

HOPE AGORA event 2025

Tailor-made care for people with COPD and comorbidities

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RE-SAMPLE has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 965315. This result reflects only the author's view and the European Commission is not responsible for any use that may be made of the information it contains.

This is Maria. She is 80 years old. She lives in a small town in the Netherlands, near the city. She loves nature and does a lot of volunteer work. To help those 'old people'. Her grandchildren live in the east of the Netherlands. She would like to go there way more often. But she is often short of breath and has problems with her feet. Walking to the train station is no longer possible.





10% COPD + 80% comorbidity

Diabetes, depression, heart failure etc.





Multimorbidity = complex care

Now: 1 in 7

In 2040: 1 in 4



THE PATIENT JOURNEY OF...



Patient journey

- Stable phase vs. Flare-ups (exacerbations)
- Time-based visits vs. treatment for worsening
- Several healthcare providers

Limited insight!

Planned and reactive care

Limited lifestyle guidance

Self-management difficult

Not sustainable!

We need preventive, proactive and tailored care!



Factsheet:

Horizon 2020
4 yrs (2021-2025)
Budget €6M
10 partners
3 pilot sites
Coordinated by UT

To identify and predict individual exacerbations and develop personalised treatment by a multi-disciplinary, adaptive virtual companionship programme for patients with COPD and CCCs



RE-SAMPLE project www.re-sample.eu



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UNIVERSITY OF TWENTE.

RE-SAMPLE - HIGHLIGHTS

HOW?

Participation & design

Holistic monitoring & RWD


Personalised eHealth programme

Evaluation & integration daily care

AI-supported predictions

Privacy-preserving Infrastructure

KEY RESULTS

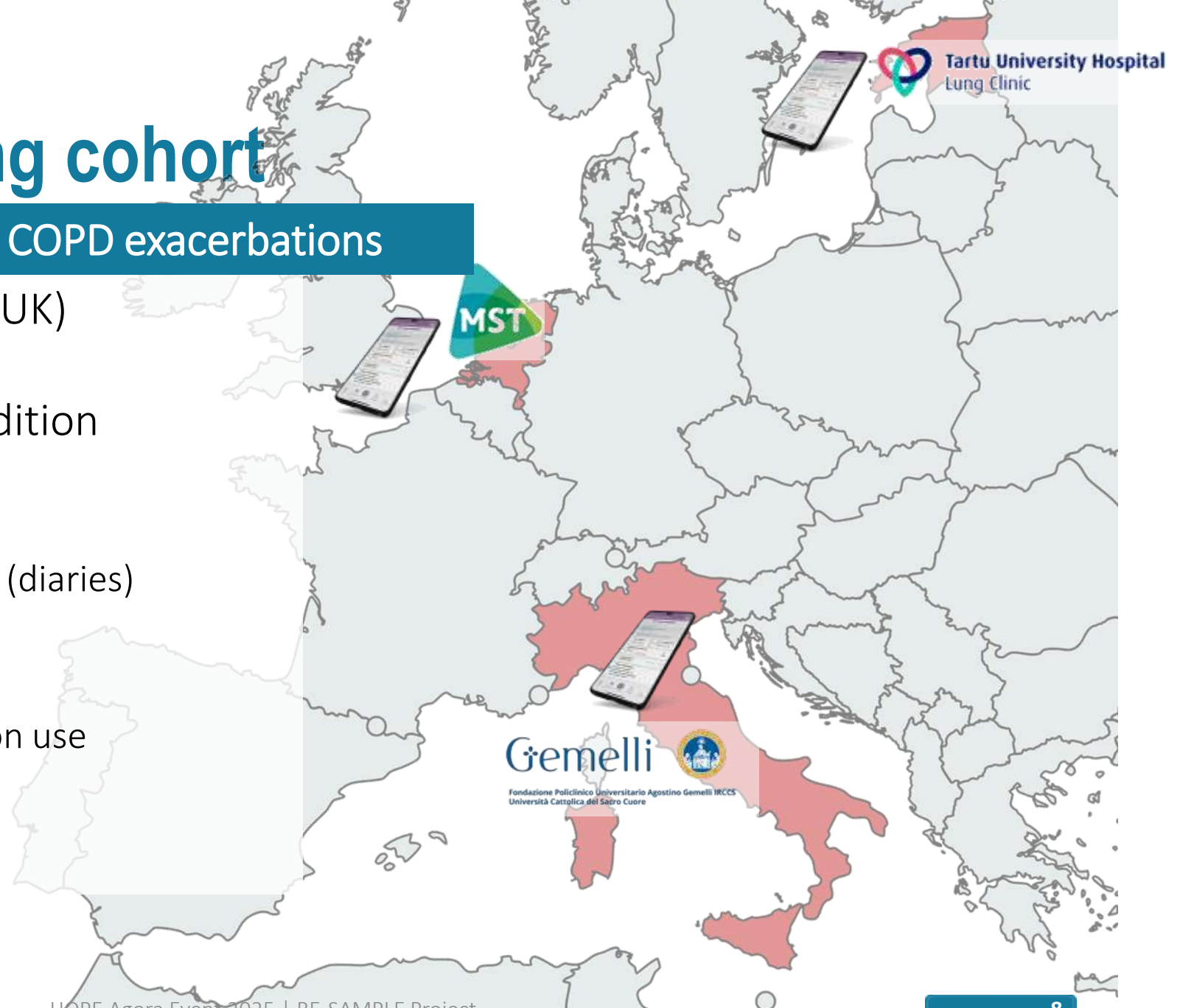
- Continuous co-creation & evaluation 
- Multi-centre Monitoring cohort
- Predictors
- Virtual companionship programme
- Action plans, shared decision making and coaching
- Service model for integration in daily care
- Societal impact, acceptance
- Data-driven machine learning
- Federated learning
- Privacy-preserving RE-SAMPLE platform

