

2 Health and well-being of the workforce

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This chapter presents the most recent data on health and well-being in the working-age population in OECD countries. It first recognises the importance of employment and working conditions on employee health and well-being. It then highlights widespread population exposures to lifestyle risk factors for health – such as obesity, smoking, harmful alcohol use, and level of stress – and assesses the distribution of non-communicable diseases (NCDs), including mental health conditions, in the working-age population. The chapter also sheds light on the disabilities caused by NCDs in the working-age population. Lastly, it assesses the effects of unhealthy lifestyles and NCDs on workforce participation and productivity.

Key findings

The nature of work, including safe work environment, job quality, work organisation, employment type and sector, and new forms of employment, influences employee health and well-being.

- Around 40% of European workers with a poor working environment reported that their work had a negative impact on their health in 2015. This was more than double the proportion (15%) among workers with a good working environment.
- Evolutions of the world of work – including new forms of employment and teleworking in the post COVID-19 pandemic – add new considerations for safety, health and well-being of the workforce, in particular with income insecurity and poor work-life balance.

Beyond work-related risks for health, lifestyle behaviours are key determinants of health in the working-age population, with 76% of all deaths in working-age people caused by smoking, poor diets, harmful alcohol use and physical inactivity. A sizeable part of the adult population is exposed to unhealthy lifestyles. Precisely, in OECD countries:

- Overweight and obesity, smoking, harmful alcohol use, and high levels of stress are major risk factors for non-communicable (NCDs) including cardiovascular diseases (CVDs), cancers, diabetes, musculoskeletal disorders (MSDs) and mental health conditions, that affect working-age people.
- More than half of the adult population (56.4%) is overweight or obese. Individuals with lower education are more likely to live with overweight or obesity, especially women.
- One in six adults (16.5%) smoke in OECD countries. In the majority of OECD countries, smokers can smoke at the workplace. In general, men and individuals with lower education are more likely to smoke.
- Nearly one in three adults (29.7%) report heavy episodic drinking at least once a month. After-work drinking can be seen by some workers as a means to socialise with colleagues. Women with higher education are 60% more likely to drink weekly than women with lower education, while this link is weaker in men.
- Two in five full-time employees (41.5%) reported being stressed. High levels of stress are leading causes for mental health conditions as well as CVDs and MSDs.

NCDs, including mental health conditions, greatly affect people in working age.

- In EU countries, about 43% of adults in working age reported suffering from MSDs, while 45% faced risk factors for mental health well-being.
- Every year, 3.2 million new cases of cancer are diagnosed in the OECD population of working age.
- Women and individuals with lower education level tend to report higher prevalence of chronic diseases than men and individuals with higher education, respectively, highlighting social inequalities in health.
- People affected by one or several chronic diseases may be limited in their participation in social activities and work, cannot fully enjoy their lives, and may have their quality of life altered.
- Cancers, MSDs and mental health conditions cause nearly half of the burden of disability in the working-age population. In addition, 47% of this burden falls onto the working ages (20-64).
- Long COVID-19 symptoms, such as fatigue, breathlessness, chest pain or anxiety that last weeks or months, affect about 10% of people who have been infected by COVID-19, especially older people, women, and those with overweight. Long COVID-19 is associated with absence from work and longer time before returning to work.

Conversely, health status affects work participation and productivity. Specifically, unhealthy lifestyles and NCDs have detrimental labour market outcomes, reflecting either a true effect of health conditions on employment and productivity, or discrimination towards people with unhealthy lifestyles and diseases, or both.

- Obesity is related to reduced employment prospects, and negatively affects productivity at work. Women with obesity are 68% more likely to miss work than women with a healthy weight, while this is not observed in men. The productivity loss associated with obesity-related diseases is equivalent to 54 million fewer full-time workers across 52 OECD, EU, G20 countries, which is similar to the number of employed persons in Mexico.
- Smoking has a negative effect on productivity of employees in the workplace through increased absenteeism and presenteeism, while also decreasing the likelihood of re-employment. For instance, current smokers in the United States have 28% more absenteeism than former smokers; this difference is 18% in five European countries while it is 61% in China.
- Evidence for direct associations between alcohol use and labour market outcomes has been debated, while a clearer pattern emerges between alcohol-related diseases and negative labour market outcomes.
- Having at least one NCD is associated with a reduced probability of being employed, for instance, workers with CVDs are 2.5 times more likely to leave employment due to disability.
- Having a NCD is correlated with additional days of sickness absence, varying for instance, from 2-10 additional days per year for workers with diabetes up to 80 days for workers with CVDs. Cancer survivors take 12 times more sick days in the first year post-diagnosis than healthy workers.
- Having a NCD tends to be associated with lower productivity at work. For instance, nearly 80% of workers who experience back pain also report working less than intended, with about one day missed per month. In general, the productivity loss due to presenteeism is higher than that due to absenteeism.

2.1. Introduction

Health and well-being are fundamental for enjoying a good and productive life. While health and well-being impact employment prospects and productivity at work, they are conversely affected by the nature of work. **This chapter aims to stress the importance of promoting health and well-being for the health benefits of working-age people, but also for better labour market outcomes.** Section 2.2 recognises the two-way relationship between health and work, and highlights how the nature of work affects health and well-being. Section 2.3 assesses adult's exposure to risk factors for health, while Section 2.4 analyses the distribution of chronic diseases, including mental health conditions, in the working-age population. Section 2.5 focusses on the burden of disability due to chronic diseases, and finally, Section 2.6 assesses the labour market outcomes of poor health.

2.2. How does the nature of work affect the relationship between work and health?

The relationship between health and work is bidirectional. The nature of work, including safe work environment, job quality, job demands, work organisation, employment type and sector, and new forms of employment, shapes and influences employee health (Saint-Martin, Inanc and Prinz, 2018^[1]). Conversely, ill-health and health conditions can have negative impacts on the productivity of employees and their participation in the labour market (as discussed in section 2.6). This section focusses on the various aspects of work that can affect employee health and well-being (Box 2.1).

Box 2.1. Definition of well-being

This report captures some aspects of the well-being of employees through various lenses (e.g. physical and mental health and job satisfaction). Throughout the report, well-being of employees refers to a general feeling of satisfaction and fulfilment in and through work that encompasses but goes beyond the absence of physical and mental health problems. Well-being at work relates to an individual experience (either physical, emotional or psychological) of situations and constraints of the work environment. For instance, well-being at work makes a person be motivated and more prone to taking initiative. Therefore, well-being at work is directly related to the level of work productivity. Other definitions of employee well-being may vary, including experience beyond work. For instance, the US National Institute for Occupational Safety and Health defines worker well-being as a subjective and objective phenomenon inclusive of experiences both within and beyond work contexts (Chari et al., 2018^[2]).

The OECD Framework for measuring well-being and social progress refers to well-being as a multi-dimensional concept that spans across income, jobs, health, housing, social connections and other dimensions (OECD, n.d.^[3]). The component of well-being captured in this report refers to as “subjective well-being” of the OECD Well-Being Framework, where subjective well-being measures refer to a specific category of self-reported measures that evaluate good mental states, including all of the various evaluations, positive and negative, that people make of their lives and the affective reactions of people to their experiences.

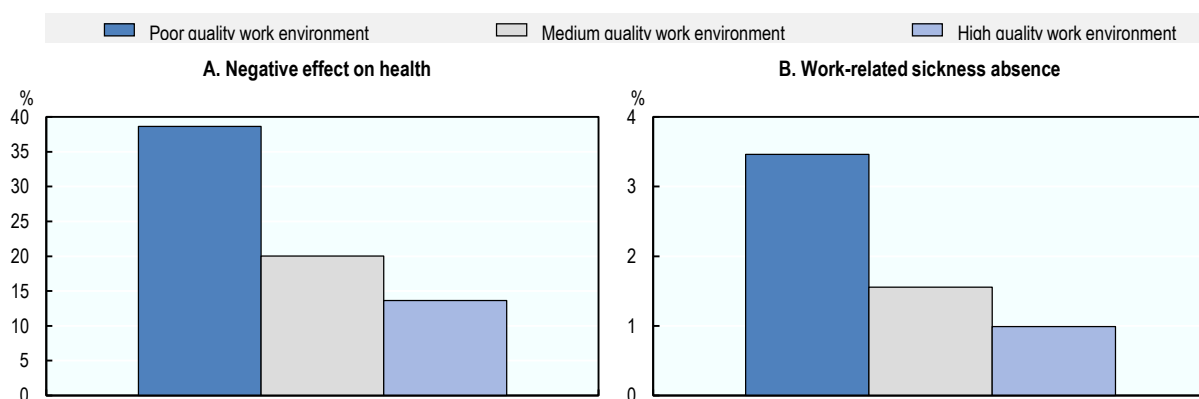
Safe work environment is essential for ensuring employee health and protecting from occupational diseases and injuries. Standards and legislation relating to health and safety at work have existed for decades at the international, national and sub-national level, requiring employers to ensure a safe work environment, free of recognised occupational hazards (such as chemicals, heavy load carriage, work stress and strain) (Chapter 4). Work-related diseases and injuries accounted for 1.9 million deaths worldwide in 2016, of which occupational injuries represent 360 000 deaths (WHO and ILO, 2021^[4]). A number of diseases, including cancer, respiratory diseases, cardiovascular diseases (CVDs), musculoskeletal disorders (MSDs) and mental health disorders, can be caused or made worse by occupational safety and health risks. Workplace exposures that contribute to the development of diseases include: dangerous substances (e.g. chemical and biological agents, including carcinogens), radiation, physical factors (including vibration, noise, manual lifting, sedentary work), and organisational and psychosocial risk factors (e.g. shift work, stress).

Job quality is a determinant for employee health and well-being. While being in good quality work generally acts to protect against ill-health, not all jobs are equally health-promoting. A poor quality and insecure job with inadequate pay and no access to sick pay, for example, is likely to offer little protection against ill-health and instead may have adverse impacts on health. Job quality that encompasses adequate earnings, job security, and good-quality working environment, are essential for ensuring health and well-being of workers (James, Devaux and Sassi, 2017^[5]; Saint-Martin, Inanc and Prinz, 2018^[1]). Differences in the nature of work by socio-economic status also reflect in the social gradient of health. Individuals of lower socio-economic status are more likely to have less secure jobs and lower quality jobs that have an adverse impact on health (Institute of Health Equity and Public Health England, 2015^[6]; Saint-Martin, Inanc and Prinz, 2018^[1]). **High job strain is a major cause of health problems, both mentally and physically.** A working environment characterised by high job strain (i.e. where demands on employees exceeds the resources available to the employee), as defined the by the OECD’s Job Quality Framework (OECD, 2018^[7]), can also have a negative impact on health. As shown in Figure 2.1, analysis of data from the 2015 European Working Conditions Survey, shows that around 40% of workers reporting a poor working environment said that their work had a negative impact on their health. This is more than double the proportion (15%) among workers with a good working environment. Characteristics of working environments with high job strain include low autonomy, physically demanding work, long working hours,

night shifts, and high frequency of workplace conflicts. In particular, **long working hours are harmful to health**. There is strong evidence that long working hours can increase the risk not only of accidents, but also a wide range of health issues, such as stress, mental health conditions, stroke and heart diseases (James, Devaux and Sassi, 2017^[5]). The **organisation of work** – ranging from the leadership of senior management to the managerial practices of immediate line managers – also has a strong impact on job quality and subsequently health. For instance, social supports, including community, co-workers, and management support and recognition, have a positive effect on worker well-being and reduced stress.

