

Social capital impact valuation

Final report for **Northumbrian Water Limited**
May 2019



Executive summary on a page



Key findings

- Good evidence that this type of support has substantial individual and societal benefits
- Estimated societal benefits in 2018 of around: **£300,000** (£170,000-£330,000)
- Based on providing tailored debt advice to 714 NWL customers, including 357 highly vulnerable customers

Detailed findings on pages 7-19

- No actual evidence that the programme influences participant behaviours, and it may be having very limited effect as currently implemented
- However, *illustrative* calculations based on a somewhat similar programme in Germany suggest that annual benefits could be as great as: **23 additional 'Healthy Life Years'** with a societal value of **£1,400,000** if long term behaviour change could be demonstrated (THESE FIGURES SHOULD NOT BE USED FOR REPORTING ON PBW)

Detailed findings on pages 20-33

- NWL is currently focusing on measurement of local procurement expenditure to meet its Ambitious Goal
- Economic multiplier analysis could give NWL a simple approach to show the benefit of this local spend for its communities

Detailed findings on pages 35-41

Key recommendation(s)

- Continue to support Step Change to reduce the negative impacts of customer debt
- Improve data capture to further strengthen the evidence of impact

Detailed recommendations on page 43

- The potential for significant societal benefits suggests that it is worth the effort to improve measurement of outcomes
- Multiple options are available to further enhance the likely effectiveness of the programme

Detailed recommendations on page 44

- Develop a simple multiplier analysis tool for staff to use
- Pilot the tool on NWL's historic spend data to provide a baseline, test its functionality and get stakeholder buy-in

Detailed recommendations on page 45

**POWERED
BY WATER**

**NORTHUMBRIAN
WATER** *living water*

(Local economic impact
- feasibility assessment)

1

Context

This report supports four of the 14 Ambitious Goals announced by NWL in 2018

NWL asked PwC to help it assess the impact of three initiatives linked to four of the 14 Ambitious Goals listed in its PR19 business plan. Details of these initiatives are provided in the body of the report.

NWL's Ambitious Goals and the focus of this project

Ambitious Goals	Step Change	Powered by Water	Supply Chain
➤ End water poverty in our operating areas by 2030	✓		
➤ Promote confidence in our drinking water so that nine out of ten of our customers choose tap water over bottled water		✓	
➤ Spend at least 60p in every £1 with suppliers in our regions			✓
➤ Be the most socially responsible water company	✓	✓	

NWL engaged PwC to help them achieve the following objectives:

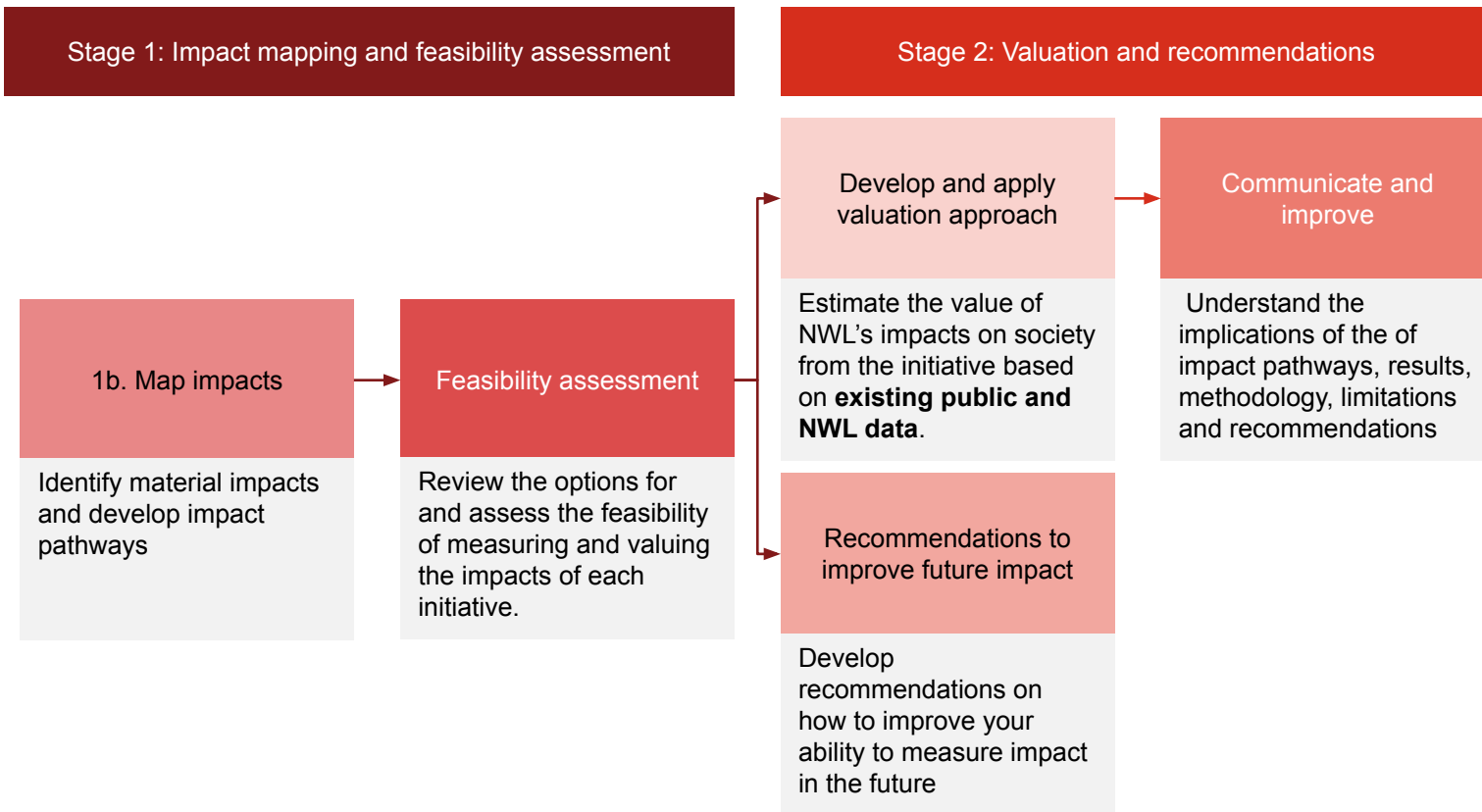
- Quantify the social value of the Step Change partnership.
- Improve social impact measurement for the Step Change and Powered by Water partnerships and understand how to quantify economic impact from local supply chain expenditure.
- Report on social impact through the 2019 Our Contribution report.

This report supports actions towards achieving the four goals.

Social impact assessment framework

The diagram below outlines the framework we used to conduct the work. The project started with impact mapping and feasibility assessment. The impact mapping is included within this report along with a summary of the key outcomes of the feasibility assessment. This report focuses on the value created for society and how it can be measured for Step Change, Powered by Water, and NWL's supply chain expenditure, as described on the following page.




Project overview



Qualitative findings and resulting focus of this report

Qualitative findings from feasibility assessment

Outcomes and focus for this report

		
<ul style="list-style-type: none"> ➤ There is evidence that debt advice has quantifiable benefits for society ➤ Benefits of the partnership between NWL and Step Change can be quantified using data provided by the two organisations ➤ Improvements in data collection could lead to improved quantification methods 	<ul style="list-style-type: none"> ➤ There is sufficient evidence to demonstrate the benefits of increased consumption of water and reduced consumption of sugar-sweetened beverages (SSBs) ➤ The key data gap is the quantification of behaviour change ➤ Improvements in data collection would make full quantification of impacts possible 	<ul style="list-style-type: none"> ➤ NWL has already engaged in a process to assess its supply chain impacts ➤ NWL wants to engage customers in understanding how the supply chain spend can benefit them
<p>We developed and applied a valuation approach to estimate the value of NWL’s impacts on society from the initiative based on existing public and NWL data</p>	<p>We developed recommendations on how to improve NWL’s ability to measure impact in the future</p>	<p>We developed recommendations on how to improve NWL’s ability to measure impact in the future</p>

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Social value of
NWL's
partnership with
Step Change

Key findings

NWL's partnership with Step Change created £300,000 value for society in 2018 (range: £170,000 - £330,000) through improved physical and mental wellbeing, increased employment and productivity, repayments to creditors, and improved personal financial management

	Total potential beneficiaries		Outcomes adjustment factor		Benefit per person		Total benefit in 2018
Central estimate	357	×	64%	×	£1,330	=	£300,000
Lower-bound estimate	357	×	100%	×	£470	=	£170,000
Upper-bound estimate	714	×	100%	×	£470	=	£330,000

Total benefit rounded to nearest £'000. Other figures rounded to nearest whole number.

In the central and lower bound estimates, beneficial effects are only included for the most vulnerable customers, because the evidence of benefits is strongest for this sub-group. As a result, the average benefit to society per customer receiving advice, including all customers who received relevant telephone debt advice during 2018 (714) is £390.

NWL has a long-standing partnership with the debt charity Step Change, providing a financial contribution and referring customers at risk of problem debt

NWL's partnership with Step Change

NWL has a longstanding partnership with Step Change, a charity that provides debt advice to help people better manage their money and improve their lives. The objective is to improve the financial and general wellbeing of NWL customers through debt reduction and financial planning support while reducing non-payment rates for water bills. There are three main components to the partnership:

- NWL refers customers to Step Change's debt advice services, so that those customers at risk of problem debt or under financial hardship can have free, independent advice to help them manage their repayments. This advice takes the form of an initial consultation - online or by phone - with follow-up sessions as required. According to Step Change (42) NWL provides the highest number of referrals per year to Step Change of any water company.
- NWL makes a financial contribution to Step Change, in the form of a "fair share" payment based on a proportion of the debt recovered by NWL, plus a donation. In total, NWL provides a financial contribution of £20,000 to Step Change per year (44).
- Step Change has also advised NWL in the design of its "affordability tariff" targeted at customers in water poverty, introduced in April 2018. Under this tariff, where customers can demonstrate that their monthly expenditure is higher than their monthly income they become eligible for a reduction in their water tariff of up to 50%.

Other NWL support to vulnerable customers

Separate to the partnership with Step Change, NWL has an "income tariff" targeted at those earning £16,105 or less per year, and offers an arrears write-off scheme for some customers who have accumulated significant historic water debts.

Scope of this section

We have estimated the value to society created by NWL's Step Change partnership. We have only analysed the benefits to customers being referred to Step Change by NWL. We have not considered the financial payback to NWL and nor have we sought to establish the impact of NWL's affordability tariff or other measures aimed at supporting low income or indebted customers.

The following pages outline our approach to estimating social value, our key findings, and recommended next steps.