Insight
Intervention
Integration

Insight: Monitoring cohort

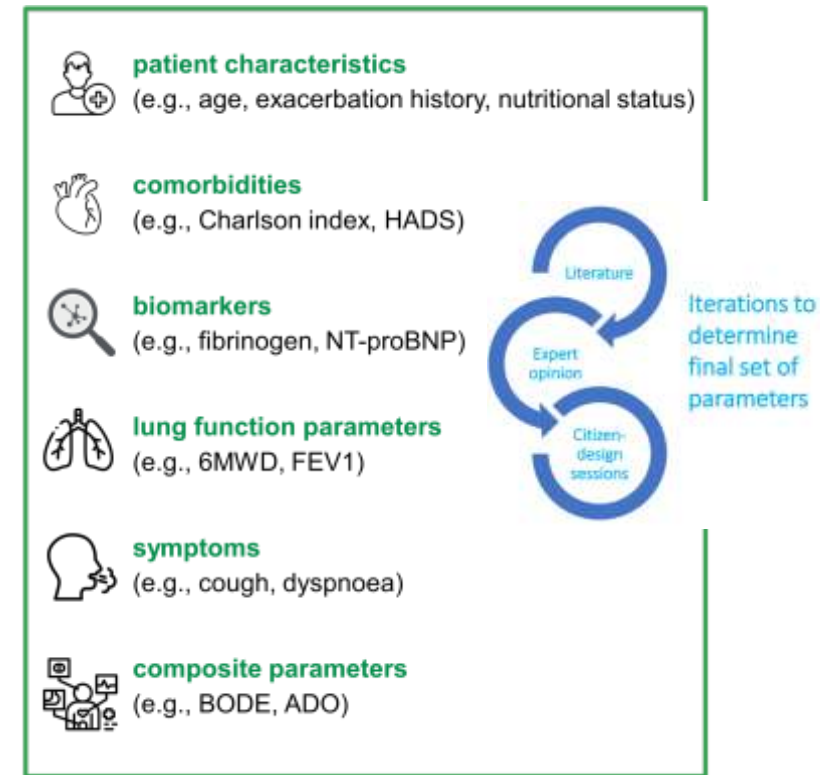
Aim: to identify predictors of COPD exacerbations

- Multi-center (GEM, MST, TUK)
- COPD with ≥ 1 chronic condition
- Multi-source data
 - Patient-reported outcomes (diaries)
 - Lung function, biomarkers
 - Physical activity (Garmin)
 - Healthcare visits, medication use



Continuously evolved RE-SAMPLE cohort

- **Knowledge base** from clinical guidelines, literature reviews, retrospective data
- **Multi-disciplinary iterative approach**
 - User requirements: focus groups patients (n=41) & HCPs (n=36)



