# "Effective lung age" in subjects with systemic sclerosis-associated interstitial lung disease (SSc-ILD) in the SENSCIS trial

Toby M Maher,¹ Arnaud Bourdin,² Elizabeth R Volkmann,³ Serena Vettori,⁴ Jörg HW Distler,⁵ Margarida Alves,⁶ Christian Stock,ⁿ Oliver Distler,⁵ on behalf of the SENSCIS trial investigators

¹Keck School of Medicine, University of Southern California, Los Angeles, California, USA; ²PhyMedExp, University of Montpellier, France; ³Department of Medicine, Division of Rheumatology, University of California, David Geffen School of Medicine, and Department of Medicine, Division of Rheumatology, University of California, David Geffen School of Medicine, Usa; ²PhyMedExp, University of Rheumatology, University of California, David Geffen School of Medicine, Usa; ²PhyMedExp, University of Rheumatology, University of California, David Geffen School of Medicine, Usa; ²PhyMedExp, University of Rheumatology, University of California, David Geffen School of Medicine, Usa; ²PhyMedExp, University of Rheumatology, University of California, Usa; ²PhyMedExp, University of Rheumatology, University of California, Usa; ²PhyMedExp, University of Rheumatology, University of Rheumatology, University of California, Usa; ²PhyMedExp, University of Rheumatology, University of California, Usa; ²PhyMedExp, University of Rheumatology, Universi Los Angeles, California, USA; 4UOC di Fisiopatologia e Riabilitazione Respiratoria, Ospedale Monaldi, Napoli, Italy; 5Department of International GmbH, Ingelheim, Germany; 7Boehringer Ingelheim

International GmbH, Ingelheim, Germany; 7Boehringer Ingelheim

International GmbH, Ingelheim, Germany; 7Boehringer Ingelheim Pharma GmbH & Co. KG, Ingelheim am Rhein, Germany; 8Department of Rheumatology, University Hospital Zurich, University of Zurich, Zurich, Switzerland.

## INTRODUCTION

- Forced vital capacity (FVC) declines gradually with aging.<sup>1</sup>
- Progression of SSc-ILD is associated with accelerated decline in FVC and an increased risk of mortality.<sup>2,3</sup> Calculating the "effective lung age" of patients with SSc-ILD (i.e., the age of healthy individuals with the same FVC) could be a useful tool to assess the impact of the disease.4,5

### AIMS

- To compare FVC values from subjects with SSc-ILD in the SENSCIS trial with those from a healthy reference population.
- To compare the effective lung age of subjects in the SENSCIS trial with their real age.

#### **Trial design**

- Subjects in the SENSCIS trial had SSc with first non-Raynaud symptom in the prior ≤7 years, extent of fibrotic ILD on high-resolution computed tomography ≥10%, FVC ≥40% predicted, DLco 30-89% predicted.<sup>6</sup> Subjects taking prednisone ≤10 mg/day and/or stable therapy with mycophenolate or methotrexate were allowed to participate.
- Subjects were randomised to receive nintedanib or placebo, stratified by anti-topoisomerase I antibody.

