Improving outcomes for people with COPD by developing networks of general practices: evaluation of a quality improvement project in east London

Sally Hull1, Rohini Mathur1, Simon Lloyd-Owen2, Thomas Round3 and John Robson1

BACKGROUND: Structured care for people with chronic obstructive pulmonary disease (COPD) can improve outcomes. Delivering care in a deprived ethnically diverse area can prove challenging.

AIMS: Evaluation of a system change to enhance COPD care delivery in a primary care setting between 2010 and 2013 using observational data.

METHODS: All 36 practices in one inner London primary care trust were grouped geographically into eight networks of 4–5 practices, each supported by a network manager, clerical staff and an educational budget. A multidisciplinary group, including a respiratory specialist and the community respiratory team, developed a ‘care package’ for COPD management, with financial incentives based on network achievements of clinical targets and supported case management and education. Monthly electronic dashboards enabled networks to track and improve performance.

RESULTS: The size of network COPD registers increased by 10% in the first year. Between 2010 and 2013 completed care plans increased from 53 to 86.5%, pulmonary rehabilitation referrals rose from 45 to 70% and rates of flu immunisation from 81 to 83%, exceeding London and England figures. Hospital admissions decreased in Tower Hamlets from a historic high base.

CONCLUSIONS: Investment of financial, organisational and educational resource into general practice networks was associated with clinically important improvements in COPD care in socially deprived, ethnically diverse communities. Key behaviour change included the following: collaborative working between practices driven by high-quality information to support performance review; shared financial incentives; and engagement between primary and secondary care clinicians.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is the fifth leading cause of death in the UK. It accounts for 30,000 deaths a year, 1.4 million general practitioner (GP) consultations, and one in eight emergency hospital admissions—and is therefore one of the most costly inpatient conditions treated by the NHS, accounting for nearly 10% of all bed days.1 The main cause of COPD is tobacco smoking, but it is also associated with occupational exposure,2 indoor air pollutants,3 alpha 1 antitrypsin deficiency4 and childhood respiratory infections.5,6 COPD is more prevalent in men, older people and in deprived and urban populations.7

Using data from the Quality and Outcomes Framework (QOF), the UK general practice pay for performance scheme,8 estimates the UK COPD prevalence to be 1.4%, but epidemiological studies suggest that the prevalence is considerably higher. A cross-sectional study using Health Survey for England data estimated the UK COPD prevalence to be 3.7% in 2005.9 Under-diagnosis appears to be more prevalent in urban areas, particularly in London.10

The majority of routine COPD management takes place in primary care, with the most cost-effective interventions being smoking cessation, flu immunisation and pulmonary rehabilitation.11

Structured care, particularly the early treatment of disease exacerbations, reduces morbidity and deterioration in the quality of life.12,13 In contrast to other major chronic disorders, such as diabetes, the evidence for promoting self-management, action plans or case management remains weak, except among selected subgroups of younger patients.14,15

Pulmonary rehabilitation is an effective intervention for COPD, with evidence of improvements in exercise capacity, health-related quality of life and dyspnoea.16 The effect size is considered to be greater than that of bronchodilator drugs.1,17 There is also evidence for reductions in length of hospital admissions.18 Rehabilitation should be considered at all stages of COPD when symptoms or disability is present (usually Medical Research Council dyspnoea grade 3).

The latest National Institute of Clinical Excellence COPD guidelines recommend a stepwise approach to COPD management including medication and a range of non-pharmacological interventions.1

The problem

GPs in the east London borough of Tower Hamlets serve a population of 260,000, of whom more than 50% are from ethnic minority groups, with 30% being south Asian. This population is one of the top three most socially deprived localities in England, and has adult male smoking rates of 24% compared with 20% for the whole of England.19 In 2012 a total of 3,466 people in the
In 2008, Tower Hamlets was one of the top three localities in England for emergency COPD hospital admissions. At the time, there was little evidence of integrated care along the COPD pathway with no provision for hospital admission avoidance and poor provision of community-based pulmonary rehabilitation. The quality of primary care for COPD was suboptimal, with lower than expected rates of diagnosis and low take-up of regular care planning reviews and non-pharmacological interventions. Recent evidence suggests that delivery of optimal, evidence-based interventions in ambulatory settings can prevent complications, reduce exacerbation rates, reduce time to recovery and reduce deterioration in the quality of life. In turn it is thought that these measures may prevent unnecessary hospital admission. It remains uncertain which model of ambulatory care translates into best outcomes, although there is evidence to suggest that health gain is greatest when the investment is in primary care settings.

