

# Rehabilitation and return to work after cancer

Literature review

European Risk Observatory

Authors:

Christina Tikka and Jos Verbeek, Finish Institute of Occupational Health

Sietske Tamminga, Monique Leensen and Angela de Boer, Coronel Institute of Occupational Health, Academic Medical Center, University of Amsterdam, the Netherlands

Project management:

Marine Cavet and Elke Schneider, European Agency for Safety and Health at Work (EU-OSHA)

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## Executive summary

The project 'Rehabilitation and return to work after cancer — instruments and practices' is intended to provide new insights into the problems encountered by workers affected by cancer and their employers. Furthermore, it will make recommendations regarding successful instruments, interventions, programmes and practices to support the return to work (RTW) of workers affected by cancer.

Each year, an estimated 3.2 million new cases of cancer are diagnosed in Europe. About half of these occur in people of working age. There are geographical differences in cancer occurrence in Europe; however, the forms of cancer with the highest incidences are breast, colorectal, prostate and lung cancer. These types of cancer were estimated to account for over half of the overall burden of cancer in Europe in 2012<sup>1</sup>.

The impact of cancer on a person's daily life is immediate and striking. The diagnosis is usually accompanied by long periods of sickness absence because of medical treatments. However, overall, cancer management has improved during the past three decades, and therefore the overall number of people who survive cancer is increasing<sup>2</sup>. Many cancer survivors face long-term symptoms and impairments, such as fatigue, after treatment ends.

These symptoms and impairments can affect the work ability of survivors, making it more difficult to remain in or re-enter the job market. Research shows that most cancer survivors are able to stay in or return to work<sup>3</sup>, but that, overall, the risk of unemployment is 1.4 times higher among cancer survivors than among healthy controls<sup>4</sup>.

Optimising the rehabilitation and RTW of workers with cancer is therefore important both to improve the well-being of this vulnerable group and to reduce the societal and financial impact of cancer cases on (European) enterprises and society at large.

### *The overall project*

The project 'Rehabilitation and return to work after cancer — instruments and practices' will inform policy on the emerging issue of rehabilitation and RTW after cancer and provide national administrations with examples of successful policies and interventions. It is divided into six main tasks:

1. literature review on rehabilitation and RTW after cancer;
2. detailed descriptions of policies, systems, programmes or instruments in the field of rehabilitation and/or RTW with or after cancer;
3. company case studies;
4. qualitative research with experts and intermediaries;
5. final report, including analysis and policy options;
6. European Agency for Safety and Health at Work (EU-OSHA) stakeholder workshop.

The report *Rehabilitation and return to work after cancer: a systematic review of the literature* is meant to provide an overview of what is known based on the scientific literature. The specific objectives of this review are:

- to review existing literature to collect knowledge on the safety and health implications for workers who are returning to work after or during cancer treatment, especially for occupational cancer;
- to gather information on wider issues that may affect the worker (compatibility of treatment and work, employment, etc.);
- to gather information on costs to employers and workers, e.g. for days lost, adaptation of

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<sup>1</sup> Ferlay et al. 2013.

<sup>2</sup> de Boer 2014.

<sup>3</sup> Bouknight et al. 2006, Bradley and Bednarek 2002, Maunsell et al. 2004, Sanchez et al. 2004, Short et al. 2005, Spelten et al. 2002, Spelten et al. 2003.

<sup>4</sup> This has been shown in a systematic review including a meta-analysis and meta-regression analysis (de Boer et al. 2009). The analyses included 20,366 cancer survivors and 157,603 healthy control participants, and 16 studies from the United States, 15 from Europe and 5 from other countries.

- equipment, compensation;
- to gather information on the issues relevant to small and medium-sized enterprises (SMEs);
- to gather information on good-practice examples of RTW interventions.

#### *Structure of the literature overview*

The report, *Rehabilitation and return to work after cancer: Literature review*, concerns the available scientific literature on rehabilitation and RTW after cancer. It includes an overview of the available initiatives, policies and practices on RTW after cancer that are described in the literature.

Other issues regarding cancer and RTW covered in this report are safety and health implications for workers; costs to employers, workers and society; wider issues that may affect the worker; work-related and occupational cancer; aspects relevant to SMEs; synergies between and roles of policy areas and (enterprise) actors.

The results presented in this report are based on a systematic approach to locating, identifying and summarising findings from scientific and grey literature in the field of cancer and RTW issues. The systematic method ensures a productive and useful overview of the scientific evidence that goes beyond relying on individual expert opinions. The methods included a comprehensive search strategy to locate relevant references from a number of databases. From those references, significant articles were selected for inclusion in this report using predefined criteria. From the articles that were included, information was extracted and summarised in this report using a predefined data extraction form. To increase the reliability of the process, two researchers independently screened the references and extracted the information from the articles. Differences in results were discussed until consensus was reached.

#### ***Safety and health implications of cancer diagnosis and treatment***

The literature shows that workers affected by cancer report various effects of cancer and its treatment on their health, including mental, cognitive and physical symptoms. The symptom most frequently reported in the literature is a diminished level of energy, described as fatigue or exhaustion and as emotional strain due to the ongoing battle with cancer. This is consistent across cancer types. Other implications of cancer and its treatment that are reported to have an effect on occupational safety and health are diminished mental health, including depression and anxiety; diminished physical functioning and symptoms including pain; and diminished cognitive capacities, including problems with attention and memory.

The explicit occupational implications that authors reported were diminished work productivity, work ability impairments and decreased functioning at work. This means that, as a result of one or more of these symptoms, workers treated for cancer are likely to have to report sick because their work capacity is diminished and it is no longer possible for them to carry out their usual tasks. These symptoms can occur early in the treatment process or last for years after a diagnosis, which makes them especially problematic. For example, workers with cancer can continue to suffer from fatigue or cognitive problems several years after diagnosis and treatment.

The literature provides a long list of factors that are considered to predict RTW. However, the studies that report these factors are not of sufficient quality to draw strong conclusions on the strength of the effects. Factors that predict a less successful RTW are reported in the literature as:

- socio-demographic factors, such as older age or lower educational level;
- work-related factors, such as high physical work demands, a non-supportive work environment, no flexible working arrangements or no reduced working hours;
- disease-related factors, such as having head/neck, brain, pancreatic, lung or liver cancer, or an advanced disease;
- treatment-related factors, such as having chemotherapy, extensive surgery or endocrine therapy;

- other miscellaneous factors, such as fear of unemployment, no advice from a doctor regarding work or low quality of life.

Relatively little is known about how employers are affected when a worker is diagnosed with cancer.

### ***Costs for workers, employers and society***

The return to work of cancer survivors is economically important. If a cancer survivor does not return to work during or after treatment, this entails a financial loss for the worker, the employer and society. Adapting the work environment may enable RTW. This may come with costs for the company and the worker, but, in the end, these may be less than the costs of long-term sick leave.

Little is reported about the costs for workers, employers or society, and what is reported does not indicate consistent results. For individuals, both serious financial difficulties and no effect on annual household income levels have been reported. There were no reports of the costs to companies of workers being diagnosed with cancer. The total economic loss to the European Union due to lost work days as a result of cancer was estimated at EUR 9.5 billion in 2009, but this loss was not entirely related to unsuccessful RTW.

### ***Wider issues that may affect the worker***

Wider issues that may affect the worker and that influence successful RTW that are reported in the literature are the meaning of work and motivation to work. Some factors are likely to encourage RTW, such as when work is perceived as a return to normal life or when it is perceived as a marker of being healthy. However, some factors hinder RTW, for example when work is not economically necessary and a person re-evaluates what work means to them as the result of a cancer diagnosis. In this case, workers often decide that RTW is not worthwhile.

Another group of factors that affect successful RTW are the attitudes and behaviours of colleagues and other people involved as experienced by the cancer survivor. Workplace accommodations that have been requested by the worker are appreciated, but unwanted workplace accommodations are experienced as negative. For example, deciding on behalf of the worker, without consulting them, that work tasks have to be changed is not usually appreciated. Negative experiences include feeling stigmatised or labelled as a cancer patient and feeling discriminated against by unfair dismissal. However, unsolicited support for RTW by healthcare professionals is usually appreciated by cancer survivors because they feel that the professionals understand that work issues are important to them.

### ***Work-related and occupational cancer***

The development of cancer may be caused by work and the work environment. Occupational cancer can be defined as cancer that is mainly caused by exposure at work, whereas work-related cancer is considered multifactorial, and work exposure plays a smaller role alongside other factors.

There are no studies focusing on RTW of workers with occupational and work-related cancer. This could mean either that this is not a problem that should be looked at separately from other types of cancer or that the problem simply has not been studied. As most occupational cancers have long latency times and occur after working life, it could be that RTW is not a desired outcome. For work-related cancers, the exposure to carcinogens at work may have gone unnoticed and thus RTW issues are not different from those for non-work-related cancers.

### ***Small and medium-sized enterprises***

The size of the company seems to have an impact on cancer survivors' opportunities to return to work. In companies with fewer than 250 workers (SMEs), information and resources for RTW strategies or programmes are lacking, and support and education are needed. These problems seem to be found in

particular in small enterprises with fewer than 50 workers, and in micro-enterprises with fewer than 10 workers<sup>5</sup>.

It is reported that RTW after cancer seems to be more problematic for the self-employed and those working in small enterprises. This is because being off work for treatment and necessary rest is more difficult in small companies; they have limited access to occupational health services and there is a lack of experience in the management of sickness absence. However, advantages were also seen in the small size of SMEs, which results in a more familial atmosphere. This may create a more supportive environment for workers with cancer in the RTW process. Little has been reported about all this in the literature, though, and the conclusions are not strong because of the small evidence base.

### ***Interventions to enhance and support return to work***

For the purposes of this overview of the literature, the term ‘intervention’ is understood in a broad way, including both very active approaches to support, such as training, and less active approaches, such as providing information by phone, online or in print form.

Only a limited number of studies have evaluated the effect of interventions to help cancer survivors to return to work. Most interventions have been developed for cancer survivors. Some interventions are specifically for employers, human resource professionals, line managers or healthcare professionals. Only a few interventions are available for SMEs and the self-employed affected by cancer. Therefore, the evaluation looked at interventions targeting individual workers, rather than considering organisational interventions such as a RTW plan or workplace interventions with the aim, for instance, of reducing working time or avoiding heavy physical work.

Forms of RTW support include psycho-educational interventions, such as counselling combined with providing information about social security issues, and physical training to increase physical and mental capacity. For these interventions, there was no effect on RTW in evaluation studies. With or without the intervention, the same fairly high numbers of cancer survivors returned to work. However, there were only few studies that properly evaluated these interventions, and it could be that future studies provide new information.

Some studies evaluated medical interventions that aimed to make treatment less burdensome, but these did not affect RTW rates. No studies were identified that had evaluated the effects of interventions to adapt the job or workplace.

Only multidisciplinary interventions that combined vocational counselling with patient counselling and physical training increased RTW rates, albeit only to a small extent. For workers who were not included in the intervention, RTW rates were on average 79 %, and this increased to 87 % with multidisciplinary intervention. This was based on 5 randomised studies with 450 participants and judged to be moderate-quality evidence for the presence of a small beneficial effect of the interventions. The interventions did not have a significant positive or negative effect on quality of life in general.

The grey literature covered a number of interventions relating to the workplace. However, these were only descriptions, without an evaluation of their effectiveness. Interventions were described as workplace accommodations, mostly intended to accommodate fatigue and provide more flexibility in working time or offer a reduction in working time, which might take the form of paid leave for healthcare appointments. Interventions included adjustments to workloads, changes to duties, provision of assistance and changes in personnel.

A large number of psycho-educational interventions, such as advising cancer survivors by telephone or providing information on a dedicated website, were found to be used in practice, but none of these has been evaluated for its effects on RTW. Available interventions include information and training on cancer and RTW issues, rehabilitation services, guidelines and workplace accommodations.

Interventions providing support to employers have been developed and are used in practice. These interventions aim to support employers by helping them to construct RTW plans for employees with cancer, providing ideas for workplace accommodations to facilitate RTW, advising employers on how to

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<sup>5</sup> EU-OSHA 2016.

improve communication with affected employees and to provide employers with factual information about diagnosis and treatment of cancer. No information on the effectiveness of these interventions could be found.

In some countries, such as the Netherlands and the United Kingdom, there are also guidelines and policies for healthcare professionals on how to support their patients in RTW. Although these efforts are appreciated by cancer survivors, it is unclear if they affect RTW rates.

Very few interventions and resources were identified that related specifically to unemployed people diagnosed with cancer, self-employed people diagnosed with cancer or SMEs.

From this overview of the literature, several good-practice examples of RTW interventions will be selected to be described in more detail in other tasks forming part of this project. In addition, company case studies will provide an overview of what interventions are used in practice and how they are implemented and experienced in companies. A qualitative study will provide information on the opinions of experts and professionals who are involved with RTW problems in cancer survivors. Together, these activities will allow an assessment of discrepancies and similarities between research, practices in companies and the practices of professionals. Furthermore, they will provide policy options that can be considered by decision-makers aiming to increase and support RTW of workers diagnosed with cancer.

### ***Synergies between policies and actors***

Synergies and collaboration between policy areas seem to be important, as it has been noted that developing and implementing efficient and effective interventions to promote RTW requires close collaboration between relevant actors. In the literature, the following key actors are discussed: the cancer survivor, healthcare professionals, employers and professionals in human resource departments, colleagues, professionals in legal rights, employment and social services, trade unions, non-governmental organisations and government. However, no evaluations were found of the possible impact of these collaborations on cancer survivors specifically.

### ***Conclusion***

Surviving cancer can limit one's work ability for various reasons. The implications of cancer and its treatment can affect all aspects of human health and well-being, and include physical, mental and cognitive symptoms. These implications can be either short or long term. When returning to work, survivors may face difficulties in balancing work and treatment demands, including negative attitudes or behaviour from their colleagues or their employers. All of this may lead to a reassessment of work and life goals, thus hindering RTW.

Various factors may influence a cancer survivor's ability to work or to resume work. However, it is unclear which of these factors are the most important and should be addressed in policies or best practices. RTW is considered to be predicted by disease-related factors, such as fatigue after treatment; workplace-related factors, such as heavy physical work; and specific type of treatment, such as chemotherapy. Addressing these factors might improve RTW rates and point out workers who are specifically at risk of not returning to work. In general, work accommodations provided by employers and support for RTW from healthcare professionals are appreciated by cancer survivors.

With the rising number of cancer survivors, effective interventions are needed to enable RTW and to reduce the costs to individuals, companies and society at large. However, to date, little is known about the effectiveness of these interventions, making it difficult to recommend best practices. The only interventions for which there is evidence that RTW is improved when compared with care as usual are multidisciplinary interventions. These interventions include physiotherapy, occupational therapy, speech therapy, vocational rehabilitation and psychology in relation to RTW (i.e. delivery of, for example, education, counselling and training).

The vast number of educational interventions that are used in practice probably do not affect RTW rates. The effects of other available interventions remain unclear, and more evaluation studies are needed to

analyse them. Research that specifically examines employers' views and needs as well as the particular issues that SMEs face with regard to RTW is needed.

There is a gap between the interventions that aim to enhance RTW that are described and evaluated in the scientific literature and those that are available in practice. In other words, little can be found in the scientific literature about existing RTW interventions. Most of the information about them in this overview comes from grey literature. Available interventions and resources include information and training on cancer and RTW issues, rehabilitation services, guidelines and workplace accommodations. Most interventions have been developed primarily for cancer survivors; others are aimed at employers and healthcare professionals. Very few interventions are available that are specifically designed for the self-employed or SMEs.

## 1 Background

Each year, an estimated 3.2 million new cases of cancer are diagnosed in Europe. About half of these occur in people of working age. There are geographical differences in cancer occurrence in Europe; however, the forms of cancer with the highest incidences are breast, colorectal, prostate and lung cancer. These types of cancer were estimated to account for over half of the overall burden of cancer in Europe in 2012 (Ferlay et al. 2013). In men, prostate cancer is the most frequently diagnosed cancer in north, west and south Europe, while lung cancer is the most frequently diagnosed cancer in central and eastern Europe. For women in every European country, the most common type of cancer is breast cancer.

The impact of cancer on a person's daily life is immediate and striking. The diagnosis is usually accompanied by long periods of sickness absence because of medical treatments. However, overall, cancer detection and care management have improved during the past three decades. Cancer mortality rates show a north-west to south-east gradient, with better outcomes in north-western Europe (Znaor et al. 2013), but the overall number of people who survive cancer is increasing (de Boer 2014). Treatment focuses on curing the disease and preventing recurrence; many cancer survivors face long-term symptoms and impairments, such as fatigue, after treatment ends (Feuerstein et al. 2010, Silver et al. 2013).

These symptoms and impairments can affect the work ability of survivors, making it more difficult to remain in or re-enter the job market. Research shows that most cancer survivors are able to stay in or return to work<sup>6</sup>, but that, overall, the risk of unemployment is 1.4 times higher among cancer survivors than among healthy controls (de Boer et al. 2009)<sup>7</sup>. This is unfortunate, as cancer survivors often perceive return to work (RTW) as an important part of their recovery.

Optimising the rehabilitation and RTW of workers with cancer is important to improve the well-being of this vulnerable group and to reduce the societal and financial impact of cancer cases on (European) society at large.

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<sup>6</sup> Bouknight et al. 2006, Bradley and Bednarek 2002, Maunsell et al. 2004, Sanchez et al. 2004, Short et al. 2005, Spelten et al. 2002, Spelten et al. 2003.

<sup>7</sup> This has been shown in a systematic review including a meta-analysis and meta-regression analysis. The analyses included 20,366 cancer survivors and 157,603 healthy control participants, and 16 studies from the United States, 15 from Europe and 5 from other countries.

## 2 Objective

The project ‘Rehabilitation and return to work after cancer — instruments and practices’ will provide new insights into the problems encountered by workers affected by cancer and their employers. Furthermore, it will make recommendations regarding successful instruments, interventions, programmes and practices to support the RTW of workers affected by cancer.

The project is divided into six main tasks:

1. literature review on rehabilitation and RTW after cancer;
2. detailed descriptions of policies, systems, programmes or instruments in the field of rehabilitation and/or RTW with or after cancer;
3. company case studies;
4. qualitative research with experts and intermediaries;
5. final report, including analysis and policy options;
6. European Agency for Safety and Health at Work (EU-OSHA) stakeholder workshop.

This report concerns Task 1, literature review on rehabilitation and RTW after cancer. The report provides an overview of available initiatives, policies and practices on RTW after cancer. From this overview, several good-practice examples will be selected to be described in more detail in Tasks 2 and 3.

The objective of this report is to provide an up-to-date literature review of the available knowledge regarding rehabilitation and RTW after cancer, covering the following areas:

- Background information on the impact of cancer on work as regards:
  - o safety and health implications;
  - o costs to employers and workers (and to society);
  - o wider issues, e.g. compatibility of treatment and work, the meaning of work.
- Available interventions and examples:
  - o available initiatives, policies, programmes, instruments and practices;
  - o examples of toolkits, guides, training tools and other instruments.
- Synergies between different policy areas and/or (enterprise) actors, including:
  - o employment and social services;
  - o general physicians;
  - o health services;
  - o non-governmental organisations (NGOs).

The review is also intended to identify issues that are relevant to small and medium-sized enterprises (SMEs) and differences in RTW outcomes for survivors by sector, occupation, size of enterprise, age, income and gender.

### 3 Methods

Three methods were used to search for, appraise and collect evidence for this literature review.

