Estimating the benefits of End Youth Homelessness's Health Fund

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April 2021

PRO BONO ECONOMICS

END YOUTH HOMELESSNESS

Pro Bono Economics uses economics to empower the social sector and to increase wellbeing across the UK. We combine project work for individual charities and social enterprises with policy research that can drive systemic change. Working with 400 volunteer economists, we have supported over 500 charities since our inception in 2009.

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Summary

End Youth Homelessness is a UK-wide movement of leading regional charities that house and support homeless young people (aged 16-24) at risk of, or experiencing, homelessness. Alongside their member charities, End Youth Homelessness aims to prevent youth homelessness but, where that is not possible, works to give homeless young people the support they need to live successful and independent lives. In 2021, End Youth Homelessness is launching a Health Fund which will, amongst other things, fund near-immediate access to specialist mental health support assistance for young people who are homeless or at risk of homelessness.

Scope of this study

Pro Bono Economics were commissioned by End Youth Homelessness to estimate the potential value for money of End Youth Homelessness's new Health Fund. We draw on existing evidence to estimate the monetary value of the potential benefits for individuals expected to benefit from this new funding through three key channels:

- Reduced use of NHS mental health services
- Reduced costs for public services for those in education
- Increased productivity for those entering or already in the labour market

We assess the potential value for money of the Health Fund by comparing these estimated benefits to the anticipated costs of the programme.

Key findings

Our analysis suggests that:

- On average the Health Fund could generate more than £800 of benefit for each young person supported.
- More than 60% of these benefits - around £500 per person - come from increasing the chances of young people finding employment in more productive roles over their working life.
- Just over a fifth of this benefit – around £180 per person – is likely to come from reduced demand on NHS mental health services.
- The remaining benefit – around £150 per young person - is likely to come from reduced costs to additional support in education and social care services for those still in education.
- If the Health Fund is able to support its target of 1,104 young people per year then it's possible that it could generate more than £900,000 in economic benefits at a cost of £570,000, delivering a net economic benefit to society of in excess of £330,000 for each year of support.

- These results imply that for every £1 spent by End Youth Homelessness through the Health Fund could generate a potential societal benefit of £1.60.

Implications

Our analysis provides evidence that the benefits to society from improving the mental health of young people experiencing, or at risk of, homelessness by providing mental health services faster and over more sessions are likely to out-weigh the costs. Whilst some of the benefits fall directly to the young people supported in the form of increased wages, we have identified that the wider public is also likely to benefit from reduced pressure on the NHS, school system and increased taxation revenue to support public services. This suggests that not only is there a moral and ethical imperative to supporting young people facing some of the most challenging circumstances but an economic case too. We hope this research can be used to highlight the value of investing money to support improvements in the mental health of vulnerable young people.

Our estimates for benefits related to End Youth Homelessness Health Fund are likely to be conservative for a few reasons. First, we do not attempt to incorporate a monetary value for the benefits to the individual beneficiaries' quality of life from improvements in their mental health. Second, the benefits associated with long-term employment are likely an underestimate of the benefits that individuals would receive over their lifetime as we only estimate the benefits up to age 46. It seems a reasonable assumption that if there is a statistically, and economically, significant negative effect of a period of youth unemployment on earnings at age 43, as found in Gregg and Tominey (2005), that there may remain a significant negative impact on wages later in life.[1] In addition, there are likely to be other benefits that we have not been able to include from reducing future demand on statutory homelessness services, reduced likelihood of involvement in the criminal justice system and reduced demand on other public services.

Our evidence suggests that our broad conclusions are robust to changes in key assumptions relating to rates of reliable recovery from mental health conditions and the characteristics of the participants involved. However, we would encourage End Youth Homelessness to capture data on these key metrics as the programme is implemented to strengthen future evaluation of the Health Fund. In particular, information on the following would increase our understanding about the importance of mental health improvements for vulnerable youths:

- Collecting evidence on the improvements in mental health during throughout treatment, including the proportion meeting NHS standard "reliable recovery" thresholds.

[1] Gregg, P. and E. Tominey (2005): *The wage scar from male youth unemployment.* Labour Economics 12(4), 487–509

- Assessing the change in outcomes such as remaining in education, employment and accommodation before and after the support provided.
- Estimating the effect of this programme on beneficiaries' wellbeing.

Introduction

Scope of this study

Pro Bono Economics (PBE) was commissioned by EYH to estimate the potential value for money of the End Youth Homelessness Health Fund. To do this, we use existing publicly available research to estimate the monetary value of potential benefits which are likely to occur due to an improvement in a young person's mental health.

Our analysis focuses on benefits from three key channels:

- Reduced NHS usage
- Reduced costs for public services for those in education
- Increased productivity for those entering or already in the labour market

We assess the potential value for money of the mental health services by comparing the monetary value of these potential benefits to the estimated costs of the programme.

We emphasise that we have focused on those benefit channels where there is sufficient evidence for us to quantify their monetary impacts. It is likely that there could be other benefits generated by the Health Fund that we have not been able to include in this study, for example, the benefits to the individuals supported most likely to accrue in the form of better quality of life due to improved mental health or the potential impacts on the likelihood of future spells of homelessness or involvement in the criminal justice system.

Background

End Youth Homelessness Programme

End Youth Homelessness currently has two funds to help young people experiencing, or at risk of homelessness: The Housing Fund and The Employability Fund. The Housing Fund provides young people with bursaries and bonds to enable them to overcome prohibitive upfront costs associated with accessing independent accommodation. The Employability Fund provides young people with access to specialist job coaches who give advice on how to gain employment and bursaries to help them pay for educational courses and/or travel fares for interviews.

In 2021 EYH will launch a Health Fund intended to support the provision of specialist mental health support to young people that are homeless or at risk of homelessness. The intention is to support the provision of mental health support to a group that is traditionally hard for statutory services to reach, providing a quality of service that exceeds the support typically offered by the NHS. In particular:

- The fund intends to support an average of 11 sessions of specialist support per young person, compared to an average in the NHS for adults of 6.4.
- The fund intends to support access to specialist mental health support within 2 weeks of referral, compared to the average wait of 31 days for adults referred to NHS services.

Related literature

There is substantial research focusing on youth homelessness (those aged 16-24) in the UK as this subset of the population is particularly susceptible to being at risk for homelessness due to several factors.[2] To begin, the youth unemployment rate has consistently been over 11% for the past 15 years and is growing due to the recent economic downturn.[3] Furthermore, young people in the UK have become more reliant on living with family members over time owing to decreasing availability of housing, increasing rent prices along with an increase in the number of youths with loans and the prevalence of youths working in part-time, temporary or self-employed jobs.[4] This dependency on others for housing, coupled with their lower earning potential, leaves young people exposed to housing instability, with the ONS observing that a quarter of households applying for homelessness help were under the age of 25 between 2017 and 2018.[5]

The size and public cost of youth homelessness in the United Kingdom is likely to be significant, although pinpointing the exact size of the youth homelessness

[2] Watts, B., S. Johnsen, and F. Sosenko (2015): *Youth homelessness in the UK: A review for the OVO Foundation*. Edinburgh: Heriot-Watt University.
[3] Powell, A. (2020): *Youth Unemployment Statistics*. Briefing Paper 5871. House of Commons Library.
[4] Watts et al. (2015).
[5] ONS (2019): *UK homelessness: 2005 to 2018*.
https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/ukhomelessness/2005to2018

problem is challenging due to data collection issues. Clarke et al. (2015) estimated that approximately 83,000 youths were aided by homelessness organisations or local authorities in 2014 but state that this number does not include 'hidden homelessness' and therefore the youth homelessness population is expected to be higher.[6] More recent data from Centrepoint's national databank on youth homelessness estimates that 121,000 young people experienced, or were at risk of experiencing, homelessness between April 2019 and March 2020. Centrepoint estimates that the public cost of youth homelessness (on top of being NEET) is approximately £8,900 per year for 16 and 17 year olds and £12,200 per year for 18-24 year olds.[7] [8]

Research has found that a large subset of the homelessness population suffers from mental illness.[9] Due to reverse causality issues, it is difficult to ascertain whether mental illness causes homelessness, homelessness causes mental illness or whether they both influence one another. Several pieces of research have shown that mental health issues are higher in the youth homeless population compared to the youth population with estimates that homeless youths are three times as likely to suffer from a mental health condition.[10] [11] [12] [13] A report from The Joseph Rowntree Foundation states that mental health problems such as anxiety and depression are commonly unmet by treatment and that treatments should be more tailored to youths to enable better outcomes.[14]

However, despite the evidence highlighting the challenge that poor mental health poses for young people that are homeless or on the edge of homelessness, there appears to be very limited evidence of the impact that mental health treatments can have for this group, or the potential wider benefits this could have for their lives. Our report takes an initial step towards filling this evidence gap – demonstrating the potential scale of impact that dedicated support might have based on pre-existing evidence for the broader UK population.

