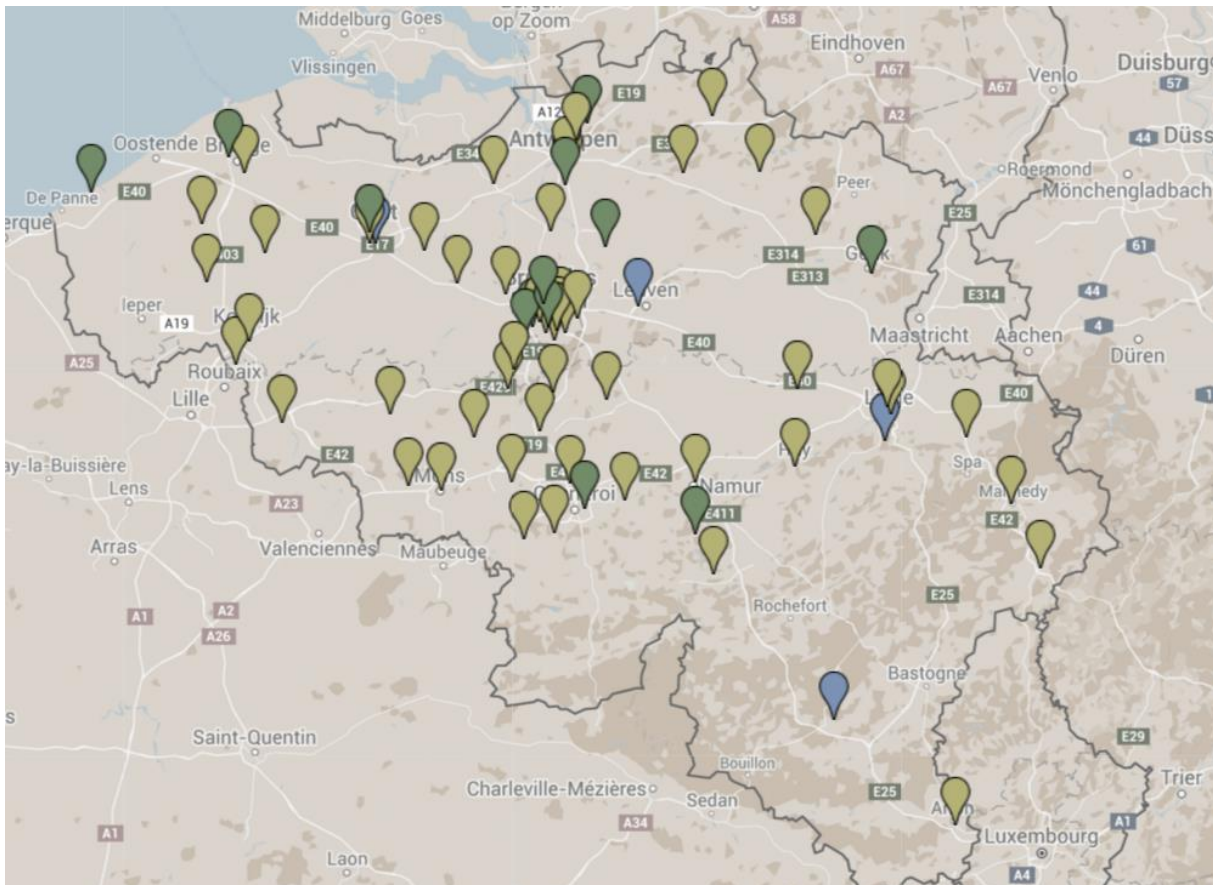


# How resources determine pulmonary rehabilitation programs: a survey among Belgian chest physicians.

## Supplementary material

**Figure S1:** Access to rehabilitation in hospital (148/200 physicians). Blue arrows: Convention hospitals, Red arrows: PRH with pulmonologist certified in pulmonary rehabilitation, Green arrows: PRH with regular pulmonologist



