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Midlands and Lancashire
Commissioning Support Unit

Executive Summary: Smarter Spending in Population Health

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

February 2022

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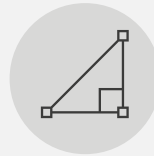
Aims for COPD in Coventry



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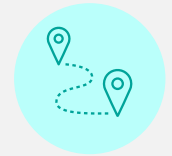
Value-for-money triangles of Coventry's current COPD pathway



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Introduction

- Aims for the COPD population in Coventry

Aims for the COPD population in Coventry

- Coventry Place's respiratory programme, 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 intended to support Coventry's aims to 'improve the health and wellbeing of people living with COPD, or at risk of developing COPD' 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 across Coventry, including people with COPD, 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, key findings and next steps. Further outputs, caveats and methodology details can be found in the full report.



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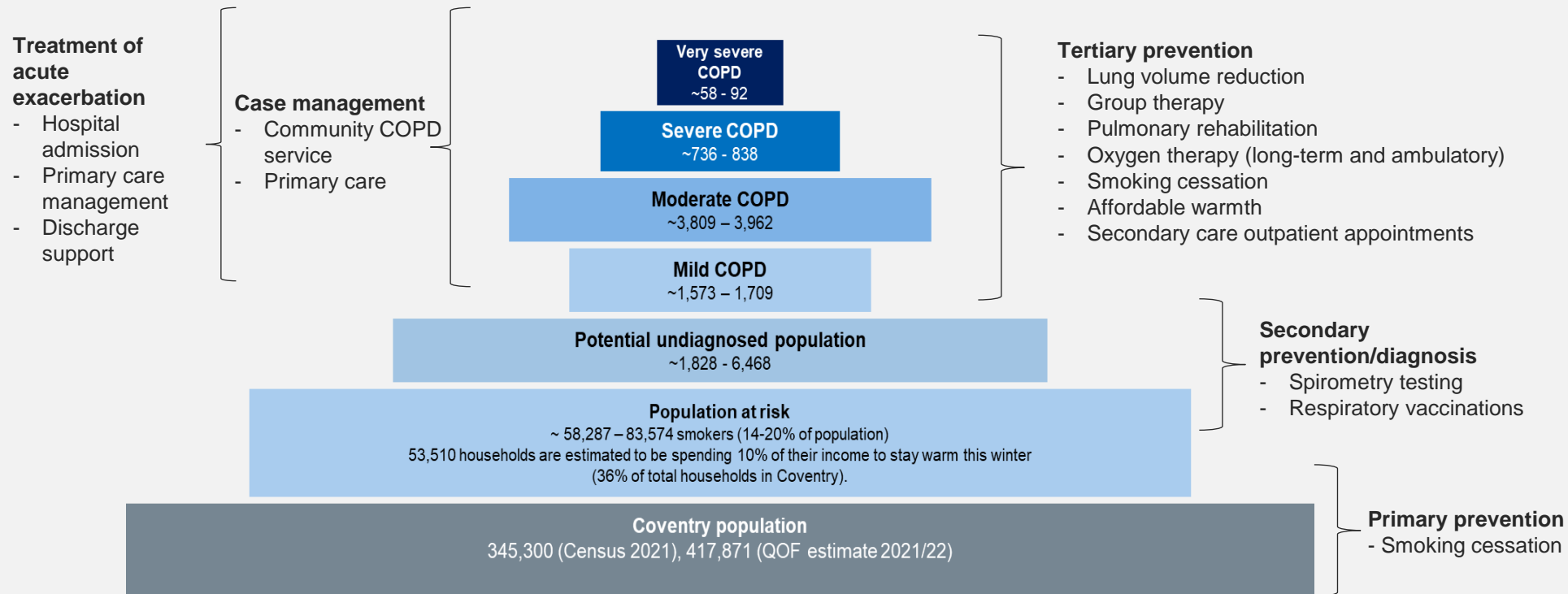
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STAR process in Coventry Place

- COPD population
- STAR process
- Coventry priorities
- Identified initiatives

The COPD population in Coventry

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



Up to ~6,600 people in Coventry have a diagnosis of COPD. This is up to 1.9% of the Coventry population.

Most people (85–87%) with diagnosed COPD in Coventry have mild or moderate disease; 13–15% 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.

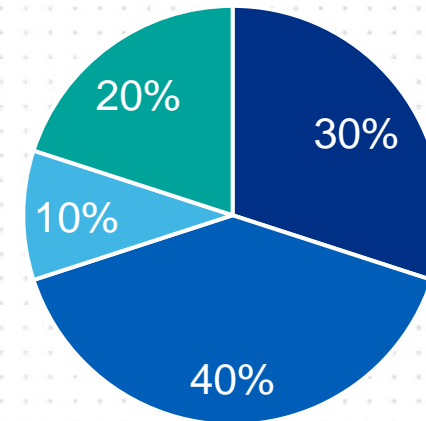
This graph gives estimates – not all precise, but an indication of how many people are in each category

(Fingertips, 2021/22 ; Mclean et al., 2016; Načul et al., 2007; Terry, 2021; Lam, 2022).

Why STAR?

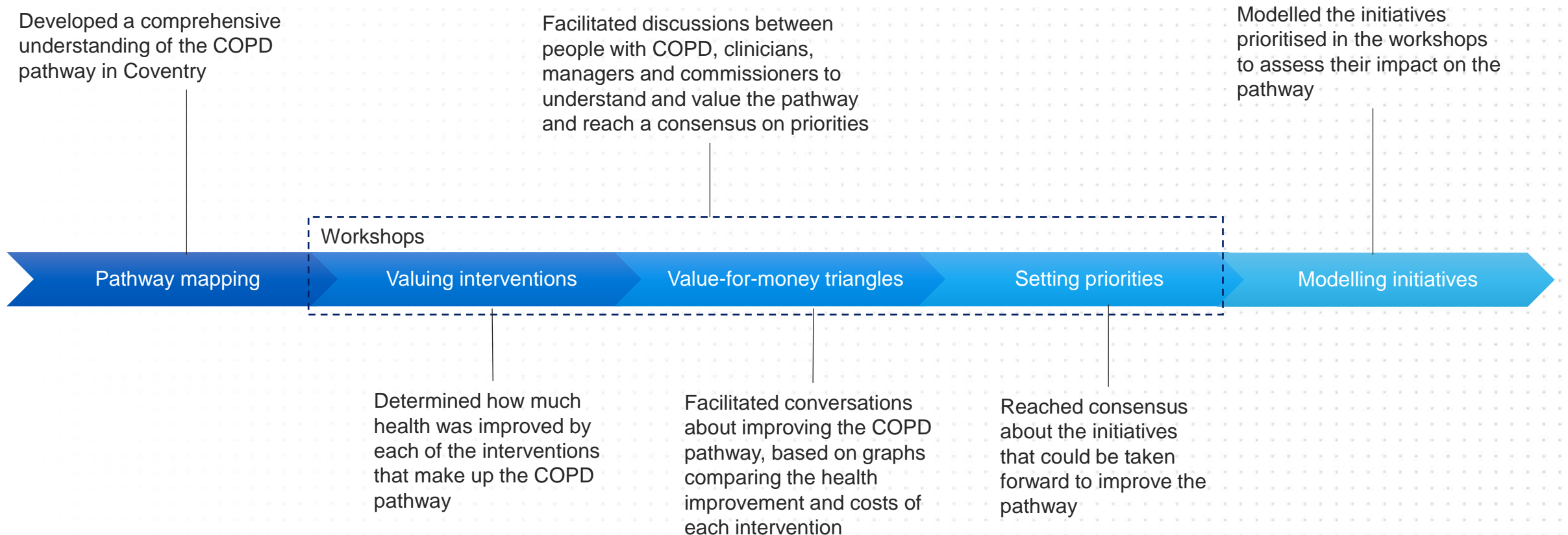
- STAR is a method that can help to determine the priorities through a technical value-for-money analysis with extensive stakeholder engagement.
- STAR provides a structured way to bring stakeholders together to think about allocating resources across the entirety of a pathway through workshops and the 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



