## FULL/LONG TITLE OF THE STUDY

A natural experimental evaluation of UK welfare grants in pregnancy and the early years: a mixed methods study

## SHORT STUDY TITLE / ACRONYM

TBC

## PROTOCOL VERSION NUMBER AND DATE

| Version | Date | Changes from previous version |
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| 1.0 | 26th November 2025 | First version |
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## DISCLAIMER

## KEY STUDY CONTACTS

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|---|---|
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| Funder(s) | National Institute of Health Research<br>Public Health Research Programme (NIHR169237) |

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## STUDY SUMMARY

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| Study Title | A natural experimental evaluation of UK welfare grants in pregnancy and the early years: a mixed methods study |
| Internal ref. no. (or short title) | Health impacts of early years' welfare grants |

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| Study Design | Mixed methods natural experiment evaluation |
| Study Participants | Children born in the UK 2002-2025 |
| Planned Size of Sample (if applicable) | Quantitative analysis: All children born in in the UK 2002-2025 and present in the relevant administrative datasets. Around 15 million.<br>Qualitative analysis: Purposive sample of 80 mothers (20 in each UK nation) from low-income families across 2011-2025. We will ensure coverage of the following priority family types: lone parents, large families, parent / child with a disability, ethnic minority groups and young mothers. |
| Planned Study Period | 2002-2025 |
| Research Question/Aim(s) | Aim: To understand the impact of UK early years welfare grants on maternal and child health outcomes and inequalities<br>Research Questions:<br>RQ1: What is the impact of restricting the Sure Start Maternity Grant (SSMG) to the first child, on the outcomes of second children in each of the UK nations?<br>RQ2: What is the impact of replacing SSMG with the Best Start Grants (BSG) on the outcomes of children in Scotland compared to the other UK nations?<br>RQ3: What is the impact of restricting SSMG to the first child on population-level inequalities in outcomes in second children in each of the UK nations?<br>RQ4: Do the effects of SSMG and BSG (RQ1-2) vary in strata of area-deprivation or poverty risk (captured by e.g. single parent families, families with a younger mother, larger families (>2 children)).<br>RQ5: Are there long-term benefits and public sector cost savings of SSMG for all children compared with SSMG restricted to the first child?<br>RQ6: Are there long-term benefits and public sector cost savings of BSG compared to SSMG? |

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|---|---|
| | RQ7: What changes to these schemes (e.g. in terms of dose and eligibility) would policy makers and citizens prioritise?<br>RQ8: What does current evidence suggest the impact on inequalities might be of these policy alternatives? |

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## ROLE OF STUDY SPONSOR AND FUNDER

The study is sponsored by the University of Glasgow. The University holds insurance providing cover for the design of the research study protocol. Otherwise, the sponsor has no role in study design, conduct, data analysis and interpretation, manuscript writing, and dissemination of results.

The funder has no role in study design, conduct, data analysis and interpretation, or manuscript writing. Dissemination will be subject to NIHR's requirements for Publication and notification: https://www.nihr.ac.uk/documents/nihr-research-outputs-and-publications-guidance/12250#Notifying_NIHR_of_upcoming_research_outputs

## ROLES AND RESPONSIBILITIES OF STUDY MANAGEMENT COMMITTEES

An Oversight Group will provide independent oversight of the project. It will be independently chaired by Professor Jean Adams, University of Cambridge. The group will meet twice a year.

The Data Management and Ethics Committee will meet once a year and will provide oversight for the recruitment and data collection for the qualitative interviews. The group is chaired by Dr Shelina Visram.

As described in the Research Protocol below, a Lived Experience panel and a Stakeholder panel will provide input into all aspects of study design, interpretation, and write-up, plus oversight of the project. Up to five, paid, peer researchers based in Scotland will receive training and support the qualitative aspects of the research.

The Study Management Group will comprise both co-PIs, all work-package (WP) co-leads and pour public member Co-Is, with peer researcher representation where appropriate. The group will meet every month to discuss progress against the timetable and milestones, data management, project risks, and to ensure collaboration and co-ordination across work packages such that the project is delivered on time and to a high standard.

## PROTOCOL CONTRIBUTORS

This protocol was developed by all of the study investigators.

The research aims and objectives were shaped by conversations with members of the public, including primary school children living in areas of high social disadvantage, who helped us in the selection of our outcomes and our plans to look at differential effects of the welfare grants according to area-level deprivation and family size. Focus groups with people with lived experience of income insecurity in Scotland highlighted the importance of examining household circumstances (e.g., parents of children with a disability, new mothers, lone parents) and an interest in looking at the restrictive eligibility criteria such as the Universal Credit two-child limit.

Stakeholders from the Maternal and Child Health Network (MatCHNet), spanning child health services, community groups, poverty charities, local government, and public health agencies from across the 4 UK nations, noted a clear need for policy evaluation, with grants and cash payments in the early years rated as highest priority. Their discussions also informed our decision to incorporate a qualitative element in the research, to better understand how these policies are experienced on the ground.

## KEY WORDS

Health inequalities, child and maternal health, early years, welfare policies, natural experiment evaluation

## STUDY PROTOCOL

A natural experimental evaluation of UK welfare grants in pregnancy and the early years: a mixed methods study

### Background and Rationale

There is a wide-ranging evidence base, including from systematic reviews, showing large socio-economic inequalities in child and maternal health in the UK and elsewhere[1-4]. These inequalities are apparent from the point of birth and persist across the life course and generations[2, 3]. Health inequalities are costly to the NHS, the economy and society[5]. Therefore, reducing health inequalities is a priority. It is widely accepted that one of the best times to intervene to reduce health inequalities is during the early years, since pregnancy and the first 1001 days are considered critical periods and intervening during this time can maximise children's life chances[6]. It is also acknowledged that 'upstream' actions – i.e. on the structures within societies which create and influence how money, power and resources are distributed across the population, are the most effective way to improve population health while also reducing inequalities[7, 8].

The UKPRP-funded Maternal and Child Health Network (MatCHNet) conducted a comprehensive policy review to identify opportunities to evaluate upstream policies with the most potential to impact on child and maternal health and health inequalities[9]. In collaboration with stakeholders, we identified policy areas of consensus for future evaluation, recognising ongoing policy evaluations[10]. One-off grants given to low-income families to provide financial support during key points in the early years (e.g. during pregnancy) were highly prioritised by the group.

Our scoping of the existing evidence base, carried out by MatCHNet and during an evaluability assessment of the Scottish Child Payment, indicates a wide range of systematic reviews linking family income and child/maternal health, including birth outcomes and infant mortality[11-16], breastfeeding[14], physical/cognitive development[12], and child/maternal mental health[13-15, 17] . When combined with well-designed observational studies[18-20], this offers irrefutable evidence that poverty is damaging to children's health, affecting growth in utero, birth outcomes and physical, emotional and cognitive development[2, 3, 21]. Trials and natural experimental evaluations of one-off cash payments to mothers during pregnancy have been shown to reduce prematurity[21] and, improve health-seeking behaviours[22], birthweight and child development[12]. Cash transfers at other points in the early years have also improved birth outcomes[15, 16], although a recent evaluation of the US cash gift trial, Baby's First Years, showed fewer benefits than expected[23]. Most of this evidence, however, comes from low- and middle-income countries or the US[11], limiting its applicability to the UK.

A small number of studies have evaluated the health impacts of relevant UK policies that provide one-off cash grants, vouchers to buy healthy foods, and in-kind contributions during pregnancy. For example, Scotland's national Baby Box Scheme, which provides essential items to all pregnant women, was found to reduce infant and primary carer tobacco smoke exposure, and increase breastfeeding among young mothers[24][17]. The Health in Pregnancy Grant (HPG) - a universal one-off, tax-free payment of £190 given to pregnant women at >25 weeks gestation - ran from 2009 to 2011. An evaluation in Scotland found the policy increased the odds of booking before 25 weeks by 10 percent[22], but had no effect on birthweight. By contrast, an HPG evaluation in England and Wales found important increases in birthweight and reductions in prematurity[18] and that the mechanism was not the policy conditionality (i.e. accessing health professional advice) but the cash itself. An evaluation of Healthy Start, a means-tested weekly voucher scheme to encourage healthy eating (which, in 2015, was worth £3.10 per week), found no effect on vitamin use pre and during pregnancy and inconclusive evidence for impacts on infant feeding[25]. There is evidence that the greatest benefits of cash payments are experienced by vulnerable groups such as younger mothers[24, 26] and black, single, low-educated mothers[27]. Collectively, this evidence implies that relatively small increases in income offer potential for tackling health inequalities, although further evidence is needed - particularly for UK schemes.

The UK Sure Start Maternity Grant (SSMG), introduced in 2000, is a one-off means-tested payment during pregnancy of £500. It comes with no conditions on how the money is spent. In

April 2011, SSMG was restricted to the first child (in most cases, see Box 1), with the potential to widen inequalities by increasing poverty in larger families. In Scotland, this was replaced by the Best Start Grant (BSG) in 2018. This provides three payments: the pregnancy and baby payment (£767.50 for first-born children, £383.75 for all other children after that), the early learning payment (£319.80 for all children) and the school age payment (also £319.80 for all children). In 2022-23, £25 million was spent on SSMG payments in England and Wales[28], with £19.5 million spent on BSG in Scotland[29]. More information on these two grants is provided in Box 1.

As shown in Figure 1 (Logic Model), both policies have the potential to positively impact upon child health and health inequalities, by targeting payments to those in greater need during a sensitive period in the life course. However, there has been no outcomes evaluation of either the SSMG or BSG since their introduction, with limited in-depth qualitative insights into the health effects of SSMG[30] and a lived experience panel[31]. Importantly, the impacts of restricting SSMG payments to first born children are not fully known. In addition to dampening the population-level health benefits (by supporting fewer children) the potential for SSMG to narrow inequalities may have been undermined, since children from less advantaged backgrounds tend to have more siblings. An interim evaluation of BSG commissioned in 2020, two years after its introduction, ruled out a quantitative evaluation due to limited data availability. Their qualitative study interviewed 36 parents after the policy’s first 18 months, focusing only on the impact of the Pregnancy and Baby Payment. The evaluation examined barriers and supports to grant uptake, how the money was spent, changes to perceived family finances, and how reduced financial pressures had a knock-on effect on perceived health and wellbeing. More in-depth work is required to understand the different aspects of health that could have been affected, and with respect to all BSG payments.

