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ABSTRACTS OPEN

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CLINICAL RESEARCH RESULTS ABSTRACTS

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CR001
Tuberculosis in the developing countries, just a tip of the iceberg

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Aim: The aim of the study was to find out the sputum smear positive cases, importance of sputum microscopy and its impact on the other family members living in close vicinity of patient with due importance to cure them resulting in breaking the chain of transmission of the disease in the society and prevention of the drug resistant Tuberculosis, which is the challenging problem for the developing countries with limited resources e.g. culture and sensitivity test for Acid Fast Bacilli. Pakistan contributes 63% of the disease burden having 420,000 new cases in the country every year. The study was carried out in Khyber Pakhtunkhwa province having population as per Pakistan Census Report is 1,7743,645 (in 1998).
Method: All TB patients included in the TB registration record having all information including name of patient, address of the contact person and Basic Medical Unit (Rural Health Centre or Hospital where diagnosis was made and where treatment is to be given), Type of patient i.e. New, Relapse, Transfer In, Treatment after default and Treatment after failure.
Results: DOTS program stop the chain reaction of transmission of bacteria which prevents the TB, failures in emergence of even more deadly strains of drug resistant TB. It not only reduces TB recurrence rate but indirectly alleviates poverty resulting to overcome TB as the stigma in the society especially for the young unmarried females. It is a cost effective strategy. Prevalence of the disease for both sputum positive and negative cases is 342 per 100,000 population. Incidence rate is 275 per 100,000 population and for sputum smear positive is 144 per 100,000 of population.
Conclusion: Tuberculosis especially Sputum Smear Positive patients are a challenging problem for the under developing countries with low literacy rate and poor health facilities. The most important priority of the government, health department and health personals is to follow the DOTS components i.e. government commitment, diagnosis by free sputum microscopy at all diagnostic centres, standardize treatment with direct observation, uninterrupted drug supply in order to control and cure the TB patients.
Declaration of Interest: None
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[CR001]

Table 1. Pulmonary sputum smear microscopy positive 2

New cases	*Previous Treated*				*Total*
	Relapses	*After Failure*	*After Default*	*Others (SS +ve)*	
239	11	02	0	1	253

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[CR001]

Table 2. New Pulmonary Sputum smear microscopy positive cases treatment outcome

Types of Patient	*Cured*	*Treatment Completed*	*Died*	*Failure*	*Defaulted*	*Transferred Out*
Smear Positive	198 (82.8%)	21 (8.7%)	3 (1.2%)	15 (6.2%)	2 (0.83%)	0 (0%)

CR002
Tracing missing contacts of TB, an unprecedented success in TBCP Khyber Pakhtunkhwa Pakistan

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Aim: Pakistan ranks 5th amongst 22 high burden countries. TB incidence in Pakistan is 276 per hundred thousand populations. Khyber Pakhtunkhwa (KP) is one of the Provinces of Pakistan. Provincial TB Control Program (PTP) KP *provides free TB care services to about 27 million populations in the province and people from adjacent tribal agencies including Afghans. There are 232 diagnostic centres in Public sector and more than 314 Private clinics across the province. Free of cost sputum smear microscopy and ATT under DOTS strategy is ensured by the Program. The objective is to detect at least 70% of cases and treat successfully 90% of them. Aim is to have TB free community.*
Method: This was a retrospective study of two years, 2013 and 2014. Registered patients in different diagnostic centres were counselled to screen their contacts for TB on volunteer basis. All the contacts of the index case were interviewed and counselled for screening on smear microscopy. Clinical history, signs and symptoms were recorded and were correlated with the smear microscopy. Only those contacts were declared positive case whose smear microscopy indicated positive results as per standard protocol of NTP/WHO. These new cases were registered in their respective treatment centre. The rest of the negative patients were educated for the care of patient and personal biosafety. *The data is analyzed through spss software.*
Results: PTPKP registered 81197 all TB Cases including 32648 B Positive TB cases. There was no significant difference between male to female ratio ($P < 0.05$). 3882 contacts were screened in 2013, out of which 276 were confirmed Smear Positive patients. The confirmed cases were 7.11% of the contacts screened. In 2014, 4315 contacts were screened, out of which 216 turned positive on sputum smear microscopy, which were 5.0% as an average out of the 7197 contacts screened, 492 positive patients were identified and registered, which are about 6.05%.
Conclusion: Although PTP-KP has played an integral role in controlling TB. However to sustain the performance and to reduce the human suffering, stigma, morbidity and mortality; efforts should be strengthened to catch the missing patients and avert possible risk of MDR TB and TB HIV Co-infection. Strategy may be refined to register more missing cases of TB, especially, by strengthening TB care in Private clinics. Ensuring these efforts will no doubt

enable PTP to reduce prevalence of primary TB burden, MDR/XDR and TBHIV co-infection in KP.
Declaration of Interest: None
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CR003
Overview of Programmatic Management of Drug Resistant TB (PMDT) Program in Khyber Pakhtunkhwa (KP), Pakistan

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Aim: The aim of the study is to have an overview of the PMDT Program in KP. We retrospectively reviewed data at different PMDT centres in KP from 1st Q 2012 -3rd Q 2015.
Method: To control the increasing rate of DR-TB in KP, PTP KP stepped up & started managing M/XDR TB in 2012 with the support of Global fund. 04 PMDT centres have been established in KP. The enrolled DR TB patients at these centres were not only provided free second line drugs but also social support and travelling allowance on monthly visits. Home visits were also made for each patient for infection control measures, contact screening and to create linkage with nearest DOTS centre at District TB control office.
Results: During this time, total of 1079 patients were enrolled in these PMDT centres and among them 742 were MDR. Among enrolled patients 469 (43.5%) male and 610 (56.5%) were female. Most of patients 798 (74.0%) were among 15-45 yrs. Age group. This study included all those patients who were registered up to October 2013 and were completed their treatment. A total of 461 patients were registered up to October 2013 out of which 450 were completed their treatment and included in this study. Among these patients 21 were Rif resistant on Xpert testing but were not declared MDR-TB on culture (18 declared cured and 3 died). 04 were Mono DR-TB (1 completed, 1 cured & 2 died). 13 were Poly DR (10 cured, 2 died & 1 was failed). 08 patients were DR-TB suspect (3 completed, 3 cured, 1 died & 1 was not evaluated). Out of study, 22 cases were XDR TB patient (6 cured, 9 died, 6 failed and 1 was loss to follow up). 382 were MDR-TB, of which 290 (76.0%) has successfully completed treatment. Unsuccessful were 92 (24.0%) (Died = 67, Failed = 23, Lost to follow up = 1, not evaluated = 1). Success rate of MDR-TB in this province is 76%, so achieved WHO target. During this time 100% received social support.
Conclusion: Multidrug-resistant tuberculosis is an emerging challenge in Pakistan. There is a need to invest in improving the capacity of the TB Program to detect and manage MDR-TB.
Declaration of Interest: None
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CR004
Do we need tailored smoking cessation interventions for smokers with COPD? - Comparing smokers with and without COPD regarding cigarette smoking and quitting

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Aim: Background: Smokers with chronic obstructive pulmonary disease (COPD) have a more urgent need to stop smoking than the general smoker. However, the prevalence of smoking in patients with COPD is high and there is some evidence that this group finds it more difficult to quit. In order to increase smoking cessation in smokers with COPD it is important to assess if there are specific smoking-related factors and experiences in these smokers. This information could then be used to tailor future interventions to the needs of smokers with COPD. Aim: To compare smokers with and without COPD on factors associated with cigarette smoking and quitting, and their experiences herewith.
Method: We conducted a questionnaire survey in all smoking patients with a recorded diagnosis of COPD from a large Dutch primary healthcare network. We compared this group with twice as many age-, sex-, and healthcare centre-matched smokers without COPD. In purposive subsamples from both groups we conducted semi-structured in depth interviews.
Results: One hundred seven smokers with COPD and 86 smokers without COPD responded to the questionnaire. As well as similarities, there were differences between the groups; smokers with COPD reported higher levels of depression and cigarette dependence, and a lower level of self efficacy to refrain from smoking. The interviews in 10 smokers with and 10 without COPD resulted in three overarching themes: balancing the health impact of smoking, autonomy being challenged by social interference and prerequisites for quitting. Both smokers with and without COPD trivialized the health consequences of smoking, however, smokers with COPD played even more ignorant. Autonomy was very important in both groups of smokers and smokers with COPD in particular had fierce emotions about the lack of empathy from doctors. Lastly, all smokers expressed fluctuation in internal and external motivation for quitting and in smokers with COPD existential feelings were more interrelated with their smoking behavior.
Conclusion: Smokers with and without COPD showed a lot of similarities, but smokers with COPD show some specific characteristics and experiences related to cigarette smoking and quitting. These differences offer the possibility to tailor smoking cessation treatments more specifically to the subgroup of smokers with COPD.
Declaration of Interest: C.P. van Schayck received unrestricted grants for nicotine addiction studies in both primary care and public health. D. Kotz received an unrestricted grant from Pzer for a trial on the effectiveness of practice nurse counselling and varenicline for smoking cessation in primary care.
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CR005
Impact of the Asthma APGAR system in US primary care practices: Beyond simply assessing control status

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Aim: Asthma is common and continues to impart a significant burden on individuals, families and the health care system. Using tools to better facilitate implementation of the 2007 evidence based national asthma guidelines may improve patient outcomes. This study was done to assess the ability of the Asthma APGAR tools to improve asthma outcomes and management in U.S. primary care practices.
Method: Using a randomized cluster trial design with cross over from control to intervention in year 3, all practices were provided with short review of the current asthma guidelines. Intervention practices were also taught how to implement and use the Asthma APGAR tools including practice asthma audit with feedback, patient completed Asthma APGAR control assessment, and a care algorithm linked to the Asthma APGAR control assessment. Both patient reported outcomes, patient demographic data and medical record abstraction data were collected at baseline and for the 24 months of enrolment.
Results: Use of the Asthma APGAR tools resulted in a significant decrease in rates of visits to the emergency department or hospitalizations for asthma (50% vs 12% reduction, respectively, $P < .001$). Intervention practices also increased their adherence to asthma guidelines specifically in the areas of prescribing daily maintenance medications and documenting asthma control assessment and assessing asthma control status. We saw no improvement in rates of asthma control or asthma related quality of life. Intervention practices had a decrease in adherence to the guideline elements in the maintenance year–year 3 of the study but still demonstrated greater adherence to assessment of control status and prescribing of daily medications compared to their baseline year, $P = 0.2$.
Conclusion: The Asthma APGAR tools improved the primary patient outcome (ED visits and hospitalizations) and some practice processes. The Asthma

APGAR system deserves further study and widespread consideration of use in primary care practice.
Declaration of Interest: This study was funded by the U.S. Agency for HealthCare Research and Quality.(5R01HS018431).
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CR006

Patient coping strategies in COPD across disease severity and quality of life: a qualitative study

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Aim: Quality of life (QoL) has a weak relationship with lung function (LF) impairment in COPD; some cope well despite poor LF, while others suffer disproportionate QoL impairment despite well-preserved LF. Adjuvant non-pharmacological interventions such as rehabilitation and psychological/behavioural support may help if acceptable and targeted appropriately, but are under-used and sometimes declined by patients. Our aim was to explore and understand variations in experiences and coping strategies in patients with different severities of disease and disease-specific Qo.
Method: Qualitative research: 34 participants were purposively sampled across a spectrum of LF and QoL impairment, to cover a grid of sub-groups ('very severe LF, good QoL', moderate LF, poor QoL' etc.). Semi-structured interviews, digitally recorded, were analysed by thematic analysis. Data saturation was achieved.
Results: Four themes emerged: *symptom impact*, *coping strategies*, *coping challenges, support needs*. Most described employing multiple coping strategies yet over half reported significant challenges coping with COPD including: psychological impact, non-acceptance of diagnosis and/or disease progression, effects of co-morbidities and inadequate self-management skills. Approximately half wanted further help, ideally non-pharmacological, across all LF impairment groups but mainly with lower QoL. Those with lower QoL additionally reported greater psychological distress and greater use of non-pharmacological support strategies where accessible.
Conclusion: Patients who develop effective coping strategies, have better quality of life independent of objective LF, whereas others cope poorly, are aware of this, and report more use of non-pharmacological approaches. This study suggests that severely impaired QoL, irrelevant of lung function, is a powerful patient centred indication to explore the positive benefits of psychological and behavioural support for distressed COPD patients.
Declaration of Interest: None
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CR007

Health status in chronic obstructive pulmonary disease: measuring the minimal clinically important difference over different periods of time

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Aim: The Minimal Clinically Important Difference (MCID) might differ depending on the time period of measurement possibly due to recall bias. This study aimed to determine the MCID of several health status instruments (Clinical COPD Questionnaire (CCQ), COPD Assessment Test (CAT) and St. George's Respiratory Questionnaire (SGRQ)) using different time windows during a 12-month follow-up period.
Method: Health status scores were collected during the RIMTCORE trial (#DRKS00004609), which investigated the effects of Inspiratory Muscle Training during Pulmonary Rehabilitation (PR). CCQ, CAT and SGRQ were administered at baseline, at the end of PR after 3 weeks, and at 3/6/9/12 months. A 15-point Likert Global Rating of Change (GRC) scale was administered for each follow-up moment. The MCID was determined using those patients indicating a minimal change with GRC scores ± 2 and ± 3 for each follow-up measurement. Question 2 of the SF-36 was used as anchor at 12-month follow-up. All measurements evaluated change between follow-up and baseline. The distribution-based methods Standard Error of Measurement (SEM) and half standard deviation of change (0.5 SD) were applied.
Results: In total 561 patients completed PR, of which 451 were included in this analysis (mean age 58 yr, 65% male, mean pack years 43, GOLD II 50%, III 39%, IV 11%). Baseline health status scores were 2.86 (CCQ), 20.23 (CAT) and 50.69 (SGRQ). MCID results are presented in table 1.
Conclusion: The use of anchor-based methods with GRCs and the SF-36 anchor question during various follow-up periods resulted in rather stable MCID estimates for CCQ, CAT and SGRQ. The ranges for improvement were 0.33-0.56 (CCQ), 1.40-3.12 (CAT), 7.58-10.28 (SGRQ). The ranges for deterioration were comparable for CCQ (0.42-0.66) and CAT (1.19-4.21), but slightly different for SGRQ (5.58-7.52). Distribution-based methods were comparable with anchor-based approaches. Recall bias seems of little influence on the MCID of health status tools.
Declaration of Interest: This study was funded by the Junior Scientific Master Class (JSM) MD-PhD programme of the University of Groningen to H.J. Alma. H.J. Alma, C. de Jong, D. Jelusic, M. Wittmann and M. Schuler have nothing to disclose. J.W.H. Kocks and K. Schultz report several personal fees all outside the submitted work. T. van der Molen developed the CCQ and holds the

[CR007]

Table 1. MCID health status vs.time period

Global Rating of Change	*CCQ*		*CAT*		*SGRQ*	
	Improved	*Deteriorated*	*Improved*	*Deteriorated*	*Improved*	*Deteriorated*
3 weeks	−0.56 (*n* = 196)	–	−3.12 (*n* = 196)	–	−8.40 (*n* = 196)	–
3 months	−0.44 (*n* = 107)	+0.42 (*n* = 36)	−2.74 (*n* = 107)	+2.71 (*n* = 36)	−7.58 (*n* = 107)	+5.01 (*n* = 36)
6 months	−0.42 (*n* = 96)	+0.48(*n* = 42)	−2.73 (*n* = 96)	+3.21 (*n* = 42)	−9.20 (*n* = 96)	+5.14 (*n* = 42)
9 months	−0.46 (*n* = 80)	+0.50 (*n* = 37)	−2.30 (*n* = 80)	+3.65 (*n* = 37)	−10.28 (*n* = 80)	+6.58 (*n* = 37)
12 months	−0.50 (*n* = 88)	+0.66 (*n* = 43)	−2.80 (*n* = 88)	+4.21 (*n* = 43)	−8.82 (*n* = 88)	+7.52 (*n* = 43)
Anchor question SF-36 after 12 months	−0.33 (*n* = 81)	+0.42 (*n* = 71)	−1.40 (*n* = 81)	+1.91 (*n* = 71)	−7.68 (*n* = 81)	+5.58 (*n* = 71)
Distribution-based						
SEM – 1.96SEM	0.29–0.56		3.28–6.43		5.20–10.19	
Range half SD periods during follow-up	0.46–0.54		2.80–3.51		6.06–7.69	

N = number of patients with a minimal improvement of deterioration.
Negative change indicates improvement, positive change represents deterioration for each questionnaire. All results significant at $P < 0.05$.
CAT, COPD Assessment Test; CCQ, Clinical COPD Questionnaire; SD, Standard Deviation; SEM Standard Error of Measurement; SGRQ, St. George's Respiratory Questionnaire.

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CR008

The impact of personality traits on health status of patients with chronic obstructive pulmonary disease in primary and secondary care in The Netherlands

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Aim: Various factors may influence health status of patients with Chronic Obstructive Pulmonary Disease (COPD). Aim of this study was to investigate the impact of individual personality traits on health status scores for COPD patients in primary and secondary care.
Method: COPD patients have been recruited between September 2015 and January 2016 from primary and secondary care in the Netherlands. Inclusion criteria were ≥40 years and diagnosis of COPD GOLD I-IV. Exclusion criteria were asthma overlap; other respiratory co-morbidities; alpha 1 antitrypsin deficiency; and inability to read Dutch questionnaires. Participants filled out the Clinical COPD Questionnaires (CCQ), COPD Assessment Test (CAT), the St. George's Respiratory Questionnaire (SGRQ) and the Eysenck Personality Questionnaire (EPQ-RSS) at home. The EPQ-RSS measures the traits Psychoticism, Extraversion and Neuroticism (min: 0, max: 12). Correlations were assessed with Pearson or Spearman correlation coefficients depending on normality of distribution.
Results: Analysis of the first patients included 175 participants of 47-84 years, 60% male, 38 mean pack years, and COPD GOLD I/II/III/IV 17/37/33/13%. Health status total baseline scores were 2.16 ± 1.04 (CCQ), 18.29 ± 7.12 (CAT), and 43.71 ± 19.45 (SGRQ). Scores on the EPQ-RSS personality traits without lie correction were 2.86 ± 1.67 (psychoticism), 6.21 ± 3.47 (extraversion) and 4.11 ± 3.31 (neuroticism). Extraversion has significant correlations with health status scores (r = -0.23 – -0.15); neuroticism has significant correlations too (r = 0.18–0.50) (see Table 1).
Conclusion: Moderate correlations exist between neuroticism and scores on the CCQ, CAT and SGRQ, with higher trait scores leading to higher health status scores. Significant correlations exists between health status and extraversion, although these are weak. No significant correlations exist taking into account psychoticism. Certain personality traits seem to have weak to moderate influence on health status scores of patients with COPD.
Declaration of Interest: This study was funded by the Junior Scientific Master Class (JSM) MD-PhD programme of the University of Groningen to Miss H.J. Alma. H.J. Alma, C. de Jong and D. Joustra have nothing to disclose. J.W.H. Kocks reports various personal fees, all outside the submitted work. T. van der Molen developed the CCQ and holds the copyright.

[CR008]

Table 1. Personality vs health status

	Psychoticism	*Extraversion*	*Neuroticism*
CCQ total	−0.05	−0.19*	+0.37*
CCQ symptoms	−0.06	−0.15*	+0.18*
CCQ functional status	−0.03	−0.19*	+0.35*
CCQ mental	−0.03	—	+0.50*
CAT	−0.03	−0.21*	+0.36*
SGRQ total	−0.04	−0.23*	+0.40*
SGRQ symptoms	−0.07	−0.18*	+0.26*
SGRQ activities	−0.06	−0.18*	+0.27*
SGRQ impact	−0.02	−0.23*	+0.45*

N = 175.
* Data presented as Pearson of Spearman correlation coefficient significant at $P < 0.05$.
CAT, COPD Assessment Test; CCQ, Clinical COPD Questionnaire; SGRQ, St George's Respiratory Questionnaire.

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CR009

Current smoking status and its relationship to COPD outcomes: an observational cohort study using routine data in the Hampshire Health Record Database

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Aim: To determine the relationship between current smoking status and clinical outcomes in a UK Primary Care COPD population.
Method: Retrospective observational study, using individual patient-anonymised routine data in the Hampshire Health Record (NHS database holding clinical data for >1 million patients in Hampshire, UK). Read codes (classification of clinical terms for electronic coding) used to identify a prevalent cohort with diagnosed COPD on 31/12/2010 and to categorise patients by latest smoking status, age, sex, body mass index (BMI), indices of multiple deprivation (IMD), FEV1/FVC%, FEV1%predicted, and by pre-existing comorbidities (18 diseases). Three outcomes over 3 years (2011-13) analysed by current smoking status: all-cause mortality, respiratory-cause unplanned hospital admissions (ICD-10 codes) and respiratory-cause Emergency Department (ED) attendances. Multivariable logistic regression used to estimate odds ratios (ORs) for each outcome.
Results: Total cohort 16479 (male 53.7%) mean (SD) age 70.1 (11.1) years. Smoking status in 97.4%: 37.2% active smokers, 57.7% ex-smokers, 2.4% never-smokers; FEV1%predicted in 89.9%: median (IQR) 60 (46.0-74.0) %; FEV1/FVC%: mean (SD) 59.6 (14.9)%; IMD deciles: median (IQR) 6 (3-9); BMI: mean (SD) 27.2 (6.0). One or more pre-existing comorbidities in 90.7%. Outcomes: multivariate analyses ($n = 13{,}220$): compared to active smokers ($n = 5015$), ex-smokers ($n = 7947$) had significantly reduced risk of death, OR 0.875 (CI 0.768-0.998); never smokers ($n = 258$): OR 0.879 (CI 0.587-1.316). Ex-smokers had significantly reduced risk of hospital admissions, OR 0.807 (CI 0.727-0.897) as did never smokers, OR 0.659 (CI 0.456-0.951). Ex-smokers had significantly reduced risk of ED attendance, OR 0.799 (CI 0.702-0.910); never smokers: OR 0.711 (CI 0.434-1.162).
Conclusion: Smoking cessation is known to reduce accelerated FEV1 decline. Even allowing for smoking related comorbidities and lung function, we have shown that current ex-smokers had a significantly lower risk of death, unplanned respiratory-cause hospital admissions and ED attendances compared with active smokers, emphasising the importance of providing more effective smoking cessation support.
Declaration of Interest: None
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CR010

Asthma ICs prescriptions in primary care in France and the United Kingdom: are they similar?

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Aim: International guidelines are developed to align routine care to best current evidence. Their implementation would be reflected in similar prescription practices across countries, while differences may arise from health system-specific factors and variations of local levels of compliance with guidelines. ASTROLAB, a FP7 European project assessing the safety of long acting β2-agonists (LABAs), included a cohort of persistent asthma patients in France and in the United Kingdom (UK) based on four therapy patterns: LABAs without inhaled corticosteroids (ICs), ICs without LABAs, LABAs and ICs as separate inhalers (LABA+ICs) or LABA/ICs fixed-dose combinations (FDCs). In

this analysis, we compared ICs prescribing patterns and associated co-therapies between the two national ICs without LABAs cohorts.
Method: Patients (6-40 years) were selected from prescribed LABA and/or ICs: ≥6 months with the same prescribed therapy pattern initially described during the 12 months of the selection period. Distribution in the 4 therapy patterns was compared between France and the UK. For patients receiving ICs without LABA, we compared ICs therapy patterns (molecule, frequency of prescriptions/dispensations, dosages/inhalation) and co-therapies. THIN prescription data were used for the UK and claims data for France.
Results: Among eligible UK and French patients ($n = 29812$ and $n = 2048$), more UK patients received ICs without LABAs group in the UK (63.0% vs 23.4%), while the FDC group was predominant in France (64.4% vs 33.3%). In the ICs without LABA group, patients received similar numbers of ICs prescriptions, (UK) or dispensations (France) over 12 months (4.3 vs. 4.0, $P = 0.12$). However, IC canisters with lower IC dosages/inhalation were more frequent in the UK (Table 1). More French patients received leukotriene-receptor antagonists (18.6% vs 8.3%, $P < 0.0001$) and oral corticosteroids (51.9 vs 15.5%, $P < 0.0001$). Conversely, most patients in both countries received short-acting beta-agonists (94.6% vs 90.7% of ICs users $P = 0.0651$).
Conclusion: Marked differences in asthma therapy patterns appeared between France and the UK, among ICs-treated patients. Understanding these further might shed light on system-specific variations in asthma care, and lead to solutions for better guideline implementation and improved health outcomes.
Declaration of Interest: The research leading to these results has received funding from the European Community's 7th Framework (FP7/2007-2013) under grant agreement n°282593.
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[CR010]

Table 1. Distribution of dosages/puff in canisters of Inhaled Cortisosteroids (ICs), according to molecule and country

Molecule	*Dosage/puff in µg*	*France*		*The United-Kingdom*	
BECLOMETASONE	50	1	0.6%	281	33.0%
	100	52	31.0%	297	34.9%
	200	13	7.7%	230	27.0%
	250	99	58.9%	43	5.1%
	400	1	0.6%	0	0.0%
	800	2	1.2%	0	0.0%
	Overall	168	100.0%	851	100.0%
BUDESONIDE	100	1	1.3%	125	49.2%
	200	40	52.6%	95	37.4%
	400	29	38.2%	19	7.5%
	500	2	2.6%	7	2.8%
	1000	4	5.3%	8	3.1%
	Overall	76	100.0%	254	100.0%
FLUTICASONE	50	64	26.1%	186	62.6%
	100	55	22.4%	22	7.4%
	125	42	17.1%	68	22.9%
	250	60	24.5%	21	7.1%
	500	24	9.8%	0	0.0%
	Overall	245	100.0%	297	100.0%

CR011
Optimizing the Management of Asthma in Primary Care in Canada: the Results of the INSPIRE Study

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Aim: Previous surveys on asthma control in Canada have shown a persistent failure to achieve guideline targets. This study was designed to identify and assess the challenges of managing Canadian asthma patients in the primary care setting.
Method: General practitioners from eight Canadian provinces completed an online memory-based assessment of their asthma management practices, and participated in regional needs assessment sessions before and after reviewing 5-10 patient profiles
Results: The assessment reviewed the practices of 212 physicians and 1075 patients. Approximately 63% of physicians saw 5-20 asthma patients per week, and 88% reported responsibility for asthma education and counselling. More than half of the physicians follow up with their moderate to severe asthmatic patients every 2-3 months, however most (72%) either rarely or never refer these patients to a certified asthma educator, or provide written asthma action plans (61%). Of the patients reviewed, 60% experienced night-time symptoms at least once per month, 50% refilled prescriptions of at least three (to >10) short-acting beta agonist inhalers per year, 48% experienced at least one exacerbation requiring oral corticosteroid showing a lack of asthma control as per the Canadian Thoracic Society guidelines. Based on a follow-up chart review of 49% of the profiled patients, referral to an asthma educator was recommended for 32% of the patients while a change in medication was proposed for 31%.
Conclusion: Consistent asthma education and management approaches are needed to improve suboptimal asthma control to lead to better outcomes.
Declaration of Interest: Study funded by Merck Frosst Canada.
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CR012
Use of Spirometry in Family Practice in Canada; results of a nationwide survey

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Aim: To determine the use of spirometry by family physicians in Canada, including barriers to testing and interpretation.
Method: A Spirometry questionnaire was developed by the special interest respiratory group of the College of Family Physicians of Canada to determine the use of spirometry in office practice. Online Surveys were distributed by email through the college website to a group of family physicians identified as having an interest in respiratory medicine. Paper copies were distributed to all attendees at the College National Conference in Toronto in November 2015 and collected on site. All results were entered and tabulated by computer.
Results: The majority of Physicians polled did use spirometry to aid in diagnosis of COPD and Asthma, and less often for other causes of dyspnea. 62% had experienced barriers to accessing spirometry and obtain results, including long wait times and poor reports. Two thirds of respondents had moderate to severe discomfort with performing spirometry and more than half were uncomfortable or very uncomfortable with interpretation. Barriers to office spirometry included time constraints and lack of personnel to perform tests. When presented with a case, the majority of respondents would perform spirometry to make a diagnosis, although only 50% used spirometry to aid in diagnosis of undifferentiated dyspnea.
Conclusion: Family physicians are interested in using spirometry to diagnose their patients with respiratory symptoms. There is a gap in knowledge in the performance and interpretation of spirometry, and variability in the availability of testing and consistency of test results. These needs can be addressed through ongoing education, including CME at the local and national level, and spirometry workshops.
Declaration of Interest: The College of Family Physicians assisted in the printing and distribution of the surveys, as well as the tabulation of the results. Special thanks go to Andre Girouard at the College for his assistance in all these tasks.
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CR013

The diagnostic added value of whole body plethysmography in patients suspected to suffer from asthma

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Aim: Whole body plethysmography (WBP) is worldwide routinely used in clinical setting for diagnostic investigation of respiratory disease. In Germany, WBP is not only implemented in hospital setting, but also in ambulatory care for investigating common diseases like asthma and COPD. However, the evidence regarding the added value remains unclear up to now. An important tool within WBP analysis is the determination of specific airway resistance (sR_{AW}) response. The aim was to compare the diagnostic accuracy of FEV_1 response on bronchial provocation with sR_{AW} response, both determined with WBP measurement.
Method: Diagnostic study with a delayed-type reference standard in 400 patients attending a private practice of pneumologists with complaints suspicious of obstructive airway disease (indicated population design). Positive bronchial provocation required a 20% fall in FEV_1 from baseline, alternatively a doubling of sR_{AW} and its increase to 2.0 kPa*s. A follow-up evaluation of patients and their physicians was performed 12 months later by telephone interview.
Results: Prevalence of asthma was 27.5% in 302 patients with complete follow-up data. Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of WBP analysis with inclusion of sR_{AW} were 95.2% (95%CI 88.3-98.1), 81.7% (76.1-86.3), 66.4% (57.5-74.2), 97.8% (94.5-99.1). Sensitivity, specificity, PPV, NPV of FEV_1 response were 44.6% (34.4-55.3), 91.3% (86.8-94.4), 66.1% (53.0-77.1), 81.3% (76.0-85.7).
Conclusion: Inclusion of sR_{AW} in WBP analysis allowed ruling out asthma with high certainty which would not be possible solely on basis of FEV_1 response. Using FEV_1 response on bronchial provocation as reference standard implicate that patients are classified false negative in 18.7%. It remains a challenge to increase the positive predictive value of bronchial provocation as this could not be improved by sR_{AW}.
Declaration of Interest: None
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CR014

30-s chair-stand test and 30 meter-walk test are both related to a history of acute visits due to respiratory problems in patients with COPD from the TIE-study

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Aim: The aim of the study was to investigate if 30-meter walk-test or 30- second chair-stand-test were related to acute visits due to respiratory problems and exacerbations in patients with COPD.
Method: 336 subjects from primary and secondary care (58% women) with physician- and spirometry-verified COPD-diagnosis were recruited. Median age was 70 years (range 49-85 years) and the COPD stages (according to FEV_1 (%predicted)), was stage 1: 7%, stage 2: 55% stage, stage 3: 28%, stage 4: 10%. Time to walk 30 meters at maximal velocity was recorded and the number of repetitions of 30- s chair-stand-test was counted. Acute visits due to respiratory problems and exacerbations during last year were assessed by questionnaire.
Results: A trend toward longer time to walk 30 meters was seen along with GOLD-class: 20.8 s in stage 1 vs 19.1 s in stage 2 vs 21.6 s in stage 3 vs 24.4 s in stage 4, $P < 0.001$. Similarly, less repetitions of sit-to-stand were found along GOLD-class: 11.4 vs 11.2 vs 10.0 vs 9.5, $P = 0.001$. The need of acute visits due to respiratory problems during last year related to both longer time to walk 30 meters (21.4 vs 19.8 s, $P = 0.02$) and fewer repetitions of sit-to-stand (10.5 vs 11.6, $P = 0.004$). Having had exacerbations last year was related with fewer repetitions of sit-to-stand: 10.5 vs 11.4, $P = 0.02$. Fewer repetitions of sit-to stand related to acute visits due to respiratory problems during last year ($P = 0.01$) after adjustments for lung function (FEV_1(%predicted)), gender, age and current smoking.
Conclusion: These preliminary data suggests that there is a relation between simple functional tests, such as 30- second chair-stand-test, and previous history of acute healthcare visits due to respiratory problems. Further studies should look at the prospective value of the test as well as its' additive value to lung function measurements.
Declaration of Interest: None
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CR015

What is the Association between Chronic Obstructive Pulmonary Disease (COPD) and Health-Related Quality of Life in Manchester in 2011?

