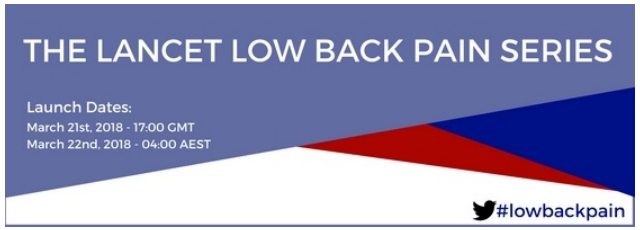
Amsterdam UMC
University Medical Centers

Intervention research to promote work participation: Should we focus on changing people or their environment?

Prof. Han Anema, MD PhD

Disclosure

- Supported through a Professorship in Insurance Medicine from the Dutch Social Security Agency
- Shareholder & senior consultant Evalua Ltd.
- Chair of the research institute of Insurance Medicine AMC, UMCG, UWV, VUmc
- Consultant & ambassador for IkHerstel Ltd.
- Chair of the ICOH committee WDPI
- Editor of Handbook for Work disability Prevention & management



Low back pain 1

What low back pain is and why we need to pay attention

Jan Hartvigsen, Mark J Hancock*, Alice Kongsted, Quinette Louw, Manuela L Ferreira, Stéphane Genevay, Damian Hoy, Jaro Karppinen, Glenn Pransky, Joachim Sieper, Rob J Smeets, Martin Underwood, on behalf of the* Lancet *Low Back Pain Series Working Group†*

Low back pain 2

Prevention and treatment of low back pain: evidence, challenges, and promising directions

Nadine E Foster, Johannes R Anema, Dan Cherkin, Roger Chou, Steven P Cohen, Douglas P Gross, Paulo H Ferreira, Julie M Fritz, Bart W Koes, Wilco Peul, Judith A Turner, Chris G Maher, on behalf of the Lancet *Low Back Pain Series Working Group**

Low back pain: a call for action

Rachelle Buchbinder, Maurits van Tulder, Birgitta Öberg, Lucíola Menezes Costa, Anthony Woolf, Mark Schoene, Peter Croft, on behalf of the Lancet *Low Back Pain Series Working Group**

Low back pain 1

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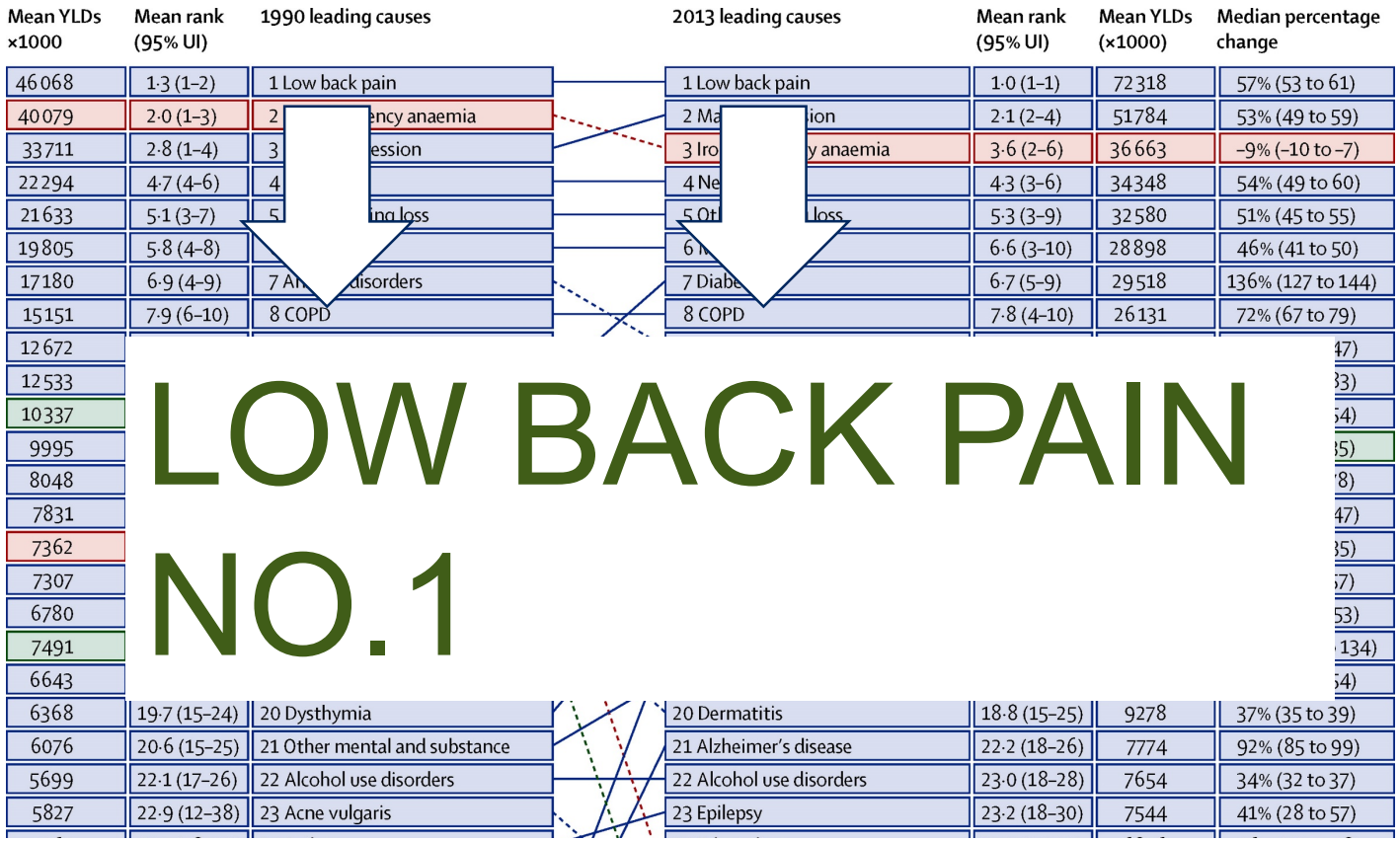
1992 – 2017 WHAT DIDN'T CHANGE

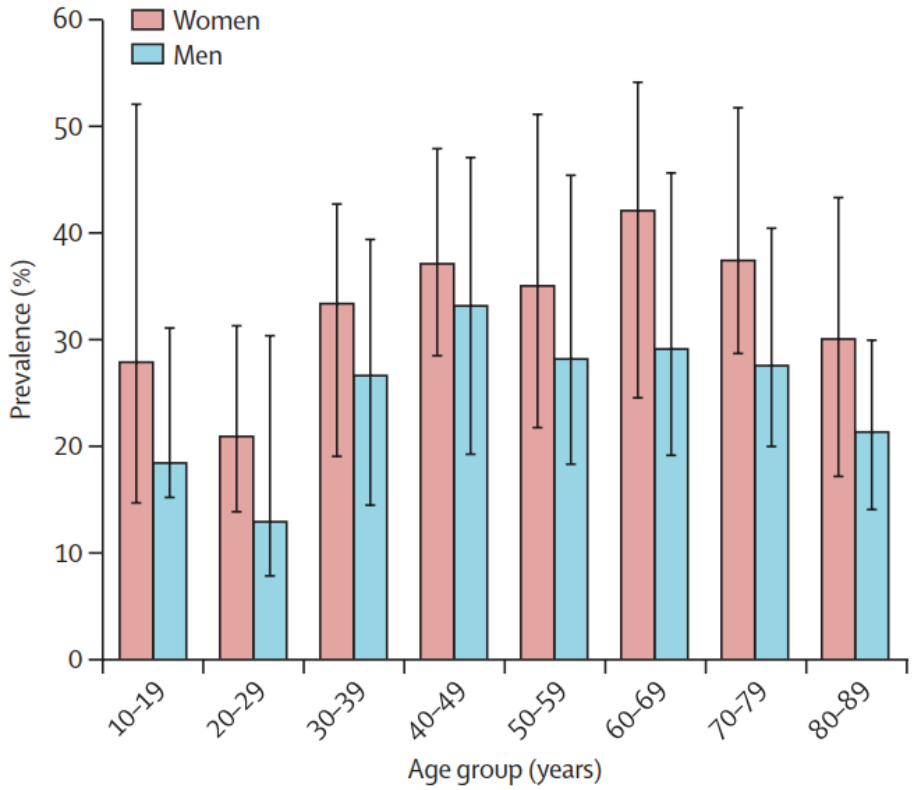


Mean YLDs ×1000	Mean rank (95% UI)	1990 leading causes	2013 leading causes	Mean rank (95% UI)	Mean YLDs (×1000)	Median percentage change
46 068	1·3 (1–2)	1 Low back pain	1 Low back pain	1·0 (1–1)	72 318	57% (53 to 61)
40 079	2·0 (1–3)	2	2 Ma ion	2·1 (2–4)	51 784	53% (49 to 59)
33 711	2·8 (1–4)	3 ession	3 Iro y anaemia	3·6 (2–6)	36 663	−9% (−10 to −7)
22 294	4·7 (4–6)	4	4 Ne	4·3 (3–6)	34 348	54% (49 to 60)
21 633	5·1 (3–7)	5 ing loss	5 Oth loss	5·3 (3–9)	32 580	51% (45 to 55)
19 805	5·8 (4–8)		6	6·6 (3–10)	28 898	46% (41 to 50)
17 180	6·9 (4–9)	7 An isorders	7 Diabe	6·7 (5–9)	29 518	136% (127 to 144)
15 151	7·9 (6–10)	8 COPD	8 COPD	7·8 (4–10)	26 131	72% (67 to 79)
12 672						47)
12 533						33)
10 337						54)
9995						35)
8048						8)
7831						47)
7362						35)
7307						57)
6780						53)
7491						134)
6643						54)
6368	19·7 (15–24)	20 Dysthymia	20 Dermatitis	18·8 (15–25)	9278	37% (35 to 39)
6076	20·6 (15–25)	21 Other mental and substance	21 Alzheimer's disease	22·2 (18–26)	7774	92% (85 to 99)
5699	22·1 (17–26)	22 Alcohol use disorders	22 Alcohol use disorders	23·0 (18–28)	7654	34% (32 to 37)
5827	22·9 (12–38)	23 Acne vulgaris	23 Epilepsy	23·2 (18–30)	7544	41% (28 to 57)