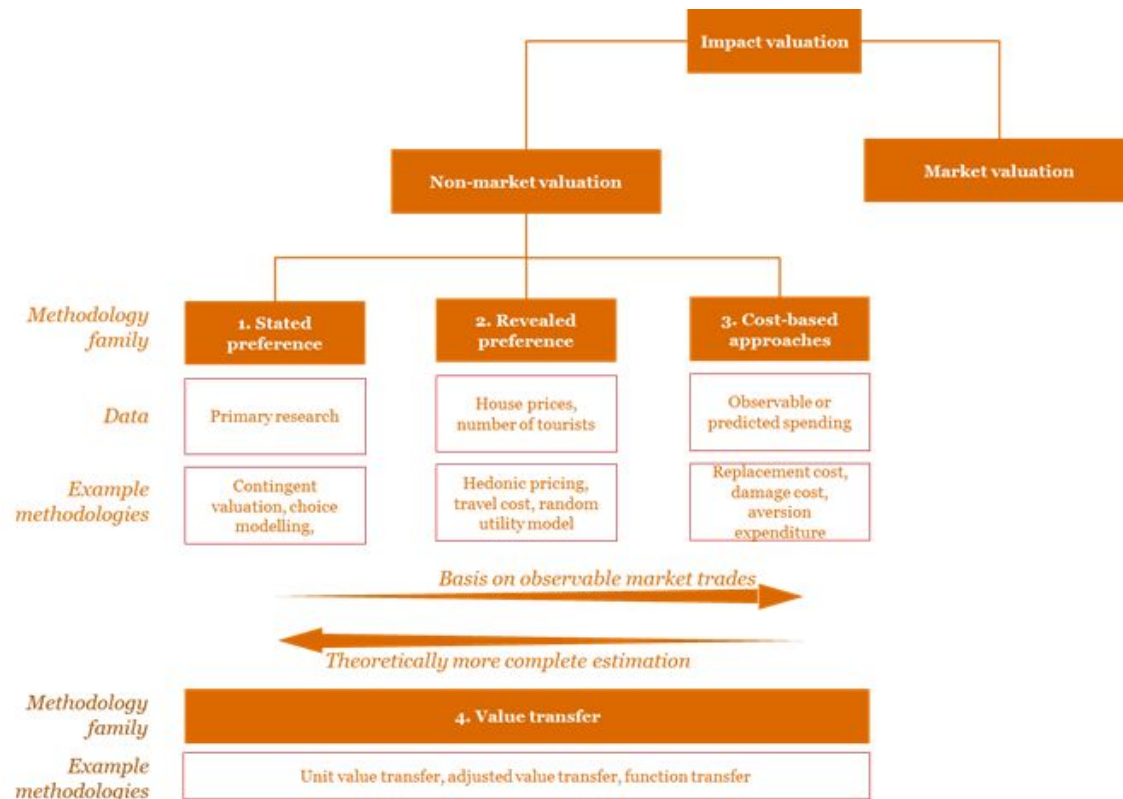
We have conducted impact analysis by combining primary data from Step Change with secondary evidence from the economic literature

Social valuation techniques

The social value created by debt advice has a number of dimensions. These include financial benefits to individuals and reduced financial costs to society associated with indebtedness. For example, the provision of debt advice is associated with improved mental and physical health outcomes, which in the UK reduces financial costs incurred by the NHS. These can be measured with market valuation techniques, i.e. observed prices.

Other benefits from debt advice, such as the benefit to the individual from improved health outcomes, are not captured in market prices. For these impacts, non-market valuation techniques are required. These are shown in the diagram to the right and described in PwC's 2017 'Our Contribution' scoping study for NWL (37).

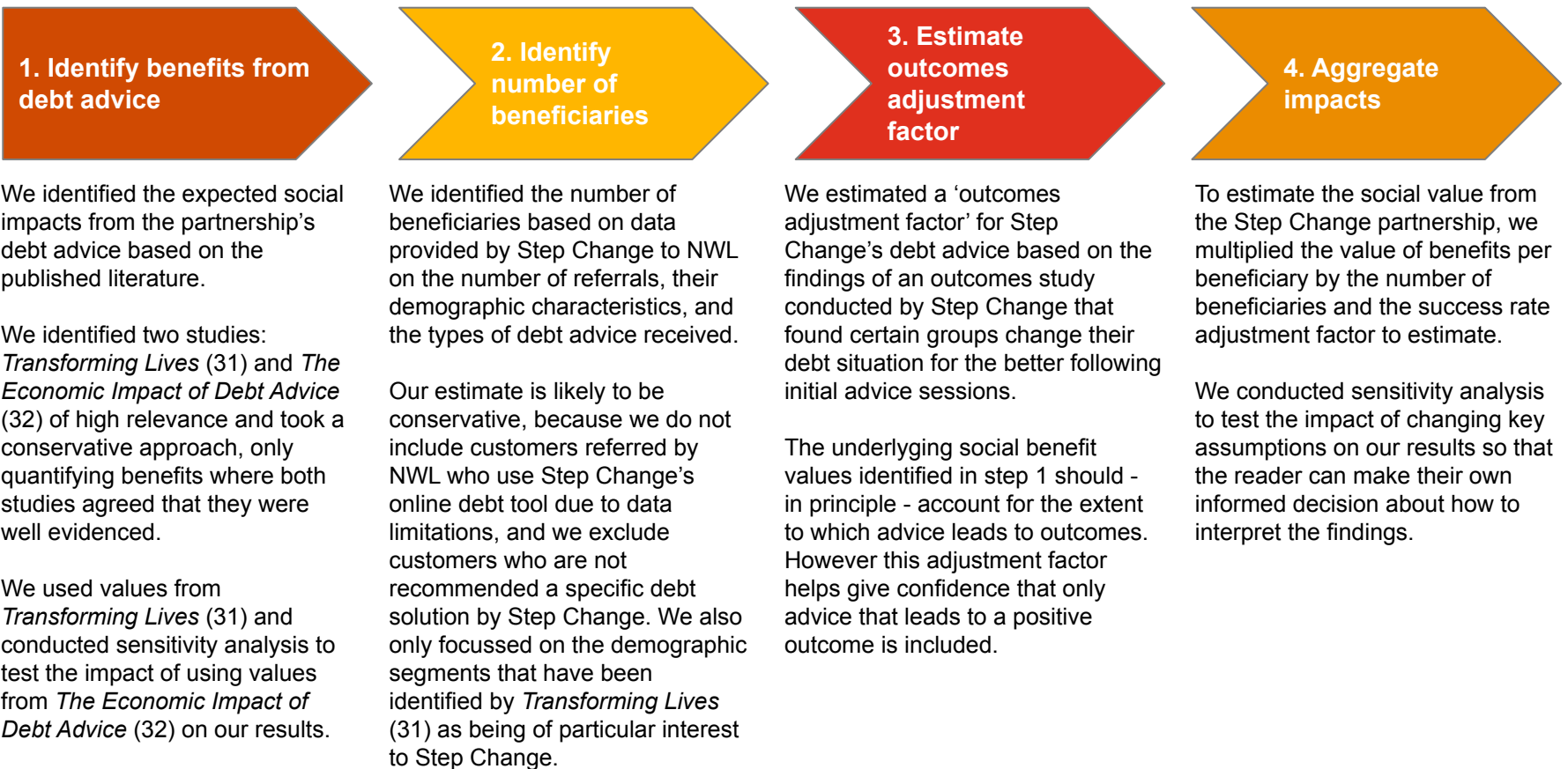
Primary non-market valuation studies can be costly and time consuming. Value transfer is a family of techniques used to apply findings from existing valuation studies to new contexts, applying appropriate adjustments. In this study, we use 'adjusted value transfer' to estimate the value to society from NWL's Step Change partnership.



Our adjusted value transfer approach has four key steps

Key steps

The following pages outline the key findings of our work, following the steps outlined below.



The published literature identified a number of beneficial impacts likely to arise from NWL's Step Change partnership

Approach to benefit identification

We conducted a rapid review of the publically available literature on the benefits of debt advice. We identified two studies of high relevance to NWL's Step Change partnership - *Transforming Lives* and *The Economic Impact of Debt Advice* - both providing a quantitative assessment of the different social benefits from debt advice (31, 32). We reviewed these studies to identify the types of social impact expected.

Social impacts identified

Transforming Lives (31) identifies 12 distinct social impacts and quantifies their expected size. "The Economic Impact of Debt Advice" (32) critically evaluates the evidence for these 12 impacts and focuses on the 5 impacts where it considers there to be sufficient evidence for quantification, and provides separate estimates of the size of these impacts. In order to avoid over-claiming benefits, we have focused only on those impacts included in both studies

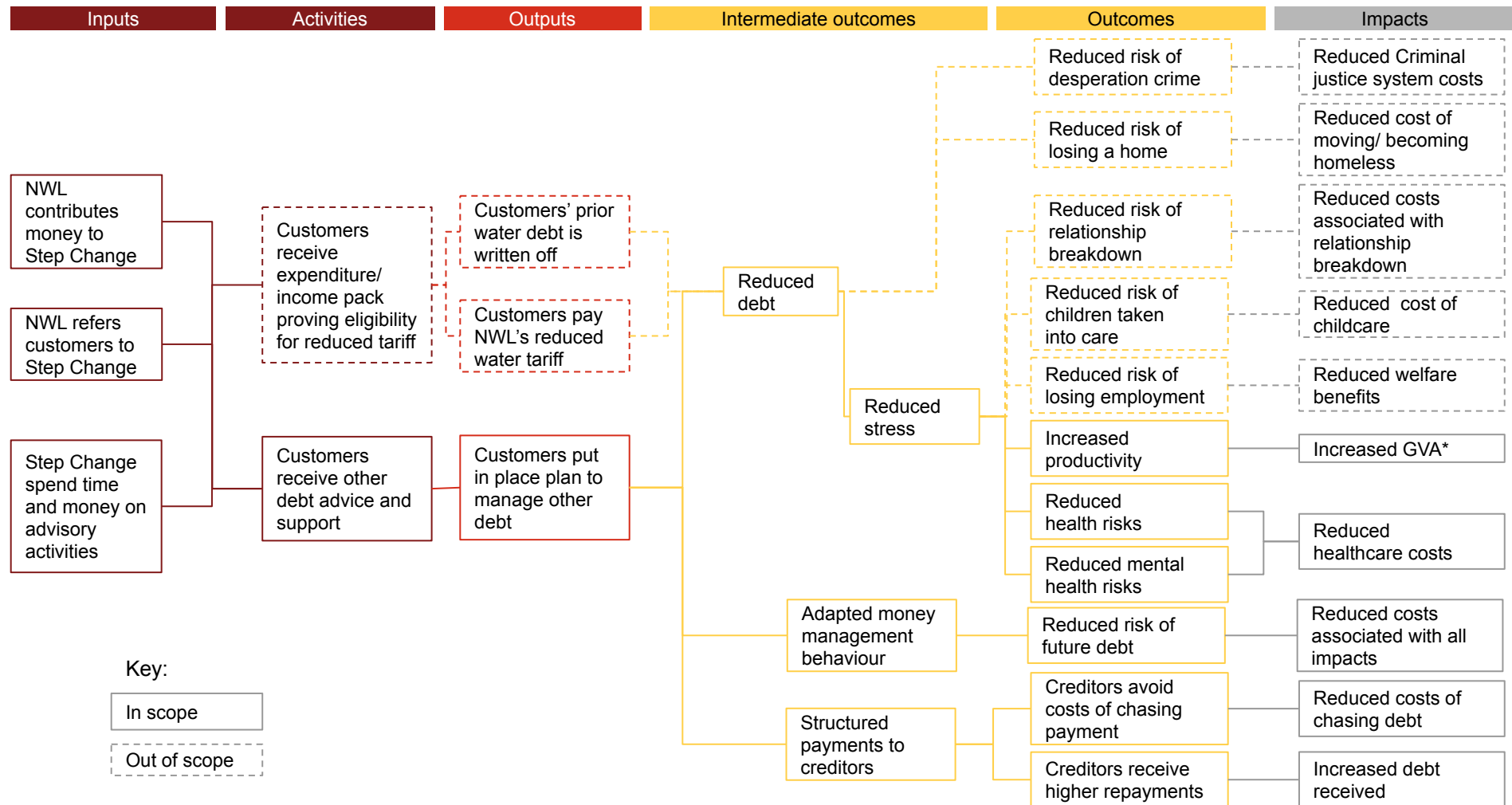
One benefit covered by both studies - creditor recovery includes the financial benefit for NWL. It is difficult to robustly separate the benefit to NWL and to other creditors in these estimates, so this needs to be taken into account when assessing the creditor benefits.

