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The impact of Inflammatory Arthritis on Work

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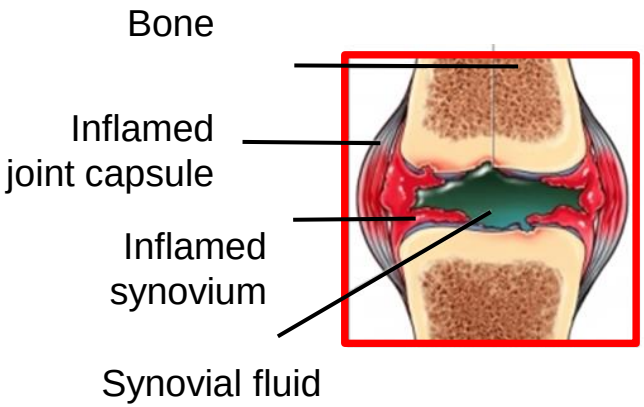
NHS
National Institute for Health Research

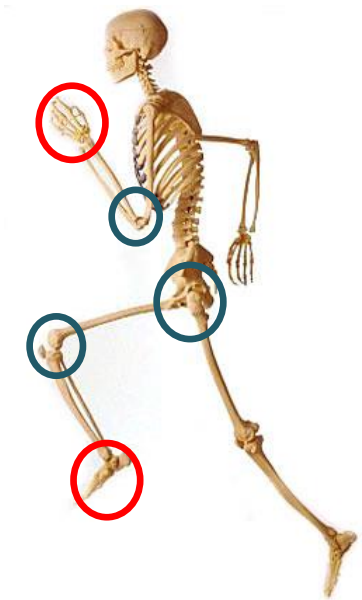
ARTHRITIS RESEARCH UK

Background

Background - RMDs

- There are many types of rheumatological conditions, affecting people from childhood to old age, e.g.:
    - Juvenile Idiopathic Arthritis (JIA)
    - Rheumatoid arthritis (RA)
    - Psoriatic arthritis (PsA)





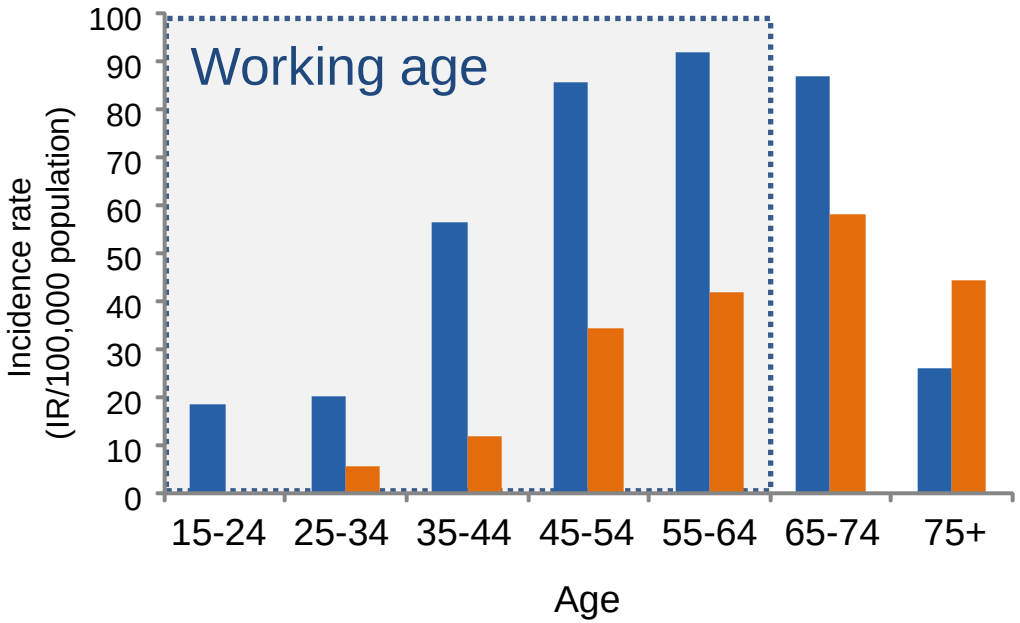
Background – Burden of RMDs

- Rheumatic and Musculoskeletal Disorders (RMDs) are the most prevalent diseases in the European working population
- Musculoskeletal problems account for the greatest number of days lost in the UK: 30.6 million per year
- 35% of days lost are due work-related ill-health are due to RMDs
- 2007-2008 expenditures on incapacity benefits for people with rheumatoid arthritis (RA): £122 million

Office for National Statistics, 2014, UK; Labour Force Survey , 2015, UK; Fit for Work Europe, MSD and Work, 2013, National Audit Office, 2009

Background – Rheumatoid Arthritis

- RA prevalence[1]: 1% UK adult population
- RA Incidence[2]:
  - Women: 54/100,000
  - Men: 25/100,000



1. Symmons, Rheumatology 2002;41:793-800; 2. Humphreys, ARD 2013;72:1315-20

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Absenteeism and Presenteeism

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Background – Worker Productivity loss

Perspective / Component	Outcome state	Cost indicator
Absenteeism	No. Days/Hours off work, work disability	Cost of time away from job
Presenteeism	Difficulties at work, at-work productivity loss due to ill health	Worker productivity loss expressed in hours translated into costs

The Journal of Rheumatology

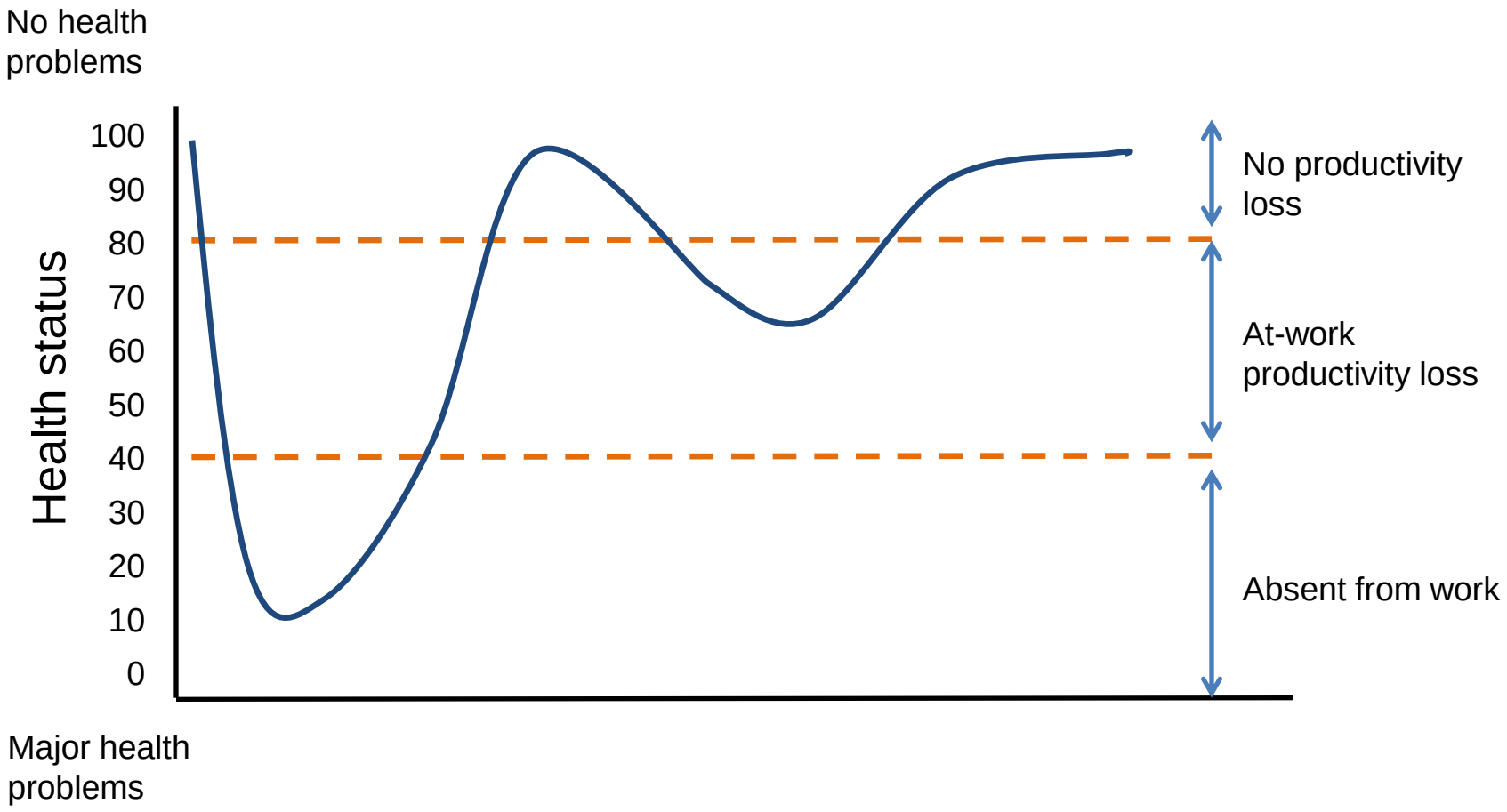
The Journal of Rheumatology Volume 36, no. 9

