralisation mentioned above, the importance given to the transmission of both expert and practical knowledge, vital for the operation of companies and the prevention of occupational risks, may turn out to be inadequate.

Regarding the health sector, the development of CPTS (territorial professional health communities) appears promising in terms of public health, and in terms of occupational health for those working in them since they contribute to giving a meaning to work and also, when necessary, ensuring recognition for the real work done in the framework of a regulated activity. Another institutional structure found in the Netherlands, the Buurtzog[13], has reorganised care given by nurses into an organisation of small self-managed teams operating per sector, acting for the well-being of patients, caregivers and the public finances.

5. The control of work interfaces multiplied by the compartmentalisation of tasks

The importance of managing the interfaces between the different actors is increasing for production due to the diversity of professional statuses (permanent employment contracts vs precarious ones, user company vs subcontracting company, etc.), the increasingly strong trend towards prescription, agility pushed as a cardinal virtue, the pace of automation which sometimes take insufficient heed of the human component, the tendency for centres of decision to distance themselves from the field (with a reduction in volume and the shift in organisation from local supervision tasks to more management), the deterioration of labour collectives, etc. The prospective approaches resulting from the different workshops showed that controlling these interfaces also represents a major challenge in terms of occupational risk prevention because it leads to the avoidance of accidents, chronic and acute exposures to pollutants, difficult postures, etc. This control implies reflection is given to all the activities and their phasing and it goes beyond regulated aspects to also consider real work, formal and informal communication, adaptation and appropriation by the employees of work requirements.

Paradoxically, whereas the use of ICTs has never reached such high levels in companies and experts have reached relative consensus in considering that this use can only increase (independently of the scenarios considered in this study), the risk is to see the emergence of grey areas: i.e., places of interaction where risks linked to joint activity are high but where the responsibilities of each actor are blurred. They jeopardise the implementation of efficient prevention (insufficient feedback on incidents, failure to record occupational exposures, lack of transparency of actions, etc.).

All said and done, the health crisis does not appear to have produced new risks. However, it has speeded up the development of certain potentially harmful situations and the deployment of technologies poorly or insufficiently controlled. This constitutes a genuine challenge for the different actors of occupational risk prevention in the coming months and years.

Prevention policy and its actors

[13] *https://www.lemediasocial-emploi.fr/article/aide-a-domicile-le-modele-buurtzorg-inspire-les-employeurs-2019-12-09-07-00*

Among the different institutions studied, most of the reflection was devoted to the occupational risk branch of the health insurance system. By way of the contributions calculated for companies the system currently has powerful means to incite the implementation of the occupational risk prevention measures it recommends. Some scenarios consider a reduction or even the disappearance of this capacity through the separation of control and advice. In the case of a change to a competitive market, some private insurers could refuse to insure “wayward pupils”, considerably increase “premiums”, without the possibility of recourse, etc. The very notion of solidarity could be called into question.

If such a scenario became reality, new missions could be imagined for the occupational risk branch of the health insurance system: contribution to defining “good prevention practices”, participating in increased recommendations by the public authorities, supporting normalisation / standardisation approaches to prevention, participation in implementing public health policies with wider objectives including a share aimed at occupational health, etc. In a prospective rationale, this enumeration in no way prejudges the efficiency of these systems in relation to what exists already.

Part 5: THE ARTICLE "IN WHAT WAYS WILL WORK EVOLVE IN THE NEXT FIVE YEARS?" PUBLISHED IN HST (4TH QUARTER 2020)

The Covid-19 health crisis has shaken up work organisations which may have to adapt in the long-term to this context and its economic and social consequences. The association Futuribles International called on several different partners to identify subjects of concern for companies regarding the impacts of the crisis, in particular on work organisations from now to 2025. This article describes four scenarios of possible transformations and four paths of strategic reflection for companies, stemming from this prospective exercise. In addition, the INRS launched a phase of work on the resulting challenges of occupational safety and health whose results will be presented in a second article due to appear in 2021.

Confronted by the Covid-19 health crisis, companies and organisations have had to adapt their operation. Some of these measures are circumstantial (physical distancing), others are linked to the acceleration of changes that had already begun (teleworking), or call into question certain types of office layout (open spaces, large tower blocks in business districts) or work organisations (working hours, teams, etc.).

Although no one is able to predict the evolutions of this crisis and its impact, it seems quite probable that it will delay for several months a return to the economic and social functioning that prevailed. In every case, it seems desirable to reflect on the transformations for which it has already been the crucible in order, according to case, to prepare or favour them, or slow them down. It is in this framework that the work group formed at the initiative of the association Futuribles International, reflected on the possible evolutions of work organisations over the next five years.

