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Patients with rheumatoid arthritis facing sick leave or work disability meet varying regulations: a study among rheumatologists and patients from 44 European countries

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Title:

Patients with rheumatoid arthritis facing sick leave or work disability meet varying regulations: a study among rheumatologists and patients from 44 European countries

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59 **Abstract**
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Objectives

To describe and explore differences in formal regulations around sick leave and work disability (WD) for patients with rheumatoid arthritis (RA), as well as perceptions by rheumatologists and patients on the system's performance, across European countries.

Methods

We conducted three cross-sectional surveys in 50 European countries: one on work (re-)integration and social security (SS) system arrangements in case of sick leave and long-term WD due to RA (one rheumatologist per country), and two among approximately 15 rheumatologists and 15 patients per country on perceptions regarding SS arrangements on work participation. Differences in regulations and perceptions were compared across categories defined by Gross Domestic Product (GDP), type of social welfare regime, European Union (EU) membership and country RA WD rates.

Results

Forty-four (88%) countries provided data on regulations, 33(75%) on perceptions of rheumatologists (n=539), and 34(77%) on perceptions of patients (n=719). While large variation was observed across all regulations across countries, no relationship was found between most of regulations or income compensation and GDP, type of SS system, or rates of WD. Regarding perceptions, rheumatologists in high GDP and EU-member countries felt less confident in their role in the decision process towards WD ($\beta=-0.5$ [95%CI[-0.9;-0.2] and $\beta=-0.5$ [-1.0;-0.1], respectively). The Scandinavian and Bismarkian system scored best on patients' and rheumatologists' perceptions of regulations and system performance.

Conclusions

There is large heterogeneity in rules and regulations of SS systems across Europe in relation to WD of patients with RA, and it cannot be explained by existing welfare regimes, EU membership or country's wealth.

Introduction

Rheumatoid arthritis (RA) is a chronic inflammatory joint disease that often starts during working life of patients.[1-3] RA has a high impact on functioning and ability to participate in social roles.[4, 5] Despite substantial improvements in treatment options in the last decades, still 20% of the patients are unable to continue to work in the first 3 years of disease and over 30% of patients become work disabled after 10 years.[6-9]

For patients, work disability (WD) implies exclusion from an essential role in society, but also loss of income and reduced economic self-sufficiency.[5, 10] To prevent individuals from poverty in case of WD, substitution of income has been introduced in some European countries in the 19th century. By now, most countries have some form of social security (SS) system in place to regulate income substitution. However, these systems are not uniform, as they have been shaped by national political and social developments throughout the 20th century. Policies targeted at income substitution balance between provision of a fair income, on one hand, and control of expenditures by restricting social security benefits only to individuals with specific levels of work restrictions, on the other hand.[11] More recently, the increasing economic burden of WD, but also the insight into social and health benefits of work participation stimulated in many countries stricter gate-keeping on the one hand, and stronger employment support to enhance endurable work participation of persons with chronic disease on the other hand.[12]

SS arrangements have been suggested to result in differences in overall patterns of employment, WD, and retirement.[13, 14] A recent worldwide multinational study (COMORA) has shown that lower economic wealth and human development of countries is associated with higher rates of unemployment and higher absenteeism.[15] Earlier, QUEST RA study has observed that in low Gross Domestic Product (GDP) countries, people remain working with higher levels of disability and disease activity compared to high GDP countries.[16] The regulations around the sick leave and work disability may be, at least partially, responsible for these differences, however, they have not been studied.

Policies with regard to work participation, however, go far beyond income substitution only. Criteria for access to WD benefits as well as levels of income

substitution likely depend, among others, on economic, political and cultural factors. While the European Union (EU) and World Health Organization (WHO) accept the historical differences in the way health and social systems are organised and function in their member states, there is a universal agreement that differences should not result in inequalities in health and quality of life of people across nations.[17] It is unclear whether EU member states achieved any degree of homogeneity in the key regulations around social policies with regards to work disability. In addition to system level factors, there is evidence that personal contextual and disease related factors [6, 18, 19], influence the decision of an individual to take sick leave or apply for long term WD.

The aim of this study was to describe and explore differences in formal regulations around sick leave and WD for patients with RA, as well as perceptions by rheumatologists and patients on the system's performance, across European countries. We hypothesised that 1) lower GDP countries have stricter rules with regard to obtaining work disability and lower income substitution once work disability is granted 2) EU countries have more homogeneous regulations compared to non-EU countries 3) patients and rheumatologists in high GDP and EU member states are more satisfied with the performance of the social security system.

Methods

Design and framework

We conducted a cross-sectional observational study consisting of three surveys in 50 of the 53 countries of the European WHO Region (in three countries, no contact person could be found), in 2014-2016 (Figure 1). The questionnaires were designed following the framework of access (originally applied in healthcare [20, 21]), with three dimensions : i) **availability** of re-integration plans or other systems/policies to facilitate work and/or prevent WD, as well as the eligibility criteria that a patient should meet to receive SS benefits; ii) **affordability**, i.e. the level of income substitution granted in case of sick leave and permanent disability; iii) **acceptability**, i.e. professional and individual perceptions of rheumatologists and patients,

respectively, around the system performance on these issues. The study has been approved by Maastricht Ethical Committee.

Participants

For each of the 50 European countries, one rheumatologist was invited as principal investigator (PI) to complete the questionnaire on SS arrangements in his/her country in case of sick leave and long-term WD due to RA (survey 1; availability and affordability). Additionally, each PI was asked to invite at least 15 rheumatologists (survey 2; acceptability) and at least 15 patients (survey 3; acceptability) to complete a questionnaire on professional and individual perceptions of the system. To recruit rheumatologists, PIs were instructed to ensure a diverse sample in terms of gender, years of professional experience, and clinical setting. Patients could also be recruited via patient organizations and aimed at representing the spectrum of patients with RA, assuring that at least a half of them had experience with (applying for a) WD pension.

Questionnaires

The questionnaire for PIs addressed national regulations (in 2014) on benefits separately for sick leave and WD (Online Supplementary Text S1a: availability and affordability), as well as calculations of the level of income for nine pre-specified scenarios (vignettes), one on sick leave and two for long-term WD across the three levels of income (Online Supplementary Text S1b). In countries where a patient research partner was available (n=21), he/she was invited to comment on any inconsistencies in the answers on the main questionnaire about the formal regulations. In this case, answers were double-checked with the PI.

The questionnaire for rheumatologists (Online Supplementary Text S2; acceptability) contained questions about perceptions on appropriateness of the SS arrangements, practical aspects of the application process for benefits, and the role of rheumatologists in the process. The questionnaire for patients (Online Supplementary Text S3; acceptability) addressed perceptions about the importance and adequacy of the existing arrangements. Additional questions were included on age, gender, work environment (non-university hospital, university hospital, private practice, other) for rheumatologists; on age, gender, disease duration, work status (paid work, no paid work but not work disabled, partially or fully work disabled) and

history of sick leave and WD. The PI decided on whether questionnaires could be applied in English, otherwise translated them, wherever possible with patient partners involved in checking the translation.

Data on Gross Domestic Product (GDP) per capita (in international dollars, 2013) were extracted from the World Development Indicators report by the World Bank [22] and used as a continuous variable or dichotomized around the median (27,000 int.\$). The welfare regimes taxonomy included five groups, namely the Anglo-Saxon, Bismarckian, Mediterranean, Post-Communist, and Scandinavian type of system.[23] Rates of work disability among RA patients have been collected by the QUEST-RA study (2009) and were available for 21 countries from our sample.[16, 24]

Statistical analysis

Arrangements to support work and social security regulations in case of sick leave or work disability due to RA (questionnaire 1)

Collected data on formal rules and policies were first presented through descriptive statistics. To investigate whether the regulations differed by the type of welfare regime[23], GDP, EU membership (EU-15, new EU member states and non-EU countries), or were associated with country-level work disability rates among RA patients[16], subgroup comparisons were performed using Pearson correlations, t-test/Mann-Whitney and chi-square/Fisher's test, as appropriate.

Patients' and rheumatologists' perceptions of the social security system (questionnaires 2 and 3)

Answers of rheumatologists on their perspective of SS arrangements were summarized and scored (the higher is the better) around the two domains: (1) 'Performance of the system' (score 0-4) and (2) 'Role of the rheumatologists' (score 0-4). Additionally, a single item on the perceived standardisation in the decision-making process was analysed separately. Input from patients was summarized following three domains: (1) 'Importance and support to remain employed' (score 0-5), (2) 'Process of applying for WD (score 0-4), and (3) 'Obtaining and living with work disability pension' (score 0-6) (complete questionnaires are provided in the Online Supplementary Texts S2 and S3). Each domain consisted of 4 to 6 questions (each on a 1 (totally agree) to 5 (totally disagree) Likert scale, dichotomized as 1 ('(totally) agree') and 0 ('not agree/not disagree', '(totally) disagree'). The

dichotomized scores per question were summed into the five domain scores (two for rheumatologists and three for patients).

Rheumatologists' and patients' characteristics were compared across the type of SS system, EU membership, and GDP. Small numbers of surveyed patients and rheumatologists in each country hindered analyses of country level means, and thus were not related to national RA work disability rates. The domain 'Importance and support to remain employed' was assessed in patients currently or ever having worked. Analyses in domains 'process of applying for work disability and 'obtaining and living with work disability were limited to patients currently work disabled or ever considered applying for WD.

Finally, we conducted multilevel (with individuals clustered in countries) multiple regression analysis with each of the domains as an outcome and type of SS system, EU membership or GDP as the independent variable of interest. Models with patient perceptions as outcome were adjusted for age, gender, education, disease duration and ever having had sick leave due to RA. When rheumatologists' perceptions were the outcome, analyses were adjusted for age, gender and work setting.

Results

Forty-four (28 EU and 16 non-EU member states) countries (88%) provided data on formal rules and regulations for sick leave and WD. Of these, 33 (75%) countries collected data from rheumatologists (n=539), and 34 (77%) countries collected data from patients (n=719) (missing countries were all non-EU members except Luxembourg).

Arrangements to support work and social security regulations in case of sick leave of work disability due to RA

While nearly all countries had arrangements to support patients with restrictions to work, a large heterogeneity was observed in the type of arrangements (Table 1, Online Supplementary Tables S1-3). All except for 12 countries had facilities to support patients with RA in paid employment (n=32, 73%), but only in a quarter of countries (n=11, 25%) rehabilitation efforts were obligatory prior to the decision about long-term WD. Twenty-five (57%) and 30 (68%) countries had a requirement for employment history or social insurance contributions in order to be eligible for sick leave or long-term WD compensation, respectively. The maximum sick leave

length before transition to long-term WD varied from 3 to 36 months (mean (SD) 13 (9)). In 8 (18%) and 5 (11%) of the countries, participation of a rheumatologist was mandatory in the process of application or decision-making process on long-term WD, respectively. In addition to a functional assessment (degree of (dis)ability), prior profession, (n=25 (57%) of countries), diagnosis (n=32 (73%)), earning capacity (n=12 (27%)), age (n=20 (45%)), and gender (n=5 (11%)) were reported to be accounted for when a decision was taken about (the degree of) WD. Prognosis, education and place of residence were mentioned as additional factors by few countries.

All countries except the former Yugoslav Republic of Macedonia, Bosnia-Herzegovina and Serbia reported to recognise partial WD, a status that partially substitutes income while the person can continue in (reduced) employment. Of the 26 countries providing data on income substitution, in 8 countries (31%) income substitution (averaged over the first 6 months of disability) in case of sick leave was less than 70% of previous income. Income substitution averaged over the first 12 months of disability was less than 70% in 18(70%) and 15 (58%) in case of moderate (partial) or severe (full) long-term disability, respectively (Table 2). While wealthier countries as expected provided higher benefits in absolute terms, when converted to percentage of the previously earned income, no relationship was found between income compensation and neither GDP, nor the type of SS system, or rates of work disability. In richer countries and in countries with the Bismarkian type of welfare regime, the WD pension burden was more likely to be shared between SS and a private insurance, while countries with lower GDP and other welfare regimes had social insurance as the main source of WD allowances (data not shown). In countries with lower GDP, a rheumatologist was more frequently necessarily involved in the application and decision making. Other aspects of the system revealed no statistically significant patterns with country-level characteristics or national WD rates.

Rheumatologists' and patients' and perceptions of social security system

In total, 539 rheumatologists (mean age (SD) 48 (10), 284 (53%) female, 278 (51%) working in university hospitals) from 33 countries filled in the questionnaires (Online Supplementary Table S4). Scores on 'Role of the rheumatologists' (0-4) and 'Performance of the system' (0-4) ranged from 1.4 (SD 0.9) (Anglo-Saxon) to 2.4 (1.1) (Post-communist) and 0.8 (0.9) (Anglo-Saxon) to 2.3 (1.2) (Scandinavian),

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respectively. Perceived level of standardization around decision-taking revealed that only 26% (n=135) of rheumatologists consider decisions on WD to be objective. Of note, those who perceived standardization as poor (vs good) scored worse on both 'Role of the rheumatologists' (-0.4 points) and 'Performance of the system' (-2.6 points) domains (t-test p-value for both scores <0.05). Multilevel analyses revealed that rheumatologists in high GDP (vs low GDP) and EU-member (vs non-EU member) countries felt less confident in having an active role in WD decisions (β = -0.5 [95%CI [-0.9;-0.2] and β = -0.5 [-1.0;-0.1], respectively). In addition, significant differences were observed across the system types with the Scandinavian type (Denmark, Iceland, Sweden, Norway, Finland) consistently scoring higher than the others on domains 'Importance and support to remain employed' and 'Process of applying for work disability pension' (Table 4 and Supplementary Table S5).

The patient sample consisted of 719 patients from 34 countries (mean age (SD) 53 (12), 76% female, 519 (78%) ever worked). The highest (=most satisfied) patient scores on all three domains were consistently observed in countries with Scandinavian and Bismarkian type of security system (Table 3). In multilevel adjusted regression models, neither country wealth nor EU status were associated with patients' perceptions (Table 4 and Supplementary Table S5). The findings across the system type were notably consistent across patient and rheumatologist domains.

Table 1. Summary of social security regulations to support stay at work and work disability arrangements for persons with RA

Regulation		N (%)*	Anglo-saxon	Scandinavian	Bismarkian	Mediterranean	Post-communist
<i>Support to stay at work</i>							
Facilities for persons with RA that aimed at keeping the patient in paid employment are available	Yes	32 (73%)	<u>IE</u> , <u>GB</u>	<u>DK</u> , <u>FI</u> , <u>IS</u> , <u>NO</u> , <u>SE</u>	<u>AU</u> , <u>BE</u> , <u>DE</u> , <u>IL</u> , <u>LU</u> , <u>CH</u> , <u>NL</u>	<u>CY</u> , <u>IT</u> , <u>PT</u>	AL, BY, <u>BG</u> , <u>CR</u> , <u>CZ</u> , LT, MK, MD, ME, <u>PL</u> , <u>RO</u> , RS, <u>SK</u> , <u>SL</u> , TJ
	No	12 (27%)	-	-	<u>FR</u>	<u>GR</u> , <u>MT</u> , <u>ES</u> , TR	BA ^P EE ^P GE ^P HU ^P RU ^P LV ^P UA ^P
<i>Access to sick-leave or short term absence</i>							
Requirement for length of previous employment AND/OR certain income earned AND/OR certain amount of social insurance tax paid in order to be eligible for sick leave compensation	Yes	25 (57%)	<u>IE</u> , <u>GB</u>	<u>DK</u> , <u>NO</u> , <u>SE</u>	<u>BE</u> , <u>FR</u> , <u>IL</u> , <u>CH</u>	<u>CY</u> , <u>GR</u> , <u>PT</u> , <u>ES</u>	AL, BY, BA, <u>BG</u> , <u>HR</u> , <u>CZ</u> , LT, MD, <u>PL</u> , <u>RO</u> , <u>SK</u> , TJ
	No	18 (41%)	-	<u>FI</u> , <u>IS</u>	<u>AU</u> , <u>DE</u> , <u>LU</u> , <u>NL</u>	<u>IT</u> , <u>MT</u> , TR	EE, GE, <u>HU</u> , <u>LV</u> , MK, ME, RU, RS, <u>SL</u> , UA
The rheumatologist is authorized to certify short-term absence from work due to RA	Yes	33 (75%)	<u>IE</u>	<u>DK</u> , <u>FI</u> , <u>IS</u> , <u>NO</u> , <u>SE</u>	<u>AU</u> , <u>BE</u> , <u>FR</u> , <u>DE</u> , <u>IL</u> , <u>LU</u> , <u>CH</u>	<u>CY</u> , <u>GR</u> , <u>MT</u> , <u>PT</u> , <u>ES</u> , TR	AL, BY, BA, <u>CZ</u> , <u>EE</u> , <u>HU</u> , LT, MK, ME, <u>PL</u> , <u>RO</u> , RU, TJ, UA
	No	10 (23%)	<u>GB</u>		<u>NL</u>	<u>IT</u>	<u>BG</u> , <u>CR</u> , GE, <u>LV</u> , MD, RS, <u>SK</u> , <u>SL</u>
First 1-3 days of sick leave are unpaid	Yes	11 (25%)	-	<u>SE</u>	<u>FR</u> , <u>IL</u>	<u>CY</u> , <u>IT</u> , <u>PT</u> , <u>ES</u> , TR	<u>CZ</u> , <u>EE</u> , <u>LV</u>
	No	32 (73%)	<u>IE</u> , <u>GB</u>	<u>DK</u> , <u>FI</u> , <u>IS</u> , <u>NO</u>	<u>AU</u> , <u>BE</u> , <u>DE</u> , <u>LU</u> , <u>CH</u> , <u>NL</u>	<u>GR</u> , <u>MT</u>	AL, BY, BA, <u>BG</u> , <u>CR</u> , GE, <u>HU</u> , LT, MK, MD, ME, <u>PL</u> , <u>RO</u> , RU, RS, <u>SK</u> , <u>SL</u> , TJ, UA
<i>Decision about long-term work disability</i>							
Maximum length of sick leave before a WD can be granted	<12 months	35 (80%)	<u>GB</u>	<u>DK</u> , <u>IS</u> , <u>SE</u>	<u>AU</u> , <u>FR</u> , <u>DE</u> , <u>IL</u> , <u>LU</u>	<u>CY</u> , <u>GR</u> , <u>IT</u> , <u>MT</u> , <u>PT</u> , <u>ES</u> , TR	AL, BY, <u>BG</u> , <u>CR</u> , <u>EE</u> , <u>LV</u> , LT, <u>HU</u> , MK, MD, ME, <u>PL</u> , <u>RO</u> , RU, RS, <u>SL</u> , TJ, UA
	≥12	8 (18%)	<u>IE</u>	<u>FI</u> , <u>NO</u>	<u>BE</u> , <u>CH</u> , <u>NL</u>	-	BA, <u>CZ</u> , <u>SK</u>

	months						
Is it <u>obligatory</u> that a rheumatologist is involved in application process (i.e. providing information about the disease)?ξ	Yes	10 (23%)	-	-	-	CY, GR	AL, BY, BG , LT, MK, SK , RU, TJ
	No	31 (70%)	IE, GB SE	DK, FI, NO	AU, BE, FR, IL, LU, CH, NL, DE	IT, MT, PT, ES, TR	BA, CR, CZ , EE, HU, LV, MD, PL, RO , RS, SL , UA
Is the rheumatologist also in an <u>obligatory</u> way involved in the decision-taking about the long-term work disability? (i.e. is part of the commission or expert committee) ξ	Yes	5 (11%)	-	-	-	CY	AL, BG, SK , TJ
	No	36 (82%)	IE, GB SE	DK, FI, NO	AU, BE, FR, IL, LU, CH, NL, DE	GR, IT, MT, PT, ES, TR	BY, BA, CR, CZ , EE, HU, LV, LT, MK, MD, PL, RO , RU, RS, SL , UA
Rehabilitation efforts are <u>obligatory</u> before a patient could be assessed for long-term disability	Yes	11 (25%)		DK, FI, SE, NO	AU, CH, NL	-	LT, MD, ME, RO, SL
	No	32 (73%)	IE, GB	IS	BE, FR, DE, IL, LU	CY, GR, IT, MT, PT, ES, TR	AL, BY, BA, BG, CR, CZ , EE, HU, LV, MK, PL , RU, RS, SK , TJ, UA

AL, Albania; AT, Austria; BA, Bosnia and Herzegovina; BE, Belgium; BG, Bulgaria; BY, Belarus; HR, Croatia; CH, Switzerland; CY, Cyprus; CZ, Czech Republic; DE, Germany; GE, Georgia; DK, Denmark; EE, Estonia; ES, Spain; FI, Finland; FR, France; GR, Greece; HU, Hungary; HR, Croatia; IE, Ireland; IS, Iceland; IL, Israel; IT, Italy; LT, Lithuania; LU, Luxemburg; LV, Latvia; MD, Moldova; ME, Montenegro; MK, Macedonia (the former Yugoslav Republic of Macedonia); MT, Malta; NL, The Netherlands; NO, Norway; PL, Poland; RO, Romania; RU, Russia; SE, Sweden; SK, Slovakia; SL, Slovenia; RS, Serbia; TR, Turkey; TJ, Tajikistan; UK, United Kingdom; UA, Ukraine

*data provided by 44 countries, Georgia reported to not have any effective social security system in place; ξ: data missing for IS, ME
EU countries are in **bold**, High GDP (>27,000 int. dollars, based on median) countries are underscored

Table 2. Income compensation in case of work disability for an employee with average income*

Type of disability	Income compensation		Anglo-saxon	Scandinavian	Bismarkian	Mediterranean	Post-communist
In case of sick leave	≤ 70% of earned income	8 (31%)**	<u>IE</u>	-	<u>BE</u>	<u>CY</u> , <u>PT</u> , TR	<u>CZ</u> , EE, SK
	> 70% of earned income	18 (69%)	-	<u>FI</u> , <u>NO</u>	<u>LU</u> , <u>NL</u> , <u>SE</u>	<u>FR</u> , <u>IT</u> , <u>ES</u>	BG, LT, LV, MD, PL, RO, RS, <u>SL</u>
In case of moderate (50%) work disability*	≤ 70% of earned income	18 (70%)	<u>IE</u>	<u>FI</u> , <u>NO</u>	<u>BE</u> , <u>SE</u> , <u>CH</u>	<u>CY</u> , TR	BY, BG, <u>CZ</u> , EE, LV, LT, MD, PL, RO, RS, SK
	> 70% of earned income	7 (27%)	-	-	<u>LU</u> , <u>NL</u>	<u>FR</u> , <u>IT</u> , <u>PT</u> , <u>ES</u>	AL
In case of severe (75%) work disability*	≤ 70% of earned income	15 (58%)	-	<u>FI</u> , <u>NO</u>	<u>BE</u> , <u>LU</u> , <u>SE</u> , <u>CH</u>	<u>CY</u> ,	<u>CZ</u> , EE, LV, LT, MD, PL, RO, RS, SK
	> 70% of earned income	10 (38%)	<u>IE</u>	-	<u>NL</u>	<u>FR</u> , <u>IT</u> , <u>PT</u> , <u>ES</u> , TR	AL, BY, BG

AL, Albania; BY, Belarus; BE, Belgium; BG, Cyprus; CZ, Czech Republic; EE, Estonia; FI, Finland; FR, France; IE, Ireland; IT, Italy; LV, Latvia; LT, Lithuania; LU, Luxemburg; MD, Moldova; NO, Norway; PL – Poland; PT, Portugal; RO, Romania; RS, Serbia; SK, Slovakia; SL, Slovenia; ES, Spain; CH, Switzerland; NL, the Netherlands; TR, Turkey

EU countries are in **bold**, High GDP (>27,000 int. dollars, based on median) countries are underscored *SL did not provide data for long term WD

*a person 50 y.o. recently diagnosed with RA, who is a citizen and has worked for 25 years full-time

**data provided by 26 countries

Table 3. Patients’ and rheumatologists’ characteristics per type of security system.

	Total	Anglo-saxon	Scandinavian	Bismarkian	Mediterranean	Post-communist	p-value
Rheumatologists characteristics (Questionnaire 2)							
N of rheumatologists (N of countries)	539 (33)	22 (2)	58 (5)	88 (6)	87 (6)	284 (15)	
Role of the rheumatologists (0-4)	2.1 (1.1)	1.4 (0.9)	1.3 (0.9)	2.1 (1.3)	1.9 (1.0)	2.4 (1.1)	<0.001
Performance of the system (0-4)	1.5 (1.1)	0.8 (0.9)	2.3 (1.2)	2.0 (1.1)	1.1 (1.0)	1.4 (1.1)	<0.001
Patient characteristics (Questionnaire 3)							
Importance and support to remain employed (0-5)	2.1 (1.2)	1.6 (0.8)	2.6 (1.2)	2.3 (1.4)	2.1 (1.2)	2.0 (1.1)	<0.001
Process of applying for WD (0-4)	2.2 (1.8)	1.3 (1.8)	3.2 (3.0)	2.4 (1.9)	2.0 (1.6)	2.3 (1.7)	<0.001
Obtaining and living with WD pension (0-6)	1.1 (1.1)	0.7 (0.8)	1.2 (1.1)	1.2 (1.4)	1.0 (1.1)	1.1 (1.1)	0.22

Anglo-saxon: UK, Ireland; **Scandinavian:** Denmark, Iceland, Sweden, Norway, Finland; **Bismarkian:** Austria, Belgium, Germany, France, Israel, Netherlands, Switzerland; **Mediterranean:** Cyprus, Greece, Italy, Portugal, Spain, Turkey; **Post-communist:** Albania, Bulgaria, Czech Republic, Croatia, Estonia, Georgia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Serbia, Tajikistan, Slovak Republic, Slovenia

Table 4. Patients’ and rheumatologists’ perceptions across several domains according to (1) GDP per capita PPP (2) EU membership status (3) Type of social security system. Models adjusted for socio-demographic confounders.

	Patients’ perceptions (n of countries = 34) [§]			Rheumatologists’ perceptions (n of countries = 33) [§]	
	Importance and support to remain employed (0-5) n=491	Process of applying for work disability pension (0-4) n=342	Obtaining and living with work disability pension (0-6) n=341	Performance of the system (0-4) n=390	Role of the rheumatologists (0-4) n=393
GDP per capita (int. \$) High vs low GDP	0.21 [-0.07;0.50]	0.39 [-.20;0.98]	-0.09 [-0.44;0.25]	0.30 [-0.08;0.72]	-0.55 [-0.94;-0.16]
EU membership EU vs non-EU member	0.20 [-0.14;0.53]	-0.41 [-1.10;0.29]	-0.16 [-0.57;0.26]	-0.12 [-0.56;0.32]	-0.54 [-0.95;-0.13]

Type of system	Reference	Reference	Reference	Reference	Reference
Scandinavian	-1.02 [-1.64;-0.39]	-1.41 [-2.73;-0.09]	-0.47 [-1.30; 0.36]	-1.49 [-2.22; -0.77]	-0.57 [-1.49;0.35]
Anglo-Saxon/liberal	-0.40 [-0.90;0.10]	-0.74 [-1.84;0.40]	-0.04 [-0.73;0.65]	-0.41 [-0.94;1.12]	-0.39 [-1.09;0.31]
Bismarckian/conservative	-0.56 [-1.06;-0.07]	-1.29 [-2.33;-0.25]	-0.20 [-0.86; 0.46]	-1.19 [-1.70; -0.69]	-0.11 [-0.78;0.56]
Mediterranean/southern	-0.63 [-1.06;-0.19]	-1.02 [-1.91;-0.13]	-0.04 [-0.62;0.53]	-0.98 [-1.44;-0.51]	0.21 [-0.40;0.83]
Post-Communist/eastern					

Coefficients are derived from separate multilevel multiple models (with individuals clustered in countries and each independent variable (i.e. GDP, EU membership or type of system), adjusted for age, gender, education, disease duration and ever having had sick leave due to RA; analyses on the rheumatologist domains were adjusted for age, gender and work setting; GDP – Gross Domestic Product, EU – European Union

Anglo-saxon: UK, Ireland; **Scandinavian:** Denmark, Iceland, Sweden, Norway, Finland; **Bismarkian:** Austria, Belgium, Germany, France, Israel, Netherlands, Switzerland; **Mediterranean:** Cyprus, Greece, Italy, Portugal, Spain, Turkey; **Post-communist:** Albania, Bulgaria, Czech Republic, Croatia, Estonia, Georgia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Serbia, Tajikistan, Slovak Republic, Slovenia

‡the higher score the more positive are the perceptions

Statistically significant (p<0.05) regression estimates are **in bold**

Discussion

To our knowledge, this is the first study to provide an extended overview of systems to support work or work disability in RA. With regard to the system rules and regulations, i.e. availability and affordability of work disability arrangements, a large heterogeneity across countries was observed for most regulations including income compensation. While research and judgement on which system is preferable is complex and beyond the aim of this study, it is striking that a person with RA, upon becoming disabled, will face very different perspectives on future work participation, depending on his/her country of residence. Only in a minority of countries work re-integration plans were obligatory before starting a procedure towards WD.

