



Income-based policies in Scotland: how would they affect health and health inequalities?

Triple I: Informing • Inequalities • Interventions

Comparing the impact of interventions to
improve health and reduce health inequalities

Authors:

Dr Elizabeth Richardson, Public Health Intelligence Adviser,
Public Health Observatory, NHS Health Scotland

Dr Lynda Fenton, Specialty Registrar, Public Health Observatory,
NHS Health Scotland

Dr Gerard McCartney, Head of Public Health Observatory,
Public Health Observatory, NHS Health Scotland

Dr Jane Parkinson, Public Health Intelligence Adviser,
Public Health Observatory, NHS Health Scotland

Mr Andrew Pulford, Public Health Intelligence Adviser,
Public Health Observatory, NHS Health Scotland

Dr Martin Taulbut, Public Health Intelligence Adviser,
Public Health Observatory, NHS Health Scotland

Dr Mark Robinson, Public Health Intelligence Principal,
Public Health Observatory, NHS Health Scotland

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For further information about this publication please contact:

Elizabeth Richardson

Public Health Intelligence Adviser

Public Health Observatory

NHS Health Scotland

Email: elizabeth.richardson1@nhs.net

Take-home messages

- Health inequalities in Scotland are stark and represent thousands of unnecessary premature deaths (death under 75 years) every year.
- Income is a key determinant of health. Policies that affect income have the potential to influence healthy life expectancy and health inequalities in Scotland.
- Modelling is an important source of evidence for prompting discussion and guiding decision-making about potential policies and interventions.
- The Triple I (Informing Interventions to reduce health Inequalities) modelling tool has been designed to estimate the potential health impact of individual policies that affect household income, without actually implementing them. The basis of the Triple I tool is that health improves as household income increases.
- Our modelling suggests that selected income-based policies could improve health and narrow health inequalities in Scotland. These policies include:
 - increasing means-tested benefits by 50%
 - introducing illustrative Citizen's Basic Income (CBI) schemes that incorporate increases to Income Tax rates
 - increasing devolved benefits by 50%
 - introducing the 'real' Living Wage.
- The most effective income-based policies for reducing health inequalities are likely to be those that disproportionately increase incomes for those with the lowest incomes.
- Of the policies modelled, the introduction of a CBI with additional payments for disabled individuals would be most cost-effective for both reducing premature mortality and reducing inequalities in premature mortality.
- The effects of a wide range of income-based policies on health and health inequalities can be modelled for different geographies and different health outcomes using our interactive policy modelling tool.
- Although modelling is subject to various assumptions and uncertainties, our findings highlight the importance of applying an inequalities lens to income-based policy options.

Key assumptions

All scenario-based models rely on the available evidence and assumptions about the relationship between policies/interventions and outcomes. The following assumptions should be considered when interpreting the findings in this briefing.

- We assumed a causal relationship between income and mortality, in that an increase in income will cause a decrease in mortality.
- A simple linear relationship between income and health was estimated based on area-level estimates of household income and mortality rates. This allowed us to estimate the effect on mortality rates of a change in household income resulting from each policy.
- The effects of a change in household income on health have been assumed to happen straight away and to remain the same over time.
- Beyond changes to household income, the model does not account for how people may alter their behaviour in response to the policies (e.g. a change in the decision to work or the number of hours worked).
- The model assumes that each policy acts individually on a static system. It does not consider the impact of a specific policy on the wider Scottish economy and public finances. For example, the net savings resulting from some policies (e.g. tax increases) could be redistributed in ways that have additional effects on health and health inequalities. Conversely, the net costs associated with other policies (e.g. benefit increases) represent funds that would need to be sourced from elsewhere, which may also have health repercussions.

Suggested actions

Local

- Explore opportunities to encourage payment of the real Living Wage.
- Find ways to maximise income, including through the increased uptake of benefits by those who are entitled to receive them.
- Support the pilots of CBI.

National

- The level at which benefits are paid could substantially impact on health and health inequalities. This impact should be a consideration when setting the rates of devolved benefit payments and when advocating for changes to means-tested benefits.
- Continue to support the evaluation of the impact of CBI and support piloting at the higher levels of income of the options available.