After having created scenarios covering a timeframe of the next 18 months [1], following the first wave of the Covid-19 epidemic, the association Futuribles International asked its partners to inform it of their issues of concern regarding the impacts of the crisis on companies and organisations. Following this consultation, the first two workgroups were launched, each grouping ten members. One1 focused on the territories and lifestyles over the next five years, whereas the second, whose works are presented in this first article, focused on the transformation of work organisations within a timeframe of five years. On the basis of this work, the INRS started a second phase of reflection, consisting in deepening the associated challenges of health and safety at work which are not specifically dealt with in this article.

Methodology

The workgroup, managed jointly by the INRS Foresight and Horizon Scanning Unit and Futuribles International, gathered twelve representatives, members of the association Futuribles International. It performed this prospective exercise according to a tight schedule, by functioning only remotely (four videoconferences between June and September 2020). The objective was to supply elements of reflection to the other members of the association, starting in the autumn.

The method chosen was that known as "contrasting scenarios", which consists in identifying the main factors of change (key variables), studying them and associating them with hypotheses of evolution during the timeframe selected (in this case 2025), then combining these hypotheses to build scenarios. This work allowed identifying the main associated challenges that organisations must face in the next five years. Given the tight work schedule, the prospective landscape was deliberately limited to the study of six variables, formulated in the form of key questions:

1. What place will remote work take? According to what modalities?
2. How will labour unions and their coordination evolve?
3. How will the rules structuring work relations evolve?

4. What forms will automation take in industry and services (robotisation, robots, algorithmic management of work, etc.)?
5. Will the criteria of social utility affect the evolution of salaries, recognition and the valorisation of skills?
6. What changes in employee training can be considered?

For each key question (variable), a sheet was written jointly (by the INRS and Futuribles), according to a plan that took account of the trends already in progress, weak signals that have emerged in recent years, modifications occurring during the crisis of spring 2020, and the key uncertainties for the next five years[2]. This work on variables relies to a great extent on the elements resulting from previous prospective works, carried out by the INRS and Futuribles on questions of work: physical assistance robots in 2030 [2], production modes and methods in France in 2040 [3], platforming the economy in 2027 [4]. For each question, four contrasting hypotheses of evolution were formulated. The sheets were reread and commented by the different members of the workgroup. The group then collectively sketched the scenarios based on the hypotheses chosen. Once the scenarios had been written and validated, discussions were held on identifying the strategic questions that these possible futures raised for different organisations.

Four scenarios of evolution for organisations by 2025

As in all prospective works, the scenarios built in the framework of this exercise are aimed at describing possible futures. They are neither forecasts nor predictions, in no way do they aim at "telling the future". The scenarios must allow decision-makers to project themselves in a variety of possible futures to prepare their strategic choices. To be useful, they consider contrasting trajectories and do not seek to describe only desirable futures. The elements presented below represent the syntheses of the scenarios envisaged.

Scenario 1: all independent service providers in organisations operating in the short term

In this scenario, companies considerably modify their modes of operation. A large number of jobs were lost at the height of the crisis. At the moment of the rebound, they were replaced either by more insecure jobs (short-term contracts, temporary work, independents), or by automation. Indeed, companies and other organisations attempt to become as flexible and resilient as possible; this requirement dictates all the strategic choices made. This quest for permanent agility pushes towards increasingly ephemeral work organisations, where teams are formed for short periods, for example, for the duration of a construction site or project. This evolution is made possible by loosening labour legislation in order to combat mass unemployment. This ephemeral and outsourced operation in project mode is done to the detriment of corporate identity, which deteriorates due a lack of stable employees who share common values. Confronted by this risk, some companies develop strategies designed to increase the loyalty of their essential employees, to whom they grant advantages in terms of social protection and training in particular.

Scenario 2: heterogeneous work organisations and statutory inequalities

The second scenario is built on the context of crisis that lasts several semesters, in which employees and the political authorities both wish to see organisations evolve. The experience of lockdown and the development of working from home result in gains in autonomy for certain employees and teams, including those who continued to work on site while rearranging their organisation (shortening decision circuits, versatility, etc.). Furthermore, political decision-makers at both the local and national levels tend to encourage remote working due to issues like environmental impact and mobility management. Faced with these aspirations, organisations adopt different stances. The oldest companies and administrations reveal their "amnesia": they resist this movement and refuse to review their modes of operation. Others grasp this opportunity to review their organisation. In parallel, alternative forms of governance and management that provide more power to employees, which were up to now emergent, develop: cooperatives, "liberated" companies, etc. These heterogeneous situations increase inequalities and conflicts in the social fabric.

