

Research Article

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The cost-utility of a return-to-work intervention in comparison to routine care for patients with mental disorders in Germany: Results from the RETURN project

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Abstract

Background. Only two-thirds of patients admitted to psychiatric wards return to their previous jobs. Return-to-work interventions in Germany are investigated for their effectiveness, but information regarding cost-effectiveness is lacking. This study investigates the cost-utility of a return-to-work intervention for patients with mental disorders compared to treatment as usual (TAU).

Methods. We used data from a cluster-randomised controlled trial including 166 patients from 28 inpatient psychiatric wards providing data at 6- and 12-month follow-ups. Health and social care service use was measured with the Client Sociodemographic and Service Receipt Inventory. Quality of life was measured with the EQ-5D-3L questionnaire. Cost-utility analysis was performed by calculating additional costs per one additional QALY (Quality-Adjusted Life Years) gained by receiving the support of return-to-work experts, in comparison to TAU.

Results. No significant cost or QALY difference between the intervention and control groups has been detected. The return-to-work intervention cannot be identified as cost-effective in comparison to TAU.

Conclusions. The employment of return-to-work experts could not reach the threshold of providing good value for money. TAU, therefore, seems to be sufficient support for the target group.

Introduction

In Germany only 20% of patients admitted to psychiatric inpatient treatment have a current job contract, and of those only two-thirds return to their previous jobs after discharge [1]. A reason for the low number of persons returning to work could be low return-to-work (RTW) self-efficacy, as it is discussed as an important factor in the process of returning to work [2]. Another reason could lie in expectations towards return-to-work. Sikora et al. [3] could show that a positive expectation towards return-to-work in patients with a common mental disorder (CMD) was associated with a quicker return to the job.

In modern societies occupational work has an important meaning not only as the main source of income but also as an indicator of social status and social inclusion [4, 5]. Work role functioning is therefore regarded as a crucial dimension of most quality-of-life concepts [6, 7]. In this respect the role of productive work and occupation for psychological well-being and quality of life of persons with mental illness has been emphasised by several authors in the field of social psychiatry [8–13].

Job loss and unemployment on the other hand are known to have a negative impact on individuals' financial, social, and mental health status, but also come with high costs to society [14–16]. But when unemployed, health problems are named as a major barrier to re-integration into the labour market [17]. Considering the 1.2 million cases of psychiatric inpatient treatment in Germany in 2016, about 240,000 of these persons are employed and could benefit from an RTW intervention to prevent job loss [18].

Economic evaluations are needed to inform policymakers to make meaningful decisions about the use of scarce health and social care resources.

The current literature about the cost-effectiveness of RTW interventions covers a broad range of health issues including mental health but draws an inconsistent picture [19]. Cullen and

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colleagues compared the effectiveness of interventions based on cognitive behavioural therapy (CBT) for patients with different health conditions, revealing reductions of costs due to work disability [20]. A recent Swedish study for people with a CMD found their intervention cost-effective from a societal perspective but not from the employer's perspective [21]. A Dutch RTW intervention for employees listed as sick (persons with severe psychiatric disorders were excluded) could not show any economic benefits in comparison to treatment as usual [22]. Two German studies showed positive RTW intervention effects (i.e. fewer days of absence from work) but did not include a health economic evaluation [23, 24]. So there is a research gap regarding the cost-effectiveness of RTW interventions in Germany.

This analysis investigates the cost-utility of a return-to-work intervention for patients with mental disorders provided by a return-to-work expert during psychiatric inpatient stay. This article therefore helps to close the information gap regarding cost-effective RTW interventions in Germany and provides decision-makers a base to build upon.

Methods

The description of the study methods and results follows the updated Consolidated Health Economic Evaluation Reporting Standards (CHEERS) [25].

Study design

Study data were collected within a multi-centre, cluster-randomised controlled trial (RCT) pursued at 28 acute wards in seven psychiatry hospitals in Munich and its surroundings to investigate the efficacy of the return-to-work intervention. Fourteen wards (clusters) were randomised to either the intervention group or the control group. Further details of the design of the RETURN project are published elsewhere [26], and results have recently been published [27].

