PARTNERING FOR PROGRESS IN RESPIRATORY CARE: CHIESI AT THE AMERICAN THORACIC SOCIETY 2024 CONGRESS

17th-22nd MAY 2024, SAN DIEGO

ATS 2024
San Diego, CA
May 17-22

CHIESI PARTNERING FOR PROGRESS IN RESPIRATORY CARE

The American Thoracic Society (ATS) 2024 Congress in San Diego was a hub of groundbreaking research and collaboration. Chiesi was proud to be a prominent participant actively shaping the future of respiratory medicine!

From May 17th-22nd, the dynamic event explored many critical topics, including the best practice for the management of COPD and asthma, across 45 scientific sessions.

Chiesi presence and impact manifested through 3 key moments:

PIONEERING RESEARCH
for people with respiratory diseases

Deep dive into
SMALL AIRWAY DYSFUNCTION

BRIDGING THE GAP: CHIESI FOUNDATION at ATS 2024 Congress

Chiesi

PIONEERING RESEARCH

DEEP DIVE INTO SAD

CHIESI FOUNDATION

PIONEERING RESEARCH IN COPD AND ASTHMA

CHIESI AT ATS 2024 CONGRESS – 17th-22nd MAY, SAN DIEGO

Chiesi showcased new publications featuring the company's latest advancements in research across asthma and chronic obstructive pulmonary disease (COPD), including:

- **Is onsite spirometry quality predicting the quality of home spirometry?** B. Cuyvers et al.
- **Effects of single inhaler combinations of extrafine BDP/FF/G and extrafine BDP/FF on lung hyperinflation and exercise endurance time in subjects with COPD: a randomised controlled trial.** H. Watz et al.
- **Extrafine formulation single-inhaler triple therapy improves lung function after six months of treatment in patients with asthma: TriMaximize Study.** C. Gessner et al.

Is onsite spirometry quality Predicting the Quality of Home Spirometry?

P. Desbordes[1], B. Cuyversi, M. Topalovic[1], S. Biondaro[2], I. Montagna[2], S. Corre[2], E. Topole[2]
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INTRODUCTION

High quality spirometry data in clinical trials is important for the assessment of efficacy, relevant clinical decision guidance and safety monitoring. Spirometry is effort-dependent and requires a correct technique to obtain clinically relevant measurements.

Therefore, the quality of FEV1 and FVC measurements is assessed based on ATS/ERS quality guidelines.

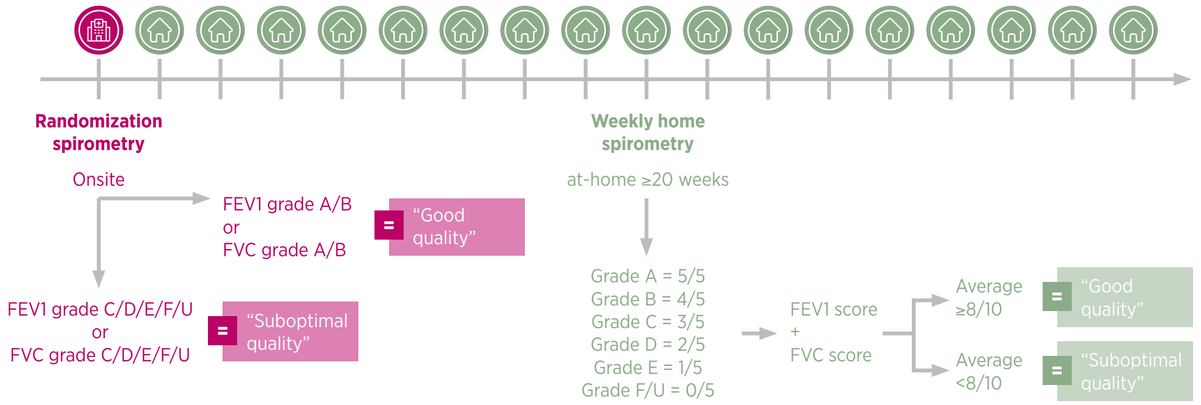
Home spirometry is a viable alternative or promising additional assessment in respiratory clinical trials. It can provide more frequent evaluation of lung function parameters and has a potential to reduce patient burden by limiting number of on-site visits. Home spirometry is performed by patients at home, without the supervision of skilled technician, therefore, efficient quality monitoring is important.