**BOX 1:** further details of grants

*Sure Start Maternity Grant*

The SSMG must be claimed within 11 weeks of the baby's due date or within 6 months after the baby's birth. Eligibility: no other children under the age of 16 and the mother/carer or their partner are in receipt of one or more of the following: Income Support, income-based Jobseeker's Allowance, income-related Employment and Support Allowance, Pension Credit, Universal Credit, or potentially if getting a Support for Mortgage Interest loan. The payment is made into a nominated bank, building society or credit union account. Payments may also be made for if expecting a multiple birth (such as twins), to a carer for someone else's (but not your partner's) child and the child was over 12 months old when the arrangement started, people with refugee status, humanitarian protection or those from Afghanistan or Ukraine, or if claiming for a family member who's under 16. The postal form must be completed, with phone-line offering support and alternative formats available (braille, large print or audio CD).

*Best Start Grant*

The first, 'pregnancy and baby' payment, can be applied for from the 24th week of pregnancy; the early learning payment when the child is aged between 2 and 3 years 6 months, and the final school age payment during the year that the child is first old enough to attend school. Eligibility: mothers/carers who are under the age of 18 or they (or their partner) are in receipt of: Universal Credit, Housing Benefit, Income Support, Pension Credit, income-based Jobseekers Allowance (JSA), income-related Employment and Support Allowance (ESA). It is administered by Social Security Scotland and applied for via a form (which can be completed online, over the phone, or in hard copy and posted). It takes around 10-20 minutes to complete. Payments are made directly into a nominated bank account or in the same way that other benefits (such as Universal Credit) are made.  Help can be provided by Social Security Scotland to complete the form if required and forms can be made available in other languages and in large print.

In the context of rising child poverty rates, a change in UK government and its commitment to developing a child poverty strategy[32], and the recent pledge by the Scottish Government to abolish the Universal Credit two child limit and eliminate child poverty [33], the need for rigorous and full evaluations of these policies is pressing. These should consider their effectiveness, the consequences of changing eligibility criteria based on family size, the implications for health inequalities and, in the longer-term, consequences for health across the life course and for public sector finances. Children's charities, advocacy groups, academics and some politicians are fighting for changes to these benefits, including uprating the SSMG (which has remained at £500 since 2002) and the abolition of restrictions on the basis of family size[30, 31, 34, 35]. However, governments are under increasing financial pressure and in need of evidence about where and how to spend. Without rigorous evaluation there is a risk that resources will be wasted on ineffective interventions or that opportunities to improve the design and administration of valuable interventions are missed.

## Aim

To understand the impact of UK early years welfare grants on maternal and child health outcomes and inequalities.

## Research Questions

RQ1: What is the impact of restricting SSMG to the first child, on the outcomes of second children in each of the UK nations?
RQ2: What is the impact of replacing SSMG with the BSG on the outcomes of children in Scotland compared to the other UK nations?
RQ3: What is the impact of restricting SSMG to the first child on population-level inequalities in outcomes in second children in each of the UK nations?
RQ4: Do the effects of SSMG and BSG (RQ1-2) vary in strata of area-deprivation or poverty risk (captured by e.g. single parent families, families with a younger mother, larger families (>2 children))?
RQ5: Are there long-term benefits and public sector cost savings of SSMG for all children compared with SSMG restricted to the first child?
RQ6: Are there long-term benefits and public sector cost savings of BSG compared to SSMG?
RQ7: What changes to these schemes (e.g. in terms of dose and eligibility) would policy makers and citizens prioritise?
RQ8: What does current evidence suggest the impact on inequalities might be of these policy alternatives?

## Research Plan and Methods

### *Design and conceptual framework*

Natural experimental methods evaluate policies that vary between regions and countries when randomised controlled trial designs are not possible. Following updated natural experiment guidance, we propose a mixed methods approach combining quantitative evaluation (WP3), qualitative approaches (WP1&4) and health economics (WP5). We will use multiple datasets (WP2) in the evaluation to account for different biases. Integration of findings (WP0) from the quantitative (WP3) and qualitative analysis (WP4) will support choices about prioritisation of outcomes and stratification groups, aid interpretation of the results and provide ideas for future policy innovation. Our main guiding paradigm is critical realism, whereby the quantitative work provides causal effect estimates and the qualitative work sheds light on contextual effects and possible mechanisms. As noted in the background, our approach is informed by the social determinants of health framework and the importance of upstream determinants[3, 36], as well as theories around how health inequalities may arise or be altered, including via differential exposure to, and differential effectiveness of, social policies[3, 37].

### *Control comparator group*

As it is not possible to determine who receives SSMG and BSG from routine data sources (since benefits data are not available), we propose an intention to treat analysis using proxies for eligibility, such as area deprivation, combined with birth order. The Scottish Government evaluation of BSG found that out of all eligible families, 45% were in the most deprived quintile of the Scottish Index of Multiple Deprivation (SIMD1) and 26% were in SIMD2, followed by 15%, 9% and 4% in SIMD3-5[38]. We are also interested to observe any impacts on health and health inequalities at the population level.

SSMG was available for all children from 2003, then in January 2011 it was restricted to 1st child in UK. In 2018, Scotland replaced the SSMG with the more generous BSMG, and SSMG was kept in the other UK nations (England (E), Wales (W), Northern Ireland (NI). Figure 2 details the comparisons.

Three effects will be estimated as follows:
(1) **SSMG vs. nothing in UK for 2nd born children**, estimated by comparing SSMG £500 for 1st child vs. nothing for 2nd child, stratified by UK nation (excluding NI).
(2) **BSG vs. SSMG in Scotland for 1st born children**; E, W, NI will be additionally used as a comparator.
(3) **BSG vs. nothing in Scotland for 2nd born children;** E, W, NI will be additionally used as a comparator.

Inequalities for all comparisons will be assessed using Indices of Multiple Deprivation, and additionally in Scotland the social class of mother and family structure. We will examine differential policy effects in other priority groups (e.g. single parents, large families) to be determined with input from our Stakeholder and Lived Experience panels.

*Progression criteria and milestones*

Main milestones and their timings are outlined for each work package (WP) in the Flow Diagram. Progression criteria include unnamed research staff recruited, stakeholder and lived experience panels recruited, datasets prepared for analysis, peer researchers recruited and trained, participants recruited for the qualitative interviews, analysis protocols published, interim policy reports, blogs, and podcasts being shared, downloaded, cited and prompting inquiries for further information, journal articles published and highly cited, policy reports published and highly cited, sustained engagement from stakeholders and Lived Experience Panel, attendance at our final dissemination event.

*Planned intervention*

Sure Start Maternity Grant (SSMG)
SSMG was introduced in all UK countries in 2000 as a one-off payment of £300, providing financial assistance to low-income pregnant women. It increased to £500 in 2002 and remains unchanged. Since January 2011, SSMG was restricted to first born children. We will use the increase to £500 to define 2003 as the baseline year.

Best Start Grant (BSG)
In 2018, Scotland replaced SSMG with BSG, a means-tested benefit with three components. The Pregnancy and Baby Payment (£767 for first child, £383 for subsequent children) replaces SSMG. Additional elements of the Early Learning Payment (£319 per child aged 2-3.5 years) and the School Age Payment (£319 per child aged 4.5-5.5 years) have no equivalent in other UK nations. The new grants provide financial support to low-income families during key transition periods in a child’s life beyond pregnancy.

*Setting and Study Population*

Children aged 0-6 years born 2003-2024 and their mothers in the UK. We have two methods to define the study population, one for the quantitative analysis and is detailed in WP3, and one for the qualitative analysis and is detailed in WP4.

*Sampling*
*Quantitative Datasets*
*Clinical Practice Research Database (CPRD):*
Approximately 3 million births from 2003-2024 across a network of more than 2000 UK GP practices

*Linked administrative data:*
Health and administrative records (these vary by country but include birth registrations, maternity hospital episodes, child health checks, early years development/school readiness assessments)

Scotland (Scottish Linked Pregnancy & Baby Dataset [SLiPBD][39], with additional linkage to child health records): ~50,000 births per year
Wales (SAIL Databank[40]): ~30,000 births per year
Northern Ireland (NI Maternity Dataset with linkage to the Child Health System (CHS) (Health & Social Care Northern Ireland, Honest Broker Service): ~23,000 births per year
England (ECHILD/Hospital Episode Statistics/National Pupil Database): ~600,000 births per year

There are 468 weekly pre-intervention data points (2003-2010) and 364 post-intervention (2011-17) = 832 data points for SSMG analysis, and 321 weekly pre-intervention data points (April 2011-17) and 364 post-intervention (2018-24) = 676 data points for SSMG analysis. Both substantially exceed minimum requirements for interrupted time series analysis[41].

*Qualitative interview sample*
For each UK nation: 10 low-income mothers (with at least one child born April 2011-2017) and 10 low-income mothers (child born since 2018). Inclusion criteria: low-income mothers with coverage of the priority groups (listed below), child born since April 2011 or 2018, all children born in UK. Priority groups: single parents, disabled, 3+ children, ethnic minority, youngest child less than 1, mothers aged <25 (recognising categories are not mutually exclusive).

*Outcome measures*

To fully understand the holistic effects of the policies and in accordance with natural experiment evaluation guidance, we will analyse a range of outcomes (see logic model). These were prioritised by our stakeholder engagement and will be further prioritised through stakeholder and lived experience panel involvement and through findings from the qualitative work.

We have three primary outcomes for the quantitative analysis - one for the mother, one for the infant/child, and a joint outcome that is related to the behaviour of the mother and health of the infant/child:

- Maternal mental health (any prescription for anxiety and/or depression for the mother)

- Hospitalisations in the child (from 6 months to 5 years)
- Immunisations included on the child vaccination schedule up to 6 years.

Primary outcomes were chosen based on the likelihood of being affected by the policies and to track across into the economic models, and availability, quality and completeness in the administrative datasets. We propose a range of timings of the outcomes according to different lifecourse periods (e.g. at child age 6 months-2 years, 2y-4y, 5y-6y). Exact ages at measurement will vary depending on data availability and completeness in the different countries. Our primary measures will capture outcomes beyond age 6 months, since both grants can be claimed from 11 weeks' gestation up until the child reaches 6 months. We will also consider outcomes before this age, subject to findings from WPs 1 and 4, which seek to improve our understanding of average timing of uptake. We have proposed outcomes up to 6 years, as it is important to understand the longer-term impact on both health outcomes and economic modelling, as well as the immediate impact on outcomes.

