



MASS cohort: Multicenter, longitudinal, and prospective study of the role of microbiome in severe pneumonia and host susceptibility

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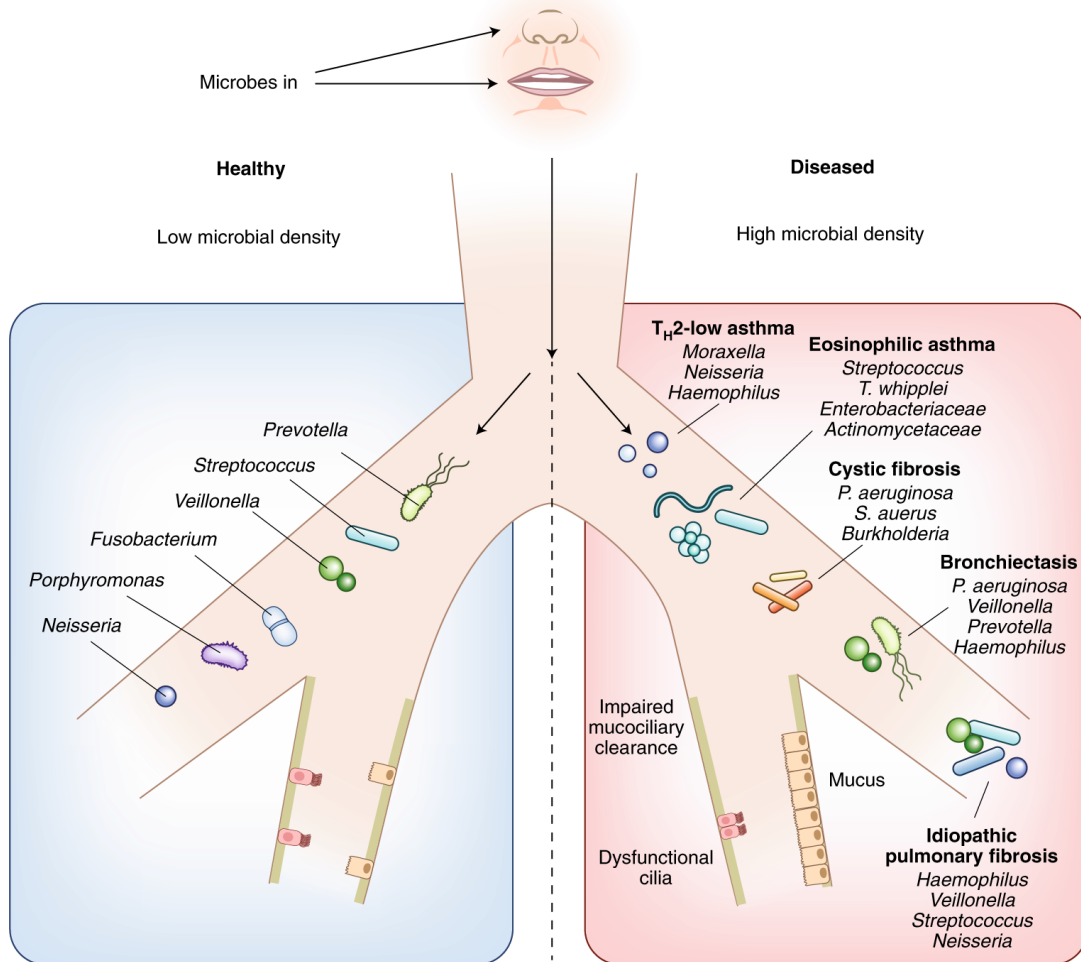
Xin Wei, Li Guo, Hongliu Cai, Silan Gu, Lingling Tang, Yuxin Leng, Minghui Cheng, Guojun He, Yijiao Han, Xindie Ren, Baoyue Lin, Longxian Lv, Huanzhang Shao, Mingqiang Wang, Hongyu Wang, Dan Dang, Shengfeng Wang, Nan Wang, Peng Shen, Qianqian Wang, Yinghe Xu, Yongpo Jiang, Ning Zhang, Xuwei He, Xuntao Deng, Muhua Dai, Lin Zhong, Yonghui Xiong, Yujie Pan, Kankai Tang, Fengqi Liu, Bin Yang, Lili Ren, Jianwei Wang, Chao Jiang, Lingtong Huang. 2024.

MASS cohort: multicenter, longitudinal, and prospective study of the role of microbiome in severe pneumonia and host susceptibility. *iMeta* 3: e218.