Figure 2.1. Poor quality working environments have an adverse impact on health at the workplace

Self-reported health and incidence of sickness absence by work environment quality in the EU-28, 2015



Note: Based on proportion of respondents reporting that work has a mainly negative effect on their health and self-reported information on the number of days of sickness absence. In a poor quality work environment, there are more job demands than job resources; in a high quality work environment, there are more job resources than job demands; and in a medium quality work environment individual job demands equal individual job resources.

Source: OECD (2018), *Good Jobs for All in a Changing World of Work: The OECD Jobs Strategy*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264308817-en>. OECD calculations based on the 6th European Working Conditions Survey (2015).

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Evolutions of the world of work – including new forms of employment and teleworking- add new considerations for health and well-being of the workforce. Non-standard employment – such as part-time, temporary or self-employed employment, in particular new forms of work (such as gig workers, platform workers) – is becoming more widespread and creates new opportunities and challenges for the world of work. For instance, flexible hours and shorter working hours can help to achieve better work-life balance. However, workers, especially casual and on-call workers, have limited control over when and how often they work, resulting in work-related stress, income insecurity and poor work-life balance (ILO, 2017^[8]). In addition, the rise of teleworking, in the post COVID-19 pandemic, adds new considerations as also discussed in Chapter 4. For instance, while well-managed telework offers benefits (such as flexible working arrangements), it may also pose new challenges (such as long working hours, social isolation and mismanagement) putting employees' physical and mental health at risk.

Employment type and sector also affect employee health. Health risks at work vary by occupation type and sector, resulting in diverse health needs of employees depending on the nature of occupational health risks, be it physical, mental or psychosocial, to which they are likely to be exposed to through work. As an example, although both health care workers and agriculture workers may be at high risk of musculoskeletal disorders, the repetitive motions they execute are not the same, as such the prevention measures need to be adapted to the sector (OSHA-EU, 2019^[9]). The health care sector, which employs a large share of the total workforce, has specific health risks in particular concerning MSDs and mental health conditions (see Box 2.2).

Box 2.2. Health risks faced by the health care workforce

In European Union, health care sector includes 10% of the total employment force, which includes work in hospitals, health care facilities, in-home and community care (OSHA-EU, 2014^[10]). Assuring good working conditions is essential to providing safe care to patients and to the reputation of the health sector – and hence the ability to recruit people to this type of employment as well as retain health care professionals throughout their working lives. This is a particularly acute challenge for health care workers in the long-term care sector, which is characterised by high insecurity; high incidence of non-standard forms of work (temporary contracts, part-time contracts and shift work); and significant physical and psychosocial risk factors (OECD, 2020^[11]). In general, MSDs and mental health conditions are two particularly important types of illness affecting the health and well-being of many health care workers and causing a significant impact on their productivity.

Musculoskeletal disorders

Sectors characterised by demanding physical effort, like the health care sector, have higher prevalence of MSDs than occupations that require less physical effort. Based on European Working Conditions Survey data, 47% of employees working in the human health and social work activities experience back pain, while 46% experienced upper limb pain in the past 12 months (OSHA-EU, 2019^[9]). Furthermore, findings from Danish Working Environment and Health study from 2018 showed that 37% of nurses and 46% of social and health care assistants experienced musculoskeletal pain on weekly frequency, compared to 32.5% of employees from general working population (National Research Centre for the Working Environment, 2018^[12]).

Mental Health

Poor mental health in the health and social care industry has been well documented. Heavy workloads, long shifts, a fast pace, lack of physical or psychological safety, chronicity of care, moral conflicts, perceived job insecurity, workplace conflicts, and lack of social support, are risk factors that add to the mental hardships experienced by health and social care professionals (Søvold et al., 2021^[13]). The workers from the health and social sector are particularly affected by poor mental health. For instance, in the United Kingdom, the rates of poor mental health in the health care industry is a third higher than the average rates across all industries (de Bienassis, Slawomirski and Klazinga, 2021^[14]).

Prior to the COVID-19 pandemic, across OECD countries, on average almost half (46%) of long-term care workers were exposed to mental health risks, including severe time pressure or overload of work, violence or threat of violence, harassment or bullying (OECD, 2020^[11]). Furthermore, risk of psychiatric illness among physicians were high, with suicide rates reported to being 5-7 times that of the general population (Ventriglio, Watson and Bhugra, 2020^[15]).

During the COVID-19 pandemic, many of the existing mental health concerns among health and social care workers became exacerbated from the intensification of the risks caused by the unprecedented demand put on the health systems. During the first wave, the limited availability of protective equipment and high risk of infection for medical workers added to the mental distress provoked by the pandemic. In fact, evidence from a systematic review covering health care workers from 21 countries identified high prevalence of moderate depression (21.7%), anxiety (22.1%) and post-traumatic stress disorder (21.5%) among health care workers during the pandemic (Li et al., 2021^[16]). In 2020, 58% of the respondents of a US physicians survey reported feeling burned out, showing an increase of 12 percentage points as compared to 2018 (40%) (The Physicians Foundation, 2020^[17]). The same study highlights that 18% of physicians have increased their use of medications, alcohol or illicit drugs as a result of COVID-19's effects on their practice or employment situation, raising concerns about risks of substance use. A Canadian study found that frontline workers were more likely than others to report suicide ideation since the COVID-19 pandemic began (Liu, Capaldi and Dopko, 2021^[18]).

Note: More details can be found in the discussion paper by OSHA-EU: Musculoskeletal disorders in health care sector.

Source: European Agency for Health and Safety (2020^[19]).

Well-being of employees is interrelated with work conditions, including job quality, and mental health. There is a clear relationship between workplace stressors (e.g. high job demands, long working hours, low job control, job insecurity) and mental health. High work intensity coupled with limited control over one's work, poor work-life balance and weak support from co-workers and management, deteriorate workers' health and well-being (Saint-Martin, Inanc and Prinz, 2018^[1]). Workplace stressors are shown to increase the odds of reporting poor physical health or having a physician-diagnosed illness (Goh et al., 2015^[20]). Conversely, workers who experience high job satisfaction as well as feeling engaged by their work, also report experiencing less anxiety and stress, and connect it to better mental health. For instance, in a US study, employees who perceived their work as both meaningful and satisfying, reported less anxiety and stress (Allan et al., 2016^[21]).

Employee health and well-being is thus significantly associated with safe work environment, work conditions and more generally the nature of work. Beyond work environment, employee health and well-being are also affected by lifestyle habits that individuals carry in their daily life, inside and outside workplaces, and that are key risk factors for chronic diseases such as diabetes, cancer, cardiovascular diseases. The next section explores these risk factors in the working-age population.

2.3. What is the share of people exposed to risk factors for chronic diseases in the working-age population?

Lifestyle behaviours and working conditions are key determinants of health in the working-age population. Main drivers of non-communicable diseases (NCDs), including comorbidities,¹ are population ageing and unhealthy lifestyles such as unhealthy diet, physical inactivity, sedentary behaviours, smoking, and harmful alcohol use. The Global Burden of Diseases data show that **smoking, poor diets, harmful alcohol use and physical inactivity are responsible for 76% of all deaths** occurring between ages 20 and 64 in OECD countries in 2019 (IHME, 2020^[22]). In particular, smoking and poor diets account for 53% of that burden. In the work-health nexus, occupational risks exposure (e.g. chemicals, heavy load carriage, work stress and strain) is another main health determinant to consider. For instance, long working hours and workplace exposure to air pollution are responsible for, respectively, 750 000 and 450 000 deaths worldwide (WHO and ILO, 2021^[4]). The rest of this section examines population exposures to four main risk factors for NCDs (overweight and obesity, smoking, harmful alcohol use and level of stress) in OECD countries. Table 2.1 summarises this data and classifies countries by level of risk exposures. The first three indicators include the overall adult population (because the data on working-age population was not available), while the indicator on level of stress focusses on full-time employees.

Table 2.1. Heatmap for lifestyle risk factors

	Proportion of overweight and obesity, 2019 (or nearest year)	Proportion of smoker, 2019 (or nearest year)	Proportion of heavy episodic drinking, 2016 (or nearest year)	Proportion of full-time employees reporting stress, 2017-19
Australia	65.2	11.2	36.0	41.3
Austria*	51.1	20.6	33.2	41.7
Belgium	55.4	15.4	32.2	43.3
Canada	59.8	10.3	21.2	50.3
Chile	74.2	24.5	21.6	42.0
Colombia			15.3	40.0
Costa Rica		4.2	13.9	47.7
Czech Republic*	58.4	18.1	42.1	31.5
Denmark*	51.0	16.9	29.8	19.0
Estonia	51.3	17.9	41.8	18.7
Finland	67.6	13.0	28.3	40.0
France	49.0	24.0	31.2	47.0
Germany	60.0	18.8	34.2	46.7
Greece*	57.2	24.9	23.6	63.3
Hungary	67.6	24.9	33.5	38.3
Iceland*	65.4	8.2	28.0	37.5
Ireland	61.0	14.0	37.8	51.0
Israel	50.9	16.4	17.1	36.7
Italy*	46.4	18.6	22.1	58.0
Japan	27.2	16.7	22.8	45.0
Korea	33.7	16.4	30.5	40.0
Latvia	58.7	22.6	44.3	27.3
Lithuania*	55.0	18.9	49.3	33.0
Luxembourg*	48.4	16.8	48.4	48.0
Mexico	75.2	7.6	18.1	43.0
Netherlands*	48.4	15.4	27.5	30.3
New Zealand	65.1	12.5	32.0	36.7
Norway*	48.0	9.0	32.0	41.3
OECD	56.4	16.5	29.7	41.5
Poland*	53.3	17.1	35.1	24.7
Portugal	67.6	14.2	26.6	47.7
Slovak Republic*	57.7	21.0	36.2	48.0
Slovenia*	56.5	17.4	37.5	34.7
Spain*	50.2	19.8	25.6	46.0
Sweden*	49.1	10.4	28.0	38.3
Switzerland*	41.8	19.1	35.6	38.0
Türkiye	64.4	28.0	1.5	60.3
United Kingdom	64.2	15.8	29.8	43.3
United States	73.1	10.9	26.1	57.7

Note: * Measured overweight and obesity, rather than self-reported. Countries are grouped by the level of risk exposure (light blue for lower risk levels, and dark blue for higher risk levels). Heavy episodic drinking is defined as at least 60 grammes or more of pure alcohol on one occasion.

Source: OECD Health Statistics 2021 for obesity/overweight and smoking; (OECD, 2021^[23]) for heavy episodic drinking; (Gallup Analytics, 2021^[24]) for level of stress.

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More than half of the adult population (56%) was living with overweight or obesity on average across OECD countries, in 2019. This proportion varies from 27% in Japan to 75% in Mexico (Table 2.1); with in general, men displaying higher rates than women (OECD, 2021^[25]). Individuals with lower incomes were two to three times more likely to live with overweight or obesity than those with higher incomes, especially among women (OECD, 2019^[26]). Overweight and obesity are major risk factors for NCDs including diabetes, CVDs and certain cancers. Overweight-related diseases are expected to cause life expectancy to be 2.7 years shorter, than it otherwise would be, on average in OECD countries over the next 30 years (OECD, 2019^[26]). Poor diet – such as high consumption of sugar, fat and salt- accompanied with lack of physical activity and sedentary lifestyles have contributed to growing obesity rates. Overweight and obesity rates have been increasing over the last decades, making overweight a top public health challenge. Over the next 30 years, overweight and obesity will be responsible for 70% of all treatment cost for diabetes, 23% of treatment costs for CVDs and 9% of cancers, on average per year. In total, OECD countries will spend 8.4% of their health budget to provide treatment for overweight-related NCDs (OECD, 2019^[26]).