The table to the right summarises the benefits included in our analysis. Further information about each type of impact is included in the Appendix.

Social impact*	Included in quantified outputs? **
Employment and productivity	Yes
Physical and mental wellbeing	Yes
Creditor recovery	Yes
Desperation crime	No
Debt recycling gain	Yes
Children taken into care	No
Loss of housing	No
Relationship breakdown	No
Employment by small businesses	No
Early entry into care home	No
Disengagement of children	No

*Identified in (31) **Impacts not validated by (32) are excluded from the scope of our analysis.

The partnership is expected to have a beneficial impact on customers' finances, productivity and physical and mental health



We identified relevant estimates of the social value per person receiving debt advice from the literature

Selection of benefit estimates

The two high relevance studies provide different estimates of the value to society per person receiving debt advice. The first study on average provides higher values than the second. However it also provides benefits that have been estimated specifically for Step Change. On this basis, we have chosen to use these figures.

To ensure that we are not over-claiming benefits by taking this approach, we estimate and apply a success adjustment factor. We derived this factor from the results of a survey conducted by Step Change of its beneficiaries (33). This is described on the following pages.

We do not believe that such an adjustment would be needed if the values from the second study were used. We test the effect on the estimated social benefits of using the values from *The Economic Impact of Debt Advice*, instead of the values from *Transforming Lives* combined with a success adjustment factor. This is described on following slides.

Social impact*	Social value per person receiving debt advice in a year*	
	Transforming Lives****	The Economic Impact of Debt Advice***
Employment and productivity	£365	£68
Physical and mental wellbeing	£80	£73
Debt recycling gain	£46	£39
Creditor gain	£780	£288
Total**	£1,271	£468

The numbers in the table above have been converted to 2018 prices using the UK GDP deflator. As a result they may not match the numbers reported in the original studies.

*The social value of advice is calculated in *Transforming Lives* by taking the total benefit in Appendix C per benefit and demographic segment, dividing this by the number of people in that segment to gain a value per segment, and then taking the average across all segments. These values are indicative only as they are not weighted across the demographics.

The social value of advice is calculate in *The Economic Impact of Debt Advice* by taking the total benefit divided by the total number of people receiving debt advice (1.5 million). The headline benefits can be found on page 5.

**For Transforming Lives, this is the weighted average across the demographic groups described on following pages, taking into account differences in the benefits experienced by people with different socioeconomic situations..

*** These values are NPV, with most impacts being a year in length. Where appropriate, a discount rate of 3.5% or 3% has been applied.

**** These values are NPV with a discount rate of 3.5% applied.

We used data from Step Change to identify the number of potential beneficiaries of debt advice

Identification of potential beneficiaries

To conduct our analysis we defined potential beneficiaries as individuals who receive meaningful debt advice from Step Change in an initial advice session. We identified the number of beneficiaries in 2018 based on data provided by Step Change to NWL on the number of referrals, the demographic characteristics of Step Change customers living in NWL's regions, and the types of debt advice recommendation received.

In order to provide a conservative estimate that aims to avoid over-claiming the scale of benefits, we only included customers who:

- **Completed a telephone consultation with Step Change.** We have not included any customers who used Step Change's online Debt Remedy Tool, as Step Change was not able to identify which of these customers were referred by NWL.
- **Were recommended a specific debt solution by Step Change.** Step Change provided us with data on the types of debt management solution recommended* to customers referred by NWL. Over 30% of people were given a recommendation labelled 'Other'. Some people within this category are likely to have been recommended NWL's affordability or income tariffs and arrears write-off scheme (41, 42), but in the absence of specific data we have not included this in our analysis.
- **Are in a vulnerable demographic group.** The primary study used as the basis for our benefit transfer exercise provides estimates of the social value of debt advice for demographic groups who are thought to benefit most from debt advice (31). We estimated the number of customers referred by NWL to Step Change within each of these demographic groups, using provided by Step Change on their customers within NWL's regions. This covers approximately half of the total number of people referred.

We accounted for potential variation in the successfulness of Step Change's debt advice per beneficiary by deriving a 'success adjustment factor' from Step Change outcomes survey data (33) (see next page).

The following page outlines the number of beneficiaries identified, including an adjustment for the success rate of advice as measured by Step Change (33).

*Recommendations are given at the end of a telephone advice session. Where more than one recommendation is given, the primary recommendation is recorded. This means that some people included in the "other" category may have also been recommended other actions too, such as to go on a Debt Management Plan. Excluding this category therefore gives a conservative estimate of people who may have been given additional advice.

We adjusted the number of beneficiaries to account for the successful outcomes rate of Step Change debt advice

Success of debt advice

The *Transforming Lives* report (31) does not systematically address the successful outcomes rate of debt advice in its benefit calculations. In contrast, (32) seeks to address this by understand the impact of advice compared to no debt advice.

We do not have access to data that determines the outcomes rate of debt advice given to NWL customers. As such, we have relied on an outcomes report produced by Step Change and based on a survey of its customers to define a success adjustment factor (33). We calculated this as the share of people who reported experiencing positive changes in their life following debt advice provided by Step Change.

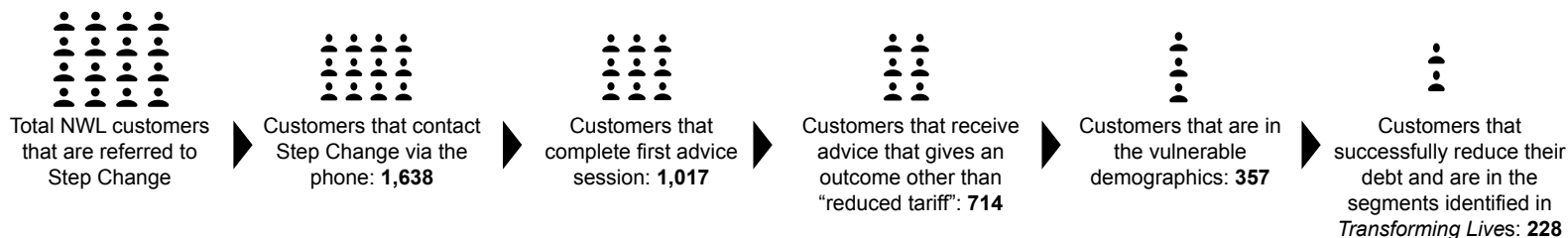
The outcomes report finds that 60% of people reported a better overall financial situation after seeking advice (33). It also finds that customers that have a positive budget before advice sessions begin tend to change their debt situation for the better following an initial advice session.

We have used demographic data provided by Step Change to identify the percentage of customers in NWL locations that have a positive budget before advice commences and used this as the success adjustment factor. Step Change provides data on positive budgets in the two NWL postcode areas: North and South. As such, we have established adjustment factors for these two areas.

This factor is applied to the total number of people receiving meaningful advice in the relevant vulnerable demographics (see previous page). As a result, the total number of NWL customers to whom we attribute benefits is 228.

Beneficiaries from NWL's Step Change partnership with successful outcomes

The figure below outlines how we estimated the number of people receiving successful debt advice (see previous page and text above for a description).



We calculated central, upper- and lower-bound estimates of the social value created by NWL's Step Change partnership

We calculated the social value of NWL's Step Change partnership based on the approach described above, using data from Step Change to estimate the number of beneficiaries and the rate of successful outcomes per beneficiary, combined with unit values estimated by *Transforming Lives* and validated by *The Economic Impact of Debt Advice*. This provides our central estimate of social value creation.

To give a the reader an indication of possible upper and lower bounds for the impact, we applied unit values from the *Economic Impact of Debt Advice*. This study accounts implicitly for the rate of successful outcomes per beneficiary in its calculation methodology, which is one factor likely to drive the lower estimated benefit per person. We therefore apply an outcomes adjustment factor of 100% for both upper and lower estimates. For the lower estimate, we apply the benefit per person to the same number of potential beneficiaries as for our central estimate, i.e. only customers in the most vulnerable groups. However this is a conservative approach as the study considers benefits per person receiving debt advice for customers of a range of ages and family composition. For our upper estimate we therefore apply this estimated benefit per person to the (higher) number of beneficiaries from all socioeconomic groups.

	Total potential beneficiaries		Outcomes adjustment factor		Benefit per person		Total benefit in 2018
Central estimate	357	×	64%	×	£1,330	=	£300,000
Lower-bound estimate	357	×	100%	×	£470	=	£170,000
Upper-bound estimate	714	×	100%	×	£470	=	£330,000

Key assumptions for Step Change calculations

Key assumptions

- **Counterfactual:** This report uses a counterfactual that customers would not otherwise seek advice from elsewhere.
 - *Transforming Lives* (31) is not consistent in its approach to a counterfactual, however it generally takes into account the fact that people may solve debt by other means by including deadweight percentages into its calculation to reduce the benefits.
 - *The Economic Impact of Debt Advice* (32) compares those in debt receiving advice and those in debt not receiving advice.
- **Year of advice:** This report seeks to understand the impacts of people referred by NWL to Step Change in the year 2018. The potential beneficiaries we have identified are those who complete at least one debt advice session in 2018 as we do not have access to specific data on the number of advice sessions completed by customers referred in 2018.
- **Nature of advice:** This report assumes that customers receive advice if they complete an initial phone advice session in 2018 that results in a recommendation that is not “other”. Over 30% of people were given a recommendation labelled ‘Other’. Some people within this category are likely to have been recommended NWL’s affordability or income tariffs and arrears write-off scheme (42) but in the absence of specific data we have not included this in our analysis. Customers who contact Step Change through the online Debt Remedy Tool are also omitted from our analysis.
- **Successful outcomes adjustment:** We assume that customers with a positive budget experience positive outcomes as a result of debt advice.
- **Demographic breakdown:** We do not have specific information on the demographic breakdown of customers that have been referred to Step Change by NWL. We have therefore applied average values based on demographics of customers that live in NWL postcodes. This data include age, family composition and average income and expenditure. Where we have needed to create a demographic group based on two variables (e.g. age and family composition) we have calculated the product of the two variables.
- **Benefit per person:** This report relies upon the accuracy of the benefits calculated in the two reports:
 - *Transforming Lives* (31) shows benefits per vulnerable demographic segment in appendix C. We assume that these have been correctly reported and attributed to relevant segments.
 - *The Economic Impact of Debt Advice* (32) shows total benefits attributed to debt advice. We have assumed that a benefit per person receiving advice can be determined using the total number of people advised as 1.5million.