<https://doi.org/10.1002/imt2.218>

Background: Lung microbiome and severe pneumonia

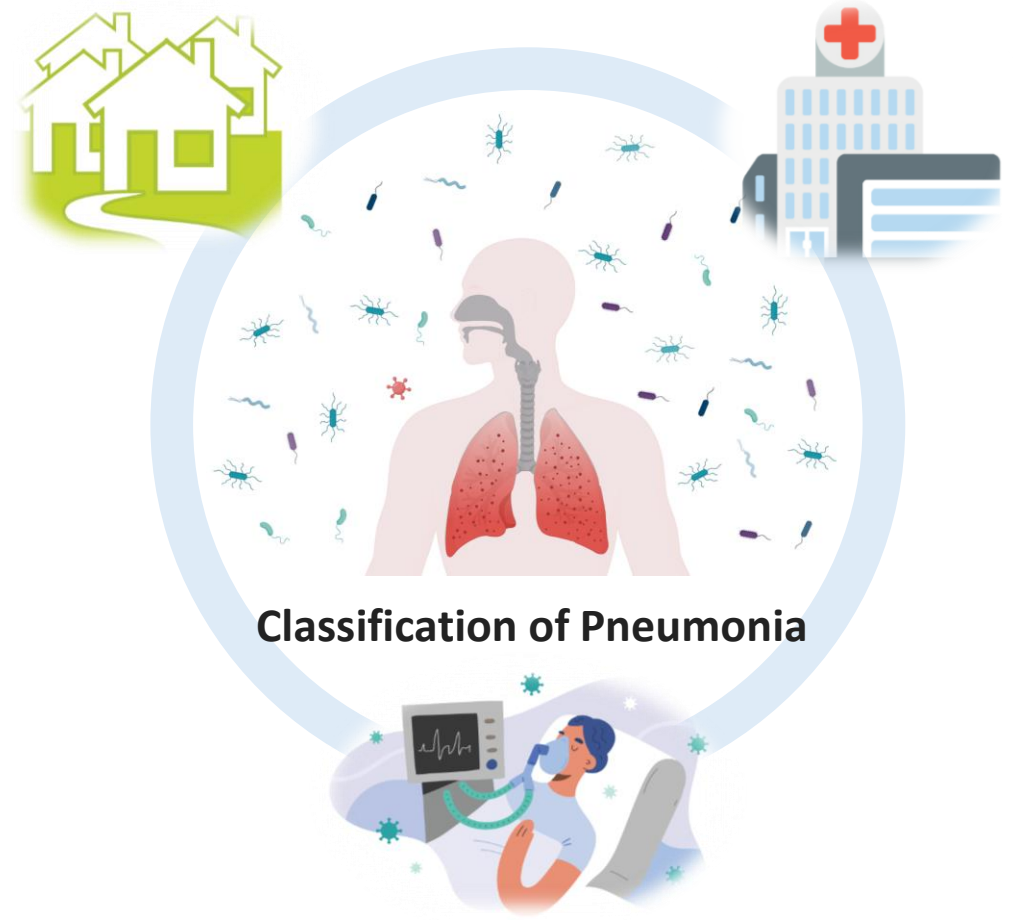
- The influence of the microbiome on respiratory health



Wypych et al. Nat Immunol, 2019

Community-acquired pneumonia (CAP)

Hospital-acquired pneumonia (HAP)



Ventilator-associated pneumonia (VAP)

Background: A paradigm of ICU cohort study—MARS cohort

- The MARS cohort recruited over 2,000 sepsis patients from ICUs in the Netherlands for multi-faceted investigations.

 **National Library of Medicine**
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ClinicalTrials.gov

Molecular Diagnosis and Risk Stratification of Sepsis (MARS)

ClinicalTrials.gov ID ⓘ NCT01905033

Sponsor ⓘ Academisch Medisch Centrum - Universiteit van Amsterdam (AMC-UvA)


Information provided by ⓘ T. van der Poll, Academisch Medisch Centrum - Universiteit



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The attributable mortality of delirium in critically ill patients: prospective cohort study

 OPEN ACCESS

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Original Investigation | Caring for the Critically Ill Patient

April 12, 2016

JAMA

Incidence, Risk Factors, and Attributable Mortality of Secondary Infections in the Intensive Care Unit After Admission for Sepsis

Lonneke A. van Vught, MD¹; Peter M. C. Klein Klouwenberg, MD, PharmD, PhD^{2,3,4}; Cristian Spitoni, PhD⁵; Brendon P. Scicluna, PhD^{1,6}; Maryse A. Wiewel, MD¹; Janneke Horn, MD, PhD⁷; Marcus J. Schultz, MD, PhD⁷; Peter Nürnberg, PhD⁸; Marc J. M. Bonten, MD, PhD^{3,4}; Olaf L. Cremer, MD, PhD²; Tom van der Poll, MD, PhD¹; for the MARS Consortium

» Author Affiliations | Article Information

JAMA. 2016;315(14):1469-1479. doi:10.1001/jama.2016.2691

THE LANCET
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Classification of patients with sepsis according to blood genomic endotype: a prospective cohort study

Dr Brendon P Scicluna, PhD  • Lonneke A van Vught, MD • Prof Aeilko H Zwinderman, PhD • Maryse A Wiewel, MD • Emma E Davenport, DPhil • Katie L Burnham, MGen • Prof Peter Nürnberg, PhD • Prof Marcus J Schultz, MD • Janneke Horn, MD • Olaf L Cremer, MD • Prof Marc J Bonten, MD • Prof Charles J Hinds, MD • Prof Hector R Wong, MD • Prof Julian C Knight, DPhil • Prof Tom van der Poll, MD • on behalf of the MARS consortium [†] • [Show less](#) • [Show footnotes](#)