One in six adults smoke in OECD countries. In the majority of countries, smokers can smoke at the workplace. Eighteen OECD countries do not have national ban on smoking in indoor offices, while 6 countries have designated smoking rooms allowed under legislation and 14 countries have a national ban (WHO, 2020^[27]). Smoking is a leading cause of multiple diseases such as cancers, CVDs, respiratory diseases, and premature mortality. Yet, 16.5% of people aged 15 or over smoked daily across OECD countries in 2019 (Table 2.1). Smoking rates are not spread evenly in the population. In general, men smoke more than women (OECD, 2021^[25]). And, individuals with lower education smoke more than individuals with higher education, with an 8-percentage point difference on average across OECD countries in 2017 (OECD, 2019^[28]). Smoking-related diseases incur medical expenditure and lost productivity cost. The total economic cost of smoking is estimated at USD PPP 1 852 billion in 2012, which corresponds to 1.8% of the world's annual Growth Domestic Product (GDP). In high-incomes countries, this is estimated at 2.2% of GDP (Goodchild, Nargis and Tursan D'espaignet, 2016^[29]).

Nearly one in three adults report heavy episodic drinking in OECD countries. In 2016, 30% of adults in OECD countries engaged in heavy episodic drinking at least once within a month – that is drinking at least 60 grammes of pure alcohol per drinking occasion, or the equivalent of more than 80% of a bottle of wine or 1.5 litres of beer per occasion (Table 2.1). Men have higher rates of heavy episodic drinking than women in all countries (OECD, 2021^[23]). Individuals with higher incomes tend to consume more than those with lower incomes, this association being especially strong among women. However, the disparities in alcohol-related harms are to the disadvantage of people with lower socio-economic status. In some countries, alcohol consumption is part of the workplace socialisation mechanism (Pidd et al., 2006^[30]). After-work drinking may be seen by some as a mean to socialise with colleagues, potentially increasing opportunities for professional contacts, networking, work responsibilities and promotion. While some studies supported that moderate drinking was associated with higher earnings (MacDonald and Shields, 2001^[31]; Peters, 2004^[32]; Lee, 2003^[33]; Hamilton et al., 1997^[34]), more recent studies suggest this association would be an artefact (Lye and Hirschberg, 2010^[35]). Women who are increasingly represented at higher socio-economic positions, tend to drink as much as men. This is also reflected in drinking disparities: in OECD countries, women with higher education are 60% more likely to drink weekly than women with lower education, while this link is weaker in men (OECD, 2021^[23]). Harmful alcohol use is responsible for heart diseases and strokes, liver cirrhosis, certain cancers, injuries -such as road traffic crashes-, and foetal alcohol syndrome. Over the next 30 years, harmful alcohol use will be annually responsible for 87% of all treatment cost for alcohol dependence, 35% of treatment costs for cirrhosis and a significant share of treatment costs for injuries, cancers and other diseases. In total, about 2.4% of annual health expenditure will be devoted to treating alcohol-related diseases in OECD countries (OECD, 2021^[23]).

Two in five full-time employees report stress in OECD countries. Occupational psychosocial risks and stress are leading factors for mental health conditions as well as CVDs and MSDs. Long working hours

(over 55 hours per week) are associated with a 17% higher risk of death from heart diseases (Li et al., 2020^[36]). Across OECD, about 10% of employees usually work 50 hours or more per week (OECD, 2020^[37]). Long-term stress increases the risk of mental health problems such as anxiety and depression, substance use problems, sleep problems, pain, physical tension, and heart diseases. Two in five full-time employees (42%) in OECD countries reported being stressed² in 2017-19 (Gallup Analytics, 2021^[24]), with variation from less than 20% in Estonia and Denmark to more than 60% in Türkiye and Greece (Table 2.1).

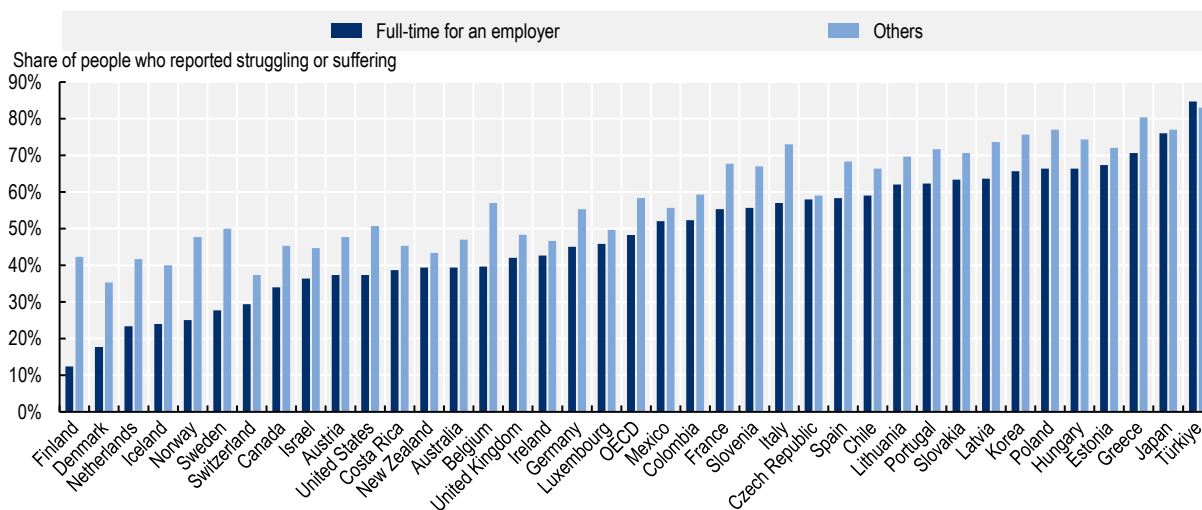
2.4. What is the share of people experiencing physical or mental health conditions in the working-age population?

In the world of work, the two most predominant conditions reported by workers are MSDs and mental health conditions. For instance, when interviewed about their most serious work-related conditions, workers in the EU were most likely to report MSDs and mental health conditions (European Agency for Safety and Health at Work, 2021^[38]).

MSDs are highly prevalent in the population of working age. MSDs are injuries or disorders of the muscles, nerves, tendons, joints, cartilage, and spinal discs. Work-related MSDs include, for instance, back pain, diseases of the neck, upper and lower limbs. The labour market and working conditions have evolved, in particular toward more digitalisation and faster and more complex work, which has led to more repetitive tasks and more work in prolonged static positions, for instance while sitting at an unadjusted workstation or in a home office (European Agency for Safety and Health at Work, 2021^[38]). Occupational ergonomic stressors such as repetitive motions, forceful extensions, non-neutral postures and vibrations from tools are risk factors for MSDs. In the European Health Interview Survey (EHIS) 2019, the interviewees were asked to report chronic diseases they had over the past 12 months. MSDs were the most commonly cited. Precisely, among those aged 15-64, 43% reported low back disorders, neck disorders or arthrosis, in 2019 (Eurostat, 2022^[39]).

Poor mental well-being affects close to half the working population. Mental health conditions are estimated to affect around one in five people at any given time (Steel et al., 2014^[40]), and an even greater proportion of individuals – including among workers – report high levels of mental distress. In EU countries, nearly half (45%) of the employed people reported facing risk factors for their mental well-being at work (Eurostat, 2021^[41]). The risk factors for mental well-being at work that were commonly cited, were time pressure, work overload, dealing with difficult customers, patients, pupils and job insecurity (Box 2.1). About the same proportion (48%) of the full-time employed workers declared suffering or struggling with life, in OECD countries (Figure 2.2). This varies widely across countries, from less than 20% in Finland and Denmark, to more than 70% in Greece, Japan and Türkiye. This proportion is 58% among people that are not in full-time employment. The COVID-19 crisis has further intensified the mental distress that many workers face and further deepened the challenges facing individuals with mental health conditions. Across all OECD countries where data were available, population mental health – captured by prevalence of symptoms of anxiety and depression – deteriorated at the onset of the COVID-19 crisis (OECD, 2021^[42]; OECD, 2021^[43]). Although trends in mental health differ across countries and surveys, a survey by Eurofound has found that the mental well-being of employees was lower in spring 2021 than in both spring and summer 2020 (Eurofound, 2021^[44]). In Canada, the proportion of adults with symptoms of depression, anxiety or posttraumatic stress disorder, raised from 21% to 25% between fall 2020 and spring 2021 (Statistics Canada, 2021^[45]).

Figure 2.2. Share of workers suffering or struggling with life

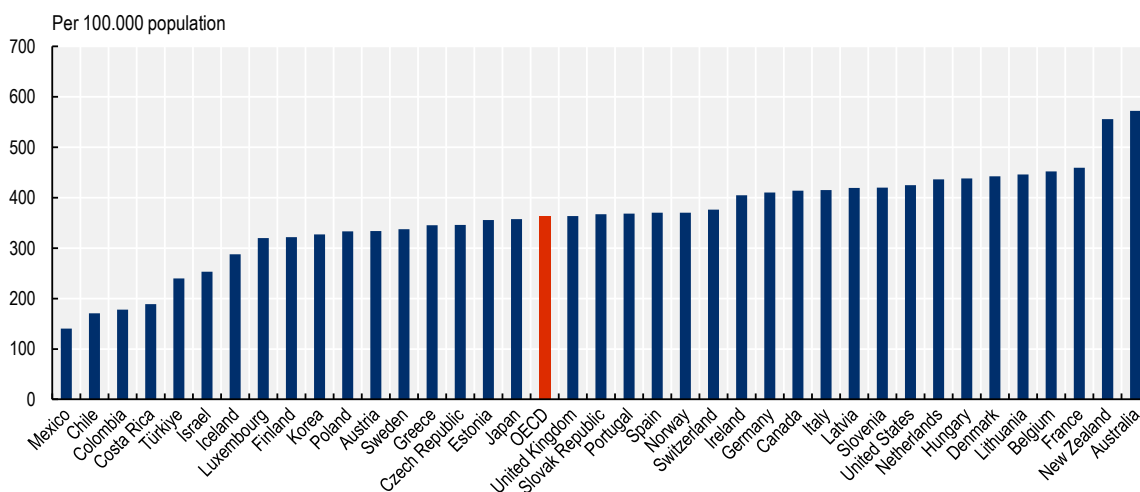


Note: The 'others' category includes all other categories of people (e.g. part-time employed, self-employed, unemployed, out of the workforce). Source: Gallup analytics, average of 2017-19. (Gallup Analytics, 2021^[24]).

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Cancer is another prevalent health condition in the working-age population. Cancer is a leading cause of mortality, accounting for a quarter of all deaths in OECD countries in 2017. Common cancers are lung cancer, colorectal cancer, breast cancer and prostate cancer. These four represent more than 40% of all cancers diagnosed in OECD countries (OECD, 2019^[28]). Among people of working age (20-64), the incidence rate of all types of cancers varies from 140 per 100 000 in Mexico to over 500 per 100 000 in New Zealand and Australia, with an average across OECD countries around 362 per 100 000 population (Figure 2.3). This corresponds to more than 3.2 million new cancer cases³ diagnosed every year in the population of working age in OECD countries. Earlier diagnosis and treatment significantly increases cancer survival rates. For example, Australia and New Zealand which have the highest rates of cancer incidence, have below average mortality rates, and above average five-year net survival (OECD, 2019^[28]).