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Aim: This study examines the association between COPD and health-related quality of life (HRQoL) in Manchester in 2011 using a generic health-related quality of life questionnaire. This study forms part of a larger primary care study, which covers 20 general practices in Greater Manchester. This number of practices will yield a large volume of responses; therefore, a smaller sub group of COPD and comparator patients from six practices were used for this abstract. It was evident in the literature that there was no recent information on this group of patients in the UK at the time of this study. Confounding variables such as age, socioeconomic status, demographics and co-morbidity in this sample are also discussed.
Method: This quantitative cross-sectional questionnaire comparator study collected data from six practices using the EQ-5D and EQ-5Dvas from a primary care patient population with COPD and co-morbidity. Patients were identified from the practice QOF registers, and a 5% randomly selected comparator group. HRQoL was measured and analysed alongside demographic information supplied by the patient.
Results: 88 patients with COPD and in the comparator group were selected from the total sample ($n = 1000$). Patients with COPD reported a lower 'health state' score compared to the comparator group. Patients with COPD were also more likely to smoke and did not complete further or higher education after the age of 16 years.
Conclusion: This study contributes to current literature, by supporting and validating previous arguments. COPD patients in Manchester had a lower health state compared to the comparator group, and responders with COPD were more likely to smoke and did not complete further education over 16 years of age. These results emphasize the importance of individual patient experience, their perceived health state and the need to continually improve disease management by applying HRQoL measurements. However, limitations of the study results include the small sample size and confounding variables such as age.
Declaration of Interest: None
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CR016

Inhalation technique assessment and inhaler device satisfaction in asthma patients

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Aim: Assess the inhalation technique, the inhaler device satisfaction and asthma control in a population sample of a Primary Care Unit.
Method: Observational and descriptive study conducted between January and May 2015, in a Portuguese Primary Care Unit, with adult patients diagnosed with asthma and with a prescription for an inhaler in the last year. All the individuals who refused to participate or whose contact was impossible were excluded, with a final sample of 34 patients. To determine asthma control, the CARAT 10 questionnaire was used; patient satisfaction was assessed through a brief questionnaire; inhalation technique was assessed through direct observation, using a standardized check-list.
Results: 53% ($n = 18$) of the sample were females, with a mean age of 50.19 years. 53% ($n = 18$) of the sample had their asthma controlled (CARAT > 24). Regarding satisfaction, 78% of the sample was very pleased with the inhaler. Almost a third (29%) performed inhalation incorrectly, and the most frequent mistake was "not to expire before inhalation".
Conclusion: Although the sample was very satisfied with the prescribed inhalers, it was found that only about a half had the disease controlled. Inhalation errors are also frequent, which might contribute to the poor control of the disease. Family Physicians – the gateway to the National Health System – must be attentive to asthma control, and should assess inhalation technique in consults frequently, in order to correct it and improve their patients' condition.
Declaration of Interest: None
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CR017

Early detection of COPD in general practice: patient or practice managed? A RCT of two strategies in different socio-economic environments

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Aim: To compare the effectiveness of two strategies for a population-based early-detection, taking into account different socioeconomic status (SES) settings.
Method: Practices were randomized on strategy and stratified on socio-economic setting. The Respiratory Health Screening Questionnaire (RHSQ) was distributed to all participants. In the practice-managed condition, the practice was responsible for the whole procedure. In the patient-managed condition patients were responsible for calculating their RHSQ risk score and applying for a spirometry test. Main outcome measure was the rate of COPD diagnoses after screening.
Results: In the practice-managed condition more new COPD patients were detected (36%) than in the patient-managed condition (18%). In low-SES practices more high-risk patients were found (16%) than in moderate-high SES practices (9%). Recalculated for a standard Dutch practice (2350 patients) the yield would be 8.9 new COPD diagnoses, which is a 20% increase of known cases.
Conclusion: The practice-managed variant of this screening procedure shows a substantial yield of new COPD diagnoses for both low-SES and moderate-high SES practices. *Acknowledgement.* This study was published in Prim Care Respir J 2013;22(3):331-7. http://dx.doi.org/10.4104/pcrj.2013.000700.
Declaration of Interest: None
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[CR017]

Table 1. Respiratory Health Screening Questionnaire (RHSQ) score card

Question	*Answer*	*Score*
1. What is your age?	*40-49*	0
Age Group, years	*50-59*	4
	60-69	8
2.a. How many cigarettes have you smoked per day?	*…….cigarettes*	
2.b. Are you smoking now?	Yes O	
	No O	
3.a. How many years have you smoked?	*…….years*	
Pack years I have smoked	*0-14*	0
	15-24	2
	25-49	3
	50+	7
4. What is your weight?	…… *kg*	
5. What is your length?	…… *mtr*	
Body Mass Index, kg/m2	*> 29.7*	0
	25.4–29.7	1
	< 25.4	5
6. Does the weather affect your cough?	*Yes*	3
	No	0
	Do not cough	0
7. Do you have phlegm without a cold?	*Yes*	3
	No	0
8. Do you have phlegm in the morning?	*Yes*	0
	No	3
9. Do you wheeze (frequency)	*Never*	0
	Sometimes or often	4
10. Have or had any allergies?	*Yes*	0
	No	3

CR018

A district-orientated view on COPD and its risk factors in the city of Nijmegen, linking general practice and community health services data

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Aim: To identify differences in incidence and prevalence of COPD between districts in the city of Nijmegen, and to identify associations between risk factors and COPD prevalence within these districts.
Method: In this retrospective observational cohort study all COPD patients aged 40+ who were registered in general practices in the city of Nijmegen in 2013 were included ($n = 2{,}994$). De-identified data about COPD diagnosis and treatment was supplied by GPs through extraction of their electronic patient journal systems. Data about risk/prognostic factors for COPD per district were supplied by the Community Health Services (GGD) Gelderland-Zuid from their annual health questionnaire survey. GGD data consisted of smoking habits, BMI, educational level and exercise level, aggregated and expressed as percentages per postal code area to represent the different districts. COPD incidence and prevalence figures were also calculated per postal code area. Correlation analysis was performed to compute associations between COPD prevalence and occurrence of risk factors on the district level.
Results: Overall COPD incidence was 3.74 (95%CI 3.28-4.26) patients/1000 person years, overall prevalence 47.2/1000 (95%CI 45.5-48.8). Incidence and prevalence increased with age. COPD incidence was higher among women, prevalence was higher among men. COPD prevalence per district ranged from 12.8/1000 (95%CI 8.6-18.9) to 73.3/1000 (95%CI 64.3-83.4). On the district level correlation analysis showed statistically significant associations between higher age, lower educational level and being overweight (BMI > 25) and the prevalence of COPD. Higher educational level was associated with a lower COPD prevalence on the district level.
Conclusion: Within the city of Nijmegen there are district-level differences in the prevalence of COPD and the occurrence of its risk factors. Our district-

orientated approach combining general practice and GGD data may be useful for directing district-specific prevention strategies, but this would require higher coverage of GGD health questionnaires per district.
Declaration of Interest: None
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CR019

Association between chronic comorbidity and exacerbation rate in primary care COPD patients. Preliminary analysis of real-life general practice data (PROSPECT1)

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Aim: COPD often coexists with other chronic conditions that may influence disease prognosis. Our aim was to study associations between a wide range of chronic comorbidities and the occurrence of exacerbations in a real-life cohort of primary care patients with COPD.
Method: Retrospective cohort study based on 2012-2013 electronic health records of general practices in the Netherlands. Patients with physician-diagnosed COPD were analysed for their comorbidities which were categorized according to International Classification of Primary Care (ICPC) codes. Chi square tests were used to univariately explore associations between comorbidities and occurrence of exacerbations, defined by prescriptions of oral corticosteroids.
Results: 16,427 patients with COPD from 178 practices were included. Mean age at study start was 67 years [SD 12], 47.1% were women. At baseline 89.1% of patients suffered from ≥1 comorbidities, while 23.1% had ≥5 comorbidities. Most prevalent comorbid conditions were hypertension (35.2%); coronary heart disease (19.2%); osteoarthritis (17.6%); diabetes (17.3%); peripheral vascular disease (14.3%). 32% of patients had ≥1 exacerbation and 5.7% ≥4 exacerbations during the 2 years study period. Patients with ≥1 comorbid conditions more often had ≥2 exacerbations per year compared to patients without comorbidity (5.9% vs 4.0%, $P = 0.001$). Patients with another chronic respiratory disease next to their COPD, ($n = 2{,}188$, 13.3%) more often had ≥2 exacerbation per year compared to patients without respiratory comorbidity (7.3% vs 5.4%, $P < 0.001$). Table 1 shows the results for other ICPC categories.
Conclusion: Chronic comorbidity is highly prevalent in COPD patients in general practice. Primary care patients with more comorbidities seem to experience more exacerbations.
Declaration of Interest: This study was funded by GlaxoSmithKline.
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[CR019]

Table 1. Prevalence of comorbidity in COPD patients by ICPC category and frequency of patients with ≥2 exacerbations per year

Comorbidity category	*Total COPD patients, n (%)*	*Patients with ≥2 exacerbations/year, n (%)*	P-*value**
Cardiovascular	9696 (59.0)	593 (6.1)	*0.006*
Musculoskeletal	4078 (24.8)	264 (6.5)	*0.014*
Mental Health	2635 (16.0)	188 (7.1)	*0.001*
Eye and Ear	3484 (13.3)	242 (6.9)	*< 0.001*
Urogenital (male and female)	2635 (9.5)	194 (7.4)	*< 0.001*
Respiratory (excl. pulmonary cancer)	2188 (13.3)	160 (7.3)	*< 0.001*
Skin	1561 (9.5)	87 (5.6)	0.867
Digestive	3150 (19.2)	215 (6.8)	*0.002*
Endocrine, metabolic and feeding	5483 (33.4)	305 (5.6)	0.596
Neurological	483 (2.9)	24 (5.0)	0.483
Blood (forming organs) and Lymphatics	128 (0.8)	10 (7.8)	0.300
Infectious	102 (15.4)	8 (7.8)	0.348
Non-pulmonary cancer	2528 (15.4)	140 (5.5)	0.706
Pulmonary cancer	389 (2.4)	37 (9.5)	*0.001*

* P-values displayed are calculated for the difference between the subgroup of patients with specific comorbidity versus those without comorbidity. We performed Chi-square tests for categorized variables. P-values < 0.05 were considered statistically significant.

CR020

Development of a validated algorithm for diagnosis of asthma in electronic medical records

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[1]University of Alberta, Canada, [2]Canadian Primary Care Sentinel Surveillance Network, Canada, [3]Alberta Health Services, Canada

Aim: The management of childhood asthma is hindered by difficulties in diagnosis. To perform research involving patients with asthma, as well as to perform clinical audits in the practice, it is essential to identify the true asthmatics in the practice. We aim to develop and validate an algorithm for detecting asthmatic children in family physicians' electronic medical records.
Method: Two physicians and a certified asthma educator identified data in patient charts that would suggest or confirm the diagnosis of asthma in a child (ages 1-17). These indicators were used by a research assistant to develop an algorithm that would identify asthmatic subjects. The algorithm was used to identify asthmatic children in a database from southern Alberta. Concurrently, two family physicians reviewed 1000 CPCSSN records and determined which subjects had asthma. A separate 100 records were initially reviewed by both physicians and inter-rater reliability was established. The list of subjects identified by the algorithm was then compared with the list identified by the experts as the gold standard. Sensitivity, specificity, and positive (ppv) and negative predictive values (npv) of the algorithm were determined.
Results: Inter-rater reliability between the experts was good (kappa 0.88). Examining the 1000 records, they agreed there was a category of subjects who could not be determined as definitely having, or not having, asthma. Some were very young (1-2 years old) and had very limited data in their record; others lacked an adequate number of indicators to make a diagnosis. The experts felt that a medication indicator should only be used if more than one medication is present, or is supported by an additional indicator. The original algorithm including medications as an independent indicator identified a prevalence of 23.6% (ages 1-17), 22.35% (ages 3-17) age group, and 19.01% (ages 6-17). This is a much higher prevalence than anticipated in Alberta. The algorithm was modified to meet the expert's suggestion, and prevalence was reduced to 16.11%, 15.59%, and 13.51%, respectively.
Conclusion: The sensitivity, specificity, and npv of the algorithm are strong, but the ppv and sensitivity in the older age group are only moderately strong. This algorithm could be used in family practice audit and research to identify children with asthma from electronic medical records.
Declaration of Interest: Supported in part by an unrestricted grant from AstraZeneca.
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[CR020]

Table 1. Results yielded by improved algorithm

Age range	*Sensitivity*	*Specificity*	*PPV*	*NPV*
1-17 years	93.00%	96.03%	79.64%	98.79%
3-17 years	92.30%	96.03%	79.51%	98.68%
6-17 years	81.11%	96.61%	80.00%	96.84%

CR021

Telehealthcare interventions in the management of obstructive sleep apnoea hypopnoea syndrome (OSAHS) - a systematic review

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Aim: Telehealthcare solutions potentially offer an option for reviewing people with Obstructive sleep apnoea hypoxia syndrome (OSAHS) using Continuous positive airway pressure (CPAP) therapy living remotely to their main sleep medicine centre. We aimed to identify and systematically review the evidence for the effectiveness of telehealthcare CPAP review verses face-to-face care in any healthcare setting.
Method: We systematically searched 11 electronic databases, scanned reference lists of included studies, (English language only), plus manual journal searches for clinical trials of telehealthcare for reviewing CPAP users. Two researchers selected, quality appraised and extracted data. Outcomes of interest were adherence to CPAP, subjective sleep, patient/clinician satisfaction, and cost effectiveness. We undertook a narrative analysis because of heterogeneity of outcomes.
Results: From 363 potentially relevant papers we identified 5 trials (total 224 patients) that met our inclusion criteria. The trials were small at moderate/high risk of bias; the largest randomised 114 patients. Adherence was measured as number of hours used/night ($n = 3$) or proportion using > 4 hours/night ($n = 2$). Telemonitoring (TM) improved adherence to CPAP compared to usual care (UC) in x/5 trials. There was no difference in the Epworth Sleepiness score ($n = 2$ trials). 4/5 trials reported similar levels of satisfaction with the clinical review. 2/2 trials reported significant cost reductions with TM compared to UC. 4/5 used teleconsultation and/or telephone consultation and telemonitoring and 1 used teleconsultation with monitoring of adherence at each virtual visit by a study nurse.
Conclusion: A telehealthcare model of clinical review in CPAP user's shows promise as a cost effective and acceptable model of care, which improved adherence to CPAP therapy, but not subjective sleepiness measured by the Epworth sleepiness scale. However the evidence is limited to 5 small, generally poor quality studies. Fully-powered, well designed studies are required to demonstrate clinical and cost effectiveness of using available technologies for people living remotely to access specialist sleep services.
Declaration of Interest: None
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CR022

What are the most common respiratory diseases encountered in clinical practice? Results of a pilot study in 737 Indian patients

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Aim: We have previously reported that respiratory diseases are the most common diseases for which a patient visits a doctor in India. A better understanding of the respiratory disease pattern and respiratory symptoms will help determine the appropriate health care management strategies and set up the necessary health care services. This pilot study was aimed to investigate the respiratory symptoms and the most common respiratory diseases for which a patient visits a doctor in India.
Method: A total of 1560 Pulmonologists, Internists and Paediatricians from our database were invited to participate in this 7- day study across India. The study questionnaire based on ICD-10 classification captured patients' demographics, smoking and biomass exposure history along with respiratory symptoms and disease diagnoses.10 doctors consented and completed the study and provided data of 737 patients of respiratory diseases. Simple descriptive analysis was performed.
Results: 63% patients (mean age 43.6 ± 18.5 yrs; M: 58.9%) presented to the doctors for chronic respiratory diseases (CRD). The most common CRDs were Chronic Obstructive Pulmonary Disease (COPD) (29.6%), Tuberculosis (TB) (23%), Asthma (22.5%) and Allergic Rhinitis (8.4%). Table 1 provides a specialty-wise prevalence of the top CRDs.

[CR022]

Table 1. Specialty-wise prevalence of Chronic Respiratory Diseases in India

	Pulmonologists	*Intensivists*	*Pediatricians*
Number of patients (N)	587 (79.7%)	125 (16.9%)	25 (3.4%)
Total number of CRD	384 (65%)	68 (54%)	14 (56%)
Asthma	21.4%	16.2%	85.7%
COPD	29.4%	36.8%	0%
TB	25.3%	14.7%	0%
Allergic rhinitis	6.3%	19.1%	14.3%
Others	17.7%	13.2%	0%

Conclusion: Chronic respiratory diseases namely COPD, Asthma, Tuberculosis and Allergic Rhinitis, are the most common reasons for a doctor visit by patients with Respiratory diseases.
Declaration of Interest: None
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CR023

Patient experiences of using a digital health intervention in COPD (EDGE): a qualitative study

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Aim: Digital health applications are increasingly seen as a way to bridge the gap between professional care and patient self-management. We aimed to explore patients' experiences of how they incorporated an internet-linked tablet computer based digital health intervention (EDGE) for COPD into their everyday lives using qualitative methods.
Method: The data presented here were part of a qualitative interview study nested within a randomised clinical trial (EDGE COPD). Interview participants were purposefully recruited from the trial sample and interviewed before receiving the intervention and after the 12 month follow up was completed. We used a modified grounded theory approach to collect and analyse data. We then compared findings to those of a recently published conceptual framework (1) assessing implementability of telehealth interventions to explore fit and identify any divergences.
Results: Twenty-five participants with moderate to very severe COPD took part in the interview study, of whom 23 (nine women) completed both the initial and follow up interview. Findings were broadly in agreement with the previously identified concepts of 'fit', 'visibility' and 'relationships'. However, existing co-morbidities created tension in terms of self-management priorities and thus the intervention was less of a 'fit' for these patients. In addition, for those patients who experienced relatively stable symptoms, the idea of 'visibility' was perceived as less beneficial compared to those with great variation in their monitoring data.
Conclusion: Patients living with co-morbidity or stable symptoms perceived the digital health intervention less beneficial and reported reduced engagement within their everyday lives. The conceptual framework we used proved useful in identifying how this intervention is incorporated in day-to-day life and self-management. We need to further explore areas where experiences do not fit established implementation frameworks to further develop our approaches and ensure digital health interventions can be implemented in the most effective way.
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Reference
(1) Vassilev I, Rowsell A, Pope C, *et al.* assessing the implementability of telehealth interventions for self-management support: a realist review. *Implementation Science* 2015; 10:59.

CR024

Self-management support using an Internet-linked tablet computer based intervention in chronic obstructive pulmonary disease (EDGE): randomised controlled trial

Andrew Farmer[1], Veronika Williams[1], Carmelo Velardo[1], Syed Ahmar Shah[1], Ly-Mee Yu[1], Heather Rutter[2], Louise Jones[1], Carl Heneghan[1], Jonathan Price[1], Maxine Hardinge[3], Lionel Tarassenko[1]

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Aim: We conducted a randomised controlled trial of an affordable Internet-linked tablet computer (EDGE) based digital health intervention for monitoring and self-management support in community based people with moderate to very severe chronic obstructive pulmonary disease (COPD). (1)
Method: Participants were recruited from respiratory outpatient clinics, pulmonary rehabilitation courses, and primary care and community clinics. Participants used the EDGE intervention daily to complete a symptom diary and record oxygen saturation and pulse with a Bluetooth linked pulse oximeter. We compared use of EDGE with usual care for twelve months. The primary outcome was the St. George's Respiratory Questionnaire for COPD (SGRQ-C). 166 patients were randomised (110 EDGE, 56 usual care). All patients were included in an intention to treat analysis.
Results: The estimated difference in SGRQ-C at twelve months (EDGE - usual care) was -1.7 with a 95% confidence interval of -6.6 to 3.2 ($P = 0.49$). The relative risk of hospital admission for EDGE was 0.83 (0.56 to 1.24, $P = 0.37$) compared to usual care. Generic health status (EQ-5D) between the groups differed significantly with better health status for the EDGE group (0.076, 95% CIs 0.008, 0.14, $P = 0.025$). The median number of visits by general practitioners for EDGE vs. usual care respectively were 4 vs. 5.5, ($P = 0.062$) and by practice nurses 1.5 vs. 2.5 ($P = 0.033$).
Conclusion: Although this clinical trial does not provide evidence for an effect from EDGE on COPD specific health status, there may be an overall benefit in generic health status. The findings confirm acceptability and feasibility previously found in pilot work (2,3). If an intervention with the effect sizes for reduced hospital admissions and primary care visits of the magnitude reported in this trial were implemented at scale it would make an important contribution to monitoring and self-management support for people with moderate to very severe COPD.
Trial registration number: ISRCTN40367841.
Declaration of Interest: None
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CR025

Are COPD outcomes different in patients who have also been diagnosed with asthma? A real-life UK cohort study

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Aim: To assess whether those also diagnosed with asthma within a UK primary care COPD cohort have different outcomes and demographic characteristics compared to those without.
Method: A retrospective observational study, using individual patient-anonymised routine data in the Hampshire Health Record Analysis Database containing linked primary and secondary care clinical data for around 1.4 million patients in Hampshire, UK. Clinical terms (Read codes) were used to identify a cohort with prevalent COPD as at 31/12/2010. Patients were categorised by smoking status, age, sex and body mass index (BMI) and by a range of comorbid conditions, including asthma. All-cause mortality, respiratory-cause unplanned hospital admissions and respiratory-cause Accident and Emergency department (A+E) attendances were the outcomes recorded over a 3-year period (2011-13). Logistic regression was used to estimate odds ratios (ORs) for each outcome, adjusting for potential confounders and testing for interactions between asthma and the main demographic variables.
Results: Of a total of 16479 COPD patients (53.7% men, mean age 70.1 years), 7858 (47.7%) also had a diagnosis of asthma at some time in the medical record. The presence of an asthma diagnosis had a statistically significant and positive association with hospital admission (OR 1.218, 95% CI:1.124-1.319, $P < 0.001$) and with A+E attendance (OR 1.227, CI:1.106-1.361, $P < 0.001$), but not with death (OR 0.924, CI:0.843-1.013, $P = 0.094$). After adjusting for age, gender, BMI, smoking status, area deprivation and comorbidities, these relationships were maintained (respectively ORs 1.208, 1.215, 1.013; $P < 0.001$, $P = 0.002$, $P = 0.520$).
Conclusion: Almost half of all patients diagnosed with COPD in a large primary care cohort also had a diagnosis of asthma made at some point. Those with an asthma diagnosis were over 20% more likely to be admitted to hospital or to attend A+E as an emergency, even when potential confounders were allowed for.
Declaration of Interest: None.
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CR026

Systematic overview of supported self-management for asthma: a healthcare service perspective

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Aim: Implementation of self-management as a routine component of proactive asthma care is a challenge for healthcare services. Our systematic overview synthesised evidence from systematic reviews of supported asthma self-management to inform policy makers and healthcare providers. Key questions were: Does supported self-management improve health outcomes? Which components, and which contextual factors influence effectiveness? Is it cost effective?
Method: We synthesised two parallel programmes of work; both followed Cochrane methodology. The Practical Systematic Review of Self-Management Support (PRISMS) searched for systematic reviews and randomised controlled trials (RCTs) since the last search date of included reviews. Reducing Care Utilisation through Self-management Interventions (RECURSIVE) completed a meta-analysis of RCTs reporting health economic outcomes. Existing searches were updated in March and September 2015 respectively.
Results: PRISMS included 25 systematic reviews and 14 RCTS; RECURSIVE included 26 RCTs. Supported self-management reduces hospitalisations (in 5/11 reviews), A&E attendances (in 7/9 reviews) and unscheduled consultations (in 6/8 reviews), and improves markers of control for people with asthma (in 5/9 reviews). Core components are patient education, provision of a personal asthma action plan and supported by regular review. Tailoring content and mode of delivery to cultural, clinical and demographic groups is crucial. Self-management interventions are associated with significant decreases in hospitalisation costs. Total healthcare costs are similar to usual care.
Conclusion: Supported self-management for asthma is a cost effective intervention that reduces unscheduled care, and improves asthma control. In order to implement optimal self-management, healthcare providers should take responsibility for providing the necessary skills training for professionals,

and ensuring that the healthcare system values and embeds self-management support.
Declaration of Interest: NIHR Health Service and Delivery Research. LD is supported by a Clinical Academic Fellowship from the Scottish Primary Care Research Network.
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CR027
Evaluation of indoor air pollution and prevalence of COPD among highlanders in Kyrgyzstan

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Aim: Evaluation the level of indoor air pollution and the frequency of COPD among highlanders in Kyrgyzstan.
Method: To determine the indoor air pollution we studied the level of respirable particles PM2.5 in the air in 37 houses on the Aksai high altitude plateau located 3200-3800 meters above sea level using special equipment TSI SidePak AM510 Personal Aerosol Monitor. To estimate respiratory function we performed spirometry with bronchodilation test (salbutamol 200mkg) and using NDD EasyOne TM Spirometer, which was approved by the ATS in terms of quality measurement and suitability for field use. Pre - and post bronchodilation FVC, FEV1, FEV1 / FVC □70% was evaluated. COPD was defined according to the GOLD criteria.
Results: All mountaineers use of biomass for cooking and heating in all the 37 houses that we have investigated. We found high levels of indoor air pollution in houses of highlanders, and it was confirmed by the high values of respirable particles PM2.5 in the air in these houses. Thus, the maximum value of the respirable particles PM2.5 (Maxmg /m3) was 7.03 ± 1,146. The average value PM2.5 (Avgmg/m 3) - 0,289 ± 0,066, and TWA (8hr) was 0,169 ± 0,037. Importantly, that we also found higher values of carbon monoxide (COppm)- 1.5 ± 0,411. We found a strong association of indoor air pollution with a frequency of COPD, in this way COPD I detected in 9.7% ($n = 6$), COPD II in 8% ($n = 5$) patients.
Conclusion: The results demonstrate that in the houses of the inhabitants of the highlands of Kyrgyzstan has a high level of indoor air pollution and it can be cause of high prevalence of COPD.
Declaration of Interest: None
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CR028
Once-daily tiotropium add-on to at least ICS improves control and reduces exacerbation risk in symptomatic asthma, independent of serum IgE or blood eosinophils

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Aim: Once-daily tiotropium (via the Respimat soft-mist device) add-on to ICS ± other maintenance therapies improves asthma symptom control and reduces risk of severe exacerbations and asthma worsening in adults with symptomatic asthma, independent of serum IgE or blood eosinophil cut-offs in conventional subgroup analyses. We assessed asthma control and exacerbation risk across a continuous range of IgE and eosinophil values following tiotropium add-on therapy.
Method: Four Phase III double-blind, placebo-controlled, parallel-group trials: PrimoTinA (two 48-week trials; NCT00776984/NCT00772538; $n = 912$), once-daily tiotropium 5 µg or placebo (via Respimat) add-on to ICS (≥800 µg budesonide or equivalent)+LABA; MezzoTinA (two 24-week trials; NCT01172808/NCT01172821; $n = 2100$), once-daily tiotropium 5 µg or 2.5 µg (via Respimat), twice-daily salmeterol 50 µg (via HFA-MDI) or placebo (double-dummy protocol) add-on to ICS (400-800 µg budesonide or equivalent). Patients had symptomatic asthma requiring at least ICS for ≥ 4 weeks before screening; COPD was excluded. *Post hoc* logistic regression modelling analyses of ACQ-7 responder rate and *post hoc* Cox regression modelling of severe exacerbations and asthma worsening were performed across continuous ranges of IgE (2-2000 µg/L) and eosinophils ($0.05\text{-}2.00 \times 10^9$/L) following tiotropium or salmeterol (MezzoTinA only) therapy.
Results: Tiotropium consistently improved ACQ-7 responder rate versus placebo across IgE and eosinophil ranges (odds ratio [OR] > 1). Salmeterol improved ACQ-7 responder rate versus placebo across IgE levels (OR > 1), and with eosinophils, as levels increased, ACQ-7 responder rate OR decreased (9/L). Generally, both tiotropium and salmeterol reduced the risk of severe exacerbations and asthma worsening at all levels of IgE and eosinophils versus placebo (hazard ratio < 1).
Conclusion: Once-daily tiotropium add-on to ICS ± other maintenance therapies improved asthma symptom control and reduced exacerbation risk in patients with moderate or severe symptomatic asthma, across IgE and eosinophil ranges.
Declaration of Interest: Trial funded by Boehringer Ingelheim. Editorial assistance provided by Complete HealthVizion.
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CR029
Nurse led asthma/COPD clinics at primary health care centres are not associated with better knowledge in COPD among the general practitioners

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Aim: To study the association between nurse-led asthma/COPD clinics (ACCs) and knowledge in COPD among general practitioners (GPs).
Method: GPs working at primary health care centres (PHCC) with either no ACC ($n = 7$), an insufficient ACC ($n = 7$) or an approved ACC ($n = 9$), according to the Swedish guidelines for ACCs, replied to 13 written questions based on patient cases. Knowledge according to current COPD guidelines and practical management of COPD in primary care were assessed using multiple choice and free text replies (scoring 0-2 points/question, total score 26 points.) PCP's gender, age and years in profession were assessed. Non-parametric tests were used.
Results: Overall, 178 GPs replied (93% response rate). The mean age was 46 years (SD = 10.2, range 27-69). The mean total score was 8.44 points (SD = 3.47), the median was 8.5 points of 26. There was no significant difference in the total score, or in any specific item, between the three different types of PHCCs. The item yielding overall best result was 'Management of smoking cessation', followed by 'Detection of clinically suspected COPD'. Poorly managed items were 'Spirometry interpretation', 'Management of exacerbations', 'Management of stable COPD', 'Inter-professional co-operation' and 'Management of multi-morbidity'. There was no significant difference in scores between genders. There was a weak, yet significant, correlation between younger GPs and a higher total score (r = -0.30, $P < 0.0001$). There was no correlation between scores and years in profession.
Conclusion: Although PHCCs with nurse-led asthma/COPD clinics are generally known to provide a better COPD care than those without, GPs at ACCs do not show better knowledge in COPD than their colleagues.
Declaration of Interest: HS: received an unrestricted research grant (AstraZeneca), honoraria for educational activities (AstraZeneca / Boehringer Ingelheim / Novartis). BS: received honoraria for educational activities / lectures / advisory boards (AstraZeneca / Boehringer Ingelheim / GlaxoSmithKline / Novartis /

MEDA / TEVA). AN: honoraria for educational activities (AstraZeneca). IK and SM: no conflicts of interest.
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CR030
Rapid assessment of the demand and supply of tobacco dependence pharmacotherapy in Uganda

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Aim: 1. Among inpatients with a tobacco attributable disease (TAD) at a tertiary hospital in Uganda, we aimed to determine the prevalence of current smoking and the willingness of smokers to quit and pay for tobacco dependency pharmacotherapy (TDP) 2. To explore the supply of TDP drugs through a survey of pharmacies licensed to import medicines and whether costs is a barrier to their use.
Method: Two elements - demand for and supply of treatment. Demand for treatment was measured in patients admitted in Mulago Hospital with TAD by medical officers using a questionnaire on smoking (status, duration and products smoked) and willingness to quit and pay for TDP. The availability of TDP in pharmacies was assessed in terms of the types of TDP and their cost.
Results: We interviewed 56 patients (71% male; mean age was 57.5 years (SD 16.4). 23 patients (41%) were hospitalized with COPD, 8 for stroke (14%), 8 (14%) for cardiovascular disease, 7 (13%) for asthma, 7 (13%) for diabetes and 3(5%) for lung cancer. Thirty five of the 56 patients (63%) interviewed were current smokers, 24 current smokers (77%) desired to quit and 10 (37%) were willing and able to pay for the drugs. Of the 38 pharmacies surveyed, one was public and one was private not for profit and 36 were private. Only seven (18%) pharmacies had at least one NRT (gum, lozenge or spray), 3 (7.8%) had bupropion and one (2.6%) had nortriptyline. The mean cost for a monthly dose of an NRT was 15.7 US dollars (USD) while that for bupropion was 17.1 USD.
Conclusion: There is a high willingness to quit amongst current smokers with TADs, a third were willing to pay for TDP, despite relatively high costs for a low income country. However availability of TDP was extremely restricted. Efforts are needed to improve access to TDPs both in terms of the range of products available in pharmacies and reducing their costs. Effective, inexpensive products such as cytisine could have a major place in preventing and improving symptoms in TADs in Uganda.
Declaration of Interest: None
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[CR030]

Table 1. Availability and cost of tobacco dependence drugs in the surveyed pharmacies

Name of drugs	*Number of pharmacies with drug in stock, n (%)*	*Average monthly cost of the drugs UGX (USD)*
Any nicotine replacement product	7 (18)	55,000(15.7)
Bupropion	3 (7.9)	60,000 (17.1)
Varenicline	0	—
Cytisine	0	—
Nortriptyline	1(2.6)	—

CR031
Defining and testing recommendations for COPD care to improve value

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Aim: COPD is estimated to affect up to 10% of the European population and presents a significant burden for patients and health care systems [1]. Yet standard measures to halt its development and to deliver high value care for patients are not widely shared or implemented. To review available COPD guidelines, frameworks and emerging measures to identify recommendations for care and test their acceptability with patients and healthcare professionals (HCPs). [1] European Lung White Book (ERS), Chronic Obstructive Pulmonary Disease, Key Points, 2012.
Method: In August 2014 we undertook a literature review of national and regional COPD guidelines, research studies and programme evaluations, generated recommendations and then commissioned YouGov to test their acceptability in 5 countries using a quantitative online survey.
Results: We identified 44 COPD guidelines, strategies and studies from which we generated 12 recommendations for high value care: 1. Help smokers quit using evidence-based treatment; 2. Control occupational exposure to dusts, chemicals and smoke; 3. Perform earlier targeted COPD diagnosis; 4. Confirm COPD diagnoses with spirometry; 5. Promote whole system implementation; 6. Develop co-ordinated multidisciplinary approaches; 7. Provide necessary COPD training and support; 8. Acknowledge central role of patient and carer and educate them; 9. Agree a personalised management plan with every person with COPD; 10. Vaccinate staff and patients against 'flu, provide pulmonary rehabilitation and oxygen services to those who will benefit; 11. Treat the whole person addressing comorbidities including mental health 12. Encourage responsible prescribing to optimise value. 1020 people were surveyed. All recommendations had over 80% of respondents' support; agreement was slightly higher in patients than HCPs. Agreement was highest in Poland; lowest in France and Germany. Reasons for disagreeing most often relate to cost, and beliefs that overall standards cannot address individual needs.
Conclusion: We offer 12 recommendations that give policymakers, patients, payors and providers the basis for high value services to reduce the COPD burden.
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[CR031]

Table 1. Summary of negative comments on recommendations and questions from the survey on 12 recommendations of standards of care for COPD. Survey and analysis performed by YouGov in March/April 2015 for the European COPD Coalition (ECC).

