Ten-year trajectories of spine-specific activity limitations among patients with non-specific chronic low back pain

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Disclosures

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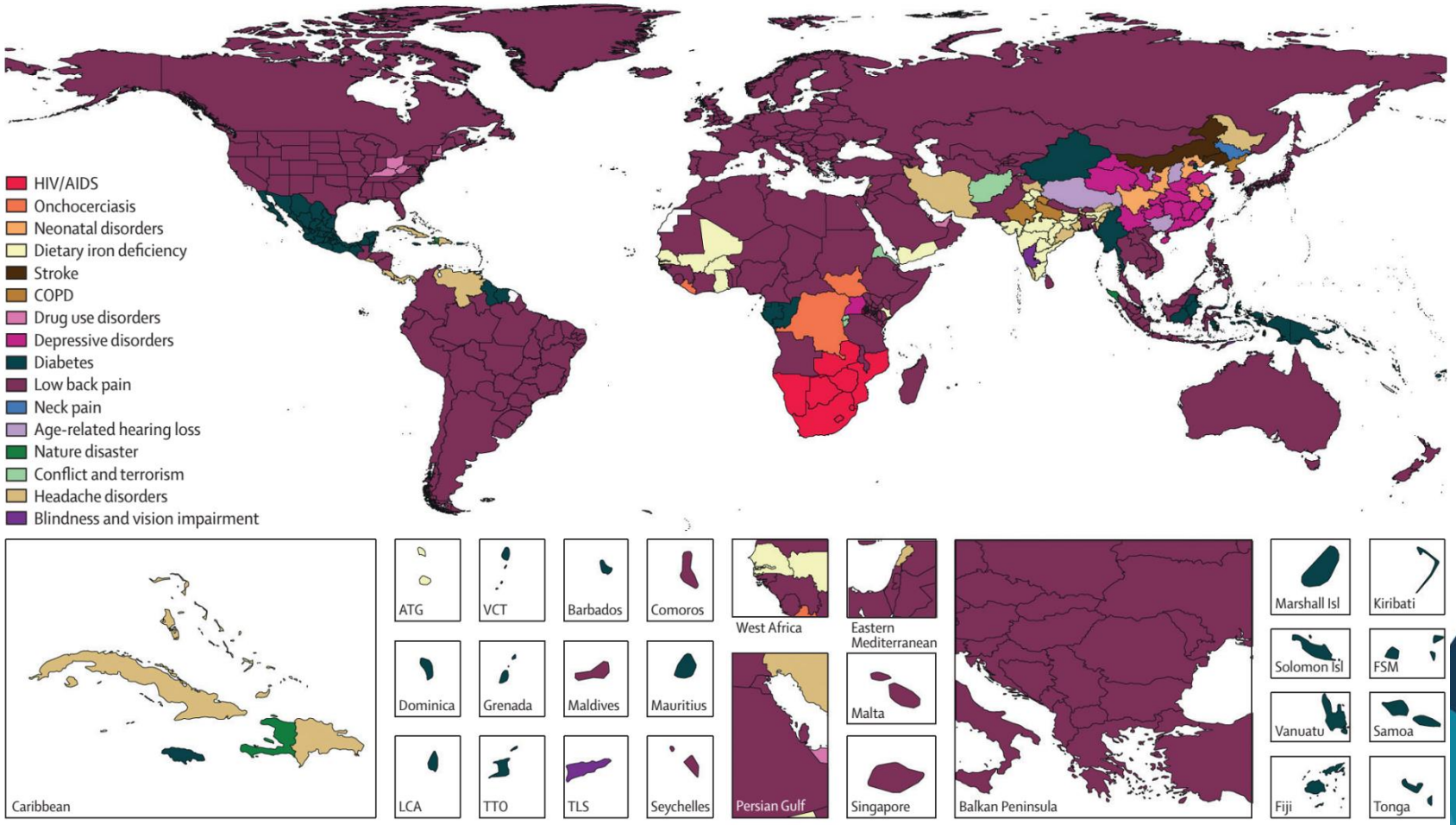
The burden of low back pain (LBP)



