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Return-to-Work in Cancer Survivors: A Definition and Proposal for Using It as a System Performance Indicator – An Association of the European Cancer Leagues' consensus statement

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Abstract

Purpose

Return-to-work (RTW) is a central rehabilitation goal for working-age cancer survivors in Europe, yet current studies use heterogeneous RTW definitions that hamper evidence synthesis, guideline development, and cross-country comparison. This consensus statement aims to define RTW for cancer survivors and to propose a standardized systems performance indicator suitable for population-level monitoring across cancers and European countries.

Methods

A structured, multi-stage consensus process was conducted within the European Cancer Leagues (ECL). Two rounds of discussion in the Patient Support Working Group refined the conceptual dimensions of RTW and a draft definition. The revised draft was circulated to ECL member organisations for written comments, which were subsequently reviewed and agreed in plenary meetings of the Working Group.

Results

The proposed RTW indicator is rooted in remunerative employment and anchored to the International Classification of Functioning category d850. RTW is defined as resuming remunerative occupational activity for a relevant amount of time after initial cancer diagnosis, at a similar volume of weekly working hours as before illness, not necessarily in the same occupation. As systems performance indicators, the group proposes fixed 12- and 24-month endpoints, operationalized as ≥ 3 and ≥ 12 consecutive months of employment, respectively, within the first 12 and 24 months since diagnosis, at ≥ 75% of pre-diagnosis weekly working hours, in survivors aged 18–64 years.

Conclusion

Adoption of this standardized RTW indicator can improve comparability of RTW outcomes, support identification of high-risk groups, and inform policy and rehabilitation planning within Europe's Beating Cancer Plan.

Introduction

Return-to-work after cancer

In Europe, around a third of all newly diagnosed cancer cases are diagnosed in people aged between 18 and 64 (World Health Organization / International Agency for Research on Cancer 2024). Although return-to-work (RTW) is considered a central rehabilitation goal, and in many cases also a key step towards normality, there is no common definition of the term in the scientific literature (Young et al. 2005; Lamore et al. 2019; Butow et al. 2020). Thus, current studies and literature reviews use different definitions when examining RTW as an outcome, some of which are difficult to compare (Mehnert 2011; Wells et al. 2013; Islam et al. 2014; Boer et al. 2015, 2024; de Boer et al. 2020; Algeo et al. 2021; Breidenbach et al. 2024; Schellack et al. 2024). In their systematic review on predictive factors for RTW among cancer survivors, Schellack et al. (2024) (Schellack et al. 2024) consider this "lack of a standardized definition and assessment of RTW […] as a barrier to synthesizing results". This inconsistency makes it challenging to interpret the heterogeneity of findings across studies. For instance, Paltrinieri et al. (2018) (Paltrinieri et al. 2018), in their systematic review on RTW among European cancer survivors, reported that overall RTW rates ranged from 39% to 77%, while rates

among those employed at the time of diagnosis varied between 60% and 92%. For breast cancer alone, rates range from 56% to 88%, as reported in the Cochrane review by Tamminga et al., considering studies from Europe and the USA (Tamminga et al. 2025). Such wide ranges highlight a fundamental attribution problem: it is difficult to determine how much of this variation reflects genuine cross-country and population factors, and how much stems from methodological inconsistencies in the definition and measurement of RTW.

The absence of a consensus on the RTW definition is a major challenge for researchers, policymakers, and cancer survivors. For researchers, the inconsistent endpoints make it difficult to map RTW correctly and precisely over time and to examine influencing factors on a standardized basis. Therefore, systematic reviews cannot synthesize the evidence properly, which also makes it more difficult to develop interventions that enhance RTW or to transfer interventions from one context (study, country) to another. Consequently, no strong evidence-based recommendations can be made within clinical guidelines, as the certainty of the evidence is too low. Policymakers must therefore make decisions, such as resource allocations, based on a complex, and low to moderate quality evidence base. For cancer survivors, this uncertainty translates into less accurate identification of high-risk groups for unsuccessful RTW outcomes and a slower development of interventions.

Providing a common conceptualization can facilitate the synthesis and comparison of study results. This can improve the lives of cancer survivors by enabling faster improvement in monitoring and the development of RTW interventions.