Published: August 29, 2017 • DOI: [https://doi.org/10.1016/S2213-2600\(17\)30294-1](https://doi.org/10.1016/S2213-2600(17)30294-1) 



Background: Limitations of previous studies

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Table of Contents
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ISSN: 1073-449X | eISSN: 1535-4970

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ORIGINAL ARTICLE

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THE LANCET
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ARTICLES | VOLUME 9, ISSUE 8, P885-896, AUGUST 2021 [Download Full Issue](#)

The sputum microbiome and clinical outcomes in patients with bronchiectasis: a prospective observational study

- Small scale
- Single-center
- Retrospective
- Single time point
- 16S sequencing data
- Contamination by microorganisms from the upper respiratory tract

nature medicine

Article <https://doi.org/10.1038/s41591-023-02617-9>

Robust airway microbiome signatures in acute respiratory failure and hospital-acquired pneumonia

nature medicine

Article <https://doi.org/10.1038/s41591-023-02424-2>

The airway microbiome mediates the interaction between environmental exposure and respiratory health in humans



Introduction

MASS cohort

19 hospitals across 10 cities in 3 provinces

2000 ICU patients with severe pneumonia

CAP HAP VAP

Multicenter study in China

ZJ cohort
Non-ZJ cohort

Henan province: Xi'an, Zhengzhou, Xinxian

Zhejiang province: Huzhou, Hangzhou, Jinhua, Lishui, Wenzhou, Jiaxing, Taizhou

Shaanxi province

○ City center
+ Hospital location

ICU patient

Longitudinal biological samples collection

Sampling Day: 0, 4, 7, 14, 21

Sputum, BALF, Stool, Anal swab

Metagenome, Metatranscriptome

Detailed clinical data

Basic info, Drug usage, Medical history, Complications, Imaging, Laboratory tests

