Health Economics Unit

NHS
Midlands and Lancashire
Commissioning Support Unit

Executive Summary: Smarter Spending in Population Health

Using the STAR method to identify value-for-money in the Northamptonshire COPD pathway

February 2023

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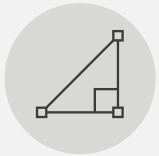

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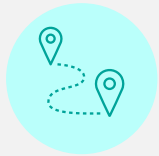

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More on methods and caveats in the full report

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Introduction

Aims for the COPD population in Northamptonshire

Aims for the COPD population in Northamptonshire

- Northamptonshire's respiratory group, in collaboration with the Health Economics Unit (HEU) supported by the Midlands Decision Support Network and partners, piloted the STAR approach to assess the allocative efficiency of their COPD pathway.

- The pilot aimed to support Northamptonshire's aim 'to improve the outcomes for our COPD patients and to empower them to make the right decisions as well as making accessing care easier' by taking a whole-pathway approach.

- The socio-technical allocation of resources (STAR) approach synthesises data from multiple sources in easy-to-interpret graphs of where value – in terms of health improvement versus costs – lies within a given pathway. This allows stakeholders, including people with COPD, across Northamptonshire to build a shared understanding of the pathway and reach consensus on how to improve it.

- This executive summary has been put together to highlight methods used, key findings and next steps. Further outputs, caveats and methodology details can be found in the full report.

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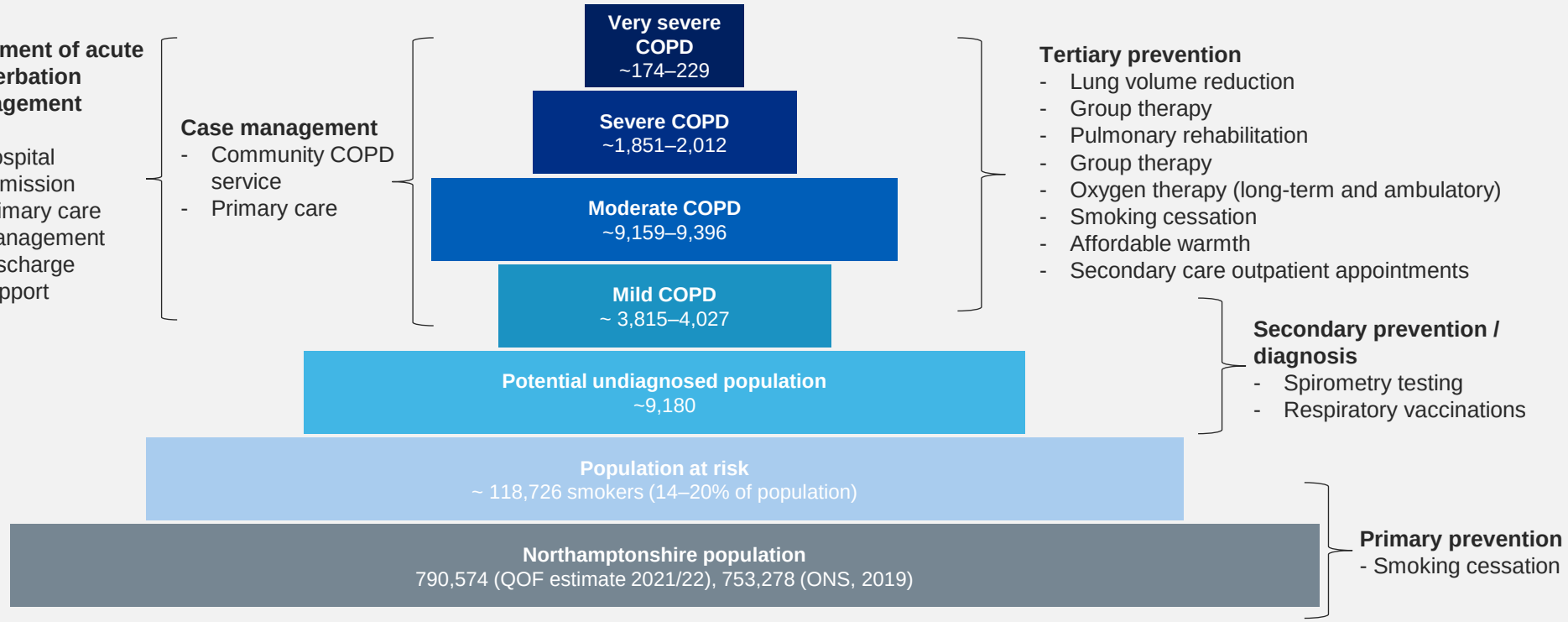
STAR process in Northamptonshire

- COPD population
- STAR process
- Northamptonshire priorities
- Initiatives identified from the process

The COPD population in Northamptonshire

The pyramid summarises the population diagnosed, undiagnosed and at risk of developing COPD and the various interventions that make up the COPD pathway



This graph gives estimates – not all precise but give an indication of how many people are in each category

There are approximately 15,600 people with a diagnosis of COPD in Northamptonshire. This is up to 2% of the county's population.

Most people (~86%) with diagnosed COPD in Northamptonshire have mild or moderate disease. Approximately 14% have severe or very severe disease.

Some estimates say that the true prevalence of COPD is 3.1%, suggesting that there are almost as many people with undiagnosed COPD as diagnosed.

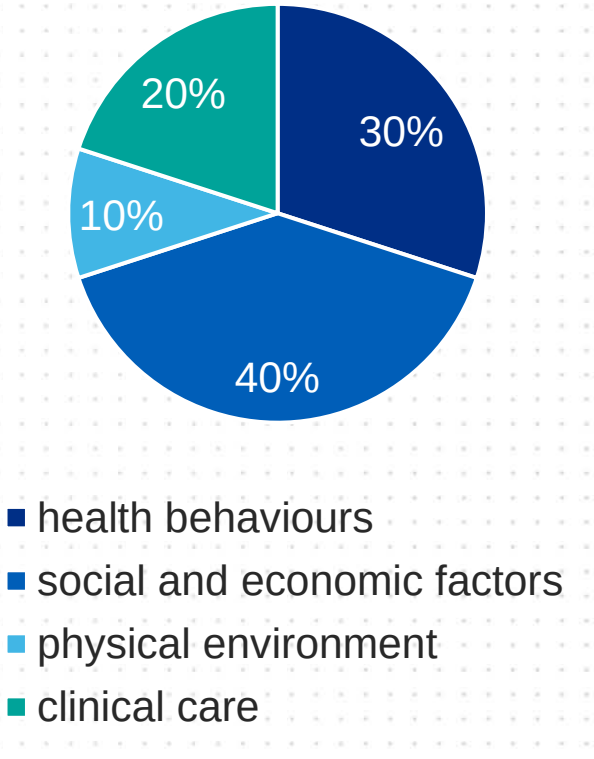
14–20% of the population are smokers, putting them at risk of COPD. Data suggests smokers are more likely to live in deprived areas.

(Mclean et al, 2016; Nacul et al. 2017; QOF, 2021/22; ONS 2022))

Why STAR?

- STAR is a method that can help to determine the priorities through a technical value-for-money analysis with extensive stakeholder engagement.
- STAR provides a structured way to bring stakeholders together to think about allocating resources across the entirety of a pathway through workshops and the building of graphs.
- Clinical care accounts for ~20% of modifiable contributors to population health. STAR allows consideration of the full pathway, including all modifiable health determinants.