- health behaviours
- social and economic factors
- physical environment
- clinical care

The STAR process



See the full report for more detail

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



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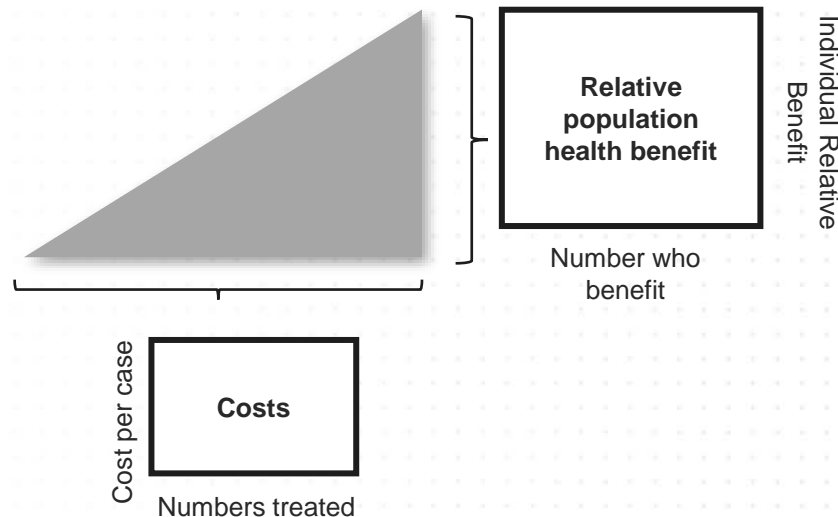
COPD pathway in Coventry Place

- Interpreting value-for-money triangles
- The Coventry 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

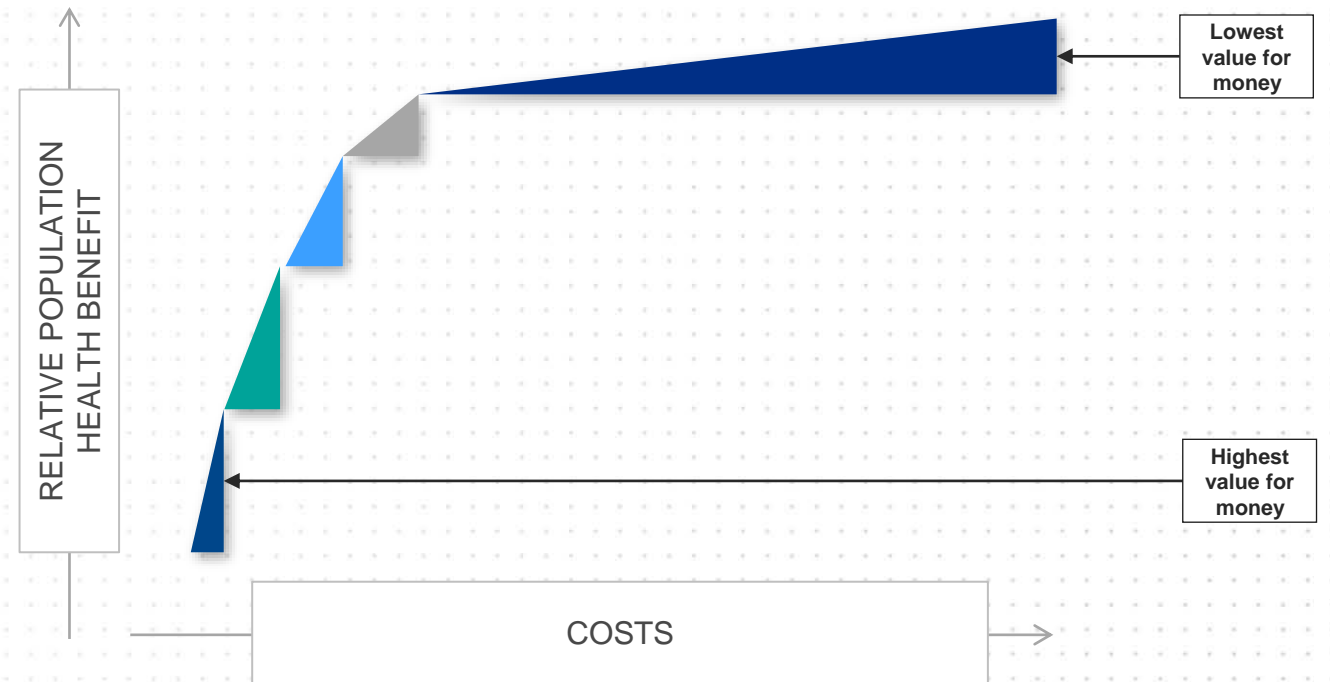
This means that this intervention is *relatively* higher value for money compared to other interventions.

Note: Higher value-for-money triangles are not necessarily 'good' and lower value-for-money triangles are not necessarily 'bad'.