OBJECTIVES

This analysis aimed to determine **whether the quality of a patient's onsite spirometry could predict the quality of his/her home spirometry.**

METHOD

On-site spirometry data from 55 randomized patients performed at randomization visit was available at the time of analysis, followed by weekly home spirometry (unsupervised) for at least 20 weeks. The quality of onsite and home spirometry was assessed post-hoc using AI-based software (ArtiQ.QC v1.5.0, ArtiQ NV, BE). The session was classified as good quality if both FEV1 and FVC were classified as A or B, according to ATS/ERS standards. For home spirometry, the average quality over time was considered. Significant differences are checked with Fisher test (p-value < 5%)



RESULTS

Onsite spirometry \ Home spirometry	Good quality N	Suboptimal quality N	Total
Good quality	**26**	**16**	42
Suboptimal quality	4	**9**	13
Total	30	25	55

Table 1: Comparison of onsite spirometry and home spirometry quality in 55 patients (good quality: both FEV1 and FVC = A or B)

CONCLUSION

- 76.4% of patients had good-quality onsite spirometry as assessed by AI based software
  - ▶ 62% continued to perform good quality spirometry at home
- 23,6% of patients had suboptimal-quality onsite spirometry
  - ▶ 31% were able to perform good-quality spirometry at home

A Fisher test (alpha = 5%) showed that this result is close to statistical significance (p=0.062). Further analysis with more data is required.

We demonstrated that the quality of onsite spirometry could be one of the indicators of the quality of subsequent home spirometry maneuvers.
This shows the potential of AI-based software for flagging patients that would equire more training and follow-up during home spirometry measurements.

Ai4Spiro

PIONEERING RESEARCH
DEEP DIVE INTO SAD
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#7419 - Effects of single inhaler combinations of extrafine BDP/FF/G and extrafine BDP/FF on lung hyperinflation and exercise endurance time in subjects with COPD: a randomised controlled trial

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[3]Centrum Medycyny Oddechowej Mroz SJ, Bialystok (Poland) [4]Global Clinical Development, Chiesi Farmaceutici S.p.A.[5] Institut für Allergie und Asthmaforschung Berlin, Berlin, Germany

BACKGROUND AND AIM

This study compared the effect of triple combination beclometasone dipropionate / formoterol fumarate / glycopyrronium **(BDP/FF/G)** 100/6/10 µg/actuation, double combination **BDP/FF** 100/6 µg/actuation and **placebo** administered as 2 inhalations twice daily for 3 weeks via pressurized metered dose inhalers on **lung hyperinflation and exercise endurance time (EET)** in subjects with **chronic obstructive pulmonary disease (COPD).**

STUDY DESIGN

This was a phase 4 randomized, double blind, 3-period cross-over, placebo-controlled study in patients with moderate-to-severe COPD and evidence of hyperinflation. The primary endpoint was **change from baseline in 2-hour post-dose inspiratory capacity at the end of each 3-week treatment.** Key-secondary endpoints included **change from baseline in IC at isotime** (shortest EET at either the start or end of each treatment period) and **2-hour post-dose EET.**

BASELINE CHARACTERISTICS

A total of **181 patients were screened, 106 were randomised and 95 (89.6%) completed the study.** Among the 11 who withdrew from the study, eight discontinued due to an adverse event, two had a COPD exacerbation, and one withdrew consent

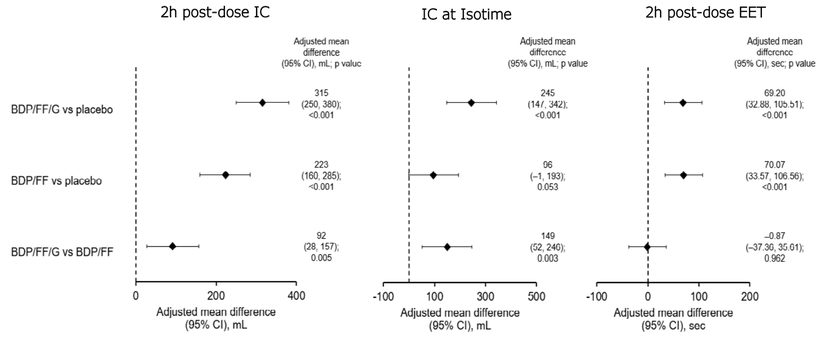
Table 1: Demographics and baseline characteristics (safety set)