Modifiable health determinants



(Hood et.al, 2016)

The STAR process

Developed a comprehensive understanding of the COPD pathway in Northamptonshire

Facilitated discussions between people with COPD, clinicians, managers and commissioners to understand and value the pathway and reach a consensus on priorities

Modelled the initiatives prioritised in the workshops to assess their impact on the pathway

Workshops

Pathway mapping → Valuing interventions → Value-for-money triangles → Setting priorities → Modelling initiatives

Determined how much health was improved by each of the interventions that make up the COPD pathway

Facilitated conversations about improving the COPD pathway, based on graphs comparing the health improvement and costs of each intervention

Reached consensus about the initiatives that could be taken forward to improve the pathway

(Airoldi et al., 2014; The Health Foundation, n.d.)

See the full report for more detail

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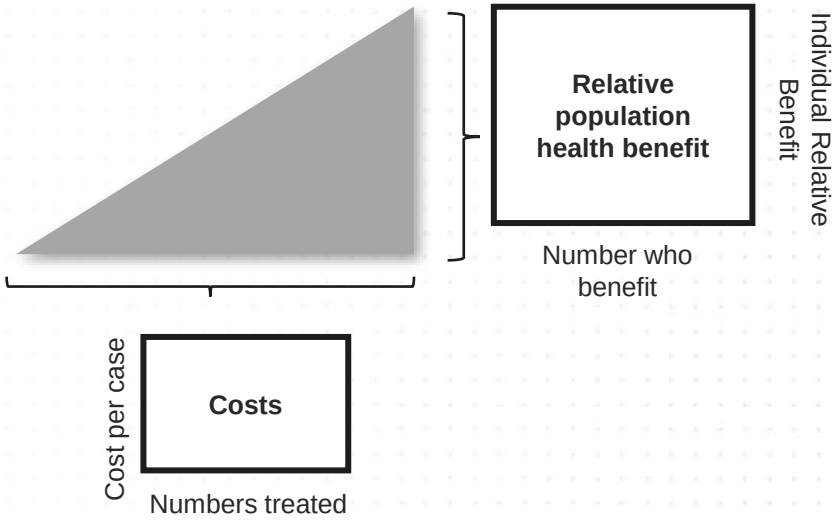
COPD pathway in Northamptonshire

- Interpreting the value-for-money triangles
- The Northamptonshire COPD value-for-money triangles

Interpreting the value-for-money triangles: An intervention

What does a value-for-money triangle represent?

- Each triangle represents an intervention or package of care.
- The steeper the slope, the higher the value for money.
- A triangle has cost across the x-axis and population health gain across the y-axis.



What does the slope of the triangle mean?

The gradient of the slope is due to the costs (numbers who are treated x the individual cost) and the benefit (numbers who benefit x the individual benefit):

Lower value-for-money triangle
This means that this intervention is *relatively* lower value for money compared to other interventions.

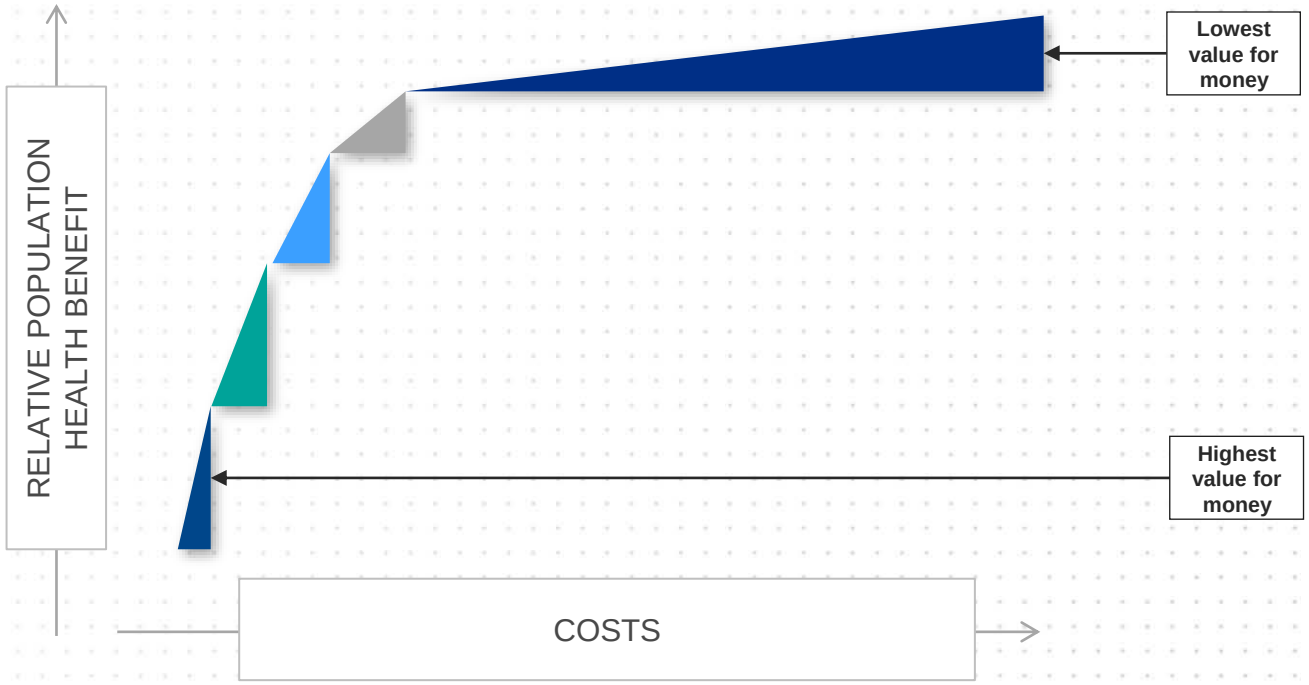
Higher value-for money triangle
This means that this intervention is *relatively* higher value for money compared to other interventions.