Recommendations to improve measurement of social value of Step Change partnership

Recommended improvements in measuring the social value of the Step Change partnership

- **Combine data sources to understand outcomes across demographic segments.** Our findings in this report show that social value varies across demographic segments. A more accurate breakdown of demographic information on people receiving debt advice would enable a more nuanced analysis to be carried out. Step Change sends a monthly referral report to NWL which could be adapted to include detail on the demographic breakdown of those referred by NWL to Step Change. The Performance and Information Team at NWL may also have datasets that help identify the characteristics of vulnerable customers and their ability to pay bills. This information could be shared with Step Change to help them better measure outcomes.
- **Understand specific outcomes through engaging with customer base.** This report relies on average values and external studies to understand the success of debt advice for customers. NWL could seek to understand the outcomes for individuals that they have referred to Step Change through issuing questionnaires. A similar exercise has been performed by Step Change in the outcomes report. However it may be possible to enhance this further through questions that are more specific about the types and levels of outcomes achieved, for example understanding impacts on absenteeism at work and mental health appointments.
- **Build data capture into the Step Change online system.** Through engaging with stakeholders in NWL and Step Change, we learned that the Step Change is in the process of developing an “omni channel approach” that will involve tracking digital referrals. NWL could partner with Step Change to ensure that this tracking captures adequate information to measure outcomes.
- **Define debt advice.** The literature on debt advice has not sought to understand the outcomes and impacts associated with different levels of advice. Further study into this area could help to provide a better picture of the outcomes associated with different types of support and provide benefits and costs for each type of advice.

Recommended actions to improve overall social measurement of NWL’s support to those in debt

- **Measure the social value of debt tariffs and schemes.** This report examines the social impact of NWL’s partnership with Step Change. As such, the social benefits of NWL’s internal offering and pricing strategy have not been measured. NWL could consider measuring the impact of its income and affordability tariffs and arrears write-off scheme. Findings of such a report may help to understand progress toward NWL’s water poverty eradication target, as well as adding to existing literature on the social benefit of financial aid provided by water companies (34). This could be developed into a streamlined tool to facilitate monitoring and reporting on progress against the Ambitious Goal.

3

Social value of
NWL's Powered
by Water
partnerships

Key findings

NWL's Powered by Water partnerships are expected to improve children's health outcomes, but this depends on whether they lead to lasting behaviour change

NWL has partnered with sports clubs to deliver the Powered by Water programme which educates school children on the importance of drinking water. The partnerships are expected to have a beneficial impact on children's health, but this depends on the extent and persistence of behaviour change.

Based on a rapid literature review we found that:

- Increased water consumption may provide health benefits if it leads to reduced total calorie intake and/or sugar intake, particularly for people who are at risk of being overweight or obese - potentially through reduced risk of type II diabetes, CVD and dental health
- Targeted public health interventions focused on education and habit formation can have a positive effect on water consumption
- Schools can have a key role in encouraging healthy eating and drinking and celebrity endorsements can be persuasive in encouraging children to change their behaviour but without an appropriate home environment behaviour change is unlikely to be lasting

Indicative estimates of the scale of benefits suggest that achieving lasting behaviour change for even a small number of PbW participants has the potential for substantial health benefits, but this will be hard to evidence

We estimated the potential scale of health benefits from a programme similar to PbW that has better evidence of effects on consumption habits amongst participants. We applied this to the number of PbW participants, to provide an approximate indication of how significant the effects of PbW could be, if the programme can be shown to have sustained effects on consumption habits amongst participants:

- Avoiding a single case of type II diabetes in the UK produces on average a gain of 1.42 healthy life years
- If PbW causes 1% of its participants to stop drinking sugar-sweetened beverages for life, 16 cases of type II diabetes could be avoided, saving 23 healthy life years
- Based on what a similar programme in Germany achieved, if PbW leads to sustained behavior change it could avoid up to 21 cases of type II diabetes over participating childrens' lifetimes per year. The estimated potential impact of PbW relies on a number of assumptions, with a particular reliance on sustained behavioural change

It would not be appropriate to rely on or report these illustrative estimates without evidence to demonstrate that the PbW programme does indeed change the consumption habits of participants.

Improved measurement of programme outputs and outcomes could provide greater certainty over impacts as well as useful information to improve programme performance

NWL has partnered with sports clubs to deliver the Powered by Water programme which educates school children on the importance of drinking water

The Powered by Water programme

The Powered by Water (PbW) programme is a series of partnerships with sports clubs that provides educational sessions that aim to encourage children to be hydrated, healthy and active. Partners include Essex Cricket Club, Newcastle Eagles and Sunderland FC - the PbW partners. The partners were selected by NWL in part due to their existing outreach activities with school children that promote healthy lifestyles.

The programme delivers workshops within schools and sports centres to educate children on the importance of drinking water and living a healthy lifestyle. These sessions are delivered as part of wider educational campaigns by schools and sports clubs. Targeting children aged between 8-12 years, these sessions are interactive and activity-focused. Through water education, PbW aims to inspire children to create and maintain healthy lifestyle changes. The programme aims to create an environment where children can establish lifelong habits, beneficial for both the individual and to wider society.

The role of NWL in the partnerships

NWL's role in the partnerships is to design the PbW sessions and provide the required materials including workbooks, t-shirts and water bottles. The sessions themselves are delivered by the partners, often including sports professionals from the partner organisations with the aim of inspiring children to make healthy choices.

Scope of this section

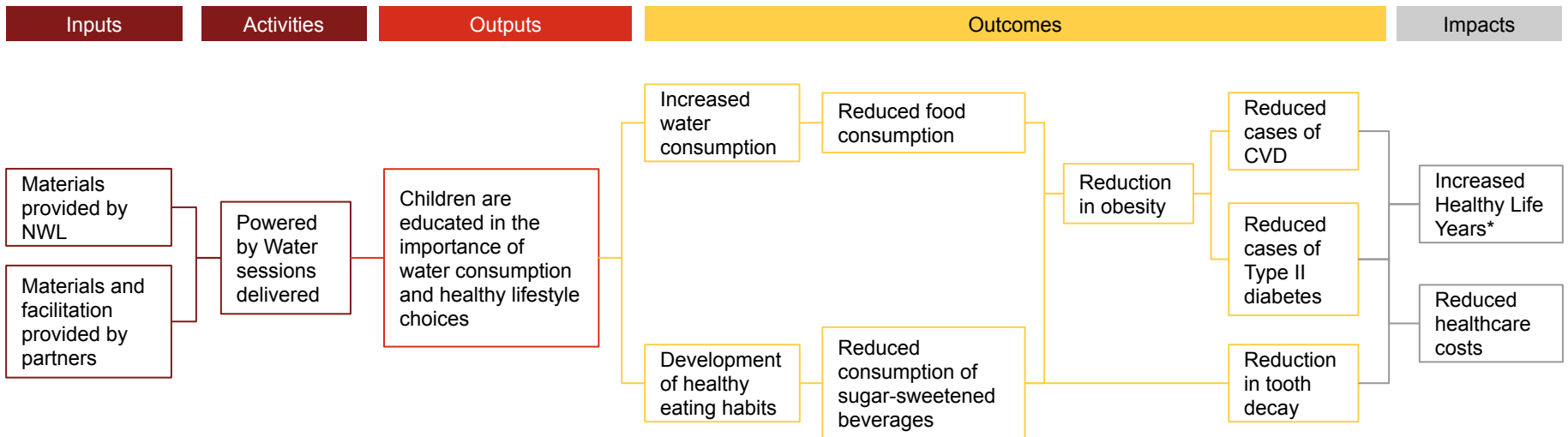
In the absence of programme data on the outcomes achieved by PbW, we conducted a literature review to identify the expected benefits from the PbW programme and draw conclusions to help NWL improve the PbW programme and how it tracks its impact.

The partnerships are expected to have a beneficial impact on children's health, but this depends on the extent and persistence of behaviour change

We identified two key potential outcomes from PbW, both of which can be linked to health benefits: increases in water consumption leading to reduced calorie intake, and reduced sugar intake. These are shown in the figure below.

The extent of these outcomes and associated health benefits depends on children changing their behaviour in response to PbW sessions. The literature reviewed (see following pages) suggests that behaviour change tends to be lasting where new habits are formed or existing habits are changed, which often requires repeated effort. In the absence of data on the behaviour change outcomes of PbW it is not possible to conclude whether a significant effect is likely, but this finding suggests that the effect may at present be limited.

The following pages review the evidence and recommend that outcomes are tracked from the programme and used to ensure the programme is effective in achieving its goals.



*Healthy Life Years are a quantified measure of health impact. One Healthy Life Year is equivalent to one year lived in perfect health. Or, for example, two years lived with a severe illness that reduces overall quality of life by half (disability weight 0.5).

Do educational sessions lead to a change in behaviour in children?

Schools can have a key role in encouraging healthy eating and drinking...

Schools play an important role in the promotion of healthy behaviours amongst children. Evidence suggests that schools can increase knowledge in healthy nutrition (25, 27). A combined meta-analysis and systematic review found that while diet and physical activity related school policies are insufficient when implemented in isolation, they are effective in reducing obesity when developed and implemented in combination (24). The importance of forming healthy habits early in life is noted in literature (26). The implementation of health curriculums which have a hands on approach in changing health behaviours, such as the provision of healthy food, have the potential for long lasting improvements in children's eating habits (27). For example, a 12 week program in a US school that utilised physical activity alongside nutritional education found significant improvements in nutrition awareness and dietary habits (3).

...and celebrity endorsements can be persuasive in encouraging children to change their behaviour...

Studies have shown that celebrity endorsement can also influence children's attitudes towards healthy eating (2), and children are more likely to buy a product if promoted by a celebrity (20). Systematic reviews and other studies have found that the use of role models to promote ideas and practices can add credibility and desire (24, 40, 5).

...but without an appropriate home environment behaviour change is unlikely to be lasting

Although schools and schemes can effectively promote a healthy lifestyle, increased knowledge may not always translate into beneficial health behaviours (25, 27). Findings from the literature review suggest that the healthy habits of children are predominantly determined in the home (21,27). Lifestyle management schemes for children are often short term and while programmes of 18-24 months in length have been shown to improve BMI in some studies, other evidence suggests that in some cases the effects do not last longer than 6 months post program completion (4). Therefore continued support is required to embed behaviours and ensure long-term impact (5).