Scenario 3: "Flexicurity" and flexibility of work organisations

In the third scenario, the economy is undergoing a change assumed to last several decades, marked by the objective of ecological reconstruction. This implies revising the modalities of work organisation: companies organise real "post-Covid19" feedback from experience and put forward for debate the modalities of work organisation in the framework of internal social dialogue, while also taking account of their external stakeholders (subcontractors, local authorities, etc.). The objective is to better identify the reality of work in order to increase resilience, adaptive capacity, speed up decision-making processes, etc. A "flexicurity" policy is implemented; it allows managing the professional transitions that multiply due to economic changes. The job market is more inclusive and certain essential professions are revalorised.

Scenario 4: companies in survival mode and job insecurity

Lastly, in the last scenario, the health crisis continues throughout 2021 and to a lesser extent in 2022, with returns to more or less localised epidemics, resulting in a major economic crisis, probably the most violent of the industrial era. Companies tend to adopt circumstantial responses to adapt to the immediate situation, by turning to solutions they esteem are the best suited to ensuring their survival: subcontracting, recourse to temporary and independent workers. In some cases, the choice tends more to automation. Employment becomes more precarious in a conflictual social climate. The deterioration of the economic situation and the massive loss of jobs leads to a shift of a major share of activity to the informal economy. The platforming of the economy accelerates and extends to new sectors and new categories of workers, white collar employees are henceforth concerned and faced with globalised competition. Circular economy strategies (territorial industrial ecology) develop locally, aimed at making certain territories more resilient.

Four themes of reflection for companies

These scenarios therefore helped the group to respond to the initial demand which was to identify the subjects for which the crisis generated a new need for questioning for organisations. Here, we chose four. For each one, the trends at work in recent years are recalled, then the weak signals and the modifications generated by the pandemic, lastly the main challenges that companies will face during the next five years. There is also the essential question of remote working.

The essential question of remote working

→ Major trends

Teleworking was not very developed in France. The data of the Dares established that only 3% of employees practiced it regularly (at least one day a week) before the crisis [5]. The hope for its development is particularly strong among employees and the public authorities are quite favourable (Cf. Macron Ruling of 2017 [6]). The social partners have long demonstrated their reticence regarding its development, (public and private) employers due to their managerial culture which fits uneasily with "distance working", and the legal questions and computer security raised by working from home. In addition labour unions are attached to the voluntary and reversible nature of its implementation [8]. However, under the combined effect of the evolution of information and communication technologies (ICT), urban congestion phenomena (transport problems and rising property prices) and growing environmental concerns, the trend (even if rather slow in France) clearly shows a boom in remote working.

→ Emerging trends

The development of teleworking gives rise to new forms of organisation, like coworking (working in a third place), crowd-working (carrying out tasks remotely by independent workers), and full remote (companies with 100% of their employees working remotely). During the lockdown, the rate of employees teleworking jumped to 25% and many companies realised that they could continue operating in this configuration. Some of them even observed productivity gains on this occasion. But the effect of massive teleworking on company cohesion, the creativity of teams and the capacity for innovation were also discussed. What is more, they have led some companies to backtrack regarding the subject in recent years (Yahoo, IBM) [8].

→ What are the challenges for organisations?

The crisis had the effect of obliging a very large number of organisations to reflect on teleworking. It was the occasion for them to realise that this question can lead them to vaster and more strategic subjects, for example involving their managerial operation and their property policy. They will inevitably have to question themselves on the conditions of maintaining cohesion and a corporate culture within physically dispersed teams, on the modalities of remote management, the resulting changes in skills, and the conditions of integrating new recruits in such configurations. In addition, companies cannot carry out such reflection without taking into account their local environments: the place of installation of the company and residence of its employees, transport networks, the proximity of essential services, etc.

Choices regarding the autonomy of employees and teams

→ Major trends

Despite the considerable increase in the use of ICTs in work, the forms of organisation of companies have evolved little in recent years. “Silo” type organisations, so often criticised, persist, likewise for very hierarchised modes of functioning. A large number of normative processes (quality, labels, etc.) and functioning in project mode have been grafted onto these organisations in order to introduce a little transversal coordination, leading to matrix management structures. In these contexts, ICTs contribute considerably to intensifying work and often reduce the leeway of employees.