This project evaluates a locality-wide quality improvement project that involved all general practices in the area. Networks made up of four to five practices (population size 25–40,000) were tasked with collectively delivering an agreed care package for COPD. The aim of the package was to achieve measurable changes in clinically important indicators of COPD management between 2010 and 2013.

Key measures for improvement

A number of care package key performance indicators (KPIs) were chosen to assess the impact on COPD care in the locality. The focus of the care package was on COPD case finding, and ensuring that all patients, including the housebound, had a structured review and care plan annually or bi-annually depending on the severity of disease. The following indicators were financially incentivised at network level.

1. An increase in the number of COPD cases on network registers (10% in the first year).
2. An increase in the number of care plans completed in the previous 15 months, with a target of 80%. Housebound patients were separately targeted.
3. Increased referrals to community-based pulmonary rehabilitation, with a target of 75% among those with an MRC dyspnoea scale of 3 or more.

Annual influenza immunisation among people with a range of chronic conditions is already financially incentivised in the QOF. This indicator was included as a quality marker for the package, but did not receive further financial incentive, and no target was set for performance.

Smoking cessation, and referral for treatment, is similarly incentivised in the QOF, and hence was not included as a targeted KPI in the care package. However, the high prevalence of smoking in inner east London as a whole, and the high persistent smoking rates among people with COPD, is a continuing concern. Smoking prevalence and the record of stop smoking attempts were routinely monitored as part of the care package metrics.

We also tracked rates of emergency hospital admission for COPD among Tower Hamlets residents.

MATERIALS AND METHODS

In 2008 Tower Hamlets became a pilot site for a borough-wide integrated care programme. Tower Hamlets PCT chose to invest in the development of GP networks across the 36 GP practices to improve the out-of-hospital care for a range of chronic diseases. Eight geographically clustered networks, each consisting of 4–5 neighbouring practices, were developed to deliver four chronic disease care packages of which COPD was one. The COPD care package, including all patients with spirometry values indicative of COPD, was phased in for all networks between April and June 2010.

The care package general practice activity and costings were developed by a group of local hospital and community clinicians supported by project management from a management consultancy firm. The content of the care package reflected National Institute of Clinical Excellence guidance. Clinical targets were set pragmatically, with the aim of extending the performance of clinical teams, but remaining achievable. The content of the care package focused on regular patient review and care planning for all, including the housebound. Using structured data entry templates for these reviews encouraged a systematic approach to monitoring the disease and co-morbidities such as depression and osteoporosis, reviewing medicine use, and encouraging the take-up of non-pharmacological interventions. Network coordinators provided a systematic approach to recall and management of non-attenders.

A further investment was in information technology (IT) required to provide real-time tracking of the KPIs for each of the care packages. As part of the set-up costs, each of the eight networks had funding for a network manager and recall coordinator to work across all care packages. All networks had training in organisational change and development. Network funding to deliver the COPD care package (approximately £300,000 across all networks per annum) was provided as 70% upfront running costs based on COPD register size and severity, and 30% at the end of the year for achieving the care package targets collectively as a network (this was reduced proportionately according to the distance from the target for each network).

Each network had autonomy on the use and distribution of funds to achieve the KPI targets. Most developed a COPD team to provide local leadership and build practice engagement. Specialist support from the community respiratory team provided spirometry training to practices, community-based pulmonary rehabilitation and a hospital admission avoidance service. This involved a same-day home assessment and review service by respiratory nurse specialists. Provision of this additional expert home support (including prescription of nebulisers and medication as required) was designed to improve patient and GP confidence in managing more patients outside the hospital. The components of the network intervention are summarised in Figure 1.