First, a search for scientific evidence was performed and systematic reviews were selected that reported on:

- the health and economic impact of cancer on the worker and employer;
- interventions and examples of how to facilitate RTW.

A lack of systematic reviews was anticipated in the fields of occupational cancer and the impact of cancer cases on SMEs. Therefore, a literature search was performed to identify qualitative and quantitative studies that complemented the results of the systematic reviews.

Third, grey literature was searched (e.g. publications from NGOs) to compile a broad overview of existing programmes and interventions.

In addition, data were collected using an online questionnaire to complement the list of interventions and to identify unpublished programmes and interventions.

A detailed description of the search strategy, the screening method for eligible publications and the data extraction process can be found in the appendix.

## 4 Results

### 4.1 Safety and health implications for workers

Work can be physically, cognitively, emotionally and interpersonally demanding, and workers need to have sufficient work capacity to be able to meet these demands. Disease can affect this capacity, making it impossible to meet demands and reducing a worker's ability to function at work. If work capacity is reduced, RTW will be impeded. Cancer survivors in particular may have long-term or even permanent health complaints, which can have implications for their ability to return to work.

This chapter is about the impact of cancer diagnosis and treatment on the work ability (e.g. the ability to concentrate or to cope with stress) of survivors during or after treatment, and the socio-demographic, job characteristic-related and disease-related factors (e.g. age, physical job demands, type of cancer, respectively) that influence the RTW process.

#### 4.1.1 Cancer survivors' personal capacity to meet work demands

The literature included in this review shows that survivors report various effects of cancer and its treatment on their health, including mental, cognitive and physical symptoms (Table 1). While some cancer survivors may be symptom free, others have to live with cancer-related symptoms and impairments for years after treatment ends (Feuerstein et al. 2010, Silver et al. 2013). In these cases, symptoms can be long term and interfere with work performance for 10 years or more after the initial diagnosis (Silver et al. 2013).

The symptom most frequently reported in the literature is a diminished level of energy, described as fatigue or exhaustion and as emotional strain due to the ongoing battle with cancer. This is consistent across cancer types<sup>8</sup>.

Mental health implications were described as diminished mental health, psychological symptoms or mental disorders. Specific examples of mental health problems were depression, lower stress tolerance, anxiety, distress, fear of recurrence, sleep problems, loss of confidence, feelings of inadequacy in relation to the job and feelings of one's own limitations with regard to re-employability<sup>9</sup>.

Cognitive implications were described by review authors as diminished cognitive capacities; problems, limitations, difficulties or impairments in cognitive functioning; or even cognitive disability<sup>10</sup>. These problems are attributed to cancer treatments such as chemotherapy and radiotherapy across cancer types. Specific examples were problems in focusing and memorising (Fitch 2013, Fitch and Nicoll 2014).

The physical health implications of cancer and its treatment were described in the literature either as diminished physical and functional capacity or as physical problems, impairment or even disability<sup>11</sup>. The most frequently reported physical health implication was (chronic) pain<sup>12</sup>. Some of the specific examples of decreased physical capacity are related to particular types of cancer and their location in the body. Problems such as bladder and bowel problems were reported in reviews focusing on haematological malignancies. Other physical problems were described as limitations in upper body movement and were mainly reported for breast cancer patients. Hot flushes and nausea were also reported as physical problems and were linked in some reviews to the type of treatment that the survivor had undergone (e.g. chemotherapy).

<sup>8</sup> Aaronson et al. 2014, Amir and Brocky 2009, Campbell et al. 2012, Duijts et al. 2014b, Feuerstein et al. 2010, Fitch and Nicoll 2014, Horsboel et al. 2012, Islam et al. 2014, Molina and Feliu 2013, Munir et al. 2009, Peteet 2000, Richardson et al. 2011, Silver et al. 2013, Stergiou-Kita et al. 2014, Wells et al. 2013.

<sup>9</sup> Aaronson et al. 2014, Amir and Brocky 2009, Banning 2011, Duijts et al. 2014b, Duijts et al. 2014a, Feuerstein et al. 2010, Fitch and Nicoll 2014, Horsboel et al. 2012, Mehnert 2011, Munir et al. 2009, Richardson et al. 2011, Wells et al. 2013.

<sup>10</sup> Amir and Brocky 2009, Banning 2011, Duijts et al. 2014b, Feuerstein et al. 2010, Fitch 2013, Fitch and Nicoll 2014, Munir et al. 2009, Richardson et al. 2011, Silver et al. 2013, Stergiou-Kita et al. 2014, Wells et al. 2013.

<sup>11</sup> Amir and Brocky 2009, Duijts et al. 2014b, Richardson et al. 2011, Wells et al. 2013.

<sup>12</sup> Aaronson et al. 2014, Duijts et al. 2014b, Feuerstein et al. 2010, Horsboel et al. 2012, Islam et al. 2014, Richardson et al. 2011, Silver et al. 2013.

Some reviews reported that health implications may result in the termination of employment, an increase in sick leave or a diminished ability to meet work demands<sup>13</sup>. This means that any of the reported symptoms and impairments may reduce a cancer survivor's personal capacity to meet work demands, although not all reviews explicitly reported a decrease in cancer survivors' work ability.

The explicit occupational implications that the review authors reported were diminished work productivity, work ability impairments and decreased functioning at work. However, these were not described in any further detail, except to say that the symptoms interacted with cognitive, physical and mental work ability or functioning at work<sup>14</sup>.

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<sup>13</sup> Feuerstein et al. 2010, Fitch and Nicoll 2014, Mehnert 2011, Molina and Feliu 2013, Munir et al. 2009, Silver et al. 2013.

<sup>14</sup> Feuerstein et al. 2010, Fitch and Nicoll 2014, Mehnert 2011, Molina and Feliu 2013, Munir et al. 2009, Silver et al. 2013.

Table 1: Overview of safety and health implications for cancer survivors returning to work identified from the literature

| Category         | Sub-category                  | Implications that have been reported in reviews   | Literature (evidence base)   | Cancer type                                     |
|------------------|-------------------------------|---|--|---|
|                  | Survivors can be symptom free | individuals can be asymptomatic despite an active disease status (Feuerstein 2010)  | <u>Narrative review</u><br>Feuerstein 2010 (Feuerstein et al. 2010)  | Any   |
|                  | Symptoms can be long term     | Many participants reported that symptoms were long term (more than one year after treatment ended). Symptoms and impairments may continue to interfere for 10 years or more after the initial diagnosis (Silver 2013)<br>Symptoms that can accompany cancer diagnosis and treatment may exist for years following treatment at varying levels of frequency and severity (Feuerstein 2010) | <u>Narrative reviews</u><br>Feuerstein 2010 (Feuerstein et al. 2010)<br>Silver 2013 (Silver et al. 2013)   | Any   |
| General findings |                               |   | <u>Qualitative syntheses</u><br>Stergiou-Kita 2014 (Stergiou-Kita et al. 2014)<br>Wells 2013 (Wells et al. 2013)<br><u>Narrative reviews</u><br>Aaronson 2014 (Aaronson et al. 2014)<br>Amir 2009 (Amir and Brocky 2009)<br>Campbell 2012 (Campbell et al. 2012)<br>Duijts 2014a (Duijts et al. 2014a and 2014b)<br>Feuerstein 2010 (Feuerstein et al. 2010)<br>Fitch 2014 (Fitch and Nicoll 2014)<br>Horsboel 2012 (Horsboel et al. 2012)<br>Islam 2014 (Islam et al. 2014)<br>Molina 2013 (Molina and Feliu 2013)<br>Munir 2009 (Munir et al. 2009)<br>Peteet 2000 (Peteet 2000)<br>Richardson 2011 (Richardson et al. 2011)<br>Silver 2013 (Silver et al. 2013) |   |
|                  | Lack of energy                | Fatigue (Aaronson 2014, Amir 2009, Campbell 2012, Duijts 2014a and 2014b, Feuerstein 2010, Fitch 2014, Horsboel 2012, Islam 2014, Molina 2013, Munir 2009, Peteet 2000, Richardson 2011, Silver 2013, Stergiou-Kita 2014)<br>Exhaustion (Islam 2014)<br>Emotional exhaustion because of ongoing battle with cancer (Wells 2013)   |  | Any, breast cancer, haematological malignancies |

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| Category                 | Sub-category                             | Implications that have been reported in reviews  | Literature (evidence base)               | Cancer type |   |
|--------------------------|--|--|--|-------------|---|
| Mental health            | Diminished mental health                 | <u>General descriptions in reviews</u>   |  |             |   |
|                          |  | Psychological symptoms (Horsboel 2012, Amir 2009)  |  |             |   |
|                          |  | Diminished mental health (Wells 2013)  |  |             |   |
|                          |  | Mental disorders (Mehnert 2011)  |  |             |   |
|                          |  | <u>Specific examples in reviews</u>  |  |             |   |
|                          |  | Distress (Aaronson 2014, Duijts 2014b, Feuerstein 2010, Fitch 2014, Horsboel 2012, Mehnert 2011, Richardson 2011)  | <u>Qualitative syntheses</u>             |             |   |
|                          |  | Depression (Aaronson 2014, Amir 2009, Duijts 2014b, Fitch 2014, Horsboel 2012, Munir 2009, Richardson 2011)  | Banning 2011 (Banning 2011)              |             |   |
|                          |  | Anxiety (Aaronson 2014, Amir 2009, Duijts 2014b, Fitch 2014, Horsboel 2012, Richardson 2011)   | Wells 2013 (Wells et al. 2013)           |             |   |
|                          |  | Fear of recurrence (Richardson 2011)   | <u>Narrative reviews</u>                 |             |   |
|                          |  | Diminished stress threshold (Wells 2013)   | Aaronson 2014 (Aaronson et al. 2014)     |             |   |
|                          |  | Sleep problems/disturbance (Aaronson 2014, Amir 2009, Feuerstein 2010, Munir 2009)   | Amir 2009 (Amir and Brocky 2009)         |             | Any, breast cancer, haematological malignancies |
|                          |  | Lower level or loss of confidence, or problems with confidence (Duijts 2014b, Fitch 2014, Munir 2009, Wells 2013)  | Duijts 2014b (Duijts et al. 2014b)       |             |   |
|                          |  | Diminished self-esteem, feelings of inadequacy/limitation (with regard to re-employability) (Wells 2013), feelings of reduced competence and physical ability, fear of job loss, worries about appearance (Banning 2011) | Feuerstein 2010 (Feuerstein et al. 2010) |             |   |
| Frustration (Wells 2013) | Fitch 2014 (Fitch and Nicoll 2014)       |  |  |             |   |
|                          | Horsboel 2012 (Horsboel et al. 2012)     |  |  |             |   |
|                          | Mehnert 2011 (Mehnert 2011)              |  |  |             |   |
|                          | Munir 2009 (Munir et al. 2009)           |  |  |             |   |
|                          | Richardson 2011 (Richardson et al. 2011) |  |  |             |   |

## Rehabilitation and return to work after cancer – Literature review

| Category         | Sub-category                  | Implications that have been reported in reviews   | Literature (evidence base)   | Cancer type                                     |
|------------------|-------------------------------|---|--|---|
| Cognitive health | Diminished cognitive capacity | <p><u>General descriptions in reviews</u><br/>Cognitive problems described as cognitive limitations, cognitive difficulties, diminished cognitive capacity, cognition impairments, cognitive disability, problems with cognition, cognitive functioning or cognitive problems related to chemotherapy (Amir 2009, Banning 2011, Duijts 2014b, Feuerstein 2010, Fitch 2014, Munir 2009, Richardson 2011, Silver 2013, Stergiou-Kita 2014, Wells 2013)</p> <p><u>Specific examples in reviews</u><br/>Cognitive impairment including concentration and memory (Fitch 2014)</p>  | <p><u>Qualitative syntheses</u><br/>Banning 2011 (Banning 2011)<br/>Stergiou-Kita 2014 (Stergiou-Kita et al. 2014)<br/>Wells 2013 (Wells et al. 2013)</p> <p><u>Narrative reviews</u><br/>Amir 2009 (Amir and Brocky 2009)<br/>Duijts 2014b (Duijts et al. 2014b)<br/>Feuerstein 2010 (Feuerstein et al. 2010)<br/>Fitch 2014 (Fitch 2013, Fitch and Nicoll 2014)<br/>Munir 2009 (Munir et al. 2009)<br/>Richardson 2011 (Richardson et al. 2011)<br/>Silver 2013 (Silver et al. 2013)</p>   | Any, breast cancer                              |
| Physical health  | Diminished physical capacity  | <p><u>General descriptions in reviews</u><br/>Lower physical capacity/functioning described in one or more of these terms: physical problems, impairment in physical functioning, functional limitations, physical limitations, diminished physical/functional capacity, physical impairment, physical disability, physical and functional disabilities (Amir 2009, Campbell 2012, Duijts 2014b, Fitch 2014, Mehnert 2011, Peteet 2000, Richardson 2011, Wells 2013)</p> <p><u>Specific examples in reviews</u><br/>Nausea (Amir 2009)<br/>Bladder/bowel problems: constipation (Horsboel 2012), incontinence (Fitch 2014)<br/>Lymphoedema (Fitch 2014), upper arm lymphoedema (Stergiou-Kita 2014)<br/>Upper body problems: breast and arm symptoms (Silver 2013), arm disability (Duijts 2014b), limitations in upper body movement (Silver 2013)<br/>Hot flushes as treatment-induced menopausal symptoms (Duijts 2014b, Fitch 2014)<br/>Pain (Silver 2013, Richardson 2011, Islam 2014, Horsboel 2012, Aaronson 2014, Duijts 2014b), chronic pain (Feuerstein 2010)</p> | <p><u>Qualitative syntheses</u><br/>Stergiou-Kita 2014 (Stergiou-Kita et al. 2014)<br/>Wells 2013 (Wells et al. 2013)</p> <p><u>Narrative reviews</u><br/>Aaronson 2014 (Aaronson et al. 2014)<br/>Amir 2009 (Amir and Brocky 2009)<br/>Campbell 2012 (Campbell et al. 2012)<br/>Duijts 2014 (Duijts et al. 2014b)<br/>Feuerstein 2010 (Feuerstein et al. 2010)<br/>Fitch 2014 (Fitch and Nicoll 2014)<br/>Horsboel 2012 (Horsboel et al. 2012)<br/>Islam 2014 (Islam et al. 2014)<br/>Mehnert 2011 (Mehnert 2011)<br/>Peteet 2000 (Peteet 2000)<br/>Richardson 2011 (Richardson et al. 2011)<br/>Silver 2013 (Silver et al. 2013)</p> | Any, breast cancer, haematological malignancies |

| Category     | Sub-category           | Implications that have been reported in reviews  | Literature (evidence base)  | Cancer type |
|--------------|------------------------|--|---|-------------|
| Work ability | Decreased work ability | <p><u>General description in reviews</u></p> <p>Decreased work capacity (Feuerstein 2010)</p> <p>Lower work productivity (Munir 2009)</p> <p>Loss in worker productivity (Fitch 2014)</p> <p>'Physical and functional disabilities psychological distress or mental disorders may adversely affect work ability' (Mehnert 2011)</p> <p>Physical and psychological symptoms impacted on the patient's ability to return to work (Molina 2013)</p> <p>Cancer-related symptoms and impairments interfered with work performance, caused possible termination of employment or increase in amount of sick leave (Silver 2013)</p> <p><u>Specific examples in reviews</u></p> <p>Treatment interfered with cognitive and physical functioning at work (Feuerstein 2010)</p> <p>Decrease/impairments in physical and mental work ability (Feuerstein 2010, Munir 2009)</p> | <p><u>Narrative reviews</u></p> <p>Feuerstein 2010 (Feuerstein et al. 2010)</p> <p>Fitch 2014 (Fitch and Nicoll 2014)</p> <p>Mehnert 2011 (Mehnert 2011)</p> <p>Molina 2013 (Molina and Feliu 2013)</p> <p>Munir 2009 (Munir et al. 2009)</p> <p>Silver 2013 (Silver et al. 2013)</p> | Any         |
|              |                        |  |   |             |

None of the reviews reported implications for safety issues at work due to cancer diagnosis or treatment. It is, however, possible that, as with any other disease that causes similar symptoms, symptoms such as a lower level of energy, tiredness or diminished cognitive, physical or mental health status could affect the safety of workers and others because of an increased risk of accidents. This might be relevant for many occupations, e.g. bus drivers, pilots, surgeons and security guards.

#### **4.1.2 Prognostic factors for return to work after cancer**

This report identified and included relevant review articles that reported on prognostic factors for RTW after cancer. Some of the authors of those reviews used qualitative methods (e.g. meta-ethnography, grounded formal theory) to synthesise results from primary studies<sup>15</sup> and most of the identified reviews did not apply methods to synthesise single study results but presented a narrative of single studies and their results<sup>16</sup>. Reviews with a narrative approach describe single studies and their results but do not apply methods to synthesise the data. Reviews with a qualitative synthesis approach give an interpretative overview of the available data.

Neither of the two approaches provides a precise estimate of effects (e.g. which factors significantly or which factor most effectively promotes RTW). However, both types of reviews provide an overview of factors that may influence a successful RTW process after cancer.

The following five groups of factors were reported to influence the RTW process (Table 2):

- socio-demographic
- work-related
- disease-related
- treatment-related
- other.

Factors that the review authors considered to positively influence RTW outcomes are marked with a plus sign (+), and factors considered barriers are marked with a minus sign (–). The review authors also listed some factors without specifying the direction of the influence, because of either missing or inconclusive evidence. These factors are marked with a question mark (?). The review authors also specified factors that were not significantly related to RTW. These are marked with a zero (0). When review authors came to different conclusions, e.g. a factor was considered a barrier in one review and not significant in another, the factors are marked with more than one sign (e.g. (–/0)).

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<sup>15</sup> Banning 2011, Spelten et al. 2002, Stergiou-Kita et al. 2014, Tiedtke et al. 2010, Wells et al. 2013.

<sup>16</sup> Aaronson et al. 2014, Amir and Brocky 2009, Campbell et al. 2012, Cox et al. 2014, Feuerstein et al. 2010, Fitch and Nicoll 2014, Harji et al. 2015, Horsboel et al. 2012, Islam et al. 2014, Mehnert 2011, Molina and Feliu 2013, Munir et al. 2009, Richardson et al. 2011, Silver et al. 2013, Steiner et al. 2004, Steiner et al. 2010, Trivers et al. 2013, Ullrich et al. 2012, van Muijen et al. 2013.