Cost/resources/not cost effective	15%
Need to examine each individual case/different patients have different needs	10%
All patients should have spirometry tests/gold standard diagnostics should always be used	9%
People who smoke do so of their own free will/shate should not pay for this	6%
Patient has to be motivated/have to want to help themselves/will power	6%
Should already be occuring/already available at pharmacies/GPs	6%
Not effective/helpful	6%
Patients with COPD are almost always active smokers/smoking is the key issue	4%
Too complicated/not meaningful	4%
Wrong focus/way of addressing it	3%
Unnecessary	3%

Base: all: 1,020: patients: 515/HCPs: 505- Countries surveyed: UK, France, Germany, Spain, Poland.
Rec.: recommendations; HCPs: healthcare professionals; GPs: general practioner. Data on file. Overall, disagreement was most likely to relate to cost and the view that patients have different needs which cannot be accommodated by general standards.

CR032
A systematic review of the explanatory factors enhancing the adoption of asthma self-management behaviour in the South Asian and black population

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Aim: UK born South Asians suffer poorer asthma outcomes and have a higher emergency hospital admissions rate than the majority White population.

[CR031]

Table 2. Overall findings of survey on 12 recommendations of standards of care for COPD Survey and analysis performed by YouGov in March/April 2015 for the European COPD Coalition (ECC)

	Overall support (in %)	*HCPs (in %)*	*Patients (in %)*	*Country with highest approval rate*
12 recommendations	> 80 Higher in patients than HCPs			Poland
Rec.1: All patients who smoke should be helped to quit using evidence-based interventions	87	85	90	UK
Rec. 2: Control occupational exposure to dusts and chemicals and second hand smoke	92	92	91	Germany
Rec. 3 Encouraging earlier diagnosis of COPD by implementing targeted screening, including early detection of Alpha1	85	81	89	Poland
Rec. 4: Ensuring that COPD diagnoses are confirmed with a spirometry test, where spirometry is available	89	90	89	Poland
Rec. 5: Promoting effective implementation of the national guidelines at all level of care	89	88	90	
Rec. 6 Developing COPD programmes and plans for the prevention and care of COPD	88	87	89	Poland
Rec. 7: Ensuring that HCPs have the necessary training, skills and support to deliver quality care and good health outcomes	94	94	95	Poland
Rec. 8: Recognising the central role the patient and his/her carer in the management and treatment of COPD	92	91	93	Poland/UK
Rec. 9 Developing a personalised care management plan with all people with COPD	91	89	93	Poland
Rec.10 Rehabilitation and oxygen services should be made available to all those who would benefit	92	90	94	Poland
Rec. 11 Recognising the complex nature of COPD care by treating patients with COPD as "whole person" including their mental health	90	87	93	Poland
Rec. 12 Encouraging responsible prescribing to optimise the use of medicines, improve health outcomes, and reduce waste	89	88	89	Poland

Base: all: 1,020: patients: 515/HCPs: 505- Countries surveyed: UK, France, Germany, Spain, Poland. Rec.: recommendations; HCPs: healthcare professionals. Data on file.

Possible reasons for these ethnic differences may be that self-management strategies either have been insufficient for their needs or have not been implemented in the first place [1]. This review aims to identify key barriers and facilitators to implementing self-management in ethnic groups and define the essential components of culturally tailored asthma interventions.
Method: We systematically searched eight electronic databases, research registers, manually searched journals and reference lists of identified systematic reviews for randomised control trials of asthma self-management in South Asian and Black populations. We extracted data on study characteristics, theoretical domains framework, barriers and facilitators, key components of interventions and outcome measures including process measures (e.g. self-efficacy), asthma control measures (e.g. health service use) and objective/validated behavioural measures (e.g. adherence).
Results: 17 studies (8 South Asian, 9 African-American) were included in the final analysis and a narrative synthesis was conducted. Only one intervention was found to be culturally tailored [2], compared to 16 culturally modified interventions. Further, there were various ethnic and minority-specific barriers and facilitators identified. Early narrative analysis of South Asian trials suggest significant impact on several self-management outcomes (e.g. knowledge) and mixed findings for other outcomes (e.g. unscheduled care).
Conclusion: There is a lack of evidence around culturally tailored interventions (as opposed to modified interventions). Early analysis suggests variable benefit on self-management outcomes. Further analysis will identify those associated with effective outcomes for qualitative exploration.
Declaration of Interest: This research project is funded by Asthma UK Centre for Applied Research.
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[2] Poureslami, I., *et al.* Effectiveness of educational interventions on asthma self-management in Punjabi and Chinese asthma patients: a randomized controlled trial. *Journal of Asthma* 49.5 (2012): 542-551.

CR033

The use of mobile technology to support self-management for people with asthma: a systematic review

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Aim: We aimed to systematically review randomised controlled trials (RCTs) of technology-supported self-management in adults/teenagers with asthma to assess clinical effectiveness, and identify features associated with improved adoption of, and adherence to the technology.
Method: We systematically searched nine databases, scanned reference lists, and undertook manual searches. We assessed all eligible papers for quality, and synthesised data on health outcomes (e.g. asthma control questionnaire and/or exacerbation rate), process or intermediate outcomes (e.g. adherence with monitoring or treatment, self-efficacy), level of adoption of and adherence to the intervention.
Results: We included 11 RCTs (published January 2000 –January 2015). The effect on health outcomes varied, but there were no examples of harm. No interventions explicitly reported the adoption of and adherence to the technology system by patients and healthcare professionals. Interventions included 10 common features, which we grouped into seven categories (education, monitoring and electronic diary, action plans, reminders or prompts to promote medication adherence, professional support for patients, raising patient awareness of asthma control, and supporting the healthcare professional) which had variable impact on process and health outcomes. Mobile technology, including an electronic diary and action plan, and incorporating education and professional support improved asthma control.
Conclusion: Mobile technology has the potential to support asthma self-management, but further studies evaluating the features associated with improved adoption of and adherence to mobile technology are needed.
Declaration of Interest: None
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[CR033]

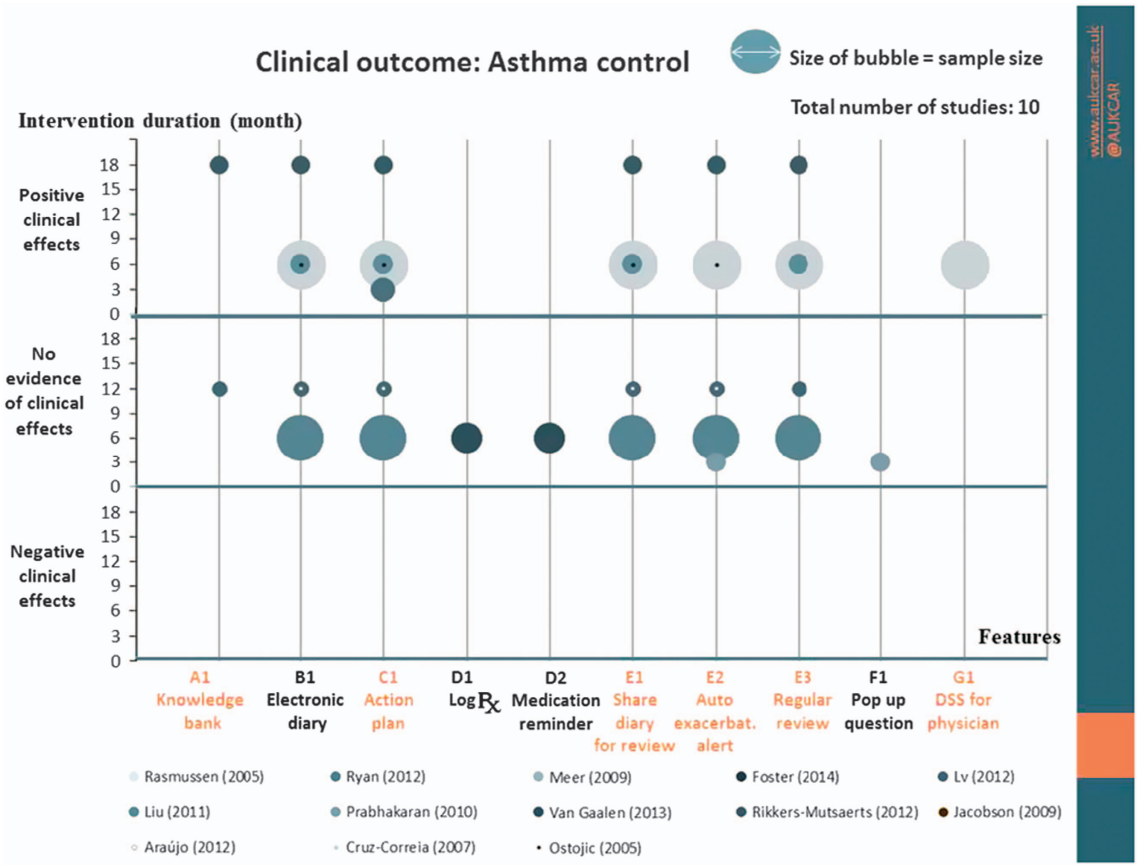

Figure 1. Clinical outcome: Asthma control.

CR034

Primary care of the patient with chronic obstructive pulmonary disease in rural province, Vietnam

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Aim: The aim of this survey was to investigate guideline-compliant COPD management among primary care physicians (PCPs) in rural province.
Method: One hundred PCPs from 11 district-level sub divisions in Tien Giang province (8 districts, 2 district-level town and 1 provincial town) involved in survey by using the set of multiple-choice questionnaire that focused on the key aspects international COPD guidelines (GOLD 2015).
Results: Several important disparity from the guidelines were remarked. In rural area, no PCPs performed spirometry themselves and about 10% of the COPD diagnosis confirmation by using spirometry. For treatment of new COPD patients, most of PCPs prescribed inhaled short-acting ß2-agonists (SABA) (41%), followed by oral SABA (37%) and oral corticosteroids (31%), further by inhaled corticosteroids (ICS) (25%) and ICS/LABA or the combination of a SABA and a short acting anticholinergic (22%). 32% PCPs indicated ICS to all COPD patients and only 16% of them used ICS with correct indication guided by GOLD. In acute exacerbation, systemic steroids were used by 38% PCPs, followed closely by theophyline (37%) and increased dose of bronchodilatators (34%), only 12% PCPs prescribed antibiotics during exacerbation. In smoking cessation, 68% PCPs offered a structured programme to all COPD patients and 49% of them using brief and single advice to educate.
Conclusion: The survey showed a large discrepancy between practice and GOLD COPD guidelines in rural area. COPD diagnosed by spirometry was still low in PCPs' practical sites. Guideline compliant COPD among PCPs in our sample was still low than our expectation also the same picture with given structure program of cessation smoking and the consultation for COPD. These specific deviations from the guidelines will be addressed in a second phase implementation project.
Declaration of Interest: None
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CR035

PLEASANT: Preventing and Lessening Exacerbations of Asthma in School-age children Associated with a New Term – A Cluster Randomised Controlled Trial

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Aim: Asthma episodes and deaths are known to be seasonal. A number of reports have shown peaks in asthma episodes in school-aged children associated with the return to school following the summer vacation. A drop in prescription collection in August has been observed which is associated with an increase in the number of unscheduled medical contacts after the return to school in September. The aim of the study was to assess if an NHS delivered public health intervention reduced the number of unscheduled medical contacts after the school return in September.
Method: Cluster randomised trial with health economic analysis. Setting: Primary care. Participants: School aged children aged 5-16 with asthma

Interventions: A letter sent, from the GP to parents/carers of school-aged children with asthma, prior to the start of school summer holidays, reminding them of the importance of taking their medication and to ensure they have sufficient medication prior to the start of the new school year (September). The control group received usual care. The primary outcome was proportion of children aged 5-16 who had an unscheduled contact in September 2013 after the return to school. Supporting endpoints include the proportion of children who collected prescriptions in August 2013 and unscheduled contacts through the following 12 months.
Results: In terms of unscheduled contacts in September there is no evidence of effect. Among children aged 5-16 the odds-ratio was 1.11 (95% CI 0.97 to 1.27) against the intervention. The intervention did increase the proportion of children collecting a prescription in August (odds-ratio 1.46; 95% CI 1.29 to 1.66) as well as scheduled contacts in the same month. For the wider time intervals (Sep-Dec 2013 and Sep-Aug 2014) there is weak evidence of the intervention reducing contacts. The economic analysis estimated a high probability that the intervention was cost saving. There was no increase in quality-adjusted life-years.
Conclusion: The intervention did not reduce unscheduled care in September although it succeeded in increasing the proportion of children collecting prescriptions as well as increasing scheduled contacts in August. After September there is weak evidence in favour of the intervention. The intervention had a favourable impact on costs but did not demonstrate any impact on quality-adjusted life-years. The intervention could be implemented by GPs who wish to increase scheduled care or NHS clinical commissioning groups in areas with high rates of asthma.
Declaration of Interest: *None*. NCT Number: ISRCTN03000938
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CR036
Validation of the ´Control of allergic rhinitis and asthma test´ (CARAT) 1-week version and app

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Aim: Asthma and allergic rhinitis often occur together. The CARAT was designed to assess asthma and rhinitis control, covering a 4 week period, using paper-and-pencil. This study aims at validating both the 1-week version (1wCARAT) and the digital CARATapp.
Method: Once a week for 4 weeks the 1wkCARAT and 1wkCARATapp were completed by asthma patients. At baseline also the Asthma Control Questionnaire (ACQ), Visual Analog Scale (VAS), Global Initiative for Asthma (GINA) assessment and the Allergic Rhinitis And Its Impact On Asthma (ARIA) assessment were completed. At final visit the 4wkCARAT and app-satisfaction questionnaire were completed. Internal consistency was analysed using Cronbach's alfa, test-retest reliability of 1wkCARAT and CARATapp using Spearmans correlation, relation between 4wkCARAT and 1wkCARAT (mean of 4 measurements) via Wilcoxon-Signed-Rank. The construct validity (using ACQ, VAS, ARIA, GINA and ARIA) was calculated using spearman correlation and students *T*-test. App satisfaction is represented in percentages.
Results: Data from 109 asthma patients (39,4% men, mean 53 yrs, median packyears 11, median FEV_1 93,95%pred) showed no significant differences between 1wkCARAT and 4wkCARAT ($P = 0{,}232$). 1wkCARAT featured Cronbach's alpha >0,787 for all (sub) scales. Correlations between 1-week-1wCARAT and ACQ/VAS/GINA were significant (all $P < 0.014$, see table 1 for correlation coefficients), as was the difference in CARAT-rhinitis score between ARIA mild vs medium/severe rhinitis ($P = 0{,}011$). Test-retest reliability using spearman correlation between the different measuring moments were all significant (all $P < 0.001$; $r \geq 0.724 \leq 0.906$) for 1wkCARAT and CARATapp. No significant differences in score were found between 1wkCARAT and CARATapp. 84.4% of patients found the app (very) easy to use. 41.3% prefers the app and 4.6% paper.
Conclusion: This final analysis indicates 1wkCARAT is valid and reliable, both as paper and app version.
Declaration of Interest: CdJ, BFdB, JdK, EvH, IT, JF and TvdM report no conflicts of interest. The study was funded by unrestricted grant by AstraZeneca.
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CR037
Comorbidities in patients with pneumococcal pneumonia

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Aim: Pneumonia is a serious health problem among adults. It is more common in patients with certain comorbidities and it will be more severe and worst evolving processes. This disease causes 1.6 million deaths annually. It has an incidence of 14 cases per 1,000 people per year requiring hospitalization for 75% of cases. Currently we have tools to avoid these cases, the use of vaccines. There are two types; VNP23 polysaccharide vaccine (without generating immune memory); PCV13 more potent immune response. The aim of our study is to determine the association between comorbilities with the incidence of pneumococcal pneumonia and disease progression. Also, see the immunization status of each patient as directed by the consensus on the anti-pneumococcal vaccination in adults with underlying disease of 2013 and see if it meets the general population.
Method: The study was realized from January 2016 to April 2016 from data obtained during the year 2015 (January to December). The study includes all patients admitted to the Hospital Dr. Peset diagnosed with pneumococcal pneumonia by Orion computer system during 2015. Using the patient's information of the health center informatic system (Abucasis) we can have their information about comorbilities and vaccine's schedule.
Results: In previous studies it has been shown that comorbilities more related to pneumococcal pneumonia are immunocompromised, kidney disease, liver disease, respiratory disease, chronic cardiovascular disease, autoimmune, diabetes, HIV, transplanted solid organ and / or hematopoietic progenitors in waiting for solid organ transplant, receiving chemotherapy, corticoids, immune-suppressants, biological, anatomical or functional asplenia. In our study we analyzed the possible relation between vaccination with

[CR036]

Table 1. CARRAT App abstract

		VAS			*ACQ*	*GINA*
		General airway complaints	*Nasal complaints*	*Bronchial/pulmonary complaints*		
CARAT	Correlation	**−0,625**	−0,482	−0,574	−0,657	−0,554
	(*P*-value)	0,000	0,000	0,000	0,000	0,000
CARAT, subscale rhinitis	Correlation	−0,354	**−0,569**	−0,234	−0,318	−0,144
	(*P*-value)	0,000	0,000	0,014	0,001	0,007
CARAT, subscale asthma	Correlation	−0,661	−0,259	**−0,695**	**−0,705**	**−0,670**
	(*P*-value)	0,000	0,007	0,000	0,000	0,000

comorbilities and the prevalence of developing pneumococcal pneumonia and severity of income. About vaccines we consider it especially for patients vaccinated against influenza and Pneumococcal VNP23 and PCV13.
Conclusion: Currently this study is being analyzing the data collected. Unable to get results that we hope to present at the conference.
Declaration of Interest: None
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CR038

An internet-delivered handwashing intervention to modify respiratory infection transmission (PRIMIT): sub-group analysis among COPD patients

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Aim: An internet-delivered handwashing intervention reduced episodes of respiratory tract infection (RTI) by 25% among healthy adults in winter. Common respiratory infections are the main cause of exacerbations among COPD patients. The aim of this analysis was to evaluate the potential effectiveness of the intervention among a sub-group of patients with diagnosed COPD.
Method: 20,666 adults identified from 344 primary care practices were individually randomised to receive either access or no access to a customised tailored web-based intervention to encourage increased handwashing behaviour in the winter and followed-up for 16 weeks. The primary outcome was the number of participants reporting one or more episodes of RTI (using standard consensus definitions) at 16 weeks. Secondary outcomes included number of episodes, number of days with symptoms, severity of symptoms, and from patient records in a sub-group, health service utilisation. For this analysis, a sub-group of COPD patients was identified from GP records and multiple logistic (converted to RR) or negative binomial regression was used as appropriate, adjusting for sex, age > 65 years, ongoing health problem, skin condition, presence of children.
Results: Among 355 registered COPD patients, 187 received the intervention and 169 were controls. Based on completed questionnaires at 16 weeks ($n = 297$), 92 (57.5%) and 89 (65%) respectively reported one or more RTIs in the last 4 months (RR 0.88 (95%CI 0.74, 1.05)). There was a statistically significant reduction in the number of RTIs (IRR 0.72 (0.55, 0.95)) and number of days with moderate/bad symptoms (IRR 0.70 (0.51, 0.96)). There was also a possible reduction in antibiotic use (RR 0.79 (0.54, 1.15)) and exacerbations over 12 months (IRR 0.91 (0.54, 1.53)) although the results were not statistically significant.
Conclusion: In a sub-group of COPD patients within the PRIMIT trial, the reduction in RTIs with an internet-delivered handwashing intervention was comparable to or greater than observed among healthy adults. Despite small numbers and post-hoc non-randomised analyses, there is potential to reduce exacerbations among COPD patients and further trials among this group are warranted.
Declaration of Interest: The PRIMIT study was funded by the Medical Research Council (09/800/22). There are no competing interests. ISRCTN75058295
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CR039

Valved holding chambers (VHCs): Can drug residue promote microbial growth?

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Aim: We have reported on survival of *Klebsiella pneumoniae* on plastic VHC-body samples (Thorax 2014;69,Suppl2:A114). The data indicated a potential value of an antimicrobial additive. We have now examined the effect of inhaled drugs on bacterial growth to better understand drug-related VHC hygiene.
Method: Drugs (salbutamol sulphate, formoterol fumarate, beclometasone dipropionate, fluticasone furoate, ciclesonide, budesonide) were dissolved in methanol, ethanol or acetone at a concentration indicative of 2 weeks' VHC drug residue. Growth kinetics of three pathogenic respiratory microbes, *Streptococcus pneumoniae* (ATCC33400), *K. pneumoniae* (ATCC15380), or *Haemophilus influenzae* (ATCC19418) in two minimal media (M9 minimal salts, R2A agar) and Tryptone Soya Broth growth medium (TSB) with different solvent concentrations were measured using the automated Bioscreen-C Analyzer. Controls were growth media with/without solvent supplementation. Drug in solvent effect on bacterial growth was measured over 48 h by bacterial plate count.
Results: Solvent concentration chosen (3%) did not interfere with bacterial growth. The bacteria tested behaved differently (Table). All drugs except ciclesonide appeared to promote *K.pneumoniae* growth (TSB data), and appeared not to be used as a nutrient source for *S.pneumoniae* and *H.influenzae*, particularly at 24 h, less so at 48 h (M9, R2A data).
Conclusion: Our data show interesting drug-specific bacterial effects and suggest that generally drugs do not retard the growth of Gram-negative *K.pneumoniae*. The presence of VHC-resident bacteria *in vivo* is common and known (Cohen & Cohen, JAMA 2003;290:195-196). Our work suggests that if water soluble drugs (for example salbutamol) form a biofilm in the humid VHC environment bacterial growth may ensue. We do not yet know, however, if microbes aerosolize through the one-way valve and within the chamber, or the effectiveness of antimicrobial plastics in this clinical scenario. Answers to these questions may inform manufacturer and Guideline-recommended wash/dry cycles, and therefore the relative importance of static-related performance effects versus VHC hygiene.
Declaration of Interest: Clement Clarke International Ltd. sponsored this research, and wishes to recognize the work of the Cardiff School of Pharmacy and Pharmaceutical Sciences, UK.
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[CR039]

Table 1. Log_{10} bacterial growth data after 24 and 48 hours incubation with drug and 3% solvent

24 HOURS		*K. pneumoniae*			*S. pneumoniae*			*H. Influenzae*		
Drug	**Conc [mg]**	**TSB**	**M9**	**R2A**	**TSB**	**M9**	**R2A**	**TSB**	**M9**	**R2A**
Control	—	1.92	0.82	0.82	4.81	0.00	4.26	3.77	0.00	3.93
salbutamol	8	1.98	1.58	1.54	3.93	0.00	0.00	1.41	0.00	0.00
formoterol	0.2	2.09	0.99	1.58	3.69	0.00	3.32	2.46	0.00	2.77
	2	1.71	0.99	3.80	3.22	0.00	3.26	2.34	0.00	2.54
fluticasone	2	2.08	0.99	1.65	3.14	0.00	3.58	2.55	0.00	0.00
ciclesonide	1	2.07	0.68	0.86	3.15	0.00	3.24	2.42	0.00	2.33
budesonide	1	2.08	0.99	1.86	3.21	0.00	3.32	1.43	0.00	2.69
48 HOURS										
Control	—	2.01	0.51	1.29	3.77	0.00	3.13	3.22	0.00	3.91
salbutamol	8	2.31	1.66	1.88	3.75	0.00	0.00	3.52	0.00	0.00
formoterol	0.2	2.30	0.81	1.84	3.79	0.00	3.30	3.07	0.00	3.77
beclometasone	2	2.36	1.36	2.26	3.56	0.00	3.30	3.31	0.00	3.63
fluticasone	2	2.45	0.71	1.89	3.75	0.00	3.19	3.52	0.00	3.11
ciclesonide	1	2.73	0.20	1.62	3.77	0.00	4.07	3.10	0.00	3.27
budesonide	1	2.39	0.77	1.95	3.82	0.00	3.16	2.88	0.00	3.29

Data in solid black lines and in shaded cells represent > 0.5 Log_{10} increase and decrease, respectively, relative to medium-only Control.

CR040
TIOtropium Safety and Performance In Respimat® (TIOSPIR®): Safety and efficacy in patients naïve to treatment with anticholinergics

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Aim: TIOSPIR® showed similar safety and exacerbation efficacy profiles for tiotropium Respimat® and HandiHaler® in patients with chronic obstructive pulmonary disease (COPD). We present the results for patients naïve to anticholinergic treatment at baseline.
Method: TIOSPIR® ($N = 17,135$), a 2-3-year, randomized, double-blind, parallel-group, event-driven trial, compared safety and efficacy of once-daily tiotropium Respimat® 5 and 2.5 µg with HandiHaler® 18 µg in patients with COPD. Primary endpoints were time to death (noninferiority of Respimat® 5 or 2.5 µg versus HandiHaler®) and time to first COPD exacerbation (superiority of Respimat® 5 µg versus HandiHaler®); safety was assessed.
Results: Overall, 6966 anticholinergic-naive patients from TIOSPIR® were randomized ($n = 2345$, $n = 2312$ and $n = 2309$ for tiotropium Respimat® 2.5, 5 µg and HandiHaler® 18 µg, respectively). There was similar risk of death (vital status follow up) (time to death) for the Respimat® groups versus HandiHaler® (Respimat® 5 µg: hazard ratio [HR], 0.93; 95% confidence interval [CI], 0.75-1.17; Respimat® 2.5 µg: HR, 1.05; 95% CI, 0.84-1.30) with similar results for the on-treatment analysis (Respimat® 5 µg: HR, 0.91; 95% CI, 0.71-1.17; Respimat® 2.5 µg: HR, 1.11; 95% CI, 0.87-1.40). Risk of exacerbation was also similar for the Respimat® groups versus HandiHaler® (time to first exacerbation) (Respimat® 5 µg: HR, 0.99; 95% CI, 0.90-1.08; Respimat® 2.5 µg: HR, 1.04; 95% CI, 0.95-1.14). Risk of major adverse cardiovascular event (MACE) or fatal MACE were also similar for the Respimat® groups versus HandiHaler® (MACE: Respimat® 5 µg: HR, 1.20; 95% CI, 0.88-1.63; Respimat® 2.5 µg: HR, 1.11; 95% CI, 0.81-1.51; fatal MACE: Respimat® 5 µg: HR, 1.14; 95% CI, 0.75-1.71, Respimat® 2.5 µg: HR, 1.12; 95% CI, 0.75-1.69).
Conclusion: Analogous to the global analysis, patients naïve to anticholinergic treatment and treated with tiotropium Respimat® or HandiHaler® in the TIOSPIR® trial exhibited similar safety and exacerbation efficacy profiles.
Declaration of Interest: AK participates in advisory boards or speakers bureau for Astra Zeneca, Boehringer Ingelheim, GlaxoSmithKline, Meda, Merck, Novartis, Pfizer, Purdue, Takeda and Teva; RAW received grants/fees from AstraZeneca, Boehringer Ingelheim Bristol-Myers Squibb, GlaxoSmithKline, Janssen, Meda, Merck, Mylan, Novartis, Pfizer, Pulmonx, Roche/Genentech, Sanofi, Spiration, Sunovion, Takeda, Teva, Theravance, Verona and Vertex; PMAC received grants/fees from AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Novartis and Takeda; RD received grants/fees from Boehringer Ingelheim and Novartis; DD received grants/fees from Boehringer Ingelheim, Chiesi, Dey Pharma, Novartis, Nycomed and Pfizer; NM, AM and AF are employees of Boehringer Ingelheim; AA received grants/fees from AstraZeneca, Boehringer Ingelheim, Forest Laboratories, GlaxoSmithKline and Novartis. NCT01126437
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Reference
Wise, *et al. npj Primary Care Respiratory Medicine* (2015) 25, 15067

CR041
Asthma health and wellbeing study

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Aim: The main objectives of this study were to investigate how adults perceive their health and wellbeing, explore how asthma severity affects their everyday life, investigate whether there is a relationship between both the concept of health and the wellbeing of those affected, and to distinguish how perceptions of health and perceptions of wellbeing affect one another.
Method: An on-line survey was used. The survey consisted of a 33-item instrument devised for the study. The study population was a convenience, self-selection sample recruited by on-line advertising. Inclusion criteria – adults (over 18yrs), who had an asthma diagnosis for 1 year or more. Demographic data were collected, with questions regarding age, gender, primary principal status etc., and multiple choice questions related to determine asthma severity in order to allow for comparisons to be drawn during data analysis.
Results: 339 responded, 218 were included. Female, $n = 162$ (76%). Age 18yrs – 64+yrs. 14 (7%) rated their health excellent, 82 (38%) rated their health good, and 15 (7%) rated their health poor. 14 (7%) reported difficulty with simple tasks, 11 (5%) reported extreme limitation with social activities. Other forms of coexisting illness were reported by 71 participants (33%), with 30 (14%) of the overall sample reporting two or more coexisting illnesses. No participants reported having Cancer, however other illnesses included depression ($n = 20$, 9.3%), COPD ($n = 13$, 6.1%), rheumatoid arthritis ($n = 6$, 2.8), diabetes ($n = 5$, 2.3%) and heart disease ($n = 4$, 1.9%). Sleep was the daily activity which 19 (9%) respondents felt was interfered with most as a result of their physical health, followed by recreational activities by 18 (8%). Depressive symptoms were reported as being non-existent by 84 (39%) of respondents, 12 (6%) admitting to feeling depressed 'most of the time', and one respondent (0.5%) reporting feeling depressed 'all of the time'.
Conclusion: In conclusion, it is evident that health and wellbeing are influenced by a number of factors. This study provides an in-depth insight into how people with asthma perceive their health and wellbeing in Ireland today. Findings suggest that functional or disease status, and measurement of symptom control should not be considered as the only measure of health. Health and wellbeing should be addressed as separate, yet co-existing components in optimising the quality of life of people with asthma.
Declaration of Interest: None
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CR042
Determinants of Client's Adherence to Public-Private Mix DOTS (PPMD) Treatment