What this means for Powered by Water

Our literature review examined studies covering a range of countries, educational interventions and ages of children. This should be taken into account when understanding the findings on outcomes associated with Powered by Water's own educational sessions with English school children.

High-profile endorsements have been shown to have a material influence on the uptake of healthy drinking and eating habits in school children. The use of partnerships with local sports professionals may enable PbW to capitalise on this effect.

Overall the review suggests that the PbW programme is likely to produce a positive impact on children's' healthy drinking habits in the very short-term, but the interventions might not produce long-term effects when implemented in isolation. Further interventions should be developed and implemented simultaneously, both in schools and the home environment.

Does increased consumption of water lead to health benefits?

Weight issues and the associated health risks are of growing concern...

Type II diabetes has emerged as a critical health issue among children, particularly in those who are overweight. Furthermore the risk of both type II diabetes and cardiovascular disease within children is increasing, driven by increasing weight issues (9,49). A systematic review into the relationship between weight and health conditions found statistically significant relationships between being being overweight and the incidence of type II diabetes, as well as the incidence of the majority of cardiovascular diseases (38). Obesity, particularly at younger ages, increases the lifetime risk of developing diabetes and those with a BMI over 30 are at a significantly higher risk of developing diabetes (14).

...however, increased water intake could help fight these health issues...

A number of studies have shown that increased water consumption results in a reduction of an individual's daily energy intake which could be a contributory factor in reducing the risk of obesity (6, 8). A higher daily water intake (5 or more glasses) is also associated with a reduced risk of CVD compared with a lower water intake (2 or fewer glasses) (7). A study that took place over 12 months found that those who drank over a litre of water per day had an increased weight loss of 0.4kg (10).

... and health schemes can be used to promote water intake...

Evidence suggests that public health interventions that aim to increase water intake in children are successful at significantly increasing water consumption (21). A study in German schools found that the provision of water fountains, water bottles, and educational classroom lessons proved successful in increasing water intake (1) and this example could be replicated in other schools. This study also found that risk of obesity decreased in schools where water interventions took place.

What this means for Powered by Water

Evidence suggests that water intake is linked to the risk of weight issues which in turn can lead to non-communicable diseases including type II diabetes and cardiovascular diseases. Prevalence of these two chronic diseases is increasing amongst children. Further evidence is needed to understand if this trend is true in children who take part in Powered by Water sessions.

It is not currently understood how weight and obesity are affected by the PbW programme. If this information is captured through weight metrics then it may be possible to quantify the impacts from the change in weight.

Studies have found that schools can increase water intake in their students through the implementation of complementary interventions. These interventions should encourage greater consumption and provide the facilities for children to do so. The effectiveness of PbW could be increased through collaboration with schools and existing outreach work.

Does reduced consumption of sugar-sweetened beverages lead to health benefits?

Sugar consumption can have a direct influence on weight...

Multiple studies have shown that sugar-sweetened beverages (SSBs) are a determinant of body weight (23). Evidence suggests that there is a positive correlation between SSB consumption and childhood obesity, and that for each SSB consumed there is an increased risk of becoming obese (11). A study showed that an increased intake of SSBs by 0.2 glasses a day translated to a 7.5% increase in obesity prevalence over a 12 month period (13).

... and obesity can put you at risk of other health issues...

Type II diabetes is a major health issue within overweight children and both type II diabetes and CVD are increasing within the pediatric population (9). Meta-analyses into SSB consumption have revealed that a reduced SSB intake has the potential to reduce risks of both obesity and type II diabetes (21,22).

Sugar consumption can also impact your dental health...

The consumption of SSBs has been linked with dental erosion, and although some believe the association to not be high (12), it has also been argued that there is a strong relationship between the risk of erosion and SSB consumption (19). Children who drink carbonated drinks are at a higher risk of dental erosion than those who drink alternative beverages such as water, milk and tea (12). A systematic review and meta-analysis that was conducted revealed that with a consistent reduction in SSB intake the risk of dental caries was also reduced (21).

Education schemes help improve drinking habits...

Educational interventions have been shown to be moderately successful in reducing SSB consumption and increasing water consumption, with one study aimed at 7-11 year olds being effective in decreasing SSB consumption (13,21).

What this means for Powered by Water

There is extensive literature evidencing that excessive consumption of SSBs can lead to weight and obesity problems in children, and that school and outreach programmes can help to educate children in the associated health risks. Some studies quantify the link between the amount consumed and related prevalence of obesity. We currently do not have information on the SSB consumption of children attending PbW sessions. If this information was captured, along with metrics on obesity, it may be possible to quantify the impact of a change in SSB consumption.

SSBs have been associated with dental issues including erosion and cavities. If it is believed that children decrease their SSB intake as a result of PbW, this may have implications for dental visits. Information on dental health of PbW participants is not currently available, but reports of dental hygiene could help to understand if this is a material impact.

Measuring the impact of health benefits

Healthcare costs

Health issues can be related to large healthcare costs. In 2018 there was a total annual healthcare cost of £9 billion associated with cardiovascular disease (39). Tooth decay also has associated complications which can require fillings, root canals or tooth extractions which for those under the age of 18 costs £75 (18).

Type II diabetes accounts for 7-12% of the NHS budget, with direct costs of £8.8bn in 2010/11. Approximately eighty percent of the costs are due to complications derived from the disease including amputation, blindness and stroke (28). Diabetic patients are more than twice as costly to manage than non-diabetic patients, due to these complications (28,16).

Economic costs

These healthcare issues also affect economic output and productivity. It has been estimated that type II diabetes cost the UK economy £9 billion in 2010/11 due to lowered productivity when working and from those unable to work due to poor health and death (28). The total cost to the UK economy associated with cardiovascular disease is £19 billion per year, derived from premature death, disability and other indirect costs (30,39). Approximately 70 billion working days are lost each year to reduced productivity related to CVD (30).

Quality of life

Type II diabetes requires a level of daily management which has been associated with having a psychological impact on an individual and a reduced quality of life (15). As diabetes is very specific to each individual it is difficult to quantify exactly how the disease will affect quality of life for a specific person (17). However, using data from the Institute of Health Metrics and Evaluation, analysis suggests that one avoided case of CVD leads to a gain of 0.58 healthy life years (HLYs), and one avoided case of type II diabetes results in a gain of 1.42 HLYs. Further information is provided on the following pages.

What this means for Powered by Water

There is currently no data on the incidence obesity or illness amongst children attending Powered by Water sessions, or the scale of behaviour change and associated impact on obesity and illness. The cost rates described above, however, show that there is significant social value from any reduction in the prevalence of chronic illnesses such as Type II diabetes or CVD. If Powered by Water can collect evidence on the change in prevalence of these health conditions, these cost rates could be used to quantify the value.

Avoiding a single case of type II diabetes could produce a gain of 1.42 healthy life years

Healthy life years gained from preventing diabetes

Type II diabetes requires daily management which has been associated with a negative psychological impact on the individual and a reduced quality of life (15,17). Furthermore, diabetes can reduce life expectancy (49). By preventing new cases of diabetes, these morbidity (non-fatal health impact) and mortality (fatal health impact) effects can be avoided.

The health benefits of mortality and morbidity can be combined in a single metric - Quality Adjusted Life Years (QALYs) - which shows the number of healthy life years saved. It is used the by the UK's National Institute for Clinical Excellence (NICE) and other international agencies and healthcare systems to inform the allocation of resources (51). We refer to these as health life years (HLYs) in this document.

The HLY indicates both the quality and quantity of life lived. One HLY is equivalent to one year of perfect health. Or, for example, two years lived with a severe illness which reduced overall quality of life by half. Using data from the Institute of Health Metrics and Evaluation, our analysis suggests that one avoided case of type II diabetes could result in a gain of 1.42 HLYs for an individual in the UK, based on average age of onset, duration, and mortality and morbidity rates for the condition.

We can quantify the benefit associated with avoiding type II diabetes by considering the value of one healthy life year. An international health economics study found that UK willingness to pay per QALY was £29,000-£46,000* in 2009 (54) and other authors find a range of values for different contexts (57). The UK government recommends a value of £60,000 per QALY for policy appraisal, which we use here (58). This reflects the utility people place on avoiding mortality and morbidity, expressed per year of life and in monetary terms to show its relatively to other things which cost money and provide value in people's lives (57). For context, NICE often applies a cost-effectiveness threshold of £20,000-£30,000 per healthy life year when considering which treatments are to be recommended for use by the NHS (although cost-effectiveness is not the only factor in the decision of what to recommend) (50, 51).

Applying this to Powered by Water

PbW could potentially prevent 21 cases of type II diabetes, with 1.42 HLYs gained per avoided case. If each HLY is considered to have a value of £60,000 then the value to society per avoided case of type II diabetes is around £85,000. This is a conservative estimate as it does not include avoided costs to the NHS or avoided loss of economic productivity.



If PbW causes 1% of its participants to stop drinking sugar-sweetened beverages for life, 16 cases of type II diabetes could be avoided, saving 23 healthy life years

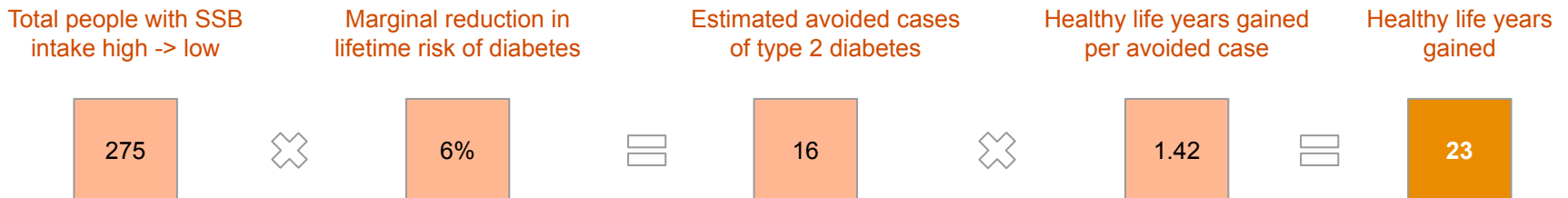
Linking SSB intake to type II diabetes and healthy life years

Consumption of excess sugar has been linked to type II diabetes, and the popularity of sugar-sweetened beverages (SSBs) in countries such as the UK is a significant contributor to excess sugar. SSBs have been linked to obesity and weight gain - both risk factors for type II diabetes - and SSB intake has been directly linked to type II diabetes risk (22, 53). Based on the healthcare literature we have estimated the potential scale of benefit that PbW could achieve for a given level of behaviour change in terms of SSB consumption.