→ Emerging trends

Faced with these rigid modes of organisation sometimes leading to harmful situations (bullshit jobs[3], hindered quality, etc.), many workers aspire to greater autonomy and recover a sense of meaning to their work. However, one is obliged to observe that alternative forms of organisation that allow giving greater empowerment to operators remain relatively marginal at present. Cooperatives of the Scop or SCIC type, or “liberated companies”, concern very few employees[4]. Some deliberately choose (or are obliged to choose) the status of independent, which has undergone very considerable growth since the establishment in 2009 of the self-employment system. During the lockdown period, some workers benefited from shortened decision circuits, or were able to intervene in the organisation of work by freeing themselves from a certain number of procedures to maintain or redirect their activity. It was the context of emergency imposed by the crisis that led to this happening in several sectors. Mention can be made in particular of hospital services, textile companies adapting to produce masks, and cosmetic companies that produced hydro-alcoholic gels. These situations also strengthened the feeling of social utility among the employees concerned. Teams that switched to teleworking at one day’s notice also had to invent new working procedures, often autonomously.

→ What are the challenges for organisations?

Once the first lockdown had ended, the return “to the new normal” (not really the previous situation) in terms of organisation was not always easy. Companies will be led to considering the issue of autonomy, also because of its numerous links with other dimensions. On the one hand, with that of remote working mentioned earlier, since when employees remain at home there can be a strong temptation to exert control remotely over their activity, a possibility now allowed by new technologies via software that monitors the activity on the computers and telephones of employees [9-10]. These types of permanent control can have negative effects on the mental health of employees. The alternative which consists in operating solely on the basis of objectives, leaving employees completely free to choose how they perform their work, can also have negative effects if the tasks assigned to them are ill-suited to their skills. This is particularly true for young employees, who may need assistance from more experienced employees in performing a job they are in the process of discovering. On the other hand, in addition to remote working, all the issues regarding investments in new technologies can be analysed in part from this angle of autonomy given to employees. For example, this is the case regarding choices made for robotisation, which can prove to be as alienating for employees, if they cause the latter to adapt the work rates and characteristics of machines, as beneficial if these choices are used to lighten the most arduous tasks, while enabling employees to use their knowhow by maintaining control over their professional movements, as provided by certain “cobot” systems. Lastly, autonomy is an issue of dialogue in the company; social dialogue with

the employees' representatives, and professional dialogue within teams, to take into account the opinions and proposals expressed by teams to improve work organisation.

Revising policies of social and environmental responsibility and the perimeter of the strategy

→ Major trends

The phenomena of subcontracting and the globalised economy have accelerated constantly over the last decades. But the negative consequences of the activities of companies, whether social or environmental, have also been revealed, leading the public authorities to encourage companies to reduce them, and to voluntary approaches adopted by companies themselves. Corporate Social and Environmental Responsibility (CSER) policies have emerged in all the major companies, nonetheless without calling into question the trends of outsourcing the most arduous and pollutant tasks to small companies and countries with low-cost labour and less strict legislations. Furthermore, environmental policies have been developed in recent years, with more ambitious and specific objectives. On the social level, the higher level of education of the population has come up against a high level of unemployment and frustration is increasing among evermore qualified job seekers who find it difficult to find jobs that match their qualifications. Gaps in income have also widened between the intellectual professions, whose incomes have progressed more quickly than those of downgraded manual jobs [11].

→ Emerging trends

It can be seen that the negative impacts of certain economic models increasingly affect companies. The working conditions of company employees and those of subcontractors, as well as the environmental impacts of activities, come under greater scrutiny from civil society, consumers, the public authorities and shareholders, obliging companies to show concretely that they are acting to reduce these impacts. Apart from questions of image, companies are becoming aware that certain weaknesses in the organisation of their production can become genuine threats. This is the case, for example, of very long value chains dependent at certain points on too few suppliers concentrated in the same country that can be interrupted by external phenomena that they cannot control. The coronavirus crisis shed a stark light on this problem.

Furthermore, the crisis also highlighted that a certain number of skills essential to urban life were given little recognition and were poorly valorised in comparison to other professions nonetheless deemed less essential in times of crisis. The issue of better recognition given to these professions has become a subject of social concern and given rise to more claims in certain sectors.

→ What are the challenges for organisations?

Companies will therefore be driven to review their CSR (corporate social responsibility) policies in the light of this new context. They will undoubtedly have to better integrate these issues in their global strategy. They will also have to review their plans for continuing their activity by taking into account the lessons learned from the crisis. Regarding this, the importance to be given to certain essential functions that they perhaps neglected in recent years could be re-evaluated. For example, it could lead them to relocate certain subcontracted activities or to revalorise certain skills they became aware were essential. This reflection on their resilience will certainly lead to better account being taken of suppliers, subcontractors and clients, since the survival of the company through time also requires the preservation of its ecosystem. "Extended company[5]" type approaches could develop.