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[6] Clarke, A., G. Burgess, S. Morris, and C. Udagawa (2015): *Estimating the scale of youth homelessness in the UK.* Cambridge Centre for Housing and Planning Research.
[7] Centrepoint (2016): *Is prevention cheaper than the cure? An estimation of the additional costs of homelessness for NEET young people*. London: Centrepoint.
[8] Centrepoint's assessment of the cost of homelessness focuses on the short-term annual public costs per each homeless young person owing to: lost tax revenue, lost National Insurance contributions, increase in housing benefits, increase in Jobseeker's Allowance, increase in Employment Support Allowance, increase in crime and increase in healthcare usage.
[9] Hodgson, K. J., K. H. Shelton, M. B. van den Bree, and F. J. Los (2013): *Psychopathology in young people experiencing homelessness: A systematic review.* American Journal of Public Health 103(6), e24–e37.
[10] Watts et al. (2015).
[11] Quilgars, D., S. Johnsen, and N. Pleace (2008): *Youth homelessness in the UK. A decade of progress?* Joseph Rowntree Foundation.
[12] Hodgson, K. J., K. H. Shelton, and M. B. van den Bree (2014): *Mental health problems in young people with experiences of homelessness and the relationship with health service use: A follow-up study.* Evidence-based Mental Health 17(3), 76–80.
[13] Vasiliou, C. (2006): *Making the link between mental health and youth homelessness: A pan-London study.* Mental Health Foundation.
[14] Quilgars et al. (2008).

Our approach

This section provides an overview of the approach used in our analysis. We start by explaining the overall analytical framework we use before highlighting the key assumptions that underpin our analysis.

Analytical framework

The overall aim of our analysis is to compare the total costs and benefits of End Youth Homelessness Health Fund and its support provided to youths aged 16-24 across the United Kingdom. This is done in three steps:

- Step 1: Estimation of the benefits per End Youth Homelessness Health Fund individual.
    - Calculate benefits from reduced costs to the NHS
    - Calculate benefits from reduced costs for those in education
    - Calculate benefits for those entering or already in the labour market
- Step 2: Estimation of the costs of the Health Fund.
- Step 3: Calculation of the value for money of the Health Fund.

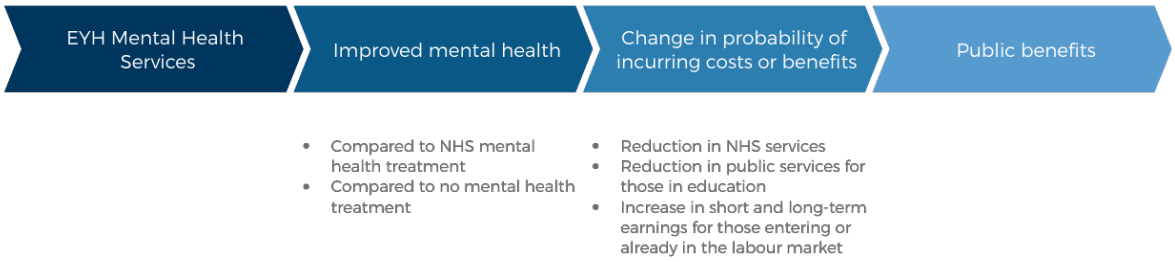
We provide further details of each of these steps below. Costs and benefits are expressed in present value terms in 2020 prices throughout. This ensures that costs and benefits that occur at different times can be compared in a robust way.[15]

Step one: estimation of benefits

This section sets out our approach to estimating the potential benefits of the EYH Health Fund. We model the potential impact of mental health services supported through the EYH Health Fund on mental health and link this to benefits from reduced use of NHS mental health services, reduced demand on education and social care services for those still in education and the increase in productivity for those entering or already in the labour market. This is summarised in Figure 1.

[15] The present value discounts future flows of benefits to reflect that individuals in society prefer to receive benefits sooner rather than later. Discounting of long-term earnings is done in line with the standard practice for economic appraisal, outlined in the HM Treasury Green Book methodology with a 3.5% discount rate. See: HM Treasury (2020): *The Green Book; appraisal and evaluation in central government*, HM Treasury.

Figure 1. Overview of analytical approach



We estimate the potential impact of the EYH Health Fund on beneficiaries' mental health by drawing on evidence for adult mental health services for anxiety and depression in the UK. To quantify the improved probability of reliably recovering from a mental health condition with EYH services, we used estimates from Clark et al. (2018) which found that reductions in wait times for mental health appointments and an increase in the number of treatment sessions are both associated with higher rates of reliable recovery.[16] As EYH services' goal is to provide mental health services faster and over more sessions than with the NHS, we are able to estimate the potential improvement in outcomes that this could provide above and beyond the support available through the NHS.

We then quantify the potential impact of this modelled improvement in mental health on the following types of benefits:

- Reduction in expenditure on health services: a reduction in the number of youths needing to seek mental health support from the NHS where they have successfully recovered as a result of support provided through the Health Fund.
- Reduction in public service costs for those in education: a reduction in costs associated with additional education, social care and health services due to mental health conditions.
- Increase in productivity for those entering or already in the labour market: we estimate productivity impacts based on the increase in wages from an improved probability of remaining in or attaining full-time employment in the short-term, and increased earnings in the long-term due to reduced probability of being NEET between 16 and 24 years old.

Throughout our analysis we clearly distinguish between those who would have sought NHS mental health treatment without End Youth Homelessness (assumed to be 30% of the EYH population) and those who would not have sought NHS treatment without End Youth Homelessness (assumed to be 70% of the EYH

[16] Clark et al. (2018). *Transparency about the outcomes of mental health services (IAPT approach): An analysis of public data*. The Lancet 391(10121), 679–686.

population) based on evidence from the wider population.[17] The estimated benefits attributable to EYH services are expected to be different for these two groups due to different potential impacts on the rate of reliable recovery due to End Youth Homelessness support.

We also assume that 40% of those supported by the EYH Health Fund will be in education, 12% will be employed and the remaining 48% will be seeking work. This is in line with estimates provided by EYH partner organisations.

We provide further information on the approach taken for each type of benefits below, full details are available in the Annexes to this paper. We have rounded estimates to nearest pound for purposes of transparency but note that this does not reflect the true level of uncertainty around these figures.

Potential savings to NHS

We assume that if an individual that would otherwise have sought NHS support for their mental health condition recovers due to support from the EYH Health Fund then they will no longer seek support from the NHS, generating a reduction in costs. Figure 2 shows how we calculated this.

First, we divide the EYH population into those who would have sought NHS mental health treatment (30%) and those who would not (70%). Second, of those that would have sought treatment outside of EYH, we divide them into two groups: those that we assume will reliably recover from their mental health condition with intervention from EYH and those that we assume will not. The EYH Health Fund is intended to provide more extensive support than available through the NHS with minimal waiting times. We use the evidence from Clark et al. (2018) to estimate that the EYH mental health services could have a reliable recovery rate of approximately 54% compared to an average reliable recovery rate of 44% for NHS treatments.[18] This reliable recovery rate results in an estimate that 16% pts of the 30% of beneficiaries that would have sought NHS support are expected to reliably recover with EYH while 14% pts of the 30% pts are not expected to reliably recover with EYH. The final column shows that there is a 16% pt reduction in probability of incurring NHS costs due to EYH as these individuals reliably recover from their mental health condition with EYH services. As the annual average cost per NHS mental health treatment is estimated to be £1,111, this results in an NHS savings of approximately £604 per person who would have sought NHS treatment.[19] [20] There is no savings for the individuals who would not have sought NHS

[17] NHS Digital (2018). *Mental Health of Children and Young People in England*, 2017 suggests that one quarter of children with a diagnosable mental health condition receive NHS support, and NHS (2014), *Adult Psychiatric Morbidity Survey: Survey of Mental Health and Wellbeing*, England, 2014 suggests that the equivalent figure for adults is 33%.

[18] Further explanation, and derivation, of the 54% reliable recovery rate with EYH can be found in Annex A.

[19] Radhakrishnan, M., G. Hammond, P. B. Jones, A. Watson, F. McMillan-Shields, and L. Lafortune (2013): *Cost of improving access to psychological therapies (IAPT) programme: An analysis of cost of session, treatment and recovery in selected primary care trusts in the East of England region*. Behaviour Research and Therapy 51(1), 37–45.