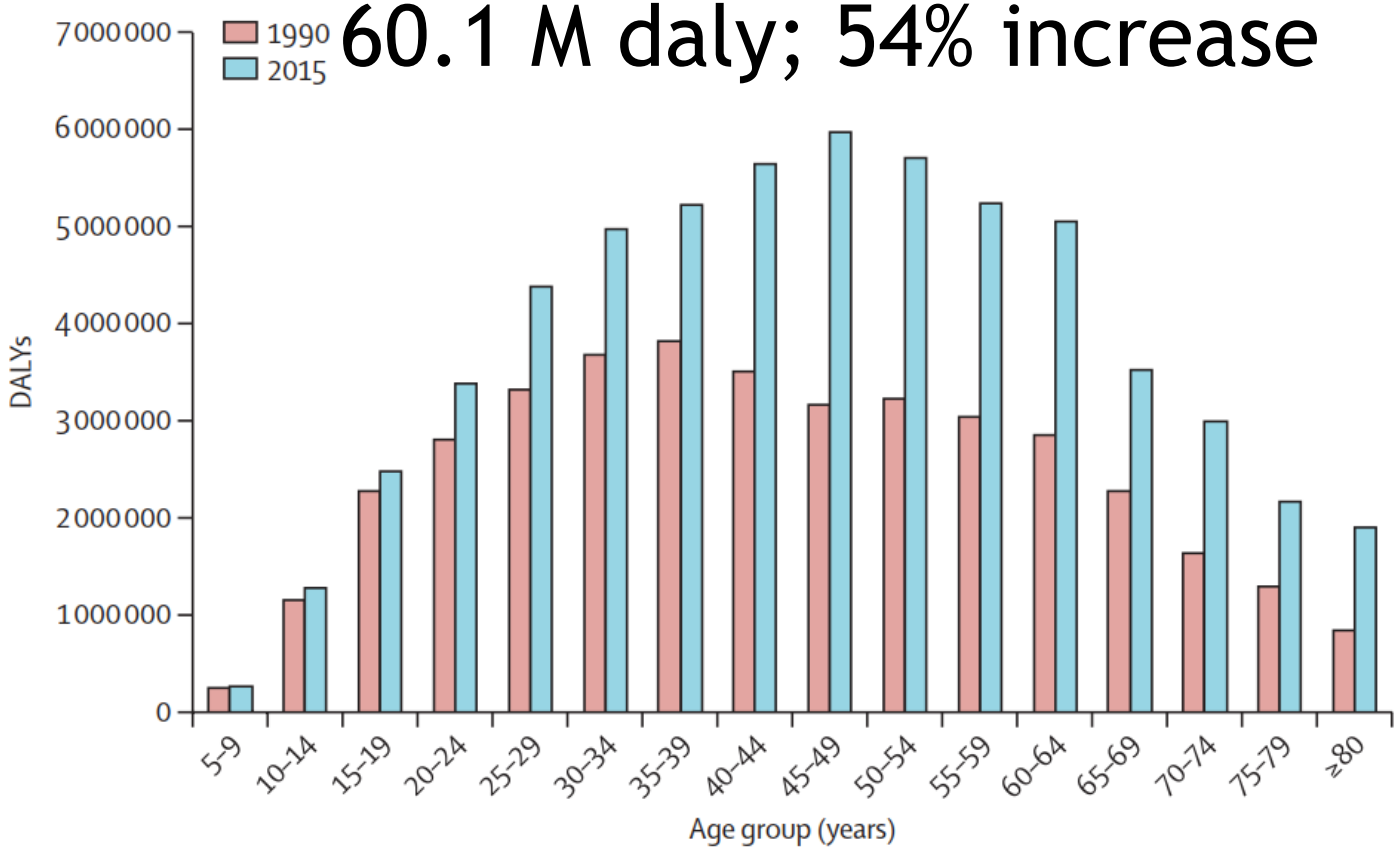
LOW BACK PAIN NO.1

Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013 – The Lancet 2015; june 5

Global 1-year prevalence and burden in disability-adjusted life-years (DALYs)



60.1 M daly; 54% increase



Hartvigsen et al. Lancet 2018

Burden of low back pain

- Disability highest in **working age populations**
  - In high-income countries ca. 80% of the costs are due to work disability

- In **low-income countries**, low back pain disability might contribute to the cycle of poverty
  - Limited possibilities for job modification
  - loss of independence and social identity

Low back pain 2

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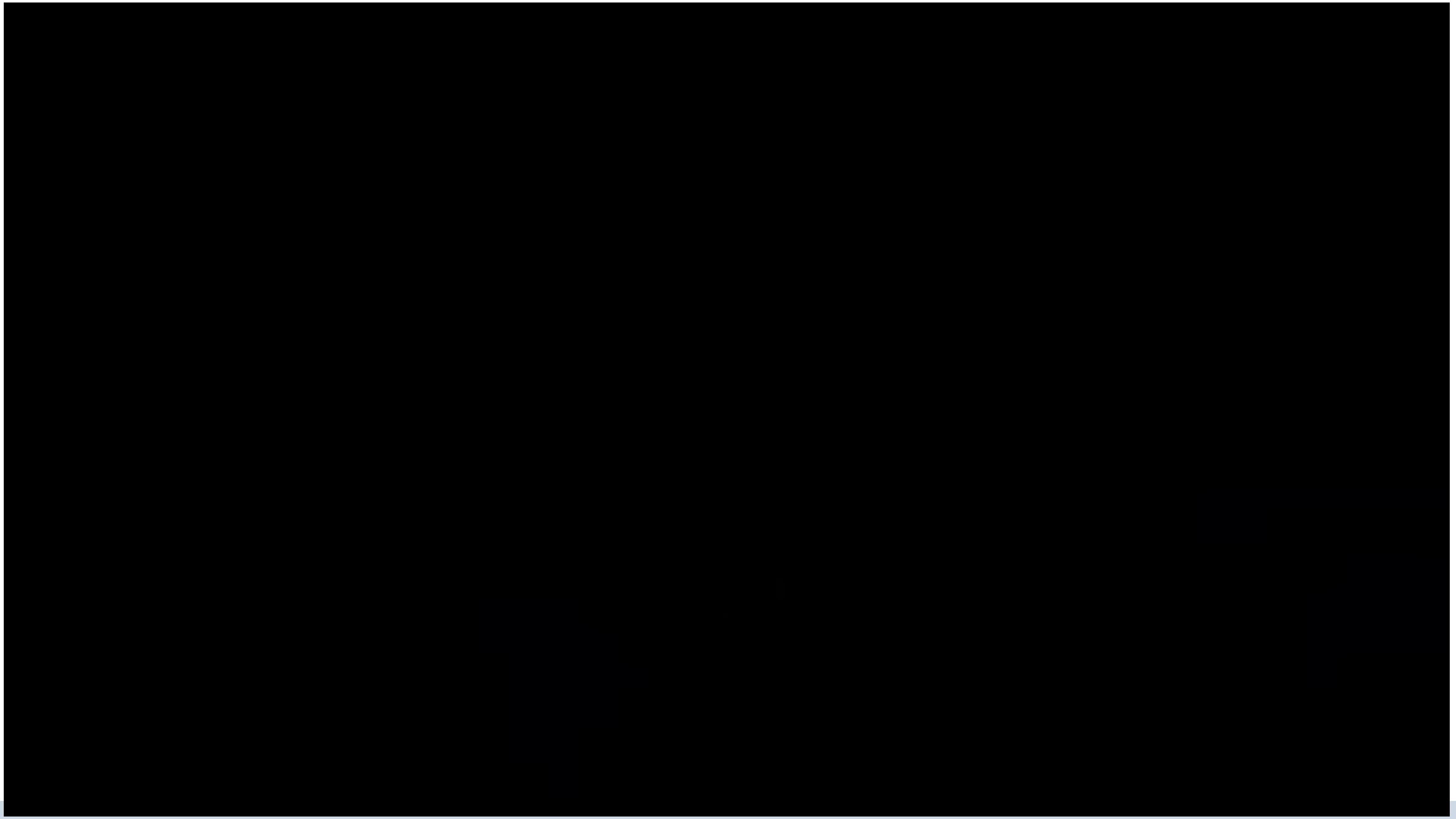
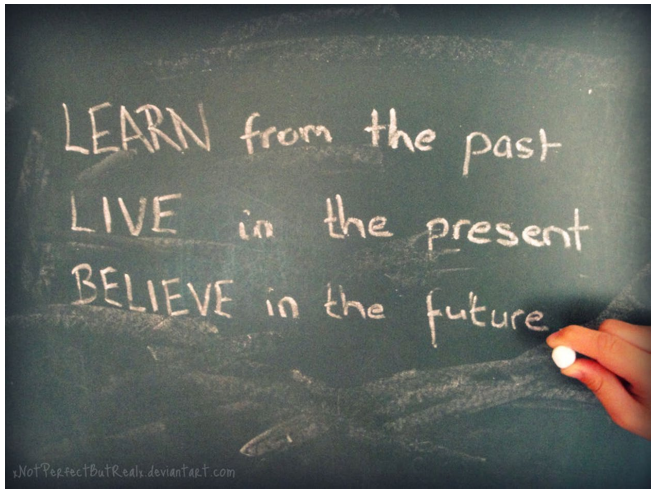


What is the problem?