Table 2: Overview of factors reported to influence return to work of cancer survivors

| Category                  | Factors listed and described in the reviews <sup>17</sup> | Evidence base                            |
|---------------------------|---|--|
|                           |   | <u>Qualitative synthesis</u>             |
|                           |   | Spelten 2002 (Spelten et al. 2002)       |
|                           |   | <u>Narrative reviews</u>                 |
|                           |   | Aaronson 2014 (Aaronson et al. 2014)     |
|                           |   | Amir 2009 (Amir and Brocky 2009)         |
|                           |   | Feuerstein 2010 (Feuerstein et al. 2010) |
|                           |   | Fitch 2014 (Fitch and Nicoll 2014)       |
|                           |   | Horsboel 2012 (Horsboel et al. 2012)     |
|                           |   | Islam 2014 (Islam et al. 2014)           |
|                           |   | Mehnert 2011 (Mehnert 2011)              |
|                           |   | Molina 2013 (Molina and Feliu 2013)      |
|                           |   | Munir 2009 (Munir et al. 2009)           |
|                           |   | Richardson 2011 (Richardson et al. 2011) |
|                           |   | Silver 2013 (Silver et al. 2013)         |
|                           |   | Steiner 2004 (Steiner et al. 2004)       |
|                           |   | Steiner 2010 (Steiner et al. 2010)       |
|                           |   | Ullrich 2012 (Ullrich et al. 2012)       |
|                           |   | Van Muijen 2013 (van Muijen et al. 2013) |
| Socio-demographic factors | Age: younger (+) versus older (-)                         |  |
|                           | Gender: men (+/0/?) versus women (-/0/?)                  |  |
|                           | Educational level: higher (+/0) versus lower (-/0)        |  |
|                           | Income: higher (+/0) versus lower (-/0)                   |  |
|                           | Occupational status: employed (+) versus unemployed (-)   |  |
|                           | Marital status (?/0)                                      |  |
|                           | Race/ethnicity (?)  |  |

<sup>17</sup> Factors were considered by the review authors barriers (-), facilitators (+), having no relevant association with RTW (0) or having an unspecified/inconclusive association with RTW (?).

| Category                  | Factors listed and described in the reviews <sup>17</sup>   | Evidence base                                  |
|---------------------------|---|--|
| Work-related factors      | <u>Type of work</u>   |  |
|                           | Physical and emotional demands: lower (+) versus higher (–) demands (e.g. desk versus manual work, non-stressful versus stressful)  | <u>Qualitative syntheses</u>                   |
|                           | <u>Work setting</u>   | Spelten 2002 (Spelten et al. 2002)             |
|                           | Workplace (?)   | Stergiou-Kita 2014 (Stergiou-Kita et al. 2014) |
|                           | Flexible working arrangements (+)   | Wells 2013 (Wells et al. 2013)                 |
|                           | Reduced working hours (+)   | <u>Narrative reviews</u>                       |
|                           | Salaried work in a company (–)  | Aaronson 2014 (Aaronson et al. 2014)           |
|                           | Health insurance coverage (–)   | Alfano 2009 (Alfano and Rowland 2009)          |
|                           | Early disability pension or longer disability pension (–)   | Amir 2009 (Amir and Brocky 2009)               |
|                           | Size of organisation (?)  | Campbell 2012 (Campbell et al. 2012)           |
|                           | Job facility (?)  | Feuerstein 2010 (Feuerstein et al. 2010)       |
|                           | <u>Social factors of work</u>   | Fitch 2014 (Fitch and Nicoll 2014)             |
|                           | Supportive work environment (+), positive attitudes of co-workers (+), supportive colleagues (+), perceived accommodating employer (e.g. RTW meeting, willingness to allow flexible working arrangements) (+) | Horsboel 2012 (Horsboel et al. 2012)           |
|                           | Disclosure of cancer to colleagues (+)  | Islam 2014 (Islam et al. 2014)                 |
|                           | Perceived discrimination at work (–/0)  | Mehnert 2011 (Mehnert 2011)                    |
|                           | Non-supportive work environment (–)   | Molina 2013 (Molina and Feliu 2013)            |
|                           | <u>Other work-related factors</u>   | Richardson 2011 (Richardson et al. 2011)       |
|                           | Discretion over working hours/amount of work (+)  | Silver 2013 (Silver et al. 2013)               |
|                           | Belonging to workers' union (+)   | Steiner 2004 (Steiner et al. 2004)             |
|                           | Job replacement services (+)  | Steiner 2010 (Steiner et al. 2010)             |
| Job search assistance (+) | Van Muijen (van Muijen et al. 2013)   |  |
| Possible job loss (–)     |   |  |

| Category                             | Factors listed and described in the reviews <sup>17</sup>  | Evidence base                                  |
|--------------------------------------|--|--|
| Disease-related factors              | <u>Cancer site or type</u>   |  |
|                                      | Cancer site or type (?/0)  |  |
|                                      | Less aggressive cancer type (+)  | <u>Qualitative syntheses</u>                   |
|                                      | Breast (+) versus colorectal cancer (-)  | Spelten 2002 (Spelten et al. 2002)             |
|                                      | Colorectal (+) versus lung cancer (-)  | Stergiou-Kita 2014 (Stergiou-Kita et al. 2014) |
|                                      | Specific types: colorectal, liver or lung cancer, advanced blood or lymph malignancies, brain or central nervous system (CNS) cancer sites, gastrointestinal cancers, pancreatic cancer, head and neck cancers (-) | <u>Narrative reviews</u>                       |
|                                      | <u>Cancer stage</u>  | Aaronson 2014 (Aaronson et al. 2014)           |
|                                      | Cancer stage (?)   | Amir 2009 (Amir and Brocky 2009)               |
|                                      | Less advanced, early-stage cancer (+)  | Campbell 2012 (Campbell et al. 2012)           |
|                                      | Advanced tumour stage (-)  | Feuerstein 2010 (Feuerstein et al. 2010)       |
|                                      | Extensive disease (-)  | Fitch 2014 (Fitch and Nicoll 2014)             |
|                                      | <u>Symptoms</u>  | Horsboel 2012 (Horsboel et al. 2012)           |
|                                      | Cancer symptoms (?)  | Islam 2014 (Islam et al. 2014)                 |
|                                      | Depression or fatigue (?/0/-)  | Mehnert 2011 (Mehnert 2011)                    |
|                                      | Fewer physical symptoms (+)  | Molina 2013 (Molina and Feliu 2013)            |
|                                      | Functional limitations (-)   | Munir 2009 (Munir et al. 2009)                 |
|                                      | Nausea (0)   | Richardson 2011 (Richardson et al. 2011)       |
| <u>Other disease-related factors</u> | Silver 2013 (Silver et al. 2013)   |  |
| Shorter length of sick leave (+)     | Steiner 2004 (Steiner et al. 2004)   |  |
|                                      |  | Steiner 2010 (Steiner et al. 2010)             |
|                                      |  | Van Muijen (van Muijen et al. 2013)            |

| Category                  | Factors listed and described in the reviews <sup>17</sup>  | Evidence base                                  |
|---------------------------|--|--|
| Treatment-related factors | <u>Type of treatment</u>   | <u>Qualitative syntheses</u>                   |
|                           | Type of treatment (?), type of treatment as predictor at beginning of treatment (?)  | Banning 2011 (Banning 2011)                    |
|                           | Less invasive/aggressive (+/?) versus invasive/aggressive (-/?)  | Spelten 2002 (Spelten et al. 2002)             |
|                           | Absence of chemotherapy, radiation or surgery (+)  | <u>Narrative reviews</u>                       |
|                           | Surgery only (+)   | Aaronson 2014 (Aaronson et al. 2014)           |
|                           | Extensive surgery (-)  | Amir 2009 (Amir and Brocky 2009)               |
|                           | Chemotherapy (-)   | Feuerstein 2010 (Feuerstein et al. 2010)       |
|                           | Endocrine therapy (-)  | Fitch 2014 (Fitch and Nicoll 2014)             |
|                           | Objective treatment response as predictor at end of treatment (?)  | Harji 2015 (Harji et al. 2015)                 |
|                           | <u>Other treatment-related factors</u>   | Horsboel 2012 (Horsboel et al. 2012)           |
|                           | Treatment length (?)   | Mehnert 2011 (Mehnert 2011)                    |
|                           | Side effects (?)   | Molina 2013 (Molina and Feliu 2013)            |
|                           | Greater number of months since treatment (+)   | Munir 2009 (Munir et al. 2009)                 |
| Other factors             | Advice from doctor regarding work (+)  | Richardson 2011 (Richardson et al. 2011)       |
|                           | Changed attitude to work, such as reduced perception of its importance or decreased work aspiration (-)                      | Silver 2013 (Silver et al. 2013)               |
|                           | Fear of unemployment (-)   | Van Muijen 2013 (van Muijen et al. 2013)       |
|                           | A change in emotional state (depression, worry, frustration, fear of potential environmental hazards, feelings of guilt) (-) | <u>Qualitative syntheses</u>                   |
|                           | Time (likelihood of returning to work over time) (?/+)   | Banning 2011 (Banning 2011)                    |
|                           |  | Stergiou-Kita 2014 (Stergiou-Kita et al. 2014) |
|                           |  | <u>Narrative reviews</u>                       |
|                           |  | Cox 2014 (Cox et al. 2014)                     |
|                           |  | Feuerstein 2010 (Feuerstein et al. 2010)       |
|                           |  | Fitch 2014 (Fitch and Nicoll 2014)             |

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| Category | Factors listed and described in the reviews <sup>17</sup>  | Evidence base                            |
|----------|--|--|
|          | Concerns about own insurance (?), private health insurance (+)   | Islam 2014 (Islam et al. 2014)           |
|          | Psychological factors: life satisfaction, willingness or self-motivation, normalcy and acceptance of maintaining a normal environment at work (+), | Mehnert 2011 (Mehnert 2011)              |
|          | Motivation (?), coping (?)   | Munir 2009 (Munir et al. 2009)           |
|          | Low quality of life scores (–)   | Richardson 2011 (Richardson et al. 2011) |
|          |  | Silver 2013 (Silver et al. 2013)         |
|          |  | Spelten 2002 (Spelten et al. 2002)       |
|          |  | Steiner 2010 (Steiner et al. 2010)       |
|          |  | Trivers 2013 (Trivers et al. 2013)       |

Socio-demographic factors associated with RTW include age, gender, educational level, occupational status, marital status and income. Individuals with a lower income, a lower level of education, in older age groups or women seem to be less likely to return to work than men, younger adults or survivors with higher levels of education and income<sup>18</sup>. This evidence is not strong, however, and reviews provide conflicting results. Only age may be significantly associated with RTW (Horsboel et al. 2012, Spelten et al. 2002).

Examples of work-related factors were the type of work (physical and emotional job demands), the work setting (e.g. the size of the organisation, working hours, health insurance and disability pension coverage), social factors at work (e.g. the attitudes of colleagues) and other factors (e.g. the possibility of job loss, union membership). Physically demanding jobs, compared with less demanding jobs, were negatively associated with RTW<sup>19</sup>. Positively associated with RTW were a work setting with flexible working arrangements and reduced working hours. Negatively associated with RTW was a workplace with health insurance coverage, as were having salaried work at a company and early access to disability pension or longer disability pension. Other factors of the work setting that were considered relevant factors influencing RTW decisions were the possibilities for adaptation of the workplace or the job and the size of the organisation. However, the effects on RTW were either not specified or the effects were considered unclear in the literature reviewed. Social aspects of work that were considered to have a positive influence on RTW related to having a supportive work environment (including positive attitudes on the part of colleagues and the perception of an accommodating employer and supportive colleagues). On the contrary, a non-supportive social work environment and perceived discrimination at work were considered barriers, although discrimination in the workplace was not found to be significantly related to RTW (Spelten et al. 2002).

Disease-related factors that were considered to influence RTW were cancer type, site, stage and symptoms, but the associations with RTW were either unclear or considered irrelevant. However, literature authors who considered more specific characteristics concluded that less aggressive cancer types are positively associated with RTW, as is a less advanced, early-stage cancer, fewer physical symptoms and a shorter length of sick leave. An advanced tumour stage, an extensive disease and functional limitations are considered barriers for RTW. Furthermore, some cancer types were considered to negatively influence RTW (colorectal, liver and lung cancer, advanced blood and lymph malignancies, brain and CNS cancer sites, gastrointestinal cancers, pancreatic cancer, head and neck cancers). In direct comparison, breast cancer patients were considered more likely to return to work than colorectal cancer patients and colorectal cancer patients more likely to return to work than lung cancer patients. The symptom nausea was considered a factor with no relevant relation to RTW.

Treatment-related factors considered in the scientific literature to influence RTW were the type of treatment (e.g. aggressive versus less aggressive), the treatment length and its side effects. RTW was negatively associated with intense and longer treatments (extensive surgery, chemotherapy, endocrine therapy) and positively associated with less invasive or aggressive treatment (absence of chemotherapy, radiation or surgery, or surgery only). One review conducted a meta-analysis of available intervention studies regarding type of treatment. The analysis showed that aggressive and less aggressive treatments result in similar RTW rates for the same cancer type, although better-quality studies are still needed to confirm this result (de Boer et al. 2015b). This could mean that, where some review authors consider an effect of the type of treatment on RTW, the effect might not be significant. Treatment length and treatment side effects were considered factors that influence RTW, but their effects were considered unclear.

Other factors that the literature considered to hinder RTW were fear of unemployment; experiencing a low quality of life; having a changed attitude to work, such as reduced perception of its importance or decreased work aspiration; and experiencing changes in emotional state, such as depression, worry, frustration, fear or guilt. Time is considered a facilitator of RTW, with the likelihood of RTW increasing over time (Steiner et al. 2010). Other factors that are considered facilitators are having private health

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<sup>18</sup> Aaronson et al. 2014, Fitch and Nicoll 2014, Mehnert 2011, Molina and Feliu 2013, Steiner et al. 2004, Steiner et al. 2010, van Muijen et al. 2013.

<sup>19</sup> Aaronson et al. 2014, Amir and Brocky 2009, Spelten et al. 2002, Steiner et al. 2004, Steiner et al. 2010.

insurance, receiving advice from one's doctor regarding work and psychological factors (life satisfaction, willingness or self-motivation, normalcy and acceptance of maintaining a normal environment at work).

Another factor that is reported in the literature to influence RTW is personal perception of one's illness, as it determines how someone manages and copes with their disease (Hoving et al. 2010). However, the results are based on studies on somatic diseases, and to what extent the findings are relevant for cancer survivors remains unclear. For this reason, this factor is not included in the table above.

### **4.1.3 Differences according to selected factors**

Some research evidence suggests that differences in RTW outcomes are due to differences in occupation, occupational sector, enterprise size, gender, age and income.

It is, however, uncertain to what extent these factors influence RTW and how they relate to other factors (e.g. treatment, diagnosis, psychological factors), because good-quality evidence and multivariate analysis data are lacking.

The influence of the size of the enterprise is even less clear. Only one review identified size of organisation as an important factor, but it failed to provide references to primary studies or specify the direction of the influence (Wells et al. 2013).

Therefore, it is uncertain whether the following suggested relationships are significant:

- Cancer survivors employed in manual labour may be less likely to return to work than survivors with less physically demanding jobs.
- The size of the organisation may be an important factor for RTW (direction unknown).
- Female cancer survivors may be less likely to return to work than male survivors.
- Older cancer survivors may be less likely to return to work than younger survivors.
- Cancer survivors with lower incomes may be less likely to return to work than survivors with higher incomes.

It is difficult to draw strong conclusions about the influence of prognostic factors on RTW, because the evidence is mainly from studies using methods that cannot answer the question precisely (qualitative or cross-sectional studies). Although these studies indicate factors that might encourage or discourage RTW, for greater certainty there is a need for longitudinal studies that indicate how strongly those factors are related to RTW.

Ideally, evidence regarding prognostic factors should be based on studies with a long follow-up period (longitudinal design). This would increase confidence in the results (minimise bias) and identify relevant factors for predicting when a worker will return to work (prediction of work status over time). Furthermore, no reviews had numerically combined the results of prognostic factors in a meta-analysis. Therefore, the reviews could not draw convincing conclusions about the significance of the identified prognostic factors. For example, no information is available on how well factors predict RTW outcomes or how different factors are related. We cannot tell, for example, the extent to which older age (versus younger age) increases the risk of not returning to work.

## **4.2 Costs to employers, workers and society**

The return to work of cancer survivors is economically important. If a cancer survivor does not return to work during or after treatment, this entails a financial loss for the worker, the employer and society. Adapting the work environment may enable RTW. This may come with costs for the company and the worker, but, in the end, these may be less than the costs of long-term sick leave.

Most of the scientific literature shows that individuals experience financial loss when they are not able to return to work after cancer. Most commonly, cancer changes the economic status of survivors and imposes financial difficulties on them and their family. Reviews reported economic losses for individuals due to reduced wages, related to, for example, delayed RTW, exhaustion of paid sick leave or

unemployment. Furthermore, additional costs due to cancer and its treatment were also reported (Table 3).

The systematic reviews provided no information relating to the economic impact on companies.

Only one review reported on the economic loss to society due to cancer-related loss of productivity and working days. For the European Union (EU), these costs were estimated to be EUR 9.5 billion in 2009 (Aaronson et al. 2014). None of the reviews reported any additional costs to society, e.g. due to implementing RTW interventions for cancer survivors.

Table 3: **Economic impact of cancer**

| Category                                      | Sub-category   | Descriptions in reviews  | Evidence base  |
|---|--|--|--|
|   |  |  | <u>Qualitative syntheses</u>                                   |
|   | General description of economic difficulties                                   | 'Financial difficulties' (Harji 2015)  | Harji 2015 (Harji et al. 2015)                                 |
|   |  | 'A serious challenge to family budgets', 'financial burden' (Wells 2013)   | Wells 2013 (Wells et al. 2013)                                 |
|   |  | 'contrary findings have been found related to earnings and wages in cancer patients' (Mehnert 2011)  | <u>Narrative review</u><br>Mehnert 2011 (Mehnert 2011)         |
| Individual level                              | No economic difference between cancer survivors and individuals without cancer | 'one ... study assessed the economic consequences of the decision to return to work on the survivor and his or her family ... [it] found that long-term survivors worked an average of > 40 hours per week and had average wages similar to individuals without cancer' (Steiner 2004) | <u>Narrative reviews</u><br>Mehnert 2011 (Mehnert 2011)        |
|   |  | 'No differences in annual household income levels, in the number of paid hours per week, in working time each week (full-time, part-time) between cancer survivors and non-cancer control' (Mehnert 2011)  | Steiner 2004 (Steiner et al. 2004)                             |
|   | Higher income among cancer survivors   | 'significantly higher earnings in breast cancer survivors than among the non-cancer comparison group' (Mehnert 2011)   | <u>Narrative review</u><br>Mehnert 2011 (Mehnert 2011)         |
|   | Economic losses  | Loss of income (including unemployment, reduced wages, delayed RTW) (Harji 2015, Ullrich 2012, Wells 2013)   | <u>Qualitative syntheses</u><br>Harji 2015 (Harji et al. 2015) |
| 'gradual exhaustion of sick pay' (Wells 2013) |  | Wells 2013 (Wells et al. 2013)   |  |
|   |  | 'cancer to be associated with a decline in overall earnings, decrease in wages' (Mehnert 2011)   | <u>Narrative reviews</u><br>Mehnert 2011 (Mehnert 2011)        |

| Category      | Sub-category     | Descriptions in reviews   | Evidence base   |
|---------------|------------------|---|---|
|               |                  | '43 % of ovarian cancer survivors reported working full-time post-diagnosis, compared to 67 % pre-diagnosis; however, this resulted in minimal impact on overall socioeconomic status' (Trivers 2013)   | Trivers 2013 (Trivers et al. 2013)<br>Ullrich 2012 (Ullrich et al. 2012)  |
|               | Additional costs | Financial burden due to cancer and treatment (including medical bills, higher heating costs, travel) (Ullrich 2012, Wells 2013)   | <u>Qualitative synthesis</u><br>Wells 2013 (Wells et al. 2013)<br><u>Narrative review</u><br>Ullrich 2012 (Ullrich et al. 2012) |
| Company level | –                | No descriptions in the reviews  | -   |
| Society level | Economic loss    | In 2009, lost working days due to cancer cost the EU EUR 9.5 billion. (Aaronson 2014)<br><br>'mean total cost of illness/patient for pancreatic cancer in Germany was EUR 31 375 (cost years 2000-2003), where ... 10 % was contributed by indirect costs including loss of productivity due to days-off work. In 2009, the estimated cost/patient associated with loss of productivity due to absenteeism was EUR 6 077 in Sweden', 'a trend in increase of fiscal burden', 'major contributors were surgery, hospitalisations, chemotherapy, and loss of productivity' (Kaushal 2012) | <u>Narrative reviews</u><br>Aaronson 2014 (Aaronson et al. 2014)<br>Kaushal 2012 (Kaushal et al. 2012)                          |

#### 4.2.1 Individual level

Systematic reviews identified that the financial impact on the cancer survivor is a combination of the additional costs of having cancer (e.g. travel and medical bills), gradual exhaustion of paid sick leave and a change in occupational status (reduced wages, unemployment or delayed RTW) (Harji et al. 2015, Ullrich et al. 2012, Wells et al. 2013).