The qualitative interviews will take a broader view of health, leaving participants to raise aspects of health that are important to them in the context of their life history, as well as asking specifically about the primary outcomes in the quantitative analysis. Secondary outcomes will be identified during qualitative interviews (WP4), as well as with our Lived Experience and Stakeholder panels, and prioritised with the lived experience panel and other stakeholders in conjunction with data availability and quality. Those raised in initial engagement work and data scoping include child physical, social and cognitive development, primary health care contacts, child mortality rates, adverse childhood experiences, overweight and obesity, and fertility rates.

*Methods for data collection and analysis*

These are now described for each WP in turn. Figure 3 provides a visual display of the work packages and how they relate to each other.

<u>WP0: Triangulation and integration of findings (RQ1-4,8)</u>

Triangulation of findings across datasets and countries, together with integration of qualitative and quantitative analysis with stakeholder and public perspectives, is a key feature of natural experimental evaluations[42], allowing us to identify remaining knowledge gaps and ensure analytical robustness. WP0 will oversee this integration.

Our integration of findings from the different work packages will occur across the three years, using a mix of exploratory and explanatory designs. For example, the qualitative interviews in WP4 can inform which sub-groups we examine in WP3, when studying the impacts of inequalities and carrying out sensitivity analyses to consider the consequences of differential uptake of the policies. The quantitative elements of the work will inform the qualitative work if, for example, we find unexpected results or we are unable to examine outcomes or subgroups that cannot be measured in the data. Assessment of policy uptake and timing of uptake will be undertaken by several WPs (e.g. WP1 in discussions with stakeholders, WP4 during qualitative interviews, with WP2 seeking official statistics via a freedom of information request). This information will be used to inform sensitivity analyses in the quantitative evaluation. The evaluation evidence, supplemented with continuous scoping and synthesis of evidence from other research and findings collated from WP1 (from our stakeholders and Lived Experience

Panel), will be used to update the logic model, ensure generalisability across the UK, and understand how early years' policies influence health and impact on population health inequalities, under different conditions.

Integration of the quantitative and qualitative findings will occur across the life of the project and in particular during the final 6 months of the project. RD, AP and GF will carry out the integration, with input from the other WPs. Once complete, we will use the "extended pillar approach" to fully integrate the findings. This mixed methods approach provides explicit steps on how to integrate findings from qualitative and quantitative methods, transparently and consistenly[43]. A joint display will be created to visualise the commonalities and differences arising across the different methods. Peer debriefings, with researchers from all work packages (including peer researchers) will be carried out to check the joint display for completeness and accuracy. Collectively, we will use the finalised joint display to identify the meta-themes. The process of sorting these into the overarching meta-themes will be carried out in consultation with our stakeholders and Lived Experience Panels. We will then use these meta-themes to co-produce future policy scenarios and changes to early years' welfare schemes, with decision-makers and citizens, for dissemination to policy audiences and examination in future research.

### WP1: Engagement and impact

WP1 aims to maximise the relevance of the research to decision makers and citizens who are directly affected by the policies. It will take a deliberative approach, across a series of meetings. This WP is subdivided into activities with policy and public members below, with findings fully integrated across the work.

#### *WP1a: Policy stakeholders*

We will convene a representative group (n=25) of civil servants in national and local government, public health and child health professionals, advocacy groups, and data officials, with coverage across all 4 UK countries. We will hold two half-day workshops, timed to take into account findings from the Lived Experience Panel meetings, with interim updates and discussions as required:

Meeting 1 (month 5): We anticipate there to be three main aims of the session, although we will seek members' views on this prior to the workshop (see WP1b).

1) We will use our preliminary policy timeline, which documents changes to the SSMG and BSG, supplemented by a scoping review of the grey literature, to discuss the details of these policies. We will include other relevant policy changes that have occurred over the same period (e.g. Scottish Child Payment and Best Start Foods) and consider how to account for this in our analyses. A horizon scanning discussion will seek to anticipate future changes to policy, strategy or evaluations and how our research questions might be received across the UK countries within the current and anticipated policy contexts.
2) We will present the logic model (see attachment) and collectively decide on any additional details or refinements required. We will discuss the proposed outcomes and subgroups and feed back and discuss priorities from the Lived Experience Panel.
3) We will stimulate discussion around the complexities of estimating the effectiveness of SSMG and BSG, which may include uptake rates, timing of uptake, and how these have changed over

time. We will collectively identify which of these complexities might be addressed in the quantitative analysis and any important gaps that can be filled within the qualitative work.

Meeting 2 (month 30): We expect this session to focus on the following areas:

1) The main findings from the quantitative and qualitative evaluations will be presented, along with citizens' views on the findings collected through WP1b. We will prompt discussion around their views and interpretations of the results – what is expected or surprising, concerning or positive? Are there any final issues to explore in the analysis?
2) We will explore members' views on whether, based on the findings, these policies should be changed. We will present example options (e.g. to the dose, eligibility criteria or how the payments are administered), informed by a contemporary policy document analysis and the views of the Lived Experience Panel, and ask for additional ideas, guided by their opinions on what would be feasible and credible. We will collectively consider which priorities can be further explored, in the final stages of the project or in future research.
3) Finally, we will agree a final dissemination plan and what to include in the final dissemination event. We will seek their support in maximising the reach of the outputs.

Between the face-to-face workshops, we will continuously horizon scan for new plans, strategies and evaluations, to account for potential shifts in the policy landscape and contemporary policy development and debate. We will provide the group with interim updates, for example via email updates, voting polls, and online visual collaboration tools (e.g. Padlet).

We will record the workshop discussions, fully transcribe them and apply a thematic coding framework. *A priori* codes will be drawn from our broader research questions and findings emerging from other WPs. Our coding will be flexible enough to permit new themes to be included. So far, we have agreement from ten stakeholders to join the group and we will use their contacts and the MatCHNet membership to recruit further members.

### *WP1b: Lived Experience Panel*

Our Lived Experience Panel, convened with support from Byres Community Hub and our stakeholder advisory group, will ensure our research is informed by the lived experience of families impacted by early years' welfare policy decisions. Their role is to scrutinise plans and emerging findings, including our proposed outcomes, priority groups, results, outputs, policy options and impact plans. We will recruit 32 members, across all UK countries, who have lived experience of social disadvantage and, in some cases, the relevant policies. We will hold four in-person and four online, half-day meetings. The first and final meetings will share the same discussion points and goals as those of the stakeholder meetings in WP1a, allowing full integration of findings:

First meeting (~month 4): This meeting will focus on the existing (and past) benefits systems and the lived experiences of the panel of these. We will use creative and accessible approaches to discuss these experiences in the context of our logic model, the proposed outcomes, and priority groups. We will collectively agree the main discussion points arising from this session to include in the first stakeholder advisory group meeting as part of those deliberative discussions.

Meetings two to seven (months 5-30 as needed) will be used to update on progress and feedback on how we are addressing the groups' priorities and suggestions or otherwise explain why we have been unable to do so.

Final (eighth) meeting (month ~30): This meeting focusses on the findings collated across work packages 2-5. We will reflect on the health impacts of the two policy changes, the differences across devolved nations and variation across different social groups. We will decide on the main messages, how to frame them, and modes of dissemination. Following this, we will explore new policy options to put to the stakeholders in their final meeting. We will ask for their views on the final dissemination event and their involvement.

Meetings will be recorded and transcribed. We will create decision logs and share these with the panel for sign off, ensuring full accountability. These meetings will be chaired by SM (public engagement Co-I lead) and will have representation from the peer researchers and all other WPs so that the panel are able to fully scrutinise the work. The peer researchers will support the planning of these meetings, shaping the methods and materials used during the sessions, and presenting to the group. Researchers from all relevant WPs will support the preparation and content of the stakeholder and Lived Experience workshops, as necessary. AP and GF will be responsible for feeding the synthesised recommendations and actions from the stakeholder workshops back to the relevant WPs, with SM doing the same for the Lived Experience Panel. Oversight of this process and harmonisation of timelines and tasks will take place in WP0.

WP2: Quantitative data acquisition and understanding (RQ1-4)

WP2 will coordinate the acquisition and management of data in all four nations of the UK. This WP will also provide expertise to the other work packages, to determine if data are available to evaluate the outcomes, define the stratification groups, and determine policy changes that the stakeholders and Lived Experience Panel prioritise. We will provide data insight when interpreting findings from the evaluations. The work can be broadly divided into five tasks:

*1) Mapping and acquisition of data*
An umbrella protocol will be developed to use across all nations to obtain the necessary approvals for the project. Key outcomes and covariates of interest will be mapped to the data available in each nation with input from the Co-Is, data providers and priorities set by the policy stakeholders and Lived Experience Panel. The data mapping will be used by WP3 when finalising the analysis plans. Each co-lead will work with the post-doctoral Research Associate (PDRA) to use the umbrella protocol, and data mapping to complete their national application process.

*2) Data cleaning and standardisation*
Data will be cleaned and assessed for completeness to determine if it is of sufficient quality before inclusion in the analysis. The data from each nation will then be standardised to a common data model an adapted version of the Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM), for pregnancy early years health data[44]. This will allow for the direct comparison of data between the four nations. Cross-coding checks will be carried out for key variables by the PDRAs working on the different datasets, overseen by the PDRA based at the University of Glasgow, with support from the Co-Is.

*3) Data characterisation*

Data in each nation will be assessed to determine the quality of mother-child linkages, including collating current descriptions where already published, and producing new analysis to describe the proportion and pattern of missing data and descriptive statistics for key outcomes and covariates of interest. The data characterisation will be used, for example, to restrict the data to years with more complete information and will feed into other work packages such as WP3.

As shown in Table 1, not all outcomes are covered by all datasets for all nations, but all will be used to consider policy impacts, using a jigsaw approach.

For some datasets (e.g. the CHS) this will be their first use for research purposes. These will therefore be treated as a supplementary dataset but have great potential to grow national capacity.

*4) Data access and storage*

Only named and approved researchers will be able to access the data. In all four countries, data will be stored and accessed in national (e.g. ONS, PHS) or institutional data safe havens or on Secure Research Platforms, as appropriate.