[20] The £877 estimate for the annual average cost per NHS mental health treatment from Radhakrishnan et al. (2013) is adjusted to be in 2020 £'s following Green Book guidance using the GDP deflator resulting in an estimate of £1,111. The final estimate uses unrounded figures for recovery rate and costs and may differ slightly from an estimate based on unrounded numbers.

treatment as they would not have used NHS's resources regardless of EYH. Weighting the benefits by the proportion of the sample that would have sought NHS treatment (30%) and those that would not have sought treatment (70%) results in an average benefit of £181 per person as shown in Figure 3.

Figure 2. NHS savings owing to EYH Health Fund

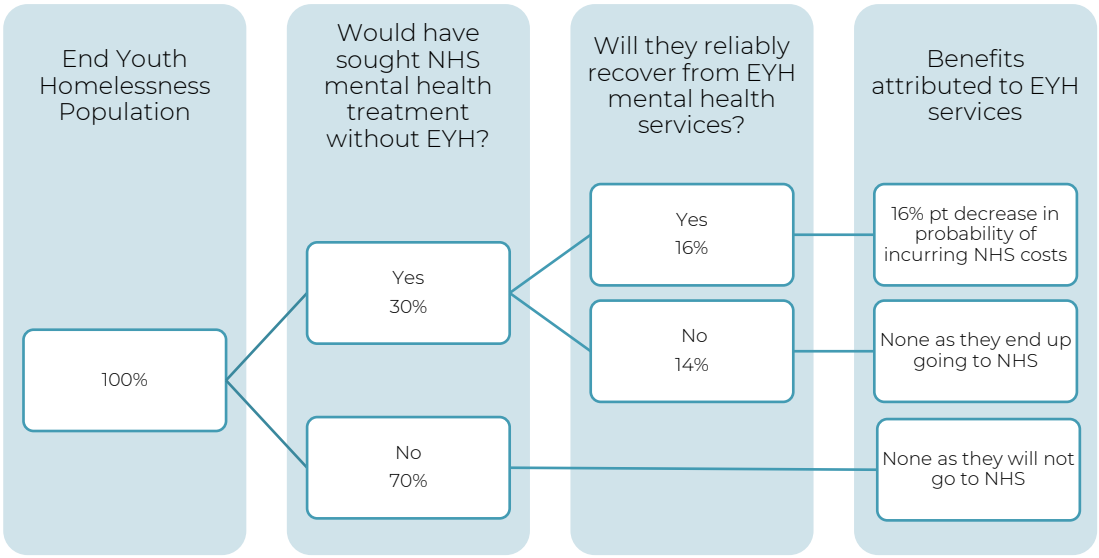


Figure 3. Benefits from reduced NHS mental health treatments

Reduced NHS costs for those who:	Benefit per person	Percentage of sample
Would have sought NHS treatment = Yes	£604	30%
Would have sought NHS treatment = No	£0	70%
Weighted Average NHS Benefit	**£181**	**100%**

Reduction in public service costs for those in education

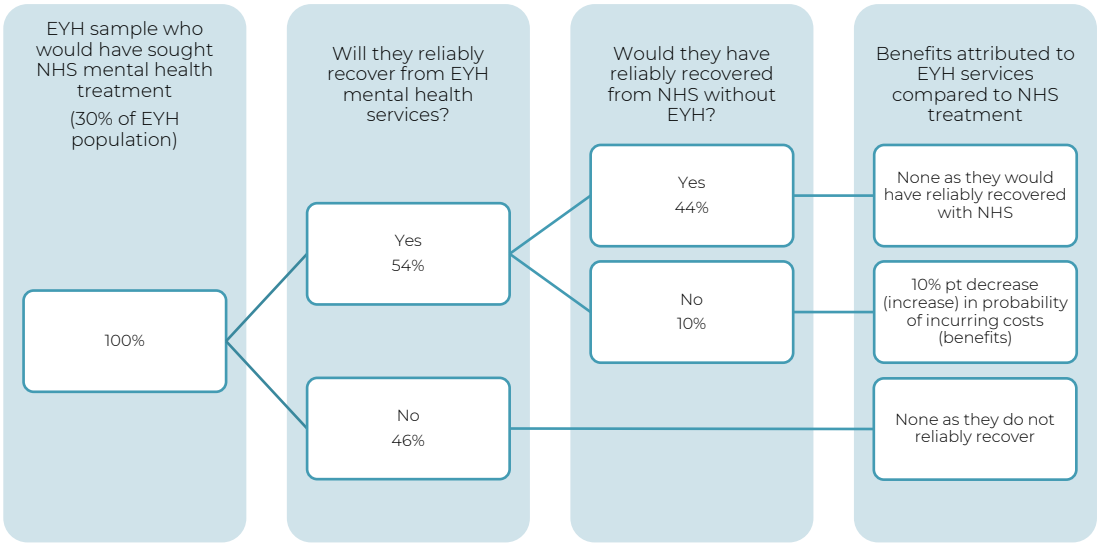
Previous research has shown that having a mental health condition whilst in education can result in costs associated with additional support from educational services, social care and other health services.[21] Figure 4 shows how we calculate the change in probability of incurring costs due to the EYH programme for those who would have sought NHS mental health treatment while Figure 5 shows the same figure for those who would not have sought NHS treatment.

As above, we use evidence from Clark et al. (2018) to calculate the reliable recovery rate of EYH services due to shorter wait times and more treatment sessions than with the NHS, suggesting that EYH mental health services could have a 54% reliable recovery rate, compared to a 44% reliable recovery rate for those receiving NHS treatment.[22] For those that would otherwise have received support from the NHS this represents a 10% pts improvement in the likelihood of recovering. As

[21] Knapp et al. (2016): *Youth Mental Health: New Economic Evidence*, Young Minds, LSE & PSSRU
[22] Clark et al. (2018), p. 681

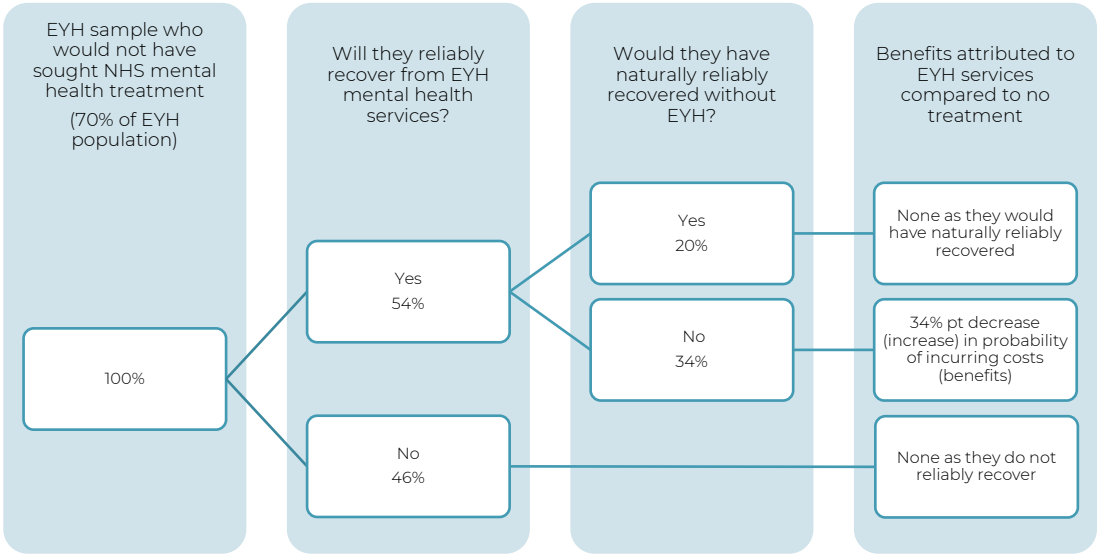
summarised in Figure 4, this improvement can be linked to a saving in costs incurred by schools, social care and other health services.

Figure 4. Benefits for those who would have sought NHS treatment



For those that would not have sought NHS mental health treatment, Figure 4 first divides the sample into those that will, and will not, reliably recover from EYH services. However, in this instance we need to compare the potential performance of the EYH Health Fund support against the likely reliable recovery rate without any mental health treatment. We assume that this is likely to be around 20%, therefore, there could be a 34% pts uplift in the likelihood of recovering as a result of the EYH Health Fund support. [23]

Figure 5. Benefits for those who would not have sought NHS treatment



[23] Clark et al. (2009): *Improving access to psychological therapy: Initial evaluation of two UK demonstration sites.* Behaviour Research and Therapy 47(11), 910–920. p. 919

It is important to notice that the benefits attributed to EYH are larger for the sample that would not have sought NHS treatment as the natural reliable recovery rate (20%) is less than the reliable recovery rate with NHS support (44%).