The reviews did not use methods that enabled quantitative analysis of the actual financial impact on cancer survivors. Authors argue, however, that this financial impact can pose a serious challenge not only for the individual but also for the family budget (Wells et al. 2013) and that it is unclear whether or not the financial status of cancer survivors is different from that of individuals without cancer (Mehnert 2011, Steiner et al. 2004).

## **4.2.2 Societal level**

It has been argued that the economic consequences of cancer-related lost productivity are significant (Wells et al. 2014). The economic costs of cancer and RTW for the EU in 2009 have been estimated at billions of euros (Aaronson et al. 2014).

## **4.3 Wider issues that may affect the worker**

### **4.3.1 Meaning of work and motivation to work**

The perceived meaning of work and the motivation to work are factors that influence RTW decisions. From the scientific literature, six factors were identified that relate to motivation to work and that either support or discourage a decision to return to work (Table 4).

#### **▪ Drivers**

A positive influence on RTW was reported when cancer survivors perceived work as (1) a marker of normality, (2) a marker of health, (3) important to their identity, (4) socially important or (5) economically necessary, or when cancer survivors perceived (6) pressure from the workplace to return to work.

Regaining normality and structure in everyday life was reported as both the motivation for returning to work and the perceived meaning of work. Cancer survivors valued the opportunity to return to 'default' or perceived work as a distraction from cancer. Others understood work as a marker of well-being, and reported that working and being at work made them feel healthy. Work was also described as being important to one's identity, and survivors returned to work to regain a sense of their former self and identity, to adjust to bodily changes or because work meant validation and achievement to them. Cancer survivors also valued relationships with co-workers and did not want to miss out on the social aspects of work. Those factors are all internally driven, but other factors that may encourage RTW were externally driven. In these cases, survivors understood work as an economic necessity to protect their lifestyle aspirations or support their family, or they returned to work for insurance reasons. Some men in one review reported feeling pressure from the workplace to return to work (Handberg et al. 2014).

#### **▪ Barriers**

In contrast, some cancer survivors choose not to return to work or choose to reduce their working hours. Factors that hindered RTW were reported as follows: workers (1) experienced a change in the perceived meaning and importance of work after their cancer diagnosis, (2) felt too ill to work, (3) perceived the workplace as discouraging or (4) simply preferred the opportunity to take a break.

The changes in the perceived meaning and importance of work described as hindering RTW were when the perceived value of work decreased after having cancer, or the survivor lost the 'taste for work'. Changes in life perspectives and priorities that affected the perceived meaning of work and altered work priorities were also described. Some felt too fragile or ill to work, or were confronted with health problems and health concerns that did not allow RTW. The characteristics that made the workplace a discouraging place and hindered RTW were not described in the included reviews.

Table 4: **Work motivation/meaning of work for cancer survivors and its influence on RTW**

| Category  | Sub-category                      | Motivation to work and meaning of work, as listed in reviews  | Evidence base   |
|---|-----------------------------------|---|---|
| Positive influence on RTW   | Regaining normality and structure | Normality (Banning 2011, Handberg 2014, Peteet 2000, Wells 2013)  | <u>Qualitative syntheses</u><br>Banning 2011 (Banning 2011)<br>Handberg 2014 (Handberg et al. 2014) |
|   |                                   | Structure, 'default' (Wells 2013)   | Wells 2013 (Wells et al. 2013)  |
|   |                                   | Work generates and structures one's everyday life (Silver 2013)   | <u>Narrative reviews</u><br>Peteet 2000 (Peteet 2000)<br>Silver 2013 (Silver et al. 2013)           |
|   | Marker of health                  | Feeling healthy (Banning 2011)  | <u>Qualitative syntheses</u><br>Banning 2011 (Banning 2011)   |
|   |                                   | Marker of health/well-being (Wells 2013)  | Wells 2013 (Wells et al. 2013)  |
|   | Important for identity            | RTW perceived as an important phase in the recovery process, a measure of control over illness, a positive step towards the future (Duijts 2014a)     | <u>Narrative review</u><br>Duijts 2014a (Duijts et al. 2014a)                                       |
|   |                                   | Sense of identity (Banning 2011), identity as a worker (Wells 2013), concept of identity (Peteet 2000)  | <u>Qualitative syntheses</u><br>Banning 2011 (Banning 2011)   |
|   | Socially important                | Achievement, validation, RTW is a goal to be achieved (Wells 2013)  | Wells 2013 (Wells et al. 2013)  |
| Working is a way of confronting and readjusting to an altered body, re-establishing a sense of one's former self (Wells 2013) |                                   | <u>Narrative review</u><br>Peteet 2000 (Peteet 2000)  |   |
| Social interaction: support, belonging (Wells 2013)   |                                   | <u>Qualitative syntheses</u><br>Handberg 2014 (Handberg et al. 2014)  |   |
|   |                                   | Social interaction: alleviation of boredom/isolation (Wells 2013)   | Wells 2013 (Wells et al. 2013)  |
|   |                                   | Close relationships with colleagues: strong desire to get back to work quickly, not missing out on the social aspect of the workplace (Handberg 2014) |   |
|   |                                   | Work and colleagues seen as rehabilitation (Handberg 2014)  |   |

| Category         | Sub-category  | Motivation to work and meaning of work, as listed in reviews   | Evidence base   |
|------------------|---|--|---|
|                  | Economically necessary  | <p>Economic necessity or protection of current/future lifestyle aspirations (Wells 2013)</p> <p>Pressure due to finances and/or insurance (Banning 2011)</p> <p>Burden of being economically responsible for the family (Handberg 2014)</p> <p>Fear of job loss (Alfano 2009)</p>  | <p><u>Qualitative syntheses</u></p> <p>Banning 2011 (Banning 2011)</p> <p>Handberg 2014 (Handberg et al. 2014)</p> <p>Wells 2013 (Wells et al. 2013)</p> <p><u>Narrative review</u></p> <p>Alfano 2009 (Alfano and Rowland 2009)</p>  |
|                  | Pressure from workplace to return to work   | <p>Feeling of pressure from the workplace for men to come back to work as soon as possible (Handberg 2014)</p> <p>Anxiety about being fired (Handberg 2014)</p> <p>Fear of sick leave (Banning 2011)</p>   | <p><u>Qualitative syntheses</u></p> <p>Banning 2011 (Banning 2011)</p> <p>Handberg 2014 (Handberg et al. 2014)</p>  |
| Hindering on RTW | influence<br>Work is less important (perceived meaning and importance of work changed after cancer diagnosis) | <p>The perceived value of work has decreased after having cancer (Feuerstein 2010)</p> <p>The survivor has lost the taste for work (Silver 2013)</p> <p>Changed life perspectives may affect the meaning of work to some degree (Handberg 2014)</p> <p>Altered work priorities (Banning 2011)</p> <p>Re-evaluation of work–life balance (job/career change or retirement, reducing hours, etc.) (Wells 2013)</p> <p>Finding new activities/meaning in life when RTW is not possible (Wells 2013)</p> <p>Voluntarily stopping working, reducing working hours or changing job content as a result of a re-evaluation of life priorities (Duijts 2014a)</p> <p>Diminished taste for work, increased time required for health maintenance (Alfano 2009)</p> | <p><u>Qualitative syntheses</u></p> <p>Handberg 2014 (Handberg et al. 2014)</p> <p>Banning 2011 (Banning 2011)</p> <p>Wells 2013 (Wells et al. 2013)</p> <p><u>Narrative reviews</u></p> <p>Alfano 2009 (Alfano and Rowland 2009)</p> <p>Duijts 2014a (Duijts et al. 2014a)</p> <p>Feuerstein 2010 (Feuerstein et al. 2010)</p> <p>Silver 2013 (Silver et al. 2013)</p> |

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| Category | Sub-category                             | Motivation to work and meaning of work, as listed in reviews   | Evidence base  |
|----------|--|--|--|
|          | Feeling too ill to work                  | Feeling too fragile to return to work (Silver 2013)<br>Required to stop working, reduce working hours or change job content because of physical or cognitive problems or psychological concerns arising from diagnosis or treatment (Duijts 2014a) | <u>Narrative reviews</u><br>Duijts 2014a (Duijts et al. 2014a)<br>Silver 2013 (Silver et al. 2013) |
|          | Perceiving the workplace as discouraging | The workplace is a discouraging place (Silver 2013)  | <u>Narrative review</u><br>Silver 2013 (Silver et al. 2013)  |
|          | Opportunity to take a break              | Taking an opportunity to pause (Silver 2013)   | <u>Narrative review</u><br>Silver 2013 (Silver et al. 2013)  |

### **4.3.2 Attitudes and behaviour of workers and their colleagues**

The behaviours and attitudes of others can affect cancer survivors' RTW decisions and influence organisational structures and interpersonal relationships. The scientific literature mainly describes the attitudes and behaviours of others from the perspective of the cancer survivor. These findings describe cancer survivors' positive and negative experiences of workplace accommodations, support from healthcare professionals, and support from their colleagues and employers (Table 5).

Negative experiences were reported in reviews as receiving unwanted workplace accommodations; a lack of support from health professionals, employers and colleagues; and facing discrimination or misconceptions regarding the impact of cancer. In contrast, positive experiences were related to receiving appropriate workplace accommodations and adjustments; organisational communication between healthcare professionals and employers; legal protection; and support from healthcare professionals, colleagues and employers.

Neither communication between healthcare professionals and employers nor the type and content of support from professionals, colleagues and employers were described in much detail in the scientific literature. However, lack of support was described as not receiving work-related guidance from professionals, or receiving insincere or only short-lived support from colleagues and employers. Examples of support that resulted in positive experiences were receiving advice from medical practitioners regarding RTW (Amir and Brocky 2009), and consistent personal and emotional support from colleagues and employers (e.g. empathy, dignity, contact during and after treatment, help with managing symptoms, help with generating a greater understanding of the illness in the workplace) (Wells et al. 2013).

Cancer survivors experienced discrimination in the form of forced changes; refusal to implement modifications; unfair dismissal; employment discrimination; and insensitive, stigmatising behaviour. Survivors also reported that employers did not always realise how long side effects could last.

The type of workplace accommodations made and whether they were perceived as wanted or unwanted were not described in detail. Examples of accommodations that were received positively were adaptations to counteract reduced work ability, such as reduced demands or shorter working hours.

Table 5: **Attitudes and behaviours of others towards cancer and RTW**

| Category                                 | Sub-category  | Description in reviews   | Evidence base  |
|--|---|--|--|
|  | Workplace accommodations  | <p>Organisational support: workplace accommodations, modifications provided (in accordance with legislation), ‘employers’ willingness and ability to make adjustments to the workplace and job role (e.g. flexible working hours and shared workloads)’, ‘modifications to the workplace, working hours, duties, accommodation of hospital appointments, load alleviation, provision of assistance and changes in personnel’ (Wells 2013)</p> <p>‘most [workers with cancer] were given work adjustments in terms of flexibility, reduced demands and shorter working hours’ (Munir 2009)</p> <p>‘Most [workers with cancer] asked for adaptations to account for poor work ability (or changed employment) or made self-adaptations’ (Munir 2009)</p> | <p><u>Qualitative synthesis</u><br/>Wells 2013 (Wells et al. 2013)</p> <p><u>Narrative review</u><br/>Munir 2009 (Munir et al. 2009)</p>                                       |
| Positive experiences of cancer survivors | Communication between healthcare professionals and employers/management | Communication about the organisation of work between healthcare professionals and employers/management (Wells 2013)  | <p><u>Qualitative synthesis</u><br/>Wells 2013 (Wells et al. 2013)</p>   |
|  | Support from health professionals                                       | <p>Advice from medical practitioners (Amir 2009)</p> <p>Support from an occupational physician (Islam 2014)</p> <p>Support related to work issues provided by healthcare professionals, social workers and occupational health services/professionals (Wells 2013)</p>   | <p><u>Qualitative synthesis</u><br/>Wells 2013 (Wells et al. 2013)</p> <p><u>Narrative reviews</u><br/>Amir 2009 (Amir and Brocky 2009)<br/>Islam 2014 (Islam et al. 2014)</p> |
|  | Legal protection  | <p>Legal protection of cancer survivors at work (Amir 2009)</p> <p>Workplace modifications provided in accordance with legislation (Wells 2013)</p>  | <p><u>Qualitative synthesis</u><br/>Wells 2013 (Wells et al. 2013)</p> <p><u>Narrative review</u><br/>Amir 2009 (Amir and Brocky 2009)</p>                                     |

| Category                                 | Sub-category   | Description in reviews  | Evidence base  |
|--|--|---|--|
|  | Personal and emotional support from colleagues and employers (including misguided support) | <p>Interpersonal support: (consistent) personal and emotional support from employers and colleagues during sick leave and on return to work (including well-meaning but misguided support), '(e.g. empathy, dignity), along with the actions and attitudes of co-workers', 'Contact with co-workers during and after treatment', 'helping the newly returned survivor manage their symptoms and in generating a greater understanding of the illness in the workplace' (Wells 2013)</p> <p>Support from colleagues and employers (Islam 2014)</p>   | <p><u>Qualitative synthesis</u><br/>Wells 2013 (Wells et al. 2013)</p> <p><u>Narrative review</u><br/>Islam 2014 (Islam et al. 2014)</p>                                 |
| Negative experiences of cancer survivors | Unwanted workplace accommodations  | 'others received adaptations they did not want e.g. demotions, task changes' (Munir 2009)   | <p><u>Narrative review</u><br/>Munir 2009 (Munir et al. 2009)</p>  |
|  | Lack of support from health professionals  | <p>Lack of work-related guidance and support from healthcare professionals, social workers and occupational health services/professionals (Wells 2013)</p> <p>Lack of 'information and guidance of their healthcare team for making decisions about returning to work' (Wells 2013)</p> <p>Feeling of 'bothering' their doctor with questions about work, or simply not knowing what to ask (Wells 2013)</p> <p>'inflexibility of healthcare appointment systems, negative attitudes towards return to work and refusal to issue sick certificates' (Wells 2013)</p> <p>Fear that the 'physician might disclose medical information that could threaten their job' (Wells 2013)</p> | <p><u>Qualitative synthesis</u><br/>Wells 2013 (Wells et al. 2013)</p>   |
|  | Discrimination   | <p>Discrimination (Peteet 2000)</p> <p>Experiencing discrimination/disadvantage: forced changes, refused modifications, unfair dismissal (Wells 2013)</p> <p>Employment discrimination (Amir 2009)</p>  | <p><u>Qualitative synthesis</u><br/>Wells 2013 (Wells et al. 2013)</p> <p><u>Narrative review</u><br/>Amir 2009 (Amir and Brocky 2009)<br/>Peteet 2000 (Peteet 2000)</p> |
|  |  |   |  |

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| Category | Sub-category                              | Description in reviews  | Evidence base  |
|----------|---|---|--|
|          |   | Insensitive, stigmatising support/communication: 'feeling stigmatized at work ranged from experiencing "awkward silences" or inappropriate gossip, to more specific instances of sexual stigmatization (gynaecologic cancers)' (Wells 2013) |  |
|          | Lack of support from employers/colleagues | Lack of support/communication, insincere or short-lived support from employers/colleagues (Wells 2013)  | <u>Qualitative synthesis</u><br>Wells 2013 (Wells et al. 2013) |
|          | Employers' misconceptions                 | 'Employers do not realize how long side-effects can last' (Munir 2009)  | <u>Narrative review</u><br>Munir 2009 (Munir et al. 2009)      |

### **4.3.3 Difficulties in balancing the demands of work and treatment**

Cancer survivors face difficulties in balancing the conflicting demands of work and treatment, such as the need for sick leave during treatment and the obligation to be at work (Wells et al. 2013). Scientific literature that describes these difficulties in more detail is lacking.

## **4.4 Work-related and occupational cancer**

The development of cancer may be caused by work and the work environment. Occupational cancer can be defined as cancer that is mainly caused by exposure at work, whereas work-related cancer is considered multifactorial, and work exposure plays a smaller role alongside other factors. Both occupational and work-related cancers can be prevented by reducing or eliminating exposures at work (e.g. to asbestos or UV light). It has been estimated that in Britain stricter interventions, including better compliance with lower exposure limits at work, would prevent more than 8 200 cancers by 2060 (Hutchings et al. 2012).

There is a lack of systematic reviews and primary studies on RTW after work-related or occupational cancer. It is unclear whether or not the findings regarding non-occupational or non-work-related cancers are applicable when the cancer is due to workplace exposure.

It is likely that the RTW process and the content of RTW interventions for occupational or work-related cancer are different from those used when cancer is not work-related. Occupational cancer types might affect survivors' work motivation more drastically and will probably require more radical workplace changes (e.g. a complete change of profession). When there is a clear diagnosis of an occupational disease, return to an unchanged workplace might not be an option. Whether or not a worker diagnosed with occupational cancer can return to his or her work depends on the circumstances and the profession or occupation. Because of latency, the cancer may be related to an exposure a long time ago. For instance, prominent occupational cancers such as mesothelioma due to asbestos exposure have a very long latency time and a very short survival time after diagnosis. In these cases, RTW is usually not an option.

For other cancers that may be work-related, such as breast cancer after exposure to night work or skin cancer after working in the construction industry, the additional diagnosis of an occupational origin for the disease is somewhat infrequent. This is because many other factors in addition to occupational exposure may be implicated; these factors may relate to the individual and/or to circumstances outside the workplace. In these cases, proper guidance from an occupational health expert on the risks involved with continuing the same work would be helpful.

## **4.5 Aspects relevant to small and medium-sized enterprises**

The size of the company seems to have an impact on cancer survivors' opportunities to return to work (Wells et al. 2013). In companies with fewer than 250 workers (SMEs), information and resources for RTW strategies or programmes are lacking, and support and education are needed (Wells et al. 2014, Williams and Westmorland 2002, Wilson et al. 2012). These problems seem to be found in particular in small enterprises with fewer than 50 workers, and in micro-enterprises with fewer than 10 workers (EU-OSHA 2016).

In general, scientific literature on SMEs, cancer and RTW is lacking. Researchers stated some time ago that studies on this 'neglected area' were needed (Wells et al. 2014). Primary studies on the following issues are still required:

- the needs, views and experiences of self-employed people and of managers working in SMEs;
- the economic impact of employing a worker diagnosed with cancer;
- the conditions that hinder or promote RTW interventions for cancer survivors in SMEs.

We identified three relevant primary studies. One study measured the effect on firms' survival of cancer cases among the self-employed and small business owners (Ha-Vinh et al. 2015). There was no significant influence on enterprise survival rates five years after diagnosis, but there was a significantly

higher hazard ratio for closing down during the first five years than among those firms without a diagnosis of cancer. The authors concluded that support for the first five years, including insurance coverage and aid from social protection systems, should be available to small business owners and the self-employed, to prevent the disease affecting the survival of their businesses.

Two other studies identified the challenges for smaller businesses in managing workers affected by cancer.