**Table S1:** Complete English version of the survey questions that were asked to the Belgian chest physicians.

| Question   | Answer  |
|--|---|
| Who is in charge of the pulmonary rehabilitation program in the hospital?                                    | Physical medicine<br>Chest physician with a recognition<br>Chest physician<br>Other<br>No responsible   |
| Who refers patients to the pulmonary rehabilitation program?   | Chest physician from your hospital<br>Self-referral<br>Chest physician from other hospitals<br>General practitioner<br>Other specialist   |
| Which types of patients are considered for a pulmonary rehabilitation program?                               | COPD (stable)<br>COPD (during or after an acute attack)<br>Asthma (light)<br>Lung cancer (before surgery)<br>Lung cancer (post-surgery)<br>Thoracic surgery (before surgery)<br>Thoracic surgery (post-surgery)<br>Interstitial lung disease<br>Cystic fibrosis<br>Pre- or post-transplantation patient<br>Restrictive ventilator troubles<br>Other |
| Number of patients who entered the pulmonary rehabilitation program during the last 12 months in your centre | X patients<br>No idea   |
| Proportion of patients refusing to participate in a rehabilitation program                                   | 0%<br>1-10%<br>11-25%<br>26-50%<br>51-75%<br>>75%<br>No idea  |
| What are the reasons for not adhering to the proposed rehabilitation program?                                | No reimbursement<br>No specific program<br>Still in activity<br>No interest<br>No transport means<br>Too far from home<br>Own physiotherapist<br>Too time consuming<br>Not convinced of possible effects<br>Patient is feeling too sick<br>Patient does not feel sufficiently sick<br>Other   |
| In case of absence of participation in a rehabilitation program, what are your preferred alternatives?       | Prescription of a trained physiotherapist<br>Prescription of a local physiotherapist<br>Letter to the general practitioner<br>Referral to another centre<br>Rehabilitation expert for an inpatient<br>Strengthening of the patient (fitness)<br>Standard treatment/medication<br>Other<br>None  |

|   |   |
|---|---|
| <p><b>In case of home rehabilitation, which reimbursement are you generally using?</b></p>              | <p>E listing<br/>F listing<br/>Normal prescription<br/>Responsibility of the general practitioner<br/>No idea</p>   |
| <p><b>What are the health care providers who are active in the respiratory rehabilitation team?</b></p> | <p>Physiotherapist<br/>Chest therapist<br/>Occupational therapist<br/>Social worker<br/>Psychologist<br/>Dietician<br/>Exercise physiologist<br/>Internist<br/>Cardiologist<br/>General practitioner<br/>Tabaccologist<br/>Pharmacist<br/>Nurse<br/>Speech therapist<br/>Other</p>  |
| <p><b>What are the interventions included in the respiratory rehabilitation program</b></p>             | <p>Outdoor walking<br/>Treadmill walking<br/>Indoor bicycle<br/>Strengthening with special devices<br/>Strengthening with weights and elastics<br/>Education<br/>Conservation of energy training (ADL)<br/>Self-management training<br/>Nutritional support<br/>Inspiratory muscles training<br/>Neuromuscular electrical stimulation<br/>Breathing pursed lips exercise<br/>Mucus clearance techniques<br/>Smoking cessation<br/>Psychological support<br/>Physical activity coaching<br/>Home visit<br/>Other<br/>No idea</p> |
| <p><b>How is the interaction between the rehabilitation team and the referral doctor organized?</b></p> | <p>Informal<br/>Report at the beginning and at the end<br/>Team meetings<br/>Clinical follow-up on site<br/>Letters<br/>Other<br/>No idea<br/>No interaction</p>  |
| <p><b>What is the standard duration of a respiratory rehabilitation program?</b></p>                    | <p>4 weeks<br/>8 weeks<br/>12 weeks<br/>16 weeks<br/>20 weeks<br/>6 months<br/>&gt;6 months<br/>No idea</p>   |
| <p><b>What is the mean frequency of rehabilitation sessions per week?</b></p>                           | <p>1<br/>2<br/>3</p>  |