Figure 6 summarises our estimates of the potential reduction in costs associated with education, social care and health services for those in education resulting from the support provided by the EYH Health Fund.[24] Previous work has estimate the annual average unit cost of a mental health condition for a youth in education is approximately £1386, this results in a savings of approximately £165 per person who would have sought NHS treatment and £471 per person who would not have sought NHS treatment.[25] Weighting the benefits by the proportion of the sample that would have sought NHS treatment (30%) and those that would not have sought treatment (70%) results in an average benefit of £379 per person.

Figure 6. Benefits from reduced public service for those in education

Reduced costs for those who:	Benefit per person	Percentage of sample for those in education
Would have sought NHS treatment = Yes	£165	30%
Would have sought NHS treatment = No	£471	70%
Weighted average benefit for those in education	**£379**	**100%**

Increase in productivity for those entering or already in the labour market

In addition to providing benefits for those in education, EYH Health Fund will also yield benefits for those not in education in the form of increased productivity due to two key effects:

- Firstly, improvements in mental health being associated with higher probabilities of remaining in, or attaining, employment.[26] The short-term earnings refer to increases in earnings due to a higher probability of remaining in, or attaining, employment that year due to improved mental health as found in Webber et al. (2015).
- Secondly, improvements in long-term productivity as a result of a lower probability of being NEET between the ages of 16 and 24 which has been linked to a long-term "scarring effect" through decreased earnings later in life.[27]

Figures 4 and 5 summarise our approach to estimating benefits in the form of increased productivity due to EYH services for those not in education. Figure 7 shows the estimates of the increased earnings, both in the short and long-term, for those not in education, attributed to having a higher probability of reliably

[24] Please see Annex C for detailed calculations of benefits.
[25] Pro Bono Economics (2021): *The impact of waiting lists for children's mental health services on the costs of wider public services.*
[26] Webber et al. (2015): *Does poor health affect employment transitions?* Joseph Rowntree Foundation. p. 33
[27] Gregg and Tominey (2005)

recovering from one's mental health condition due to EYH services.[28] In addition to the benefits differing based on whether one would have sought NHS treatment, the benefits also differ based on whether the individual is currently employed or unemployed. This is because the probability of remaining in employment is different than the probability of gaining employment for those whose mental health improves.[29] Figure 7 shows that the estimated benefits attributed to EYH are again higher for those that would not have sought NHS treatment. Weighting the benefits by the proportion of the sample that would, and would not have, sought NHS treatment and by the proportion of the sample employed (12%) and unemployed (88%) for those not in education, results in an average benefit of £849 per person due to higher earnings.

Figure 7. Benefits from increased earnings and productivity for those entering or already in the labour market

Increased earnings for those who:	Benefit per person	Percentage of sample for those entering or already in the labour market
Would have sought NHS treatment = Yes Employed = No	£281	26%[30]
Would have sought NHS treatment = Yes Employed = Yes	£196	4%
Would have sought NHS treatment = No Employed = No	£1,139	62%
Would have sought NHS treatment = No Employed = Yes	£794	8%
Weighted Average Increased Productivity for those not in education	**£849**	**100%**

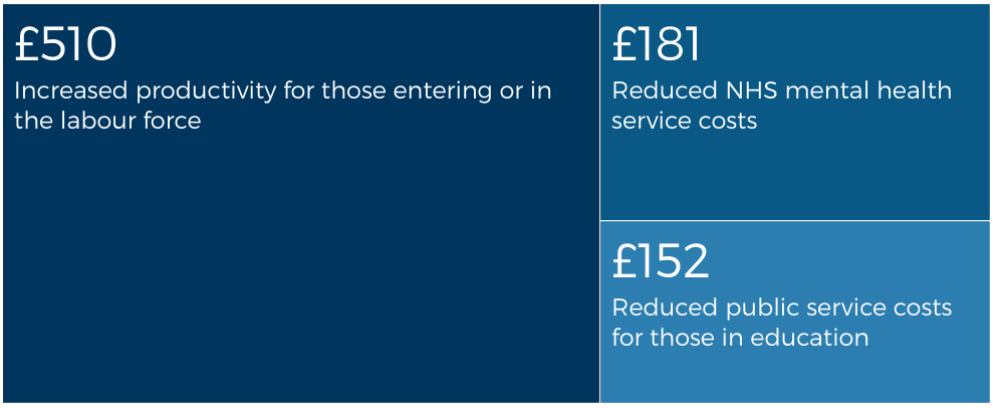
*These estimates are the average male and female benefits.

Summary of total benefits

Figure 8 summarises our estimates of the potential average benefits from the EYH Health Fund, weighting for the fact that 40% of future beneficiaries are assumed to be in education, 12% in employment and 48% seeking employment.[31] On average we estimate that the EYH Health Fund could deliver benefits of around £843 per young person supported, with around £510 of benefits from increased productivity for those not in education, £181 in reduced NHS mental health service costs and £152 from reduced public service costs for those in education.

[28] Please see Annex D and E for detailed calculations of short and long-term earnings.
[29] Please see Annex E for more details.
[30] These percentages are a product of two factors – whether or not the individual would have sought NHS treatment and whether or not they are employed. For example, for the top group, we assume 30% would have sought NHS treatment and that 88% of the group would not have been employed; 30%*88%=26%.
[31] Note that the savings due to reduced NHS costs are the same as in Table 1 as these do not change based on whether an individual is in education.

Figure 8. Total weighted benefits of EYH Health Fund per person (£842)



Step 2: Estimation of costs

In Step 2 we estimate the costs of the End Youth Homelessness Health Fund using estimates provided by End Youth Homelessness.

EYH estimates that they will provide each of their eleven charities £35,000 to cover salary, administration and marketing for the new mental health programme. The individual charities will provide a minimum of 23 counselling hours a week for 48 weeks of the year resulting in 12,144 counselling hours across the eleven charities. EYH estimates that they will provide an average of 11 sessions per person resulting in 1,104 young people supported over the course of the year.

Furthermore, EYH estimates that they will spend an additional £50,000 on supporting the fund. EYH will also provide one general £20,000 pilot bursary which the charities can pull from if they require additional resources that their counsellors cannot provide.

This results in the estimated annual costs of the programme being £455,000. Due to EYH's funding model, they require 20% of costs to be retained by EYH to cover their own overhead costs resulting in a final estimated annual cost of £570,000 for the mental health programme. This results in a cost per person of approximately £517 if they service 1,104 young people at a cost of £47 per hour of support.

Figure 9. Estimated cost of EYH Health Fund per person

11	x	£47	=	£517
sessions		session cost		total cost

Step 3: Estimation of the value for money of programme

In Step 3 we calculate the value for money of the End Youth Homelessness Health Fund using the estimated costs and benefits. We use two key metrics for assessing the cost-effectiveness of the programme:

- The net benefit per young person: this is equal to the benefit per pupil minus the cost per pupil and provides an indication of how much extra benefit is generated per pupil supported.[32]
- The Benefit Cost Ratio: this is equal to the benefits divided by the costs and provides an indication of the benefits generated for each £1 spent on the programme.

Key assumptions

Our analysis is based on several key assumptions, the most important of which are:

- Assumptions relating to the characteristics of those that will be supported by the End Youth Homelessness Health Fund are largely based on estimates provided by current providers of similar services to young people who are homeless or on the edge of homelessness. There were a range of estimates provided (summarised in Annex F) and we have not been able to verify the accuracy or consistency of data collections processes. For this reason, although we believe they are reasonable estimates, there is significant uncertainty about the following assumptions that:
    - 70% of individuals who would use End Youth Homelessness mental health services would not have sought NHS mental health treatment while 30% of individuals who would use End Youth Homelessness mental health services would have sought NHS mental health treatment in the absence of End Youth Homelessness.[33]
    - 60% of individuals who would use End Youth Homelessness mental health services will not currently be in education and that, of this subsample, 12% of individuals will be employed (88% unemployed).
- Our assumptions about treatment recovery rates are based on evidence from adult IAPT services for anxiety and depression.[34] [35] In reality, the individuals being supported by the End Youth Homelessness Health Fund are generally younger and may have a wider range of mental health difficulties compared to the population served by IAPT. However, adult IAPT services offer a rich evidence base for informing our analysis compared to evidence for younger people and evidence for other conditions so we have little option other than to assume that these recovery rates will be representative of what the End Youth Homelessness intervention might expect.
- Our analysis effectively assumes that mental health can be treated as a binary variable with a single threshold of “reliable recovery”. This is clearly a simplification or the complex realities of managing and treating mental health conditions and is an approach driven by the existence of limited

[32] Both costs and benefits are discounted to present value, as outlined above.
[33] NHS Digital (2018)
[34] Clark et al. (2018), p. 681
[35] Clark et al. (2009), p. 919

evidence showing how more gradual improvements in mental health can be linked to public service usage and employment outcomes.