Despite important variation, we could not detect patterns explaining differences in the formal rules and regulations of the SS systems, with only few exceptions. We could not find support to our first hypothesis that lower GDP countries would have stricter rules around work disability or lower relative income substitution when WD is granted, nor did we find any common features of systems in lower GDP countries or EU vs non-EU member states. Moreover, the rules of the SS system did not seem to have a large role in explaining differences in WD in RA. Earlier research – mainly in general population and above 50 years of age in a number of European countries and dating back to 2007 - suggested that the national SS system and, in particular, generosity of benefits, explains a large proportion of between country variations in disability rates.[25] We could not reproduce these results in our study among patients with RA. It is worth noting that data on work disability rates in RA was available for 21 countries only and collected almost a decade earlier, and was based on a sample of patients rather than national statistics.[16]

In contrast to findings on formal regulations (availability and affordability), patients' and rheumatologists' perceptions of systems to support persons with RA encountering work restrictions (acceptability), showed an apparent variation according to the type of the social security system: the Scandinavian and Bismarkian employment support and social security system consistently appeared to most adequately meet the expectations of patients and rheumatologists regarding remaining at work and application for a work disability pension. At the same time, little differences were related to country's wealth or EU-membership, and only a weak signal suggested that rheumatologists in lower

income countries are more confident in their role to support patient in work disability issues. The latter may indicate that rheumatologists in low income countries interact more intensively with patients on these issues and accept work disability questions as part of their responsibility. Alternatively, other cultural and system factors could be considered, e.g. patients referring to other professionals within the system (such as primary care or state agencies) for advice and support regarding work disability decisions.[26] Overall, a lack of standardisation in the decision-making process on work disability was reported by nearly three quarters of the rheumatologists, and reinforces earlier calls for efforts for standardisation and homogenisation.[27] Therefore, our third hypothesis that levels of satisfaction with the system is higher in EU member states and higher GDP countries was not supported by the available data, while initial insight was generated with respect to the social security system type where no hypotheses were formed a priori.

This study has some notable limitations. First, the complexity of access to social security related to work and disability is hard to capture with a questionnaire that unavoidably simplifies reality. In absence of a validated tool to measure formal social security regulations and perceptions around the system performance, we used self-developed questionnaires. These happened in intensive collaboration with several international experts on work participation studies. We did not follow a formal translation procedure and the decision and responsibility to translate was left with the PI, however, the translations were double-checked by patient partners. While government authorities would be the most knowledgeable parties to enquire about rules and regulations, the feasibility issues around establishing a direct contact with agencies from >30 European countries, in different languages, and where they likely have little or no interest to contribute to a research project, led us to choose for the well-established network of rheumatologists active in research was approached instead. To improve data quality and accuracy, PIs were encouraged to seek help from other experts in their country; the summary was sent to available patient partners for a face-validity check of data in their country, and the results showed a good agreement. It is emphasized in the discussion that this study has an explorative nature and limited conclusions should be drawn.

We have to acknowledge that *application* of the formal rules and regulations can differ substantially from the formal rules, and hence patients in countries with similar rules

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could potentially have different experiences when rules are applied. For example, partial work disability (which formally implies that a patient can work part of the time) may be a barrier to any employment in some countries and thus perceived differently compared to countries where patients deemed partially disabled are able to use their right for part-time work. We have attempted to get the initial insight into this through the surveys among patients and rheumatologists. Furthermore, it was challenging to select the best country-level characteristics that should be related to indicators of access. On this line, the social security system taxonomy used[23] is most likely an oversimplification of the complex systems that are constantly changing and developing, but to our knowledge, no alternative taxonomy exists. Recourse to (official) disability is a complex construct in which social security has a limited role. Alternative approaches to gain insight into international variation should be considered to study the performance and impact or social security systems. One of the potentially promising method could consist of series of clinical vignettes. By considering the rules and regulations that are to be applied to a hypothetical patient with given characteristics in terms of disease, work situation and disability, as well as attitudes and values about role of work in life and society, countries could be compared and further classified. Despite limitations, we hereby present the first attempt to understand whether patterns in regulations can be found to help to understand differences in employment, sick leave and work disability. We found differences in regulations and income substitution that are challenging our perceptions of equity and call for further research to justify them or for efforts to define the acceptable standards. Cost-effectiveness models in RA often count with an improvement of work disability in parallel with the improvement of the health status of the patient (e.g. HAQ based Markov models). Our study suggests that large variations exist between countries regarding regulations of short term absence or work disability that can affect their chances to return to work, a point to consider in economic evaluations. Although we did not find clear relations between regulations and work participation rates, we should keep in mind the previous research that suggested that patients continue to work at different health status across countries.[16] As system type appears to have a rather limited impact on regulations and perceptions on them, this might indicate that interventions to support work retention in patients with RA could in principle be considered irrespective of social security system. Moreover, the ageing of

the population worldwide urges policy-makers to increase the age of retirement, meaning that people with RA will also be expected to work longer in the years to come.

In conclusion, we observed large heterogeneity in rules and regulations of social security systems across Europe in relation to work disability of patients with RA, and these cannot be explained by existing welfare regimes, EU membership or country's wealth. These differences call for a platform to consider harmonization of policies for patients with RA who experience restrictions in work participation. While remarkably little differences of patients' and rheumatologists' perceptions are related to country's wealth and membership in EU, Scandinavian employment support and social security system appears to most adequately meet the expectations of patients and rheumatologists regarding enduring work participation and access to work disability pension.

What is already known about this subject?

- RA has a high impact on functional ability and work participation.

What does this study add?

- Large variation in social security regulations for sick leave and work disability for patients with RA was observed across countries.
- This heterogeneity cannot be explained by existing welfare regimes, EU membership or country's wealth.

How might this impact on clinical practice?

- Heterogeneity between countries regarding regulations for sick leave and work disability can affect patients' chances to return to work.
- These differences call for a platform to consider harmonization of policies for patients with RA who experience restrictions in work participation.

Competing interests

Authors declare no conflict of interest.

Contributorship

PP, SR and AB conceived the study idea, FG, MP, FS, TS, MdW, AW, AZ contributed to the protocol and conceptualisation, AK advised on statistical analyses, DA, FB, IB, SB, KC, PC, RC, ED, ND, AF, OFG, GG, NG, PG, MH, IJ, JV, XJ, MKov, MKull, LCM, MM, SMP, IN, ON, IFP, KP, BR, HR, FS, GS, IS, NS, PS, RS, SSok, SShuk, AT, MT, TU, SV collected data. All authors read the manuscript draft and approved the final submission.

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Patient and Public Involvement

Patient partners have been involved in design of the study, as well in developing and testing survey instruments in different countries.

Ethical approval information

The project has been approved by Maastricht Ethical Committee. Principal Investigators in each country were responsible for local ethical approvals, where necessary.

Data sharing statement

Most of the data is provided in the online appendices. Further details can be provided upon request.

Figures

Figure 1. Study design.

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Title:

Patients with rheumatoid arthritis facing sick leave or work disability meet varying regulations: a study among rheumatologists and patients from 44 European countries

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Abstract

Objectives

To describe and explore differences in formal regulations around sick leave and work disability (WD) for patients with rheumatoid arthritis (RA), as well as perceptions by rheumatologists and patients on the system's performance, across European countries.

Methods

We conducted three cross-sectional surveys in 50 European countries: one on work (re-)integration and social security (SS) system arrangements in case of sick leave and long-term WD due to RA (one rheumatologist per country), and two among approximately 15 rheumatologists and 15 patients per country on perceptions regarding SS arrangements on work participation. Differences in regulations and perceptions were compared across categories defined by Gross Domestic Product (GDP), type of social welfare regime, European Union (EU) membership and country RA WD rates.

Results

Forty-four (88%) countries provided data on regulations, 33(75%) on perceptions of rheumatologists (n=539), and 34(77%) on perceptions of patients (n=719). While large variation was observed across all regulations across countries, no relationship was found between most of regulations or income compensation and GDP, type of SS system, or rates of WD. Regarding perceptions, rheumatologists in high GDP and EU-member countries felt less confident in their role in the decision process towards WD ($\beta=-0.5$ [95%CI[-0.9;-0.2] and $\beta=-0.5$ [-1.0;-0.1], respectively). The Scandinavian and Bismarkian system scored best on patients' and rheumatologists' perceptions of regulations and system performance.

Conclusions

There is large heterogeneity in rules and regulations of SS systems across Europe in relation to WD of patients with RA, and it cannot be explained by existing welfare regimes, EU membership or country's wealth.

Introduction

Rheumatoid arthritis (RA) is a chronic inflammatory joint disease that often starts during working life of patients.[1-3] RA has a high impact on functioning and ability to participate in social roles.[4, 5] Despite substantial improvements in treatment options in the last decades, still 20% of the patients are unable to continue to work in the first 3 years of disease and over 30% of patients become work disabled after 10 years.[6-9]

For patients, work disability (WD) implies exclusion from an essential role in society, but also loss of income and reduced economic self-sufficiency.[5, 10] To prevent individuals from poverty in case of WD, substitution of income has been introduced in some European countries in the 19th century. By now, most countries have some form of social security (SS) system in place to regulate income substitution. However, these systems are not uniform, as they have been shaped by national political and social developments throughout the 20th century. Policies targeted at income substitution balance between provision of a fair income, on one hand, and control of expenditures by restricting social security benefits only to individuals with specific levels of work restrictions, on the other hand.[11] More recently, the increasing economic burden of WD, but also the insight into social and health benefits of work participation stimulated in many countries stricter gate-keeping on the one hand, and stronger employment support to enhance endurable work participation of persons with chronic disease on the other hand.[12]

SS arrangements have been suggested to result in differences in overall patterns of employment, WD, and retirement.[13, 14] A recent worldwide multinational study (COMORA) has shown that lower economic wealth and human development of countries is associated with higher rates of unemployment and higher absenteeism.[15] Earlier, QUEST RA study has observed that in low Gross Domestic Product (GDP) countries, people remain working with higher levels of disability and disease activity compared to high GDP countries.[16] The regulations around the sick leave and work disability may be, at least partially, responsible for these differences, however, they have not been studied.

Policies with regard to work participation, however, go far beyond income substitution only. Criteria for access to WD benefits as well as levels of income substitution likely

depend, among others, on economic, political and cultural factors. While the European Union (EU) and World Health Organization (WHO) accept the historical differences in the way health and social systems are organised and function in their member states, there is a universal agreement that differences should not result in inequalities in health and quality of life of people across nations.[17] It is unclear whether EU member states achieved any degree of homogeneity in the key regulations around social policies with regards to work disability. In addition to system level factors, there is evidence that personal contextual and disease related factors [6, 18, 19], influence the decision of an individual to take sick leave or apply for long term WD.

The aim of this study was to describe and explore differences in formal regulations around sick leave and WD for patients with RA, as well as perceptions by rheumatologists and patients on the system's performance, across European countries. We hypothesised that 1) lower GDP countries have stricter rules with regards to obtaining work disability and lower income substitution once work disability is granted 2) EU countries have more homogeneous regulations compared to non-EU countries 3) patients and rheumatologists in high GDP and EU member states are more satisfied with the performance of the social security system.

Methods

Design and framework

We conducted a cross-sectional observational study consisting of three surveys in 50 of the 53 countries of the European WHO Region (in three countries, no contact person could be found), in 2014-2016 (Figure 1). The questionnaires were designed following the framework of access (originally applied in healthcare [20, 21]), with three dimensions : i) **availability** of re-integration plans or other systems/policies to facilitate work and/or prevent WD, as well as the eligibility criteria that a patient should meet to receive SS benefits; ii) **affordability**, i.e. the level of income substitution granted in case of sick leave and permanent disability; iii) **acceptability**, i.e. professional and individual perceptions of rheumatologists and patients, respectively, around the system performance on these issues. The study has been approved by Maastricht Ethical Committee.

Participants

For each of the 50 European countries, one rheumatologist was invited as principal investigator (PI) to complete the questionnaire on SS arrangements in his/her country in case of sick leave and long-term WD due to RA (survey 1; availability and affordability). Additionally, each PI was asked to invite at least 15 rheumatologists (survey 2; acceptability) and at least 15 patients (survey 3; acceptability) to complete a questionnaire on professional and individual perceptions of the system. To recruit rheumatologists, PIs were instructed to ensure a diverse sample in terms of gender, years of professional experience, and clinical setting. Patients could also be recruited via patient organizations and aimed at representing the spectrum of patients with RA, assuring that at least a half of them had experience with (applying for a) WD pension.

Questionnaires

The questionnaire for PIs addressed national regulations (in 2014) on benefits separately for sick leave and WD (Online Supplementary Text S1a: availability and affordability), as well as calculations of the level of income for ~~three~~nine pre-specified scenarios (vignettes), one on sick leave and two for long-term WD across the three levels of income (Online Supplementary Text S1b). In countries where a patient research partner was available (n=21), he/she was invited to comment on any inconsistencies in the answers on the main questionnaire about the formal regulations. In this case, answers were double-checked with the PI.

The questionnaire for rheumatologists (Online Supplementary Text S2; acceptability) contained questions about perceptions on appropriateness of the SS arrangements, practical aspects of the application process for benefits, and the role of rheumatologists in the process. The questionnaire for patients (Online Supplementary Text S3; acceptability) addressed perceptions about the importance and adequacy of the existing arrangements. Additional questions were included on age, gender, work environment (non-university hospital, university hospital, private practice, other) for rheumatologists; on age, gender, disease duration, work status (paid work, no paid work but not work disabled, partially or fully work disabled) and history of sick leave and WD. The PI decided on whether questionnaires could be applied in English, otherwise translated them, wherever possible with patient partners involved in checking the translation.

Data on Gross Domestic Product (GDP) per capita (in international dollars, 2013) were extracted from the World Development Indicators report by the World Bank [22] and used as a continuous variable or dichotomized around the median (27,000 int.\$). The welfare regimes taxonomy included five groups, namely the Anglo-Saxon, Bismarckian, Mediterranean, Post-Communist, and Scandinavian type of system.[23] Rates of work disability among RA patients have been collected by the QUEST-RA study (2009) and were available for 21 countries from our sample.[16, 24]

Figure 1. Study design

Statistical analysis

Arrangements to support work and social security regulations in case of sick leave or work disability due to RA (questionnaire 1)

Collected data on formal rules and policies were first presented through descriptive statistics. To investigate whether the regulations differed by the type of welfare regime[23], GDP, EU membership (EU-15, new EU member states and non-EU countries), or were associated with country-level work disability rates among RA patients[16], subgroup comparisons were performed using Pearson correlations, t-test/Mann-Whitney and chi-square/Fisher's test, as appropriate.

Patients' and rheumatologists' perceptions of the social security system (questionnaires 2 and 3)

Answers of rheumatologists on their perspective of SS arrangements were summarized and scored (the higher is the better) around the two domains: (1)

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'Performance of the system' (score 0-4), ~~questions Q2, Q8, Q9, Q11; Online Supplementary Text S2~~) and (2) 'Role of the rheumatologists' (score 0-4), ~~Q3 Q4 Q5 Q10~~). Additionally, a single item on the perceived standardisation in the decision-making process (~~Q7~~) was analysed separately. Input from patients was summarized following three domains: (1) 'Importance and support to remain employed' (score 0-5, ~~Q10, Q11, Q12, Q13, Q14, Online Supplementary Text S3~~), (2) 'Process of applying for WD (score 0-4, ~~Q20, Q21, Q22, Q23, Q25~~), and (3) 'Obtaining and living with work disability pension' (score 0-6, ~~Q15, Q16, Q17, Q18~~) (complete questionnaires are provided in the Online Supplementary Texts S2 and S3). Each domain consisted of 4 to 6 questions (each on a 1 (totally agree) to 5 (totally disagree) Likert scale, dichotomized as 1 ('(totally) agree') and 0 ('not agree/not disagree', '(totally) disagree'). The dichotomized scores per question were summed into the five domain scores (two for rheumatologists and three for patients).

Rheumatologists' and patients' characteristics were compared across the type of SS system, EU membership, and GDP. Small numbers of surveyed patients and rheumatologists in each country hindered analyses of country level means, and thus were not related to national RA work disability rates. The domain 'Importance and support to remain employed' was assessed in patients currently or ever having worked. Analyses in domains 'process of applying for work disability and 'obtaining and living with work disability were limited to patients currently work disabled or ever considered applying for WD.

Finally, we conducted multilevel (with individuals clustered in countries) multiple regression analysis with each of the domains as an outcome and type of SS system, EU membership or GDP as the independent variable of interest. Models with patient perceptions as outcome were adjusted for age, gender, education, disease duration and ever having had sick leave due to RA. When rheumatologists' perceptions were the outcome, analyses were adjusted for age, gender and work setting.

Results

Forty-four (28 EU and 16 non-EU member states) countries (88%) provided data on formal rules and regulations for sick leave and WD. Of these, 33 (75%) countries collected data from rheumatologists (n=539), and 34 (77%) countries collected data from patients (n=719) (missing countries were all non-EU members except Luxembourg).

Arrangements to support work and social security regulations in case of sick leave of work disability due to RA

While nearly all countries had arrangements to support patients with restrictions to work, a large heterogeneity was observed in the type of arrangements (Table 1, Online Supplementary Tables S1-3). All except for 12 countries had facilities to support patients with RA in paid employment (n=32, 73%), but only in a quarter of countries (n=11, 25%) rehabilitation efforts were obligatory prior to the decision about long-term WD. Twenty-five (57%) and 30 (68%) countries had a requirement for employment history or social insurance contributions in order to be eligible for sick leave or long-term WD compensation, respectively. The maximum sick leave length before transition to long-term WD varied from 3 to 36 months (mean (SD) 13 (9)). In 8 (18%) and 5 (11%) of the countries, participation of a rheumatologist was mandatory in the process of application or decision-making process on long-term WD, respectively. In addition to a functional assessment (degree of (dis)ability), prior profession, (n=25 (57%) of countries), diagnosis (n=32 (73%)), earning capacity (n=12 (27%)), age (n=20 (45%)), and gender (n=5 (11%)) were reported to be accounted for when a decision was taken about (the degree of) WD. Prognosis, education and place of residence were mentioned as additional factors by few countries.

All countries except the former Yugoslav Republic of Macedonia, Bosnia-Herzegovina and Serbia reported to recognise partial WD, a status that partially substitutes income while the person can continue in (reduced) employment. Of the 26 countries providing data on income substitution, in 8 countries (31%) income substitution (averaged over the first 6 months of disability) in case of sick leave was less than 70% of previous income. Income substitution averaged over the first 12 months of disability was less than 70% in 18(70%) and 15 (58%) in case of moderate (partial) or severe (full) long-term disability, respectively (Table 2). While wealthier countries as expected provided higher benefits in absolute terms, when converted to percentage of the previously earned income, no relationship was found between income compensation and neither GDP, nor the type of SS system, or rates of work disability. In richer countries and in countries with the Bismarkian type of welfare regime, the WD pension burden was more likely to be shared between SS and a private insurance, while countries with lower GDP and other welfare regimes had social insurance as the main source of WD allowances (data not shown). In countries with lower GDP, a rheumatologist was more frequently necessarily involved in the application and decision making. Other aspects

of the system revealed no statistically significant patterns with country-level characteristics or national WD rates.

Rheumatologists’ and patients’ and perceptions of social security system

In total, 539 rheumatologists (mean age (SD) 48 (10), 284 (53%) female, 278 (51%) working in university hospitals) from 33 countries filled in the questionnaires ([Table Online Supplementary Table 3S4](#)). Scores on ‘Role of the rheumatologists’ (0-4) and ‘Performance of the system’ (0-4) ranged from 1.4 (SD 0.9) (Anglo-Saxon) to 2.4 (1.1) (Post-communist) and 0.8 (0.9) (Anglo-Saxon) to 2.3 (1.2) (Scandinavian), respectively. Perceived level of standardization around decision-taking revealed that only 26% (n=135) of rheumatologists consider decisions on WD to be objective. Of note, those who perceived standardization as poor (vs good) scored worse on both ‘Role of the rheumatologists’ (-0.4 points) and ‘Performance of the system’ (-2.6 points) domains (t-test p-value for both scores <0.05). Remarkably, multilevel analyses revealed that rheumatologists in high GDP (vs low GDP) and EU-member (vs non-EU member) countries felt less confident in having an active role in WD decisions ($\beta=-0.5$ [95%CI [-0.9;-0.2] and $\beta=-0.5$ [-1.0;-0.1], respectively). In addition, significant differences were observed across the system types with the Scandinavian type (Denmark, Iceland, Sweden, Norway, Finland) consistently scoring higher than the others on domains ‘Importance and support to remain employed’ and ‘Process of applying for work disability pension’ (Table 4 [and Supplementary Table S5](#)).

The patient sample consisted of 719 patients from 34 countries (mean age (SD) 53 (12), 76% female, 519 (78%) ever worked). The highest (=most satisfied) patient scores on all three domains were consistently observed in countries with Scandinavian and Bismarkian type of security system (Table 3). In multilevel adjusted regression models, neither country wealth nor EU status were associated with patients’ perceptions (Table 4 [and Supplementary Table S5](#)). The findings across the system type were notably consistent across patient and rheumatologist domains.

Table 1. Summary of social security regulations to support stay at work and work disability arrangements for persons with RA

Regulation		N (%)*	Anglo-saxon	Scandinavian	Bismarkian	Mediterranean	Post-communist
<i>Support to stay at work</i>							
Facilities for persons with RA that aimed at keeping the patient in paid employment are available	Yes	32 (73%)	<u>IE</u> , <u>GB</u>	<u>DK</u> , <u>FI</u> , <u>IS</u> , <u>NO</u> , <u>SE</u>	<u>AU</u> , <u>BE</u> , <u>DE</u> , <u>IL</u> , <u>LU</u> , <u>CH</u> , <u>NL</u>	<u>CY</u> , <u>IT</u> , <u>PT</u>	AL, BY, <u>BG</u> , <u>CR</u> , <u>CZ</u> , LT, MK, MD, ME, <u>PL</u> , <u>RO</u> , RS, <u>SK</u> , <u>SL</u> , TJ
	No	12 (27%)	-	-	<u>FR</u>	<u>GR</u> , <u>MT</u> , <u>ES</u> , TR	BA ^P EE ^P GE ^P HU ^P RU ^P LV ^P UA ^P
<i>Access to sick-leave or short term absence</i>							
Requirement for length of previous employment AND/OR certain income earned AND/OR certain amount of social insurance tax paid in order to be eligible for sick leave compensation	Yes	25 (57%)	<u>IE</u> , <u>GB</u>	<u>DK</u> , <u>NO</u> , <u>SE</u>	<u>BE</u> , <u>FR</u> , <u>IL</u> , <u>CH</u>	<u>CY</u> , <u>GR</u> , <u>PT</u> , <u>ES</u>	AL, BY, BA, <u>BG</u> , <u>HR</u> , <u>CZ</u> , LT, MD, <u>PL</u> , <u>RO</u> , <u>SK</u> , TJ
	No	18 (41%)	-	<u>FI</u> , <u>IS</u>	<u>AU</u> , <u>DE</u> , <u>LU</u> , <u>NL</u>	<u>IT</u> , <u>MT</u> , TR	EE, GE, <u>HU</u> , <u>LV</u> , MK, ME, RU, RS, <u>SL</u> , UA
The rheumatologist is authorized to certify short-term absence from work due to RA	Yes	33 (75%)	<u>IE</u>	<u>DK</u> , <u>FI</u> , <u>IS</u> , <u>NO</u> , <u>SE</u>	<u>AU</u> , <u>BE</u> , <u>FR</u> , <u>DE</u> , <u>IL</u> , <u>LU</u> , <u>CH</u>	<u>CY</u> , <u>GR</u> , <u>MT</u> , <u>PT</u> , <u>ES</u> , TR	AL, BY, BA, <u>CZ</u> , <u>EE</u> , <u>HU</u> , LT, MK, ME, <u>PL</u> , <u>RO</u> , RU, TJ, UA
	No	10 (23%)	<u>GB</u>		<u>NL</u>	<u>IT</u>	<u>BG</u> , <u>CR</u> , GE, <u>LV</u> , MD, RS, <u>SK</u> , <u>SL</u>
First 1-3 days of sick leave are unpaid	Yes	11 (25%)	-	<u>SE</u>	<u>FR</u> , <u>IL</u>	<u>CY</u> , <u>IT</u> , <u>PT</u> , <u>ES</u> , TR	<u>CZ</u> , <u>EE</u> , <u>LV</u>
	No	32 (73%)	<u>IE</u> , <u>GB</u>	<u>DK</u> , <u>FI</u> , <u>IS</u> , <u>NO</u>	<u>AU</u> , <u>BE</u> , <u>DE</u> , <u>LU</u> , <u>CH</u> , <u>NL</u>	<u>GR</u> , <u>MT</u>	AL, BY, BA, <u>BG</u> , <u>CR</u> , GE, <u>HU</u> , LT, MK, MD, ME, <u>PL</u> , <u>RO</u> , RU, RS, <u>SK</u> , <u>SL</u> , TJ, UA
<i>Decision about long-term work disability</i>							
Maximum length of sick leave before a WD can be granted	<12 months	35 (80%)	<u>GB</u>	<u>DK</u> , <u>IS</u> , <u>SE</u>	<u>AU</u> , <u>FR</u> , <u>DE</u> , <u>IL</u> , <u>LU</u>	<u>CY</u> , <u>GR</u> , <u>IT</u> , <u>MT</u> , <u>PT</u> , <u>ES</u> , TR	AL, BY, <u>BG</u> , <u>CR</u> , <u>EE</u> , <u>LV</u> , LT, <u>HU</u> , MK, MD, ME, <u>PL</u> , <u>RO</u> , RU, RS, <u>SL</u> , TJ, UA

	≥12 months	8 (18%)	<u>IE</u>	<u>FI</u> , <u>NO</u>	<u>BE</u> , <u>CH</u> , <u>NL</u>	-	BA, <u>CZ</u> , SK
Is it <u>obligatory</u> that a rheumatologist is involved in application process (i.e. providing information about the disease)?ξ	Yes	10 (23%)	-	-	-	<u>CY</u> , GR	AL, BY, BG , LT , MK, SK , RU, TJ
	No	31 (70%)	<u>IE</u> , <u>GB</u> , <u>SE</u>	<u>DK</u> , <u>FI</u> , <u>NO</u>	<u>AU</u> , <u>BE</u> , <u>FR</u> , <u>IL</u> , <u>LU</u> , <u>CH</u> , <u>NL</u> , <u>DE</u>	<u>IT</u> , <u>MT</u> , <u>PT</u> , <u>ES</u> , TR	BA, CR , <u>CZ</u> , EE , HU , LV , MD, PL , RO , RS, <u>SL</u> , UA
Is the rheumatologist also in an <u>obligatory</u> way involved in the decision-taking about the long-term work disability? (i.e. is part of the commission or expert committee) ξ	Yes	5 (11%)	-	-	-	<u>CY</u>	AL, BG , SK , TJ
	No	36 (82%)	<u>IE</u> , <u>GB</u> , <u>SE</u>	<u>DK</u> , <u>FI</u> , <u>NO</u>	<u>AU</u> , <u>BE</u> , <u>FR</u> , <u>IL</u> , <u>LU</u> , <u>CH</u> , <u>NL</u> , <u>DE</u>	<u>GR</u> , <u>IT</u> , <u>MT</u> , <u>PT</u> , <u>ES</u> , TR	BY, BA, CR , <u>CZ</u> , EE , HU , LV , LT , MK, MD, PL , RO , RU, RS, <u>SL</u> , UA
Rehabilitation efforts are <u>obligatory</u> before a patient could be assessed for long-term disability	Yes	11 (25%)		<u>DK</u> , <u>FI</u> , <u>SE</u> , <u>NO</u>	<u>AU</u> , <u>CH</u> , <u>NL</u>	-	LT , MD, ME, RO , <u>SL</u>
	No	32 (73%)	<u>IE</u> , <u>GB</u>	<u>IS</u>	<u>BE</u> , <u>FR</u> , <u>DE</u> , <u>IL</u> , <u>LU</u>	<u>CY</u> , <u>GR</u> , <u>IT</u> , <u>MT</u> , <u>PT</u> , <u>ES</u> , TR	AL, BY, BA, BG , CR , <u>CZ</u> , EE , HU , LV , MK, PL , RU, RS, SK , TJ, UA