Design of the economic evaluation

We conducted an incremental cost-utility analysis from the societal perspective which provides the basis for resource allocation under consideration of opportunity costs and which is therefore regarded as the gold standard in health economic evaluation [13, 28–30]. In order to provide information about intervention-specific economic outcomes, we also conducted a cost-effectiveness analysis (CEA) using the number of days worked as the measure of effectiveness.

Time horizon and discounting

The time horizon did not exceed 12 months, so discounting of cost data or results was not necessary.

Inclusion and exclusion criteria

Participants with (1) a diagnosis of a mental illness [ICD-10 F2–4, 6], (2) current employment to which they could return, (3) an age of 18 to 60 years, and (4) mental capability to reflect on their own work were eligible for participation. Persons with (1) cognitive impairment, (2) insufficient knowledge of German, or (3) a diagnosis of an organic mental disorder [F0], substance abuse [F1], or an eating disorder [F5] were excluded from the study.

Intervention

Return-to-work (RTW) experts (social workers) provide guidance and support related to patients possibly returning to the workplace. Four RTW experts participated in 8 h of training to perform manual-based guidance for the patients (for details see [31]). RTW experts meet with the study participants at least twice in 6 months. The main tasks of RTW experts include job-related preparation of clinical discharge, activation of outpatient mental health support measures, and individual support for an easier re-integration into the workplace. More in-depth details of the intervention can be found elsewhere [26, 31].

Treatment as usual

Study participants in the control group received standard inpatient care (treatment as usual – TAU). Standard clinical social services include assistance to insure a decent livelihood, transfer to outpatient treatment and care, information regarding disability pensions or sickness allowances, or the inclusion of relatives [32].

Measures

In Germany mental health services costs are covered by different payers (statutory health insurance, pension funds, tax based at different levels of administration like municipal, county, and federal state) on the basis of several of the twelve parts of the social code. Due to strict data privacy law a common service use or cost registry does not exist and merging costs from different registries on an individual basis is therefore not possible so far.

Therefore, an assessment of health and social care service use as a basis for cost estimation in patients with mental illness is commonly done in Germany but also in other countries such as the United Kingdom or the Netherlands by retrospective surveys.

In our study we used the German version of the Client Socio-demographic and Service Receipt Inventory (CSSRI) [33, 34] at baseline, and then at 6- and 12-month follow-ups by study personnel. The full CSSRI assess inpatient care, outpatient care, social care services, housing services; occupational rehabilitation; justice system costs, and medication. Corresponding unit costs were assigned to each service and afterwards extrapolated to 6 months. Furthermore assessed were the number of days of sick leave in the last 3 months and the days worked for the last 6 months at 6- and 12-month follow-ups.

The EQ-5D-3L questionnaire of the Euroqol Foundation was used to assess individual quality of life in terms of five criteria (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) with three possible responses: no problems, some problems, and extreme problems [35]. It was assessed at baseline, again before discharge, and then at 6- and 12-month follow-ups. For this analysis, we have used the data from the 6- and 12-month follow-ups.

To describe the study population, the Clinical Global Impression (CGI) and the Global Assessment of Functioning (GAF) was used. The CGI rates the symptom severity of a patient's mental illness from 1 (normal, not at all ill) to 7 (among the most extremely ill patients) [36].

The GAF is used to estimate the level of functioning of a person in a clinical setting [37]. Mental, social, and job-related functioning is measured on a scale from 1 (person is a danger to themselves or to others) to 100 (no difficulties, full functioning).

Cost analysis

Unit costs for services for the year 2021 have been estimated in euros on the basis of available literature and internet research, and by the personal consultation of service providers, health insurance companies, and other payers. Inpatient cost information has been drawn from the German psychiatric system of diagnosis-related groups, called PEPP (Entgeltssystem Psychiatrie, Psychotherapie und Psychosomatik) [38]. The physician fee schedule within the German Statutory Health Insurance Scheme (Einheitlicher Bewertungsmaßstab, EBM) [39] was used to calculate costs for physicians in their own offices. A unit cost list is provided in Table 1.