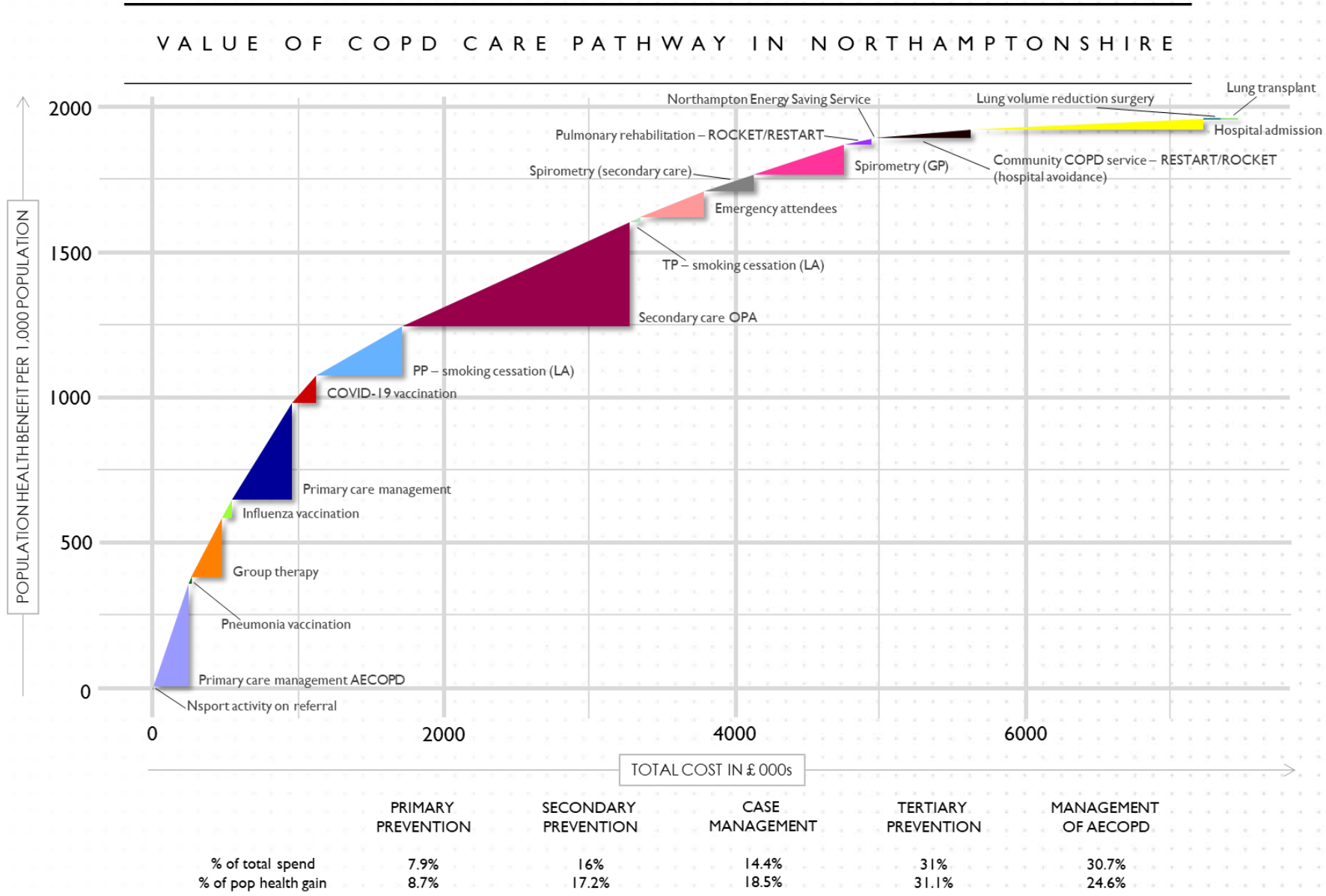
Note: Higher value-for-money triangles are not necessarily “good” and lower value-for-money triangles are not necessarily “bad”

Interpreting the value-for-money triangles: The pathway

- This is an easy-to-interpret graph of where the value in a pathway lies.
- The triangles (interventions) are ordered by their value for money (highest to lowest) to create a view of the entire pathway.
- Costs, benefits, numbers who benefit and numbers treated were sourced from data, literature and workshops.
- Workshop discussions were used to help the group work together to gain consensus, with the support of facilitators, evidence and data.

More detail on methods can be found in the full report





	PRIMARY PREVENTION	SECONDARY PREVENTION	CASE MANAGEMENT	TERTIARY PREVENTION	MANAGEMENT OF AECOPD
% of total spend	7.9%	16%	14.4%	31%	30.7%
% of pop health gain	8.7%	17.2%	18.5%	31.1%	24.6%

This shows the value-for-money triangles of the current COPD pathway.

The aim of identifying initiatives is to alter individual interventions to ultimately shift the pathway:

↑ **Upward** Increasing population health benefits

← **Left** Reducing costs (where appropriate)

Key messages on the efficiency frontier

Primary care based activities should be maximised

Primary care based activities are the main driver of the value of the COPD pathway, this is because things like primary care case management and management of acute exacerbations and vaccinations are relatively cheap per case and reach a large amount of the population. This is despite them having low relative individual health benefit scores compared to other interventions.

Increasing completion rates for interventions with high health benefit would improve the value of the pathway

Activities that were given high relative individual health benefit scores, like pulmonary rehabilitation (PR) and smoking cessation (75 as tertiary prevention and 100 as primary prevention) appear to be lower value for money. This is because the number of people who complete the courses are low. In Northamptonshire, 15.7% of those referred for PR complete the course and 27.4% of referrals to smoking cessation services lead to someone successfully quitting after four weeks.

Improving the diagnosis rate of spirometry would improve the value of testing

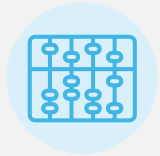
Spirometry testing was given an individual relative health benefit score of 98 (second only to primary prevention smoking cessation), yet appears low value as the number who benefit (those diagnosed with COPD) is low at only 12.1% (some spirometry tests will be done to monitor COPD decline rather than attempting to diagnose).

Avoiding exacerbations represents a large cost saving opportunity

The management of exacerbations, through those managed in primary care, emergency attendances an hospital admissions account for 30.7% of the total spend of the pathway and increases the rate of decline in someone's COPD. Avoiding exacerbations represents an opportunity to improve health as well as reducing costs.

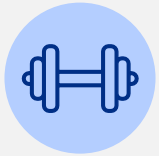
Priority areas identified

After reviewing the efficiency frontier, five key areas of focus were identified to improve the COPD pathway in Northamptonshire:



Improving capacity for spirometry testing

Reducing variability of initial patient management



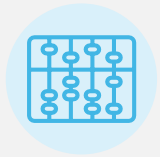
Improving uptake of pulmonary rehabilitation and similar services

Doing more to stop people smoking

Reducing hospital admissions

Interventions and initiatives identified to improve the pathway

As part of the process, interventions and initiatives within the five key areas were identified and prioritised:

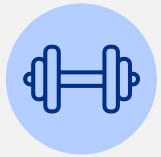


Improving capacity for spirometry testing

- Expanding spirometry

Reducing variability in initial patient management

- Launch of myCOPD app
- Group consultations
- Improving signposting



Improving uptake of pulmonary rehabilitation and similar services

- Expanding pulmonary rehabilitation services

Doing more to stop people smoking

- Increasing uptake of services
- Very brief advice

Reducing hospital admissions

- Supporting and championing HEPA filters in schools
- Post-exacerbation support

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Improving the pathway

- Initiatives and their modelled impacts
- Next steps and recommendations

Interventions and initiatives identified to improve the pathway

The interventions and initiatives identified in the workshops are shown below:

1. Increasing capacity in spirometry testing
2. Launching the myCOPD app
3. Conducting patients' yearly reviews through group consultations
4. Post exacerbation support for patients following a hospital admission
5. Improving signposting to key services
6. Expansion of PR services
7. Increasing uptake to smoking cessation services
8. Very brief advice on smoking cessation training in primary care
9. Introducing high-efficiency particulate air (HEPA) filters in schools

The potential impact on the rest of the pathway was assessed and modelled following the workshops. The following section outlines the findings.

Assessing the impact of initiatives on COPD pathway

Aim

- To demonstrate the potential impact of the interventions on the COPD pathway to support conversations on priority-setting.

Methods

- Discussion in the workshops was used to build out what the scenarios could look like. This was confirmed and refined through conversations following the workshops. This was combined with assumptions and evidence from the literature (identified through an umbrella literature review) looking at how an intervention may change healthcare resource use.

Limitations

- The analysis presented here is not intended to be a full cost-effectiveness/economic evaluation.
- Only the costs of provision have been included. Programme and capital spend that would be required to set up the interventions have not been included.
- Further work would need to be done to adapt these scenarios into business cases

More information is available in the full report.