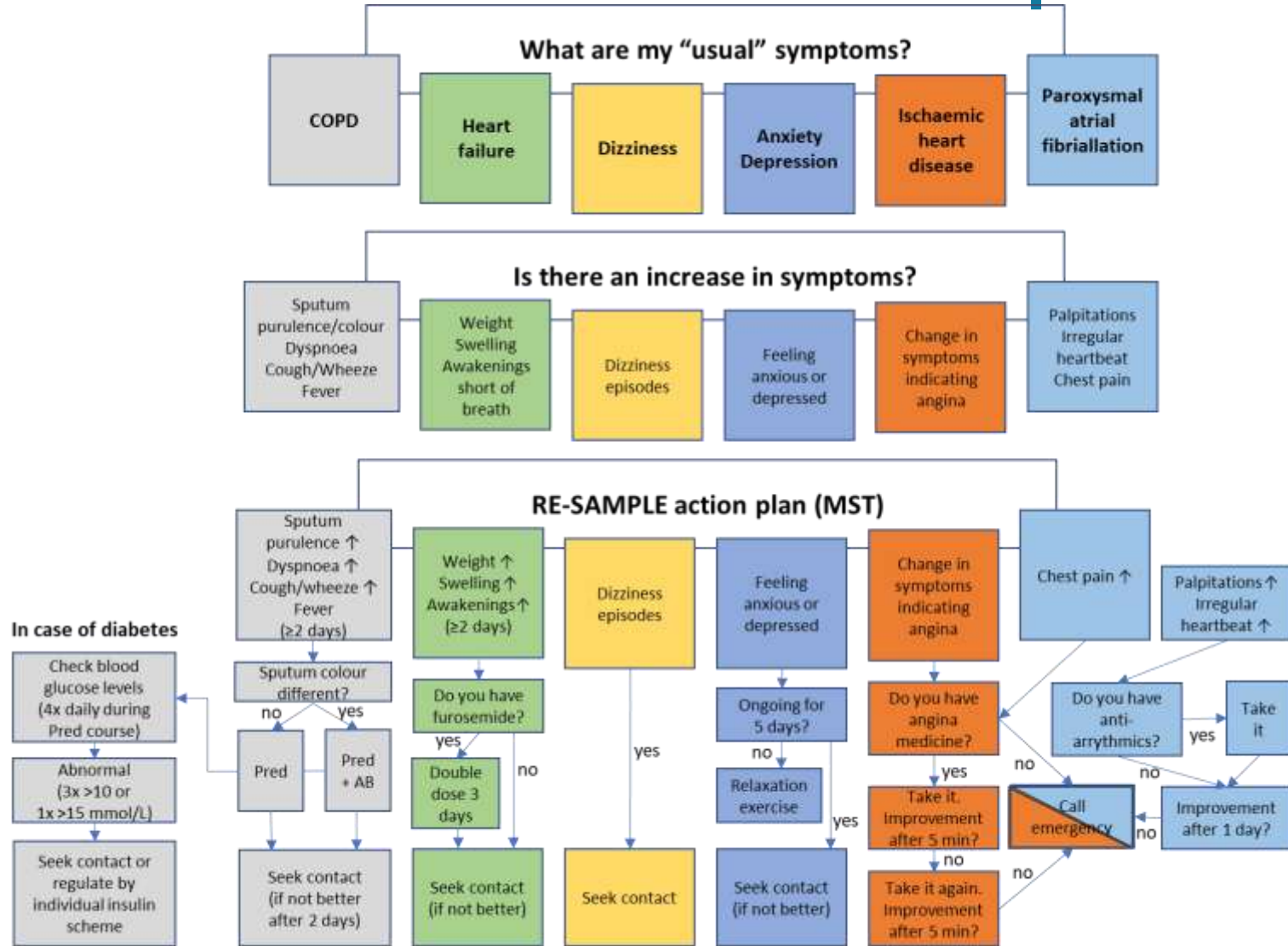
Chamaon et al., submitted 2025
van Dijk et al., Int J COPD 2024
van Dijk et al., BMJ Open 2023

Intervention: Virtual companionship programme

Aim: to provide tailored care and support for patients with COPD and comorbidities

- Ongoing tailored self-management support
 - Self-management training sessions
 - Education about COPD and comorbidities
 - Recognition and self-treatment of symptoms (action plans)
 - Breathing and relaxation exercises
 - Shared decision making and personalised coaching
 - Individual goal setting based on preferences and risk profile
 - Tailored coaching dialogues

Multi-morbid action plan



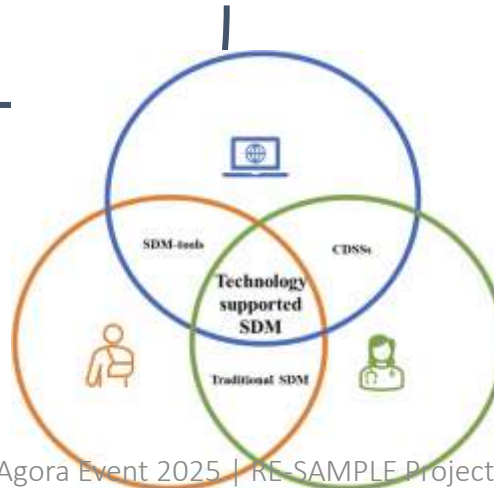
Adapted from Vanfleteren & Fabbri ERJ 2019
Lenferink et al. ERJ 2019



