

#### ResApp to Present at ShareCafe Investor Webinar

**Brisbane, Australia, 17 July 2020** – ResApp Health Limited (ASX:RAP), a leading digital health company developing smartphone applications for the diagnosis and management of respiratory disease, is pleased to advise shareholders and investors that ResApp CEO and Managing Director, Tony Keating, will present at the ShareCafe Micro/Small Cap "Hidden Gems" webinar to be held at 12:30pm AEST on Friday the 17<sup>th</sup> of July. A copy of the presentation is attached.

The event is free and investors can register online to view the presentation here: <a href="https://www.resapphealth.com.au/sharecafe/">https://www.resapphealth.com.au/sharecafe/</a>

After registering attendees will receive an email with all login details (a website link or phone dial in details). A recorded copy of the webinar will be made available following the event.

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#### **About ResApp Health Limited**

ResApp Health Limited (ASX: RAP) is a leading digital health company developing smartphone applications for the diagnosis and management of the respiratory disease. ResApp's machine learning algorithms use sound to diagnose and measure the severity of respiratory conditions without the need for additional accessories or hardware. ResApp's regulatory-approved and clinically validated products include ResAppDx, a smartphone-based acute respiratory disease diagnostic test for use in telehealth, emergency department and primary care settings; and SleepCheck, a smartphone application which allows consumers to self-assess their risk of sleep apnoea. Both products are CE Marked in Europe and TGA approved in Australia. For more information, please visit <a href="https://www.resapphealth.com.au">www.resapphealth.com.au</a>.

#### **Contacts**

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This ASX announcement was approved and authorised for release by the board of directors of ResApp Health.



# Res pp

Digital Health for Respiratory Disease

> Investor Presentation 17 July 2020

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All amounts in Australian dollars unless stated otherwise.



## Who We Are: ResApp Health

- The leading digital health company commercialising regulatory-approved and clinically validated respiratory disease tools that only require a smartphone
- Industry-leading product pipeline:
  - ResAppDx, the first and only smartphone-based diagnostic test for acute respiratory disease → recently launched on telehealth platforms
  - SleepCheck, the first and only direct-to-consumer sleep apnoea screening app → now available on the App Store
  - R&D in COPD and asthma management, consumer health and wearable devices





#### Corporate Overview

#### Capital Structure (ASX:RAP)

Market Cap. as of 16 July 2020	\$110M
Share Price as of 16 July 2020	\$0.145
Shares on Issue	755M
Incentive Options <sup>1</sup>	28M
Cash Balance as of 31 March 2020	\$6.9M + \$1.4M received from options exercise in July

Issued to directors, staff and scientific advisory board with various vesting conditions

#### Board of Directors

Roger Aston, Ph.D. Non-Executive Chairman (Chairman of PharmAust and Immuron, Non-Exec. Director of Oncosil Medical, formerly CEO of Mayne Pharma, Cambridge Antibody, co-founder of pSivida)

**Tony Keating, Ph.D.** Managing Director and CEO (formerly Director, Commercial Engagement at UniQuest, engineering management roles with Exa Corporation)

**Dr Michael Stein, Ph.D.** Non-Executive Director (Acting CEO of Valo Therapeutics, formerly co-founder of The Map of Medicine, founding CEO of Doctor Care Anywhere and OxStem)

**Chris Ntoumenopoulos** Non-Executive Director (Managing Director at Twenty 1 Corporate, Non-Exec. Director at Race Oncology, formerly at Citigroup, Indian Ocean Capital and CPS Capital)

#### Substantial Shareholders\*

Fidelity International: 9.48%

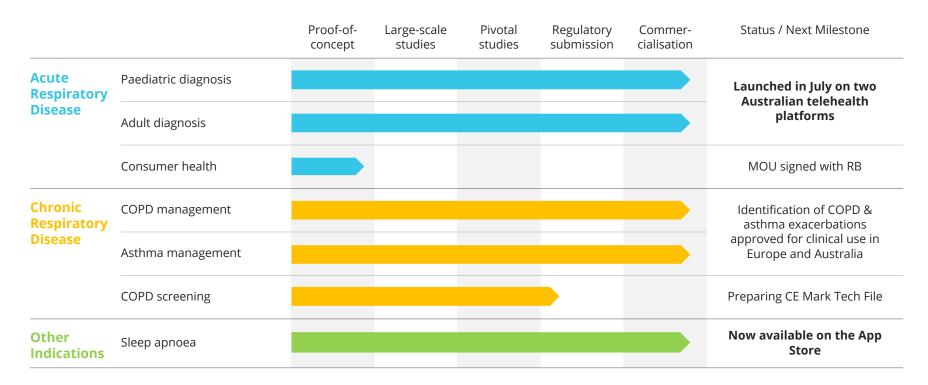
Freeman Road: 6.25%

Ian Francis Reynolds: 5.30%



<sup>\*</sup> Based on Substantial Shareholder Notices lodged by the respective holders

