The clinical and socioeconomic burden of bronchiectasis: results of a systematic literature review

James D Chalmers¹, Marcus A Mall²⁻⁴, Pamela J McShane⁵, Kim G Nielsen⁶⁻⁸, Michal Shteinberg^{9,10}, Sean D Sullivan¹¹ and Sanjay H Chotirmall^{12,13}

¹University of Dundee, Dundee, Dundee, United Kingdom; ²Department of Pediatric Respiratory Medicine, Charité - Universitätsmedizin Berlin, Germany; ³German Center for Lung Research (DZL), associated partner site, Berlin, Germany; ⁴Berlin Institute of Health at Charité - Universitätsmedizin Berlin, Berlin, Germany; 5 University of Texas Health Science Center at Tyler, TX, USA; 6 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 6 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 6 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 6 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 6 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 6 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 6 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 6 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 6 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 6 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 7 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 8 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 9 Paediatric Pulmonary Service, Department of Clinical Medicine, University of Texas Health Science Center at Tyler, TX, USA; 9 Paediatric Pulmonary Service, University of Texas Health Science Center at Tyler, TX, USA; 9 Paediatric Pulmonary Service, USA; 9 Paediatric Copenhagen, Copenhagen, Denmark; ⁸ European Reference Network on rare respiratory diseases (ERN-LUNG); ⁹ Lady Davis Carmel Medical Center, Haifa, Israel; ¹⁰ Technion - Israel Institute, University of Washington, Seattle, WA, USA; ¹²Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore; ¹³Department of Respiratory and Critical Care Medicine, Tan Tock Seng Hospital, Singapore

BACKGROUND

- Bronchiectasis is a chronic respiratory disease clinically characterized by chronic cough, excessive sputum production and recurrent pulmonary exacerbations. 1,2
- Bronchiectasis is associated with several genetic, autoimmune, airway and infectious disorders; however, regardless of the underlying etiology, the defining features of bronchiectasis are chronic inflammation and infection, impaired mucociliary clearance and mucus hypersecretion, as well as progressive structural lung damage. 4,5 These features interact with one another in a 'vicious vortex' leading to a decline in lung function and increase in pulmonary exacerbations, which are major drivers of morbidity, mortality and worsened quality of life.^{4,5}
- The clinical and socioeconomic burden that bronchiectasis imposes on patients and their families and employers, as well as on healthcare systems, remains poorly understood.
- A better understanding of the overarching burden of bronchiectasis, both overall and across individual etiologies and associated diseases, could highlight the need for new therapies and assist healthcare systems in planning care and required resources.

To present the findings of a systematic literature review of the overall clinical and socioeconomic burden of bronchiectasis across etiologies and its associated diseases.

METHODS

- Systematic literature review conducted according to PRISMA guidelines⁶
- Databases searched Embase, MEDLINE and the Cochrane Library
- **Publications included**
- Prospective and retrospective observational studies
- Registry studies Randomized controlled trials
- (for extraction of baseline data)
- Reviews, meta-analyses and editorials (for identification of primary studies)

Limits applied

- Written in English
- Published over a 5-year period (December 2017 to December 2022)
- Screening and data extraction processes
- All titles and abstracts screened to identify publications for full-text review

Standardized table used to record data from the final set of publications

- Full publications screened for potential inclusion Results of both title/abstract screen and full-text screen verified by
- second reviewer

