

**Table S4.** The baseline survey and follow-up investigation contents for respective target populations.

Contents		Baseline			Follow-ups						
					Month 1	Month 3	Month 6		Month 12		
		High-risk population I (face-to-face)	High-risk population II (face-to-face)	Confirmed patients (face-to-face)	Confirmed patients (telephone)	Confirmed patients (telephone)	High-risk population I (telephone)	High-risk population II (face-to-face)	High-risk population I (face-to-face)	High-risk population II (face-to-face)	Confirmed patients (face-to-face)
<b>Baseline investigation and intervention</b>											
COPD-SQ questionnaire	Basic information	✓	✓	✓							
	Smoking exposures	✓	✓	✓							
	Biomass exposure	✓	✓	✓							
	Medical history and symptoms	✓	✓	✓							
	Height and weight	✓	✓	✓							
Baseline questionnaire	Basic information	✓	✓	✓							
	Sociodemographics	✓	✓	✓							
	Occupational exposure	✓	✓	✓							
	Biomass exposure	✓	✓	✓							
	Smoking exposure	✓	✓	✓							
	Physical activities	✓	✓	✓							
	Medical history and symptoms	✓	✓	✓							
	Vaccinations	✓	✓	✓							
	Quality of life	✓	✓	✓							
	Costs	✓	✓	✓							
	Spirometry test results and quality assessments	✓	✓	✓							
Anthropometry measurement		✓	✓	✓							
Pre-bronchodilator spirometry test		✓	✓	✓							

Contents		Baseline			Follow-ups						
					Month 1	Month 3	Month 6		Month 12		
		High-risk population I (face-to-face)	High-risk population II (face-to-face)	Confirmed patients (face-to-face)	Confirmed patients (telephone)	Confirmed patients (telephone)	High-risk population I (telephone)	High-risk population II (face-to-face)	High-risk population I (face-to-face)	High-risk population II (face-to-face)	Confirmed patients (face-to-face)
Post-bronchodilator spirometry test			✓	✓							
In-time interventions		✓	✓	✓							
Follow-up investigation and intervention											
Follow-up questionnaire	Basic information				✓	✓	✓	✓	✓	✓	✓
	Follow-up status				✓	✓	✓	✓	✓	✓	✓
	Smoking status					✓	✓	✓	✓	✓	✓
	Vaccinations								✓	✓	✓
	Symptoms and progression of the disease					✓	✓	✓	✓	✓	✓
	Physical activities					✓	✓	✓	✓	✓	✓
	Mental health								✓	✓	✓
	Quality of life						✓	✓	✓	✓	✓
	Diagnosis of COPD or other (respiratory) disease				✓		✓	✓	✓	✓	
	Diagnosis of allergic rhinitis, allergic conjunctivitis, and/or asthma							✓			
	Comorbidities								✓	✓	✓
	Treatment regimens								✓	✓	✓
	Non-								✓	✓	✓

Contents		Baseline			Follow-ups						
					Month 1	Month 3	Month 6		Month 12		
		High-risk population I (face-to-face)	High-risk population II (face-to-face)	Confirmed patients (face-to-face)	Confirmed patients (telephone)	Confirmed patients (telephone)	High-risk population I (telephone)	High-risk population II (face-to-face)	High-risk population I (face-to-face)	High-risk population II (face-to-face)	Confirmed patients (face-to-face)
	pharmaceutical treatment										
	Pharmaceutical treatment				✓	✓					✓
	Costs				✓	✓	✓	✓	✓	✓	✓
	Spirometry test results and quality assessments							✓	✓	✓	✓
Pre-bronchodilator spirometry test								✓	✓	✓	✓
Post-bronchodilator spirometry test								✓	✓	✓	✓
Secondary interventions						✓	✓	✓	✓	✓	✓