Increasing capacity in spirometry testing

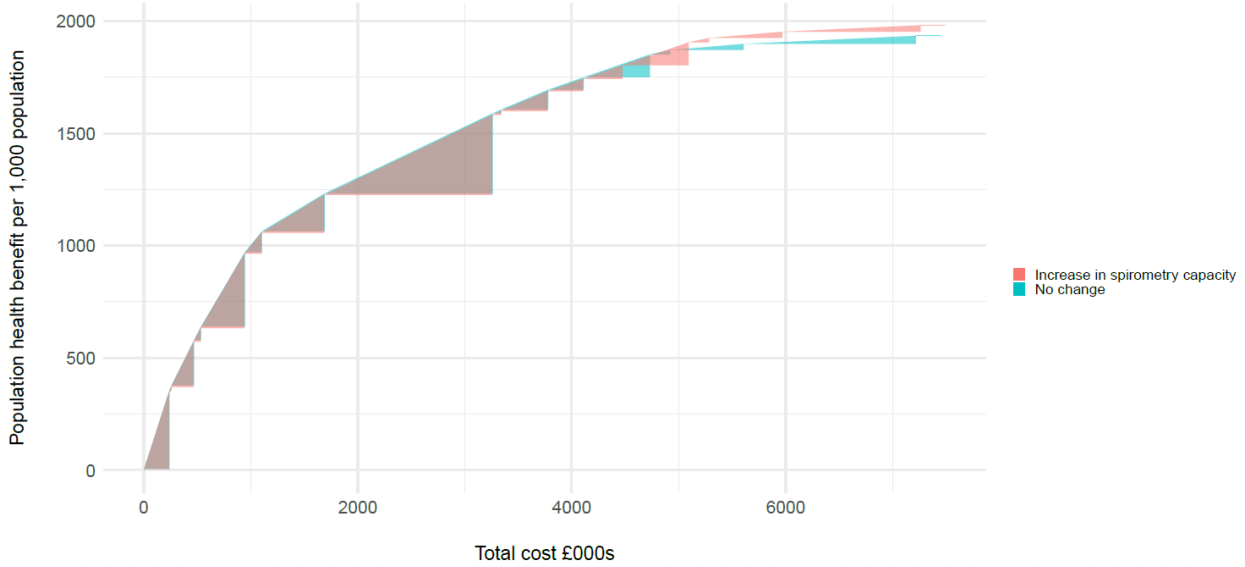
Intervention

Four respiratory hubs are in the process of being set up to provide rapid access to a range of diagnostic tests. Clinics can operate four times a week over a year, seeing six-ten patients a clinic.

Expected change

It is assumed that the expansion of spirometry testing will lead to an increase in patients being diagnosed early. Diagnosing earlier will allow access to treatment earlier. In terms of cost, although earlier diagnoses should lead to a reduction in acute exacerbations and hospitalisations, the savings are not expected to make up for the costs of the intervention.

Metric	Total	Interpretation
Total additional pathway costs	£33,972.66	There is an estimated additional cost of £33,972.66 per year for the COPD pathway
Additional cost/ additional population health ratio	0.56	It is estimated that increasing capacity in spirometry testing would cost £0.56 for every additional unit of population health gain generated.
Cost ratio	0.91	The intervention is not cost-saving. £0.91 is saved elsewhere in the pathway for every £1 spent.



Launching the myCOPD app

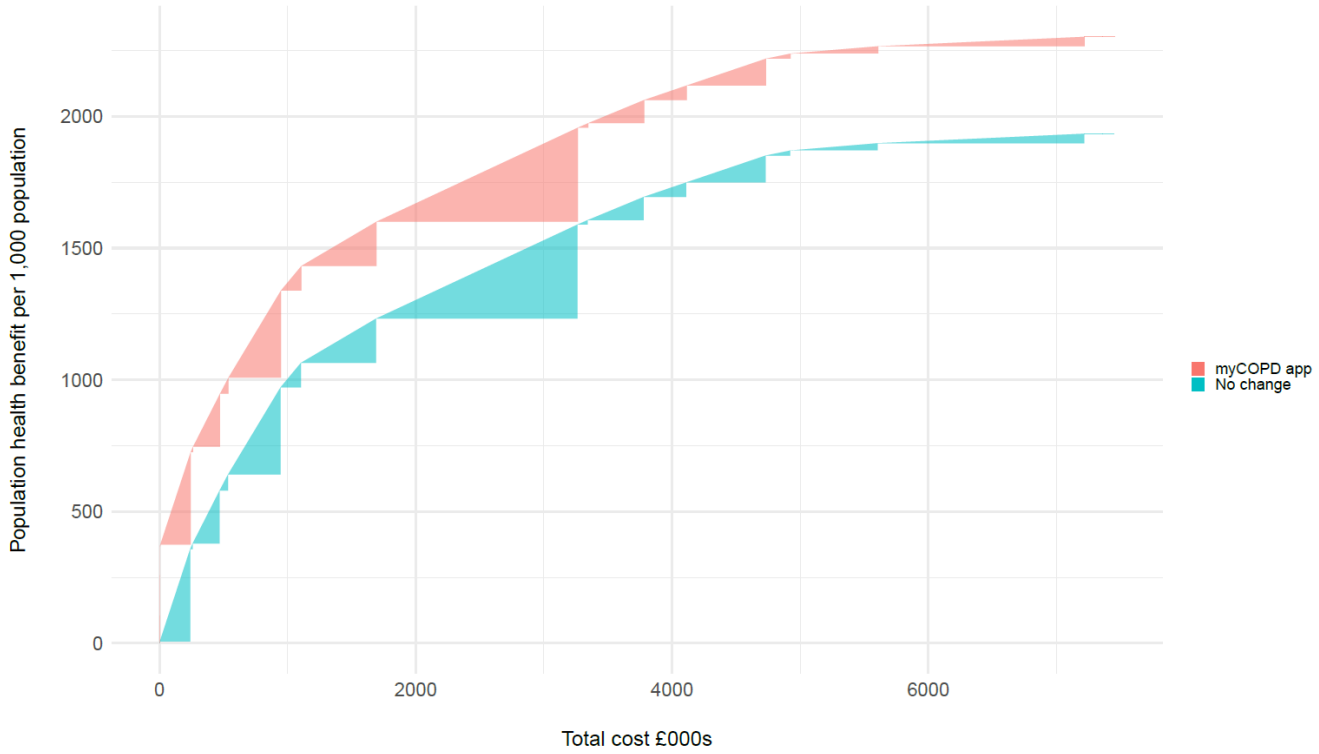
Intervention

The smartphone application supports self-management of any stage of COPD. It provides education, self-management help, prescription assessments, symptom tracking, signposting and a six-week pulmonary rehabilitation course.

Expected change

The app supports patients to self-manage as well as receiving information from their care providers. The app is a relatively cheap intervention, with an estimated cost of £3,832 to offer it to everyone with COPD in Northamptonshire for a year.

Metric	Total	Interpretation
Total additional pathway costs	£3,832	This is the estimated cost of rolling out the intervention as there are no expected cost savings elsewhere in the pathway
Additional cost/ additional population health ratio	0.01	It is estimated that the myCOPD app would cost £0.01 for every additional unit of population health gain generated.
Cost ratio	infinite	As there are no expected cost savings elsewhere in the pathway, the cost ratio appears infinite.