Existing approaches to definition and conceptualization

RTW can be conceptualized both as an outcome—representing the initial point in time at which an individual resumes work—and as the process of restoring functional health. When treated as an outcome, RTW captures a person's work status at specific measurement points (e.g., employment status 12 months after diagnosis). This approach, however, overlooks fluctuations in employment before or after the time point measured. To address this limitation, RTW can also be expressed as a cumulative rate over a defined period (e.g., at least six months of employment within 12 months post-diagnosis). When used as an aggregated (population) indicator, this rate is similar to other key indicators such as cancer recurrence or survival. Unlike these indicators, RTW may occur multiple times, and its interpretation shifts with frequency: a single RTW event indicates a favorable outcome, whereas two or more events suggest interruptions in work participation. This non-linearity, combined with the diverse contexts in which RTW is applied, has led different research groups to adopt varying—and often social system-specific—operationalizations.

The established generic approaches of conceptualizing and measuring RTW proposed by Young et al. (2005) (Young et al. 2005) and Wasiak et al. (2007) (Wasiak et al. 2007) provide important theoretical background and a definition of key terms. They represent a broad view of RTW and identify gaps in the instrumentation of the outcome. In brief, their approach synthesized existing RTW measurements and conceptualized RTW as an evolving process, comprising four key phases: i.e., "off work," "work re-entry," "retention," and "advancement".

Based on their generic conceptualization, RTW can be assessed from different perspectives. What is seen as a successful RTW can vary depending on the stakeholder. While individual studies have addressed the employer's perspective on the work participation of cancer survivors (Jakobsen and and Lillefjell 2014; Greidanus et al. 2018; Popa et al. 2022; Leoni 2024), the majority of conceptualization approaches are based on the patient/survivor perspective.

Models that primarily focus on neurological, neuromusculoskeletal, or mental illnesses (Treger et al. 2007; Schultz et al. 2007; Kirsh et al. 2010; Franzsen et al. 2023) are often difficult to apply to cancer survivors, due to the specific long-term side effects and distinct treatment pathways involved. Cancer-specific frameworks, such as those of Feuerstein et al. (2010) (Feuerstein et al. 2010) or Bradley et al. (2024) (Bradley et al. 2024) provide important guidance in conceptualizing problems related to work, but primarily address factors to be considered in the RTW process and

expand on the inclusion of work-related outcomes. Truly transdisciplinary models that address temporal and multidimensional aspects of occupational disability remain an important goal of rehabilitation research (Schultz et al. 2007). The Core Outcome Set for work participation interventions across health conditions by Ravinskaya et al. (2023) (Ravinskaya et al. 2023) specifies key outcomes to assess across four stages: initiating employment, having employment, increasing/maintaining productivity at work, and returning to employment. However, while the outcome set clarifies what to measure, it lacks consensus on the exact definitions and does not specify how to measure these outcomes. Therefore, current approaches to defining and conceptualizing RTW are insufficient for use as system performance indicators for cancer survivors.

Objective and Consensus Process

A precise and unambiguous understanding of a successful RTW at the individual level—as perceived by European health and social care experts—is essential for gaining further insights into the effects, prediction, assessment, and perceptions of RTW, as well as for ensuring the comparability of these results.

Consensus on the RTW dimensions and the proposed systems performance indicator was reached through a structured, iterative process. Two rounds of discussion were conducted within the European Cancer Leagues' Patient Support Working Group to refine the conceptual framework and draft definition. The revised draft was then circulated to ECL member organisations for written comment, and all suggested changes were reviewed and discussed in plenary meetings of the Working Group.

The aim of this statement is thus to gain consensus on 1) the dimensions of RTW that should be addressed when measuring RTW and 2) a RTW definition for European cancer survivors and an accompanying systems performance indicator that allow for the comparison of RTW rates across cancers and countries. The ECL suggests using this definition/indicator unless the underlying data does not allow it or it is not appropriate for the given situation. Any deviations from the definition/indicator should be explained.