Two meta-analysis studies (22, 53) suggest that there is a **26%** higher risk of type II diabetes for people with excess SSB intake (defined as 1-2 servings per day) compared to people with low SSB intake (defined as <1 serving per month). There is around a **30%** lifetime type II diabetes risk at birth for a person in the UK (55, 56). On the basis that a significant share of people in the UK currently have excess SSB intake, and that type II diabetes is rare amongst children, we have assumed that this 30% represents the remaining lifetime type II diabetes risk for PbW participants with excess sugar consumption. Combined with the meta-analysis evidence (22, 53) this suggests a **24%** lifetime type II diabetes risk ($30\% \div 1.26$) for those with low SSB intake: a **6%** reduction in the absolute risk of a person getting diabetes over their lifetime versus someone with high SSB intake (30%-24%). This estimate (6%) does not consider co-variates of risk or historical behaviours and is based on correlation rather than direct evidence of causation, so should be treated with caution, but may nonetheless provide an indication of the potential scale of impact. This also assumes that the 26% difference in risk applies to lifetime type II diabetes risk.

PbW has **27,457** participants in the most recent year. If 1% of these children shifted from high to low SSB consumption as a result, these **275** ($27,457 \times 1\%$) children could have a 6% lower lifetime type II diabetes risk, i.e. **16** ($275 \times 6\%$) of these children would avoid developing type II diabetes over their lifetime. Assuming a gain of **1.42** HLYs per case of type II diabetes (see previous page), this equates to a saving of **23** healthy life years for these participants. This does not include any of the possible health benefits from diabetes onset occurring later in life.

To achieve such benefits, these children would need to shift their behaviour permanently from 1-2 SSB servings per day to <1 SSB servings per month. Key challenges in applying this to PbW are likely to include the measurement or estimation of how persistent behaviour change is, and the reliance on self-reported data.



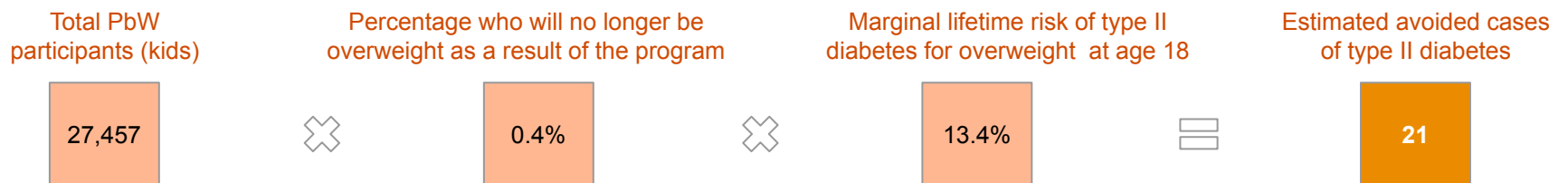
Based on what a similar programme in Germany achieved, if PbW leads to sustained behavior change it could avoid up to 21 cases of type II diabetes over those childrens' lifetimes per year - *but we believe this could be a significant overestimate for PbW (1/2)*

We have calculated a high level estimate of the potential scale of benefit from PbW if it is successful at creating lasting behaviour change in terms of reducing overweightness amongst children. This is based on studies in the healthcare and health economics literature from different countries and focusing on different interventions, so the number here should be treated as indicative only, rather than as an estimate of the value created by PbW itself. Nonetheless, this highlights how lasting effects on the behaviour of even a small number of children can have a significant value to society over the long term.

Avoided cases of diabetes

A study in Germany of a similar intervention (1) showed a reduction in incidence of overweight children after 1 year. A separate study for the US estimates the increase in lifetime type II diabetes incidence risk from being overweight versus normal weight* at age 18. We combined the results from these studies with the number of children receiving PbW sessions in the last academic year (see page 32 for further details) to provide an upper estimate of the potential scale of PbW's health impacts - **21** avoided cases of type 2 diabetes, as shown in the figure below. This estimate relies on the assumption that behavioural change is achieved and sustained until age 18. It does not include possible health benefits from any diabetes onset occurring later in life.

Applying the value per case of type II diabetes shown earlier in this section, avoiding 21 cases of type II diabetes in the UK has a value to society of £1,785,000. To estimate an economic value consistent with those for Step Change this value would need to be discounted to present value, using an appropriate social discount rate, based on when the average age of onset is of type II diabetes for overweight people in the UK, which would reduce the size of the number, potentially significantly.



Due to the differences in the programmes and resulting potential for difference in behaviour changes, as well as the assumptions that have been made about the persistence of this behaviour change over time, this estimate is highly uncertain and we believe that it could be a significant overestimate of the effect of PbW.

*"normal" weight group is defined as BMI range 18.5 - 25 and "marginally overweight" is defined as BMI range 25- 30, where BMI is Body Mass Index (kg/m2)

Note: numbers on this page are rounded to avoid false sense of precision.

Based on what a similar programme in Germany achieved, if PbW leads to sustained behavior change it could avoid up to 21 cases of type II diabetes over those childrens' lifetimes per year - *but we believe this could be a significant overestimate for PbW (2/2)*

This page provides an overview of how the numbers on the previous page have been calculated. Further information on assumptions is provided on the following page.

Estimating the number of PbW participants who may avoid becoming overweight due to the programme

A randomised controlled trial (RCT) performed in German schools during the school year August 2006 to June 2007 found that water drinking interventions caused a reduction in the risk of becoming overweight by **31%** after one year. This study looked at the difference between schools where no intervention occurred and schools where interventions included classroom sessions, goal-setting and encouragement from teachers. It then assessed overweightness in follow-up sessions 10 months after the start of intervention. Children in this study were ages 7 - 9. While this study assesses interventions with a similar focus on drinking water to PbW, there are a number of differences, including:

- The depth and persistence of engagement with participants is likely to be higher in the German school interventions than for PbW, which may consist of only a single contact with participants, which we would expect to leads to a greater effect on behaviour change for the German example.
- Age, cultural, and socioeconomic differences between the participating children in the UK and Germany
- Differences in school systems

We estimated the percentage of non-overweight children attending PbW classes using the English national average (**70%**) (52). The RCT study (1) found that the risk of becoming overweight in the next year is **1.91%** for non-overweight kids. The product of these figures imply that around **1.34%** of all participating children would become overweight in a year without the intervention. Applying the **31%** reduction in overweight incidence from (1) suggests that **0.4%** of the total number of participating children may avoid becoming overweight after a year due to the programme..

Marginal lifetime risk of type II diabetes for overweight at age 18

We estimated the difference in lifetime risk of type II diabetes for people who are overweight versus normal weight at age 18 based on a study of people in the USA (14). We extracted the difference in lifetime risk of developing diabetes (both type I and II) for 18 year olds in two borderline BMI groups: "normal" weight and "marginally overweight"*. This average difference for males and females is **14.1%**, i.e. if someone is "marginally overweight" at age 18, their risk of developing diabetes is 14.1 percentage points higher than someone who is "normal" weight. This study examines the lifetime risk of both types of diabetes combined. The incidence of type II diabetes is around **95%** of all diabetes, therefore we have applied this to the marginal difference of 14.1% to give a decreased risk of **13.4%**. This is conservative as while type II diabetes is related to overweightness and obesity, type I diabetes is not. In applying the numbers from the US study, we are assuming that the difference in lifetime diabetes risk is the same in the US and UK, which is not likely to hold in reality.

The estimated potential impact of PbW relies on a number of assumptions, with a particular reliance on sustained behavioural change

In addition to the calculations and assumptions described on previous pages, the table below sets out key assumptions underpinning these calculations.

<p>Total PbW participants (kids) 27,457</p>	<ul style="list-style-type: none"> Powered by Water partners provide annual reports to NWL on the number of children who attended Powered by water sessions. We are assessing the impact of the intervention for sessions that were delivered during the first year for Southend United, Essex cricket; and the 2017/18 academic year for Middlesbrough Football Club, Sunderland Foundation of Light, Newcastle Eagles and Mowden Park Community.
<p>Percentage who will no longer be overweight as a result of the program 0.4%</p> <p>114 PbW kids</p>	<ul style="list-style-type: none"> We assume that PbW interventions have the same impact on behaviour as the interventions discussed in the German study (1). The interventions in Germany included daily encouragement from teachers, as well as free water bottles for all participants and installation of water fountains. We assume that without intervention, 1.91% of children would become overweight. This figure was observed in the German study control group (1). We assume that children attending PbW sessions are of the same overweight split as the national English average. Further refinement could be achieved for example by weighting based on the fact that some children attending sessions are part of sports clubs, as well as age and sex.
<p>Marginal lifetime risk of type II diabetes for overweight at age 18 13.4%</p> <p>21 avoided cases of type II diabetes</p>	<ul style="list-style-type: none"> We assume that the behaviour change learned is sustained until age 18. This is likely an overestimate given that evidence shows behaviour change of this nature is not always lasting (see previous pages). We assume that there is an increase in the risk of diabetes once a person becomes overweight (having previously been in the normal weight range) of 14.1% (14). This figure is based on the risk of diabetes amongst four distinct groups of 18 year olds: males with BMI 18.5 - 25 (risk = 19.8%) ; females with BMI 18.5 - 25 (risk = 17.1%); males with BMI 25 - 30 (risk = 29.7%); and females with BMI 25 - 30 (risk = 35.4%). We first calculated the difference between the two male groups, followed by the difference between the female groups. This was then averaged to get an overall difference of 14.1%. This figure relies on the assumption that the the group of young people is gender balanced as well as assuming that movement between “overweight” and “not overweight” is distributed about the mid-point of the two BMI groups (e.g. not moving from 24.9 to 25.1 BMI).. We assume that the future risk of diabetes is made up of 95% of risk of type II diabetes and 5% type I diabetes. This is based on the global lifetime incidence rate of type II diabetes vs type I diabetes. (14)

There are a number of actions that NWL can take to better measure, and increase, the impact of the PbW programme

Recommended actions NWL can take to **better measure** the impact of Powered by Water

- **Create a survey to track drinking behaviour among participants.** The objective of Powered by Water sessions is to encourage children to drink more water. Our literature review shows that educational interventions on water intake can lead to a change in behaviour in children. There is currently no data on the behavioural changes seen in children who have attended Powered by Water sessions. The creation of a survey, to be completed by teachers or parents, that records participants' drinking habits before the PbW session will help to ascertain the baseline. Another survey could then be completed at a short-term point (for example 3 months after intervention) and then at a longer-term point (for example 1 year after the intervention).
- **Create a survey to track the health and BMI of participants.** This report finds that water intake and SSB intake are linked to obesity. In order to understand the effect of PbW's educational sessions on obesity, NWL could create a survey that measures the weight changes seen in children who have attended the PbW programme. Similar to the suggested survey for tracking drinking behaviours, there could be a baseline survey followed by short- and long-term follow-up surveys.

