



Health
Economics
Unit



Midlands and Lancashire
Commissioning Support Unit

Smarter Spending in Population Health

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

March 2023

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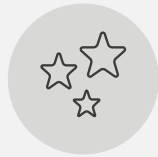
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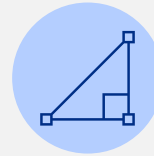
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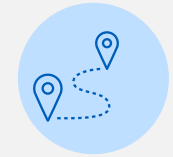
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This is the condensed report. For more on methods, references and caveats, please see the full report.

Executive summary

- Overview of the process, findings and recommendations

Process

The project aimed to understand how to increase allocative efficiency of the COPD pathway in Gloucestershire. It was facilitated through the following process:



[More details on the project process are on page 12](#)

Key priorities and findings

More proactive and earlier interventions in primary care



Many high value interventions are delivered in primary care. However, there is variability in care the offered and a significant undiagnosed population. Therefore standardising the quality of primary care and increasing early diagnosis could help with early intervention.

Creation of a tobacco prevention and treatment alliance



More can be done to prevent tobacco use and help people to quit. An alliance could be set up to implement pathway improvements and advocate for changes beyond their remit.

Enhancing the role of social prescribing and awareness of services



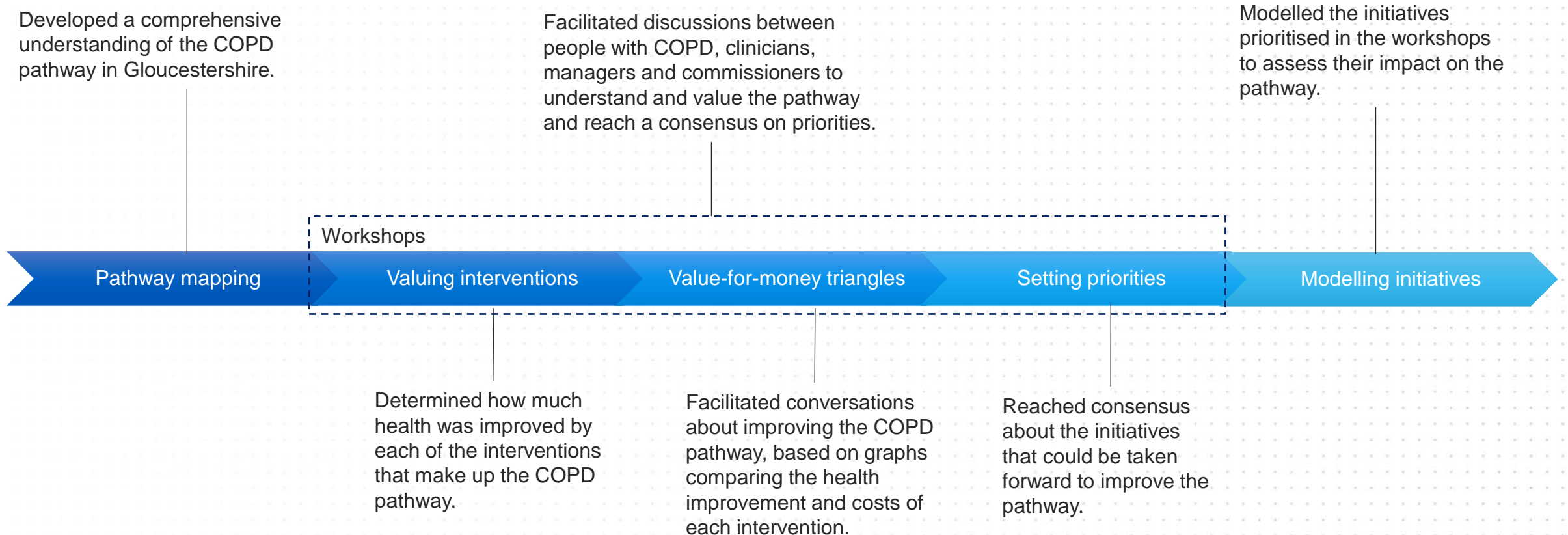
Many available services have been proven to improve quality of life, wellbeing and reduce hospital admissions such as pulmonary rehabilitation (PR), KiActiv and Mindsong groups. However these services are not widely known and completion of courses could be higher.

Managing acute exacerbations more efficiently



The management of acute exacerbations accounts for 45.2% of the total COPD pathway spend. Treating people outside of hospital is beneficial for both the patient and the system. Doing more to keep people out of hospital could free up resource that can be used elsewhere.

The STAR process



See the full report for more detail

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



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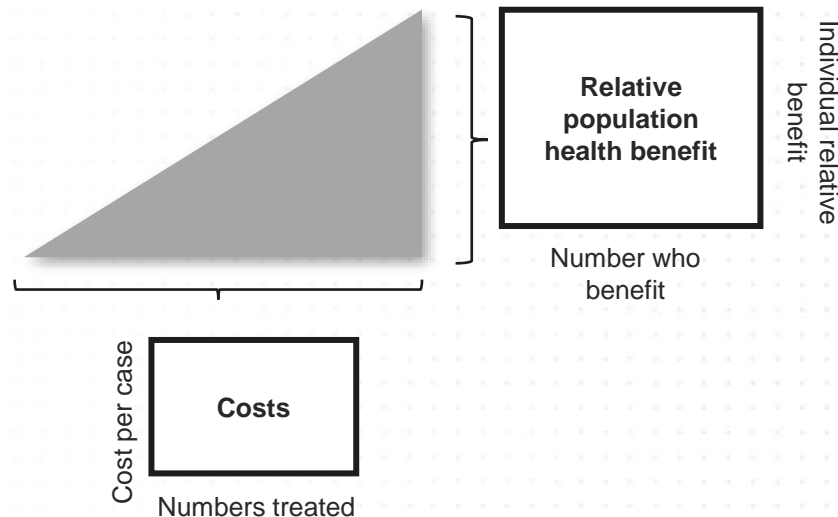
Current pathway

- Interpreting the value-for-money triangles
- The Gloucestershire 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

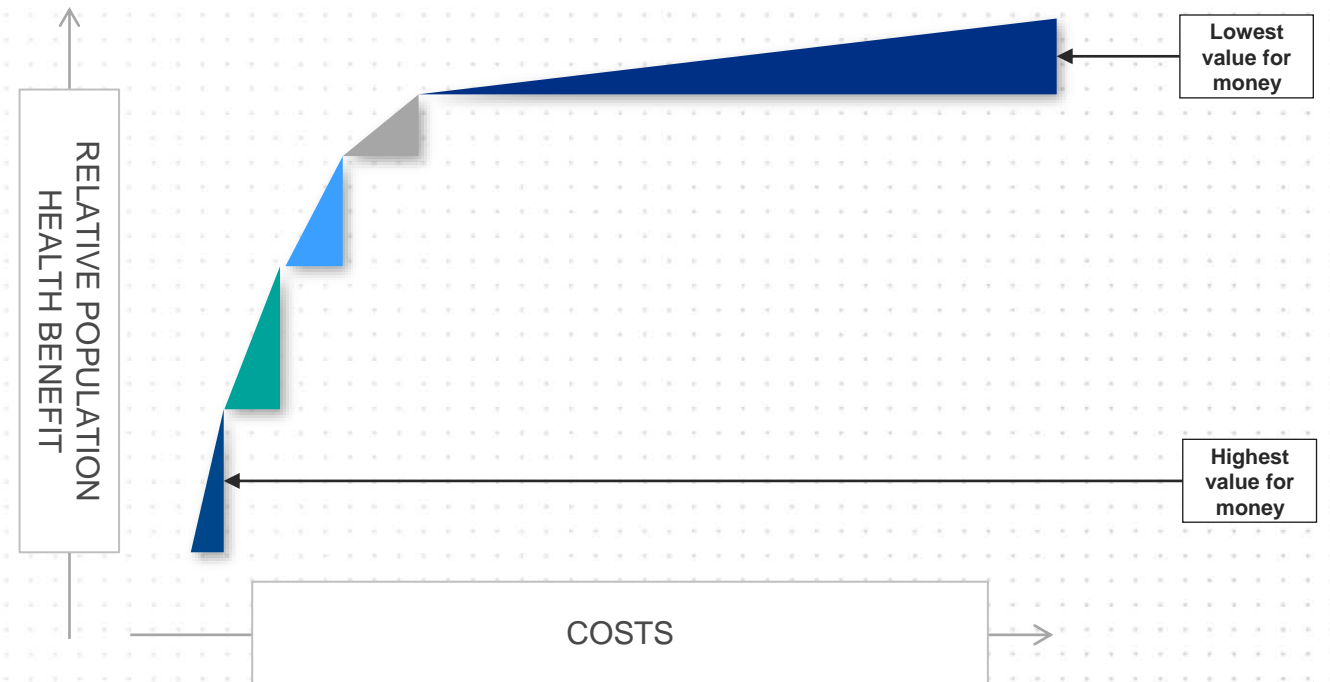
This means that this intervention is *relatively* higher value for money compared to other interventions.