GBD 2017 Disease and Injury Incidence and Prevalence Collaborators, Lancet 2018

Current challenges

Chronic LBP

- LBP lasting more than 3 months
- Challenges for chronic ≠ from acute and subacute LBP

The BACK-4P project was designed to tackle 2 key challenges

- Prediction of persistent and high levels of activity limitations in the long term based on personomics biomarkers
- Prevention of unfavourable evolution by targeted and personalized interventions to mitigate predicted trajectories

BACK-4P project structure

ComPaRe Lombalgie chronique

WP1

E-COHORT OF CHRONIC LOW BACK PAIN ADULTS

C. NGUYEN, F. RANNOU, G. SNOUBRA, V.-T. TRAN

WP2

PREDICTION OF PERSISTENT DISABILITY

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LISN
LABORATOIRE INTERDISCIPLINAIRE DES SCIENCES DU NUMÉRIQUE

WP3

DEVELOPMENT OF TARGETED INTERVENTIONS

C. CLAVEL, F. DEBACKERE, JC. MARTIN, C. NGUYEN, A.RORÉN, ÉQUIPE CLINIQUE DE COCHIN

GÉRALPAR
COCHIN

WP4

ASSESSMENT OF INTERVENTIONS

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ISPRM International Society of Physical and Rehabilitation Medicine

Chronic LBP e-cohort (part of ComPaRe cohort)

2026 participants included in the chronic LBP cohort

ComPaRe
Lombalgie chronique

Baseline characteristics (annual update)

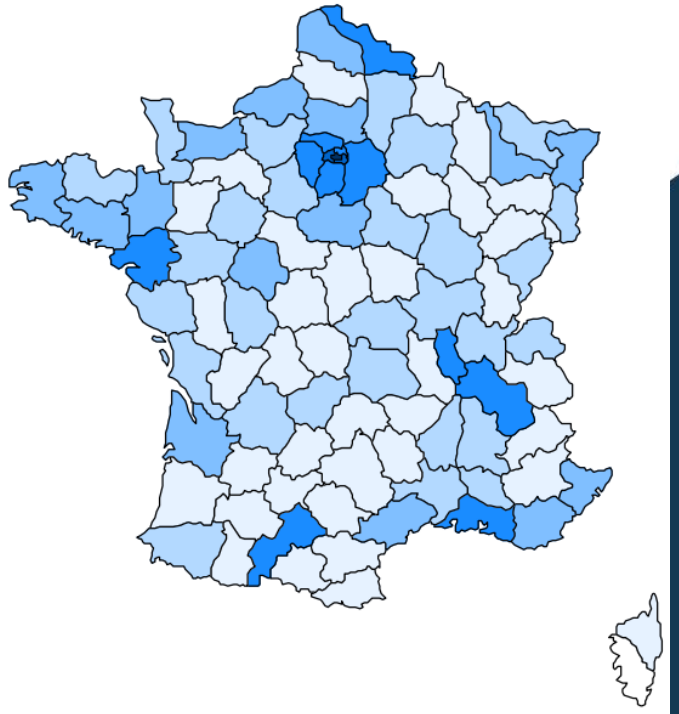
- Demographic/Clinical (Diseases/Treatments)
- Fear Avoidance Beliefs (FABQ)
- Coping Strategies (CSQ)

Specific follow-up for chronic LBP participants (4 months)

- Pain
- Activity limitations (Roland Morris Disability Questionnaire (RMDQ))
- Employment status

Common follow-up for all participants to ComPaRe

- Quality of Life (EQ-5D)
- Perceived standard of living (question & EPICES)
- Burden of Treatment (TBQ)
- Perceived Symptom Severity (MYMOP2)
- Sleep (PSQI)
- Anxiety (GAD-7) and depression (PHQ-9)