Information on the use of drugs and medication was not available but was accounted for in the sensitivity analysis.

Intervention costs have been calculated by summing up the costs of training RTW experts, including overhead costs for training and average allowances of the RTW experts for running the intervention, multiplied by the average amount of time used during and after the inpatient stay. The cost of training these experts was calculated as follows: 8 h of training for four persons (three pedagogues and one psychologist) multiplied by average hourly staff wage, plus overhead costs (room rental).

Statistical analysis

All analyses were conducted on an intention to treat (ITT) basis. Missing follow-up data was imputed by carrying forward the last available information. Incremental cost-utility analyses (ICUA) [29] were conducted from the societal perspective. Quality-adjusted life years (QALYs) were generated by means of the German value set [35].

Group differences in costs and QALYs were estimated by linear regression models. Robust standard errors were estimated to take into account the skewed distribution of cost data (by using the Huber–White sandwich estimator; see [40]).

We estimated incremental cost-utility ratios (ICUR) by calculating additional costs per one additional QALY gained by receiving the support of return-to-work experts, in comparison to TAU. Furthermore, an ICUR by calculating additional costs per one additional day worked, in comparison to TAU was estimated. Non-parametric bootstrapping with 4,000 replications was applied to estimate stochastic uncertainty [29, 41].

Table 1. Unit costs

	Unit	Euro	Source
Inpatient psychiatric treatment	day	250	GKV Spitzenverband 2017
Inpatient non-psychiatric treatment	day	643.15	GKV Spitzenverband 2017
Psychiatrist	contact	20.64	KBV 2017
Psychotherapist	contact	94.44	KBV 2021
Socio-psychiatric counselling at psychiatric outpatient clinic (PIA)	contact	83.73	PIA Richtlinie 2021
Legal guardian	contact	34.83	Federal Ministry of Justice. Law on the reimbursement of legal guardians VBVG 2005

A cost-effectiveness acceptability curve (CEAC) and the net monetary benefit were estimated for a maximum willingness-to-pay (MWTP) range between 0 and €125,000 [29].

Sensitivity analyses

For the purpose of sensitivity analysis we recalculated the ICUR including estimated costs for outpatient medication based on the most recent available data on mental health care expenditures in Germany for the year 2015. The proportion of costs for outpatient medication amounted to 15.2% of total expenses for mental health care [42].

Results

Of 819 eligible persons, 268 were randomised to the intervention (n = 137) or the control group (n = 131). At the 6-month follow-up, the data of 166 persons could be used for analysis (TAU = 83, intervention = 83). Sixty-seven out of 83 participants received a minimum of intervention sessions. Participants were on average 41 years old and 99 were female. About one-third were married or living with a partner, whereas about two-thirds were single, divorced, or widowed. There were no significant differences between study groups at baseline regarding the aforementioned characteristics (see Table 2).

Overhead costs of the intervention were calculated at €112 (8 h x €14/h of room rental including tax). The average hourly staff wage (€66.47) was calculated using the average hourly rate of a psychologist (€94.44) and a pedagogue/social worker (€38.50). Total expert training costs are €1791.52. Broken down to 83 persons of the intervention group, this makes a share of €21.58 per person respectively. For running the intervention, the average hourly staff wage (€66.47) was multiplied by the average amount of time spent with the study participant during inpatient stay (2.55 h) and after discharge (3.24 h). Total intervention cost is €406 per participating person of the intervention group.

The average annual cost and QALYs of the study population have been estimated at €18,085.21 (SD = €25,658.48) and 0.650 (SD = 0.224), respectively.

Table 3 indicates that differences in costs and QALYs have not been significant between study groups.

The intervention group showed a cost difference of € -3879.70 to the control group and a QALYs difference of 0.042, respectively. The ICUR reached € -92,373.81.