A distributed analysis approach will be taken, with WP3 providing a central analysis script run locally or on the relevant secure platform on the standardised data sets to produce output tables. All individual-level data will remain in the source nation (where relevant). Code used to create these will be made publicly available (for example in GitHub or the Open Science Framework).

*5) Provision of results to other work packages*

Depending on the requirements of the different data owners, results will be cleared for internal sharing with RD (as Co-lead of WP0) to ensure consistency and oversight across all WPs. Once finalised, results will be cleared for wider release for sharing with the other work packages. WP2 co-leads will provide continuous insight into the interpretation of results.

Table 1: Coverage of *primary outcomes* across the UK nations and in relation to the two policies of interest

| | **Policy A: One child limit in SSMG**<br>Time series: 2003-2018;<br>Interruption: 2011<br>Case: 2nd born children<br>Control: 1st born children | **Policy B: Change from SSMG to BSG**<br>Time series: 2011-2025;<br>Interruption: 2018<br>Case: Scotland<br>Control: rest of UK |
|---|---|---|
| Child Hospitalisations (6m-6y) | E (ECHILD/HES, 2003+), S (SMR01, 2000+), W (SAIL, 1997+) | E (ECHILD/HES, 2003+), S (SMR01, 2000+),<br>W (SAIL, 1997+), NI (PAS, 2008+) |
| Mother: Prescribing for anxiety/ depression in mother (6m-6y) | E (CPRD), S (PIS, 2008+), W (SAIL, 1997+) | E (CPRD), S (PIS, 2008+), W (SAIL, 1997+), NI (EPD, 2010+) |
| Immunisation uptake (6m to 6y) | E (CPRD), S (SIRS, 2002+), W (SAIL/NCCHD 1987+) | E (CPRD), S (SIRS, 2002+), W (SAIL/NCCHD 1987+), NI (CHS 2004-24) |

E: England, S: Scotland, W: Wales, NI: Northern Ireland. ECHILD: Education and Child Health Insights from Data; HES: Hospital Episode Statistics; SMR01: Scottish Morbidity Records 01; SAIL: Secure Anonymised Information Linkage Database; NCCHD: National Community Child Health

Database; PIS: prescribing information system; CHS: Child Health System; SIRS: Scottish Immunisation Recall System; PAS: Patient Administration System; EPD: Enhanced Prescribing Database; CPRD: Clinical Practice Research Datalink.

WP3: Quantitative evaluation (RQ1-4)

We will use controlled interrupted time series (CITS)[45]to estimate the population-level health impacts of 1) restricting SSMG to the first child in the family and 2) replacing the SSMG with the BSG in Scotland. Interrupted time series allows for an estimate of the change in level of outcome at the point of intervention and an estimate of the change in trend of the outcome post-intervention. A change in level indicates an immediate effect of the intervention and can detect an increase or decrease in the outcome. A change in trend post-intervention (either increase or decrease) indicates a gradual change in the outcome during the post-intervention period. The use of control groups (for example countries or demographic groups where a policy change did not take place) strengthens the ITS design by accounting for confounding influences which may have changed over time (e.g. cost of living) but would be expected to impact on all groups equally.

The analysis displaying intervention and control time periods for each country is visualised in the Logic Model and Figure 1.

To estimate the impact of restricting SSMG to the first child in the family we will compare the outcomes for 2nd children who could have received SSMG from 2003-2011 to those who would not have been eligible from April 2011-2018. Any change in the intervention group will be compared with a change in the control group, 1st born children. We can do this for England using ECHILD and CPRD, Scotland using SLiPBD and Wales using SAIL datasets.

To estimate the impact of replacing SSMG with BSG in Scotland, we will compare the outcomes for 1st born children who could have received SSMG from April 2011-2017 to those who could have received BSG from 2018-2024. This will capture the impacts of the higher value payments of BSG compared to SSMG. There will be three control groups: 1st born children in England, Wales and Northern Ireland. We will repeat this analysis for 2nd children to capture the total effect of BSG, since 2nd born children in other UK nations would have not received SSMG.

To carry out the CITS analysis, we will fit a trend line to observations from 2003-2011 before the restriction of SSMG in 2011 to estimate the baseline trend as a hypothesis of the trajectory the outcomes in each country for 1st and 2nd born children would have followed if the SSMG had not been restricted. We will then fit an intervention trend line to data from April 2011-2018 to estimate the changes in trend and level of outcomes from the start of the restrictions to SSMG.

To carry out the CITS analysis for BSG, we will fit a trend line to observations from April 2011-2017 before the introduction of BSG in 2018 to estimate the baseline trend as a hypothesis of the trajectory the outcomes in each country for 1st and 2nd born children would have followed if the BSG had not been introduced. We will then fit an intervention trend line to data from 2018-2024 to estimate the changes in trend and level of outcomes from the start of the introduction of BSG.

We will test for autocorrelation using Durbin-Watson tests, and autocorrelation function plots. We will apply corrections to our final models if autocorrelation is evident from the tests.

We will explore a synthetic control design for the BSG analysis using regions or Local Authorities in the rest of the UK[46]. A synthetic control is a weighted average of untreated units that closely matches the pre-intervention characteristics, including prior observations of the outcome, of the treated unit. This approach ensures that the control group effectively serves as a reliable counterfactual for estimating treatment effects. We will explore the availability of complete and useable data for each data set (WP2) at Local Government level and will conduct synthetic control analyses where the data allows.

As SSMG and BSG recipients are not known from the administrative datasets, sensitivity analysis using different uptake scenarios identified in WP0 will be carried out, including differential uptake across the priority demographic groups.

Inequalities will be considered for all comparisons, using indices of multiple deprivation, and additionally in Scotland the social class of mother, single parenthood and family size. We will examine differential policy effects in other priority groups (e.g. single parents, large families) to be determined with our Stakeholder and Lived Experience Panels. This will include looking for differential effects within these different groups, as well as changes in population-level inequalities (agnostic to the birth order of the child).

WP4: Qualitative evaluation (RQ1-4, 7)

This cross-sectional qualitative study seeks to generate ‘thick’ data’[47]. Using ethnographically informed interviews that privilege life stories, we will generate insights into the health impacts of maternity grants [48, 49] and situate grants in the context of women’s lives before and after pregnancy, to map the wider policy environment and the shifting early years policy landscape. In addition to providing a deeper understanding of how these policies can influence health, this WP will allow us to include the voices of marginalised groups who cannot be considered in the quantitative evaluation. Interviews will either be conducted in-person or online, depending on interviewee preference. During interviews, we will use visual methods including a Life Grid Approach[50, 51] and PhotoVoice[52] to help connect the wider social and political context to key life stages such as pregnancy, birth and start of school. This approach will provide a visual anchor to organise narratives and the basis to explore sensitive questions around experiences of poverty and related stigma, awareness, use and perceived benefits, shortcomings and unintended consequences of the SSMG/BSG (informed by the logic model). We will adopt an inductive approach to analysing the transcript data.

We will purposively sample 80 mothers (20 in each UK nation) from low-income families who are or have been eligible for SSMG or BSG across 2011-2025. This sample size is vital to achieve data adequacy to allow for theoretical saturation, focusing both on the structure of the sample as well as the size[53]. We will examine mothers’ experiences of maternity grants (past and current recipients) since the SSMG was restricted to the first child. We will purposively sample mothers who have received the SSMG for all, some, or only one of their children. We will also sample families with children born between 2018-2025, who have received BSG payments. Our proposed sampling frame will be informed by the quantitative analysis, and input from the stakeholder and Lived Experience panels. We will recruit across priority demographics (e.g. ethnic minority groups, single parents, large families, young parents) and include those who did and did not take up the grants, in all four UK nations. Recruiting across the UK nations will allow emergent themes to be integrated with the quantitative analysis in WP3.

We will recruit interviewees through several channels including existing MatCHNet stakeholder organisations (see letters of support for examples) and snowballing techniques, with support from our Public Engagement lead and Co-I (SM) and Byres Community Hub. Up to five peer researchers based in Scotland will support this WP, recruited and trained through Byres Community Hub. This will help to reach into seldom-heard communities, establish rapport with participants, empower and upskill citizens and communities, and improve the quality and relevance of the research[54]. They will work with the research team and our partners to recruit interviewees, develop information leaflets and consent forms, and co-create the interview schedules. They will be supported to lead on the PhotoVoice activities and co-create the initial Life Grid with a subsample of 25 interviewees. The photos will be used as a launch pad to the in-depth interviews (carried out by the PDRA and WP4 leads due to the demanding nature of this element of the work), presented to the stakeholder advisory group to bring these issues to life, and used to form a public exhibition at the end of the project. The peer researchers will also work alongside the research team to contribute to the analysis and writing up of the research.

Training will be arranged for these peer researchers at key points and will include in-house training on conducting qualitative research and research ethics as well as bespoke training on PhotoVoice and analysing interview data.

WP5 Health Economic Modelling (RQ5,6)

We will take the short-term effectiveness estimates produced by WP3 and extrapolate these into the long-term using our updated and improved version of an existing birth cohort microsimulation modelling platform called LifeSim[55].

We will use LifeSim to do a model-based forward-looking analysis of the long-term benefits and public cost savings of not restricting the SSMG on the basis of family size and/or increasing the SSMG to the value of BSG, as if implemented in the UK in 2025.

We will also commission a bespoke estimate of the short-term financial cost of applying these policies in 2025 from a specialist using one of the UK's standard short-term tax-benefit microsimulation models, such as UKMOD. This will involve modelling the incremental short-term costs compared with a counterfactual baseline situation with zero maternity grant provision in 2025. We will then compare these short-term financial costs with the long-term benefits and cost savings estimating using LifeSim. Finally, we will also do a simple re-scaling of the resulting figures per UK child to match the total populations of the four UK populations.

These prospective estimates will be more policy relevant than retrospective estimates of the long-term benefits and cost savings of the two policies when they were first introduced in 2011 and 2018. They are also less costly to produce, as a historical analysis would require not only construction of additional historical "pseudo cohort" populations, but also extensive re-calibration of LifeSim with target data for population level averages of all relevant outcomes at different ages for that specific historical birth cohort (e.g. population average levels of educational attainment, earnings, mortality, and other outcomes for children born in England in 2011 and Scotland in 2018).