Characteristic	Safety Set N=106
Age, years	65.4 (7.2)
Sex, male	66 (62.3%)
Ex-smoker	47 (44.3%)
Current smoker	59 (55.7%)
Post-bronchodilator FEV_1 % predicted	60.60 (12.10)
FRC, % predicted	144.8 (26.0)
GOLD Stage	
1 (FEV_1 ≥80% predicted)	4 (3.8%)
2 (FEV_1 <80% and ≥50% predicted)	75 (70.8%)
3 (FEV_1 <50% and ≥30% predicted)	25 (23.6%)
4 (FEV_1 <30% predicted)	2 (1.9%)
Pre-exercise Inspiratory capacity, L	2.205 (0.804)
Exercise endurance time, min	6.12 (2.94)

Mean and standard deviation or number and percentage are reported

RESULTS

BDP/FF/G showed improvement vs. placebo in both change from baseline in 2-hour post-dose IC [0.315 L (95% CI: 0.250, 0.380), p<0.001] and IC at isotime [0.245 L (95% CI: 0.147, 0.342), p<0.001]. **BDP/FF showed improvement vs. placebo** in 2-hour post-dose IC [0.223 L (95% CI: 0.160, 0.285), p<0.001] and IC at isotime [0.096 L (95% CI: -0.001, 0.193), p=0.053]. **An improvement with BDP/FF/G vs. BDP/FF was observed** in both IC 2-hour post dose [0.092 L (95% CI: 0.028, 0.157), p=0.005] and IC at isotime [0.149 L (95% CI: 0.052, 0.246), p=0.003]. **EET time was similar with the two active treatments.**
All three treatments were generally well tolerated.



In patients with COPD, BDP/FF/GB provided statistically and clinically relevant improvements vs. BDP/FF in static and dynamic hyperinflation, together with an improvement vs. placebo in exercise endurance time. (ClinicalTrials.gov ID: NCT05097014)

PIONEERING RESEARCH
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Extrafine Formulation Single-Inhaler Triple Therapy Improves Lung Function after Six Months of Treatment in Patients with Asthma: TriMaximize Study

TRIMAXIMIZE

C. Gessner[1]*, V. Bogoevska[2], D. Nachtigall[2], R. Russell[3], C. Suppli Ulrik[4], W. Pohl[5], V. Plaza[6], A. Bourdin[7], B. Akyildiz[2], F. Trinkmann[8].
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BACKGROUND

- Randomized clinical trials have shown drug efficacy of extrafine formulation single-inhaler triple therapy (efSITT) consisting of beclomethasone dipropionate/formoterol fumarate/glycopyrronium (BDP/FF/G)[1].
- TriMaximize study was designed to observe patients who have switched to efSITT in a real-world setting over a period of one to three years.

METHODS

- TriMaximize is a multinational, observational study that follows patients with asthma being prescribed efSITT. Patients were recruited in 125 centers across six countries (Germany, United Kingdom, Austria, Denmark, France and Spain).
- Pre-bronchodilator lung function was measured by spirometry and body plethysmography at baseline and after six months of treatment with efSITT along with additional descriptive analyses.

CONCLUSION

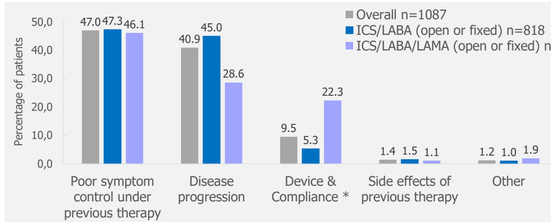
Significant improvement in lung function, including parameters of central (FEV_1) and peripheral (sRtot) airflow limitation as well as hyperinflation (RV/TLC) and reduction of rescue medication was observed six months after switching to efSITT from ICS/LABA or other combination of ICS/LABA/LAMA.