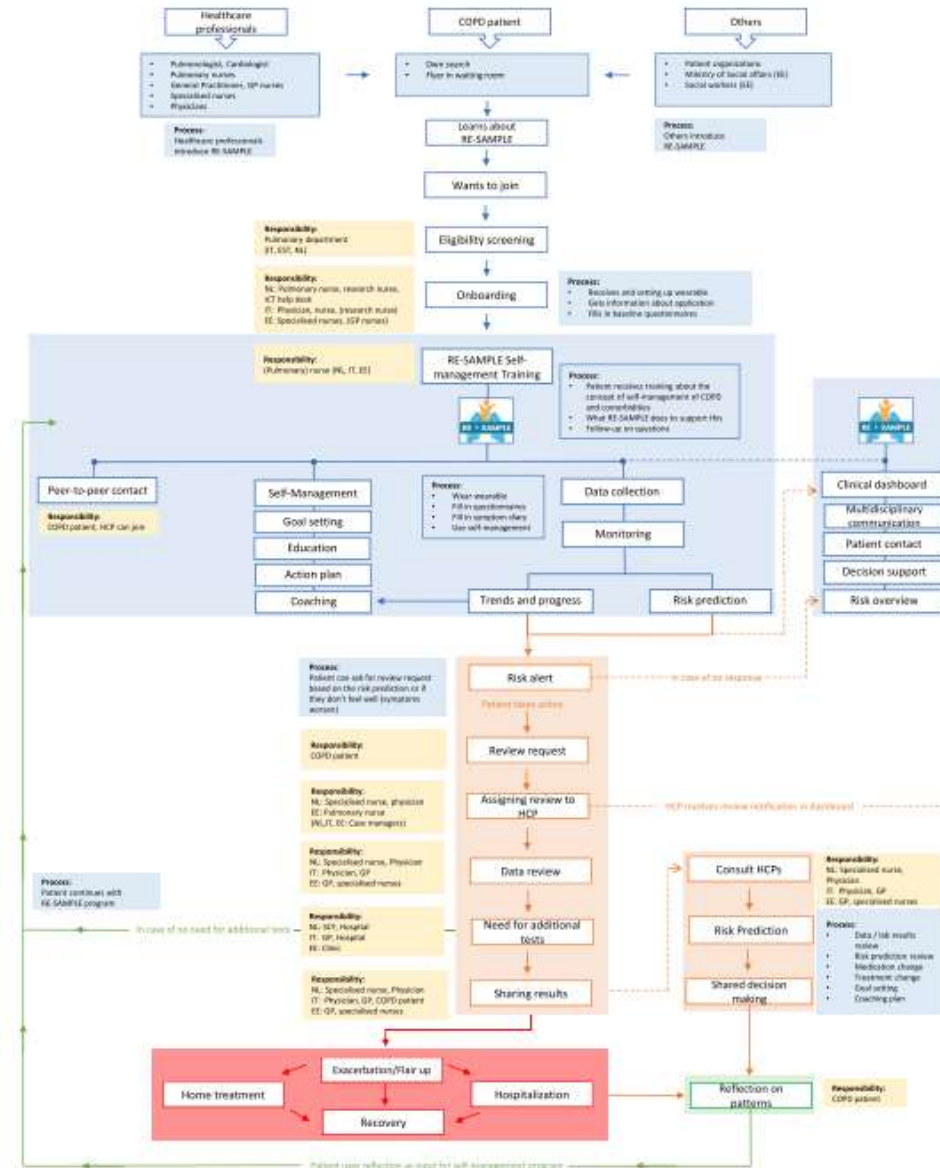
Personalised coaching



Shared Decision Making



Integration: Service model and integrated care protocol



RE-SAMPLE - HIGHLIGHTS

HOW?