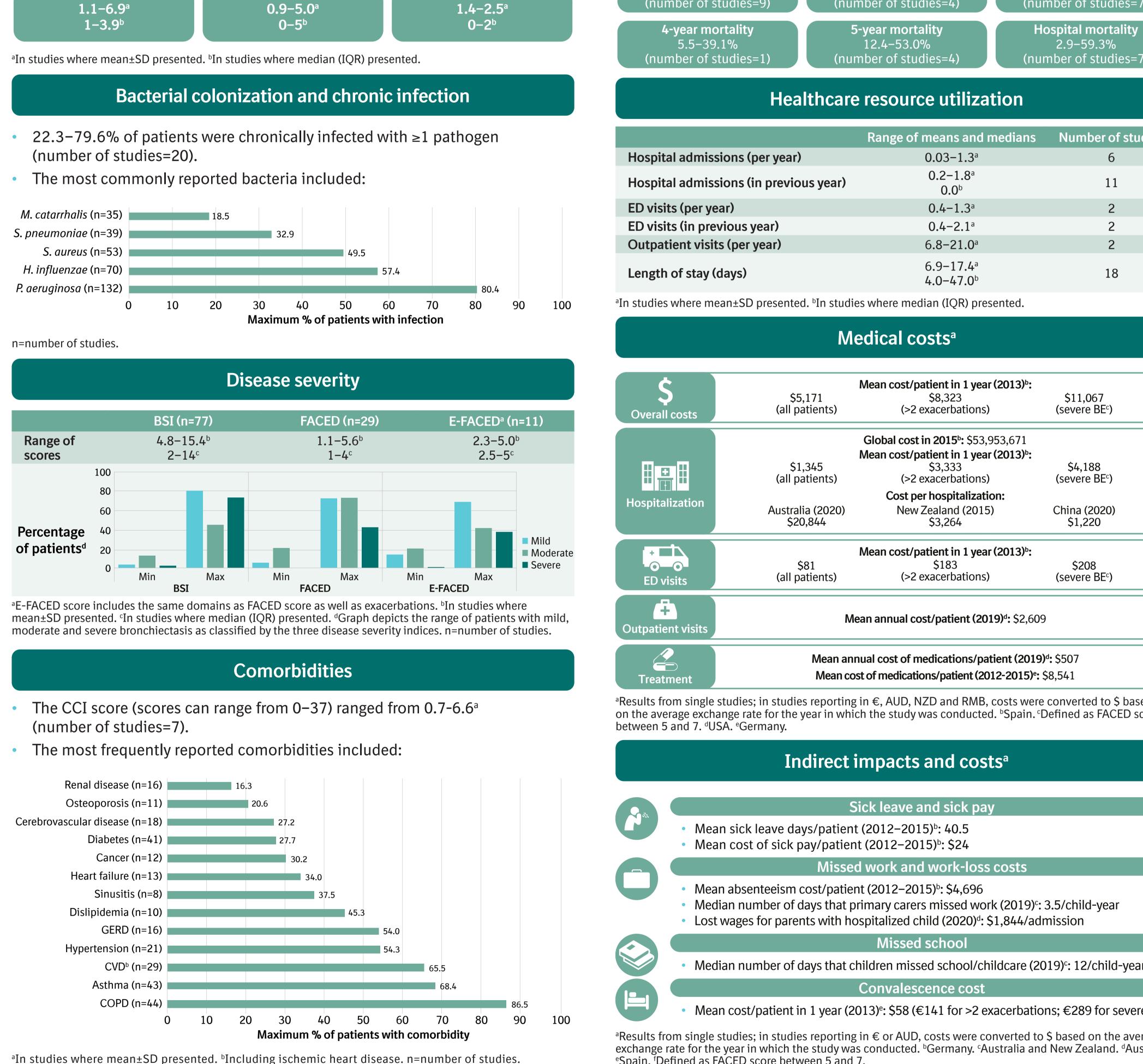
^aIncluding literature reviews, systematic reviews and meta-analyses, editorials and letters to the editor.