Antibiotics

Sequencing

DNA/RNA extraction

Host transcriptome

Blood

Analyzing

Validation

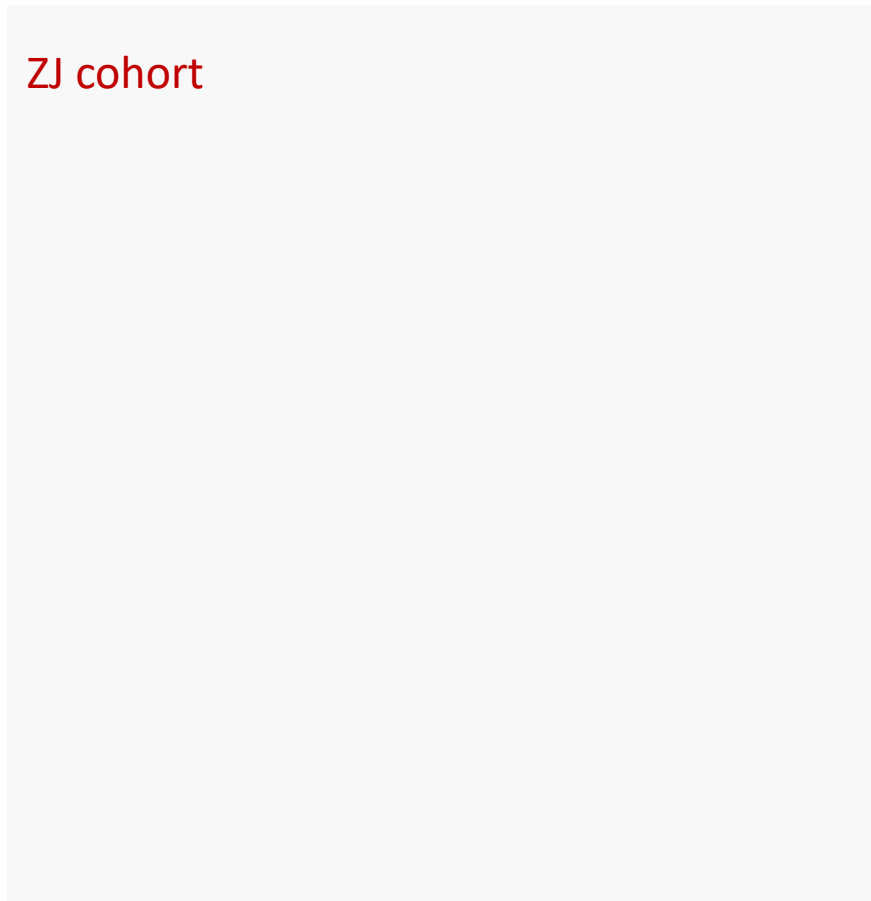
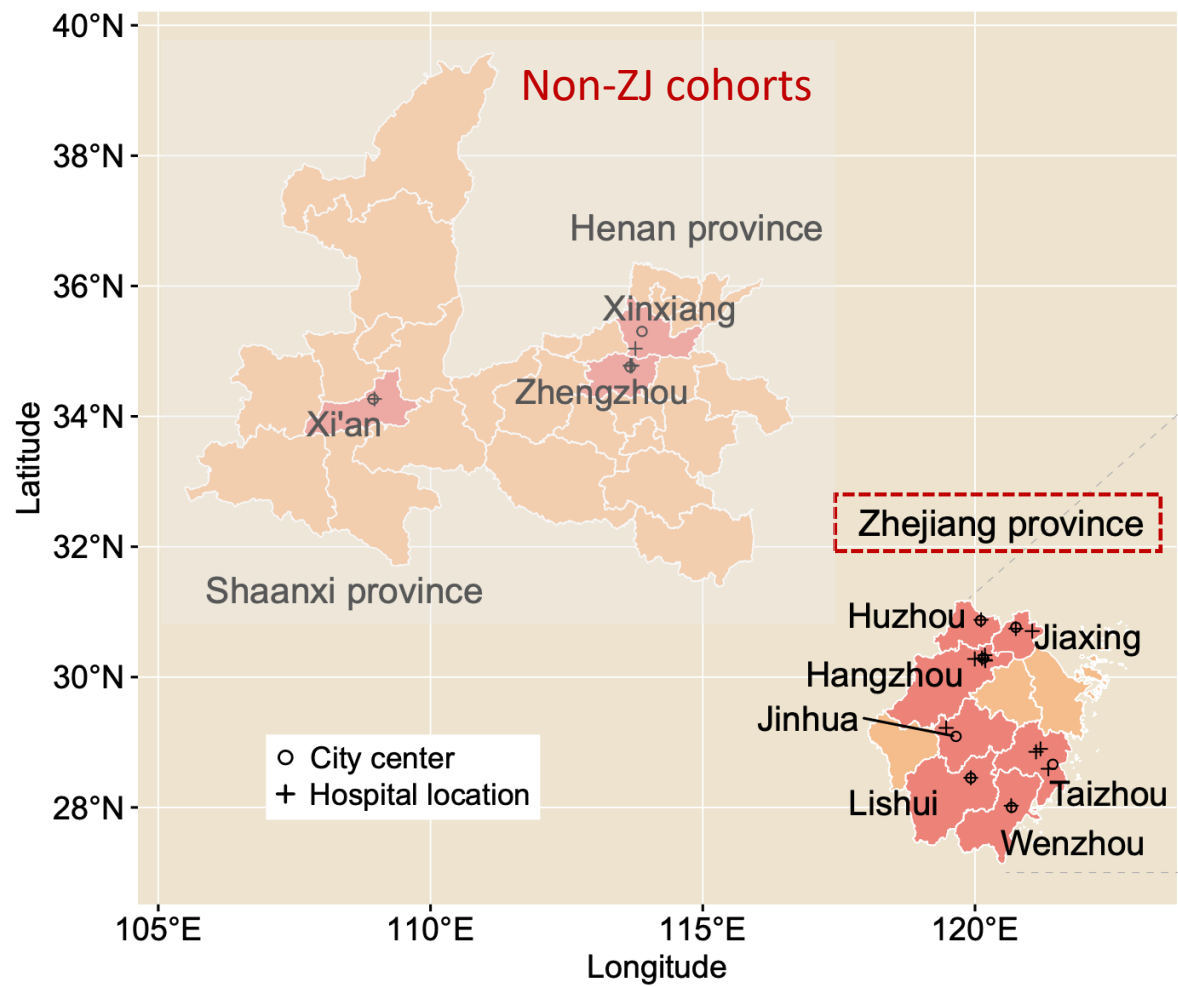
Application