What is this briefing about?

Income is a key social determinant of health, but we know little about how income-based policies (e.g. changes in taxation or benefits) compare in terms of their effects on health and health inequalities.

This briefing describes research we carried out to fill this evidence gap for Scotland. We used the best available data and evidence to model various policies and compare how they would affect household incomes, population health, health inequalities and government revenues.

What are health inequalities?

Health inequalities are the unfair and avoidable differences in people's health across social groups and between different population groups. They represent thousands of unnecessary premature deaths (death under 75 years) every year in Scotland. For men in the most deprived areas, nearly 25 fewer years are spent in 'good health' than men in the least deprived areas. For women this is 22 years. Reducing income inequalities in a country is an important part of reducing health inequalities and so aspects of policy that impact on household incomes are important in addressing this.

What are income-based policies?

In our research we considered three types of policies that can change household incomes:



1. Taxation-based policies 2. Benefits-based policies 3. Novel policies

These were selected to represent a range of existing and future options, with varying levels of practical feasibility. The policies presented here are described briefly below.

Further details (including a wider range of policies) are provided in the supplementary information which is available alongside this briefing.

Taxation-based policies

Income Tax +1p^{†,*}: All Income Tax rates increased by 1p (to 21p basic rate, 41p higher rate and 46p additional rate).

Income Tax -1p^{†,*}: All Income Tax rates decreased by 1p (to 19p basic rate, 39p higher rate and 44p additional rate).

Personal Allowance +£1K[†]: Income Tax Personal Allowance increased from £11,000 to £12,000.

Personal Allowance -£1K[†]: Income Tax Personal Allowance decreased from £11,000 to £10,000.

Council Tax increase*: Council Tax increased for bands E (+7.5%, increasing from Scottish average of £1390 to £1494 pa), F (+12.5%, from £1643 to £1848 pa), G (+17.5%, from £1895 to £2227 pa) and H (+22.5%, from £2275 to £2786 pa).

[†]The Income Tax structure reflects the regime in Scotland at the baseline year of 2016. A new system of Income Tax rates and bands came into force in Scotland in April 2018.

*These policies could be introduced in Scotland with existing devolved powers.

Benefits-based policies

Means-tested benefits +50%: 50% increase in these benefits paid to those who pass an income test: Child Tax Credit, Working Tax Credit, Housing Benefit, income-based Jobseeker's Allowance, income-based Employment and Support Allowance, and Income Support.

Devolved benefits +50%*: 50% increase in these benefits devolved to the Scottish Government: Attendance Allowance, Carer's Allowance, Disability Living Allowance/Personal Independence Payment, Industrial Injuries Disability Benefit, Severe Disability Allowance and Winter Fuel Allowance.

Novel policies

Citizen's Basic Income (CBI)[‡]: Illustrative CBI scheme introduced: an income from the state received by every citizen, not dependent on need. Rates = £67.01/week for < 18 years old, £73.10/week for women aged 18–62 years old and men aged 18–64 years old; £155.60/week for women aged > 62 years old and men > 64 years old. Most other benefits would be withdrawn. National Insurance would be set to 12% flat rate for all earnings, and Income Tax rates increased by 6p.

Citizen's Basic Income Plus[‡]: Illustrative CBI scheme introduced (as above) with additional payments for disabled adults (£35.75/week or £112.40/week for severely disabled) and children (£24.07/week or £83.52/week if severely disabled). Income Tax rates increased by 7p.

Local Income Tax^{†,*}: Council Tax removed and Income Tax rates increased by 3p.

Living Wage: Mandatory payment of the real Living Wage to all employees (calculated as £8.25 per hour for 2016/17 by the Living Wage Foundation based on living costs).

Benefit uptake +1%*: A 1% increase in the number of claimants of means-tested benefits, which may arise from wider availability of income-maximisation advice services, for example.