Participation & design

Holistic monitoring & RWD


Personalised eHealth
programme

Evaluation &
integration daily care

AI-supported predictions

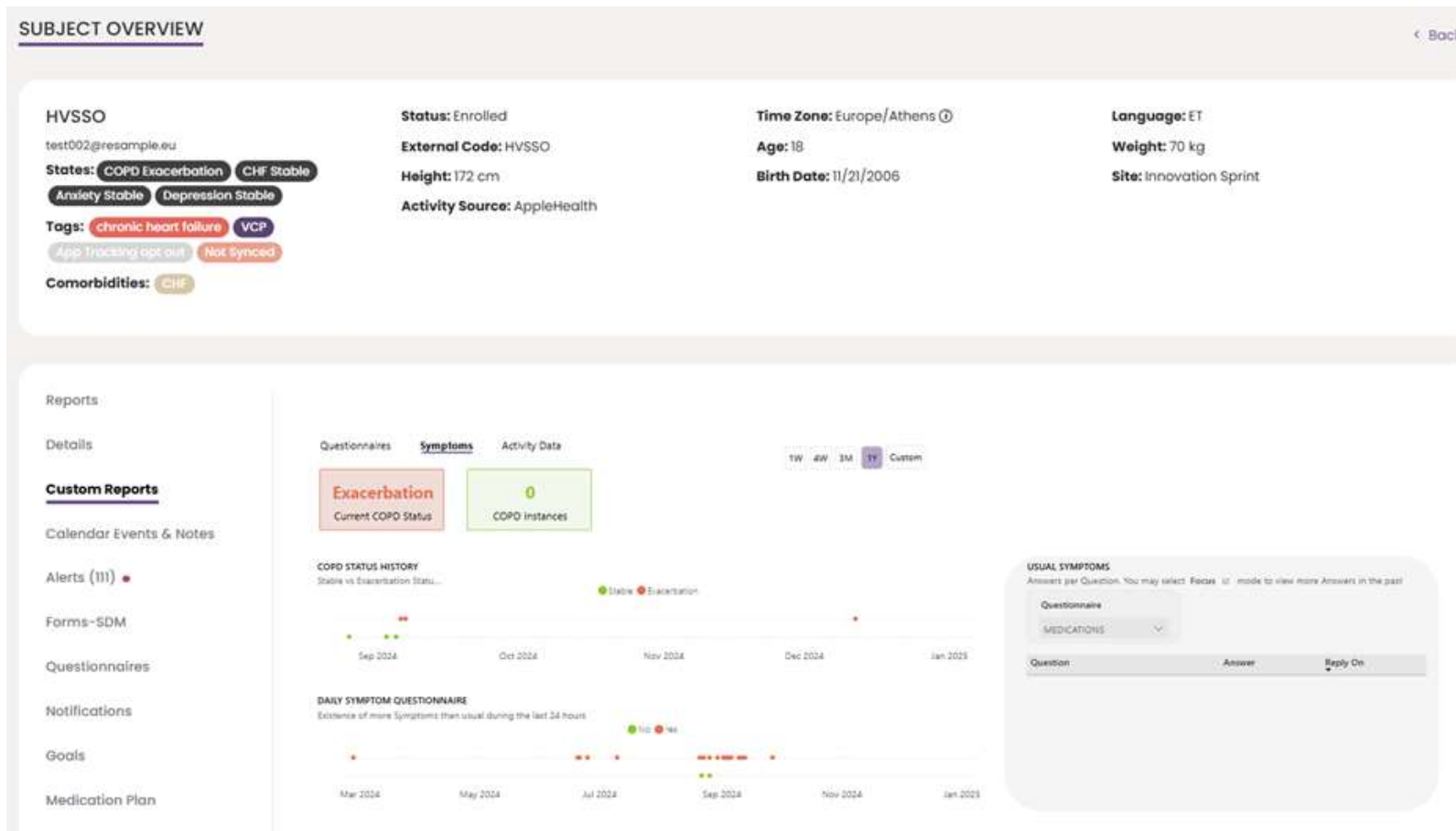
Privacy-preserving
Infrastructure

KEY RESULTS

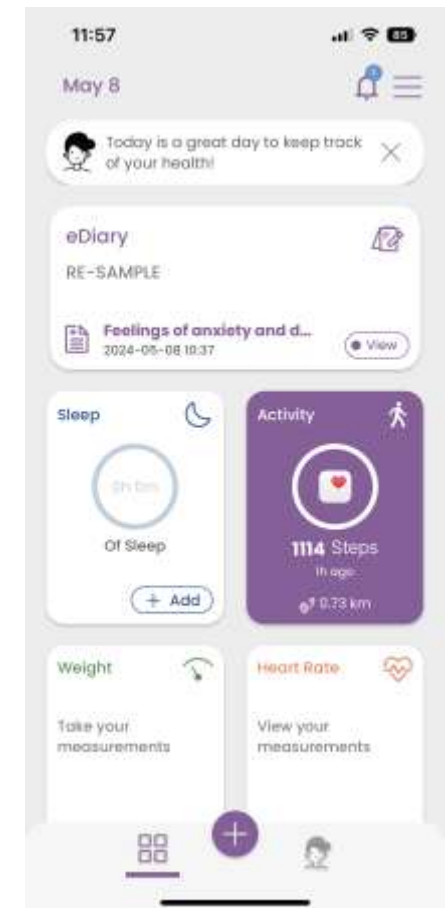
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Data-driven
Predictions
Platform