Measuring Worker Productivity: Frameworks and Measures

DORCAS BEATON, CLAIRE BOMBARDIER, REUBEN ESCORPIZO, WEI ZHANG, DIANE LACAILLE, ANNELIES BOONEN, RICHARD H. OSBORNE, ASLAM H. ANIS, C. VIBEKE STRAND and PETER S. TUGWELL

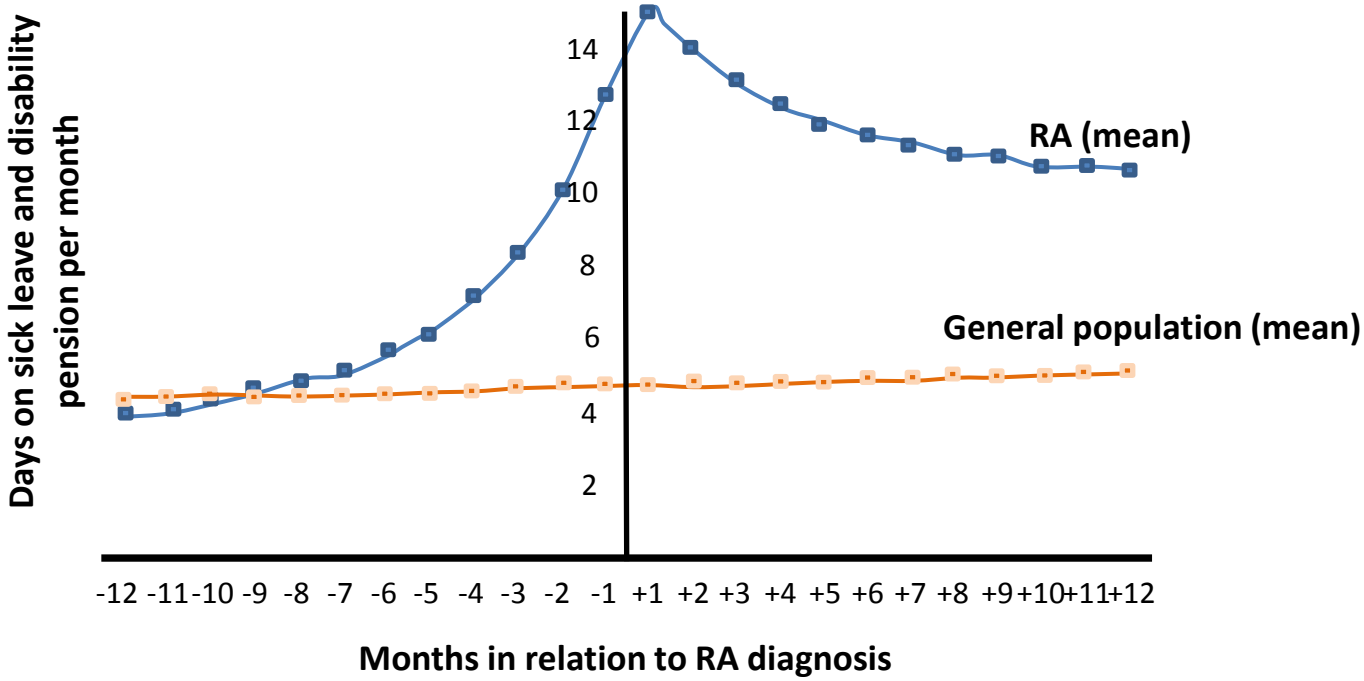
J Rheumatol 2009;36;2100-2109

Absenteeism and Presenteeism



Tang et al, J Rheumatol, 2011;38:1776-80; Verstappen, Best Pract Res Clin Rheumatol, 2015, 496-511

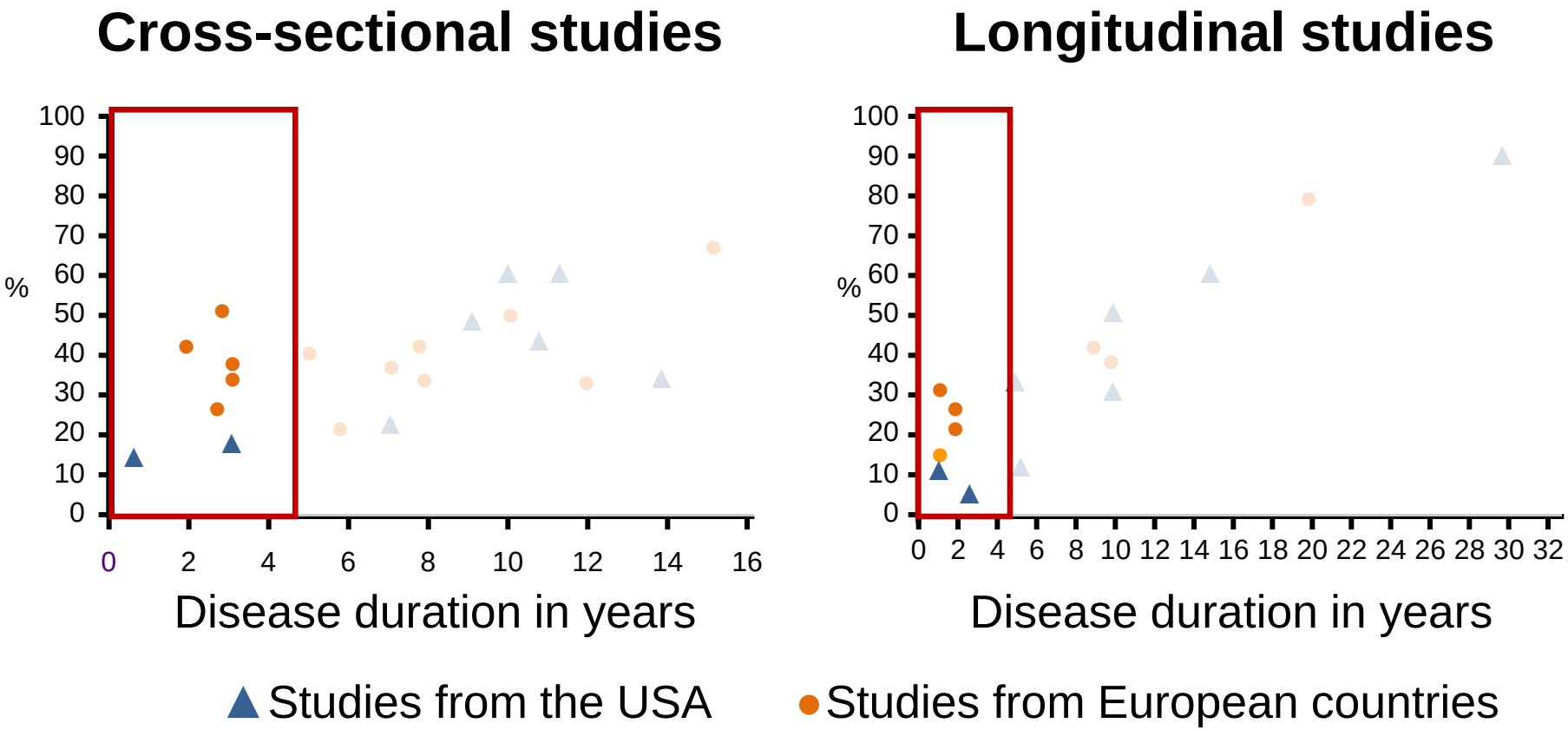
Sick Leave – before and after diagnosis rheumatoid arthritis



Days on sick leave and disability pension in relation to RA diagnosis (patients diagnosed 1999–2007; n=3029). General population comparators matched 5:1 on age (±1 year), sex, education level and county.