We will start with a simulated “pseudo” cohort of newborn children, apply the estimated short-term effects on maternal and child outcomes found in WP3, and then use microsimulation modelling to extrapolate those effects across the rest of life. LifeSim has already been published in embryonic form and is currently in process of being substantially improved with funding from a UKRI project due to complete in May 2026, six months before this work package will start. LifeSim predicts long-term benefits and public cost savings from birth to death across multiple policy domains – including education, health, earnings, taxes and benefits, employment and crime - by synthesising a wide range of data sources within a clear and coherent causal inference framework based on current scientific knowledge about the relevant causal pathways throughout the life course. Our improved LifeSim platform (“LifeSim 2”) will have two linked components. LifeSim Childhood predicts outcomes from age 0 to 17 based on careful causal inference analysis of longitudinal data following the lives of children born in the UK around 2000-1: the Millennium Cohort Study. LifeSim Adulthood then predicts life outcomes from age 17 for the rest of life, based on careful causal inference analysis of a wider range of datasets including the British Cohort Study of children born in 1970 but also a wide range of more recent datasets as appropriate to piece together the best available estimates of different outcome trajectories in different parts of the life course. This allows us to address potential cohort bias when using data on children born in 1970 to predict outcomes for children born in more recent decades, for example biases relating to higher education outcomes which have changed substantially since then.

Our primary analysis will focus on anxiety and depression of the mother. We will map quasi-experimental administrative data on short-term effects with observational survey data from the longitudinal Millennium Cohort Study (MCS) at ages 9 months and 3 years, and then use microsimulation to extrapolate long-term effects. The administrative data focuses on reports of current prescribed pharmaceutical treatment for anxiety and depression, while the survey data focuses on self-reported maternal experiences of psychological symptoms using the adapted Rutter scale. We will carry out sensitivity analyses (e.g. applying different Rutter thresholds) to account for the differences in administrative and survey measures.

If the quasi-experimental work is able reliably to estimate secondary effects on holistic school readiness at age 5, using ECHILD data on the Early Years Foundation Stage Profile, we will also conduct a secondary analysis around this outcome by mapping it to the MCS measure of cognitive delay at age 5 as a proxy for school readiness.

We will run preliminary simulations in phase 1 (months 26-33) using placeholder interim estimates (from the literature and early WP3 results) and final simulations in phase 2 (months 33 to 36) once WP3 final results are ready in month 33, replacing placeholders with finalised causal estimates from WP3 to produce the definitive results.

*Follow-up, and assessment of effectiveness and unanticipated outcomes*

Participants will be passively assessed and followed-up using routine administrative data for the quantitative analysis. For the qualitative analysis there will be 80 face-to-face interviews of 60-90 minutes. Assessment of effectiveness will be carried out in WP3&4 with integration of the results done in WP0 to give a complete understanding of the effectiveness of the maternity grants. Unanticipated outcomes are detailed in logic model and will be explored and prioritised with the Lived Experience Panel. The analysis will be able to determine if outcomes improve or worsen. These are described in more detail in WPs 2, 3, 4. WP5 will extrapolate the expected long-term health and societal impacts based on the findings from WP3.

*Scalability and translation*

SSMG is a policy that covers all low-income families with one child in England, Wales and Northern Ireland. BSG is a policy that covers all children living in low-income families in Scotland. We will test the effectiveness and cost-effectiveness of extending SSMG to all children in low-income families for England, Wales and Northern Ireland; and the effectiveness and cost-effectiveness of BSG compared to SSMG. Therefore, demonstrating scalability of BSG to the whole of the UK. We will work with policy stakeholders to ensure that findings can be translated into benefits for the low-income families in the four UK nations. We have confirmed with various decision-makers that these findings are of relevance to their departments (see letters of support), including the Start for Life Evidence and Evaluation Team at Department of Health and Social Care.

*Socioeconomic position and inequalities*

We aim to evaluate the impacts of early years' welfare payments to low-income families, on child and maternal health inequalities. Inequalities will be considered according to area deprivation and, where possible (i.e. in Scotland), ethnicity, social class and family structure. This will include examining the impacts of limiting the Sure Start Maternity Grant to first born children – which is likely to have led to a widening of social inequalities due to the social gradient and ethnic differences in family size. In addition, we will consider any ameliorating effects that have occurred in Scotland, since the introduction of the Best Start Grant, which are given to low-income families (in varying amounts), regardless of family size. Our qualitative work will delve more deeply into how and why these grants may influence health inequalities, by considering the lived experience of low-income families. We will ensure that the views of families affected by social disadvantages are taken in account across the entire project, via our Lived Experience panel and the involvement of peer researchers.

## Patient and Public Involvement

We will incorporate the views of the public throughout the research process to ensure that the research questions and interpretation of findings reflect the lived experiences of families that the SSMG and BSG are designed to support. Professor Sara Macdonald is our Public Engagement-Co-I, in her capacity as co-lead of the Byres Community Hub - a unique space for research and community collaboration in the heart of Glasgow's west end. A panel of parents with experience of low incomes (Lived Experience Panel) will form WP1b.

Peer researchers - parents and at least some of whom will have experience of the issues being explored in this research – will support the qualitative work in WP4. The Byres Community Hub community includes grassroots voluntary organisations, charities, community interest companies and statutory services from one of the UK's most deprived regions. The space is open to the public every weekday, and offers free meeting spaces, accessible facilities, knowledge and skill sharing opportunities, and an exciting exhibitions and events programme from small scale regular drop-ins to one-off large community days. In its first year (2023-24) over 5,000 people engaged with the hub. The Hub has developed lived experience panels allowing citizens to identify new research questions and shape and participate in research studies. Thus, it is well placed to support the project, along with our other stakeholders across the UK, to recruit members of the Lived Experience Panel, peer researchers and research participants.

We will consult with our Lived Experience Panel every 6 months, taking a deliberative approach, to scrutinise plans and emerging findings, including outcomes, priority groups, results, and policy options. The panel will consist of 32 members (8 per UK country), with lived experience of social disadvantage and, in some cases, the relevant policies. We will hold four in-person and four online, half-day meetings (see WP1b). We will reimburse members for their attendance at the meetings, as well as travel and preparation time. The meetings will be transcribed and analysed by WP1b, supporting consistent and transparent integration with the other work packages. Our peer researchers will help to facilitate the panel and ensure accountability. We will create decision logs and share these with the panel for sign off.

The peer researchers will be based in Glasgow (in order for them to be supported by the research team). They will primarily contribute to WP4 – helping to create information sheets for research participants, arranging interviews, analysing interview transcripts, and identifying meta-themes from the combined qualitative and quantitative findings. They will lead on a PhotoVoice project – each supporting five research participants to take photos representing their experiences of early years payments in the context of their everyday lives. These photos will be used to develop interview schedules for the more in-depth qualitative interviews (carried out by SM, ES and the PDRA due to the complexity of the methods) and a public exhibition. SM will provide the peer researchers with bespoke training, developed for community researchers, in: literature reviews, qualitative data collection and analysis (including PhotoVoice), ethics, and researching sensitive topics training. Peer researchers will be fully reimbursed for their time and childcare costs and any required travel and subsistence.

## Ethical and regulatory considerations

We will seek ethical approval from the College of Medical, Veterinary, and Life Sciences Ethics Committee at the University of Glasgow, for “research involving already available data”. The 5 data holders have different application procedures. We will follow these and abide by all regulations and data sharing agreements in our acquisition and use of the data. The Millennium Cohort Study forms the basis of LifeSim and is available from the UK Data Service. Code will be made available in an open access repository such as GitHub or the Open Science Framework so all analyses can be replicated by researchers with approvals to access the datasets.

For qualitative interviews and stakeholder workshops, we will obtain ethical approval from the College of Medical, Veterinary, and Life Sciences Ethics Committee at the University of Glasgow. We will obtain informed consent, including permission to share anonymised data in an open access repository. All researchers will be fully trained to conduct interviews that include people discussing personal experiences and potentially sensitive topics. Interviews will be audio recorded using an encrypted digital recording device. Recordings will be sent anonymised to the transcribing service. Those involved will be subject to University of Glasgow confidentiality policies. Data will be transferred and held in a secure environment subject to University of Glasgow data sharing policies. Participants will be given a £30 voucher for taking part in the one-off interview, and an additional £30 for PhotoVoice participants. Payments will be arranged as per NIHR guidelines. When recruiting public contributors who are in receipt of state benefits, we will be mindful of NIHR guidance and procedures. This includes negotiating and setting out clear payment guidance[56]. When required, we will also liaise with JobCentre Plus to clearly explain the difference between service user involvement and work.

An outline and a full proposal for the study were reviewed by the NIHR Public Health Research Programme Funding Committee. Independent peer review was also sought to inform the Committee's decision.

*Protocol compliance*

Compliance with the protocol will be monitored by the Data Management and Ethics Monitoring committee. Any revisions required to the protocol will be submitted to the SSC for approval, before being incorporated in a new version of the protocol that will be submitted to the funder.

*Indemnity*

The study is sponsored by the University of Glasgow. The University holds insurance providing cover for the design and conduct of the research.

### Dissemination policy

We will contribute to the formulation of early years' welfare policies by producing information of past and current schemes on health and health inequalities and proposing options for future policies, co-produced with our policy stakeholders and Lived Experience panel. Translation of findings into policy change requires political will; we will maximise this through involvement of decision-makers throughout the life of the project. Our key policy and third sector contacts (representing local and national Government, public health bodies and advocacy groups), and links with wider policy makers via MatCHNet, will support the identification of key messages and knowledge exchange to ensure the research reaches relevant parties.

Our dissemination plan will be finalised in collaboration with stakeholders, the Lived Experience Panel and the project advisory and steering groups. Our Expected outputs are summarised according to each WP below:

WP0: Visualisation of the final meta-themes from the mixed methods integration, for use in our final dissemination outputs, which are likely to include a blog, an accessible policy report, and journal article describing the mixed method approach.

WP1: Summary documents outlining the discussions from the workshops; a co-produced logic model and policy timeline; a summary piece synthesising the stakeholder and citizen priorities for policy changes and identifying gaps in the data and / or methods that have or may prevent them for being explored; co-produced blogs, podcasts and other accessible outputs for disseminating the main messages to wider audiences.

WP2: short report and visualisation describing the data and gaps, code made available in appropriate open access repository (e.g. GitHub or Open Science), conference presentations.

WP3 and 4: two protocol papers for the mixed methods evaluations (one per policy), two journal papers presenting the findings (one per policy), conference presentations, two policy briefings. Anonymised transcripts from WP4 will be archived in UK Data Archive.