PRISMA flow diagram Records identified through MEDLINE through Embase through Cochrane Library **Duplicates** removed Total records identified (n=249) (n=1,834) Records screened Records excluded (title/abstract) (n=1,585)Records screened Records included (n=259 including 149 primary citations and 110 secondary citations^a) Primary records obtained from secondary citations (n=189)

CONCLUSIONS

- Collectively, these results show that bronchiectasis imposes a significant clinical and socioeconomic burden on patients and their families and employers, as well as on healthcare systems.
- Disease-modifying therapies that reduce symptoms, improve quality of life and reduce both healthcare resource utilization and costs are urgently needed

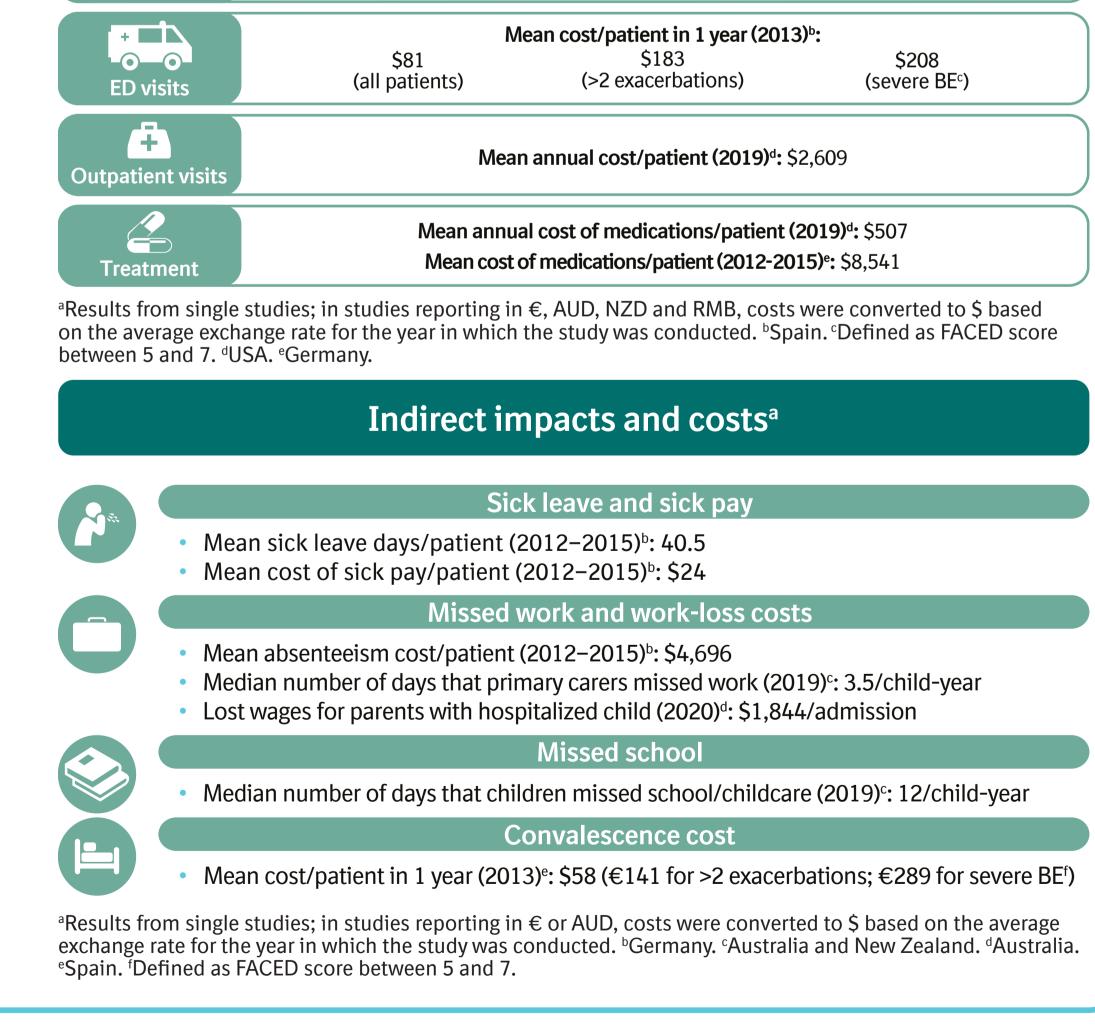
Symptom burden The prevalence of the most commonly reported symptoms in patients with bronchiectasis across all etiologies and for specific etiologies can be seen in the table below. Prevalence in BE overal Prevalence by etiology **Number of studie** (range of %) 7.1-78.1 Not reported 15.0-65.3 Wheezing Sputum 22.0-92.7 production 2.4-63.5 Post-infectious ^aSignificantly greater prevalence in patients with PCD-related BE versus AATD and CVID etiologies (P=0.012) (single study). ^bSignificantly greater prevalence in patients with PCD-related BE versus other etiologies (P<0.0001) (single study). ^cSignificantly greater prevalence in patients with COPD-related BE versus other etiologies (P=0.001) (single study). Patient-reported outcomes: HRQoL, fatigue, anxiety and depression Bronchiectasis impacted HRQoL across several patient-reported outcome measures and domains, with patients experiencing fatigue, anxiety and depression. QOL-B Respiratory symptoms (n=21) QoL-B Physical functioning (n=10) QoL-B Vitality (n=9) QoL-B Role functioning (n=11) OoL-B Emotional functioning (n=10) OoL-B Social functioning (n=11) OoL-B Treatment burden (n=11) QoL-B Health perceptions (n=11 Mean min/total score