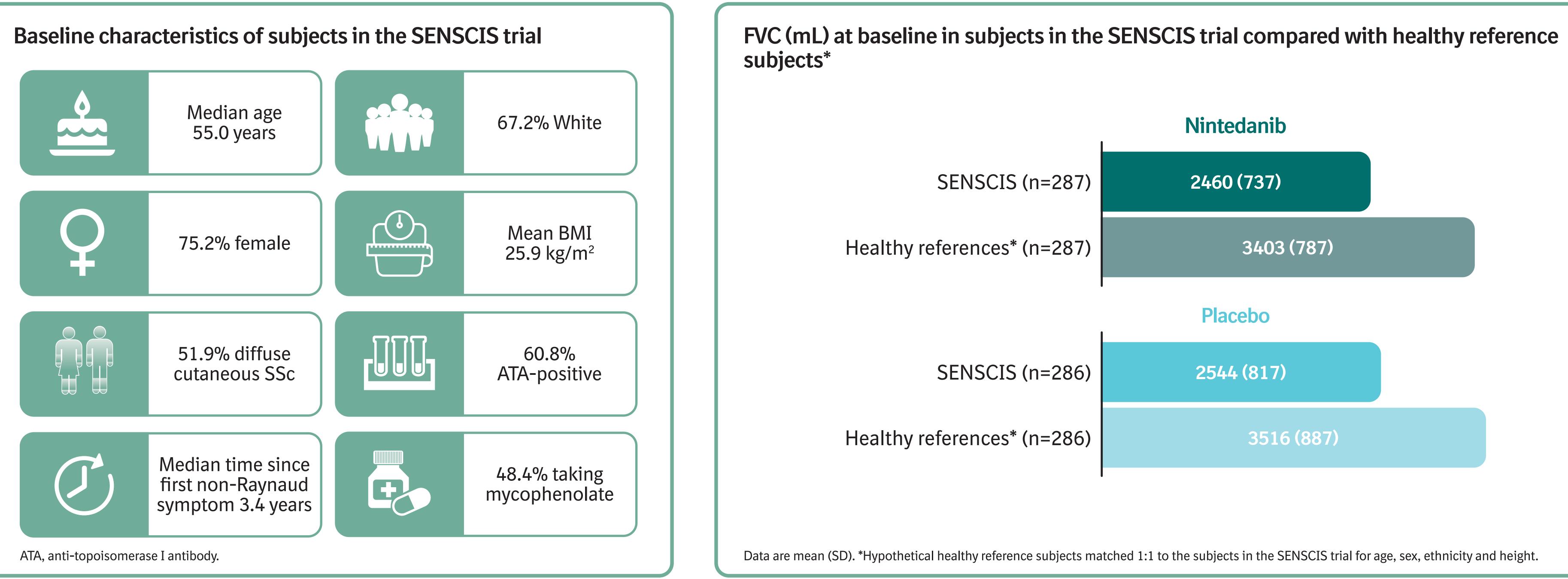
### **Analyses**

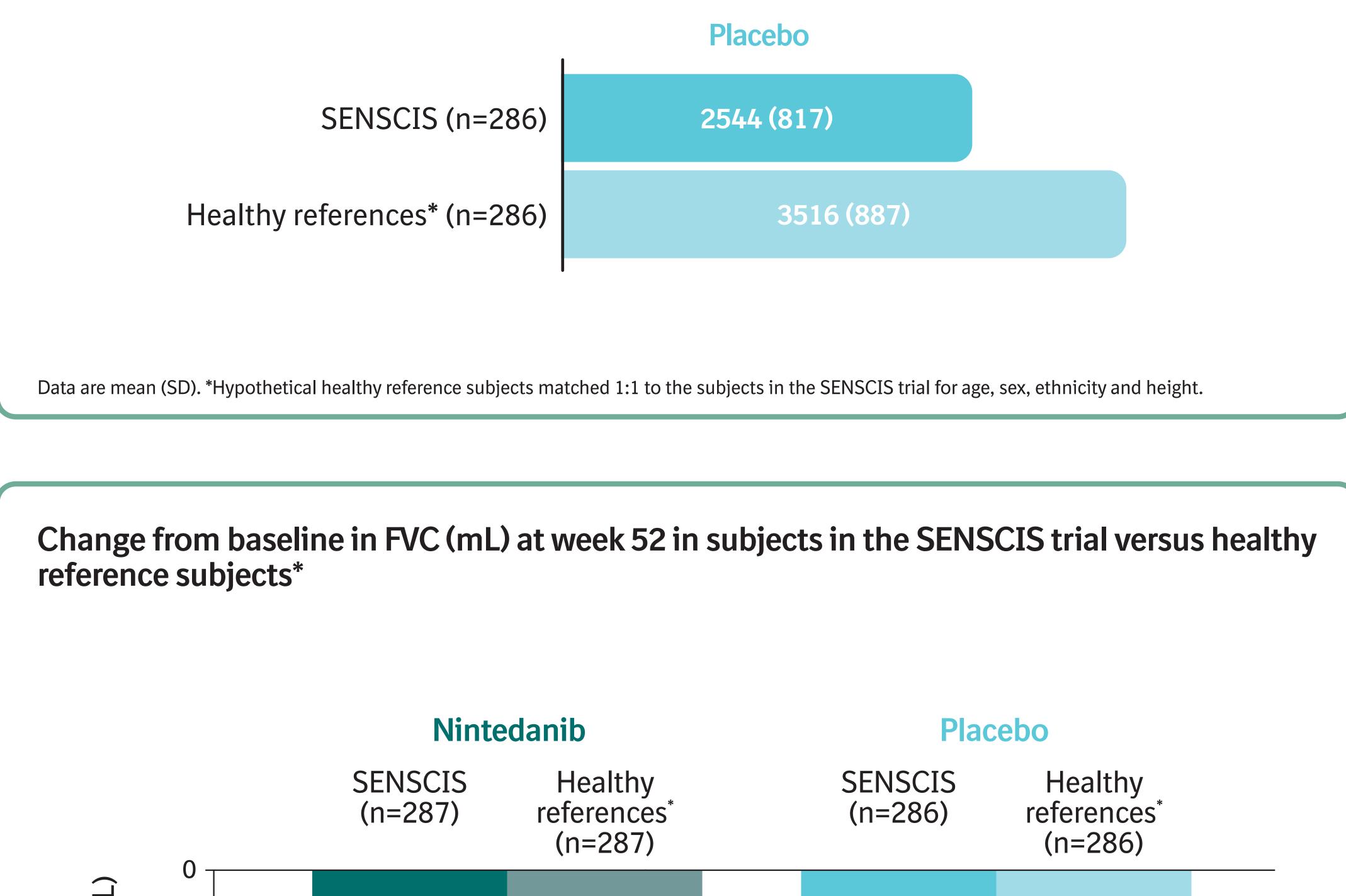
- We used reference equations developed by the European Respiratory Society Global Lung Function Initiative based on data collected from over 70,000 healthy individuals from 26 countries<sup>1</sup> to:
- Estimate baseline FVC and change in FVC over 52 weeks in hypothetical healthy reference subjects matched 1:1 to the subjects in the SENSCIS trial for age, sex, ethnicity and height, and compare these with data from the SENSCIS trial
- Estimate the effective lung ages of subjects in the SENSCIS trial at baseline and at week 52 based on their FVC, sex, ethnicity and height, and compare these with the subjects' real ages. Subjects aged <25 years were excluded. The upper limit of effective lung age was considered to be 95 years.