HCP

- Medicalised approach for LBP
- Ineffective & harmful practises despite evidence/guidelines
  - Over-reliance on medication and other passive treatments
  - Overuse of invasive treatments

Industry & reimbursement systems

- promoting ineffective practises like medication and invasive treatments for LBP

Public

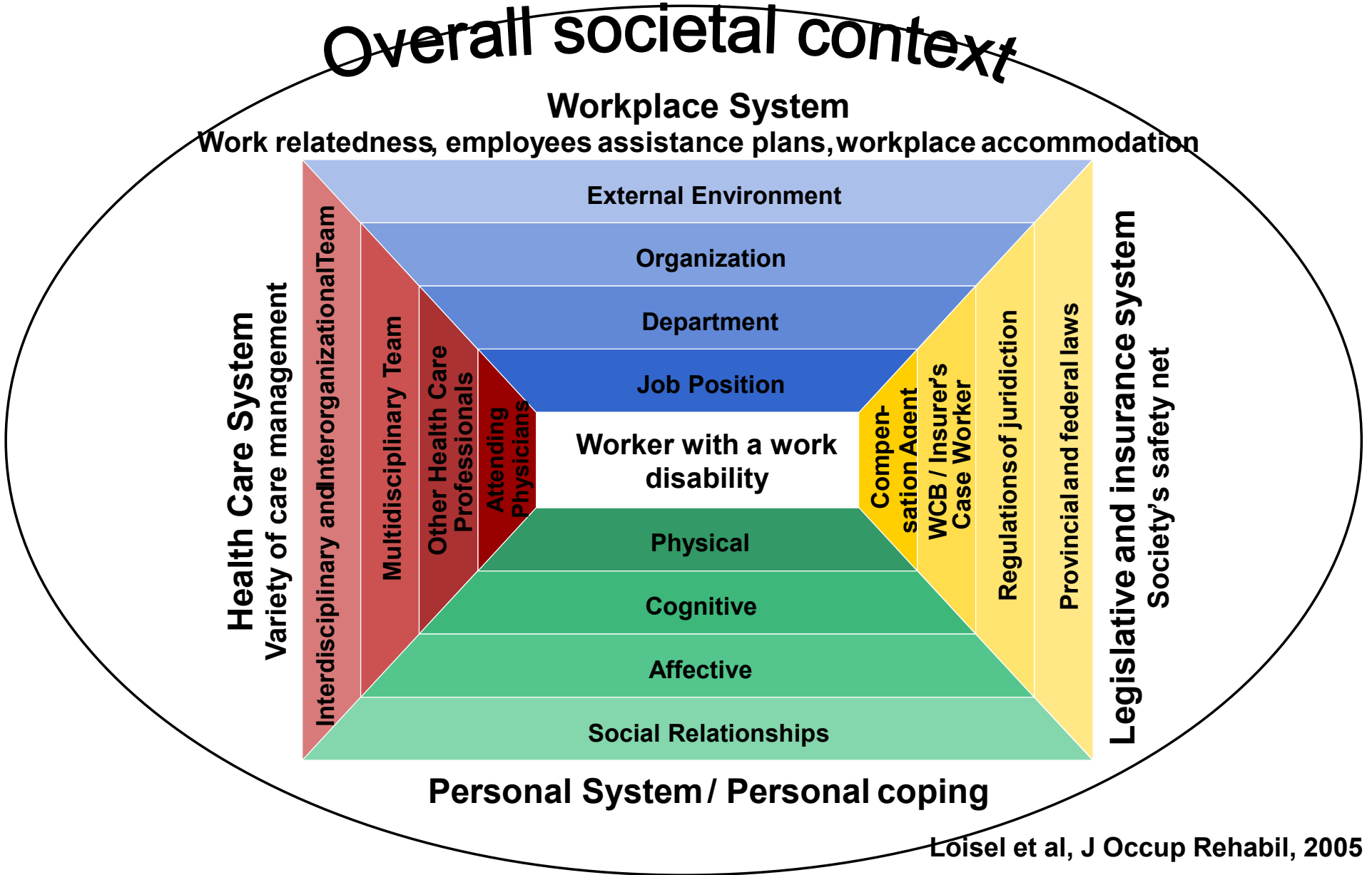
- Misconceptions about towards medical investigations and treatment for LBP

Foster et al. Lancet 2018

Lancet series

Buchbinder et al. Lancet 2018

Work Disability Paradigm



Loisel et al, J Occup Rehabil, 2005

Promising New Directions

- ✓ Public health system
- Social/compensation system
- Work system
- Healthcare system

Foster et al. Lancet 2018

Misconceptions among the public

- Mismatch
  - General public's beliefs & behaviours about medical investigations and treatment for LBP
  - Best practises in HCP guidelines: advice to stay active and at work

- Need to educate the public
  - in line with the concept 'positive health' regarding *their beliefs & behaviours of non-specific low back pain (Huber, BMJ 2011)*

	Australia “Back Pain: Don’t Take it Lying Down”	“Working Backs” Scotland	Canada “Back Active”	Norway “Active Back”
Setting	Victoria, Australia	Scotland, UK	Alberta, Canada	2 counties, Norway
Period	Sept 1997 - Dec 1999	Feb 2001 - 2004	May 2005 - Present	Apr 2002 – Jun 2005
Main medium	TV adverts in prime time	Radio adverts	Radio adverts	Local TV, radio/cinema ads
Other media	Radio, billboard, print ads, posters, seminars, visits by well-known personalities to workplaces, publicity articles and publications	Professional education campaign, leaflets, clinical guidelines, Back Book, book on Managing Back Pain in the Workplace, posters	Website, posters, pamphlets, bus and billboard ads, public and industry news publications. TV announcements	Website, posters with the messages of the campaign at healthcare clinics and information papers sent to all households
Intensity and frequency	Intense for 12 months, then less intense for 12 months and then final intense campaign for 3 months.	1777 15-second ads on all 15 radio stations in Scotland during a 4 week period. Heard by 60% of adults	Continuous website. Radio ads during peak listening months only. Heard by 49%	Website throughout the period, 4 one-month campaign periods during the total period
Main messages	Back pain not serious; Positive attitudes important; Continue usual activities; Continue exercising Remain at work if possible; X-rays are not useful; Surgery may not be the answer; Keep employees at work	Stay active; Try simple pain relief; If you need it, get advice. Don't take back pain lying down; There's a lot you can do to help yourself; Prognosis is good	The key to feeling better sooner when you have back pain is to stay active	LBP rarely dangerous; X-rays rarely reveal cause; Moving = improve faster; Work with your back; Return to work as soon as possible; Only a few people with back pain need surgery

	Australia "Back Pain: Don't Take it Lying Down"	"Working Backs" Scotland	Canada "Back Active"	Norway "Active Back"
Campaign messengers	International back pain experts, sports personalities who had successfully managed back pain, actors, comedians, healthcare professionals, Minister for Health	Support from a well-known Scottish sports personality produced extensive (free) press and television news cover	Local healthcare professionals and organizations, Olympic Gold Medalist	Animation figure (humorous)
Overall cost	USD $7·6 million	~USD $400,000	USD $934,500	USD $1·1 million
Results	Improvements in back pain beliefs in Victoria (Back Beliefs Questionnaire scores 26·5,28·4,29·7), v control (26·3,26·2,26·3). Reduction in number of claims (15%), medical payments for claims for back pain (20%) and rate of days compensated	Significant change in back pain beliefs, from ~55% rest versus 40% staying active to ~30% rest versus 60% staying active ($p < 0·001$) No effect on sickness absence or new awards of social security benefits for back pain	Proportion agreeing with statement about staying active increased from 56% to 63% ($p=0·008$) with no change in control (consistently ~60%). No effect on healthcare use (imaging or visits to health professionals or work disability claims)	Improvement in beliefs, eg. beliefs about the use of X-rays and importance of remaining active and at work. No corresponding change in healthcare utilization (imaging or surgery for back pain)