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

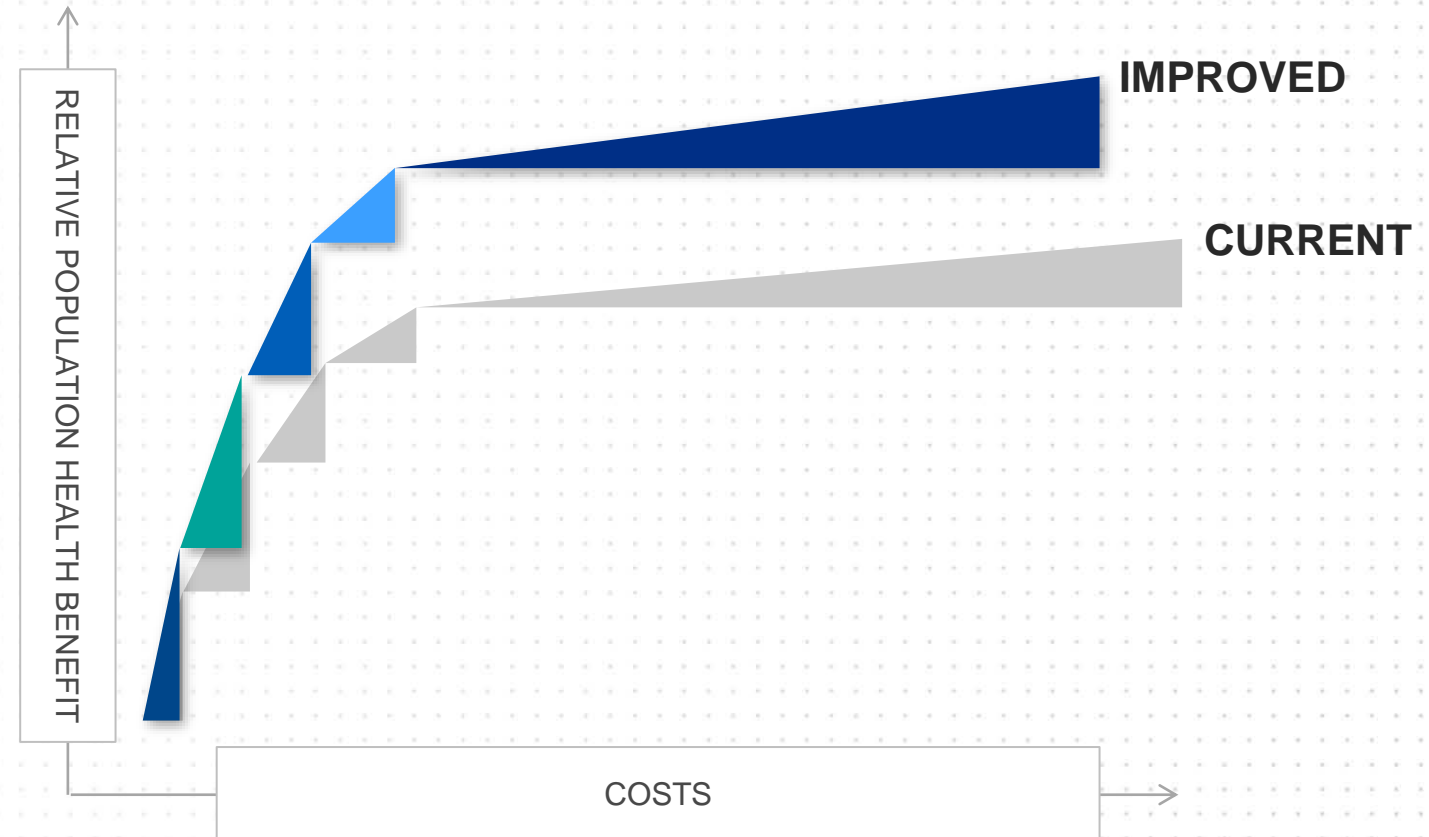
Interpreting the value-for-money triangles: the pathway

- This is an easy-to-interpret graph of where the value lies in a pathway.
- 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.

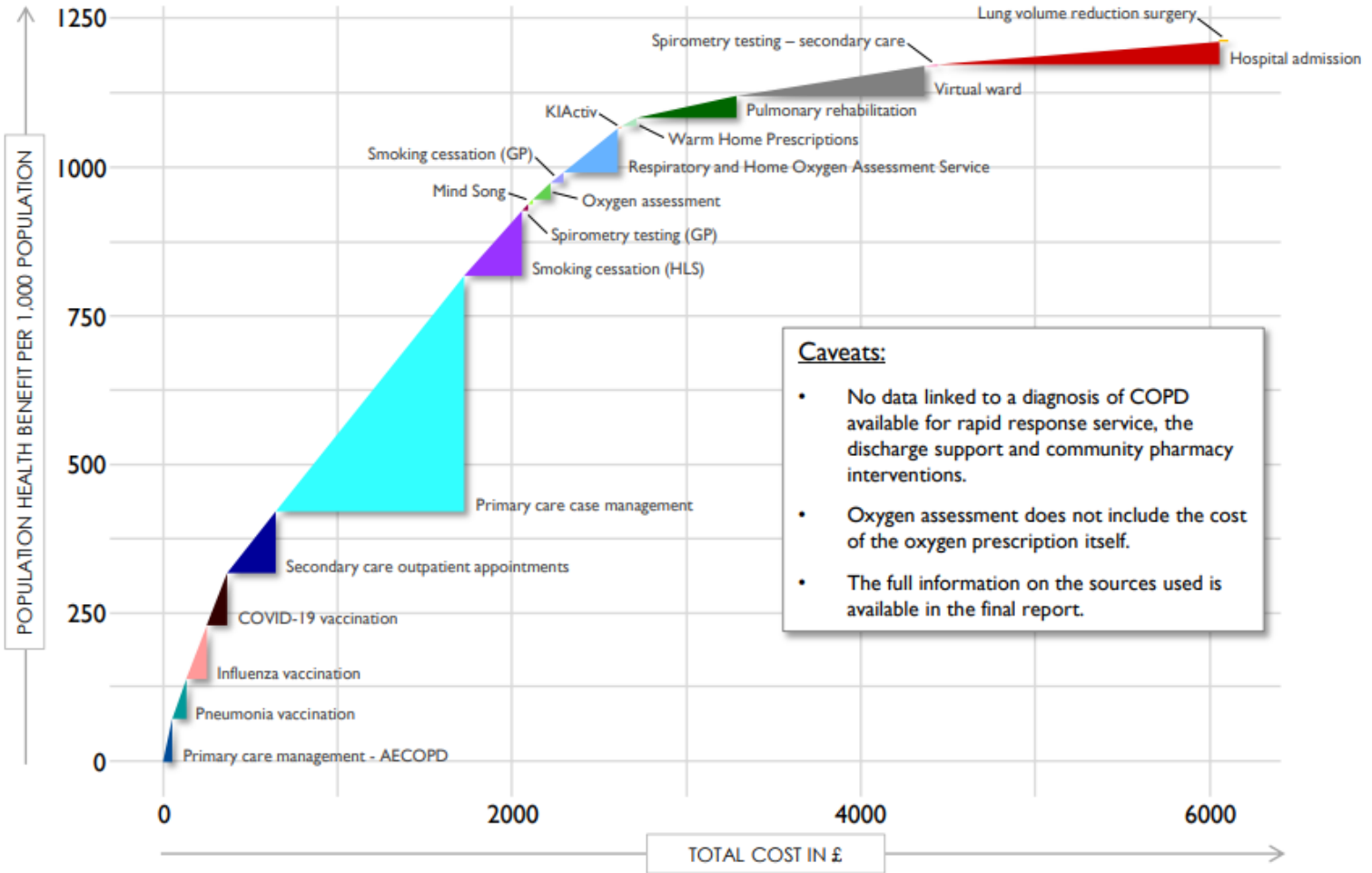


Interpreting the value-for-money triangles: Improvements

The value for money triangles can be improved by increasing the population health gain and freeing-up resource/reducing costs. This can be done by:



VALUE OF COPD CARE PATHWAY IN GLOUCESTERSHIRE



Caveats:

- No data linked to a diagnosis of COPD available for rapid response service, the discharge support and community pharmacy interventions.
- Oxygen assessment does not include the cost of the oxygen prescription itself.
- The full information on the sources used is available in the final report.

	PRIMARY PREVENTION	SECONDARY PREVENTION/DIAGNOSIS	STABLE MANAGEMENT	TERTIARY PREVENTION	MANAGEMENT OF ACUTE EXACERBATIONS
% of total spend	6.7%	8.3%	27.4%	12.4%	45.2%
% of pop health gain	10.5%	22.6%	47.4%	6%	13.5%

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

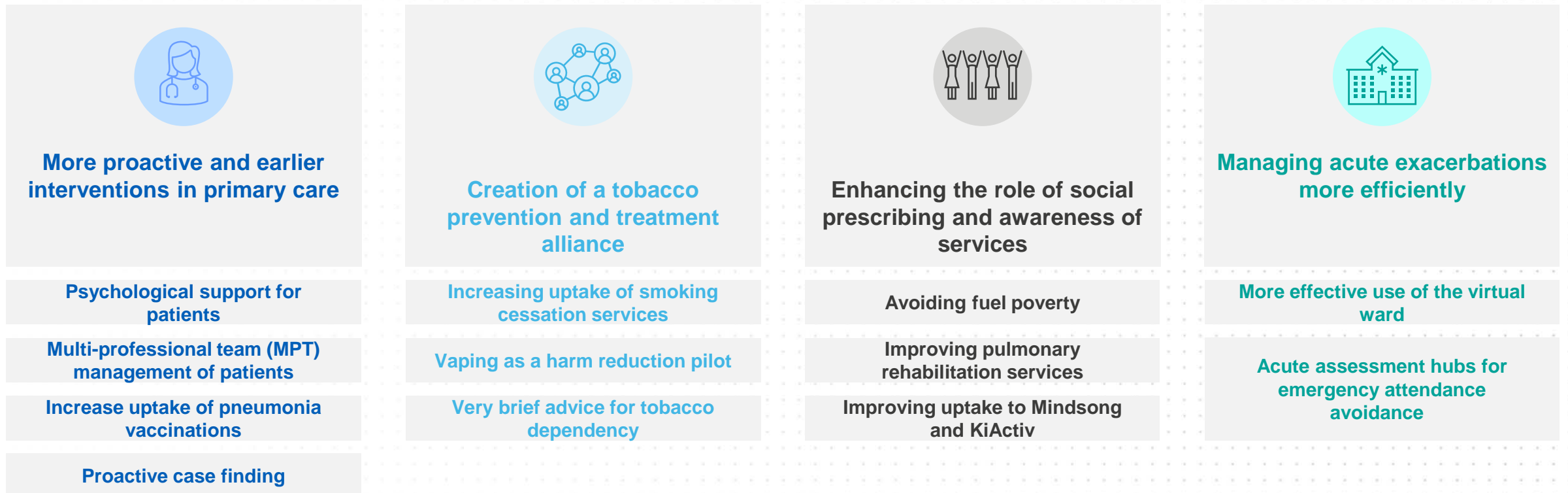
The aim of identifying initiatives is to alter individual interventions to ultimately shift the pathway:

Upward
Increasing population health benefit

Left
Reducing costs (where appropriate)

The pathway improvements identified in each priority area

Interventions and initiatives within the four key areas were identified to be taken forward for modelling:



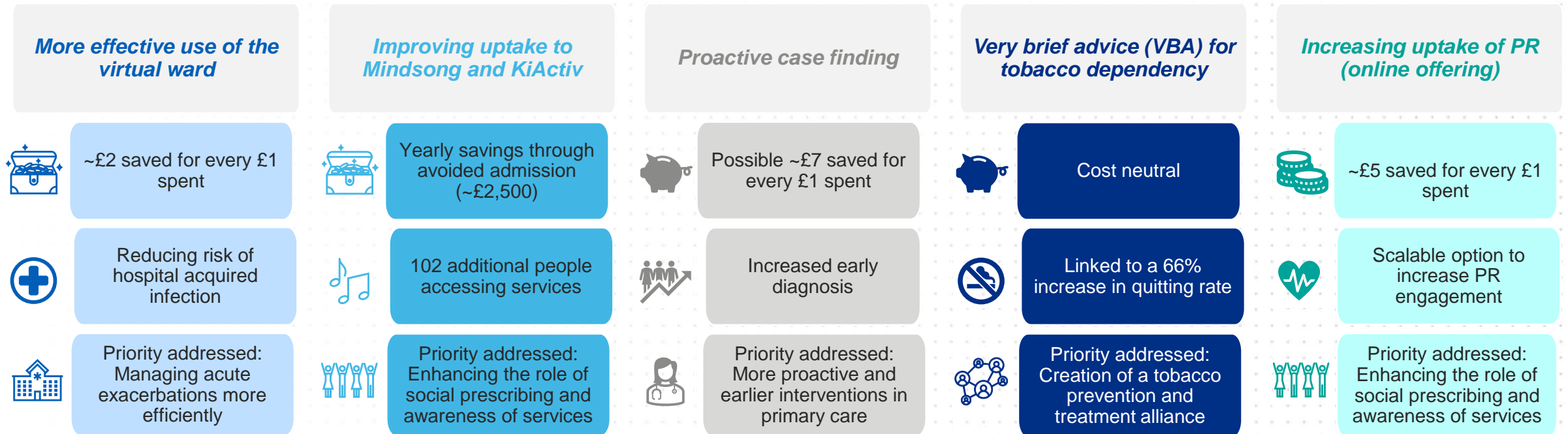
Ranking scores

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	More effective use of the virtual ward	-19.09
2	Proactive case finding (most optimistic scenario)	-6.87
3	Improving uptake to Mindsong and KiActiv	-0.39
4	VBA for tobacco dependency	-0.03
5	Increasing uptake of PR (online offering)	-0.66
6	Vaping as a harm reduction pilot	0.32
7	Improving uptake of pneumonia vaccinations	0.47
8	MPT management of patients (1 PCN)	1.87
9	MPT management of patients (2 PCNs)	2.25
10	Proactive case finding (most pessimistic scenario)	2.36
11	MPT management of patients (3 PCNs)	2.61
12	Increasing uptake of smoking cessation services	3.00
13	Avoiding fuel poverty	6.67
14	Psychological support for patients	7.97
15	Increasing uptake of PR (improving completion rates in the current services)	11.34
16	Increasing uptake of PR (improving uptake through the standard route)	15.07

Recommendations

The following pathway improvements have been modelled and are recommended for implementation as they are likely to lead to the most health generation per pound spent.



If implemented, these pathway improvements are expected to be cost saving. They are estimated to save £1.04m net per year and lead to a 12.4% percentage point increase to population health.

[More details on intervention, recommendations and next steps on pages 20-38](#)

More effective use of the virtual ward

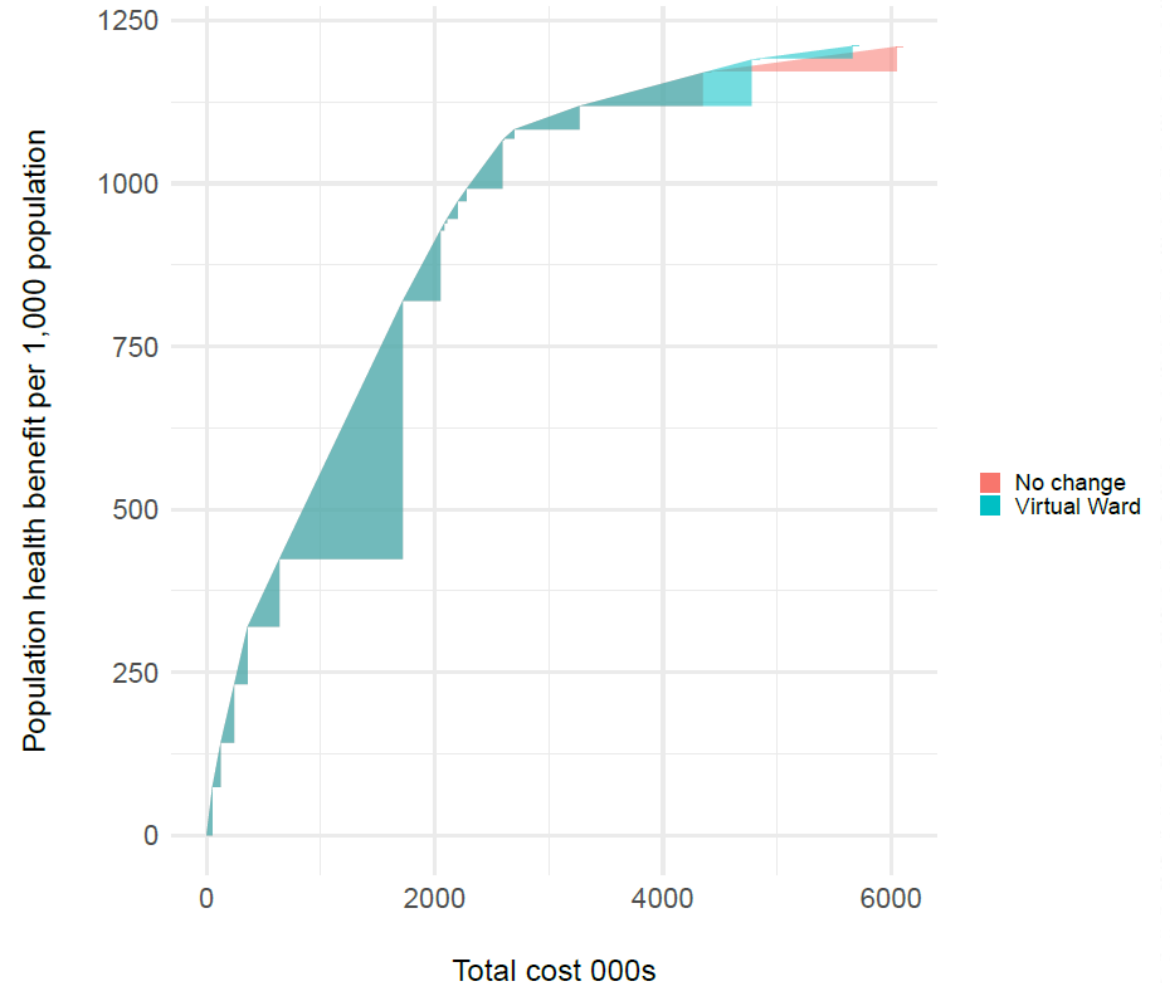
Intervention

The virtual ward is a remote monitoring service where people receive hospital-level care from home. There were 827 patients with COPD on the virtual ward in 2021/22. An expansion of this service could lead to system savings as people with an acute exacerbation of COPD would spend less time in hospital.

Expected change

Here we model the expected impact of including the remaining eligible people admitted to hospital on the virtual ward. It is assumed that patients with a DECAF score of 0 or 1 (approximately 50% of patients) are eligible (Echevarria et al., 2018). Treating a patient on the virtual ward is expected to cost 52.48% of the cost of treating an acute exacerbation through a hospital admission alone so will save money.

Metric	Total	Interpretation
Total additional pathway costs	-£385,821	This pathway improvement is expected to be cost saving as it is cheaper to treat someone on a virtual ward rather than in a hospital bed.
Additional cost/ additional population health ratio	-19.09	This pathway improvement is estimated to save £19.09 for every one unit of population health gain it generates.
Cost ratio	1.91	This pathway improvement is expected to save £1.91 for every £1 spent.