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Aim: The study aimed to determine the significant relationship between the selected predictors and adherence to PPMD treatment.
Method: Grounded on Pender's Health Promotion Model, the study employed a descriptive correlational research. Anti-Tuberculosis Chemotherapy Adherence Index, consisting of a researcher-made and standardized tool, was based on literature reviewed, content was evaluated by experts and reliability was tested through Cronbach alpha. Seventy respondents (adherent and non-adherent) were selected through simple random sampling. Data was processed using Statistical Package for Social Sciences (SPSS) version 16. A discriminant analysis was conducted to predict adherence with age, educational attainment, income, sputum smear status, accessibility, co-morbidity, perceived self-efficacy, quality of health services, perceived social support, perceived social stigma, motivation, side-effects and adverse reactions to treatment as the variables.
Results: The discriminant analysis results presented three variables which have bearing on adherence to PPMD treatment, namely, quality of health services ($P = 0.007$), income ($P = 0.030$) and perceived social stigma ($P = 0.032$). Quality of health services directly affects adherence. Situational influences in the external environment can increase or decrease commitment to or participation in health-promoting behaviour such as adherence to a treatment regimen. Indirect cost of treatment may not be an issue for those with high income level but may constitute a problem for program providers since patients may intentionally drop-out from the National TB Program because they can well afford the cost of treatment while avoiding the hassle of constant follow-up to the TB DOTS unit. Perceived social stigma inversely

influences adherence. This constitute both a barrier and unfavourable environment where adherence might occur. This isolation may lead to poor follow-up in TB DOTS unit especially where the patient can be seen or identified as seeking treatment for Tuberculosis.
Conclusion: Client's adherence to Public-Private Mix DOTS (PPMD) treatment is an interplay of healthcare delivery system and socio-economic factors.
Declaration of Interest: None
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CR043

Factors associated with exacerbations, admissions and overall mortality of patients with Chronic Obstructive Pulmonary Disease (COPD) in Primary Care

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Aim: The exacerbations of Chronic Obstructive Pulmonary Disease (COPD) have an impact both on the patient and on the health system. Factors associated with exacerbations, admissions and overall mortality of patients with COPD are analyzed in Primary Care conditions both for their early identification and for the improvement of results in health.
Method: An analytical study was carried out with retrospective and prospective cohort in exacerbated COPD patients attended/treated in the extra hospital emergency services of a Primary Care District ($N = 523$; 21% loss). The analysis of exacerbations (01/08/2013–31/03/2014), admissions (01/04/2013–31/03/2014), overall mortality (01/03/2014–31/03/2015), and their relation with spirometry parameters, clinic and follow up variables, was performed using a logistic regression model for each dependent variable.
Results: 410 COPD patients were included. The risk of having ≥ 2 exacerbations was 4 (95%CI 2.4-6.8) if ≤ 1 previous admissions, 2.1 (95%CI 1.3-3.2) in influenza vaccination and 1.7 (95%CI 1.1-2.7) if they had inhaled corticosteroids. The risk of having ≥ 1 admission was 1.6 (IC95% 1.1-2.6) in males, 1.5 (95%CI 1.01-2.3) if anti-pneumococcal vaccine and 4.1 (95%CI 2.5-7.04) if ≥ 2 exacerbations. The overall mortality was related to age (OR = 1.8) (1.02-1.07), chronic renal failure (OR = 3.1, 1.5-7.1), diabetes (OR = 1.8, 1.1-2.9), treatment with oral corticosteroids (OR = 2.1, 1.1-3.9), having protective factors such as long-acting beta adrenergics (OR = 0.47, 0.3-0.7) and influenza vaccination (OR = 0.45, 0.2-0.7).
Conclusion: Exacerbations and previous admissions, immunization status, presence of Diabetes and Chronic Renal Insufficiency as well as treatment are easily identifiable factors in order to act on highest risk patients.
Declaration of Interest: None
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CR044

The impact of ethnicity and socioeconomic factors on the prevalence of COPD in a low income country of sub-Saharan Africa: FRESH AIR Uganda

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Aim: In Uganda, biomass fuel use seems the largest risk factor for COPD. Socioeconomic factors (such as ethnicity) may play a mediating role. Therefore, more in-depth research was needed to better understand the risk factors of COPD. The aim was to investigate the impact of ethnicity (Bantu and non-Bantu) and socioeconomic factors on COPD prevalence in Uganda.
Method: The population comprised of 588 randomly selected participants ($\geq$ 30 years) in Masindi who previously participated in the FRESH AIR Uganda study. In this *post-hoc* analysis, the impact of several socioeconomic characteristics on the prevalence of COPD was assessed using direct subgroup comparisons (for ethnicity and gender) and logistic regression analyses.
Results: Ninety-five (16.2%) participants had COPD. Ethnicity had significant impact on COPD prevalence: Bantu 12.9% and non-Bantu 20% ($P = 0.020$). Further analysis showed a difference in socioeconomic factors between these groups, reflected in active smoking (32.6% in non-Bantu vs 10.7%), living in tobacco-growing areas (72% in non-Bantu vs 14.8%), charcoal usage (22% in non-Bantu vs 40%), and education (no education 28.5% in non-Bantu vs 12%). Cough (non-COPD 18.1% and COPD 30.5%, $P = 0.005$), wheeze (non-COPD 6.5% and COPD 16.8%, $P = 0.001$) and men with >2 chest infections per year (non-COPD 33.3% and COPD 57.8%) were more prevalent in COPD patients. Among men, logistic regression analyses showed that both coughing during the day (OR 3.17, CI 1.14-8.77, $P = 0.026$) and ethnicity (non-Bantu OR 2.12, CI 1.06-4.26, $P = 0.034$) were associated with COPD. Among women, breathless with wheezing (OR 3.28, CI 1.07-10.01, $P = 0.037$) and former smoking (OR 3.21, CI 1.29-8.02, $P = 0.012$) were associated with COPD.
Conclusion: Within the two ethnic groups, a difference in COPD prevalence was found; this is probably associated with lower socioeconomic circumstances. Therefore, more research is needed to clarify the complexity of the different risk factors on the development of COPD in low- and middle-income countries.
Declaration of Interest: None
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CR045

Glycopyrronium significantly improves lung function, dyspnoea and health status in COPD patients in all GOLD groups

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Aim: Glycopyrronium and tiotropium are inhaled long-acting muscarinic agonists recommended for COPD patients in all GOLD groups (A, B, C & D) [1]. Glycopyrronium is effective and well tolerated in moderate-to-severe COPD patients, similar to tiotropium, and has faster onset and better bronchodilation in the first 4 h after first dose.
Method: Glycopyrronium and tiotropium efficacy was analysed post hoc in patients by GOLD group (A, B, C & D), with data from four randomised controlled clinical trials, pooled and adjusted by mix-model. Patient classification (A or C, low-symptom groups; B or D, high-symptom groups) was based on baseline dyspnoea index (BDI ≥ 7 = low symptoms; BDI < 7 = high symptoms) [2] and lung function ($FEV_1 < / \geq$ 50% predicted normal for groups C or D and A or B, respectively), without considering baseline exacerbation risk. Efficacy of glycopyrronium and tiotropium was measured by mean change from baseline at 12 weeks for trough FEV_1 ($tFEV_1$), health status (SGRQ score) and transition dyspnoea index (TDI score).
Results: Of the 2599 patients (glycopyrronium, $n = 1628$; tiotropium, $n = 971$), 29.7% and 13.1% were in groups A and C, with baseline mean (SD) BDI scores of 8.19 (1.29) and 7.95 (1.23), respectively, and baseline FEV_1% predicted normal mean (SD) 64.66 (8.58) and 41.85 (5.68); 30.6% and 26.7% patients were in groups B and D, respectively, with BDI (SD) 5.11 (1.31) and 4.72 (1.47) and baseline FEV_1% predicted normal (SD) 62.54 (7.94) and 40.50 (6.07), respectively. Based on the least square means change from baseline at 12 weeks, glycopyrronium led to statistically significant improvements in $tFEV_1$, TDI score and health status in all GOLD groups (Table); there was no significant difference between glycopyrronium and tiotropium.
Conclusion: Glycopyrronium significantly improved lung function, dyspnoea score and health status in COPD patients in all GOLD groups, similar to tiotropium.
Declaration of Interest: Anthony D'Urzo has received research, consulting and lecturing fees from Glaxo Smithkline, Sepracor, Schering Plough, Altana, Methapharma, AstraZeneca, ONO pharma, Merck Canada, Forest Laboratories,

Novartis Canada/USA, Boehringer Ingelheim (Canada) Ltd, Pfizer Canada, SkyePharma, KOS Pharmaceuticals and Almirall. This study was sponsored by Novartis Pharma AG. Giovanni Bader, Pablo Altman and Pankaj Goyal are employees of Novartis.
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[CR045]

Table 1. Mean change from baseline in trough FEV_1, TDI and SGRQ score (glycopyrronium treatment) at Week 12

GOLD groups	*$tFEV_1$ (L)*	*TDI score*	*SGRQ*
GOLD A	0.09 (0.01)*	2.28 (0.14)*	−5.99 (0.50)*
GOLD B	0.09 (0.01)*	1.90 (0.14)*	−9.53 (0.60)*
GOLD C	0.09 (0.01)*	2.40 (0.22)*	−5.89 (0.77)*
GOLD D	0.09 (0.01)*	1.80 (0.15)*	−7.18 (0.61)*

*$P < 0.0001$; Data is least square mean (standard error).
SGRQ, St George's Respiratory Questionnaire; TDI, transition dyspnea index; $tFEV_1$, trough forced expiratory volume in 1 sec.

CR046
Glycopyrronium and tiotropium comparison: lung function, dyspnoea and health status in COPD patients in all GOLD groups

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Aim: Inhaled long-acting muscarinic antagonists are recommended for COPD patients in all GOLD groups (A, B, C, and D).[1] Glycopyrronium 50 µg is effective and well tolerated in moderate-to-severe COPD patients, similar to tiotropium 18 µg with faster onset and better bronchodilation in the first 4 h after the first dose.
Method: The effect of glycopyrronium and tiotropium in patients categorised by GOLD group was analysed post hoc using data from four randomised controlled clinical trials pooled and adjusted using mix-model. GOLD classification was done based on baseline St George's Respiratory Questionnaire (SGRQ) score (cut point = 25) and lung function (FEV_1; 1 ($tFEV_1$), SGRQ score, and Transition Dyspnoea Index (TDI) score.
Results: Of the 2599 patients (glycopyrronium, $n = 1628$, tiotropium, $n = 971$), 7.6%, 52.6%, 2.8% and 37.0% were classified in GOLD groups A, B, C and D, respectively. Glycopyrronium showed significant improvement in $tFEV_1$ in patients in all groups after 12 weeks treatment compared with baseline; tiotropium showed significant improvement only in B and D groups. In group A, glycopyrronium was significantly better than tiotropium (Table 1). Glycopyrronium significantly improved TDI score in patients in all GOLD groups, similar to tiotropium. Glycopyrronium and tiotropium showed similar and significant improvement in SGRQ score in GOLD groups B and D (Table 1).
Conclusion: Glycopyrronium and tiotropium significantly improved dyspnoea score (in all GOLD groups) and health status (GOLD groups B and D). Glycopyrronium provided significant improvement in $tFEV_1$ in patients in all GOLD groups, while tiotropium showed statistically significant improvement in $tFEV_1$ only in patients in group B and D.
Declaration of Interest: Anthony D'Urzo has received research, consulting and lecturing fees from Glaxo Smithkline, Sepracor, Schering Plough, Altana, Methapharma, AstraZeneca, ONO pharma, Merck Canada, Forest Laboratories, Novartis Canada/USA, Boehringer Ingelheim (Canada) Ltd, Pfizer Canada, SkyePharma, KOS Pharmaceuticals and Almirall. This study was sponsored by Novartis Pharma. AG. Giovanni Bader, Pablo Altman, Pankaj Goyal are employees of Novartis.
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Reference
[1] GOLD 2015, http://www.goldcopd.org/

[CR046]

Table 1. Comparison of glycopyrronium and tiotropium: treatment difference in trough FEV_1, TDI, and SGRQ score at Week 12

GOLD groups	*$tFEV_1$ (L)*	*TDI score*	*SGRQ*
GOLD A	0.075 (0.025)*	0.105 (0.454)^{NS}	−0.329 (1.099)^{NS}
GOLD B	−0.002 (0.012)^{NS}	0.107 (0.173)^{NS}	−0.265 (0.711)^{NS}
GOLD C	0.031 (0.046)^{NS}	−0.221 (0.769)^{NS}	−1.344 (2.375)^{NS}
GOLD D	0.019 (0.012)^{NS}	0.165 (0.204)^{NS}	0.339 (0.787)^{NS}

Data are least square mean treatment difference (standard error); *$P < 0.01$ vs tiotropium.NS, non-significant; SGRQ, St George's Respiratory Questionnaire; TDI, transition dyspnea index; $tFEV_1$, trough forced expiratory volume in 1 sec.

CR047
Benefits of tiotropium+olodaterol on symptoms and health-related quality of life in moderate to severe COPD patients with chronic bronchitis and/or emphysema

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Aim: Chronic bronchitis and emphysema are common features of chronic obstructive pulmonary disease (COPD) and are associated with adverse symptoms and poor health-related quality of life. Efficacy and safety of tiotropium, a long-acting muscarinic antagonist,+olodaterol, a long-acting β_2-agonist, have previously been established in COPD. This *post hoc* analysis of data from two Phase IIIb studies assessed the effect of tiotropium+olodaterol on lung function, symptoms and health-related quality of life in patients with COPD (GOLD 2–3) with chronic bronchitis and/or emphysema.
Method: In two replicate, randomised, double-blind, parallel-group, 12-week studies (OTEMTO® 1 and 2; 1237.25 and 1237.26; NCT01964352 and NCT02006732), patients received tiotropium+olodaterol 5/5 or 2.5/5 µg, tiotropium 5 µg or placebo. Patients were classified as having chronic bronchitis, emphysema or both based on the investigator's clinical judgement (chest computed tomography scan or assessment of diffusion capacity may not have been performed). Forced expiratory volume in 1 second (FEV_1) area under the curve from 0–3 hours (AUC_{0-3}), trough FEV_1 and St George's Respiratory Questionnaire (SGRQ) were primary end points; secondary end points included Mahler Transition Dyspnoea Index (TDI). Comparisons between tiotropium+olodaterol 5/5 µg, tiotropium 5 µg and placebo are presented.
Results: Patients numbers were: bronchitis, $n = 506$; emphysema, $n = 476$; both, $n = 206$. Baseline patient characteristics were generally comparable. After 12 weeks of treatment, there were significant improvements in FEV_1 AUC_{0-3}, trough FEV_1, SGRQ and TDI in all groups with tiotropium+olodaterol 5/5 µg, compared to placebo, with similar improvements across groups (Table 1).
Conclusion: Tiotropium+olodaterol 5/5 µg provided significant improvements in lung function, dyspnoea and health-related quality of life in patients with moderate to severe COPD with bronchitis, emphysema or both.
Declaration of Interest: Trial funding provided by Boehringer Ingelheim. Editorial assistance provided by Complete HealthVizion.
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[CR047]

Table 1. Primary and secondary end-point results from the OTEMTO® 1 and 2 studies in patients with chronic bronchitis and/or emphysema

End point	*Treatment comparison*	*Adjusted mean difference (95% confidence interval) at Week 12*		
		Bronchitis	*Emphysema*	*Both*
FEV_1 AUC_{0-3} response, mL	Tiotropium+olodaterol 5/5 µg vs placebo	306 (264, 347)***	321 (277, 366)***	285 (203, 366)***
	Tiotropium+olodaterol 5/5 µg vs tiotropium 5 µg	97 (55, 138)***	121 (79, 162)***	86 (8, 165)*
Trough FEV_1 response, mL	Tiotropium+olodaterol 5/5 µg vs placebo	157 (115, 199)***	178 (137, 220)***	147 (81, 212)***
	Tiotropium+olodaterol 5/5 µg vs tiotropium 5 µg	24 (−18, 66)	44 (4, 85)*	21 (−44, 87)
SGRQ, Δ	Tiotropium+olodaterol 5/5 µg vs placebo	−6.16 (−8.19, −4.13)***	−6.76 (−8.87, −4.65)***	−6.76 (−10.06, −3.47)***
	Tiotropium+olodaterol 5/5 µg vs tiotropium 5 µg	−2.63 (−4.66, −0.61)*	−2.24 (−4.33, −0.16)*	−3.10 (−6.40, 0.20)
TDI, Δ	Tiotropium+olodaterol 5/5 µg vs placebo	2.11 (1.52, 2.69)***	2.22 (1.63, 2.81)***	2.43 (1.47, 3.38)***
	Tiotropium+olodaterol 5/5 µg vs tiotropium 5 µg	0.61 (0.02, 1.19)*	0.74 (0.16, 1.32)*	0.53 (−0.43, 1.49)

CR048

Effect of indacaterol versus salmeterol/fluticasone on COPD exacerbations using baseline blood eosinophil count: A post-hoc analysis from the INSTEAD study

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Aim: To assess if baseline blood eosinophil count has an impact on exacerbation risk, this post hoc analysis from the INSTEAD study[1] compares the effect of once-daily indacaterol (IND) 150 µg versus twice-daily salmeterol/fluticasone combination (SFC) 50/500 µg on COPD exacerbation rates in subgroups of patients with moderate COPD, stratified using baseline blood eosinophil count.

Method: Data from the patients ($N = 581$) from the INSTEAD study were analysed to assess the exacerbation rate (mild, moderate or severe) using baseline absolute blood eosinophil count ($< 150/mm^3$; ≥ 150 to $< 300/mm^3$ and $\geq 300/mm^3$) and blood eosinophils as percentage of total leukocyte count (TLC, 2% [$< 2\%$ versus $\geq 2\%$]; 3% [$< 3\%$ versus $\geq 3\%$]; 4% [$< 4\%$ versus $\geq 4\%$] and 5% [$< 5\%$ versus $\geq 5\%$]).

Results: At Week 26, no significant difference was observed (IND versus SFC) in the rate of all exacerbations (incidence rate ratio [IRR] 0.86; 95%CI: 0.62, 1.20; $P = 0.367$).[1] When patients were categorised using baseline absolute blood eosinophil count of $< 150/mm^3$, $n = 239$, ≥ 150 to $< 300/mm^3$, $n = 199$ and $\geq 300/mm^3$, $n = 130$, the exacerbation rate (IND versus SFC) had an IRR of 0.75 (95% CI: 0.44, 1.27; $P = 0.29$), 0.90 (95% CI: 0.49, 1.65; $P = 0.73$) and 1.02 (95% CI: 0.49, 2.13; $P = 0.95$), respectively, with no significant difference between the treatments at any of the cut-offs used. Also, when patients were categorised using baseline blood eosinophils as percentage of TLC, no significant difference between the exacerbation rates (IND versus SFC) in any of these sub-groups was observed (Figure 1).

Conclusion: This post hoc analysis shows that indacaterol was as effective as salmeterol/fluticasone combination in reducing exacerbation risk in COPD patients, irrespective of the baseline blood eosinophil count.

Declaration of Interest: Andrea Rossi received grants, personal fees and non-financial support from Novartis, personal fees and non-financial support from GlaxoSmithKline and Boehringer Ingelheim, grants and personal fees from Chiesi Farmaceutici SPA, outside the submitted work. Pankaj Goyal, Giovanni Bader and Pablo Altman are employees of Novartis.

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Reference

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CR049

Why anxiety associates with non-completion of pulmonary rehabilitation program in patients with COPD?

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Aim: Recently, we have designed a disease-specific anxiety scale that measures anxiety [1,2] in patients with chronic obstructive pulmonary disease (COPD). Thus, we examined whether the Anxiety Inventory for Respiratory disease (AIR) is a predictor of non-completion of eight-week pulmonary rehabilitation (PR) programme.

Method: We have prospectively collected baseline data of patients with COPD who participated in eight-week PR. Pre and post-rehabilitation outcome measures were obtained: exercise capacity was assessed by incremental shuttle walk test (ISWT), quality of life measured using the St-Georges Respiratory Questionnaire (SGRQ), and severity of dyspnoea was assessed using the Medical Research Council scale. Anxiety was measured using the self-administered AIR scale. Completion was defined as attending 75% of the designated PR schedules and completed the eight weeks evaluation.

Results: Two hundred fifty seven COPD patients were recruited into community-based PR program. 192 (75%) COPD patients completed the eight weeks PR program. Table shows baseline differences between completers and non-completers of PR program. Non-completers had lower exercise capacity, higher dyspnea and higher level of anxiety compared to completers. Logistic regression analysis showed that only those with high load of anxiety symptoms were less likely to complete the PR program with odds ratio (95% CI) 0.93 (0.89–0.97), $P < 0.002$. Other clinical variables did not contribute to the model.

Conclusion: Patients with COPD with high load of anxiety symptoms are less likely to complete the PR program. Thus, those with high load of anxiety symptoms may benefit with additional practical support of including psychological therapy to complete PR.

Declaration of Interest: None

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[CR048]

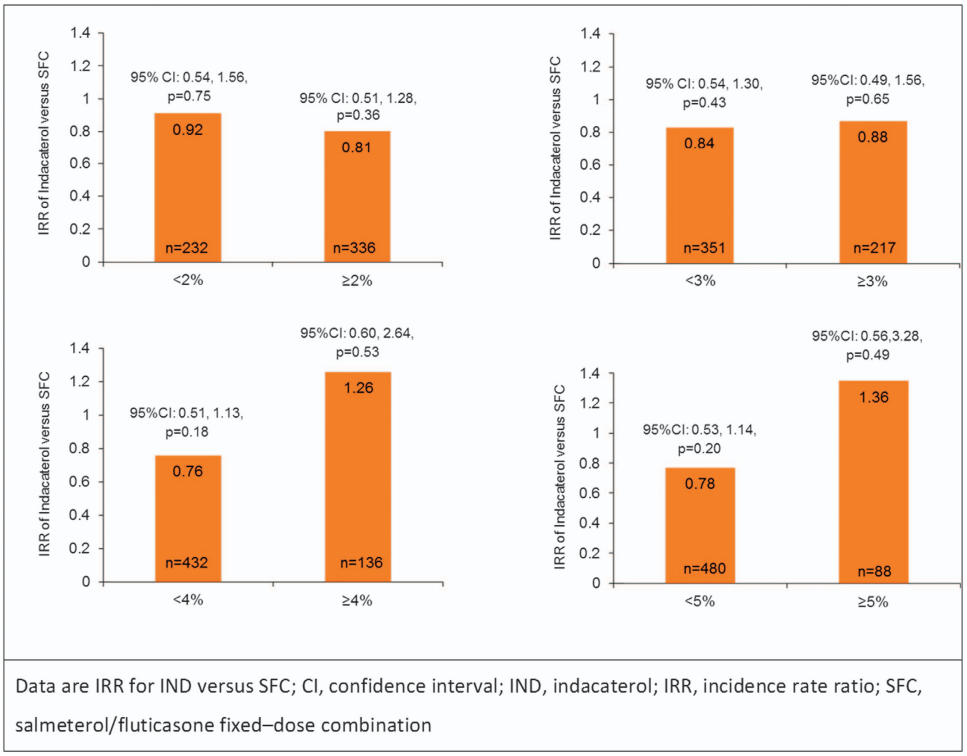

Figure 1. Exacerbation risk with IND versus SFC by percentage of blood eosinophill count.

[CR049]

Table 1. Baseline differences between completers versus non-completers of PR program in patients with COPD Mean (SD)

Characteristics	*Completers (n = 192)*	*Non-completers (n- 65)*	*t-value*	P-value
Age (years)	71.1 (8.51)	69.42 (9.86)	1.32	0.18
FEV_1(% predicted)	56.91 (15.16)	55.68 (14.48)	0.49	0.62
FEV_1/FVC	45.91 (20.16)	44.71 (14.29)	0.48	0.64
Sex (%)				
Male	48.95	52.31	$\chi^2 = 0.67$	0.37
Female	51.05	47.69		
AIR score	5.36 (5.37)	8.05 (7.13)	3.19	< 0.002
SGRQ				
Symptoms	65.12 (20.39)	68.78 (21.41)	1.24	0.21
Impact	37.91 (19.93)	41.63 (19.81)	1.30	0.19
Activity	67.17 (23.73)	73.82 (20.35)	2.02	0.04
Total	51.22 (19.06)	41.63 (19.81)	1.78	0.07
ISWT	213.85 (127.38)	177.69 (117.53)	2.01	0.04
MRC dyspnea	2.79 (1.12)	3.12 (1.24)	1.96	0.05

MRC = Medical Research Council; ISWT = Incremental Shuttle Walk Test; AIR = Anxiety Inventory for Respiratory Disease; SGRQ = St. Georges Respiratory Questionnaire.

CR050
Tiotropium+olodaterol shows clinically meaningful improvements in quality of life versus placebo

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Aim: Efficacy and safety of tiotropium, a long-acting muscarinic antagonist, +olodaterol, a long-acting β_2-agonist, have previously been established in pivotal Phase III studies in chronic obstructive pulmonary disease (COPD). The present studies (OTEMTO® 1 and 2; 1237.25 and 1237.26; NCT01964352 and NCT02006732) evaluated forced expiratory volume in 1 second (FEV_1) and St George's Respiratory Questionnaire (SGRQ) score after 12 weeks of treatment with tiotropium+olodaterol (2.5/5 µg and 5/5 µg) and tiotropium 5 µg, compared to placebo, in patients with moderate to severe COPD.
Method: Two replicate, randomised, double-blind, parallel-group, Phase IIIb, 12-week studies assessed the efficacy and safety of tiotropium+olodaterol 2.5/5 µg or 5/5 µg and tiotropium 5 µg, compared to placebo. Key inclusion criteria were age ≥ 40 years, diagnosis of COPD and post-bronchodilator FEV_1 ≥ 30 and < 80% predicted (GOLD 2–3).
Results: 1621 patients were evaluated. Baseline patient characteristics were similar between OTEMTO® 1 and 2: mean post-bronchodilator FEV_1 was 1.52 L and 1.55 L (55.3% and 54.8% predicted), respectively. Both studies met primary

end points and significantly improved FEV_1 area under the curve from 0–3 hours ($AUC_{0–3}$), trough FEV_1 and SGRQ with all treatments, versus placebo (Table 1). There were no relevant safety findings.
Conclusion: These studies show a consistent clinically meaningful improvement in SGRQ with tiotropium+olodaterol 5/5 µg, versus placebo, while confirming its effects on lung-function parameters and safety.
Declaration of Interest: Trial funding provided by Boehringer Ingelheim. Editorial assistance provided by Complete HealthVizion.
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[CR050]

Table 1. Primary end-point results from the OTEMTO* 1 and 2 studies

Treatment comparison vs placebo	*Adjusted mean difference at Week 12*					
	OTEMTO 1*			*OTEMTO* 2*		
	SGRQ, Δ	*FEV_1 $AUC_{0–3}$, mL*	*Trough FEV_1, mL*	*SGRQ, Δ*	*FEV_1 $AUC_{0–3}$, mL*	*Trough FEV_1, mL*
Tiotropium +olodaterol 5/5 µg	−4.89*	331*	162*	−4.56*	299*	166*
Tiotropium +olodaterol 2.5/5 µg	−4.12*	300*	150*	−3.67†	284*	169*
Tiotropium 5 µg	−2.40‡	219*	134*	−2.85†	194*	127*

*$P < 0.0001$; †$P < 0.005$; ‡$P < 0.02$.

CR051
Gender differences in baseline characteristics of COPD patients: pooled analysis of pivotal clinical trials of Indacaterol/Glycopyrronium from IGNITE programme

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Aim: Chronic obstructive pulmonary disease (COPD) has been perceived as a disease of men; however, the perspective has changed with an increase in COPD prevalence and mortality rate among women.[1] Here, we present a pooled analysis of pivotal indacaterol/glycopyrronium trials from IGNITE programme to investigate the differences in baseline characteristics of COPD patients across both genders.
Method: Baseline data were pooled from 6 pivotal randomised clinical trials (≥6 months duration) of indacaterol/glycopyrronium 110/50 µg once daily conducted in patients with moderate-to-very severe COPD. Gender differences based on baseline demographics and disease characteristics were analysed.
Results: A total of 6134 patients were included in 6 IGNITE trials (SHINE [$N = 2144$], SPARK [$N = 2224$], ILLUMINATE [$N = 523$], ENLIGHTEN [$N = 339$], ARISE [$N = 160$], and LANTERN [$N = 744$]), of whom 6108 (4719 men and 1389 women) were included in this pooled analysis. All baseline parameters, except symptom score (e-diary), differed significantly between men and women (Table 1). Women patients with COPD were relatively younger and had lower total exposure to smoking. More women than men were current smokers. The percentage of COPD patients with a diagnosis of moderate COPD and a history of COPD exacerbations was higher amongst women. Post-bronchodilator forced expiratory volume in 1 second (FEV_1) % predicted and FEV_1/forced vital capacity (FVC) % differed significantly between the genders (favouring female). Baseline dyspnoea index (BDI) scores were somewhat lower for women compared to men and St. George's Respiratory Questionnaire (SGRQ) score was relatively higher for women indicating a worse quality of life. Use of rescue medication (number of puffs per day, $P < 0.0001$) was also higher in women.
Conclusion: Results suggest significant differences in demographics and disease characteristics across both genders, and may provide clinical guidance on gender-specific approach to COPD management.
Declaration of Interest: Sebastian Fucile, Karen Mezzi, Robert Fogel, and Konstantinos Kostikas are employees of Novartis Pharmaceuticals Corporation. Ioanna Tsiligianni has received honoraria for educational activities, speaking engagements and advisory boards from Boehringer Ingelheim, Novartis, AstraZeneca and GlaxoSmithKline, but none related to this study.
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[CR051]

Table 1. Baseline demographics and disease characteristics by gender

	Men n = *4719*	*Women* n = *1389*	P *value*
Age, year (mean ± SD)	64.5 ± 8.3	61.6 ± 8.0	< 0.0001
Duration of COPD, years (mean ± SD)	6.3 ± 5.5	6.9 ± 5.3	< 0.0001
COPD severity, n (%)			
Moderate or less	1913 (40.6)	602 (43.3)	0.0738
Severe or worse	2798 (59.4)	787 (56.7)	
Inhaled corticosteroid use, n (%)	2786 (59.0)	889 (64.0)	0.001
Current smokers, n (%)	1642 (34.8)	672 (48.4)	< 0.0001
Pack-years (mean ± SD)	44.9 ± 24.8	39.5 ± 19.7	< 0.0001
COPD exacerbation history, n (%)			
1 or more	2268 (48.0)	750 (54.0)	< 0.0001
Baseline symptom score (e-diary) (mean ± SD)	6.9 ± 2.8	6.9 ± 3.0	0.3459
Spirometry (mean ± SD)			
Post-bronchodilator FEV_1, % predicted	48.5 ± 14.6	50.0 ± 13.8	0.0006
Post-bronchodilator FEV_1 reversibility, %	19.4 ± 17.3	20.4 ± 18.5	0.0656
Post-bronchodilator FEV_1/FVC%	44.4 ± 11.1	47.0 ± 11.0	< 0.0001
BDI score (mean ± SD)	6.4 ± 2.0	6.2 ± 2.0	0.0011
SGRQ total score (mean ± SD)	46.1 ± 18.2	51.2 ± 17.4	< 0.0001

Values are mean ± SD and n (%).