The decision to fund networks rather than individual practices encouraged a process of peer scrutiny, and required the collective management of the financial resource. Network boards reviewed practice performance against targets, and the clinical leads worked with practice teams to support delivery and share best practice.

The introduction of a quarterly community COPD multidisciplinary team meeting (MDT), led by a respiratory consultant, provided educational support to all primary care clinicians, with discussion time for recent advances or guidelines, and complex cases (see Figure 2).
Information sources
We used EMIS Web (http://www.emis-online.com/emis-web) to collect demographics (age, sex, social deprivation and ethnicity) and routinely collected clinical COPD management data from all 36 general practices in Tower Hamlets, and similar data from two neighbouring primary care trusts (PCTs) to enable local comparisons. Hospital Episode Statistics (HES) data for COPD-related emergency hospital admissions for Tower Hamlets resident population were accessed from the Tower Hamlets commissioning support unit. These are collated for the whole population in financial years (April to March). Admission data for London and England up to 2010 were obtained from HES e-atlas (http://www.apho.org.uk/). All hospital admission rates were age standardised to the European standard population. Information on pulmonary rehabilitation and community respiratory team activity came from correlated emergency hospital admissions for Tower Hamlets resident demographics (age, sex, social deprivation and ethnicity) and routinely collected clinical COPD management data from all 36 general practices in Tower Hamlets, and similar data from two neighbouring primary care trusts (PCTs) to enable local comparisons. Hospital Episode Statistics (HES) data for COPD-related emergency hospital admissions for Tower Hamlets resident population were accessed from the Tower Hamlets commissioning support unit. These are collated for the whole population in financial years (April to March). Admission data for London and England up to 2010 were obtained from HES e-atlas (http://www.apho.org.uk/). All hospital admission rates were age standardised to the European standard population. Information on pulmonary rehabilitation and community respiratory team activity came from

Multidisciplinary team meetings—the consultant’s perspective

Including MDTs as part of the COPD care package was crucial. We tend to work in silos and getting together with primary care and community colleagues to discuss COPD, and individual patients, has been enlightening. First, I think we all understand our own services better, and the challenges faced when looking after complicated patients: from pulmonary rehabilitation (‘don’t call it that to patients’), to oxygen assessments (‘ear lobe blood gases’) and the complexities and magic of the GP computer systems (‘what does it say on EMIS?’). I did not realise how much of the work in primary care is done by the practice nurses and how important their hard work is. The probing of my knowledge during sessions has been good for me. I now make sure I have read up on every new guideline or study, because I am sure someone will ask about it. Certain issues have come up that we may not have thought about much before, such as fitness to fly assessments, lung transplantation and early palliative care involvement. The focus on the care package metrics (and payments), and the sharing of best practice to deal with them, has given the meetings a powerful direction. Most importantly, the patient discussions have been insightful. By thinking about one patient in detail, we worked out that certain issues have come up that we may not have thought about much before, such as fitness to fly assessments, lung transplantation and early palliative care involvement. The focus on the care package metrics (and payments), and the sharing of best practice to deal with them, has given the meetings a powerful direction. Most importantly, the patient discussions have been insightful. By thinking about one patient in detail, we worked out that certain issues have come up that we may not have thought about much before, such as fitness to fly assessments, lung transplantation and early palliative care involvement. The focus on the care package metrics (and payments), and the sharing of best practice to deal with them, has given the meetings a powerful direction. Most importantly, the patient discussions have been insightful. By thinking about one patient in detail, we worked out that...
Historic high levels of emergency COPD admissions residents were tracked during the introduction of the care package. In 2010, 39% were still smokers; in 2013 this value was 40.4%.

At the start of the care annual review, we were not able to show changes in smoking persistence among patients with COPD. Although smoking cessation was a central component of the network infrastructure that supports patient recall and annual reviews. Figure 4). Sustaining this improved performance may be linked to immunisation shows steady improvement, and for 2012 was significantly different from England rates.

The targets for the care package were designed to challenge financial and organisational investment into geographical clusters of general practices. Behaviour change included IT-driven performance feedback, alongside educational facilitation and financial performance incentives at the network level.