- The long-term employment-related benefits of decreased probability of being unemployed during one's youth is based on published research by Gregg and Tominey (2005). They found that experiencing a 7-12 month period of unemployment in between the ages of 16 and 23 is associated with significant long-term decreases in wages at different ages (at ages, 23, 33 and 42). Our analysis assumes that individuals in End Youth Homelessness mental health services would experience the same long-term wage effects.

We explore the impact of these key assumptions in the sensitivity analysis summarised in key results section of our report.

Summary of key results

This section explains our analysis of the value for money of the End Youth Homelessness programme. We start by outlining the conclusions from our core scenario before exploring the impact of some of our key assumptions on these findings using a sensitivity analysis.

The value for money of the End Youth Homelessness Health Fund

Our analysis suggests that:

- On average the Health Fund could generate around £842 of benefit for each young person supported.
- With an estimated cost of £517 per person supported, this suggests that the net benefit of the EYH Health Fund is around £325 per young person supported
- These results imply that for every £1 spent by End Youth Homelessness through the Health Fund could generate economic benefits of around £1.60.

Figure 10 summarises these key findings, that suggest the EYH Health Fund is likely to generate economic benefits in excess of its cost per young person supported.

Figure 10. Benefit Cost Ratio for the EYH Health Fund

	Per Person
Benefits per young person supported	£842
Costs per young person supported	£517
Net benefit per young person	£325
Benefit Cost Ratio	1.63

If the Health Fund is able to support its target of 1,104 young people in a year, then it's possible that it could potentially generate more than £930,000 in economic benefits at a cost of £570,000, delivering a net economic benefit to society of in excess of £330,000 for one year of support.

Sensitivity analysis

In this section we assess the robustness of the above findings by analysing the change in the Benefit Cost Ratio resulting from changes in the key assumptions. Our analysis suggests that the benefits of the programme are likely to exceed its costs across a wide range of plausible variations in the assumptions.

Sensitivity 1: Changing proportion who would have sought NHS treatment

In our core scenario we assume that 30% of those supported by the EYH Health Fund would otherwise have sought support from the NHS. In this sensitivity we

explore the impact of changing this assumption across the full range from 0% seeking NHS support to 100%.

We find that:

- If we reduce the assumption for the proportion that would have sought NHS treatment to 0% then the Benefit Cost Ratio changes from 1.63 to 1.64.
- If we increase the assumption for the proportion that would have sought NHS treatment to 100% then the Benefit Cost Ratio changes from 1.63 to 1.61.

This demonstrates that this assumption has very little impact on our key results.[36]

Sensitivity 2: Reliable Recovery Rate Assumptions

In our core scenario we assume that 54% of those receiving mental health support from the EYH health fund will reliably recover, compared to 44% for those receiving NHS mental health service and 20% of those receiving no treatment. In this sensitivity we explore the extent to which the EYH reliable recovery rate would need to change before the benefits of the EYH health fund no longer outweigh the costs (Benefit Cost Ratio = 1).[37]

We estimate that the EYH Health Fund recovery rate would need to reduce to be as low as 42% before the costs of the programme out-weight the costs. This is rate below the level seen in the NHS and could be possible if the quality of support provided through the EYH Health Fund is lower than the quality of support provided within NHS services. [38]

This sensitivity shows that our broad conclusions about the value for money of the EYH Health Fund could be affected if it delivers significantly lower quality service than that provided by the NHS resulting in a reliable recovery rate that is nearly a quarter lower than is estimated in our core scenario. This is possible but appears unlikely given that the fund is aiming to provide more intensive service (more sessions of support), delivered with shorter waiting times which have both been shown to systematically increase reliable recovery rates as well as a wider variety of therapeutic interventions.

Sensitivity 3: Higher cost assumptions

In our core scenario we assume that the average per-person, per-specialist mental health session supported through the EYH Health Fund is likely to cost £47.[39] In

[36] Changing the proportion of individuals who would have sought NHS treatment has little impact on the Benefit Cost Ratio because when the proportion is low, there are greater potential benefits through improving outcomes for both those in education and those in the labour market. If the proportion is high, then there is a large savings due to reducing NHS usage.
[37] Note that a lower NHS recovery rate decreases the cost effectiveness of the program due to its relationship with the EYH recovery rate. A decrease in the NHS recovery rate decreases the EYH recovery rate as it is calculated from improvements in the NHS recovery rate due to shorter wait times and more sessions as shown in Appendix blank.
[38] Even with a lower reliable recovery rate than the NHS the EYH Health Fund could deliver benefits through reaching those that wouldn't otherwise receive any support and reducing demand on NHS services.
[39] This estimate includes an apportionment of overhead costs.

this sensitivity we explore the extent to which this cost would need to be increased before the benefits of the programme no longer out-weigh the costs.

We find that the cost would need to increase from £47 per session to £77 per session before the benefits of the programme no longer outweigh the costs – an increase of 63%.

This suggests that the assumed costs would need to be significantly different before it would affect our broad conclusion that the benefits of the EYH health fund are likely to out-weigh the costs.

Conclusion

Our study provides an estimate of the potential value for money of the End Youth Homelessness Health Fund. It has demonstrated that improving the mental health of youths experiencing, or at risk of, homelessness is likely to yield benefits that outweigh the costs of the Fund.

Our analysis suggests that:

- On average the Health Fund could generate more than £800 of benefit for each young person supported.
- More than 60% of these benefits - around £500 per person - come from increasing the chances of young people finding employment in more productive roles over their working life.
- Just over a fifth of this benefit – around £180 per person – is likely to come from reduced demand on NHS mental health services.
- The remaining benefit – around £150 per young person - is likely to come from reduced costs to additional support in education and social care services for those still in education.
- If the Health Fund is able to support its target of 1,104 young people per year then it's possible that it could generate more than £900,000 in economic benefits at a cost of £570,000, delivering a net economic benefit to society of in excess of £330,000 for each year of support.
- These results imply that for every £1 spent by End Youth Homelessness through the Health Fund could generate a potential societal benefit of £1.60.

Our estimates for benefits related to the EYH Health Fund are likely to be conservative for a few reasons. First, we do not attempt to incorporate a monetary value for the benefits to the individual beneficiaries' quality of life from improvements in their mental health. Second, the benefits associated with long-term employment are likely an underestimate of the benefits that individuals would receive over their lifetime as we only estimate the benefits up to age 46. It seems a reasonable assumption that if there is a statistically, and economically, significant negative effect of a period of youth unemployment on earnings at age 43, as found in Gregg and Tominey (2005), that there may remain a significant negative impact on wages later in life. In addition, there are likely to be other benefits that we have not been able to include from reducing future demand on statutory homelessness services, reduced likelihood of involvement in the criminal justice system and reduced demand on other public services.

Implications

The End Youth Homelessness Health Fund seeks to improve the mental health of young people experiencing, or at risk of, homelessness by providing mental health

services to young people using their services. Our analysis provides evidence that the benefits to society from improving the mental health of young people experiencing, or at risk of, homelessness by providing mental health services faster and over more sessions are likely to out-weigh the costs. Whilst some of the benefits fall directly to the young people supported in the form of increased wages, we have identified that the wider public is also likely to benefit from reduced pressure on the NHS, school system and increased taxation revenue to support public services. Furthermore, the intention is for the EYH Health Fund to reach those that would not have otherwise accessed mainstream NHS mental health services. As such it will directly serve those most at risk of falling through the cracks.

Overall, our analysis suggests that not only is there a moral and ethical imperative to supporting young people facing some of the most challenging circumstances but an economic case too. We hope this research can be used to highlight the value of investing money to support improvements in the mental health of vulnerable youths.

Our broad conclusions are relatively robust to changes in key assumptions relating to rates of reliable recovery from mental health conditions, the characteristics of the participants involved and the costs of the programme. However, we would encourage End Youth Homelessness to capture data on these key metrics as the programme is implemented to strengthen future evaluations of the Health Fund. In particular, information on the following would increase our understanding about the importance of mental health improvements for vulnerable youths:

- Collecting evidence on the improvements in mental health during throughout treatment, including the proportion meeting NHS standard “reliable recovery” thresholds.
- Assessing the change in outcomes such as remaining in education, employment and accommodation before and after the support provided.
- Estimating the effect of this programme on beneficiaries’ wellbeing.

