423. Respiratory epidemiology: methods, definitions and phenotypes

P4149

Awareness of COPD in Portugal general practitioners, follow up 2010

Cristina Bárbara[1], João Cardoso[2], Paula Pamplona[3], Joaquim Moita[4], Maria João Matos[5], Paula Simão[6], Sara Conde[7], Graça Coutinho. *[1]Serviço de Pneumologia II, Hospital Pulido Valente- Centro Hospitalar Lisboa Norte EPE, Lisboa, Portugal; [2]Serviço de Pneumologia, Hospital de Santa Marta - Centro Hospitalar de Lisboa Central EPE, Lisboa, Portugal; [3]Serviço de Pneumologia II, Hospital Pulido Valente- Centro Hospitalar Lisboa Norte EPE, Lisboa, Portugal; [4]Serviço de Pneumologia, Centro Hospitalar de Coimbra EPE, Coimbra, Portugal; [5]Serviço de Pneumologia, Hospitais da Universidade de Coimbra EPE, Coimbra, Portugal; [6]Serviço de Pneumologia, Hospital Pedro Hispano, Matosinhos, Portugal; [7]Serviço de Pneumologia, Centro Hospitalar de Vila Nova de Gaia/Espinho EPE, Vila Nova de Gaia, Portugal; [8]Medical Department, Altana Portugal, Nycomed Group, Lisboa, Portugal*

In order to evaluate the impact of GOLD Project in Portugal we conducted a survey on COPD awareness in General Practitioners (GPs). We aimed to know the level of disease knowledge and the privileged sources of information. The study was conducted in two waves the first one in 2006, the second one, similar in 2010. We conducted face-to-face interviews to 375, randomly selected GPs.
Results: COPD was the main disease associated with cigarette smoking 76% vs 81% in 2006, followed by Lung Cancer 59% and Chronic Bronchitis 45%.Cardiovascular Disease (CV) went from third to fourth place in 2010. GPs referred to COPD as the 2nd cause of mortality in Portugal just overtaken by CV (in 2006 COPD was considered the third cause of mortality after CV and Diabetes). The perception that the prevalence of the disease is increasing remains strong (65% vs 87% in 2006) and that "stabilized" has increased (26% vs 9% in 2006). COPD was considered an inflammatory airway disease with not fully reversible airflow limitation (more than in 2006). Similarly to 2006, spirometry was the main diagnostic method (93%). The most relevant characteristic for diagnosis was the spirometric obstructive pattern. There remains some confusion regarding the diagnostic relevance of restrictive pattern but to less extent than in 2006. COPD sessions were attended by 41% GPs, no difference vs 2006. 68% of the GPs were aware of GOLD Project, an increase in 10% vs 2006. Sources for obtaining information were similar: published studies (47%), conferences (52%) and technical books (32%).
Conclusion: The results indicate a trend of growing knowledge about COPD and GOLD project in Portuguese GPs. Supported with a grant from ALTANA Portugal-Nycomed Group.

P4150

COPD in Portugal 2010, one step towards a better awareness

Cristina Bárbara[1], João Cardoso[2], Paula Pamplona, Joaquim Moita, Maria João Matos, Paula Simão, Sara Conde, Graça Coutinho. *[1]Serviço de Pneumologia II, Hospital Pulido Valente- Centro Hospitalar de Lisboa Norte EPE, Lisboa, Portugal; [2]Serviço de Pneumologia, Hospital de Santa Marta- Centro Hospitalar de Lisboa Central EPE, Lisboa, Portugal; [3]Serviço de Pneumologia II, Hospital Pulido Valente- Centro Hospitalar de Lisboa Norte EPE, Lisboa, Portugal; [4]Serviço Pneumologia, Centro Hospitalar de Coimbra EPE, Coimbra, Portugal; [5]Serviço de Pneumologia, Hospitais da Universidade de Coimbra EPE, Coimbra, Portugal;[6]Serviço de Pneumologia, Hospial Pedro Hispano, Matosinhos, Portugal; [7]Serviço de Pneumologia, Centro Hospitalar de Vila Nova de Gaia-Espinho EPE, Vila Nova de Gaia, Portugal; [8]Medical Department, Altana-Portugal, Nycomed Group, Lisboa, Portugal*

In 2010, we conducted a second evaluation about the awareness of COPD in the Portuguese population, following a previous study in 2006. We aimed to analyze the impact on the awareness of COPD in the Portuguese population, of all the actions taken during the last four years by Gold Committee in Portugal. Using the same questionnaire of 2006, we conducted a survey in 782 randomly selected residents with telephone line and ≥35 years old, both sexes.
Results: 15.7% of the inquired people were smokers compared to 13.6% in 2006. Spontaneous awareness of COPD increased to 5.4% in the all group and 11.4% in the smokers vs 2.6% and 6.6% in 2006, respectively. The main reported disease associated with cigarette smoking was still lung cancer (72%). Like in 2006, asthma was the most often referred disease associated with respiratory insufficiency (54%), followed by chronic bronchitis (33%). Only 38% of smokers referred they have been informed by their physician about the damage of smoking (versus 29.9% in 2006). Not different from the previous survey there was a perception that the prevalence of the disease is increasing (57%).The population related COPD to cigarette smoking and considered COPD less serious than lung cancer,cardiovascular disease and AIDS. There is a growing interest on obtaining more information about COPD. The preferred way for obtaining information changed and is now the physician (37% vs 27%) and the media (31% vs 49%).
Conclusion: COPD awareness of Portuguese population is increasing though remaining low. However there is a high interest in obtaining more COPD information, showing that there is plenty of room for further awareness programs. Supported with a grant from ALTANA Portugal-Nycomed Group.