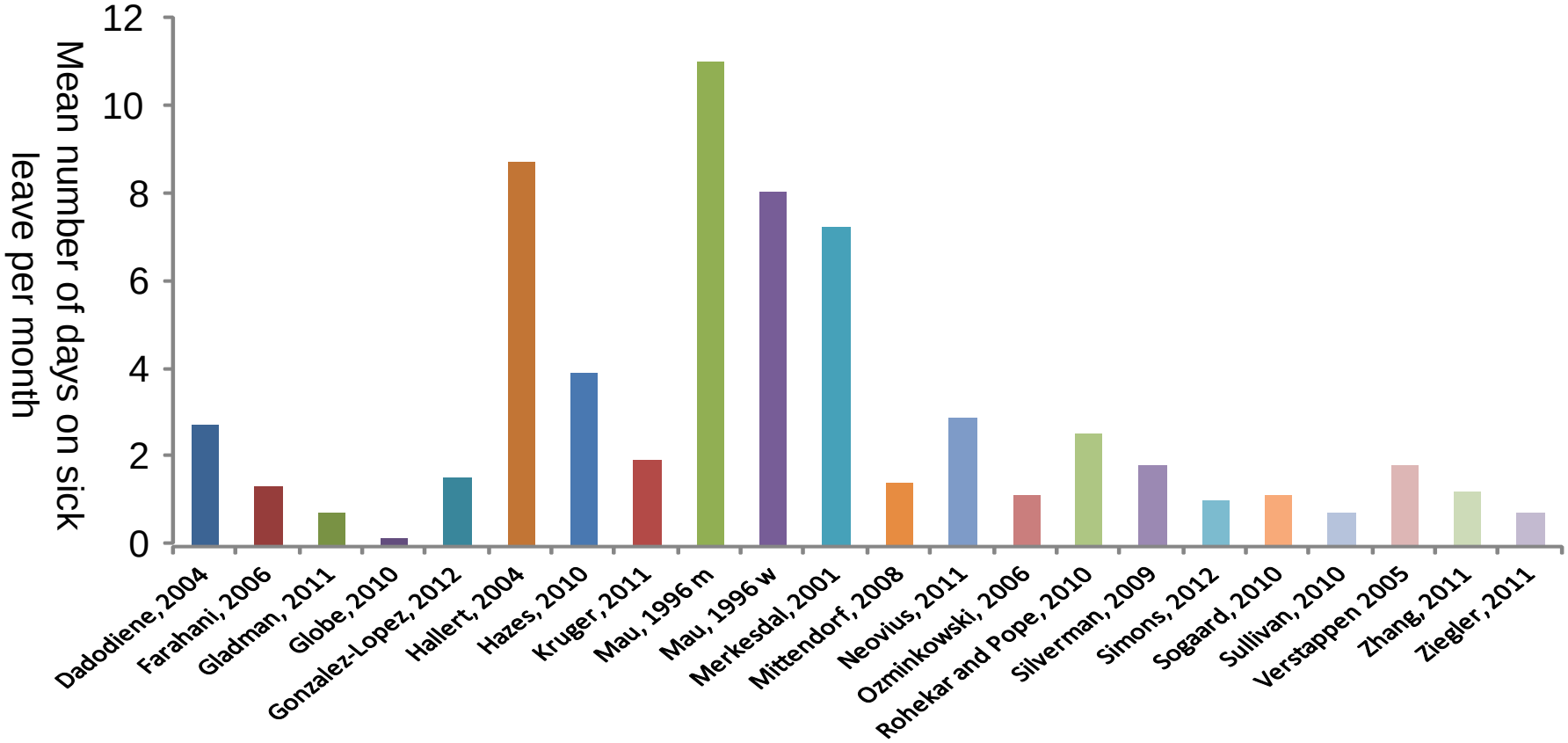
Adapted from Neovius et al. ARD 2011;70:1010-1015

Work Disability



Adapted from Verstappen et al. Arthritis Rheum 2004;51:488-97

Sick Leave



Adapted from Lenssinck et al. ARD 2013;72:493-505

Indirect costs (absenteeism)

	Men (n=159)	Women (n=417)	Total study population (n=576)
Paid productivity costs:			
FC method	473 (2182) [0 to 14223]	203 (1237) [0 to 12455]	278 (1559) [0 to 14113]
HC method	7750 (15131) [0 to 42020]	3170 (6654) [0 to 18683]	4434 (9957) [0 to 42020]
Household productivity costs:			
Formal Help	153 (1101)	619 (1306)	491 (1269)
Informal help	1250 (4109)	1670 (3338)	1554 (3569)
Total	1403 (4499)	2289 (3595)	2045 (3882)

Values are mean (SD) [range] costs in Euros per patient per year. The gross national wage was used to value loss of paid productivity in FC and HC methods. FC=friction cost method, HC=human capital method

Verstappen et al, ARD, 2005, 64: 1754-1750

Presenteeism

Multi-Item Measures

WALS & WLQ-25 continued...

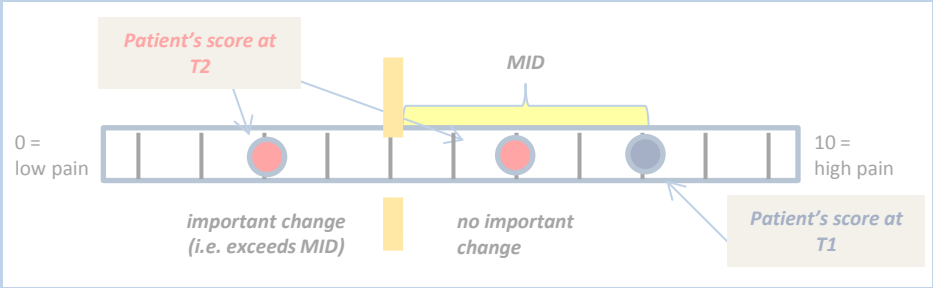
*The following questions ask about your work experiences in the **PAST TWO WEEKS**. The left column asks questions on the **amount of difficulty** experienced, and the right c about the **amount of time** you had difficulty. Please answer the questions below in both columns by ticking the box that is most appropriate to you.*

	In the past **2 WEEKS**, *how much difficulty* did you experience in each of the following because of your physical health or emotional problems?					In the past **2 WEEKS**, how much of the time did your physical health or emotional problems make it **DIFFICULT** for you to do the following?					
	No difficulty	**Some difficulty**	**A lot of difficulty**	**Not able to do**	**Difficulty not related to arthritis**	**None of the time (0%)**	**A slight bit of the time**	**Some of the time (about 50%)**	**Most of the time**	**All of the time (100%)**	**Not part of my job/not applicable**
7. Crouching, bending, kneeling or working in awkward positions?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8. Reaching?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9. Schedule or hours of work that your job requires?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10. Pace of work that your job requires?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11. Meeting your current job demands?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12. Concentrating or keeping your mind on your work?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

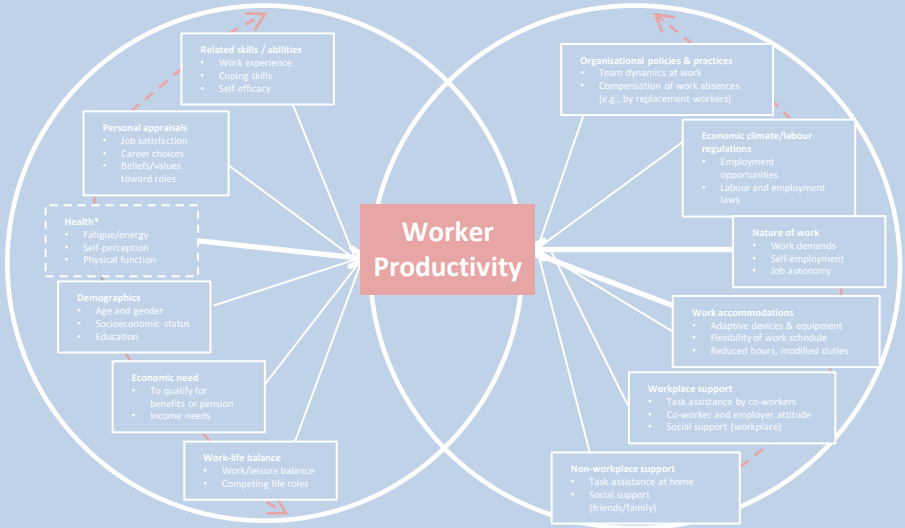
Global Measures

Rheumatologic condition had no effect on my work — 0 1 2 3 4 5 6 7 8 9 10 — Rheumatologic condition completely prevented me from working