CR052
Evaluation of inhaler device preference items in patients with chronic obstructive pulmonary disease: A cognitive interview study

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Aim: Confidence in feedback mechanisms, ease of inhalation, and ease of use/comfort of mouthpiece are important attributes of inhalation devices for COPD patients. The aim of this study was to develop a new questionnaire, and modify it through cognitive interviews with COPD patients to enhance its content validity.
Method: The questionnaire of items (framed in English language) evaluated the confidence in device feedback mechanisms, ease of inhalation, and ease of use/comfort of mouthpiece. Cognitive interviews were conducted with adult COPD patients in the UK using a standardised interview guide. Participants were asked to review 8 items with 2 alternative response formats (11-point numeric rating scale versus 5-point verbal rating scale), followed by a cognitive interview designed to evaluate the interpretation, comprehensibility and

relevance of items, and to gather feedback on modifications to improve the content validity of the measure. Data were analysed using ATLAS.ti (version 7.5.2) software.
Results: The study included 10 patients (50% male; mean age 60.3 years), diagnosed with COPD for ≥6 months. Participants generally perceived the questionnaire items to be clear and easy to understand, and interpreted the questions as intended. Wherever the items were unclear, participants suggested an alternative wording to enhance clarity. Sixty percent of the patients preferred the 5-point verbal rating scale as it supports standardised interpretation and reporting.
Conclusion: A final questionnaire consisting of five items with a 5-point verbal rating scale was considered content valid measure suitable for use in trial settings to assess inhaler device preferences in patients with COPD.
Declaration of Interest: Pankaj Goyal, Lorena Garcia Conde are employees of Novartis Pharma AG, Basel, Switzerland. Pablo Altman is employee of Novartis Pharmaceuticals Corporation, East Hanover, USA. Margaret Vernon, Evan Davies, Savita Bakhshi Anand have nothing to disclose.
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CR053

Association between baseline symptom scores and future risk of severe exacerbations in patients with moderate-to-severe COPD data from the SPARK study

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Aim: We investigated the correlation between baseline daily symptom scores and future risk of severe exacerbations in patients from the SPARK study.
Method: The SPARK study was a 64-week, multicentre, double-blind study that evaluated the effects of a dual bronchodilator versus long-acting muscarinic antagonists on exacerbations in patients with severe-to-very severe COPD with a history of ≥1 exacerbations in the previous year. Patients were randomised (1:1:1) to receive a once-daily dose of either indacaterol/glycopyrronium (IND/GLY; 110/50 µg) fixed-dose combination or glycopyrronium 50 µg or open-label tiotropium 18 µg.[1] This post hoc analysis compares the baseline daily symptom scores, recorded by means of electronic diaries, of 2182 patients from the SPARK study who experienced ≥1 severe exacerbations ($n = 248$), ≥1 mild-moderate exacerbations ($n = 1628$) and no exacerbations ($n = 306$) during the study.
Results: Patients who experienced ≥1 severe exacerbations had significantly higher baseline total symptom scores (8.57) as compared to those who experienced ≥1 mild-moderate exacerbations (7.45) or no exacerbations (7.18); LSM difference: 1.13 and 1.39, respectively (both $P < 0.0001$). Several individual symptoms, including dyspnoea, cough, wheeze and sputum production, were also significantly greater in patients with severe exacerbations than in those from the other two strata (Figure). There was no significant correlation between the baseline symptom scores of fever, cold and sore throat in patients with severe and non-severe exacerbations. However, patients with severe exacerbations had significantly higher baseline symptom scores of fever, cold and sore throat as compared to those with no exacerbations.
Conclusion: In the SPARK study, patients with significantly higher baseline symptom scores, specifically with respect to dyspnoea, experienced more severe exacerbations during the study as compared to those with lower baseline symptom scores. Thus, a high level of daily symptom burden may reflect a group of patients who should be carefully followed for risk of severe exacerbations.
Declaration of Interest Professor Jadwiga A. Wedzicha has received fees for speaking and/or advisory board from GlaxoSmithKline, AstraZeneca, Novartis, Bayer, Boehringer Ingelheim, Takeda, Chiesi, Respifor, and Almirall as well as travel reimbursements from Boehringer Ingelheim and research grants from GlaxoSmithKline, AstraZeneca, Chiesi, Takeda and Novartis, with no stock holdings in pharmaceutical companies. Karen Mezzi, and Robert Fogel are employees of Novartis.
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Reference
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[CR053]

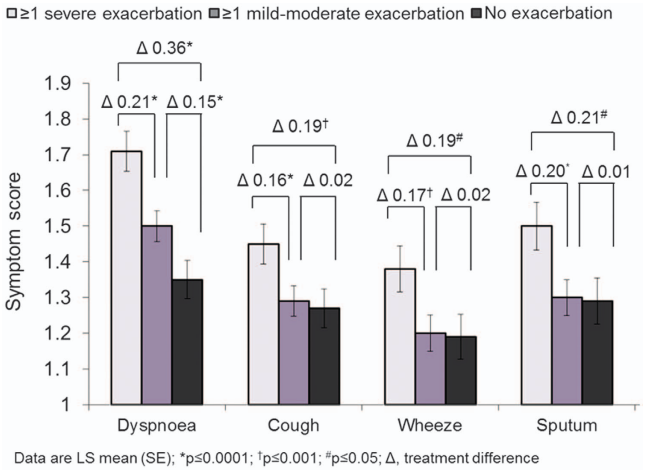

Figure 1. Individual symptom scores across groups

CR054

ENERGITO®: efficacy and safety of once-daily tiotropium +olodaterol versus twice-daily fluticasone propionate +salmeterol

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Aim: Combination of tiotropium, a well-established long-acting muscarinic antagonist,+olodaterol, a long-acting β_2-agonist (LABA), has been shown to provide consistent improvements in lung function over tiotropium or olodaterol alone in Phase III studies in chronic obstructive pulmonary disease (COPD). Addition of an inhaled corticosteroid (ICS) to a LABA has also demonstrated lung-function improvements over LABA alone in some studies. The ENERGITO® study (1237.11; NCT01969721) evaluated bronchodilator efficacy and safety of once-daily tiotropium+olodaterol compared to twice-daily fluticasone+salmeterol.
Method: This Phase IIIb, randomised, double-blind, double-dummy, four-period crossover trial evaluated lung function after 6 weeks of treatment with once-daily tiotropium+olodaterol 2.5/5 or 5/5 µg versus twice-daily fluticasone +salmeterol 250/50 or 500/50 µg. End points were forced expiratory volume in 1 second (FEV_1) area under the curve from 0–12 hours (AUC_{0-12}) (primary end point), FEV_1 AUC from 0–24 hours (AUC_{0-24}), FEV_1 AUC from 12–24 hours (AUC_{12-24}) and trough FEV_1 responses. Key inclusion criteria were age ≥40 years, smoking history >10 pack-years, and post-bronchodilator FEV_1 ≥30 and <80% predicted (GOLD 2–3).
Results: 229 patients were enrolled and treated: 64.6% male and 72.1% GOLD 2. Tiotropium+olodaterol significantly improved FEV_1 AUC_{0-12} response and all other FEV_1 end points over fluticasone+salmeterol (Table 1). No safety signals were identified.
Conclusion: This study suggests that using LABA+ICS (fluticasone+salmeterol) in patients with moderate to severe COPD may provide sub-optimal lung-function improvements compared to tiotropium+olodaterol.

[CR054]

Table 1. FEV_1 end-point results from the ENERGITO® study

Treatment comparison	*Adjusted mean difference (95% confidence interval) at Week 6, mL*			
	FEV_1 $AUC_{0–12}$	*FEV_1 $AUC_{0–24}$*	*FEV_1 $AUC_{12–24}$*	*Trough FEV_1*
Tiotropium+olodaterol 5/5 µg vs fluticasone+salmeterol 250/50 µg	125*** (103, 147)	82*** (61, 103)	39** (17, 62)	47** (22, 71)
Tiotropium+olodaterol 5/5 µg vs fluticasone+salmeterol 500/50 µg	129*** (107, 150)	86*** (65, 107)	43** (21, 65)	58*** (34, 84)
Tiotropium+olodaterol 2.5/5 µg vs fluticasone+salmeterol 250/50 µg	103*** (81, 124)	65*** (45, 86)	28* (6, 51)	42** (18, 67)
Tiotropium+olodaterol 2.5/5 µg vs fluticasone+salmeterol 500/50 µg	106*** (85, 128)	69*** (48, 90)	32* (9, 54)	54*** (29, 78)

*$P < 0.05$; **$P < 0.001$; ***$P < 0.0001$.

Declaration of Interest: Trial funding provided by Boehringer Ingelheim. Editorial assistance provided by Complete HealthVizion.
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CR055
ICS and risk of pneumonia in Swedish COPD patients: ARCTIC study

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Aim: To assess the risk of pneumonia among Swedish chronic obstructive pulmonary disease (COPD) patients treated with inhaled corticosteroids (ICS).
Method: Retrospective electronic medical records (EMRs) data were collected from COPD patients and a matched reference group from Swedish primary care centres (2000-2014) and linked to information from national primary and secondary care registries. The COPD and matched reference group (non-COPD) patients were divided into three groups: high- (≥800 µg daily budesonide), low- (1 >50% predicted).
Results: There were 593, 1,453 and 2,124 COPD patients and 3,464, 10,619 and 68,957 non-COPD patients in the high-, low- and no-ICS dose groups, respectively. Mean follow-up was 5.7 years (SD = 4.1). ICS use at both low and high doses was associated with higher prevalence of pneumonia in COPD (low, HR 1.15 [95% CI 1.00, 1.32]; high, HR 1.23 [95% CI 1.04, 1.46]) compared to COPD patients not using ICS (table). An association between ICS use and pneumonia was also found in non-COPD patients (low, HR 1.66 [95% CI 1.56, 1.76]; high, HR 1.76 [95% CI 1.61, 1.93]) compared with no-ICS use in non-COPD patients (table). COPD patients had a higher risk of pneumonia than non-COPD patients (HR 3.33 [95% CI 3.12, 3.56]).
Conclusion: Having COPD or taking high- or low-dose ICS are both associated with increased risk of pneumonia.
Declaration of Interest: This study was funded by Novartis. CJ has received honoraria for educational activities/ lectures / advisory boards from AstraZeneca / BI / Chiesi /Novartis /TEVA K. Larsson has served in advisory board /speaker /education roles for AstraZeneca / BI / GlaxoSmithKline / MEDA / MSD / Takeda / NovartisChiesiTeva. GJ is a steering committee member for this study and served on advisory boards for AstraZeneca / Novo Nordisk / Takeda. BS has received honoraria for educational activities / lectures /advisory boards from AstraZeneca / Boehringer Ingelheim (BI) / GlaxoSmithKline / Novartis / MEDA / TEVA. K. Lisspers has received honoraria for educational activities/lectures/advisory boards from AstraZeneca / GlaxoSmithKline / Novartis / MEDA / Takeda. PO and DK are Novartis employees. LJ and PS are IMS Health employees, who received remuneration for statistical analysis.
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[CR055]

Table 1. Proportion of patients with pneumonia, stratified by disease status and ICS group

	Non-COPD	*COPD*
No ICS	0.5%	19%
Low dose ICS	7%	22%
High dose ICS	10%	22%

CR056
TIOtropium Safety and Performance In Respimat® (TIOSPIR®): Safety and efficacy in patients with tiotropium HandiHaler® use at baseline

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Aim: TIOSPIR® showed that tiotropium Respimat® 5 µg and HandiHaler® 18 µg have similar safety and exacerbation efficacy profiles in patients with chronic obstructive pulmonary disease (COPD). We present results for patients using tiotropium HandiHaler® at baseline.
Method: TIOSPIR® (*N* = 17,135), a 2-3-year, randomized, double-blind, parallel-group, event-driven trial, compared safety and efficacy of once-daily tiotropium Respimat® 5 and 2.5 µg with HandiHaler® 18 µg in patients with COPD. Primary endpoints were time to death and first COPD exacerbation. Patients receiving tiotropium at baseline from countries where only tiotropium HandiHaler® was available at the time of study initiation were analyzed.
Results: Overall, 2784 patients treated with tiotropium HandiHaler® 18 µg at baseline were analyzed (*n* = 914 and *n* = 918 for tiotropium Respimat® 2.5 and 5 µg; *n* = 952 for HandiHaler® 18 µg). Baseline characteristics were similar across groups. Risk of death was similar for the Respimat® groups versus HandiHaler® (Respimat® 5 µg: hazard ratio [HR], 0.79; 95% confidence interval [CI], 0.58-1.07; Respimat® 2.5 µg: HR, 0.87; 95% CI, 0.64-1.17). Risks of major adverse cardiovascular event (MACE) and fatal MACE were similar for Respimat® versus HandiHaler® (MACE: Respimat® 5 µg: HR, 0.69; 95% CI, 0.44-1.08; Respimat® 2.5 µg: HR, 0.73; 95% CI, 0.47-1.15; fatal MACE: Respimat® 5 µg: HR, 0.67; 95% CI, 0.33-1.34; Respimat® 2.5 µg: HR, 0.57; 95% CI, 0.27-1.19). Overall risk of a fatal event (ontreatment) was lower for Respimat® 5 µg versus HandiHaler® (Respimat® 5 µg: HR, 0.62; 95% CI, 0.43-0.89). Risk of exacerbation was similar across groups (Respimat® 5 and 2.5 µg versus HandiHaler®: HR [95% CI]: 0.96 [0.86-1.08] and 1.03 [0.92-1.16]).
Conclusion: Patients treated with tiotropium HandiHaler® 18 µg at baseline, and who subsequently received tiotropium Respimat®, had similar risk of all-

cause mortality, fatal MACE, MACE and exacerbation as those who continued to be treated with tiotropium HandiHaler®.
Declaration of Interest: IT received fees for educational activities, speaking engagements and advisory boards from AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline and Novartis; PMAC received grants or fees from AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Novartis and Takeda; AA received grants or fees from AstraZeneca, Boehringer Ingelheim, Forest Laboratories, GlaxoSmithKline and Novartis; RD received grants or fees from Boehringer Ingelheim and Novartis; AM, AF and NM are employees of Boehringer Ingelheim; RAW received grants or fees from AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Mylan, Novartis, Pearl Therapeutics, Pfizer, Pulmonx, Roche, Spiration, Sunovion, Takeda and Theravance; DD received grants or fees from Boehringer Ingelheim, Chiesi, Dey Pharma, Novartis, Nycomed and Pfizer. NCT01126437
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Reference
Dahl R, *et al. BMJ Open* 2015; 5: e009015

CR057
Asthma impacts on workplace productivity and daily activities in employed patients who are symptomatic despite background therapy: a multi-national survey

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Aim: Despite treatment according to current recommendations, ≥40% of patients with asthma have disease that remains uncontrolled.[1,2] Poorly controlled asthma is associated with reduced work productivity and increased activity impairment versus well-controlled asthma,[1,3] but research is limited. This multi-national survey aimed to increase understanding of the impact of symptomatic asthma on work productivity and daily activities in adults receiving maintenance therapy.
Method: The Work Productivity and Activity Impairment Specific Health Problem questionnaire is an internationally recognised and validated, six-question, patient-administered, quantitative assessment of absenteeism, presenteeism (reduced on-the-job effectiveness) and daily activity impairment attributable to a specific health problem, during the past 7 days.[4] Adults (aged >18 years) with asthma, diagnosed by a healthcare professional, in full-/part-time employment and confirmed as symptomatic (using Royal College of Physicians Three Questions tool), despite receiving long-term asthma control medication, were identified from a consumer panel using initial screening questions and surveyed via an internet questionnaire.
Results: Of 6140 participants, 1598 fulfilled screening criteria and completed the survey: Brazil, $n=200$; Canada, $n=200$; Germany, $n=293$; Japan, $n=305$; Spain, $n=300$; UK, $n=300$. Mean scores at respondent level were: absenteeism, 9.1%; presenteeism, 31.5%; overall work impairment, 35.7%; non-work activity impairment, 38.1%. On average, 74% of participants reported some reduction (question score ≥1/10) in work productivity, while 42% and 51% of participants reported a prominent reduction (question score ≥4/10) in work productivity and ability to perform daily activities, respectively, because of asthma. Respondents reported missing, on average, 3 working hours per week because of asthma symptoms. The majority of participants indicated that asthma at work affects them physically and mentally; only 13% reported no impact.
Conclusion: For a substantial proportion of adult patients in employment with symptomatic asthma despite long-term maintenance medication, asthma has a large negative impact on work productivity and daily activity.
Declaration of Interest: Survey funding: Kantar Health received funding from Boehringer Ingelheim to conduct the WPAI survey; Complete HealthVizion received funding from Boehringer Ingelheim to provide the authors with editorial assistance.. Editorial assistance: Complete HealthVizion.
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CR058
Experiences of using a mobile phone application to motivate physical activity in persons with COPD: a mixed method study

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Aim: To describe the experiences of using a saturation meter with a mobile application with alarm to motivate physical activity, explore if this application increases the level of physical activity and describe persons with COPD experiences of reasons to be physical active.
Method: A mixed method design was used. Persons with COPD at GOLD stadium II and III who had fulfilled both a quantitative intervention and an interview participated ($n=10$). The intervention consisted of one group information followed by six weeks using the mobile application. Quantitative data of physical activity was collected by accelerometer one week before and one week after the intervention period, and analysed statistically; such data were available for seven participants. The qualitative interview study investigated experiences of using the technical devices as well as motivation and barriers for physical activity and was analysed with qualitative content analysis.
Results: The participants were mostly at sedentary level. Two of the participants increased their level of physical activity from baseline to follow up after 6 weeks. Three of the participants reached the recommended 30 minutes per day of physical activity. The qualitative findings revealed two themes; "My use of saturation meter connected to a mobile application with alarm meant difficulties with the technical devices" and; "My relation to physical activity is a sense of resignation when I want to do more than I can".
Conclusion: There were unexpectedly much technical problems experienced. To manage physical activities to handle daily life, they walked slower, stayed and rest and avoided activities with others. Participants were very active for only one or two hours per day but the rest of the day the accelerometer registered only low or no levels of activity. However, participants experienced that they were very active. That would be valuable to investigate further.
Declaration of Interest: None
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CR059
'Time without exacerbations' as a novel approach to assess the impact of exacerbations on patients with COPD

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Aim: Traditionally, studies on pharmaceutical or non-pharmaceutical treatments of COPD exacerbations use exacerbation frequency as the primary outcome measure. However, measuring the time without exacerbations may better reflect the impact of exacerbations from the patient's perspective. We examined the association between exacerbation-free weeks and exacerbation

[CR059]

Table 1. Demographics at baseline and study descriptive

N	208
Primary care/Secondary care (%)	132 (63.5) /76 (36.5)
Age (SD)	65.1 (9.4)
Male/Female (%)	143 (68.8) / 65 (31.3)
FEV1%pred (SD)	60.8 (17.9)
GOLD 1 (%)	29 (13.9)
GOLD 2 (%)	123 (59.1)
GOLD 3 (%)	46 (22.1)
GOLD 4 (%)	9 (4.3)
BMI (SD)	26.4 (4.5)
Currently smoking (%)	55 (26.4)
Exacerbation frequency (SD)	4.7 (2.6)
Exacerbation-free weeks (SD)	32.8 (12.5)

FEV1%pred: Percentage of predicted Forced Expiratory Volume in one second; GOLD: Global Initiative for Lung Disease; BMI: Body mass index.

[CR059]

Table 2. Range of exacerbation frequency within groups, and Pearson's correlations between exacerbation-free weeks and exacerbation frequency groups

	N	*Range*	*r exacerbation-free weeks*
Exacerbation frequency	208	0-13.7	-.68*
Infrequent exacerbators	69	0-3.5	-.73*
Medium frequent exacerbators	73	3.5-5.8	-.22
High frequent exacerbators	66	5.8-13.7	-.32*

*$P < 0.01$.

[CR059]

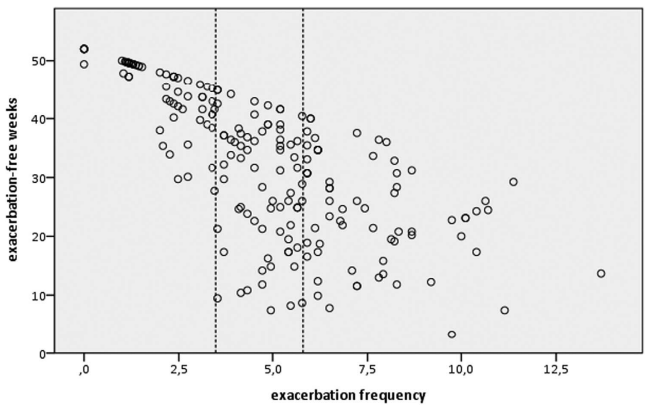

Figure 1. Scatterplot of Pearson's correlation between exacerbation frequency and exacerbation-free weeks. Dotted lines show distribution of exacerbation frequency in tertiles.

frequency, and assessed how these relate to disease-specific quality of life (dsQoL).
Method: Two existing datasets were used for retrospective analyses. Symptom changes were recorded every fortnight using an automated telephone system. A worsening of at least one major and one minor symptom for at least two consecutive days was considered an exacerbation. DsQoL was measured with the Chronic Respiratory Questionnaire (CRQ). Pearson's correlations were calculated between exacerbation-free weeks and exacerbation frequency, and between exacerbation-free weeks and exacerbation frequency subgroups 'infrequent exacerbators', 'medium frequent exacerbators', and 'high frequent exacerbators'. Finally, regression analyses were used to test if exacerbation-free weeks were a better predictor of dsQoL than exacerbation frequency.
Results: Demographics are shown in Table 1. Analyses on 208 subjects showed a strong negative correlation between exacerbation-free weeks and exacerbation frequency (r = -.68) (See Table 2 and Figure 1). The correlation between exacerbation-free weeks and infrequent exacerbators was strong (r = -.73). Correlations of exacerbation-free weeks with medium-frequent and high-frequent exacerbators were low (r = -.22 and -.32, respectively). Linear regression of data of 127 patients showed that exacerbation frequency explained 5.3% of the variance of the CRQ total scores at 12 months, whereas exacerbation-free weeks explained 11.9%.
Conclusion: In frequent exacerbators the frequency of exacerbations is not related to the time without exacerbations. In addition, time without exacerbations was a better predictor of disease-specific QoL than exacerbation frequency. This suggests that time without exacerbations should be preferred above exacerbation frequency as an outcome in studies on the impact of exacerbations in patients with COPD.
Declaration of Interest: None
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CR060
How well have the recommendations of the National Review of Asthma Deaths been implemented in Dumfries and Galloway?

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Aim: The National Review of Asthma Deaths (NRAD) led by the Royal College of Physicians in London was published in May 2014 with widespread publicity. In Dumfries and Galloway an evening meeting was arranged with one of the authors and an e-mail summary of the recommendations was sent from Managed Clinical Network lead to each GP and practice nurse in the area. In order to plan where to target support for practices we decided to assess the impact of this mass targeting of information approach on the implementation of the recommendations at a practice level.
Method: A questionnaire was sent to each practice in Dumfries and Galloway to be completed by the practice respiratory lead. The questionnaire was closely based on the recommendations for Primary Care from NRAD. Non responders were chased up twice over a period of a month. The questionnaire was self-reported and no detailed searches were required by the practices.
Results: Responses were received from 20 out of 35 practices. The main findings were that 95% or more of practices: a) had a named respiratory lead; b) followed up non attenders at asthma clinic; c) rapidly assessed acutely ill patients and had the equipment to treat them; d) had a process of identifying those most at risk; e) actively monitored medication use of asthma patients and f) used a standardised review template.
85% of nurses involved in asthma review held a recognised qualification in asthma 60% of practices followed up all asthmatics within 48 hours of discharge and a further 20% had plans to implement this. An average of 38% of patients had been given asthma action plans. 20% of practices had asthma as a regular topic of Significant Event Analysis.
Conclusion: As this survey was self-reported, there was no objective evidence that practices were actually doing all they said or that procedures were robust but high numbers of practices stating that they complied with most of the recommendations was encouraging. It was surprising that despite the guidance of the importance of asthma action plans that there was such a low percentage of patients who had been issued with one. Given that this figure was self-reported it would not be surprising if the actual figure is lower. Practices had been given supplies of both paediatric and adult asthma action plans to use from the Respiratory Managed Clinical Network. Feedback suggested these were too detailed and a more basic one has been devised.
Declaration of Interest: None
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CR061

The prevalence of comorbidities in Swedish COPD and non-COPD patients: The ARCTIC study

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Aim: To quantify the comorbidities of chronic obstructive pulmonary disease (COPD) patients and to compare the healthcare utilization of COPD patients with a non-COPD reference population.
Method: Medical records data from COPD patients were collected from 52 primary care centres in Sweden (2000–2014) and linked to national registries with information from primary and secondary care. Data included drug prescriptions, mortality, hospital care, income and social characteristics. Comorbidities were obtained from primary care records and from secondary care registries. The percentage of patients with a specified comorbidity was calculated for each day of the study period relative to the date of COPD diagnosis (index date) and compared with an age-, gender- and calendar year-matched reference population. Comorbidities were analyzed pre- and post-diagnosis and healthcare costs were categorized as COPD-related and non-COPD related, and comprised drug costs and primary and secondary care visits.
Results: There were 17,545 COPD and 84,514 reference group patients. A higher pre-COPD diagnosis comorbidity of asthma, depression, type II diabetes, osteoporosis, fractures, cardiovascular disease, rheumatoid arthritis, and lung cancer was observed in COPD patients compared with the reference population (table). Two years post-diagnosis, the comorbidity rate increased for both the COPD and the reference patients, but the proportion of COPD patients with each comorbidity was considerably higher than the reference population (table). Costs of treating COPD comorbidities were higher than COPD-related costs at all time points (e.g. €8,295 vs €620 for non-COPD vs COPD-related hospital nights, respectively, in 2013).
Conclusion: Comorbidities are more prevalent in COPD patients than non-COPD patients and are the major contributor to healthcare costs.
Declaration of Interest: The study was funded by Novartis BS has received honoraria for educational activities/lectures/advisory boards from AstraZeneca/Boehringer Ingelheim (BI)/GlaxoSmithKline/Novartis/MEDA/TEVA. CJ has received honoraria for educational activities/lectures/advisory boards from AstraZeneca/BI/Chiesi/Novartis/TEVA K.Larsson has served in advisory board/speaker/education roles for AstraZeneca/BI/GlaxoSmithKline/MEDA/MSD/Takeda/NovartisChiesiTeva. GJ is a steering committee member for this study and served on advisory boards for AstraZeneca/Novo Nordisk/Takeda. K. Lisspers has received honoraria for educational activities/lectures/advisory boards from AstraZeneca/GlaxoSmithKline/Novartis/MEDA/Takeda. KK and J-BG are Novartis employees. KK has received honoraria for educational activities/lectures/advisory boards from AstraZeneca/BI/Chiesi/ELPEN/GSK/MSD/Novartis/Takeda/UCB. LJ and PS are IMS Health employees, who received remuneration for statistical analysis.
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[CR061]

Table 1. Comorbidity profiles pre- and post-COPD diagnosis in COPD and reference patients

Comorbidity	*2 years pre-first COPD diagnosis*		*2 years post-first COPD diagnosis*	
	COPD patients (%)	*Reference patients (%)*	*COPD patients (%)*	*Reference patients (%)*
Asthma	10.1	5.6	37.0	7.8
Depression	5.0	2.8	21.3	4.1
Type II diabetes	5.6	3.8	19.0	5.7
Osteoporosis	1.3	0.7	10.7	1.2
Fractures	7.5	5.7	32.3	8.6
Cardiovascular disease	30.2	21.6	81.8	30.7
Rheumatoid arthritis	1.5	0.9	3.7	1.2
Lung cancer	0.4	0.1	5.5	0.2

CR062

Symptomatic treatment of pollen-related allergic rhinoconjunctivitis in children: randomized controlled trial

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Aim: Allergic rhinoconjunctivitis (AR) affects almost 12% of the children. The main symptomatic treatments are intranasal corticosteroids (INCS) (used daily or on demand) and oral antihistamines. Which treatment brings the best relief of symptoms in children is not clear. The aim of this study was to test whether daily use of INCS is superior to on demand use or to oral antihistamines on demand.
Method: Children (6-18 years old) with (grass) pollen related AR and previous symptoms were randomized to either INCS daily, INCS on demand or oral antihistamines on demand, for three months during the hay fever season. A daily online symptom diary on both nose and eye symptoms was completed. The main outcome was the percentage of symptom free days. A difference of 10% points was considered clinically relevant.
Results: We randomized 150 children. The percentage symptom-free days was in favour of INCS on demand (30%) compared with INCS daily (22%), i.e. 8% difference (95% CI -5 to +21%; not significant). The antihistamine on demand group had 15% symptom-free days; i.e. 7% difference compared to INCS daily (95% CI -6 to +19%, not significant). Patients in the INCS on demand group used on average 61% less fluticasone than patients in the INCS daily group during the study period ($P > 0.000$).
Conclusion: This trial with three parallel treatment groups shows that INCS daily was not superior to INCS on demand or to antihistamine on demand regarding the number of symptom-free days. An on-demand INCS strategy has the advantage of a lower overall corticosteroid exposure and less costs.
Declaration of Interest: None
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CR063

Lung cancer epidemiology: Two decades' records collected by the cancer registry of Crete

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Aim: Greece lacks national systematic records of lung cancer (LC) cases. The regional Cancer Registry of Crete (CRC) operates since 1992 aiming to collect cancer mortality/morbidity data and propose reliable preventive and management measures.
Method: Data of LC cases (1992-2013) were obtained from the CRC. Age-standardized Mortality Rates (ASMR), Age-Standardized Incidence Rates (ASIR) and Age-standardized Ratios (SMRs) were estimated to assess the LC burden. Survival analysis was performed (1st, 5th, 10th and 15th year after diagnosis). Kappa statistic and Getis Ord G were estimated to capture the present status ($a = 0.05$), while a prediction model (Bayesian Kriging) spatio-temporally estimated the expected rates for the next decade.
Results: LC mortality differs significantly among Crete's municipalities (Pvalue = 0.02); mean ASMR of 36.5/100,000/year [males:66.8/100,000/year, females: 10.3/100,000/year], while 9% of new cancer cases are accredited to LC (40.2 new LC cases/100,000/year). LC hot spots were observed in south-east and north-west Crete (RR = 2.1; 95%CI = 1.381-3.205). LC mortality rates varied

among years for both genders, with men presenting slightly increasing rates (1992: 66.5; 2013: 66.8) and women significantly ranging from 6.9 in 1992 to 10.9 in 2013 (Pvalue = 0.01). Around 8% survived LC for 10 or more years, while survival decreases based on the year of diagnosis (1st: 35%; 5th: 12.7%; 10th: 8.1% and 15th: 7.8%). Women present different trends in terms of mortality and morbidity as well as survival, while their rates are expected to increase within the next 10years (predicted ASMR = 12.1/100,000/year and predicted ASIR: 13.7/100,000/year).

Conclusion: Burden of LC in Crete is lower than in Europe, but presents constantly increasing trends especially among female residents of eastern Crete. Therefore, targeted preventive measures and comprehensive rehabilitation programmes should be adopted, within Primary Care settings at LC hot spots in Crete to cover the full spectrum of LC care and prevention.

Declaration of Interest: None

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CR064

"A different kind of breath": Re-perceiving breathlessness after mindfulness training

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Aim: Patients with asthma and COPD often experience anxiety and depression in relation to their respiratory condition. The aim was to explore, through qualitative interviews, the experiences of patients with asthma and COPD participating in an 8 week Mindfulness Based Cognitive Therapy (MBCT) course. Our analysis of the data used the multi-dimensional model of dyspnea (MDP) framework to explore differences within the individual patient's experience and response to dyspnea after the course.

Method: 22 patients were recruited from primary and secondary care to receive an 8 week course in MBCT, delivered in a community setting. Of the 22 patients who attended the course, 12 patients were purposively sampled to take part in an in-depth qualitative interview two months after completion. We also collected enquiry data from each weekly session (discussions that took place between participants and the mindfulness teachers). Verbatim enquiry and interview data were recorded, transcribed and analysed. Within a framework analysis we used different components of the MDP model (i.e. descriptions of sensory intensity, descriptions of immediate unpleasantness, descriptions of emotional responses, immediate (reactive behaviours) and long term behavioural changes (lifestyle changes)) to organise the verbatim data. The analysis then articulated different types of mindfulness attention that may be useful for dyspnea. This allowed us to build up examples of different types of mindfulness attention and see their relationship to the components of the MDP model. We also looked across the data set for disconfirming cases.

Results: Mindfulness training appears to develop three types of mindful attention (broad attention, informative attention and re-directive attention) which impact upon the sensory perception of breathlessness. In the affective stage 2 of the MDP model, all three types of mindful attention are influential in reducing the intensity of emotions experienced.

Conclusion: MBCT appears to target affective and sensory perceptions outlined in the MDP model. The findings reported here improve our understanding of differences in dyspnea for chronic respiratory disease. Training in mindfulness may improve the ability to detect and monitor respiratory load and immediate ventilatory needs by cultivating a non-evaluative awareness of interoceptive (internal) sensations which over time may mediate perceptions of these sensations. MBCT may help primary care patients learn how to adjust to breathing related anxiety and other psychological barriers that impede coping and living with a chronic respiratory condition.

Declaration of Interest: None

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CR065

The economic burden of COPD in a Swedish cohort: The ARCTIC study

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Aim: To assess healthcare utilisation and societal costs associated with chronic obstructive pulmonary disease (COPD) in a large Swedish retrospective cohort.

Method: Primary care medical records data from Swedish COPD patients (2000–2014) were linked with information from national primary and secondary care registries. Data included prescriptions, mortality, hospital care, income and social characteristics. Direct costs were categorized as COPD-related or not COPD-related. Drug costs (patient fees+subsidized prices), outpatient/inpatient costs, and primary care visits (divided into nurse and physician visits) were also calculated. Indirect costs (i.e. loss of income) were calculated by comparing age group-specific income levels between COPD patients and case control-matched reference patients. Income was defined as pre-tax earnings, excluding pensions or welfare benefits.