Our results show that all eight networks achieved improvements in the identification of COPD cases within the practice population and for COPD care processes over the 3-year period. We also show that Tower Hamlets PCT achieved improvements in QOF indicators in comparison with England.

The targets for the care package were designed to challenge performance by the networks and to encourage network clinical leaders to work towards integrating essential community respiratory services into the care pathway. We report on hospital admissions, and note that the local rate for emergency COPD admissions have fallen, although rates remain higher than the London average (see Figure 5). The introduction of an outreach team for admission avoidance may have contributed to further decline since 2011. The annual activity of this team for the year to March 2012 included 120 patients referred by GPs for admission avoidance. Of them, 24 required hospital admission within 28 days of referral.

DISCUSSION

Main findings

The network intervention introduced a combination of financial and organisational investment into geographical clusters of general practices. Behaviour change included IT-driven performance feedback, alongside educational facilitation and financial performance incentives at the network level.

Our results show that all eight networks achieved improvements in the identification of COPD cases within the practice population and for COPD care processes over the 3-year period. We also show that Tower Hamlets PCT achieved improvements in QOF indicators in comparison with England.

The targets for the care package were designed to challenge performance by the networks and to encourage network clinical leaders to work towards integrating essential community respiratory services into the care pathway. We report on hospital admissions, and note that the local rate for emergency COPD admissions have fallen, although rates remain higher than the London average (see Figure 5). The introduction of an outreach team for admission avoidance may have contributed to further decline since 2011. The annual activity of this team for the year to March 2012 included 120 patients referred by GPs for admission avoidance. Of them, 24 required hospital admission within 28 days of referral.

DISCUSSION

Main findings

The network intervention introduced a combination of financial and organisational investment into geographical clusters of general practices. Behaviour change included IT-driven performance feedback, alongside educational facilitation and financial performance incentives at the network level.

Our results show that all eight networks achieved improvements in the identification of COPD cases within the practice population and for COPD care processes over the 3-year period. We also show that Tower Hamlets PCT achieved improvements in QOF indicators in comparison with England.

The targets for the care package were designed to challenge performance by the networks and to encourage network clinical leaders to work towards integrating essential community respiratory services into the care pathway. We report on hospital admissions, and note that the local rate for emergency COPD admissions have fallen, although rates remain higher than the London average (see Figure 5). The introduction of an outreach team for admission avoidance may have contributed to further decline since 2011. The annual activity of this team for the year to March 2012 included 120 patients referred by GPs for admission avoidance. Of them, 24 required hospital admission within 28 days of referral.

DISCUSSION

Main findings

The network intervention introduced a combination of financial and organisational investment into geographical clusters of general practices. Behaviour change included IT-driven performance feedback, alongside educational facilitation and financial performance incentives at the network level.

Our results show that all eight networks achieved improvements in the identification of COPD cases within the practice population and for COPD care processes over the 3-year period. We also show that Tower Hamlets PCT achieved improvements in QOF indicators in comparison with England.

The targets for the care package were designed to challenge performance by the networks and to encourage network clinical leaders to work towards integrating essential community respiratory services into the care pathway. We report on hospital admissions, and note that the local rate for emergency COPD admissions have fallen, although rates remain higher than the London average (see Figure 5). The introduction of an outreach team for admission avoidance may have contributed to further decline since 2011. The annual activity of this team for the year to March 2012 included 120 patients referred by GPs for admission avoidance. Of them, 24 required hospital admission within 28 days of referral.

DISCUSSION

Main findings

The network intervention introduced a combination of financial and organisational investment into geographical clusters of general practices. Behaviour change included IT-driven performance feedback, alongside educational facilitation and financial performance incentives at the network level.

Our results show that all eight networks achieved improvements in the identification of COPD cases within the practice population and for COPD care processes over the 3-year period. We also show that Tower Hamlets PCT achieved improvements in QOF indicators in comparison with England.

The targets for the care package were designed to challenge performance by the networks and to encourage network clinical leaders to work towards integrating essential community respiratory services into the care pathway. We report on hospital admissions, and note that the local rate for emergency COPD admissions have fallen, although rates remain higher than the London average (see Figure 5). The introduction of an outreach team for admission avoidance may have contributed to further decline since 2011. The annual activity of this team for the year to March 2012 included 120 patients referred by GPs for admission avoidance. Of them, 24 required hospital admission within 28 days of referral.