P4151

Results of the World Spirometry Day in Buenos Aires, Argentina

Juan Antonio Mazzei[1], Carlos Benjamin Alvarez[2], Mariano Egidio Mazzei[1], Hugo Esteva[1]. *[1]Departamento de Medicina, Fundación Argentina del Tórax, C.A.Buenos Aires, Argentina; [2]Facultad de Medicina, Universidad Católica Argentina, C.A.Buenos Aires, Argentina*

Objetive: To perform spirometries in Buenos Aires City during World Spirometry Day, analyse the findings and correlate them with the survey proposed by European Respiratory Society
Methods: 6 Vitalograph Alpha spirometers were set on 3 sites in Buenos Aires City, with technicians and physicians. On previous days, the event was communicated and promoted.
Attendants filled in the survey proposed by the European Respiratory Society, went through the spirometry, and a physician explained results to them.
Results: 387 spirometries were evaluated, as they met the acceptability and reproducibility criteria; 133 spirometries were carried out on site 1 (shopping arcade), 119 on site 2 (theatre hall and gym hall), and 135 on site 3 (Universidad Católica Argentina). Ages ranged from 18 to 87, the mean age being 48.6. 199 men (51.8%) participated. 74% lived in Buenos Aires City. 25.8% volunteers were smokers, 36.8% former smokers and 37.4% had never smoked. 23% of evaluated participants had cough, 27% had habitual sputum, and 59% had dyspnoea with heavy exercise, 35% on fast walk, 4% on 100-meter walks, 12% on normal walking and l 4% when getting dressed or undressed. 59% did not know spirometry existed, 73% had never done one. COPD frequency was 27.7% (IC 95% = 23.31-32.47). Out of 107 participants with COPD, 49 (45.79%) did not know spirometry existed and 62 had never done one (57.94%), 23 had GOLD 1, 35 had GOLD 2, and 4 Gold 3. Out of the 279 COPD free participants, 179 did not know about the test and had never been through one.
Conclusion: Publicising and performing spirometries on public places, allowed us to introduce the test to 59% of attendants, carry it out for the first time on 73% and diagnose COPD among 27.7% of participants.

P4152

Early diagnosis of COPD in a high-risk population using spirometric screening in general practice

Charlotte Suppli Ulrik[1], Anders Løkke[2], Ronald Dahl[2], Liane Plauborg[3], Jens Dollerup[4], Luise Cederkvist Kristiansen[5], Patrick Hagge Cording[5], Christian Dehlendorff[5]. *[1]Respiratory Section, Internal Medicine Unit, Hvidovre University Hospital, Hvidovre, Denmark; [2]Respiratory Medicine, Århus University Hospital, Århus, Denmark; [3]R&D, Boehringer Ingelheim Denmark, Copenhagen, Denmark; [4]R&D, Pfizer Aps Denmark, Ballerup, Denmark; [5]DTU Informatics, Technical University of Denmark, Lyngby, Denmark*

Background and aim: Under-diagnosis of COPD is a widespread problem. This study aimed to identify early stages of COPD in a high-risk population identified through general practice.
Methods: Participating GPs (n=241) recruited subjects with no previous diagnosis of obstructive lung disease, > 35 yrs, and at least one respiratory symptom. Age, smoking status, pack-years, BMI, dyspnoea score (MRC), and pre- and post-bronchodilator spirometry data was obtained.
Results: A total of 4.049 (49% females) subjects were included; mean age 58 yrs, BMI 27, and 32 pack-years. The COPD prevalence in our population was 21.7%; 8.3% in subjects younger than 48 years. Most patients were classified in GOLD stages I and II (36% and 50%, respectively). The number needed to screen (NNS)

for a new diagnosis of COPD was 4.6. COPD diagnosis was related to gender, age, BMI ($p<0.001$), pack-years, and cough ($p<0.001$), wheezing ($p<0.001$) and sputum production ($p=0.002$). A threshold of 10% pre-test risk of COPD would have reduced the number of spirometry tests by 35% although 90% of the patients with COPD would still have been identified (NNS 3.9).
Conclusions: A case-finding strategy providing screening and diagnostic spirometry to high-risk subjects in primary care identifies a large proportion of undiagnosed COPD patients, especially in the early stages of the disease.

P4153
Is spirometry screening useful for detecting undiagnosed COPD?
Kart Levent, Sezer Murat, Karakose Fatma, Akkoyunlu Muhammet.
Pulmonology, Bezmialem Vakif University, Istanbul, Turkey

In BOLD Adana study COPD prevalence was 19.3% over 40 years of age but diagnosed COPD prevalence was 10% in 2004. Screening by spirometry might improve the detection of COPD. We aimed to answer the question that what is the contrubition of spirometry screening in early detection of COPD. We recruited to study adult visitors (age>18 years of age) to spirometry tent in our hospital garden during three days between 13 October 15 October 2010 (world spirometry day) for spirometry screening in Istanbul. We applied to the paticipants standard spirometry and questionnaire. 397 participant enrolled to the study. Mean age of study population was 43.9±11.8. 243 were female (%61.2) and 154 were male (38.8%). 151 were smoker (38%), 206 were nonsmoker (51%) and 40 were exsmoker (10.1%). 252 participants (63%) were over 40 years of age. Spirometry was performed in 224/252 and questionnaire was performed in 198/252 of people. In participant who were smoker and exsmoker (n:94 37%) FEV1/FVC ratio under 70% were in 12/94 (12%) and COPD symptoms (were positive in 41/94 (43%) people who were over 40 years of age and who have smoking history. 44/94 (3+41) people (46%) have either obstruction or symptoms. The patients who have previous COPD diagnosis were 39/111 (35.1%) in smokers. In our study spirometry screening can be useful for early detection of COPD. But combined screening modalities such as questionnaire that are better than spirometry alone are necessary for identifying those who are truly at risk, and effective treatments beyond smoking cessation are needed for preventing progression.