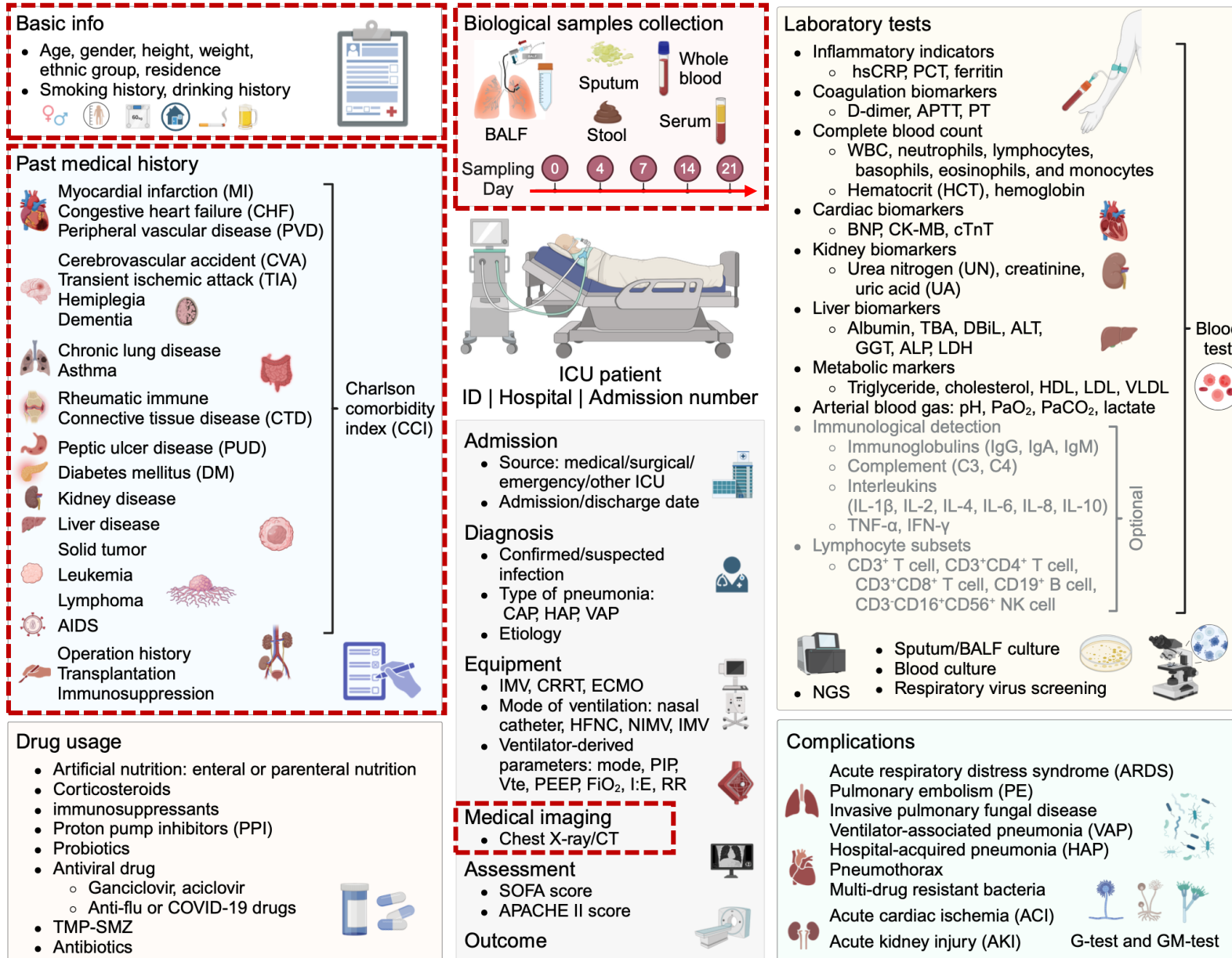
Geographical distributions of the 19 medical centers

- MASS cooperates with 26 ICUs across 19 medical centers in China.