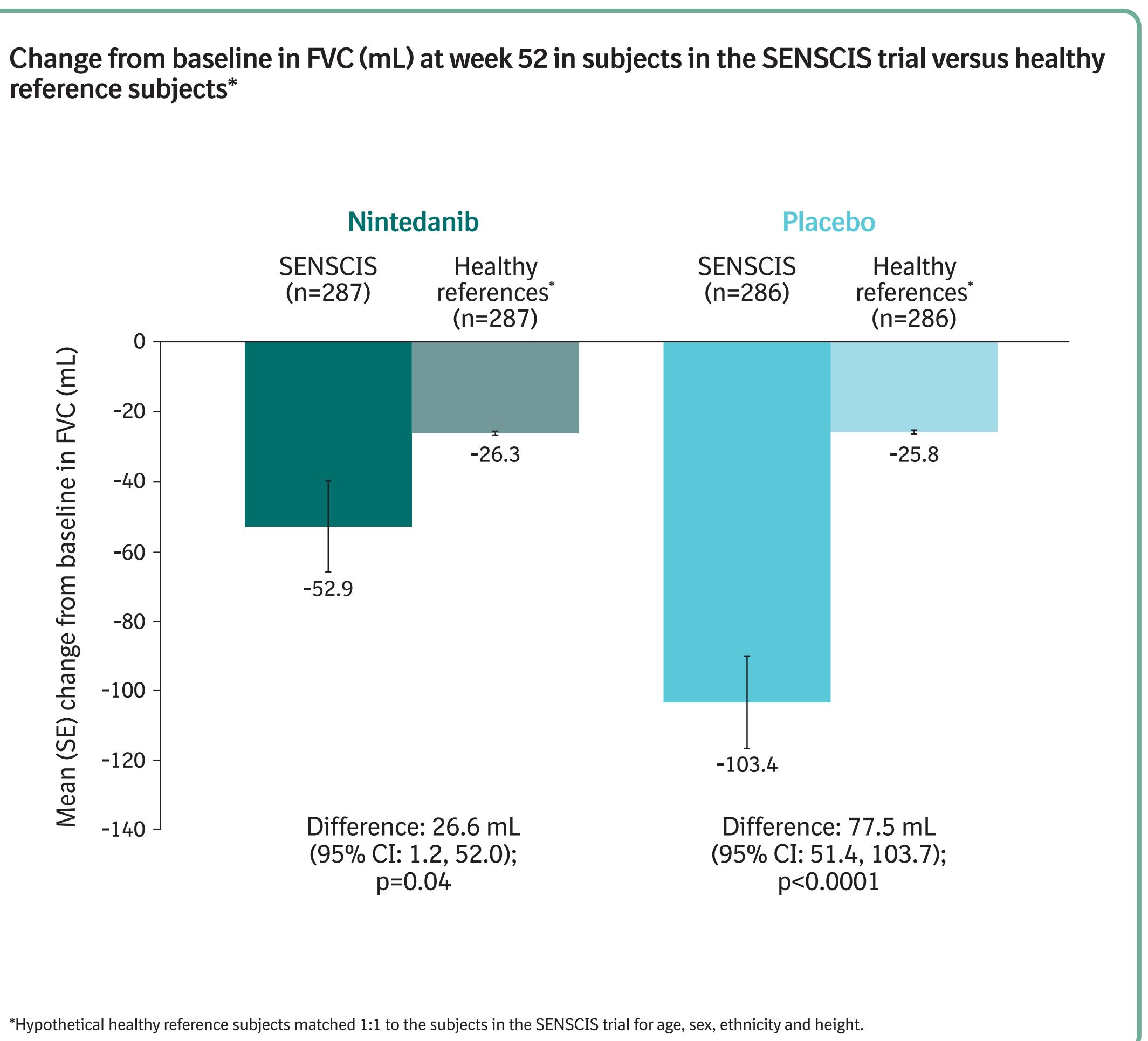
### CONCLUSIONS

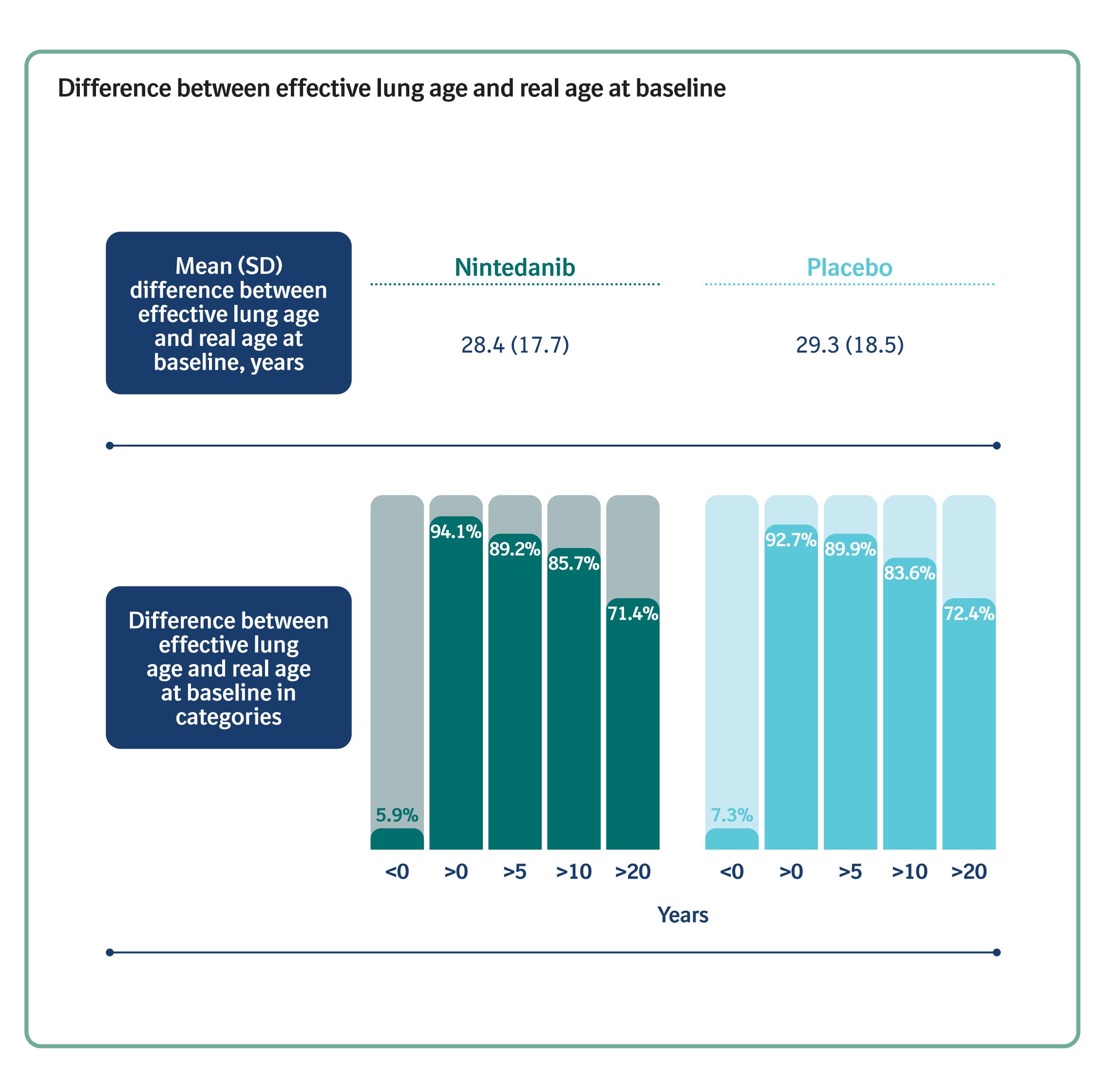
- At baseline of the SENSCIS trial, subjects with SSc-ILD had an effective lung age that was much higher
- Over 52 weeks, the decline in FVC in the placebo group was 4-fold greater than in healthy reference subjects matched for age, sex, ethnicity and height, whereas the decline in FVC in the nintedanib group was 2-fold greater than in healthy reference subjects. Subjects treated with nintedanib had a smaller
- These data show that marked loss of lung function can occur in the few years following onset of SSc-ILD and support a benefit of nintedanib in slowing the progression of SSc-ILD.