Improving uptake to Mindsong and KiActiv

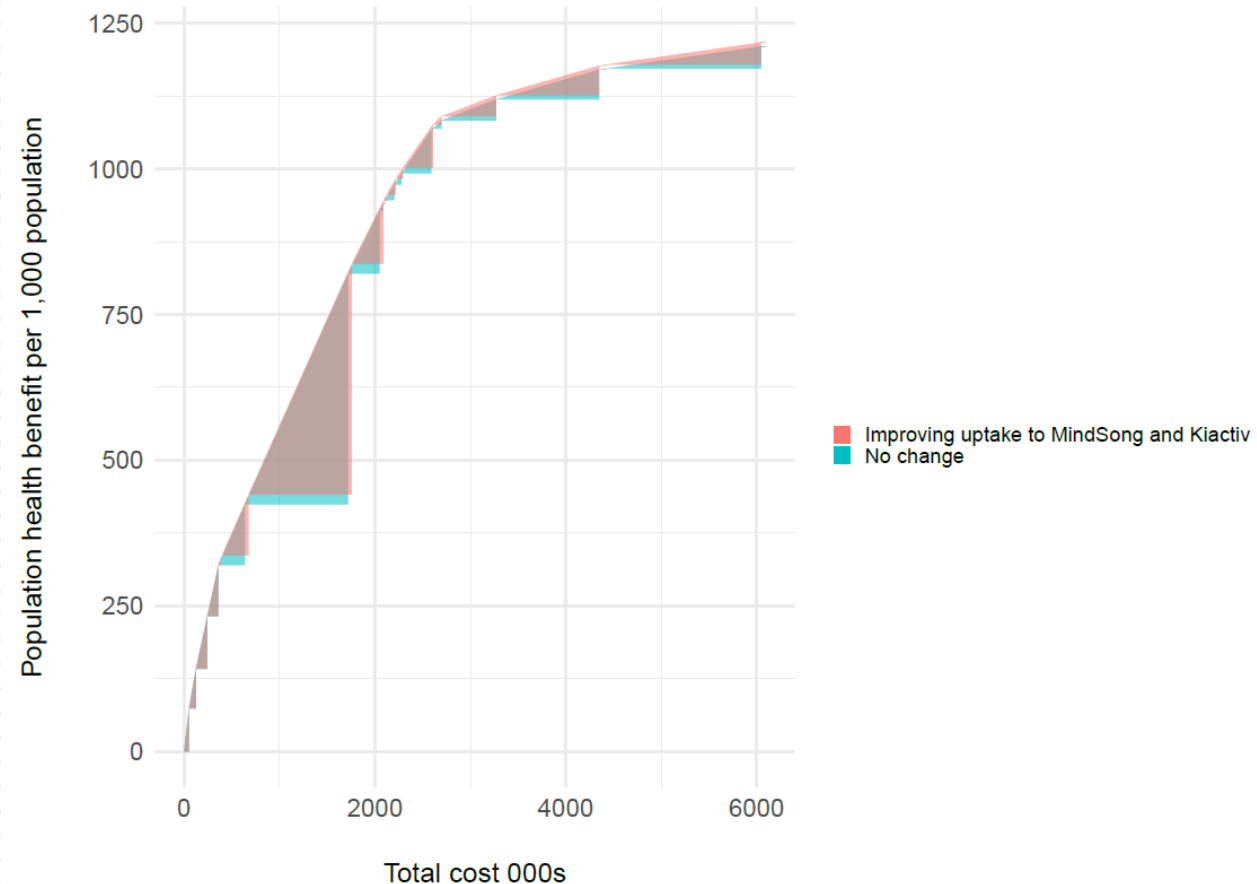
Intervention

Mindsong offer a ‘Breathe in Sing out’ course and KiActiv offers a digital activity hub for patients. These services offer many of the same benefits as PR; physical activity, self-management and, in the case of Mindsong, socialising. These services could be an option for people for whom PR is inappropriate. These services are not yet at capacity so it is possible to increase uptake without increasing costs. Currently only a minority of general practice staff know these services exist and most referrals are either self-referrals or come from secondary care.

Expected change

The number of people using both services should be maximised to get as much benefit out of them for the associated costs. Here we model what it would look like if Mindsong was running at capacity and KiActiv had capacity expanded by 100%. The additional number of people that this improvement is expected to benefit is relatively small (102 people), but as the cost is assumed to be 0, it is cost-effective as it is health generating.

Metric	Total	Interpretation
Total additional pathway costs	-£2,490.88	It is expected that this improvement would lead to one hospital admission avoided.
Additional cost/additional population health ratio	-0.39	This improvement would have £0.39 for every additional unit of population health gain generated.
Cost ratio	N/A	As there are no costs associated with the it is not possible to calculate a cost ratio



Proactive case finding

Intervention

Opportunistic case detection could be a cost-effective way to find undiagnosed cases in people at higher risk of developing COPD (e.g., high-risk smokers). This could be achieved through:

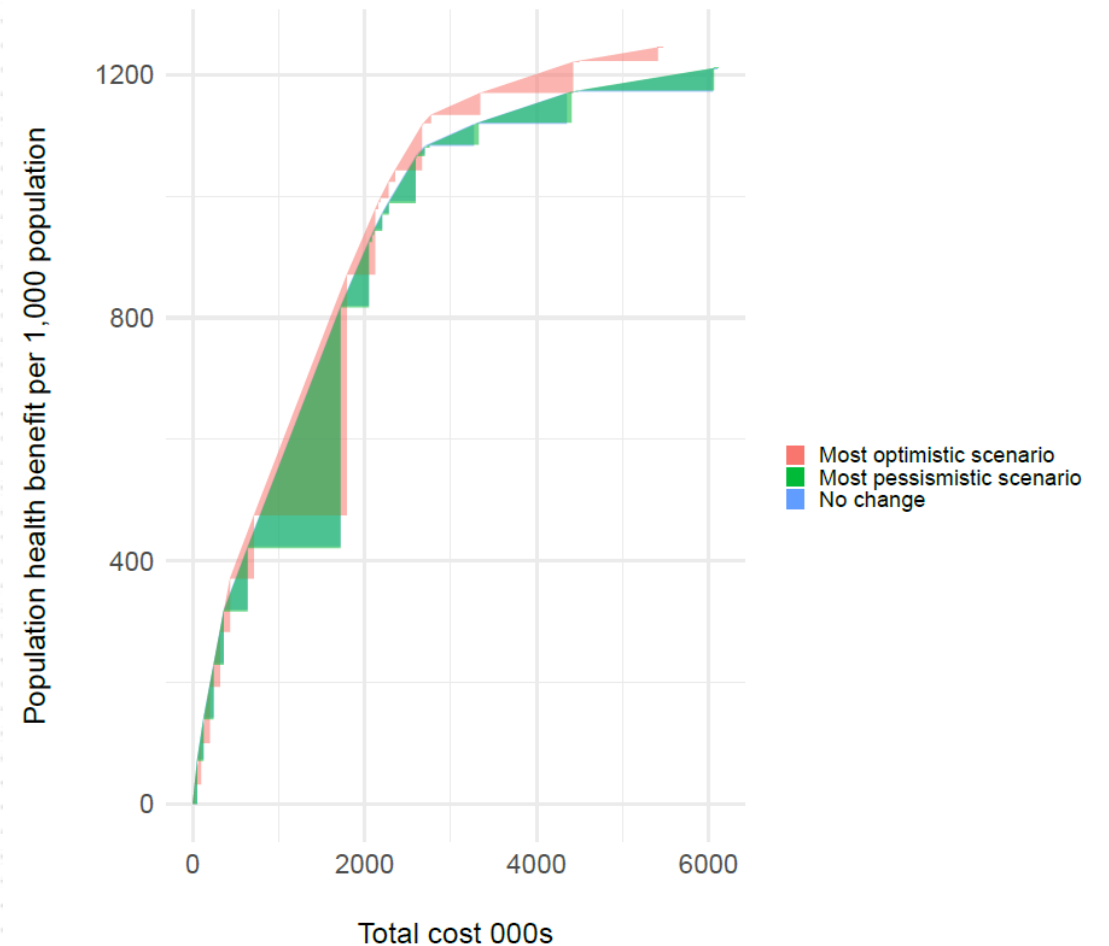
1. Identifying high-risk smokers through risk stratification.
2. Screening them with a clinically validated survey.
3. Administering diagnostic spirometry testing for those with a COPD diagnostic questionnaire (CDQ) score of 16.5+.

Expected change

Here we model two scenarios:

1. Most optimistic: 80% are contacted for the survey and 50% complete it. 70% of those who complete the survey and meet the CDQ score come forward for testing and the diagnosis rate is improved.
2. Most pessimistic: 80% are contacted for the survey and 20% complete it. 70% of those who complete the survey and meet the CDQ score come forward for testing and the diagnosis rate stays at the current level.

Metric	Total	Interpretation
Total additional pathway costs	Optimistic scenario = -£639,803 Pessimistic scenario = £12,919	The additional pathway costs are dependent on diagnosis rate and how many people complete the survey.
Additional cost/ additional population health ratio	Optimistic scenario = -6.87 Pessimistic scenario = 2.36	In the most optimistic scenario, this would save £6.87 for every additional unit of population health gain it generates. In the most pessimistic scenario it would cost £2.36 for every additional unit of population health gain it generates.
Cost ratio	Optimistic scenario = 7.30 Pessimistic scenario = 0.77	In the most optimistic scenario, this pathway improvement would save £7.30 in the pathway for every £1 spent. In the most pessimistic scenario, this pathway improvement would save £0.77 for every £1 spent.