Results: 17,545 COPD patients and 84,514 reference patients were analysed. The economic burden of COPD varied markedly by age group (Figure). The main driver of direct costs across all age-groups was hospital nights not related to COPD (predominantly associated with cardiovascular disease). Respiratory drug costs were similar across age-groups; however, costs of COPD-related and non-COPD-related nights in hospital increased with age. Direct COPD-related costs increased with disease severity: €7,320 for mild (FEV_1 > 80% predicted), €8,280 moderate (FEV_1 50–80%), €9,230 severe (FEV_1 < 50–30%) and €11,810 for very severe (FEV_1 < 30%) disease. For patients of working age (< 67 years), indirect costs was the largest contributor to total economic burden (Figure). The mean total cost per year was €17,518; €10,750 as direct and €6,768 as indirect costs. COPD patients' income was, on average, less than half that of the reference population (e.g. €11,500 vs. €29,000 in 2012).

Conclusion: Non-COPD related hospital nights are the largest direct cost and increase with age. Direct COPD-related costs increase with disease severity. Indirect costs represent the largest economic burden associated with COPD patients of working age.

Declaration of Interest: The study was funded by Novartis. K.Lisspers has received honoraria for educational activities/lectures/advisory boards from AstraZeneca/GlaxoSmithKline/Novartis/MEDA/Takeda. BS has received honoraria for educational activities/lectures/advisory boards from

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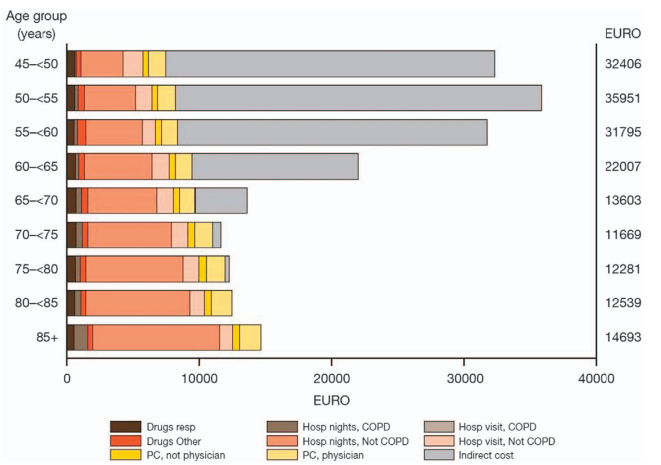

Figure 1. Direct and estimated indirect costs stratified by age category. Note. Costs in EUR during 2013 Brown = COPD; orange = not COPD; yellow = primary care; blue = loss of income (indirect costs). PC = primary care.

AstraZeneca/Boehringer Ingelheim (BI)/GlaxoSmithKline/Novartis/MEDA/TEVA. K.Larsson has served in advisory board/speaker/education roles for AstraZeneca/BI/GlaxoSmithKline/MEDA/MSD/Takeda/NovartisChiesiTeva. GJ is a steering committee member for this study and served on advisory boards for AstraZeneca/Novo Nordisk/Takeda. CJ has received honoraria for educational activities/lectures/advisory boards from AstraZeneca/BI/Chiesi/Novartis/TEVA MC-S and J-BG are Novartis employees. MU, LJ, and PS are IMS Health employees, who received remuneration for statistical analysis.
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CR066
PAMA (Minimum asthma package). Approach from Primary Attention

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Aim: Analyse if "PAMA"'s application in primary attention: Improves asthma control level and its quality of life; reduces the number of asthma exacerbations and visits. Secondary aims: To determine which time interval is more effective for "PAMA's" application. PAMA's cost effect.
Method: 3 year randomized clinical trial including 10 primary attention centres. 498 asthmatic patients (18 to 75 years old) recruited at the beginning were divided in 4 groups: Group I PAMA's application every 6 months ($n = 124$); II: every 12 months ($n = 120$); III: every 18 months ($n = 115$); control group: regular clinical practice ($n = 139$). "PAMA" consists of: explaining the disease, inhaler systems and exacerbations symptoms, application of asthma control test (ACT), delivery of an asthma action plan for the exacerbations and an avoidance plan.
Results: Baseline results compared to the ones after one year were the following. Taking into account that after one year follow-up 392 patients were still participating in the study: 110 in the control group, 84 in group I, 98 in group II and 100 in group III. Average age of 49 and 50.6 years old respectively. 72/73.5% women. 18.7/16.1% of smokers (significant differences $P = 0.05$). 70.1/73.2% of the patients had well-controlled asthma, 24.1/18.6% partially controlled and 5.8/4.8% poorly controlled. 36.9/36% of patients had intermittent asthma, 17.3/22.2% mild persistent asthma, 40/35.7% moderate persistent and 5.8/4.1% severe persistent. The average ACT score was 20.9 (SD 4.2) at baseline and 21.8 (SD 4.14) after one year, and mini-AQLQ was 5.7 (SD 1.1) and 5.98 (1.05) respectively. No significant differences. The percentage of patients who presented exacerbations one year prior and one year after the study (46,76% vs 39,8% in the control group, 58,06% vs 43.02% in group I, 52,17% vs 43,88% in group II and 49,19% vs 52,55% in group III respectively) did not show significant differences between groups. Costs only due to exacerbation visits were: in the control group 7447/5182 euros, 7391/3330 euros in group I, 5897/5466 in group II, and 8116/5357 euros in group III.
Conclusion: Study groups are comparable between each other. Patients included in the study maintain a good asthma control (ACT) and good quality of life (mini-AQLQ). There is a lower percentage of higher severity asthma patients. There has been a reduction in the total number of exacerbations and the patients who present them. Therefore a cost reduction has also taken place. There has been an increase in the number of patients who treat their exacerbations following an action plan.
Declaration of Interest: None
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CR067
Analysis of an intervention on primary care professionals for the improvement of health outcomes in acute exacerbation of COPD in primary care

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Aim: To examine the impact of an intervention on Primary Care (PC) professionals of a Health District on the clinical outcomes for treating COPD exacerbations by analysing indicators of process and outcome (Clinical audit).
Method: Design: Observational, cross-sectional audit of clinical practice. Setting: Malaga-Guadalhorce Sanitary District (DSMG). Participants: Exacerbated COPD patients treated by the extra hospital emergency services ($N = 523$; 21% losses). Interventions: Professional training in the usual clinical practice and inclusion of process indicators of COPD targets in relation with incentives. Principal measurements: Comparison of external audit results (process and results variables) from medical records and Health Outcomes (exacerbations, hospitalisations). Variable response: Difference of exacerbations and hospitalisations in two periods analysed. Bivariant and multivariant analysis.
Results: Average age was 75 (± 9.3), 63.7% males with a BMI of 29.4 (± 7.1), 21% active smokers. Average FEV1, 48.2% (± 18.7). Average of exacerbations in the first period, 2.86 (± 2.29) and in the second 1.36 (± 1.56) ($P < 0.001$). Average admissions in the first and second period, 0.56 (± 0.94) and 0.31 (± 0.66) ($P < 0.001$) respectively. The decrease in the number of exacerbations was directly associated with having ≥2 exacerbations in the first period, revised in primary care, and inversely with Heart Failure and with having ≥2 exacerbations in the second period ($R2 = 0.28$; $P < 0.001$).
Conclusion: The number of exacerbations and admissions in both assessed periods decreased significantly. However, the evaluated process indicators did not improve. Prospective intervention studies are necessary to establish the possible cause relationship.
Declaration of Interest: None
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CR068
Severe health status impairment in COPD patients treated in general practice: is it a problem?

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Aim: The vast majority of COPD patients are treated by the general practitioner (GP). It is assumed that these patients experience only mild health status impairment compared to patients treated by the pulmonologist. However, studies providing a detailed assessment of health status of COPD patients treated in general practice are lacking.
Method: We assessed health status using the Nijmegen Clinical Screening Instrument (NCSI). The NCSI provides a detailed assessment of health status by measuring eight sub-domains, covering symptoms, functional impairment, and quality of life. Normative data indicate sub-domain scores as normal functioning, mild impairment or severe impairment. We compared COPD patients treated by Dutch GPs with patients treated in a specialized respiratory care outpatient clinic.
Results: We collected data from 134 COPD patients (57% male, mean post-BD FEV1 66% predicted) treated in five general practices in the Nijmegen region and compared these with 303 patients (63% male, mean post-BD FEV1 55% predicted) treated in the University Centre for Chronic Diseases Dekkerswald. Percentages of GP patients with severe impairment varied from 21% (sub-domain "satisfaction with relations") to 65% (sub-domain "general quality of life"). This was comparable to patients treated by the pulmonologist. Fifty percent of GP patients experienced severe impairment in at least three of the eight NCSI sub-domains compared to 63% of patients treated by the pulmonologist.

Conclusion: One in every two COPD patients treated by the GP seems to experience severe health status impairment, which is unexpected and only slightly lower than in patients treated by the pulmonologist. Assessing health status in detail should form an important part of COPD disease management in general practice as it supports GPs in providing personalized COPD care.
Declaration of Interest: None
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CR069
Utility of the Nijmegen Clinical Screening Instrument (NCSI)-method as a tool for personalised COPD disease management in general practice

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Aim: To understand the impact of COPD on the individual patient, assessment of health status should form an important part of routine COPD care. The Nijmegen Clinical Screening Instrument (NCSI)-method provides a detailed assessment of health status, but has not been used in general practice so far. Our aim was to assess the utility of the NCSI-method in COPD disease management in general practice.
Method: We conducted a mixed-method non-experimental study in which we integrated the NCSI-method in an existing COPD disease management programme in five Dutch general practices. We assessed the utility of the NCSI-method by evaluating (i) the severity of health status impairment by using the NCSI-questionnaire, (ii) whether the NCSI-method fitted in the framework of the existing COPD disease management programme by using digital registration and logs, and (iii) how patients and practice nurses valued the NCSI-method by using focus group interviews.
Results: Of the 180 COPD patients enrolled in the COPD disease management programme, 134 (74%) filled in the NCSI-questionnaire, mainly by computer at home. Prior to the study, 81% of patients in the COPD disease management programme were estimated to have mild health status impairment. However, according to the NCSI-method, 50% of COPD patients experienced severe impairment in at least three of the eight NCSI sub-domains. The NCSI-method fitted well in the framework of the existing COPD disease management programme. Patients as well as practice nurses thought the NCSI-method was a helpful tool for tailoring COPD care to individual patient needs.
Conclusion: Severe health status impairment in COPD patients treated in general practice is more common than expected. The NCSI-method helps to assess health status in detail, fits in the framework of COPD disease management programmes and supports personalised COPD care according to patients and practice nurses.
Declaration of Interest: None
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CR070
Improving the quality of spirometry through use of Spirometry360, an online training and feedback system, in an outpatient setting in Bangladesh

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Aim: Spirometry is an important objective measure of lung function available in outpatient settings. This simple tool is increasingly available in low resource settings, but training on proper use and interpretation of spirometric data is limited. Spirometry360 was developed as a comprehensive online interactive training and feedback system for distance learning. We hypothesized that implementation of this training system would improve quality of spirometry at an outpatient respiratory clinic in Bangladesh.
Method: The Spirometry360 program was made available through University of Washington (UW) for five months. Funding was provided by the UW CoMotion Program. Our team of seven primary care physicians and one medical assistant was trained on the available modules: Spirometry Fundamentals and Self-Paced Learning Labs. Spirometry was performed on patients deemed appropriate for evaluation by their clinician. Personal health information was disabled when uploading tests to ensure patient anonymity. Tests were graded using ATS/ERS criteria. Monthly meetings were conducted with the clinical group to review feedback reports provided by Spirometry360 and discuss improvement strategies.
Results: A total of 3622 tests were uploaded from the beginning to the end of the intervention period from February to June 2015. A test was considered clinically useful if receiving a grade A, B, or C. Useful test rate improved from 85% (779/914) to 91% (488/ 538) (Chi-sq P-value < 0.01) over the course of the study, with Grade A tests increasing from 66% (599/914) to 77% (416/538) (Chi-sq P-value < 0.001). The most common failure types were submaximal effort, early termination, and variable flow.
Conclusion: Implementation of an online learning and feedback system improved quality of spirometry in a busy outpatient setting in Bangladesh. By improving the quality of testing, we may more accurately identify and treat obstructive and restrictive lung disease in low resource settings.
Declaration of Interest: None
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CR071
Validation of a novel smart-phone spirometer in adult and pediatric patients with respiratory diseases: a cross-sectional pilot study'

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Aim: There is an unmet need for user friendly and low-cost objective self-management tools for chronic lung diseases. A smart-phone based spirometer has the potential to make remote lung function monitoring available to anyone with a smart-phone. SpiroSmart is a novel spirometer software application for smart-phones that extracts pulmonary function measurements from the microphone as the user blows at the device from arm's length. In head-to-head comparisons of healthy subjects, SpiroSmart produces results very comparable to commercial spirometers. Creating a mathematical model for obstructive lung disease has presented unforeseen challenges, requiring many more patients than originally anticipated. Accordingly, the SpiroSmart team has welcomed involvement of both domestic and international partners. We report here on the user experience from Community Respiratory Clinic in Khulna, Bangladesh.
Method: After informed consent, during a single visit, head-to-head data are collected from patients with obstructive lung disease using SpiroSmart and the ndd EasyOne Diagnostic as the "gold standard" spirometer. Device sequence is randomly chosen. A quality grade is assigned to the SpiroSmart effort and tracing based on visual inspection by a clinical expert (MH). These data are then uploaded to train the algorithm for obstruction.
Results: To date, we have had 2002 patients contribute head-to-head data from this site, ranging in age from 5 to 90 years, and representing patients with all severity levels of obstruction. These data comprise the majority of our dataset. Analysis is currently ongoing and our first inspection of obstructed patient models will occur in February.
Conclusion: from these analyses are pending, and will be presented at the IPCRG meeting. We will also share the wealth of experience gained from using SpiroSmart in a busy clinical setting.
Declaration of Interest: None
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CR072

Pilot study to examine the feasibility of automatically providing results and treatment advices from lung function assessments directly to the patient

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Aim: Patients nowadays are well educated and the Internet provides easy accessible disease information which enhances patients' involvement in their treatment. Along with this development, previous research by our department showed that many asthma and COPD patients would like to have access in their medical results. We examined the feasibility of automatically providing results from lung assessments. Additionally, we evaluated patients' feedback.
Method: We included 46 patients (19.6% male, mean age 61.0 [range 20-86] years, 41.3% asthma, 30.4% COPD) who were assessed by an asthma/COPD-service for primary care. In the regular AC-service procedure patients are assessed using spirometry, the Asthma COPD Questionnaire (ACQ), the Clinical COPD Questionnaire (CCQ) and a history questionnaire. A pulmonologist judges the results from the assessments through the internet and provides patient's GP with diagnosis and treatment advice. For our study, we asked the GPs from the included patients to discuss these results with their patients within 3 weeks. After 3 weeks patients received their results at home by mail. An algorithm was developed to automatically generate a results overview for patients according to the 3 formats below (see table 1). We examined participants' opinions and preferences with an evaluation questionnaire.
Results: The algorithm was able to generate a clear overview for all 46 patients. In some cases, the pulmonologist gave an inconsistent medication advice. It was then not possible to automatically generate a clear advice for the patient and manual adaptations had to be made. Preliminary results from 24 evaluation questionnaires showed that 95.8% of participants want to view their lung function test results again, 79.2% preferred to view all formats. 75.0% to 95.8% considered the information to be understandable (depending on the format). Information about diagnosis and disease severity caused some patients to feel anxious (respectively 8.3% and 4.2%) which might have been caused by the fact that 50% of the patients were not informed about the results by their GP within 3 weeks. 75% considered the information to be helpful in dealing with their respiratory symptoms.
Conclusion: This study has shown that automatically providing results from lung function tests is feasible and well appreciated by patients. Some patients got worried by the diagnostic results and require extra attention when providing patients with their results. Questionnaires are still coming in, more extensive data will be presented at the IPCRG.
Declaration of Interest: This study was funded by the University Medical Center Groningen. TvdM is member of the board of trustees of Certe Laboratories.
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CR073

Opinion and preferences of young asthma patients about inhaler technique instruction: a qualitative interview study

Esther Metting[1], Mariëlle de Bruijn-Tameling[1], Thys van der Molen[1], Janwillem Kocks[1]

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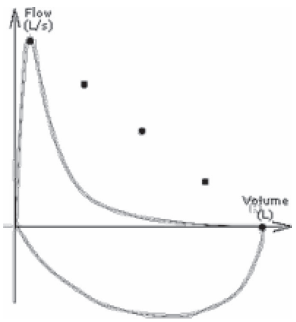
Aim: Patient: "I am sure that it would be OK. But let's say… I do not really experience it. I do what I think I need to do and hop, finished." Despite available effective treatment for asthma 45% of the patients are still uncontrolled. Inhaler therapy is the cornerstone of asthma management,

[CR072]

Table 1. Description and rating of the 3 provided formats

	Format 1	Format 2	Format 3
Content	• Diagnosis and explanation of diagnosis	As format 1, with additionally:	As format 2, with additionally:
	• Disease severity and explanation of disease severity based on ACQ, CCQ and pulmonary function testing	• Raw/Crude pulmonary function test results, expressed in numbers	• Patient's low-volume curve, for example: 
	• Medication advice and explanation of medication advice	• Raw/Crude ACQ and CCQ outcomes, along with a legend	
	• Lifestyle advice and explanation of lifestyle advice	• Correspondence between pulmonologist and GP	
Overall rating, mean [range]*	8[5-10]	7[2-10]**	8[4-10]**

*Participants rated our information on a scale of 1 to 10 (1 = lowest, 10 = highest).
Format 1 is very basic whereas format 2 and 3 also display crude test results. In format 3, patients see their own flow-volume curve along with a standardized "healthy" flow-volume curve.

however inhaler technique is poor and this leads to poor asthma control. Current guideline guided inhaler instructions are not enough to improve inhaler technique in all patients. We have evaluates patients' perspectives on inhaler technique instructions.
Method: Semi-structured interviews were used to interview 24 young asthma patients (average age 21.9 ± 3.7 years) about their experiences and preferences with inhaler instructions. Additionally we have evaluated their inhaler technique using video recordings. The interviews were audio-recorded, transcribed verbatim and analysed using grounded theory. We used a history questionnaire and the Asthma Control Questionnaire (ACQ) for background information. This data was analysed using SPSS.
Results: Male, 43 years: "I need at least an instruction about the inhaler technique. You can easily swallow a pill, but this is something else, something you have to get used to. I think that if you have practiced the technique once or twice you will do fine." 46% ($n = 11$) participants had controlled asthma (ACQ < 0.75). 25% of them used their inhaler correct while 75% rated their inhaler technique correct. All patients have had one or more inhaler instruction by GP, practice nurse or pharmacist. Remarkable was that most patients did not search for solutions regarding inhaler technique if they had trouble using their device at home. Inhaler instructions should be 1) personal, 2) given by a qualified instructor, 3) include hands-on training and feedback, 4) include information about asthma and the working mechanism of the medication. Some patient would like to have additional (digital) information to use at home. Follow-up assessment were not preferred by all patients.
Conclusion: Woman, 23 years: "I do not remember very well whether it (aero-chamber) had to make a sound or not. I remember that they said you could use it to check if you inhale correctly but it was not clear how." We obtained new ideas for improving inhaler technique. The most important finding is that inhaler instruction should be embedded in information about asthma: healthcare professionals should explain the reasoning behind inhaler technique. This study is part of the European study from the Inhaler Research Workgroup.
Declaration of Interest: This study was funded by AstraZeneca with an unrestricted grant.
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CR074
Clinical validation of a remote sleep apnea detection device

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Aim: The main purpose of the current study is to investigate the accuracy and effectiveness of a remote sleep apnea detection device, which could detect heart and breathing rate.
Method: The device includes two sensors, which monitor the weight and the vibration of the bed, respectively. The device is placed underneath one of the feet of a bed and connected to a cloud server through internet. Two hundreds of patients, which include 136 male and 64 female, were recruited from sleep center in Zhongshan hospital, Fudan University, in Shanghai from January 2014 to December 2015. The age of patients ranges from 18 to 80, and the mean age the group is 34.4 ± 9.5. The patients were simultaneously monitored with a traditional polysomnography (PSG) device and the remote sleep apnoea detection device for studying sleep disorders.
Results: We found that there was no difference in heart rate, breathing rate, the time of awakening, and the total sleep time between the two devices.
Conclusion: Our study indicates that the newly developed remote sleep apnoea detection device is able to monitor the heart and breathing rate of patients subjected to sleep disorder tests and could be potentially used in Medical Internet of Things (MIoT) ecosystem.
Declaration of Interest: None
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CR075
Prevalence of subjective swallowing dysfunction in patients with stable COPD. The TIE-study

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Aim: The Swedish TIE-study is a prospective multi-centre study in primary and secondary care to identify the underlying etiology of exacerbations in COPD patients. The aims of this study were to investigate the prevalence of subjective swallowing dysfunction, i.e. oropharyngeal dysphagia (OPD), and to determine the relation to COPD disease stage (GOLD), gender, exacerbations and physical activity.
Method: In total 335 patients (58% female) with a physician- and spirometry-verified COPD diagnosis were included. Data pertaining patients' subjective swallowing ability was gathered through a questionnaire where patients were asked: 1. If food gets stuck in the throat when swallowed. 2. If they cough when eating and 3. If they choke when eating. Physical capacity was assessed by means of 30 seconds sit-to-stand test and 30 meters walking test.
Results: 117 (35%) experienced signs or symptoms (s/s) of OPD. Table 1 shows the distribution of patients. No significant difference was found between men and women. Subjects reporting OPD had a similar age (median, range) as subjects without OPD: 70 years (50-84) vs 70 years (49-85), $P = 0.90$. Patients who experienced a swallowing dysfunction were found in all stages with no difference between the stages ($P = 0.58$). No relation between dysphagia symptoms and acute visits due to respiratory problems ($P = 0.93$) or COPD exacerbations ($P = 0.59$) during preceding year were found. Subjects with dysphagia had poorer physical capacity, assessed by both number of sit to stand repetitions during 30 seconds ($P = 0.01$) and time to walk 30 meters at maximal speed ($P = 0.04$).
Conclusion: Swallowing dysfunction is more commonly experienced by COPD patients than in the general geriatric population (15-22%). Speech pathologists are trained to diagnose and treat OPD and could potentially play an important role in the multidisciplinary management of COPD.
Declaration of Interest: None
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[CR075]

Table 1. Distribution of patients experiencing oropharyngeal dysphagia (OPD) according to COPD disease stage (GOLD)

Stage (GOLD)	*Study population (n)*	*Patients with subjective s/s of OPD (n)*	*OPD by COPD stage*
1	23	11	44%
2	185	61	33%
3	94	35	37%
4	34	10	29%
Total	335	117	35%

CR076
Assessment of risk factors in acute bronchiolitis patients referring to emergency department

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Aim: Acute bronchiolitis is an inflammation and edema of the bronchioles resulting lower respiratory tract infection mostly caused by viruses in 0-24

months older children. In this study, we aimed to investigate the risk factors in patients with acute bronchiolitis.
Method: In this cross-sectional descriptive study, patients were children who diagnosed with acute bronchiolitis referring with wheezing complaints to emergency department of Izmir Tepecik Training and Research Hospital in the period of March 2015 - April 2015. Parents of the individuals were given a questionnaire investigating smoking at home, maternal smoking during pregnancy, heating source of the current residence, sharing the same environment with the child at night. Data distributions displayed using percentages.
Results: In the study, 9 patients were 0-3 months old, 18 patients were 3-6 months old, 25 cases were 6 - 12 months old, 21 patients were older than 12 months. We determined that %70 of the 74 cases has smoking in the family and in %44 of these cases also pregnancy maternal smoking occurred. Smoking took place in the homes of all the subjects of the ages 0- 3 months old, of %61 were 3-6 months old, of %60 were 6-12 months old and of %77 were older than 12 months. Maternal smoking during pregnancy has been noticed in the largest group with the 25 cases of 6-12 months old. %33 patient of up to three-months-old cases -which is the most critical group in terms of mortality- has been also associated with the maternal smoking during pregnancy. Home heating sources of the patients' were stove ($n=60$), air conditioning ($n=8$), electric stove ($n=4$), gas ($n=2$). Moreover 73 of 74 patients found to be sharing the same environment with the child at night. 17 children had suffered multiple bronchiolitis attacks and 8 patients had no history of smoking in the family
Conclusion: Results of our study indicate variables as the use of smoke in the family, maternal smoking during pregnancy, heating sources and sleeping in the same room are significant environmental risk factors for acute bronchiolitis.
Declaration of Interest: None
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CR077
A survey of knowledge, attitudes and practices of doctors in general practice in Singapore towards chronic obstructive pulmonary disease

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Aim: To examine the knowledge, attitudes and practices of doctors in general practice towards chronic obstructive pulmonary disease (COPD) in Singapore and to understand the barriers towards managing COPD by general practitioners (GPs) in Singapore.
Method: A descriptive cross-sectional study was conducted using a self-administered questionnaire through a postal survey sent to 1619 members of the College of Family Physicians Singapore.
Results: Out of the 1619 questionnaires mailed out, 425 were returned (26.25%). The survey showed poor awareness of COPD with 8.9% not knowing the prevalence rate and 11.8% stating the prevalence of COPD as less than 5%. There was an over-reliance on symptoms, low use of spirometry and high use of X-rays in the diagnosis of COPD. GPs also had low access to spirometry with 33.1% having direct access. However, they correctly based treatment decisions on symptoms, exacerbation history and COPD assessment scores. The most commonly used pharmaceutical agents were inhaled short acting broncho-dilators followed by inhaled corticosteroids with long acting beta agonists. Guideline-recommended inhaled long-acting bronchodilators were not commonly used. Only 42.6% used COPD guidelines with GOLD guidelines being the most commonly used. Half of the GPs felt that their lack of knowledge of COPD was a barrier to treatment, with patient's lack of knowledge, poor compliance and medication costs being other barriers. GPs with post-graduate qualifications were more likely to use guidelines and spirometry. Private sector GPs had less access to spirometry used less spirometry.
Conclusion: Despite being an affluent country, COPD diagnosis and treatment in Singapore still falls short of guideline recommendations. More education is clearly needed for both GP and patient, with increased access to spirometry. The cost of medications should also be looked into.
Declaration of Interest: None
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CR078
Chilaiditi syndrome with dispnea disease and chest pain

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Aim: Chilaiditis sign, which means colonic interposition between the liver and diaphragm as a radiologic evidence, first documented in 1865 but named in 1910 by Denetrius Chilaiditi when he reported three cases of asymptomatic patients with this radiologic sign on routine abdominal or chest x-ray. This sign found incidentally in 0.025%–0.28% of chest and abdominal plain films and 1.18%–2.4% of abdominal computed tomography (CT) scans. It is four times more common in male than female. Our main purpose in this case is to emphasize interpreting the patient with history, physical exam, laboratories and plain films on whole as a primary care medicine instead of focusing just previous diagnosis.
Method: In this case an 82-year-old man, who presented to the emergency department several times with frequent chest pain, dyspnea and extreme abdominal distention, was diagnosed with chilaiditis syndrome with chest x-ray during his clinical follow up visit. His main complement was chest pain as he presented to the Emergency Medicine for six times through the last 5 years. His cardiac enzymes were in normal range or mild above the upper limit. But he has abnormalities in ECG diagnosed as right bundle brunch block and arritmia. We informed the patient as a primary care medicine about chilaiditis syndrome, its symptoms and how to manage it like bed rests, fluid supplementation nasogastric decompression laxatives and stool softeners.
Conclusion: In primary care examinations, Chiliaditi syndrome should be considered in patients with chest or /and abdominal pain. We must be careful about Chiliaditi syndrome in primary care examinations.
Declaration of Interest: None
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CR079
Evidence based practice in using antibiotics for acute tonsillitis in primary care practice

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Aim: To assess use of evidence based practice among general practitioners in antibiotic prescribing for acute tonsillitis in R.of Macedonia.
Method: Data are used from national project about antibiotic prescribing for acute respiratory tract infections which has been run in 2014 November as a part of E quality program. 81 general practitioners from Macedonia have taken participation. The group of 1768 patients, old from 2 months to 88 years of age, with diagnosis of acute tonsillitis was analysed. Antibiotic prescription was compared to the Cochran' guidelines which are used as national guidelines.
Results: 88.8% of patients were treated with antibiotics. Most of the patients (45.2%) are at age range between 3-14 years. Diagnosis is mostly done based on clinical picture. In 2.4% is performed CRP, and in 1.9% streptest. According Centor score, 28% of patients with Centor score $< = 1$ the most were treated with antibiotics, while 8% with score 4 and 5 didn't received antibiotic. In 889 patients (50.8%) with score 2 and 3, 88.5% of them were treated with antibiotics. There is no correlation between prescription of antibiotics for acute tonsillitis and age of the patient, day care or school attendance, parent's

education or education of patients and working status of patients (Spearman Rank Order Correlation; $P > 0,05$). The most prescribing drug was amoxicillin-clavulonate (622 patients), while only 47% of patients received a recommended antibiotic according the guideline. 2.5% were treated with ampular therapy.
Conclusion: There is inappropriate prescribing of antibiotics and broad spectrum antimicrobial drugs in patients with acute tonsillitis in Macedonia. Use of guidelines and Centor criteria can help in rational prescribing, but it should be supported with laboratory tests. Although there are guidelines, compliance is still very low.
Declaration of Interest: None
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CR080
COPD guides and inhaled corticosteroids. Do we prescribe them correctly in primary attention?