AL, Albania; AT, Austria; BA, Bosnia and Herzegovina; BE, Belgium; BG, Bulgaria; BY, Belarus; HR, Croatia; CH, Switzerland; CY, Cyprus; CZ, Czech Republic; DE, Germany; GE, Georgia; DK, Denmark; EE, Estonia; ES, Spain; FI, Finland; FR, France; GR, Greece; HU, Hungary; HR, Croatia; IE, Ireland; IS, Iceland; IL, Israel; IT, Italy; LT, Lithuania; LU, Luxemburg; LV, Latvia; MD, Moldova; ME, Montenegro; MK, Macedonia (the former Yugoslav Republic of Macedonia); MT, Malta; NL, The Netherlands; NO, Norway; PL, Poland; RO, Romania; RU, Russia; SE, Sweden; SK, Slovakia; SL, Slovenia; RS, Serbia; TR, Turkey; TJ, Tajikistan; UK, United Kingdom; UA, Ukraine

*data provided by 44 countries, Georgia reported to not have any effective social security system in place; ξ: data missing for IS, ME
EU countries are in **bold**, High GDP (>27,000 int. dollars, based on median) countries are underscored

Table 2. Income compensation in case of work disability for an employee with average income*

Type of disability	Income compensation		Anglo-saxon	Scandinavian	Bismarkian	Mediterranean	Post-communist
In case of sick leave	≤ 70% of earned income	8 (31%)**	<u>IE</u>	-	<u>BE</u>	<u>CY</u> , <u>PT</u> , TR	<u>CZ</u> , EE, SK
	> 70% of earned income	18 (69%)	-	<u>FI</u> , <u>NO</u>	<u>LU</u> , <u>NL</u> , <u>SE</u>	<u>FR</u> , <u>IT</u> , <u>ES</u>	BG, LT, LV, MD, PL, RO, RS, <u>SL</u>
In case of moderate (50%) work disability*	≤ 70% of earned income	18 (70%)	<u>IE</u>	<u>FI</u> , <u>NO</u>	<u>BE</u> , <u>SE</u> , <u>CH</u>	<u>CY</u> , TR	BY, BG, <u>CZ</u> , EE, LV, LT, MD, PL, RO, RS, SK
	> 70% of earned income	7 (27%)	-	-	<u>LU</u> , <u>NL</u>	<u>FR</u> , <u>IT</u> , <u>PT</u> , <u>ES</u>	AL
In case of severe (75%) work disability*	≤ 70% of earned income	15 (58%)	-	<u>FI</u> , <u>NO</u>	<u>BE</u> , <u>LU</u> , <u>SE</u> , <u>CH</u>	<u>CY</u> ,	<u>CZ</u> , EE, LV, LT, MD, PL, RO, RS, SK
	> 70% of earned income	10 (38%)	<u>IE</u>	-	<u>NL</u>	<u>FR</u> , <u>IT</u> , <u>PT</u> , <u>ES</u> , TR	AL, BY, BG

AL, Albania; BY, Belarus; BE, Belgium; BG, Cyprus; CZ, Czech Republic; EE, Estonia; FI, Finland; FR, France; IE, Ireland; IT, Italy; LV, Latvia; LT, Lithuania; LU, Luxemburg; MD, Moldova; NO, Norway; PL – Poland; PT, Portugal; RO, Romania; RS, Serbia; SK, Slovakia; SL, Slovenia; ES, Spain; CH, Switzerland; NL, the Netherlands; TR, Turkey

EU countries are in **bold**, High GDP (>27,000 int. dollars, based on median) countries are underscored *SL did not provide data for long term WD

*a person 50 y.o. recently diagnosed with RA, who is a citizen and has worked for 25 years full-time

**data provided by 26 countries

Table 3. Patients’ and rheumatologists’ characteristics per type of security system.

	Total	Anglo-saxon	Scandinavian	Bismarkian	Mediterranean	Post-communist	p-value
Rheumatologists characteristics (Questionnaire 2)							
N of rheumatologists (N of countries)	539 (33)	22 (2)	58 (5)	88 (6)	87 (6)	284 (15)	
Age (years)	47.5 (10.2)	45.1 (8.1)	51.8 (10.5)	51.1 (9.5)	47.4 (9.5)	45.5 (10.3)	<0.001
Gender, female	284 (53%)	9 (41%)	25 (43%)	38 (43%)	45 (52%)	167 (59%)	<0.01
Current work environment							
Non-university hospital**	142 (26%)	10 (45%)	12 (21%)	19 (22%)	23 (26%)	78 (27%)	<0.001
University hospital	278 (51%)	7 (32%)	39 (67%)	48 (55%)	50 (57%)	132 (46%)	
Private practice	52 (10%)	1 (5%)	0 (0%)	14 (16%)	8 (9%)	29 (10%)	
Other	22 (4%)	1 (5%)	0 (0%)	5 (6%)	4 (5%)	12 (4%)	
Years of work experience	2.5 (1.1)	2.6 (1.1)	2.4 (1.2)	2.9 (1.1)	2.7 (1.0)	2.4 (1.2)	<0.001
Average hours of patient care per week	33.5 (12.3)	32.2 (12.2)	29.9 (10.8)	32.0 (12.9)	32.0 (11.9)	35.4 (12.2)	<0.05
Role of the rheumatologists (0-4)	2.1 (1.1)	1.4 (0.9)	1.3 (0.9)	2.1 (1.3)	1.9 (1.0)	2.4 (1.1)	<0.001
Performance of the system (0-4)	1.5 (1.1)	0.8 (0.9)	2.3 (1.2)	2.0 (1.1)	1.1 (1.0)	1.4 (1.1)	<0.001
Patient characteristics (Questionnaire 3)							
N of patients (N of countries)	719 (34)	47 (2)	60 (5)	137 (7)	119 (6)	356 (16)	
Age (years)	53.1 (12.2)	48.6 (9.9)	57.9 (11.0)	54.7 (11.9)	52.2 (12.1)	52.7 (12.4)	<0.001
Gender, female	541 (76%)	44 (94%)	48 (80%)	101 (74%)	90 (76%)	261 (74%)	<0.05
Education							
Primary	110 (16%)	0 (0%)	15 (25%)	16 (12%)	30 (25%)	49 (14%)	<0.01
Secondary	254 (36%)	14 (30%)	16 (27%)	31 (24%)	43 (36%)	150 (43%)	
High	339 (48%)	32 (70%)	28 (47%)	82 (64%)	45 (38%)	151 (43%)	
Work status							
Paid work	317 (45%)	21 (47%)	23 (38%)	75 (55%)	57 (49%)	140 (40%)	<0.01
No-paid work*	180 (26%)	13 (29%)	12 (20%)	31 (23%)	36 (31%)	88 (25%)	
Work disabled (WD)	172 (24%)	9 (2%)	16 (27%)	24 (18%)	22 (19%)	101 (29%)	
Paid work + WD	34 (5%)	2 (4%)	9 (15%)	3 (2%)	1 (1%)	19 (6%)	
Symptom duration (years)	15.0 (11.1)	13.3 (9.6)	17.7 (11.2)	14.6 (11.8)	15.8 (10.4)	14.8 (11.1)	0.22
Ever absent from work due to RA	472 (69%)	33 (89%)	42 (71%)	83 (63%)	74 (64%)	239 (70%)	<0.05
Importance and support to remain employed (0-5)	2.1 (1.2)	1.6 (0.8)	2.6 (1.2)	2.3 (1.4)	2.1 (1.2)	2.0 (1.1)	<0.001
Process of applying for WD (0-4)	2.2 (1.8)	1.3 (1.8)	3.2 (3.0)	2.4 (1.9)	2.0 (1.6)	2.3 (1.7)	<0.001
Obtaining and living with WD pension (0-6)	1.1 (1.1)	0.7 (0.8)	1.2 (1.1)	1.2 (1.4)	1.0 (1.1)	1.1 (1.1)	0.22

Values reflect mean (SD) or n (%), as appropriate; WD – work disability * but not work disabled ** private or public. **Anglo-saxon:** UK, Ireland; **Scandinavian:** Denmark, Iceland, Sweden, Norway, Finland; **Bismarkian:** Austria, Belgium, Germany, France, Israel, Netherlands, Switzerland; **Mediterranean:** Cyprus, Greece, Italy, Portugal, Spain, Turkey; **Post-communist:** Albania, Bulgaria, Czech Republic, Croatia, Estonia, Georgia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Serbia, Tajikistan, Slovak Republic, Slovenia

Table 4. Patients' and rheumatologists' perceptions across several domains according to (1) GDP per capita PPP (2) EU membership status (3) Type of social security system. Models adjusted for socio-demographic confounders.

	Patients' perceptions (n of countries = 34) [§]			Rheumatologists' perceptions (n of countries = 33) [§]	
	Importance and support to remain employed (0-5) n=491	Process of applying for work disability pension (0-4) n=342	Obtaining and living with work disability pension (0-6) n=341	Performance of the system (0-4) n=390	Role of the rheumatologists (0-4) n=393
GDP per capita (int. \$) High vs low GDP	0.21 [-0.07;0.50]	0.39 [-.20;0.98]	-0.09 [-0.44;0.25]	0.30 [-0.08;0.72]	-0.55 [-0.94;-0.16]
EU membership EU vs non-EU member	0.20 [-0.14;0.53]	-0.41 [-1.10;0.29]	-0.16 [-0.57;0.26]	-0.12 [-0.56;0.32]	-0.54 [-0.95;-0.13]
Type of system					
Scandinavian	Reference	Reference	Reference	Reference	Reference
Anglo-Saxon/liberal	-1.02 [-1.64;-0.39]	-1.41 [-2.73;-0.09]	-0.47 [-1.30; 0.36]	-1.49 [-2.22; -0.77]	-0.57 [-1.49;0.35]
Bismarckian/conservative	-0.40 [-0.90;0.10]	-0.74 [-1.84;0.40]	-0.04 [-0.73;0.65]	-0.41 [-0.94;1.12]	-0.39 [-1.09;0.31]
Mediterranean/southern	-0.56 [-1.06;-0.07]	-1.29 [-2.33;-0.25]	-0.20 [-0.86; 0.46]	-1.19 [-1.70; -0.69]	-0.11 [-0.78;0.56]
Post-Communist/eastern	-0.63 [-1.06;-0.19]	-1.02 [-1.91;-0.13]	-0.04 [-0.62;0.53]	-0.98 [-1.44;-0.51]	0.21 [-0.40;0.83]

Coefficients are derived from separate multilevel multiple models (with individuals clustered in countries and each independent variable (i.e. GDP, EU membership or type of system), adjusted for age, gender, education, disease duration and ever having had sick leave due to RA; analyses on the rheumatologist domains were adjusted for age, gender and work setting; GDP – Gross Domestic Product, EU – European Union

Anglo-saxon: UK, Ireland; **Scandinavian:** Denmark, Iceland, Sweden, Norway, Finland; **Bismarckian:** Austria, Belgium, Germany, France, Israel, Netherlands, Switzerland; **Mediterranean:** Cyprus, Greece, Italy, Portugal, Spain, Turkey; **Post-communist:** Albania, Bulgaria, Czech Republic, Croatia, Estonia, Georgia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Serbia, Tajikistan, Slovak Republic, Slovenia

[§]the higher score the more positive are the perceptions

Statistically significant (p<0.05) regression estimates are in **bold**

Discussion

To our knowledge, this is the first study to provide an extended overview of systems to support work or work disability in RA. With regard to the system rules and regulations, i.e. availability and affordability of work disability arrangements, a large heterogeneity across countries was observed for most regulations including income compensation. While research and judgement on which system is preferable is complex and beyond the aim of this study, it is striking that a person with RA, upon becoming disabled, will face very different perspectives on future work participation, depending on his/her country of residence. Only in a minority of countries work re-integration plans were obligatory before starting a procedure towards WD.

Despite important variation, we could not detect patterns explaining differences in the formal rules and regulations of the SS systems, with only few exceptions. We could not find support to our first hypothesis that lower GDP countries would have stricter rules around work disability or lower relative income substitution when WD is granted, nor did we find any common features of systems in lower GDP countries or EU vs non-EU member states. Moreover, the rules of the SS system did not seem to have a large role in explaining differences in WD in RA. Earlier research – mainly in general population and above 50 years of age in a number of European countries and dating back to 2007 - suggested that the national SS system and, in particular, generosity of benefits, explains a large proportion of between country variations in disability rates.[25] We could not reproduce these results in our study among patients with RA. It is worth noting that data on work disability rates in RA was available for 21 countries only and collected almost a decade earlier, and was based on a sample of patients rather than national statistics.[16]

In contrast to findings on formal regulations (availability and affordability), patients' and rheumatologists' perceptions of systems to support persons with RA encountering work restrictions (acceptability), showed an apparent variation according to the type of the social security system: the Scandinavian and Bismarkian employment support and social security system consistently appeared to most adequately meet the expectations of patients and rheumatologists regarding remaining at work and application for a work disability pension. At the same time, little differences were related to country's wealth or EU-membership, and only a weak signal suggested that rheumatologists in lower income countries are more confident in their role to support patient in work disability issues. The

latter may indicate that rheumatologists in low income countries interact more intensively with patients on these issues and accept work disability questions as part of their responsibility. Alternatively, other cultural and system factors could be considered, e.g. patients referring to other professionals within the system (such as primary care or state agencies) for advice and support regarding work disability decisions.[26] Overall, a lack of standardisation in the decision-making process on work disability was reported by nearly three quarters of the rheumatologists, and reinforces earlier calls for efforts for standardisation and homogenisation.[27] Therefore, our third hypothesis that levels of satisfaction with the system is higher in EU member states and higher GDP countries was not supported by the available data, while initial insight was generated with respect to the social security system type where no hypotheses were formed a priori.

This study has some notable limitations. First, the complexity of access to social security related to work and disability is hard to capture with a questionnaire that unavoidably simplifies reality. In absence of a validated tool to measure formal social security regulations and perceptions around the system performance, we used self-developed questionnaires. These happened in intensive collaboration with several international experts on work participation studies. We did not follow a formal translation procedure and the decision and responsibility to translate was left with the PI, however, the translations were double-checked by patient partners. While government authorities would be the most knowledgeable parties to enquire about rules and regulations, the feasibility issues around establishing a direct contact with agencies from >30 European countries, in different languages, and where they likely have little or no interest to contribute to a research project, led us to choose for the well-established network of rheumatologists active in research was approached instead. To improve data quality and accuracy, PIs were encouraged to seek help from other experts in their country; the summary was sent to available patient partners for a face-validity check of data in their country, and the results showed a good agreement. It is emphasized in the discussion that this study has an explorative nature and limited conclusions should be drawn.

We have to acknowledge that *application* of the formal rules and regulations can differ substantially from the formal rules, and hence patients in countries with similar rules could potentially have different experiences when rules are applied. For example, partial work disability (which formally implies that a patient can work part of the time) may be a barrier

to any employment in some countries and thus perceived differently compared to countries where patients deemed partially disabled are able to use their right for part-time work. We have attempted to get the initial insight on this through the surveys among patients and rheumatologists. Furthermore, it was challenging to select the best country-level characteristics that should be related to indicators of access. On this line, the social security system taxonomy used[23] is most likely an oversimplification of the complex systems that are constantly changing and developing, but to our knowledge, no alternative taxonomy exists. Recourse to (official) disability is a complex construct in which social security has a limited role. Alternative approaches to gain insight into international variation should be considered to study the performance and impact of social security systems. One of the potentially promising method could consist of series of clinical vignettes. By considering the rules and regulations that are to be applied to a hypothetical patient with given characteristics in terms of disease, work situation and disability, as well as attitudes and values about role of work in life and society, countries could be compared and further classified.

Despite limitations, we hereby present the first attempt to understand whether patterns in regulations can be found to help to understand differences in employment, sick leave and work disability. We found differences in regulations and income substitution that are challenging our perceptions of equity and call for further research to justify them or for efforts to define the acceptable standards. Cost-effectiveness models in RA often count with an improvement of work disability in parallel with the improvement of the health status of the patient (e.g. HAQ based Markov models). Our study suggests that large variations exist between countries regarding regulations of short term absence or work disability that can affect their chances to return to work, a point to consider in economic evaluations. Although we did not find clear relations between regulations and work participation rates, we should keep in mind the previous research that suggested that patients continue to work at different health status across countries.[16] As system type appears to have a rather limited impact on regulations and perceptions on them, this might indicate that interventions to support work retention in patients with RA could in principle be considered irrespective of social security system. Moreover, the ageing of the population worldwide urges policy-makers to increase the age of retirement, meaning that people with RA will also be expected to work longer in the years to come.

In conclusion, we observed large heterogeneity in rules and regulations of social security systems across Europe in relation to work disability of patients with RA, and these cannot be explained by existing welfare regimes, EU membership or country's wealth. These differences call for a platform to consider harmonization of policies for patients with RA who experience restrictions in work participation. While remarkably little differences of patients' and rheumatologists' perceptions are related to country's wealth and membership in EU, Scandinavian employment support and social security system appears to most adequately meet the expectations of patients and rheumatologists regarding enduring work participation and access to work disability pension.

Disclosure

~~Authors declare no conflict of interest.~~

Competing interests

Authors declare no conflict of interest.

Contributorship

PP, SR and AB conceived the study idea, FG, MP, FS, TS, MdW, AW, AZ contributed to the protocol and conceptualisation, AK advised on statistical analyses, DA, FB, IB, SB, KC, PC, RC, ED, ND, AF, OFG, GG, NG, PG, MH, IJ, JV, XJ, MKov, MKull, LCM, MM, SMP, IN, ON, IFP, KP, BR, HR, FS, GS, IS, NS, PS, RS, SSok, SShuk, AT, MT, TU, SV collected data. All authors read the manuscript draft and approved the final submission.

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Funding info

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[Patient and Public Involvement](#)

[Patient partners have been involved in design of the study, as well in developing and testing survey instruments in different countries.](#)

[Ethical approval information](#)

[The project has been approved by Maastricht Ethical Committee. Principal Investigators in each country were responsible for local ethical approvals, where necessary.](#)

[Data sharing statement](#)

[Most of the data is provided in the online appendices. Further details can be provided upon request.](#)

[Figure 1. Study design.](#)

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Online supplementary material

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**Online Supplementary Text S1a. Questionnaire administered to Principal Investigators
(one rheumatologists per country, Survey 1)**

Research project: “Access to social security benefits in case of sick leave or work disability in rheumatoid arthritis across European countries”.

The aim of the project is:

1. To gain insight into the differences in access to social security benefits in case of sick leave and work disability for **patients with rheumatoid arthritis (RA)**, in terms of eligibility criteria, and
2. To compare the level of income substitution and impoverishment in different countries across Europe.

Questionnaire to be completed by the principal investigator of each country

The principal investigator of each country is asked to complete the questionnaire below. This questionnaire consists of five parts:

1. Facilities to allow continuing participation in work force and to prevent work disability
2. Regulations in case of sick leave (short-term work disability)
3. Regulations in case of long-term work disability
4. Facilities to return to work after a period of long-term disability
5. Regulations in case of disability for self-employed persons

Co-authorship rules

The **Principal Investigator will be a co-author** in case the journal does not set strict limitations for the number of authors. We have confirmed with ARD (journal of first choice) that >40 authors is allowed given that author provides sufficient contribution. In this case the co-author will become co-responsible for the information published. More than 40 countries are invited to participate. Therefore, please note that due to restrictions from journals regarding the maximum number of authors, we can include **only one person per country as a co-author**. If the journal allows, one additional person who has substantially contributed to the data collection process could be included as a member of the working group and up to two persons can be acknowledged at the end of the manuscript.

Instructions on how to complete the questionnaire

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Completion of some parts of the questionnaire may require inquiring **experts in your country who possess the specific knowledge** on regulations in respect of work disability allowances. We encourage you to make all the efforts to obtain the most reliable information, which will likely involve contacting other people you consider appropriate. We also ask you **to provide the official sources of information** of the obtained data, as those are essential for publication of the final manuscript.

Focus of the questionnaire

Please, keep in mind that all the questions are related to work disability due to **rheumatoid arthritis** and patients who have **an employment contract**. In view of increasing rates of self-employed in some countries, we have added a section with a few general questions on work disability rules for self-employed patients at the end of the questionnaire.

Further recommendations on completing the questionnaire

Due to expected large differences between systems, we attempt to make a universally applicable questionnaire to cover the general topics. It can be that some questions are not applicable to the situation in your country. After each question, there is always space left for additional comments from your side, and we invite you to provide additional comments for us to understand the local system better. **Always think about the most general and most applicable case.** Please, disregard variations and exceptions (for example, across regions or minority groups) or, if in doubt, describe them in the field for additional comments). In case it seems that the questions do not cover sufficiently the situation in your country, please indicate this in your comments. We will be in contact with Principal Investigator and adjust the questionnaire with country specific additions, if needed.

Paper and online versions of the questionnaire

It is also possible to fill in this questionnaire online. Individual link to the survey is available in the invitation letter you have received. Questions are identical in both versions of the survey, and either of two is enough to complete. Should you have difficulties in accessing the online survey, please, let us know as soon as possible.

Contact information

Polina Putrik, e-mail: polina.putrik@gmail.com

Q1 Country

Please, indicate for which country are you completing the questionnaire:

Country name: _____

Confidential: For Review Only

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Definitions and terms

Please note, that unless explicitly stated otherwise, the questions are always referring to patients with RA.

For purposes of our project (and based on collected knowledge about different social security systems), we feel we should distinguish **two** situations in which a patient cannot continue working because of RA:

- 1. Sick leave (also referred to as short-term work disability)**, which is absence from work due to disease starting from day 1 of the disease-related absence with a prospect to go back to the same work place after recovery.
- 2. Long-term work disability**, which implies permanent disability to work, which generally follows a period of sickness (short-term work disability). In this case, contract with employer is usually no longer in place

Additional terminology

Degree (%) of work disability refers to level of incapacity to work due to physical and/or mental reasons.
Degree (%) of work ability is an alternative measure of work disability that is being used in some countries. It relates to the extent a person is able to perform work activities compared to a non-disabled person.

Q2

Are these two definitions (sick leave and long-term work disability) similar to the definitions used in your country?

- ☐ Yes
- ☐ No, please explain_____

Additional comments _____

Structure of the questionnaire:

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Part 1. Regulations to prevent work disability and help staying at work for people with RA

Q3	Are there arrangements or facilities available for persons with RA that aim at retention of the patient in paid employment?
	<div>☐ No</div> <div>☐ Yes. Please, choose below if applicable:<div>☐ Vocational rehabilitation in the hospital</div><div>☐ Vocational rehabilitation in private sector</div><div>☐ Self-learning/self-management</div><div>☐ Work coaches</div><div>☐ Advice from occupational physician</div><div>☐ Coaching (advice) from employment agency</div><div>☐ Other, please, explain below</div></div>

Part 2. Short- and long-term work disability regulations

This part contains questions about system-related (part 2.1) and disease-related (part 2.2) criteria for obtaining the short-term work disability (sick leave) allowance.

For example, should a person be a citizen of the country to qualify, how long the person should be employed before he or she has a right for sick leave allowance, who is authorized to certify the sick leave, etc. Please, in part 2.1 fill in the information for both permanent and temporary contracts even if similar rules apply for both.

Q4	<p>In your country, if a person (who has a regular employment contract) becomes ill and cannot (temporary or permanently) work, is there legislation in place that would ensure at least partial income compensation to this person (it can be funds of employer, state funds, social insurance etc.)?</p> <p>Please, fill in the information for both permanent and temporary contracts even if similar rules apply for both.</p>	
	Permanent employment contract	Temporary employment contract
	☐ No* ☐ Yes, but only for long-term work disability** ☐ Yes, both for short-term disability and long-term disability	☐ No* ☐ Yes, but only for long-term work disability** ☐ Yes, both for short-term disability and long-term disability
	<p>*If you answer “no” for both permanent and temporary contracts, please, go to part 4. **If you answer “Yes, but only for longer term disability” for both permanent and temporary contract, please, go to part 3.</p>	
	Source of information	
	Additional comments	

Part 2.1 Regulations related to sick leave (short-term work disability): system-related requirements

Q5	Is there a requirement for a minimum number of years a person should reside in the country to become eligible for sick leave allowance?	
	Permanent employment contract	Temporary employment contract
	☐ No ☐ Yes. Please, indicate the minimally required period _____ years ☐ Yes, a person should be a citizen ☐ Other. Please, explain _____ _____	☐ No ☐ Yes. Please, indicate the minimally required period _____ years ☐ Yes, a person should be a citizen ☐ Other. Please, explain _____ _____
	☐ Not applicable	
	Source of information	
Additional comments		
Q6	Is there a requirement for the minimum length of official employment in order to be eligible for a sick leave allowance?	
	Permanent employment contract	Temporary employment contract
	☐ No ☐ Yes, _____ months ☐ Yes, _____ working hours ☐ Yes, _____ (other _____) ☐ Not applicable	☐ No ☐ Yes, _____ months ☐ Yes, _____ working hours ☐ Yes, _____ (other _____) ☐ Not applicable
	Source of information	
	Additional comments	

Q7	Is there a requirement for previously earned income (previously to sickness) before the sick leave allowance can be awarded?	
	Permanent employment contract	Temporary employment contract
	☐ No ☐ Yes. _____ (indicate also currency) ☐ Not applicable	☐ No ☐ Yes. _____ (indicate also currency) ☐ Not applicable
	Source of information	
	Additional comments	
Q8	Is there a requirement for a certain amount of disability insurance premium or social tax to be paid before the person can apply for the sick leave allowance?	
	Permanent employment contract	Temporary employment contract
	☐ No, the access to sick leave allowance is granted independently of the amount of insurance premium/social tax paid ☐ Yes. _____ (indicate also currency) ☐ The question is not applicable: sick leave attribution is not insurance-based	☐ No, the access to sick leave allowance is granted independently of the amount of insurance premium/social tax paid ☐ Yes. _____ (indicate also currency) ☐ The question is not applicable: sick leave attribution is not insurance-based
	Source of information	
	Additional comments	

Part 2.2. Regulations related to sick leave (short-term work disability): disease-related criteria for eligibility

Q9	Is there a difference in sick leave compensation in case of permanent or temporary employment contract?				
	☐ No, there is no difference				
	☐ Yes, the arrangement is different. Please, explain briefly _____				
	Source of information				
Additional comments					
In case regulations for sick leave compensation are different for permanent and temporary contracts, please refer in the following questions (Q10-Q14) to the conditions valid for those with a permanent work contract					
Q10	In case of RA, who can officially (i.e. legally) justify sick leave? We allow a possibility to distinguish between the initial sick leave and prolonged sick leave, please, adjust the table according to the reality in your country. It may be that not all columns have to be completed.				
	Qualification		Initial sick leave (from day ____ till day ____)	First prolongation sick leave (from day ____ till day ____)*	Second prolongation sick leave (from day ____ till day ____)*
			*if applicable		
	General practitioner (GP)		☐	☐	☐
	Rheumatologist		☐	☐	☐
	Physician (working for public or private insurance company/institute)	Specialised in occupational issues: ☐ Yes ☐ No	☐	☐	☐
	Physician (working for employer)	Specialised in occupational issues: ☐ Yes ☐ No	☐	☐	☐
	Other		☐	☐	☐
	Should not be justified (patient can report to be sick and stay at home without anyone certifying the reasons)		☐	☐	☐
	Source of information				
Additional comments					

Q11	Are there changes in the level/degree of compensation depending on the duration of sick leave?				
		Period 1 <i>For example: 1st day</i>	Period 2 <i>For example: After 1st day until 12 weeks</i>	Period 3 <i>For example: 12 weeks until 6 months</i>	Period 4 <i>For example: 6 months until 1 year</i>
	Specify time/length of period that are used in your country				
	Specify the range (minimum and maximum) of income substitution (absolute amount or relative to the previous income (%))				
	Source of information				
	Additional comments				
Q12	Who is responsible for paying the income substitution allowance?				
	Period 1 <i>For example: 1st day</i>	Period 2 <i>For example: After 1st day until 12 weeks</i>	Period 3 <i>For example: 12 weeks until 6 months</i>	Period 4 <i>For example: 6 months until 1 year</i>	
	☐ Employer ☐ Social insurance fund (state) ☐ Private insurance ☐ Other. Please, specify _____ _____	☐ Employer ☐ Social insurance fund (state) ☐ Private insurance ☐ Other. Please, specify _____ _____	☐ Employer ☐ Social insurance fund (state) ☐ Private insurance ☐ Other. Please, specify _____ _____	☐ Employer ☐ Social insurance fund (state) ☐ Private insurance ☐ Other. Please, specify _____ _____	
	Source of information				
	Additional comments				

Q13	What is the maximum duration of sick leave allowed (e.g. eligible for compensation), without entering long-term disability?
	<div>☐ There is no maximum duration of sick leave specified</div> <div>☐ Continuous sick leave of _____ months</div> <div>☐ Total sick leave of _____ months (e.g. several periods of sick leave) per<div>☐ Year</div><div>☐ Other period _____</div></div>
	Source of information
	Additional comments

Part 2.3. Regulations related to long-term work disability: system-related requirements

Part 2.3 and 2.4 contain questions about system-related and disease-related criteria that apply when a person needs to receive **long-term work disability** allowance. Questions cover such topics as citizenship rules, length of employment contract, earned income etc. Further, you will be inquired about authorities that certify the disease and the fact that a person is not able to continue working and the criteria that would be taken into account when such decision is taken. Furthermore, questions about the levels of compensation (e.g. income substitution by the work disability pension) are asked. Please, in part 2.3 fill in the information for both permanent and temporary contracts even if similar rules apply for both.