Australian PH campaign

- Changes in back beliefs
- Change in claim behaviours

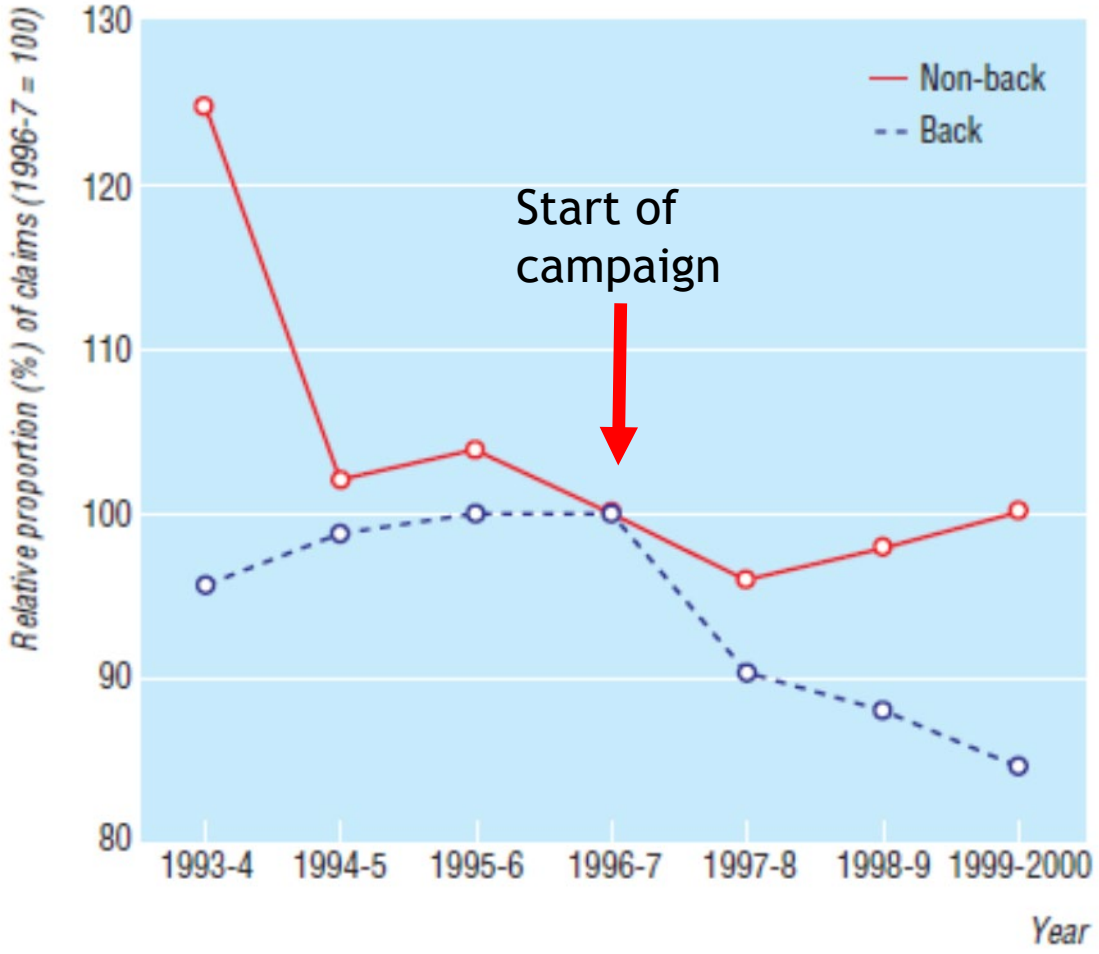
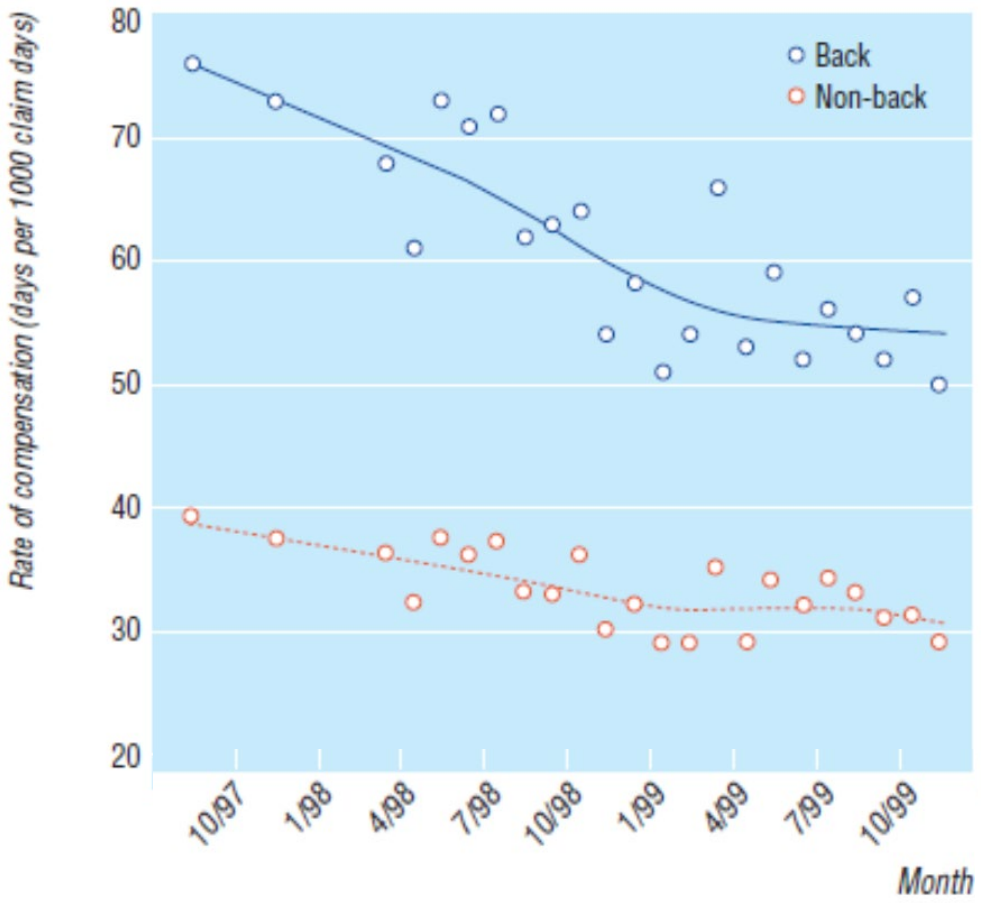
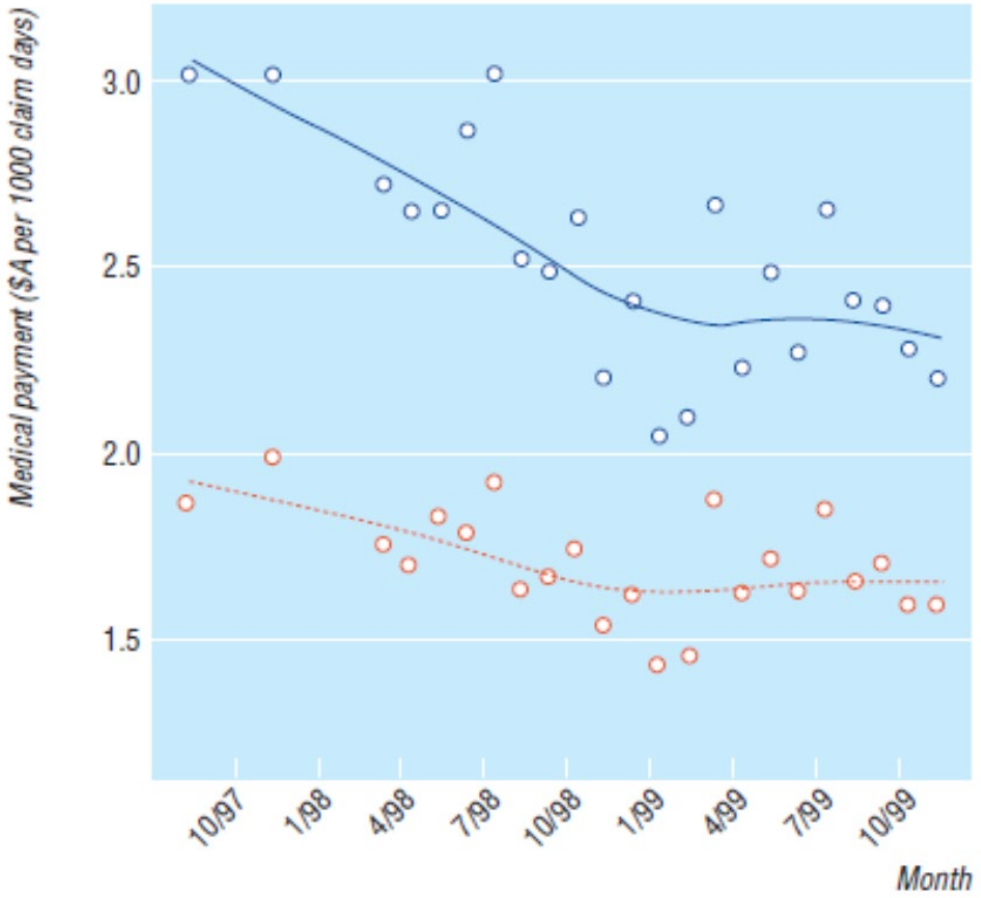


Fig 1 Change in numbers of claims over time by type of claim, Victorian WorkCover database, 1993-4 to 1999-2000. Both series indexed to number of claims in 1996-7

Buchbinder, et al BMJ 2001

Compensation & medical payment





Buchbinder, et al BMJ 2001

More personalised targeted approach

- Netherlands
- Inspired by the Australian campaign
- 779 patients
- 53 GPs
- Stepped wedge RCT

- Multidisciplinary training for professionals (GPs, PTs & OPs)

- Website & social media with videomessages for LBP patients

Suman et al 2015

Results

Multifaceted strategy

58 % of GPs attended the training

55% of patients used website/ social media/ videomessage

Guideline adherance (n = 5130 contacts)
- ↓ referrals to neurologists
- × referrals to other specialists
- × referrals diagnostic imaging
- ×collaboration in primary care

Clinical outcomes (n =779 patients)
- ×Back Beliefs
- ×Functional Status
- ×Work status

healthcare costs
productivity loss costs

Suman et al 2018, & Suman et al. Preliminary UNPUBLISHED DATA DO NOT DUPLICATE, CITE OR DISTRIBUTE

Table 4. Crude costs per cost category in euros (Δ).