Dimensions of RTW

Any RTW operationalization should address the following aspects of a successful RTW at the individual level:

Description	Options
Content of RTW	
Which activities are considered for a successful RTW?	Gainful employment, self-employment, care work, etc.
Beginning of the RTW time	
What is the earliest point in time at which an RTW can take place/start? From what point in time are RTW outcomes measured?	At diagnosis, at the start/end of treatment, at the start/end of rehabilitation etc.
Duration of the work time until successful RTW	
For how long does the work period need to persist until RTW is considered successful? Does it have to be consecutive?	Time in days/months from defined starting point (“Beginning of the RTW time”) to achievement of successful RTW, or days/months in work within a timeframe
Proportion of the average weekly working time	
What proportion of the average weekly working hours must be covered during the work phase for the RTW to be successful?	Weekly working hours, Proportion/Percentage of standard weekly hours considered as successful RTW (e.g. 20h or 50%), or reference to individual previous employment
Time points and periods for RTW measurement	
(Up to) which points in time should be used for measuring the RTW?	Specific time points or intervals for measuring RTW (e.g., 3, 6, 12 months after “Beginning of the RTW time”)
Age restrictions for relevant cohorts	
Cohorts of which age range should be considered for the measurement of RTW outcomes?	Defined age ranges in which RTW is considered a relevant endpoint (e.g., 18–64 years)
Competing events (endpoints/periods) and reporting	
Which events can be competing events to the RTW?	Types of competing events that should be reported (e.g., sick leave, disability pension, retirement, death, etc.)

Proposed Definition

The definition proposed by the group is: “RTW in cancer survivors is defined as returning to an occupational activity in a remunerative employment (International Classification of Functioning, Disability and Health (ICF): d850) for a relevant amount of time after the initial diagnosis. The occupational activity does not have to be the same as before the illness. However, the remunerated employment must be performed for a similar volume of working hours compared to the previous activity.

For studies, and as a systems performance indicator, we suggest that RTW is recorded at least 12 and 24 months after diagnosis. Individuals in the study population should not be older than 64 years at the time of diagnosis. For individuals who do not reach RTW, (cancer-specific) mortality and receipt of social benefits (sickness benefits, pensions) should be reported. The proposed operationalization of the 12-month RTW that serves as the systems performance indicator is:

Performing an occupational activity in a remunerative employment for at least 3 consecutive months in the first 12 months since the initial cancer diagnosis with at least 75% of the weekly working hours prior to the onset of the illness.

The duration of at least three consecutive months was chosen to account for both the active treatment phase immediately after the diagnosis that often lasts six months or longer (chemotherapy, radiation therapy) and the different data sources that sometimes only allow for depicting occupational activities after a certain time span[1]. To give a more comprehensive picture we therefore suggest to additionally report 24-month RTW. The proposed operationalization of the 24-month RTW that serves as the systems performance indicator is:

Performing an occupational activity in a remunerative employment for at least 12 consecutive months in the first 24 months since the initial cancer diagnosis with at least 75% of the weekly working hours prior to the onset of the illness.

Discussion

The proposed definition addresses the critical lack of standardization in RTW research by establishing a clear, measurable systems performance indicator for European cancer survivors. The performance indicator aims to enable policymakers to benchmark RTW across cancers and nations, informing resource allocation under Europe's Beating Cancer Plan and reducing evidence gaps in research synthesis. This move toward standardized, functioning-based indicators is consistent with the recent shift in the WHO Global Rehabilitation Indicators, which similarly emphasize measuring functioning and quality of life over disease counts, and caution against reducing rehabilitation performance to isolated outputs (e.g., assistive-device provision) rather than sustained investment in workforce and systems capacity (Coghlan et al. 2026). Adoption could harmonize guidelines, accelerating intervention transfer and supporting the identification of at-risk groups for targeted interventions.

A major strength of this operationalization is its fixed measurement that incorporates different quantifiable dimensions of RTW. At the same time, we are aware that the required data, particularly longitudinal information and pre-treatment employment details, may not be routinely available and can be difficult to obtain. Some of the proposed criteria will therefore be open to critical debate and may need adaptation when applied in specific national or research contexts.