## A Leading Digital Respiratory Disease Portfolio



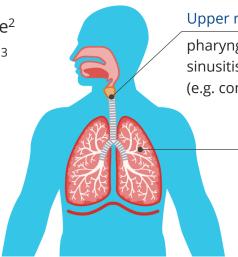


## Respiratory Disease Diagnosis is the Most Common Outcome from a Doctor Visit<sup>1</sup>

700M+ doctor visits p.a. for respiratory disease<sup>2</sup>

Most common reasons for hospital admission<sup>3</sup>

- Bronchiolitis (infants)
- Asthma and pneumonia (children)
- Pneumonia and COPD (older adults)
- High prevalence and growth in Asia
  - 100M adults in China with COPD<sup>4</sup>



#### Upper respiratory tract

pharyngitis, nasopharyngitis, sinusitis, laryngitis and tracheitis (e.g. common cold)

#### Lower respiratory tract

asthma, pneumonia, bronchiolitis, bronchitis, COPD and other viral lower respiratory tract infections

Diagnosed today using stethoscope, imaging, spirometry, blood and/or sputum tests

→ Time consuming, expensive, subjective and inaccurate



<sup>1.</sup> Ambulatory care visits (office and emergency department), National Ambulatory Medical Care Survey 2015

<sup>2.</sup> ResApp estimate based on OECD doctor consultations per capita data (http://stats.oecd.org), and assuming 10% of visits (US prevalence based on NAMCS 2015 data) are for respiratory disease.

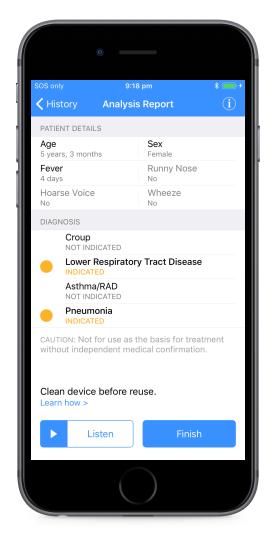
<sup>3.</sup> HCUP Statistical Brief #148 (2010)

<sup>4.</sup> Fang. L, et al., Chronic obstructive pulmonary disease in China: a nationwide prevalence study, The Lancet Respiratory Medicine 6(6), 2018

## ResAppDx Smartphone App

#### Rapid point-of-care diagnosis

- Machine learning technology using signatures in cough sounds to diagnose respiratory disease
- Uses the built-in microphone
  - No additional hardware required
  - Real-time on-device analysis
- CE Marked and TGA approved as a Class 2a medical device
- Underpinned by growing patent portfolio and data assets
  - Core patent granted in US, Australia, South Korea and Japan<sup>1</sup>,
     pending in Europe and China; six additional patent applications
  - Proprietary data set of 6,000+ patients' cough and breathing sounds with matching clinical signs, symptoms and diagnosis





#### Validated in Clinical Studies in Australia and the US

#### Paediatric

Breathe Easy
ANZCTR: ACTRN12618001521213

585 patient, double-blind, prospective study at two Australian hospitals complete

**83-97% PPA and 81-91% NPA** compared to clinical diagnosis for lower respiratory tract disease, croup, bronchiolitis, pneumonia and asthma/RAD

Results published in *Respiratory* Research<sup>1</sup>

#### SMARTCOUGH-C-2

ClinicalTrials.gov: NCT03392363

1,470 patient, double-blind, prospective study at MGH, Cleveland Clinic and Texas Children's Hospital complete

**73-77% PPA and 70-86% NPA** compared to clinical diagnosis for upper respiratory tract disease, LRTD, croup and asthma/RAD

Pneumonia and bronchiolitis <70% PPA and NPA due to clinical practice differences between US and Australia