RESULTS

Table 1. Baseline characteristics of patients (n=1090).

Age, mean years (±SD)		58 (15)
Sex, n (%)	Female	690 (63.3)
	Male	400 (36.7)
BMI (kg/m²), mean (±SD)		29.3 (7.8)
Smoking status, n (%)	Former smoker	340 (31.2)
	Current smoker	202 (18.5)
Pack years, mean (±SD)	Former smoker	19.1 (15.5)
	Current smoker	24.9 (15.5)
Time since stopped smoking, years (±SD)		14.8 (12.5)
Time since diagnosis at baseline visit, years (±SD)		14.4 (14.1)
FEV_1 % predicted at baseline visit, mean (±SD)		67.08 (16.96)
Rate of moderate or severe asthma exacerbations in previous year, mean (±SD)		1.8 (1.7)
Asthma maintenance treatment before switch to efSITT, n (%)	ICS/LABA (open or fixed)	821 (75.3)
	ICS/LABA/LAMA (open or fixed)	269 (24.7)
Classification according to GINA criteria, n (%)	GINA 4	878 (82.6)
	GINA 5	185 (17.4)

Figure 1. Main reasons for being prescribed BDP/FF/G.



*Device simplification or poor compliance under previous therapy due to multiple i

Table 2. Mean FEV1 (±SD) at baseline (Visit 1), stratified by prior asthma maintenance treatment.

Overall n=856	2.03 L (0.82)
ICS/LABA (open or fixed) n=651	2.05 L (0.81)
ICS/LABA/LAMA (open or fixed) n=205	1.95 L (0.84)

Table 3. Mean change in lung function parameters after six months of treatment with BDP/FF/G, stratified by prior asthma maintenance treatment.

Parameters	Overall population	Prior ICS/LABA*	Prior ICS/LABA/LAMA*
FEV_1 (mL) (±SD)	**130** (460) p<0.0001 n=389	**150** (440) p<0.0001 n=312	**70** (540) p<0.2797 n=77
FEV_1 (% of predicted) (±SD)	**3.95** (13.51) p<0.0001 n=338	**4.09** (13.18) p<0.0001 n=278	**3.43** (14.85) p<0.0575 n=70
RV/TLC (% of predicted) (±SD)	**-7.79** (39.33) p=0.0017 n=256	**-9.07** (37.52) p=0.0007 n=205	**-2.64** (45.95) p=0.6828 n=51
sRtot (% of predicted) (±SD)	**-19.31** (84.52) p<0.0163 n=114	**-28.08** (80.04) p<0.0011 n=92	**17.37** (94.49) p=0.3983 n=22
MEF 25-75 (L/s) (±SD)	**0.10** (0.98) p=0.2430 n=142	**0.12** (0.85) p=0.1387 n=112	**0.01** (1.38) p=0.9656 n=30

For the mean change (V3-V1) only patients with spirometry and/or body plethysmography performed at Visit 1 and Visit 3 were included (a total of 453 patients, 355 were previously treated with ICS/LABA and 98 patients with ICS/LABA/LAMA).

*(fixed or open); FEV_1 - forced expiratory volume in 1 second; RV/TLC - residual volume to total lung capacity ratio; sRtot - total specific resistance; MEF 25-75 - maximum expiratory flow at 25-75% of FVC; ICS - Inhaled corticosteroid; LABA - Long-acting beta2-agonist; LAMA - Long-acting muscarinic antagonist.

Table 4. Total mean number of puffs (±SD) of rescue medication in the previous week at Visit 1 and Visit 3, stratified by prior asthma maintenance treatment.

	Visit 1	Visit 3
Overall	11.3 (11.9) n=665	7.4 (7.5) n=279
ICS/LABA (fixed or open)	10.8 (11.2) n=501	7.2 (7.2) n=215
ICS/LABA/LAMA (fixed or open)	12.7 (13.5) n=164	8.2 (8.3) n=64

Figure 2. Mean change in total number of puffs of rescue medication in the previous week V3-V1, stratified by prior asthma maintenance treatment (n=229).