#### **At baseline:**

- All study participants share the same baseline survey questionnaires, including the COPD-SQ questionnaire (please see Table S1), a baseline questionnaire (please see above), and a simple anthropometry measurement (e.g. height, weight, BMI, waistline, hipline, blood pressure, resting heart rate, and SpO2).
- In the COPD-SQ questionnaire, the medical history and symptoms refer to (1) respiratory disease history (e.g. COPD, chronic bronchitis, and/or pulmonary emphysema) of parents, siblings, and/or children; and (2) personal respiratory symptoms (e.g. cough, and/or dyspnea). In the baseline questionnaire, the medical history and symptoms include (1) respiratory disease history (e.g. COPD, chronic bronchitis, pulmonary emphysema, asthma, tuberculosis, and/or lung cancer) of parents, siblings, and/or children; (2) personal respiratory disease history (e.g. COPD, pneumonia, asthma, and/or bronchitis); (3) personal respiratory symptoms (e.g. cough, dyspnea, mMRC, CAT, and/or exacerbation); and (4) personal comorbidities.
- In the baseline questionnaire, the health-related quality of life is determined by EQ-5D-5L.
- In the baseline questionnaire, the costs are assessed by (1) household expenditure (e.g. on clothes, food, resident, transportation, medicine, etc.) in the past year; and (2) indirect costs (e.g. indirect financial cost, time consumed, and opportunity cost, etc.) due to participating in this screening program.
- The in-time interventions refer to brochure and health education given by the local medical staff. The contents on brochure and of health education for respective target populations are listed in Table S5.

**During follow-ups:**

- Follow-up investigation aims to assess the impact of this mass screening program among the study population, including behavior change (e.g. smoking, vaccination, and physical activity), variation of pulmonary function, improvement or deterioration of symptoms, non-pharmaceutical and pharmaceutical treatment regimens, physical and mental health, health-related quality of life, emerging comorbidities, progression of the disease (e.g. exacerbation), vital outcomes (e.g. death), direct and indirect costs due to the disease.
- Specifically, (1) for the suspected COPD patients, the local medical staff will contact them to confirm the definite diagnosis of (respiratory) disease and treatment regimen in the transferred superior hospital at month 1 (telephone follow-up); (2) for the COPD high-risk population II, they will be asked if suffering from allergic disease and/or asthma at month 6 (face-to-face follow-up) to avoid over estimation of COPD, since they probably could have a post-bronchodilator FEV1/FVC ratio < 0.7 due to poor control of their disease; (3) for COPD high-risk population I and II, they will be asked if they have been diagnosed with COPD at month 6 (telephone and face-to-face follow-up respectively) and at month 12 (face-to-face follow-up); (4) all participants will receive both pre- and post-bronchodilator spirometry tests at month 12 (face-to-face follow-up) to determine if there is change to their disease status (i.e. high-risk population I, II, or confirmed patients).
- In the follow-up questionnaire, symptoms and progression are assessed by mMRC, CAT, and progression of the disease (e.g. exacerbation, outpatient visit, and/or hospital admission, etc.); mental health is measured using PHQ-9; and health-related quality of life is determined by EQ-5D-5L.
- In the follow-up questionnaire, the costs are assessed by (1) time expended on current follow-up and health education; (2) financial costs of vaccination (if vaccinated) and smoking cessation (if quitted); and/or (3) direct and indirect costs due to outpatient visit, hospital admission, and/or self-treatment of the disease.
- The secondary interventions mainly refer to similar health education as at baseline. The contents of health education for respective target populations are listed in Table S5.

**Abbreviations:**

BMI: body mass index; CAT: chronic obstructive pulmonary disease assessment test; COPD: chronic obstructive pulmonary disease; COPD-SQ: chronic obstructive pulmonary disease screening questionnaire; EQ-5D-5L: EuroQoL 5-dimensions 5-levels; FEV1: forced expiratory volume in one second; FVC: forced vital capacity; mMRC: modified medical research council; PHQ-9: patient health questionnaire-9; SpO2: saturation of pulse oxygen.