DISCUSSION

Main findings

The network intervention introduced a combination of financial and organisational investment into geographical clusters of general practices. Behaviour change included IT-driven performance feedback, alongside educational facilitation and financial performance incentives at the network level.

Our results show that all eight networks achieved improvements in the identification of COPD cases within the practice population and for COPD care processes over the 3-year period. We also show that Tower Hamlets PCT achieved improvements in QOF indicators in comparison with England.

The targets for the care package were designed to challenge performance by the networks and to encourage network clinical leaders to work towards integrating essential community respiratory services into the care pathway. We report on hospital admissions, and note that the local rate for emergency COPD admissions have fallen, although rates remain higher than the London average (see Figure 5). The introduction of an outreach team for admission avoidance may have contributed to further decline since 2011. The annual activity of this team for the year to March 2012 included 120 patients referred by GPs for admission avoidance. Of them, 24 required hospital admission within 28 days of referral.

DISCUSSION

Main findings

The network intervention introduced a combination of financial and organisational investment into geographical clusters of general practices. Behaviour change included IT-driven performance feedback, alongside educational facilitation and financial performance incentives at the network level.

Our results show that all eight networks achieved improvements in the identification of COPD cases within the practice population and for COPD care processes over the 3-year period. We also show that Tower Hamlets PCT achieved improvements in QOF indicators in comparison with England.

The targets for the care package were designed to challenge performance by the networks and to encourage network clinical leaders to work towards integrating essential community respiratory services into the care pathway. We report on hospital admissions, and note that the local rate for emergency COPD admissions have fallen, although rates remain higher than the London average (see Figure 5). The introduction of an outreach team for admission avoidance may have contributed to further decline since 2011. The annual activity of this team for the year to March 2012 included 120 patients referred by GPs for admission avoidance. Of them, 24 required hospital admission within 28 days of referral.

DISCUSSION

Main findings

The network intervention introduced a combination of financial and organisational investment into geographical clusters of general practices. Behaviour change included IT-driven performance feedback, alongside educational facilitation and financial performance incentives at the network level.

Our results show that all eight networks achieved improvements in the identification of COPD cases within the practice population and for COPD care processes over the 3-year period. We also show that Tower Hamlets PCT achieved improvements in QOF indicators in comparison with England.

The targets for the care package were designed to challenge performance by the networks and to encourage network clinical leaders to work towards integrating essential community respiratory services into the care pathway. We report on hospital admissions, and note that the local rate for emergency COPD admissions have fallen, although rates remain higher than the London average (see Figure 5). The introduction of an outreach team for admission avoidance may have contributed to further decline since 2011. The annual activity of this team for the year to March 2012 included 120 patients referred by GPs for admission avoidance. Of them, 24 required hospital admission within 28 days of referral.
admission (which was among the highest in London) is reducing towards London and national rates. We speculate that improvements to preventative activity and exacerbation management may contribute to these results, alongside the work of admission avoidance by the community respiratory team. National admission rates for COPD show wide variations by primary care organisations (PCOs) and by practice, and are associated with COPD prevalence, social deprivation and higher population smoking rates. However, we are aware that at present there is no current UK evidence to link improvement in practice-based disease management with changes in COPD admission rates, and the observed results for Tower Hamlets may equally reflect changes to hospital practice or methods of coding hospital admission.

Smoking prevalence remains high in Tower Hamlets, and there is a paucity of evidence on which stop smoking interventions work best with socially disadvantaged populations. Our analysis shows that on average 40% of COPD patients continue to smoke. Similar figures were found in Salford.

Commissioning an adequate capacity of community-based pulmonary rehabilitation, in geographic locations spread throughout the borough, formed part of the integrated care pathway for COPD. However, even when there is good local provision, engagement of patients remains a challenge. Data from a London-wide collaboration on COPD suggest a 30% drop-out rate between referral and first attendance for assessment. Figures for Tower Hamlets showed high rates of referral into the service (70% of patients) but we report a similar rate of 35% for attrition between referral and first attendance.