P4154
Spirometry test quality (home vs clinic performance) in a respiratory epidemiology survey in an Italian population sample
Giuseppe Sarno[1], Sara Maio[1], Sandra Baldacci[1], Sonia Cerrai[1], Martina Fresta[1], Franca Martini[1], Anna Angino[1], Francesco Di Pede[1], Giovanni Viegi[1,2].
[1]Pulmonary Environmental Epidemiology Unit, CNR Institute of Clinical Physiology (IFC), Pisa, Italy; [2]CNR, Institute of Biomedicine and Molecular Immunology (IBIM) "A. Monroy", Palermo, Italy

Background: European Commission plans to implement Health Interview & Examination Surveys in order to overcome the limitations of Health Interview Surveys.
Aim: To assess the influence of home location on the spirometry test quality.
Methods: A sample of subjects living in Pisa (Central Italy) was selected within IMCA2 (Indicators for Monitoring COPD and Asthma in the EU) project.
An questionnaire on socio-demographic characteristics, respiratory symptoms/diseases and risk factors was used.
The NDD EasyOne Model 2001 was used for spirometry test, at home or in clinic; at the end of the maneuvers the quality grades A/B/C indicated a reliable result, grades D/F indicated inadequate test quality.
A logistic regression analysis adjusted for smoking habits, age, sex, season, cardio-respiratory diseases, disability, previous respiratory medical examination and test was run to assess association between inadequate test quality and spirometry test performance location.
Results: Analyses concerned 630/1354 participants who performed spirometry (mean age:55.8 yrs±17.0; mean BMI: 26.9±4.6 kg/m^2; 45.4% male):42.4% at home, 57.6% in clinic. 91.3% of subjects had quality grades A/B/C; 8.7% of subjects had grades D/F (63.6% of these had performed spirometry at home).
Inadequate test quality was significantly associated with home location (OR=2.5; 95% CI=1.3-4.6), age ≥ 65yrs (OR=2.3; 95% CI= 1.3-4.2) and no previous spirometry (inexpert) (OR=2.7; 95% CI=1.5-5.0).
Conclusions: Although an high percentage of adequate test quality, in a respiratory epidemiological survey a special attention would be addressed when performing spirometry at home, notably in elderly and inexpert subjects.

P4155
Lower limit of normal (LLN) for lung function parameters for over 80 year-old caucasians
Simone Accordini[1], Alessandro Fois[2], Barbara Piras[2], Giovanni Porqueddu[2], Valentina Spada[2], Francesco Borgo[1], Roberto de Marco[1], Pietro Pirina[2]. *[1]Unit of Epidemiology and Medical Statistics, University of Verona, Verona, Italy; [2]Institute of Respiratory Diseases, University of Sassari, Sassari, Italy*

Spirometric reference values for over 80 year-old populations have not been calculated yet. The present study is aimed at estimating the LLN equations for Caucasians.
In an ongoing clinical study, 214 subjects aged 80-88 performed valid lung function tests (according to the acceptability and reproducibility criteria of the American Thoracic Society) in 2001/2011 at the University Hospital of Sassari in Sardinia (Italy). During the clinical examination, these subjects: (i) did not report a diagnosis of respiratory diseases, symptoms of dyspnoea at rest/productive cough/bronchospasm, drug use for respiratory problems, and comorbidities (associated with impaired lung function) during lifetime; (ii) reported to be non smokers or to have quit smoking for ≥20 years. Past smokers with >15 pack-years were excluded.
Among the 120 males and 94 females, the mean height was 162 and 151 cm, and the percentage of past smokers was 59.2 and 4.3%, respectively. The sex-age specific mean (standard deviation) of FEV1, FVC, and FEV1/FVC ratio is reported in the following table:

		[80–84.5) years	[84.5–88] years
Males	n	94	26
	FEV1, L	1.85 (0.61)	1.80 (0.80)
	FVC, L	2.45 (0.65)	2.44 (0.96)
	FEV1/FVC, %	72.2 (11.8)	70.1 (10.5)
Females	n	75	19
	FEV1, L	1.43 (0.34)	1.33 (0.33)
	FVC, L	1.82 (0.48)	1.58 (0.47)
	FEV1/FVC, %	77.2 (8.8)	81.6 (7.9)

On average, the FEV1/FVC ratio did not significantly decrease according to age among males ($p=0.42$), whereas it slightly increased among females ($p=0.054$).
These preliminary results suggest that the reference equations obtained from younger populations cannot be used for the long-term survivors. Appropriate LLN equations will be computed when a greater sample size is reached.