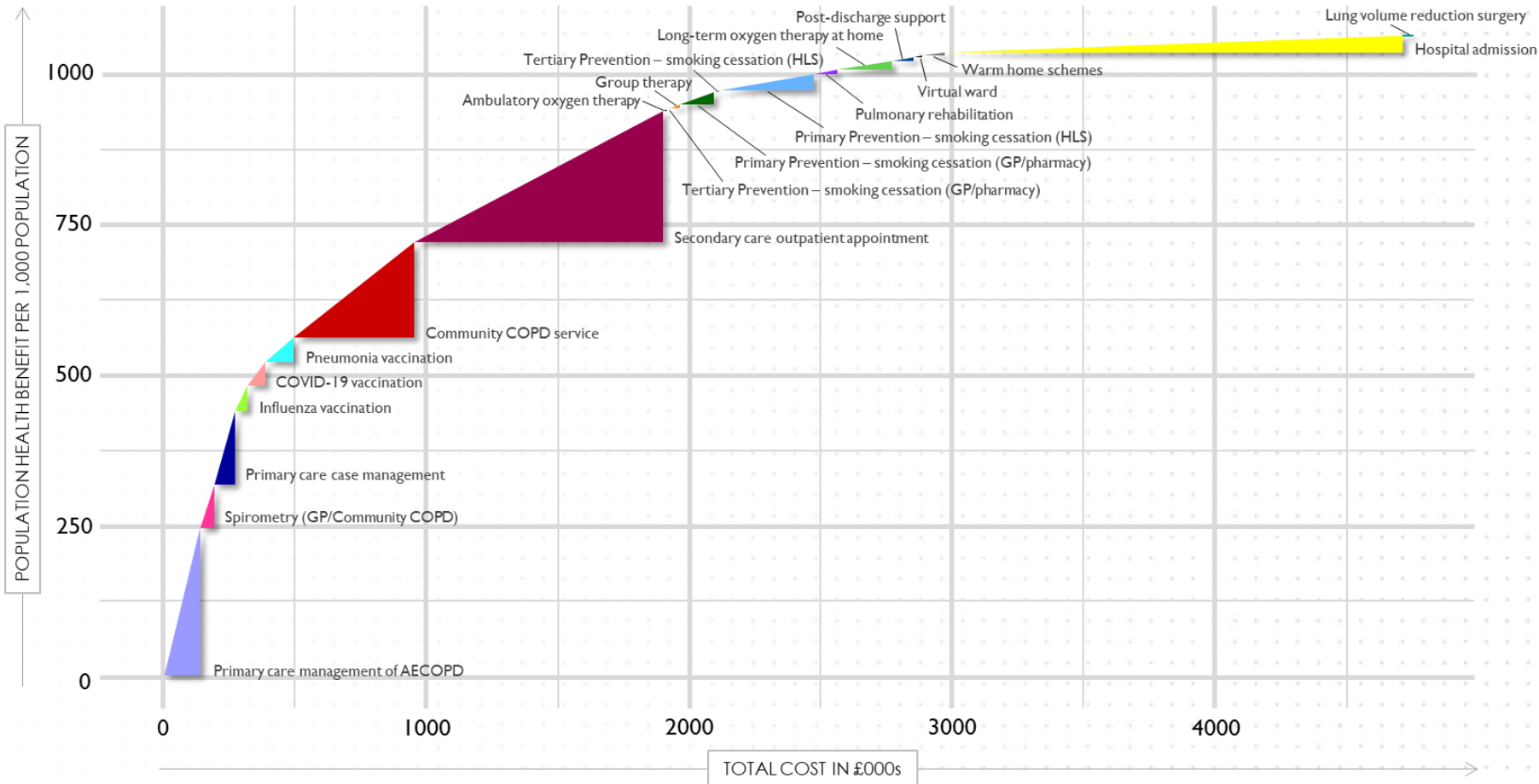
Interpreting the value-for-money triangles: The pathway

- 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



VALUE OF COPD CARE PATHWAY IN COVENTRY



	PRIMARY PREVENTION	SECONDARY PREVENTION	CASE MANAGEMENT	TERTIARY PREVENTION	MANAGEMENT OF AECOPD
% of total spend	10.3%	5.5%	11.3%	30.8%	42%
% of pop health gain	5%	17.9%	26.3%	24.1%	26.6%

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 such as primary care case management and management of acute exacerbations and vaccinations are relatively cheap per case and reach a large segment of the population, despite them having low relative individual health benefit scores compared with 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, such as pulmonary rehabilitation (90) and smoking cessation (99 as tertiary prevention, 100 as primary prevention) appear to offer lower value for money, because only low numbers of people complete the courses. In Coventry, 37% of those referred for pulmonary rehabilitation complete the course, while 43.03% of quit dates set in Health Lifestyle-run smoking cessation services and 29% of those in GP- and pharmacy-led services lead to successful 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, yet appears to offer low value for money because the number who benefit (those diagnosed with COPD) is estimated to be only 28.14% (some spirometry tests will be done to monitor COPD decline rather than attempting to diagnose).

Avoiding exacerbations represents a large cost-saving opportunity

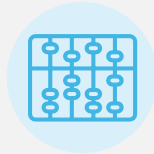
The management of exacerbations (those managed in primary care, emergency attendances and hospital admissions) accounts for 42% of the total spend of the pathway; acute exacerbations also increase the rate of decline in individual cases of COPD. Avoiding exacerbations represents an opportunity to improve health as well as reducing costs.

Priority areas identified

After reviewing the efficiency frontier, the following four key areas of focus to improve the COPD pathway in Coventry Place were identified:



Improving primary care management



Expanding spirometry testing and improving accessibility



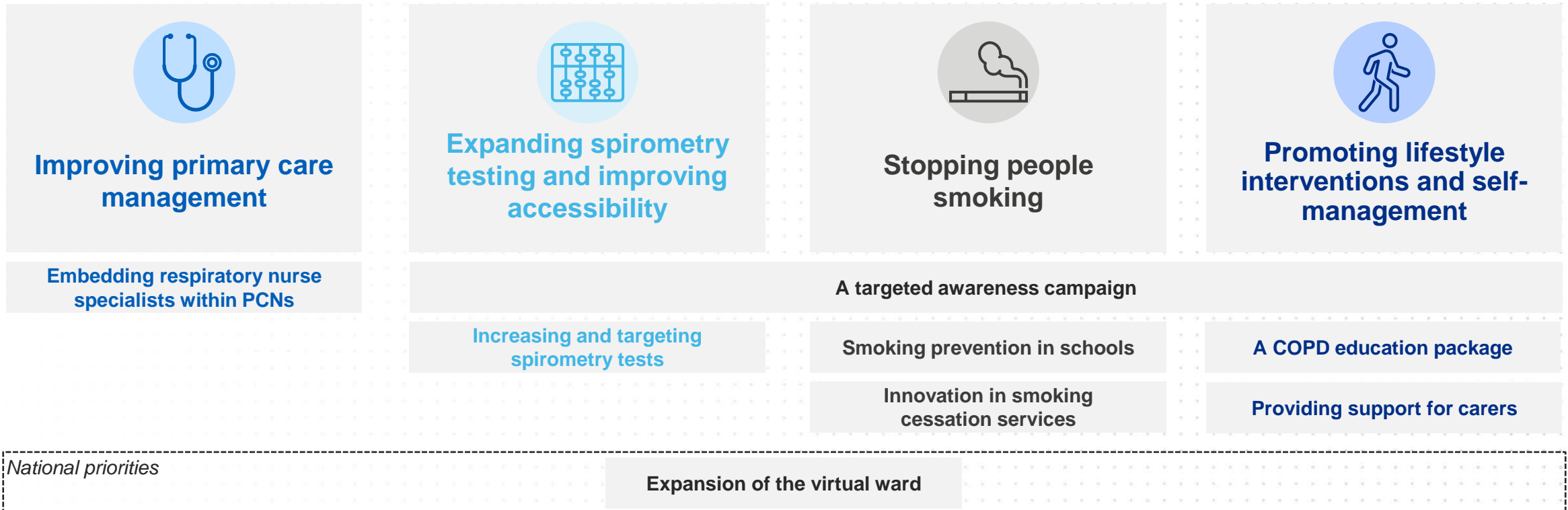
Stopping people smoking



Promoting lifestyle interventions and self-management

Interventions and initiatives identified to improve the pathway

Interventions and initiatives within the four key areas were identified and prioritised.