In follow-up yea

Number of exacerbations

In previous year



Mortality

0.03-1.3^a

0.4-1.3a

 $0.4 - 2.1^{a}$

6.8-21.0^a

6.9-17.4^a

4.0-47.0^b

(>2 exacerbations)

Cost per hospitalization

New Zealand (2015

3-year mortality

0.0-21.0%

2.9-59.3%

\$11,067 (severe BE^c)

(severe BEc)

China (2020)

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^a1.00 indicates the worst possible outcome for each measure, n=number of studies.

ABBREVIATIONS AATD, alpha-1 antitrypsin deficiency; ABPA, allergic bronchopulmonary aspergillosis; AUD, Australian dollar; BE, bronchiectasis; BHQ, Bronchiectasis Health Questionnaire; BSI, Bronchiectasis Severity Index; CAT, COPD Assessment Test; CCI, Charlson Comorbidity Index; COPD, chronic obstructive pulmonary disease; CVD, cardiovascular disease; CVID, common variable immunodeficiency; ED, emergency department; E-FACED, Exacerbations, FEV,, Age, Chronic Colonization, Extension, Dyspnea; FACED, FEV, Age, Chronic Colonization, Extension, Dyspnea; FSS, Fatigue Severity Scale; GERD, gastroesophageal reflux disease; H. influenzae, Haemophilus influenzae; HADS-A; Hospital Anxiety and Depression Scale-Anxiety; HADS-D; Hospital Anxiety and Depression Scale-Depression; HRQoL, health-related quality of life; ID, immunodeficiency; IQR, interquartile range; LCQ, Leicester Cough Questionnaire; M. catarrhalis, Moraxella catarrhalis;

max, maximum; min, minimum; NZD, New Zealand dollar; *P. aeruginosa, Pseudomonas aeruginosa*; PCD, primary ciliary dyskinesia; PC-QoL; Parent Cough Specific

Quality of Life; PHQ-9, 9-question Patient Health Questionnaire; PNA, pneumonia; PRISMA, Preferred Reporting Items for Systematic Review and Meta-Analyses;

OoL-B, Quality of Life-Bronchiectasis; RMB, Chinese Yuan; S. aureus, Staphylococcus aureus; SD, standard deviation; S. pneumoniae, Streptococcus pneumoniae;

SGRQ, St. George's Respiratory Questionnaire; TB, tuberculosis.

Scores/total possible score^a

DISCLOSURES

Mean max/total score

Median min/total score

Median max/total score

RESULTS

Bronchiectasis imposes a high clinical and socioeconomic burden on patients and their families, as well as on healthcare systems

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