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Aim: To determinate the number of patients that are being correctly treated with inhaled corticosteroids (IC) according to the stage and the different guides. To determinate the percentage of patients treated correctly according to the stage, severity and the guide used (GOLD or GesEPOC).
Method: Multicentre transversal study in Barcelona city. A total of 401 patients diagnosed of COPD and with FEV1/FVC after bronchodilatation < 0.70 in spirometry test, from 6 primary attention centres, were included. The treatment prescribed to the patients was analysed and compared to the recommendations given in both guides. Statistical bivariate analysis.
Results: If we analyse the IC treatment according to GOLD's classification, the highest percentage of prescribed IC is in stage B (81.5%). Although, if we analyse it according to GesEPOC's classification, the highest percentage is in phenotype D (80%). The adequacy of prescribed treatment according to GOLD's guide is correct in 89.5% of the patients in stage B. On the other hand, according to GesEPOC's guide, 70.6% of phenotype C patients have IC correctly prescribed.
Conclusion: According to GOLD's guide, there's a high percentage of patients in mild and moderate stages who should not have IC prescrived. Regarding GesEPOC's guide, the same happens with phenotype A patients. There is a correct adequacy of prescrived IC in the other stages and phenotypes. Globally, we can observe a better treatment adequacy in mild and very severe stages according to GOLD's guide, and phenotypes A and C in accordance to GesEPOC's guide.
Declaration of Interest: None
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CR081
Avoiding infections among patients with COPD: cross sectional analysis of the Birmingham COPD cohort

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Aim: Most COPD exacerbations are caused by respiratory infections. Methods to avoid infection such as more frequent handwashing have been shown to reduce respiratory infections among healthy adults and children. The aim of this analysis is to explore the association between self-reported infection avoidance behaviours and risk of severe exacerbation using data from the Birmingham COPD cohort.
Method: The Birmingham COPD cohort is a unique primary care cohort which recruited 1558 patients with diagnosed COPD during 2012-13 from 71 general practices in the West Midlands, UK. Patients received one initial face-to-face clinical assessment with questionnaires at 6-month intervals. Questions about infection avoidance practices (hand hygiene and social distancing) were included within the 18 m questionnaire, along with sociodemographic and medical information. The primary outcome was self-reported inpatient hospital respiratory admission over the last 12months/length of stay. Logistic and Poisson regression were used as appropriate in cross-sectional analyses with adjustment for age, sex, smoking status, MRC breathlessness score, GOLD stage and number of co-morbidities.
Results: Complete data for 818 patients were available so far, of whom 534 (65.3%) were male and mean age (SD) was 71.4 (8.4) years. 75% patients washed their hands between 3 and 9 times per day, and 757 (93.3%) usually/always used soap. 200 (27.6%) patients washed their hands more than usual if someone they lived with had cold/flu, and 449 (55.3%) avoided meeting friends/relatives if they had a cold/flu. 77 patients (9.4% of available data) reported respiratory admissions in the previous 12months. After adjustment for potential confounding factors, participants who avoided meeting friends/relatives with respiratory infections reported fewer days in hospital (IRR 0.55 (0.46, 0.65)) and reduced number of admissions (IRR 0.90 (0.58, 1.40)) although this was not statistically significant. Other handwashing behaviours showed inconsistent patterns across outcomes.
Conclusion: This observational data suggests that avoiding friends/relatives with respiratory infections may be beneficial in reducing the impact of severe exacerbations among COPD patients. The effects of other infection avoidance behaviours are inconsistent but may be subject to recall or social acceptability bias, or reverse causation. Longitudinal analysis will be required to confirm if the association is causal.
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CR082
An effective COPD case finding strategy in Primary Care

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Aim: COPD remains widely underdiagnosed worldwide, but the most effective case finding approach is still unknown. We conducted a pilot study to evaluate the effectiveness of an opportunistic, targeted screening approach for COPD in Primary Care. We targeted high risk patients for COPD (smokers, having ≥ 1 respiratory symptom).
Method: Patients from different types of general practice settings in Greece (urban, semi-urban and rural) were included. They had to be ≥ 40 years, smokers or ex-smokers, with ≥ 1 respiratory symptom present (dyspnea, cough, wheeze or phlegm) and with no previous diagnosis of COPD. Smokers completed a short COPD screener questionnaire. Eligible patients were offered a spirometry.
Results: 250 patients from 5 GPs working in different Primary Care settings were included. 213 had an acceptable spirometry. From them, 82 patients (38.5%) were diagnosed with COPD (FEV1 / FVC $< 70\%$). The majority of them had mild or moderate obstruction. The number needed-to-screen (NNS) for a new diagnosis of COPD was 2,6.
Conclusion: Targeting those at higher risk (e.g., smokers) and pre-screening (e.g., using questionnaires) consist a highly effective and feasible strategy to identify undetected patients with COPD in Primary Care.
Declaration of Interest: None
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CR083

Correlations of Fractional Exhaled Nitric Oxide (FeNO) with asthma control and severity in asthmatic patients in Ho Chi Minh City, Vietnam

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Aim: To determine the association between FeNO and measures of asthma control [GINA classification and Asthma Control Test (ACT) score] and asthma severity (GINA treatment step).
Method: Prospective observational study performed at an outpatient respiratory clinic, in the University Medical Center, Ho Chi Minh City, Vietnam from March 2015 to January 2016. We included asthmatics, 12 year olds or older with an asthma diagnosis since at least 6 months (according to GINA criteria) and a non-asthmatic control group. Data collected included asthma history, symptoms, rescue medication use, spirometry and FeNO; in the control group only FeNO was assessed. Asthma control was classified according to GINA categories (uncontrolled, partly-controlled and controlled) and ACT categories (ACT score).
Results: 175 patients with asthma (73% female) with mean age 40 (±15) and 30 controls (60% female) with mean age 38 (±9) were recruited. Mean FeNO in patients with asthma was significant higher than this in controls (30 vs. 20.6 ± 13ppb, $P = 0.037$). FeNO was weakly inversely correlated to ACT score (Spearman's rho = -0.2, $P = 0.008$). FeNO was significantly different among asthmatics with different levels of GINA defined asthma control (uncontrolled, partly-controlled and controlled) with mean FeNO of 37 ± 30ppb, 34 ± 27ppb and 26 ± 19ppb, respectively ($P = 0.032$). Mean FeNO also different among three levels of ACT defined asthma control with 49 ± 38ppb in uncontrolled; 33 ± 28ppb in partly-controlled and 26 ± 16ppb in controlled asthma group ($P < 0.001$). FeNO was not significantly different between those with mild (30 ± 23), moderate (26 ± 21) and severe (31 ± 27) asthma estimated by GINA treatment step ($P = 0.59$).
Conclusion: FeNO values were elevated in patients with asthma as compared with patients without asthma FeNO was weakly associated with ACT score and levels of asthma control defined by GINA or ACT score but not with asthma treatment step. FeNO is feasible in low-income country settings and further research is needed to determine its clinical and cost effectiveness in the outpatient clinic setting.
Declaration of Interest: Aerocrine supplied the equipment for this study to the study team in Vietnam, and the IPCRG supported Nguyen Nhu Vinh as part of its E-Faculty programme.
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CR084

Preference of diagnostic tools, medications and devices for asthma management: A survey of doctors in Algeria

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Aim: The study aimed to assess the doctors' practice in using tools for diagnosis, prescribing medications and devices for treatment of asthma in Algeria.
Method: Data was collated from randomly selected physicians, paediatricians, allergists and pulmonologists through a questionnaire based survey, in 12 cities and 60 rural locations across Algeria.
Results: Of the total 213 doctors who responded to the survey, more than 90% doctors attend an average of 20 patients with asthma in a day. Peak flow meter was used by 69% doctors for diagnosis and by 93% for monitoring of asthma. It was also observed that about 76% used spirometry for diagnosis of asthma. Budesonide (86%), fluticasone (46%) and beclomethasone (40%) are the most prescribed ICS by doctors. Formoterol/budesonide is the most preferred option (72%), followed by salmeterol/fluticasone (57%) for the treatment of asthma. Salbutamol or levosalbutamol is preferred by 93% doctors as a reliever medication. ICS is the preferred controller in mild asthma (76%), and ICS/LABA combination in the management of moderate (74%) and severe asthma (80%), respectively. Most doctors (94%) prefer pMDIs with (46%) or without spacer (48%), over DPIs (57%) and nebulizers (14%) for treatment of asthma. Most of the doctors (83%) also perceived that pMDI with spacer would show a better outcome in asthma, over pMDI alone. Continuous exposure to allergens/smoking (73%) and incorrect inhaler technique (66%) were the top rated reasons for uncontrolled asthma.
Conclusion: The use of diagnostic tools in asthma was found to be fairly good among the doctors in Algeria. The preference of medication in treatment of asthma was found to comply with GINA guidelines by most of the doctors. The spacer was found to be less prescribed in regular treatment, despite having good awareness for its better outcomes.
Declaration of Interest: Nimit Mehta, Vaibhav Gaur and Jaideep Gogtay are full time employees of Cipla Ltd.
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CR085

Lung deposition analysis of two formulations of fluticasone/salmeterol HFA pMDI in stable asthma patients

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Aim: Lung deposition analysis of two formulations of fluticasone/salmeterol HFA pMDI (250/25 mcg) using functional respiratory imaging (FRI) based computational fluid dynamics (CFD) in asthmatic patients.
Method: In this randomised, double-blind, double-dummy, single-dose, two-period, crossover study, 16 stable adult patients with asthma received 2 puffs of either the test (Cipla Ltd., India) or the reference product (Seretide Evohaler, GlaxoSmithKline UK) on the first treatment day, and the alternative treatment on the second treatment day. The two dosing days were separated by a washout period of 3-7 days. The primary comparison was based on changes in airway volumes (iVaw) and surface area (iSaw) between baseline and post treatment for the test and the reference product assessed using FRI based CFD.
Results: Significant post treatment changes from baseline were observed for the test and the reference product (table 1). The difference in treatment effects between the test and reference product was not statistically significant for the imaging tests.

[CR085]

Table 1. Imaging test results for post treatment changes for the test and reference product

IMAGING TESTS	*Change Test Mean (SD)*	*Change Reference Mean (SD)*	P *value*
iVaw [cm^3]			
Total	3.72 (3.36)	3.23 (1.82)	0.393
Central	1.39 (1.61)	1.03 (1.17)	0.266
Distal	2.34 (2.12)	2.20 (1.37)	0.698
iSaw [cm^2]			
Total	22.33 (17.37)	20.25 (12.02)	0.660
Central	3.23 (2.68)	2.92 (3.12)	0.338
Distal	19.10 (15.73)	17.32 (12.00)	0.587
iRaw [kPas/L]			
Total	−0.012 (0.013)	0.014 (0.013)	0.453
Central	−0.002 (0.003)	0.002 (0.003)	0.897
Distal	−0.010 (0.011)	0.012 (0.011)	0.485

Conclusion: Lung deposition analysis confirm no significant difference in the treatment effects between the two formulations of fluticasone/salmeterol HFA pMDI.
Declaration of Interest: Juliet Rebello, Mayuri Mangale and Jaideep Gogtay are full time employees of Cipla Ltd. The study was funded by Cipla Ltd.
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CR086
Evaluation of asthma control in primary care using asthma control test and peak expiratory flow rate

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Aim: Asthma is considered a major health problem in Sri Lanka as well as globally. The burden of asthma is overwhelming. Asthma control has not been formally evaluated in Sri Lanka. This study has comparatively evaluated disease control with Asthma Control Test (ACT) and peak expiratory flow rate (PEFR).
Method: Asthma control was examined in a cross-section of 449 asthmatics above 5 and below 70 years of age using the ACT, and on the PEFR % predicted. Scores below 20 on the ACT and PEFR below 80% predicted indicated uncontrolled asthma. Simultaneously, patients were clinically evaluated, whether their asthma was controlled or uncontrolled. Asthmatics were again evaluated fortnight after treatment according to Global Initiative for Asthma (GINA) guidelines in two primary care clinics in Sri Lanka.
Results: Asthma control numbers were 344(76.6%) according to ACT and 345 (76.8%) according to PEFR. Performance of Asthma control of ACT and PEFR were basically considered for pediatrics (Age $< = 12$) and adults (Age > 12) groups separately. Kappa statistic indicated substantial agreement of the ACT for pediatrics 0.6099 (CI 95% 0.4506, 0.7692) as well as for adults 0.6345 (CI 95% 0.5212, 0.7478), While PEFR shows moderate agreement for pediatrics 0.5314 (CI 95% 0.3723, 0.6906) as well as for adults 0.4318 (CI 95% 0.3195, 0.5441) when compared with the clinical judgment. Pediatric and Adult status was associated with control on the PEFR ($P < 0.05$) but not with the ACT.
Conclusion: Asthma control evaluation is stable and independent with ACT for both pediatrics and adults age groups and it shows good agreement when compared with clinical evaluation. PEFR constitute poor agreement as compared with ACT and dependent with pediatrics and adults groups. This proves PEFR is unstable in evaluating asthma control but ACT is recommended for all ages.
Declaration of Interest: None
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CR087
Medical care and self-management support for asthma in primary care: a comparison between France and the United Kingdom

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Aim: Managing asthma in primary care relies on delivering both medical care and behavioural support for self-management. Clinical guidelines and behavioural research recommend several routine activities for optimizing asthma-related outcomes. However information on current content of care is scarce across health care systems, as is concrete advice on guideline implementation. We compared practitioner-reported routine asthma care in two European countries to understand variations in care and system- and practitioner-specific facilitators.
Method: Primary care practitioners participating in an asthma cohort study in France and the United Kingdom answered an online survey including 12 medical and 25 behavioural care activities. Questions were developed in English following literature review, back-translated in French, and pre-piloted. We compared the content and structure of asthma care and relationships with possible predictors, via psychometrics and association tests.
Results: The survey was completed by 156 French general practitioners (GPs), and 68 GPs and 52 nurses from 50 UK practices. French and British GPs reported similar behavioural support levels (Fisher's p)
Conclusion: Asthma care is facilitated in UK primary care by the collaboration between GPs and nurses. In both countries, developing positive beliefs and skills regarding behavioural support might help practitioners offer more comprehensive care.
Declaration of Interest: The research leading to these results has received funding from the European Community's 7th Framework (FP7/2007-2013) under grant agreement n°282593.
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CR088
What anti-smoking therapy lengthens withdrawal time most?

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Aim: This study compares the different treatments used to help give up smoking and tests which one keeps the patient smoke-free the longest.
Method: Descriptive cross-sectional study carried out in Primary Care. Collection of the data came from questionnaires, together with informed consents, completed by smokers who participated in the smoking withdrawal workshop. This data was analysed according to the time without smoking and the treatment used.
Results: Analysed questionnaires: 156. Data collection time: 2010-2015. Urban Health Centre. Males: 46.2%. Females: 53.8%. Average age: 52. Average smoking time: 32.74 years. Average withdrawal time: 14.36 months. 27.6% never tried to quit. 19.1% relapsed in a month. 18% informed of the therapy used to give up smoking, out of which a half used pharmacological treatment (smoke-free average time: 14 months), 22% used cognitive-behavioural therapy (smoke-free average time: 39 months) and the rest used other treatments.
Conclusion: Despite the few smokers that provide information, the cognitive-behavioural therapy exceeds the pharmacological therapy in the cessation time upkeep. It would be interesting to extend the study to a random sample of general population in order to test if these results are similar and assess the long-term effectiveness of the cognitive-behavioural therapy.
Declaration of Interest: None
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CR089
What causes smoking relapse?

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Aim: This study aims to understand the reasons why the smokers attending our tobacco withdrawal workshops, relapse. By understanding these reasons we will be able to work on those factors that lead to relapse in order to prevent them. Currently, cognitive-behavioural therapy is being used to help withdraw smoking, assuming environment and social events as the most frequent causes of relapse.

Method: Data was collected from Primary Care about smokers who attended the tobacco withdrawal workshop together with their corresponding informed consent. Analysis was carried out of the reasons why the patients relapsed after some time without smoking, the length of this time was noted as was the method used for withdrawing
Results: Questionnaires: 156. Period: 2010–2015. Urban Health Centre. Males: 46.2%. Females: 53.8%. Average age: 52. Average smoking time: 32.74 years. Average withdrawal time: 14.36 months. 62% informed of their reasons to relapse; Most of these (39) related relapse with social events and over-confidence in controlling the habit. There is also a high proportion of smokers who relapse because of stress or low mood (26).
Conclusion: As it was assumed, psychosocial factors such as social events or smoking environments predispose to smoking relapse. We conclude that in the interventions the strategies affecting these factors must be reinforced so that the smokers stay smoke-free longer.
Declaration of Interest: None
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CR090
Women and COPD: a systematic review of female gender specificities in primary care

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Aim: To describe the relationship between the female gender and the natural history of COPD (diagnosis, treatment, prognostic), in order to determine gender-specific management intended for primary care practitioners.
Method: A systematic literature review was conducted based on the PRISMA statement recommendations. The Medline and Cochrane databases were searched from 2005 to 2015, studies references were examined and grey literature was searched. The studies included were scored using R-AMSTAR scale, Newcastle-Ottawa Assessment Scale and the Cochrane collaboration Tool for assessing risk of bias.
Results: 40 articles were identified. Overall, analytical studies were of moderate quality (46% with a NOS score between 5 and 7). The majority were cross-sectional ($n = 18$), followed by longitudinal studies ($n = 11$), systematic reviews ($n = 7$, 3 with a meta-analysis) that were of mixed quality, case-control studies ($n = 3$) and finally one randomized controlled trial ($n = 1$) at a high risk of bias. Hospitals inpatients and outpatients accounted for 61% of the studied population and diagnostic certainty of an isolated COPD was obtained in only 3 studies. Women were more exposed to passive smoking and in low-middle income countries to air pollution. After the age of 50, they showed an annual decline of their Forced Expiratory Volume faster than men ($r2 = 0.56$; $P = 0.008$), regardless of the amount of tobacco consumed. For the same degree of bronchial obstruction, women reported more dyspnoea, which was correlated with the severity of a depressive disorder ($r = 0.364$, $P < 0.01$) and finally, women had less sputum. Women were most at risk of being underdiagnosed with COPD than men (RR = 2.6, 95% CI [1.14-6.26], $P = 0.24$). Their tobacco dependence was more behavioural and nicotine replacement therapy less effective than for men. For the same degree of bronchial obstruction, quality of life was more impaired than men, in its psychological as well as in its physical aspects. Anxiety was specifically associated with the risk of death in COPD women but not in men (HR = 13.76, 95% CI [2.13-88.6]; $P < 0.006$).
Conclusion: Studies had the best level of evidence in showing that women undergo a specific exposure to risk factors for COPD. Primary care research perspectives must be developed taking into account the gender dimension in order to develop gender-specific health care strategies.
Declaration of Interest: None
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CR091
Evaluation of systemic exposure between two nasal spray formulations of mometasone furoate in healthy subjects

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Aim: The aim of this study was to evaluate the total systemic exposure of mometasone furoate (MF) when administered as nasal spray between the test product (MF aqueous nasal spray suspension 50 mcg/ actuation of Cipla Ltd., India) and the reference product (Nasonex, containing MF 50 mcg/actuation of Merck Sharp & Dohme Ltd., UK).
Method: This was an open label, randomized, crossover study, in which 48 healthy adult male human subjects received a single dose of 400 mcg (4 x 50 mcg in each nostril) of test or reference formulation of mometasone furoate nasal spray on two treatment days separated by a washout period of 14 days. Blood samples of the subjects were collected post-dose up to 72 hrs. The primary endpoints were peak plasma concentration (C_{max}) and area under the plasma concentration-time curve from 0 to 72 hours ($AUC_{0\text{-}72}$).
Results: Of the 48 subjects screened, 45 completed the study. The mean ± SD values of C_{max} (pg/mL) for test and reference products were 17.15 ± 8.34 and 18.28 ± 8.21, respectively, and the mean ± SD values of $AUC_{0\text{-}72}$ (hr.pg/mL) for test and reference products were 192.61 ± 92.15 and 187.65 ± 103.45, respectively. The ratios of log transformed geometric mean of C_{max} and $AUC_{0\text{-}72}$ were analyzed to be 93.98 (90% CI: 85.61-103.17) and 105.56 (90% CI: 96.17-115.87), respectively. No serious adverse events was reported during the course of study and both the products were well tolerated after administration of single dose of 400 mcg.
Conclusion: The C_{max} and $AUC_{0\text{-}72}$ were within the bioequivalence limit of 80-125% in the study, and hence it can be concluded that the test product (MF nasal spray, Cipla Ltd.) was bioequivalent to the reference product (Nasonex nasal spray, Merck Sharp & Dohme Ltd.).
Declaration of Interest: Mukul Phatak, Shrinivas Purandare, Geena Malhotra, Kalindi Gandhi and Jaideep Gogtay are employees of Cipla Ltd.
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CR092
Fluticasone/Formoterol delivered via Revolizer® as maintenance therapy for persistent asthma: A real world effectiveness study in India

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Aim: To assess effectiveness, in real life setting, of fluticasone/formoterol (100/6 or 250/6 mcg) twice daily (FF) delivered via Revolizer® (dry powder inhaler device) in patients with persistent asthma.
Method: This was a 24 weeks, prospective, non-comparative, multi-centre, open-label, real-world observational study. Patients participating in this study were either already on FF at any dose via Revolizer® or were uncontrolled on other treatment via Revolizer® and required a change in their treatment to FF, as per treating physicians' discretion. We assessed asthma control at baseline, Weeks 4, 8, 16 and 24 using Asthma Control Test™ (ACT). Morning and evening peak expiratory flow rate (PEFR), day and night time symptom scores, and safety were also evaluated.
Results: Out of 401 patients enrolled, [mean age 41.1 ± 14.36; 202(50.37%) males; 140 (34.91%) patients had mild asthma, 192 (47.88%) patients had

moderate asthma and 69 (17.21%) patient had severe asthma], 385 completed the study. At Week 24, the asthma control was significantly improved (mean change ACT score 6.7 (95% Confidence interval: 6.32, 7.06, $P < 0.0001$) from baseline. A significant increase in ACT scores from baseline were also observed at Weeks 4, 8 and 16, all p

Conclusion: In a real world setting, twice daily fluticasone/formoterol significantly improved asthma control and was well tolerated in patients with persistent asthma.

Declaration of Interest: Mahip Saluja had received financial support for conducting the study by Cipla Ltd. Abhijit Vaidya and Jaideep Gogtay are employees of Cipla Ltd.

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CR093

Tobacco use and attitudes towards smoking among medical students in the Algarve region (Portugal)

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Aim: As there are no studies on the smoking habits of medical students in our region, it is of interest to determine their smoking behaviours, need for training and attitudes concerning smoking.

Method: Cross-sectional study by self-administered questionnaire to medical students from the University of Algarve (October 2014- February 2015), collecting biographical data, smoking habits, exposure to smoke at home, willingness to quit, need for training in smoking, opinions about anti-tobacco measures, role of physicians and e-cigarettes. The relationships between some of the variables were analysed using the χ^2 test, with pby SPSS® 19.0.

Results: We obtained 72.4% answers ($n = 105$): 54.2% female; mean age was 30 ± 4.6 years. The majority had tried smoking (68.5%), average age: 16 years. 21% of students are smokers, 18% are regular and 2.9% occasional smokers, although an additional 16% rarely smokes. Vast majority consumes manufactured cigarettes and started at 19 ± 2.8 years. There is slightly higher prevalence in men (53.8%); the average consumption is 7 ± 5 cigarettes/day; 5.6% smokes at home; 81% have a low nicotine dependence; 54.4% are determined to stop; 2/3 have tried quitting. Most students agree with banning smoking in public places (92.2%); 70.9% feel need more information about smoking and 50% agree doctors should not smoke as role-models of society -smoking behaviour influences this variable (T-Student $P = 0.004$) but does not the degree of studies (ANOVA $P = 0.909$)-.

Conclusion: The prevalence of smoking among our students is high, with a low dependence and better willingness to stop, in line with other Iberian surveys. Anti-smoking policies seem to reach consensus but not the beliefs about physicians play a key role as models for society, regarding smoking. Our students need to improve their knowledge about smoking and to be promoted for smoking cessation.

Declaration of Interest: None

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CR094

A difficult asthma management case

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Aim: Asthma is a complex, variable, recurrent disease with airway obstruction, bronchial hiperactivity and underlying chronic inflammation. The aim in the asthma treatment are reducing /eliminating asthma symptoms, improve daily/ physical activity, improve the sleeping quality(nor/less night awakenings), prevent from exacerbations,ensure a normal pulmoner function capacity (fev1/fvc) and less or no need for SABA drugs during follow up. The difficulties in the asthma treatment could be because of the patient or/and health personnel.

Method: A 43 years old (M) patient with HT, epilepsy, major depression, asthma and allergic rhinitis diagnoses applied to our hospital for valproic asid dose regulation. He used valporic acid 500 3*1, ICS+LABA inhaler 400 2*1, SABA inhaler 4*1. The FEV1/FVC rate was %68, the physical examination showed that he had hiperemic tonsils and by pulmoner oscultation you could hear roncus all over. The posterioanterior pulmoner chest x-ray showed no significant changes. The patient was overweight with a BMI: 36 kg/m^2, was smoking 4 packages/year and had no intention of becoming a non-smoker. He explained that he was in need of SABA ınhalers every time he walked more than 100 meters, that he had night awakenings almost every night a week. Also because of family problems he had a bad health follow up.Since one month he began using montelukast sodyum preparates including his asthma treatment and states that his asthma exacerbations had lessened due to the new treatment.

Results: Conclusion: Difficulties in asthma treatment can be caused by patient or/and health personnel. Patient oriented problems are taking asthma symptoms lightly or ignore them, bad treatment compliance, no faith in the asthma curability, smoking, false usage of inhaler /drugs or the expenses. Health personnel causes are ignorance or false judgement of the asthma stage which causes insufficient treatment, insufficient control follow ups.

Declaration of Interest: None.

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CR095

Quality of life and asthma control in elderly asthmatics: a seven year follow-up – results from the PRAXIS study

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Aim: Asthma in older adults is very common, though we know little about quality of life and asthma control in this population, especially not longitudinally. The aim of this study was to analyse the course of quality of life and asthma control between 2005 and 2012 in older asthmatics. Secondly, to compare these outcomes with younger asthmatics.

Method: 747 randomly selected asthma patients (age 18-75) from primary and secondary care completed two questionnaires seven years apart. The mini Asthma Quality of Life Questionnaire (miniAQLQ) was used to assess quality of life and asthma control was defined according to the Global Initiative for Asthma (GINA) guidelines, using symptoms, medication and emergency visits. Multiple logistic regression was used to evaluate possible predictors for decreased quality of life and uncontrolled asthma.

Results: Of the 747 responders, 496 patients were younger than 60 years in 2005 and 251 were 60 years or older. At baseline the older age group was more likely to have a lower educational level, to be a former smoker, to have a lower personal best of FEV1% predicted, more comorbidities (except for depression), less allergic symptoms, a higher treatment level and to have late-onset asthma. MiniAQLQ scores did not change between 2005 and 2012 in the older, and neither in younger asthmatics. The MiniAQLQ scores were significantly lower in older asthmatics compared to the younger (2005: 5.09 vs 5.46, $P < 0.001$; 2012: 5.12 vs 5.54, $P < 0.001$). The proportion of controlled asthma increased in both the older (29.3% to 40.4%, $P = 0.002$) and the younger asthmatics (37.2% to 44.3%, $P = 0.003$). Predictors for decreased quality of life and uncontrolled asthma were a lower educational level, having a depression or allergy, and being in a higher treatment level.

Conclusion: MiniAQLQ scores were lower for older asthmatics than for younger asthmatics, but did not change in the seven year follow-up period. The proportion of asthma control increased in both the older and the younger asthmatics. Optimizing clinical management is essential, especially also in the older asthmatic.

Declaration of Interest: BS has received honoraria for educational activities/ lectures/advisory boards from AstraZeneca/Boehringer Ingelheim (BI)/

GlaxoSmithKline/Novartis/MEDA/TEVA.CJ has received honoraria for educational activities/lectures/advisory boards from AstraZeneca/BI/Chiesi/Novartis/TEVAKL has received honoraria for educational activities/lectures/advisory boards from AstraZeneca/GlaxoSmithKline/Novartis/MEDA/Takeda. JH, MK, SM, TS, JS had no conflict of interests related with the present study.
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CR096
Advantages of case finding for COPD in asymptomatic smokers patients

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Aim: To determine the performance of a program of case finding for COPD in two health centres, among smokers older than 40 years, evaluating the number of newly diagnosed cases of COPD and those who are potentially treatable.
Method: Opportunistic case finding was conducted in two health centres for 6 months, performing spirometry with bronchodilator test in patients over 40 years of smoking more than 10 packs-years, regardless of the presence or absence of symptoms, and the reason of their visit. All of them were asked to complete the questionnaire CAT. Any patient with an obstruction and an FEV1 $<$ 80% (GOLD spirometric stages II, III and IV) was considered for treatment.
Results: In the six-month study to 310 patients, 284 held a valid spirometry to be assessed. Amongst those, COPD (FEV1 / FVC after bronchodilation of all patients diagnosed with COPD, 33.3% had mild spirometric impairment (FEV1 $>$ 80%), 55.6% moderate (FEV1 between 80 and 50%) and 11.1% severe (FEV1 between 50 and 30%). There were no patients with very severe involvement spirometric (FEV1 $<$ 30%). 66.7% of all patients diagnosed were considered suitable for treatment.
Conclusion: It is advisable to perform a spirometry to anyone smoking more than 10 packs-years, regardless of the presence or absence of symptoms, since two-thirds of those diagnosed are likely to require treatment.
Declaration of Interest: None
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CR097
Evaluating health seeking behavior of parents regarding ARI in under five years old children

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Aim: Acute respiratory infections (ARIs) are commonly experienced in primary care, adults 2-4 ARIs a year and children 6-8. The perception, knowledge, attitude and practice of parents play an important role in the reduction of morbidity in under 5 years old children. The Aim of this study is to evaluate the health seeking behaviour of parents, regarding ARI in under five year old children, to assess the attitude, practices and estimate the knowledge of parents, regarding ARI.
Method: Data are used from national project (cross sectional study) conducted in November 2014, at Primary care settings in Republic of Macedonia as a part of E quality program. Eighty-one physicians were included. Data was entered and analysed on SPSS 22.
Results: Group of 3027 patients, 0-5 years old, were analysed. The duration of illness was less than 2 days in 36, 2% and more than 2 days in 63, 8% of children. 13, 1% children are less than 1 year age, 57, 6% between 1 year and 3 years age and 29, 4% between the age of 4 to 5 years. Leading symptom in all three groups was cough with 81%, 71, 8% and 69% each.
Conclusion: Overall, the study showed that health seeking behaviour of parents indicates low level of knowledge among parents of children with ARI. Interventions like health education sessions, media campaign, banners etc. are needed to improve situation.
Declaration of Interest: None
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CR098
Atopic disorders in Dutch children: an epidemiological study in general practice

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Aim: In many countries, general practitioners (GP) will treat atopic children. The medical records of these children form a reliable source of epidemiological data. Calculating incidences and prevalence will give insight in the burden of these disorders on health care systems. Data on 'prescriptions' can be used to assess the accuracy of an atopic diagnosis given by a GP and will in addition also provide insight in frequently prescribed medication among atopic children. Data on 'comorbidity' can be used to study the epidemiology of atopic and non-atopic disorders and its interrelationships.
Method: Data of The Netherlands Institute for Health Services Research (NIVEL) Primary Care Database was studied, using routinely recorded data in electronic medical records. Prevalence will be calculated as percentages on the first of

January (point-prevalence), using prescription-data to assess the accuracy of the diagnosis. Incidences are calculated per 1000 persons years at risk. Data regarding comorbidity and prescriptions will be studied by calculating odds ratios.
Results: A total of 862.668 possible eligible children (0-18yrs) were derived from the NIVEL Primary Care Database in the period from 2002-2014. Finally, 478.076 met the inclusion criteria (e.g. a minimum of three year follow up). The mean age at the beginning of the registration is 7.2yrs (SD: 6.0) of which 51.1% were male. On average 2397 days (SD: 1724) of follow-up were available.
Conclusion: Data will be presented on incidences, prevalence, medication use and comorbidity of atopic dermatitis, asthma, allergic rhinitis and the combination of these three conditions in children.
Declaration of Interest: None
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CR099
Assessment of anterior segment findings in patients with obstructive sleep apnea syndrome

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Aim: To evaluate the anterior segment findings of the patients with obstructive sleep apnea syndrome (OSAS). Also we aimed to assess the findings in anterior segment which strongly indicating this syndrome.
Method: This is a prospective, comparative study of the 32 patients with OSAS and 36 age and sex-matched control subjects. After routine eye examination, anterior segment evaluation, including, keratometry, Schirmer testing, tear break-up time, lower and upper eyelid laxity measurements.
Results: There was no significant difference between two groups in respect of age and sex ($P = 0{,}10$ and $P = 0{,}19$ respectively). In our study group, all were severe OSAS cases. The mean keratometry value was 43 diopter in both groups and did not differ significantly ($P = 0{,}748$). Schirmer test comparison showed that the score was significantly higher in the OSAS group compared to the control group ($P = 0{,}004$). However tear break-up time was significantly lower in OSAS group, as compared with the control ($P < 0{,}001$). Both lower eyelid and upper eyelid laxity were significantly more in the OSAS group ($P = < 0{,}001$ ve $P = 0{,}011$ respectively).
Conclusion: In the present study, the eyelid laxity and Schirmer test were found to be higher in patients with OSAS compared to the controls. Additionally, tear break-up time was found to be lower than controls. Thus, ophthalmologists should refer their patients who have tear dysfunction and poorly respond conventional treatment for OSAS investigation. Similarly chest disease specialists and family physicians should be alert to the possibility of eye disorders in their patients with OSAS.
Declaration of Interest: None
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CR100
Change in health status in COPD over seven years of follow-up

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Aim: Health status is important in assessment of COPD. The aim was to examine associations of different clinical factors with change in health status measured by CCQ over a seven-year follow-up period.
Method: In 2005, 970 randomly selected primary and secondary care patients with a COPD diagnosis completed questionnaires including clinical characteristics and health status assessed by the Clinical COPD Questionnaire (CCQ). In 2012, 413 of 501 patients with information from 2005 completed the CCQ (main study group). Linear regression used difference in mean total CCQ score between 2005 and 2012 as dependent variable, and as independent variables; baseline CCQ score 2005, sex, age, educational level, BMI, smoking status, heart disease, diabetes, depression, number of exacerbations recent year, mMRC, and in a subgroup, COPD stage ($n = 237$).
Results: Health status worsened from mean total CCQ (+SD) 2.03 (+1.26) in 2005 to 2.16 (+1.37) in 2012 ($P = 0.011$). Linear regression with adjustment for baseline CCQ showed significant associations with worsened health status at the follow-up in 2012 for higher age, lower education, higher mMRC and higher COPD stage at baseline, and with improved health status at follow-up for BMI 26-30 kg/m2 at baseline. When sex, age and all statistically significant measures in the main study group were included simultaneously, higher mMRC at baseline was associated with worsened health status at the follow up (adjusted regression coefficient (95%CI) 0.26 (0.16 to 0.36), $P < 0.0001$), and BMI 26-30 kg/m2 at baseline with improved health status at follow-up (-0.32 (-0.56 to -0.09), $P = 0.008$).
Conclusion: In this study, higher mMRC is associated with decline in health status and overweight with improving health status in COPD. Strategies for decreasing dyspnoea and awareness of the possible increased risk of worsening disease in under and normal weight patients with COPD might be of clinical importance.
Declaration of Interest: JS has received lecture fees from AstraZeneca, Boehringer Ingelheim, Novartis, Takeda. SM, MH, MK have no conflicts of interest. CJ has received honoraria for educational activities and lectures from AstraZeneca, Boehringer Ingelheim, Chiesi, Novartis and TEVA, and has served on advisory boards arranged by AstraZeneca, TEVA and Boehringer Ingelheim. BS has received honoraria for educational activities and lectures from AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Novartis, MEDA and TEVA, and has served on advisory boards arranged by AstraZeneca, Novartis, GSK and Boehringer Ingelheim. KL has received honoraria for educational activities and lectures from AstraZeneca, GlaxoSmithKline, Novartis, Meda and Takeda and has served on advisory boards arranged by Meda, Novartis.
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CR101
Microspirometry as a 'point of care' test to facilitate the diagnostic process in subjects at risk of COPD in general practice. A cluster-randomised trial

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Aim: To investigate whether the use of FEV1/FEV6-based microspirometry as a point-of-care (POC) test during routine general practice consultations in subjects at risk of undiagnosed COPD who consult their GP with respiratory complaints is able to facilitate the diagnostic process for these individuals.
Method: We performed an 8-month clustered RCT. GPs allocated to microspirometry (MI) were instructed through e-learning in how to use a COPD-6 (Vitalograph Ltd) microspirometer in subjects who consulted them with respiratory complaints that could indicate undiagnosed COPD. The GPs were instructed to refer patients for full spirometry if pre-BD FEV1/FEV6 from microspirometry was lower than 0.73. Introduction of the COPD-6 was postponed in practice allocated to usual care (UC). Medical records of subjects that fulfilled the study criteria were analysed. Main outcome was a completed diagnostic process (DP) of COPD within 3 months after the initial GP office visit. Differences between MI and UC were compared using logistic regression with correction for clustering within practices and relevant covariates.
Results: 21 practices (83 GPs) participated. 78 subjects (of all 192 eligible subjects) were listed by GPs in the MI group and DP was completed in 60 subjects (77%), compared to 61 (out of 224 eligible) subjects and 27 (44%) completed DPs by GPs in the UC group (Odds Ratio: OR 2.9, 95%CI 1.0; 8.3). Final diagnostic conclusions were more frequent in MI subjects (OR 3.7, 95%CI 1.2; 11.0). Proportions of potential COPD patients that were identified by the GPs were 39% in the MI and 27% in the UC group, respectively.