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Improving the pathway

- Identified initiatives and their modelled impacts

Interventions and initiatives identified to improve the pathway

The interventions and initiatives identified in the workshops are shown below, ordered by highest priority:

1. Joint clinics in primary care with respiratory nurse specialists
2. Targeting spirometry testing and improving uptake
3. Carer support
4. Innovation in smoking cessation services
5. Targeted awareness campaign
6. Education in schools against smoking and vaping
7. Expansion of the virtual ward

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 the 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, and combined with assumptions 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 intended to be a high level analysis to steer and direct decision making, rather than an in depth analysis. More work is needed when implementing and evaluating the interventions/recommendations.
- Only 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 be needed to adapt these scenarios into business cases.

More information is available in the full report

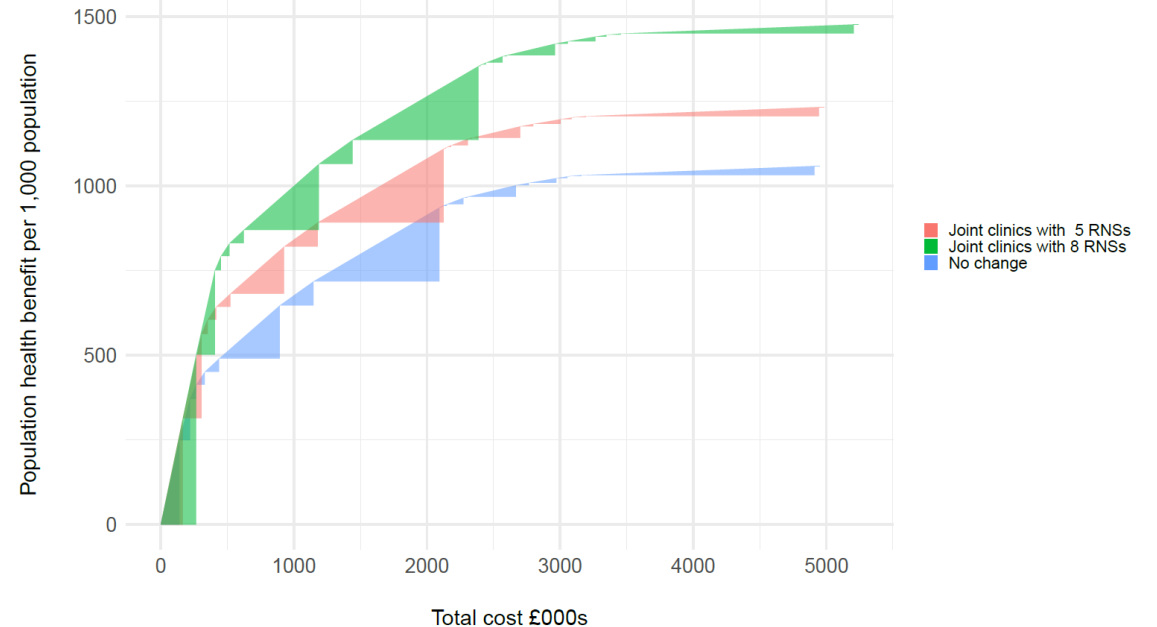
Joint clinics in primary care with respiratory nurse specialists (RNSs)

Intervention

Helping GP staff to build up specialist knowledge in COPD management could help to reduce variability in provision. Allowing the RNSs to hold joint clinics in general practices for yearly reviews could leave knowledge behind and to increase capacity for primary care case management.

Expected change

Here we model two scenarios; **holding joint clinics with the current establishment of 5.6 RNSs** and **hiring an additional 3 RNSs**. Both scenarios greatly increase the population health gain because they improve the relative health benefit score of primary care case management and, in the case of hiring additional RNSs, expands capacity in the community. However, both scenarios have cost implications.



Metric	Joint clinics with the current establishment of 5.6 RNSs		Joint clinics with 8.6 RNSs (an additional 3 RNSs)	
	Total	Interpretation	Total	Interpretation
Total additional pathway costs	£37,714.35	The pathway improvement is not cost saving. This is mainly due to the cost of the additional yearly reviews.	£381,795.58	The pathway improvement has a large cost associated with it. This is due to the additional reviews in primary care and the cost of the additional RNSs.
Additional cost/ additional population health ratio	0.22	The pathway improvement would cost £0.22 for every additional unit of population health gain generated.	0.85	The pathway improvement would cost £0.85 for every additional unit of population health gain generated.
Cost ratio	0.56	The pathway improvement is not cost saving. It would save £0.56 (due to reduction in community COPD service) contacts for every £1 spent.	-1.05	The pathway improvement is cost incurring. It would cost £0.56 (due to an increase in community COPD service capacity) contacts for every £1 spent on the joint clinics.

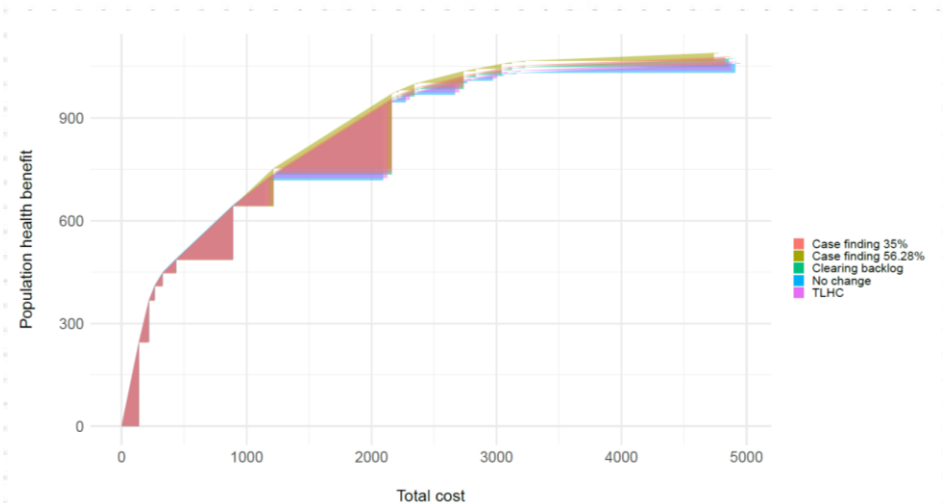
Targeting spirometry testing and improving uptake

Intervention

There is not enough capacity to meet the demand of the spirometry wait list, and there are several communities that do not normally interact with respiratory services. So improving testing access and targeting populations could lead to more tests being done, reduced waits and earlier diagnoses.

Expected change

Here we have modelled four scenarios: increasing capacity to meet demand, improving diagnosis rate to 56.28% through case finding, improving diagnosis rate to 35% and expanding targeted lung health checks by testing patients with moderate emphysema. All of these scenarios are expected to be cost saving. Spirometry testing strategies should be designed to diagnose as many people as possible per test given, to make the testing as cost-effective as possible.