|  |  |
|--|--|
|  | <ul style="list-style-type: none"> <li>4</li> <li>3 and 2</li> <li>Other</li> <li>No idea</li> </ul>   |
| <b>What is the mean duration of a respiratory rehabilitation session?</b>  | <ul style="list-style-type: none"> <li>30 minutes</li> <li>1 hour</li> <li>1.5 hour</li> <li>2 hours</li> <li>No idea</li> </ul>   |
| <b>What are the respiratory rehabilitation program results delivered to the referral physician at the end of the program?</b>        | <ul style="list-style-type: none"> <li>6-min walking distance</li> <li>Pulmonary function</li> <li>Bicycle endurance</li> <li>Maximum exercise test</li> <li>EMG</li> <li>Lower limbs muscular strength</li> <li>Inspiratory muscular strength</li> <li>Body composition</li> <li>Quality of life</li> <li>Dyspnoea</li> <li>Fatigue</li> <li>Depression</li> <li>Anxiety</li> <li>Daily activities</li> <li>Optimal drug treatment</li> <li>Smoking stop</li> <li>Physical activity surveillance</li> <li>Self-management qualities</li> <li>Other</li> <li>None</li> </ul> |
| <b>What are the 5 results of the rehabilitation program which are the most important for you?</b>                                    | Same proposals as above  |
| <b>How is the follow-up ensured after the end of the rehabilitation program?</b>   | <ul style="list-style-type: none"> <li>Maintenance program in a centre</li> <li>Re-evaluation after 6 months – 1 year</li> <li>Reference to a local physiotherapist</li> <li>Reference to a fitness centre</li> <li>Physical activity recommended orally</li> <li>Back to the referring chest physician</li> <li>Other</li> <li>No follow-up/Drug only</li> </ul>  |
| <b>Are you satisfied of the rehabilitation program?</b>  | <ul style="list-style-type: none"> <li>Entirely</li> <li>Yes</li> <li>It depends</li> <li>No (and why?)</li> <li>Not at all (and why?)</li> </ul>  |
| <b>Could you estimate the proportion of your patients who has significantly improved after following the rehabilitation program?</b> | <ul style="list-style-type: none"> <li>&lt;20%</li> <li>21-50%</li> <li>51-80%</li> <li>&gt;80%</li> <li>No idea</li> </ul>  |
| <b>What are the principal improvements to bring, in the future, to rehabilitation programs?</b>                                      | <ul style="list-style-type: none"> <li>Larger multidisciplinary</li> <li>Individualized program</li> <li>Structural involvement of the chest physician</li> <li>Standardized follow-up</li> <li>Broader access</li> <li>Larger referencing</li> <li>Improved reimbursement</li> <li>Other</li> <li>None</li> </ul>   |

**Table S2:** Preferred alternative options for rehabilitation in patients who, for whatever reasons, refused to participate in a pulmonary rehabilitation program (PR). The results are shown in % of chest physicians who could choose a maximum of three options

|   | Total responders<br>(n=200)<br>(%) | CH<br>(n=24)<br>(%) | PRH<br>(n=124)<br>(%) | Non-PRH<br>(n=52)<br>(%) |
|---|------------------------------------|---------------------|-----------------------|--------------------------|
| General prescription for local physiotherapist        | 61                                 | 41                  | 64                    | 64                       |
| Specific prescription for experienced physiotherapist | 46                                 | 73                  | 40                    | 46                       |
| Just standard care or medication                      | 36                                 | 36                  | 38                    | 27                       |
| Empowerment of patient (Fitness)                      | 31                                 | 41                  | 30                    | 27                       |
| Recommendation letter for the general practitioner    | 25                                 | 32                  | 24                    | 27                       |
| Referral to another expert in a rehabilitation centre | 19                                 | 9                   | 21                    | 18                       |
| Expert inpatient rehabilitation                       | 46                                 | 32                  | 12                    | 18                       |
| other   | 2                                  | none                | 3                     | none                     |
| None  | 1                                  | none                | 1                     | none                     |

**Table S3:** Types of professions active in pulmonary rehabilitation teams. Results are expressed as % of chest physicians responding yes to the item.

|                        | CH<br>(n=24)<br>(%) | PRH<br>(n=124)<br>(%) |
|------------------------|---------------------|-----------------------|
| PHYSIOTHERAPIST        | 96                  | 94                    |
| CHEST PHYSICIAN        | 92                  | 77                    |
| DIETICIAN              | 84                  | 52                    |
| OCCUPATIONAL THERAPIST | 72                  | 52                    |
| SOCIAL WORKER          | 76                  | 51                    |
| PSYCHOLOGIST           | 76                  | 48                    |
| TOBACCOLOGIST          | 56                  | 35                    |
| NURSE                  | 32                  | 30                    |
| EXERCISE PSYCHOLOGIST  | 40                  | 19                    |
| CARDIOLOGIST           | 16                  | 15                    |
| GENERAL PRACTITIONER   | 4                   | 5                     |
| INTERNIST              | 12                  | 4                     |
| OTHERS                 | 8                   | 2                     |