Very brief advice (VBA) for tobacco dependency

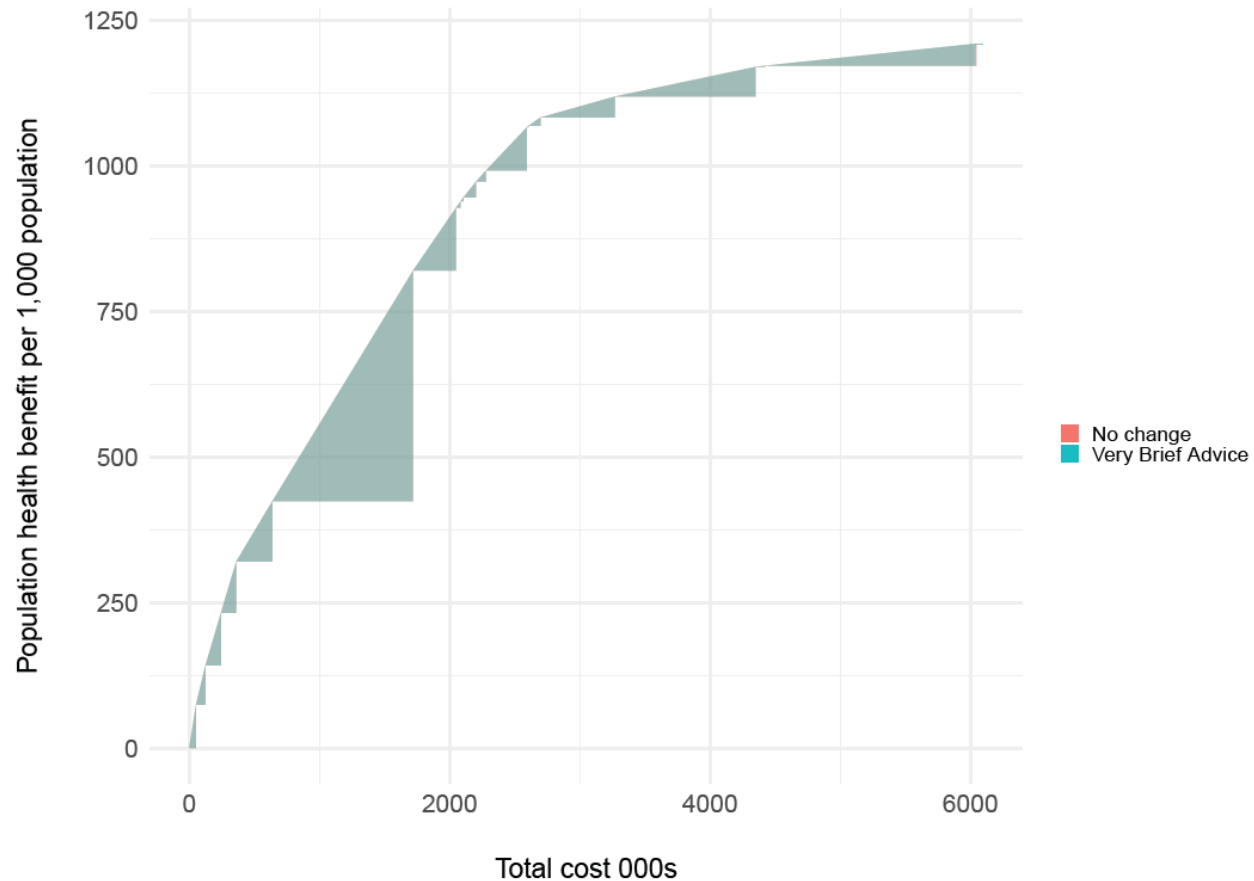
Intervention

Staff in general practice could be mandated to offer ‘very brief advice’ (VBA) to people with COPD as part of their yearly reviews. This can increase the likelihood that a smoker will go on to engage with a smoking cessation service and successfully quit smoking. [This online module is a recognised training available for staff.](#)

Expected change

The effect on the overall pathway is minimal - the VBA and no change scenarios are virtually indistinguishable. This is because it is expected to lead to only 144 extra quitters. That said, as it is a cheap intervention, it appears to be essentially cost neutral.

Metric	Total	Interpretation
Total additional pathway costs	-£399.21	This pathway improvement is effectively cost neutral.
Additional cost/ additional population health ratio	-0.03	This pathway improvement would save £0.03 for each additional unit of population health gain generated.
Cost ratio	1.06	This pathway improvement is estimated to save £1.06 for every £1 spent.



Improving pulmonary rehabilitation (PR) services

Intervention

Online PR, and moving PR services to community venues, could improve the number of people completing PR. Of the 4,000+ people eligible, only 15% attend a course due to accessibility and capacity. Accessing a hospital twice a week 9-5 is not possible for all and the Home Oxygen and Respiratory Service (HORS) only has a limited amount of capacity.

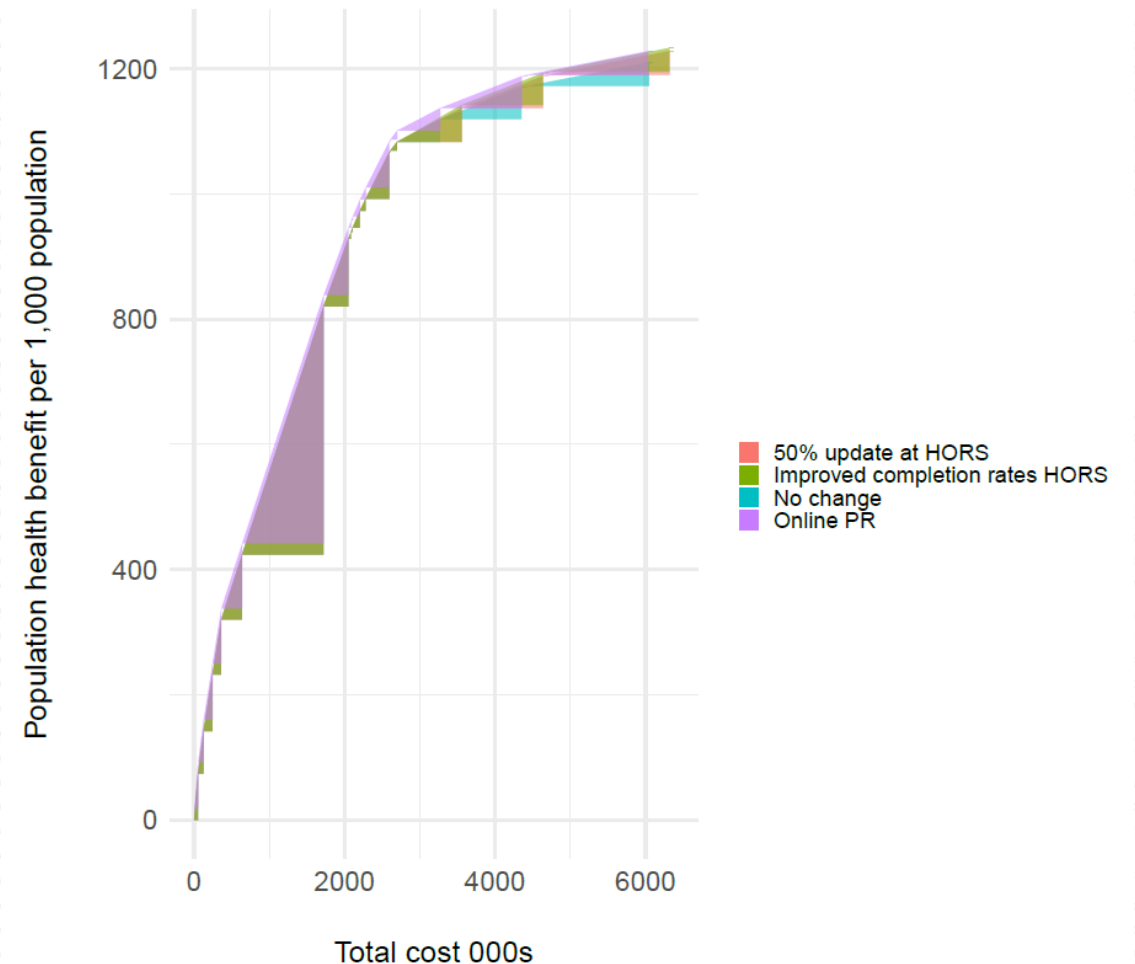
Expected change

Here we model three scenarios:

- Improving uptake 50% through the HORS.
- Improving uptake 50% through introducing online courses.
- Improving uptake by 50% and completion rates in PR services offered by HORS.

All three scenarios are health generating but the online offer is expected to be much less expensive per person and easier to scale up.

Metric	Total	Interpretation
Total additional pathway costs	50% uptake at HORS: £271,254.72 50% uptake online: -£11,874.28 50% uptake and improved completion: £266,272.92	The cost of the scenarios which require face to face care are expected to have significant cost burdens. The online offering could be cost saving as the costs of delivering PR are cheaper.
Additional cost/ additional population health ratio	50% uptake at HORS: 15.07 50% uptake online: -0.66 50% uptake and improved completion: 11.34	
Cost ratio	50% uptake at HORS: -0.05 50% uptake online: 4.87 50% uptake and improved completion: 0.07	



Assessing the impact of improvements 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. This was combined with assumptions from the literature (identified through an umbrella literature review) looking at how an intervention may change healthcare resource use.

Limitations

- 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 need to be done to adapt these scenarios into business cases.

More information is available in the full report.