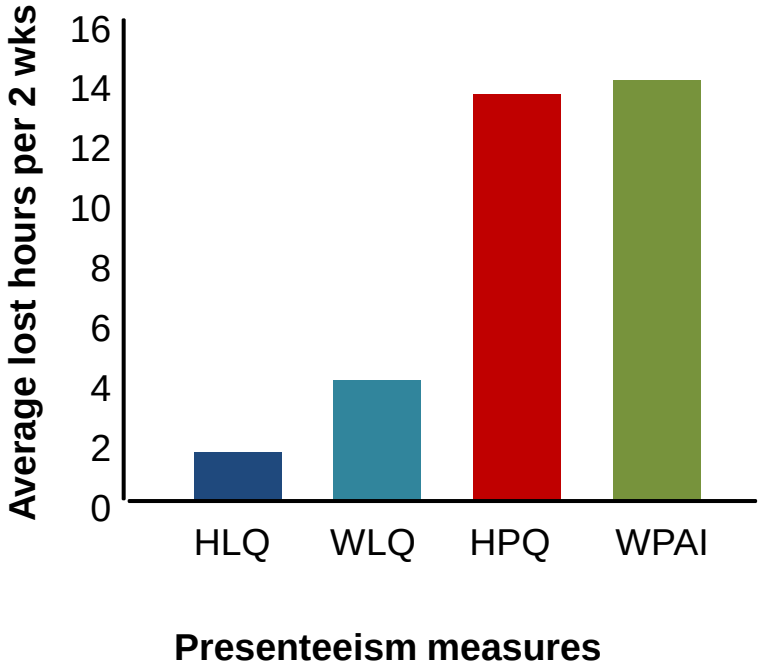
PASS & MID



Contextual Factors

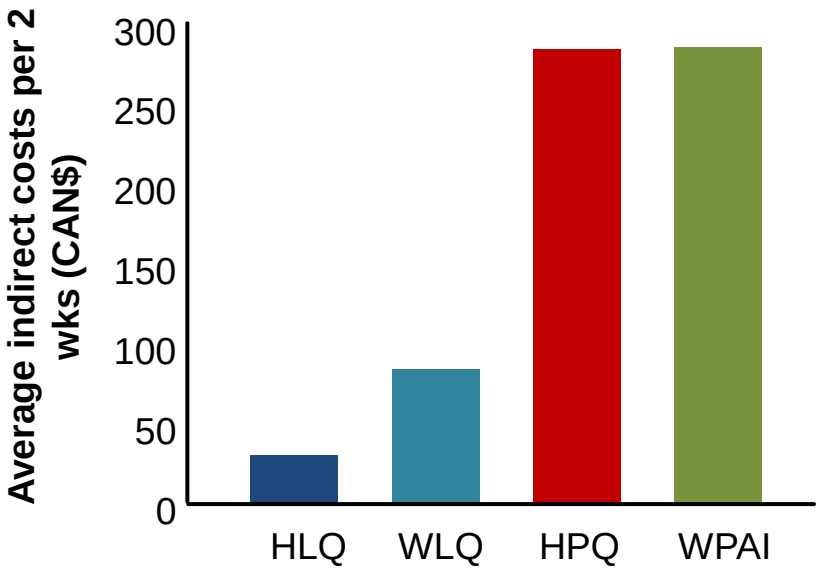


Presenteeism



Adapted from Zhang et al. J Rheumatol 2010;37:1805-14

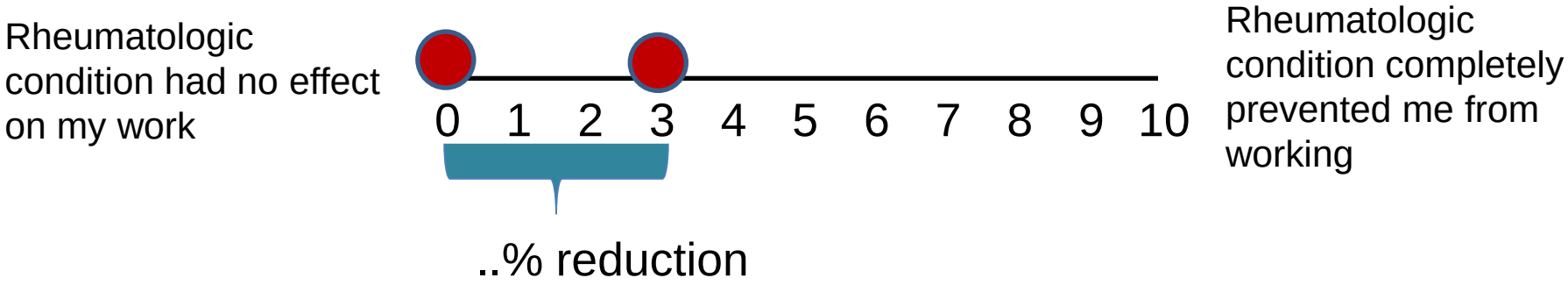
Indirect costs (presenteeism)



Presenteeism measures

Zhang et al. J Rheumatol2010;37:1805-14

Indirect costs (presenteeism)

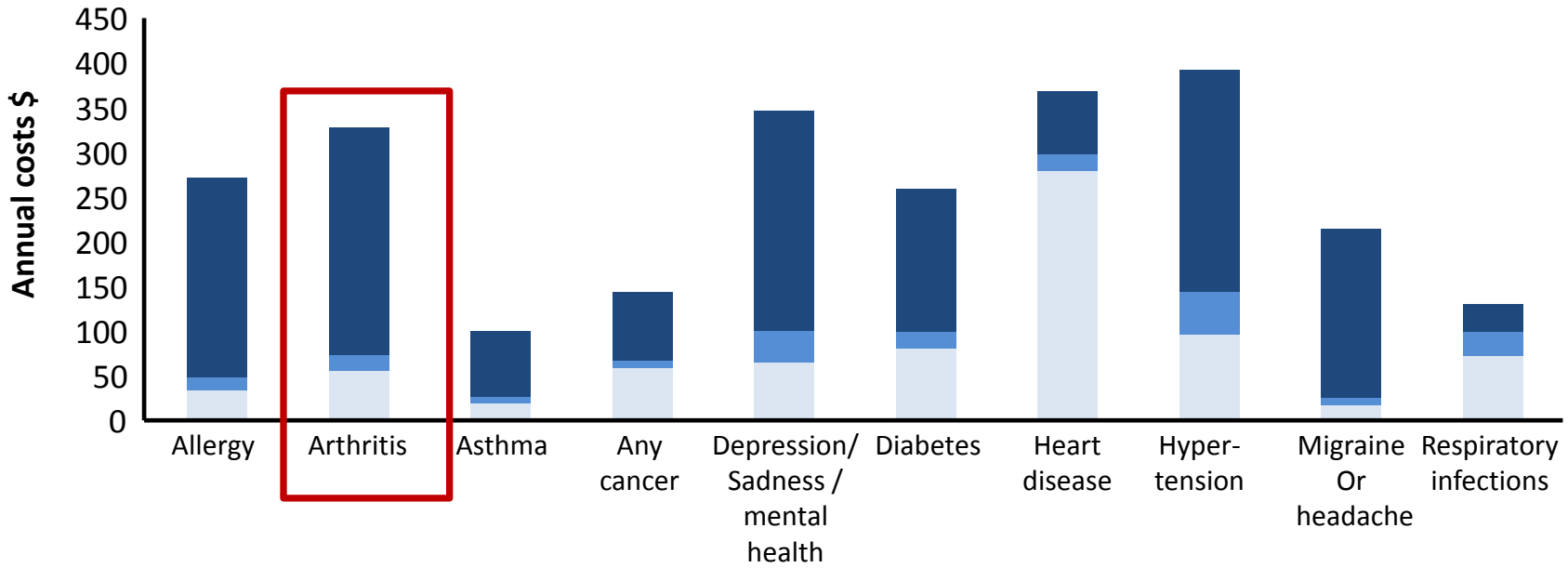


Indirect costs due to presenteeism = number of days affected * number of hours working per day * percentage impairment * hourly wage

Correct costs:

- Societal perspective?
- Employer's perspective?
- Patient's perspective?