WP5: one journal paper and policy briefing presenting the findings from the health economics modelling (covering both policies).

Combined outputs (spanning all work packages): a final policy report synthesising all findings; blogs and podcasts (at least one per policy); dissemination event and accompanying webpage (containing slides, recordings, graphic recording etc.), a public event showcasing the photos from WP4.

Anticipated impact: evidence from this work being used by decision-makers with regards to the introduction, alteration or withdrawal of early years welfare policies. Please see letters of support confirming the appetite for this evidence.

*Authorship eligibility guidelines*

We will adopt an inclusive authorship policy. When planning a publication, we will offer the opportunity to all authors to contribute from as early as possible in the process. The final list of authors must, however, meet authorship criteria in the CRediT taxonomy (https://www.elsevier.com/researcher/author/policies-and-guidelines/credit-author-statement). Joint first- and senior-authorship will be encouraged where appropriate.

## Copyright Statement

**Figure 1:** Logic model for the Sure Start Maternity Grant and Best Start Grant

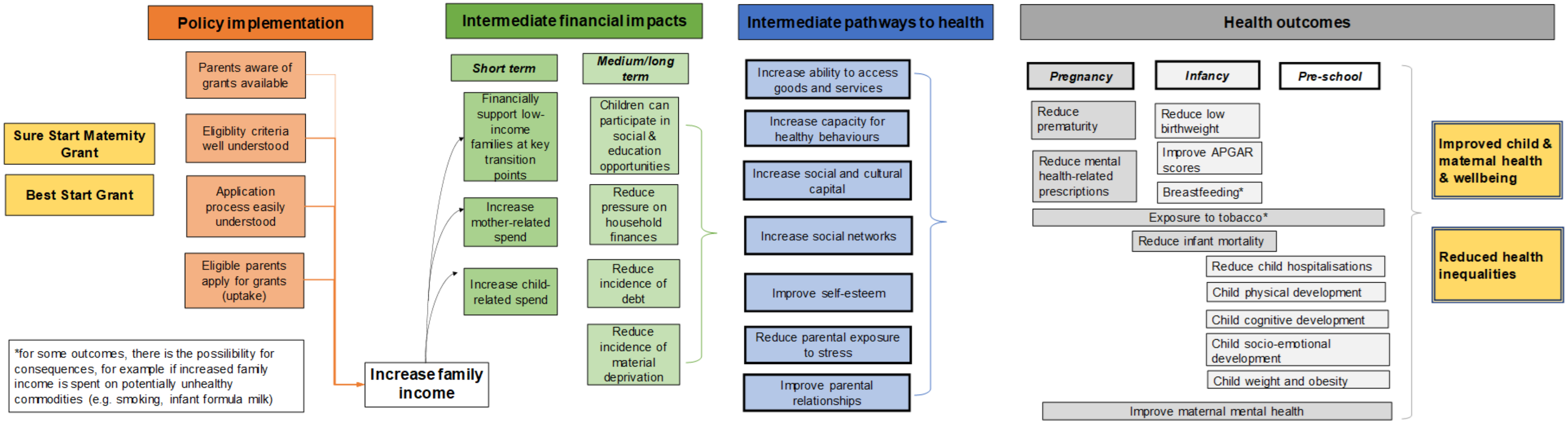


**Figure 2** Intervention and control time periods for Sure Start Maternity Grant and Best Start Grant with cases and comparators shown for the Controlled Interrupted Time Series analysis.

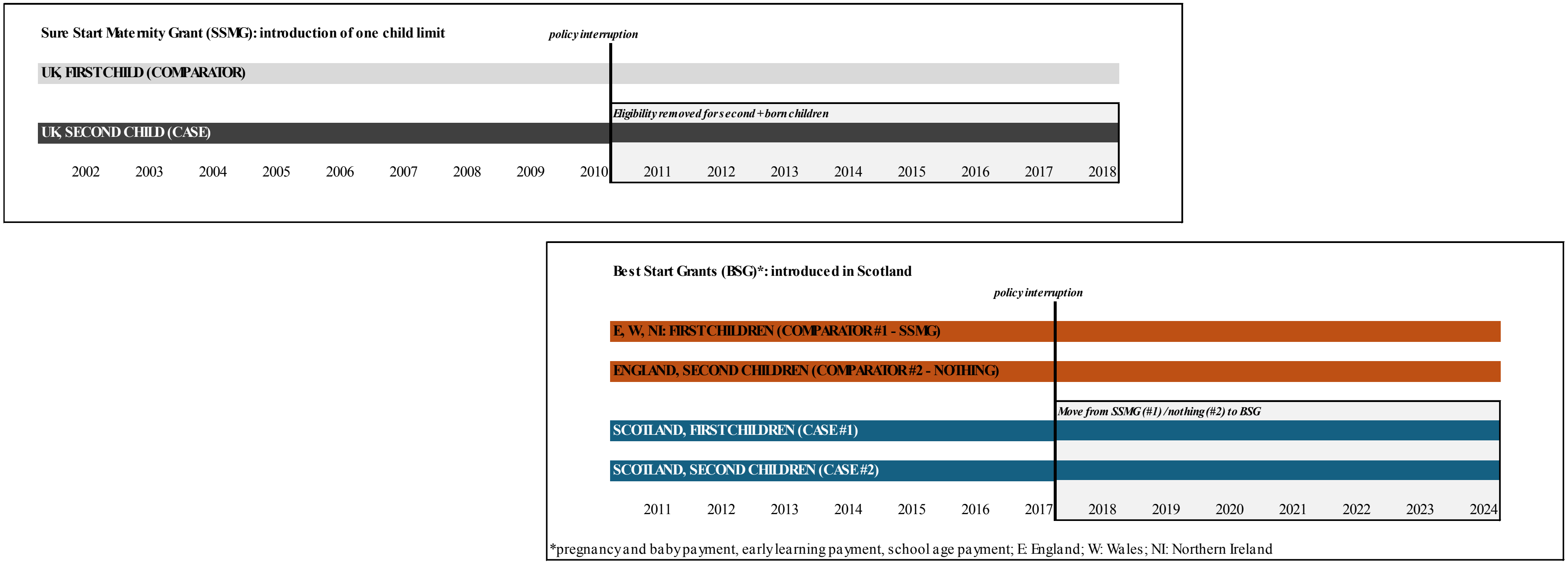
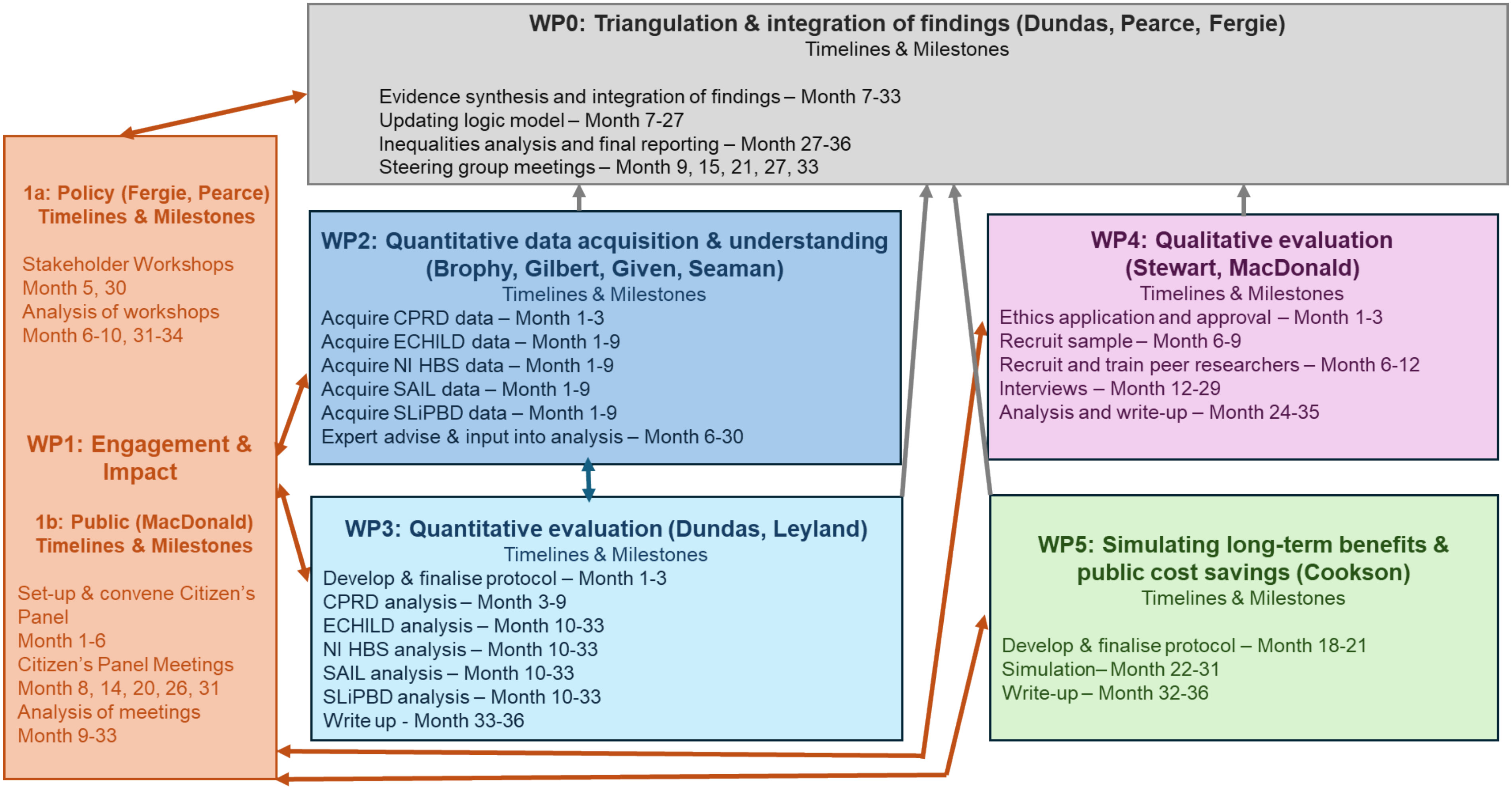