Psychological support for patients

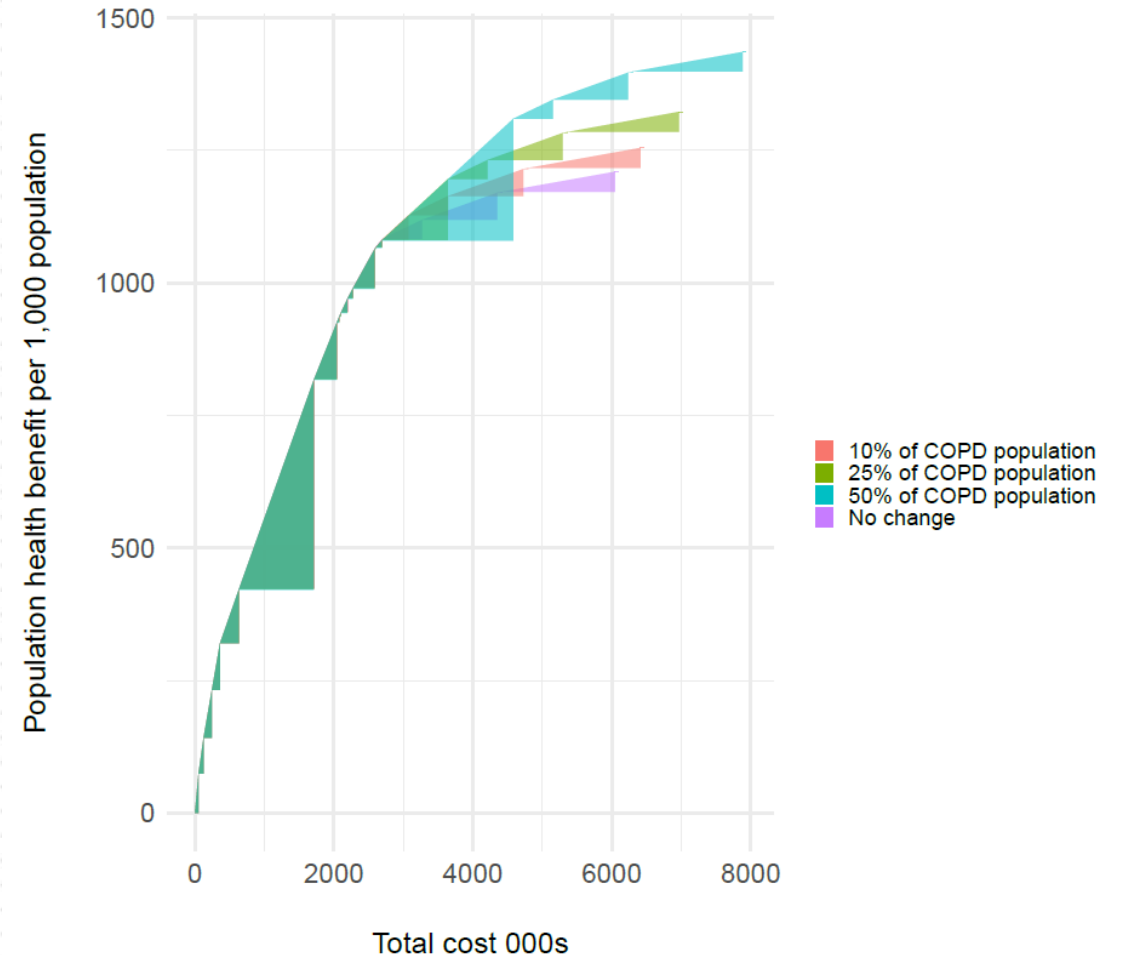
Intervention

Improving Access to Psychological Therapies (IAPT) services provide evidence-based treatments for people with depression and anxiety, and comorbid long-term physical health conditions. Anxiety and depression are among the main comorbidities for people living with COPD and can make it difficult for someone to self-manage their condition. Increasing referrals to IAPT services could help to improve physical and mental wellbeing, as well as reduce the burden on hospital admissions and outpatient attendances.

Expected change

Here we estimate the effect if 10%, 25% or 50% of people with COPD in Gloucestershire, living with anxiety or depression, were referred to IAPT services. The hospital admissions expected to be avoided due to IAPT services are not expected to offset the cost, although it is expected to generate benefit.

Metric	Total	Interpretation
Total additional pathway costs	10%: £366,864.34 25%: £917,844.64 50%: £1,835,822.88	There are significant costs associated with increasing IAPT capacity.
Additional cost/ additional population health ratio	7.97	This pathway improvement is expected to cost £7.97 for every additional unit of population health it generates.
Cost ratio	0.03	This pathway improvement is not cost saving. It is estimated to save £0.03 elsewhere in the pathway for every £1 spent on the intervention.



Multi-professional team (MPT) management of patients

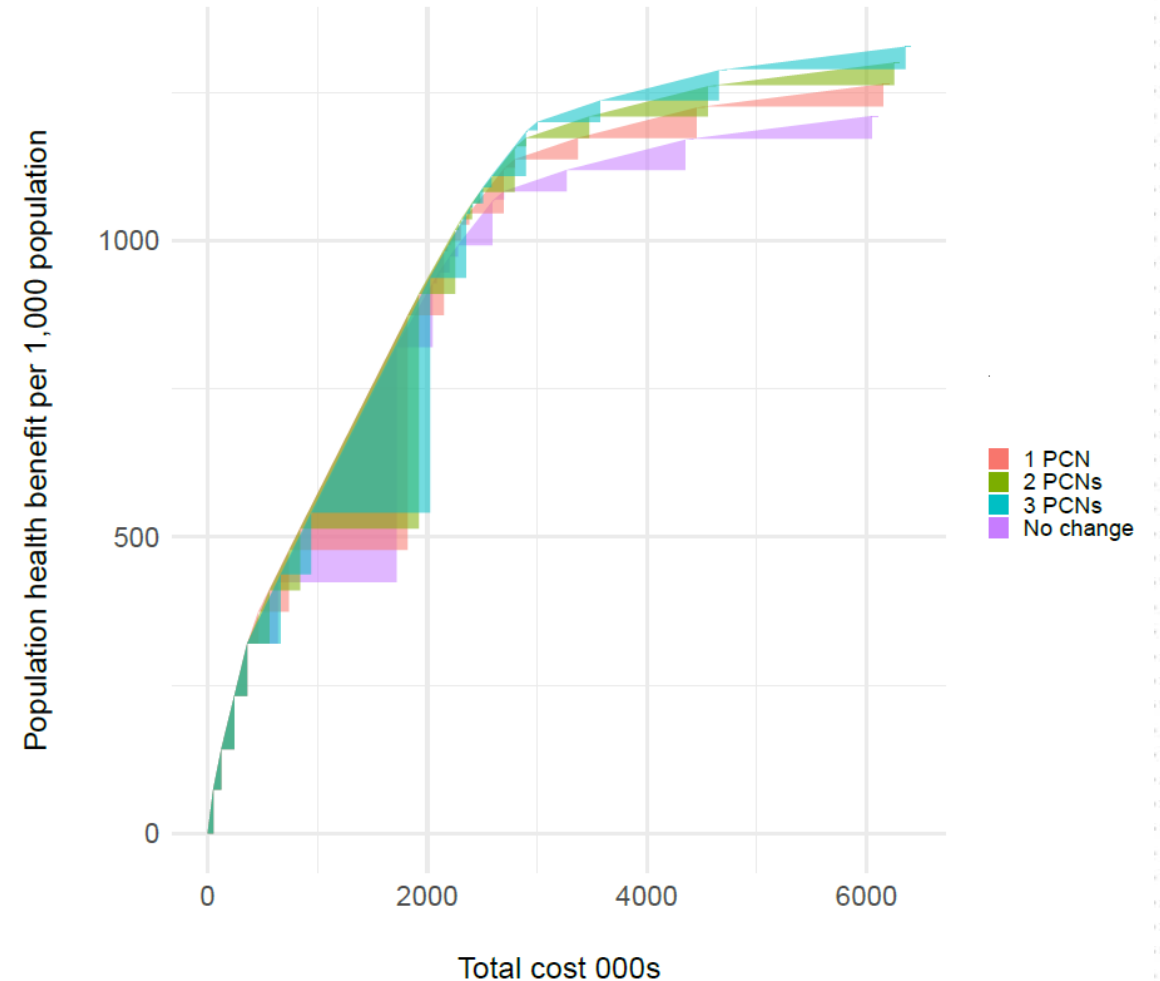
Intervention

The aim of embedding an MPT team into each Primary Care Network (PCN) is to improve the quality of primary care case management and care coordination by upskilling clinicians to conduct more beneficial annual reviews, including medicine optimisation and symptom management advice.

Expected change

Here we look at embedding specialists in the PCNs with the highest number of people with COPD (Forest of Dean PCN, St Paul’s PCN and Gloucester inner city). All the scenarios are expected to be health generating but cost inducing with no savings expected in the rest of the pathway.

Metric	Total	Interpretation
Total additional pathway costs	1 PCN: £101,559	There are no expected savings for this pathway improvement.
	2 PCNs: £203,118	
	3 PCNs: £304,677	
Additional cost/ additional population health ratio	1 PCN: 1.87	The cost/population health ratio is dependent on the population each MPT team covers.
	2 PCNs: 2.25	
	3 PCNs: 2.61	
Cost ratio	N/A	There are no expected savings for this pathway improvement.