Indirect costs (presenteeism)



Direct and indirect burden of illness, by condition and service area (using average impairment and prevalence rates for presenteeism component and $23.15/hour wage estimate)

Presenteeism Absence Direct costs

Adapted from Goetzel et al, J Occup Environ Med, 2004 46; 398-412

EULAR-PRO study

- Qualitative research:
  - Content validity
- Test-Retest study
- N=7 countries (n=10 patients per country)

Global measures:

- Work Productivity and Activity Impairment questionnaire (WPAI) *(Reilly et al, Pharmacoeconomics, 1993)*
- Work Productivity Scale – RA (WPS-RA) *(Osterhaus et al, Arthritis Res Ther, 2009)*
- Work Ability Index (WAI) *(Tuomi et al, 1998)*
- Quality and Quantity questionnaire (Q&Q) *(Brouwer et al, Health Policy, 1999)*
- WHO Health and Work Performance Questionnaire (HPQ) *(Kessler et al, J Occup Environ Med, 2003)*

Concept

Productivity

Ability

WPAI

During the past seven days, how much did your rheumatic condition affect your productivity while you were working?

How much did your rheumatic condition affect your **productivity** while you were working?

Rheumatologic condition had no effect on my work

0 1 2 3 4 5 6 7 8 9 10

Rheumatologic condition completely prevented me from working

Performance

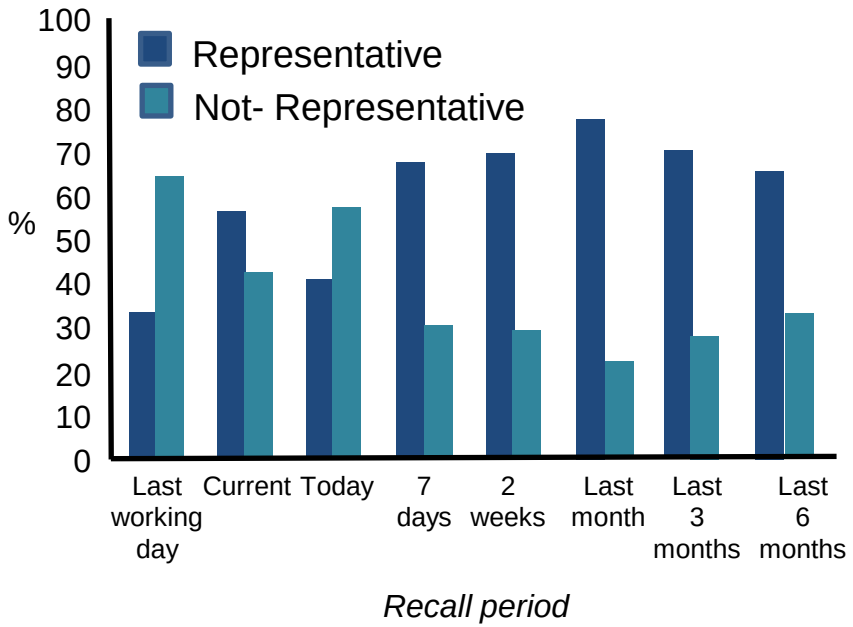
Quality

Quantity

Leggett et al. Rheumatology,2016;55:1364-73

Phase I - Results

WPAI - Productivity	QQ - Quality & Quantity	WAI – Work ability	HPQ- Performance	WPS-RA - Interference
• Efficacy (UK) • Output (Romania)	• Accuracy (Sweden) • Amount (The Netherlands)	• Fulfill (Canada) • Performance (France)	• Competing sports (Romania / Sweden) • Effective (Canada)	• Interrupt (Italy) • Impact (UK)



Leggett et al. Rheumatology,2016;55:1364-73

EULAR-PRO – Phase II

	United Kingdom N=76	France N=45	The Netherlands N=96	Estonia N=81	Sweden N=66	Romania N=-62	Italy N=31	Canada N=46
Age, years	48 (8)	46 (10)	49 (11)	46 (11)	49 (9)	42 (9)	47 (9)	51 (9)
Gender, female	53%	60%	54%	62%	73%	55%	84%	83%
General job demands:								
slightly demanding	12%	11%	34%	66%	12%	16%	7%	20%
demanding	41%	40%	40%	30%	41%	54%	50%	33%
very demanding	47%	49%	26%	4%	47%	30%	43%	47%
Job satisfaction:								
satisfied	57%	78%	84%	81%	66%	74%	73%	71%
neutral	19%	11%	11%	13%	17%	21%	17%	11%
unsatisfied	24%	11%	4%	6%	17%	5%	10%	18%
% patients absent in previous week due to ill-health	16%	20%	15%	26%	23%	18%	26%	33%
% work time missed due ill-health*	24 [9-100]	20 [13 – 34]	50 [19 – 72]	19 [10 – 50]	15 [9 – 50]	15 [9 – 50]	19 [5 – 33]	15 [3 – 50]
% impairment due to ill-health while working	20 [0-50]	20 [0 – 30]	20 [0 – 50]	20 [0 – 40]	30 [5 – 45]	20 [10 – 50]	20 [0 – 50]	20 [10 – 60]

Values are mean (SD) or median [IQR] depending on the distribution of the data. Categorical data are presented as %. * in those absent due to ill-health. # WPAI (0=condition no effect on work – 10=condition completely prevented work) /10 * 100*

Verstappen et al, EULAR 2017

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Interventions

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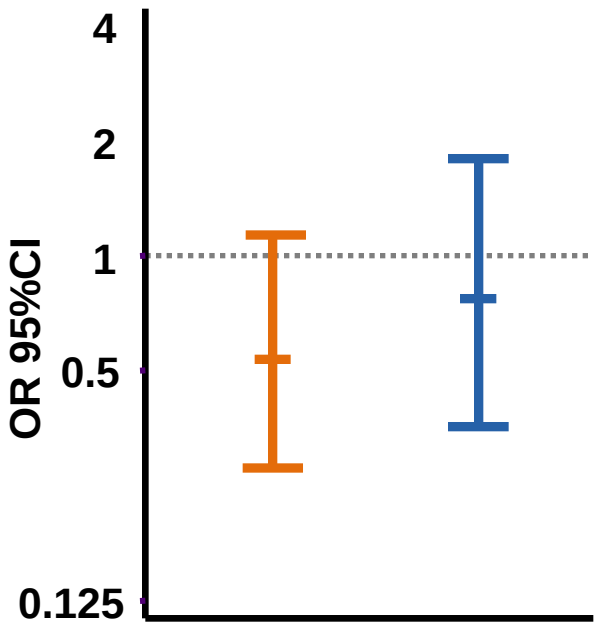
Pharmacological Interventions



- Anti-TNF use did not prevent new work disability
- Patients who responded to anti-TNF therapy were less likely to become work disabled

Unadjusted OR

Adjusted OR (adjusted for HAQ, DAS28 and job type)

Verstappen et al. Rheumatology, 2010;49:1570-7

Presenteeism and anti-TNF therapy RCTs

Author	Study design	Treatment	N	Disease duration in months	Presenteeism measure	Time points	Result	Sign.
Anis, 2009	RCT (COMET)	MTX ETN+MTX	100 105	8.9 (5.6) 8.6 (5.3)	WPAI (imputed based on HAQ) WLQ (imputed based on HAQ)	Baseline – 52 wks	WPAI % productivity loss, bootstrapped mean (95%CI): 23.1 vs 15.6, Δ-7.5 (95%CI -11.2, -4.2) WLQ % productivity loss, boostrapped mean (95%CI): 6.2 vs 4.8, Δ-1.4 (95%CI -2.1 to -0.7)	[↑] [↑]
Kavanaugh, 2009	Phase II RCT (RAPID I)	CZP200+MTX, CZP400+MTX, Placebo	162 139 69	6.1 (4.2)* 6.2 (4.4)* 6.2 (4.4)*	WPS-RA	0, 4, 24, 52 wks	RAPID I: MTX: mean 5.5 vs 4.2 vs 5.2 vs 5.2 CZP200: mean 5.2, 3.5, 2.7, 2.4 CZP400: mean 5.1, 3.6, 2.7, 2.4	[=] [↑] 24 and 52
Van Vollenhoven, 2010	RCT	MTX ADA+MTX ADA+placebo	214 219 231	0.8 (0.9)* 0.8 (0.8)* 0.7 (0.8)*	VAS degree to which patient's normal work performance is affected by RA in last week (0=unaffected to 100mm=completely affected)	0, 4, 8, 10, 12, 26,42, 52, 76 and 104 wks (random effects model)	Comb. Vs MTX: Δ difference ranging from 7.2 to 15.7 across visits ADA vs MTX: Δ NS at most visits	[↑] [=]