Cost category		Mean costs (SEM) in €	Δ Costs (95%-CI) in €
	Intervention	Control	
Direct costs			
Primary care	340 (26)	405 (26)	-65 (-134;-2)
Secondary care	478 (228)	229 (42)	249 (58;515)
Alternative care	742 (218)	322 (55)	421 (182;722)
Medication	29 (7)	44 (9)	-15 (-45;-0.70)
Intervention	70	0	70 (N/A)
Indirect costs			
Absenteeism	1034 (242)	1547 (235)	-513 (-941;-77)
Presenteeism	5735 (681)	6342 (537)	-607 (-2076;-831)
Unpaid productivity	4000 (887)	5047 (616)	-1047 (-1954;-203)
Total societal costs	8444 (820)	8979 (619)	-535 (-2230;1172)

Suman et al 2018, & Suman et al. Preliminary

Key message: Public health strategies

Promising PH strategies include:

- Replication Australian mass media campaign in other countries
  - Focus on change of behavior

- More targeted & personalized approach using multimedia & ehealth

- the concept of ‘positive health’ in LBP campaigns: Self manage and adapt

Promising New Directions

- Public health system
- ✓ Social/Compensation system
- Work system
- Healthcare system

Foster et al. Lancet 2018

Compensation systems

Substantial differences between compensation systems in

- **LBP-related claim rates** for disability benefits
  - USA 60 times higher than Japan (Volinn et al 2005)
  - claims in Brazil 5-6 times higher in more developed states (Vieira et al 2011)
- **Claim duration**
  - Change from a fault-based to no fault-based system (Cassidy 2003; Elbers 2016; Souza 2012)

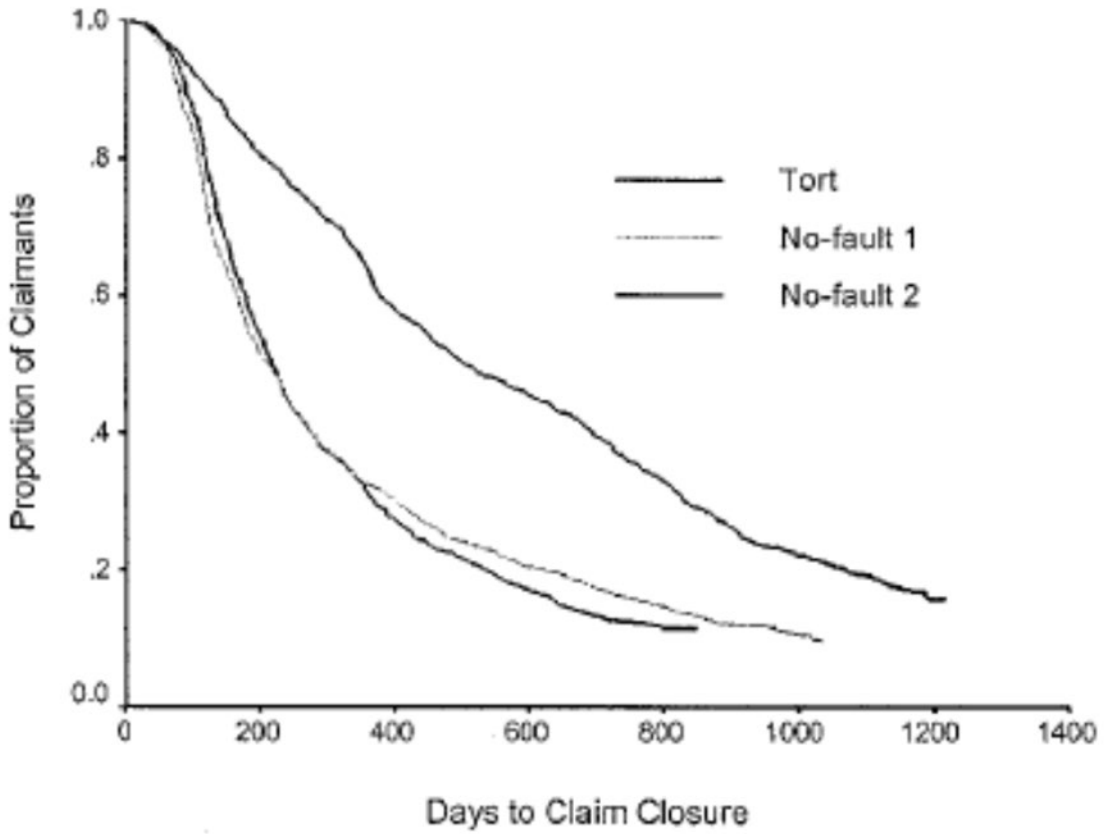


Figure 1. Kaplan–Meier estimates of time to claim closure for claimants with low back pain (n = 3,232). No-fault 1 denotes claimants from the first 6 months of the no-fault insurance period, and no-fault 2 denotes claimants from the second 6 months of the no-fault insurance period.

Canada:

Change from fault to no fault compensation system

- LBP Claim rate after Traffic Collisions decreased from 256 -> 177/100,000 adults (-32%)
- Median LBP Claim duration decreased 505 days ->210 days (-58%)

Cassidy, et al. 2003 Spine

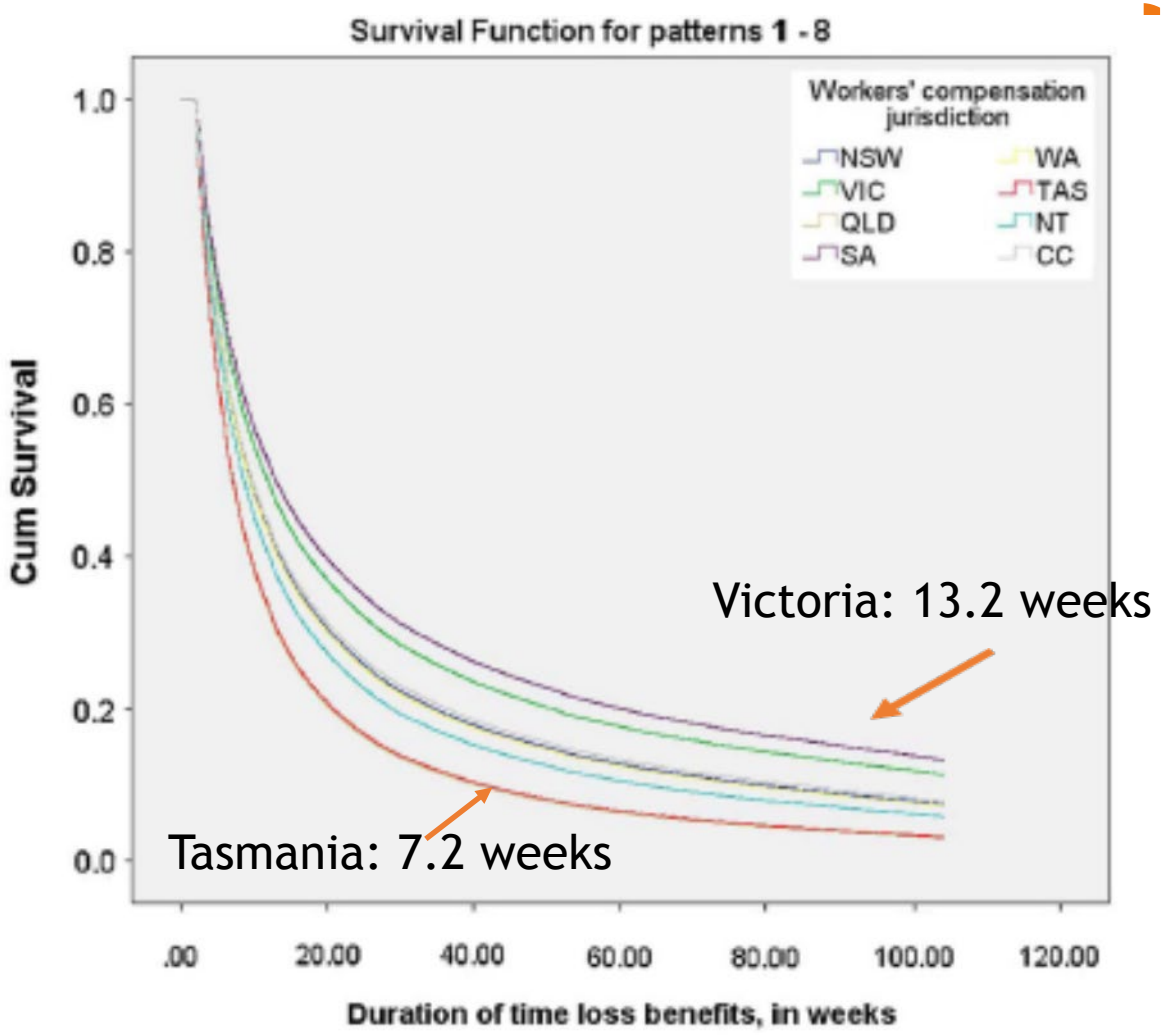


Figure 1 Adjusted survival plots for duration of time loss (weeks) by jurisdiction.