Increase uptake of pneumonia vaccinations

Intervention

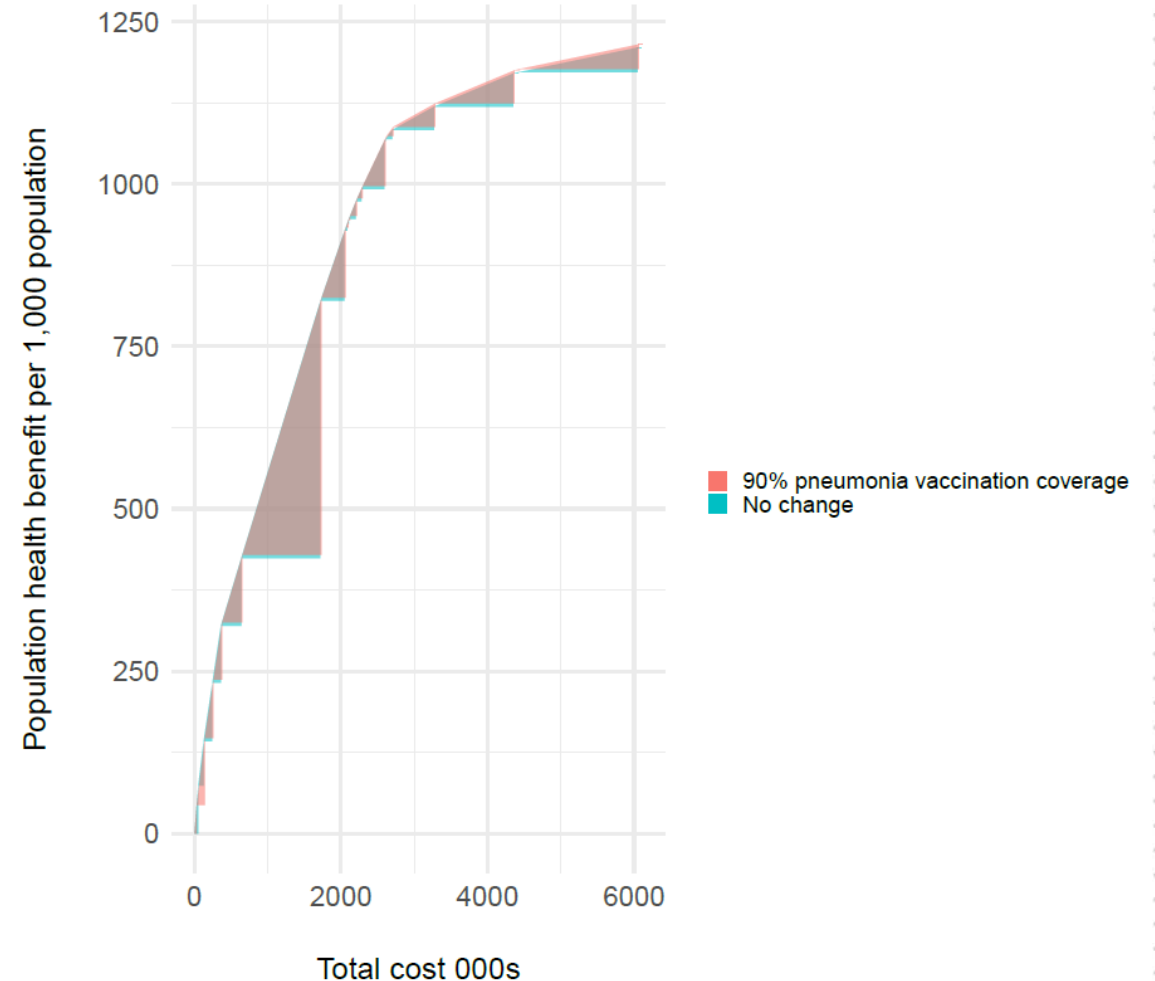
It is estimated that 97% and 96% of people with COPD in Gloucestershire had their influenza and COVID-19 vaccinations respectively in 2021/22. However, only an estimated 60% of people had their pneumonia vaccination. Therefore more can be done to improve the uptake of a pneumonia vaccination for those with COPD.

Expected change

Here we model what it would look like if pneumonia vaccination coverage was expanded to 90% of patients with COPD. The overall impact on the pathway is small, as the number of people it is expected to benefit is small (an estimated 456 people will not have an acute exacerbation).

Although the improvement alone is not expected to be cost saving here, the additional cost is expected to be just £16,082.18. Additionally, the intervention would save 1 acute exacerbation for every 8 vaccinations delivered.

Metric	Total	Interpretation
Total additional pathway costs	£16,082.18	This pathway improvement is not expected to save enough money to make it cost saving.
Additional cost/ additional population health ratio	0.47	This pathway improvement is expected to cost £0.47 for every additional unit of population health gain it generates.
Cost ratio	0.56	This pathway improvement is estimated to save £0.56 for every additional £1 spent on it.



Increasing uptake of smoking cessation services

Intervention

Stopping people from smoking, whether they have COPD or not, was regarded in the decision conferences as the best thing you can do for someone's health. There is an estimated 78,300 smokers in Gloucestershire (see the population pyramid). In 2021/22, an estimated 1,882 people set a quit date (2.4% of the smoking population). Of these people, 67.27% quit after four 4 weeks. Increasing the number of people with and without COPD accessing smoking cessation services could greatly improve the value of the COPD pathway.

Expected change

The number of cases of COPD expected to be averted is not expected to be cost saving when you look at the expected savings over a one-year period. However, this number is subject to a sensitivity analysis in the full report.

The additional number of people that could be reached to engage with smoking cessation services is unknown. Therefore, we model what it would look like if double the number of people set quit dates in the existing Healthy Lifestyle Service.

Whether or not someone who engages with the smoking cessation service and has COPD is not known. Therefore, we will assume that all the increase in smoking cessation services is for primary prevention only. This means we are unable to map its impact on the COPD pathway as the only effect would be as primary prevention.

Metric	Total	Interpretation
Total additional pathway costs	£323,059.56	This pathway improvement is not expected to avert enough cases of COPD to be cost-effective.
Additional cost/ additional population health ratio	3.00	This pathway improvement would cost £3.00 for every additional unit of population health gain it generates.
Cost ratio	0.02	This pathway improvement is estimated to save £0.02 for every £1 spent on it due to averted cases of COPD.

Vaping as a harm reduction pilot

Intervention

Although the evidence surrounding the potential health benefits of vaping over smoking is growing, the long-term effect is not known. Therefore a vaping intervention could be piloted to build the evidence base around vaping as a harm reduction approach. The Healthy Lifestyle Service would also work with people to ensure the addiction to vaping is reduced.

Expected change

Here we look at two scenarios:

1. If the Healthy Lifestyle Service was to offer vapes/e-cigarettes for one month to people who do not successfully quit smoking after four 4 weeks to help them reduce their tobacco dependency.
2. As e-cigarettes could be a scalable intervention, we also look at the impact of offering e-cigarettes to 10% of the smoking population in Gloucestershire for one month.

Although some people engaging with the smoking cessation/substitution service have COPD, we do not know the proportion, making it difficult to estimate the impact of these services on secondary and tertiary prevention. Therefore we conservatively assume that all the increase in smoking cessation services is for primary prevention. This means we are unable to map its full impact on the COPD pathway as the only effect would be as primary prevention.

The low cost of the vapes makes this scenario markedly more cost-effective than increasing capacity in the current smoking cessation service, assuming moving to vaping with COPD has the same effect on risk as not smoking. However, as stated, the long-term effects of vaping are not known. For this pathway improvement to be cost neutral, it would have to avoid one case of COPD for every 13.42 vapes prescribed (based on a one-month cost of vapes of £37 and the expected cost of treating someone with COPD for one year at £496.38). In the current scenario, it is estimated that one case of COPD is avoided for every 87.72 vapes that are prescribed (see calculations in the appendices).

Metric	Total	Interpretation
Total additional pathway costs <ul style="list-style-type: none"> • Non quitters • 10% of all smokers 	£13,687.10 £245,532.18	This pathway improvement is not expected to be cost saving due to the number of cases of COPD it could avert.
Additional cost/ additional population health ratio <ul style="list-style-type: none"> • Non quitters • 10% of all smokers 	0.32 0.33	This pathway improvement would cost £0.32 or £0.33 for every additional unit of population health gain generated.
Cost ratio	0.15	This pathway improvement is estimated to save £0.15 for every £1 spent in either scenario.