Q14	Is there a requirement for a minimum number of years a person should reside in the country to become eligible for long-term work disability allowance?	
	Permanent employment contract	Temporary employment contract
	<div>☐ No</div> <div>☐ Yes. Please, indicate the minimally required period: _____ years</div> <div>☐ Yes, a person should be a citizen</div> <div>☐ Not applicable</div>	<div>☐ No</div> <div>☐ Yes. Please, indicate the minimally required period: _____ years</div> <div>☐ Yes, a person should be a citizen</div> <div>☐ Not applicable</div>
	Source of information	
	Additional comments	
Q15	Is there a requirement for the minimum length of (official) employment in order to be eligible for a long-term work disability allowance?	

	Permanent employment contract	Temporary employment contract
	☐ No ☐ Yes. _____ months ☐ Yes. _____ working hours ☐ Yes. _____ (other _____) ☐ Not applicable	☐ No ☐ Yes. _____ months ☐ Yes. _____ working hours ☐ Yes. _____ (other _____) ☐ Not applicable
	Source of information	
	Additional comments	
Q16	Is there a requirement concerning the total amount of earned income (previously to sickness) before the long-term work disability can be awarded?	
	Permanent employment contract	Temporary employment contract
	☐ No ☐ Yes. _____ currency ☐ Not applicable	☐ No ☐ Yes. _____ currency ☐ Not applicable
	Source of information	
	Additional comments	
Q17	Is there a requirement concerning total amount of disability insurance premium or social tax to have been paid before the person can apply for the long-term work disability allowance?	
	Permanent employment contract	Temporary employment contract
	☐ No, the access to work disability allowance is granted independently of amount of insurance premium/social tax paid ☐ Yes, _____ (currency) ☐ The question is not applicable: work disability attribution is not insurance-based	☐ No, the access to work disability allowance is granted independently of amount of insurance premium/social tax paid ☐ Yes, _____ (currency) ☐ The question is not applicable: work disability attribution is not insurance-based
	Source of information	
	Additional comments	

Part 2.4. Regulations related to long-term work disability: disease related criteria

Q18	Is there a difference in long-term work disability allowances in case of permanent or temporary contract?
	☐ No, there is not difference
	☐ Yes, the arrangement is different. Please, explain briefly _____
	Source of information
	Additional comments
In case regulations for sick leave compensation are different for permanent and temporary contracts, please refer in the following questions (Q19-Q30) to the conditions valid for those with a permanent work contract.	
Q19	Who is legally authorized to take care of administrative/paper work during the application for work disability (multiple answers possible)?
	☐ Patient him/herself
	☐ Rheumatologist
	☐ General practitioner (GP)
	☐ Occupational physician
	☐ Vocational physician
	☐ Other. Please, specify _____
	Source of information
	Additional comments
Q20	Is there a requirement for minimum duration of a sick leave (due to RA) before a permanent disability status can be granted?
	☐ No
	☐ Yes. _____ months
	Source of information

	Additional comments		
Q21	Are there periodic reassessments (to re-evaluate the degree of disability after the work disability has been assigned)?		
	☐ No		
	☐ Yes. Please, specify period until first re-assessment: _____ months		
	Source of information		
	Additional comments		
Q22	Which factors are taken into account when a decision is taken about the degree of work disability (more than one answer is possible)?		
	Factor that can be taken into account		Minimum value (can be expressed in points, % or otherwise). Please, add all necessary details in the field below.
	Prior profession	☐	n/a
	Diagnosis	☐	n/a
	Physical disability	☐	
	Physical ability	☐	
	Earning capacity (i.e. ability to earn the salary of the work a person had before assessment)	☐	
	Age	☐	n/a
	Gender	☐	n/a
	Other _____	☐	
	Source of information		
	Additional comments		
Q23	At a stage of attributing a long-term work disability, different factors can be taken into account (as specified in previous question). Overall, is priority given to diagnosis or to assessment of individual capacity ?		
	☐ Diagnosis		
	☐ Assessment of individual capacity		
	☐ Other _____		
	Source of information		

	Additional comments
Q24	Is participation in programs to facilitate staying in paid employment (e.g. counselling, adaptation of working place) obligatory before a work disability pension can be requested?
	☐ Yes. Please, specify _____
	☐ No
	☐ Not applicable. Such arrangements do not exist in my country
	Source of information
	Additional comments
Q25	Who is the payer of long-term work disability benefit?
	☐ Employer
	☐ Social insurance fund (state)
	☐ Private insurance company
	☐ Combination. Please, explain _____
	☐ Other. Please, explain _____
	Source of information
	Additional comments
Q26	Is there a maximum term/time period in which a work-disability request process should be completed by the responsible authority and decision taken and communicated to the patient?
	☐ No
	☐ Yes. _____ months
	Source of information
	Additional comments

Q28-29-30	<p>In the table below we ask you to specify the degree of income substitution (absolute amount or relative to the previous income (%)) (range minimum-maximum). We assume it may be dependent on the work (dis)ability one has. Some countries use degree of work disability (for example, 30%, 60% etc.), others assess the degree of full work ability (see definitions in the beginning to the questionnaire). Cut-offs differ between countries, therefore we ask you to specify the ones used in your country, either in column “Degree of disability” or “Degree of full work ability”, depending on what applies to your country.</p>			
Specify relevant cut-offs used in your system (it can be in %, points or another metrics; please, add necessary explanations in the field below):	Level of income substitution Period 1 (from month ____ until month ____) 	Level of income substitution Period 2 (from month ____ until month ____) 	Level of income substitution Period 3 (from month ____ until month ____) 	
Degree of disability	Degree of full work ability			
Source of information				
Additional comments				
Q31	<p>In addition to income substitution specified in question Q28-29-30, does patient with work disability also get a right for non-monetary benefits? (if yes, please, indicate the maximum possible size of benefit, including currency if applicable):</p>			
<p>☐ No</p> <p>☐ Yes. Please, specify below:</p> <ul style="list-style-type: none"> ☐ Home assistance _____ ☐ Transport allowance _____ ☐ Extra benefit per each dependent child _____ ☐ Other _____ 				
Source of information				
Additional comments				

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Part 3. Arrangements to facilitate return to work for patients with health problems due to rheumatoid arthritis

The questions of this section refer to the possibilities of continuing with work activity by a patient who was assigned a degree of long-term work disability, and possible regulations related to this process.

Q32	Does the person who was assigned any degree of work disability have a right to work for a monetary reward (it can be regular paid employment, occasional temporary work etc.)?
	☐ No [go to question Q34]
	☐ Yes
	Source of information
	Additional comments
Q33	Does the right to work depend on the degree of work disability?
	☐ No
	☐ Yes. Please, explain (including the relevant cut-offs for degrees of disability)
	Source of information
	Additional comments
Q34	Are there any forms of societal support for people with a disability that would help them to get employed (example can be special quotas for employers to hire people with disability, subsidies for companies that employ people with disability, programs of additional education etc.)
	☐ No, this does not exist
	☐ Yes, but this does not apply for persons with RA
	☐ Yes, it exists, and also applies for persons with RA. Please, explain
	Source of information

	Additional comments

Part 4. Regulations in case of work disability for patients who are self-employed

Previous questions were referring to regulations concerning patients who are regularly employed (i.e. do not run their own business) at the moment of becoming ill. However, in some countries, the number of self-employed people is relatively large, and it is likely that other criteria for disability allowances apply for this group. Therefore, we added the section below with several general questions about work-disability regulations for self-employed population.

Q35	Do people who are self-employed at the moment of sickness have a right for sick leave compensation in case of temporary illness (in this question, we refer to state regulations, not the voluntary insurance or individual savings)?
	☐ No
	☐ Yes
	Source of information
	Additional comments
Q36	Are people who are self-employed eligible for applying for long-term disability pension in case their condition does not allow to continue working activities (in this question, we refer to state regulations, not the voluntary insurance or individual savings)?
	☐ No [Please, go to question Q38]
	☐ Yes. After _____ months since the beginning of disease
	Source of information
	Additional comments
Q37	You have answered that a person who is self-employed at the moment of sickness is eligible for applying for long-term disability benefit in case his/her condition does not allow to continue working activities. How is the amount of compensation (i.e. disability pension) determined?
	☐ Based on previous income (please, specify the rules applied, including min and max)
	☐ Fixed amount _____ (indicate currency)

	☐ Other rule, please, specify _____
	Source of information
	Additional comments
Q38	In case of prolonged sick leave, has a self-employed person right for work re-integration scheme?
	☐ No
	☐ Yes, please explain _____
	Source of information
	Additional comments
Q39	For people who were previously self-employed and had to stop working due to RA, are there any forms of societal support that would help them to get paid work (example can be special quotas for employers to hire people with disability, subsidies for companies that employ people with disability, programs of additional education etc.)
	☐ No. It does not exists for people who used to be self-employed at the moment they became ill
	☐ Yes, but it does not apply for persons with RA
	☐ Yes, it exists for persons who used to be self-employed, and also applies for persons with RA. Please, explain _____
	Source of information
	Additional comments

Part 5. Other chronic diseases

Q40	Are the criteria/allowances specified in the previous sections of the questionnaire applicable to other conditions than RA?
	☐ No, only to RA ☐ Yes, to all rheumatologic conditions ☐ Yes, but only for (select the ones that are applicable): <ul style="list-style-type: none"> ☐ Psoriatic arthritis ☐ Osteoarthritis ☐ Ankylosis spondylitis/Spondyloarthritis ☐ Polyarthritis ☐ Chronic back pain ☐ Other chronic conditions, namely _____
	Source of information
	Additional comments

Thank you for filling in the questionnaire!

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Online Supplementary Text S1b. Questionnaire administered to Principal Investigators (one rheumatologists per country, vignette scenario for income compensation)

	Female, 50 years old, citizen of the country Has 25 years of work experience Works in a large private company, 40 working hours per week (equivalent to full-time work)		
Previous income during years preceding illness	Minimum salary per 1 month ----- (euro/other currency_____)	Average salary per 1 month ----- (euro/other currency_____)	3 times average salary per 1 month ----- (euro/other currency_____)
The patient was <i>recently diagnosed</i> with very active RA and has not been able to attend work job for 6 months (full-time sick leave/short-term disability) <ul style="list-style-type: none">Please, indicate actual amount of income compensation that a person will receive during 6 months period (gross income, ie. before taxes, if any)	Income compensation (per 6 months, as described in scenario) ----- (euro/other currency_____)	Income compensation (per 6 months, as described in scenario) ----- (euro/other currency_____)	Income compensation (per 6 months, as described in scenario) ----- (euro/other currency_____)
Patient <i>has longstanding RA (10 years)</i> and was granted a year ago a permanent (long-term) moderate work disability because of physical incapacity to perform half (50%) of usual work activities) <ul style="list-style-type: none">Please, indicate actual amount of disability pension that a person would have received during <u>first year</u> (gross income, ie. before taxes, if any)	Disability pension (per 1 year, as described in scenario) ----- (euro/other currency_____)	Disability pension (per 1 year, as described in scenario) ----- (euro/other currency_____)	Disability pension (per 1 year, as described in scenario) ----- (euro/other currency_____)

<p>Patient has longstanding RA (10 years) and was granted a year ago a permanent (long-term) severe work disability, because of physical incapacity to perform 3/4 (>75%) of usual work activities</p> <ul style="list-style-type: none">Please, indicate actual amount of disability pension that a person would have received during <u>first year</u> (gross income, ie. before taxes, if any)	<p>Disability pension (per 1 year, as described in scenario)</p> <p>----- (euro/other currency_____)</p>	<p>Disability pension (per 1 year, as described in scenario)</p> <p>----- (euro/other currency_____)</p>	<p>Disability pension (per 1 year, as described in scenario)</p> <p>----- (euro/other currency_____)</p>
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Online Supplementary Text S2. Questionnaire for rheumatologists (Survey 2)

Perspective of rheumatologists

Acceptability of arrangements aimed at helping to stay at work or acquiring work disability pensions for patients with rheumatoid arthritis.

This questionnaire is created to investigate opinion of rheumatologists about existing work support systems as well as regulations and attitudes in relation to work disability benefits for patient with rheumatoid arthritis in your country.

This study is part of a larger initiative to understand access to support systems and social security in case of problems to sustain paid work in patients with rheumatoid arthritis.

You have received this questionnaire because you are a rheumatologist and may have direct or indirect experience with the work participation and work disability benefits for patients with rheumatoid arthritis.

We are interested in having your opinion about different aspects related to work disability arrangements. We would like to ask you to give your opinion on the questions and statements below.

Please, note that the questionnaire is completely anonymous. Once you have completed the questionnaire you may choose among the following options to send it:

- You may send the completed version directly to the research team (Polina Putrik, polina.putrik@maastrichtuniversity.nl)*
- You may return the questionnaire to the Principal Investigator in your country Dr. _____)*

Q1 Please, indicate which country you are working in. *

*This survey is completely anonymous, and only generalizations on country level will be made during analyses stage.

1. Arrangements aimed at supporting to stay at work or acquiring work disability status for patients with rheumatoid arthritis

Q2	The work related needs of patients with RA are met by the (social security) system in my country (i.e. those who are able to work have opportunity to continue working with necessary adaptations)	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q3	I feel that offering patient a chance to stay at work (e.g. by developing a work integration plan given patient's reduced physical capacity) is as important as offering a medical treatment for his condition	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q4	I feel confident and well-prepared when it comes to supporting a patient in maintaining/adjusting his/her work duties so that he/she can continue working	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q5	The role of the rheumatologist in my country is sufficient in the process of decision making regarding assigning the long-term disability status for a patient	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion

Q6	If according to the rules in your country you are the person who is authorized to apply for work disability pension on behalf of the patient , how satisfied are you with this task?	☐ I am not authorized to apply a and feel comfortable with it ☐ I am not authorized to apply a and it is regrettable ☐ I am authorized to apply and feel comfortable with this role ☐ I am authorized to apply and feel uncomfortable with this role ☐ Other _____
Q7	If according to the rules in your country you are the person who is authorized to be involved in the decision process for work disability pension , how satisfied are you with this task?	☐ I am not authorized to decide a and feel comfortable with it ☐ I am not authorized to decide a and it is regrettable ☐ I am authorized to decide and feel comfortable with this role ☐ I am authorized to decide and feel uncomfortable with this role ☐ Other _____
Q8	The social security system is working in a way that patients who need it can get a work disability pension (given the health status and personal situation, such as family and work)	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q9	How would you rate the level of standardization (as opposite to subjectivity) in the decision-taking process regarding the long-term disability?	☐ Very high level of standardization (i.e. decisions are very <i>objective</i>) ☐ High level of standardization (i.e. decisions are <i>objective</i>) ☐ Neither high nor low ☐ Low level of standardization (i.e. decisions are <i>subjective</i>) ☐ Very low level of standardization (i.e. decisions are very <i>subjective</i>) ☐ No opinion
Q10	I feel confident and well-prepared when it comes to facilitating the process of application for long-term work disability benefit for my patients	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q11	Taking all factors into account, rheumatologists face a lot of	☐ Yes, totally agree ☐ Yes, agree

	barriers when a patient should be recognized as work disabled.	☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
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2. Background information about respondent

*This section contains questions about **you and your work environment**. This information will help us to understand and analyse your previous answers. All your responses will be anonymous, treated strictly confidential and used for the purpose of this study only.*

Q12	What is your gender ?	☐ Male ☐ Female
Q13	What is your year of birth?	19__
Q14	What best describes your current work environment ? (In case several responses apply, please select your main work environment only)	☐ University hospital (academic setting) ☐ Non-university (private or public) hospital ☐ Private practice ☐ Other: _____
Q15	How many years of work experience as certified rheumatologist do you have?	☐ Less than 5 years ☐ 6 to 10 years ☐ 11 to 20 years ☐ More than 20 years
Q16	What is the number of hours you spend on patient care per week (average)?	__ hours

Thank you for taking time to complete the questionnaire!

In case of questions, feel free to take direct contact with the research team:
Polina Putrik, polina.putrik@maastrichtuniversity.nl or via telephone: (+31) 624 78 72 78

Online Supplementary Text S3. Questionnaire for patients (Survey 3)

Perspective of patients

Acceptability of arrangements aimed at helping to stay at work and acquiring work disability pensions for patients with RA.

This questionnaire is created to investigate

- the attitude of persons around you towards patients who have difficulties to work due to rheumatoid arthritis and*
- the acceptability of processes and regulations related to acquiring work disability status for patients with rheumatoid arthritis*

You have received this questionnaire because you are a patient with rheumatoid arthritis and may have an opinion about different aspects related to work disability, such as possibilities to continue working despite of the disease, attitude of colleagues/society to patients with rheumatoid arthritis, application process to receive a disability pension, size of payments, etc. We would like to ask you to give your opinion on the questions and statements below.

*Please, note that the questionnaire is completely anonymous. **Once you have completed the questionnaire you may choose among the following options to send it:***

- You may send the completed version directly to the research team (Polina Putrik, polina.putrik@maastrichtuniversity.nl)*
- You may return the questionnaire to the Principal Investigator in your country (Dr. _____ Principal Investigator, PLEASE REPLACE YOUR NAME HERE BEFORE PRINTING)*

Q1 Please, indicate which country you are living in*

*This survey is completely anonymous, and only generalizations on country level will be made during analyses stage.

1. Background information about respondent

Q2	What is your gender ?	☐ Male ☐ Female
Q3	What is your year of birth?	19__
Q4	When did you first experience symptoms of rheumatoid arthritis (year)?	____ (indicate year)
Q5	When were you diagnosed with rheumatoid arthritis?	____ (indicate year)
Q6	Have you ever had to be absent from work due to your rheumatoid arthritis (i.e. ask for a sick leave). If yes, please indicate the longest period?	☐ No ☐ Yes. Longest period was ____ days
Q7	Has your RA ever caused substantial problems with your work that made you consider applying for work disability?	☐ No ☐ Yes
Q8	What is the highest level education you have ever completed?	☐ Primary school diploma ☐ Secondary school diploma ☐ Higher than secondary diploma (e.g. (in)completed university diploma)
Q9	What is your current work status ? (check all the boxes that apply)	☐ Paid work, part- or full-time ☐ Do not have a paid work (but NOT work disabled; e.g. unemployed, student, housewife, retired due to age) ☐ Certified work disability (full or partial)

2. Stay at work arrangements for patients with rheumatoid arthritis

Q10	Society (it can be, for example, colleagues and/or employer) has an adequate understanding of what I am able and not able to do in a view of physical limitations resulting from my RA	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q11	Society perceives me as less valuable because of my RA (i.e. as being less able to contribute to society).	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q12	I feel it is personally (not considering financial benefit) rewarding to be able to stay at work despite the physical limitation caused by RA	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q13	I can get sufficient support in case I prefer to stay at work despite of RA (e.g. my working space can be adapted, as well as work duties, schedules etc.)	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q14	My rheumatologist/ occupational physician pays sufficient attention to work related problems caused by RA (i.e. makes suggestions/plans on how to maintain the employment given my medical condition)	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion

3. Work disability pension for patients with rheumatoid arthritis who are not able to continue working

Q15	I perceive the level of work disability pension due to RA as sufficient (i.e. I do	☐ Yes, totally agree ☐ Yes, agree
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	not feel forced to stay at work in order to not loose income)	☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q16	If I am not able to work due to my RA, I can obtain work disability pension without particular difficulties	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q17	In my opinion, persons who are authorized to take decision regarding work disability are knowledgeable about the condition , i.e. know the natural history of disease with flares, and the impact of fatigue etc.	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q18	If I apply for work disability pension, my personal situation (type of work, family situation) will be taken into account during the decision process	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q19	I think my gender makes a difference for the process and decision regarding the work disability pension due to RA	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion

4. Process of applying for official work disability for patients with rheumatoid arthritis who are not able to continue working

Q20	I can easily access sufficient information about requirements for application for work disability pension for RA patients	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree
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		☐ Completely disagree ☐ No opinion
Q21	I can easily access sufficient information about levels of compensation (monetary and non-monetary benefits) in case of work disability	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q22	In my opinion, the application process in order to receive disability pension due to RA is not difficult	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q23	In my opinion, I would be treated with dignity and respect if I should apply for work disability pension (or I have been treated with dignity and respect when applying for the pension)	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q24	In my opinion, there is sufficient confidentiality throughout the process of application to work disability pension due to RA	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q25	I think that my rheumatologist has sufficient role and influence in the application process for work disability pension due to RA	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion

In case of questions, feel free to take direct contact with the research team:
Polina Putrik, polina.putrik@maastrichtuniversity.nl or via telephone: +31 624 78 72 78

Thank you for taking time to complete the questionnaire!

Online Supplementary Table S1. Social security system arrangements in case of sick leave due to RA

Country	Number of years of residence to be eligible for Short-term work disability	Length of employment to be eligible for Short-term work disability	Requirement for previously earned income and/or for a certain amount of disability insurance premium/social tax paid	Who can justify sick leave?	When can rheumatologist be involved in certifying sick leave	When can occupational therapist be involved in certifying sick leave	When can commission of physicians be involved in certifying sick-leave?	Unpaid first period of sick leave	Maximum duration of sick leave	% of income compensation in first 3 months	Period that employer is responsible for (part of) payment of income compensation	Is part of this period shared with social insurance?
Albania ^P (Non-EU, Low GDP)	No	Not specified	Yes	GP, RHEUM, physician ⁴ , health commission	from day 1	from day 60	from day 180	No	6 months in one year	70-80%	first 12 weeks	No
Austria ^B (EU-15_High GDP)	No	Not specified	No	GP, RHEUM, physician ⁵	from day 1	from day 1	na	No	26 or 52 weeks ⁷ , with max 31 days interruption	83%	day 4 - 12	No
Belarus ^P (Non-EU, Low GDP)	Yes ¹	Not specified	No	GP, RHEUM, physician ⁵	from day 1	na	na	No	120 days continuously or 150 days intermittently	96%	first 6 months	No
Belgium ^B (EU-15, High GDP)	No	1 - 6 months	No	GP, rheumat.	from day 1	na	na	No	12 months, max. 3 months interruption	60%	day 7 - 30	No
Bosnia&Herzegovina ^P (Non-EU, Low GDP)	No	Not specified	No	GP, rheumat.	from day 1	na	na	No	12 months	90%	first 12 weeks	No
Bulgaria ^P (EU-28_Low GDP)	No	>= 6 months	No	GP, hospital MD, medical advisory committees, territorial expert medical commission	na	na	from day 30	No	18 months	80%	first 3 days	No
Croatia ^P (EU-28, Low GDP)	No	>=6 months	No	GP, physician ⁵	na	from day 365	na	No	12 months	75%	first 42 days	No
Cyprus ^M (EU-28, HighGDP)	No	>=6 months	Yes	GP, RHEUM, Physician ⁶	from day 1	from day 1	na	Yes, 3 days	156 days	57%	first 156 days	Yes

1	Czech Republic ^P (EU-28, High GDP)	No	Not specified	Yes	GP, physician ⁵	from day 1	from day 1	na	Yes, 3 days	12 months	57%	day 4 - 14	No
2	Denmark ^S (EU-15, High GDP)	No	1 - 6 months	No	RHEUM, physician ⁵	from day 1	na	na	No	3 years	100%	first 22 weeks	Yes
3										Continuous sick leave of 182 days or total sick leave of 250 days (e.g. several periods of sick leave)			
4	Eestonia ^P (EU-28, Low GDP)	No	1 - 6 months	No	GP, physician ⁵	from day 1	from day 121	na	Yes		67%	day 4 - 8	No
5	Finland ^S (EU-15, High GDP)	No	Not specified	No	GP, RHEUM, physician ⁶	from day 1	from day 1	na	No	12 months per 2 years	not possible to define %	First 56 days	Yes
6												from day 4, max. 360 days per 3 years	
7	France ^B (EU-15, High GDP)	No	1 - 6 months	Yes	GP, RHEUM	from day 1	na	na	Yes, 3 days	360 days per 3 years	76%		Yes
8	Georgia ^P (Non-EU, Low GDP)	na	Not specified	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
9											70% of brutto or 90% of netto income		
10	Germany ^B (EU-15, High GDP)	No	Not specified	No	GP, RHEUM	from day 3	na	na	No	78 weeks per 3 years		first 45 days	No
11										maximum of sick- leave in months equal to the sum of years in work	not possible to define %		
12	Greece ^M (EU-15, Low GDP)	No	1 - 6 months	Yes	GP, RHEUM, physician ⁶	From day 1	from day 1	Day 16	No			day 1-25	Yes
13					GP, RHEUM, Supervisors of the National Health Insurance Fund Administration	from day 1	na	from day 30	No				
14	Hungary ^P (EU-28, Low GDP)	No	Not specified	No		from day 1	na	from day 30	No	370 days	60%	day 1-380	Yes
15	Iceland ^S (Non-EU, High GDP)	No	Depends on work union	No	GP, RHEUM	from day 1	na	na	No	48 months	80-100%	first 3 months	No
16	Ireland ^A (EU-15, High GDP)	Yes ²	>=6 months	Yes	GP, RHEUM, Physician ⁶	from day 3	from day 3	na	No	24 months	not possible to define % ⁸	day 7 - 1 year	Yes
17	Israel ^B (Non-EU, High GDP)	No	1 - 6 months	No	GP, RHEUM	from day 1	na	na	Yes, 1 day	3 months	98%	first 90 days	Yes
18	Italy ^M (EU-15, High GDP)	No	Not specified	No	GP	na	na	na	Yes, 3 days	6 months	64%	first 90 days	No