Figure 2.3. Incidence of all types of cancer, people aged 20-64, 2020



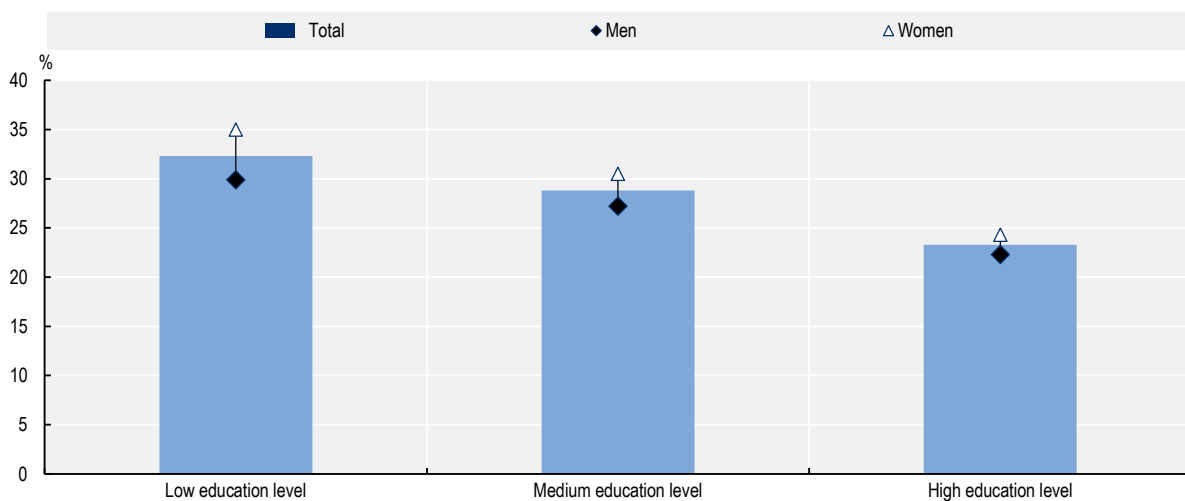
Note: Crude rate. Source: (IARC, 2022^[46]).

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Beyond MSDs, mental health conditions and cancers, other chronic diseases and conditions affect people of working age. In the EHIS 2019 survey, when asked about their chronic diseases, people of working age reported -beyond MSDs- high blood pressure (13% of those aged 15-64), high blood lipids (9%), respiratory diseases (8%) and diabetes (4%) (Eurostat, 2022^[39]). The presence of multiple chronic diseases is common, and increasing with age. Almost one in four people of working age (24%) lived with two or more chronic conditions across OECD countries in 2014 (OECD, 2019^[28]).

Women and individuals with lower education level tend to report more chronic diseases. Health conditions are unevenly spread across genders and education levels. Among people of working age, in EU countries, women reported more often than men having a long-standing illness or health problem. The gender gap was 3 percentage points (29% of working-age women versus 26% of working-age men) in 2020 (Eurostat, 2022^[39]). There are also important social inequalities in health. People with lower education were 39% more likely to report a long-standing illness or health problem than those with higher education (32% of those with primary level of education versus 23% of those with tertiary education) (Figure 2.4). Both men and women display similar patterns of social inequalities in health. Such social inequalities in health are also found in OECD non-EU countries. For instance, in the United States, in a sample of 30-64 years-olds, people with less than bachelor's degree have greater multimorbidity than those with bachelor's degree or higher (Johnson-Lawrence, Zajacova and Sneed, 2017^[47]). In Canada, nearly 18% of adults with less than high school education reported being diagnosed with at least two chronic diseases, compared to 7% of those with post-secondary graduate education, in 2019 (Public Health Agency of Canada, 2021^[48]).

Figure 2.4. Share of people having a long-standing illness or health problem, by education level, people aged 16-64, EU countries, 2020



Note: Low education level refers to “Less than primary, primary and lower secondary education (levels 0-2)”; Medium educational level “Upper secondary and post-secondary non-tertiary education (Levels 3 and 4)”; and High education level “Tertiary education (Levels 5-8)”.

Source: (Eurostat, 2022^[39]) based on the European Union Statistics on Income and Living Conditions survey 2020.

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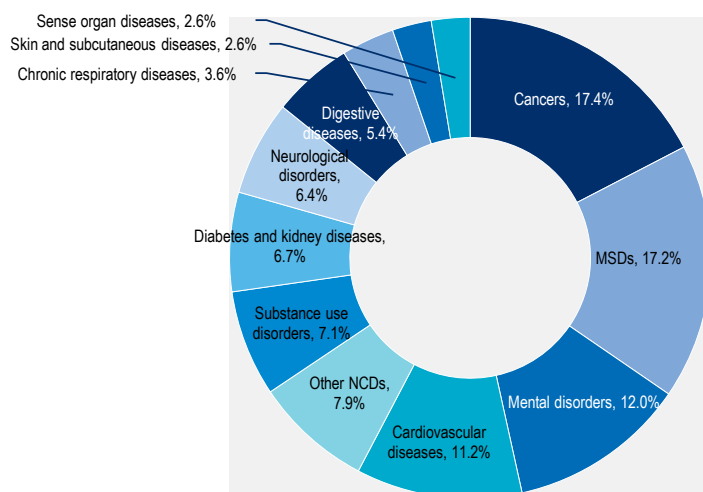
Public budget spent on treating NCDs is large. An analysis based on the OECD SPHeP-NCD model estimated the treatment cost for NCDs among people of working age (Annex 2.A). In total across 38 OECD countries, USD PPP⁴ 562 billion are spent annually on treating NCDs in people aged 20-64 years, which is similar to the GDP of Sweden.

2.5. What is the burden of disability from chronic diseases in the working-age population?

The burden of disability affects as much the working-age people as older people. People living with one or multiple chronic diseases are likely to develop impairments as the diseases progress, which may limit their participation in social activities and work, alter their quality of life and prevent them from fully enjoying their lives. The burden of disease borne by individuals is measured using the disability-adjusted life years (DALYs), a measure taking into account both premature mortality and quality of life. It is estimated that 339 million disability-adjusted life years⁵ (DALYs) are lost every year because of chronic conditions in OECD countries, this represents 85% of the total burden of any diseases in OECD countries. **Nearly half of the disability burden (47.4%) occurs in ages 20-64**, while another 47.4% is concentrated in ages 65 and above, and 5.2% in ages under 20 (IHME, 2020^[22]). While workers are projected to work longer and the workforce is ageing, the burden of NCDs-related disability is a key challenge for the world of work and for societies more in general.

The burden of disability from chronic conditions in people of working age is caused primarily by cancers, MSDs and mental health conditions. The Global Burden of Diseases data show that in 2019, across OECD countries, the top-three leading disability causes in people aged 20-64 were cancers, MSDs, and mental health conditions, followed by CVDs, substance use disorders, and diabetes and kidney diseases (Figure 2.5). Cancers and MSDs account respectively for 17.4% and 17.2% of the burden of NCDs-related disability in the age group 20-64, while mental conditions and CVDs account respectively for 12.0% and 11.2%. Other groups of chronic diseases cause between 2% and 8% of the burden. Cancers rank as the top leading cause of disability. Compared to MSDs and mental health conditions – that were often reported in working-age people (Section 2.2) – cancers can cause premature mortality and heavily weigh on years lived with disability.

Figure 2.5. The burden of disability by NCD group, ages 20-64, OECD countries, 2019

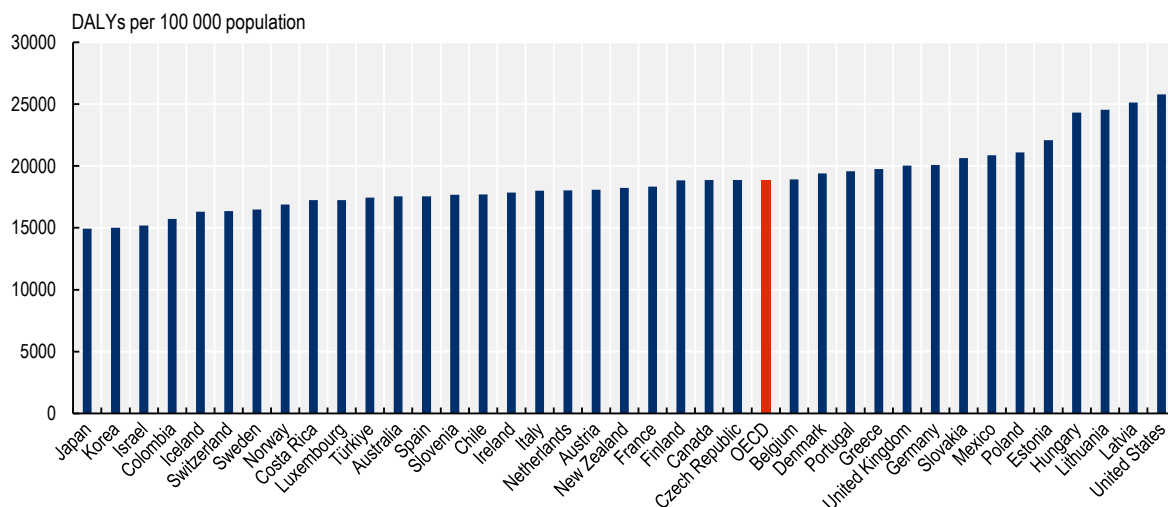


Source: (IHME, 2020^[22]).

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Nearly 19 000 life years in good health per 100 000 population are lost due to chronic conditions every year in the OECD population aged 20-64. The burden of NCDs-related disability in the population aged 20-64 is measured at 18 860 DALYs per 100 000 population on average across OECD countries in 2019. About 60% of this burden is attributable to years lived with disability while 40% is attributable to years of life lost. In other words, 60% of this burden is caused by lower quality of life due to diseases, while 40% is caused by premature deaths. This estimate varies widely across OECD countries. The largest rates are found in the United States, Latvia, Lithuania and Hungary with more than 24 000 DALYs per 100 000 population, while Japan and Korea have lower rates (with 15 000 or less per 100 000 population) (Figure 2.6).

Figure 2.6. The burden of NCDs-related disability in ages 20-64, by country, 2019



Source: (IHME, 2020^[22]).

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Long COVID-19 symptoms that last weeks after the infection has gone can cause long-lasting impacts on the health of workers. Although the burden of COVID-19 is outside the scope of this report, post-COVID syndrome or long COVID can have long-lasting impacts on the health of workers. These long-term symptoms include fatigue, breathlessness, chest pain or anxiety, which can result in extended absence from work and an increased risk of exit from the labour market altogether (Box 2.3). Long COVID-19 symptoms affect about 10% of people infected by the coronavirus. While the full scope of the labour market impacts of long COVID remain unclear, given the large number of workers potentially affected, it is an emerging issue in workplace health.

Box 2.3. Long COVID-19 and its consequences

Long COVID-19 is characterised by a range of symptoms – including fatigue, breathlessness, chest pain or anxiety – that can last weeks after first being infected with COVID-19. People affected by long COVID have more difficulties returning to normal life, with potential long-lasting social and work consequences.