Avoiding fuel poverty

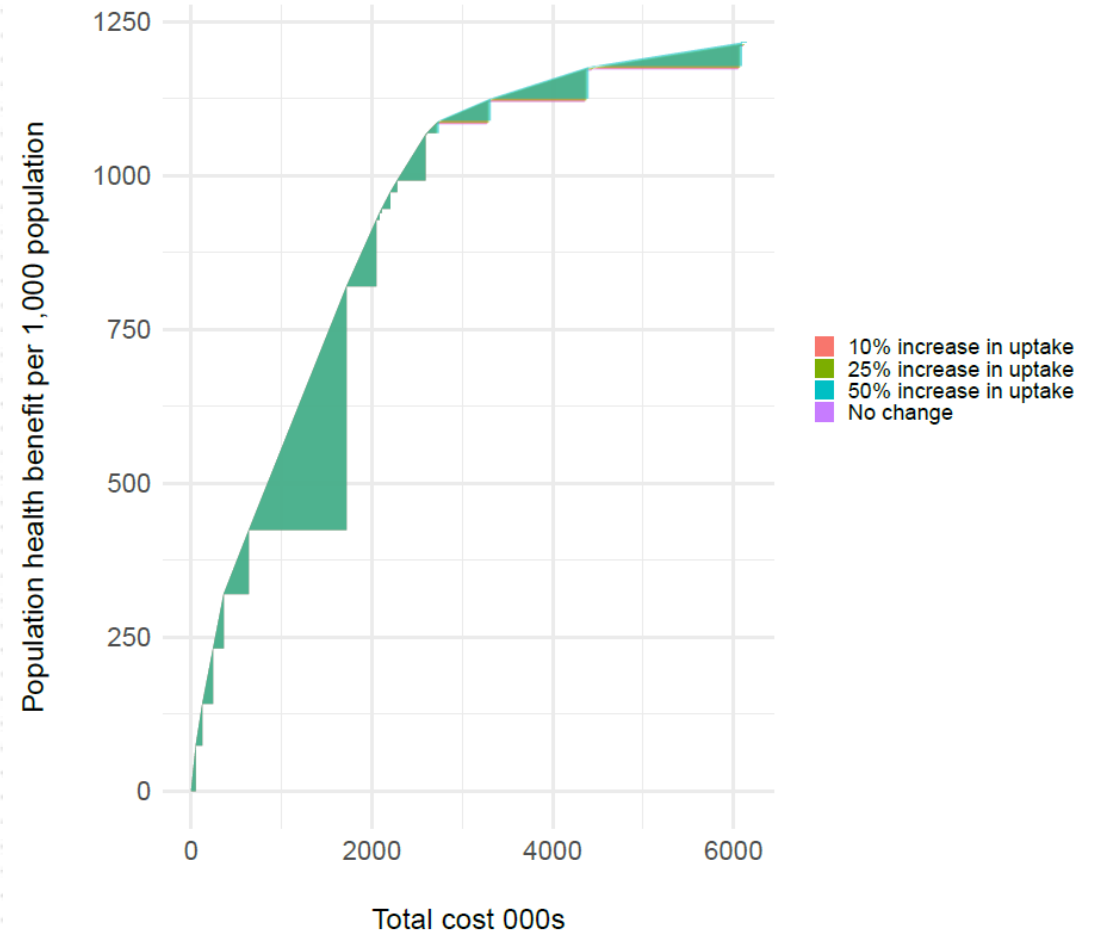
Intervention

Currently there is a ‘warm home on prescription’ pilot with Gloucester City Homes which looks to support people with respiratory conditions, such as COPD. Should this scheme prove to be successful, a wider rollout could bring benefits to patients and the health system. Expanding the budget available for warm home on prescription schemes could help to meet the increased demand for affordable warmth schemes brought about by the cost-of-living crisis.

Expected change

As the number of people who would be eligible for warm home on prescription schemes is not known, we model what a 10%, 25% and 50% increase in uptake would look like. Even a 50% increase in uptake will only have a small effect on the COPD pathway as the number of people that would benefit is relatively small. As we cannot expect a reduction in hospital admissions, the pathway improvement is expected to be cost incurring.

Metric	Total	Interpretation
Total additional pathway costs		There are no expected cost savings from this pathway improvement so it is cost incurring.
• 10% increase in uptake	£9,000	
• 25% increase in uptake	£22,800	
• 50% increase in uptake	£45,000	
Additional cost/additional population health ratio	6.67	This pathway improvement is estimated to cost £6.67 for every additional unit of population health gain it generates.
Cost ratio	n/a	This pathway improvement is not expected to create any savings.



Acute assessment hubs for emergency attendance avoidance

Intervention

There are currently two PCNs that run acute assessment hubs. The aim of these hubs is to avoid emergency department attendances. They would have benefits to the system, through a reduction in emergency attendances, and to patients as more patients would be able to be treated closer to home.

Expected change

No papers were identified in the literature review which looked at acute assessment hubs or similar interventions. Therefore, we are unable to assess the impact of this intervention on the COPD pathway. However, learning can be taken from the acute respiratory infection hubs developed during the COVID-19 pandemic. These hubs aim to support people with acute respiratory needs, treat them closer to home and keep people out of the hospital.

One such hub in Dudley, providing urgent same day appointments, is staffed by either two GPs or one GP and an Advanced Nurse Practitioner, two reception staff and a hub manager. Assuming the Advanced Nurse Practitioner is a band 7, the two-reception staff are band 4 and the hub manager is a band 6, the estimated running cost of the acute assessment hubs (excluding capital costs and assuming prescription costs would not vary dependent on where the patient is treated) would be £2,452.50 a day. This would mean approximately one hospital admission (at a cost of £2,490.88) would have to be avoided per day to make the hub cost saving to the system.



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Next steps

- Prioritising identified initiatives
- Next steps and recommendations for Gloucestershire

Three ways in which the initiatives can be prioritised

Below are three approaches to priority-setting. The HEU recommends that priority-setting of the pathway improvements is done based on the cost/population health ratio (1). 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.

Recommendations

It is recommended that Gloucestershire invest in the pathway improvements that have the best cost/population health ratio, as this will ensure the investment leads to the most health generated per pound spent. It is recommended that the ICS focus on the following interventions:

- **More effective use 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.
- **Improving uptake to Mindsong and KiActiv:** As these services are not currently running at capacity, there is an opportunity to expand the number of people that are treated by them without increasing costs.
- **Proactive case finding:** Identifying people earlier in their disease pathway will mean that they can receive treatment quicker and reduce hospital admissions. Finding ways to improve the diagnosis rate from spirometry is key to making this a cost-effective intervention to limit the number of tests needed.
- **VBA for tobacco dependency:** Even though this improvement is only expected to lead to a small number of additional people quitting (144) per year, it is inexpensive for clinicians to offer this advice, making it cost-effective.
- **Increasing uptake of PR (online offering):** PR is clinically one of the best things to do to improve the quality of life of someone with COPD. Online PR courses offer an inexpensive and scalable way to increase the number of people with COPD who undertake PR.

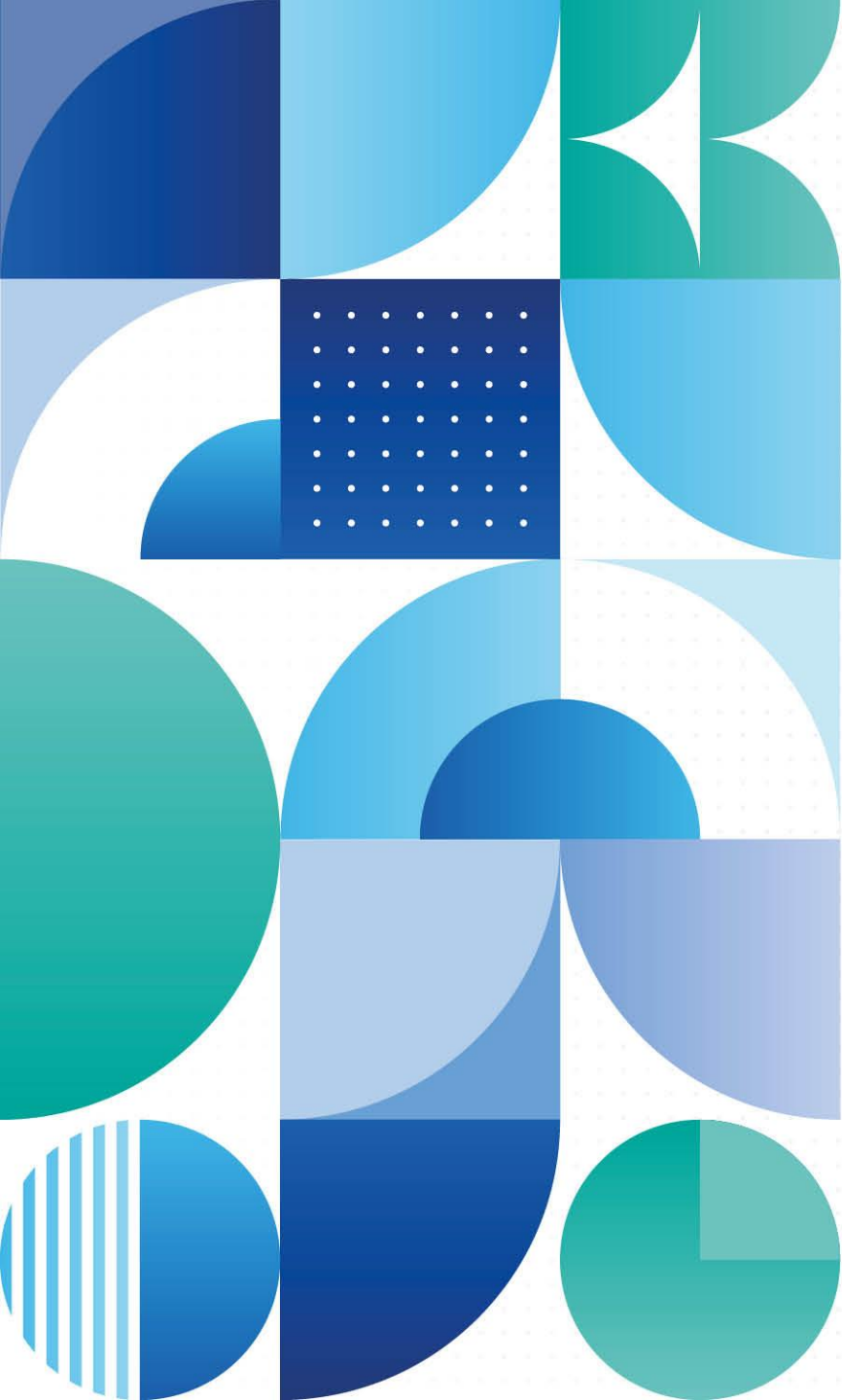
If implemented, these pathway improvements are expected to be cost saving. They are estimated to save £1.04m net per year and lead to a 12.4% percentage point increase to population health.

Next steps

Improving the allocative efficiency of the COPD pathway will improve the health of the COPD population in Gloucestershire.

We recommend that:

1. The group should review these findings, agree next steps and choose the interventions and initiatives.
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. HEU can support the group with this.
4. The system can then navigate relevant funding and governance for the chosen interventions. 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.



Health
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