Australia:

Claim duration in different compensation systems

Collie et al BMJ Open 2016

Key message: social system strategies

Compensation systems have an influence on claim rate and duration

Promising strategies in the social system include

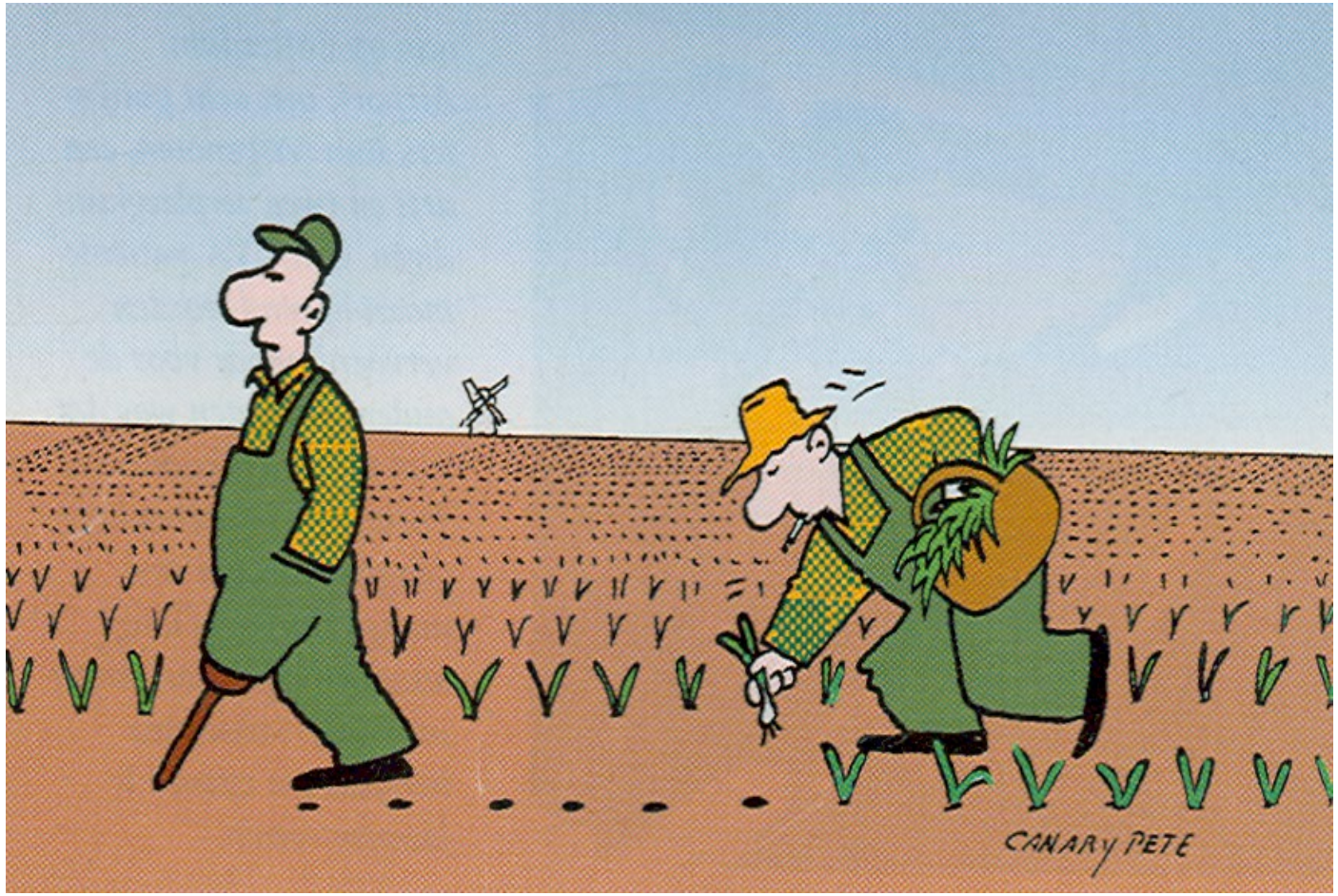
- Changes from fault to no fault systems

Promising New Directions

- Public health system
- Social system
- ✓ Work system
- Healthcare system

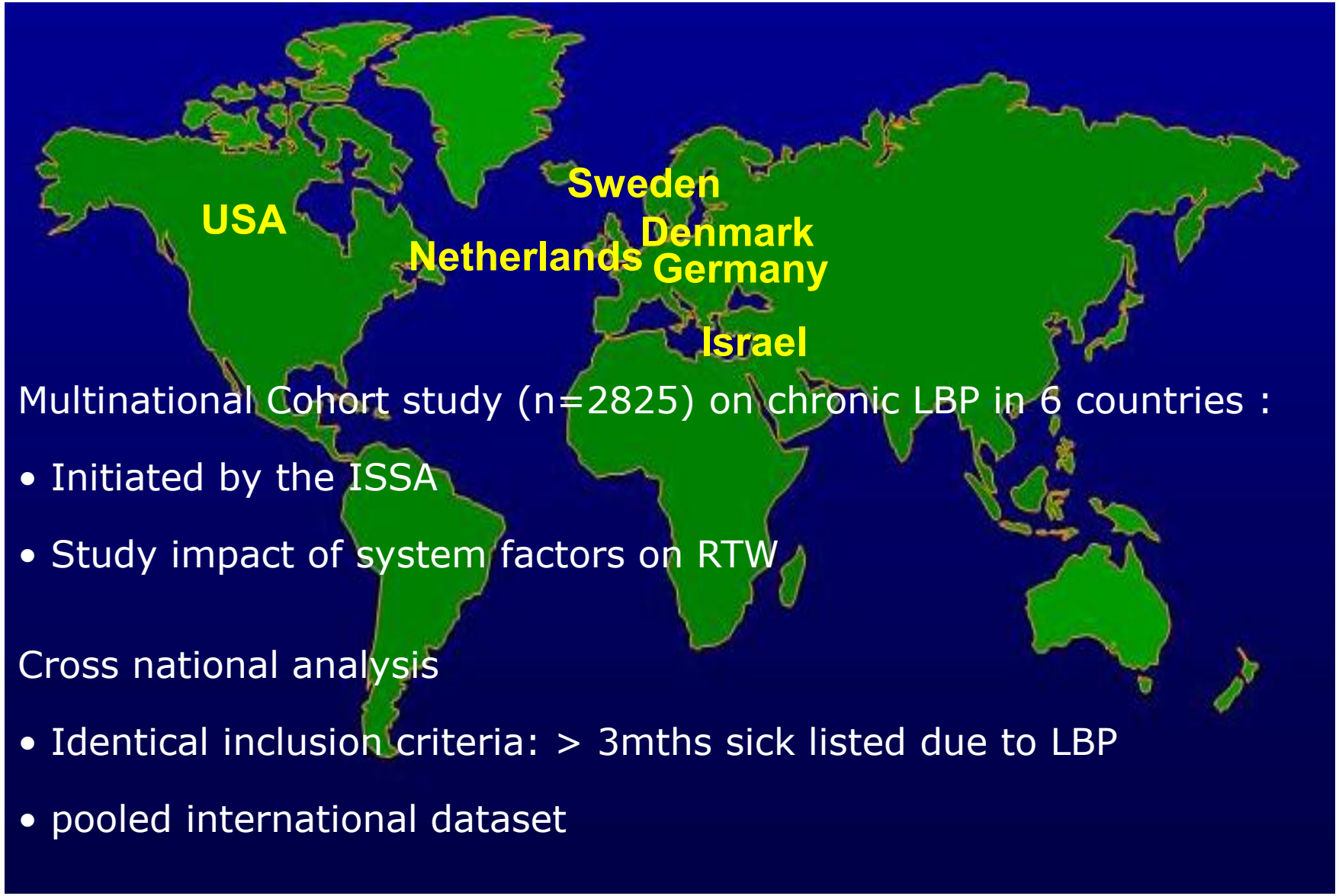
Foster et al. Lancet 2018

Fit the job to the worker



Trailer

Multinational cohort study



Multinational Cohort study (n=2825) on chronic LBP in 6 countries :

- Initiated by the ISSA
- Study impact of system factors on RTW

Cross national analysis

- Identical inclusion criteria: > 3mths sick listed due to LBP
- pooled international dataset