1	Latvia ^P		Not		GP, The Expert Medical			from week		26 weeks, or 52			
2	(EU-28, Low GDP)	No	specified	No	Commission	na	na	26	Yes, 1 day	weeks of the three	74%	day 2 -10	No
3										year period			
4	Lithuania ^P		1 - 6		GP, RHEUM, physician					Continuous sick leave			
5	(EU-28, Low GDP)	No	months	No	working at institution	From day 1	na	na	No	of 122 days or Total	77%	first 2 days	No
6					Social Insurance Fund					sick leave of 153 days			
7										per year			
8	Luxemburg ^B		Not		GP, RHEUM, any MD								
9	(EU-15, High GDP)	No	specified	No	approved by ministry of	from day 1	na	na	No	12 months	100%	first 90 days	No
10					for social security								
11	FYR Macedonia ^P		Not		GP, RHEUM, Team								
12	(Non-EU, Low)	No	specified	No	(Commission) of Three	from day 21	na	from day 60	No	9 months	87%	first 30 days	No
13					Rheumatologists								
14	Malta ^M		Not		GP, RHEUM, any								
15	(EU-28, High GDP)	No	specified	No	physician working in	from day 1	na	na	No	156 days per year	50%	first 3 days	No
16					public sector								
17													
18	Moldova ^P		> = 6		GP, Medical Expertise					Total sick leave of			
19	(Non-EU, Low GDP)	No	months	No	Committee (GP, RHEUM,	na	na	from day 7	No	calendar 210 days			
20					head of medical unit)					(e.g. several periods	60-90%	first 5 days	No
21	Montenegro ^P		Not		GP, RHEUM, sick leave					of sick leave) per			
22	(Non-EU, Low GDP)	No	specified	No	grant commissions	from day 1	na	from day 31	No	10 months	70%	first 60 days	No
23	Norway ^S		1 - 6		GP, RHEUM, physician								
24	(Non-EU, High GDP)	No	months	No	(working for employer)	from day 1	from day 1	na	No	12 months	100%	first 16 days	No
25													
26	PoLand ^P		1 - 6		Any MD authorized by					182 days (6 months)			
27	(EU-28, Low GDP)	No	months	No	the Social Insurance	from day 1	na	na	No	per 1 year	80%	first 30 days	No
28					Institution								
29	Portugal ^M		1 - 6		GP, RHEUM, any					1095 days/ 36		Employer	
30	(EU-15, High GDP)	No	months	No	physician working in	from day 1	na	na	Yes, 3 days	months	56%	does not	na
31					public sector							contribute	
32	Romania ^P		1 - 6										
33	(EU-28, Low GDP)	No	months	No	GP, RHEUM, physician ⁶	from day 1	from day 1	na	No	6 months in one year	75%	first 5 days	No
34													
35	Russia ^P		Not										
36	(Non-EU, Low GDP)	No	specified	No	GP, RHEUM	from day 1	na	na	No	12 months	60-100% ⁷	first 3 days	na
37													
38	Serbia ^P		Not		GP, Board (Consilium of 3			data not		There is no maximum			
39	(Non-EU, Low GDP)	No	specified	No	physicians)	na	na	provided	No	duration of sick leave	70-100%	first 4 weeks	No
40										specified			
41	Slovakia ^P		1 - 6		GP, Physician specialized								
42	(EU-28, Low GDP)	No	months	Yes	in occupational issues	na	week 52	na	No	12 months	54%	first 10 days	no
43													
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1	Slovenia ^P (EU-28, High GDP)	No	Not specified	No	GP, Physician ⁵	na	from day 30	na	No	12 months	80%	first 30 days	No
2	Spain ^M (EU-15, High GDP)	No	1 - 6 months	No	GP, rheumat.	From day 1	na	na	Yes, 3 days	545 calendar days, or 18 months	70%	day 4-15	No
3	Sweden ^S (EU-15, High GDP)	No	>=6 months	No	GP, RHEUM, Physician ⁶	from day 8	From day 8	na	Yes, 1 day	24 months	79%	day 2 - 14	No
4	Switzerland ^B (Non-EU, High GDP)	No	Not specified	No	GP, rheumat.	from day 1	na	na	No	730 days during a period of 900 days	not possible to define %	first year	Yes
5	TaJikistan (Non-EU, Low GDP)	Yes ¹	Not specified	No	GP, RHEUM, the vice director of the medical institution together with the family medical doctor, rheumatologist and/or main specialist	from day 7	na	from day 7	No	Continuous sick leave of 120 days or interrupted sick leave for 150 days during past 12 month	30-80%	first 14 days	No
6	The Netherlands ^B (EU-15, High GDP)	No	Not specified	No	Physician (working for employer) specialized in occupational issues	na	from day 1	na	No	24 months	100%	first 2 years	No
7	Turkey ^M (Non-EU, Low GDP)	No ³	Not specified	No	GP, RHEUM, physician ⁶ , health commission	from day 1	na	from day 40	Yes, 3 days	12 months	63%	Emploer does not contribute	na
8	Great Britain ^A (EU-15, High GDP)	No	Not specified	Yes	GP	na	na	na	No	28 weeks (approx. 7 months)	not possible to define % ⁸	first 28 weeks	No
9	Ukraine ^P (Non-EU, Low GDP)	No	Not specified	No	RHEUM, physician ⁵	from day 1	from day 90	na	No	Continuous sick-leave of 3 months or total 4 months of sick-leave during one year	50-100% ⁷	Emploer does not contribute	na

28 A - Anglo-saxon, S – Scandinavian, B – Bismarkian, M – Mediterranean, P - Post-communist
29 EU – European Union, GDP – Gross Domestic Product (classification based on GDP per capita in international dollars), MD – medical doctor, GP – general practitioner, RHEUM - rheumatologist
30 Na – not applicable
31 ¹ a person should be a citizen
32 ² Minimum 2 years
33 ³ but only citizen can get permanent contract)
34 ⁴ working for employer or public or private insurance institute and specialized in occupational issues
35 ⁵ working for public or private insurance company/institute
36 ⁶ working for public or private insurance company/institute or for employer
37 ⁷ depending on the work experience
38 ⁸ fixed level of payment

Online Supplementary Table S2. Social security system arrangements in case of work disability due to RA

Country	Eligibility for work disability			Arrangements around work disability					
	Number of years of residence to be eligible for long-term work disability	Length of employment to be eligible for long-term work disability	Requirement for previously earned income and/or for a certain amount of disability insurance premium/social tax paid	Is it OBLIGATORY that rheumatologist is involved in application process (i.e.. providing information about the disease etc)?	Is the rheumatologist also in an OBLIGATORY way involved in the decision-taking about the long-term work disability? (for example, is part of the commission or expert committee)	Requirement for minimum duration for sick leave before a WD can be granted?	Periodic re-assessments of WD status	Priority given to diagnosis or to individual capacity?	Who is the payer of WD?
Albania ^P (Non-EU, Low GDP)	Patient has to be a citizen	Age dependent + a least 12 months in the past 5 years	No requirement	Yes	Yes	6 months	12 months	Individual capacity	SI/state
Austria ^B (EU-15_High GDP)	No requirement	No requirement	No requirement	No	No	26 weeks	Yes, every 2 years	Individual capacity	Social&private insurance
Belarus ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	Yes	No	No requirement	12 months	Diagnosis	SI/state
Belgium ^B (EU-15, High GDP)	No requirement	6 months	Yes ¹	No	No	12 months	Not defined, first time +/- 6 weeks	Individual capacity	SI/state
Bosnia&Herzegovina ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	No	No	12 months	No periodical assessments	Individual capacity	SI/state
Bulgaria ^P (EU-28_Low GDP)	No requirement	No requirement	No requirement	Yes	Yes	No requirement	12-36 months	Individual capacity	SI/state
Croatia ^P (EU-28, Low GDP)	No requirement	>=1/3 of work life period ³	No requirement	No	No	No requirement	36 months	Individual capacity	SI/state
Cyprus ^M (EU-28, HighGDP)	No requirement	156 weeks	No requirement	Yes	Yes	156 days	Yes, period varies	Individual capacity	SI/state
Czech Republic ^P (EU-28, High GDP)	No requirement	Age dependent, 1-10 years	Yes ²	No	No	12 months	12 months	Individual capacity	SI/state
Denmark ^S (EU-15, High GDP)	No requirement	8-26 weeks ⁵	No requirement	No	No	No requirement	Yes, first time after 22 weeks, later intervals vary	Individual capacity	SI/state

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Eestonia ^P (EU-28, Low GDP)	No requirement	Age dependent, 1 to 14 years	No requirement	No	No	No requirement	12 months	Individual capacity	SI/state
Finland ^S (EU-15, High GDP)	No requirement	No requirement	No	No	No	12 months	No periodical assessments	Individual capacity	Social&private insurance
France ^B (EU-15, High GDP)	No requirement	No requirement for disabled adult allowance ⁷	Yes ⁶	No	No	No requirement	12 months	Individual capacity	SI/state
Georgia ^P (Non-EU, Low GDP)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Germany ^B (EU-15, High GDP)	No requirement	No requirement	Yes ⁸	No	No	No requirement	3 years	Individual capacity	SI/state
Greece ^M (EU-15, Low GDP)	No requirement	500 days and last day not longer than 5 years ago	No requirement	Yes	No	No requirement	12-36 months	Individual capacity	SI/state
Hungary ^P (EU-28, Low GDP)	No requirement	1095 days in the past 5 years	No requirement	No	No	No requirement	3 years	Individual capacity	SI/state
Iceland ^S (Non-EU, High GDP)	6 months	No requirement	No requirement	data not provided	data not provided	varied depending on age and severity	12-60 months	Individual capacity	SI/state
Ireland ^A (EU-15, High GDP)	No requirement	5 years	earned income >40 euro per week	No	No	12 months	Yes, every 6 months	Diagnosis and Individual capacity	SI/state
Israel ^B (Non-EU, High GDP)	No requirement	No requirement	No requirement	No	No	No requirement	12-24 months	Individual capacity	Social&private insurance
Italy ^M (EU-15, High GDP)	No requirement	No requirement	No requirement	No	No	No requirement	Yes, period varies	Individual capacity	SI/state
Latvia ^P (EU-28, Low GDP)	No requirement	36 months	No requirement	No	No	26-52 weeks	No periodical assessments	Diagnosis	SI/state
Lithuania ^P (EU-28, Low GDP)	Citizen	Age dependent, 1- 30 years	No requirement	Yes	No	122 (continuous) or 153 (total) days	Yes, after 6 months, 1 year or 2 years	Individual capacity	SI/state
Luxemburg ^B (EU-15, High GDP)	No requirement	6 months	No	No	No	5 weeks	12 months	Individual capacity	SI/state
FYR Macedonia ^P (Non-EU, Low)	No requirement	15 years	No requirement	Yes	No	9 months	24 months	Individual capacity	SI/state
Malta ^M (EU-28, High GDP)	No requirement	12 months	>=250 contributions to social security	No	No	6 months	36 months	Individual capacity	SI/state

			system and annual average ≥50.						
Moldova ^P (Non-EU, Low GDP)	Citizen	No requirement	No requirement	No	No	No requirement	12 months	Individual capacity	SI/state
Montenegro ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	data not provided	data not provided	No requirement	No periodical assessments	Individual capacity	SI/state
Norway ^S (Non-EU, High GDP)	3 years	No requirement	No	No	No	52 weeks	Yes, 2-3 years	Individual capacity	SI/state
PoLand ^P (EU-28, Low GDP)	No requirement	Minimum 5 years during last 10 years	No requirement	No	No	182 days	12 months	Individual capacity	SI/state
Portugal ^M (EU-15, High GDP)	No requirement	120 worked days in last 3-5 years	No requirement	No	No	No requirement	36 months	Individual capacity	SI/state
Romania ^P (EU-28, Low GDP)	Citizen	Age dependent, 1- 27 years	No requirement	No	No	183 days	12-36 months	Individual capacity	SI/state
Russia ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	Yes	No	No requirement	1-2 years	Individual capacity	SI/state
Serbia ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	No	No	6 months	No periodical assessments	Individual capacity	SI/state
Slovakia ^P (EU-28, Low GDP)	No requirement	Age dependent, 1 - 15 years	No requirement	Yes	Yes	12 months	Yes, period varies	Individual capacity	SI/state
Slovenia ^P (EU-28, High GDP)	No requirement	Age dependent, ≥ 1/3 of the period 'age of disability - 20'	No requirement	No	No	No requirement	Yes, 12-60 months	Individual capacity	SI/state
Spain ^M (EU-15, High GDP)	No requirement	Min 1800 working days in preceding 10 years for partial WD	No requirement	No	No	No requirement	2 years	Individual capacity	SI/state
Sweden ^S (EU-15, High GDP)	No requirement	6 months	No	No	No	No requirement	12 months	Individual capacity	SI/state
Switzerland ^B (Non-EU, High GDP)	No requirement	No requirement	No requirement	No	No	2 years	5-10 years	Individual capacity	Social&private insurance

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Tajikistan (Non-EU, Low GDP)	Citizen	No requirement	No requirement	Yes	Yes	120 working days	Yes, every 11 months	Individual capacity	SI/state
The Netherlands ^B (EU-15, High GDP)	No requirement	No requirement	No requirement	No	No	24 months	Yes, period varies and depends on diagnosis	Individual capacity	SI/state
Turkey ^M (Non-EU, Low GDP)	No requirement	120 months	No requirement	No	No	No requirement	2 years	Individual capacity	SI/state
Great Britain ^A (EU-15, High GDP)	No requirement	No requirement	Yes ⁴	No	No	28 weeks	Yes, period varies and depends on diagnosis	Individual capacity	SI/state
Ukraine ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	No	No	3 months	Yes, every 12 months	Individual capacity	SI/state

A - Anglo-saxon, S – Scandinavian, B – Bismarkian, M – Mediterranean, P - Post-communist
EU – European Union, GDP – Gross Domestic Product (classification based on GDP per capita in international dollars) , SI – social insurance
¹ 1501,82 / 1082,65 euro per trimester for a person >=21 / <21 years old, resp
² >=36 months of payments to the statutory pension insurance within the last 5 years
³ from 20-26 y.o. depending on education
⁴ depends on multiple factors of individual situation (online calculator)
⁵ Public benefit: continuous employment, the last 26 weeks (min. 240 hours) Employer-paid benefit: 8 weeks of employment (min. 74 hours)
⁶ Previously earned income 19,142.9 euro for invalidity pension / 9,482.16 euro for disabled adult allowance
⁷ 800 working hours in previous 12 months for invalidity pension
⁸ >=36 months of payments to the statutory pension insurance within the last 5 years

Online Supplementary Table S3. Regulations to prevent work disability and help staying at work for people with RA

Country	Facilities available to support stay at work								Participation in programs to facilitate employment before a WD can be granted?	Working with disability		Forms of societal support for employment of people with disabilities
	Yes/No	Vocational rehabilitation in the hospital	Vocational rehabilitation in private sector	Self-learning/self-management	Work coaches	Advice from occupational physician	Coaching (advice) from employment agency	Other		Can a person with WD perform a paid work?	Does the right to work depend on degree of disability?	
Albania ^P (Non-EU, Low GDP)	Yes	Yes	No	Yes	No	No	No		No	Yes	Yes	reductions in taxes for employers
Austria ^B (EU-15_High GDP)	Yes	No	Yes	No	No	Yes	No		Yes	Yes ⁶	No	protection against dismissal; wage protection; additional annual leave; benefits for the employer and his business if disabled people are employed; tax benefits
Belarus ^P (Non-EU, Low GDP)	Yes	Yes	No	Yes	No	No	No		No	Yes	Yes	reductions in taxes for employers
Belgium ^B (EU-15, High GDP)	Yes	Yes	No	No	Yes	Yes	Yes	Yes ¹	No	Yes	Yes	compensation for work place adjustments, travel expenses, subsidies for employers
Bosnia&Herzegovina ^P (Non-EU, Low GDP)	No	na	na	na	na	na	na		No	No	NA	none
Bulgaria ^P (EU-28_Low GDP)	Yes	Yes	No	Yes	No	Yes	Yes		No	Yes	No	obligatory quotas of patients with disabilities that should be employed.
Croatia ^P (EU-28, Low GDP)	Yes	No	No	No	No	Yes	Yes	Yes ²	No	Yes ⁷	No	obligatory quotas of patients with disabilities that should be employed.
Cyprus ^M (EU-28, HighGDP)	Yes	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	Yes	obligatory quotas of patients with disabilities that should be employed, subsidies for companies, programs of additional education and training
Czech Republic ^P (EU-28, High GDP)	Yes	Yes	Yes	Yes	No	Yes	No		No	Yes	No	reductions in taxes for employers
Denmark ^S (EU-15, High GDP)	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	wages subsidies
Eestonia ^P (EU-28, Low GDP)	No	na	na	na	na	na	na		No	Yes	No	reductions in taxes for employers
Finland ^S (EU-15, High GDP)	Yes	Yes	Yes	Yes	No	Yes	Yes		Yes	Yes	Yes	subsidies for companies, programs of additional education and training

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France ^B (EU-15, High GDP)	No	na	na	na	na	na	na		No	Yes	No	obligatory quotas of patients with disabilities that should be employed.
Georgia ^P (Non-EU, Low GDP)	No	na	na	na	na	na	na		n/a	na	na	none
Germany ^B (EU-15, High GDP)	Yes	No	Yes	Yes	Yes	Yes	Yes		No	Yes ⁶	Yes	obligatory quotas of patients with disabilities that should be employed.
Greece ^M (EU-15, Low GDP)	No	na	na	na	na	na	na		No	Yes ⁷	Yes	none
Hungary ^P (EU-28, Low GDP)	No	na	na	na	na	na	na		No	Yes	Yes	obligatory quotas of patients with disabilities that should be employed.
Iceland ^S (Non-EU, High GDP)	Yes	Yes	Yes			Yes			No	Yes	No	subsidies for companies
Ireland ^A (EU-15, High GDP)	Yes	No	Yes	Yes	No	Yes	No		No	Yes	Yes	obligatory quotas of patients with disabilities that should be employed, subsidies for companies, workplace adaptations
Israel ^B (Non-EU, High GDP)	Yes	Yes	Yes	No	No	Yes	No		No	Yes	No	education programs
Italy ^M (EU-15, High GDP)	Yes	No	No	Yes	No	No	No		No	Yes	Yes	obligatory quotas of patients with disabilities that should be employedYes
Latvia ^P (EU-28, Low GDP)	No	na	na	na	na	na	na		No	Yes	No	subsidies for companies
Lithuania ^P (EU-28, Low GDP)	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Education programs
Luxembourg ^B (EU-15, High GDP)	Yes	No	No	No	No	Yes	No	Yes ²	No	Yes	No	yes, details not specified
FYR Macedonia ^P (Non-EU, Low)	Yes	Yes	Yes	Yes	No	Yes	No		No	No	NA	reductions in taxes for employers (1 year of employment)
Malta ^M (EU-28, High GDP)	No	na	na	na	na	na	na		No	Yes	No	reductions in taxes for employers, subsidies for companies, obligatory quotas of patients with disabilities that should be employed
Moldova ^P (Non-EU, Low GDP)	Yes	Yes	Yes	Yes	No	No	Yes		Yes	Yes	Yes	obligatory quotas of patients with disabilities that should be employed
Montenegro ^P (Non-EU, Low GDP)	Yes	Yes	No	No	No	No	No		Yes	Yes	Yes	yes, details not specified
Norway ^S (Non-EU, High GDP)	Yes	yes	No	No	No	Yes	yes		Yes	Yes (after 1 year) ⁷	No	in case of re-entering employment, employer may for the first months (up to one year) get refund of salary by the social security system.
PoLand ^P (EU-28, Low GDP)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes ⁴	No	Yes	Yes	obligatory quotas of patients with disabilities that should be employed, educational programs, subsidies for companies
Portugal ^M (EU-15, High GDP)	Yes	No	No	No	No	Yes	No		No	Yes ⁶	Yes	obligatory quotas of patients with disabilities that should be employed, reductions in taxes for employers
Romania ^P	Yes	No	No	No	No	Yes	No		Yes	Yes	Yes	None

(EU-28, Low GDP)												
Russia ^P (Non-EU, Low GDP)	No	na	na	na	na	na	na		No	No	NA	“supported employment” ⁸ , obligatory quotas of patients with disabilities that should be employed
Serbia ^P (Non-EU, Low GDP)	Yes	Yes	No	Yes	No	No	No		No	No	NA	yes, details not specified
Slovakia ^P (EU-28, Low GDP)	Yes	Yes	Yes	No	No	Yes	No		No	Yes	No	obligatory quotas of patients with disabilities that should be employed
Slovenia ^P (EU-28, High GDP)	Yes	No	No	Yes	No	Yes	Yes		Yes	Yes ⁶	Yes	obligatory quotas of patients with disabilities that should be employed
Spain ^M (EU-15, High GDP)	No	na	na	na	na	na	na		No	Yes	Yes	subsidies for companies, reductions in taxes for employers
Sweden ⁵ (EU-15, High GDP)	Yes	No	yes	Yes	No	Yes	Yes		Yes	Yes	Yes	subsidies for companies, reductions in taxes for employers
Switzerland ^B (Non-EU, High GDP)	Yes	Yes	No	No	No	Yes	No		Yes	Yes ⁶	Yes	“supported employment”, “sheltered employment”, or social enterprises with partially subsidized job
Tajikistan (Non-EU, Low GDP)	Yes	Yes	No	Yes	Yes	Yes	No		No	Yes	No	reductions in taxes for employers, educational programs
The Netherlands ^B (EU-15, High GDP)	Yes	Yes	Yes	No	No	Yes	No		Yes	Yes	Yes	subsidies for companies in particular in respect of sickness benefits, wage dispensation (paying wage under minimum wage), compensation of work place adaptations
Turkey ^M (Non-EU, Low GDP)	No	na	na	na	na	na	na		No	Yes	Yes	obligatory quotas of patients with disabilities that should be employed
Great Britain ^A (EU-15, High GDP)	Yes	No	No	No	No	No	No	Yes ⁵	No	Yes ⁶	No	yes, details not specified
Ukraine ^P (Non-EU, Low GDP)	No	na	na	na	na	na	na		No	Yes	No	None

A - Anglo-saxon, S – Scandinavian, B – Bismarkian, M – Mediterranean, P - Post-communist

EU – European Union, GDP – Gross Domestic Product (classification based on GDP per capita in international dollars)

¹ Progressive work reintegration

² Professional rehabilitation right provided and payed by social insurance

³ Internal or external reclassification coached by social security

⁴ Working in protected conditions, conditions of employment in sheltered workshops, customized workplace

⁵ An occupational health assessment with recommendations made to their employer and doctor

⁶ With a limitation on earnings

⁷ Amount of pension may be reduced

⁸ Salaries may be lower than average disability pension

Online Supplementary Table S4. Patients’ and rheumatologists’ characteristics.

	Total
Rheumatologists characteristics (Questionnaire 2)	
N of rheumatologists (N of countries)	539 (33)
Age (years)	47.5 (10.2)
Gender, female	284 (53%)
Current work environment	
Non-university hospital**	142 (26%)
University hospital	278 (51%)
Private practice	52 (10%)
Other	22 (4%)
Years of work experience	2.5 (1.1)
Average hours of patient care per week	33.5 (12.3)
Patient characteristics (Questionnaire 3)	
N of patients (N of countries)	719 (34)
Age (years)	53.1 (12.2)
Gender, female	541 (76%)
Education	
Primary	110 (16%)
Secondary	254 (36%)
High	339 (48%)
Work status	
Paid work	317 (45%)
No paid work*	180 (26%)
Work disabled (WD)	172 (24%)
Paid work + WD	34 (5%)
Symptom duration (years)	15.0 (11.1)
Ever absent from work due to RA	472 (69%)

Values reflect mean (SD) or n (%), as appropriate; WD – work disability * but not work disabled ** private or public **Anglo-saxon**: UK, Ireland; **Scandinavian**: Denmark, Iceland, Sweden, Norway, Finland; **Bismarkian**: Austria, Belgium, Germany, France, Israel, Netherlands, Switzerland; **Mediterranean**: Cyprus, Greece, Italy, Portugal, Spain, Turkey; **Post-communist**: Albania, Bulgaria, Czech Republic, Croatia, Estonia, Georgia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Serbia, Tajikistan, Slovak Republic, Slovenia

Online Supplementary Table S5. Patients' and rheumatologists' perceptions across several domains according to (1) GDP per capita PPP (2) EU membership status (3) Type of social security system

	Patients' perceptions [‡]			Rheumatologists' perceptions [‡]	
	Importance and support to remain employed (0-5) n=520	Process of applying for work disability pension (0-4) n=360	Obtaining and living with work disability pension (0-6) n=358	Performance of the system (0-4) n=498	Role of the rheumatologists (0-4) n=507
GDP per capita (int. \$) High vs low GDP	0.16 [-0.12;0.44]	0.36 [-0.27;0.99]	-0.13 [-0.49;0.23]	0.31 [-0.08; 0.69]	-0.54 [-0.89;-0.20]
EU membership EU vs non-EU member	0.19 [-0.13;0.52]	-0.43 [-1.17;0.32]	-0.19 [-0.61;0.24]	0.02 [-0.43;0.46]	-0.42 [-0.83;-0.00]
Type of system	Reference	Reference	Reference	Reference	Reference
Scandinavian	Reference	Reference	Reference	Reference	Reference
Anglo-Saxon/liberal	-1.02 [-1.62; -0.42]	-1.87 [-3.24;-0.50]	-0.42 [-1.25;0.41]	-1.40 [-2.14; -0.67]	-0.60 [-1.47;0.27]
Bismarckian/conservative	-0.39 [-0.88;0.11]	-1.02 [-2.15;0.12]	-0.02 [-0.71;0.67]	-0.29 [-0.79;0.21]	-0.34 [-0.95;0.27]
Mediterranean/southern	-0.55 [-1.04; -0.06]	-1.37 [-2.46;-0.29]	-0.25 [-0.90;0.41]	-1.18 [-1.68; -0.67]	-0.10 [-0.71;0.51]
Post-Communist/eastern	-0.58 [-1.00; -0.15]	-1.14 [-2.07;-0.22]	-0.11 [-0.67;0.46]	-0.86 [-1.30; -0.42]	0.24 [-0.29;0.77]

Coefficients are derived from multilevel models (with individuals clustered in countries) and each independent variable (i.e. GDP, EU membership or type of system) entered in a separate model; GDP – Gross Domestic Product, EU – European Union

Anglo-saxon: UK, Ireland; **Scandinavian:** Denmark, Iceland, Sweden, Norway, Finland; **Bismarkian:** Austria, Belgium, Germany, France, Israel, Netherlands, Switzerland; **Mediterranean:** Cyprus, Greece, Italy, Portugal, Spain, Turkey; **Post-communist:** Albania, Bulgaria, Czech Republic, Croatia, Estonia, Georgia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Serbia, Tajikistan, Slovak Republic, Slovenia

[‡]the higher score the more positive are the perception

Online Supplementary Table S6. N(%) of missing data per variable.

	N (%) missing
Rheumatologists characteristics (Questionnaire 2)	
N of rheumatologists (N of countries)	539 (33)
Age (years)	136 (25.2)
Gender, female	43 (8.0)
Current work environment	47 (8.7)
Years of work experience	45 (8.4)
Average hours of patient care per week	53 (9.8)
Role of the rheumatologists (0-4)	32 (5.9)
Performance of the system (0-4)	41 (7.6)
Patient characteristics (Questionnaire 3)	
N of patients (N of countries)	719 (34)
Age (years)	18 (2.5)
Gender, female	19 (2.6)
Education	30 (4.1)
Work status	30 (4.1)
Symptom duration (years)	32 (4.4)
Ever absent from work due to RA	46 (6.3)
Importance and support to remain employed (0-5)	53 (9.3)*
Process of applying for WD (0-4)	78 (17.8)**
Obtaining and living with WD pension (0-6)	80 (19.2)**

WD – work disability * but not work disabled ** private or public

*only assessed in patients currently or ever having worked (n=573)

**only assessed in patients currently work disabled or ever considered applying for WD (n=438)

Online supplementary material

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Online Supplementary Text S1a. Questionnaire administered to Principal Investigators (one rheumatologists per country, Survey 1)

Research project: “Access to social security benefits in case of sick leave or work disability in rheumatoid arthritis across European countries”.

The aim of the project is:

1. To gain insight into the differences in access to social security benefits in case of sick leave and work disability for **patients with rheumatoid arthritis (RA)**, in terms of eligibility criteria, and
2. To compare the level of income substitution and impoverishment in different countries across Europe.