Annex A: Odds Ratio and Probability Calculations

Approach

This annex provides further information for how the reliable recovery rate for the End Youth Homelessness mental health services is calculated. The discussion below focuses on how the approach using published research from Clark et al. (2018) to calculate the effectiveness of the programme due to improvements in wait time and number of therapy sessions compared to NHS mental health services.

Calculation – Improvements in odds of reliable recovery due to obtaining treatment faster

We estimate the additive odds ratio for reliable recovery due to End Youth Homeless providing mental health services more quickly than the NHS with the following equation:[40]

$$AOR_{EYH,Wait} = \exp\left(\log(OR_{NHS,Wait}) \cdot (Wait_{NHS} - Wait_{EYH})\right)$$

Where:

- $AOR_{EYH,wait}$ = the additive odds ratio for End Youth Homelessness improvement in mental health due to shorter wait times for mental health services than with the NHS.
- OR_{NHS} = the reciprocal odds ratio for days before entering mental health treatment association with reliably recovering in NHS in 2015/16.[41]
- $Wait_{NHS}$ = the average number of days for adults to get mental health treatment after referral in 2015/16.[42]
- $Wait_{EYH}$ = the target number of days for adults to get mental health treatment after referral with End Youth Homelessness

Calculation – Improvements in odds of reliable recovery due to having more sessions

We estimate the additive odds ratio for reliable recovery due to End Youth Homeless providing more sessions in their mental health service than the NHS with the following equation:

$$AOR_{EYH,sessions} = \exp\left(\log(OR_{NHS,Sessions}) \cdot (Sessions_{EYH} - Sessions_{NHS})\right)$$

[40] Clark et al. (2018), p. 682
[41] Clark et al. (2018), p. 684
[42] Clark et al. (2018), p. 681

Where:

- $AOR_{EYH,sessions}$ = the additive odds ratio for End Youth Homelessness improvement in mental health due to more mental health sessions than with the NHS.
- $OR_{NHS,Sessions}$ = the reciprocal odds ratio for number of mental health sessions association with reliably recovering in NHS in 2015/16.[43]
- $Sessions_{EYH}$ = the target number of mental health sessions with End Youth Homelessness
- $Sessions_{NHS}$ = the average number of mental health sessions for adults in 2015/16.[44]

Calculation – Odds of reliable recovery from NHS mental health services

$$OR_{NHS} = \frac{Recovery_{NHS}}{(1 - Recovery_{NHS})}$$

Where:

- OR_{NHS} = the odds ratio for reliable recovery due to NHS mental health services.
- $Recovery_{NHS}$ = average probability of reliable recovery due to NHS mental health services.[45]

Calculation – Adjusted odds of reliable recovery with End Youth Homelessness

$$AOR_{EYH} = AOR_{EYH,Wait} \cdot AOR_{EYH,sessions} \cdot OR_{NHS}$$

Calculation – Adjusted probability of reliable recovery with End Youth Homelessness

$$Recovery_{EYH} = \frac{AOR_{EYH}}{(1 + AOR_{EYH})}$$

Calculation – Increased probability of reliable recovery due to End Youth Homelessness compared to NHS treatment

$$Improved\_Recovery_{EYH}^{Yes} = Recovery_{EYH} - Recovery_{NHS}$$

Calculation – Increased probability of reliable recovery due to End Youth Homelessness compared to no mental health treatment

$$Improved\_Recovery_{EYH}^{No} = Recovery_{EYH} - Recovery_{Natural}$$

[43] Clark et al. (2018), p. 684
[44] Clark et al. (2018), p. 681
[45] Clark et al. (2018), p. 681

Figure 11. Summary of key variables for calculating probability of recovery due to EYH

Variable	Value
$OR_{NHS,Wait}$	1.004
$Wait_{NHS}$	30.98 days
$Wait_{EYH}$	14 days
$OR_{NHS,Sessions}$	1.075
$Sessions_{EYH}$	11 sessions
$Sessions_{NHS}$	6.41 sessions
$Recovery_{NHS}$	0.44
$Recovery_{Natural}$	0.20
$Recovery_{EYH}$	0.54
$AOR_{EYH,Wait}$	1.07
$AOR_{EYH,Sessions}$	1.39
OR_{NHS}	0.80
AOR_{EYH}	1.19
$Improved\_Recovery_{EYH}^{Yes}$	0.10
$Improved\_Recovery_{EYH}^{No}$	0.34

Annex B: Savings from reduced need for NHS treatment

Approach – Benefits for those who would have sought NHS mental health treatment

$$NHS\_Benefit^{Yes} = Recovery_{EYH} \cdot Prop^{Yes} \cdot Cost_{NHS}$$

Where

- $Prop^{Yes}$ = proportion of individuals in End Youth Homelessness who would have sought NHS mental health treatment.
- $Cost_{NHS}$ = annual average cost per NHS mental health treatment.[46]

Figure 12. Summary of key variables for savings from reduced NHS services

Variable	Value
$Recovery_{EYH}$	0.54 (In Table 6)
$Prop^{Yes}$	0.30
$Cost_{NHS}$	£1111
$NHS\_Benefit^{Yes}$	£181

[46] Radhakrishnan et. al (2013), p.1.

Annex C: Benefits for those in education

Approach – Benefits for those who would have sought NHS mental health treatment

$$Educ\_Benefit^{Yes} = [Cost_{Educ} \cdot Improved\_Recovery_{EYH}^{Yes}] + \left[Recovery_{NHS} \cdot \frac{(Wait_{NHS} - Wait_{EYH})}{365} \cdot Cost_{Educ}\right]$$

Where:

$Cost_{Educ}$ = unit cost of mental health condition for a youth in education[47]

Calculating the benefits that End Youth Homelessness brings in the form of reduced public service costs for those in education consists of two parts for those who would have sought NHS treatment. The first part is calculating the savings due to EYH as they have improved reliable recovery compared to the NHS. This means that there is a decrease in the probability of incurring these costs. The second part calculates the benefits due to shorter wait times for individuals with the End Youth Homelessness programme.

Approach – Benefits for those who would not have sought NHS mental health treatment

$$Educ\_Benefit^{No} = [Cost_{Educ} \cdot Improved\_Recovery_{EYH}^{No}]$$

Approach – Total benefits for those in education

$$Educ\_Benefit = (Educ\_Benefit^{Yes} \cdot Prop^{Yes}) + (Educ\_Benefit^{No} \cdot (1 - Prop^{Yes}))$$

Figure 13. Summary of variables for savings from reduced NHS services

Variable	Value
$Cost_{Educ}$	£1386
$Improved\_Recovery_{EYH}^{Yes}$	0.10 (In Table 6)
$Recovery_{EYH}$	0.54 (In Table 6)
$Wait_{NHS}$	30.98 days (In Table 6)
$Wait_{EYH}$	14 days (In Table 6)
$Educ\_Benefit^{Yes}$	£165
$Improved\_Recovery_{EYH}^{No}$	0.34 (In Table 6)
$Educ\_Benefit^{No}$	£471
$Educ\_Benefit$	£379

[47] This is based on an analysis of the cost data underlying Knapp et al. (2016): *Youth Mental Health: New Economic Evidence* discussed in PBE (2021): The impact of waiting lists for children's mental health services on the costs of wider public services. The PBE analysis strips out large out-lying costs for a small group of individuals to provide a more representative cost of the typical young person requiring mental health support.

$Prop^{Yes}$	0.30 (In Table 7)

Annex D: Short-term and Long-term Earnings Calculations

Approach – Short-term earnings

Calculations of the potential employment benefits that are attributable to End Youth Homelessness require use of earnings data from the ONS and previous published research on the relationship between periods of youth unemployment on long-term earnings. The employment benefits consist of two parts: short-term benefits (due to increased probabilities of attaining or remaining in employment in the short-term) and long-term benefits (due to decreased probability of experiencing significant period of youth unemployment which is negatively associated with earnings in the long-term). To enable this analysis, estimates of the wages that youths would earn in the short and long-term are necessary and are acquired from the Office of National Statistics (ONS) 2019 Annual Survey of Hours and Earnings (ASHE).[48] When estimating annual earnings, it is important to analyse wages separately by gender as there are significantly different annual earnings based on gender. Table 6.7a from the ONS provides mean, and percentile, earnings data for employees of different age ranges as shown in the following table:

Figure 14. Earnings of 2019 full-time employees in the UK

	Male		Female	
Age Range	Mean Earnings	25th Percentile Earnings	Mean Earnings	25th Percentile Earnings
16-17	£10,533	N/A	£8,581	N/A
18-21	£18,746	£14,028	£15,810	£12,102
22-29	£29,262	£20,333	£25,622	£18,580
30-39	£40,070	£24,850	£33,346	£21,222
40-49	£47,480	£26,802	£35,864	£21,113

Data from ONS ASHE Table 6.7a Revised 2019.