RCT = randomised clinical trial: anti-TNF=anti-tumour necrosis factor; ETN = etanercept; ADA = adalimumab; INF=infliximab; MTX=methotrexate;N=number of participants; WPS-RA=Work Productivity Survey for Rheumatoid Arthritis; WPAI = Work Productivity and Activity Impairment Scale; * disease duration of total study population; Δ = difference; [=] = no significant difference; statistical significant difference

Verstappen et al. Best Practice & Res Clin Rheum, 2015;29:495-511

Non-Pharmacological Interventions

	Intervention group (patients with inflammatory arthritis)	Control group (patients with inflammatory arthritis)
Allaire et al, 2003	• 1.5 hrs sessions during 5 months: – Job accommodation – Vocational counselling and guidance – Education and self-advocacy	• Written information on how to manage health related employment
De Buck et al, 2005	• Hospital-based multidisciplinary vocational rehabilitation programme during 4 to 12 weeks – Systematic assessment – Optional: education, counselling or treatment – Discussion	• Usual outpatient care
Macedo et al, 2009	• Comprehensive occupational therapy for a max. of 6 months – Work and functional assessment – Occupational therapy intervention – Referrals to eg multidisciplinary team or community service	• Routine review by rheumatologist

Hoving et al. Cochrane Database Syst Rev 2014

OMERACT Worker Productivity Group

Multi-Item Measures

WALS & WLQ-25 continued...

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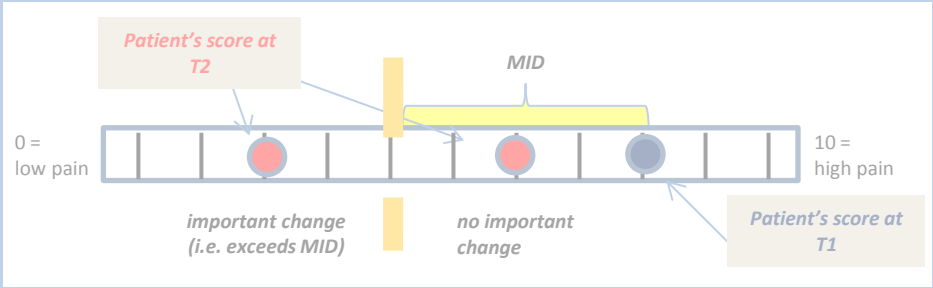
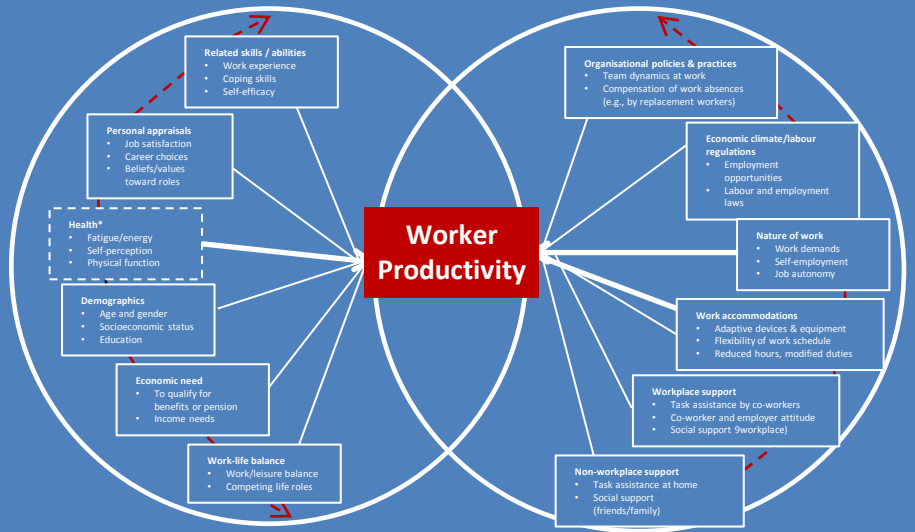


Contextual Factors



Environmental factors

- Coping skills
- Self-efficacy

- Socioeconomic status
- Education

Organisational policies & practices
- Team dynamics at work
- Compensation of work absences (e.g., by replacement workers)

Economic climate/labour regulations

Nature of work
- Work demands
- Self-employment
- Job autonomy

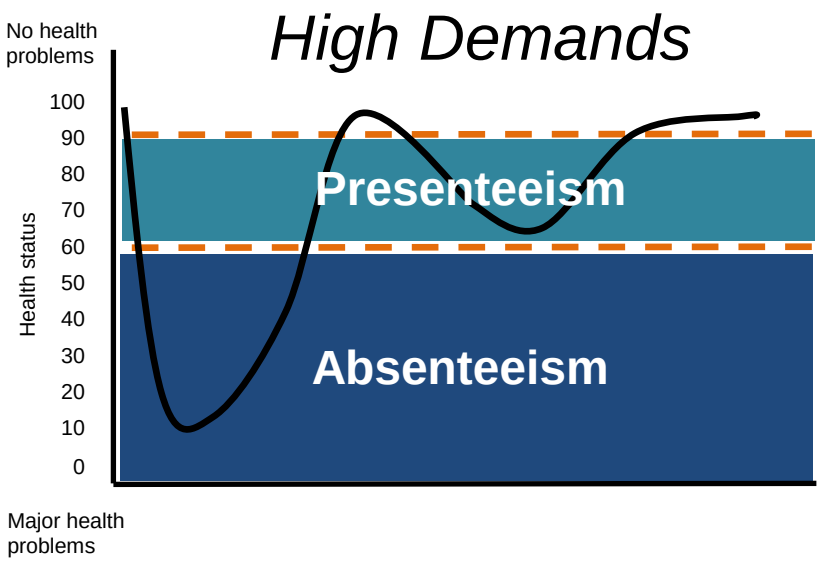
- Flexibility of work schedule
- Reduced hours, modified duties

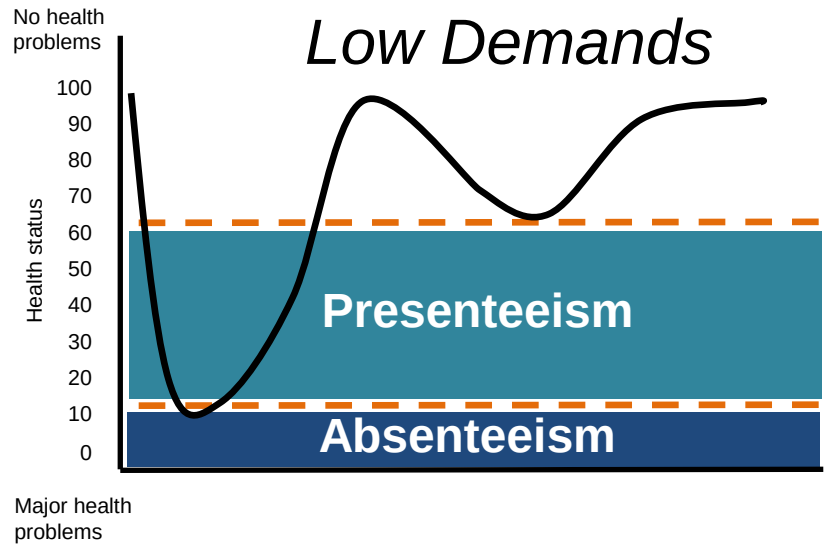
Workplace support
- Task assistance by co-workers
- Co-worker and employer attitude
- Social support 9workplace)

Non-workplace support
- Task assistance at home
- Social support (friends/family)