Conducting patients' yearly reviews through group consultations

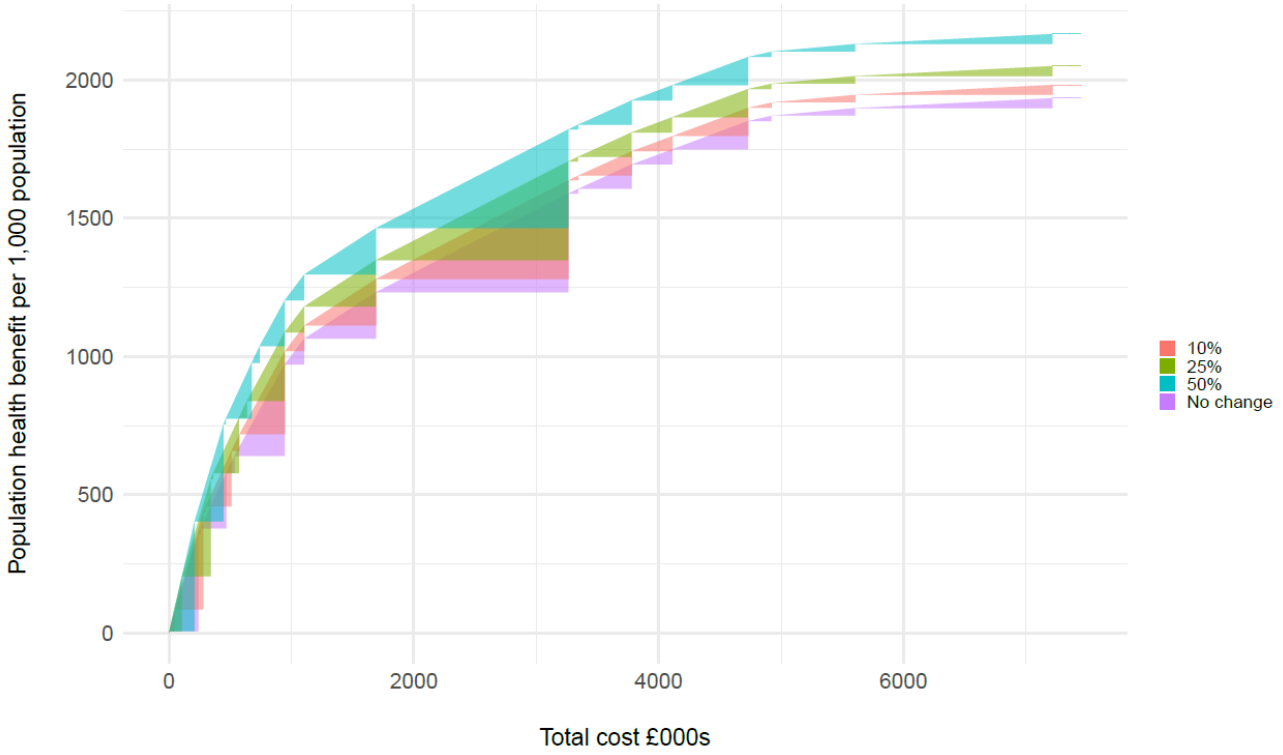
Intervention

Group consultations involve seeing multiple patients in one session. This contrasts with the current reviews which normally take around 15 minutes. Such appointments could improve case management by allowing clinicians more time to give advice and allowing peer learning.

Expected change

Allocating 10%, 25% and 50% of the time spent on yearly reviews to group consultations could lead to 11%, 28% and 56% more people reviewed respectively. Introducing group consultations is estimated to be almost cost neutral and health generating.

Metric	Total	Interpretation
Total additional pathway costs	10%: -£178.95 25%: -£14.36 50%: -£28.73	In all cases, the introduction of group consultations is almost cost neutral with minor cost savings expected.
Additional cost/ additional population health ratio	10%: 0.00 25%: 0.00 50%: 0.00	The intervention is essentially cost neutral and health generating.
Cost ratio	10%: 1.00 25%: 1.00 50%: 1.00	The intervention is essentially cost neutral



Post exacerbation support for patients following a hospital admission

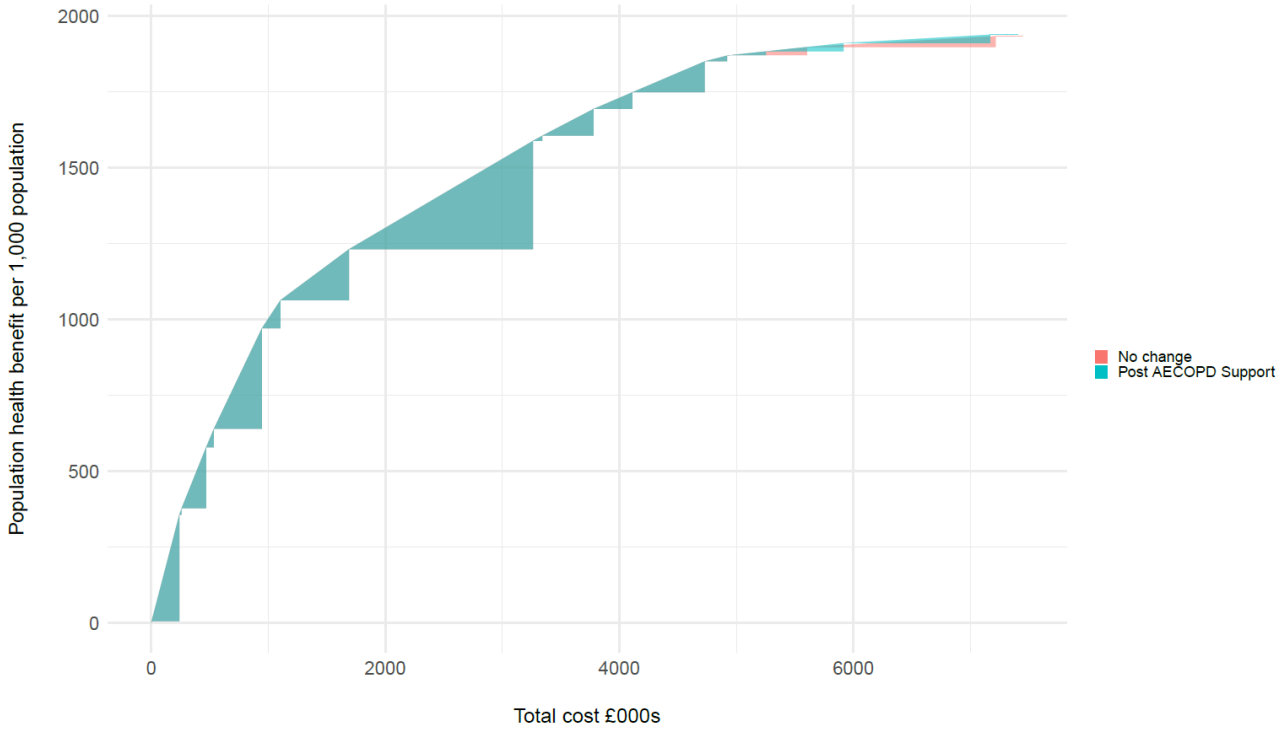
Intervention

Including post-exacerbation support, in addition to ROCKET and RESTART, could increase the number of people receiving information and support; potentially avoiding readmissions.

Expected change

This could have the largest impact on reductions in hospital admissions, an estimated 161. The cost is expected to be offset by the reduction in admissions meaning it is likely to be cost saving. The reduction in hospital admissions could be expected a year after implementation.

Metric	Total	Interpretation
Total additional pathway costs	-£46,757.25	Post exacerbation support is expected to be cost saving. Although post-exacerbation support is a relatively expensive intervention, this cost is more than offset by the number of hospital admissions it is expected to avoid.
Additional cost/ additional population health ratio	-0.28	Post-exacerbation support schemes are both cost saving and health generating. For every 1 unit of population health gain generated, it would save £0.28.
Cost ratio	1.15	Post exacerbation support is cost saving, £1.15 is saved due to a reduction in hospital admissions for every pound spent on post-exacerbation support.