Metric	Increasing capacity to meet demand		Improving the diagnosis rate to 56.28%		Improving the diagnosis rate to 35%		Expanding targeted lung health checks	
	Total	Interpretation	Total	Interpretation	Total	Interpretation	Total	Interpretation
Total additional pathway costs	-£52,051.25	This scenario is cost saving due to the estimated reduction in hospital admissions and primary care-managed acute exacerbations that an early diagnosis is expected to lead to compared to a late diagnosis	-£171,981.70	This scenario is cost saving. It will incur less costs over the pathway than any other scenario for spirometry testing.	-£80,713.57	This scenario is expected to lead to a large enough reduction in hospital admissions and primary care-managed AECOPDs to be cost-saving.	-£26,258.27	This scenario is not expected to lead to a large enough reduction in hospital admissions and primary care-managed AECOPDs to be cost-saving.
Additional cost/ additional population health ratio	-2.62	This scenario is cost saving and health generating. It would save £2.62 for each additional unit of population health gain it generates.	-4.33	This scenario is cost saving and health generating. It would save £4.33 for every additional unit of population health gain it generates.	-3.27	This scenario is cost saving and health generating. It is estimated to cost £3.27 for every additional unit of population health gain generated.	-2.58	This scenario would save £2.58 for every additional unit of population health gain it generates.
Cost ratio	1.74	This improvement is cost-saving. It is estimated to save £1.74 elsewhere in the pathway for every £1 spent on the testing.	3.44	This scenario is expected to be cost-saving. It is estimated to save £3.44 elsewhere in the pathway for every £1 spent on spirometry testing.	2.15	This scenario is not cost-saving. It is estimated to save £2.15 elsewhere in the pathway for every £1 spent on spirometry testing.	1.72	This scenario is cost-saving. It would save £1.72 elsewhere in the pathway for every £1 spent on spirometry testing.

Carer support

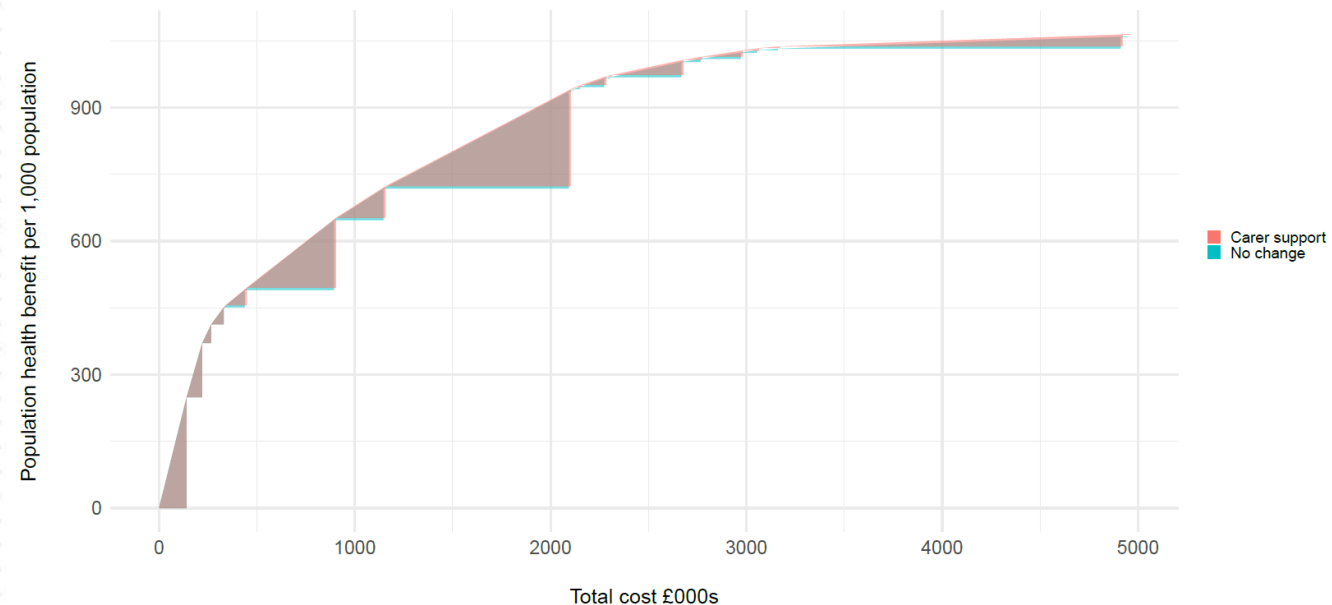
Intervention

Non-professional or informal carers play a large role in the care of people with COPD (Peña-Longobardo et al., 2015). Support for carers could be given alongside the peer support that is offered by RIPPLE.

Expected change

As the carer groups only reach a small amount of people, it should only have a minimal impact on the pathway. As it is not expected to lead to changes in other pathway elements, it is not expected to be cost saving. Offering the carer support groups to more people could improve the overall benefit of the carer support groups.

Metric	Total	Interpretation
Total additional pathway costs	£10,080	As carer support is not expected to lead to any changes in other pathway components, it is not expected to be cost saving.
Additional cost/ additional population health ratio	2.1	It is expected carer support would cost £2.10 for every additional unit of population health gain it generates.
Cost ratio	N/A	As carer support is not expected to lead to any changes in other pathway components, it is not possible to calculate a cost ratio as the numerator would be 0.



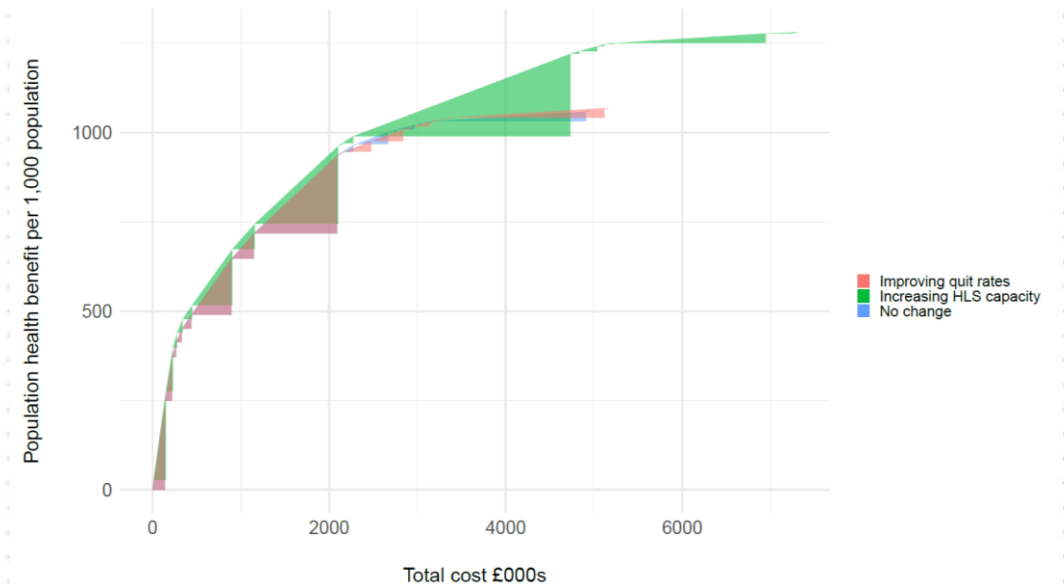
Innovation in smoking cessation services

Intervention

Getting more at-risk people to quit smoking will stop people developing COPD in the first place. People with COPD who have quit smoking should experience fewer exacerbations and have improved symptoms. It was agreed that more can be done to stop people smoking across the board.

Expected change

Here we have two modelled scenarios; increasing capacity in the Health Lifestyles Service and improving quit rates from GP- and pharmacy-led services. Both scenarios are estimated to greatly improve the population health benefit of the pathway but also have large cost implications. The pathway savings are not expected to make up for the cost. This is because many people need to be treated per year to avoid admissions and acute exacerbations.