One study conducted in-depth interviews with 35 selected employers from the United Kingdom who had some experience of managing workers with cancer, and 14 professionals working closely with small businesses (Wilson et al. 2012). The study's authors interpreted the results in terms of advantages and disadvantages that SMEs (compared with, for example, larger companies) have in managing the absences of workers with cancer. Advantages were seen in the small size of the enterprises, which results in a more familial atmosphere. This may create a more supportive environment for workers with cancer in the RTW process. Furthermore, communication between worker and employer about cancer and work-related issues may be easier. Disadvantages were reported to be lack of experience in the management of absence and health issues in the workplace, limited access to occupational health services (the smaller the company the less likely it is that occupational health services will be provided by the workplace) and the lack of (experienced) human resource departments in small companies. Those drawbacks can make it difficult for the employer to balance the responsibilities of running the company and managing issues related to health and absence. The study's authors concluded that appropriate support especially tailored for SMEs is needed. Some employers reported preferring telephone support, while others preferred internet-based or paper-based information materials.

Another study was conducted in Singapore, on the perceived barriers and facilitators for employers in hiring or retraining cancer survivors (Leong et al. 2011). The study's authors enrolled 500 SMEs in an online survey and carried out 10 in-depth interviews with SME employers. The top three concerns were survivors' current health state, insurance costs and the ability to meet job demands, whereas the facilitators were the perceived moral obligation and existing government initiatives to promote the RTW of cancer survivors. Considering the economic, societal and cultural differences between Singapore and Europe, it is difficult to determine whether or not these results apply in the European context.

## 4.6 Interventions and resources

For the purposes of this overview of the literature, the terms 'intervention' and 'resources' are understood in a broad way. An intervention is employed in a situation where a need has been identified and action has been undertaken that is expected to have an effect. The intervention would have to draw on resources, whether from inside or outside the organisation. A brochure is a resource that could be used to raise awareness, which would be the intervention, or as an aid to training (again, the intervention). Resources could also be broader and include external service providers, who would draw on their own resources, but again this would be part of an intervention: a need is identified that can be addressed through using the services of an external provider. In this sense, interventions include both very active approaches to support, such as training, and less active approaches, such as providing information by phone, online or in print form.

The overview shows that only a few scientific studies describe available interventions and resources relevant for cancer and RTW, and that only a few scientific reviews report on their effectiveness in relation to RTW. Most information on available interventions was found in the grey literature. The problem is that an evaluation of their effectiveness in promoting RTW is completely missing from this type of literature. This shows the gap that exists between practice and research on this important subject.

This section provides an overview of the available interventions and resources that have been identified. Interventions were included if they specifically focused on the issue of the RTW of cancer survivors and if they were described in either the scientific or the grey literature.

Most interventions have been developed for cancer survivors (Table 6). Some interventions are specifically for employers, human resource professionals, line managers (Table 7) or healthcare professionals (Table 8). Only a few interventions are available for SMEs and the self-employed affected by cancer (Table 9).

The interventions described in the scientific literature focus on rehabilitation, guidelines and workplace accommodations. Rehabilitation services for cancer survivors, with the aim of improving their work ability, can include vocational, medical, physical, psycho-educational and multidisciplinary interventions. A positive influence on RTW could be shown only for multidisciplinary interventions (de Boer et al. 2015b, de Boer et al. 2015a). The effects of the other interventions are uncertain.

Results from the grey literature show that many additional interventions are available that provide information, training and assistance related to employment after cancer diagnosis and treatment. However, none of these has been evaluated, and their effects on RTW are unknown. Most services are provided by NGOs and focus mainly on providing information and consultancy regarding cancer and RTW. The interventions available are in the form of webinars, seminars, lectures, online material, videos, printed material (posters, brochures), telephone and email support or personal consultancy meetings. Other interventions enable the exchange of experiences, ideas and communication among those affected by cancer or working with cancer survivors, through membership of networks and support groups.

#### **4.6.1 For cancer survivors**

Depending on the country, cancer survivors have access to different rehabilitation services and information sources from the social and healthcare sector. They can include vocational, medical, physical, psycho-educational and multidisciplinary interventions.

Survivors can find further support from NGOs. These services are mostly informative (resources) and do not include rehabilitation. The aim of these interventions is to enable cancer survivors to adapt to their new situation and make informed decisions regarding their RTW. The information is disseminated in printed form (e.g. brochures), personally (e.g. in-house counselling, by telephone) or over the internet (e.g. online articles, videos and webinars).

Some cancer survivors receive support from their employers in the RTW process, for example when the company has RTW programmes and policies in place that can assist cancer survivors with workplace concerns (Black and Frost 2011, Short and Vargo 2006). In the scientific literature, more detailed descriptions of those programmes and policies are almost entirely absent. Evaluations of the effectiveness of those interventions are entirely absent. The scientific literature reports that workplace adjustments and accommodations relate to flexibility with regard to how long, where, when and at what times employees work. This includes adjustments to working hours (e.g. gradual RTW, flexible working hours), adjustments in the workplace (e.g. own office space instead of open-plan office, remote work), paid leave for healthcare appointments and adjustments to workload (e.g. job-sharing, reduced demands, provision of assistance) (see Table 6). The grey literature provides resources (e.g. booklets) that give information about possible accommodations and programmes, but it is unclear if these are actually implemented as interventions. One of the grey literature resources listed in the table below is the website of the Job Accommodation Network. This website provides the following list of possible workplace accommodations:

1) To accommodate fatigue and weakness:

- reduce or eliminate physical exertion and workplace stress;
- schedule periodic rest breaks away from the workstation;
- allow a flexible work schedule and flexible use of leave time;
- allow work from home;
- implement ergonomic workstation design;
- provide a scooter or other mobility aid if walking cannot be reduced;
- provide parking close to the work site;
- install automatic door openers;
- make sure materials and equipment are within reach;
- move workstation close to other work areas, office equipment and break rooms;
- reduce noise with sound-absorbent baffles/partitions, environmental sound machines and headsets;

- provide an alternative work space to reduce visual and auditory distractions.

2) To accommodate medical treatment:

- provide flexible schedules and leave time;
- allow a self-paced workload with flexible hours;
- allow employee to work from home;
- provide part-time work schedules.

3) To accommodate respiratory difficulties:

- provide adjustable ventilation;
- keep work environment free from dust, smoke, odour and fumes;
- implement a 'fragrance-free' workplace policy and a 'smoke free' building policy;
- avoid temperature extremes;
- allow for use of a fan/air conditioner or heater at the workstation;
- redirect air conditioning and heating vents.

4) To accommodate skin irritations:

- avoid infectious agents and chemicals;
- avoid invasive procedures (activities that could exacerbate a person's skin condition);
- provide alternative and protective clothing.

5) To accommodate stress:

- develop strategies to deal with work problems before they arise;
- provide sensitivity training to co-workers;
- allow telephone calls during working hours to doctors and others for support;
- provide information on counselling and worker assistance programmes;
- create a flexible work environment:
  - flexible scheduling;
  - modified break schedule;
  - leave for counselling;
  - work from home/flexi-place.

6) to accommodate temperature sensitivity:

- modify the work site temperature;
- modify the dress code;
- allow for use of a fan/air conditioner or heater at the workstation;
- allow flexible scheduling and flexible use of leave time;
- allow work from home during extremely hot or cold weather;
- maintain the ventilation system;
- redirect air conditioning and heating vents;
- provide an office with separate temperature control.

Although differences exist between countries, governments provide legal protection for cancer survivors at work or returning to work from, for example, employment discrimination. In all EU member states, employers are bound by law to make reasonable adjustments for people with disabilities. Examples of such adjustments are reducing working days, altering working hours and altering the work environment.

Table 6: Overview and examples of interventions and resources for cancer survivors

| Type as described by authors <sup>20</sup> | Topics and content  | Provider/sources  | Evaluation of the effect on RTW <sup>21</sup>  |
|--|---|---|--|
| Examples from the scientific literature    |   |   |  |
| Guideline                                  | 10-step plan on how to return to work for cancer survivors and occupational health professionals  | Amir and Brocky 2009, de Boer and Frings-Dresen 2009, Egan et al. 2013, Nieuwenhuijsen et al. 2006      | No effect on RTW ((Amir and Brocky 2009) on the basis of one study)  |
| Psycho-educational intervention            | Self-care behaviours to reduce cancer-related fatigue (including lectures, handbook, goal-setting, progress diary), or patient education on physical side effects, stress and coping (including group discussions and lectures)   | de Boer et al. 2015b  | Low-quality evidence of no considerable difference in the effect of psycho-educational interventions compared with care as usual on RTW (de Boer et al. 2015b) |
| Person-directed vocational intervention    | Interventions include advanced vocational training, retraining, workplace accommodations, work trials, assistance with job placement and therapy to restore an individual's work-related functions. Interventions are covered by (depending on country) a statutory pension insurance scheme, an employment agency, injury insurance or an employers' liability insurance association. They are provided by (occupational) health professionals | Parkinson et al. 2010, Rick et al. 2012, Short and Vargo 2006, Silver et al. 2013; Steimann et al. 2014 | Higher RTW in the intervention group ((Steimann 2014) on the basis of one study)   |

<sup>20</sup> If the authors provided no description, the intervention is described as 'Website'.

<sup>21</sup> The best available evidence identified in this review is presented.

| Type as described by authors <sup>22</sup> | Topics and content  | Provider/sources   | Evaluation of the effect on RTW <sup>23</sup>  |
|--|---|--|--|
| Medical intervention                       | Interventions including less radical treatment and function-conserving treatment  | de Boer et al. 2015b   | Low-quality evidence that function-conserving approaches yield similar RTW rates to those of more radical treatments (de Boer et al. 2015b)  |
| Physical intervention                      | Interventions include physical activity, behaviour-change intervention, walking and supervised exercise   | de Boer and Frings-Dresen 2009, de Boer et al. 2015b, Hoving et al. 2009, Short and Vargo 2006, Silver et al. 2013                       | Low-quality evidence that physical training is not more effective than care as usual for RTW (systematic reviews (de Boer et al. 2015b, de Boer et al. 2015a))   |
| Multidisciplinary intervention             | Interventions include physiotherapy, occupational therapy, speech therapy, vocational rehabilitation and psychology in relation to RTW (e.g. delivering education, counselling, training) | de Boer and Frings-Dresen 2009, de Boer et al. 2015b, Hoving et al. 2009, Short and Vargo 2006, Silver et al. 2013, Tamminga et al. 2012 | Moderate-quality evidence that multidisciplinary interventions that combine vocational counselling with patient education, patient counselling, and biofeedback-assisted behavioural training or physical exercises produce a higher RTW rate than care as usual (based on one systematic review with a meta-analysis combining five randomised controlled trials (RCTs) (de Boer et al. 2015b, de Boer et al. 2015a)) |

<sup>22</sup> If the authors provided no description, the intervention is described as 'Website'.

<sup>23</sup> The best available evidence identified in this review is presented.

| Examples from the grey literature and the online questionnaire               |   |   |               |
|--|---|---|---------------|
| Advice by telephone  | Information on legislation, cancer survivors' experiences of cancer and work, work adaptations, and advice on RTW   | <a href="#">Kom op tegen kanker</a> (BE)  | Not performed |
| Advice by telephone  | Information on RTW and legislation; communication with the employer, general practitioner and medical specialist; work adaptations; collaboration with occupational health organisations, hospitals and employer organisations  | <a href="#">LIKAS</a> (BE)  | Not performed |
| Advice by telephone and online, referral to occupational health professional | Referrals can be made by the general practitioner or employer after four weeks of absence with the consent of the worker; an occupational health professional identifies obstacles preventing the worker from returning to work, produces a RTW plan tailored to the worker's needs (the programme is designed to be used alongside, not to replace, existing occupational health services) | <a href="#">Fit for work</a> (United Kingdom)                                       | Not performed |
| Article  | Information on employment options, steps to take to continue working, legal rights and resolving employment problems  | <a href="#">Livestrong.org</a> (US)   | Not performed |
| Booklet  | Information on rehabilitation including vocational rehabilitation; gradual RTW (the 'Hamburger Model'); financial help; unemployment; legal rights regarding termination of one's work contract   | <a href="#">Roche Pharma AG</a> (DE)  | Not performed |
| Booklet  | Information on employment law, disability status, financial issues, self-employment, unemployment, rehabilitation and gradual RTW; contact addresses for consultancy; answers to the 100 most frequently asked questions regarding cancer and work  | <a href="#">Österreichische Krebshilfe</a> and <a href="#">Krebshilfe Wien</a> (AT) | Not performed |

| Examples from the grey literature and the online questionnaire |  |  |               |
|--|--|--|---------------|
| Booklet  | Information on talking to one's employer and colleagues, legal rights, disability status, vocational rehabilitation, workplace accommodations, financial support   | <a href="#">Krebs und Beruf</a> (DE)       | Not performed |
| Consultation   | Developing occupational goals, RTW motivation and job application training   | <a href="#">Krebs und Beruf</a> (DE)       | Not performed |
| Consultation: telephone and email                              | Any topic related to cancer, including RTW   | <a href="#">Deutsche Krebshilfe</a> (DE)   | Not performed |
| Consultation, help and information: written and audio material | <p>Face-to-face consultation at <i>Krebsberatungsstellen</i> (cancer counselling centres) about anything (including cancer and RTW)</p> <p>Written material: vocational rehabilitation, goal-setting, first weeks at work, communicating in the workplace</p> <p>Audio material: expert interview about cancer and RTW</p>   | <a href="#">German Cancer Society</a> (DE) | Not performed |
| Consultation: individual or group coaching                     | Advice on learning how to cope with the long-term effects of a cancer diagnosis and cancer treatment; education for workers on legislation, creating an RTW plan and the involvement of their employer and colleagues  | <a href="#">Rentree</a> (BE)               | Not performed |
| Consultation, website, individual coaching                     | Generally, tailored guidance is provided after an initial consultation, and might relate to recovery, empowerment, a fitness plan, learning how to cope with the long-term effects of a cancer diagnosis and cancer treatment, education for the worker and the employer, improving communication, getting the expert view of an occupational physician, RTW support, changing duties/employer | <a href="#">Re-turn</a> (NL)               | Not performed |

| Examples from the grey literature and the online questionnaire |   |   |               |
|--|---|---|---------------|
| Counselling  | Requesting reasonable accommodations, finding a job after cancer<br>Patient information website   | <a href="#">American Society of Clinical Oncology (ASCO)</a> (US) | Not performed |
| Factsheet  | Information on legal protection   | <a href="#">CancerCare</a> (US)                                   | Not performed |
| Individual coaching  | Individual support for one year to help cancer survivors with no job to find gainful employment   | <a href="#">oPuce (NL)</a>  | Not performed |
| Information  | Collection of links to information about gradual rehabilitation, legal rights, pensions, rehabilitation   | <a href="#">INKA</a> (DE)   | Not performed |
| Information  | Advice on talking to employers, colleagues and human resources, the financial impact, gradual RTW, managing tiredness at work, resources, help and support  | <a href="#">Bupa</a> (United Kingdom)                             | Not performed |
| Information  | Key questions; reasons to work; what to consider when making a decision regarding RTW; information on flexible working arrangements, access to leave entitlements, managing and controlling side effects, making work adjustments and changing jobs; information for working carers | <a href="#">Cancer Council NSW</a> (AU)                           | Not performed |
| Information and consultation                                   | Advice on vocational and medical rehabilitation, gradual RTW and the implications of cancer for work ability  | <a href="#">NCT Heidelberg</a> (DE)                               | Not performed |
| Information and slideshow                                      | General information about cancer, unemployment, communication in the workplace, disability status and gradual RTW   | <a href="#">Integrationsämter BIH</a> (DE)                        | Not performed |
| Information  | General information about cancer and employment   | <a href="#">REHADAT</a> (DE)                                      | Not performed |
| Information  | Examples of good practices in RTW   | <a href="#">REHADAT</a> (DE)                                      | Not performed |

| Examples from the grey literature and the online questionnaire  |  |   |               |
|---|--|---|---------------|
| Information   | General information about cancer and employment  | <a href="#">INKA</a> (DE)                                       | Not performed |
| Information and support by phone or email   | Confidential service: individuals can speak to or email a specialist health professional about anything to do with cancer  | <a href="#">Cancer Council NSW</a> (AU)                         | Not performed |
| Information centres   | Information on cancer and a range of support services available within hospitals and treatment centres around New South Wales for cancer patients, cancer carers, their friends and families   | <a href="#">Cancer Council NSW</a> (AU)                         | Not performed |
| Information (online video, DVD, e-learning course, guide and toolkit (written information package)) and advice by telephone | Information on coping with side effects, treatment decisions, rights at work, working during treatment and talking to employers, as well as other resources  | <a href="#">MacMillan</a> (United Kingdom)                      | Not performed |
| Recorded work and cancer webinars   | Recorded to enable viewing after live events (including links to webinar recordings, copies of PowerPoint presentations and list of resources for future reference): the resources cover bowel cancer and RTW, work–life balance, financial issues and work, legal issues, and how RTW can affect cancer survivors | <a href="#">Cancer Council NSW</a> (AU)                         | Not performed |
| Seminars, consultation (for groups or individuals)  | Advice on self-help, integration rather than isolation, professional communication skills and job coaching, stress management and mobilising personal resources, legal issues, adverse reactions to therapies, fatigue and benefits  | <a href="#">Sachsen-Anhaltische Krebsgesellschaft e.V.</a> (DE) | Not performed |

| Examples from the grey literature and the online questionnaire |  |  |               |
|--|--|--|---------------|
| Support group  | Offering the opportunity to talk to other people who have been affected by cancer  | <a href="#">Macmillan</a> (United Kingdom),<br><a href="#">Breastcancer.org</a> (US) | Not performed |
| Support group  | Offering support in relation to barriers and facilitators to RTW, work environment, flexibility on the part of employers, workplace adaptations, relationships with colleagues (communication), perceived discrimination, bullying, dealing with limitations and deficits, and developing solutions and strategies to stay at work | <a href="#">Sachsen-Anhaltische Krebsgesellschaft e.V.</a> (DE)                      | Not performed |
| Technical assistance   | A list of possible workplace accommodations  | <a href="#">Job Accommodation Network</a> (US)                                       | Not performed |
| Toolkit or guide   | Information on communication, RTW options and work–life balance  | <a href="#">Maggie's and Unum</a> (United Kingdom)                                   | Not performed |
| Training and workshops   | Advice on life after cancer, including the transition back to work   | <a href="#">Maggie's</a> (United Kingdom)  | Not performed |
| Website  | Information on RTW; legislation; communication with one's employer, general practitioner and medical specialist; work adaptations; and collaboration with occupational health organisations, hospitals and employer organisations  | <a href="#">LIKAS</a> (BE)   | Not performed |
| Website  | Information on legislation, cancer survivors' experiences of cancer and work, and work adaptations, as well as advice on RTW   | <a href="#">Kom op tegen kanker</a> (BE)   | Not performed |
| Website  | Information on vocational rehabilitation, gradual RTW, working part time, disability status, unemployment benefits and pensions  | <a href="#">Leben mit Brustkrebs</a> (DE)  | Not performed |

| Examples from the grey literature and the online questionnaire |   |   |               |
|--|---|---|---------------|
| Website  | Advice on setting professional boundaries, recasting yourself, the 'new normal', the effects of cancer on work, legal protection, relieving stress, travelling with cancer and achieving a helpful mindset          | <a href="#">Cancer and Careers</a> (US)                           | Not performed |
| Website  | Information on employment rights  | <a href="#">National Coalition for Cancer Survivorship</a> (US)   | Not performed |
| Website  | Advice on telling co-workers, reasonable workplace accommodations, discrimination and legal protection, as well as other resources  | <a href="#">American Cancer Society</a> (US)                      | Not performed |
| Website  | Advice on telling employers and co-workers, working during treatment, taking time off work for treatment, looking for a new job, recognising and responding to discrimination, and balancing your job and treatment | <a href="#">Breastcancer.org</a> (US)                             | Not performed |
| Website  | Advice on talking and relating to others, handling problems and legal rights at work  | <a href="#">National Cancer Institute</a> (US)                    | Not performed |
| Website  | Information on gradual reintegration, workplace adaptations, rehabilitation and unemployment benefits   | <a href="#">Betanet</a> (DE)                                      | Not performed |
| Workshops  | Advice on developing occupational goals, the compatibility of one's job and cancer care, job applications and communication in the workplace  | <a href="#">KOBRA</a> (DE), <a href="#">Leben nach Krebs</a> (DE) | Not performed |

#### 4.6.2 For employers, line managers and human resource professionals

Support for employers focuses on managing sick workers and how to support their RTW (e.g. appropriate workplace accommodations). The interventions available for employers mainly provide information, and may include counselling or in-house training courses. Scientific evaluation reports on the effectiveness of available interventions are lacking.