**Table S4:** Type of interventions included in the pulmonary rehabilitation programs. Results expressed as percentage of physicians responding yes to the item

|  | CH<br>(n=24)<br>(%) | PRH<br>(n=124)<br>(%) |
|--|---------------------|-----------------------|
| Stationary cycling                                       | 96                  | 91                    |
| Treadmill walking  | 100                 | 90                    |
| Resistance training using apparatus                      | 88                  | 74                    |
| Education  | 84                  | 66                    |
| Smoking cessation  | 84                  | 62                    |
| Breathing exercises/Pursed lips breathing                | 76                  | 64                    |
| Resistance training using handheld weights/elastic bands | 80                  | 63                    |
| Inspiratory muscle training                              | 76                  | 62                    |
| Nutritional support                                      | 76                  | 53                    |
| Psychosocial support                                     | 72                  | 45                    |
| Self-management training                                 | 60                  | 44                    |
| Physical activity coaching                               | 72                  | 34                    |
| Energy conservation technique/ADL training               | 60                  | 34                    |
| Mucus clearance techniques                               | 56                  | 32                    |
| Neuromuscular electrical stimulation                     | 48                  | 24                    |
| Walking outdoor  | 32                  | 22                    |
| Home visit   | 12                  | 6                     |
| No idea  | 0                   | 7                     |

**Table S5:** Types of outcomes of the pulmonary rehabilitation program provided to the referring physician at the end of the program. Results expressed as percentage of physicians responding yes to the item.

|                              | CH<br>(n=24)<br>(%) | PRH<br>(n=124)<br>(%) |
|------------------------------|---------------------|-----------------------|
| 6-min walking distance       | 92                  | 74                    |
| Lung function                | 96                  | 65                    |
| Quality of life              | 80                  | 54                    |
| Dyspnoea                     | 84                  | 53                    |
| Cycling endurance            | 68                  | 53                    |
| Maximum exercise testing     | 80                  | 50                    |
| Smoking cessation            | 60                  | 46                    |
| Inspiratory muscle strength  | 72                  | 43                    |
| Lower-limb muscle strength   | 80                  | 43                    |
| Daily life activities        | 60                  | 46                    |
| Fatigue                      | 60                  | 38                    |
| Optimal drug treatment       | 68                  | 39                    |
| Physical activity monitoring | 68                  | 37                    |
| Body composition             | 52                  | 29                    |
| Anxiety                      | 48                  | 19                    |
| Depression                   | 44                  | 19                    |
| Self-management skills       | 36                  | 16                    |
| Electromyography             | 12                  | 18                    |
| None                         | 0                   | 8                     |
| Other                        | 0                   | 2                     |



**Table S6:** Types of follow-up organised by the pulmonary rehabilitation team at the end of the program. Results are expressed in % of chest physicians responding yes to the item.

|  | CH<br>(n=24)<br>(%) | PRH<br>(n=124)<br>(%) |
|--|---------------------|-----------------------|
| Back to referring pulmonologist                                | 88                  | 89                    |
| Oral recommendation for physical activity                      | 64                  | 51                    |
| Maintenance program in center                                  | 44                  | 50                    |
| Reassessment of rehabilitation outcomes after 6 months- 1 year | 76                  | 37                    |
| Referral to local physiotherapist                              | 56                  | 39                    |
| Referral to fitness center                                     | 48                  | 19                    |
| None   | 0                   | 2                     |
| No idea  | 0                   | 2                     |

**Table S7:** Main targets for future improvements of pulmonary rehabilitation programs. Results are expressed in % of chest physicians responding yes to the item

|   | Total responders<br>(n=200)<br>(%) | CH<br>(n=24)<br>(%) | PRH<br>(n=124)<br>(%) | Non-PRH<br>(n=52)<br>(%) |
|---|------------------------------------|---------------------|-----------------------|--------------------------|
| Better reimbursement                                | 73                                 | 76                  | 77                    | 62                       |
| Broader access                                      | 66                                 | 88                  | 61                    | 65                       |
| Broader multidisciplinary                           | 53                                 | 52                  | 58                    | 42                       |
| More individualized program                         | 51                                 | 68                  | 52                    | 40                       |
| Larger referral                                     | 51                                 | 56                  | 54                    | 39                       |
| Structural involvement of the respiratory physician | 41                                 | 36                  | 44                    | 33                       |
| Standardized follow-up                              | 41                                 | 36                  | 44                    | 37                       |
| Other   | 15                                 | 20                  | 13                    | 15                       |
| None  | 4                                  | 0                   | 5                     | 4                        |