Questionnaire to be completed by the principal investigator of each country

The principal investigator of each country is asked to complete the questionnaire below. This questionnaire consists of five parts:

1. Facilities to allow continuing participation in work force and to prevent work disability
2. Regulations in case of sick leave (short-term work disability)
3. Regulations in case of long-term work disability
4. Facilities to return to work after a period of long-term disability
5. Regulations in case of disability for self-employed persons

Co-authorship rules

The **Principal Investigator will be a co-author** in case the journal does not set strict limitations for the number of authors. We have confirmed with ARD (journal of first choice) that >40 authors is allowed given that author provides sufficient contribution. In this case the co-author will become co-responsible for the information published. More than 40 countries are invited to participate. Therefore, please note that due to restrictions from journals regarding the maximum number of authors, we can include **only one person per country as a co-author**. If the journal allows, one additional person who has substantially contributed to the data collection process could be included as a member of the working group and up to two persons can be acknowledged at the end of the manuscript.

Instructions on how to complete the questionnaire

Completion of some parts of the questionnaire may require inquiring **experts in your country who possess the specific knowledge** on regulations in respect of work disability allowances. We encourage you to make all the efforts to obtain the most reliable information, which will likely involve contacting other people you consider appropriate. We also ask you **to provide the official sources of information** of the obtained data, as those are essential for publication of the final manuscript.

Focus of the questionnaire

Please, keep in mind that all the questions are related to work disability due to **rheumatoid arthritis** and patients who have **an employment contract**. In view of increasing rates of self-employed in some countries, we have added a section with a few general questions on work disability rules for self-employed patients at the end of the questionnaire.

Further recommendations on completing the questionnaire

Due to expected large differences between systems, we attempt to make a universally applicable questionnaire to cover the general topics. It can be that some questions are not applicable to the situation in your country. After each question, there is always space left for additional comments from your side, and we invite you to provide additional comments for us to understand the local system better. **Always think about the most general and most applicable case.** Please, disregard variations and exceptions (for example, across regions or minority groups) or, if in doubt, describe them in the field for additional comments). In case it seems that the questions do not cover sufficiently the situation in your country, please indicate this in your comments. We will be in contact with Principal Investigator and adjust the questionnaire with country specific additions, if needed.

Paper and online versions of the questionnaire

It is also possible to fill in this questionnaire online. Individual link to the survey is available in the invitation letter you have received. Questions are identical in both versions of the survey, and either of two is enough to complete. Should you have difficulties in accessing the online survey, please, let us know as soon as possible.

Contact information

Polina Putrik, e-mail: polina.putrik@gmail.com

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Q1 Country

Please, indicate for which country are you completing the questionnaire:

Country name: _____

Confidential: For Review Only

Definitions and terms

Please note, that unless explicitly stated otherwise, the questions are always referring to patients with RA.

For purposes of our project (and based on collected knowledge about different social security systems), we feel we should distinguish **two** situations in which a patient cannot continue working because of RA:

1. Sick leave (also referred to as short-term work disability), which is absence from work due to disease starting from day 1 of the disease-related absence with a prospect to go back to the same work place after recovery.

2. Long-term work disability, which implies permanent disability to work, which generally follows a period of sickness (short-term work disability). In this case, contract with employer is usually no longer in place

Additional terminology

Degree (%) of work disability refers to level of incapacity to work due to physical and/or mental reasons.

Degree (%) of work ability is an alternative measure of work disability that is being used in some countries. It relates to the extent a person is able to perform work activities compared to a non-disabled person.

Q2

Are these two definitions (sick leave and long-term work disability) similar to the definitions used in your country?

☐ Yes

☐ No, please explain _____

Additional comments _____

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Part 1. Regulations to prevent work disability and help staying at work for people with RA

Q3	Are there arrangements or facilities available for persons with RA that aim at retention of the patient in paid employment?
	☐ No ☐ Yes. Please, choose below if applicable: ☐ Vocational rehabilitation in the hospital ☐ Vocational rehabilitation in private sector ☐ Self-learning/self-management ☐ Work coaches ☐ Advice from occupational physician ☐ Coaching (advice) from employment agency ☐ Other, please, explain below
	Source of information
	Additional comments

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Part 2. Short- and long-term work disability regulations

This part contains questions about system-related (part 2.1) and disease-related (part 2.2) criteria for obtaining the short-term work disability (sick leave) allowance.

For example, should a person be a citizen of the country to qualify, how long the person should be employed before he or she has a right for sick leave allowance, who is authorized to certify the sick leave, etc. Please, in part 2.1 fill in the information for both permanent and temporary contracts even if similar rules apply for both.

Q4	In your country, if a person (who has a regular employment contract) becomes ill and cannot (temporary or permanently) work, is there legislation in place that would ensure at least partial income compensation to this person (it can be funds of employer, state funds, social insurance etc.)?	
	Please, fill in the information for both permanent and temporary contracts even if similar rules apply for both.	
	Permanent employment contract	Temporary employment contract
	☐ No* ☐ Yes, but only for long-term work disability** ☐ Yes, both for short-term disability and long-term disability	☐ No* ☐ Yes, but only for long-term work disability** ☐ Yes, both for short-term disability and long-term disability
	*If you answer “no” for both permanent and temporary contracts, please, go to part 4. **If you answer “Yes, but only for longer term disability” for both permanent and temporary contract, please, go to part 3.	
	Source of information	
Additional comments		

Part 2.1 Regulations related to sick leave (short-term work disability): system-related requirements

Q5	Is there a requirement for a minimum number of years a person should reside in the country to become eligible for sick leave allowance?	
	Permanent employment contract	Temporary employment contract
	☐ No ☐ Yes. Please, indicate the minimally required period _____ years ☐ Yes, a person should be a citizen ☐ Other. Please, explain _____ ☐ Not applicable	☐ No ☐ Yes. Please, indicate the minimally required period _____ years ☐ Yes, a person should be a citizen ☐ Other. Please, explain _____ ☐ Not applicable
	Source of information	
	Additional comments	
Q6	Is there a requirement for the minimum length of official employment in order to be eligible for a sick leave allowance?	
	Permanent employment contract	Temporary employment contract
	☐ No ☐ Yes, _____ months ☐ Yes, _____ working hours ☐ Yes, _____ (other _____) ☐ Not applicable	☐ No ☐ Yes, _____ months ☐ Yes, _____ working hours ☐ Yes, _____ (other _____) ☐ Not applicable
	Source of information	
	Additional comments	

Q7	Is there a requirement for previously earned income (previously to sickness) before the sick leave allowance can be awarded?	
	Permanent employment contract	Temporary employment contract
	☐ No ☐ Yes. _____ (indicate also currency) ☐ Not applicable	☐ No ☐ Yes. _____ (indicate also currency) ☐ Not applicable
	Source of information	
	Additional comments	
Q8	Is there a requirement for a certain amount of disability insurance premium or social tax to be paid before the person can apply for the sick leave allowance?	
	Permanent employment contract	Temporary employment contract
	☐ No, the access to sick leave allowance is granted independently of the amount of insurance premium/social tax paid ☐ Yes. _____ (indicate also currency) ☐ The question is not applicable: sick leave attribution is not insurance-based	☐ No, the access to sick leave allowance is granted independently of the amount of insurance premium/social tax paid ☐ Yes. _____ (indicate also currency) ☐ The question is not applicable: sick leave attribution is not insurance-based
	Source of information	
	Additional comments	

Part 2.2. Regulations related to sick leave (short-term work disability): disease-related criteria for eligibility

Q9	Is there a difference in sick leave compensation in case of permanent or temporary employment contract?				
	☐ No, there is no difference ☐ Yes, the arrangement is different. Please, explain briefly _____ _____				
	Source of information				
	Additional comments				
In case regulations for sick leave compensation are different for permanent and temporary contracts, please refer in the following questions (Q10-Q14) to the conditions valid for those with a permanent work contract					
Q10	In case of RA, who can officially (i.e. legally) justify sick leave? We allow a possibility to distinguish between the initial sick leave and prolonged sick leave, please, adjust the table according to the reality in your country. It may be that not all columns have to be completed.				
	Qualification		Initial sick leave (from day ____ till day ____)	First prolongation sick leave (from day ____ till day ____)*	Second prolongation sick leave (from day ____ till day ____)*
			*if applicable		
	General practitioner (GP)		☐	☐	☐
	Rheumatologist		☐	☐	☐
	Physician (working for public or private insurance company/institute)	Specialised in occupational issues: ☐ Yes ☐ No	☐	☐	☐
	Physician (working for employer)	Specialised in occupational issues: ☐ Yes ☐ No	☐	☐	☐
	Other _____		☐	☐	☐
	Should not be justified (patient can report to be sick and stay at home without anyone certifying the reasons)		☐	☐	☐
	Source of information				
Additional comments					

Q11	Are there changes in the level/degree of compensation depending on the duration of sick leave?				
		Period 1 <i>For example: 1st day</i>	Period 2 <i>For example: After 1st day until 12 weeks</i>	Period 3 <i>For example: 12 weeks until 6 months</i>	Period 4 <i>For example: 6 months until 1 year</i>
	Specify time/length of period that are used in your country				
	Specify the range (minimum and maximum) of income substitution (absolute amount or relative to the previous income (%))?				
	Source of information				
	Additional comments				
Q12	Who is responsible for paying the income substitution allowance?				
	Period 1 <i>For example: 1st day</i>	Period 2 <i>For example: After 1st day until 12 weeks</i>	Period 3 <i>For example: 12 weeks until 6 months</i>	Period 4 <i>For example: 6 months until 1 year</i>	
	☐ Employer ☐ Social insurance fund (state) ☐ Private insurance ☐ Other. Please, specify _____ _____	☐ Employer ☐ Social insurance fund (state) ☐ Private insurance ☐ Other. Please, specify _____ _____	☐ Employer ☐ Social insurance fund (state) ☐ Private insurance ☐ Other. Please, specify _____ _____	☐ Employer ☐ Social insurance fund (state) ☐ Private insurance ☐ Other. Please, specify _____ _____	
	Source of information				
	Additional comments				

Q13	What is the maximum duration of sick leave allowed (e.g. eligible for compensation), without entering long-term disability?
	☐ There is no maximum duration of sick leave specified ☐ Continuous sick leave of _____ months ☐ Total sick leave of _____ months (e.g. several periods of sick leave) per ☐ Year ☐ Other period _____
	Source of information
	Additional comments

Part 2.3. Regulations related to long-term work disability: system-related requirements

Part 2.3 and 2.4 contain questions about system-related and disease-related criteria that apply when a person needs to receive **long-term work disability** allowance. Questions cover such topics as citizenship rules, length of employment contract, earned income etc. Further, you will be inquired about authorities that certify the disease and the fact that a person is not able to continue working and the criteria that would be taken into account when such decision is taken. Furthermore, questions about the levels of compensation (e.g. income substitution by the work disability pension) are asked. Please, in part 2.3 fill in the information for both permanent and temporary contracts even if similar rules apply for both.

Q14	Is there a requirement for a minimum number of years a person should reside in the country to become eligible for long-term work disability allowance?	
	Permanent employment contract	Temporary employment contract
	☐ No ☐ Yes. Please, indicate the minimally required period: _____ years ☐ Yes, a person should be a citizen ☐ Not applicable	☐ No ☐ Yes. Please, indicate the minimally required period: _____ years ☐ Yes, a person should be a citizen ☐ Not applicable
	Source of information	
	Additional comments	
Q15	Is there a requirement for the minimum length of (official) employment in order to be eligible for a long-term work disability allowance?	

	Permanent employment contract	Temporary employment contract
	☐ No	☐ No
	☐ Yes. _____ months	☐ Yes. _____ months
	☐ Yes. _____ working hours	☐ Yes. _____ working hours
	☐ Yes. _____ (other _____)	☐ Yes. _____ (other _____)
	☐ Not applicable	☐ Not applicable
	Source of information	
	Additional comments	
Q16	Is there a requirement concerning the total amount of earned income (previously to sickness) before the long-term work disability can be awarded?	
	Permanent employment contract	Temporary employment contract
	☐ No	☐ No
	☐ Yes. _____ currency	☐ Yes. _____ currency
	☐ Not applicable	☐ Not applicable
	Source of information	
	Additional comments	
Q17	Is there a requirement concerning total amount of disability insurance premium or social tax to have been paid before the person can apply for the long-term work disability allowance?	
	Permanent employment contract	Temporary employment contract
	☐ No, the access to work disability allowance is granted independently of amount of insurance premium/social tax paid	☐ No, the access to work disability allowance is granted independently of amount of insurance premium/social tax paid
	☐ Yes, _____ (currency)	☐ Yes, _____ (currency)
	☐ The question is not applicable: work disability attribution is not insurance-based	☐ The question is not applicable: work disability attribution is not insurance-based
	Source of information	
	Additional comments	

Part 2.4. Regulations related to long-term work disability: disease related criteria

Q18	<p>Is there a difference in long-term work disability allowances in case of permanent or temporary contract?</p> <p>☐ No, there is not difference</p> <p>☐ Yes, the arrangement is different. Please, explain briefly _____</p> <p>_____</p> <p>Source of information</p> <p>Additional comments</p>
<p>In case regulations for sick leave compensation are different for permanent and temporary contracts, please refer in the following questions (Q19-Q30) to the conditions valid for those with a permanent work contract.</p>	
Q19	<p>Who is legally authorized to take care of administrative/paper work during the application for work disability (multiple answers possible)?</p> <p>☐ Patient him/herself</p> <p>☐ Rheumatologist</p> <p>☐ General practitioner (GP)</p> <p>☐ Occupational physician</p> <p>☐ Vocational physician</p> <p>☐ Other. Please, specify _____</p> <p>Source of information</p> <p>Additional comments</p>
Q20	<p>Is there a requirement for minimum duration of a sick leave (due to RA) before a permanent disability status can be granted?</p> <p>☐ No</p> <p>☐ Yes. _____ months</p> <p>Source of information</p>

	Additional comments		
Q21	Are there periodic reassessments (to re-evaluate the degree of disability after the work disability has been assigned)?		
	☐ No		
	☐ Yes. Please, specify period until first re-assessment: _____ months		
	Source of information		
	Additional comments		
Q22	Which factors are taken into account when a decision is taken about the degree of work disability (more than one answer is possible)?		
	Factor that can be taken into account		Minimum value (can be expressed in points, % or otherwise). Please, add all necessary details in the field below.
	Prior profession	☐	n/a
	Diagnosis	☐	n/a
	Physical disability	☐	
	Physical ability	☐	
	Earning capacity (i.e. ability to earn the salary of the work a person had before assessment)	☐	
	Age	☐	n/a
	Gender	☐	n/a
	Other _____	☐	
	Source of information		
	Additional comments		
	Q23	At a stage of attributing a long-term work disability, different factors can be taken into account (as specified in previous question). Overall, is priority given to diagnosis or to assessment of individual capacity ?	
☐ Diagnosis			
☐ Assessment of individual capacity			
☐ Other _____			
	Source of information		

	Additional comments
Q24	Is participation in programs to facilitate staying in paid employment (e.g. counselling, adaptation of working place) obligatory before a work disability pension can be requested?
	☐ Yes. Please, specify _____ ☐ No ☐ Not applicable. Such arrangements do not exist in my country
	Source of information
	Additional comments
Q25	Who is the payer of long-term work disability benefit?
	☐ Employer ☐ Social insurance fund (state) ☐ Private insurance company ☐ Combination. Please, explain _____ ☐ Other. Please, explain _____
	Source of information
	Additional comments
Q26	Is there a maximum term/time period in which a work-disability request process should be completed by the responsible authority and decision taken and communicated to the patient?
	☐ No ☐ Yes. _____ months
	Source of information
	Additional comments

Q28-29-30	<p>In the table below we ask you to specify the degree of income substitution (absolute amount or relative to the previous income (%)) (range minimum-maximum). We assume it may be dependent on the work (dis)ability one has. Some countries use degree of work disability (for example, 30%, 60% etc.), others assess the degree of full work ability (see definitions in the beginning to the questionnaire). Cut-offs differ between countries, therefore we ask you to specify the ones used in your country, either in column “Degree of disability” or “Degree of full work ability”, depending on what applies to your country.</p>			
	Specify relevant cut-offs used in your system (it can be in %, points or another metrics; please, add necessary explanations in the field below):	Level of income substitution	Level of income substitution	Level of income substitution
	Degree of disability	Degree of full work ability	Period 1 (from month ____ until month ____)	Period 2 (from month ____ until month ____)
				Period 3 (from month ____ until month ____)
	Source of information			
	Additional comments			
Q31	<p>In addition to income substitution specified in question Q28-29-30, does patient with work disability also get a right for non-monetary benefits? (if yes, please, indicate the maximum possible size of benefit, including currency if applicable):</p>			
	<p>☐ No</p> <p>☐ Yes. Please, specify below:</p> <ul style="list-style-type: none">○ Home assistance _____○ Transport allowance _____○ Extra benefit per each dependent child _____○ Other _____			
	Source of information			
	Additional comments			

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Part 3. Arrangements to facilitate return to work for patients with health problems due to rheumatoid arthritis

The questions of this section refer to the possibilities of continuing with work activity by a patient who was assigned a degree of long-term work disability, and possible regulations related to this process.

Q32	Does the person who was assigned any degree of work disability have a right to work for a monetary reward (it can be regular paid employment, occasional temporary work etc.)?
	☐ No [go to question Q34] ☐ Yes
	Source of information
	Additional comments
Q33	Does the right to work depend on the degree of work disability?
	☐ No ☐ Yes. Please, explain (including the relevant cut-offs for degrees of disability) <hr/>
	Source of information
	Additional comments
Q34	Are there any forms of societal support for people with a disability that would help them to get employed (example can be special quotas for employers to hire people with disability, subsidies for companies that employ people with disability, programs of additional education etc.)
	☐ No, this does not exist ☐ Yes, but this does not apply for persons with RA ☐ Yes, it exists, and also applies for persons with RA. Please, explain <hr/> <hr/>
	Source of information

	Additional comments

Part 4. Regulations in case of work disability for patients who are self-employed

Previous questions were referring to regulations concerning patients who are regularly employed (i.e. do not run their own business) at the moment of becoming ill. However, in some countries, the number of self-employed people is relatively large, and it is likely that other criteria for disability allowances apply for this group. Therefore, we added the section below with several general questions about work-disability regulations for self-employed population.

Q35	Do people who are self-employed at the moment of sickness have a right for sick leave compensation in case of temporary illness (in this question, we refer to state regulations, not the voluntary insurance or individual savings)?
	☐ No
	☐ Yes
	Source of information
	Additional comments
Q36	Are people who are self-employed eligible for applying for long-term disability pension in case their condition does not allow to continue working activities (in this question, we refer to state regulations, not the voluntary insurance or individual savings)?
	☐ No [Please, go to question Q38]
	☐ Yes. After _____ months since the beginning of disease
	Source of information
	Additional comments
Q37	You have answered that a person who is self-employed at the moment of sickness is eligible for applying for long-term disability benefit in case his/her condition does not allow to continue working activities. How is the amount of compensation (i.e. disability pension) determined?
	☐ Based on previous income (please, specify the rules applied, including min and max)
	☐ Fixed amount _____ (indicate currency)

	☐ Other rule, please, specify _____
	Source of information
	Additional comments
Q38	In case of prolonged sick leave, has a self-employed person right for work re-integration scheme?
	☐ No
	☐ Yes, please explain _____
	Source of information
	Additional comments
Q39	For people who were previously self-employed and had to stop working due to RA, are there any forms of societal support that would help them to get paid work (example can be special quotas for employers to hire people with disability, subsidies for companies that employ people with disability, programs of additional education etc.)
	☐ No. It does not exist for people who used to be self-employed at the moment they became ill
	☐ Yes, but it does not apply for persons with RA
	☐ Yes, it exists for persons who used to be self-employed, and also applies for persons with RA. Please, explain _____
	Source of information
	Additional comments

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Part 5. Other chronic diseases

Q40	Are the criteria/allowances specified in the previous sections of the questionnaire applicable to other conditions than RA?
	<div>☐ No, only to RA</div> <div>☐ Yes, to all rheumatologic conditions</div> <div>☐ Yes, but only for (select the ones that are applicable):<div><div>☐ Psoriatic arthritis</div><div>☐ Osteoarthritis</div><div>☐ Ankylosis spondylitis/Spondyloarthritis</div><div>☐ Polyarthritis</div><div>☐ Chronic back pain</div><div>☐ Other chronic conditions, namely _____</div></div></div>
	Source of information
	Additional comments

Thank you for filling in the questionnaire!

Online Supplementary Text S1b. Questionnaire administered to Principal Investigators (one rheumatologists per country, vignette scenario for income compensation)

	<u>Female, 50 years old, citizen of the country</u> <u>Has 25 years of work experience</u> <u>Works in a large private company, 40 working hours per week (equivalent to full-time work)</u>		
<u>Previous income during years preceding illness</u>	<u>Minimum salary per 1 month</u> _____ (euro/other currency)	<u>Average salary per 1 month</u> _____ (euro/other currency)	<u>3 times average salary per 1 month</u> _____ (euro/other currency)
<u>The patient was <i>recently diagnosed</i> with very active RA and has not been able to attend work job for 6 months (full-time sick leave/short-term disability)</u> • Please, indicate actual amount of income compensation that a person will receive during 6 months period (gross income, ie. before taxes, if any)	<u>Income compensation (per 6 months, as described in scenario)</u> _____ (euro/other currency)	<u>Income compensation (per 6 months, as described in scenario)</u> _____ (euro/other currency)	<u>Income compensation (per 6 months, as described in scenario)</u> _____ (euro/other currency)
<u>Patient has longstanding RA (10 years) and was granted a year ago a permanent (long-term) moderate work disability because of physical incapacity to perform half (50%) of usual work activities)</u> • Please, indicate actual amount of disability pension that a person would have received during first year (gross income, ie. before taxes, if any)	<u>Disability pension (per 1 year, as described in scenario)</u> _____ (euro/other currency)	<u>Disability pension (per 1 year, as described in scenario)</u> _____ (euro/other currency)	<u>Disability pension (per 1 year, as described in scenario)</u> _____ (euro/other currency)

<p><u>Patient has longstanding RA (10 years) and was granted a year ago a permanent (long-term) severe work disability, because of physical incapacity to perform 3/4 (>75%) of usual work activities</u></p> <ul style="list-style-type: none"><u>Please, indicate actual amount of disability pension that a person would have received during first year (gross income, ie. before taxes, if any)</u>	<p><u>Disability pension (per 1 year, as described in scenario)</u></p> <p>_____ . (euro/other currency _____)</p>	<p><u>Disability pension (per 1 year, as described in scenario)</u></p> <p>_____ . (euro/other currency _____)</p>	<p><u>Disability pension (per 1 year, as described in scenario)</u></p> <p>_____ . (euro/other currency _____)</p>
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Online Supplementary Text S2. Questionnaire for rheumatologists (Survey 2)

Perspective of rheumatologists

Acceptability of arrangements aimed at helping to stay at work or acquiring work disability pensions for patients with rheumatoid arthritis.

This questionnaire is created to investigate opinion of rheumatologists about existing work support systems as well as regulations and attitudes in relation to work disability benefits for patient with rheumatoid arthritis in your country.

This study is part of a larger initiative to understand access to support systems and social security in case of problems to sustain paid work in patients with rheumatoid arthritis.

You have received this questionnaire because you are a rheumatologist and may have direct or indirect experience with the work participation and work disability benefits for patients with rheumatoid arthritis.

We are interested in having your opinion about different aspects related to work disability arrangements. We would like to ask you to give your opinion on the questions and statements below.

Please, note that the questionnaire is completely anonymous. Once you have completed the questionnaire you may choose among the following options to send it:

- You may send the completed version directly to the research team (Polina Putrik, polina.putrik@maastrichtuniversity.nl)*
- You may return the questionnaire to the Principal Investigator in your country Dr. _____)*

Q1 Please, indicate which country you are working in. *

*This survey is completely anonymous, and only generalizations on country level will be made during analyses stage.

1. Arrangements aimed at supporting to stay at work or acquiring work disability status for patients with rheumatoid arthritis

Q2	The work related needs of patients with RA are met by the (social security) system in my country (i.e. those who are able to work have opportunity to continue working with necessary adaptations)	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q3	I feel that offering patient a chance to stay at work (e.g. by developing a work integration plan given patient's reduced physical capacity) is as important as offering a medical treatment for his condition	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q4	I feel confident and well-prepared when it comes to supporting a patient in maintaining/adjusting his/her work duties so that he/she can continue working	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q5	The role of the rheumatologist in my country is sufficient in the process of decision making regarding assigning the long-term disability status for a patient	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion

Q6	If according to the rules in your country you are the person who is authorized to apply for work disability pension on behalf of the patient , how satisfied are you with this task?	☐ I am not authorized to apply a and feel comfortable with it ☐ I am not authorized to apply a and it is regrettable ☐ I am authorized to apply and feel comfortable with this role ☐ I am authorized to apply and feel uncomfortable with this role ☐ Other _____
Q7	If according to the rules in your country you are the person who is authorized to be involved in the decision process for work disability pension , how satisfied are you with this task?	☐ I am not authorized to decide a and feel comfortable with it ☐ I am not authorized to decide a and it is regrettable ☐ I am authorized to decide and feel comfortable with this role ☐ I am authorized to decide and feel uncomfortable with this role ☐ Other _____
Q8	The social security system is working in a way that patients who need it can get a work disability pension (given the health status and personal situation, such as family and work)	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q9	How would you rate the level of standardization (as opposite to subjectivity) in the decision-taking process regarding the long-term disability?	☐ Very high level of standardization (i.e. decisions are very <i>objective</i>) ☐ High level of standardization (i.e. decisions are <i>objective</i>) ☐ Neither high nor low ☐ Low level of standardization (i.e. decisions are <i>subjective</i>) ☐ Very low level of standardization (i.e. decisions are very <i>subjective</i>) ☐ No opinion
Q10	I feel confident and well-prepared when it comes to facilitating the process of application for long-term work disability benefit for my patients	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q11	Taking all factors into account, rheumatologists face a lot of	☐ Yes, totally agree ☐ Yes, agree

	barriers when a patient should be recognized as work disabled.	☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
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2. Background information about respondent

*This section contains questions about **you and your work environment**. This information will help us to understand and analyse your previous answers. All your responses will be anonymous, treated strictly confidential and used for the purpose of this study only.*

Q12	What is your gender ?	☐ Male ☐ Female
Q13	What is your year of birth?	19__
Q14	What best describes your current work environment ? (In case several responses apply, please select your main work environment only)	☐ University hospital (academic setting) ☐ Non-university (private or public) hospital ☐ Private practice ☐ Other: _____
Q15	How many years of work experience as certified rheumatologist do you have?	☐ Less than 5 years ☐ 6 to 10 years ☐ 11 to 20 years ☐ More than 20 years
Q16	What is the number of hours you spend on patient care per week (average)?	__ hours

Thank you for taking time to complete the questionnaire!

In case of questions, feel free to take direct contact with the research team:
Polina Putrik, polina.putrik@maastrichtuniversity.nl or via telephone: (+31) 624 78 72 78

Online Supplementary Text S3. Questionnaire for patients (Survey 3)

Perspective of patients

Acceptability of arrangements aimed at helping to stay at work and acquiring work disability pensions for patients with RA.

This questionnaire is created to investigate

- *the attitude of persons around you towards patients who have difficulties to work due to rheumatoid arthritis and*
- *the acceptability of processes and regulations related to acquiring work disability status for patients with rheumatoid arthritis*

You have received this questionnaire because you are a patient with rheumatoid arthritis and may have an opinion about different aspects related to work disability, such as possibilities to continue working despite of the disease, attitude of colleagues/society to patients with rheumatoid arthritis, application process to receive a disability pension, size of payments, etc. We would like to ask you to give your opinion on the questions and statements below.

*Please, note that the questionnaire is completely anonymous. **Once you have completed the questionnaire you may choose among the following options to send it:***

- *You may send the completed version directly to the research team (Polina Putrik, polina.putrik@maastrichtuniversity.nl)*
- *You may return the questionnaire to the Principal Investigator in your country (Dr. _____ Principal Investigator, PLEASE REPLACE YOUR NAME HERE BEFORE PRINTING)*

Q1 Please, indicate which country you are living in*

*This survey is completely anonymous, and only generalizations on country level will be made during analyses stage.