19 hospitals, 10 cities in 3 provinces

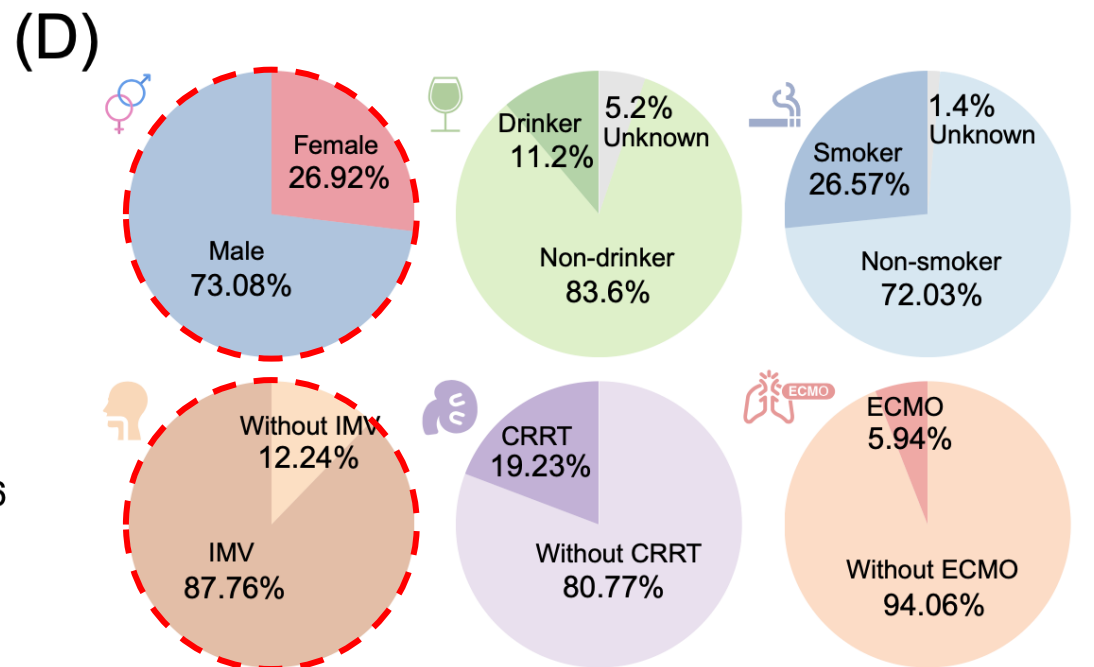
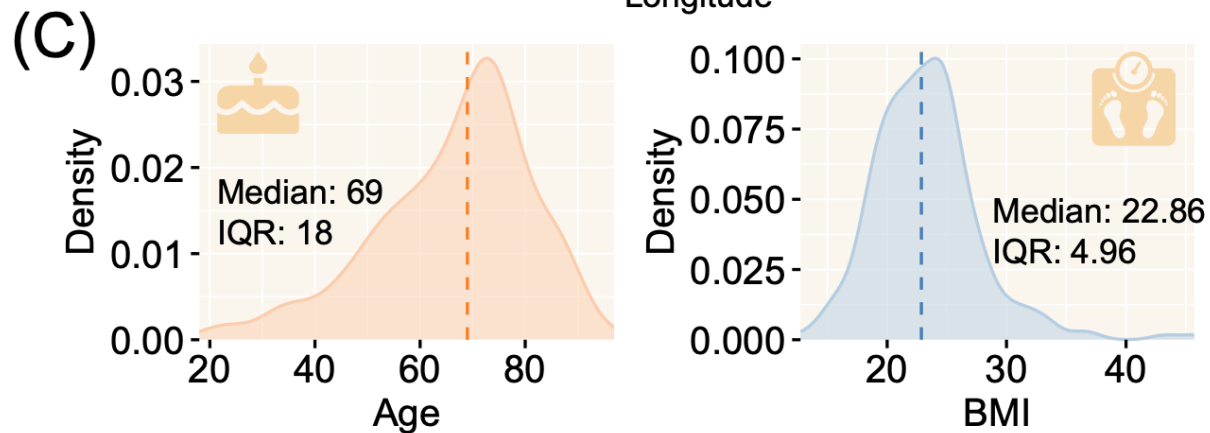