Clinical and Patient reported data in RE-SAMPLE

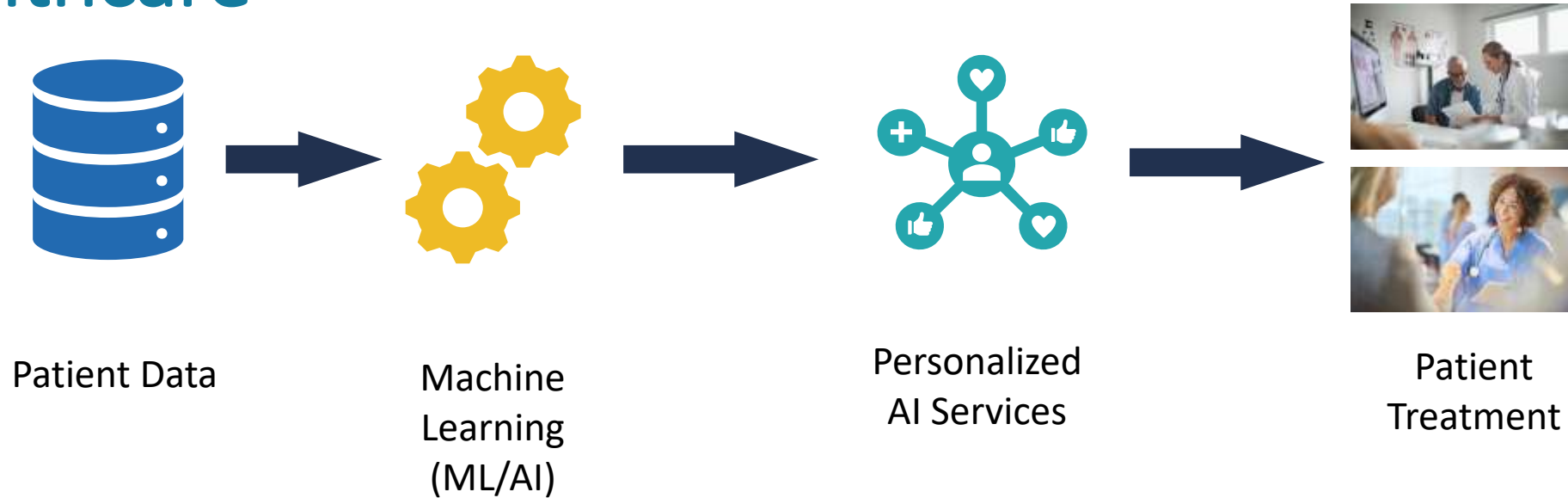


Screenshot of the Healthentia dashboard used in RE-SAMPLE



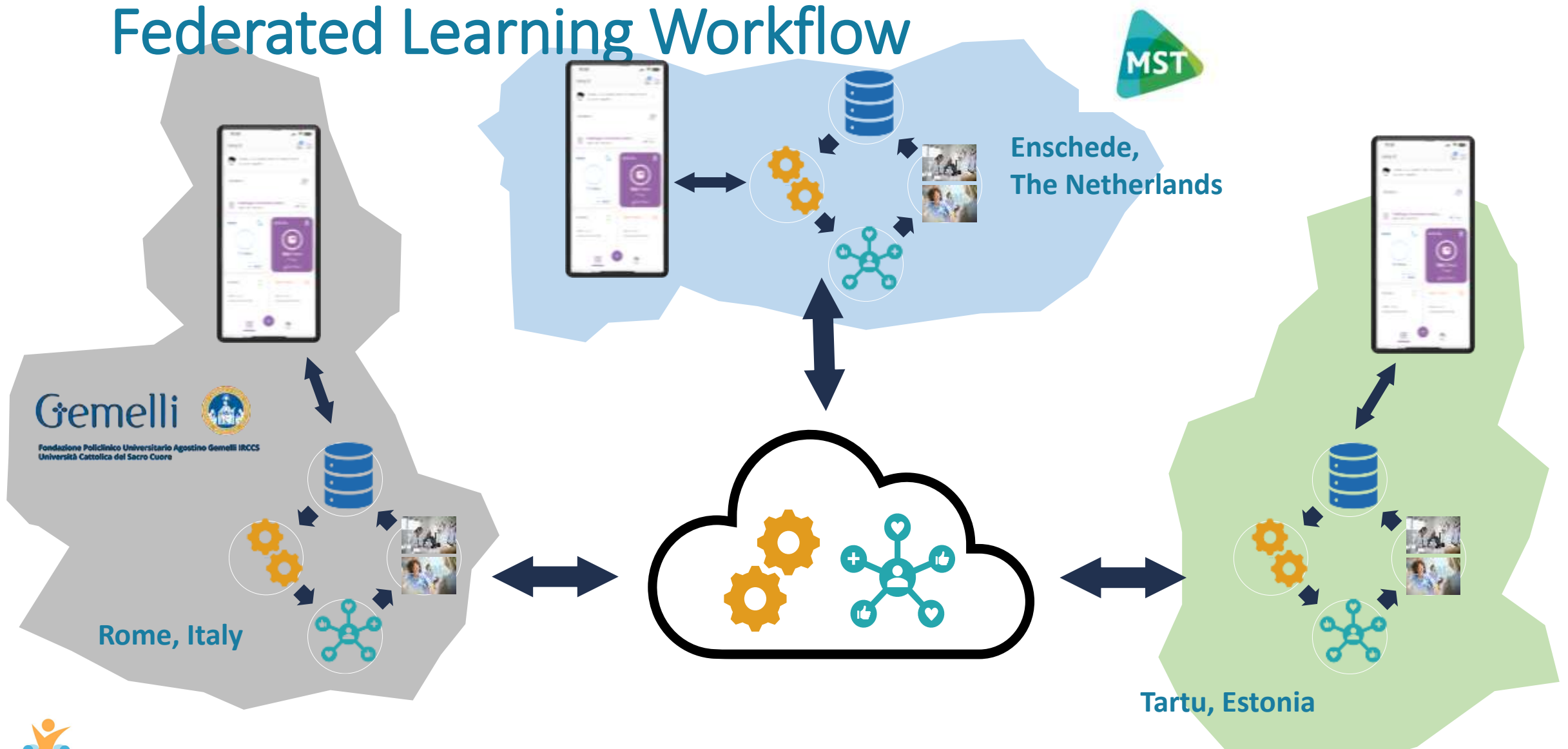
Screenshot of the patient app

Data-driven ML-based Support for Personalized Healthcare



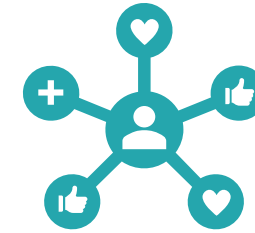
1. Patient data collection and curation
2. Machine learning model training
3. ML results generation
4. Use for shared decision-making

Federated Learning Workflow



Predictions and Support based on that

Predictive models used for patients under treatment



- Predictions of target variables
 - Disease exacerbation, FEV1 predicted
 - Quality of Life/Health Status:
 - EQ-5D, CAT scores