P4156
Canadian prediction equation of spirometric lung function for caucasian adults 18-90 years: Results from the Canadian obstructive lung disease (COLD) study and the Canadian ECRHS study
COLD Investigators[1], ECRHS Investigators[2]. *[1]UBC James Hogg Cardiopulmonary Research Lab, University of British Columbia, St Paul's Hosp., Vancouver, BC, Canada; [2]Division of Respiratory Medicine, University of British Columbia, Vancouver General Hospital, Vancouver, BC, Canada*

Background: There are no preexisting reference for spirometry based on a randomly selected Canadian population.
Objective: To construct spirometric reference values for adults, aged 18 -90 years, by combining data of healthy life-long non-smokers from two population based studies: the Canadian Obstructive Lung disease [COLD] study and the Canadian European Community Respiratory Health Survey [ECRHS] Study.
Method: Spirometric lung function data were available from 3042 subjects in the COLD study and from 2571 subjects in the Canadian ECRHS. Exploratory curves for the combined spirometric variables versus age were continuous and linear. We identified 844 [ages 40-90 years] and 812 [aged 18-44 years] healthy, asymptomatic, life-long nonsmokers to provide normative reference values for spirometry. Multiple regression models were constructed separately for self-reported Caucasian men and women for FEV1, FVC, FEV1/FVC with covariates of height, sex and age.
Results: The summary for the best-fitting regression models for healthy never-smoking, asymptomatic men and women, 18-90 years old, are as follows:

Sex	Parameter	Intercept	Age	Height	R-square	SEE
Male	FEV1	–2.06961	–0.03167	0.04215	0.56010	0.50586
	FVC	–5.39383	–0.02286	0.06500	0.45720	0.63557
	FEV1FVC	122.0893	–0.27977	–0.17794	0.35770	5.48656
Female	FEV1	–1.68697	–0.02773	0.03557	0.68390	0.36973
	FVC	–4.11886	–0.02124	0.05310	0.52160	0.49381
	FEV1FVC	120.5969	–0.30805	–0.16531	0.39550	5.68808

Conclusion: These spirometry reference equations, derived from population-based cohorts with stringently monitored lung function measurements, provides data currently lacking in Canada.

P4157
Pulmonary resistance measured by impulse oscillometry system (IOS) seems to be related to self-reported COPD and respiratory symptoms
Sophia Frantz[1], Ulf Nihlén[2], Magnus Dencker[1], Gunnar Engström[3], Claes-Göran Löfdahl[2], Per Wollmer[1]. *[1]Clinical Physiology and Nuclear Medicine Unit, Department of Clinical Sciences, Lund University, Malmö, Sweden; [2]Respiratory Medicine and Allergology Unit, Department of Clinical Sciences, Lund University, Lund, Sweden; [3]Cardiovascular Epidemiology Research Group, Department of Clinical Science, Lund University, Malmö, Sweden*

Background: COPD is considered to start with small airway disease, which is not readily detected by spirometry. Measuring pulmonary resistance by IOS may be a more sensitive technique and more closely related to respiratory symptoms.
Aims and objectives: This study aimed at examining pulmonary resistance mea-

sured by IOS in COPD, self-reported and/or diagnosed with spirometry according to GOLD criteria.
Methods: 419 subjects (173 men/246 women), 46-78 years, who participated in a previous population-based study, were examined with spirometry and IOS (resistance at 5 Hz (R5), resistance at 20 Hz (R20) and the difference between them (R5-R20)) and answered a questionnaire on respiratory symptoms and diseases.
Results: 77 subjects had self-reported COPD and of them 34 subjects had COPD according to GOLD criteria. Of the 342 subjects with no-self reported COPD 90 subjects had COPD according to GOLD criteria. Subjects with self-reported COPD had higher pulmonary resistance than subjects with no self-reported COPD (R5 0.40/0.32 kPa/l/s, R20 0.28/0.24 and R5-R20 0.12/0.072, $p<0.01$ for all), both in subjects with (R5 0.42/0.33, R20 0.28/0.24, R5-R20 0.14/0.085, $p<0.05$ for all) and without spirometry verified COPD (R5 0.38/0.31, R20 0.28/0.24, R5-R20 0.11/0.068, $p<0.05$ for all). Respiratory symptoms, e g long-standing cough, were more commonly reported by subjects with self-reported than spirometry verified COPD ($p<0.01$).
Conclusions: Self-reported COPD is characterized by more respiratory symptoms and higher resistance measured by IOS, compared with spirometry verified COPD. High resistance may reflect early small airway disease better than spirometry.

P4158
Definition and validation of a predictive model to identify COPD patients from administrative databases
Lisa Bauleo, Nera Agabiti, Ursula Kirchmayer, Valeria Belleudi, Luigi Pinnarelli, Silvia Cascini, Danilo Fusco, Massimo Arcà, Marina Davoli. *Department of Epidemiology, Regional Health Service, Lazio, Rome, Lazio, Italy*

Background: Large administrative databases are increasingly used to identify patients with chronic conditions, however the best methodology for Chronic Obstructive Pulmonary Disease (COPD) is still debated.
Objective: To develop and validate a predictive model to identify patients with COPD in Lazio region (2,625,102 residents over 45) linking clinical and administrative data.
Methods: From regional hospitalizations and drug prescriptions, through record linkage, we identified patterns of specific drug use (minimum 2 prescription during 12 months) and COPD hospitalizations during a 9-year period in 428 patients with COPD, who attended an outpatient clinic in 2006, and in 2140 people without COPD (selection from outpatients' specialized health care registry). Through a Bootstrap-Stepwise procedure we analyzed COPD associated factors. We validated the algorithm through internal (cross-validation-bootstrap, jack-knife) and external validation (comparison with COPD patients with confirmed diagnosis).
Results: Prevalence of COPD was 7.8%. Factors associated with COPD were prescription of beta2-agonists, anticholinergics, corticosteroids, oxygen, previous hospitalization for COPD and respiratory failure. For each patient we estimated an expected probability to suffer from COPD. Depending on the cut-point of expected probability, sensibility ranged from 74.5 to 99.6%, specificity from 37.8 to 86.2%. We defined a cut-point of 0.30 to identify COPD patients. Applying our algorithm on external COPD patients we succeeded to identify 70%.
Conclusion: The predictive model showed good performance to identify COPD patients confirming the strength of administrative data for monitoring chronic diseases.