We deliberately limited the scope of the RTW content to remunerative as defined by ICF category d850, encompassing self-employment as well as paid part-time and full-time work. This operational choice excludes preparation for (returning to) work as described in d840 “Apprenticeship (work preparation)” and d845 “Acquiring, keeping and terminating a job”, as well as unpaid forms of work, such as care work or voluntary engagement (d855). Although these activities can be highly meaningful for cancer survivors and relevant to broader concepts of social participation, their strong dependence on country-specific welfare regimes and informal care structures makes them difficult to standardize for use in a comparative performance indicator. We therefore recommend that periods not spent in remunerative employment be reported in as much detail as possible. In particular, mortality, disability and old age pensions, and benefit receipt are key competing events as they can be clearly distinguished, are consistently recorded in many systems, and have direct policy implications. Whenever feasible, RTW should also be differentiated by type to capture relevant dimensions beyond the core operational definition, such as returning to the same or a different occupation or returning with workplace adaptations.

The chosen duration and intensity thresholds for RTW are intended primarily to capture a stable and long-term RTW. Recording RTW at 12 and 24 months after diagnosis offers a balance between clinical relevance, feasibility, and discriminatory power at the population level. Alternative or additional endpoints, such as “initial RTW” shortly after treatment, may be useful in clinical or intervention studies but are more sensitive to temporary fluctuations (for example, recurrent sick leave or unstable employment) and are therefore less suitable as a population-based performance indicator. Ideally, the fixed time indicator would be complemented with a time-varying model incorporating state probabilities, on a weekly or monthly basis, thereby capturing employment trajectories and the associated competing events.

Restricting the cohort to individuals aged 18–64 at the time of diagnosis follows European epidemiological conventions and creates a coherent denominator for population-level comparisons. Extending the upper age limit could better reflect the increasing importance of work participation beyond traditional retirement ages for some individuals, but it would also include many survivors who are no longer active in the labour market for reasons unrelated to cancer. Similarly, underage cancer survivors are excluded from this indicator. While work-related outcomes are important for adolescents and young adults, other priorities—such as educational attainment, vocational training, and initial labour market integration—are often more salient. Separate, age-appropriate indicators might therefore be needed to capture their specific trajectories and needs.

Overall, we have intentionally prioritized comparability and discriminative capacity over completeness with respect to the full spectrum of work-related participation. The indicator is designed as a population level tool, not to set RTW goals for individual patients. It does not capture the full range of limitations and preferences that survivors may experience, nor the broader social and contextual factors shaping participation. For instance, the threshold of at least 75% of pre-diagnosis weekly working hours may classify a clinically and personally meaningful partial RTW as “unsuccessful”, even when a substantial reduction in hours is a necessary adaptation to long-term side effects such as chronic fatigue. This highlights the need to use the proposed indicator alongside more nuanced, patient-centered measures of work participation in both research and practice, and to interpret system level comparisons in light of these inherent tradeoffs.

Declarations

Competing Interests

Johannes Soff, Sophie Klara Schellack, Hannah Lange, Clara Breidenbach, and Christoph Kowalski are employees of the German Cancer Society. This institutional relationship is disclosed in the interest of transparency. All other authors report no conflict of interest.

Ethics approval

This article reports a consensus statement developed by expert representatives of cancer organisations. No patient data or personal health data were collected, and no human participants were recruited for research purposes. The participants in the consensus process contributed as members of their organisations and as authors of this statement.

Consent to participate

Not applicable. No individual participant data were collected.

Consent to publish

Not applicable. This manuscript does not contain any individual person's data in any form.

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Author Contribution

All authors contributed to the study conception and agreement process. Material preparation and discussion leads were performed by J.S. and S.K.S. The first draft of the manuscript was written by J.S. and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data Availability

No datasets were generated or analysed in this study. The consensus process was based on discussions within the ECL Patient Support Working Group and written comments from ECL member organisations.

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29. Statements & Declarations

Footnotes

1. An example is Germany where the most solid data stem from the rehabilitation database of the Federal Pension Fund. In this dataset information on the time of rehabilitation is available as well as information on employment after end of rehabilitation – but not for the time between diagnosis and end of rehabilitation.