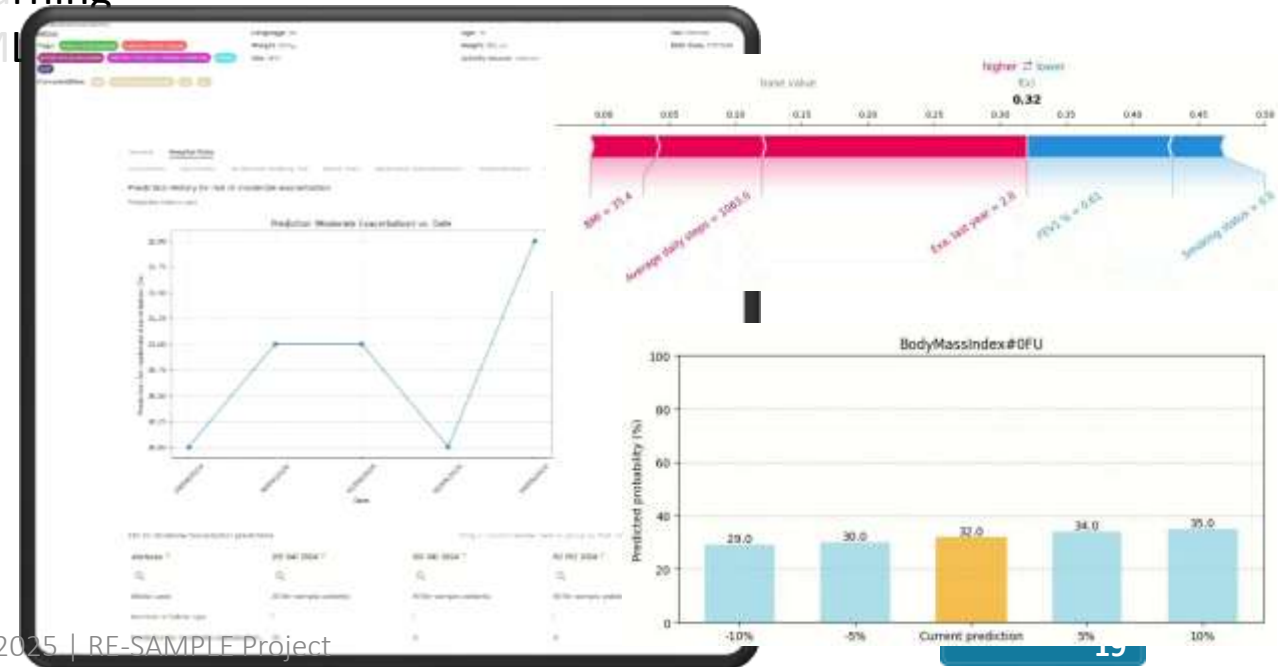
Machine Learning (ML)

Personalized ML Services

Patient Treatment

ML Services

1. Decision making support
2. Explanations to/for predictions
 - Validation
3. Simulations: What-If -Analyses



Availability of the RE-SAMPLE Platform

- Platform
 - Production use at 3 sites since August 2024
 - ~100 patients in virtual companionship programme
- Upon data ingestion the platform offers:
 - Patient monitoring and alerts
 - Automatic ML model training
 - Personalized AI predictions and simulations
 - exacerbation, FEV1predicted, EQ-5D, CAT
- Datasets: 2068 retrospective patients
~150 prospective patients
- Core software components without dashboard are free software (Apache license 2.0)
- Standalone version with ML models trained on synthetic data will be made available in August 2025 (free software, Apache license 2.0)



Jakob Lehmann, et. al. *Federated Learning in Multi-Center, Personalized Healthcare for COPD and Comorbidities*, In Proceedings 18th International Conference on Health Informatics (HEALTHINF 2025), 20-22 February 2025, Porto, Portugal, SCITEPRESS, February, 2025

RE-SAMPLE – KEY RESULTS FOR USE

Insight
Intervention
Integration

Data-driven
Predictions
Platform

Knowledge

- COPD & CCCs
- Integration in daily care

eHealth modules (incl coaching & dashboard)

- Intervention contents
- Personalization

RE-SAMPLE platform

(synthetic) data and models

See RE-SAMPLE website

- Publications
- Deliverables
- Open research data policy

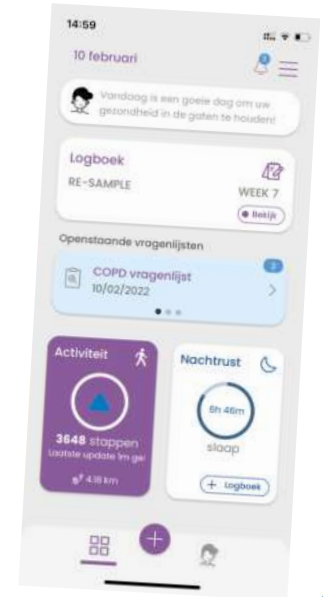
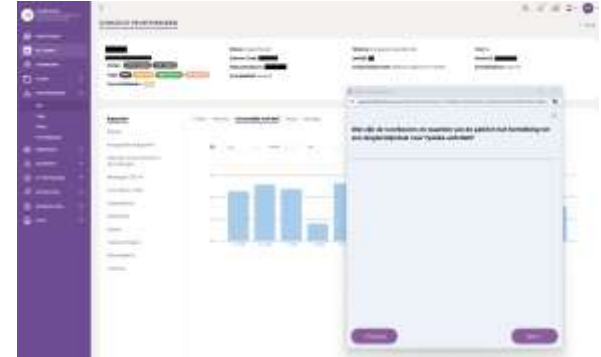
And our youtube for videos

Tailor-made care for COPD and comorbidities



“Because of RE-SAMPLE, I have more self-confidence as I have better insights in my health status”

“RE-SAMPLE increased my curiosity in disease management”



Thank you! Questions, suggestions?

More information:
www.re-sample.eu



Video

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