**Figure 3:** Work package flow diagram



**WP0: Triangulation & integration of findings (Dundas, Pearce, Fergie)**
Timelines & Milestones

Evidence synthesis and integration of findings – Month 7-33
Updating logic model – Month 7-27
Inequalities analysis and final reporting – Month 27-36
Steering group meetings – Month 9, 15, 21, 27, 33

**WP1: Engagement & Impact**

**1a: Policy (Fergie, Pearce)**
**Timelines & Milestones**

Stakeholder Workshops
Month 5, 30
Analysis of workshops
Month 6-10, 31-34

**1b: Public (MacDonald)**
**Timelines & Milestones**

Set-up & convene Citizen's Panel
Month 1-6
Citizen's Panel Meetings
Month 8, 14, 20, 26, 31
Analysis of meetings
Month 9-33

**WP2: Quantitative data acquisition & understanding (Brophy, Gilbert, Given, Seaman)**
Timelines & Milestones
Acquire CPRD data – Month 1-3
Acquire ECHILD data – Month 1-9
Acquire NI HBS data – Month 1-9
Acquire SAIL data – Month 1-9
Acquire SLiPBD data – Month 1-9
Expert advise & input into analysis – Month 6-30

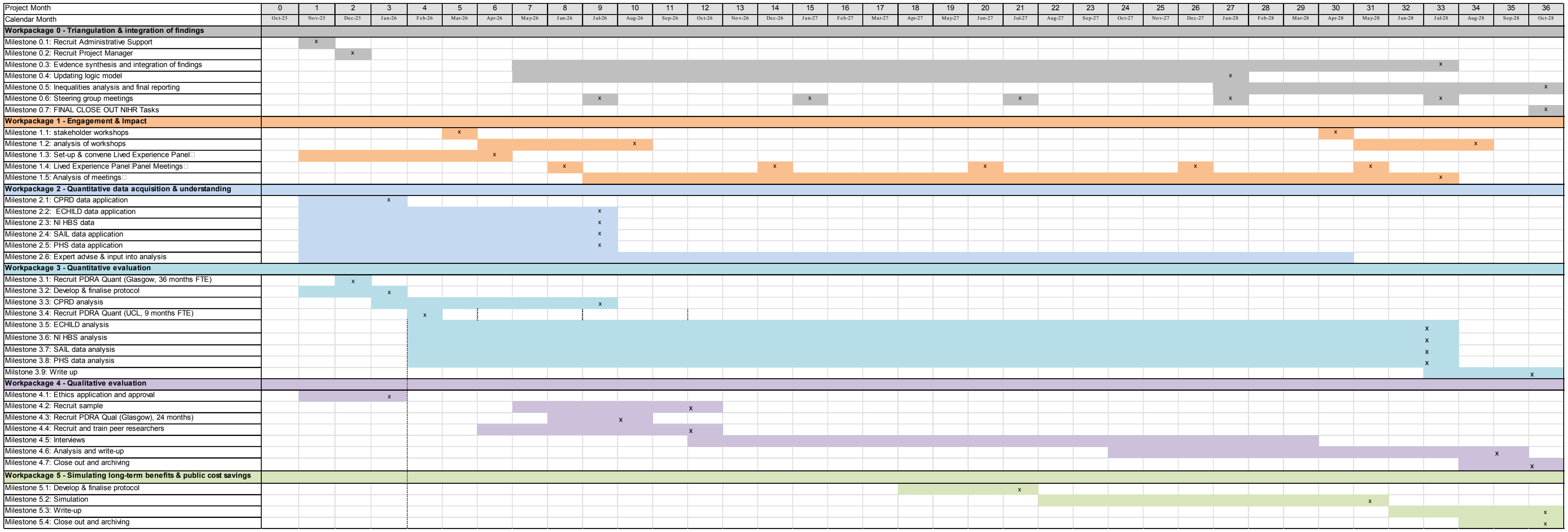
**WP3: Quantitative evaluation (Dundas, Leyland)**
Timelines & Milestones
Develop & finalise protocol – Month 1-3
CPRD analysis – Month 3-9
ECHILD analysis – Month 10-33
NI HBS analysis – Month 10-33
SAIL analysis – Month 10-33
SLiPBD analysis – Month 10-33
Write up - Month 33-36

**WP4: Qualitative evaluation (Stewart, MacDonald)**
Timelines & Milestones
Ethics application and approval – Month 1-3
Recruit sample – Month 6-9
Recruit and train peer researchers – Month 6-12
Interviews – Month 12-29
Analysis and write-up – Month 24-35

**WP5: Simulating long-term benefits & public cost savings (Cookson)**
Timelines & Milestones

Develop & finalise protocol – Month 18-21
Simulation – Month 22-31
Write-up – Month 32-36

# Gantt Chart



| Project Month | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
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| Calendar Month | Oct-25 | Nov-25 | Dec-25 | Jan-26 | Feb-26 | Mar-26 | Apr-26 | May-26 | Jun-26 | Jul-26 | Aug-26 | Sep-26 | Oct-26 | Nov-26 | Dec-26 | Jan-27 | Feb-27 | Mar-27 | Apr-27 | May-27 | Jun-27 | Jul-27 | Aug-27 | Sep-27 | Oct-27 | Nov-27 | Dec-27 | Jan-28 | Feb-28 | Mar-28 | Apr-28 | May-28 | Jun-28 | Jul-28 | Aug-28 | Sep-28 | Oct-28 |
| **Workpackage 0 - Triangulation & integration of findings** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 0.1: Recruit Administrative Support |  | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 0.2: Recruit Project Manager |  |  | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 0.3: Evidence synthesis and integration of findings |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |
| Milestone 0.4: Updating logic model |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |
| Milestone 0.5: Inequalities analysis and final reporting |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |
| Milestone 0.6: Steering group meetings |  |  |  |  |  |  |  |  |  | x |  |  |  |  |  | x |  |  |  |  |  | x |  |  |  |  |  | x |  |  |  |  |  | x |  |  |  |
| Milestone 0.7: FINAL CLOSE OUT NIHR Tasks |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |
| **Workpackage 1 - Engagement & Impact** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 1.1: stakeholder workshops |  |  |  |  |  | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  |  |  |  |  |  |
| Milestone 1.2: analysis of workshops |  |  |  |  |  |  | ▨ | ▨ | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | x |  |  |
| Milestone 1.3: Set-up & convene Lived Experience Panel |  | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 1.4: Lived Experience Panel Panel Meetings |  |  |  |  |  |  |  |  | x |  |  |  |  |  | x |  |  |  |  |  | x |  |  |  |  |  | x |  |  |  |  | x |  |  |  |  |  |
| Milestone 1.5: Analysis of meetings |  |  |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |
| **Workpackage 2 - Quantitative data acquisition & understanding** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 2.1: CPRD data application |  | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 2.2: ECHILD data application |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 2.3: NI HBS data |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 2.4: SAIL data application |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 2.5: PHS data application |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 2.6: Expert advise & input into analysis |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ |  |  |  |  |  |  |
| **Workpackage 3 - Quantitative evaluation** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 3.1: Recruit PDRA Quant (Glasgow, 36 months FTE) |  |  | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 3.2: Develop & finalise protocol |  | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 3.3: CPRD analysis |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 3.4: Recruit PDRA Quant (UCL, 9 months FTE) |  |  |  |  | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 3.5: ECHILD analysis |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |
| Milestone 3.6: NI HBS analysis |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |
| Milestone 3.7: SAIL data analysis |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |
| Milestone 3.8: PHS data analysis |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |
| Milstone 3.9: Write up |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | x |
| **Workpackage 4 - Qualitative evaluation** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 4.1: Ethics application and approval |  | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 4.2: Recruit sample |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 4.3: Recruit PDRA Qual (Glasgow), 24 months) |  |  |  |  |  |  |  |  | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 4.4: Recruit and train peer researchers |  |  |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 4.5: Interviews |  |  |  |  |  |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ |  |  |  |  |  |  |  |
| Milestone 4.6: Analysis and write-up |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |
| Milestone 4.7: Close out and archiving |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▨ | ▨ | x |
| **Workpackage 5 - Simulating long-term benefits & public cost savings** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 5.1: Develop & finalise protocol |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Milestone 5.2: Simulation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | x |  |  |  |  |  |
| Milestone 5.3: Write-up |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▨ | ▨ | ▨ | ▨ | x |
| Milestone 5.4: Close out and archiving |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ▨ | ▨ | x |

## REFERENCES

1. Pillas D, Marmot M, Naicker K, Goldblatt P, Morrison J, Pikhart H. Social inequalities in early childhood health and development: a European-wide systematic review. Pediatr Res. 2014;76(5):418-24.10.1038/pr.2014.122
2. Royal College of Paediatrics and Child Health. State of child health: England. London: RCPCH; 2020.
3. Pearce A, Dundas R, Whitehead M, Taylor-Robinson D. Pathways to inequalities in child health. Archives of Disease in Childhood. 2019;104(10):998-1003.10.1136/archdischild-2018-314808
4. Weightman AL, Morgan HE, Shepherd MA, Kitcher H, Roberts C, Dunstan FD. Social inequality and infant health in the UK: systematic review and meta-analyses. BMJ Open. 2012;2(3):e000964.10.1136/bmjopen-2012-000964
5. Frontier Economics. Estimating the costs of health inequalities: a report prepared for the Marmot review. London; 2010.
6. Leadsom A, Field F, Burstow P, Lucas C. 1001 Critical Days: The Importance of the Conception to Age Two Period. A cross party manifesto Wave Trust; 2014. https://www.wavetrust.org/1001-critical-days-the-importance-of-the-conception-to-age-two-period
7. Whitehead M. A typology of actions to tackle social inequalities in health. Journal of Epidemiology and Community Health. 2007;61(6):473-8, http://jech.bmj.com
8. Spencer N. Reducing child health inequalities: what's the problem? Archives of Disease in Childhood. 2013;98(11):836-7.10.1136/archdischild-2013-304347
9. Stewart E, Pearce A, Given J, Gilbert R, Brophy S, Cookson R, et al. Identifying opportunities for upstream evaluations relevant to child and maternal health: a UK policy-mapping review. Archives of Disease in Childhood. 2023;108(7):556-62.10.1136/archdischild-2022-325219
10. Craig P, Barr B, Baxter AJ, Brown H, Cheetham M, Gibson M, et al. Evaluation of the mental health impacts of Universal Credit: protocol for a mixed methods study. BMJ Open. 2022;12(4):e061340.10.1136/bmjopen-2022-061340
11. Brydon R, Haseeb SB, Park G-R, Ziegler C, Hwang SW, Forget EL, et al. The effect of cash transfers on health in high-income countries: A scoping review. Social Science & Medicine. 2024;362:117397.https://doi.org/10.1016/j.socscimed.2024.117397
12. Boccia D, Maritano S, Pizzi C, Richiardi MG, Lioret S, Richiardi L. The impact of income-support interventions on life course risk factors and health outcomes during childhood: a systematic review in high income countries. BMC Public Health. 2023;23(1):744.10.1186/s12889-023-15595-x
13. Cooper K, Stewart K. Does household income affect children’s outcomes? A systematic review of the evidence. Child Indicators Research. 2021;14(3):981-1005,
14. Fuller AE, Zaffar N, Cohen E, Pentland M, Siddiqi A, Vandermorris A, et al. Cash transfer programs and child health and family economic outcomes: a systematic review. Can J Public Health. 2022;113(3):433-45.10.17269/s41997-022-00610-2