Presented at ATS 2019, Dallas, TX

#### Adult

Breathe Easy
ANZCTR: ACTRN12618001521213

979 patient, double-blind prospective study complete

**86-88% PPA and 87-89% NPA** compared to clinical diagnosis for lower respiratory tract disease and pneumonia

**83-89% PPA and 84-91% NPA** compared to clinical diagnosis for acute exacerbations of COPD and asthma

**86% PPA and 85% NPA** for population screening of COPD

Presented at ERS 2019, Spain and APSR 2019, Vietnam



## Telehealth is the Fastest Growing Area of Healthcare

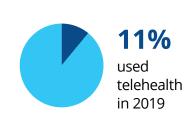
Large addressable market

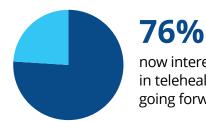
400M 150M

GP visits could be replaced by telehealth<sup>1,2</sup>

projected annual telehealth consults by 20263

High consumer demand





now interested in telehealth going forward<sup>4</sup>

Lower cost of care

**US\$472** cost savings per visit<sup>5</sup> £7.5B estimated annual savings to the NHS6





37 states and DC have **parity laws** which mandate private payer reimbursement for telehealth



All patients will have the right to online consultations by April 2020 and video consultation by April 20217



- 1. US addressable market based on one-third of the 1.25B ambulatory visits commonly recognised as replaceable by telehealth.
- 2. UK addressable market based on Royal College of General Practitioner's longterm estimate of 50% of GP visits being remote.
- 3. Frost and Sullivan research

- 4. McKinsey research, Telehealth: A guarter-trillion-dollar post-COVID-19 reality
- 5. Teladoc
- 6. Now Heathcare Group
- 7. NHS Digital First Primary Care

#### COVID-19 Has Accelerated Telehealth Adoption









#### 1 billion

virtual visits predicted for 2020<sup>1</sup>

Providers have seen **50-175x** telehealth visits than pre-COVID<sup>2</sup>

#### 1.1 billion

visitors to Ping An Good Doctor's online platform from Jan 20 to Feb 10<sup>3</sup>

Ping An Good Doctor had **266 million** online consultations in 2019<sup>4</sup>

#### 71%

of all GP visits in April were remote (compared to 25% pre-COVID)<sup>5</sup>

(out of **300 million** GP visits per year in the UK)

#### 35%

of all GP visits in May were remote (compared to 0.1% pre-COVID)<sup>6</sup>

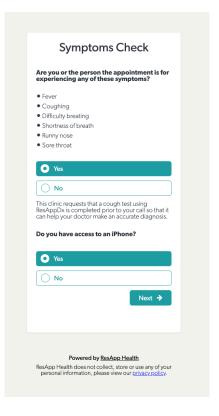
(out of **120 million** GP visits per year in Australia)



- Forrester Research
- 2. McKinsey research, Telehealth: A quarter-trillion-dollar post-COVID-19 reality
- S&P Global Market Intelligence: China's online health platforms see spike in usage amid coronavirus outbreak
- Ping An Good Doctor Annual Report 2019
- Royal College of General Practitioners
- Based on Medicare Item Reports for May 2020

## ResAppDx Enables Telehealth with Remote Diagnosis

- Up to half of all telehealth visits are for respiratory disease<sup>1,2</sup>
- Today, there is no ability to use a stethoscope and no accurate remote diagnosis tools available
- ResAppDx is integrated into telehealth software platforms providing a software-only remote diagnostic test
- Launched on Phenix Health and Coviu's platforms
- Per test fee received by ResApp undisclosed (within targeted range of \$5-10 per test)





## ResAppDx Targets Multiple Market Segments

	Telehealth	Clinical use	Developing world	Direct-to-consumer		
Market size		visits in OECD y disease p.a.¹	<ul> <li>1M child deaths due to pneumonia p.a.<sup>2</sup></li> <li>151M cases of pneumonia in developing countries p.a.<sup>2</sup></li> </ul>	<ul> <li>728M iPhone users<sup>3</sup></li> <li>2B+ Android users<sup>4</sup></li> <li>mHealth app market to grow to \$31B by end 2020<sup>5</sup></li> </ul>		
Value proposition	<ul><li>✓ Only clinically-accurate remote diagnostic tool</li><li>✓ Easily integrated</li></ul>	<ul><li>✓ Faster triage</li><li>✓ Reduced costs due to unnecessary testing</li></ul>	<ul><li>Low cost, accurate &amp; fast</li><li>Usable by non-medical personnel</li></ul>	<ul><li>✓ Convenient</li><li>✓ Low cost</li><li>✓ Consumer empowerment</li></ul>		
Commercial strategy	Partner with telehealth providers	Initial use in emergency departments (ED), extending to regular clinics	Partner with leading international aid agencies to equip field personnel	Direct to consumer sales and marketing		
Revenue model	\$5-\$10 per test fee from telehealth providers	\$5-\$10 per test fee from healthcare payors	annual subscription from aid agencies	download and subscription fees direct from consumers		
Status	Now available on Phenix and Coviu's telehealth platforms in Australia	Approvals for health- economic evaluations in the UK and Germany	Partnership with llara Health (Kenya)	Partnership with RB		