Improving signposting to key services

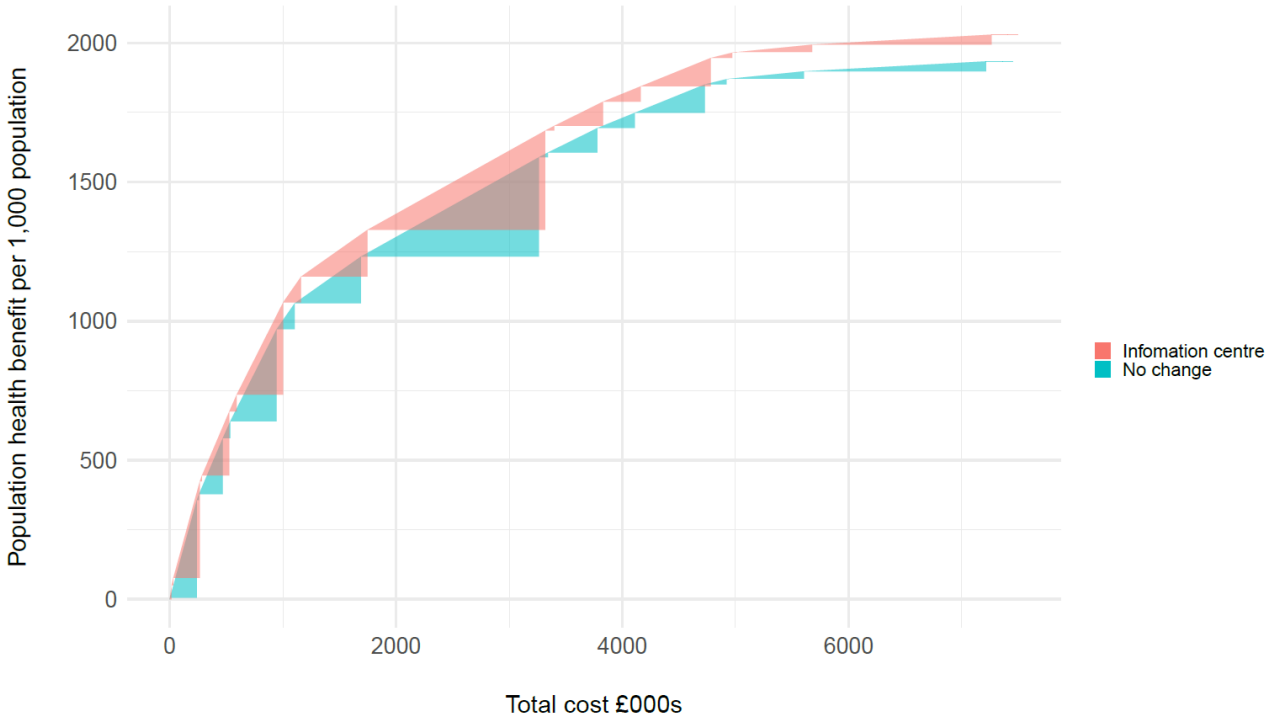
Intervention

All newly diagnosed people are sent to information centres within respiratory hubs, each person receives a 30-minute appointment with a respiratory nurse specialist before being referred to either Breathing Space and Activity on Referral in equal amounts. People who are in fuel poverty are referred to NESS.

Expected change

The increase in activity and the benefit of the information centres themselves, improve the population health gain generated by the pathway. The reduction in urgent care services is not expected to offset the additional cost of the information centres.

Metric	Total	Interpretation
Total additional pathway costs	£47,432.86	Information centres would not be cost saving.
Additional cost/ additional population health ratio	0.47	It is estimated that the information centres would cost £0.47 for every additional unit of population health gain generated.
Cost ratio	0.41	The intervention is cost incurring. Only £0.41 is estimated to be saved elsewhere in the pathway per £1 spent



Expansion of pulmonary rehabilitation (PR) services

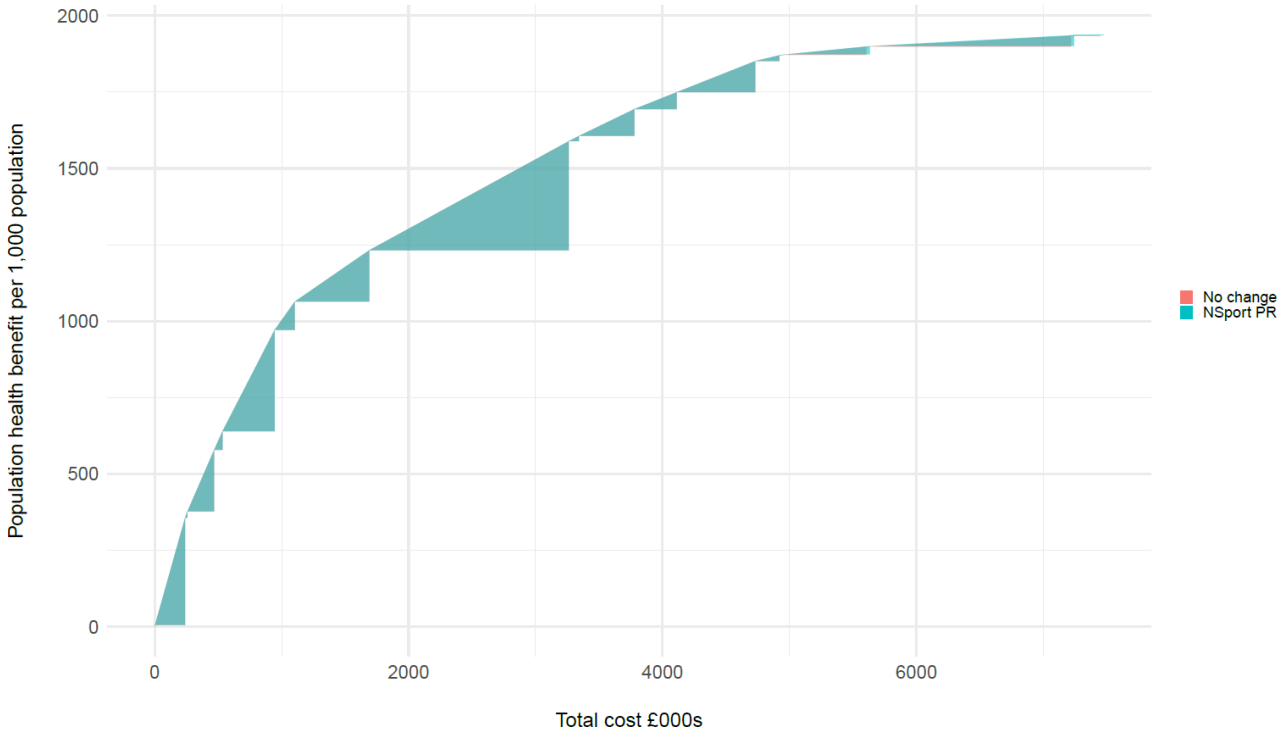
Intervention

PR is currently offered by the ROCKET and RESTART teams. Northamptonshire Sport is expanding PR capacity by setting up a community-based programme, including peer support. This will be aimed at people deemed to be low-medium risk when triaged by the ROCKET and RESTART teams.

Expected change

The impact of the Northamptonshire Sport PR is expected to be low. Due to the limited numbers estimated to access the programme (~120-150) and complete the course (~15.7%), this means those that would benefit is also limited. The existing pathway (no change scenario) is virtually indistinguishable from the proposed pathway. The key to making PR more cost-efficient is to increase the number of people completing the course.