Findings in relation to previously published work

Integrated care programmes aim to improve clinical outcomes and patient experience by developing a range of organisational and clinical integration across primary, community and hospital settings. Programme also aim to shift care from expensive acute hospitals to cheaper primary and community service settings for those conditions best managed out of hospital. The programme organisational structure can take a variety of forms, and there is little consensus on which structures best achieve, and sustain, the desired changes. Evidence from other out-of-hospital quality improvement schemes for COPD in the UK is scarce. Some London boroughs have introduced local pay for performance schemes, which have increased the prevalence of recognised COPD. Finding the 'missing millions' is particularly important in London where the gap between observed and predicted prevalence is the widest. The Finnish 10-year national programme for COPD effectiveness in changes in the process of diagnosis and care, and a reduction in the number of hospital episodes was also noted.

Strengths and limitations of the study

This evaluation benefits from the inclusion of all practices, and hence all patients with a diagnosis of COPD, in the study area. Engagement with the intervention, and performance as measured by the quantitative metrics, varied between networks, reflecting differences in the prior organisation and capacity of the constituent practices and differences between patients in the areas served. We found that a key factor for success was the engagement of clinicians, both in the planning, implementation and governance of the programme and in contributing to the educational support seen in the MDT meetings. However, the unique contribution in this initiative has been the financial investment in a practice network structure, alongside investment in an IT backbone to support the development of real-time information on clinical performance, which has high face validity for both clinicians and commissioners. Devolving resource and responsibility to groups of local providers enabled the practices to find collective local solutions to deal systematically with the complexities and fragmentation of existing care pathways.

The decision to fund networks rather than individual practices encouraged a process of peer scrutiny and collective management of the financial resource. Network boards reviewed practice performance against targets and the clinical leads worked with practice teams to support delivery. The introduction of a quarterly community COPD MDT meeting, led by a respiratory consultant, provided ongoing education to all primary care clinicians, with discussion time set aside for analysis of key performance indicators, recent advances in treatment and individual discussion of difficult cases. The consultant also provided rapid access to advice by e-mail or telephone. These elements provided an alternative source of clinical support to reduce the need for outpatient referrals.

The design of this quality improvement programme has important limitations. Practices were not randomised to the intervention, and other factors may have affected primary care management of COPD during the period of the intervention. Hence, uncertainty remains about the relationship between the intervention and the observed outcomes. Despite these limitations, routinely available data make essential contributions to the evaluation of system change programmes introduced pragmatically by commissioning organisations.

Implications for future research, policy and practice

For the future, there is a review of the care packages on a yearly basis. Targets are reviewed and stretched if necessary, or dropped in favour of others. We hope to develop greater input from patients to determine whether they consider the process of COPD care to have been enhanced as a result of the network care packages.

Conclusions

Improvements in COPD primary care in a socially deprived, ethnically diverse locality were observed over a 3-year period following financial and organisational investment into general practice networks.

ACKNOWLEDGEMENTS

This evaluation is based on the work of clinical staff in all the Tower Hamlets practice networks. We are grateful for the continuing support of PCT administrators and public health personnel. The CEG provided local data for this evaluation.

CONTRIBUTIONS

SH, JR and TR had the original idea for the paper. RM provided the analysis and is responsible for the presentation of the data. SH, TR and SL-O wrote the first and final drafts. SH is the guarantor.

COMPETING INTERESTS

The authors declare no conflict of interest.

FUNDING

Tower Hamlets PCT.

REFERENCES

1 National Institute of Clinical Excellence. Management of Chronic Obstructive Pulmonary Disease in Adults in Primary and Secondary Care. NICE, London, UK, 2010.

2 Bakke PS, Baste V, Hanoa R, Gulsvik A. Prevalence of obstructive lung disease in a general population: relation to occupational title and exposure to some airborne agents. Thorax 1991; 46: 863–870.

3 Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJL. Measuring the global burden of disease and risk factors, 1990–2001. In: Lopez AD, Mathers CD, Ezzati M,