P4159
Respiratory symptoms, smoking history and airflow limitation: How should we define COPD?
Lowie Vanfleteren[1], Frits Franssen[2], Gernot Rohde[1], Emiel Wouters[1].
[1]Respiratory Medicine, Maastricht University Medical Center, Maastricht, Netherlands; [2]Program Development Centre, Ciro+, Centre of Expertise for Chronic Organ Failure, Horn, Netherlands

Background: Using fixed FEV1/FVC values as a diagnostic criterium may misestimate the prevalence of clinically relevant COPD, especially if subjects are asymptomatic and/or do not have prior exposure to noxious substances. We compared potential overdiagnosing for GOLD defined COPD and COPD defined using lower limit of normal (LLN).
Method: A gender-stratified random sample of the inhabitants of Maastricht aged $\geq$ 40 years was analyzed as part of the BOLD initiative. Post-bronchodilator spirometry was obtained. GOLD COPD was defined according to GOLD. LLN COPD was defined as FEV1/FVC < LLN. Respiratory symptoms were defined as reporting chronic cough, chronic phlegm, wheeze or dyspnea (mMRC >0). Important smoking history was defined as $\geq$ 10 pack years.
Results: 590 subjects (age 57,6±10,7, 300 male (50,8%)) completed questionnaires and had acceptable spirometry. Use of LLN resulted in a 34.8% reduction in diagnosis of COPD compared to GOLD: 88 (14,9%) vs 135 (22,9%) respectively. Furthermore, use of LLN resulted in a 49% reduction in diagnosing COPD in asymptomatic subjects, compared to GOLD: 25 of 88 (28,4%) versus 49 of 135 (36,3%) subjects respectively. 17 (19,3%) of 88 LLN COPD subjects smoked < 10 pack years versus 41 (30,4%) of 135 GOLD COPD subjects. Finally, use of LLN resulted in 73,3% reduction in diagnosing COPD in subjects who were asymptomatic or had < 10 pack years: 5 (5,7%) of 88 LLN COPD subjects versus 19 (14,1%) of 135 GOLD COPD subjects.
Conclusion: Using the LLN criterium to define COPD results in an important reduction in diagnosis of COPD in asymptomatic subjects, compared with the GOLD criterium. A further reduction is seen if also smoking history is taken into account.

P4160
Dyspnoea, obstruction, smoking and exacerbation (DOSE) index and mortality in COPD
Josefin Sundh[1], Christer Janson[2], Karin Lisspers[3], Björn Ställberg[3], Scott Montgomery[4]. *[1]Department of Respiratory Medicine, Örebro University Hospital, Örebro, Sweden; [2]Department of Medical Sciences, Respiratory Medicine and Allergology, Uppsala University, Uppsala, Sweden; [3]Department of Public Health and Caring Science, Family Medicine and Clinical Epidemiology, Uppsala University, Uppsala, Sweden; [4]Clinical Epidemiology and Biostatistics Unit, Örebro University Hospital, School of Health and Medical Science, Örebro University, Örebro, Sweden*

Introduction: The DOSE index was designed to assess disease severity and for clinical management of COPD, but has not been evaluated as a prognostic instrument for mortality. This study investigated associations with all cause-mortality.
Methods: A total of 1548 patients with a diagnosis of COPD were randomly selected from 70 Swedish primary and secondary care centers. Information was collected using questionnaires and record review. The Swedish Board of Health and Welfare provided mortality data. The DOSE index was calculated using the MRC dyspnoea scale, FEV1 as percent of predicted (FEV1%pred), smoking status and exacerbation rate. Information on exacerbation rate over the last six months was used to estimate the annual rate. Some 527 patients, aged 34-75 years, were included in Cox regression analyses to estimate survival with adjustment for age, sex and heart disease.
Results: Over five years, 110 patients (20,9%) died. Mortality was higher in patients with DOSE index $\geq$4, than for lower scores (42.7% vs 10.4%). This produced a hazard ratio (HR) of 4.45 (95%CI 2.99 to 6.64) after adjustment for age, sex and heart disease. When investigating the separate components in the DOSE index, the HR for a unit change in the DOSE index components was 1.81 (1.52 to 2.14) for MRC; 2.27 (1.77 to 2.92) for FEV1%pred; 0.98 (0,64 to 1.49) for smoking status and 1.72 (1.36 to 2.17) for exacerbation score; all after adjustment for age, sex and heart disease. The associations with mortality for the separate components were all statistically significant when these measures were included simultaneously in the same model.
Conclusion: The DOSE index is associated with mortality in COPD patients.

P4161
Determination of COPD characteristics via unsupervised clustering of the ECLIPSE cohort
Stephen Rennard[1], Bruno Delafont[2], Nicholas Locantore[3], Alvar Agusti[4], Peter Calverley[5], Edwin Silverman[6], Ruth Tal-Singer[7], Jorgen Vestbo[8].
[1]University of Nebraska Medical Center, University of Nebraska, Omaha, NE, United States; [2]Department of Statistics, Boehringer-Ingelheim, Paris, France; [3]Respiratory Medicines Development, GlaxoSmithKline, RTP, NC, United States; [4]Institut del Torax, CIBER Enfermedades Respiratorias and Fundacion Caubet-Cimera, Barcelona, Spain; [5]Department of Respiratory Medicine, University of Liverpool, Liverpool, United Kingdom; [6]Pulmonary and Critical Care Division, Brigham and Women's Hospital, Boston, MA, United States; [7]Respiratory Center of Drug Development, GlaxoSmithKline, Philadelphia, PA, United States; [8]Cardiology and Respiratory Medicine, Hvidovre Hospital and University of Copenhagen, Copenhagen, Denmark