While the ICUR is located in the lower right quadrant, the ICUR variance presented in Figure 1 reveals a distribution over all four quadrants of the cost-effectiveness plane without an estimable 95% confidence interval indicating an inconclusive result of the cost-utility analysis (CUA).

This is supported by the cost-effectiveness acceptability curve presented in Figure 2, revealing that the probability that the intervention is cost-effective in comparison to TAU alone is below 90% at a willingness-to-pay (WTP) range between 0 and €125,000.

This is also confirmed by the net monetary benefit (NMB) curve in Figure 3 indicating no significant NMB over the WTP range between 0 and €125,000.

The analysis was repeated with the outcome variable “days worked”. In this sample 159 participants provided information regarding days worked (intervention group: n = 79; TAU: n = 80). The average age was now 42 years and 95 were female. Fifty persons lived with a partner, whereas the other participants were single, divorced, or widowed. There were no differences

Table 2. Study population

		Total N = 166	TAU N = 83	Intervention N = 83	Difference between groups <i>p</i>
Baseline					
Gender	Female <i>n</i> (%)	99 (59.6)	53 (63.9)	46 (55.4)	0.271
Age	m (sd)	41.4 (10.8)	40.7 (11.1)	42.1 (10.5)	0.410
Married/living with a partner	<i>n</i> (%)	53 (31.9)	27 (32.5)	26 (31.3)	0.483
Education	A-levels	93 (56.0%)	47 (56.6)	46 (55.4)	0.645
Working hours (prior hospitalization)	Hours per week	35.0 (7.4)	34.6 (8.1)	35.4 (6.7)	0.500
CGI total (1–7) ^a	m (sd)	4.4 (1.0)	4.3 (0.9)	4.6 (1.1)	0.241
GAF (1–100) ^b	m (sd)	42.5 (31.3)	44.6 (31.3)	40.4 (31.3)	0.404
T3 (6 month)					
Sick leave (since T2)	Days m (sd)	30.2 (36.9)	35.5 (39.7)	25.1 (33.5)	0.098
	<i>n</i> ^c	131	64	67	
Clinic days (since T2)	Days m (sd)	4.9 (15.8)	7.0 (18.8)	2.9 (12.0)	0.094
Additional days worked (since T2)	Days m (sd)	75.1 (54.0)	66.0 (55.1)	84.4 (51.5)	0.030
	<i>n</i> ^d	124	59	65	
T4 (12 month)					
Sick leave (since T3)	Days m (sd)	28.6 (40.7)	23.8 (36.3)	32.6 (44.0)	0.252
	<i>n</i> ^c	107	49	58	
Clinic days (since T3)	Days m (sd)	3.1 (11.8)	3.0 (12.0)	3.2 (11.7)	0.897
Additional days worked (since T3)	Days m (sd)	92.8 (47.8)	93.1 (46.9)	92.6 (48.9)	0.944
	<i>n</i> ^d	136	69	67	

^aClinical Global Impression (CGI): 1 = normal, not at all ill; 7 = among the most extremely ill patients.

^bGlobal Assessment of Functioning (GAF): 1 = in permanent danger to harm oneself or others, 100 = no difficulties, full functioning. T2 = at discharge; T3 = 6-months; T4 = 12 months.

^cOnly *n* with sick leave (missing not included).

^d*N* who provided data on days worked.

Bolded = statistically significant *p*-value.

Table 3. Point estimates of the incremental cost-utility ratios (ICUR)