[‡]Many different versions of CBI have been proposed. We selected two illustrative schemes considered to be 'plausible' by the Institute of Policy Research at the University of Bath www.bath.ac.uk/publications/exploring-the-distributional-work-incentive-effects-of-plausible-illustrative-basic-income-schemes/attachments/Luke_WP2_Web.pdf. We set Income Tax rates to approximate fiscal neutrality for Scotland, and incorporated partial benefit uptake. More detail is provided in the supplementary information.

[†]The Income Tax structure reflects the regime in Scotland at the baseline year of 2016. A new system of Income Tax rates and bands came into force in Scotland in April 2018.

*These policies could be introduced in Scotland with existing devolved powers.

How did we do the research?

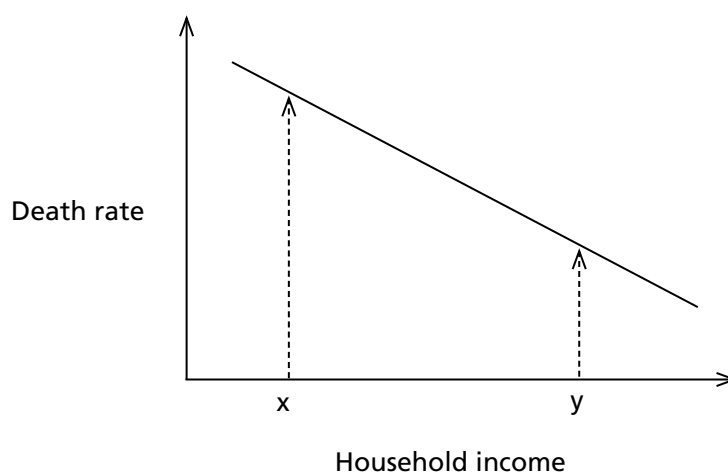
1. We modelled the effect of each policy on the incomes of Scottish households

This was done using 'EUROMOD', a detailed tax-benefit microsimulation model which draws on data from a representative sample of households in Scotland who responded to the Family Resources Survey (FRS). The year modelled was 2016. For each policy we estimated average household income change (before housing costs) for each quintile of the 2016 Scottish Index of Multiple Deprivation (SIMD). It should be noted that the SIMD measures the deprivation levels of areas rather than individuals; areas grouped according to a certain level of deprivation contain people with varying income levels. The implications for government expenditure on benefits and revenue from taxes and National Insurance contributions were also estimated from the EUROMOD output.

2. We estimated the relationship between household income and mortality in Scotland

Health outcomes are almost always better among those with higher incomes and those living in the least deprived circumstances, with a stepwise gradient across the population. However, there is an absence of evidence showing the effect of changes in household or individual income on changes in mortality. We therefore estimated the (linear) relationship between income and all-cause deaths in Scotland using available data. The data we used were: average household income levels by SIMD quintile from the FRS, and all-cause mortality rates by SIMD for 2016 from National Records of Scotland. This allowed us to estimate the effect on mortality rates of a change in household income resulting from each policy. The key assumption underpinning this relationship is that if a policy increases a household's income (for example, from x to y in **Figure 1**), the risk of death of that household will improve immediately to the level of a household on income y . This is illustrated in **Figure 1**.

Figure 1: An illustration of a key assumption in the Triple I income model.



3. We modelled the effect of the income-based policies on premature mortality and inequalities in premature mortality

The information from **steps 1 and 2** was entered into the Scottish Public Health Observatory's (ScotPHO) health inequalities scenario modelling tool called 'Informing Interventions to reduce health Inequalities', or 'Triple I'. In this briefing paper, we have used the tool to estimate projected policy impacts on premature mortality (death under 75 years) in Scotland after five years. The baseline scenario estimates the number of premature deaths in Scotland over the next five years based on current population figures and mortality projections. The policy scenario adjusts the baseline scenario by taking into account the predicted effects of the policy (based on steps 1 and 2 above). The difference between the baseline scenario and the policy scenario is the estimated policy effect.

The **Triple I spreadsheet tool** can be downloaded and used to produce detailed results for different geographies (Scotland, council areas, Health Boards, city regions or Integrated Joint Boards) and health outcomes (premature mortality, years of life lost or hospital stays).