1. **Background information about respondent**

Q2	What is your gender ?	☐ Male ☐ Female
Q3	What is your year of birth?	19__
Q4	When did you first experience symptoms of rheumatoid arthritis (year)?	____ (indicate year)
Q5	When were you diagnosed with rheumatoid arthritis?	____ (indicate year)
Q6	Have you ever had to be absent from work due to your rheumatoid arthritis (i.e. ask for a sick leave). If yes, please indicate the longest period?	☐ No ☐ Yes. Longest period was ____ days
Q7	Has your RA ever caused substantial problems with your work that made you consider applying for work disability?	☐ No ☐ Yes
Q8	What is the highest level education you have ever completed?	☐ Primary school diploma ☐ Secondary school diploma ☐ Higher than secondary diploma (e.g. (in)completed university diploma)
Q9	What is your current work status ? (check all the boxes that apply)	☐ Paid work, part- or full-time ☐ Do not have a paid work (but NOT work disabled; e.g. unemployed, student, housewife, retired due to age) ☐ Certified work disability (full or partial)

2. Stay at work arrangements for patients with rheumatoid arthritis

Q10	Society (it can be, for example, colleagues and/or employer) has an adequate understanding of what I am able and not able to do in a view of physical limitations resulting from my RA	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q11	Society perceives me as less valuable because of my RA (i.e. as being less able to contribute to society).	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q12	I feel it is personally (not considering financial benefit) rewarding to be able to stay at work despite the physical limitation caused by RA	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q13	I can get sufficient support in case I prefer to stay at work despite of RA (e.g. my working space can be adapted, as well as work duties, schedules etc.)	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q14	My rheumatologist/ occupational physician pays sufficient attention to work related problems caused by RA (i.e. makes suggestions/plans on how to maintain the employment given my medical condition)	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion

3. Work disability pension for patients with rheumatoid arthritis who are not able to continue working

Q15	I perceive the level of work disability pension due to RA as sufficient (i.e. I do	☐ Yes, totally agree ☐ Yes, agree
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	not feel forced to stay at work in order to not loose income)	☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q16	If I am not able to work due to my RA, I can obtain work disability pension without particular difficulties	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q17	In my opinion, persons who are authorized to take decision regarding work disability are knowledgeable about the condition , i.e. know the natural history of disease with flares, and the impact of fatigue etc.	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q18	If I apply for work disability pension, my personal situation (type of work, family situation) will be taken into account during the decision process	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q19	I think my gender makes a difference for the process and decision regarding the work disability pension due to RA	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion

4. Process of applying for official work disability for patients with rheumatoid arthritis who are not able to continue working

Q20	I can easily access sufficient information about requirements for application for work disability pension for RA patients	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree
-----	---	--

		☐ Completely disagree ☐ No opinion
Q21	I can easily access sufficient information about levels of compensation (monetary and non-monetary benefits) in case of work disability	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q22	In my opinion, the application process in order to receive disability pension due to RA is not difficult	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q23	In my opinion, I would be treated with dignity and respect if I should apply for work disability pension (or I have been treated with dignity and respect when applying for the pension)	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q24	In my opinion, there is sufficient confidentiality throughout the process of application to work disability pension due to RA	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion
Q25	I think that my rheumatologist has sufficient role and influence in the application process for work disability pension due to RA	☐ Yes, totally agree ☐ Yes, agree ☐ Neither agree nor disagree ☐ No, disagree ☐ Completely disagree ☐ No opinion

In case of questions, feel free to take direct contact with the research team:
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Thank you for taking time to complete the questionnaire!

Online Supplementary Table S1. Social security system arrangements in case of sick leave due to RA

Country	Number of years of residence to be eligible for Short - term work disability	Length of employment to be eligible for Short - term work disability	Requirement for previously earned income and/or for a certain amount of disability insurance premium/social tax paid	Who can justify sick leave?	When can rheumatologist be involved in certifying sick leave	When can occupational therapist be involved in certifying sick leave	When can commission of physicians be involved in certifying sick-leave?	Unpaid first period of sick leave	Maximum duration of sick leave	% of income compensation in first 3 months	Period that employer is responsible for (part of) payment of income compensation	Is part of this period shared with social insurance?
Albania ^P (Non-EU, Low GDP)	No	Not specified	Yes	GP, RHEUM, physician ⁴ , health commission	from day 1	from day 60	from day 180	No	6 months in one year	70-80%	first 12 weeks	No
Austria ^B (EU-15_High GDP)	No	Not specified	No	GP, RHEUM, physician ⁵	from day 1	from day 1	na	No	26 or 52 weeks ⁷ , with max 31 days interruption	83%	day 4 - 12	No
Belarus ^P (Non-EU, Low GDP)	Yes ¹	Not specified	No	GP, RHEUM, physician ⁵	from day 1	na	na	No	120 days continuously or 150 days intermittently	96%	first 6 months	No
Belgium ^B (EU-15, High GDP)	No	1 - 6 months	No	GP, rheumat.	from day 1	na	na	No	12 months, max. 3 months interruption	60%	day 7 - 30	No
Bosnia&Herzegovina ^P (Non-EU, Low GDP)	No	Not specified	No	GP, rheumat.	from day 1	na	na	No	12 months	90%	first 12 weeks	No
Bulgaria ^P (EU-28_Low GDP)	No	> = 6 months	No	GP, hospital MD, medical advisory committees, territorial expert medical commission	na	na	from day 30	No	18 months	80%	first 3 days	No
Croatia ^P (EU-28, Low GDP)	No	>=6 months	No	GP, physician ⁵	na	from day 365	na	No	12 months	75%	first 42 days	No
Cyprus ^M (EU-28, HighGDP)	No	>=6 months	Yes	GP, RHEUM, Physician ⁶	from day 1	from day 1	na	Yes, 3 days	156 days	57%	first 156 days	Yes

1	Czech Republic ^P (EU-28, High GDP)	No	Not specified	Yes	GP, physician ⁵	from day 1	from day 1	na	Yes, 3 days	12 months	57%	day 4 - 14	No
2	Denmark ^S (EU-15, High GDP)	No	1 - 6 months	No	RHEUM, physician ⁵	from day 1	na	na	No	3 years	100%	first 22 weeks	Yes
3										Continuous sick leave of 182 days or total sick leave of 250 days (e.g. several periods of sick leave)			
4	Eestonia ^P (EU-28, Low GDP)	No	1 - 6 months	No	GP, physician ⁵	from day 1	from day 121	na	Yes		67%	day 4 - 8	No
5	Finland ^S (EU-15, High GDP)	No	Not specified	No	GP, RHEUM, physician ⁶	from day 1	from day 1	na	No	12 months per 2 years	not possible to define %	First 56 days	Yes
6												from day 4, max. 360 days per 3 years	
7	France ^B (EU-15, High GDP)	No	1 - 6 months	Yes	GP, RHEUM	from day 1	na	na	Yes, 3 days	360 days per 3 years	76%		Yes
8	Georgia ^P (Non-EU, Low GDP)	na	Not specified	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
9											70% of brutto or 90% of netto income		
10	Germany ^B (EU-15, High GDP)	No	Not specified	No	GP, RHEUM	from day 3	na	na	No	78 weeks per 3 years		first 45 days	No
11										maximum of sick- leave in months equal to the sum of years in work	not possible to define %		
12	Greece ^M (EU-15, Low GDP)	No	1 - 6 months	Yes	GP, RHEUM, physician ⁶	From day 1	from day 1	Day 16	No			day 1-25	Yes
13					GP, RHEUM, Supervisors of the National Health Insurance Fund Administration	from day 1	na	from day 30	No				
14	Hungary ^P (EU-28, Low GDP)	No	Not specified	No		from day 1	na	from day 30	No	370 days	60%	day 1-380	Yes
15	Iceland ^S (Non-EU, High GDP)	No	Depends on work union	No	GP, RHEUM	from day 1	na	na	No	48 months	80-100%	first 3 months	No
16	Ireland ^A (EU-15, High GDP)	Yes ²	>=6 months	Yes	GP, RHEUM, Physician ⁶	from day 3	from day 3	na	No	24 months	not possible to define % ⁸	day 7 - 1 year	Yes
17	Israel ^B (Non-EU, High GDP)	No	1 - 6 months	No	GP, RHEUM	from day 1	na	na	Yes, 1 day	3 months	98%	first 90 days	Yes
18	Italy ^M (EU-15, High GDP)	No	Not specified	No	GP	na	na	na	Yes, 3 days	6 months	64%	first 90 days	No

1	Latvia ^P		Not		GP, The Expert Medical			from week		26 weeks, or 52			
2	(EU-28, Low GDP)	No	specified	No	Commission	na	na	26	Yes, 1 day	weeks of the three	74%	day 2 -10	No
3										year period			
4	Lithuania ^P		1 - 6		GP, RHEUM, physician					Continuous sick leave			
5	(EU-28, Low GDP)	No	months	No	working at institution	From day 1	na	na	No	of 122 days or Total	77%	first 2 days	No
6					Social Insurance Fund					sick leave of 153 days			
7					per year								
8	Luxemburg ^B		Not		GP, RHEUM, any MD								
9	(EU-15, High GDP)	No	specified	No	approved by ministry of	from day 1	na	na	No	12 months	100%	first 90 days	No
10					for social security								
11	FYR Macedonia ^P		Not		GP, RHEUM, Team								
12	(Non-EU, Low)	No	specified	No	(Commission) of Three	from day 21	na	from day 60	No	9 months	87%	first 30 days	No
13					Rheumatologists								
14	Malta ^M		Not		GP, RHEUM, any								
15	(EU-28, High GDP)	No	specified	No	physician working in	from day 1	na	na	No	156 days per year	50%	first 3 days	No
16					public sector								
17													
18	Moldova ^P		> = 6		GP, Medical Expertise					Total sick leave of			
19	(Non-EU, Low GDP)	No	months	No	Committee (GP, RHEUM,	na	na	from day 7	No	calendar 210 days			
20					head of medical unit)					(e.g. several periods	60-90%	first 5 days	No
21	Montenegro ^P		Not		GP, RHEUM, sick leave					of sick leave) per			
22	(Non-EU, Low GDP)	No	specified	No	grant commissions	from day 1	na	from day 31	No	10 months	70%	first 60 days	No
23	Norway ^S		1 - 6		GP, RHEUM, physician								
24	(Non-EU, High GDP)	No	months	No	(working for employer)	from day 1	from day 1	na	No	12 months	100%	first 16 days	No
25													
26	PoLand ^P		1 - 6		Any MD authorized by					182 days (6 months)			
27	(EU-28, Low GDP)	No	months	No	the Social Insurance	from day 1	na	na	No	per 1 year	80%	first 30 days	No
28					Institution								
29	Portugal ^M		1 - 6		GP, RHEUM, any					1095 days/ 36		Emploer	
30	(EU-15, High GDP)	No	months	No	physician working in	from day 1	na	na	Yes, 3 days	months	56%	does not	na
31					public sector							contribute	
32	Romania ^P		1 - 6										
33	(EU-28, Low GDP)	No	months	No	GP, RHEUM, physician ⁶	from day 1	from day 1	na	No	6 months in one year	75%	first 5 days	No
34													
35	Russia ^P		Not		GP, RHEUM								
36	(Non-EU, Low GDP)	No	specified	No		from day 1	na	na	No	12 months	60-100% ⁷	first 3 days	na
37													
38	Serbia ^P		Not		GP, Board (Consilium of 3			data not		There is no maximum			
39	(Non-EU, Low GDP)	No	specified	No	physicians)	na	na	provided	No	duration of sick leave	70-100%	first 4 weeks	No
40										specified			
41	Slovakia ^P		1 - 6		GP, Physician specialized								
42	(EU-28, Low GDP)	No	months	Yes	in occupational issues	na	week 52	na	No	12 months	54%	first 10 days	no
43													
44													
45													
46													

1	Slovenia ^P (EU-28, High GDP)	No	Not specified	No	GP, Physician ⁵	na	from day 30	na	No	12 months	80%	first 30 days	No
2	Spain ^M (EU-15, High GDP)	No	1 - 6 months	No	GP, rheumat.	From day 1	na	na	Yes, 3 days	545 calendar days, or 18 months	70%	day 4-15	No
3	Sweden ^S (EU-15, High GDP)	No	>=6 months	No	GP, RHEUM, Physician ⁶	from day 8	From day 8	na	Yes, 1 day	24 months	79%	day 2 - 14	No
4	Switzerland ^B (Non-EU, High GDP)	No	Not specified	No	GP, rheumat.	from day 1	na	na	No	730 days during a period of 900 days	not possible to define %	first year	Yes
5	Tajikistan (Non-EU, Low GDP)	Yes ¹	Not specified	No	GP, RHEUM, the vice director of the medical institution together with the family medical doctor, rheumatologist and/or main specialist	from day 7	na	from day 7	No	Continuous sick leave of 120 days or interrupted sick leave for 150 days during past 12 month	30-80%	first 14 days	No
6	The Netherlands ^B (EU-15, High GDP)	No	Not specified	No	Physician (working for employer) specialized in occupational issues	na	from day 1	na	No	24 months	100%	first 2 years	No
7	Turkey ^M (Non-EU, Low GDP)	No ³	Not specified	No	GP, RHEUM, physician ⁶ , health commission	from day 1	na	from day 40	Yes, 3 days	12 months	63%	Employer does not contribute	na
8	Great Britain ^A (EU-15, High GDP)	No	Not specified	Yes	GP	na	na	na	No	28 weeks (approx. 7 months)	not possible to define % ⁸	first 28 weeks	No
9	Ukraine ^P (Non-EU, Low GDP)	No	Not specified	No	RHEUM, physician ⁵	from day 1	from day 90	na	No	Continuous sick-leave of 3 months or total 4 months of sick-leave during one year	50-100% ⁷	Employer does not contribute	na

A - Anglo-saxon, S – Scandinavian, B – Bismarkian, M – Mediterranean, P - Post-communist

EU – European Union, GDP – Gross Domestic Product (classification based on GDP per capita in international dollars), MD – medical doctor, GP – general practitioner, RHEUM - rheumatologist

Na – not applicable

¹ a person should be a citizen

² Minimum 2 years

³ but only citizen can get permanent contract)

⁴ working for employer or public or private insurance institute and specialized in occupational issues

⁵ working for public or private insurance company/institute

⁶ working for public or private insurance company/institute or for employer

⁷ depending on the work experience

⁸ fixed level of payment

Online Supplementary Table S2. Social security system arrangements in case of work disability due to RA

Country	Eligibility for work disability			Arrangements around work disability					
	Number of years of residence to be eligible for long-term work disability	Length of employment to be eligible for long-term work disability	Requirement for previously earned income and/or for a certain amount of disability insurance premium/social tax paid	Is it OBLIGATORY that rheumatologist is involved in application process (i.e.. providing information about the disease etc)?	Is the rheumatologist also in an OBLIGATORY way involved in the decision-taking about the long-term work disability? (for example, is part of the commission or expert committee)	Requirement for minimum duration for sick leave before a WD can be granted?	Periodic re-assessments of WD status	Priority given to diagnosis or to individual capacity?	Who is the payer of WD?
Albania ^P (Non-EU, Low GDP)	Patient has to be a citizen	Age dependent + a least 12 months in the past 5 years	No requirement	Yes	Yes	6 months	12 months	Individual capacity	SI/state
Austria ^B (EU-15_High GDP)	No requirement	No requirement	No requirement	No	No	26 weeks	Yes, every 2 years	Individual capacity	Social&private insurance
Belarus ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	Yes	No	No requirement	12 months	Diagnosis	SI/state
Belgium ^B (EU-15, High GDP)	No requirement	6 months	Yes ¹	No	No	12 months	Not defined, first time +/- 6 weeks	Individual capacity	SI/state
Bosnia&Herzegovina ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	No	No	12 months	No periodical assessments	Individual capacity	SI/state
Bulgaria ^P (EU-28_Low GDP)	No requirement	No requirement	No requirement	Yes	Yes	No requirement	12-36 months	Individual capacity	SI/state
Croatia ^P (EU-28, Low GDP)	No requirement	>=1/3 of work life period ³	No requirement	No	No	No requirement	36 months	Individual capacity	SI/state
Cyprus ^M (EU-28, HighGDP)	No requirement	156 weeks	No requirement	Yes	Yes	156 days	Yes, period varies	Individual capacity	SI/state
Czech Republic ^P (EU-28, High GDP)	No requirement	Age dependent, 1-10 years	Yes ²	No	No	12 months	12 months	Individual capacity	SI/state
Denmark ^S (EU-15, High GDP)	No requirement	8-26 weeks ⁵	No requirement	No	No	No requirement	Yes, first time after 22 weeks, later intervals vary	Individual capacity	SI/state

Eestonia ^P (EU-28, Low GDP)	No requirement	Age dependent, 1 to 14 years	No requirement	No	No	No requirement	12 months	Individual capacity	SI/state
Finland ^S (EU-15, High GDP)	No requirement	No requirement	No	No	No	12 months	No periodical assessments	Individual capacity	Social&private insurance
France ^B (EU-15, High GDP)	No requirement	No requirement for disabled adult allowance ⁷	Yes ⁶	No	No	No requirement	12 months	Individual capacity	SI/state
Georgia ^P (Non-EU, Low GDP)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Germany ^B (EU-15, High GDP)	No requirement	No requirement	Yes ⁸	No	No	No requirement	3 years	Individual capacity	SI/state
Greece ^M (EU-15, Low GDP)	No requirement	500 days and last day not longer than 5 years ago	No requirement	Yes	No	No requirement	12-36 months	Individual capacity	SI/state
Hungary ^P (EU-28, Low GDP)	No requirement	1095 days in the past 5 years	No requirement	No	No	No requirement	3 years	Individual capacity	SI/state
Iceland ^S (Non-EU, High GDP)	6 months	No requirement	No requirement	data not provided	data not provided	varied depending on age and severity	12-60 months	Individual capacity	SI/state
Ireland ^A (EU-15, High GDP)	No requirement	5 years	earned income >40 euro per week	No	No	12 months	Yes, every 6 months	Diagnosis and Individual capacity	SI/state
Israel ^B (Non-EU, High GDP)	No requirement	No requirement	No requirement	No	No	No requirement	12-24 months	Individual capacity	Social&private insurance
Italy ^M (EU-15, High GDP)	No requirement	No requirement	No requirement	No	No	No requirement	Yes, period varies	Individual capacity	SI/state
Latvia ^P (EU-28, Low GDP)	No requirement	36 months	No requirement	No	No	26-52 weeks	No periodical assessments	Diagnosis	SI/state
Lithuania ^P (EU-28, Low GDP)	Citizen	Age dependent, 1- 30 years	No requirement	Yes	No	122 (continuous) or 153 (total) days	Yes, after 6 months, 1 year or 2 years	Individual capacity	SI/state
Luxemburg ^B (EU-15, High GDP)	No requirement	6 months	No	No	No	5 weeks	12 months	Individual capacity	SI/state
FYR Macedonia ^P (Non-EU, Low)	No requirement	15 years	No requirement	Yes	No	9 months	24 months	Individual capacity	SI/state
Malta ^M (EU-28, High GDP)	No requirement	12 months	>=250 contributions to social security	No	No	6 months	36 months	Individual capacity	SI/state

			system and annual average >=50.						
Moldova ^P (Non-EU, Low GDP)	Citizen	No requirement	No requirement	No	No	No requirement	12 months	Individual capacity	SI/state
Montenegro ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	data not provided	data not provided	No requirement	No periodical assessments	Individual capacity	SI/state
Norway ^S (Non-EU, High GDP)	3 years	No requirement	No	No	No	52 weeks	Yes, 2-3 years	Individual capacity	SI/state
PoLand ^P (EU-28, Low GDP)	No requirement	Minimum 5 years during last 10 years	No requirement	No	No	182 days	12 months	Individual capacity	SI/state
Portugal ^M (EU-15, High GDP)	No requirement	120 worked days in last 3-5 years	No requirement	No	No	No requirement	36 months	Individual capacity	SI/state
Romania ^P (EU-28, Low GDP)	Citizen	Age dependent, 1- 27 years	No requirement	No	No	183 days	12-36 months	Individual capacity	SI/state
Russia ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	Yes	No	No requirement	1-2 years	Individual capacity	SI/state
Serbia ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	No	No	6 months	No periodical assessments	Individual capacity	SI/state
Slovakia ^P (EU-28, Low GDP)	No requirement	Age dependent, 1 - 15 years	No requirement	Yes	Yes	12 months	Yes, period varies	Individual capacity	SI/state
Slovenia ^P (EU-28, High GDP)	No requirement	Age dependent, >= 1/3 of the period 'age of disability - 20'	No requirement	No	No	No requirement	Yes, 12-60 months	Individual capacity	SI/state
Spain ^M (EU-15, High GDP)	No requirement	Min 1800 working days in preceding 10 years for partial WD	No requirement	No	No	No requirement	2 years	Individual capacity	SI/state
Sweden ^S (EU-15, High GDP)	No requirement	6 months	No	No	No	No requirement	12 months	Individual capacity	SI/state
Switzerland ^B (Non-EU, High GDP)	No requirement	No requirement	No requirement	No	No	2 years	5-10 years	Individual capacity	Social&private insurance

Tajikistan (Non-EU, Low GDP)	Citizen	No requirement	No requirement	Yes	Yes	120 working days	Yes, every 11 months	Individual capacity	SI/state
The Netherlands ^B (EU-15, High GDP)	No requirement	No requirement	No requirement	No	No	24 months	Yes, period varies and depends on diagnosis	Individual capacity	SI/state
Turkey ^M (Non-EU, Low GDP)	No requirement	120 months	No requirement	No	No	No requirement	2 years	Individual capacity	SI/state
Great Britain ^A (EU-15, High GDP)	No requirement	No requirement	Yes ⁴	No	No	28 weeks	Yes, period varies and depends on diagnosis	Individual capacity	SI/state
Ukraine ^P (Non-EU, Low GDP)	No requirement	No requirement	No requirement	No	No	3 months	Yes, every 12 months	Individual capacity	SI/state

A - Anglo-saxon, S – Scandinavian, B – Bismarkian, M – Mediterranean, P - Post-communist

EU – European Union, GDP – Gross Domestic Product (classification based on GDP per capita in international dollars) , SI – social insurance

¹ 1501,82 / 1082,65 euro per trimester for a person ≥ 21 / < 21 years old, resp

² ≥ 36 months of payments to the statutory pension insurance within the last 5 years

³ from 20-26 y.o. depending on education

⁴ depends on multiple factors of individual situation (online calculator)

⁵ Public benefit: continuous employment, the last 26 weeks (min. 240 hours) Employer-paid benefit: 8 weeks of employment (min. 74 hours)

⁶ Previously earned income 19,142.9 euro for invalidity pension / 9,482.16 euro for disabled adult allowance

⁷ 800 working hours in previous 12 months for invalidity pension

⁸ ≥ 36 months of payments to the statutory pension insurance within the last 5 years

Online Supplementary Table S3. Regulations to prevent work disability and help staying at work for people with RA

Country	Facilities available to support stay at work								Participation in programs to facilitate employment before a WD can be granted?	Working with disability		Forms of societal support for employment of people with disabilities
	Yes/No	Vocational rehabilitation in the hospital	Vocational rehabilitation in private sector	Self-learning/self-management	Work coaches	Advice from occupational physician	Coaching (advice) from employment agency	Other		Can a person with WD perform a paid work?	Does the right to work depend on degree of disability?	
Albania ^P (Non-EU, Low GDP)	Yes	Yes	No	Yes	No	No	No		No	Yes	Yes	reductions in taxes for employers
Austria ^B (EU-15_High GDP)	Yes	No	Yes	No	No	Yes	No		Yes	Yes ⁶	No	protection against dismissal; wage protection; additional annual leave; benefits for the employer and his business if disabled people are employed; tax benefits
Belarus ^P (Non-EU, Low GDP)	Yes	Yes	No	Yes	No	No	No		No	Yes	Yes	reductions in taxes for employers
Belgium ^B (EU-15, High GDP)	Yes	Yes	No	No	Yes	Yes	Yes	Yes ¹	No	Yes	Yes	compensation for work place adjustments, travel expenses, subsidies for employers
Bosnia&Herzegovina ^P (Non-EU, Low GDP)	No	na	na	na	na	na	na		No	No	NA	none
Bulgaria ^P (EU-28_Low GDP)	Yes	Yes	No	Yes	No	Yes	Yes		No	Yes	No	obligatory quotas of patients with disabilities that should be employed.
Croatia ^P (EU-28, Low GDP)	Yes	No	No	No	No	Yes	Yes	Yes ²	No	Yes ⁷	No	obligatory quotas of patients with disabilities that should be employed.
Cyprus ^M (EU-28, HighGDP)	Yes	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	Yes	obligatory quotas of patients with disabilities that should be employed, subsidies for companies, programs of additional education and training
Czech Republic ^P (EU-28, High GDP)	Yes	Yes	Yes	Yes	No	Yes	No		No	Yes	No	reductions in taxes for employers
Denmark ^S (EU-15, High GDP)	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	wages subsidies
Eestonia ^P (EU-28, Low GDP)	No	na	na	na	na	na	na		No	Yes	No	reductions in taxes for employers
Finland ^S (EU-15, High GDP)	Yes	Yes	Yes	Yes	No	Yes	Yes		Yes	Yes	Yes	subsidies for companies, programs of additional education and training

France ^B (EU-15, High GDP)	No	na	na	na	na	na	na		No	Yes	No	obligatory quotas of patients with disabilities that should be employed.
Georgia ^P (Non-EU, Low GDP)	No	na	na	na	na	na	na		n/a	na	na	none
Germany ^B (EU-15, High GDP)	Yes	No	Yes	Yes	Yes	Yes	Yes		No	Yes ⁶	Yes	obligatory quotas of patients with disabilities that should be employed.
Greece ^M (EU-15, Low GDP)	No	na	na	na	na	na	na		No	Yes ⁷	Yes	none
Hungary ^P (EU-28, Low GDP)	No	na	na	na	na	na	na		No	Yes	Yes	obligatory quotas of patients with disabilities that should be employed.
Iceland ^S (Non-EU, High GDP)	Yes	Yes	Yes			Yes			No	Yes	No	subsidies for companies
Ireland ^A (EU-15, High GDP)	Yes	No	Yes	Yes	No	Yes	No		No	Yes	Yes	obligatory quotas of patients with disabilities that should be employed, subsidies for companies, workplace adaptations
Israel ^B (Non-EU, High GDP)	Yes	Yes	Yes	No	No	Yes	No		No	Yes	No	education programs
Italy ^M (EU-15, High GDP)	Yes	No	No	Yes	No	No	No		No	Yes	Yes	obligatory quotas of patients with disabilities that should be employedYes
Latvia ^P (EU-28, Low GDP)	No	na	na	na	na	na	na		No	Yes	No	subsidies for companies
Lithuania ^P (EU-28, Low GDP)	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Education programs
Luxembourg ^B (EU-15, High GDP)	Yes	No	No	No	No	Yes	No	Yes ²	No	Yes	No	yes, details not specified
FYR Macedonia ^P (Non-EU, Low)	Yes	Yes	Yes	Yes	No	Yes	No		No	No	NA	reductions in taxes for employers (1 year of employment)
Malta ^M (EU-28, High GDP)	No	na	na	na	na	na	na		No	Yes	No	reductions in taxes for employers, subsidies for companies, obligatory quotas of patients with disabilities that should be employed
Moldova ^P (Non-EU, Low GDP)	Yes	Yes	Yes	Yes	No	No	Yes		Yes	Yes	Yes	obligatory quotas of patients with disabilities that should be employed
Montenegro ^P (Non-EU, Low GDP)	Yes	Yes	No	No	No	No	No		Yes	Yes	Yes	yes, details not specified
Norway ^S (Non-EU, High GDP)	Yes	yes	No	No	No	Yes	yes		Yes	Yes (after 1 year) ⁷	No	in case of re-entering employment, employer may for the first months (up to one year) get refund of salary by the social security system.
PoLand ^P (EU-28, Low GDP)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes ⁴	No	Yes	Yes	obligatory quotas of patients with disabilities that should be employed, educational programs, subsidies for companies
Portugal ^M (EU-15, High GDP)	Yes	No	No	No	No	Yes	No		No	Yes ⁶	Yes	obligatory quotas of patients with disabilities that should be employed, reductions in taxes for employers
Romania ^P	Yes	No	No	No	No	Yes	No		Yes	Yes	Yes	None

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(EU-28, Low GDP)												
Russia ^P (Non-EU, Low GDP)	No	na	na	na	na	na	na		No	No	NA	“supported employment” ⁸ , obligatory quotas of patients with disabilities that should be employed
Serbia ^P (Non-EU, Low GDP)	Yes	Yes	No	Yes	No	No	No		No	No	NA	yes, details not specified
Slovakia ^P (EU-28, Low GDP)	Yes	Yes	Yes	No	No	Yes	No		No	Yes	No	obligatory quotas of patients with disabilities that should be employed
Slovenia ^P (EU-28, High GDP)	Yes	No	No	Yes	No	Yes	Yes		Yes	Yes ⁶	Yes	obligatory quotas of patients with disabilities that should be employed
Spain ^M (EU-15, High GDP)	No	na	na	na	na	na	na		No	Yes	Yes	subsidies for companies, reductions in taxes for employers
Sweden ⁵ (EU-15, High GDP)	Yes	No	yes	Yes	No	Yes	Yes		Yes	Yes	Yes	subsidies for companies, reductions in taxes for employers
Switzerland ^B (Non-EU, High GDP)	Yes	Yes	No	No	No	Yes	No		Yes	Yes ⁶	Yes	“supported employment”, “sheltered employment”, or social enterprises with partially subsidized job
Tajikistan (Non-EU, Low GDP)	Yes	Yes	No	Yes	Yes	Yes	No		No	Yes	No	reductions in taxes for employers, educational programs
The Netherlands ^B (EU-15, High GDP)	Yes	Yes	Yes	No	No	Yes	No		Yes	Yes	Yes	subsidies for companies in particular in respect of sickness benefits, wage dispensation (paying wage under minimum wage), compensation of work place adaptations
Turkey ^M (Non-EU, Low GDP)	No	na	na	na	na	na	na		No	Yes	Yes	obligatory quotas of patients with disabilities that should be employed
Great Britain ^A (EU-15, High GDP)	Yes	No	No	No	No	No	No	Yes ⁵	No	Yes ⁶	No	yes, details not specified
Ukraine ^P (Non-EU, Low GDP)	No	na	na	na	na	na	na		No	Yes	No	None

A - Anglo-saxon, S – Scandinavian, B – Bismarkian, M – Mediterranean, P - Post-communist
EU – European Union, GDP – Gross Domestic Product (classification based on GDP per capita in international dollars)

- ¹ Progressive work reintegration
² Professional rehabilitation right provided and payed by social insurance
³ Internal or external reclassification coached by social security
⁴ Working in protected conditions, conditions of employment in sheltered workshops, customized workplace
⁵ An occupational health assessment with recommendations made to their employer and doctor
⁶ With a limitation on earnings
⁷ Amount of pension may be reduced
⁸ Salaries may be lower than average disability pension

Online Supplementary Table S4. Patients' and rheumatologists' characteristics.