<sup>1.</sup> ResApp estimate based on OECD per capita data

<sup>.</sup> WHO estimate

<sup>3.</sup> iPhone users: Statista (2017 estimates), Android: Google (2017 estimates)

<sup>4.</sup> Research2guidance mHealth App market sizing 2015-2020

## Improving Chronic Disease Management

- 339M people have asthma<sup>1</sup>
  - \$80B+ p.a. US economic burden (2013)<sup>2</sup>
  - Poor medication adherence
- 251M people have COPD<sup>3</sup>
  - Emphysema and chronic bronchitis, primarily caused by smoking
  - 3.17M people died of COPD in 2015, 5% of all deaths globally



- Measure severity, without the cost of hardware or the need to carry an extra device
  - Accurately identified COPD/asthma exacerbations (>83% PPA and >84% NPA in prospective study)
  - Accurately identified asthmatic children requiring treatment (94% accuracy in proof-of-concept study)



- 1. The Global Asthma Report 2018 (Global Asthma Network), citing the 2016 Global Burden of Disease Study
- $2. \ \ US\ CDC, \ https://www.ajmc.com/newsroom/cdc-study-puts-economic-burden-of-asthma-at-more-than-80-billion-per-year$
- 3. WHO, citing the 2015 Global Burden of Disease Study, http://www.who.int/news-room/fact-sheets/detail/chronic-obstructive-pulmonary-disease-(copd)
- $4. \ International \ Study \ of \ Asthma\ and\ Allergies\ in\ Childhood\ via\ 2014\ \ Global\ Asthma\ Report,\ http://www.globalasthmareport.org/2014/priority/ncd.php$
- 5. COPD Foundation, https://www.copdfoundation.org/About-Us/Press-Room/Press-Releases/Article/965/COPD-Foundation-Goes-Orange-for-National-COPD-Awareness-Month-in-November.aspx

## Sleep Apnoea is the Most Common Sleep Breathing Disorder<sup>1</sup> and is Significantly Underdiagnosed

- 3 in 10 men and 2 in 10 women have sleep apnoea<sup>2</sup>
- 80% of adults with sleep apnoea are undiagnosed<sup>3</sup>
- Linked to heart disease, stroke and type 2 diabetes<sup>4</sup>
- Major barriers to diagnosis:

Sleep laboratory polysomnography (PSG)	Requires referral Long wait times \$600-\$5,000 per test Uncomfortable & unfamiliar environment
Home sleep testing (HST)	Requires referral & training Up to 18% failure rate <sup>5</sup> \$150-\$500 per test Uncomfortable





<sup>1.</sup> American Thoracic Society, Breathing in America: Diseases, Progress and Hope, https://www.thoracic.org/patients/patient-resources/breathing-in-america/resources/chapter-23-sleep-disordered-breathing.pdf

<sup>2.</sup> Peppard et al., Increasing prevalence of sleep-disordered breathing in adults, Am J Epidemiol 177(9), 2013

<sup>3.</sup> Frost & Sullivan, Hidden Health Crisis Costing America Billions, https://aasm.org/resources/pdf/sleep-apnea-economic-crisis.pdf
4. American Academy of Sleep Medicine, Severe obstructive sleep apnea hurts hearts, https://aasm.org/severe-obstructive-sleep-apnea-hurts-hearts/

<sup>5.</sup> Clinical Guidelines for the Use of Unattended Portable Monitors in the Diagnosis of Obstructive Sleep Apnea in Adult Patients, American Academy of Sleep Medicine