	TAU (sd)	Intervention (sd)	Δ Int.–TAU (se)	<i>p</i> Δ	ICUR ΔCost / ΔQALY
Costs 6 + 12 month follow-up (ITT)	20.025,06 (27.600,28)	16.145,36 (23.565,88)	-3879,70 (3983,59)	0.332	€-92.373,81
QALY 6 + 12 month follow-up (ITT)	0.629 (0.237)	0.671 (0.209)	0.042 (0.035)	0.232	
Cost 6 month follow-up	9.511,96 (15.616,87)	6.726,10 (11.269,91)	-2.785,86 (2.113,92)	0.189	€-14.740
QALY 6 month follow-up	0.558 (0.349)	0.592 (0.316)	0.034 (0.052)	0.509	
Cost 12 month follow-up ITT	10.513,10 (16.093,56)	9.419,23 (16.994,97)	-1.093,84 (2.569,12)	0.671	€-1.630,16
QALY 12 month follow-up ITT	0.701 (0.203)	0.750 (0.185)	0.049 (0.030)	0.106	
ICUR ΔCost / Δdays worked					
Costs 6 + 12 month follow-up (ITT)	20.776 (3112,41)	16.921,07 (23.899,45)	-3.854,93 (4.112,99)	0.350	€-214,76
Additional days worked 12 month (ITT)	159 (91)	177 (91)	17.95 (14.4)	0.215	

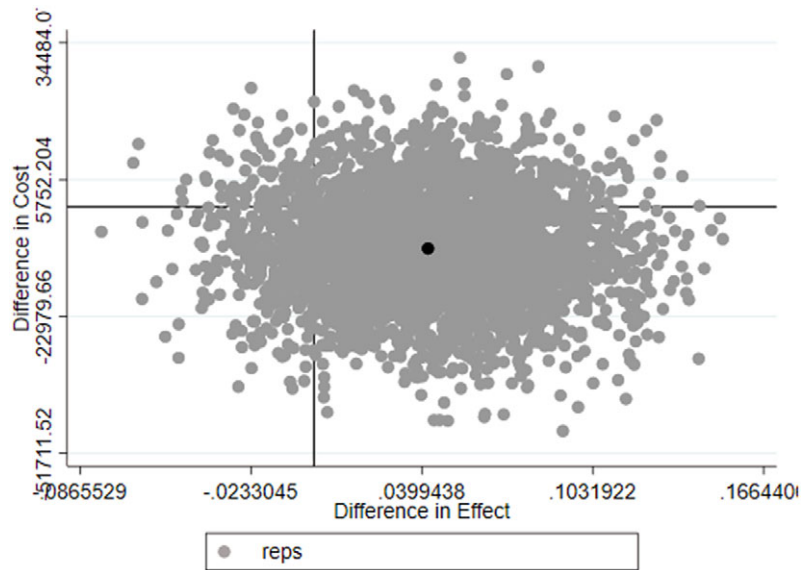


Figure 1. Cost-effectiveness-plane with the ICUR in the lower right quadrant with QALY as outcome variable.

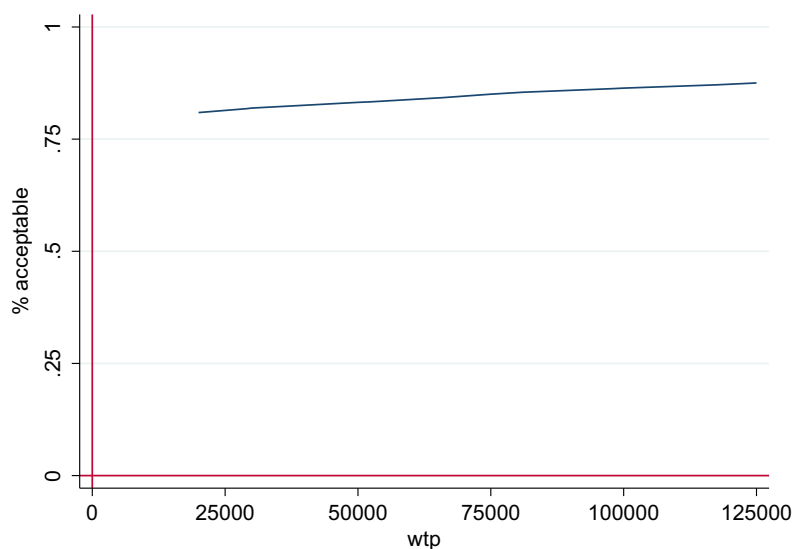


Figure 2. Cost-effectiveness acceptability curve: acceptability curve for a willingness-to-pay (WTP) range between 0 and €125,000.

between study groups regarding the named variables. A difference between groups could be found between days worked at 6 months follow-up ($p = 0.030$, see Table 2). The average annual cost and days worked of the subsample have been estimated at €-18,860.66 (SD = 25,945.47) and 168 (SD = 91.0), respectively.