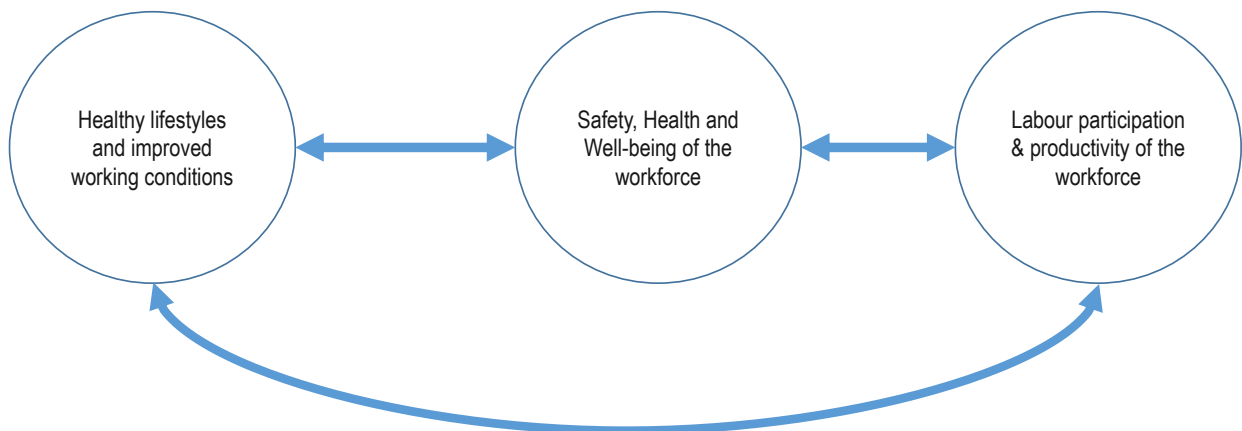
The prevalence of long COVID cases differs widely across studies depending on study design, populations analysed and other factors (OECD, 2021^[25]). A study that summarises results from Europe, the United States and China, concluded that around one-quarter of people with COVID-19 have continuing symptoms 4-5 weeks after testing positive, and about one in ten experience symptoms after 12 weeks (Rajan et al., 2021^[49]). At the population level, 2% of the population in the United Kingdom (1.3 million people) self-reported long COVID as of December 2021 (Office for National Statistics, 2022^[50]). Long COVID-19 symptoms are more often associated with age, being female, overweight, prior hospitalisation for COVID-19, and a number of symptoms in the acute phase (OECD, 2021^[25]). A recent UK study identified that the prevalence of self-reported long COVID was greatest in people aged 35 to 69 years, females, people living in more deprived areas, those working in health care, social care, or teaching and education, and those with another activity-limiting health condition or disability (Office for National Statistics, 2022^[50]).

Long-COVID can have consequences on employment and labour productivity, for instance on sickness absence and time to return to work. Evidence from France suggests that 31% of people previously employed did not return to work 3-4 months after COVID-19 hospital admission (Garrigues et al., 2020^[51]). A US study found that 23% of those previously working could not return to their job for health reasons 60 days after hospital discharge. Among those who returned to work, 26% either worked reduced hours or had modified duties for health reasons (Chopra et al., 2020^[52]). A Danish study found that patients with COVID-19 have a lower chance of returning to work 3 months after positive test, with the lowest chance in patients admitted to an intensive care unit department (Jacobsen et al., 2022^[53]).

2.6. What are the effects of unhealthy lifestyles, poor health and poor well-being on workforce participation and productivity?

This section examines the effects of unhealthy lifestyles, poor health and poor well-being on labour participation and productivity of the workforce,⁶ and reports the related indirect cost. The framework for this analysis considers that occupational and lifestyle risk factors are main drivers for chronic diseases, which in turn affect workforce participation and productivity. There is also potentially a direct (bi-directional) relationship between risk factors and workforce participation and productivity (Figure 2.7). The health conditions studied here have multifactorial components, including individual modifiable lifestyles, social determinants, and environmental and occupational exposures, which can all interrelate, delivering a complex picture with multiple layers.

Figure 2.7. Health, well-being and work are interrelated



Source: Authors.

People living with at least one NCD are less likely to be employed than those with no such condition, and are less productive at work, due to increased sickness absenteeism and presenteeism (Box 2.4). In particular, while employed, individuals living with a least one chronic disease, have nearly 3 additional days of missed work per year, and those with at least two chronic diseases have 7 additional missed days, across European countries (Feigl et al., 2019^[54]). The risk of discrimination against workers with NCDs cannot be overlooked. Negative labour market effects of unhealthy lifestyles and NCDs may reflect a true effect of unhealthy lifestyles and related health conditions on disabilities and work, or discrimination and stigmatisation towards people with unhealthy lifestyles and NCDs (see section 2.6.2), or both.

2.6.1. Summary of findings

Table 2.2 presents a summary of the associations between lifestyle risk factors and NCDs on the one hand, and labour market outcomes on the other. Labour market outcomes are measured along three dimensions: employment, absenteeism, and presenteeism. The labour market outcomes of NCDs are specific to disease characteristics (e.g. type and phase of the disease, complication), and thus, the review of the associations between NCDs and labour market outcomes is presented by disease. A great number of NCDs and related risk factors such as substance use disorders,⁷ lifestyle behaviours related to diet, sedentary behaviour, physical activity and sleep are likely correlated with labour market outcomes. However, the review presented here mainly focusses on five major NCDs (diabetes, cancer, CVDs, mental health conditions and MSDs), and three key behavioural risk factors (obesity, smoking, and harmful alcohol consumption), while updating a previous OECD work (Devaux and Sassi, 2015^[55]). In most cases, the causal link cannot be asserted, although a few studies suggest evidence for a causal relationship as indicated in the table below. Other factors, such as age, gender, level of health literacy, can alter the association between labour and diseases.

Box 2.4. Measuring presenteeism

Measuring the loss of individual productivity due to presenteeism is a difficult task, unlike absence related productivity loss, there are no compensation claims from absences that may be recorded. Primarily, loss of productivity due to presenteeism is estimated based on self-reported data collected from employees, these measurements rely on personal perceptions and ability to recollect the levels of effort and engagement in the workplace over a particular period of time (Johnston et al., 2019^[56]). Additional difficulty is presented by the variety of measurements collected across different countries (Knies et al., 2012^[57]). The two most commonly cited presenteeism measures are the Stanford Presenteeism Scale (SPS-6) and WHO's Health and Work Performance Questionnaire (HPQ).

- **Stanford Presenteeism Survey (SPS-6):** This is a self-reported tool, which includes six items of 5-point scales with responses ranging from: strongly disagree to strongly agree options. The questionnaire originally includes the wording “health problem”, which can be changed to any health condition (depression/anxiety, musculoskeletal pain, cardiovascular conditions etc.) (Garrow, 2016^[58]). In addition, countries are able to adapt the questionnaire to their cultural needs and translate it easily to any language (Hutting et al., 2013^[59]).
- **WHO's Health and Work Performance Questionnaire (HPQ):** This is also a self-reported tool which aims to obtain three types of information: screening information about the prevalence and treatment of the commonly occurring health problems; information about three types of workplace consequences (sickness absence, presenteeism, and critical incidents); and basic demographic information (Garrow, 2016^[58]). HPQ questionnaire is designed to visualise presenteeism as a measure of actual performance in relation to potential performance. Additionally, HPQ responses in conjunction of master database for HPQ allows advanced statistical imputation for more complex estimates of presenteeism. Finally, this tool includes memory-priming questions for improved accuracy and imputation and consistency checks for question that are left unanswered (Garrow, 2016^[58]).

Cross-country comparisons in the level of presenteeism are scarce due to the lack of uniform measures used throughout the world. However, two European surveys can be cited: the 2010 Eurobarometer survey measured the proportion of workers who were not absent *in the past four weeks* but who accomplished less than they would like as a result of an emotional or physical problem. The average proportion stood at 35% (OECD, 2012^[60]). The 2015 Eurofound's European Working Conditions Survey measured the proportion of people who have worked while they were sick *over past 12 months*. The average proportion was 42% across OECD European countries (Eurofound, 2016^[61]). In addition, a report for the US Chamber of Commerce examines the cost of absenteeism and presenteeism due to NCDs across 18 countries, and shows that the productivity losses amount to 3.5% to 5.5% of GDP (Rasmussen, Sweeny and Sheehan, 2016^[62]).

Presenteeism and absenteeism are related, although it is difficult to define the nature of the relationship for at least two reasons. First, the relationship between both phenomena varies across health conditions (Goetzel et al., 2004^[63]), and across countries. In particular, a study of the economic impacts due to NCDs found that the costs arising from presenteeism are two to three times higher than that from absenteeism. More precisely, the costs from presenteeism were twice higher in Colombia, and up to three times higher in Japan (Rasmussen, Sweeny and Sheehan, 2016^[62]). Second, while evidence suggests that both phenomena substitute each other (Caverley, Barton Cunningham and MacGregor, 2007^[64]), other studies finds that they are complementary, as workers who use presenteeism behaviours also demonstrate absenteeism behaviours at the same time (Gosselin, Lemyre and Corneil, 2013^[65]). Hence, it appears important to monitor both presenteeism and absenteeism behaviours. Evolutions in presenteeism have to be interpreted in the light of that of absenteeism, and vice-versa. For instance, increases in absenteeism may not be a poor outcome if there are accompanied with reductions in presenteeism.

Table 2.2. Summary of the associations between lifestyle risk factors, NCDs and labour market outcomes

	Employment	Absenteeism	Presenteeism
Obesity	People with obesity are less likely to be employed as compared to individuals with healthy weight. (Campbell et al., 2021 ^[66])	Higher BMI increases risk of sickness and disability by 8% per 1 kg/m ² BMI increase (Campbell et al., 2021 ^[66]). (causal) Women with obesity are 68% more likely to miss work than women with healthy weight, this effect is non significant among men (Destri et al., 2021 ^[67])	Presenteeism was found to be more prevalent among workers with obesity and overweight as compared to their those with healthy weight (Keramat et al., 2020 ^[68]).
Smoking	Smokers who are seeking reemployment, 27% were re-employed a year after job loss, compared to 56% of non-smokers (Prochaska et al., 2016 ^[69]).	Current smokers in the US have 28% more absenteeism than former smokers; in five European countries, the difference is 18% while it is 61% in China (Baker et al., 2017 ^[70]).	Current smokers have 28%, 18% and 16% more presenteeism than former smokers, respectively in the US, five European countries and China (Baker et al., 2017 ^[70]).
Alcohol	Problem drinking reduces employment (MacDonald and Shields, 2004 ^[71]) and is linked to job loss (Airagnes et al., 2019 ^[72])	Former drinkers and heavy drinkers work annually 1-1.5 month less over the 20-year observation period, compared with moderate drinkers (Böckerman, Hyytinen and Maczulskij, 2017 ^[73]).	A large body of evidence exists in support of alcohol-related presenteeism, but that this is weakened by low research quality and a lack of longitudinal designs (Magnus Thørrisen et al., 2019 ^[74])
Diabetes	Lower probability of employment (Devaux and Sassi, 2015 ^[55]); and longer period of unemployment (Rodríguez-Sánchez and Cantarero-Prieto, 2017 ^[75]).	2-10 more days of sickness absences (causal) (Breton et al., 2013 ^[76]).	Less workhour productivity when diabetic with symptoms: Individuals with diabetes and neuropathic symptoms are found to be 18% more likely to lose more than 2 hours of work per week due to illness when compared to their non-diabetic counterparts (causal) (Breton et al., 2013 ^[76]) (Mori et al., 2020 ^[77]).
Cancer	Lung cancer survivors are 61% more likely to be unemployed (Vayr et al., 2019 ^[78]).	Cancer survivors take 12 times more sick leave in the first year post-diagnosis than healthy workers, with sick leaving remaining still higher than the healthy average worker in the subsequent years (Sjövall et al., 2012 ^[79])	Cancer patients and cancer survivors are more likely to experience presenteeism than controls, due to chronic symptoms associated cancer with treatment (Soejima and Kamibeppu, 2016 ^[80]).
Cardiovascular diseases (CVD)	Workers with CVD were 2.5 times more likely to leave employment due to disability, 1.3 times more likely to take early retirement (Kouwenhoven-Pasmooij et al., 2016 ^[81]).	CVD workers missed 92 days compared to 11 days missed by non-CVD workers (Calvo-Bonacho et al., 2014 ^[82]).	The productivity loss among workers with CVD is twice higher from presenteeism than from absenteeism (Gordois et al., 2016 ^[83]).
Mental health conditions	60% of people with moderate mental health conditions are employed compared to 70% of those with no mental distress (OECD, 2021 ^[84]).	Employees living with mental health conditions are more likely to be absent compared to those without mental health conditions; 12 additional days of sickness absence per year (OECD, 2021 ^[84]).	The productivity loss among workers with a mental health conditions is partially attributable to presenteeism. It is not clear if the impact of mental health conditions on presenteeism outweighs the impacts on absenteeism, and this may differ across countries (OECD, 2012 ^[60]).
MSDs	Workers with MSD are less likely to be in fulltime employment (Summers, Jinnett and Bevan, 2015 ^[85]); Working-age men/women with arthritis are 20%/25% less likely than their counterparts without arthritis to be economically active (Lubeck, 2003 ^[86]).	The number of days missed peaked at 147 days per year in the group diagnosed with rheumatoid arthritis, compared to 59 days in the general population (Neovius, Simard and Askling, 2011 ^[87]).	For the workers who experience clinically meaningful back pain, almost 80% of them also report productivity loss due to presenteeism, with 4.4 hours missed per worker over a two-week period (Dall et al., 2013 ^[88]).