What did we find?

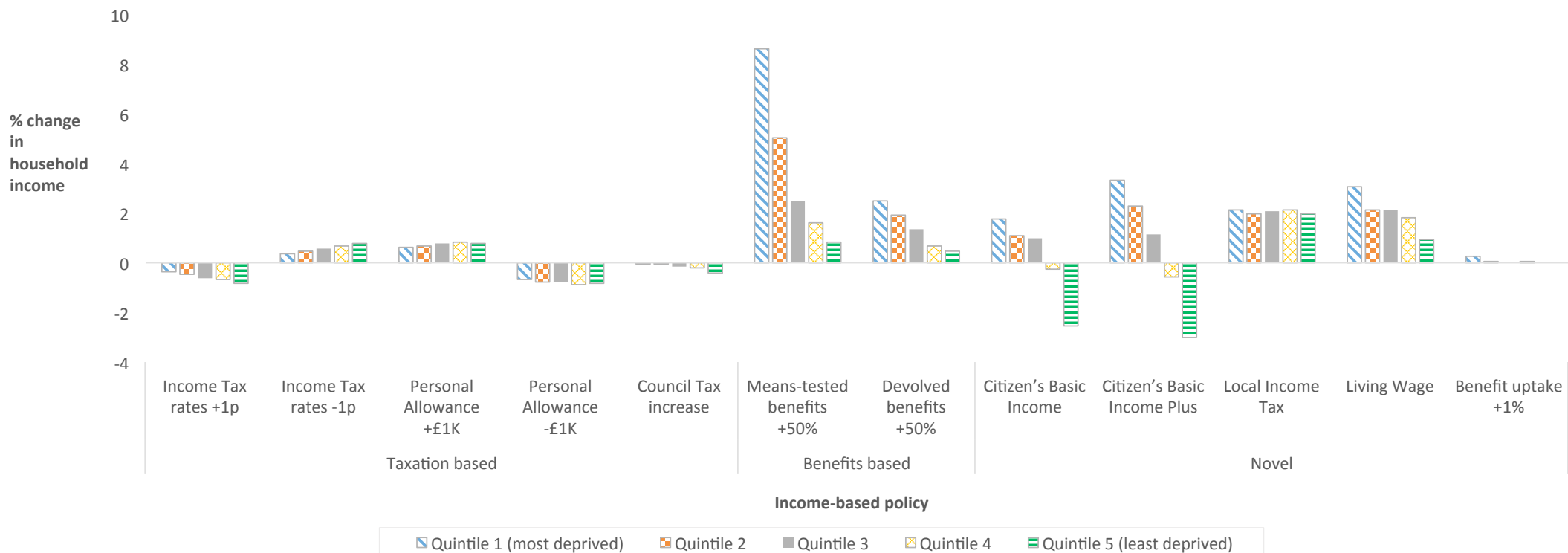
Effect on household incomes

Figure 2 shows the estimated effects of the policies on household incomes in Scotland. Household incomes were 'equivalised', which means that they were recalculated to account for differences in household size and composition. We found that:

- The taxation-based policies we modelled would result in small changes to household income (less than 1%), that differed little between the most and least deprived areas.
- Policies involving increasing benefit payments would result in larger increases in income for the most deprived areas (3% for devolved benefits, 9% for means-tested benefits) and modest increases for the least deprived (less than 1%).
- Increasing means-tested benefits by 50% would result in incomes roughly equivalent to the minimum income for healthy living.**
- The illustrative CBI schemes (which incorporate increases to Income Tax rates) would increase incomes in more deprived areas and reduce them in less deprived areas. The effect would be greater if there were additional payments to disabled individuals (CBI Plus).
- Local Income Tax and the real Living Wage policies would also generate greater increases in incomes in the most deprived areas.
- Increasing benefit uptake would also disproportionately benefit the incomes of those living in more deprived areas, although the effects would be small.