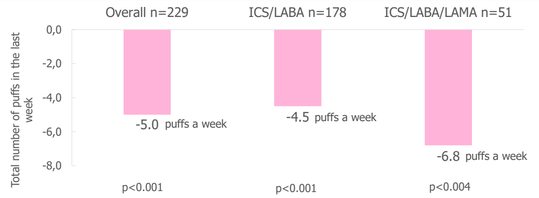
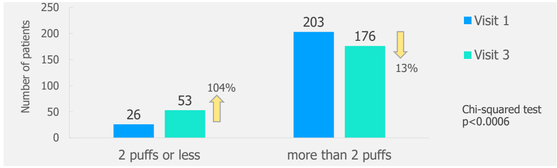


Figure 3. Number of patients taking a rescue medication in the previous week comparing Visit 1 and Visit 3 for high and low users (n=229).



References:
[1] Virchow J.C. et al., Single inhaler extrafine triple therapy in uncontrolled asthma (TRIMARAN and TRIGGER): two double-blind, parallel-group, randomised, controlled phase 3 trials. The Lancet, 2019. 394(10210): p. 1737-1749.
[2] Schatz M. et al., Asthma Control Test: reliability, validity, and responsiveness in patients not previously followed by asthma specialists. J Allergy Clin Immunol, 2006. 117: p. 549-556.

The TriMaximize study was funded by Chiesi. CG, RR, CSU, WP, VP, AB and FT have received fees for conducting the study. VB, DN, BA are employees of Chiesi GmbH during the planning, implementation or evaluation of the study.

Scan to download the poster.

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DEEP DIVE INTO SMALL AIRWAY DYSFUNCTION

CHIESI AT ATS 2024 CONGRESS – 17th-22nd MAY, SAN DIEGO

On 19th of May at the expert-led Chiesi Innovation Hub, Professor Monica Kraft shared insightful data and considerations about small airway dysfunction (SAD), a current challenge in respiratory health, which can help set the stage for future advancements.

Silent No More – Uncovering the Role of Small Airways in Asthma

In a captivating speech, **Professor Monica Kraft** shed light on a crucial yet often overlooked aspect of asthma: **small airway disease (SAD)**. Traditionally, research focused on large airways; however, recent discoveries highlight SAD as a significant contributor to airflow obstruction in asthmatic patients.

During the speech, compelling evidence was presented suggesting SAD as an early indicator of asthma's development. **SAD is linked to a multitude of daily challenges** faced by asthma patients, including hyperresponsiveness, exercise-induced asthma, exacerbations and reduced asthma control.

The ATLANTIS Study

Today the diagnosis of SAD remains a challenge – Prof. Monica Kraft pinpointed. Its minimal early symptoms make detection and measurement with conventional testing methods difficult.

The ATLANTIS Study, **the world's largest longitudinal study of SAD**, aimed to determine the **optimal combination of clinical approaches** to assess small and large airway dysfunction. By unraveling these connections, it could empower clinicians to identify patients at a higher risk of exacerbations and **pave the way for more personalized and effective asthma management strategies.**

The ATLANTIS Study findings around the role of SAD in asthma at ATS 2024 Congress

CONCLUSIONS

- SAD is present in **91% of the asthma population** across all severities and particularly in more severe asthma.[1]
- Tests of small airway function including **IOS, body plethysmography**, and **spirometry** can be used to assess SAD groups in clinical practice.[1]
- R5-R20, AX, and X5 measured via IOS can provide information about **exacerbation risk**.[2]
- SAD **predicts** exacerbations, symptoms, and quality of life.[2]
- The use of the SAD questionnaire can detect small airways dysfunction in a **real-life clinical setting**.[3]

FUTURE DIRECTIONS

- Evaluate the SAD questionnaire to **identify patients with asthma and SAD** in clinical practice alone or in combination with physiologic measurements.
- Determine the **diagnostic utility** of oscillometry a priori and compare it to use of spirometry in clinical practice.
- Optimize the use of the ordinal score as part of a **treatment algorithm to target SAD** and evaluate clinical outcomes with treatment.
- Expand the evaluation of SAD to patients with **COPD**.

AX, area of reactance; **COPD,** chronic obstructive pulmonary disease; **IOS,** impulse oscillometry; **R5,** resistance at 5 Hz; **R5–R20,** peripheral airway resistance; **R20,** resistance at 20 Hz; **SAD,** small airways dysfunction; **X5,** reactance at 5 Hz.