Interventions and resources are currently available for employers, line managers and human resource professionals in the form of personal consultations, videos, newsletters, webinars, posters, booklets, workshops and e-learning courses.

Topics include general information about cancer, legislation and finances, roles, and the support needs of staff and cancer carers. Information is available about how cancer and its treatment affects people and how they may affect a person's work. Employers can learn about common myths and facts regarding cancer, and about death and bereavement. Further information is available on the legal background to work and cancer, the financial support available to workers, the role of the employer with regard to occupational health, and the support needs of staff (survivors and colleagues) and carers working in the company.

Other topics are communication with survivors and their colleagues, and how to offer practical support to help cancer survivors return to and stay in work. Employers can learn about confidentiality issues, managing absences, workplace policies, creating a RTW plan<sup>24</sup> and possible changes to work arrangements (workplace accommodation/adjustments). Possible workplace accommodations include paid working time for medical appointments, reduced working hours and RTW meetings<sup>25</sup>.

Table 7: **Overview and examples of available interventions for employers, line managers and human resource professionals**

| Type as described by authors   | Topics and content  | Provider and sources                       | Evaluation of the effect on RTW <sup>26</sup> |
|--|---|--|---|
| Examples from the grey literature and the online questionnaire   |   |  |   |
| Consultation, individual coaching  | Generally, tailored guidance is provided after an initial consultation, on, for example, creating a RTW plan, the employer's role and how to support the worker when they come back to work   | <a href="#">Re-turn</a> (NL)               | Not performed                                 |
| Information (website, online video, cancer policy templates, DVD, e-learning course) and advice by telephone | Advice on legislation regarding work and cancer, how cancer affects people, possible changes to work arrangements, supporting carers, workplace policies, financial support for workers, managing absence, self-employment and cancer, communicating about work with your worker and setting up a cancer policy for your company, as well as courses for employers, managers, human resource professionals and unions representatives | <a href="#">Macmillan</a> (United Kingdom) | Not performed                                 |

<sup>24</sup> A RTW plan is a written document about the RTW process agreed between a worker and their superiors, and possibly also health professionals. The plan may include exact dates, required adjustments, and agreed priorities.

<sup>25</sup> A RTW meeting is an informal conversation between a worker returning to work and their superior with the purpose of ensuring a successful RTW. Regular meetings may include discussions about problems that may cause further absence and require adjustments to the workplace/hours/duties.

<sup>26</sup> The best available evidence identified in this review is presented.

| Type as described by authors  | Topics and content   | Provider and sources                               | Evaluation of the effect on RTW <sup>26</sup> |
|---|--|--|---|
| Open workshops, in-company workshops, face-to-face consultancy, e-newsletter, toolkit (written information package) | Interactive workshops (on cancer treatment, its side effects and the impact on a person's work; legislation; talking about cancer; and making workplace adjustments)<br>Consultation about best practice provision (e.g. reviewing long-term sickness, bereavement and carers' policies, advising on the support needs of staff) | <a href="#">Macmillan</a> (United Kingdom)         | Not performed                                 |
| Technical assistance, factsheets, consultancy   | Ideas for accommodating cancer survivors   | <a href="#">Job Accommodation Network</a> (US)     | Not performed                                 |
| Toolkit or employer's guide   | Information on creating a graduated RTW plan, the employer's role, how to support the worker when they come back to work, how to plan for RTW  | <a href="#">Maggie's and Unum</a> (United Kingdom) | Not performed                                 |
| Workplace factsheets, workplace posters   | How to provide a supportive, fair work environment: overview, myths and facts, talking to your worker (the first conversation), managing treatment effects, creating cancer-friendly workplaces, supporting a colleague with cancer, supporting working carers, and death and bereavement  | <a href="#">Cancer Council NSW</a> (AU)            | Not performed                                 |

### 4.6.3 For healthcare professionals

Healthcare professionals can support cancer survivors' RTW. Interventions to improve healthcare professionals' skills and expertise may include information advising on how to communicate about employment issues with people affected by cancer, how to develop and deliver care and services, and on their roles and responsibilities.

Guidelines are available that provide advice on, for example, workplace accommodations, communication between healthcare professionals and communication with cancer survivors. One example of an intervention took place in a hospital in the Netherlands, where participants were given advice on how to communicate about a cancer diagnosis, the treatment plan and its outcome. As part of this, cancer survivors and physicians received a leaflet that described a detailed 10-step plan for returning to work and included an activity plan and goals.

In addition, professional networks exist that enable members to share expertise and knowledge.

Table 8: **Overview and examples of available interventions and resources for healthcare professionals**

| Type as described by authors  | Topics and content   | Source   | Evaluation of the effect on RTW <sup>27</sup>   |
|---|--|--|---|
| Examples from the scientific evidence   |  |  |   |
| Guideline   | Advice on communication between attending and occupational physicians and a 10-step plan on how to return to work for cancer survivors and occupational health professionals | Amir and Brocky 2009, de Boer and Frings-Dresen 2009, Egan et al. 2013, Nieuwenhuijsen et al. 2006 | No effect on RTW (result from systematic reviews (Amir and Brocky 2009, de Boer and Frings-Dresen 2009) based on one primary study) |
| Examples from the grey literature   |  |  |   |
| Information (website, online video, e-learning course, guide (written information package)) | Advice on talking about employment issues with people affected by cancer, delivering care, and the professional's role and responsibilities, as well as other resources      | <a href="#">Macmillan</a> (United Kingdom)   | Not performed   |
| Consultation (advice by telephone)  | Help regarding giving advice on work-related issues, learning about the effects of cancer treatment on work, and promoting services providing advice on work-related issues  | <a href="#">Macmillan</a> (United Kingdom)   | Not performed   |
| Professional networks   | Offering opportunities to share expertise and knowledge  | <a href="#">Macmillan</a> (United Kingdom)   | Not performed   |

#### **4.6.4 For the self-employed and owners of small and medium-sized enterprises**

Interventions that specifically focus on the self-employed and SME owners are the least commonly described in the literature, and are therefore likely to be less frequently available. This is despite the fact that SMEs make up by far the largest proportion of enterprises in Europe. Interventions that are currently available are provided by telephone, on video or in written form.

Interventions that are specifically for the self-employed cover topics about treatment decisions and about founding, running and closing down a business. This includes information about working during treatment, giving up work, managing workload, making decisions about working, financial issues and support, and communication with clients.

<sup>27</sup> The best available evidence identified in this review is presented.

Owners of SMEs have access to relevant information, including regarding their legal responsibilities, communication, examples of support for carers and survivors, and the impact of cancer on their business (e.g. through Macmillan (United Kingdom)).

Table 9: **Overview and examples of interventions and resources for the self-employed and SMEs**

| Type as described by authors <sup>28</sup>                       | Topics and content  | Provider and Sources                       | Evaluation of the effect on RTW <sup>29</sup> |
|--|---|--|---|
| Examples from the grey literature for SME owners                 |   |  |   |
| Information (website, online video, DVD) and advice by telephone | Information on communication, resources, legal responsibilities, bereavement, examples of support for carers and survivors, and the impact of cancer cases on business  | <a href="#">Macmillan</a> (United Kingdom) | Not performed                                 |
| Examples from the grey literature for the self-employed          |   |  |   |
| Information (website), advice by telephone, online community     | Provision of financial and emotional support, as well as advice on working during treatment, giving up work, communication, treatment decisions and managing workload   | <a href="#">Macmillan</a> (United Kingdom) | Not performed                                 |
| E-learning   | E-learning for cancer survivors who want to start up their own company  | <a href="#">Leven met kanker</a> (NL)      | Not performed                                 |
| Consultation   | For self-employed people who are insured against work disability; generally, tailored guidance is provided after an initial consultation, on, for example, recovery, empowerment, a fitness plan, and learning how to cope with the long-term effects of a cancer diagnosis and treatment | <a href="#">Re-turn</a> (NL)               | Not performed                                 |
| Information  | Advice on making a decision about working, managing your business, telling clients about the cancer, and financial issues   | <a href="#">Cancer Council NSW</a> (AU)    | Not performed                                 |

<sup>28</sup> If the authors provided no description, the intervention is described as 'Website'.

<sup>29</sup> The best available evidence identified in this review is presented.

| Type as described by authors <sup>28</sup> | Topics and content  | Provider and Sources                  | Evaluation of the effect on RTW <sup>29</sup> |
|--|---|---------------------------------------|---|
| Website                                    | How to keep your business running during treatment  | <a href="#">Breastcancer.org</a> (US) | Not performed                                 |
| Workshop                                   | Advice on a career plan, work accommodations, work ability, working conditions, communication regarding limited capacity and job applications | <a href="#">KOBRA</a> (DE)            | Not performed                                 |

## 4.7 Synergies between and roles of policy areas and (enterprise) actors

The scientific literature about cancer and RTW does not study the different roles of and synergies between policy areas and (enterprise) actors in awareness-raising, information provision and support for cancer survivors in their return to work. Systematic analyses of the interactions and roles of the relevant stakeholders are lacking.

The actors who are frequently mentioned in the literature as influencing RTW decisions, in addition to cancer survivors themselves, are healthcare professionals; employers, including workers in human resource departments; colleagues; and trade unions. The grey literature also mentions other actors as providing support to employers and workers: employment and social services, professionals in the area of legal protection, and NGOs.

Communication among healthcare professionals, employers and workers is not described in much detail in the literature, despite the fact that communication between these actors can be an important factor for a successful RTW process (see section 4.3.2).

Support for the employer or cancer survivor may be direct, for example by providing information, training courses, consultation or legal representation. An example of more indirect support is a national awareness-raising campaign.

Actors in this process vary. Even though the types of actors may be similar across countries, their responsibilities, their ability to influence and the ways in which the actors communicate will differ significantly. These differences, as well as similarities, are not well documented in either the grey or the scientific literature. However, they may be crucial when developing and implementing interventions to promote RTW among cancer survivors.

## 5 Discussion

### 5.1 Strengths and weaknesses of the report

Because the search of the scientific literature has been done systematically in multiple databases, it can be said with confidence that all relevant studies have been located. In addition, the screening process has been done in duplicate, so it is unlikely that any relevant literature has been missed. The lack of reviews on SMEs and occupational or work-related cancer was anticipated, and the results were supplemented by data from individual studies, which increased the usefulness of this literature overview.

The results of this report are mostly based on systematic review results and have been summarised using a systematic qualitative approach. Although more meaningful results could be achieved if results from primary studies were combined numerically in a meta-analysis, the studies at hand and the time available for this review did not permit such an approach. The strength of the qualitative approach is that it provides a broad overview of the available knowledge on the various implications that cancer has for RTW. Furthermore, it shows if and where evidence that could provide more meaningful results is missing. This has not been done before and can inform further research.

To obtain a complete overview of the available interventions, this review applied a broad search, looking beyond the scientific literature. The results are based on a systematic search of electronic databases for relevant systematic reviews, primary studies and grey literature. Furthermore, experts in the field were contacted, and an additional Google search was performed to supplement the results from the traditional literature search of databases. The broader, Google-based approach revealed, in particular, what is available in practice and what has not been described in the scientific literature.

Although this report used an English search strategy in electronic databases, the results of the search of the scientific literature are not biased by language. Publications were identified using an English search strategy irrespective of the language of the article, because the keywords and titles of these articles are indexed in English. Moreover, none of the identified studies was excluded on the basis of publication language. The additional Google search was carried out in English and German, because the results are sensitive to the language of the search terms. As most of the results of the overview of interventions are based on the Google search results, the list is not exhaustive. However, the results of the Google search provide information on an interesting variety of interventions. It is likely that, even though interventions from other countries would not be identified using English and German keywords to search Google, the types of available interventions identified (e.g. leaflet, consultation) are very similar across countries.

This report made a very broad assessment of the quality of the evidence. Reviews and RCTs were rated as being of the highest quality; individual studies were considered of lower quality; and grey literature and expert opinions were considered the lowest-quality evidence. This is a very crude method of estimating the quality of the evidence. A better understanding of the quality of the evidence could have been achieved using a more sophisticated approach (e.g. the GRADE system), but the method used allows a reasonable assessment of the quality of the evidence.

### 5.2 Authors' conclusions

#### 5.2.1 Implications for practice

Surviving cancer can limit one's work ability for various reasons. The implications of cancer and its treatment can affect all aspects of human health and well-being, and include physical, mental and cognitive symptoms. These implications can be either short or long term. Having cancer may also lead to a reassessment of one's life and the meaning of work. Survivors may be highly motivated to return to work in order to regain normality and control of their lives, or they may decide not to return to work at all. When returning to work, survivors may face difficulties in balancing work and treatment demands, including negative attitudes or behaviour from their colleagues or their employers. All of this may lead to a reassessment of work and life goals, thus hindering RTW.

There is a gap between the interventions that aim to enhance RTW that are described and evaluated in the scientific literature and those that are available in practice. In other words, little can be found in the scientific literature about existing RTW interventions and resources. Most of the information about them in this overview comes from grey literature. Available interventions and resources include information and training on cancer and RTW issues, rehabilitation services, guidelines and workplace accommodations. Most interventions and resources have been developed primarily for cancer survivors; others are aimed at employers and healthcare professionals. Very few interventions and resources are available that are specifically designed for the self-employed or SMEs.

With the rising number of cancer survivors, effective interventions are needed to enable RTW and to reduce the costs to individuals and society at large. However, to date, little is known about the effectiveness of these interventions, making it difficult to recommend best practices. The only interventions for which there is evidence that RTW is improved when compared with care as usual are multidisciplinary interventions. These interventions include physiotherapy, occupational therapy, speech therapy, vocational rehabilitation and psychology in relation to RTW (i.e. delivery of, for example, education, counselling and training) (de Boer et al. 2015a).

In addition to considering cancer type, treatment and side effects, the literature examines a broad spectrum of prognostic factors, including socio-demographic and workplace-related factors. However, it is unclear which factors are the most important and to what degree they influence RTW. Once the most important factors are identified, RTW interventions should be tailored to match them, for example interventions to reduce physical workload or interventions specifically designed for older workers.

As it is unclear which factors are most relevant, cancer survivors, employers and healthcare professionals could consider monitoring and reducing physical and emotional job demands, working hours, and unsupportive attitudes of colleagues to prevent discrimination in the workplace and with the aim of increasing RTW. It might also be helpful to ensure access to health insurance and disability pension coverage. If cancer survivors and healthcare professionals consider the possible impact on RTW of all treatment decisions, the likelihood of RTW may increase.

Some other possible prognostic factors for RTW are not amenable to change (e.g. age, gender, disease). However, it might be helpful to consider that older workers, women and survivors of more serious cancer types may need different or increased support to return to work. Psychological factors such as willingness or self-motivation, and changes in emotional state such as depression, worry, frustration or fear may also reduce a survivor's chances of returning to work and may need to be considered when offering support to survivors or when planning RTW.

Developing and implementing efficient and effective interventions to promote RTW may require close collaboration between government, stakeholders and practitioners. This at least has been argued to be 'critical in developing an evidence-based occupational rehabilitation system for cancer survivors' (Mak 2011). To build these relationships, a comprehensive overview of relevant stakeholders and their roles is still needed. The key actors who need to communicate to develop and implement interventions are the cancer survivors themselves, healthcare professionals, employers and workers in human resource departments, colleagues, professionals in legal rights, employment and social services, trade unions, NGOs and government.

It is uncertain whether there are differences between the RTW implications and interventions for occupational or work-related cancers and those for cancers that are not associated with exposure at work. However, given that the implications for survivors' psychological health and the risk of recurrence are different, it is likely that the RTW process and RTW interventions are or should be different. Occupational or work-related cancer may call for different psychological interventions and more substantial vocational rehabilitation services (e.g. enabling re-entry into a new sector of the job market).

It is also unknown whether or not cancer has a different impact on large companies, on the one hand, and on SMEs and the self-employed on the other. However, it has been argued that SMEs and the self-employed are less likely to be able to provide workplace accommodations that can enable a worker with cancer to return to work. Furthermore, it has been shown that the self-employed are at a higher risk of having to close down their business during the first five years after a cancer diagnosis. The bigger a company is, the more likely it is that it will have the resources to support and retain a worker with reduced work ability or who requires a long period of sick leave. On the other hand, workers in SMEs may have

a closer relationship with their employers, and keeping in contact during treatment may be easier, which may in turn facilitate RTW. Motivation to return to work may also be higher among the self-employed and for workers in small companies than it is among workers in large companies.

Interventions that are designed for small business owners are lacking. For example, it might be useful to provide access to financial aid during the first five years after diagnosis to prevent the risk of these businesses closing down. In addition, further support may be needed to help small business owners draw up policies that regulate and assist in the management of issues such as time off and bereavement.

### **5.2.2 Implications for research**

Most of the existing knowledge is about the implications of a cancer diagnosis for workers. Comparably little is known about the employer's side, including the self-employed and owners of SMEs.

There is a need for studies on employers' needs, experiences, motivations and perceptions of cancer, and on the barriers to and facilitators of returning to work in Europe. Moreover, the economic aspects of the work-related problems caused by cancer, such as absence from work, decreased work productivity and early retirement have been almost entirely neglected in the scientific literature. Further reviews are needed on the economic impact of employing a worker diagnosed with cancer and the conditions that hinder or promote RTW interventions for cancer survivors in SMEs. Studies should highlight the differences in the impact of cancer on big companies, SMEs and the self-employed.

There is also a need for evidence regarding the economic difference between cancer survivors and people without cancer. Studies should account for country-specific differences, e.g. access to financial support for cancer survivors.

Studies on the implementation and effectiveness of RTW interventions are also lacking. The evidence available from primary studies is of moderate or poor quality (de Boer et al. 2015b). The impact an intervention has on actual RTW outcomes, such as number of working days, amount of sick leave or unemployment rate, should be measured. Improvements in, for example, adherence to rehabilitation recommendations; satisfaction with the processes; communication among patients, occupational physicians, colleagues and employers; and the number of people drawing up RTW plans are only proxy measures, and do not measure the actual effect on RTW.

To develop effective and efficient RTW interventions, there is a need for better-quality studies on prognostic factors and the impact of work-related or occupational cancer on RTW. Evidence regarding prognostic factors should be based on long-term studies, and reviews should use methods to numerically combine study results.