Metric	<i>Increasing capacity in the Health Lifestyles Service</i>		<i>Improving quit rates from GP- and pharmacy-led services</i>	
	Total	Interpretation	Total	Interpretation
Total additional pathway costs	£1,372,001.46	This scenario has a large cost implication associated with it. When looking at only the benefits that this will bring to the COPD pathway, the cost savings account for only a fraction of the cost of the scenario.	£189,477.75	This scenario is not cost-saving. The extra number of quitters is not large enough to avoid any further acute exacerbations or hospital admissions, so the cost savings are minimal.
Additional cost/ additional population health ratio	9.80	This scenario is expected to cost £9.80 for every additional unit of population health gain it generates.	18.59	This scenario would cost £18.59 for every additional unit of population health gain it generates for the COPD pathway.
Cost ratio	0.08	This scenario is not cost-saving. It would save £0.08 elsewhere in the COPD pathway for every £1 spent.	0.04	This scenario is not cost-saving. It would save £0.04 elsewhere in the COPD pathway for every £1 spent.

Education package for people with COPD

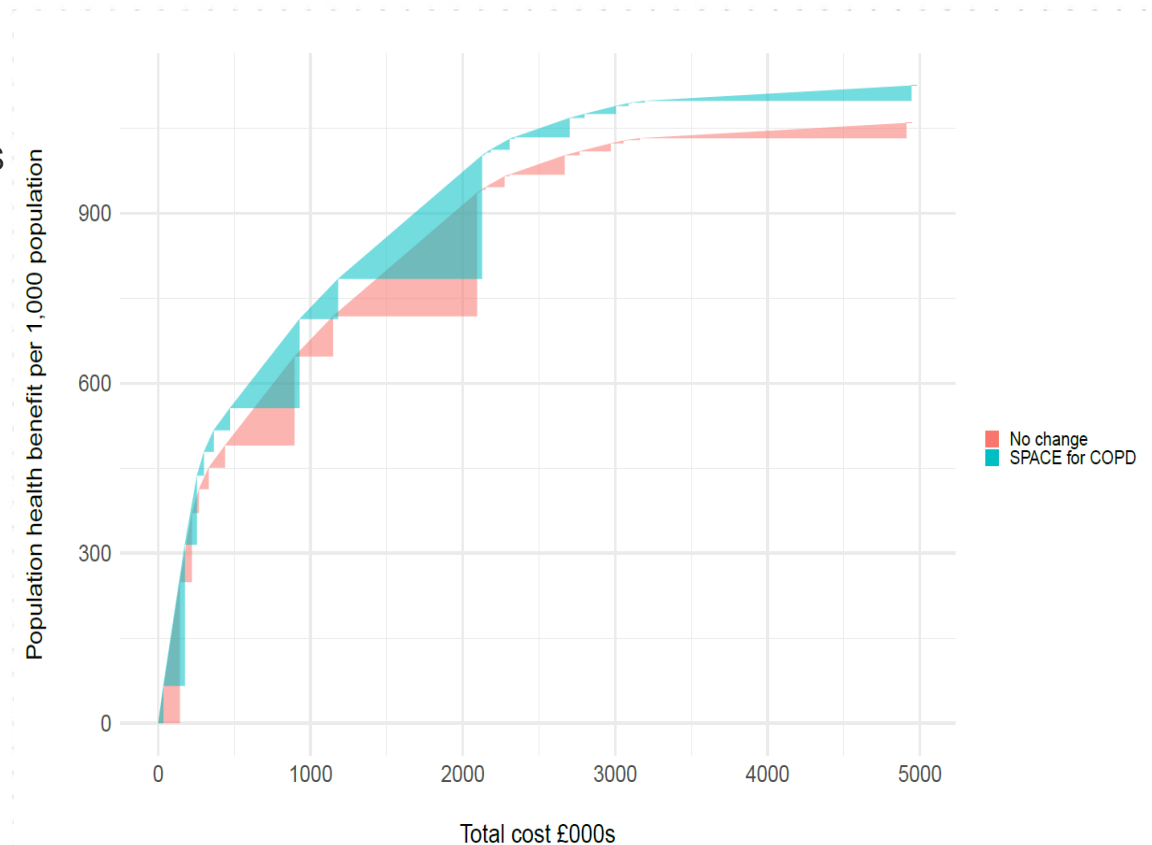
Intervention

There is no significant education programme to help people with COPD manage their condition. This contrasts to diabetes care where people can attend the DESMOND course (Gillett et al., 2010). A programme similar to DESMOND for diabetes has been developed by the University of Leicester called SPACE for COPD (University Hospitals Leicester NHS Trust, 2023). This self-management programme covers topics such as information about medication, breathing control, exercise and nutritional advice.

Expected change

An education programme would help people to understand and self-manage their own condition better (NICE, n.d.). No papers looking at healthcare resource use for the SPACE programme or similar interventions were identified.

Metric	Total	Interpretation
Total additional pathway costs	£33,250.50	The education package is cost-incurring as there are no expected cost savings elsewhere in the pathway.
Additional cost/ additional population health ratio	0.51	The education package would cost £0.51 for every additional unit of population health gain it generates.
Cost ratio	N/A	As the education package is not expected to lead to any changes in other pathway components, it is not possible to calculate a cost ratio as the numerator would be 0.



Targeted awareness campaign

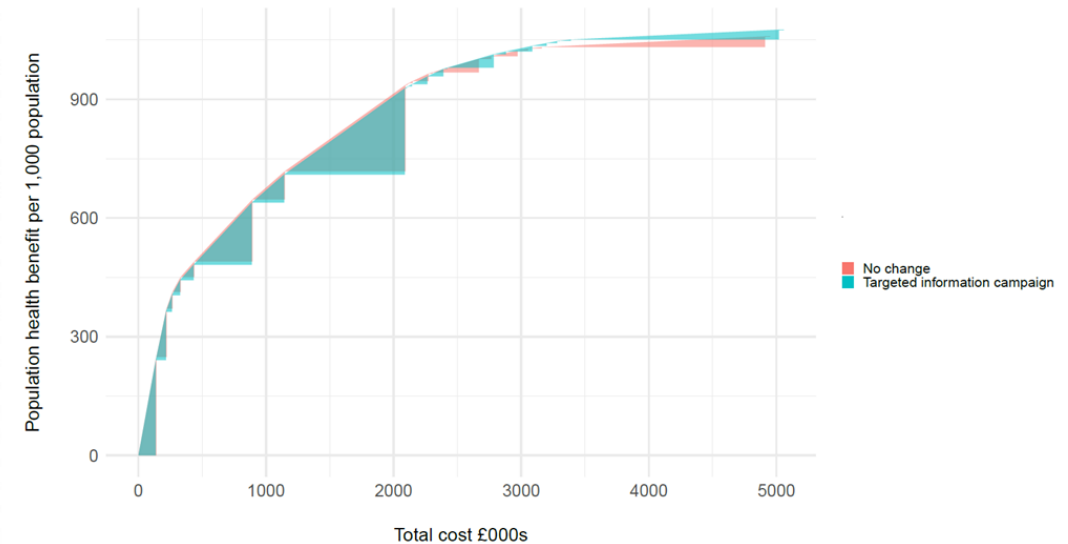
Intervention

Despite its high prevalence, COPD is less well known compared with more common respiratory conditions such as lung cancer and asthma. This means people who may be experiencing symptoms of COPD may not recognise their symptoms and are therefore less likely to present to healthcare services. Here we look at the impact that a targeted awareness campaign may have, assuming it improves the number of people coming forward for spirometry testing and pulmonary rehabilitation.