** Estimated in 2000, and inflated to 2016: Morris JN, et al. A minimum income for healthy living. *Journal of Epidemiology and Community Health* 2000;54:885–889.

Figure 2: Percentage change in equivalised household income (before housing costs) for each policy, by SIMD 2016 quintile.



Effect on health and health inequalities

The baseline scenario, with no changes to taxation or benefits, would see 99,416 people dying prematurely (under 75 years of age) over the five-year period. Premature mortality rates would be 32% lower in the least deprived areas (1,648 per 100,000 population) than in the most deprived areas (2,426 per 100,000 population).

Given that our joint policy objectives are to **improve** health and **reduce** health inequalities we invert changes in premature deaths to give 'premature deaths prevented' (positive values = improvement), while presenting changes in health inequalities as negative if they represent a narrowing of the gap (negative values = improvement).

From the options modelled, increasing means-tested benefits by 50% is modelled to have the biggest effect on reducing premature mortality (5% prevented) and narrowing inequalities in premature mortality (-8%) (**Figure 3**). The results also suggest that the real Living Wage, Local Income Tax and increasing devolved benefits by 50% would be good policies for reducing premature mortality (~2% prevented for each). The two illustrative CBI schemes are also likely to be effective at narrowing health inequalities (-4% for CBI, and -6% for CBI Plus).

Any changes to taxation policy (shown by circles in **Figure 3**) were modelled to either improve health but worsen health inequalities (if taxes were decreased, and hence incomes increased), or worsen health while reducing health inequalities (if taxes were increased).

Which policies are most cost-effective?

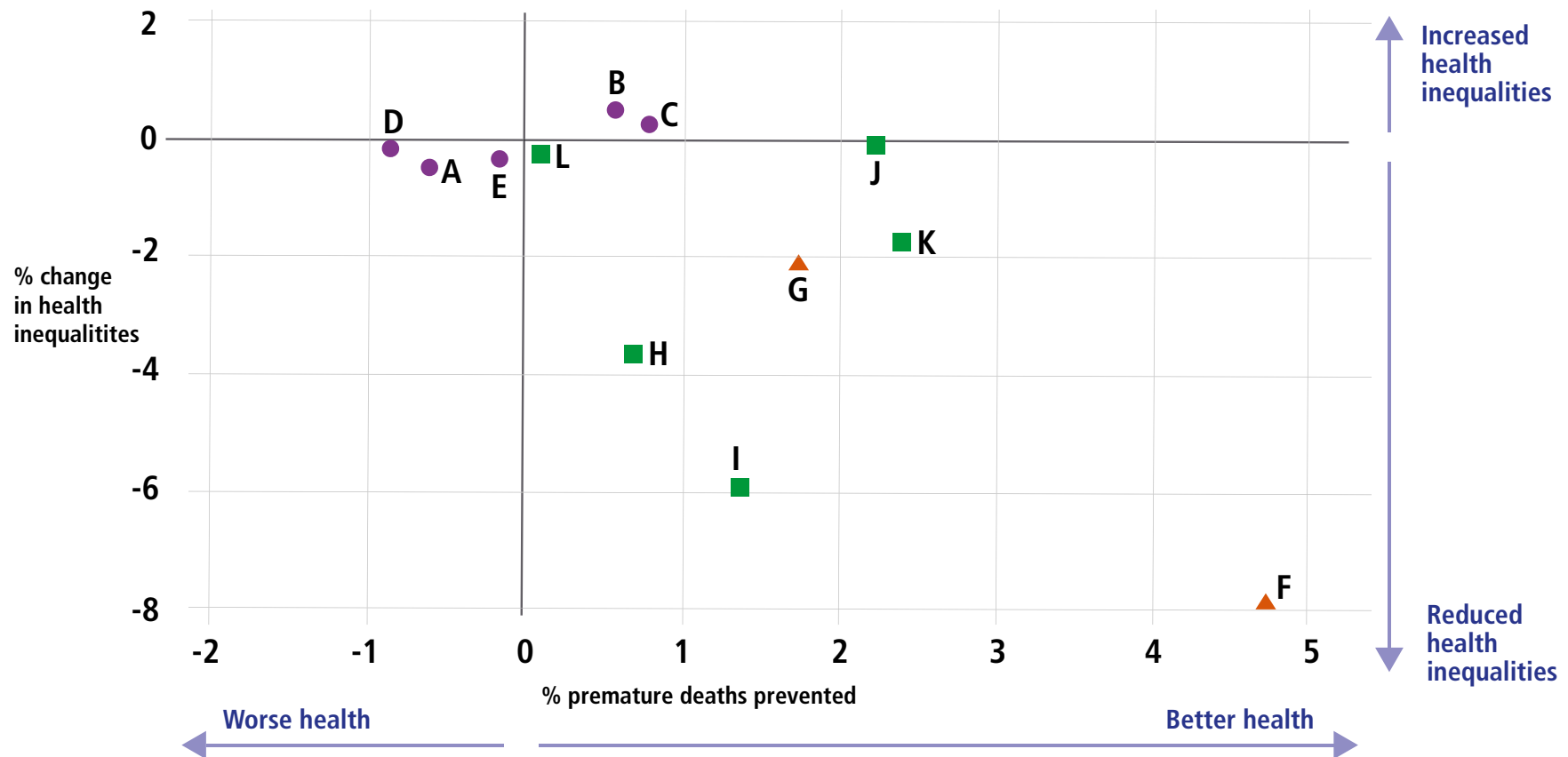
The net cost of each policy to the government was calculated relative to the baseline (no change) scenario (**Table 1**). The calculation accounted for changes in revenue from taxes and National Insurance contributions, and balanced these against changes in expenditure on benefits. Expenditure for the real Living Wage policy also included the increased wage bill, which would be borne by all employers, not just the government.