Objective

To identify and describe the trajectories of spine-specific activity limitations among individuals with chronic LBP based on the dataset of the ComPaRe chronic LBP e-cohort

Participants

Inclusion criteria

- All adult participants (≥ 18 years old)
- Nonspecific chronic low back pain (> 3 months)
- Diagnosis of chronic LBP < 10 years

Exclusion criteria

- Participants with malignancy, vertebral fracture, infection and/or inflammatory disorders such as spondylarthritis

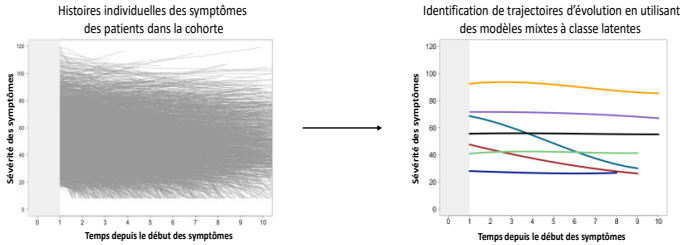
Main outcome

Spine-specific activity limitations

- **Assessed every 4 months, with the RMDQ**
- Range from 0, no limitations to 24, maximal limitations
- Score ≥ 7 as a cut-off for high levels of activity limitations

Stratford PW et al, Physiotherapy, 2016

Analyses



Pour chaque patient, on estime la probabilité qu'il appartienne à chacune des trajectoires

	Trajectory 1	Trajectory 2	...	Trajectory i
Patient 1	0.04	0.15	...	0.73
Patient 2	0.82	0.12	...	0.15
Patient 3	0.06	0.90	...	0.22
...				

Latent class mixed modelling (LCMM) was used to identify distinct trajectories

- This approach characterises trajectories in repeated measurements, with the assumption that several underlying subpopulations (i.e., latent trajectories) exist
- The LCMM does not require
  - The same number of measurements per participant or
  - The same number of measurement time points per participant
- The time metric was the time in years from diagnosis

Covariates

- Gender
- Age at disease diagnosis (as a continuous variable)
- Educational level (≥ 2 years post high school vs others)
- Number of comorbidities
- Psychiatric disease at the time of the diagnosis
- Functional disease at the time of the diagnosis
- Context of the LBP (trauma-related)
- Context of the LBP (work-related)

Results

10-years trajectories of function among patients with non-specific chronic low back pain

Viet-Thi Tran MD, PhD, Christelle Nguyen MD, PhD, François Rannou MD, PhD, Élodie Perrodeau PhD, Raphaël Porcher PhD

Tran VT et al (in preparation)

Participants

Chracteristics at enrolment	N=1018
Age (years), median [IQR]	47.6 [37.4 ; 56.8]
Women, n (%)	758 (75)
BMI (kg/m²), median	24.8 [21.9 ; 28.7]
Higher education, n (%)	**697 (68)**
From France, n (%)	998 (98)
History of spinal surgery, n (%)	127 (13)
Sick leave ongoing, n/N (%)	63/548 (11)
Sick leave in the previous year, n/N (%)	**194/548 (35)**
Duration of sick leave in the previous year (days), median [IQR]	**18.0 [7.0 ; 44.2]**
Duration of symptoms (years), median [IQR]	**3.0 [1.0 ; 5.8]**
Pain intensity (NRS), mean (SD)	**47.6 (24.2)**
Significant activity limitations (RMDQ ≥ 7), n (%)	**507 (49.8)**
Fear avoidance beliefs work (FABQ), mean (SD)	14.7 (12.9)
Fear avoidance beliefs physical (FABQ), mean (SD)	14.1 (5.8)