Background: Identifying clinically meaningful groups of COPD patients is a crucial goal to explore COPD heterogeneity. We attempt to define groups using unsupervised clustering methods.
Methods: Data from the 2164 COPD patients in the Evaluation of COPD Longitudinally to Identify Predictive Surrogate Endpoints (ECLIPSE) study were assessed. Using forty-one baseline variables describing demographic, clinical, quality of life, laboratory and biomarker values, twelve factors were identified via factor analysis that accounted for 61% of the variance in the data set. The variables with the highest loadings for those factors were used to define five patient groups using unsupervised clustering, and relationships to longitudinal outcomes were assessed.
Results: Demographic profiles are shown in table 1. Over three years, higher mortality was seen in Cluster 2 (characterized by higher comorbidity and BMI, despite FEV1 values that were not substantially lower than other groups) and Cluster 5, characterized by more airflow limitation.

Baseline Characteristics and Longitudinal Outcomes

Variable	Cluster 1 (n=1117)	Cluster 2 (n=423)	Cluster 3 (n=205)	Cluster 4 (n=98)	Cluster 5 (n=321)
Age (y)	63 (7)	64 (7)	64 (7)	63 (6)	63 (7)
% Females	42	13	34	34	38
% Current Smokers	42	35	25	31	25
FEV1%pred	49 (15)	51 (15)	55 (15)	51 (17)	38 (13)
BMI (kg/m^2)	25 (5)	32 (6)	26 (4)	27 (6)	24 (4)
% Died w/in 3 yrs	9	13	3	6	12

Table values are mean (SD) or %.

Conclusion: Unsupervised cluster analysis identified 5 groups of COPD patients

in ECLIPSE that differ in their baseline demographics and outcomes over 3 years. These may represent subtypes of COPD.
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P4162
Asthma with and without sinusitis, results from the Swedish GA²LEN study
Roelinde Middelveld[1], Alexandra Ek[1], Bertil Forsberg[2], Bo Lundbäck[3], Sven-Erik Dahlén[1], Christer Janson[4]. *[1]The Centre for Allergy Research/Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden; [2]Department of Occupational and Environmental Medicine, Umeå University, Umeå, Sweden; [3]Department of Internal Medicine, University of Gothenburg, Gothenburg, Sweden; [4]Department of Medical Sciences, Uppsala University, Uppsala, Sweden*

Introduction: In order to study the consequences of having both asthma and sinusitis compared to having asthma only, four Swedish centres studied cohorts of asthma patients (A), and asthma+sinusitis patients (AS). The study was part of the Global Allergy and Asthma European Network (GA²LEN) survey and follow-up.
Methods: Participants in the survey were invited for a clinical follow-up visit for interviews, and measurements of lung function, fraction of exhaled nitric oxide (FeNO) and quality of life. Group allocations were based on the interviews. A was defined as self-reported diagnosis of asthma and presence of at least one asthma symptom or use of asthma medication. AS was defined as having asthma as well as at least two sinusitis symptoms, providing that nasal blockage or nasal discharge were reported.
Results: A consisted of 470 subjects (mean age 44, BMI 27, 60% females) and AS of 130 subjects (mean age 45, BMI 27, 57% females). AS had lower FEV1%pred, FVC%pred and quality of life (mini Asthma Quality of Life Questionnaire-AQLQ), compared to A. There were no differences in FeNO, FEV1/FVC1 and reported nasal allergies.

Table 1

	Asthma	Asthma + Sinusitis	p value
FEV1% pred (95% CI)	91.8 (90.2–93.4)	88.4 (85.0–91.8)	0.04
FVC % pred (95% CI)	103.9 (102.4–105.4)	99.9 (96.7–103.0)	0.01
FEV1/FVC (%) (95% CI)	74.8 (73.9–75.7)	73.8 (71.8–75.7)	ns
FeNO (median, ppb) (IQ range)	18 (12–29)	17 (12–32)	ns
MiniAQLQ ±SD	6.0±0.9	5.4±1.2	<0.0001
Reported nasal allergies (%)	69	72	ns

Mean values.

Conclusion: We conclude that having both asthma and sinusitis results in lower lung function and lower quality of life compared to having asthma only.

P4163
Statistical cluster analysis on the BTS refractory asthma cohort
Chris Newby[1], Liam Heaney[2], Andrew Menzies-Gow[3], Rob Niven[4], Chris Brightling[1]. *[1]Department of Infection, Inflammation and Immunity, Institute for Lung Health,University of Leicester, Leicester, United Kingdom; [2]Centre for Infection and Immunity, Queen's University, Belfact, United Kingdom; [3]Royal Brompton Hospital, Royal Brompton Hospital, London, United Kingdom; [4]North West Lung Centre, University of Manchester, Manchester, United Kingdom*

Background: Severe asthma is no longer believed to be a single homogeneous condition but rather a heterogeneous disease possibly containing subsets of patients. A number of clustering algorithms have been carried out on various datasets of asthmatics of differing severities but few have been confirmed by follow-up studies.
Aims and objectives: To further understand these clusters, statistical analysis was carried out to determine the patterns of variation seen in a large cohort with well characterised refractory asthma (Heaney. L et al,2010).
Methods: Independent structure was determined using Bayesian factor analysis followed by statistical cluster analysis. The analysis revealed clinically relevant factors and statistical significant clusters.
Results: 4 factors were obtained from the Bayesian factor analysis. Factor 1 described lung function, factor 2 atopy, factor 3 BMI and factor 4 Inflammation. 4 clusters were found. These clusters were significant at the 0.05 level for over 26 asthma variables e.g. Pre bronchodilator FEV1 ($p<0.001$), age of asthma onset ($p<0.001$), gender ($p=0.041$), atopy ($p=0.004$). Notably,the proportion of each cluster was differentially represented across different Centres.
Conclusions: Cluster 1, described an older group of patients with the longest disease duration. Cluster 2, a mainly female group that had late onset and high BMI. Cluster 3 described an atopic group with high blood eosinophils and low age of onset. Cluster 4 were mainly male, had good lung function and were also the youngest. These clusters have been differentially represented in previous work in asthmatic populations of variable severity. Further analysis will be carried out longitudinally to determine outcomes for the clusters.

