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**Body:** INTRODUCTION Chronic obstructive pulmonary disease (COPD) is a common disease in the general population, especially among elderly. For COPD diagnosis, spirometry demonstrating an obstructive syndrome ( $FEV_1/FVC < 0.70$  according to GOLD), is mandatory. AIMS We evaluated the association of frailty and the capability of a participant to perform a high-quality spirometry according to ATS/ERS guidelines. METHODS This study was part of the Rotterdam Study, a prospective population-based cohort study performed in subjects aged  $\geq 55$ . Frailty was defined as meeting  $\geq 3$  of 5 established criteria for frailty, evaluating nutritional status, physical activity, mobility, strength and energy. Spirometry was classified as not interpretable when ATS/ERS criteria for acceptability/reproducibility were not met. RESULTS Of the 2730 subjects evaluated for frailty who visited the research centre for lung function measurement, 2487(91.1%) performed an interpretable spirometry and in 232(8.5%) subjects spirometry was not interpretable. 11(0.4%) subjects could not complete spirometry due to technical problems and were excluded. Compared to non-frail subjects( $n=2564$ ), frail elderly( $n=155$ ) had an almost threefold increased tendency to perform a spirometry which was not interpretable due to a lack of quality (OR 2.94;95%CI:1.93-4.47; $p < 0.001$ ). Adjusted for sex and age, this risk of acquiring a non-interpretable spirometry in frail subjects remained statistically significant (OR 1.69;95%CI:1.08-2.64; $p = 0.021$ ). CONCLUSIONS This prospective study in a general elderly population indicates that frail persons have more difficulties in performing a high-quality lung function test. This observation might indicate underdiagnosis of COPD in this group.