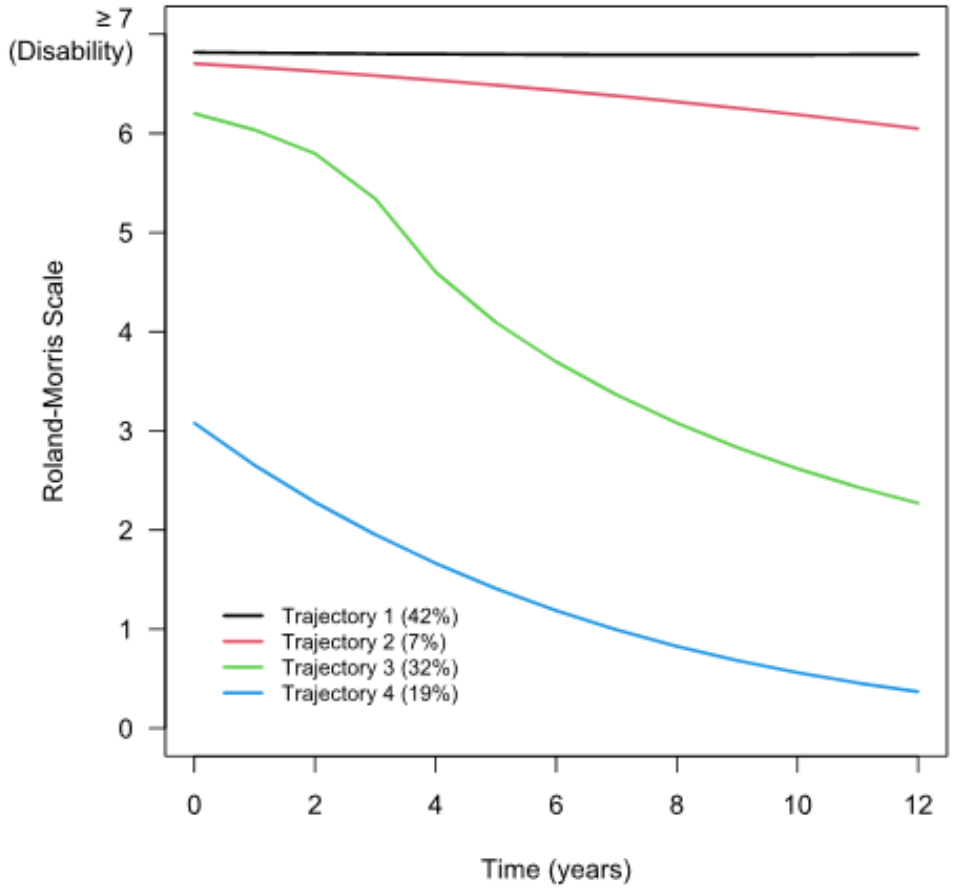
Follow-up

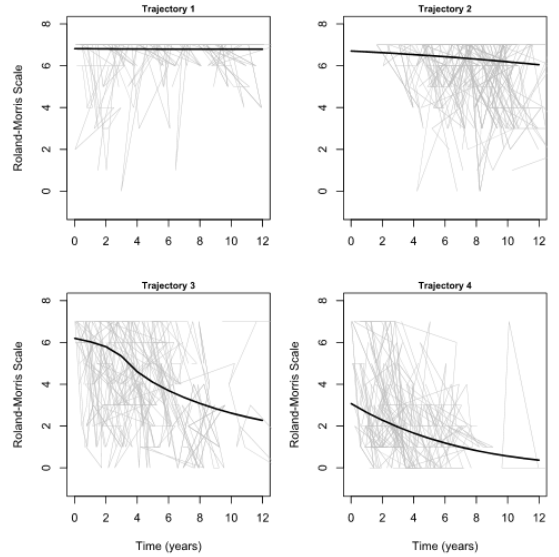
Our dataset covered 1783 person-years

- Median follow-up period = 17 months (IQR 5–33 months),
- Total RMDQ scores collected = 3018

Final model

909/1018 (89%) were included in the final model (109 missing data)