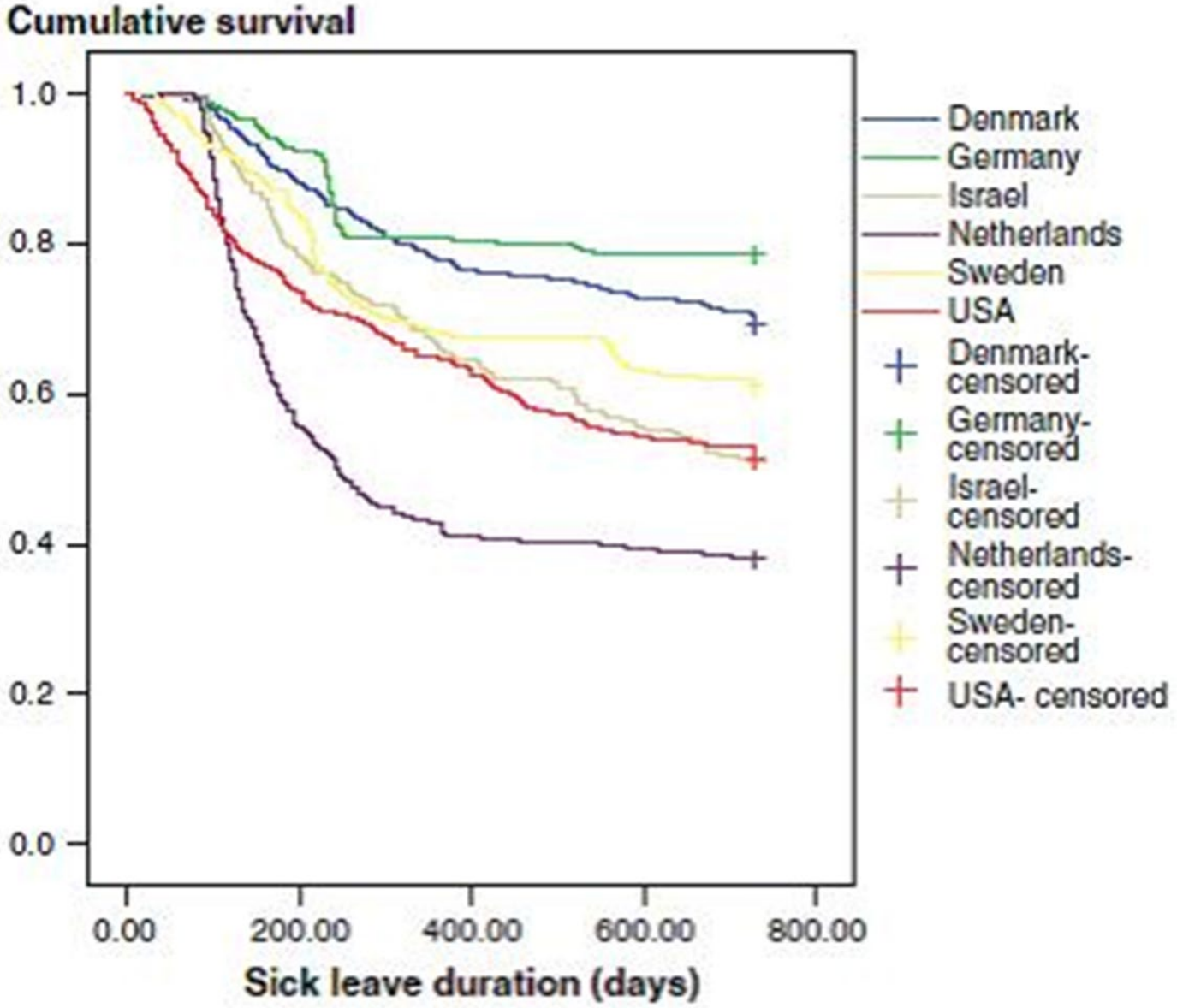


Fig. 1 Survival curves of work disability duration until sustainable RTW for workers in six countries sick listed 3–4 months due to LBP

Six country study

- N=2865 compansation claimants with chronic LBP
- 22% RTW in Germany vs 62% in Netherlands
- Differences explained by work interventions

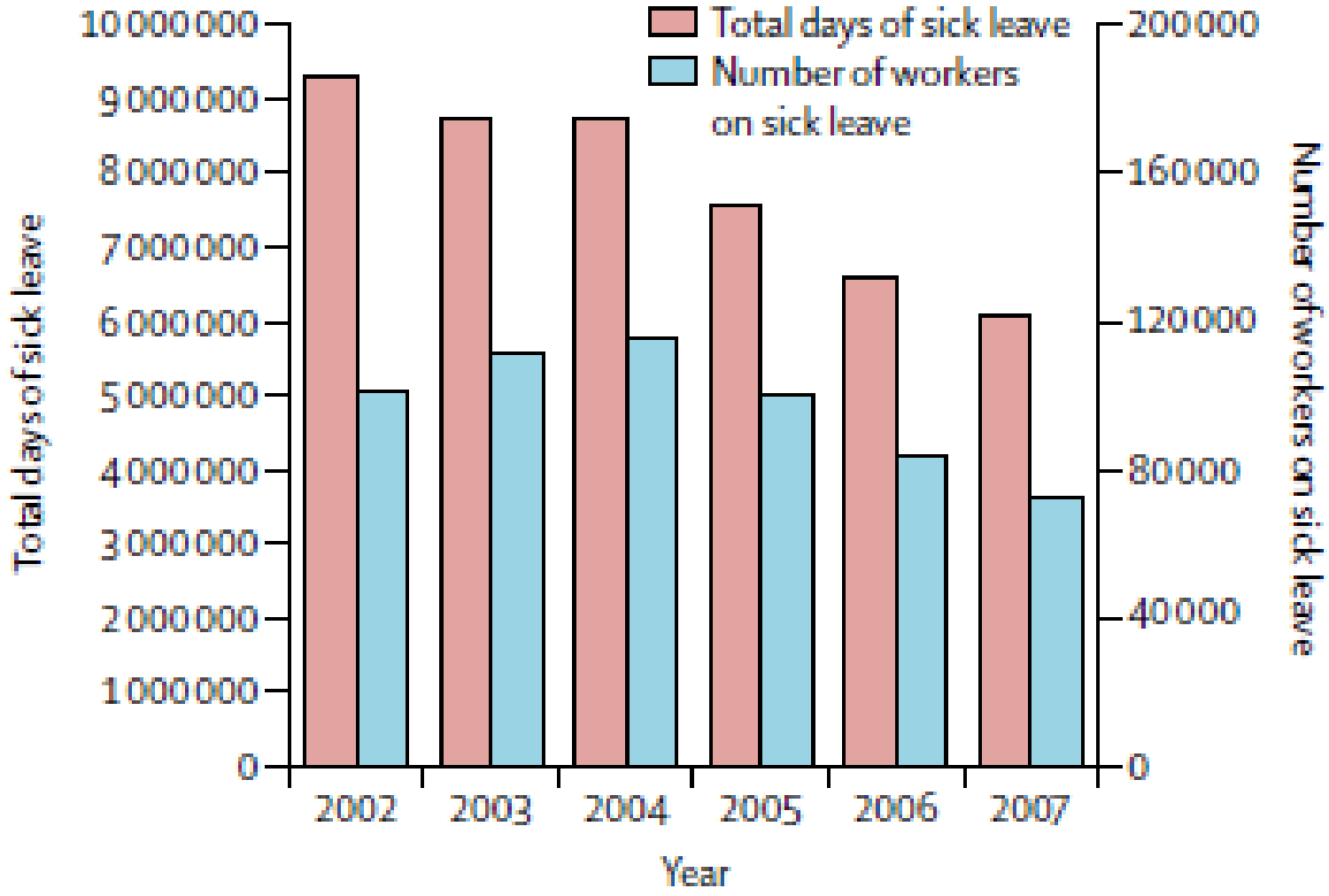
Anema et al 2009 JOR

Reform of the Dutch system as an example

New laws:

- make a return-to-work plan agreed by employer & employee
- penalties when RTW plan was inadequate or not executed by employer
- pay 70-100% wages to their sick employees for 2 years
- Medical assessments for work disability benefits postponed to 2 years

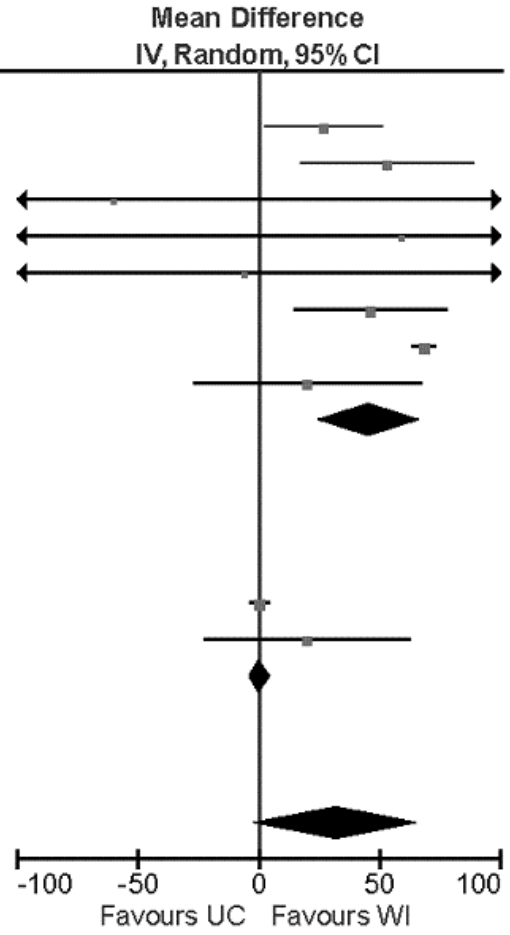
Effects of the policy reforms on LBP compensation claims



Lancet 2018 reproduced from Lambeek et 2011

Effect work interventions for LBP on RTW

Study or Subgroup	UC Mean	UC SD	UC Total	WI Mean	WI SD	WI Total	Weight	Mean Difference IV, Random, 95% CI
1.3.1 Musculoskeletal disorders								
Anema/Steenstra 2007	135.1	95.6	100	108.4	76.8	96	14.0%	26.70 [2.47, 50.93]
Arnetz 2003	197.9	118.8	72	144.9	95.1	65	12.9%	53.00 [17.12, 88.88]
Busch 2011	525.5	417.5	16	585.5	410.3	49	1.8%	-60.00 [-294.62, 174.62]
Busch 2011	525.5	417.5	16	466.5	353.9	63	2.0%	59.00 [-163.46, 281.46]
Busch 2011	525.5	417.5	16	531.5	405.4	54	1.9%	-6.00 [-237.39, 225.39]
Bültmann 2009	134.8	90.4	47	88.7	76.4	66	13.3%	46.10 [14.36, 77.84]
Lambeek 2010	197.63	15.68	68	129.44	14.52	66	15.0%	68.19 [63.08, 73.30]
Verbeek 2002	134	126	49	114	113	50	11.7%	20.00 [-27.18, 67.18]
Subtotal (95% CI)			**384**			**509**	**72.8%**	**45.35 [24.35, 66.34]**
Heterogeneity: Tau² = 377.41; Chi² = 17.83, df = 7 (P = 0.01); I² = 61%								
Test for overall effect: Z = 4.23 (P < 0.0001)								
1.3.2 Mental health problems								
Van Oostrom 2010	141	12.9	72	140.9	13.2	73	15.1%	0.10 [-4.15, 4.35]
Vlasveld 2012	210	124	61	190	120	65	12.2%	20.00 [-22.65, 62.65]
Subtotal (95% CI)			**133**			**138**	**27.2%**	**0.30 [-3.93, 4.52]**
Heterogeneity: Tau² = 0.00; Chi² = 0.83, df = 1 (P = 0.36); I² = 0%								
Test for overall effect: Z = 0.14 (P = 0.89)								
Total (95% CI)			**517**			**647**	**100.0%**	**31.76 [-2.24, 65.75]**
Heterogeneity: Tau² = 1993.97; Chi² = 406.93, df = 9 (P < 0.00001); I² = 98%								
Test for overall effect: Z = 1.83 (P = 0.07)								
Test for subgroup differences: Chi² = 17.00, df = 1 (P < 0.0001), I² = 94.1%								



Effective for MSD, but not mental disorders

Cochrane review, Vilsteren.. Anema; 2015

Key message: work system strategies

Promising strategies in the work system include

- changes from passive benefit systems and legislation towards work accommodation promoting systems (OECD recommendations)
- accommodate the workplace with the support of the employer for RTW for MSK

Promising New Directions

- Public health system
- Social system
- Work system
- ✓ Healthcare system

Foster et al. Lancet 2018

Integrating occupational health in health care

- UK example in primary care
- Netherlands example in secondary care

UK example: stepped primary care pathway

Step 3: Further face to face meetings with the VA

- Targeted advice
- Contact workplace and other services (as required).
- Set new date for RTW

Step 2: Face to face meeting with the VA

- Assessment of obstacles to work.
- Develop strategies tackle these.
- Develop return to work plan.