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## Appendix

### Methods — scientific literature

#### *Criteria for considering literature*

To be included in this report, studies and reviews had to focus on adult cancer survivors and report on the following outcomes, RTW interventions and/or synergies and roles:

1. Safety and health implications for workers returning to work during or after cancer treatment (e.g. health symptoms, prognostic factors)
2. Economic impact of cancer on the cancer survivor and employer (e.g. days lost, adaption of equipment, compensation payments)
3. Wider issues that may affect the worker (e.g. the compatibility of treatment and work, employment, a change in perception of the meaning of work, employer discrimination).
4. Interventions or policies aiming to promote the RTW of cancer survivors (e.g. population, setting)
5. Synergies between and roles of policy areas and (enterprise) actors (e.g. communication, shared responsibilities).

This means that reviews or studies that did not report relevant outcomes were excluded from this report, as were reviews and studies that focused on childhood cancer survivors and first-time employment.

Furthermore, to ensure the relevance of the included reviews, we applied two minimum quality requirements. First, only reviews with a systematic literature search were included. We excluded reviews that used only selected primary studies without performing a systematic search, to ensure that review results were less biased and based on all the available evidence. Second, only reviews published after or in 2000 were included. We excluded older reviews to ensure that the review results were based on sufficiently recent, relevant studies.

The titles and keywords of the scientific literature are always published in English in the electronic databases used for this report, as, often, are the abstracts. This means that relevant reviews and primary studies can be identified using an English search strategy even if the publication is in a language other than English. All search results were included in the screening and data extraction process, irrespective of the language of publication or publication status.

#### *Search methods — scientific literature*

The systematic literature search was run in four electronic databases (MEDLINE through PubMed, Embase through Scopus, PsycINFO and OSH Update). The search strategy consisted of concepts for cancer, RTW outcomes, and RTW programmes and practices. For reviews, a search filter was added, which was developed by the Centre for Reviews and Dissemination at the University of York (CRD York). For primary studies, search words were added for occupational cancer and SMEs. The full search strategy for all databases is described below (Tables 12-15).

All findings of the search were imported into the reference management program Endnote and duplicates were deleted. All irrelevant findings were excluded from this reference database, first on the basis of title and abstract, and second on the basis of full text.

#### *Selection of studies*

Two researchers independently screened the review literature for eligibility on the basis of title and abstract. Any conflicts were resolved in a telephone conference. The second screening and data extraction were carried out in full text and duplicate, until similar results were reached (which was after six reviews). Screening and data extraction were performed by one researcher per reference.

The search results for primary studies were screened by one researcher. The same researcher extracted the data from the included primary studies.

## **Data extraction and management**

The following data were extracted from the results section, the conclusion and discussion section of all included reviews and primary studies, using a pre-constructed data extraction form:

1. General information about the article (e.g. authors, year, objectives and population characteristics).
2. Relevant outcomes:
  - a. safety and health implications for workers returning to work during or after cancer treatment (e.g. health symptoms, prognostic factors);
  - b. economic impact of cancer on the cancer survivor and employer (e.g. days lost, adaption of equipment, compensation payments);
  - c. wider issues that may affect the worker (e.g. the compatibility of treatment and work, employment, a change in perception of the meaning of work, employer discrimination);
  - d. differences in employment sector, occupation, size of enterprise, social gradient or gender in outcomes a, b and c.
3. Interventions or policies aiming to promote the RTW of cancer survivors (e.g. population, setting).
4. Synergies between and roles of policy areas and (enterprise) actors (e.g. communication, shared responsibilities).

The form was designed to highlight data that focused on occupational or work-related cancer (e.g. differences in motivation to return to work) and/or reports on aspects specifically relevant to SMEs (e.g. specific conditions that may hinder or promote action in SMEs).

## **Data synthesis**

Microsoft Office's Excel and Word were used to synthesise the extracted data, and qualitative research methods were applied to analyse and synthesise the data from all included systematic reviews and primary studies. This included up to three levels of analysis:

1. identifying similar findings (using Pivot tables in Microsoft Excel);
2. synthesising similar findings to first-order interpretations (using Microsoft Word);
3. if appropriate, synthesising first-order to second-order interpretations (using Microsoft Word).

The results of this synthesis are presented in tables 1 to 9 for each level of analysis (see section 4, 'Results'). To improve the readability of the report, the different levels of analysis are reported in the tables as 'description in reviews'/'listed in reviews', 'sub-category' and/or 'category'.

## **Methods — grey literature**

Grey literature is literature that has not been published in a scientific peer-reviewed journal and includes policy papers, dissertations and government documents. Therefore, the grey literature would not have been found using the systematic search of scientific literature described above.

## **Criteria for considering literature**

The aim of including grey literature was to compensate for the expected lack of scientific evidence reporting interventions, programmes or policies focusing on cancer survivors and RTW. Grey literature that reported only other outcomes, such as prognostic factors, was excluded from this report.

## **Search methods for identifying grey literature**

To search for relevant grey literature the following databases and sources were used:

- OpenGrey
- Google.com
- Specific websites of governments and occupational safety and health (OSH) organisations, social partners and NGOs, including:
  - OECD (Organisation for Economic Co-operation and Development)
  - Eurostat
  - EU-OSHA
  - IARC (International Agency for Research on Cancer)
  - ANSES (the French Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail)
  - FIOH (Finnish Institute of Occupational Health)
  - Occupational health research team / University of Southampton
  - KU Leuven
  - The Health Council of the Netherlands.

### ***Selection of studies***

One researcher screened the literature for eligibility, first on the basis of title and abstract, and second on the basis of full text. The data from each article were extracted by one researcher.

### ***Data extraction and management***

Data were collected from the included articles using the same preconstructed data extraction form as that used for the reviews and primary studies. This included general information about the publication (e.g. authors, year and objectives) and data on any relevant RTW intervention, programme or policy (e.g. country, name, effectiveness, additional sources for further information).

Interventions were relevant for this report when their aim was to promote the RTW of cancer survivors and they concerned more than the rehabilitation of cancer survivors to increase their work ability (e.g. hormone therapy, psychotherapy, physiotherapy, less invasive surgery). Relevant interventions were, for example, workplace policies, guidelines, workplace adaptations, national strategies and awareness-raising campaigns.

## **Methods — online questionnaire**

### ***Criteria for considering participants for the online questionnaire***

Participants were contacted who were likely to be able to provide us with information regarding existing RTW interventions for cancer survivors. Relevant participants worked in the field of occupational safety and health, RTW interventions or cancer rehabilitation.

### ***Identification of participants***

First, professional networks active in the relevant fields were identified (Table 10). The questionnaire was then disseminated via email, either by the research team using a mailing list, or through contacts in networks of which the authors of this report were not members.

Table 10: List of relevant networks

| Name        | Description   | Contacted through                |
|-------------|---|----------------------------------|
| COST CANWON | COST Cancer and Work Network: European Cooperation in Science and Technology. Twenty-three participating European countries, development and evaluation of new programmes for rehabilitation and RTW after cancer. Members include IARC and come from around 10 countries (e.g. Denmark, Finland, France, Germany, the Netherlands, Slovakia, Slovenia, Spain, Sweden and the United Kingdom) where action has been taken in this specific area at an institutional level | Mailing list direct to members   |
| CANCON      | EU Joint Action on Cancer Control. Aims to contribute in various ways to reducing the cancer burden in the EU, including through reintegration of cancer patients   | Mailing list direct to members   |
| EPR         | European Platform for Rehabilitation, a network of leading European providers of rehabilitation services for people with disabilities and other disadvantaged groups. EPR's member organisations are influential in their countries and stand for high-quality service delivery in the fields of vocational training, reintegration and social care   | Mailing list to EPR coordinators |
| PEROSH      | Network comprising 12 OSH institutes across the EU, all playing key roles through their national affiliations to governments/authorities and health and accident insurance systems  | Contact person                   |
| EU-OSHA     | The European Agency for Safety and Health at Work is a tripartite organisation of the EU with the task of collecting, analysing and disseminating relevant information that can serve the needs of people involved in safety and health at work. Its website provides access to various publications in the field of OSH.   | Contact person                   |
| EASME       | Executive Agency for Small and Medium-sized Enterprises   | Contact person                   |
| ENWHP       | European Network for Workplace Health Promotion   | Contact person                   |

### **Development of questionnaire**

The aim of the questionnaire was to collect additional material from experts in the field, i.e. material that was not covered by the scientific and grey literature. The questionnaire was disseminated by email. This allowed the participants to reply to the contact person directly and attach any additional documents.

The introduction included a brief description of the aim of the project and of the organisations and authors involved in the report. Participants were asked to provide the following information:

- name of the intervention, practice or policy;
- any links to (information on) the intervention, practice or policy, if available;
- any contact details for people involved, if available;
- any additional information (e.g. in a PDF or Word file), if available.

## Data collection and information analysis

Data were retrieved by email. The material was screened and the data extracted following the same criteria and steps as those for the grey literature.

### Search strategies

Table 11 provides a general overview of the searches performed.

The searches for systematic reviews and primary studies were performed in January and March 2016, in four different search engines.

Grey literature was searched for in March, April and May 2016 in one electronic database, selected websites and one internet search engine (Google).

All searches included keywords for cancer and RTW, and additional keywords were added where needed (e.g. for SMEs).

Table 11: **Summary of search for literature**

| Database/Source                | Latest search    | Search terms  |
|--------------------------------|------------------|---|
| Systematic reviews             |                  |   |
| MEDLINE through PubMed         | 28 January 2016  | Cancer<br>Return-to-work, work adaptations, work outcomes (including costs such as days lost)<br>Programmes and initiatives |
| OSH Update                     | 03 March 2016    |   |
| PsycINFO                       | 28 January 2016  |   |
| Embase                         | 27 January 2016  |   |
| Primary studies                |                  |   |
| MEDLINE through PubMed         | 28 March 2016    | 1. search:<br>Occupational cancer, return to work<br>2. search:<br>SMEs, cancer (return to work)                            |
| OSH Update                     | 03 March 2016    |   |
| PsycINFO                       | 25 March 2016    |   |
| Embase                         | 28 March 2016    |   |
| Grey literature                |                  |   |
| OpenGrey                       | 17 May 2016      | Cancer<br>Work (return to work)   |
| Google (English)               | April 2016       |   |
| Google (German, Dutch, French) | May 2016         |   |
| Online questionnaire           | March/April 2016 |   |

Tables 12-15 detail the exact search strategies and the numbers of items found by all search engines for:

- systematic reviews;
- occupational or work-related cancer;
- primary studies on SMEs;
- grey literature **Error! Reference source not found..**

Table 12: **Search strategy for systematic reviews**

| <b>Database: PubMed (28.01.16)</b>  |  |             |
|---|--|-------------|
| Search  | Query  | Items found |
| #1: Search words for cancer and work-related cancer   | neoplasms [MeSH Terms] or cancer* [Text Word] or neoplasm* [Text Word] or carcinoma* [Text Word] or oncolog* [Text Word] or malignan* [Text Word] or tumor [Text Word] or tumour [Text Word] or tumors [Text Word] or tumours [Text Word] or leukemia* [Text Word] or sarcoma* [Text Word] or lymphoma* [Text Word] or melanoma* [Text Word] or blastoma* [Text Word] or radiotherapy [Text Word] or chemotherapy [Text Word] or occupational cancer [Text Word] | 82,714      |
| #2: Search words for return to work, work outcomes and work adaptations (including costs such as days lost) | “return to work” [Text word] or employment [MeSH Terms] or employment [Text Word] or unemployment [MeSH Terms] or unemployment [Text Word] or unemployed [Text Word] or retirement [Text Word] or “sick leave” [MeSH Terms] or “sick leave” [Text Word] or “Sickness absence” [Text Word] or absenteeism [MeSH Terms] or absenteeism [Text word] or “work” [MeSH Terms] or company [Text Word] or work adaptation* [Text word]                                   | 184,369     |
| #3: Search words for programmes and initiatives   | “rehabilitation, vocational” [MeSH Terms] or rehabilitation [MeSH Terms:NoExp] or “neoplasms/rehabilitation” [MeSH Terms] or vocational* [Text Word] or “work rehabilitation” [Text Word] or program* [Text Word] or intervention [Text Word]  | 801,089     |
| #4: All   | #1 AND #2 AND #3   | 772         |
| #5: Review filter (developed by CRD York)   | "meta-analysis as topic"[MeSH Terms] OR meta-analysis[pt] OR meta-analysis[tiab] OR review[pt] OR review[tiab] NOT (letter[pt] OR editorial[pt] OR comment[pt]) NOT ("animals"[MeSH Terms:noexp] NOT "humans"[MeSH Terms])   | 523,590     |
| #6: Reviews only  | #4 AND #5  | 124         |
| Published after 1999  | Using Endnote  | <b>104</b>  |
| Removal of duplicates   | Using Endnote  | <b>84</b>   |

| <b>Database: PubMed (28.01.16)</b>   |   |             |
|--|---|-------------|
| <b>Database: OSH Update (03.03.2016)</b>   |   |             |
| Search   | Query   | Items found |
| #1   | "return to work" OR rehabilitation OR "sick leave" OR absence [Title]   | –           |
| #2   | cancer OR neoplasm OR mesothelioma OR lymphoma OR leukemia [All fields]   | –           |
| #3   | " OUCCOHS" / " OUCISD" / " OUEUAG" / " OUHSEL" / " OUBIB" / " OUIINF" / " OUIRFT" / " OUIRLG" / " OUISST" / " OUNIOC" / " OUNIOS" / " OURILO" [Databases]   | –           |
| #4   | #1 AND #2 AND #3  | 59          |
| <b>Database: PsycINFO (28.01.16)</b>   |   |             |
| Search   | Query   | Items found |
| #1: Cancer and work-related cancer   | neoplasm* OR cancer* OR carcinoma* OR oncolog* OR tumour OR tumor OR leukemia* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma* OR radiotherapy OR chemotherapy OR "occupational cancer"  | 82,714      |
| #2: Return to work, work outcomes and work adaptations (including costs such as days lost) | "return to work" OR subject("Reemployment ") OR employment OR unemployment OR unemployed OR "sick leave" OR "sickness absence" OR "absenteeism" OR mjsub(work) OR subject("Occupational Adjustment") OR (work AND adaption) OR SU.exact("OCCUPATIONAL HEALTH") OR company | 184,369     |
| #3: Programmes and initiatives   | subject("Vocational Rehabilitation") OR SU.exact("REHABILITATION") OR (neoplasms AND SU.exact("REHABILITATION")) OR vocational OR "work rehabilitation" OR program* OR intervention*  | 801,089     |
| #4: All  | #1 AND #2 AND #3  | 772         |
| #5: review filter  | "Meta Analysis" OR review   | 523,590     |
| #6: Reviews only   | #4 AND #5   | 124         |
| #7: Published after 1999   | #6 AND YR(2000-2017)  | 104         |
| Removal of duplicates  | Endnote   | 84          |
| <b>Database: Embase (27.01.2016)</b>   |   |             |

| Database: PubMed (28.01.16)            |   |             |
|--|---|-------------|
| Search                                 | Query   | Items found |
| #1: Cancer                             | 'cancer'/exp OR 'cancer' OR 'neoplasm'/de OR 'neoplasm' OR carcinoma* OR oncolog* OR malignan* OR tumor OR tumour OR tumors OR tumours OR leukemia* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma* OR radiotherapy OR chemotherapy OR 'occupational cancer'   | 5,165,898   |
| #2: Return to work                     | 'return to work' OR employment OR 'employment'/de OR 'unemployment'/de OR unemployment OR unemployed OR retirement OR 'sick leave'/de OR 'sick leave' OR 'sickness absence' OR 'absenteeism'/de OR absenteeism OR 'work'/de OR company OR 'work' NEXT/1 adaption* | 319,090     |
| #3: Rehabilitation program             | 'rehabilitation, vocational'/de OR 'rehabilitation'/de OR 'neoplasms/rehabilitation' OR vocational* OR 'work rehabilitation' OR program* OR intervention  | 2,002,918   |
| #4: Review filter published after 1999 | 'meta analysis (topic)'/de OR 'meta analysis':it OR review:it OR review:ab,ti NOT (letter:it OR editorial:it OR comment:it) AND [2000-2016]/py  | 1,941,154   |
| #6: Reviews only                       | #1 AND #2 AND #3 AND #4   | 716         |
| Removal of duplicates                  | Endnote   | 645         |

Table 13: Search strategy for primary studies on occupational and work-related cancer

| Database: PubMed (28.03.2016) |  |             |
|-------------------------------|--|-------------|
| Search                        | Query  | Items found |
| #1                            | ("Ionizing radiation"[title/abstract]) AND ("bone cancer" [Title/Abstract] OR "bone neoplasm*" [Title/Abstract] OR "bone neoplasms"[MeSH Terms] OR "leukaemia"[Title/Abstract] OR "leukemia"[MeSH Terms] OR "leukemia"[Title/Abstract] OR "lung neoplasms"[MeSH Terms] OR "lung neoplasm*" [Title/Abstract] OR "lung cancer" [Title/Abstract] OR "liver neoplasms"[MeSH Terms] OR "liver neoplasm*" [Title/Abstract] OR "liver cancer" [Title/Abstract] OR "thyroid neoplasms"[MeSH Terms] OR "thyroid neoplasm*" [Title/Abstract] OR "thyroid cancer" [Title/Abstract]) | 1,835       |
| #2                            | (Sun[Title/Abstract] OR solar radiation[Title/Abstract] OR UV[Title/Abstract]) AND ("skin neoplasms"[MeSH Terms] OR "skin neoplasm*" [title/abstract] OR "skin cancer" [title/abstract])   | 6,823       |
| #3                            | (PAH[Title/Abstract] OR benzoapyrene[Title/Abstract] OR benzopyrene[Title/Abstract]) AND ("lung neoplasms"[MeSH Terms] OR "lung neoplasm*" [Title/Abstract] OR "lung cancer" [Title/Abstract] OR "urinary  | 493         |

| <b>Database: PubMed (28.03.2016)</b> |   |        |
|--------------------------------------|---|--------|
|                                      | bladder neoplasms"[MeSH Terms] OR "urinary bladder neoplasm*"[Title/Abstract] OR "bladder cancer"[Title/Abstract] OR "skin neoplasms"[MeSH Terms] OR "skin neoplasm*"[Title/Abstract] OR "skin cancer"[Title/Abstract])   |        |
| #4                                   | (asbestos[Title/Abstract]) AND (Mesothelioma[Title/Abstract] OR "lung neoplasms"[MeSH Terms] OR "lung neoplasm*"[Title/Abstract] OR "lung cancer"[Title/Abstract])  | 4,977  |
| #5                                   | (Silica[Title/Abstract] OR quartz[Title/Abstract]) AND ("lung neoplasms"[MeSH Terms] OR "lung neoplasm*"[Title/Abstract] OR "lung cancer"[Title/Abstract])  | 694    |
| #6                                   | ("wood dust" [Title/Abstract]) AND ("nose neoplasms"[MeSH Terms] OR "nose neoplasm*"[Title/Abstract] OR "nasal cancer"[Title/Abstract])   | 164    |
| #7                                   | (Arsenic[Title/Abstract] OR Beryllium[Title/Abstract] OR Cadmium[Title/Abstract] OR Chromium[Title/Abstract] OR Nickel[Title/Abstract]) AND ("lung neoplasms"[MeSH Terms] OR "lung neoplasm*"[Title/Abstract] OR "lung cancer"[Title/Abstract])   | 1,257  |
| #8                                   | (Benzene[Title/Abstract]) AND ("leukaemia"[Title/Abstract] OR "leukemia"[MeSH Terms] OR "leukemia"[Title/Abstract] OR "lymphoma"[MeSH Terms] OR "lymphoma"[Title/Abstract])   | 1,050  |
| #9                                   | ("Coal tar" [Title/Abstract] OR "mineral oil" [Title/Abstract] OR soot[Title/Abstract]) AND ("skin neoplasms"[MeSH Terms] OR "skin neoplasm*"[Title/Abstract] OR "skin cancer"[Title/Abstract])   | 107    |
| #10                                  | (Plastic[Title/Abstract] OR rubber[Title/Abstract] OR dye[Title/Abstract]) AND ("urinary bladder neoplasms"[MeSH Terms] OR "urinary bladder neoplasm*"[Title/Abstract] OR "bladder cancer"[Title/Abstract])   | 485    |
| #11                                  | (Pesticides[Title/Abstract]) AND ("lymphoma"[MeSH Terms] OR "lymphoma"[Title/Abstract] OR lymphoid[Title/Abstract])   | 240    |
| #12                                  | ("shift work" [Title/Abstract]) AND ("breast neoplasms"[MeSH Terms] OR "breast neoplasm*"[Title/Abstract] OR "breast cancer"[Title/Abstract])   | 132    |
| #13                                  | (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12)   | 17,842 |
| #14                                  | "occupational cancer"[title/abstract] OR (("work related"[title/abstract] OR "occupational exposure"[title/abstract] OR "work exposure" [title/abstract]) AND cancer[title/abstract])   | 3,185  |
| #15                                  | #13 OR #14  | 20,274 |
| #16                                  | ("return-to-work"[Title/abstract] OR re-employment[Title/abstract] OR "rehabilitation, vocational" [MeSH Terms] OR vocational*[Text Word] OR "work ability"[Text Word] OR "work capacity"[Text Word] OR "work activity"[Text Word] OR "work disability"[Text Word] OR "work rehabilitation"[Text Word] OR "work status"[Text Word] OR "work retention"[Text Word] OR workability[Text Word] OR employability[Text Word] OR employable[Text Word]) | 35,975 |