We assume that individuals in End Youth Homelessness would have short-term annual earnings of £14,028 for men and £12,102 for women which is equal to the 25th percentile of annual earnings for men and women aged between 18 and 21. This age range is captured within the End Youth Homelessness sample as they are between 16 and 26 years old. This cost is then grossed up to include non-wage employment costs and brought into line with 2020 prices using the ONS GDP

[48]ONS (2019): ASHE Table 6, 2019 revised URL: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/agegroupashetable6

deflator, giving final short-term annual productivity impacts of £17,633 for men and £15,212 for women.[49]

Approach – Long-term earnings

We calculate how one's earnings over a period of their life would change if they experienced a 7-12 month period of unemployment in their youth. This analysis is shown in the following equation:

$$Long\_Earnings_{Sex} = \sum_{T=0}^{30} (Assumed\_Earnings_{Age,Sex} \cdot Penalty_{Age,Sex}) DF^{T}$$

Where:

$Assumed\_Earnings_{Age,Sex}$ is the assumed earnings based on one's age and sex that is calculated in Figure 6 below.

$Penalty_{Age,Sex}$ is the earnings penalty based on one's age and sex that is taken from previous published research by Gregg and Tominey (2005) and described in more detail below.

DF^{T} is the discount factor, with T representing the 30 years between age 16 and 46 which is in line with HM Treasury's Green Book guidance.

Inputs

Assumed Earnings

To calculate the potential earnings of individuals who use End Youth Homelessness services would earn at a given age, we use the information from Table 9. For 16 and 17 year olds, not in education, we assume that End Youth Homelessness sample's earnings would be equal to the mean earnings for full-time employed 16-17 year olds (as there is no reported 25th percentile). For ages, 18-46, we assume that the End Youth Homelessness sample's earnings would be equal to the 25th percentile annual earnings for a given age category as we assume that individuals in the programme are likely to earn less than average annual earnings. The following Figure Blanks shows our assumed future earnings for men and women in the End Youth Homelessness program for different ages:

Figure 15. Assumed annual earnings of 2019 full-time employees in the UK by age

Assumed Male Earnings	Age	16-17	18-21	22-29	30-39	40-46
	Earnings	£10,533	£14,028	£20,333	£24,850	£26,802
Assumed Female Earnings	Age	16-17	18-21	22-29	30-39	40-46
	Earnings	£8,581	£12,102	£18,580	£21,222	£21,113

Data from ONS ASHE Table 6.7a Revised 2019.

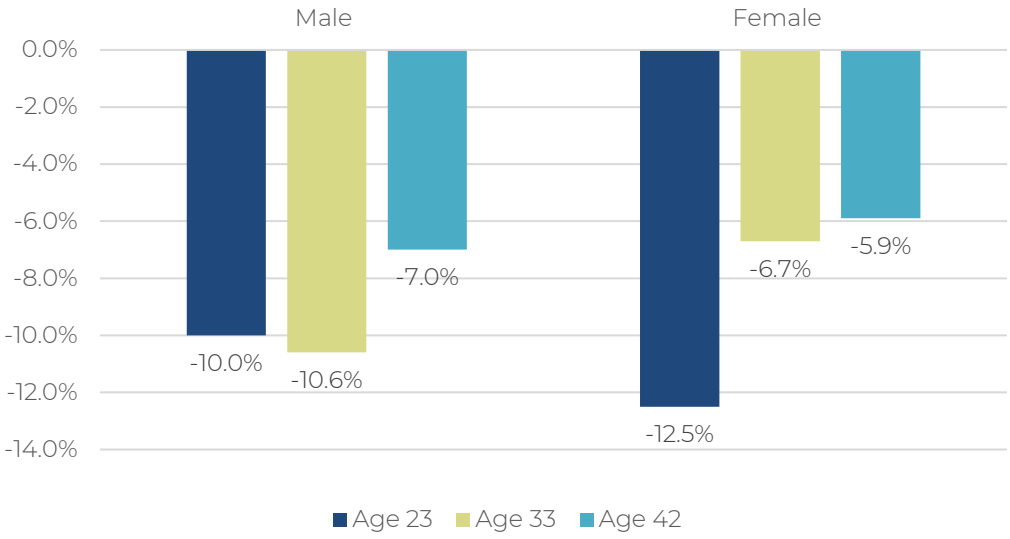
Earning Penalties from Youth Unemployment

After calculating the assumed earnings that men and women in End Youth Homelessness would earn if employed full-time for a year, we look to previous

[49] This is in line with HM Treasury Green Book best practice.

published research by Gregg and Tominey (2005) to understand how their future earnings would change if they have a period of youth unemployment. Using the National Child Development Survey (NCDS), which follows a cohort born in the same week in March 1958 in Great Britain, Gregg and Tominey (2005) were able to see periods of unemployment during one's youth (16-23 years old) and the annual earnings of this sample up to 42 years of age (due to data limitations at the time). Due to the detailed survey, they were able to causally link a 7-12 month period of unemployment in one's youth to lower annual earnings at 23, 33 and 42 years old as shown in Figure 7:

Figure 16. Long-term Earnings Penalties due to Period of Youth Unemployment



Data from Gregg & Tominey (2005).

Our analysis assumes that individuals in End Youth Homelessness would experience the same long-term wage penalties so we can use the wage effect estimates from Gregg and Tominey (2005) to calculate how much our assumed wages would decrease due to a period of youth unemployment. We calculate the reduction in annual earnings by multiplying the assumed earnings in Figure 6 by the wage penalties in Figure 7. We use the wage penalty at age 23 for ages 17-28, the wage penalty at age 33 for ages 29-38 and the wage penalty at 42 for ages 39-46.

This cost is then grossed up to include non-wage employment costs and brought into line with 2020 prices using the ONS GDP deflator, giving final long-term productivity impacts of £46,061 for men and £37,829 for women.[50]

[50] This is in line with HM Treasury Green Book best practice.

Annex E: Increased productivity for those entering or already in the labour market

Approach

Calculate the change in likelihood of being in full-time employment due to End Youth Homelessness:

$$Improved\_Employ_{Status}^{Treat} = Improved\_Employ_{Status} \cdot Improved\_Recovery_{EYH}^{Treat}$$

Where:

$Treat$ is yes if one would have sought treatment from the NHS and no otherwise.

$Status$ is one's labour market status of unemployed or employed.

$Improved\_Employ_{Status}$ when status equals unemployed is the change in absolute probability of becoming full-time employed due to improving mental health while having no qualifications.[51] When status equals employed it is the change in absolute probability of retaining full-time employment due to improving mental health while having no qualifications. [52]

Calculate the short-term earnings benefit of End Youth Homelessness treatment:

$$Short\_Benefit_{Status,Sex}^{Treat} = Short\_Earnings_{Sex} \cdot Improved\_Employ_{Status}^{Treat} \cdot Length\_Employ^{Treat}$$

Where:

$Length\_Employ^{Treat}$ when treat=yes is the proportion of the year longer employed due to shorter wait times for treatment at End Youth Homelessness compared to NHS. When treat=no it is the proportion of the year longer assumed to have job (which we assume is 0.5). [53]

Now we can calculate the long-term benefit due to End Youth Homelessness increasing the probability of gaining or retaining, full-time employment and not having a negative effect on future earnings due to better mental health with the following equation:

$$Long\_Benefit_{Status,Sex}^{Treat} = Long\_Earnings_{Sex} \cdot Improved\_Employ_{Status}^{Treat}$$

This then leads to a total employment benefits:

$$Emp\_Ben_{Status,Sex}^{Treat} = Short\_Benefit_{Status,Sex}^{Treat} + Long\_Benefit_{Status,Sex}^{Treat}$$

Approach – Total benefits for those in labour market

First, we calculate the employment benefits for individuals if they would have sought NHS mental health treatment while accounting for the proportion of the

[51] Webber et al. (2015) p. 33
[52] Webber et al. (2015) p. 33
[53] The Webber et al. (2015) study analysed employment transitions over the period of a year. We assume that jobs are uniformly spread resulting in having an additional job for 0.5 of a year, on average.

sample who would have sought NHS treatment (30%) and the proportion of the sample who was employed (12%) or unemployed (88%):

$$Emp\_Ben_{Sex}^{Yes} = \left(Emp\_Ben_{Emp,Sex}^{Yes} \cdot Prop^{Yes} \cdot Prop_{Emp}\right) + \left(Emp\_Ben_{Un,Sex}^{Yes} \cdot Prop^{Yes} \cdot Prop_{Un}\right)$$