Source: Authors.

2.6.2. Obesity

Obesity is clearly related to reduced employment prospects, in particular by increasing the risk of obesity-related diseases. People with obesity are less likely to be employed than those with healthy weight (Devaux and Sassi, 2015^[55]; Campbell et al., 2021^[66]), and they have higher likelihood to exit from paid employment (Robroek et al., 2013^[89]). The employment status of people with overweight and obesity is often influenced by the negative and discriminatory views of employers, as individuals with excess weight are erroneously attributed as being less productive (Rooth, 2009^[90]). Such discrimination results in employers giving lesser opportunities for the same positions to people with obesity and overweight compared to their healthy weight peers, such as discriminatory hiring and sorting into jobs with less customer contact (Averett, 2019^[91]). That said, obesity appears to exert a causal effect on employment status, largely by affecting an individual's health (diseases) rather than through increased unemployment arising from social discrimination (Campbell et al., 2021^[66]).

Obesity negatively affects productivity at work, in particular with greater sickness absence. A study based on the UK Biobank data found that higher BMI causally increases risk of sickness and disability by 8% per 1 kg/m² BMI increase (Campbell et al., 2021^[66]). People with obesity and overweight have greater sick leave trends compared with those with healthy weight, especially among women. In a large Portuguese population-based prospective study, women with obesity are 68% more likely to miss work than women with healthy weight, with significant increases in likelihood of absenteeism observed in women in both white- and blue-collar professions (82% and 48%, respectively) (Destri et al., 2021^[67]). Although similar trends were observed among men (12%), the differences were not significant. Similar outcomes are observed in the presenteeism rates for people living with obesity and overweight (Janssens et al., 2012^[92]), however presenteeism is more prevalent among people with obesity than for people with overweight (Keramat et al., 2020^[68]). The excess weight put a strain on many daily activities in the workplace, which can lead to limiting certain work-related functions of the employees. A 2019 OECD report estimates that obesity-related diseases reduce employment by about 0.43% annually, and increase sickness-related absenteeism by 0.38% and presenteeism by 0.81% among those who are employed. The associated productivity loss is equivalent to 54 million fewer full-time workers across 52 OECD, EU, G20 countries, which is similar to the number of employed persons in Mexico. Overall, overweight-related diseases make GDP 3.3% lower than it would be if people were not overweight, on average in OECD countries (OECD, 2019^[26]).

2.6.3. Smoking

Tobacco smoking has a negative effect on productivity of employees in the workplace through increased absenteeism and presenteeism, while also decreasing a likelihood of re-employment. Smoking is associated with certain personal and societal consequences, which are reflected in the workplace outcomes of an employee. Smoking results in worker's loss of productivity from tobacco-use associated illnesses, frequent smoke breaks, increased accidents during work time, and is a source of higher costs in particular due to higher insurance premiums, increased fires and fire insurance costs, negative effect on non-smokers colleagues, and early retirement (Bunn et al., 2006^[93]). Current smokers have more absences per year than non-smokers or former smokers, however the amounts of days missed vary depending on the country, since work-cultures and leave policies differ from one country to another. For instance, in the US, current smokers have 28% more absenteeism than former smokers; in five large European countries,⁸ the difference is 18% while it is 61% in China (Baker et al., 2017^[70]). Additionally, studies show that smokers who quit smoking, 0-4 years after, experience much lower absenteeism than their pre-cessation outcomes, and these rates become comparable to never-smokers (Baker et al., 2017^[70]; Yun et al., 2016^[94]).

Workers who smoke are also more likely to take breaks during work, which can result in reduced productivity. This is due to the need by the workers to take more breaks due to dependence on nicotine.

In the US, five European countries and China, current smokers have respectively 28%, 18% and 16% more presenteeism than former smokers (Baker et al., 2017^[70]). A Japanese study looking at the presenteeism among workers found that current smokers were 7% more likely to exhibit presenteeism than former smokers, while the difference between former smokers and never-smokers was not significant (Suwa et al., 2017^[95]). Smoking cessation has a positive impact on the at-work activity impairment among smokers, through the reduction in presenteeism. Those who quit smoking 0-4 years ago had lower presenteeism, ranging from 9% to 18% across countries, compared to current smokers (Baker et al., 2017^[70]).

Smoking is also likely to have an undesirable effect on the ability for smokers to re-enter in employment. In a US study, among individuals who were unemployed and in active search for re-employment, 27% of smokers were re-employed one year after, compared to the 56% of non-smokers (Prochaska et al., 2016^[69]). The same study also shows that smokers were more likely to be chronically unemployed, and were reported to have lower income than non-smokers. Contributing factors to the wage gap between smokers and non-smokers are education and inconsistent time preference (Hotchkiss and Pitts, 2013^[96]).

2.6.4. Harmful alcohol use

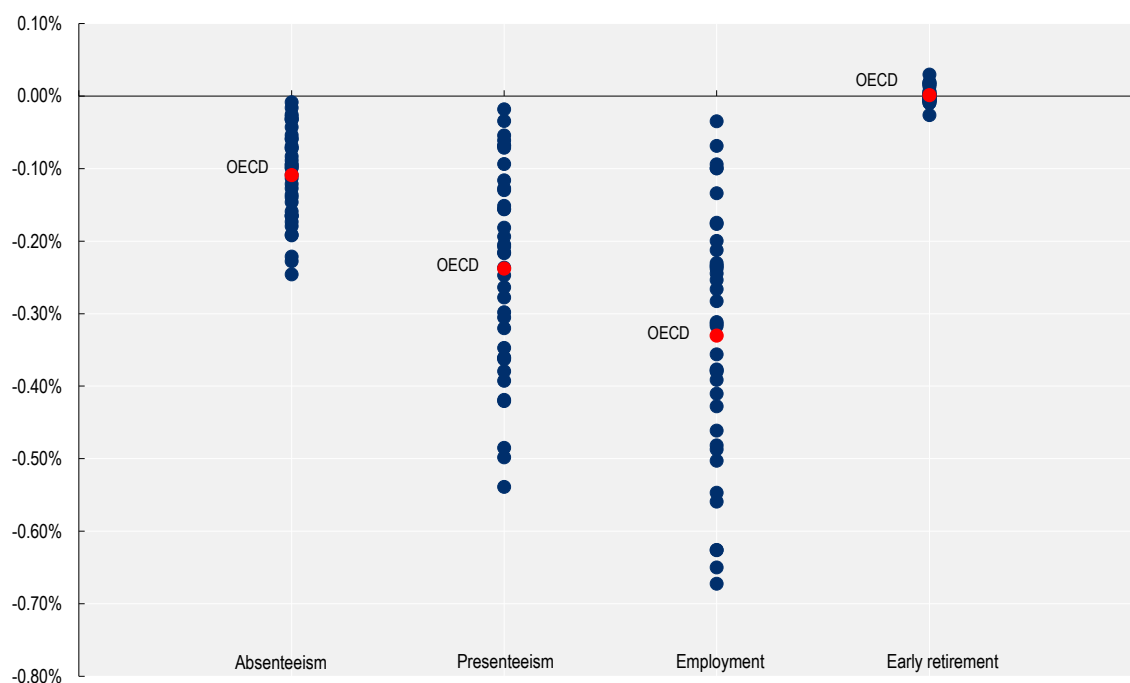
Evidence for direct associations between alcohol use and labour market outcomes has been debated, while a clearer pattern emerges between alcohol-related diseases (e.g. alcohol use disorders) and negative labour market outcomes. As highlighted in (OECD, 2021^[23]), the relationship between alcohol consumption and labour market outcomes is complex, because, first, it can be affected in both directions. Second, some cofounders may not be taken into account in studies, and this may hide or make false a relationship between alcohol consumption and labour market outcomes. While some studies found no significant relationship between alcohol abuse⁹ and employment (Feng et al., 2001^[97]), other research points to some associations. For instance, a study based on English data shows that problem drinking¹⁰ reduces by 7% to 31% the probability of being in employment in both men and women (MacDonald and Shields, 2004^[71]). A Norwegian study found that frequent alcohol consumption and problematic alcohol use – defined by physiological and physical symptoms of drinking- were associated with increased risk of unemployment (Kaspersen et al., 2016^[98]). A recent French study also found that problematic drinking is associated with job loss (Airagnes et al., 2019^[72]). While evidence suggests that heavy drinking and problematic drinking reduce employment, low levels of alcohol consumption can be associated with better labour market outcomes. For instance, in a Swedish study, women with long-term light drinking¹¹ have better employment opportunities than any other group, including former drinkers, former abstainers, long-term heavy drinkers and abstainers (Jarl and Gerdtham, 2012^[99]). Whether this reflects some sort of true causal effect (e.g. occasional drinkers can be more likely to socialise and build stronger networks, which in turn can help improve their employment prospects), or whether light drinking is simply a proxy for good health, remains to be established (OECD, 2021^[23]).

Evidence suggests that higher levels of alcohol consumption are associated with more sickness absence and presenteeism. A recent systematic review and meta-analysis shows that heavy drinkers are more likely to have sickness absence than low-risk drinkers¹² (odds ratio= 2.34 [1.17-4.65]) when abstainers are excluded (Hashemi et al., 2022^[100]). When abstainers are included, it is important to distinguish people who never drank in life and those who quit drinking, as only former drinking is associated with sickness absence (Kaila-Kangas et al., 2018^[101]). A Finnish study found that former drinkers and heavy drinkers work annually 1-1.5 month less over the 20-year observation period, compared with moderate drinkers¹³ (Böckerman, Hyytinen and Maczulskij, 2017^[73]). Besides, a recent systematic review concludes that a large body of evidence exists in support of alcohol-related presenteeism,¹⁴ but that this is weakened by low research quality and a lack of longitudinal designs (Magnus Thørrisen et al., 2019^[74]). A quantitative assessment by the OECD estimates that alcohol-related diseases (e.g. alcohol dependence,

cirrhosis, etc.) reduce employment by about 0.33% annually, and reduce labour force productivity by 0.11% due to sickness-related absences, and by 0.24% due to presenteeism, while the effect on early retirement is generally negligible (Figure 2.8). These effects translate into a reduction in the workforce by the equivalent of 33 million fewer full-time workers, across 52 OECD, EU, G20 countries. At the macroeconomic level, alcohol-related diseases make GDP 1.6% lower than it would be otherwise, on average in OECD countries (OECD, 2021^[23]).