Recommended actions NWL can take to have a **bigger impact** through Powered by Water

- **Develop and implement complementary interventions for children on the PbW programme.** Our findings in this report suggest that behavioural change is more effective when there are multiple health-related interventions implemented together and over the long-term. These complementary interventions may include integrating sports sessions and building health-related learning into school curriculums.
- **Integrate learning at home.** We have found that health-related interventions should be introduced in homes, additional to schools, in order to produce long-term effects. Lifelong habits often start in the home and additional programmes focusing here may have greater impact than school-based programmes on their own.
- **Provide facilities for increased water consumption, including water fountains.** Our findings suggest that actions taken by schools can have significant influence on water consumption. In addition to water fountains, actions could include the provision of water bottles, lessons focused on water consumption, and encouragement from teachers.
- **Encourage sports players to attend all PbW sessions.** High-profile endorsement of practices, such as water consumption, have been found to provide credibility and increase uptake among children.

4

Measuring the
impact of NWL's
local expenditure

Key findings

NWL may wish to focus on its local economic contribution (jobs, wages, profit) rather than purely its local procurement

NWL spends approximately half its procurement budget with local suppliers and aims to increase this to 60% by 2025. However, we believe that **local economic contribution is more meaningful than local procurement** for understanding how NWL benefits its local communities. If **NWL can quantify the value it creates for its communities, through the procurement of goods and services from local businesses** and the income this supports, decision makers within the organisation will be able to take a broader view of 'value' in procurement.

NWL may wish to consider developing a simple to use tool that estimates local economic contribution based on procurement data that it already collects

We believe that **NWL should consider using established economic indicators** to demonstrate its contribution to its communities and to the UK as a whole. In the past, NWL has used the LM3 tool to estimate its local economic contribution in the past, but this has a number of limitations in the context of NWL's objectives.

We recommend that NWL develop a simple, transparent tool based on local economic multipliers to estimate the impact of prospective and historic spend. We recommend that the tool houses economic multipliers appropriate to the nature of NWL's supply chain; **allows staff to quickly input simple data to get results, with all analysis automated within the tool**; produces output data in a format that can be directly shared and **reported in real-time without additional effort**; and is well documented and tested prior to launch.

Conducting a pilot study to develop and test the model

We recommend conducting a **rapid pilot study to develop the tool** described above, including appropriate economic multipliers to NWL's business activities. This **would allow the approach to be tested on current and historic procurement data** to test its validity and refine the model before it is used.

Such a study would **also allow NWL to engage its key stakeholders around the tool** to ensure buy-in as well as securing reputational benefits.

NWL spends approximately half its procurement budget with local suppliers and aims to increase this to 60% by 2025

Local procurement is an Ambitious Goal in NWL's PR19 business plan

In its PR19 business, NWL set itself an Ambitious Goal to “spend at least 60p in every £1 with suppliers in our regions” (50). At present, NWL spends approximately 50% of its procurement budget with local suppliers (48).

Potential benefits to NWL from local procurement

As a place-based organisation, NWL recognises that its success relies on its local community. It recognises that small and medium-sized businesses located in its operating areas are a key pillar of the local economy and that its procurement decisions are a factor in their success.

Contributing to the local economy in this way may also help NWL achieve some of the other Ambitious Goals outlined in its PR19 business plan. For example, increasing local employment and incomes may help it achieve the goal of eradicating water poverty in its operating areas. This, in turn, may reduce the need for income and affordability tariffs and reduce the firm's exposure to bad debts.

There are further potential benefits for NWL: communicating NWL's economic contribution and how it is working to enhance this helps secure social licence to operate, particularly amongst its customers and local stakeholders; and it protects the firm's reputation and demonstrates its broader purpose.

The opportunity for NWL

If NWL can quantify the value it creates for its communities, through the procurement of goods and services from local businesses and the income this supports, decision makers within the organisation will be able to take a broader view of 'value' in procurement.

This section reviews NWL's existing work on the impact of local expenditure. It will provide recommendations of how NWL can build on this to create a simple, transparent methodology to track its economic contribution to its local communities, inform procurement decisions, and communicate with stakeholders.

Local economic contribution is more meaningful than local procurement for understanding how NWL benefits its local communities

Defining local procurement expenditure

In anticipation of the 2020-2025 AMP, NWL has started work to define local procurement and map suppliers to 'local' and 'non-local' categories.

NWL currently defines local procurement expenditure as spending with suppliers with a postcode that falls within its operating area. This is based on the 'pay site' defined on supplier invoices. In calculating local procurement expenditure, NWL includes both capex and opex, but excludes certain spend categories such as power and taxes that cannot be defined as local. Excluding these items removes approximately 20% of the total expenditure. Wages are also not included in this calculation.

For smaller companies, invoice location is likely to be a reasonable proxy for where the company is based and where its employees work and live. However for larger companies that operate over larger geographical areas - possibly even across countries - this is less robust. In recognition of this, NWL manually adjusts the location of selected large suppliers to better reflect where the work is conducted. Moreover, the extent to which suppliers purchase their inputs locally or from overseas can vary significantly. For example, steel pipes may be purchased from a UK distributor but with the value-adding steel and pipe production occurring in Italy and France, uses raw materials from elsewhere in the world.

Local procurement versus local economic contribution

The above discussion shows that for NWL's objectives, it is not where a company is located that matters, but how it contributes to the local economy. In particular:

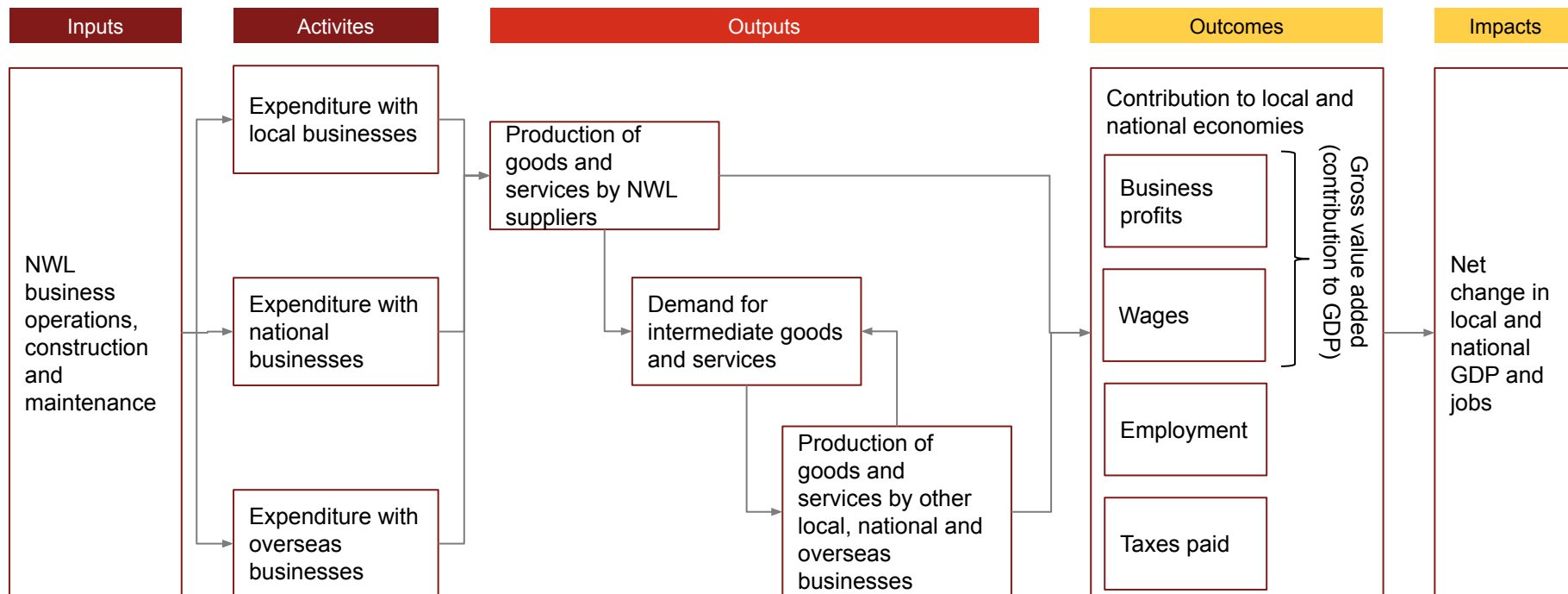
- It is the effect of expenditure on indicators of local economic performance that matter, such as employment and income, rather than amount of money spent in a particular location.
- The extent to which expenditure supports the local economy depends on not only the locality of expenditure but also the geography of the supply chain for goods and services purchased by NWL.

The following page outlines proposed indicators that NWL could use to measure its contribution to its local economies via local expenditure, as well as its overall contribution to the UK economy.

NWL should consider using established indicators to demonstrate its economic contribution to its communities and to the UK as a whole

Economic impacts of local procurement

The impact pathway below shows how NWL's procurement expenditure is expected to contribute to the local economy in its regions as well as the UK overall. Expenditure with suppliers supports business profits, wages and employment in the local economy and beyond. These metrics are established economic indicators that are likely to resonate well with stakeholders but are more challenging to estimate than the percentage of local procurement. We recommend focusing on **footprint**, i.e. the level of economic contribution through procurement expenditure, rather than impact (net change GDP and employment from an increase in local procurement). The latter would be challenging to estimate reliably in the context of NWL's resources, in part due to the need for a robust counterfactual.



NWL has used the LM3 tool to estimate its local economic contribution in the past, but this has a number of limitations in the context of NWL's objectives

Using the LM3 tool to measure NWL's local economic contribution

In 2015 (48), NWL used the LM3 tool to assess the contribution of its expenditure to the local economy*. The LM3 approach calculates the extent to which local procurement expenditure is recycled within the local economy, based on survey questions sent to suppliers. It covers the first three tiers of suppliers, where tier 1 suppliers are those that NWL purchases goods and services directly from (NWL's direct procurement spend), tier 2 firms supply tier 1 firms, and tier 3 firms supply the tier 2 firms. The result is a 'multiplier' - in this case a number between 1 and 3 describing how much output (revenue) NWL's expenditure generates for the local economy.

Strengths and limitations of the LM3 tool

This approach has a number of strengths:

- **It is based on supplier survey data** so captures the specific purchasing patterns of suppliers
- **It is simple to understand** the approach

However, it also has a number of limitations which we believe means it may not be the most appropriate tool for NWL to use to measure its economic impact:

- **It measures expenditure rather than economic value.** Indicators such as gross value added (GVA), which comprises wages paid to staff and business profits, show the economic value retained locally. The 'induced' economic effect when employees in the supply chain spend their wages locally is also not included.
- **The multiplier is hard to interpret.** For NWL's customers and other stakeholders, more intuitive metrics such as contribution to local employment, wages, local business profits, and local and central government tax revenue are likely to have more resonance. **The process may be labour intensive if scaled up.** A more streamlined workflow is likely to be needed to provide replicable and auditable results without putting undue pressure on NWL's staff time.

We would recommend developing a transparent and replicable approach to economic impact assessment that focuses on economic value and produces metrics with a clearer meaning to stakeholders. It should simultaneously recognise the important role that specific supplier data can have in assessing supply chain impacts.