15. Gibson M, Hearty W, Craig P. The public health effects of interventions similar to basic income: a scoping review. Lancet Public Health. 2020;5(3):e165-e76.10.1016/s2468-2667(20)30005-0
16. Siddiqi A, Rajaram A, Miller SP. Do cash transfer programmes yield better health in the first year of life? A systematic review linking low-income/middle-income and high-income contexts. Arch Dis Child. 2018;103(10):920-6.10.1136/archdischild-2017-314301
17. Simpson J, Albani V, Bell Z, Bambra C, Brown H. Effects of social security policy reforms on mental health and inequalities: A systematic review of observational studies in high-income countries. Social Science & Medicine. 2021;272:113717.https://doi.org/10.1016/j.socscimed.2021.113717
18. Wickham S, Whitehead M, Taylor-Robinson D, Barr B. The effect of a transition into poverty on child and maternal mental health: a longitudinal analysis of the UK Millennium Cohort Study. The Lancet Public Health. 2017;2(3):e141-e8.10.1016/S2468-2667(17)30011-7
19. Elstad JI, Pedersen AW. The Impact of Relative Poverty on Norwegian Adolescents' Subjective Health: A Causal Analysis with Propensity Score Matching. International Journal of Environmental Research and Public Health. 2012;9(12):4715-31, https://www.mdpi.com/1660-4601/9/12/4715
20. McCabe R, Pollack R, Broadbent P, Thomson RM, Igelström E, Pearce A, et al. Implications of child poverty reduction targets for public health and health inequalities in England: a modelling study between 2024 and 2033. Journal of Epidemiology and Community Health. 2024;78(10):632-40.10.1136/jech-2024-222313
21. Lisboa CS, Guimarães NS, Ferreira AJF, Silva K, Alves FJO, Rocha ADS, et al. Impact of cash transfer programs on birth and child growth outcomes: systematic review. Cien Saude Colet. 2023;28(8):2417-32.10.1590/1413-81232023288.14082022
22. Leyland AH, Ouédraogo S, Nam J, Bond L, Briggs AH, Gray R, et al. Evaluation of Health in Pregnancy grants in Scotland: a natural experiment using routine data. Public Health Research. 2017.10.3310/phr05060
23. Magnuson K, Duncan G, Yoshikawa H, Yoo P, Han S, Gennetian L, et al. Can Cash Transfers Improve Maternal Well-being and Family Processes among Families with Young Children? An Experimental Analysis2024.
24. McCabe R, Katikireddi SV, Dundas R, Craig P. The health impact of Scotland's Baby Box Scheme: a natural experiment evaluation using national linked health data. The Lancet Public Health. 2023;8(7):e504-e10.10.1016/S2468-2667(23)00121-4
25. Dundas R, Boroujerdi M, Browne S, Deidda M, Bradshaw P, Craig P, et al. Evaluation of the Healthy Start voucher scheme on maternal vitamin use and child breastfeeding: a natural experiment using data linkage. 2023,
26. Reader M. The infant health effects of starting universal child benefits in pregnancy: Evidence from England and Wales. Journal of Health Economics. 2023;89:102751.https://doi.org/10.1016/j.jhealeco.2023.102751
27. Hoynes H, Miller D, Simon D. Income, the Earned Income Tax Credit, and Infant Health. American Economic Journal: Economic Policy. 2015;7(1):172–211.10.1257/pol.20120179

28. Department for Work & Pensions. Social Fund Account 2022 to 2023. https://www.gov.uk: UK Government; 2023,
29. Social Security Scotland. Best Start Grant and Best Start Foods: high level statistics to 31 December 2023 Edinburgh: Scottish Government; 2023,
30. Maternity Action. Valuing Families? The Impact of Cuts to Maternity Benefits. https://maternityaction.org.uk/wp-content/uploads/Valuing-Families-report-.pdf: Maternity Action UK; 2014.
31. Psarros A, Moran K, Khan N, Arrowsmith L, Bragg R. A Perfect Storm: Pregnancy, New Motherhood and the Cost of Living Crisis. https://maternityaction.org.uk/wp-content/uploads/A-Perfect-Storm-ReportNov2023FINAL.pdf: Maternity Action UK; 2023.
32. Cabinet Office. Tackling Child Poverty: Developing Our Strategy (HTML): UK Government; 2024 [Available from: https://www.gov.uk/government/publications/tackling-child-poverty-developing-our-strategy/tackling-child-poverty-developing-our-strategy-html.
33. Scottish Government. Scottish Budget: 2025-26. Edinburgh: Scottish Government; 2024,
34. Child Poverty Action Group. The benefit cap: our position: Child Poverty Action Group; 2024 [Available from: https://cpag.org.uk/policy-and-research/our-position/benefit-cap-our-position.
35. Goddard J. Universal Credit (Removal of Two Child Limit) Bill. Library Briefing. . House of Lords; 2022,
36. Diderichsen F, Evans T, Whitehead M. The social basis for disparities in health. In: Evans T, Whitehead M, Diderichsen F, Bhuiya A, Wirth M, editors. Challenging inequities in health: from ethics to action: Oxford University Press; 2007.
37. Dahlgren G, Whitehead M. Levelling up (part 1): Concepts and principles for tackling social inequities in health (No 2). WHO EUROPE 2007.
38. Scottish Government. Best Start Grant: Interim Evaluation. https://www.gov.scot/publications/interim-evaluation-best-start-grant/: Scottish Government; 2020.
39. Lindsay L, Mark K, Moore E, Carruthers J, Hopkins L, Jennings D, et al. Data resource profile: Scottish Linked Pregnancy and Baby Dataset (SLiPBD). International Journal of Population Data Science. 2024;9(2).10.23889/ijpds.v9i2.2390
40. SAIL Databank. SAIL Databank is a rich and trusted population databank: SAIL Databank; 2024 [Available from: https://saildatabank.com/.
41. Penfold RB, Zhang F. Use of interrupted time series analysis in evaluating health care quality improvements. Acad Pediatr. 2013;13(6 Suppl):S38-44.10.1016/j.acap.2013.08.002
42. Craig P, Campbell M, Bauman A, Deidda M, Dundas R, Fitzgerald N, et al. Making better use of natural experimental evaluation in population health. BMJ. 2022;379:e070872.10.1136/bmj-2022-070872
43. Gauly J, Ulahannan A, Grove AL. The Extended Pillar Integration Process (ePIP): A Data Integration Method Allowing the Systematic Synthesis of Findings From

Three Different Sources. Journal of Mixed Methods Research. 2024;18(1):31-47.10.1177/15586898221135409
44. Seaborne M, Jones H, Cockburn N, Durbaba S, González-Izquierdo A, Hough A, et al. Mother and Infant Research Electronic Data Analysis (MIREDA): A protocol for creating a common data model for federated analysis of UK birth cohorts and the life course. International Journal of Population Data Science. 2024;9.10.23889/ijpds.v9i2.2406
45. Lopez Bernal J, Cummins S, Gasparrini A. The use of controls in interrupted time series studies of public health interventions. International journal of epidemiology. 2018;47(6):2082-93.10.1093/ije/dyy135
46. Abadie A, Diamond A, Hainmueller J. Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program. Journal of the American Statistical Association. 2010;105(490):493-505.10.1198/jasa.2009.ap08746
47. Geertz. Thick description: Toward an Interpretive Theory of Culture. Interpretations of Cultures. New York: Basic Book; 1973.
48. Tsui EK, Starecheski A. Uses of oral history and digital storytelling in public health research and practice. Public Health. 2018;154:24-30.10.1016/j.puhe.2017.10.008
49. Trundle C, Gardner J, Phillips T. The Ethnographic Interview: An Interdisciplinary Guide for Developing an Ethnographic Disposition in Health Research. Qual Health Res. 2024:10497323241241225.10.1177/10497323241241225
50. Blane DB. Collecting retrospective data: Development of a reliable method and a pilot study of its use. Social Science & Medicine. 1996;42(5):751-7.https://doi.org/10.1016/0277-9536(95)00340-1
51. Gilhooly M, Hanlon P, Mowat H, Cullen B, Macdonald S, Whyte B. Successful ageing in an area of deprivation: part 1--a qualitative exploration of the role of life experiences in good health in old age. Public Health. 2007;121(11):807-13.10.1016/j.puhe.2007.03.005
52. Sutton-Brown CA. Photovoice: A Methodological Guide. Photography and Culture. 2014;7(2):169-85.10.2752/175145214X13999922103165
53. Vasileiou K, Barnett J, Thorpe S, Young T. Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. BMC Medical Research Methodology. 2018;18(1):148.10.1186/s12874-018-0594-7
54. Southby K, Coan S, Rushworth S, South J, Bagnall A-M, Lam T, et al. The contribution of peer research in evaluating complex public health interventions: examples from two UK community empowerment projects. BMC Public Health. 2022;22(1):2164.10.1186/s12889-022-14465-2
55. Skarda I, Asaria M, Cookson R. LifeSim: A Lifecourse Dynamic Microsimulation Model of the Millennium Birth Cohort in England. IJM. 2021;14(1):2-42.10.34196/ijm.00228

56. Cheetham M, Atkinson P, Gibson M, Katikireddi S, Moffatt S, Morris S, et al. Exploring the mental health effects of Universal Credit: a journey of co-production. Perspectives in Public Health. 2022;142:209 - 12,