Figure 2.8. The impact of diseases caused by alcohol consumption on employment and productivity

Percentage difference in labour market inputs due to diseases caused by alcohol consumption above 1 drink per day for women and 1.5 drinks per day for men, per capita, average 2020-50



Note: Labour market inputs include employment and productivity when employed. They are expressed in the number of full-time equivalent workers and are calculated for the working-age population. OECD analyses based on the OECD SPHeP-NCDs model, which forecast the evolution of NCDs and risk factors and their related costs over the next 30 years.

Source: OECD (2021^[23]), *Preventing Harmful Alcohol Use*, <https://doi.org/10.1787/6e4b4ffb-en>.

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2.6.5. Diabetes

People living with diabetes are less likely to be employed than those with no such condition. A review of evidence from European countries, Australia, Canada, Mexico, and the United States shows that people with diabetes are less likely to be employed, and the more severe the symptoms caused by the disease, the stronger the association (Devaux and Sassi, 2015^[55]). Moreover, diabetes is associated with long-term unemployment (Rodríguez-Sánchez and Cantarero-Prieto, 2017^[75]).

The relationship between diabetes and lost productivity (absenteeism and presenteeism) is strong, and it intensifies with the complications caused by diabetes and their severity. The more severe the

gravity of diabetic symptoms and its associated complications (dry mouth, polyuria, hypoglycaemia, diabetic painful neuropathy, and mood disorders), the more sick days are taken by employees, and they are less likely to be productive at work. A systematic review revealed that individuals with diabetes have 2 to 10 more days of absence per year than individuals without diabetes, the number of missed days being greater when associated with diabetes related complications (e.g. neuropathy, depression) (Breton et al., 2013^[76]). Regarding presenteeism, individuals with diabetes and neuropathic symptoms are found to be 18% more likely to lose more than 2 hours of work per week due to illness when compared to their non-diabetic counterparts. A Japanese study also confirms the presence of more detrimental effects on work performance associated with diabetes complications. Once diabetes is combined with its complications and requires treatment, then presenteeism losses become visibly higher (Mori et al., 2020^[77]).

2.6.6. Cancer

Cancer has a negative impact on the employment status both on those living with cancer, as well as recent and long-term survivors. The impact on these labour market outcomes varies depending on the characteristics of cancer diagnosis (i.e. cancer type and stage) as well as the individual's age and gender. A meta-analysis covering a number of OECD countries has found that after diagnosis and treatment, lung cancer survivors were 61% more likely to be unemployed than the general population (Vayr et al., 2019^[78]). Cancer patients who undergo chemotherapy or other forms of therapies can develop treatment-induced peripheral neuropathy. These patients also have lower employment rates than those without neuropathy (Blinder and Gany, 2019^[102]). Patients that had developed cancer in childhood and are long-term survivors continue experience negative impact on employment. A meta-analysis found that childhood cancer survivors were 1.5 times more likely to be unemployed than controls (Mader, Michel and Roser, 2017^[103]).

Absence and presenteeism in the wake of a cancer diagnosis is an anticipated outcome of the disease, with diminishing effects after the five-year survival period. An analysis of Swedish health care and social insurance data has found that cancer patients took more sick leave in the one year following diagnosis compared to those without cancer. Lung cancer patients appear among the most affected, and took on average 12 times more sick days compared to those without cancer in this period, with 63% still on sick leave one year after diagnosis (Sjövall et al., 2012^[79]). Sick leave is part of the path for cancer patients and survivors, with clear variability of sick leave depending on the stage, type and treatment regime of the cancer diagnosed. Although survivors diagnosed in the past five years report taking more absence leave than those without a health condition, this trend becomes insignificant after the five-year survival period (Soejima and Kamibeppu, 2016^[80]).

Presenteeism is reported more frequently in cancer survivors diagnosed in the past five years than in healthy population, although no causal inferences can be made (Soejima and Kamibeppu, 2016^[80]). Cancer survivors report having greater fatigue/exhaustion, work-related impairment in executive function, working memory and attention compared to controls. These chronic negative symptoms contribute to the association of cancer with presenteeism. Several factors like age at the time of diagnosis, gender, lifestyle choices (i.e. smoking, harmful alcohol use and insufficient sleep), are known risk factors for presenteeism among cancer survivors (Soejima and Kamibeppu, 2016^[80]).

2.6.7. Cardiovascular diseases

CVDs can significantly impair workers' ability to remain in employment, and increase absenteeism and presenteeism incurred from need to recover from the illness or surgery. Workers with CVDs are less likely to remain in employment in the long-term. A European study looking at the impacts of CVDs on early exit from employment found that workers with CVDs were 2.5 times more likely than those without such conditions to leave employment due to disability, and 1.3 times more likely to take early retirement (Kouwenhoven-Pasmooij et al., 2016^[81]). Evidence shows that workers who suffered a first or a recurrent severe CVD event are completely unable to participate in employment and thereby permanently exit labour market (Li et al., 2016^[104]).

CVD events can occur suddenly and the ability of workers to perform their duties can be affected over a prolonged period. A Spanish study shows that CVD workers missed 92 days compared to 11 days missed by non-CVD workers (Calvo-Bonacho et al., 2014^[82]). In a systematic review, the loss of productivity among workers who experience CVDs is twice higher from presenteeism than from absenteeism (Gordois et al., 2016^[83]). The rates of absenteeism and presenteeism differ from country to country as well as with difference between the cardiovascular conditions as they can vary in severity (Gordois et al., 2016^[83]). Work hours lost by the caregivers of patients in recovery from CVDs also contribute to the total labour market costs. For instance, in a study from Portugal, while stroke patients lose about 65 working days due to both absenteeism and presenteeism in the first year following stroke, caregivers lose 12 days for providing support to stroke patients (Marques et al., 2021^[105]).

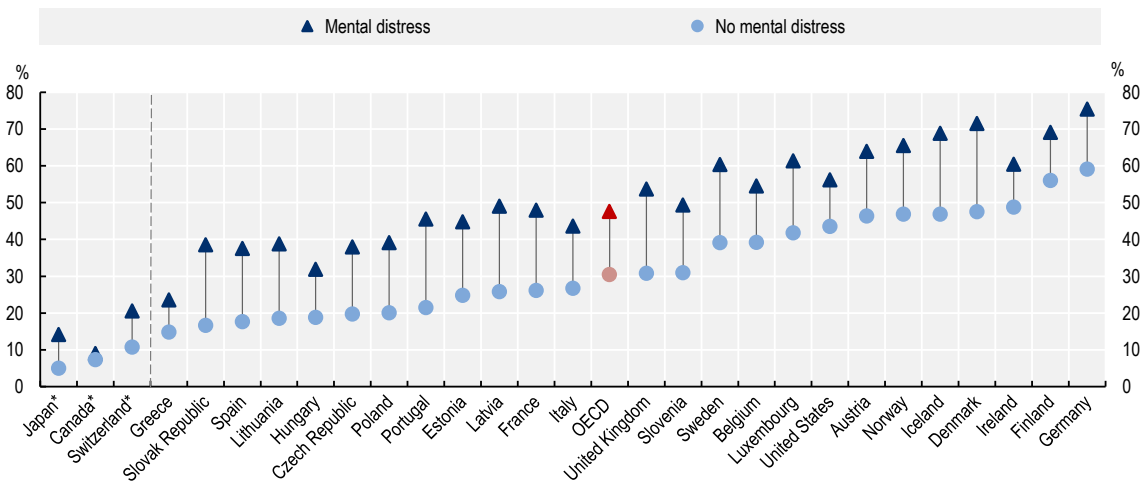
2.6.8. Mental health conditions

Mental health conditions are strongly associated with lower employment, and many individuals with mental health conditions are unable to find or keep jobs. Across OECD countries, 60% of people with moderate mental health conditions are employed compared to 70% of those without a mental health condition.¹⁵ The employment gap is 10 percentage points for those with a moderate mental health condition and about 25 percentage points for those with a severe mental health condition. Individuals with a mental health condition are also almost twice as likely (85% higher) to be unemployed, indicating that many are either looking for jobs without success and/or are transitioning into and out of work more often (OECD, 2021^[84]).

Poor mental health has considerable impacts on prevalence of sick leave and lost productivity. Across OECD countries, almost half (47.6%) of people with mental health conditions were absent from work at least once over the previous year, compared with just under a third (30.4%) of those without such conditions (Figure 2.9). The average number of missed days among workers with mental health conditions (33.6 leave days per year) was also greater than among those without such a condition (21.4 days) (OECD, 2021^[84]). Even while at work, many individuals experiencing mental health conditions may be less likely to be productive at work. For instance, workers with a severe mental disorder were more than three times as likely as those without any such disorder to accomplish less than they would like because of either emotional or physical health problems (88% versus 26%) (OECD, 2012^[60]). In total, the labour market costs of poor mental health exceed 1.5% of GDP across European countries (OECD, 2021^[84]).

Figure 2.9. Prevalence of absence due to illness among people with and without mental distress

Share of workers who have been absent from work at least once over the past 12 months, by mental health status, 2012-16



Note: (*) Data for Japan and Switzerland use a reporting period of four weeks; Canada uses a reporting period of one week.

Source: (OECD, 2021^[84]), *Fitter minds, Fitter jobs*; Analyses based on National Surveys.

StatLink  <https://stat.link/z6i0ln>

It is not clear if the impact of mental health conditions on presenteeism outweighs the impacts on absenteeism, and this may differ across countries. In Japan, individuals with mental health conditions take around 17 days off work on average, which is around half of the OECD average (OECD, 2021^[84]). Yet one estimate from pharmaceutical companies has found that the cost of presenteeism was almost six times as high as that of absenteeism due to mental health conditions (Nagata et al., 2018^[106]). High levels of presenteeism may indicate stigma associated with mental health conditions, and that workers feel unable to request absence due to mental health issues. By comparison, the Australia Productivity Commission has estimated the cost of absenteeism to stand at AUD 9.6 billion (USD 7.2 billion), slightly higher than the cost of presenteeism at AUD 7.0 billion (USD 5.3 billion) (Australia Productivity Commission, 2020^[107]).

2.6.9. Musculoskeletal disorders (MSD)

MSDs are among the primary causes for work disability, sick leaves from work, and loss of productivity. Estimations for the total cost of lost productivity attributed to MSDs among European working-age people account for as much as 2% of GDP (Bevan, 2015^[108]). In the United States, MSDs are also recognised as a leading cause for lost workdays, accounting for 31% of all cases of occupational diseases and injuries with days away from work in 2015 (U.S. Bureau of Labor Statistics, 2016^[109]).