Expected change

The aim of this campaign would be to target communities where the expected prevalence of COPD is higher than the recorded prevalence. This would make people more aware of the symptoms of COPD and the services available for new and existing patients, encouraging them to come forward for testing or to request referrals to other services.

Metric	Total	Interpretation
Total additional pathway costs	£143,628.89	It is not expected that the targeted information campaign would be cost-saving.
Additional cost/ additional population health ratio	5.76	The targeted information campaign is expected to cost £5.76 for each additional unit of population health gain it generates.
Cost ratio	0.46	The targeted information campaign is not expected to be cost-saving. It is estimated to save £0.46 elsewhere in the pathway for every £1 spent.



Education in schools against smoking and vaping

Intervention

More could be done to stop young people from smoking and vaping in the first place.

NICE recommends school-based interventions as one way of achieving this through whole-school smoke-free policies and adult- and peer-led interventions (NICE, 2021). One such programme is the INTENT smoking prevention programme.

Expected change

The INTENT programme could lead to fewer people taking up smoking. It has been tested in three studies, including a cluster randomised controlled trial, and has shown positive effects on smoking initiation in schools (Conner et al., 2019). People who do not smoke are much less likely to develop COPD than those who do (Terzikhan et al., 2016).

Intended impact on pathway

As the only impact of this intervention would be primary prevention, we have not created a visualisation for this scenario.

It can be expected that this would avoid 102 cases of COPD for every year that the programme runs. This scenario has not been modelled as it only impacts on primary prevention.

It should be noted that stopping individuals smoking also has wider benefits outside of the COPD pathway, including reducing the risk of a wide range of other diseases, saving money and a reduction in second-hand smoke for others.

Metric	Total	Interpretation
Total additional pathway costs	£107,938.78	The cost savings due to the number of COPD cases avoided are not expected to make this campaign cost-saving.
Additional cost/ additional population health ratio	1.10	Education against smoking and vaping in schools is expected to cost £1.20 for every additional unit of population health gain it generates.
Cost ratio	0.41	Education against smoking and vaping in schools is not cost-saving. It would save £0.41 for every £1 spent due to cases of COPD avoided.

Expansion of the virtual ward

Intervention

The virtual ward is a time-limited service that allows a patient, through remote monitoring, to receive hospital-level care in the comfort of their own home.

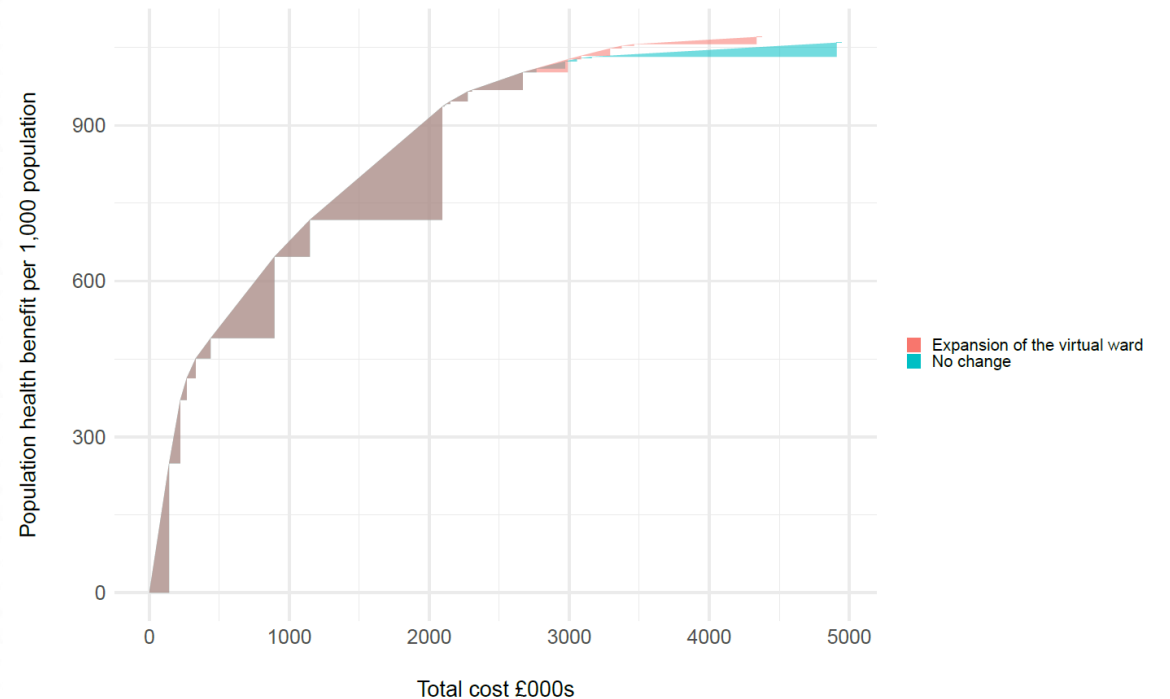
UHCW is currently piloting a virtual ward for COPD patients (Coventry and Warwickshire CCG, 2022). An expansion of this service could lead to system benefits by keeping people with COPD out of hospital.

Expected change

People admitted to hospital with an acute exacerbation of COPD spend less time in hospital. A recent Cochrane Review showed virtual wards to be similar compared with current practice in terms of readmission to hospital (Gonçalves-Bradley et al., 2017).

Intended impact on pathway

It is assumed that patients with a DECAF score of 0 or 1 (approximately 50% of patients) are eligible (Echevarria et al., 2018). As can be seen in the graph, the virtual ward is cost-saving overall because it should be cheaper to treat someone on the virtual ward rather than in hospital. It also improves the value as people are treated at home rather than in hospital.



Metric	Total	Interpretation
Total additional pathway costs	-£553,523.40	The virtual ward is expected to be cost-saving. This is because it is estimated to cost £1,628.01 less to care for someone on a virtual ward than in hospital following an acute exacerbation.
Additional cost/additional population health ratio	-22.30	The virtual ward is expected to be cost-saving and health-generating. It is estimated to save £22.30 for every additional unit of population health gain it generates.
Cost ratio	2.72	The virtual ward would save £2.72 due to reduced spend on hospital admissions for every £1 spent on the virtual ward.