Worker Productivity

Impact job demands on Productivity loss





Predictors of work disability in RA

	↑ Disease duration	↑ Age	↓ Education	Marital status	Gender	↑ ESR	RF+	↑ Functional disability	↑ Joint count	↑ X-ray score	↑ Pain	↑ Disease severity
Doeglas	+	-	+		-	+		+				
Eberhardt		-b	-b	-b	-b	-b		+b	-b		-b	-b
Borg		+b	-b	-b	-b	-b		+b	-b		-b	
Young		+b				+b		+b	-b	+b		
Reisine	-	+	-	-	-			+				+
Mau	+b	+b				-b	+b	+b	+b	+b		
Fex		+b	+b	-b	-b			+b	-b	-b	-b	
Callahan	-	+	-	-	-		-	+	-	-		
Reisine	-	+b		-b	-b				+b		-b	
De Roos	+	+	-b	-	-			+	+pain, b		+	
Yelin	-	+b	+	-b	-b	-b	-b	+b	-m			-b
Wolfe	-m	-m	-b	+m		+m		+m		-b	+m	-m
Jantti			+m					+		-		
Sokka		+b	-b	-b	-b		-b		+b			
Barrett		-b					-b	+b	-b			
% sign. associations	3 (38)	10 (71)	4 (36)	4 (36)	0 (0)	3 (43)	3 (25)	13 (100)	4 (36)	2 (33)	2 (33)	1 (25)

ESR = erythrocyte sedimentation rate; RF=rheumatoid factor; + = significant finding; b=baseline value; m= mean value from over time

Verstappen et al. Arthritis Rheum 2004;51:488-97

Predictors of work disability in RA

	Job type	Physically demanding job	Self employment
Doeglas			
Eberhardt		+b	
Borg	+b		
Young	+b		
Reisine	-	+	
Mau	-b	-b	
Fex		-b	
Callahan	+b		
Reisine			
De Roos	-		
Yelin		+b	-b
Wolfe		+m	
Jantti	-b		
Sokka		+b	
Barrett			
	3 (43)	5(71)	0 (0)

+ = significant finding; b=baseline value; m= mean value from over time

Verstappen et al. Arthritis Rheum 2004;51:488-97

Challenges and Barriers to Remain in Work

Work Matters

A UK wide survey of adults with Rheumatoid Arthritis and Juvenile Idiopathic Arthritis on the impact of their disease on work

nras National Rheumatoid Arthritis Society

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Challenges

"The nature of reception work with it's constant interruptions of answering the front door and the telephone while trying to complete admin tasks that [illegible] accuracy and concentration...."

"All work is PC based which can be difficult during a flare [illegible] wrists are very painful."

"The amount of stress created by my employer doubting [illegible] my need for time off – even [illegible] letter from the doctor and refusing to accommodate my need to change my hours has made my life hellish. I feel more ill as a result and have been suffering with anxiety to the point of becoming unable to cope."

"The job is physically challenging particularly because the employer refused to upgrade the equipment or [illegible] the warehouse area to make it easier to pull [illegible] cages. The employer really cannot be bothered to support me at all and is looking to use the company's disciplinary process to sack me!"

"Difficult commute (can take 40 to 60 minutes), long hours on my feet nearly all day, lots of twisting of my hands and lifting."

"Getting to and from work during rush hour. Getting to different work sites for meetings..."

"The key challenge is making the chain of command understand invisible illnesses and overcoming stigma of *'you don't look ill'*; there is work ongoing to address this."

"Lack of understanding about the illness; employer pursuing capability following long term absence – stressful situation; threat of dismissal if further absence."

PC work difficult when having a flare

Commute to work

Lack of understanding

Advantages

"[illegible] insurance and additional sick [illegible] for the company."

"It pays the mortgage, I can afford to go on holiday, it sometimes keeps me going when I don't feel like it..."

"Gives me a sense of purpose and makes me get going in the morning. Keeps me cheerful."

"I retain a bit of independence and self respect."

"Continue to be active, keeps mind active, social, financially better off"

"I like the job, the company, colleagues and getting out of the house."

"Flexibility when I do my hours. If I am stiff in the morning I can work in the afternoon when I feel better."

"It is very physical and tiring, however I have requested that I do not work more than 2 days in a row, and this is working out ok."

"Local, close to home. Park right outside the building. All on one level, no stairs."

"Some equipment made available [illegible] after first being diagnosed [illegible]"

"Colleagues know and understand [illegible]"

"They are fully aware of my current health and needs. They have acknowledged my requirements to reduce hours and flexible working"