Rheumatoid arthritis, a highly-prevalent MSD, severely affects the ability of workers to remain in full-time long-term employment, most often leading to reduced hours worked or resulting in disability and consequently loss of employment. Rheumatoid arthritis (RA) is a MSD often cited in the literature as having an effect on work productivity. The estimations on work loss due to RA can range from 36% to 85% of people of working age living with RA (Burton et al., 2006^[110]). Every third new patient with RA eventually becomes disabled due to the condition, however people living in lower-GDP countries remain in the workforce but with high degrees of disability (Sokka et al., 2009^[111]). A survey of Irish workers reported that 67% of those unemployed or in part-time employment had to reduce or leave their jobs due to their arthritis (Summers, Jinnett and Bevan, 2015^[85]). Findings on US data show that working-age men

with arthritis are 20% less likely than men of the same age without arthritis to be economically active, while this association is 25% among women (Lubeck, 2003^[86]).

MSDs are the largest cause of work absenteeism, with poorly adapted working conditions being associated with the development of these disorders. A Swedish study shows that the average annual days on sick leave and disability pension increased in patients newly diagnosed with RA compared to the general population, in the year prior to the diagnosis and the four following years after diagnosis. The number of days missed peaked at 147 days per year in the RA diagnosed group, compared to 59 days in the general population (Neovius, Simard and Askling, 2011^[87]). Back pain is also strongly linked with loss of work productivity through high rates of presenteeism. A study on back pain found that nearly 80% of workers who experienced clinically meaningful back pain also reported productivity loss due to presenteeism, with 4.4 hours missed per worker over a two-week period (Dall et al., 2013^[88]).

Job satisfaction, a core element of well-being at work, is correlated with lower MSD pain. A Polish study on men working in forestry industry found that there was significant correlation between overall job satisfaction and musculoskeletal pain (Lachowski et al., 2017^[112]). The lower the level of job satisfaction, the more frequent the experiencing of MSDs. Similar conclusions were observed in Korean emotional labourers,¹⁶ where job satisfaction was strongly correlated to musculoskeletal pain, with lower pain among those with higher subjective job satisfaction (Baek et al., 2018^[113]).

Job engagement is negatively affected by lifestyles and psychosocial well-being in the presence of musculoskeletal pain. Job engagement can be defined as a positive and fulfilling work-related state of mind that is characterised by vigour, dedication, and absorption (Schaufeli et al., 2002^[114]), and is used as a proxy for productivity at work. Engaged employees produce better business outcomes, with an 18% gap in productivity between the top and bottom engaged employees (Gallup, n.d.^[115]). While job engagement is not directly associated to MSD pain (Knardahl, 2017^[116]), evidence shows that psychological and lifestyle factors (e.g. psychological traits, leisure time physical activity, and work and family stress) are correlated with job engagement in the presence of MSD pain, suggesting a mediation effect (Malmberg-Ceder et al., 2017^[117]).

2.7. Conclusion

While the nature of work, including safe work environment, job quality, work organisation, employment type and sector, and new forms of employment, is an important determinant of employee health and well-being, lifestyle habits are also key contributors to employee health and well-being. Lifestyle risk factors – smoking, poor diets, harmful alcohol use and physical inactivity – are responsible for 76% of all deaths in working-age people in OECD countries and are leading causes for the occurrence of chronic conditions such as CVDs, cancers, diabetes, MSDs, and mental health conditions. About 43% and 45% of European adults in working age reported suffering from MSDs and facing risk factors for mental health well-being (including mental health), suggesting a need for further preventative actions at the workplace. People affected by one or several chronic diseases may have reduced quality of life. Nearly half of the burden of disability in the working-age population is caused by cancers, MSDs and mental health conditions. And, 47% of this burden fall into the working ages (20-64). Chronic diseases and risk factor exposures negatively affect individual's labour participation and productivity, potentially reducing the performance of the workplace. The following chapter examines the potential of workplace-based interventions to enhance the health and well-being at the workplace.

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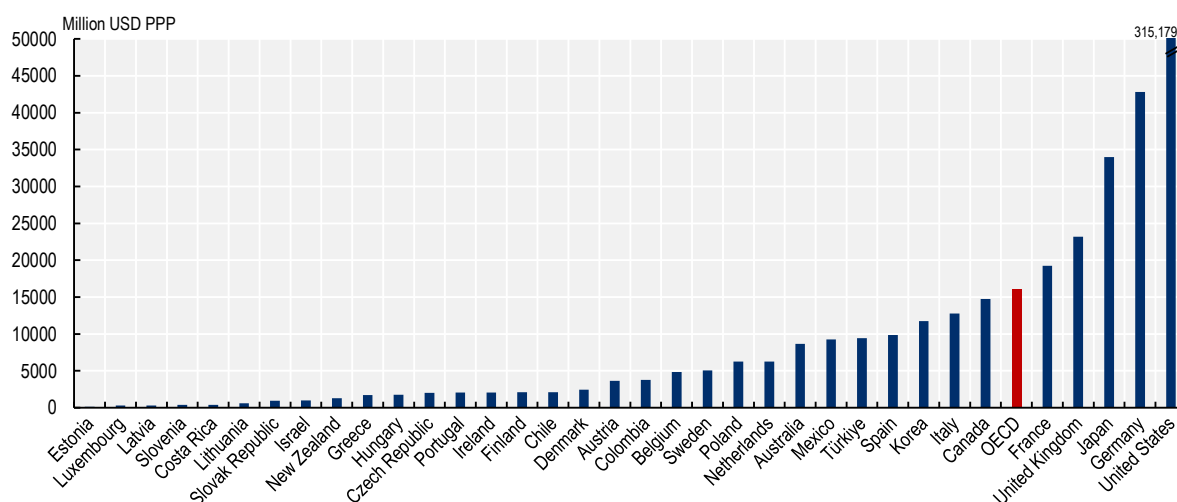
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Annex 2.A. Supplementary files

Estimating the health care expenditures related to NCDs treatment in people aged 20-64

The cost of treating NCDs in the working-age population is large. An analysis based on the OECD SPHeP-NCD model estimated the treatment cost for NCDs among people aged 20-64 (Annex Box 2.A.1). In total across OECD countries, USD PPP 562 billion are spent annually on treating NCDs in people aged 20-64, which is similar to the GDP of Sweden. More than half of this amount is driven by the expenditure in the United States (more than USD PPP 300 billion) (Annex Figure 2.A.1). Expenditures on disease treatment greatly vary by country, reflecting variations in population size and prices.

Annex Figure 2.A.1. Estimated treatment cost associated to NCDs and mental health conditions among people aged 20-64, OECD countries, 2020



Source: OECD SPHeP-NCDs model, 2020.

StatLink  <https://stat.link/4hda7g>

Annex Box 2.A.1. The OECD SPHeP-NCD model

The OECD SPHeP-NCDs model is an advanced systems modelling tool for public health policy and strategic planning. It is used to predict the health and economic outcomes of the population of a country or a region up to 2050. The model consolidates previous OECD modelling work into a single platform to produce a comprehensive set of key behavioural and physiological risk factors (e.g. obesity, physical activity, alcohol consumption, blood pressure) and their associated NCDs and other medical conditions. The model covers 52 countries, including OECD member countries, G20 countries, EU27 countries and OECD accession and selected partner countries.

For each of the 52 countries, the model uses demographic and risk factor characteristics by age- and sex-specific population groups from international databases. These inputs are used to generate synthetic populations, in which each individual is assigned demographic characteristics and a risk factor profile. Based on these characteristics, an individual has a certain risk of developing a disease each year. Individuals can develop 12 categories of disease (such as diabetes, stroke, ischaemic heart disease, cancer, depression, dementia, musculo-skeletal disorders (e.g. low back pain, rheumatoid arthritis), chronic obstructive pulmonary diseases, cirrhosis, alcohol dependence, injuries). Incidence and prevalence of diseases in a specific country's population were calibrated to match estimates from international datasets (IHME, 2020^[22]; IARC, 2020^[118]).

For each year, a cross-sectional representation of the population can be obtained, to calculate health status indicators such as life expectancy, disease prevalence and disability-adjusted life years using disability weights.

Health care costs of disease treatment are estimated based on a per-case annual cost, which is extrapolated from national health-related expenditure data. The additional cost of multi-morbidity is also calculated and applied. The extra cost of end-of-life care is also taken into account.

The labour market module uses relative risks to relate disease status to the risk of absenteeism, presenteeism (where sick individuals, even if physically present at work, are not fully productive), early retirement and employment. These changes in employment and productivity are estimated in number of full-time equivalent workers and costed based on a human capital approach,¹ using national average wages.

For more information on the OECD SPHeP-NCDs model, see the SPHeP-NCDs Technical Documentation, available at: <http://oecdpublichealthexplorer.org/ncd-doc>.

¹ The human capital approach is based on assumptions simplifying the economic dynamics leading to economic losses – including, for example, assumptions about reserve labour force, friction costs, and the impact on reserve wages.

Notes

¹ People living with multiples chronic diseases.

² Survey respondents are asked if they experienced stress yesterday.

³ Resulting from the average incidence rate multiplied by the OECD population of working age (that corresponds to 64.8% of the OECD total population of 1 369 million people in 2020).

⁴ Purchasing power parity.

⁵ DALYs are used to measure total burden of disease – both from years of life lost and years lived with a disability. One DALY equals one lost year of healthy life.

⁶ The workforce or labour force is the labour pool either in employment or in unemployment.

⁷ For instance, opioids – initially used to treat acute and chronic pain, but with the risk of dependence, dose increase and death- are causing a rising epidemic in North America. Employer costs related to the opioid crisis, include increased spending on health care, lost productivity, and increased disability and workers' claims, estimated nearly USD 150 billion in 2019 (Davenport, Caverly and Matthews, 2020^[122]).

⁸ The United Kingdom, France, Germany, Italy, and Spain.

⁹ Defined in this study as a combination of criteria of alcohol abuse (DSM-IV criteria) and harmful consumption.

¹⁰ Defined in this study by either physiological and physical symptoms, frequency or quantity of drinking.

¹¹ Defined in this study as below 20 grammes of pure alcohol per week for women (and 40 g for men).

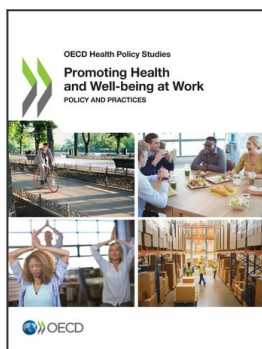
¹² In this study, low-risk drinking refers to consumption below 20 grammes of pure alcohol per day, while risky drinking to consumption above 20 g per day.

¹³ In this study, moderate drinking corresponds to consumption below 280 grammes per week for men and 190 g for women, while heavy drinking to more than 280/190 g.

¹⁴ higher levels of alcohol consumption were associated with higher levels of impaired work performance.

¹⁵ Individuals in the bottom quintile of scores on mental health status were classified as indicating “mental distress” or exhibiting symptoms of a “mental health condition”. This is based on the evidence that around 1 in 5 people experience a mental health condition at any given time (Steel et al., 2014^[40]). Where appropriate, individuals in the bottom 10% were classified as indicating “severe mental distress” or “severe mental health conditions”, whereas individuals in the 10% to 20% range are classified as indicating “moderate mental distress” or “moderate mental health conditions”. The data on mental health from European OECD countries are primarily obtained from the Patient Health Questionnaire-8, a battery of questions to assess extent of symptoms of depression, as this is the question on mental health included in the European Health Interview Survey. This method allows for cross-country comparison and is less affected by stigma and cultural differences, which can result in variations in extent of under-reporting of symptoms. However, this also means that it cannot be said with certainty that an individual classified as having a mental health condition for the purposes of this analysis actually has a mental health condition.

¹⁶ Employees perform emotional labour when they regulate their emotions to meet organisation-mandated rules and achieve professional goals. Examples of emotional workers are frontline, public-facing job interacting with clients, customers and patients.



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