4 trajectories were identified using LCMM

Trajectory 1 (42%): high dysfunction, no improvement

Trajectory 2 (7%): high dysfunction, slow improvement

Trajectory 3 (32%): high dysfunction, rapid improvement

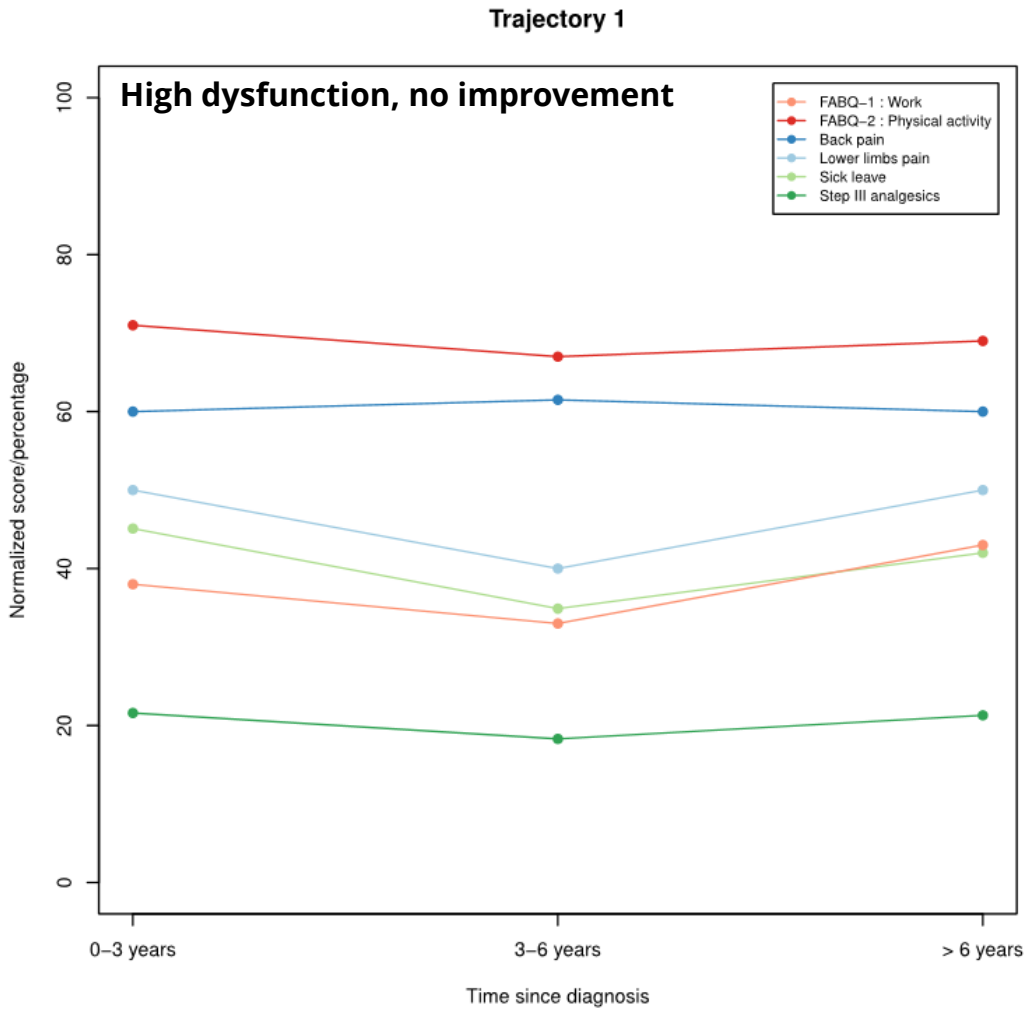
Trajectory 4 (19%): mild dysfunction, rapid improvement