Metric	Total	Interpretation
Total additional pathway costs	£25,836.15	Expansion of PR services is not expected to be cost saving
Additional cost/ additional population health ratio	13.37	It is estimated that expansion in PR services would cost £13.37 for every additional unit of population health gain generated.
Cost ratio	0.08	The intervention is not cost saving. It is estimated that only £0.08 would be saved elsewhere in the pathway due to a reduction in hospital admissions for every £1 spent.



Increasing uptake to smoking cessation services

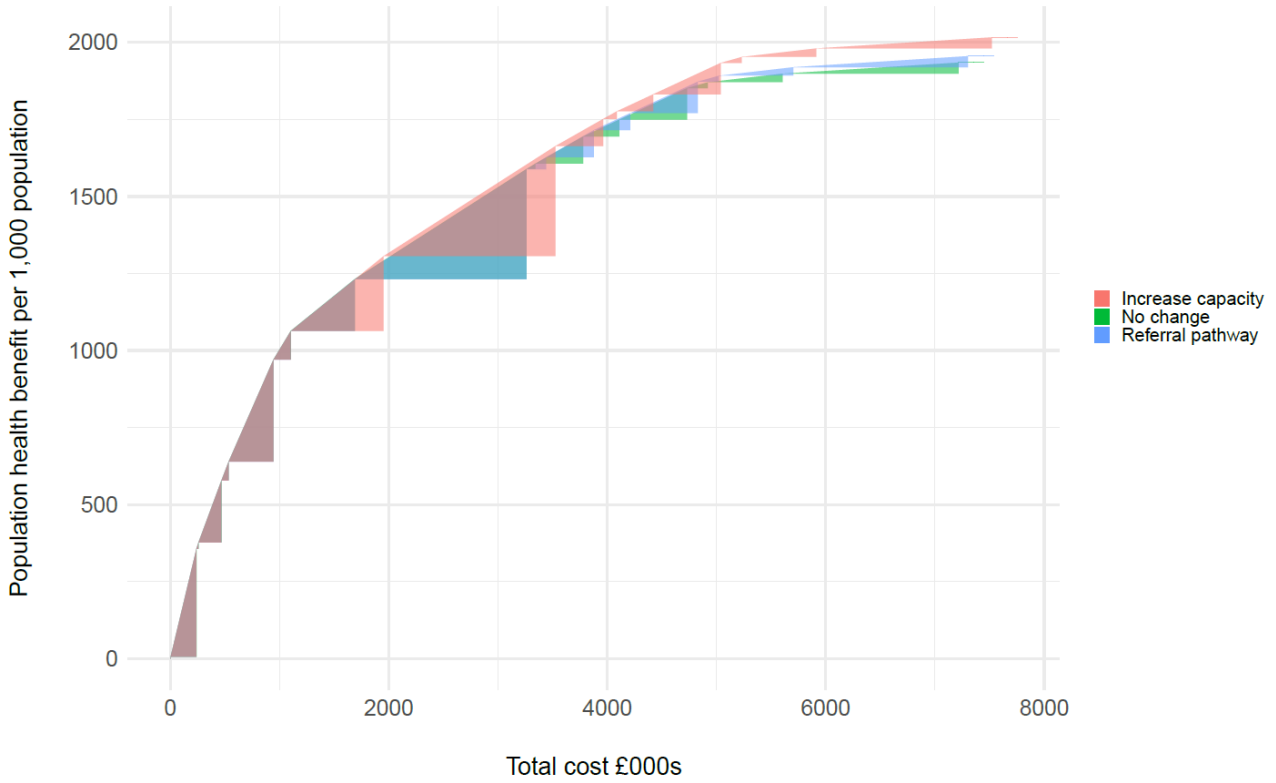
Intervention

Stopping people smoking is regarded as one of the best approaches to prevent COPD or improve symptoms of COPD. Northamptonshire has one of the highest reported quit rates in the country (~61%). Introducing standardised referral pathways for people newly diagnosed (blue) and increasing the capacity of smoking cessation more widely (red) are modelled opposite.

Expected change

Improving the capacity to all smoking cessation services would have the greatest impact on the population health gain of the two scenarios. However the standardised referral pathways would lead to an estimated additional 183 people with COPD quitting smoking every year compared to just increasing the capacity of the services, having a more immediate impact.

Metric	Total	Interpretation
Total additional pathway costs	£85,963.65	The expected reduction in acute exacerbations and hospital admissions is not expected to offset the costs of introducing a standardised referral pathways for people with COPD to smoking cessation.
Additional cost/ additional population health ratio	4.01	It is estimated that the standardised referral pathways would cost £4.01 for every additional unit of population health gain generated
Cost ratio	0.14	Standardised referral pathways are not expected to be cost saving for the COPD pathway. Only £0.14 is saved elsewhere in the pathway for every £1 spent.



Very brief advice (VBA) on smoking cessation in primary care

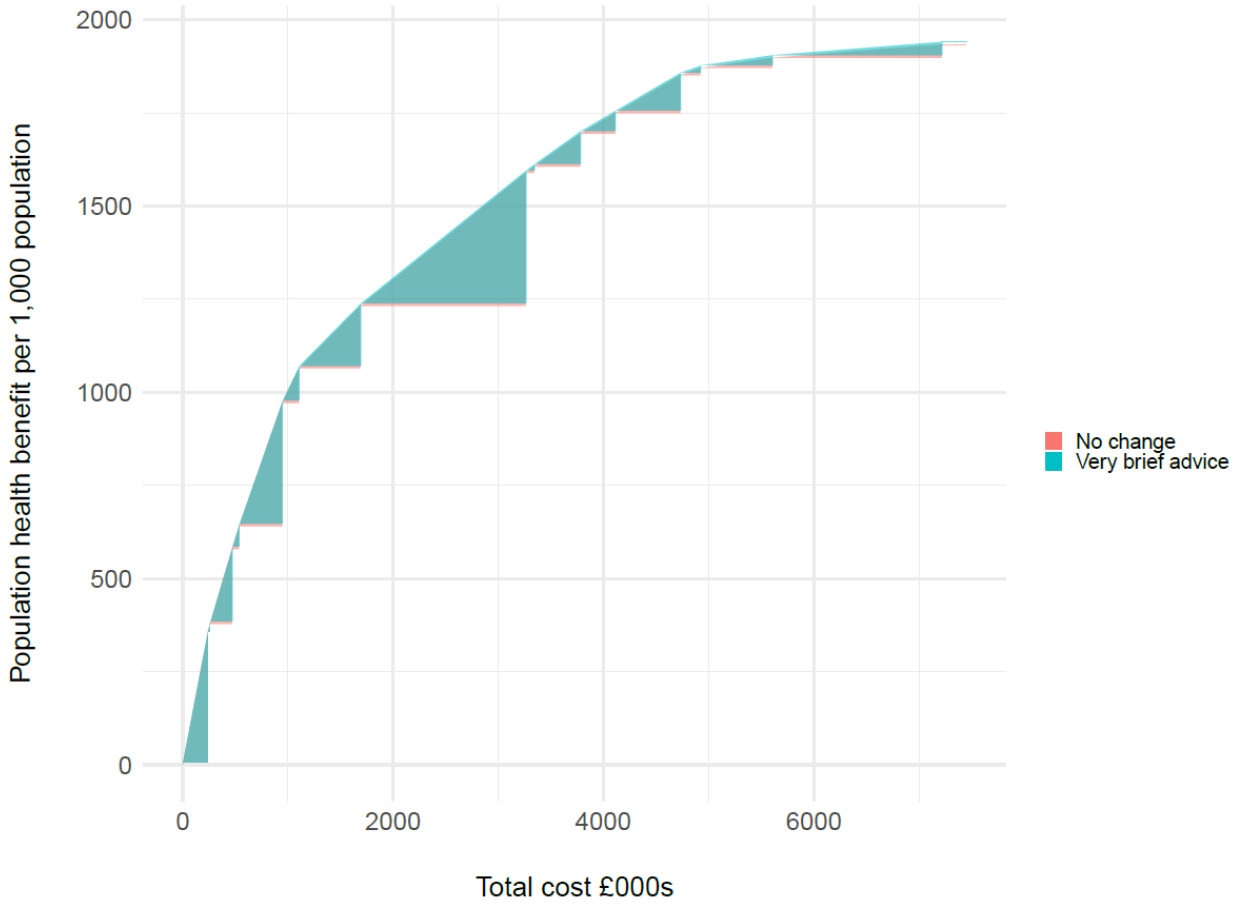
Intervention

One way of improving the number of people who quit smoking would be for all general practitioners to offer VBA on the benefits of stopping smoking, as part of their yearly reviews. The National Centre for smoking cessation and training (NCST) offer a free VBA training module that is available to clinicians working in primary care