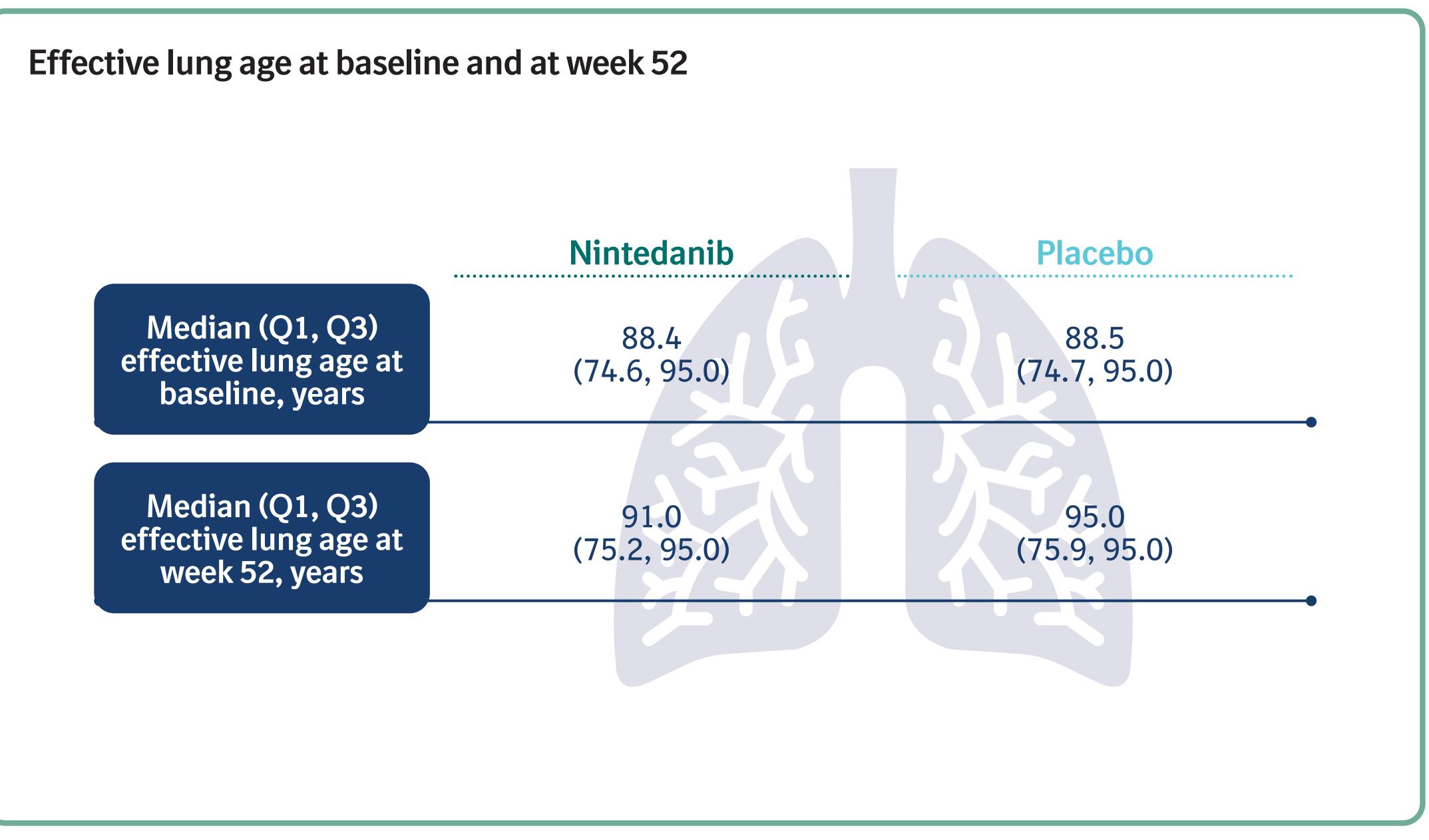
# RESULTS











- than their real age (on average, by approximately 29 years).
- increase in effective lung age than those who received placebo.

# Scan QR code or visit URL for a webpage featuring BI-supported publications at EULAR 2022. this poster including a voiceover from the lead author.

- . Quanjer PH et al. Eur Respir J 2012;40:1324-1343.
- . Hoffmann-Vold AM et al. Am ] Respir Crit Care Med 2019;200:1258–1266.
- 3. Volkmann ER et al. Ann Rheum Dis 2019;78:122–130.
- 4. Discacciati A et al. Int J Epidemiol 2016;45:278-284. Spiegelhalter D. BMC Med Inform Decis Mak 2016;16:104.
- 6. Distler O et al. N Engl J Med 2019;380:2518–252.