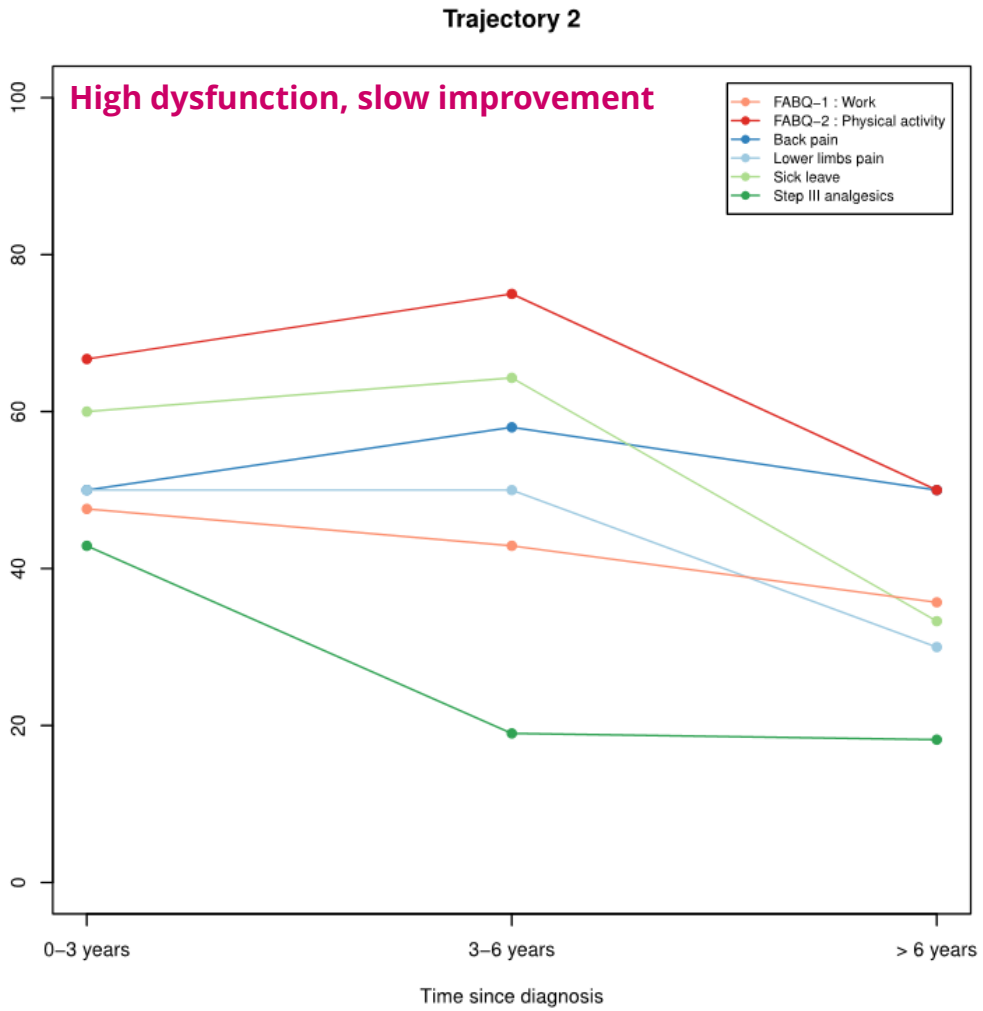
Variables at baseline associated with the probability to belong to a given trajectory

	Trajectory 2	Trajectory 3	Trajectory 4
Gender	1.50 (0.77–2.92)	1.52 (0.35–6.60)	0.67 (0.038–11.62)
Age at disease diagnosis	0.99 (0.97–1.01)	1.00 (0.96–1.05)	1.04 (0.95–1.13)
Higher education	1.34 (0.76–2.39)	2.56 (0.72–9.11)	8.92 (0.75–105.37)
Number of comorbidities	1.03 (0.89–1.19)	1.11 (0.80–1.54)	1.26 (0.67–2.37)
Psychiatric disease	0.85 (0.43–1.65)	0.84 (0.19–3.69)	1.24 (0.071–21.84)
Functional disease	**0.42 (0.18–0.98)**	**0.11 (0.017–0.70)**	**0.014 (0.00037–0.51)**
Trauma-related LBP	0.64 (0.36–1.17)	0.43 (0.12–1.59)	0.35 (0.027–4.40)
Work-related LBP	0.98 (0.52–1.83)	0.69 (0.17–2.76)	0.30 (0.02–4.38)