Next steps and recommendations

- Prioritising identified initiatives
- Next steps and recommendations for Coventry

Three ways in which the initiatives can be prioritised

Below are three approaches to priority-setting. The HEU recommends using approach 1, ranking the cost/health ratio for priority-setting of the pathway improvements. 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 pathway.** Prioritising in this way can determine the intervention will offset costs elsewhere in the pathway. A number between 0 and 1 represents cost savings elsewhere in the pathway.
- 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

The table below shows the initiatives ranked in order of their cost/health ratio. We recommend using this method as it 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	Expansion of the virtual ward	-22.30
2	Targeting spirometry testing and improving uptake (improving the diagnosis rate to 56.28%)	-4.33
3	Targeting spirometry testing and improving uptake (improving the diagnosis rate to 35%)	-3.27
4	Targeting spirometry testing and improving uptake (increasing capacity to meet demand)	-2.62
5	Targeting spirometry testing and improving uptake (expanding TLHCs)	-2.58
6	Joint clinics in primary care (with current establishment of 5.6 RNSs)	0.22
7	Education package for people with COPD	0.51
8	Joint clinics in primary care (with 8.6 RNSs)	0.85
9	Education in schools against smoking and vaping	1.10
10	Carer support	2.1
11	Targeted awareness campaign	5.76
12	Innovation in smoking cessation services (increasing capacity in Healthy Lifestyles service)	9.80
13	Innovation in smoking cessation services (improving quit rates in GP- and pharmacy-led services)	18.59

Recommendations

Through the STAR process, it is recommended that Coventry Place invest in the following interventions:

- **Expansion of the virtual ward.** The expansion of the virtual ward is a national priority. This improvement is expected to lead to a large cost saving as it is less expensive to treat someone at home, through the virtual ward, than in a hospital. It would be expected to save £553,523.40 per year if 50% of all hospital admissions for an acute exacerbation were treated through the virtual ward.
- **Targeting spirometry testing and improving diagnosis.** Expanding the capacity in spirometry testing is key to overcoming the difficulties in spirometry testing following the COVID-19 pandemic. All the scenarios modelled here are expected to be cost-saving. The better the diagnosis rate, the more cost effective spirometry testing will be.
- **Joint clinics in primary care (current establishment of 5.6 RNSs).** This improvement is the most cost-effective approach for addressing the importance of primary care. It is expected to cost an estimated additional £86,463.72 per year. Hiring an extra three RNSs is estimated to generate the most additional population health benefit of any scenario suggested in this report. However, the additional cost that this would incur, and the expected shortage of RNSs to hire, mean that using the current establishment of nurses would be more cost-effective.
- **Education package for people with COPD.** This pathway improvement would help people to realise the long-term benefits of lifestyle interventions by supporting people with COPD to better manage their own condition. It is expected to cost an additional £33,250.50.
- **Education in schools against smoking and vaping.** This improvement would help to stop more people from smoking as primary prevention. This improvement is expected to cost an additional £183,884.92 per year.

Investing in all these recommended improvements would have an estimated yearly budget impact (sum of the additional costs of the pathway improvement) of £727,362.34 or £693,212.69 dependent on whether spirometry testing is carried out is part of the targeted lung health checks (£693,212.69) or not (£727,362.34).

That said, the savings from the virtual ward, expected to be £553,523.40, would save enough to cover most of these additional costs. For these recommendations to be carried out, the capacity and resource available to the community COPD service should be considered carefully; both the virtual ward and the joint clinics involve their input. From a financial point of view, the challenge is being able to release the savings from the virtual ward into other parts of the system.

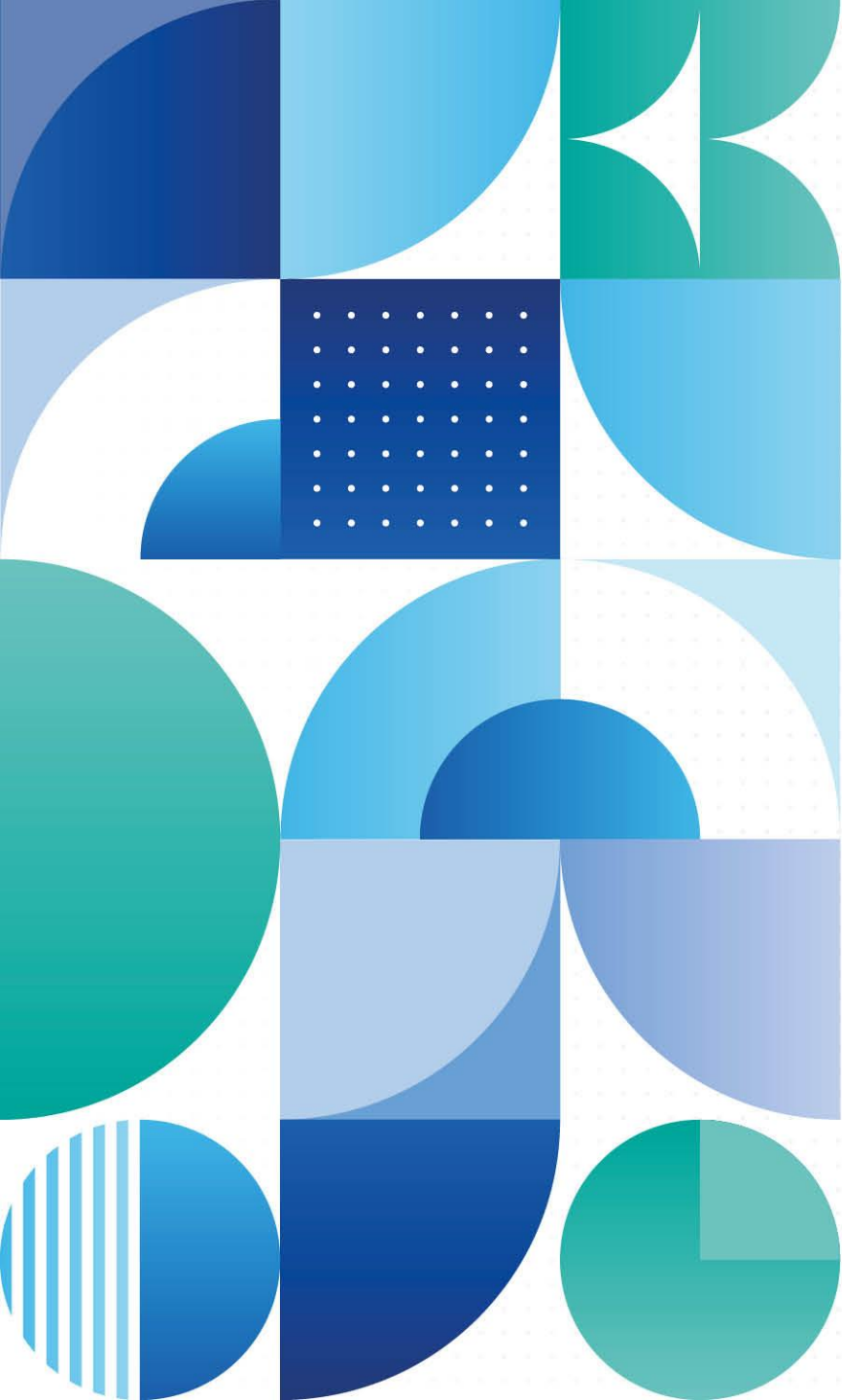
Next steps

Improving the allocative efficiency of the COPD pathway will improve the health of the COPD population in Coventry. The HEU 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. It is assumed that Coventry Place have a fixed budget for their respiratory programme. Therefore, it is recommended that discussions are held with the relevant stakeholders on how the savings and resources created by the virtual ward can be used to support the other initiatives. 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 Place. The HEU can support the group with this.
4. The Place 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, 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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