Expected change

This intervention, as the course is freely available, will have little cost implication and could lead to an extra 87 people with COPD quitting smoking per year

Metric	Total	Interpretation
Total additional pathway costs	£1,955.55	As the VBA training is free, there is very little cost associated with the interventions. However, the number of acute exacerbations and hospital admissions it is expected to avoid is also small.
Additional cost/ additional population health ratio	0.29	It is estimated that very brief advice on smoking cessation would cost an additional £0.29 for every additional unit of population health gain it generates
Cost ratio	0.70	VBA would save £0.70 elsewhere in the pathway for every £1 spent on it.



Introducing HEPA filters in schools

Intervention

Respiratory viruses drive acute exacerbations of COPD, and it is widely accepted that the spread of respiratory viruses is driven by school-age children. Introducing HEPA filters in schools could reduce transmission of viral particulates and the incidence of respiratory conditions in schools. Theoretically this could in turn reduce the number of people with COPD catching viruses and therefore reduce acute exacerbations.

Expected change

Due to an absence of evidence looking at the effect that HEPA filters in schools would have on people with COPD, it is not possible to visualise the impact of this intervention on the COPD pathway. That said, assuming the HEPA filters are only installed in primary schools, we can estimate the number of hospital admissions that would need to be avoided to make the programme cost neutral in terms of the COPD pathway. By estimating the costs of installation, we can estimate the installation of HEPA filters in primary schools would have to offset between 474 and 1,306 hospital admissions for COPD before it became cost saving. In 2021/22 there were an estimated 725 admissions for COPD

It should be noted that the introduction of HEPA filters could have wider benefits for the health system and society that would affect the cost-benefit calculation. However, these are out of scope of this project.

Metric	Total	Interpretation
Total additional pathway costs	£1,955.55	As the VBA training is free, there is very little cost associated with the interventions. However, the number of acute exacerbations and hospital admissions it is expected to avoid is also small.
Additional cost/ additional population health ratio	0.29	It is estimated that very brief advice on smoking cessation would cost an additional £0.29 for every additional unit of population health gain it generates
Cost ratio	0.70	VBA would save £0.70 elsewhere in the pathway for every £1 spent on it.

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Next steps and recommendations

- Prioritising identified initiatives
- Next steps and recommendations for Northamptonshire

Three ways in which the initiatives can be prioritised

Below are three approaches to priority-setting. The Health Economics Unit recommends that priority-setting of the pathway improvements is done based on the cost/population health ratio (2). Using this method will ensure the most efficient allocation of resources based on cost per unit of population health gain, therefore improving the value for money of the pathway:

1. **Ranking the interventions by a net cost/health ratio** Prioritising in this way will help to ensure that the interventions taken forward will produce the most health within the given available budget. The lower the ratio the better with a negative ratio representing interventions which are both cost saving and health generating.
2. **Ranking the interventions by the ratio of the cost of the intervention to the cost savings elsewhere in the system**. Prioritising in this way can determine the intervention will offset costs elsewhere in the system. A number between 0 and 1 represents cost savings elsewhere in the system.
3. **Looking at the net cost of the intervention**. Similar to looking at the cost ratio, this method can determine whether the intervention is likely to save money overall or incur additional costs.

Ranking scores

In the table below the initiatives have been ranked in order of their cost/health ratio. Using this method will ensure the most efficient allocation of resources based on cost per unit of population health gain:

Ranking	Pathway improvement (scenario)	Cost/population health ratio
1	Post-exacerbation support	-0.28
2	Reducing unwarranted variation in primary care yearly reviews through group consultations (all scenarios)	0.00
3	Launch of myCOPD app	0.01
4	VBA in primary care	0.29
5	Improved signposting to services through information centres	0.47
6	Increasing capacity in spirometry testing	0.56
7	Increasing uptake of smoking cessation services (increasing capacity)	3.05
8	Increasing uptake of smoking cessation services (standardised referral pathways)	4.01
9	Expansion of PR services	13.37

Recommendations

Through the STAR process, it is recommended that Northamptonshire ICS invest in the following interventions:

- **Post exacerbation support.** This initiative is the only one to be cost saving and health generating. It is expected to offset £1.15 for every pound spent due to the reduction in readmissions and save £46,757.25 per year. It would, however, likely require significant upfront investment to hire the staff required to conduct the sessions.
- **Group consultations.** Offering group consultations for yearly reviews is effectively cost-neutral in all three scenarios modelled (whether 10%, 25% or 50% of time spent on yearly reviews is devoted to group consultations). At the same time, a large amount of net population health benefit is generated by the initiatives due to the extra people that will receive a yearly review.
- **Launch of myCOPD app.** Launching the myCOPD app is associated with only a small (£3,832) cost increase and has a large potential population health gain, as it can be offered to everyone with COPD in the county.
- **Very brief advice for smoking cessation.** Although VBA may not generate the most population health benefit compared with some other initiatives (6,525 units), as the cost is minimal it has a favourable cost/population health ratio.

Investing in all these pathway improvements would have a yearly budget impact (sum of the additional costs of the improvements) of £362,310.60, £423,954.09 or £526,363.32 dependent on whether 10%, 25% or 50% of time spent on yearly reviews is allocated to group consultations. The vast majority of this cost (£311,025) is associated with the post-exacerbation support, but this pathway improvement is the only one that is expected to be cost saving

Further information on the recommendations, discussion and limitations can be found in the full report.

Next steps

Improving the allocative efficiency of the COPD pathway will improve the health of the COPD population in Northamptonshire. The Health Economics Unit recommends that:

1. The group should review these findings, agree next steps, and choose the interventions and initiatives to prioritise.
2. The group should then further develop and evidence those interventions and initiatives, using local intelligence and expertise to make the case for change. There are a number of ways to approach this, including through the development of business cases.
3. The group should approach stakeholders for funding and support with governance. Moving resources can be challenging but does lead to improvements in population health. Having the support of relevant stakeholders will ensure successful interventions and initiatives. Buy-in may be achieved by drawing attention to this report, presenting findings and continuing conversations throughout the system. The HEU can support the group with this.
4. The system can then navigate relevant funding and governance for priorities. This may be achieved in a variety of ways (e.g. seeking funding, transferring responsibility for budgets to the most relevant organisations, and reviewing and streamlining existing assumptions and processes).
5. Finally, selected and appropriately resourced initiatives should be closely monitored, measured and controlled to assess impact. This could be done by managing a similar STAR process in 12 months' time.

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