P4164
The comparison of early and late onset asthma among elderly asthmatics
Bülent Bozkurt, Hale Sahin, Duygu Özol, Zeki Yildirim. *Dept. of Chest Diseases, Fatih University, School of Medicine, Ankara, Turkey*

Introduction: Asthma is important cause of morbidity and mortality in elderly.There are significant effects of long standing inflammation on airway obstruction and remodeling.This study aims to compare clinical characteristics of early and late-onset elderly asthmatics.
Method: A retrospective study was conducted in 116 elderly asthmatics admitted to Fatih University,Dept of Chest between January 2008-2011. Onset of asthma was the year when dyspnea firstly appear (cut-off age for onset; 65).
Results: Mean age of patients was 73±6.2years and 23of them were male. 21.6% of patients were smoker. 19% of patients had allergic rhinitis. 3.4% of the patients had complete asthma control.Main systemic disease was hypertension (69.8%). There were 48 early-onset and 68 late-onset asthmatics. Cough (2.7 (95%CI:1.2-5.8)and sputum production (3.3 (95%CI:1.5-7.7)were more frequent in late onset asthmatics. Medications were rarely prescribed (0.07 (95%CI:0.02-0.19) in late-onset asthmatics. Theophylline (0.18 (95%CI: 0.04-0.89)and salbutamol (0.21 (95%CI: 0.07-0.65)were rarely used in late-onset asthma ($p<0.05$).
Conclusions: Desired clinical outcomes may be more difficult to achieve in elderly asthmatics due to comorbid conditions, cognitive and financial status.Chronic cough with sputum is not unusual in elderly with asthma, although it is usually associated with smoking, chronic bronchitis, and several conditions in late-onset asthmatics. Risk of adverse effects of treatment increases with increasing age and often limits choice and frequency of medications; moreover theophylline and salbutamol are rarely prescribed to patients with late-onset asthma. Future studies may give better understanding of etiopathogenesis of early and late-onset asthma.

P4165
Wheezing in morbidly obese patients is not always due to asthma
Astrid van Huisstede[1], Arjan Rudolphus[1], Hans Zengerink[2], Gert-Jan van de Geijn[3], Pieter Hiemstra[4], Gert-Jan Braunstahl[1]. *[1]Department of Pulmonology, Sint Franciscus Gasthuis, Rotterdam, Netherlands; [2]Department of Surgery, Sint Franciscus Gasthuis, Rotterdam, Netherlands; [3]Department of Clinical Chemistry, Sint Franciscus Gasthuis, Rotterdam, Netherlands; [4]Department of Pulmonology, Leiden University Medical Center, Leiden, Netherlands*

Background: Morbid obesity is becoming a world wide epidemic. Morbidly obese patients are at risk for asthma.
Aim of the study: To investigate the differences in symptoms and lung function test in morbidly obese patients with and without asthma.
Methods: A group of 93 morbidly obese patients (BMI>35 kg/m², age 18-50y) was studied. Asthma was defined as the presence of reversible airway obstruction ($\Delta FEV1 \geq 12\%$) and/or PC20 methacholine of <8 mg/ml. Patients with a physician diagnosis asthma, but not fulfilling the criteria of asthma after stopping ICS were defined as "asthma-like symptoms" (asthma-l.s.).
Results: 29 patients fulfilled the criteria of asthma, 14 had asthma-l.s., and 50 control group patients. Sex, age, BMI, smoking, abdominal circumference, atopy, FeNO, FVC, DLCO, Eppworth Sleepiness Scale score, GERD questionnaire and steps a day did not differ between the groups. Patients with asthma or asthma-l.s. had significantly more symptoms (wheezing [$p<0.001$], coughing [$p<0.001$]), and significant worse AQLQ-scores (mean 5.7 points [p=0.004], 5.5 points [p=0.002] respectively) and ACT-scores (mean 1.1 points [p=0.000] and 1.0 points [p=0.015] respectively) compared to controls (AQLQ 6.5 points, ACT 0.3 points). Patients with asthma had a significantly lower FEV1 (86% pred) and FEV1/FVC (76%pred) than the group with asthma-l.s. (102%pred [$p<0.001$], and 83%pred [p=0.001] respectively) and the control group (97%pred [p=0.001], and 81%pred [p=0.001] respectively).
Conclusion: A significant proportion of the patients with morbid obesity and a history of asthma does not fulfill the criteria of asthma. These patients have the same symptom scores as "asthma-like symptoms" asthmatics, despite supranormal lung function parameters.