The evolution of employees' skills

→ Major trends

In many sectors, the divergence between the needs of companies and the skills of applicants seeking employment has been observed. This leads to labour shortage phenomena that could jeopardise certain companies and sectors. This problem of divergence is aggravated by changes in production modes linked to automation and ecological transition. They increase the need to regularly upgrade skills and resituate labour needs. The management of employees' professional transitions from sectors in which jobs are lost to those that create them is complex and requires considerable resources.

→ Emerging trends

Over the past few years, the needs for job retraining have increased substantially. Many jobs have been lost, especially in industry due to relocations and the increasing automation of production. The jobs created in the service sector during this period are not equivalent. They can be less qualified and less well-paid (handler in logistics), thus hardly attractive, or highly qualified (software developer) and thus difficult to obtain for persons undergoing retraining. The economic crisis that is starting will aggravate this problem and economic recovery plans risk coming up against these questions of availability of qualified labour in certain dynamic sectors. These phenomena lead major companies to be increasingly active regarding training, whether by creating their own initial training establishments, to ensure a supply of candidates for the skills they seek, or by investing in large internal systems to nurture the skills of their employees and be able to reassign them to new posts. Small companies do not have the same resources; their main tool for training and integration is apprenticeship. They therefore greatly depend on the image of their sector of activity and its capacity to attract candidates. The increasingly strong individualisation of skills management is also manifested by professional retraining approaches, at the initiative of people who voluntarily wish to change profession, notably in an approach to find meaning. It is possible that the crisis will lead to increasing these individual approaches.

→ What are the challenges for organisations?

Regarding this context Job and Career Path Management[6] will also have to be requisitioned in companies. In addition to the need to upgrade skills generated by the boom in ICTs, it must certainly be adapted to changes in management functions and the aspiration of employees to gain more autonomy and meaning in their work. Here again, companies may have to adopt a wider vision of their local environment, by collaborating with each other and the local authorities on the scale of their employment area to better manage their labour requirements. It could entail improving the possibilities of transition from one company to another, professional retraining for job seekers and solutions for sharing labour on the territorial scale.

Conclusion

Observation: the pandemic episode of 2020 will inevitably have an impact on corporate organisation. In many ways, this crisis acts as a catalyser of changes already underway in the world of work, and will no doubt drive companies to follow approaches aimed at updating their strategies regarding this new context marked by considerable uncertainty. The quest for resilience (rather than simply saying survival) will be their main objective.

The aim of this prospective exercise, carried out in a very modest format, was to rapidly provide them with elements to fuel their reflection. It permitted highlighting transversal issues that companies must transpose to their specific contexts, since one of the characteristics of the current economic crisis is that it affects different sectors of activity in very contrasted ways.

The challenges of occupational safety and health, which have returned to centre stage among the concerns of employers and employees [12], will no doubt occupy an important place in the post-crisis considerations that will take place. The INRS will deepen reflection on this subject to provide companies with specific elucidation on questions of prevention associated with these different strategic tasks. These elements will lead to a second article in a forthcoming edition[7].

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2. For Futuribles, the works conducted on the transformations of companies and work are gathered on this page: www.futuribles.com/fr/thematique/entreprises-travail/
For the INRS, all the prospective works are available on: www.inrs.fr/inrs/prospective

3. American expression meaning "stupid jobs", meaning jobs consisting in performing useless, superficial and meaningless tasks, popularised by the American anthropologist David Graeber in his work Bullshit Jobs *(Les Liens qui Libèrent, 2018, for the French edition).*

4. Scop: Participatory cooperative company. SCIC: Cooperative company in the collective interest. End of 2019, the Mouvement des sociétés coopératives has 3,439 active cooperatives throughout the territory and 63,000 cooperative jobs. Since the end of 2016, the workforce has risen by 18%. See: www.les-scop.coop/chiffres-cles

5. An extended company (also known as "network company") is a group of companies and economic actors associated to perform common projects. It essentially operates on the basis of alliances and partnerships.

6.Formerly GPEC: provisional management of jobs and skills. See: www.legifrance.gouv.fr/conv_coll/ id/KALISCTA000036870364/?idConteneur=KALICO NT000036872099/

*7. This second article will appear under the Benchmarking and prospective heading of the review: www.inrs.fr/publications/hst/veille-et-prospective.html**

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