Conclusion: Microspirometry facilitated the diagnostic process in subjects who consulted their GP with respiratory complaints that may indicate undiagnosed COPD.
Declaration of Interest: This investigator-initiated study was sponsored by Boehringer Ingelheim.
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CR102

Symptoms, comorbidities, mental health and frailty in patients with COPD in Greek primary care settings

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Aim: To explore symptoms and their diurnal variation in patients with COPD in Greek primary care settings. To explore which diseases are comorbid, if mental disorders and frailty is present.
Method: This was a cross sectional study. Thirty primary care practices were invited to participate across Greece. The plan was to obtain a general sample of more than 500 patients with COPD or asthma. The patients through an interview with the investigator answered 18 different questionnaires about their medical history, symptomatology, psychological status (GAD and PHQ), sleep habits (Sleep Index), medications, frailty (simple frailty questionnaire), etc. Spirometry measurements were recorded. A pre-tested questionnaire to explore which are the more bothering symptoms and their diurnal variability was constructed and distributed. Descriptive statistics are presented at this stage.
Results: We present preliminary results based on a sample of 146 COPD patients participating mainly from the island of Crete. All patients of the specific sample were male ($n = 146$,100%), mean age 64 (median $= 58$, SD = 15.2), married ($n = 144$, 98.6%), pensioners ($n = 134$, 91.7%), active smokers ($n = 136$, 91.3%). The most bothering symptom was dyspnea ($n = 83$, 55.3%) mainly in awaking ($n = 110$, 77.3%), followed by bad sleep due to dyspnea ($n = 61$, 40.7%).Comorbid diseases were hypertension ($n = 97$, 66.4%) dyslipidemia ($n = 38$, 26%) and in a less rate diabetes ($n = 4$, 2.7%). Feelings of anxiety and disappointment were reported. Those have never being evaluated by their physician before. In the sample regarding GAD and PHQ9 none of the patients scored high enough to be classified with psychological disorder, however there was a specific question for each questionnaire that many patients answered positively. In the frailty questionnaire only feelings of vanity were referred ($n = 56$, 37.3%).
Conclusion: General practitioners should give importance in diurnal variability, focus on smoking cessation, recognize common comorbidities and investigate frailty and mental disorders in order to evaluate the patient holistically
Declaration of Interest: Grant provided by IPCRG (International Primary Care Respiratory Group) following the UNLOCK project.
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CR103

Spirituality, coherence and self-efficacy of patients with COPD in Greek primary care settings

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Aim: To explore the role that spirituality, coherence and self-efficacy have in patients with COPD.
Method: This was a cross sectional study. Thirty primary care practices were invited to participate in the study. Patients with COPD answered the following questionnaires: the Royal Free Interview for Religious and Spiritual Beliefs (RFI), the coherence scale and the self-efficacy scale (SES). Coherence questionnaire investigates the positive thoughts and attitude of a person and self-efficacy is a scale to measure determination and self-esteem. High scores in these questionnaires indicate a firm capability coping with problems. The data were collected and recorded. Descriptive statistics are presented.
Results: Of the 580 participants we present the preliminary results of 146 patients with COPD. They declared to be spiritual ($n = 108$,74%) and all spiritual patients were found with higher scores in coherence and self-efficacy questionnaires in comparison to those that answered to have weak opinion about religion($n = 2$,1.3%).The mean score of each question in SES questionnaire was for spiritual patients 3(median $= 4$,SD = 1) and for coherence scale was 6(median $= 7$,SD = 1) compared to non-spiritual that the mean score for SES was 2(median $= 3$,SD = 1) and 5 for the coherence questionnaire respectively(median $= 6$,SD = 1). They fast in the fasting periods that religion suggests. As main religious related activity they refer praying.
Conclusion: These preliminary results show that spiritual patients are more self-confident and coherent. Better coherence and self-efficacy are parameters that enable a person to cope more effectively with daily stress. In that direction spirituality may help improving patients coping with life. Physicians of primary care should feel comfortable in discussing spirituality and try to promote it so to achieve a better coping with the disease.
Declaration of Interest: Grant provided by IPCRG (International Primary Care Respiratory Group) following the UNLOCK project.
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CR104

Challenges in recruiting primary care doctors for a randomized controlled trial to study change in prescription practices due to our educational intervention

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Aim: To recruit primary care doctors for a randomized controlled trial to study the change in prescription practices as an impact of our educational intervention.
Method: From the database of Primary Care Physicians from Pune and adjoining districts of the Indian Medical Association, we recruited doctors telephonically. Those who consented, received customized prescription pads to record respiratory cases, their symptoms, diagnosis and treatment prescribed. Their prescriptions were scored by a blinded study coordinator to identify a pool of doctors who did not manage Asthma according to the GINA guidelines. These doctors were enrolled in the study and randomized into study and control groups. Study group had to attend a one day training on Asthma diagnosis and management. Both groups are again keeping the prescription record for us to analyse if there is any change in prescription practices.
Results: 118/ 907 (12%) doctors we contacted telephonically agreed to participate in this study. Of the 118 only 52 doctors (44%) gave us their recorded prescriptions while 36% said they were too busy to record, 8% prescription pads were lost in transit, 2.5% lost them due to shift in practice, 4.23% dropped out and 4.23% sited other reasons for not recording. Out of the 52 doctors, 84.6% (44) doctors were managing their asthma cases inappropriately and we randomized them into study and control group. However of the 22 in study group only 13 (59%) came for the educational intervention. At the post training follow up, one dropped out leaving us with only 12 in the study group.
Conclusion: It is a real world challenge to enrol primary care doctors in a randomized controlled study involving them keeping prescription records and attending a training on Asthma. We need alternate, more simple methods to evaluate the impact of our training programmes.
Declaration of Interest: None
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CR105
Quality of spirometry performed by French general practitioners. A national descriptive retrospective study

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Aim: To assess the reliability of spirometry performed by the general practitioners (GPs) working in France, in terms of conformity and reproducibility of forced vital capacity (FVC) manoeuvres. To identify the GPs characteristics significantly linked with highest conformity of spirometry.
Method: A retrospective descriptive study was performed randomly among all the French GPs practicing spirometry according to the national health system. GPs were asked to send the last ten anonymized spirometry curves they performed and to fulfil a questionnaire about them and their practice. The FVC manoeuvre was evaluated by a scale based on the ATS/ERS guidelines, including three criteria evaluable on paper: good start of the test, volume plateau reached or exhalation ≥ 6 seconds and no cough during the first blow second. A manoeuvre was considered acceptable if it met all three criteria, usable if it met the first two criteria, unusable otherwise. The spirometry test was sorted by conformity degree: high conformity if at least three manoeuvres were acceptable and reproducible, good conformity if at least three manoeuvres were acceptable but not reproducible, intermediary conformity if at least three manoeuvres were usable, non-conformity otherwise. Statistics tests used were chi-square test for univariate analysis and a linear regression for multivariate analysis.
Results: 33 GPs were included. 547 manoeuvre were analysed: 490 (89.6%) were acceptable, 45 (8.2%) usable. 327 spirometry tests were analysed: 250 (76.5%) were non-conform whereas 51 (15.6%) met the high conformity criteria. Only 5 spirometry tests (2%) included three manoeuvres. Half of the GPs practiced in a GP group practice. GPs mainly used certified devices with disposable flow sensors. The average of reported duration of the spirometry test was 15.6 mn. GPs who declared having a formation performed significantly more acceptable manoeuvres than those with no formation ($P = 0.018$, OR = 2.1 [1.08-3.93]). The longest tests (20-30 mn) were more conform than the shortest ones (5-15 mn) ($P = 0.007$). The frequency of spirometry realization by the GP was not a significant factor, nor the age and seniority of the GP, nor the kind of practice.
Conclusion: French GPs performed conform FVC manoeuvres but spirometry tests are mainly non-conform, due to a lack of repetition of the manoeuvres to reach the repeatability criteria. GPs formation and duration of the test are leads to explore to enhance French GPs spirometry tests conformity.
Declaration of Interest: None
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CR106
Evaluation of the Spirometry quality in primary care in relation to the reference hospital

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Aim: To evaluate and compare the quality between of spirometries done in several primary care centers in relation to a reference general hospital.
Method: A cross-sectional study assessing a systematic random sample of the spirometries done during 2 months to people older than 14 years at 10 health centres and one general hospital. It was evaluated the quality of spirometry according to the regulations of ERS / ATS as a good start, adequate effort, no artifacts, duration of the test, number of tests performed and reproducibility, calculating the percentage of completion of each section and global compliance.
Results: We studied 547 spirometries (60.5% in PC and 39.5% in hospital). Complied the criteria good start, effort and the absence of artifacts the 63.7% of spirometries done in PC compared 75.8% in Hospital. The two most frequent errors were variable effort and duration of the test over 6 seconds only in 34.7% at PC, and 48.7% at HN. Overall, the quality was adequate at 26.6% in PC, and 29.9% in Hospital, with no significant differences between PC and Hospital.
Conclusion: The quality of spirometries can be improved, especially as it relates to the effort and duration of the test. The quality of Spirometry in PC is comparable to that obtained in a hospital
Declaration of Interest: None
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CR107
Adherence and beliefs to medication/inhalers in patients with COPD

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Aim: To assess whether or not patients with COPD have an adequate adherence to their therapy for inhalers and other medications, investigate if there is any difference between adherence to inhalers and other medications and if this is influenced by their beliefs.
Method: This was a cross sectional study where primary care practices across Greece were invited to participate. The questionnaires that patients were asked to complete were: a detailed personal medical history, the measure of beliefs about medicines (BMQ), the Medication Adherence Rating Scale (MARS), the MARS for inhalers and the Test of the Adherence to Inhalers (TAI). Descriptive statistics are presented.
Results: We present preliminary results of 146 patients with COPD (out of 580). Most of the patients were using dry powder inhalers($n = 78$,53.4),take three medications per day($n = 89$,61% as recorded in BMQ), took their medication the last week for 6.8 days(mean = 6.8,median = 7,SD = 1),have difficulty in remembering all dosages ($n = 80$,56.4% BMQ).They had a good opinion about effectiveness ($n = 138$,94.6% BMQ questionnaire) and presented not to be careless about taking their inhaler ($n = 141$,97.3% MARS questionnaire).Many of them interrupt the use of their inhaler when they feel better($n = 52$,34.9% MARS questionnaire).Most of them don't know the proper dose ($n = 89$,61% TAI questionnaire) and do crucial mistakes in utilization of their inhaler ($n = 114$,78% TAI questionnaire). Because BMQ and MARS questionnaires do not distinguish adherence for medications and inhalers, the differential between these parameters can be conducted after the general sample is examined and scores of TAI, MARS and BMQ questionnaires are compared.
Conclusion: General practitioners must be aware of the proper use of inhalers and demonstrate repeatedly the inhaler technique, investigate patients' beliefs and opinions about medication and explore if they take them constantly.
Declaration of Interest: This study was granted by IPCRG (International Primary Care Respiratory Group) following the UNLOCK project.
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CR108
Evaluating the prevalence and patterns of multimorbidity in children with asthma and their families from a disadvantaged Chilean population

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Aim: Multimorbidity has been defined as the "coexistence of two or more chronic diseases in the same individual". Individuals with multimorbidity are difficult to manage, need frequent health care, frequent hospitalizations, and represent a major cost to the health system. Primary health care professionals have reported difficulties to serve them in a time of limited consultation, leading to the adoption of a model of "sequential additive" decision-making, leaving important issues unprioritized during the consultation. This has

[CR108]

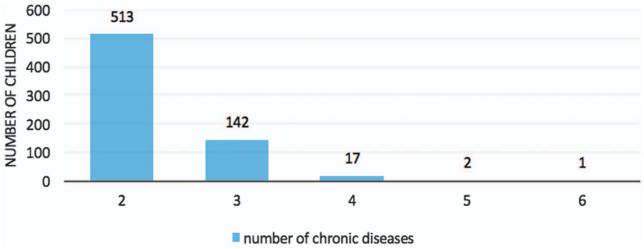

Figure 1. Multimorbididity in children with asthma.

motivated studies about the prevalence of multimorbidity to structure more appropriate care for these patients. Although, studies in younger population are scarce, particularly those about chronic respiratory diseases like asthma. The aim of the study is to identify the prevalence and patterns of multimorbidity in children with asthma and their families.
Method: Descriptive study using clinical data from a population of 72437 patients belonging to three primary health care centers in disadvantaged neighborhoods of Santiago de Chile. For the analysis the case mix ACG software system of the John Hopkins University was used. Data were extracted from the electronic medical record in use since 2005.
Results: The prevalence of asthma and multimorbidity in children (under 10 years) was identified: (a) Children (b) Children with asthma 2667 (21.3%) (c) Children with asthma and multimorbidity 675 (5.4%) (Figure 1) (d) Chronic respiratory conditions represent the most common health problem in children with multimorbidity. We identified 825 different patterns of multimorbidity. Individually, the association of childhood asthma were more frequent with mental health, oral health and nutritional problems. At family level the association of childhood asthma was more frequent with mental health problems within the family.
Conclusion: A significant prevalence of multimorbidity in children with asthma was identified in our population. Individual and family patterns of multimorbidity indicate the need for health care based on a model of family health rather than the sequential approach used today in primary health care also promoted by specific disease guidelines and many secondary level specialties.
Declaration of Interest: None
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CR109
The impact of incentives on the implementation of asthma or diabetes self-management: a systematic review

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Aim: To systematically review the evidence investigating the impact of financial incentives for implementation of supported self-management on organisational process outcomes, individual behavioural outcomes, and health outcomes for individuals with asthma or diabetes; both conditions with a mature evidence base for self-management.
Method: We followed Cochrane methodology, using a PICOS search strategy to search 8 databases, including a broad range of implementation methodologies. Selection was undertaken by TJ and CYH. Studies will be classified by robustness of methodology, number of participants and the quality score (Cochrane). We used narrative synthesis due to heterogeneity.
Results: We identified 2017 articles; 11 met our inclusion criteria. The articles were from the US ($n = 7$) with and UK ($n = 4$). Self-management outcomes that were measured were practice or practitioner performance scores for HbA1c testing ($n = 9$), written self-management plan for asthma ($n = 1$) and hospital/emergency department visits ($n = 1$). Three of the studies were part of a larger incentive scheme including many conditions; one focused on asthma; seven focussed on diabetes. The majority of interventions involved financial incentives being paid on target achievement except one which investigated reimbursement for intensive case management components. In asthma, the proportion receiving 'perfect care' (which includes written self-management plan) increased from 4% to 88% in one study, and there were fewer hospitalisations/emergency department visits in another study. In nine diabetes studies, quality-of-care/GP performance scores improved in 2/9, was unchanged in 6/9 and deteriorated in 1/9.
Conclusion: Results for the impact of financial incentives for the implementation of self-management were mixed. Overall, the evidence in diabetes suggests no impact in diabetes. There was evidence from single studies of improved process and health outcomes in asthma. Further research is needed to confirm these findings and understand the process by which financial incentives impact (or not) on care.
Declaration of Interest: None
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CR110
The prevalence of smoking and tobacco addiction among university students

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Aim: Five million people die worldwide each year because of health problems related to smoking. In our country, about 100 thousand deaths each year are performed for this reason (1). Smoking habits is also identified as a significant public health problem in our country (2). According to 2008 Global Adult Tobacco Survey of Turkey, daily tobacco consumption is 21.7% in the 15-24 age group, the rate was 34.9% in men and 9.1% in women. The same survey showed that 39.3% of daily smokers started to smoke at "15-17" age group (3). In this study, we aim to determine the prevalence of smoking in university students, to study the socio-demographic factors associated with smoking and to contribute preventive examinations to the program.
Method: This cross-sectional study was carried out on students of the Celal Bayar University between March and May 2015. Sample size and sampling method used in the study was initiated in order to reach approximately 3,000 students. The research data was collected by questionnaires created by researchers after obtaining verbal consent with students face to face interview. The dependent variable of the study was defined as smoking status. The independent variables were age, class, departments, current location and family smoking. Also Fagerstrom Tolerance Test (nicotine addiction measurement test) to measure the level of nicotine dependence were used. The data was evaluated with descriptive statistics and chi-square test.
Results: 2170 students participated in the study. 53.4% of the students were female, 46.6% of them were male. The average age of students was 21.5 ± 2.034. 23.6% of students ($n = 518$) were current smokers, 68.8% of students ($n = 1493$) said that they never smoked and 7.3% of them quit smoking. When we look at the current smoking, men were significantly more smokers than female students ($P < 0.001$) Table-1. Significant differences in smoking status were observed according to the location (*With Family, Dorm, With Friends, Alone*) of the students Table-2. The interesting note here is that the girls in the dormitory significantly higher smoking rate ($P < 0.001$). Current smoking rate in the Faculty of Engineering students (33.2%) was highest and the lowest was at the students of vocational school of health Table-3. Based on Fagerstrom Tolerance Test, 8.9% of students identified as addicts. Addiction was detected higher at male students and which were rest with friends.
Conclusion: As a result, smoking is a common behaviour among university students and increased rates of smoking was demonstrated at the later years of education. Lessons regarding the prevention of starting smoking should be

added to the curriculum. It should also be included in the curriculum in support of smoking cessation programs for smokers.

Declaration of Interest: None

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[CR110]

Table 1. Current smoking status according to sex of students

Students	N *(%) Total = 2170*	*Male (%) Total = 921*	*Female (%) Total = 1249*	P
Current smokers	518	312	206	< 0.001
Ex-smokers	159	81	78	
Never smoked	1493	528	965	

[CR110]

Table 2. Current smoking status according to location and family smoking

	N *(%) Total = 2170*	*Current smokers N(%) Total = 518*	*Male smoking* N *(%)*	*Female smoking* N *(%)*	P
Location					
With Family	759 (35.0)	181 (23.8)	106 (58.6)	75 (41.4)	< 0.001
Dorm	732 (33.7)	123 (16.8)	48 (39.0)	75 (61.0)	< 0.001
With Friends	596 (27.5)	185 (31.0)	135 (73.0)	50 (27.0)	< 0.001
Alone	83 (3.8)	29 (34.9)	23 (79.3)	6 (20.7)	0.003
Family smoking					
Yes	1048 (48.3)	327 (63.1)	190 (58.1)	137 (41.9)	< 0.001
No	1122 (51.7)	191 (36.9)	122 (63.9)	69 (36.1)	< 0.001

[CR110]

Table 3. Current smoking rate in the Faculty of Engineering students (33.2%) was highest and the lowest was at the students of vocational school of health

Departments	N *(%) Total = 2170*	*Current smokers (%) Total = 518*	P
Faculty of Science and Letters	410 (18,9)	101 (24,6)	< 0.001
Faculty of Engineering	238 (11,0)	79 (33,2)	
Faculty of Medicine	308 (14,2)	48 (15,6)	
Faculty of Economics and Administrive Science	296 (13,6)	77 (26,0)	
School of Physical Education and Sports	411 (18,9)	121 (29,4)	
Vocational School of Health	208 (9,6)	31 (20,4)	
Faculty of Education	299 (13,8)	61 (20,4)	

CR111

A randomized switch trial of indacaterol and salmeterol/fluticasone combination in patients with moderate COPD: Symptom score analysis from the INSTEAD study

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Aim: Patients at a low risk of exacerbation and moderate airflow limitation have been frequently prescribed inhaled corticosteroids, contrary to GOLD recommendations.[1] Data from INSTEAD study showed that patients with moderate COPD and no exacerbations in the previous year can be switched from salmeterol/fluticasone combination (SFC) to indacaterol (IND) with no efficacy loss.[2] Here we present the exploratory analysis of the INSTEAD study to investigate the efficacy of IND versus SFC in terms of change in symptom scores.

Method: INSTEAD was a 26-week, double-blind, parallel-group, double-dummy, non-inferiority study conducted in patients with moderate COPD and no history of exacerbation, which recruited patients who had been receiving SFC 50/500 µg b.i.d. for at least 3 months prior to entry. Patients were randomized (1:1) to continue to receive SFC 50/500 µg b.i.d. or were switched to IND 150 µg o.d. with no washout period. Morning/evening daily respiratory symptoms (cough, wheezing, sputum volume and colour, breathlessness, sore throat, cold and fever), percentage of 'nights with no night-time awakenings', 'days with no daytime symptoms' and 'days able to perform usual daily activities' were recorded by means of electronic diaries over 12 and 26 weeks of treatment.

Results: No statistically significant differences were observed in symptom scores, percentage of 'nights with no night-time awakenings', 'days with no daytime symptoms' and 'days able to perform usual daily activities' between IND versus SFC at Weeks 12 and 26 (Table).

Conclusion: The INSTEAD study demonstrated that patients with moderate airflow limitation and low risk of exacerbations could be switched to indacaterol from salmeterol/fluticasone with no deterioration in symptoms/symptom scores.

Declaration of Interest: AR received grants, personal fees and non-financial support from Novartis, personal fees and non-financial support from Glaxosmithkline and Boehringer Ingelheim, grants and personal fees from Chiesi Farmaceutici SPA, outside the submitted work. PG, MQ and PA are employees of Novartis NCT01555138

[CR111]

Table 1. Exploratory symptom efficacy outcomes

Daily score	*Treatment difference*			
	Week 12		*Week 26*	
	LS mean (CI)	P *value*	*LS mean (CI)*	P *value*
Cough	0.04 (−0.07, 0.16)	0.458	0.03 (−0.09, 0.16)	0.586
Wheezing	0.00 (−0.11, 0.11)	0.954	−0.02 (−0.14, 0.09)	0.672
Production of sputum	0.02 (−0.11, 0.14)	0.806	−0.01 (−0.13, 0.12)	0.934
Colour of sputum	0.06 (−0.04, 0.16)	0.273	0.04 (−0.07, 0.14)	0.511
Breathlessness	0.00 (−0.12, 0.13)	0.961	0.02 (−0.12, 0.15)	0.825
Sore throat	−0.03 (−0.10, 0.04)	0.428	−0.04 (−0.11, 0.03)	0.232
Cold	0.00 (−0.12, 0.12)	0.999	−0.03 (−0.16, 0.10)	0.678
Fever	0.00 (−0.02, 0.03)	0.827	0.01 (−0.02, 0.03)	0.618

Treatment difference (indacaterol versus salmeterol/fluticasone) in change from baseline in daily individual symptom scores at Weeks 12 and 26. LS mean, least square mean; CI, confidence intervals.

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CR112

Study of indoor pollution from fine particles (PM 2.5) delivered by electronic cigarettes (e-cig) and tobacco smoke

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Aim: To assess the concentration of fine particles (PM2.5) in dual consumers of e-cigs and tobacco
Method: Experimental study of fine particles concentration consuming e-cigs with nicotine concentrations 6, 12 and 19 mg/ ml versus conventional cigarette measured in a space of 48 m^3 for 30 minutes on different days on the same stage. The scenario reproduces average of smoker's density in bars and cafeterias in countries were e-cigs consumption in indoor places are not banned. To measure particles every minute during 30 minutes a Monitor SidePack aerosol monitor AM510 was used. Threshold of PM 2.5 on average for 24 hours proposed by WHO: 25 µg/m^3 and by American EPA: 35 µg/m^3.
Results: Particle pollution from e-cigs was 211.8 mg / m^3 (SD: 214.4), 6-8 times higher than international standards allow for a period of 24 hours (EPA and WHO: 35-25 ug/m^3). Particle pollution from conventional cigarettes was 1181.3 mg / m^3 (SD: 456.0), 33-47 times higher than that recommended by international organizations. Maximum peak for e-cigs were 6685.1 µg/m^3 at 20 minutes and for cigarettes were 7540.1 µg/m^3 also at 20 minutes.
Conclusion: The e-cigs releases particles PM 2.5 in amount less than conventional cigarettes but bigger than recommended by international standards. This data must be considered together many others for public policy on indoor environment pollutants.
Declaration of Interest: None
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CR113

Therapeutic validity and effectiveness of supervised physical exercise in patients with COPD - A systematic review and meta-analysis

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Aim: Background: In patients with COPD the effects of physical exercise on exercise capacity seem only modest and the type, dose and duration of exercise training to optimize exercise capacity unclear. Up until now no specific attention has been given to the therapeutic validity of physical exercise training programs. Our aim was to determine the effectiveness of supervised physical exercise training in patients with COPD taken into consideration indices such as therapeutic validity of the interventions, methodological quality of studies and exercise volume.
Method: RCTs comparing supervised exercise training with usual care were identified. Therapeutic validity of exercise training and methodological quality of included studies were assessed. Overall effects were calculated using a random effects model for maximal and endurance exercise capacity.
Results: 12 RCTs involving 613 patients with COPD were included. Significant differences in maximal exercise capacity (SMD 0.72, 95% CI 0.45-0.96) and endurance exercise capacity (SMD 0.82, 95% CI 0.56-1.08) in favour of supervised physical exercise training were found. Surprisingly, overall effects were not significantly influenced by methodological quality of included studies, therapeutic validity of the interventions, exercise volume per week, or total exercise volume.
Conclusion: Supervised physical exercise training for patients with COPD increases both maximal and endurance exercise capacity. The optimal type, dose and duration of physical exercise training however remains unclear and probably needs further thorough in depth meta-analysis of the clustered data of all the here included trials.
Declaration of Interest: None
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Validity and usability of low-cost accelerometers for internet-based self-monitoring of physical activity in patients with COPD

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Aim: The importance of regular physical activity for patients with COPD is well established. However many patients do not meet the recommended daily amount. Accelerometers might provide patients with the information needed to increase physical activity in daily life. Our objective was to assess the concurrent validity and usability of two low-cost internet-connected accelerometers.
Method: First, to assess validity we conducted a field validation study with patients who wore two low-cost accelerometers (Fitbit and PAM) at the same time along with a validated multisensor accelerometer (SenseWear Armband) for forty-eight hours. Data on energy expenditure assessed from registrations from the two low-cost accelerometers were compared to the reference criterion. Usability was examined in a cross-over study with patients who, in succession, wore the Fitbit and the PAM for seven consecutive days and filled out a sixteen item questionnaire with regards to the use of the corresponding device.
Results: The agreement between energy expenditure from SenseWear Armband with METs estimated by the Fitbit and PAM was good ($r = 0.77$) and moderate ($r = 0.41$), respectively. With regards to the usability both the Fitbit and PAM were well rated on all items with no significant differences between the two devices.
Conclusion: The low-cost Fitbit and PAM are valid and usable devices to measure physical activity in patients with COPD. Therewithal, as patients showed willingness to monitor physical activity for longer periods, these devices may be useful in long-term self-management interventions aiming at increasing physical activity levels in these patients.
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Pulmonary function and fraction exhaled nitric oxide in people with a GP diagnosis of asthma

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Aim: Obesity has impact on respiratory function, including an increased risk of developing asthma. Asthma as a result of obesity is recognized as being a distinct asthma phenotype. More evidence on differences between obese and non-obese patients with asthma can help to improve diagnostic accuracy of asthma and to optimize treatment. This study aims to explore pulmonary function, inflammation and complaints in asthma patients.
Method: The Netherlands Epidemiology of Obesity (NEO) study is a population based cohort study in 6,671 men and women, aged 45 to 65 years, of which 582 have a GP diagnosis asthma at baseline. Differences in pulmonary function, fractional exhaled nitric oxide (FeNO) and complaints between obese

and non-obese subjects with a GP diagnosis asthma, are explored using chi-square tests, independent *t*-tests and Mann Whitney U tests.
Results: Of the 582 patients with asthma, 314 have obesity (BMI ≥ 30). Asthma patients without obesity have better FEV_1 values and FVC values compared to their counterparts with obesity (100.2% pred vs. 96.5% pred, $P = 0.015$; 112.1% pred vs. 107.0% pred, $p\ P = 0.038$). Patients with obesity report more often the complaints wheezing and dyspnoea than patients without obesity (33.3% vs 42.0%, $P = 0.031$ and 16.9% vs 33.4%, $p < 0.001$).
Conclusion: Asthma patients without obesity have better spirometry outcomes than asthma patients with obesity, but have higher FeNO levels, indicating more inflammation. Patients with obesity experience more asthma-related complaints. It can be thought that these obese patients represent a distinct asthma phenotype in which inflammation is less often present. Different treatment strategies might be more efficient in these patients.
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Asthma prescribing practices and risk of hospital admission: an analysis of linked primary and secondary care data in East London

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Aim: The National Review of Asthma Deaths (UK) highlighted inappropriate prescribing in primary care in nearly half of asthma deaths reviewed. In particular, excess prescribing of short acting beta2-agonist inhalers (>12 a year SABA), under-prescribing of inhaled corticosteroid inhalers (a) is the inappropriate prescribing of asthma medication associated with risk of hospital admission? b) Which population groups are at increased risk of hospitalisation with asthma?
Method: In August 2015, anonymised EMIS-Web data for 36,126 people with asthma (aged 5-75 years) across 139 ethnically diverse practices in Hackney, Tower Hamlets and Newham Clinical Commissioning Groups (CCGs) was extracted from the North and East London Commissioning Support Unit (NELCSU), which holds data linked to hospital Secondary Uses Services (SUS).
Results: The greatest burden of emergency hospital admissions (51%) occurs in those prescribed Multivariate analyses in adults shows risk of admission rises with increasing BTS step (Step 3 OR 2.8, Step 4/5 OR 9.1), increasing use of SABA inhalers (4-12 SABA OR 1.7, >13 SABA OR 3.3) and in people from Black (OR 2.3) and south Asian ethnic groups (OR 1.9). Results in children are similar, but risk is not related to ethnic group.
Conclusion: We confirm that prescription of >3 SABA inhalers/year is associated with increased risk of hospital admission. Adults (but not children) from Black and South Asian groups are at increased risk of admission. Further work is needed to target care for these at-risk groups.
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View of adolescents with asthma on adherence and derived recommendations

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Aim: Asthma is the most chronic disease in childhood. Adolescents are less adherent than children between the ages of 7 to 9. Reasons are unknown. So far research focused on the views of parents and physicians. EFA interviewed adolescents directly to understand their poor adherence and become able to recommend on how to improve adherence of adolescents with asthma. Primary Care Physicians are involved in the treatment of adolescents with asthma.
Method: A multi-national survey was conducted with 200 12-17 year old adolescents with asthma in France, Germany, Spain and United Kingdom from July to October 2015. The telephone interviews included items on health status, asthma severity, attitude, treatment, role of physicians and health literacy.
Results: The survey indicated two factors that could largely explain variety of adherence: *Attitude* and *Daily Impact of Asthma*. Within these factors, six drivers of adherence with adolescents were identified: *Forgetfulness, Rebellion, Good days, Support, Careless,* and *Ignorant*. Health literacy did not have direct relation to adherence, but did correlate with Attitude, and may thus impact adherence indirectly. High trust in the physician advice was confirmed.
Conclusion: Adolescents' trust in physicians indicates the need for them to take on a mentoring role. Primary care physicians, due to their familiarity with the patients may play a key role in informing and advising adolescents with asthma to make well-informed decisions regarding the management of their condition.
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