*This report was not made available to us during the course of our analysis

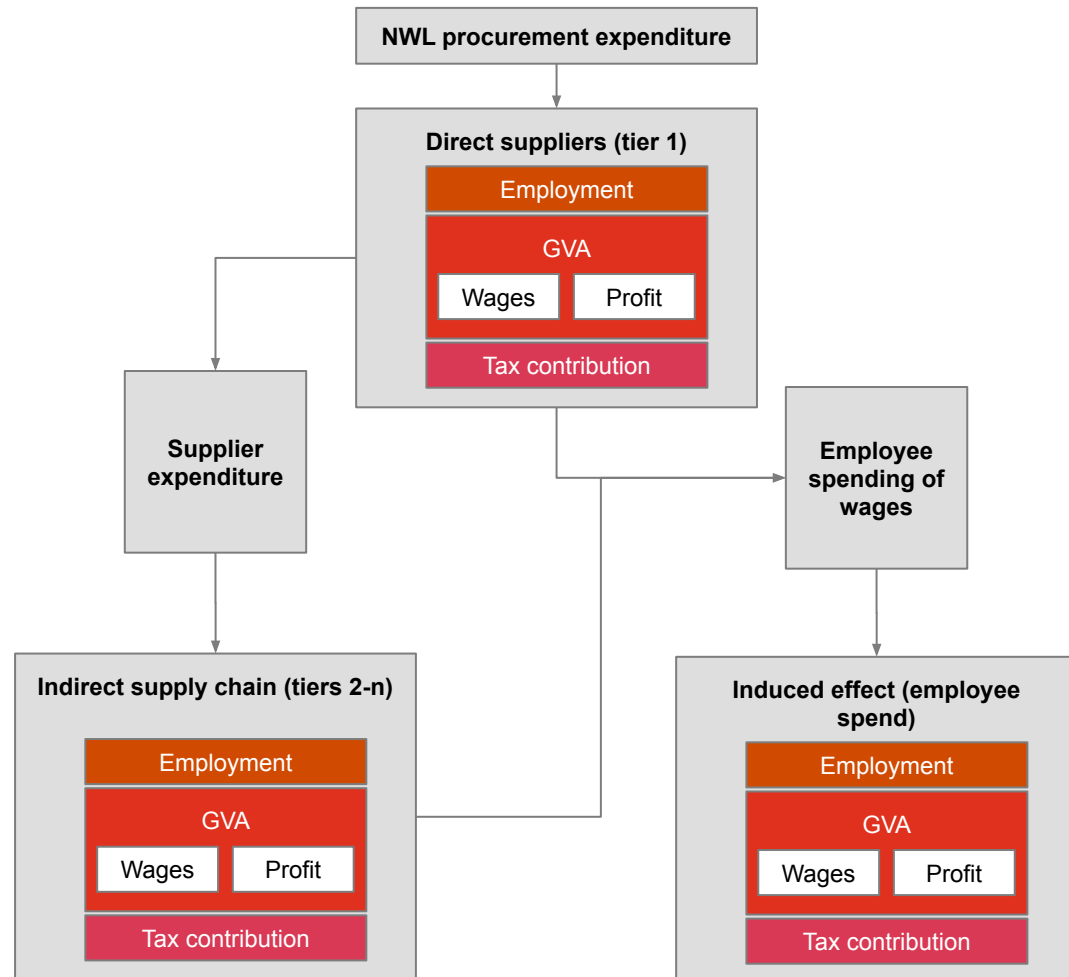
We recommend that NWL develop a simple, transparent tool based on local economic multipliers to estimate the impact of prospective and historic spend (1/2)

Multiplier analysis

We recommend using economic multiplier analysis to calculate the contribution of NWL to the local - and potentially national - economy. This is a transparent approach used by a wide range of organisations, including public and private sector, to measure their economic contribution. Economic multipliers, calculated using an economic modelling technique known as input-output analysis, shows the wages and profits (together, GVA), employment, and tax contribution from each tier of the supply chain. This covers three distinct channels of impact:

- Direct impact of procurement: the economic contribution from NWL's expenditure with its suppliers
- Indirect impact: the economic contribution as NWL's expenditure ripples through the supply chain - locally, nationally and overseas
- Induced impact: when NWL spends money, it supports employment by suppliers and firms in the indirect supply chain - increasing incomes which are spent locally and provide an economic boost to the area.

The figure to the right outlines the approach.



We recommend that NWL develop a simple, transparent tool based on local economic multipliers to estimate the impact of prospective and historic spend (2/2)

Creating a tool to streamline measurement of local economic impact

It is important that NWL develop a repeatable and transparent method to measure the impact of its local procurement. We recommend that NWL develop a simple multiplier tool that:

- Houses economic multipliers appropriate to the nature of NWL's supply chain
- Allows staff to quickly input simple data to get results, with all analysis automated within the tool
- Produces output data in a format that can be directly shared and reported in real-time without additional effort
- Is well documented and tested prior to launch

Key features of this tool are likely to include:

- Pre-calculated multipliers relevant to NWL's geographies, based on UK national economic statistics and following guidance from UK Government, Eurostat, and other recognised statistical and economic organisations
- Automated supplier location and sector classification
- Flexibility to incorporate supplier- or contract-specific information where relevant (e.g. on supplier location, local employment, and geography of supplier expenditure), but using proxy data from economic models where not available

Conducting a pilot study to develop and test the model

We recommend conducting a rapid pilot study to develop the tool described above, including appropriate economic multipliers to NWL's business activities. This would allow the approach to be tested on current and historic procurement data to test its validity and refine the model before it is used.

Such a study would also allow NWL to engage its key stakeholders around the tool to ensure buy-in as well as securing reputational benefits. Importantly, it would allow internal users of the tool and its outputs to shape it to their needs and understand how they can use it in their decision-making.

5

Summary of
recommendations
and suggested next
steps

Recommendations to better measure the effectiveness of NWL's actions to **reduce water poverty**

Recommended improvements in measuring the social value of the Step Change partnership

- **Combine data sources to understand outcomes across demographic segments.** Our findings in this report show that social value varies across demographic segments. A more accurate breakdown of demographic information on people receiving debt advice would enable a more nuanced analysis to be carried out. Step Change sends a monthly referral report to NWL which could be adapted to include detail on the demographic breakdown of those referred by NWL to Step Change. The Performance and Information Team at NWL may also have datasets that help identify the characteristics of vulnerable customers and their ability to pay bills. This information could be shared with Step Change to help them better measure outcomes.
- **Understand specific outcomes through engaging with customer base.** This report relies on average values and external studies to understand the success of debt advice for customers. NWL could seek to understand the outcomes for individuals that they have referred to Step Change through issuing questionnaires. A similar exercise has been performed by Step Change in the outcomes report. However it may be possible to enhance this further through questions that are more specific about the types and levels of outcomes achieved, for example understanding impacts on absenteeism at work and mental health appointments.
- **Build data capture into the Step Change online system.** Through engaging with stakeholders in NWL and Step Change, we learned that the Step Change is in the process of developing an “omni channel approach” that will involve tracking digital referrals. NWL could partner with Step Change to ensure that this tracking captures adequate information to measure outcomes.
- **Define debt advice.** The literature on debt advice has not sought to understand the outcomes and impacts associated with different levels of advice. Further study into this area could help to provide a better picture of the outcomes associated with different types of support and provide benefits and costs for each type of advice.

Recommended actions to improve overall social measurement of NWL's support to those in debt

- **Measure the social value of debt tariffs and schemes.** This report examines the social impact of NWL's partnership with Step Change. As such, the social benefits of NWL's internal offering and pricing strategy have not been measured. NWL could consider measuring the impact of its income and affordability tariffs and arrears write-off scheme. Findings of such a report may help to understand progress toward NWL's water poverty eradication target, as well as adding to existing literature on the social benefit of financial aid provided by water companies (34). This could be developed into a streamlined tool to facilitate monitoring and reporting on progress against the Ambitious Goal.

Recommendations to better measure the effectiveness of NWL's actions to **improve health**

Recommended actions NWL can take to **better measure** the impact of Powered by Water

- **Create a survey to track drinking behaviour among participants.** The objective of Powered by Water sessions is to encourage children to drink more water. Our literature review shows that educational interventions on water intake can lead to a change in behaviour in children. There is currently no data on the behavioural changes seen in children who have attended Powered by Water sessions. The creation of a survey, to be completed by teachers or parents, that records participants' drinking habits before the PbW session will help to ascertain the baseline. Another survey could then be completed at a short-term point (for example 3 months after intervention) and then at a longer-term point (for example 1 year after the intervention).
- **Create a survey to track the health and BMI of participants.** This report finds that water intake and SSB intake are linked to obesity. In order to understand the effect of PbW's educational sessions on obesity, NWL could create a survey that measures the weight changes seen in children who have attended the PbW programme. Similar to the suggested survey for tracking drinking behaviours, there could be a baseline survey followed by short- and long-term follow-up surveys.

Recommended actions NWL can take to have a **bigger impact** through Powered by Water

- **Develop and implement complementary interventions for children on the PbW programme.** Our findings in this report suggest that behavioural change is more effective when there are multiple health-related interventions implemented together and over the long-term. These complementary interventions may include integrating sports sessions and building health-related learning into school curriculums.
- **Integrate learning at home.** We have found that health-related interventions should be introduced in homes, additional to schools, in order to produce long-term effects. Lifelong habits often start in the home and additional programmes focusing here may have greater impact than school-based programmes on their own.
- **Provide facilities for increased water consumption, including water fountains.** Our findings suggest that actions taken by schools can have significant influence on water consumption. In addition to water fountains, actions could include the provision of water bottles, lessons focused on water consumption, and encouragement from teachers.
- **Encourage sports players to attend all PbW sessions.** High-profile endorsement of practices, such as water consumption, have been found to provide credibility and increase uptake among children.

Recommendations to better measure the effectiveness of NWL's actions to **boost its local economies**

Creating a tool to streamline measurement of local economic impact

It is important that NWL develop a repeatable and transparent method to measure the impact of its local procurement. We recommend that NWL develop a simple multiplier tool that:

- Houses economic multipliers appropriate to the nature of NWL's supply chain
- Allows staff to quickly input simple data to get results, with all analysis automated within the tool
- Produces output data in a format that can be directly shared and reported in real-time without additional effort
- Is well documented and tested prior to launch

Key features of this tool are likely to include:

- Pre-calculated multipliers relevant to NWL's geographies, based on UK national economic statistics and following guidance from UK Government, Eurostat, and other recognised statistical and economic organisations
- Automated supplier location and sector classification
- Flexibility to incorporate supplier- or contract-specific information where relevant (e.g. on supplier location, local employment, and geography of supplier expenditure), but using proxy data from economic models where not available

Conducting a pilot study to **develop and test the model**

We recommend conducting a rapid pilot study to develop the tool described above, including appropriate economic multipliers to NWL's business activities. This would allow the approach to be tested on current and historic procurement data to test its validity and refine the model before it is used.

Such a study would also allow NWL to engage its key stakeholders around the tool to ensure buy-in as well as securing reputational benefits. Importantly, it would allow internal users of the tool and its outputs to shape it to their needs and understand how they can use it in their decision-making.

6

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