Second, we calculate the employment benefits for individuals if they would not have sought NHS mental health treatment while accounting for the proportion of the sample who would not have sought NHS treatment (70%) and the proportion of the sample who was employed (12%) or unemployed (88%):

$$Emp\_Ben_{Sex}^{No} = \left[Emp\_Ben_{Emp,Sex}^{No} \cdot (1 - Prop^{Yes}) \cdot Prop_{Emp}\right] + \left[Emp\_Ben_{Un,Sex}^{No} \cdot (1 - Prop^{Yes}) \cdot Prop_{Un}\right]$$

Third, we sum the employment benefits for individuals who would and would not have sought NHS treatment:

$$Emp\_Ben_{Sex} = Emp\_Ben_{Sex}^{Yes} + Emp\_Ben_{Sex}^{No}$$

To then get the average employment benefits for the sample, we assume that the sample consists of 50% females so we take the average of the female and male employment benefits to get the average benefits:

$$Emp\_Ben = \frac{(Emp\_Ben_{Male} + Emp\_Ben_{Female})}{2}$$

Figure 17. Summary of variables for benefits of those in the labour market

Variable	Value
$Improved\_Employ_{Emp}^{Yes}$	0.0046
$Improved\_Employ_{Un}^{Yes}$	0.007
$Improved\_Employ_{Emp}^{No}$	0.016
$Improved\_Employ_{Un}^{No}$	0.023
$Improved\_Employ_{Emp}$	0.046
$Improved\_Employ_{Un}$	0.066
$Improved\_Recovery_{EYH}^{Yes}$	0.10 (In Table 6)
$Improved\_Recovery_{EYH}^{No}$	0.34 (In Table 6)
$Short\_Earnings_{Male}$	£17,633
$Short\_Earnings_{Female}$	£15,212
$Length\_Employ^{Yes}$	0.05 years
$Length\_Employ^{No}$	0.5 years
$Short\_Benefit_{Emp,Male}^{Yes}$	£4
$Short\_Benefit_{Emp,Female}^{Yes}$	£3

$Short\_Benefit^{Yes}_{Un,Male}$	£5
$Short\_Benefit^{Yes}_{Un,Female}$	£5
$Short\_Benefit^{No}_{Emp,Male}$	£140
$Short\_Benefit^{No}_{Emp,Female}$	£120
$Short\_Benefit^{No}_{Un,Male}$	£200
$Short\_Benefit^{No}_{Un,Female}$	£173
$Long\_Earnings_{Male}$	£46,061
$Long\_Earnings_{Female}$	£37,829
$Long\_Benefit^{Yes}_{Emp,Male}$	£211
$Long\_Benefit^{Yes}_{Emp,Female}$	£173
$Long\_Benefit^{Yes}_{Un,Male}$	£303
$Long\_Benefit^{Yes}_{Un,Female}$	£249
$Long\_Benefit^{No}_{Emp,Male}$	£729
$Long\_Benefit^{No}_{Emp,Female}$	£599
$Long\_Benefit^{No}_{Un,Male}$	£1,046
$Long\_Benefit^{No}_{Un,Female}$	£859
$Emp\_Ben^{Yes}_{Emp,Male}$	£215
$Emp\_Ben^{Yes}_{Emp,Female}$	£176
$Emp\_Ben^{Yes}_{Un,Male}$	£308
$Emp\_Ben^{Yes}_{Un,Female}$	£254
$Emp\_Ben^{No}_{Emp,Male}$	£869
$Emp\_Ben^{No}_{Emp,Female}$	£719
$Emp\_Ben^{No}_{Un,Male}$	£1,246
$Emp\_Ben^{No}_{Un,Female}$	£1,032
$Prop^{Yes}$	0.30 (In Table 7)
$Prop_{Emp}$	0.12
$Prop_{Un}$	0.88
$Emp\_Ben^{Yes}_{Male}$	£89

$Emp\_Ben_{Female}^{Yes}$	£73
$Emp\_Ben_{Male}^{No}$	£840
$Emp\_Ben_{Female}^{No}$	£696
Emp_Ben_{Male}	£930
Emp_Ben_{Female}	£769
Emp_Ben	£849

Figure 18. Summary of variables used in our analysis

Variable	Value
$Wait_{NHS}$	Average number of days for adults to get mental health treatment after referral in 2015/16 from Clark et al. (2018), p. 681.
$Wait_{EYH}$	Target number of days for adults to get mental health treatment after referral with End Youth Homelessness
$Sessions_{NHS}$	Average number of NHS mental health sessions for adults who are referred in 2015/16 from Clark et al. (2018), p. 681.
$Sessions_{EYH}$	Target number of mental health sessions with End Youth Homelessness
$Recovery_{NHS}$	Average probability of reliable recovery due to NHS mental health services from Clark et al. (2018), p. 681.
$Recovery_{EYH}$	Estimated average probability of reliable recovery due to EYH mental health services
$Recovery_{Natural}$	Average probability of reliable recovery with no mental health services from Clark et al. (2009), p. 919.
$Superscript^{Treat}$	Yes = individual would have sought mental health treatment from the NHS without EYH. No = individual would not have sought mental health treatment.
$Improved\_Recovery_{EYH}^{Treat}$	Difference in probability of reliable recovery due to EYH compared to with the NHS or no treatment.
$Prop^{Treat}$	Proportion of the sample who would and would not have sought NHS mental health treatment without EYH.
$Cost_{NHS}$	Annual average cost per NHS mental health treatment from Radhakrishnan et. al (2013).

$NHS\_Benefit^{Treat}$	Benefits in the form of savings to NHS.
$Cost_{Educ}$	Unit cost of mental health condition for a youth in education from Blank.
$Educ\_Benefit^{Treat}$	Benefits for those in education in the form of reduced public service costs.
$Assumed\_Earnings_{Age,Sex}$	Assumed earnings based on one's age and sex from ONS ASHE Results (2019).
$Penalty_{Age,Sex}$	Earnings penalty due to period of being NEET between the age of 16-24 based on one's age and sex from Gregg and Tominey (2005).
DF^{T}	Discount factor, with T representing the 30 years between age 16 and 46 which is in line with HM Treasury's 2020 Green Book guidance.
$Long\_Earnings_{Sex}$	Average potential future earnings up the age of 46.
$Subscript_{Status}$	Individual's labour market status of unemployed or employed.
$Improved\_Employ_{Status}$	When status equals unemployed is the change in absolute probability of becoming full-time employed due to improving mental health while having no qualifications. When status equals employed it is the change in absolute probability of retaining full-time employment due to improving mental health while having no qualifications. Both estimates are from Webber et al. (2015) p. 33.
$Short\_Earnings_{Sex}$	Average annual earnings for 18-21 year olds at the 25th percentile of earnings from ONS ASHE Results (2019).
$Length\_Employ^{Treat}$	When treat=yes, it is the proportion of the year longer employed due to shorter wait times for treatment at End Youth Homelessness compared to NHS. When treat=no it is the proportion of the year longer assumed to have job (which we assume is 0.5 years based on jobs being uniformly distributed across the year).
$Short\_Benefit^{Treat}_{Status,Sex}$	Increase in short-term annual earnings attributed to EYH.
$Long\_Benefit^{Treat}_{Status,Sex}$	Increase in long-term earnings attributed to EYH.
$Emp\_Ben^{Treat}_{Status,Sex}$	Sum of short and long-term increases in earnings attributed to EYH.
$Prop_{Status}$	Proportion of the sample not in education that is employed or unemployed.

Annex F: Summary of evidence on key assumptions from EYH partner charities

To support the analysis EYH approached a number of partner organisations on a confidential basis for available data that might support some of the key assumptions. This evidence was not independently quality assured but is used to inform judgements through-out the report. Table 12 provides a summary.

Figure 19. Summary of evidence relating to key assumptions from EYH partner organisations

	Organisation A	Organisation B	Organisation C	Organisation D	Organisation E
Proportion that would have sought NHS support?		44% "would have been comfortable approaching NHS"	39% "would be able to seek mental health support if needed"	45% "would feel comfortable seeking support"	"Highly unlikely"
Proportion in Education	80% of under 16s, 20% of those aged over 16, 60% of those accessing counselling services	60%	14%	43%	N/A
What proportion in employment (when referred)		12%	9%	14%	N/A
How quickly to support?	In school then 2/3 days, Internal clients within 1 week, External clients 2 months	3 to 6 months	1-2 weeks (but can vary by location)	N/A	Target of two weeks, has risen to two months during pandemic
How many sessions?	Average attended is 10 sessions	Up to 26 sessions offered (but no average number provided)	Up to 2 years of support	N/A	Up to 24 with an average of 12

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