Step 1: Telephone contact with the VA

- Initial assessment of beliefs about work and health and obstacles to remaining in/returning to work.
- Discuss date for return to work.

Figure 1. Model of stepped care provided by the vocational advisor (VA). RTW, return to work.

Wynne-Jones et al., 2018

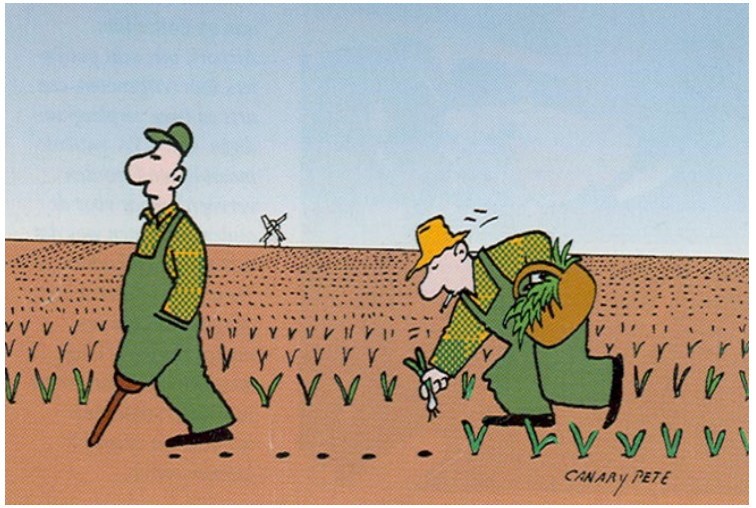
Results

	Intervention arm; n = 109	Control arm; n = 131
Cost analysis		
Mean (SD) NHS cost (£)	528.34 (1110.49)	480.29 (938.77)
Adjusted mean difference (95% CI) [*P*-value]*	48.04 (−209.58 to 305.68) [0.715]	
Mean (SD) health care cost (£)	568.10 (1127.39)	553.32 (976.58)
Adjusted mean difference (95% CI) [*P*-value]*	14.78† (−249.76 to 279.33) [0.913]	
Total indirect costs (Benefit) (£)	1636.69 (3671.02)	2257.56 (5233.29)
Adjusted mean difference (95% CI) [*P*-value]*	−748** (−2278.45 to 781.44)	
Effectiveness analysis (work-related outcomes)		
Mean (SD) days off work	20.26 (40.63)	24.34 (50.67)
Adjusted days off work; mean difference (95% CIs) [*P*-value]*	−6.67 (−23.55 to 10.20) [0.438]	
Cost effectiveness and cost–benefit analyses		
ICER NHS perspective		−£7.2 per sick day avoided
ICER health care perspective		−£2.2 per sick day avoided
Net societal benefit		£733 (£748* −£15†)
Return on investment (per £1 invested)		£49 (£733/£15†)

Wynne-Jones et al., 2018

Dutch example: Integrated care pathway for chronic back pain

- Team: OP, orthopedic surgeon, neurologist, PT, OT
- RTW = a shared treatment goal
- Graded activity & workplace intervention



Lambeek et al. BMJ 2010

Results

BMJ

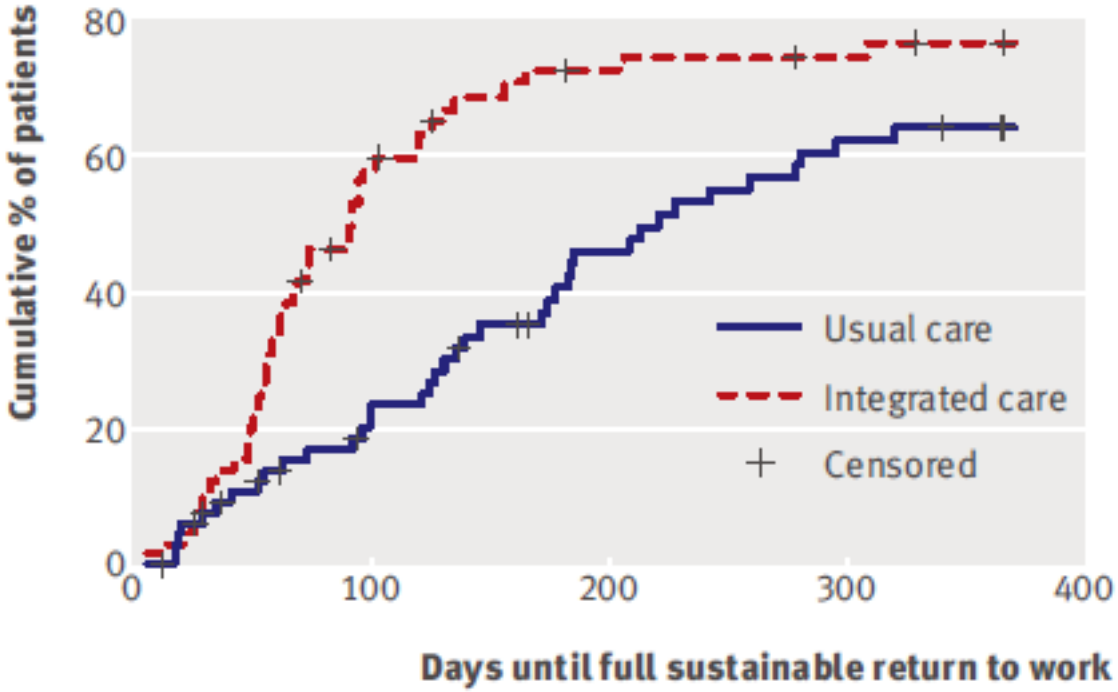
RESEARCH

Effect of integrated care for sick listed patients with chronic low back pain: economic evaluation alongside a randomised controlled trial

Ludeke C Lambeek, researcher,[1,2] Judith E Bosmans, senior researcher,[3] Barend J Van Royen, professor,[4,5] Maurits W Van Tulder, professor,[3] Willem Van Mechelen, professor,[1,2,6] Johannes R Anema, professor[1,2,6]

Chronic back pain patients sicklisted ½ yr

- sustainable full RTW: 4 mnths earlier
- functional status in private life improved
- Very satisfied patients (mean >8)



Lambeek et al 2010 a and b BMJ

Pooled mean total effects and costs

Pooled variables	Mean total effect (SD)		Mean difference (95% CI)
	Integrated care (n=66)	Usual care (n=68)	
Effects			
Mean (SD) total effect:			
Days until sustainable return to work	129 (117)	197 (129)	−68 (−110 to −26)
QALY	0.74 (0.19)	0.65 (0.21)	0.09 (0.01 to 0.16)
Costs			
Mean (SD) total costs (£):			
Total direct costs*	1479 (1133)	1262 (1094)	217 (−131 to 662)
Primary care costs	1251 (700)	857 (758)	395 (131 to 687)
Secondary care costs	124 (416)	247 (425)	−122 (−274 to 43)
Direct non-healthcare costs	104 (225)	159 (325)	−55 (−196 to 98)
Total indirect costs	11 686 (12 553)	17 213 (13 416)	−5527 (−10 160 to −740)
Total costs†	13 165 (13 600)	18 475 (13 616)	−5310 (−10 042 to −391)

*Direct healthcare costs added to direct non-healthcare costs.
†Total direct costs added to indirect costs.

→ROI 1:26

Lambeek et al 2010 a and b BMJ

Promising example educational & reimbursement strategy

Center of Occupational Health & Education
St. Luke's Rehabilitation Institute

Example USA

- HCP received education on OH best practices and incentive pay for following best practices
- Results (n=15322 LBP patients)
  - RR of being off work and on disability due to LBP at 1 year was 37% lower for COHE patients compared to comparison patients
  - Reduction of LBP disability claim costs of $542 per claim for COHE patients ($p<.0001$)

Wickizer, 2011

Key message: health care system strategies

Promising strategies in the health care system include

- redesign of clinical pathways towards integrated health and occupational care with focus on SAW/RTW
- Change reimbursement from pay for service towards pay for perfomance


SUMMARY

Promising directions for work participation

- Invest in public health strategies and campaigns to change public's beliefs and behaviours
- Change compensation and disability policies towards more employment promoting systems
- Work interventions are most effective
- Change clinical pathways for low back pain by integrating occupational health interventions
- Change reimbursement system towards pay for performance with work participation as a goal

Foster et al 2018, Lancet

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