#### Introducing SleepCheck

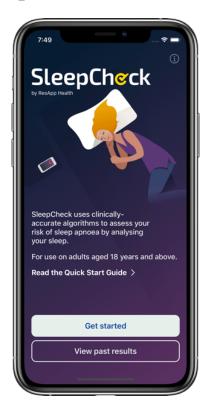
#### At-home sleep apnoea screening using only a smartphone

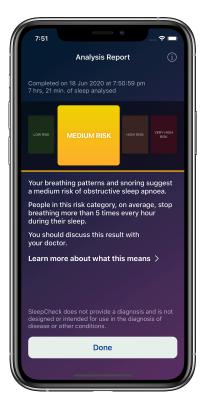
- Direct-to-consumer, no doctor's referral needed
- Validated in a large clinical study
- CE Marked and TGA approved as a Class 1 medical device
- No wires, no cuffs, no attachments



Now available on the App Store in Australia and the UK

\* Coming soon in additional countries and on Android







#### Summary

- ResAppDx, an acute respiratory disease diagnostic test for clinical use
  - Now available on multiple telehealth platforms in Australia
  - Focus this quarter on expanding availability in Australia and partnering in UK/Europe
  - Additional opportunities in in-person care and emerging markets
  - Working closely with a global health products manufacturer to develop a direct-to-consumer app
- SleepCheck, a direct-to-consumer sleep apnoea screening app
  - Available now for iPhone on the App Store in Australia and the UK
  - Marketing campaign to launch in the first week of August
  - Product updates, Android support and additional countries to follow
- Industry leading product pipeline with near, mid- and long-term opportunities
  - Chronic respiratory disease screening and management
  - Low cost handheld device and wearables with CE Marking planned for Q1 FY2021



## Detailed Clinical Study Data



## Australian Blinded Prospective Paediatric Clinical Study

## Breathe Easy Paediatric Study (ANZCTR: ACTRN12618001521213)

- Double-blind, prospective study of 585 patients, aged 29 days to 12 years, presenting with signs and symptoms of respiratory disease at two Australian hospital sites
- Comparison to clinical diagnosis (including CXR, lab tests) formed by clinical adjudication committee

Porter, P et al., A prospective multicentre study testing the diagnostic accuracy of an automated cough sound centred analytic system for the identification of common respiratory disorders in children, Respiratory Research 20(18), 2019.

	Patients <sup>1</sup> Y N		Positive Percent Agreement <sup>2</sup> (95% CI)	Negative Percent Agreement <sup>2</sup> (95% CI)	
Lower respiratory tract disease	419	154	83% (79-86%)	82% (75-88%)	
Asthma/reactive airways disease	149	381	97% (92-99%)	91% (88-94%)	
Croup	68	500	88% (78-95%)	86% (82-89%)	
Pneumonia	60	509	87% (75-94%)	85% (82-88%)	
Primary upper respiratory tract disease	89	482	79% (69-87%)	80% (76-83%)	
Bronchiolitis (patients aged < 2 years old)	131	26	84% (77-90%)	81% (61-93%)	

<sup>1.</sup> Number of patients clinically diagnosed as having disease (Y) or not having disease (N).



<sup>2.</sup> As per FDA guidance, positive and negative percent agreement (rather than sensitivity and specificity) are used when a new test is compared to a non-reference standard such as a clinical diagnosis.

## US Blinded Prospective Paediatric Clinical Study

#### SMARTCOUGH-C-2 Study

(ClinicalTrials.gov: NCT03392363)

- Double-blind, prospective study of 1,470 patients, aged 29 days to 12 years, presenting with signs and symptoms of respiratory disease at three US hospital sites (MGH, Cleveland Clinic and TCH)
- Comparison to clinical diagnosis (including CXR, lab tests) formed by clinical adjudication committee

Moschovis PP et al., A cough analysis smartphone application for diagnosis of acute respiratory illness in children, American Thoracic Society Conference 2019.

Patients <sup>1</sup>		Positive Percent	Negative Percent
Υ	N	Agreement <sup>2</sup> (95% CI)	Agreement <sup>2</sup> (95% CI)
412	775	73% (68-77%)	77% (74-80%)
176	886	71% (64-78%)	86% (83-88%)
177	779	75% (68-82%)	84% (82-87%)
29	1207	74% (53-87%)	74% (71-76%)
722	453	76% (73-79%)	70% (66-74%)
52	1027	67% (53-80%)	64% (61-67%)
100	1150	63% (53-72%)	62% (59-65%)
42	89	76% (60-88%)	60% (59-70%)
	Y 412 176 177 29 722 52 100	Y N 412 775 176 886 177 779 29 1207 722 453 52 1027 100 1150	Positive Percent Agreement <sup>2</sup> (95% CI)  412 775 73% (68-77%)  176 886 71% (64-78%)  177 779 75% (68-82%)  29 1207 74% (53-87%)  722 453 76% (73-79%)  52 1027 67% (53-80%)  100 1150 63% (53-72%)

<sup>1.</sup> Number of patients clinically diagnosed as having disease (Y) or not having disease (N).