The size of the effect on premature mortality correlated closely with the cost to the government: more expensive policies would result in greater health gains, and cost-saving policies would be bad for health (**Table 1**). But this was not the case for health inequalities. This indicates that the design of the policy is more important than the cost.

For the seven policies that both improved health and reduced health inequalities we calculated cost-effectiveness (the cost per percentage point change). The results are shown in **Table 2**. The illustrative CBI Plus scheme (incorporating increases to Income Tax rates) was estimated to be most cost-effective for reducing premature mortality[#], while the illustrative CBI and CBI Plus schemes were estimated to be the most cost-effective for reducing health inequalities.

[#]Increasing benefit uptake by 1% appears more cost-effective from **Table 2**, but the full cost of implementing this policy has not been estimated.

Figure 3: Effects of each policy on premature death numbers and inequalities after five years, relative to baseline.



Taxation-based policies

- A Increase Income Tax rates by 1p
- B Decrease Income Tax rates by 1p
- C Increase Personal Allowance by £1000
- D Decrease Personal Allowance by £1000
- E Increase Council Tax



Benefits-based policies

- F Increase means-tested benefits by 50%
- G Increase devolved benefits by 50%



Novel policies

- H Introduce Citizen's Basic Income
- I Introduce Citizen's Basic Income Plus
- J Introduce Local Income Tax
- K Introduce real Living Wage
- L Increase benefit uptake by 1%

Table 1: Implications for health and health inequalities of each policy, relative to baseline, after five years. Policies are ranked in descending order of government cost.

Policy	Net government cost (£m pa)	Premature deaths prevented (%)	Inequality in premature deaths (% change)
Policies with net cost			
Means-tested benefits +50%	2,173	4.7	-8.0
Local Income Tax	1,288	2.2	-0.0
Real Living Wage	1,264	2.4	-1.8
Devolved benefits +50%	773	1.8	-2.2
CBI Plus	535	1.4	-5.9
Personal Allowance +£1K	513	0.8	0.2
CBI	442	0.7	-3.6
Income Tax rates -1p	429	0.6	0.5
Benefit uptake +1%	36	0.1	-0.2
Policies with net savings			
Council Tax increase	-135	-0.1	-0.4
Income Tax rates +1p	-429	-0.6	-0.5
Personal Allowance -£1K	-541	-0.9	-0.2