#### **ACKNOWLEDGEMENTS AND DISCLOSURES**

Effective lung

age at week 52

Schematic illustration of course of FVC decline in subjects in the

Week 52

Schematic illustration of difference between effective lung age and

SENSCIS trial and healthy reference subjects

actual age in subjects in the SENSCIS trial

Age at Age at Effective lung

baseline week 52 age at baseline

Baseline

The SENSCIS trial was supported by Boehringer Ingelheim International GmbH (BI). The authors did not receive payment for the development of this poster. Julie Fleming of FleishmanHillard, and the International Committee of Medical Journal Editors (ICMJE). The authors did not receive payment for the development of this poster. Julie Fleming of FleishmanHillard, and the International Committee of Medical Journal Editors (ICMJE). The authors did not receive payment for the development of this poster. Julie Fleming of FleishmanHillard, and the International Committee of Medical Journal Editors (ICMJE). The authors did not receive payment for the development of this poster. Julie Fleming of FleishmanHillard, and the International Committee of Medical Journal Editors (ICMJE). The authors did not receive payment for the development of this poster. Julie Fleming of FleishmanHillard, and the International Committee of Medical Journal Editors (ICMJE). The authors did not receive payment for the development of the International Committee of Medical Journal Editors (ICMJE). The authors did not receive payment for the International Committee of Medical Journal Editors (ICMJE). The authors did not receive payment for the International Committee of Medical Journal Editors (ICMJE). The authors did not receive payment for the International Committee of Medical Journal Editors (ICMJE). The authors did not receive payment for the International Committee of Medical Journal Editors (ICMJE). London, UK, provided writing, editorial and formatting assistance, which was contracted and funded by BI. BI was given the opportunity to review the poster for medical and scientific accuracy as well as intellectual property considerations. Toby Maher reports consulting fees from AstraZeneca, Bayer, Blade Therapeutics, BI, Bristol Myers Squibb, Galapagos, Galecto, GlaxoSmithKline, IQVIA, Pliant, Respivant Sciences, Roche/Genentech, Theravance Biopharma, Veracyte and payment for presentations from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and payment for presentations from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and payment for presentations from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and payment for presentations from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and payment for presentations from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and payment for presentations from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and payment for presentations from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and Policies from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and Policies from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and Policies from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and Policies from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and Policies from BI, Kymera, Mitsubishi Tanabe; consultancy fees from AbbVie, Acceleron and Policies from BI, Kymera, Mitsubishi Tanabe; consultancy fees from BI, William Fi, Mitsubishi Tanabe; consultancy fees from BI, William Fi, Mitsubishi Tanabe; consultancy fees from BI, William Fi, Mitsubishi Tanabe; consultancy fees fro Pharma, Alcimed, Altavant Sciences, Amgen, AnaMar, Arxx Therapeutics, Horizon Therapeutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Kymera, Lupin, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Inventiva, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Merck Sharp & Dohme, Miltenyi Biotec, Mitsubishi Pharmaceutics, Merck Sharp & Dohme, Merck Sharp & Dohme, Merck Sharp & Dohme, Merck Sharp & Merck Tanabe, Novartis, Pfizer, Prometheus Biosciences, Redx Pharma, Roivant Sciences, Sanofi, Topadur; speaking fees from Bayer, BI, Janssen, Medscape; and holds patent US8247389 for the treatment of SSc. In addition, he is Chair of the Executive Committee for the FOREUM Foundation, Co-Chair of the ERS/EULAR Guidelines, President of EUSTAR, a Member of the Board of Trustees for the Swiss Clinical Quality Management in Rheumatic Diseases (SCQM) and the Hartmann Müller Foundation, and a Senate member of the Swiss Academy of Medical Sciences.