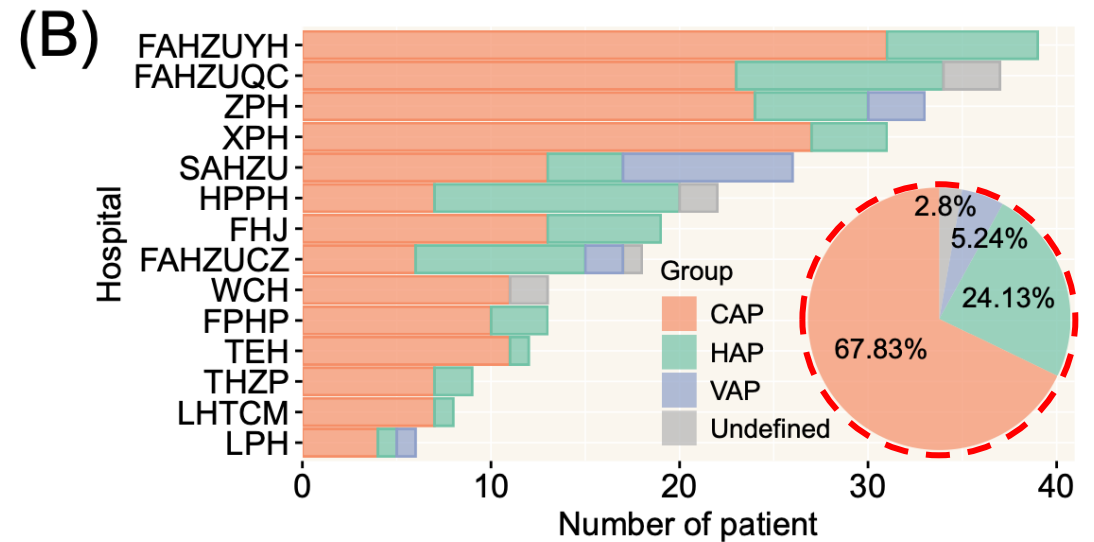
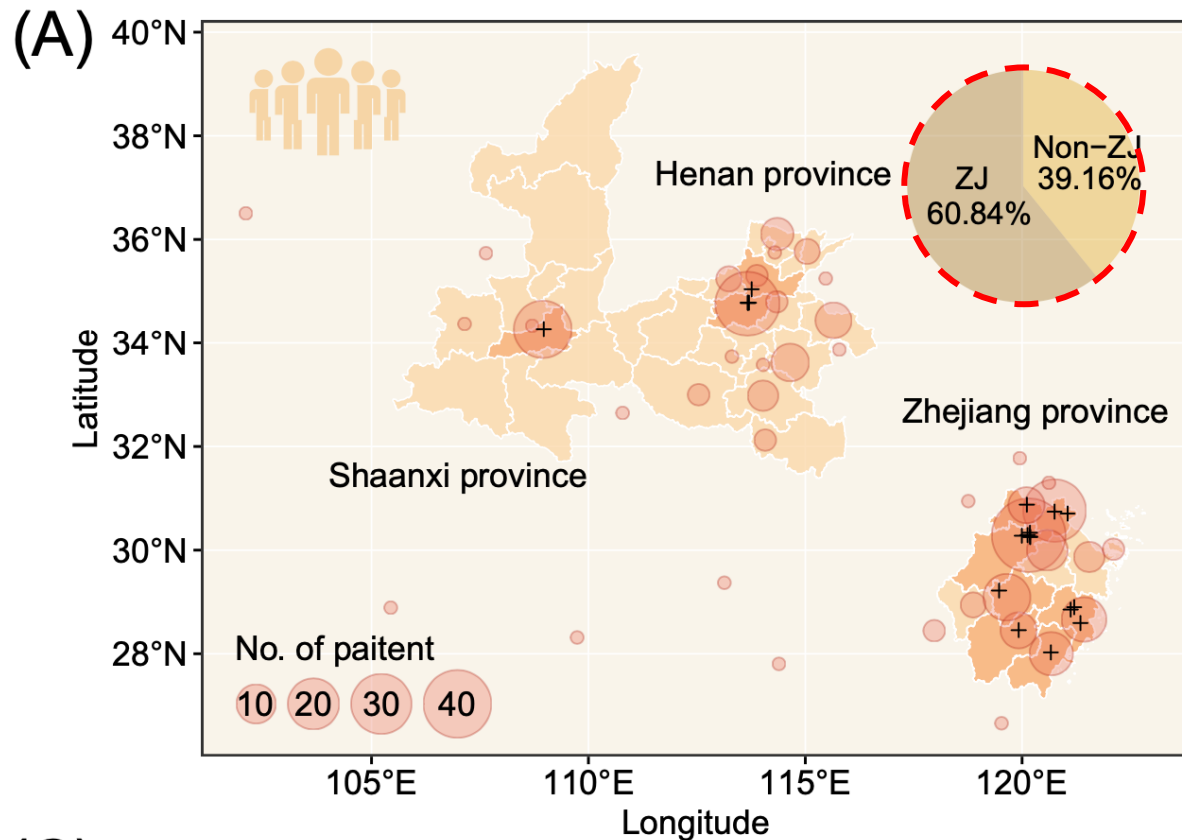