Notes:

1. The costs for increasing spending on devolved benefits calculated from EUROMOD do not correspond to expenditure on these benefits as published by the Department for Work and Pensions. This is most likely because benefit income is underreported in the FRS and we were unable to incorporate increases to certain benefits (see the supplementary information document).
2. Health inequalities are measured using the Relative Index of Inequality (RII): a regression-based index which summarises relative inequalities in health by socioeconomic status.
3. Government cost for Living Wage includes £2,148 million increased wage bill that is likely to be borne between the government and employers, minus the government's net savings arising from increased tax and National Insurance contributions, and reduced benefit expenditure.
4. Government cost for benefit uptake +1% excludes cost of implementing the intervention (income-maximisation advice services).

Table 2: Government cost (£m pa) per percentage-point improvement in premature deaths and health inequalities, for the seven policies that improved health and reduced inequalities.

Policy	Premature deaths	Inequality in premature deaths
CBI Plus	395	90
CBI	654	121
Benefit uptake +1%	386	146
Means-tested benefits +50%	460	273
Devolved benefits +50%	442	360
Real Living Wage	528	718
Local Income Tax	576	100,654

Notes:

1. The full cost of implementing 'Benefit uptake +1%' has not been estimated, hence these figures should be interpreted with caution.

Strengths of this research

The key strengths of this research are that:

- modelling different policies as we have done provides a flexible and efficient way of estimating their effects without implementing them
- we used a detailed model, incorporating a representative sample of Scottish households, hence the results are applicable to Scotland as a whole
- this work can inform decision-makers about resource allocation and policy formulation.

Key assumptions and limitations

The following assumptions and limitations should be considered when interpreting the findings in this briefing.

- These are theoretical policy options. The public acceptability of such policies and their wider impact on long-term outcomes have not been considered.
- The model assumes that each policy acts individually on a static system. It does not consider the impact of a specific policy on the wider Scottish economy and public finances.
- Owing to data availability we modelled implications for areas (grouped by SIMD deprivation) rather than individuals or households. The impact of each policy on household income is therefore represented by the average impact across households living in each SIMD quintile. In reality, areas grouped according to a certain level of deprivation will contain people with varying income levels.
- We assumed a causal relationship between income and mortality, in that an increase in income will cause a decrease in mortality. The causal nature of the income–health relationship at population level has been studied extensively, with other explanations such as reverse causality (i.e. poor health resulting in lower income) and confounding by health behaviours being largely refuted.
- Although there is strong and consistent evidence that level of income influences health, there is a lack of direct research evidence on if, and by how much, increasing household income reduces mortality. If the relationship is weaker than we have assumed, the impact on premature mortality estimated by our model will be similarly affected across all policies and therefore the relative findings will be unchanged. However, the results would show that the policies modelled would become less cost-effective (i.e. more expensive per percentage-point improvement in premature mortality and inequalities in premature mortality).
- The effects of a change in household income on health have been assumed to be immediate and constant over time.
- Behavioural responses to tax, benefit or income changes have not been modelled (e.g. a change in the decision to work or the number of hours worked).
- The different policies would vary in their cost to the government, and the results should be interpreted with this in mind. The net savings resulting from some policies (e.g. tax increases) could be redistributed in ways that have additional effects on health and health inequalities. Conversely, the net costs associated with other policies (e.g. benefit increase) represent funds that would need to be sourced from elsewhere, which also may have health consequences. Such additional health effects have not been modelled.

- The costs associated with the policy to increase benefit uptake rates by 1% are not well captured by a simple balancing of government income and costs. This policy would require investment in income-maximisation advice services, which have not been costed here.

Summary

Policies that affect household incomes influence health and health inequalities in Scotland. We estimated that the most effective policies for reducing health inequalities are likely to be those that disproportionately increase incomes for those with the lowest incomes. The modelling is subject to various assumptions and sources of uncertainty, but nonetheless highlights the importance of applying an inequalities lens to income-based policy options. The findings in this briefing should be used to inform discussion and debate about the potential health impacts of different income-based policies.