References: 1. Postma DS et al. Lancet Respir Med. 2019;7(5):402-416. **2.** Kraft M et al. Lancet Respir Med. 2022;10:661-668. **3.** Kocks J et al. Eur Respir J. 2023;61(3):2200558.

BRIDGING THE GAP: CHIESI FOUNDATION AT ATS 2024 CONGRESS

The Chiesi Foundation marked a significant milestone by participating for the first time in the 2024 American Thoracic Society (ATS) International Conference held in San Diego. This participation represented a good opportunity to raise awareness about chronic respiratory diseases (CRDs) in the Global South.

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CHIESI FOUNDATION

Chiesi Foundation at the 2024 American Thoracic Society Conference: A Focus on Global Health Inequities

The Foundation's central contribution was a well-received symposium titled **"Global Health Inequities in Chronic Respiratory Disease: Challenges and Potential Solutions"**. Chaired by **Dr Mario Scuri**, Technical Advisor of Chiesi Foundation, the session featured renowned specialists in the field.

Highlighting the GASP Model

A key focus of the symposium was the **Global Access to Spirometry Project (GASP)**, a Chiesi Foundation initiative to establish sustainable respiratory healthcare solutions in low- and middle-income countries (LMICs). **Prof. Robert D. Levy** of the University of British Columbia presented the project's success story in Guyana.

The GASP model addresses crucial challenges by introducing essential spirometry equipment, providing ongoing training for healthcare workers, developing educational materials for patients and families, and implementing a "coach the trainer" model for long-term sustainability. The model also includes the education and sensitization of the patients and their families regarding the management of the chronic nature of the disease, by attending the follow-up visits, avoiding smoking habits or the use of biomasses for cooking.

This comprehensive approach has the potential to significantly **improve access to proper diagnosis and management** of CRDs in LMICs.

Addressing the Burden of COPD

The symposium also shed light on the concerning burden of chronic obstructive pulmonary disease (COPD) in LMICs. **Prof. William Checkley** of Johns Hopkins University emphasized the alarming rates of underdiagnosis and misdiagnosis, highlighting that **over 80% of COPD** cases in these regions **remain undetected**.

He presented statistics showcasing the **disproportionate impact of COPD on the Global South**, with 84% of deaths and disability-adjusted life years (DALYs) attributable to the disease occurring in LMICs. The session explored critical questions regarding the implementation of COPD guidelines and identification of barriers hindering access to cost-effective interventions in these settings.

Disparities in CRD Diagnosis and Management

Prof. Laura Nicolaou of Johns Hopkins University emphasized the critical role of resources in tackling CRDs. The session addressed the significant barriers created by **limited funding for prevention, diagnosis, and treatment**, particularly in LMICs.

It explored various factors contributing to CRD risk in these regions, including environmental exposures, respiratory infections, and social determinants of health. Dr Nicolaou highlighted the urgent need for comprehensive tobacco cessation programs tailored to address the cost-coverage limitations in LMICs.

The symposium also discussed the concerning rates of under-diagnosis and misdiagnosis of CRDs, particularly COPD, in LMICs. The discussion explored the **role of sociological, economical and cultural factors, education level, and access to spirometry** in perpetuating these disparities.

Looking Ahead: A Commitment to Global Health Equity

The Chiesi Foundation's participation in the ATS conference signifies its unwavering commitment to addressing global health inequities in CRDs. By fostering collaboration, raising awareness, and promoting successful models like GASP, the Foundation aspires to **bridge the gap and improve the quality of life for thousands of patients worldwide**, contributing to the reach of Sustainable Development Goal no. 3 of the UN 2030 Agenda.

About Chiesi Foundation

Chiesi Foundation is a philanthropic organization founded in 2005, as an expression of the **social responsibility of Chiesi Farmaceutici**, who aims at improving the health and alleviating the suffering of patients affected by respiratory diseases and neonatal diseases in low- and middle-income Countries.

The Foundation supports international scientific research and develops projects to transfer medical-scientific knowledge at a local level, **promoting sustainable development and the progressive autonomy of local communities**.