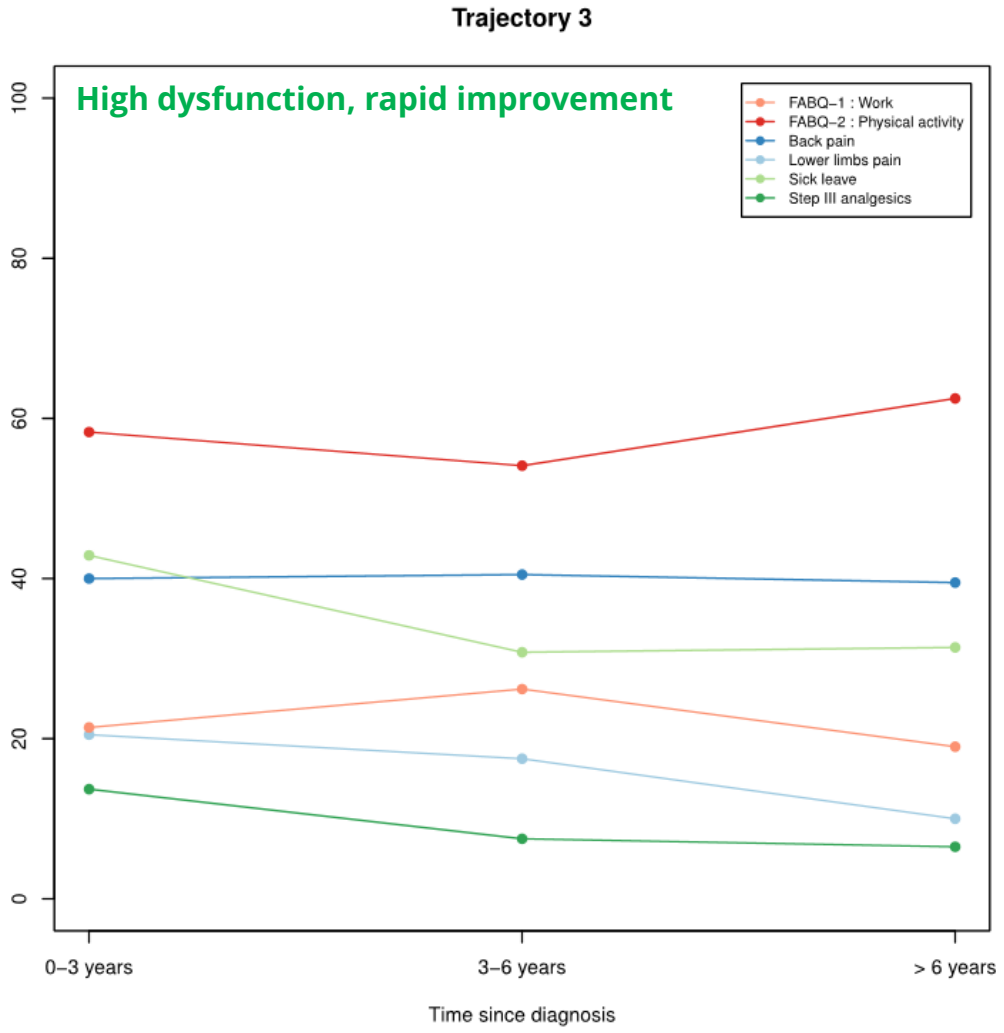
Reference = trajectory 1

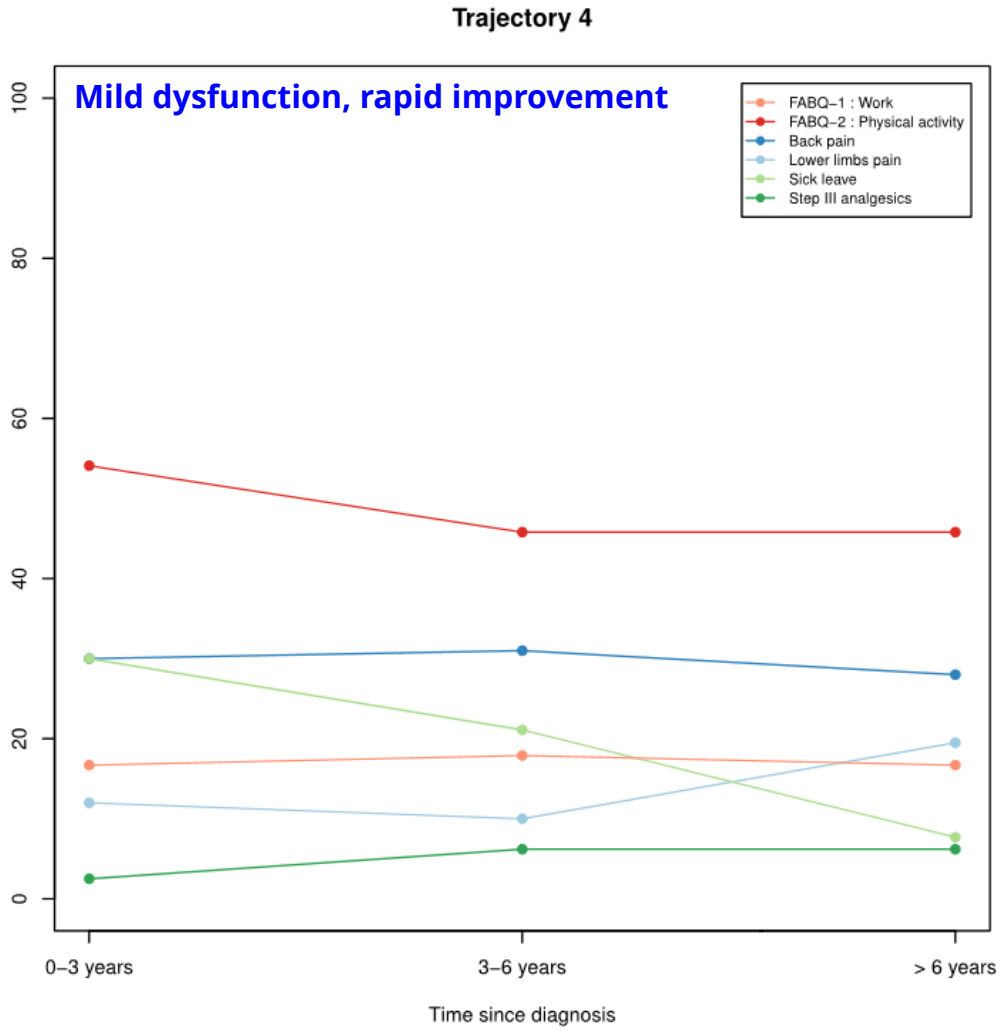
Trajectories of variables associated with trajectories 1 and 2





Trajectories of variables associated with trajectories 3 and 4





Summary and perspectives

4 trajectories of spine-specific activity limitations in individuals with chronic LBP

- Trajectory 1: high dysfunction, no improvement
- Trajectory 2: high dysfunction, slow improvement
- Trajectory 3: high dysfunction, rapid improvement
- Trajectory 4: mild dysfunction, rapid improvement

> 50% of the patients with chronic LBP will improve overtime !

Strongest predictor at baseline to belong to trajectory 1 = functional disease at the time of diagnosis (ie, fibromyalgia, chronic fatigue syndrome, tension headache, and irritable bowel disease)

Perspectives

- Fully describe individuals belonging to each trajectory
- Designing specific interventions to prevent or mitigate trajectories 1 ± 2

Ackowledgements

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Thank you

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