Table 2 indicates that differences in costs and days worked have not been significant between study groups.

The intervention group showed a cost difference of € -3,854.93 (SD = €4,112.99) to the control group and a difference of additional days worked of 18.0 (SD = 14.4) days, respectively. The ICUR reached € -214.16.

While the ICUR is located in the lower right quadrant, the ICUR variance presented in Figures 4, 5 and 6 reveals a distribution over all four quadrants of the cost-effectiveness plane without an estimable

95% confidence interval indicating an inconclusive result of the cost-utility analysis (CUA).

Sensitivity analysis did not change the results.

Discussion

The intervention aimed to promote re-integration into the labour market and reduce sick leave through a return-to-work programme following inpatient treatment, but failed to be cost-effective.

Our findings of non-significant differences in costs and effects correspond with the results of Salize et al. [43] from 2007, who also could not detect any long-term cost differences in vocational rehabilitation programmes for patients with schizophrenia. However, cross-national results of return-to-work interventions with

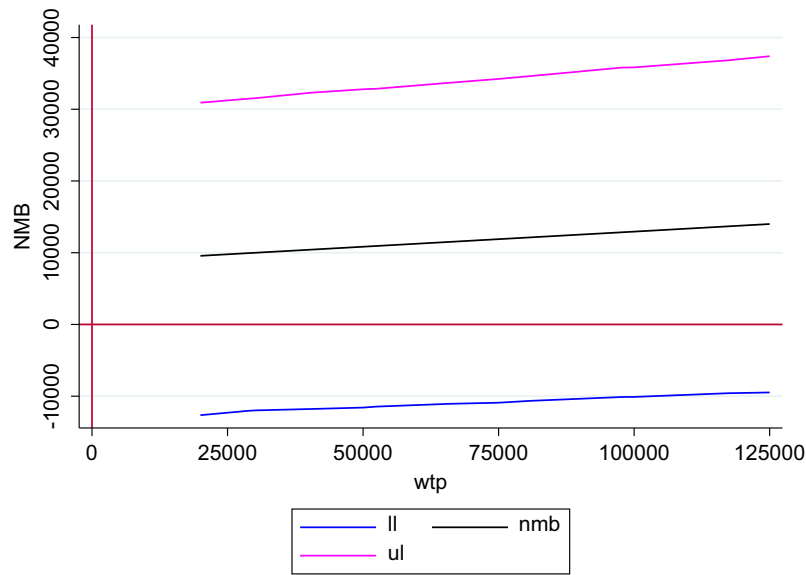


Figure 3. Net monetary benefit curve for a WTP range between 0 and €125,000 with ll, lower bound, ul, upper bound, and nmb, net monetary benefit.