| <b>Database: PubMed (28.03.2016)</b>             |   |             |
|--|---|-------------|
| #17  | #15 AND #16   | 81          |
| #18  | ("randomized-controlled-trial"[Publication Type] OR "controlled clinical trial"[Publication Type] OR "Randomized Controlled Trials as Topic"[Majr] OR "random allocation" [MeSH Terms] OR "double blind method" [MeSH Terms] OR single blind method[MeSH Terms] OR "clinical trial"[Publication Type] OR "Clinical Trials as Topic"[Mesh:NoExp] OR (clin* n25 trial*[Title/Abstract]) OR ((singl* [Text Word] OR doubl* [Text Word] OR trebl* [Text Word] OR tripl* [Text Word]) AND (mask* [Text Word] OR blind* [Text Word])) OR placebos[MeSH Terms] OR placebo* [Text Word] OR random* [Text Word] OR "research design"[Mesh:NoExp] OR "comparative study"[Publication Type] OR "evaluation studies"[Publication Type] OR "follow-up studies" [MeSH Terms] OR "prospective studies" [MeSH Terms] OR "cross-over studies" [MeSH Terms] OR control* [Text Word] OR prospectiv* [Text Word] OR volunteer*[Text Word] OR Evaluate* [Text Word] OR Compare* [Text Word] OR Program* [Text Word]) | 9,020,520   |
| #19  | #17 AND #18   | 49          |
| <b>Database: Embase (via Ovid, 25.03.2016)</b>   |   |             |
| Search   | Query   | Items found |
| #1 Occ cancer                                    | ('work-related cancer' or 'occupational cancer').mp.  | 3,120       |
| #2 RTW   | ('return to work' or employment or vocational).mp. or 'work'/de   | 122,325     |
| #3 Occ cancer and RTW                            | (1 and 2)   | 332         |
| #4 Occ cancer and RTW, not risk or prevention    | (1 and 2) not (risk or epidemiological or prevention).mp.   | 70          |
| <b>Database: PsycINFO (via Ovid, 28.03.2016)</b> |   |             |
| Search   | Query   | Items found |
| #1 Occ cancer                                    | ('work-related cancer' or 'occupational cancer').mp.  | 6           |
| #2 RTW   | ('return to work' or employment or vocational).mp. or 'work'/de   | 78,600      |
| #3 Occ cancer and RTW                            | (1 and 2)   | 1           |

| Database: PubMed (28.03.2016) |   |             |
|-------------------------------|---|-------------|
| Database: OSH Update          |   |             |
| Search                        | Query   | Items found |
| #1                            | "return to work" OR rehabilitation OR "sick leave" OR absence [Title]   | –           |
| #2                            | cancer OR neoplasm OR mesothelioma OR lymphoma OR leukemia [All fields]   | –           |
| #3                            | " OUCCOHS" / " OUCISD" / " OUEUAG" / " OUHSEL" / " OUBIB" / " OUINFT" / " OUIRFT" / " OUIRLG" / " OUISST" / " OUNIOC" / " OUNIOS" / " OURILO" [Databases] | –           |
| #4                            | #1 AND #2 AND #3  | 59          |

Table 14: Search strategy for primary studies focusing on SMEs

| Database: PubMed                        |   |             |
|---|---|-------------|
| Search                                  | Query   | Items found |
| #1<br>Cancer                            | (neoplasms[MeSH Terms] OR cancer*[Text Word] OR neoplasm*[Text Word] OR carcinoma*[Text Word] OR oncolog*[Text Word] OR malignan*[Text Word] OR tumor[Text Word] OR tumour[Text Word] OR tumors[Text Word] OR tumours[Text Word] OR leukemia*[Text Word] OR sarcoma*[Text Word] OR lymphoma*[Text Word] OR melanoma*[Text Word] OR blastoma*[Text Word] OR radiotherapy[Text Word] OR chemotherapy[Text Word])  | 3,685,488   |
| #2<br>RTW                               | "return-to-work"[Text Word] OR employment[MeSH Terms] OR employment[Text Word] OR unemployment[MeSH Terms] OR unemployment[Text Word] OR unemployed[Text Word] OR retirement[Text Word] OR "sick leave" [MeSH Terms] OR sick leave[Text Word] OR Sickness absence[Text Word] OR absenteeism[MeSH Terms] OR absenteeism[Text Word] OR "work" [MeSH Terms] OR occupations[MeSH Terms] OR "occupational medicine" [MeSH Terms] OR "occupational health" [MeSH Terms] OR "occupational health services" [MeSH Terms] OR "disability management"[Text Word] OR "rehabilitation, vocational" [MeSH Terms] OR occupation*[Text Word] OR "Rehabilitation"[Mesh:NoExp] OR "neoplasms/rehabilitation" [MeSH Terms] OR vocational*[Text Word] OR "work ability"[Text Word] OR "work capacity"[Text Word] OR "work activity"[Text Word] OR "work disability"[Text Word] OR "work rehabilitation"[Text Word] OR "work status"[Text Word] OR "work retention"[Text Word] OR workability[Text Word] OR employability[Text Word] OR employable[Text Word] OR employee*[Text Word] | 469,312     |
| #3<br>SMEs                              | ((Micro OR small OR medium OR micro-size* OR small-size* OR medium-size* OR micro-scale* OR small-scale* OR medium-scale* OR SME OR MSE) AND (enterprise* OR business*)) OR "enterprise size" OR "enterprise scale")  | 5,336       |
| #4                                      | #1 AND #2 AND #3  | 41          |
| Database: Embase (via Ovid, 25.03.2016) |   |             |

| <b>Database: PubMed</b>                          |  |             |
|--|--|-------------|
| Search   | Query  | Items found |
| #1<br>Cancer                                     | 'cancer'/exp or 'cancer'.mp. or 'neoplasm'/de or 'neoplasm'.mp. or carcinoma*.mp. or oncolog*.mp. or malignan*.mp. or tumor.mp. or tumour.mp. or tumors.mp. or tumours.mp. or leukemia*.mp. or sarcoma*.mp. or lymphoma*.mp. or melanoma*.mp. or blastoma*.mp. or radiotherapy.mp. or chemotherapy.mp. or 'occupational cancer'.mp. [mp=title, abstract, heading word, drug tradename, original title, device manufacturer, drug manufacturer, device trade name, keyword] | 4,759,118   |
| #2<br>SMEs                                       | ('small enterprise*' or 'medium enterprise*' or 'micro business' or (('medium scale' or 'small scale' or 'small size' or 'medium size') and (business or enterprise*))).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device tradename, keyword]   | 1,087       |
| #3   | #1 AND #2  | 67          |
| <b>Database: PsycINFO (via Ovid, 25.03.2016)</b> |  |             |
| Search   | Query  | Items found |
| #1<br>Cancer                                     | (neoplasm* or cancer* or carcinoma* or oncolog* or tumour or tumor or leukemia* or sarcoma* or lymphoma* or melanoma* or blastoma* or radiotherapy or chemotherapy or 'occupational cancer').mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]   | 64,193      |
| #2<br>SMEs                                       | ('small enterprise*' or 'medium enterprise*' or 'micro business' or (('medium scale' or 'small scale' or 'small size' or 'medium size') and (business or enterprise*))).mp. [mp=title, abstract, heading word, drug tradename, original title, device manufacturer, drug manufacturer, device tradename, keyword]  | 724         |
| #3   | #1 AND #2  | 3           |

Table 15: Search strategy for grey literature

| <b>Database: OpenGrey (17.05.2016)</b>   |                            |                             |
|--|----------------------------|-----------------------------|
| Search                                   | Query                      | Items found                 |
| #1                                       | Cancer AND return AND work | 5                           |
| <b>Database: Google.com (17.05.2016)</b> |                            |                             |
| Search                                   | Query                      | Items included in screening |

| Database: OpenGrey (17.05.2016) |                           |                      |
|---------------------------------|---------------------------|----------------------|
| #1                              | Cancer work               | The first 20 results |
| #2                              | Cancer occupation         | The first 20 results |
| #3                              | Cancer employment         | The first 20 results |
| Search                          | Query                     | Items found          |
| #1                              | Krebs Arbeit              | The first 20 results |
| #2                              | Krebs Wiedereinstieg      | As above             |
| #3                              | Krebs Wiedereingliederung | –                    |
| #4                              | Krebs Beruf               | As above             |

## Results of search and screening process

The section above contains a detailed description of the databases and search engines used and the keywords applied. Below, the results of the searches and the screening process are presented.

### Scientific review

The search for systematic reviews located 989 articles. Subsequently, 72 duplicates were excluded and 917 articles screened via title and abstract. Most articles (837 articles) did not fulfil the inclusion criteria and were excluded. A total of 80 articles were then screened in full text to check their eligibility; of these, 40 did not fulfil the criteria and were excluded, leaving 40 articles.

In the next step, the search for original studies was conducted and 242 articles were found. During title and abstract screening, 202 articles were identified as not fulfilling the inclusion criteria and were excluded. Forty articles were screened in full text, two of which fulfilled the inclusion criteria.

### Grey literature

As a first step, the database OpenGrey was searched and five articles were located. However, none of these articles fulfilled the inclusion criteria.

The search engine Google.com was used to locate further publications. The first 20 results were screened for each combination of keywords.

The specific internet pages were screened and three articles were located. One of those had already been identified and included through the systematic search for scientific literature (de Boer et al. 2015a), one was a description of an ongoing research study for which no results are yet available (Desiron et al. 2016) and the third did not fulfil the inclusion criteria.

The responses to the online questionnaire provided no additional literature that fulfilled the inclusion criteria.

## Description of included scientific literature

This report included 36 systematic reviews and 3 primary studies. Most reviews did not use methods for synthesising the results of primary studies (narrative reviews) and included studies on any type of cancer. Publications were in either German, English or French (Table 16 **Error! Reference source not found.**).

Table 16: Overview of the included scientific literature

| Numbers of publications | Study ID      | Methods  | Date of publication | Type of cancer (as stated by author) | Language of publication |
|-------------------------|---------------|--|---------------------|--------------------------------------|-------------------------|
| <b>Primary studies</b>  |               |  |                     |                                      |                         |
| 1.                      | Ha-Vinh 2015  | Population-based longitudinal study              | 2015                | Any                                  | French                  |
| 2.                      | Leong 2011    | Survey, interview study                          | 2011                | Any                                  | English                 |
| 3.                      | Tamminga 2012 | RCT  | 2012                | Any                                  | English                 |
| <b>Reviews</b>          |               |  |                     |                                      |                         |
| 1.                      | Aaronson 2014 | Narrative studies (quantitative and qualitative) | 2014                | Any                                  | English                 |
| 2.                      | Alfano 2009   | Narrative  | 2009                | Any                                  | English                 |
| 3.                      | Amir 2009     | Narrative  | 2009                | Any                                  | English                 |
| 4.                      | Banning 2011  | Qualitative: meta-ethnographic                   | 2011                | Breast cancer                        | English                 |
| 5.                      | Campbell 2012 | Narrative  | 2012                | Breast cancer                        | English                 |
| 6.                      | Cox 2014      | Narrative  | 2014                | Any                                  | English                 |

## Rehabilitation and return to work after cancer – Literature review

| Numbers of publications | Study ID        | Methods  | Date of publication                                | Type of cancer (as stated by author) | Language of publication |
|-------------------------|-----------------|--|--|--------------------------------------|-------------------------|
| 7.                      | de Boer 2015b   | Quantitative: meta-analysis                      | 2015   | Any                                  | English                 |
| 8.                      | Duijts 2014a    | Narrative  | 2014   | Any                                  | English                 |
| 9.                      | Duijts 2014b    | Narrative (quantitative and qualitative studies) | 2014   | Any                                  | English                 |
| 10.                     | Egan 2013       | Narrative (review of reviews and RCTs)           | 2013   | Any                                  | English                 |
| 11.                     | Feuerstein 2010 | Narrative  | 2010   | Any                                  | English                 |
| 12.                     | Fitch 2013      | Narrative  | 2013 and 2014 (two publications of the same study) | Any                                  | English                 |
| 13.                     | Fitch 2014      |  |  |                                      |                         |
| 14.                     | Handberg 2014   | Qualitative: interpretive description analysis   | 2014   | Any but men only                     | English                 |
| 15.                     | Harji 2015      | Qualitative: content analysis                    | 2015   | Locally recurrent rectal cancer      | English                 |
| 16.                     | Horsboel 2012   | Narrative  | 2012   | Haematological malignancies          | English                 |
| 17.                     | Hoving 2009     | Narrative  | 2009   | Breast cancer                        | English                 |

Rehabilitation and return to work after cancer – Literature review

| Numbers of publications | Study ID        | Methods                                      | Date of publication | Type of cancer (as stated by author) | Language of publication |
|-------------------------|-----------------|--|---------------------|--------------------------------------|-------------------------|
| 18.                     | Hoving 2010     | Narrative                                    | 2010                | Somatic diseases and symptoms        | English                 |
| 19.                     | Islam 2014      | Narrative                                    | 2014                | Breast cancer                        | English                 |
| 20.                     | Kaushal 2012    | Narrative                                    | 2012                | Pancreatic cancer                    | English                 |
| 21.                     | Mehnert 2011    | Narrative                                    | 2011                | Any                                  | English                 |
| 22.                     | Molina 2013     | Narrative (qualitative)                      | 2013                | Any                                  | English                 |
| 23.                     | Munir 2009      | Narrative                                    | 2009                | Any                                  | English                 |
| 24.                     | Parkinson 2010  | Narrative                                    | 2010                | Any                                  | English                 |
| 25.                     | Peteet 2000     | Narrative                                    | 2000                | Not reported                         | English                 |
| 26.                     | Richardson 2011 | Narrative                                    | 2011                | Any                                  | English                 |
| 27.                     | Silver 2013     | Narrative                                    | 2013                | Any                                  | English                 |
| 28.                     | Spelten 2002    | Qualitative synthesis (quantitative studies) | 2002                | Any                                  | English                 |

## Rehabilitation and return to work after cancer – Literature review

| Numbers of publications | Study ID           | Methods   | Date of publication           | Type of cancer (as stated by author) | Language of publication |
|-------------------------|--------------------|---|-------------------------------|--------------------------------------|-------------------------|
| 29.                     | Steiner 2004       | Narrative (quantitative)  | 2004                          | Any                                  | English                 |
| 30.                     | Steiner 2010       | Narrative (quantitative studies)  | 2010 (update of Steiner 2004) | Any                                  | English                 |
| 31.                     | Stergiou-Kita 2014 | Qualitative: meta-ethnography (qualitative studies)                                     | 2014                          | Any                                  | English                 |
| 32.                     | Tiedtke 2010       | Qualitative: method not defined (using abstraction and synthesis) (qualitative studies) | 2010                          | Breast cancer                        | English                 |
| 33.                     | Trivers 2013       | Narrative (quantitative studies)  | 2013                          | Ovarian cancer                       | English                 |
| 34.                     | Ullrich 2012       | Narrative (quantitative studies)  | 2012                          | Any                                  | German                  |
| 35.                     | van Muijen 2013    | Narrative (quantitative studies)  | 2013                          | Any                                  | English                 |
| 36.                     | Wells 2013         | Qualitative: meta-synthesis   | 2013                          | Any                                  | English                 |

## Description of online questionnaire participants

Networks and institutes active in the field of cancer and RTW were contacted to reach study participants. After the first round of emails, five participants from two different networks (CANWON and EPR) replied. Even after a reminder was sent out, only one further reply was received.

## Assessment of quality of included studies

The quality appraisal of the included literature was based on a crude assessment of the risk of bias of the applied study methods, rather than weighing qualitative against quantitative approaches. The studies with the lowest risk of bias were considered to be at the highest level of quality.

The studies were categorised into five levels of quality:

1. systematic reviews including a meta-analysis (e.g. meta-regression);
2. systematic reviews without a meta-analysis and RCTs;
3. controlled and/or long-term studies (e.g. cohort studies, case-control studies);
4. uncontrolled and short-term studies (e.g. surveys, case series, case reports);
5. reports without a valid study population (e.g. expert opinions).

Systematic reviews were categorised in the top two levels, as they included evidence from multiple studies, thus drawing conclusions on the basis of a larger number of study participants. Results from a single RCT are at a low risk of bias, and for this reason were grouped at the same level as systematic reviews without a meta-analysis.

At the highest level were systematic reviews that numerically combined study results. These reviews provide a more precise estimate of effects than reviews that report a narrative of single study results or use a qualitative approach to combine study results (e.g. meta-ethnography, grounded formal theory).

Reviews with a qualitative synthesis approach give an important interpretative overview of the available data but cannot give an effect estimate (e.g. which work motivation most effectively promotes RTW).

Single studies are on levels three and four.

Better-quality studies are those that are either long-term (with a long follow-up period) or that include a control group. Both study designs were considered to lower the risk of bias compared with single studies with a short follow-up period or without a control group.

On the lowest quality level of evidence are publications that lack data on a valid study population. These reports may be based on experiences with the related subject (e.g. expert opinion papers), but are at a higher risk of bias than the research methods described above.

**The European Agency for Safety and Health at Work (EU-OSHA)** contributes to making Europe a safer, healthier and more productive place to work. The Agency researches, develops, and distributes reliable, balanced, and impartial safety and health information and organises pan-European awareness raising campaigns. Set up by the European Union in 1994 and based in Bilbao, Spain, the Agency brings together representatives from the European Commission, Member State governments, employers' and workers' organisations, as well as leading experts in each of the EU Member States and beyond.

**European Agency for Safety and Health at Work**

Santiago de Compostela, 12 – 5<sup>o</sup> planta  
48003 Bilbao, Spain  
Tel. +34 9444358400  
Fax +34 944358402  
E-mail: [information@osha.europa.eu](mailto:information@osha.europa.eu)

<http://osha.europa.eu>