<sup>2.</sup> As per FDA guidance, positive and negative percent agreement (rather than sensitivity and specificity) are used when a new test is compared to a non-reference standard such as a clinical diagnosis.

## Australian Blinded Prospective Adult Clinical Study

#### Breathe Easy Adult Study

(ANZCTR: ACTRN12618001521213)

- Double-blind, prospective study of 979 subjects
- Comparison to clinical diagnosis (including CXR, CT, spirometry, lab tests) by expert clinicians

	Subjects <sup>1</sup>		Positive Percent	Negative Percent	
	Υ	Ν	Agreement <sup>2</sup> (95% CI)	Agreement <sup>2</sup> (95% CI)	
Lower respiratory tract disease	358	163	88% (84-91%)	89% (83-93%)	
Pneumonia	159	163	86% (80-91%)	87% (80-91%)	
Asthma exacerbation	46	73	89% (76-96%)	84% (73-91%)	
COPD	117	381	86% (79-92%)	85% (81-89%)	
COPD exacerbation	86	78	83% (73-90%)	91% (82-96%)	

<sup>1.</sup> Number of patients clinically diagnosed as having disease (Y) or not having disease (N).

Claxton S et al., Diagnosis of chronic obstructive pulmonary disease (COPD) exacerbations using a smartphone-based, cough-centred algorithm, European Respiratory Society International Congress 2019.

Porter P et al., Diagnosis of Chronic Obstructive Pulmonary Disease (COPD) Using a Smartphone-Based Cough-Centred Algorithm in a Mixed Disease Acute-Care Cohort, 24th Congress of the Asian Pacific Society of Respirology, 2019.

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Porter P et al., Diagnosis of Lower Respiratory Tract Disease (LRTD) and Pneumonia Using a Smartphone-Based Cough-Centred Algorithm in an Adolescent and Adult Acute-Care Cohort, 24th Congress of the Asian Pacific Society of Respirology, 2019.

Claxton S et al., Detection of Asthma Exacerbation in Adolescent and Adult Subjects with Chronic Asthma Using a Cough-Centred, Smartphone-Based Algorithm, ANZSRS/TSANZ Annual Scientific Meeting 2020.

<sup>2.</sup> As per FDA guidance, positive and negative percent agreement (rather than sensitivity and specificity) are used when a new test is compared to a non-reference standard such as a clinical diagnosis.

## Obstructive Sleep Apnoea Study

#### OSA SNOREAPP Study

- Blinded, prospective study of 582 patients (in sleep laboratory) and 238 patients (at-home)
- Comparison to PSG AASM Type I sleep study (in sleep laboratory) and PSG AASM Type II sleep study (at-home)

	Comparison to AASM Type I (in laboratory) sleep study					Comparison to AASM Type II (at-home) sleep study				
	Patients <sup>1</sup>		AUC	Sensitivity	Specificity	Patients <sup>1</sup>		AUC	Sensitivity	Specificity
	Υ	Ν	(95% CI)	(95% CI)	(95% CI)	Υ	Ν	(95% CI)	(95% CI)	(95% CI)
AHI ≥ 5/h (Mild)	507	47	0.90 (0.87-0.93)	84% (80-87%)	83% (69-92%)	212	26	0.91 (0.85-0.96)	85% (80-90%)	73% (52-88%)
AHI ≥ 15/h (Moderate)	346	205	0.88 (0.85-0.91)	80% (75-84%)	80% (73-85%)	126	92	0.91 (0.87-0.95)	83% (76-89%)	80% (71-88%)
AHI ≥ 30/h (Severe)	191	372	0.90 (0.87-0.93)	82% (76-87%)	82% (77-86%)	75	153	0.93 (0.90-0.96)	83% (72-90%)	90% (84-94%)

<sup>1.</sup> Number of patients clinically diagnosed as having disease (Y) or not having disease (N).