P4166
Incidence of asthma and wheeze during adolescence – The impact of study design
Linnea Hedman[1,2], Anders Bjerg[1], Sigrid Sundberg[1], Eva Rönmark[1,2]. *[1]The OLIN Studies, Norrbotten County Council, Lulea, Sweden; [2]Public Health and Clinical Medicine, Occupational and Environmental Medicine, Umea, Sweden*

Aim: To study the impact of study design on the incidence rates of asthma and wheeze during the teen ages.
Method: In a longitudinal study about asthma and allergic diseases within the OLIN studies in northern Sweden, a cohort of school children (n=3,430) was followed annually from age 7-8yrs by completion of an extended ISAAC questionnaire. In the endpoint survey (age 19yrs) 2,861 (83% of original responders) participated. Incident cases of asthma and wheeze from age 12 to 19yrs were identified by two methods: the annual questionnaire surveys and the endpoint survey only, respectively.
Results: The incidence was consistently higher when the incidence was based on annual surveys compared to the endpoint survey only. Based on the endpoint survey, the average annual incidence of current asthma, physician-diagnosed asthma

and ever asthma was 0.7-1.4/100/y and current wheeze was 1.5/100/y. Based on the annual surveys, the incidence of asthma was 0.9-2.7/100/y and current wheeze 3.6-5.3/100/y. In both study designs, the incidence of asthma and wheeze was higher among girls than boys (p-values<0.01). At the onset, the additional cases of current asthma identified by the annual surveys had slightly less severe asthma than those identified only in the endpoint survey (p<0.06).
Conclusion: The incidence of asthma and wheeze was affected by study design. The incidence was underestimated when only baseline and endpoint data was used. Study design and follow-up time is important to consider for comparisons of the incidence of asthma and wheeze between studies.

P4167
Reproducibility of an asthma symptoms and rescue medication diary: Paper and AM3™ modes
Andrea Ireland[1], Ingela Wiklund[2], Peter Dale[3], Ray Hsieh[4], Erin O'Rourke[1].
[1]GES, United BioSource Corporation, Bethesda, MD, United States; [2]Health Care Analytics, United BioSource Corporation, Bethesda, MD, United States; [3]Global Health Outcomes, GlaxoSmithKline, Stockley Park, Uxbridge, United Kingdom; [4]Biostatistics and Data Analysis, United BioSource Corporation, Bethesda, MD, United States

Objective: This study investigated the test-retest reliability of a twice-daily (morning and evening) asthma symptoms and rescue medication diary within two modes of administration: 1) paper-and-pencil; and 2) AM3™ electronic device in patients with persistent asthma.
Methods: Prospective cross-over study where key inclusion criteria were Asthma Control Test (ACT) scores ≥16, ICS with or without LABA use, <2 nocturnal awakenings due to asthma (past week), and activity limitations ≤1 per week. Participants were randomly allocated to complete the diary in each mode for 15 days. Spirometry was performed at randomisation, cross over, and end of study and changes in asthma resource use were captured. Weekly percentage of symptom-free days (SFD) and rescue-free days (RFD) were calculated using diary data. Intraclass correlation coefficients (ICC) of mean Week 1 SFD and RFD (test) and Week 2 mean SFD and RFD (retest) were estimated for three groups of stable participants: 1) patient who reported little or no change in asthma symptoms and rescue use at Day 15; 2) <±15% change in FEV_1 (L); and 3) ACT change scores <|3| (final visit versus baseline).
Results: The mean age of the participants (n=50) was 36.5±17.5 years. Independent of mode of administration, SFD demonstrated acceptable test-retest reliability (ICC≥0.70) based upon all three definitions of asthma stability. By comparison, acceptable reproducibility of the percentage of RFD (ICC 0.78) was only observed for the electronic diary using the FEV_1 stability criterion.
Conclusion: This study provides evidence of the test-retest reliability of SFD and RFD diary as well as concordance between the two modes of administration.
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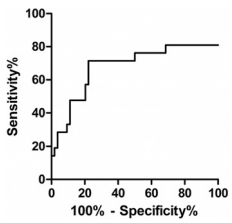
P4168
Exclusion of asthma for screening purposes using exhaled air molecular profiling by electronic nose
N. Fens[1], Y. Gaarthuis[2], A.C. Bos[3], N.J.J. Schlösser[2], P.J. Sterk[1]. *[1]Respiratory Medicine, Academic Medical Center, University of Amsterdam, Amsterdam, Netherlands; [2]Pulmonology, Central Military Hospital, Utrecht, Netherlands; [3]Research & Development, C-it, Zutphen, Netherlands*

Background: Asthma is presently diagnosed by its clinical presentation, including the presence of dyspnea, cough, chest tightness and wheezing (GINA). When combined with bronchial challenge testing, asthma can be assessed with high accuracy. Excluding asthma is the primary objective when screening for military service. Profiles of exhaled compounds as measured by electronic nose (eNose) could be a rapid non-invasive test for this purpose.
Hypothesis: Exhaled breath molecular profiles measured by eNose can be used to exclude asthma in a screening setting for military recruits.
Methods: Military recruits (16-27 yr, mean 19.8; M/F 64/11) were included in a cross-sectional study. Exhaled breath samples were measured by DiagNose eNose (C-it, Zutphen, NL). Symptoms of asthma were assessed by validated questionnaires (Burney *et al*, ERJ '94) and a histamine challenge test was performed. Asthma was considered to be present when both symptoms and PC20<8 were present (gold standard). ROC analysis was performed to assess optimal specificity.
Results: 75 recruits were included, of which 21 had a gold standard diagnosis of asthma. ROC analysis of exhaled breath profiling resulted in an AUC of 0.70 (p=0.007).
Optimal specificity reached 89% (sensitivity 48%).



Conclusion: Exhaled breath molecular profiling using an eNose can be a suitable screening instrument to exclude asthma in young, otherwise healthy military recruits.