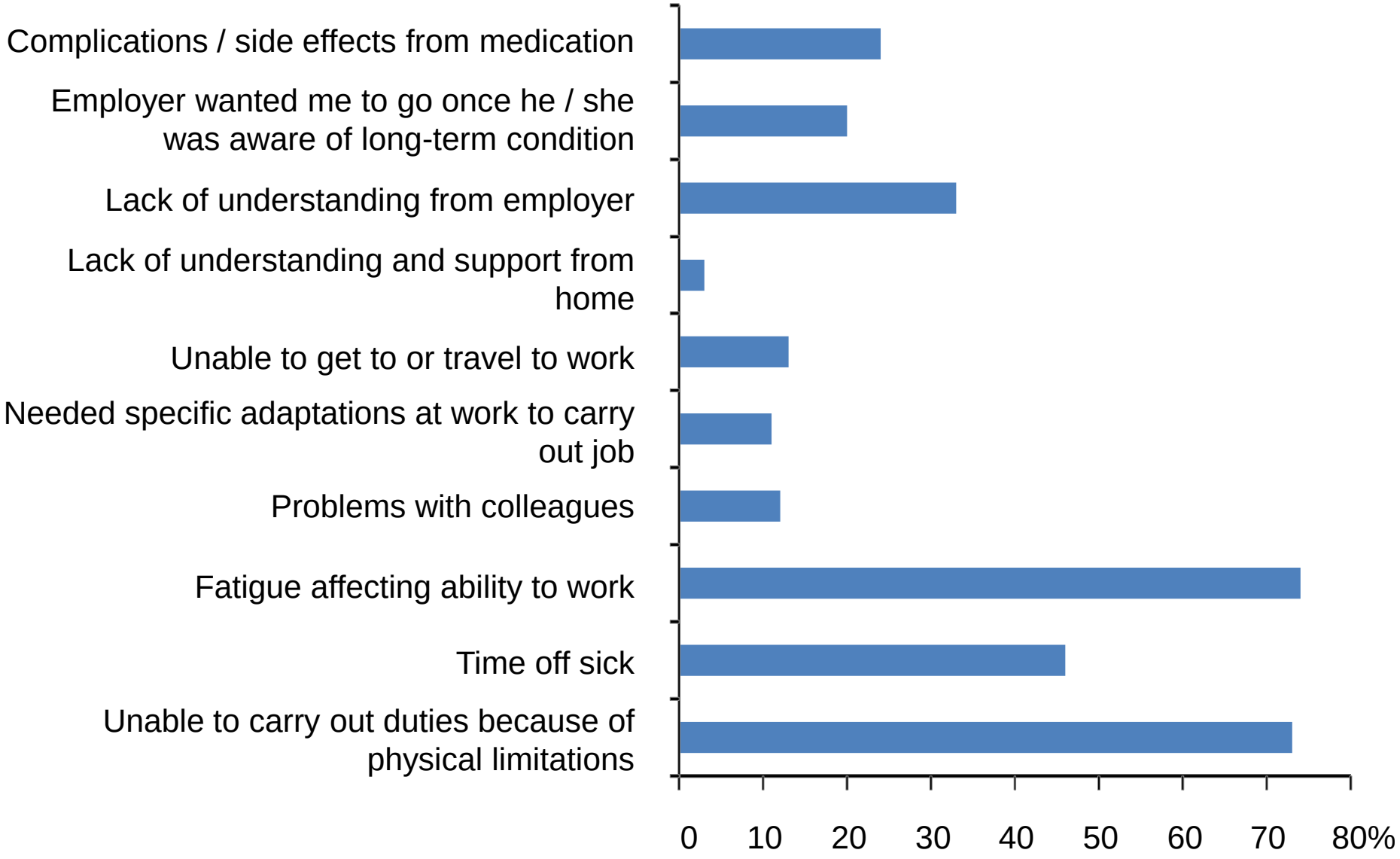
Financially

Flexibility

Availability of equipment

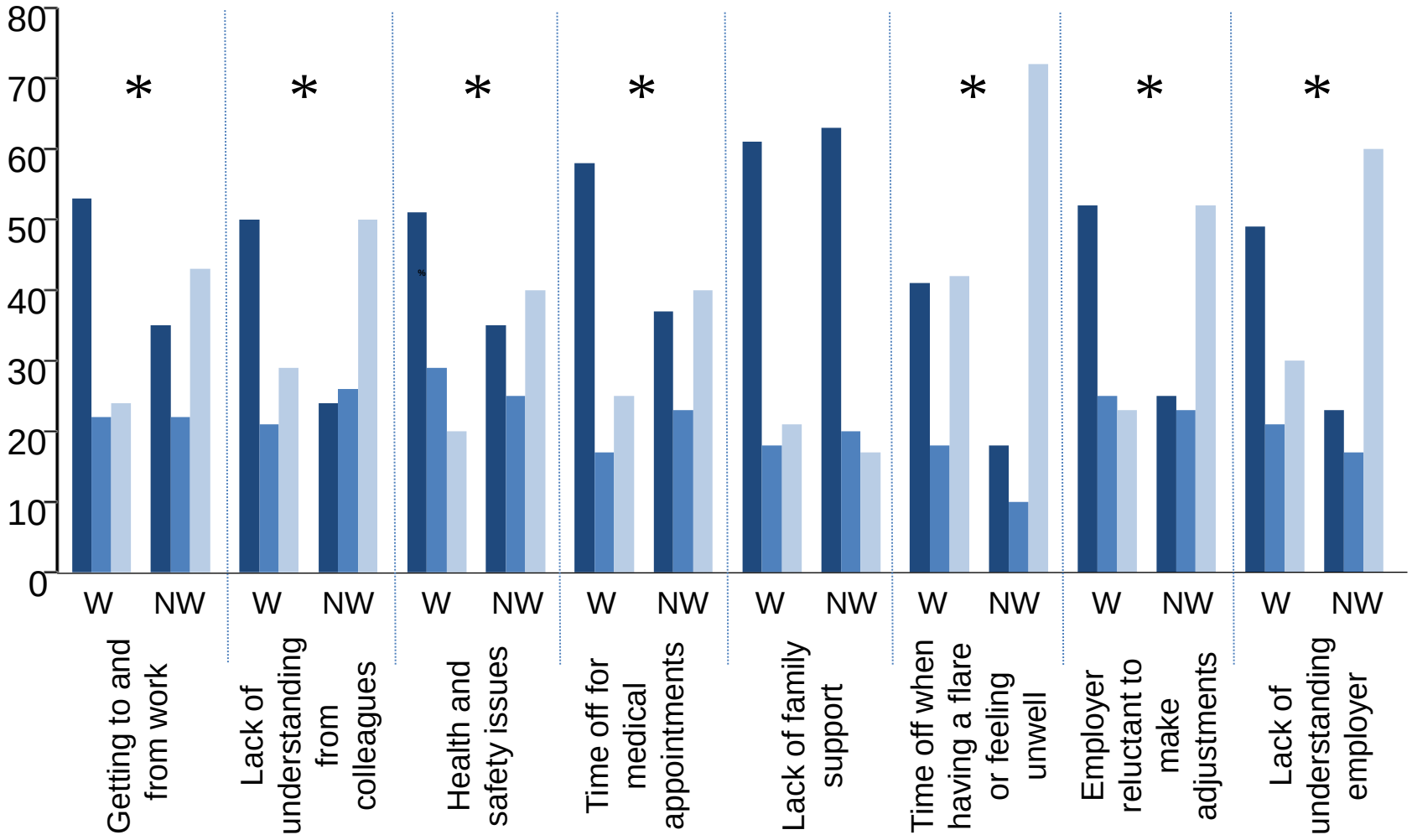
National Rheumatoid Arthritis Society Survey, 2017: https://www.nras.org.uk/publications/work-matters

Challenges and Barriers to Remain in Work



Verstappen et al, EULAR 2018

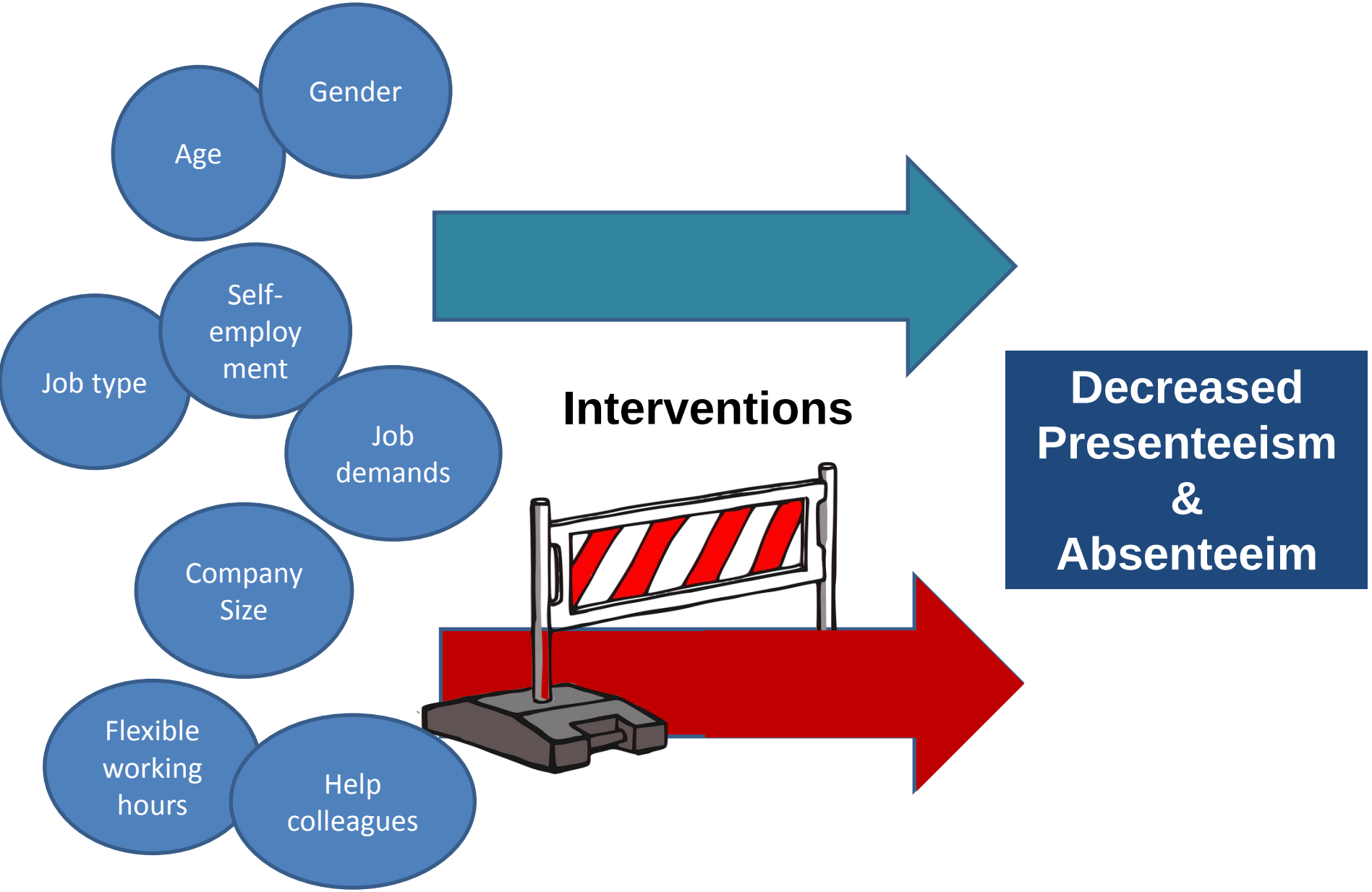
Challenges and Barriers to Remain in Work



Problems patients with RA experience in their current job for those working (W) or in their last job prior to stopping work or early retirement (NW). ■ not serious; ■ neither serious nor non-serious; ■ (very) serious.
* $p<0.05$

Verstappen et al, EULAR 2018

Barriers and Facilitators



Conclusions

- Work important for patients with RA:
  - Self-esteem
  - Financial independence
- Worker productivity loss still major socio-economic problem in patients with RA
- Several disease related and job related factors associated with worker productivity loss
- Personalized interventions

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