Overview of clinical data and biological sample collection



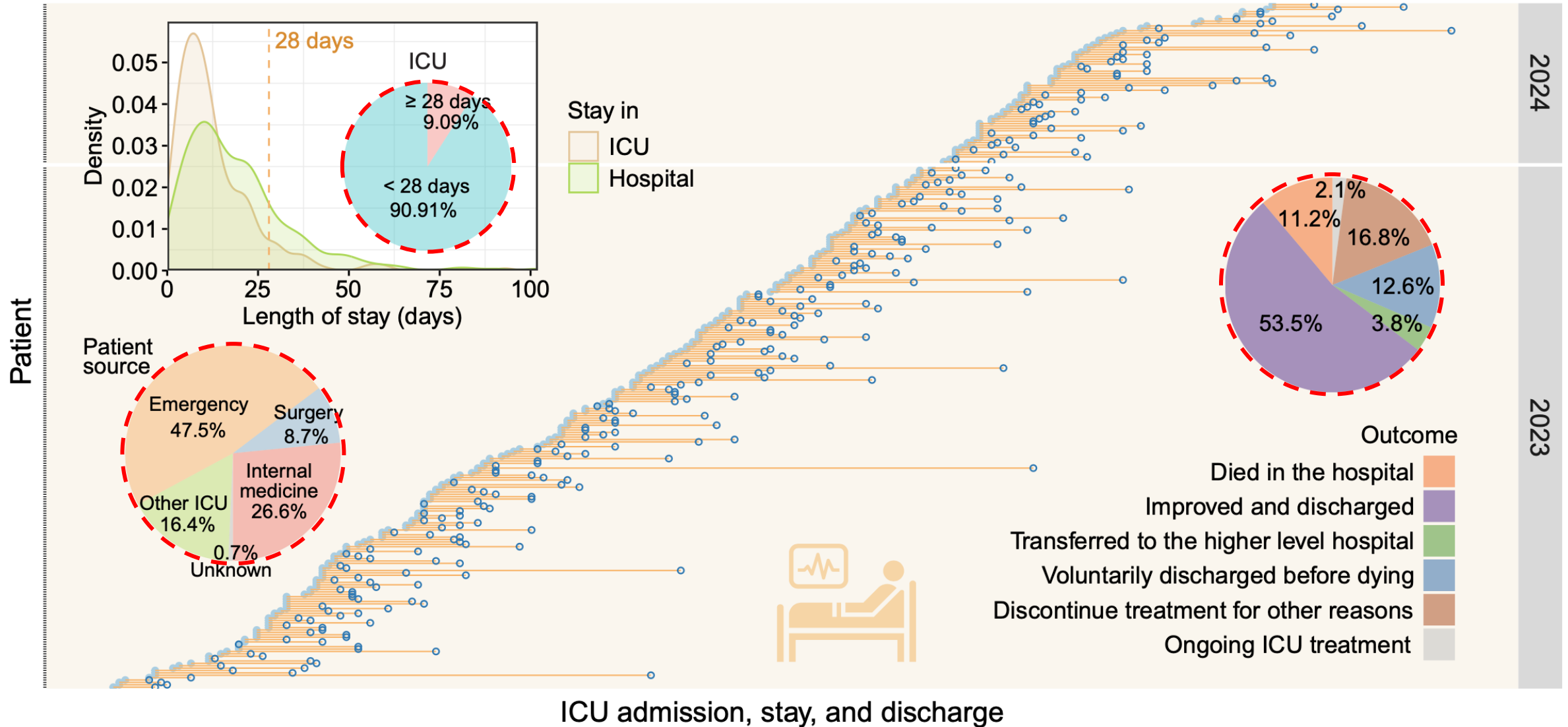


Progress in patient recruitment

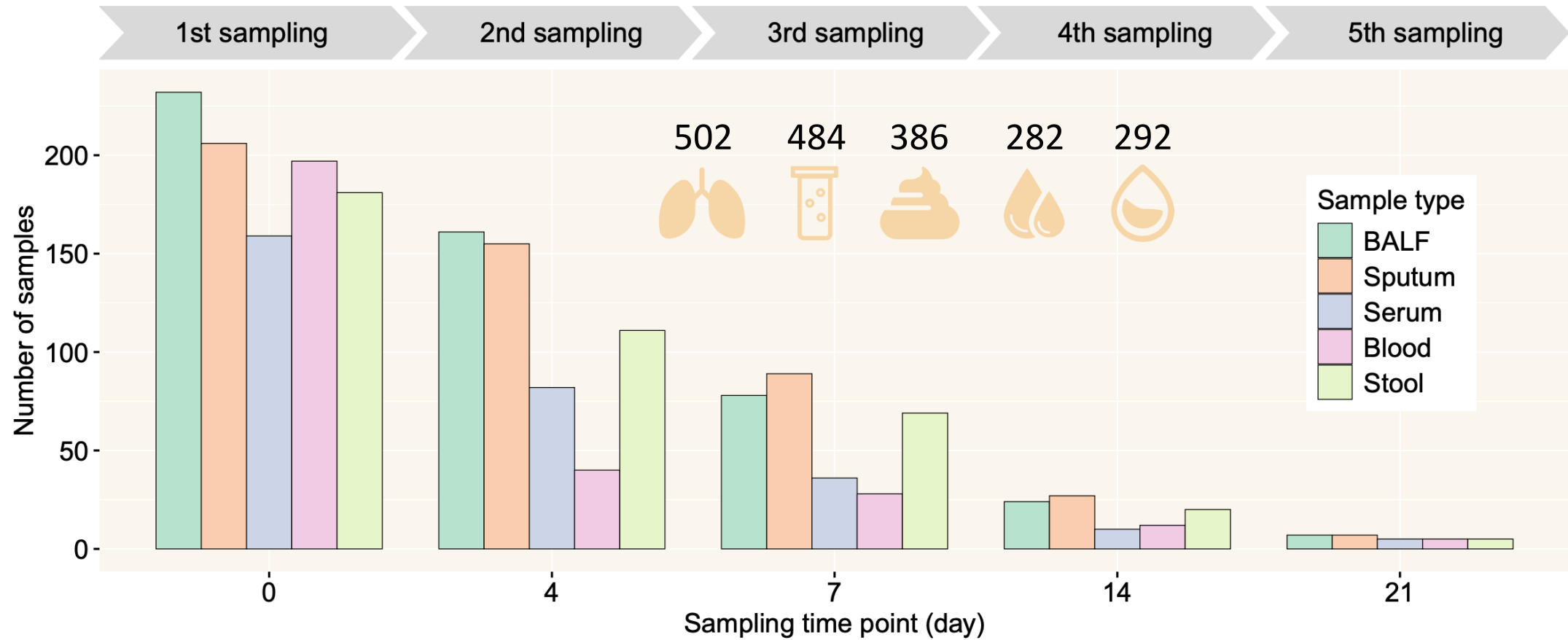




Progress in patient recruitment



Progress in biological sampling





Organizations participating in MASS cohort

Medical centers

Research institutions



Summary



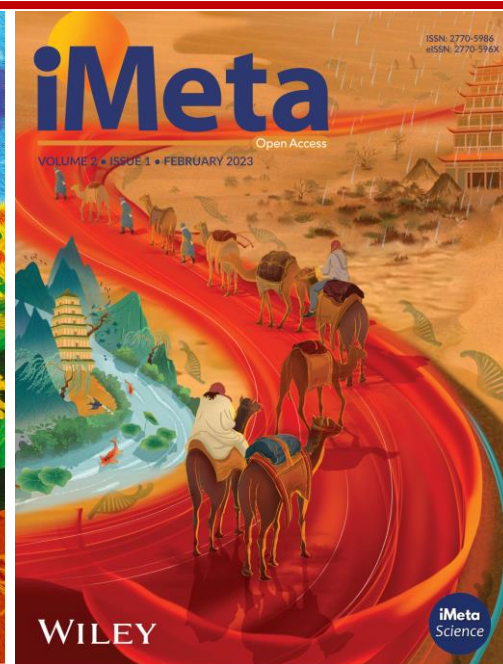
- ❑ The MASS cohort comprises 2000 ICU patients with severe pneumonia, sourced from 19 hospitals across 10 cities in 3 provinces.
- ❑ A wide array of samples including BALF, sputum, feces, and blood are longitudinally collected throughout patients' ICU stays.
- ❑ The cohort study seeks to uncover the dynamics of lung and gut microbiomes and their associations with severe pneumonia and host susceptibility, integrating deep metagenomics and transcriptomics with detailed clinical data.

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