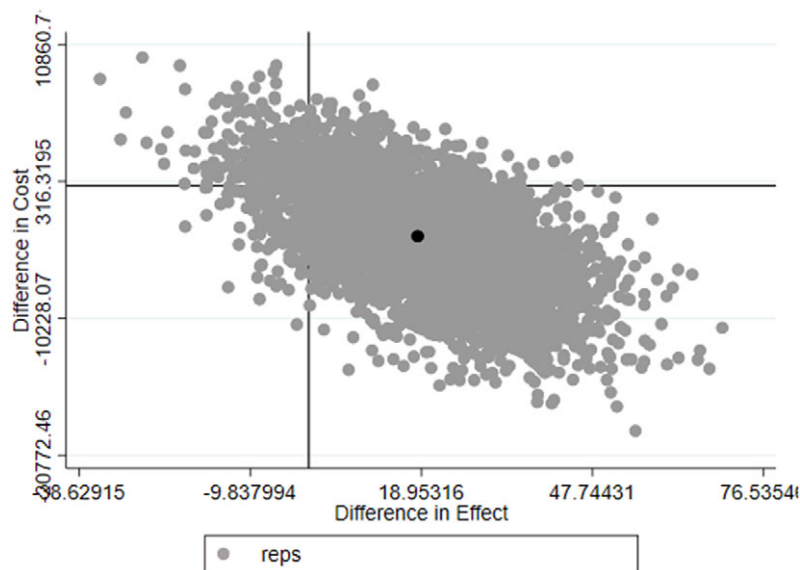


Figure 4. Cost-effectiveness plane with the ICUR in the lower right quadrant with additional days worked as outcome variable.

cognitive behavioural therapy (CBT) showed strong positive effects on costs associated with work disability due to mental health conditions [20]. Despite CBT not being part of the programme analyzed, it could be an approach to minimize long-term societal costs. Considering the indirect costs due to loss of productivity resulting from absence from work (sick leave and early retirement; estimated at €205 per person per day in 2020 [44]), and high costs for health and social care service use, there is a need for cost-effective interventions to increase the chances of psychiatric inpatients returning to the labour market after hospital admission. A Cochrane Review addressing the effectiveness of RTW interventions for people with depression concluded that a combination of workplace adaptations with clinical programmes helps patients best to quickly return to the workplace and reduce sick days [45]. Still, cost-effectiveness analyses (CEA) of combined interventions are needed to show potential differences in costs and effects.

Even though the distribution of measurement points emphasises on the lower right quadrant of the cost-effectiveness plane, it is still distributed over all four quadrants and therefore reveals little to no impact of outliers on the results.

The CUA with days worked as outcome variable revealed an interesting result. Despite us not being able to provide a normative statement, as the 95% CI was not reached, with a CI of 80% (kind of a trend) we can say, the tested RTW intervention is dominant over TAU for a WTP of more than €528 and at least 18 days worked. Taking into account the results of the Health and Safety Executive [44] with €205 per person and day of sick leave costs, the intervention would quickly be recouped. This seems promising.

As an important precondition, further research on the reasons for the low RTW rates is needed [22]. Brouwer *et al.* [46] named greater perceived social support and a better perceived work attitude as barriers to RTW. Results of a recent qualitative study

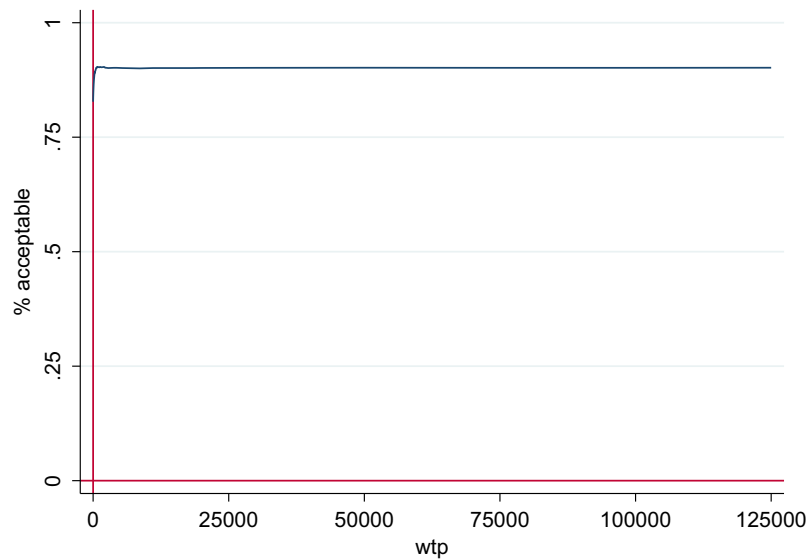


Figure 5. Cost-effectiveness acceptability curve: acceptability curve for a WTP range between 0 and €125,000 with additional days worked as outcome variable.