	Total
Rheumatologists characteristics (Questionnaire 2)	
N of rheumatologists (N of countries)	539 (33)
Age (years)	47.5 (10.2)
Gender, female	284 (53%)
Current work environment	
Non-university hospital**	142 (26%)
University hospital	278 (51%)
Private practice	52 (10%)
Other	22 (4%)
Years of work experience	2.5 (1.1)
Average hours of patient care per week	33.5 (12.3)
Patient characteristics (Questionnaire 3)	
N of patients (N of countries)	719 (34)
Age (years)	53.1 (12.2)
Gender, female	541 (76%)
Education	
Primary	110 (16%)
Secondary	254 (36%)
High	339 (48%)
Work status	
Paid work	317 (45%)
No paid work*	180 (26%)
Work disabled (WD)	172 (24%)
Paid work + WD	34 (5%)
Symptom duration (years)	15.0 (11.1)
Ever absent from work due to RA	472 (69%)

Values reflect mean (SD) or n (%), as appropriate; WD – work disability * but not work disabled ** private or public **Anglo-saxon**: UK, Ireland; **Scandinavian**: Denmark, Iceland, Sweden, Norway, Finland; **Bismarkian**: Austria, Belgium, Germany, France, Israel, Netherlands, Switzerland; **Mediterranean**: Cyprus, Greece, Italy, Portugal, Spain, Turkey; **Post-communist**: Albania, Bulgaria, Czech Republic, Croatia, Estonia, Georgia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Serbia, Tajikistan, Slovak Republic, Slovenia

Online Supplementary Table S4S5. Patients’ and rheumatologists’ perceptions across several domains according to (1) GDP per capita PPP (2) EU membership status (3) Type of social security system

	Patients’ perceptions [‡]			Rheumatologists’ perceptions [‡]	
	Importance and support to remain employed (0-5) n=520	Process of applying for work disability pension (0-4) n=360	Obtaining and living with work disability pension (0-6) n=358	Performance of the system (0-4) n=498	Role of the rheumatologists (0-4) n=507
GDP per capita (int. \$) High vs low GDP	0.16 [-0.12;0.44]	0.36 [-0.27;0.99]	-0.13 [-0.49;0.23]	0.31 [-0.08; 0.69]	-0.54 [-0.89;-0.20]
EU membership EU vs non-EU member	0.19 [-0.13;0.52]	-0.43 [-1.17;0.32]	-0.19 [-0.61;0.24]	0.02 [-0.43;0.46]	-0.42 [-0.83;-0.00]
Type of system					
Scandinavian	Reference	Reference	Reference	Reference	Reference
Anglo-Saxon/liberal	-1.02 [-1.62; -0.42]	-1.87 [-3.24;-0.50]	-0.42 [-1.25;0.41]	-1.40 [-2.14; -0.67]	-0.60 [-1.47;0.27]
Bismarckian/conservative	-0.39 [-0.88;0.11]	-1.02 [-2.15;0.12]	-0.02 [-0.71;0.67]	-0.29 [-0.79;0.21]	-0.34 [-0.95;0.27]
Mediterranean/southern	-0.55 [-1.04; -0.06]	-1.37 [-2.46;-0.29]	-0.25 [-0.90;0.41]	-1.18 [-1.68; -0.67]	-0.10 [-0.71;0.51]
Post-Communist/eastern	-0.58 [-1.00; -0.15]	-1.14 [-2.07;-0.22]	-0.11 [-0.67;0.46]	-0.86 [-1.30; -0.42]	0.24 [-0.29;0.77]

Coefficients are derived from multilevel models (with individuals clustered in countries) and each independent variable (i.e. GDP, EU membership or type of system) entered in a separate model; GDP – Gross Domestic Product, EU – European Union

Anglo-saxon: UK, Ireland; **Scandinavian:** Denmark, Iceland, Sweden, Norway, Finland; **Bismarkian:** Austria, Belgium, Germany, France, Israel, Netherlands, Switzerland; **Mediterranean:** Cyprus, Greece, Italy, Portugal, Spain, Turkey; **Post-communist:** Albania, Bulgaria, Czech Republic, Croatia, Estonia, Georgia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Serbia, Tajikistan, Slovak Republic, Slovenia

[‡]the higher score the more positive are the perception

Online Supplementary Table S5S6. N(%) of missing data per variable.

	N (%) missing
Rheumatologists characteristics (Questionnaire 2)	
N of rheumatologists (N of countries)	539 (33)
Age (years)	136 (25.2)
Gender, female	43 (8.0)
Current work environment	47 (8.7)
Years of work experience	45 (8.4)
Average hours of patient care per week	53 (9.8)
Role of the rheumatologists (0-4)	32 (5.9)
Performance of the system (0-4)	41 (7.6)
Patient characteristics (Questionnaire 3)	
N of patients (N of countries)	719 (34)
Age (years)	18 (2.5)
Gender, female	19 (2.6)
Education	30 (4.1)
Work status	30 (4.1)
Symptom duration (years)	32 (4.4)
Ever absent from work due to RA	46 (6.3)
Importance and support to remain employed (0-5)	213 53 (29.13)*
Process of applying for WD (0-4)	373 8 (5017.89)**
Obtaining and living with WD pension (0-6)	375 80 (519.2)**

WD – work disability * but not work disabled ** private or public

*only assessed in patients currently or ever having worked (n=573)

**only assessed in patients currently work disabled or ever considered applying for WD (n=438)

Figure 1. Study design.

FORMATTING AMENDMENTS (if any)

Required amendments will be listed here; please include these changes in your revised version:

Please make sure the following statements are included in the main document file, which should match the details given in the submission pages:

Competing interests

Contributorship

Acknowledgements

Funding info

Patient and Public Involvement

Ethical approval information

Data sharing statement

Authors' answer: The requested statements have been added at the end of the manuscript.

The figure(s) shouldn't be embedded in the text file, but supplied in 300dpi TIFF, EPS, JPEG or PDF format. And legend(s) supplied at the end of the manuscript.

Authors' answer: The figure has now been uploaded separately, a legend is included at the end of the manuscript.

Please modify the references according the guidelines:

1 (list 3 authors et al if there are or fewer) Surname AB, Surname CD. Article title.

Journal abbreviation Year;Vol:Start page-End page. (see punctuation and no month after year of publication)

See: <https://authors.bmj.com/writing-and-formatting/formatting-your-paper/>

Authors' answer: The reference style has been amended as per requirements.

If your article is a Clinical trial, please comply with our new format requirements for Clinical trials, including extension studies.

See: <http://ard.bmj.com/pages/authors/>

under the heading Clinical trials, including extension studies

Authors' answer: Our study does not report on a clinical trial.

Reviewer(s)' Comments to Author:

Reviewer: 1

Comments to the Author

Disability, even as a legal or administrative construct, is still a social construction that loosely relates to work capacity. The provision of recourse for disability, likewise, is a social construction that generalizes very poorly over time and real politic. The authors acknowledge as much even in their willingness to describe the regulatory climate as Anglo-Saxon, Scandinavian, Bismarckian, etc. without delineating the defining characteristics of each that they perceive as important. This paper is a demonstration that "disability" is a semiotic and that the accompanying analysis is no match for parsing commonalities.

This is not to say that the quest for commonalities and determinant is irrelevant. The value in this papers is that it offers insights as to how not to go about it. The paper should be written to make this point clearly. Furthermore, if the authors see alternative path forward or not, that would be valuable. One might offer a series of clinical vignettes and have the rheumatologists and patients score these as to the likelihood they would lead to a positive "disability" assessment administratively, by the clinicians, or by peers.

Authors' answer to reviewer 1: The authors appreciate the critical reflection of the reviewer and appreciation of the complexity of the studied topic. Indeed, recourse to (official) disability is a complex construct in which social security has a limited role, and our study reinforced this.

The idea of clinical vignettes is valuable and was indeed discussed by our research team at the start of the project. Given the paucity of studies in this field we aimed first to sketch the broad picture of the state of art, and therefore we have opted for the questionnaire approach to review rules and regulations as well as perceptions thereof. We are pleased to have the opportunity to clarify that we have still used vignettes for collection of part of data on income compensation using the 9 scenarios for a female with 25 years of full-time work history: 1) sick leave for 6 months 2) long-term work disability in case of 50% incapacity to work 3) long-term work disability in case of 75% incapacity to work, and each scenario considered for income at the level of minimum salary, average salary and 3 times average salary. The vignettes were initially referred to as 'scenarios' on p. 6 of the manuscript. This has now been clarified in the manuscript, and vignette template also added to Online Appendix Text S1b.

Clinical vignettes to extensively study application of regulations and judgments whether a work disability would be the 'preferred/best' solution given patient's health and his/her personal and environmental context would be a logical follow up of our study, which outlined some major differences between the countries and in this ways informs further research activities. This was also a next planned step we had, admittedly not mentioned in the discussion, which would probably benefit from it.

We have edited part of the methods (p. 6) and discussion (p. 17) which now read as follows:

p. 6: The questionnaire for PIs addressed national regulations (in 2014) on benefits separately for sick leave and WD (Online Supplementary Text S1a: availability and affordability), as well as calculations of the level of income for nine pre-specified scenarios (vignettes), one on sick leave and two for long-term WD across the three levels of income (Online Supplementary Text S1b). In countries where a patient research partner was available (n=21), he/she was invited to comment on any inconsistencies in the answers on the main questionnaire about the formal regulations. In this case, answers were double-checked with the PI.

p. 17: Recourse to (official) disability is a complex construct in which social security has a limited role. Alternative approaches to gain insight into international variation should be considered to study the performance and impact of social security systems. One of the potentially promising method could consist of series of clinical vignettes. By considering the rules and regulations that are to be applied to a hypothetical patient with given characteristics in terms of disease, work situation and disability, as well as attitudes and values about role of work in life and society, countries could be compared and further classified.

Reviewer: 2

Comments to the Author

The topic of work participation and work disability compensation is an important one and you are to be commended for a systematic study of the phenomena. The main issue for this reviewer is the generalizability of the sampling of primary rheumatologist in each country as well as the resulting samples of about 15 rheumatologists and patients per country. In short, how was the primary reporting rheumatologist selected in each country? While well known rheumatologists and/or those with high patient loads may be able to report on country compensation systems, they may still not account for the bulk of RA patients and so may have a unrepresentative picture of the reality of the patients in their respective country. Similarly, their selection of the rheumatologists and patients for the more impressionistic study questionnaires could be problematic. At the very least, how the primary rheumatologists and other participants were enrolled should be given adequate description. it would be preferable to at least attempt to show how representative they are of the universe of rheumatologists and RA patients in each country.

In the end, however, the most important issue is establishing the extent to which your informants among rheumatologists and patients are representative of the universe from which they were chosen.

The important data you report will be more influential once the reader has a sense of the context of the respondents relative to the sampling universes of rheumatologists and patients.

Authors' answer to reviewer 2/question 1:

We thank reviewer for appreciating the importance of the topic. The reviewer touches upon one of the limitations of the study, namely, limited samples of patients and rheumatologists and representativeness of these samples of the respective sample frames in each country. The authors acknowledge that it was not feasible to obtain a comprehensive list of all rheumatologists and all patients in each country to ensure some form of random sampling that would guarantee a representative sample. In turn, the Principle Investigators were instructed to recruit subjects with diverse backgrounds, with at least half patients having experience with work disability, and at least half rheumatologists working in non-academic settings. In this way, we believe to have obtained a diverse (but not necessarily representative) mix of patients and rheumatologists. To reduce the burden on the Principal Investigators and ensure that most of the countries in the European Region would participate in this project (which did not offer financial incentives to PIs), we have limited the number of survey participants to 15 patients and 15 rheumatologists. Of note, the data was not analyzed on a country level due to restricted samples (as stated on p. 8), and analyses were done on larger groups (e.g. GDP or EU status) that included at least several countries each.

Another issue is that, as of you note, official policy and unofficial bureaucratic norms may affect how the system is experienced. Providing some qualitative description of how the official policies and unofficial implementation differ may be necessary for the reader to know whether the impressions of the rheumatologists and patients reflect what's on paper or just how the policies are with real world implementation.

Authors' answer to reviewer 2/question 2:

We are pleased to hear that the reviewer shares our point of view on official and unofficial regulations. This aligns with the acknowledgement by reviewer 1 that 'official disability' is a social construct in which the role of the social security system is limited. In addition to the adjustment based on the comment of reviewer 1, we have also expanded on this in the manuscript (p. 17) to make this point clear to the readership. This paragraph now reads as following:

We have to acknowledge that the actual application of the formal rules and regulations can differ substantially from the formal rules themselves, and hence patients in countries with similar rules could potentially have different experiences. For example, partial work disability (which formally implies that a patient can work part of the time) may be a barrier to any employment in some countries and thus perceived differently compared to countries where patients deemed partially disabled are able to use their right for part-time work. We have attempted to get the initial insight into this through the surveys among patients and rheumatologists.

Reviewer: 3

Comments to the Author

This is an interesting study by Dr. Putrik and colleagues examining policies around sick leave and work disability for patients with RA across Europe. The strengths of

the study are the following: 1) this is a relatively understudied area and therefore the study and findings are novel; 2) the number of countries surveyed is quite comprehensive; 3) the variation in policies, although expected, is interesting. The weaknesses of the study are the following: 1) The reader gets lost in a large amount of data drawn from several surveys. This feeling of getting lost is at least in part because no hypotheses are stated in the introduction. What are 2-3 main hypotheses that you were trying to explore with this research? Without organizing the paper in this way, the paper reads like a descriptive thesis rather than hypothesis-driven scientific manuscript; 2) the number of patients from each country is likely too low to draw any reliable conclusions, particularly since not all were on work disability and given the very high missing item count for some of the survey items.

Authors' answer to reviewer 3/question 1:

We thank reviewer for appreciation of the strengths of our study. With respect to the mentioned limitations, we have addressed them and provide detailed answers to the specific comments point-by-point below.

Additional specific comments as follows:

-Introduction:

There needs to be a stronger justification for the study and if possible, some specific hypotheses listed. As is, the aim is just too broad, "To describe and explore differences in formal regulations around sick leave and WD" - what specific aspects were explored and why? That will go a long way in framing the paper and ensuring reader's don't get lost in a sea of data.

Authors' answer to reviewer 3/question 2:

To address the reviewers comments, authors revised the introduction and specified the hypotheses tested in this study (pp. 5-6). The edited part of the introduction now reads:

SS arrangements have been suggested to result in differences in overall patterns of employment, WD, and retirement.[13, 14] A recent worldwide multinational study (COMORA) has shown that lower economic wealth and human development of countries is associated with higher rates of unemployment and higher absenteeism.[15] Earlier, QUEST RA study has observed that in low Gross Domestic Product (GDP) countries, people remain working with higher levels of disability and disease activity compared to high GDP countries.[16] The regulations around the sick leave and work disability may be, at least partially, responsible for these differences, however, they have not been studied.

Policies with regard to work participation, however, go far beyond income substitution only. Criteria for access to WD benefits as well as levels of income substitution likely depend, among others, on economic, political and cultural factors. While the European Union (EU) and World Health Organization (WHO) accept the historical differences in the way health and social systems are organized and function in their member states, there is a universal agreement that differences should not result in inequalities in health and quality of life of people across nations.[17] It is unclear whether EU member states achieved any degree of homogeneity in the key regulations around social policies with

regards to work disability. In addition to system level factors, there is evidence that personal contextual and disease related factors [6, 18, 19], influence the decision of an individual to take sick leave or apply for long term WD.

The aim of this study was to describe and explore differences in formal regulations around sick leave and WD for patients with RA, as well as perceptions by rheumatologists and patients on the system's performance, across European countries. We hypothesized that 1) lower GDP countries have stricter rules with regard to obtaining work disability and lower income substitution once work disability is granted 2) EU countries have more homogeneous regulations compared to non-EU countries 3) patients and rheumatologists in high GDP and EU member states are more satisfied with the performance of the social security system.

-Methods:

--Can you please provide more information on the IRB procedure? Were local IRBs required before surveying patients at individual sites, or was there a central IRB?

Authors' answer to reviewer 3/question 3:

Before the start of the study, we have obtained the ethical clearance from Maastricht Ethical Review board. We have shared this document with the Principal Investigators in each country. It was the responsibility of the Principal Investigator to adhere to local IRB procedures. In some countries, the decision of Maastricht IRB was sufficient, in other countries the PI had to go through an additional local procedure. We have now clarified this in the relevant section at the end of the manuscript.

Ethical approval information

The project has been approved by the Ethical Committee from the Maastricht University Medical Center. Principal Investigators in each country were responsible for local ethical approvals, where necessary.

--Can you clarify why you went to rheumatologists for information on sick leave and WD benefits (rather than, for example, government agencies who might provide formal policies)? In the U.S., the average rheumatologist doesn't know the details of these policies – it may be different in Europe. Although the large percentage of missing variables in Supp Table S5 (51% for process of applying for WD and 51% for obtaining and living with WD), seems to support this.

Authors' answer to reviewer 3/question 4:

The reviewer definitely raises a relevant point. When developing the study protocol, authors were aware that governmental authorities would more likely be able to provide data on regulatory procedures around sick leave and work disability.

However, the feasibility of this approach is very limited (e.g. language issues but also motivation to collaborate in research) and we have opted to rely on our established international network of rheumatologists. We strongly encouraged rheumatologists to refer to local agencies for information, and to our knowledge, most of them did so. This was a compromise solution to ensure we cover a large amount of countries,

which is, as also acknowledged by the reviewer, one of the major strengths of this study. We emphasize in the discussion and limitations (p. 17) that this is an exploratory study which can only provide a first insight in this understudied topic. The edited text reads as follows:

While government authorities would be the most knowledgeable parties to enquire about rules and regulations, the feasibility issues around establishing a direct contact with agencies from >30 European countries, in different languages, and where they likely have little or no interest to contribute to a research project, led us to choose for the well-established network of rheumatologists active in research was approached instead. To improve data quality and accuracy, PIs were encouraged to seek help from other experts in their country; the summary was sent to available patient partners for a face-validity check of data in their country, and the results showed a good agreement. It is emphasized in the discussion that this study has an explorative nature and limited conclusions should be drawn.

--Can you clarify why you included patients who had not applied for WD – how would these patients know about regulations that do not apply to them?

Authors' answer to reviewer 3/question 5:

Patients who have not (yet) apply for work disability may be an important source of information about their perceptions of the system. Some may have tried to apply and have been unsuccessful, others never applied because of – perceived - system barriers. To account for prior knowledge and relevance of the questions for the patients, we have limited the analyses in the following way (as described on p. 8):

- 'Importance and support to remain employed' was assessed in patients currently or ever having worked.
- 'Process of applying for work disability' and 'Obtaining and living with work disability' were limited to patients currently work disabled or ever considered applying for WD. This also explains apparent large number of reported missing data which is further address in the answer to question 13.

--The translation procedures for the patient questionnaire are likely inadequate (having the PI translate the questionnaires). Generally, at the very least, a back-translation to English by a different person to ensure the meaning is not lost would be beneficial. I realize this is a limitation that cannot be addressed at this point.

Authors' answer to reviewer 3/question 6:

We agree with the reviewer that validated translation procedures would have made the translations more accurate. After initial translation by PIs, we have though asked local patient partners who were proficient in English language to verify the translations and reassuringly no major issues were raised for the questionnaires that were checked. Therefore, while the translation procedures used remain a strong limitation (acknowledged in the discussion (p.17)), we have reasons to believe that translation was unlikely to cause serious bias in this exploratory analyses.

-In the methods, the authors state that they investigated whether regulations differ by the type of welfare regime, GDP, EU membership, country-level WD rates. That is a lot of comparisons and getting back to the introduction, there is really no justification of why these specific things were looked at, what the specific hypothesis were etc. For example, why would EU membership influence the examined relationships (assuming that the average reader does not know the details of EU policies and how they would relate to WD etc).

Authors' answer to reviewer 3/question 7:

This comment has now been addressed and introduction has been edited throughout (see Authors' answer to reviewer 3/question 2).

-The question where questionnaire item numbers "Q23" doesn't work. The average reader is not going to look at item-by-item questions in the supplement. I would recommend keeping this description at a high level and then referring to the supplement just once for more detail.

Authors' answer to reviewer 3/question 8:

We thank reviewer for this comment. We have edited the text and references to the online supplementary file pp.7-8 to facilitate readership. The paragraph now reads as follows:

Answers of rheumatologists on their perspective of SS arrangements were summarized and scored (the higher is the better) around the two domains: (1) 'Performance of the system' (score 0-4) and (2) 'Role of the rheumatologists' (score 0-4). Additionally, a single item on the perceived standardization in the decision-making process was analyzed separately. Input from patients was summarized following three domains: (1) 'Importance and support to remain employed' (score 0-5), (2) 'Process of applying for WD (score 0-4), and (3) 'Obtaining and living with work disability pension' (score 0-6) (complete questionnaires are provided in the Online Supplementary Texts S2 and S3). Each domain consisted of 4 to 6 questions (each on a 1 (totally agree) to 5 (totally disagree) Likert scale, dichotomized as 1 ('totally agree') and 0 ('not agree/not disagree', ('totally) disagree'). The dichotomized scores per question were summed into the five domain scores (two for rheumatologists and three for patients).

-Again, with the theme of too many comparisons being made – the authors examine the relationship between rheumatologists age, gender and work setting on preceptions. This almost feels like a whole other paper (shift from policies and country-level things to individual characteristics). I really think it is just too much for one paper. Similarly, for patients, why would a patient's gender/age/earning capacity influence their perceptions – although these factors may certainly play a role, the paper does not set the reader up to understand the importance of making such a comparison or justify why this is being explored.

Authors' answer to reviewer 3/question 9:

We appreciate the comment. We have initially considered two publications but preferred to avoid multiplying the papers for the same project, a 'slicing' phenomenon not appreciated in the scientific community. We would like to emphasize that individual characteristics of patients and rheumatologists are only used to adjust regression analyses and the associations between the individual factors and perceptions about social security system are not interpreted or discussed separately. The main research question and interpretation from the models remains the effect of country-level socio-economic factors (e.g. GDP, EU-membership, social security system) on the perceptions about the social security system. To reduce unessential details and simplify the paper, we have now moved descriptive statistics of the individual characteristics from Table 3 to Online Supplementary Table S4.

Results:

-The sentence, "Remarkably, multilevel analysis revealed that rheumatologists in high GDP and EU member countries felt less confident in having an active role in WD decisions". I am not sure why this is "remarkable" – isn't this expected? In countries with more resources, there is often a larger set of resources to address these issues – for example, there might be more infrastructure in primary care settings or more government agencies. This may then place less burden on the rheumatologists. Even if this is not the case, further clarification of this point is needed.

Authors' answer to reviewer 3/question 10:

Authors thank reviewer for this insight. We agree with the comment and have down-tuned the statement towards a more constructive reflection. The edited sentence in the Results (p. 9-10) now reads as follows:

Multilevel analyses revealed that rheumatologists in high GDP (vs low GDP) and EU-member (vs non-EU member) countries felt less confident in having an active role in WD decisions ($\beta=-0.5$ [95%CI [-0.9;-0.2] and $\beta=-0.5$ [-1.0;-0.1], respectively).

And pp. 16-17 in the Discussion:

At the same time, little differences were related to country's wealth or EU-membership, and only a weak signal suggested that rheumatologists in lower income countries are more confident in their role to support patient in work disability issues. The latter may indicate that rheumatologists in low income countries interact more intensively with patients on these issues and accept work disability questions as part of their responsibility. Alternatively, other cultural and system factors could be considered, e.g. patients referring to other professionals within the system (such as primary care or state agencies) for advice and support regarding work disability decisions.[26]

-The Supplemental Tables are so extensive – I suspect if the paper is more focused, at least half of these Tables can be removed.

Authors' answer to reviewer 3/question 11:

We thank reviewer for this suggestion. We believe that extensive online appendix is preferred as it provides the data for interested readers, as well as country specific details that could not be possibly reported in the main manuscript. In our experience from previous studies at a European level, people in the individual countries value the access to information from their own country in the online appendices. It does not complicate the main paper and rather substantiates the claims made about the patterns on macro level. We leave it up to discretion of the editor and can shorten the appendix if deemed necessary.

Discussion:

-In general, the discussion would be richer if it focused on further exploring the few key hypotheses that should be laid out in the introduction. As it stands, it is very general

Authors' answer to reviewer 3/question 12:

Discussion has now been edited (pp. 16-17) along the hypotheses introduced in the introduction. Given that most of the paragraphs were edited, the authors do not copy the text here and refer the reviewer to the manuscript text where edits are marked in track-changes.

-Please include a more detailed discussion of missingness. There are survey items that have over 50% missing and this is a significant limitation that needs to be addressed directly.

Authors' answer to reviewer 3/question 13:

We thank reviewer for this comment that allowed us to spot inaccuracy of reporting the numbers of missing data. The apparently large number of missings on the domains 'Process of applying for work disability' (50.9%) and 'Obtaining and living with work disability' (51.2%) – which are combinations of the survey items as outlines on p.7 of the manuscript (composition and calculation of the domains) - is explained by the fact that analyses were limited to patients currently work disabled or ever considered applying for WD. To prevent misleading interpretations when calculating N of missing from the total number of patients, we have now edited the table S6 in the appendix to make this point clear. We hope this clarifies the issue and reassures the reviewer the missingness, albeit present as in almost any survey research, does not present a major concern.