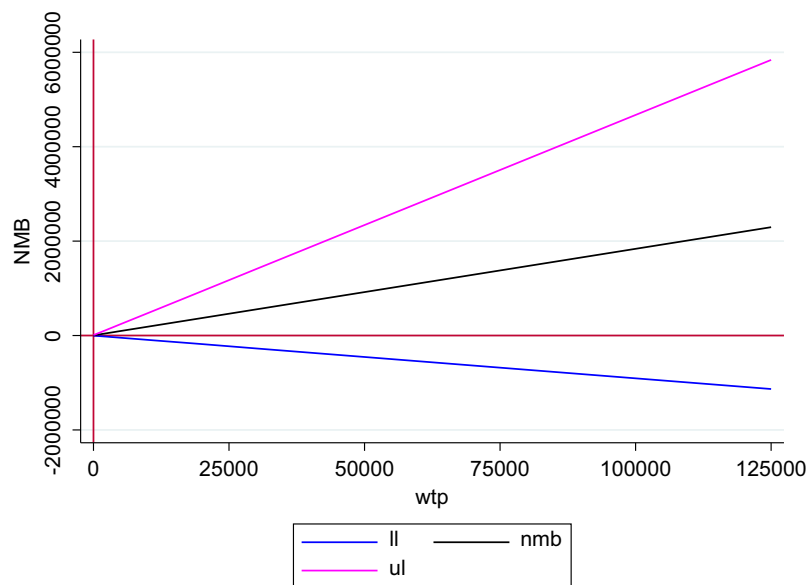


Figure 6. Net monetary benefit curve for a WTP range between 0 and € 125,000 with additional days worked as outcome variable with ll, lower bound, ul, upper bound, and nmb, net monetary benefit.

indicated that women on long-term sick leave due to common mental disorders perceived their symptoms as barriers to RTW [47]. So there might be a discrepancy between clinical symptom assessment by professionals in the healthcare setting and a subjective readiness to carry out one's job. Expected or experienced stigmatisation in the workplace, as well as self-stigma [48] or low self-efficacy [49] might increase fears around RTW. Furthermore, (expected) working conditions might not be suitable (anymore) for the person after hospitalisation. Considering these reasons for not going back to the previous job and the lack of detectable cost-effectiveness of the RTW intervention, a larger effort for individual solutions needs to be made. We especially agree with our fellow researchers from the Netherlands that some further research is needed about return-to-work interventions *despite*

possible remaining symptoms after an inpatient mental health stay [22].

Strengths and limitations

To our knowledge this is the first health economic evaluation from a societal perspective of a return-to-work intervention for psychiatric inpatients in Germany. The strength of this analysis is the application of a sound health economic evaluation approach using clinical trial data which is reported following the CHEERS criteria.

This analysis has some limitations which need to be considered. First, all individual cost data is based on self-disclosure. This implies a potential recall bias, underestimating costs. Second, results are only true to the target group and generalisability is

therefore limited: participating persons were recruited in inpatient mental health facilities. Nevertheless, there might be many people benefitting from return-to-work interventions from outpatient settings, underestimating the cost-effectiveness of the intervention. Third, TAU might have varied between participating clinics, due to differing commitments or capacities of social workers/staff. Fourth, despite low intervention costs per participant, no proof of cost benefit in comparison to TAU could be found. Fifth, the proportion of costs of persons with any service use might be underestimated, while the frequency of service use and costs of service users might have been overestimated, as service use was extrapolated to 12 months. Sixth, even though we expected no changes in results, not inflated unit costs to the year of 2021 costs might have influenced the height of costs. Seventh, to detect matters of heterogeneity, sensitivity analysis has been performed. No differences in results could be detected by adding the average costs of medication. It is clear that individual medication costs could provide greater detail on costs. Eighth, due to the limited time horizon, economic effects due to reduced welfare payments or higher earnings in the long run are not visible.

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Competing interest. J.H. received lecture honoraria from JnJ, Otsuka/Lundbeck, and ROVI. All other authors declare that they have no competing interests.

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