STUDY PROTOCOL

Optimising care for perinatal anxiety: Evaluation of health service utilisation, outcomes and costs

(MAP ALLIANCE)

Short Title	Optimising Care for Perinatal Anxiety
Acronym	MAP Alliance
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Chief Investigator	Dr Susan Ayers
Host Institution	School of Health Sciences, City, University of London
Start date	1st January 2022
Project duration	30 Months

SIGNATURE PAGE

The undersigned confirm that the following protocol has been agreed and accepted and that the Chief Investigator agrees to conduct the study in compliance with the approved protocol and will adhere to the principles outlined in the Declaration of Helsinki, the Sponsor's SOPs, and other regulatory requirement.

I agree to ensure that the confidential information contained in this document will not be used for any other purpose other than the evaluation or conduct of the investigation without the prior written consent of the Sponsor

I also confirm that I will make the findings of the study publicly available through publication or other dissemination tools without any unnecessary delay and that an honest accurate and transparent account of the study will be given; and that any discrepancies from the study as planned in this protocol will be explained.

For and on behalf of the Study Sponsor:			
Leanne Aitken	Associate Dean for Research	Date: 13 December 2021	
Chief Investigator:			
Susan Ayers	Chief Investigator	Date: 13 December 2021	
Rose Coates	Co-Lead	Date: 01 February 2022	

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SCIENTIFIC ABSTRACT

Background: Perinatal mental health (PMH) problems affect one in five women and cost the UK £8.1 billion for every year of births, with 72% of this cost due to the long-term impact on the child. Currently only 30-50% of women with PMH problems are identified and 7% referred to specialist care. The majority of women with PMH problems therefore do not access care and this may be particularly the case for women with mild to moderate PMH problems or those with less commonly recognised problems, such as anxiety, obsessive compulsive disorder or post-traumatic stress disorder. Despite this, there is no quantitative research with nationally representative samples looking at care and health service use for perinatal anxiety and associated disorders. Health service use can be affected by many factors, such as whether anxiety is identified, what services are available, whether they are accessible, and whether they are acceptable to women. To improve access to care the NHS continues to invest in PMH services but there is little UK-wide research on how these services are being used by women.

Aims: To examine what care is offered to and accessed by women experiencing perinatal anxiety and associated disorders; the impact and cost of that care; as well as inequalities and regional variation from the perspectives of women and healthcare personnel.

Methods: This will be achieved through five connected work packages (WP). WP1 will determine the health service utilisation, self-report experiences and outcome measures, and health inequalities of women with and without perinatal anxiety and associated disorders. We will follow up an existing cohort of over 2000 women who are currently being followed through pregnancy by the MAP study (HS&DR 17/105/16) at 6, 12 and 24 months after birth. In WP2 we will examine mental health history and health service utilisation in more detail, and examine concordance with self-report measures, by extracting data from primary care records for a subsample of up to 44 women diagnosed with anxiety or associated disorders during pregnancy or after birth. WP3 will explore women's preferences for, perceptions of and acceptability of care they were offered/received, and regional variation through in-depth qualitative interviews with a purposive subsample of 60 women. WP4 will explore views on and barriers to management of perinatal anxiety and associated disorders and how to develop pathways for optimal care through in-depth qualitative interviews with a purposive sample of 60 health professionals working with perinatal women (e.g. maternity, primary care, health visiting and mental health services) or commissioning services. In WP5 we will determine the costs of health service use for women with and without perinatal anxiety and associated disorders through embedded health economic measures in WP1, WP2 and WP3.

Anticipated impact: This study will lead to recommendations for accessible, integrated care that is acceptable to women. It will assist NHS commissioners and providers in the design and transformation of services for perinatal women. This will increase the chances for women to receive better care to improve maternal and child outcomes.

PLAIN ENGLISH SUMMARY

One in five women experience a mental health problem in pregnancy or the first year after birth (also called the perinatal period). Perinatal anxiety and associated disorders such as depression are most common, and cause suffering for women and their families. They are associated with poorer birth outcomes including premature birth and can lead to mental health and behavioural problems for children through to adulthood. This is a significant public health problem which costs £8.1 billion for every year of births in the UK; most of this is caused by the long-term impact on children. If women with perinatal anxiety have access to care that is effective, acceptable, and practical for the NHS to provide, this burden could be reduced. At the moment we know little about what care is offered to and accessed by women with perinatal anxiety and associated disorders, and what the impact and cost of that care is.

We aim to produce high quality evidence about the accessibility, acceptability and costs of support, care and treatments for perinatal anxiety. To do this we need to know: what care is offered to women with and without anxiety and whether they access that care; the costs of that care; and women and health professionals' experiences and views of that care. We will gather this information by following up a group of over 2000 women who we are already working with. The Methods of Assessing Perinatal Anxiety (MAP) study began in 2020 and is following women through their pregnancy to find the best way of identifying women with anxiety. This new study (MAP ALLIANCE) will continue following these women and their babies until two years after birth in five connected projects.

In project 1 we will identify which health services women are offered, which services they access, and regional differences. We will also find out whether all women have access to services to support their needs. We will ask all women to complete questionnaires about their anxiety, general health, and health service use 6, 12 and 24 months after birth. This will highlight women with perinatal anxiety who do not receive care and help us recommend ways these women can be better identified and supported.

In project 2 we will examine medical records of up to 44 women who have a diagnosis of perinatal anxiety or an associated disorder, to assess the relationship between when anxiety started and health service use. We will also check whether questionnaires give similar information about health service use compared to medical records.

In project 3 we will interview 60 women who experienced anxiety or distress to get their views of the care they were offered/received and how acceptable they found it. In project 4 we will interview 60 health professionals and managers about their role in managing perinatal anxiety, and factors that help or hinder this. In project 5 the costs of health service use for women with and without anxiety will be calculated.

We developed this research with women who have experience of perinatal mental illness, midwives and mental health professionals, who will continue to work with us throughout this project. One woman said "[if] a clear pathway can be defined to treat this effectively and quickly then this will be hugely beneficial to thousands of women and their families". This research will enable us to make recommendations about what is working and what can be improved to support women with perinatal anxiety which will therefore benefit women, their families, and our healthcare system..

KEY WORDS: Anxiety, Care, Costs, Pregnancy, Postpartum, Treatment

AMENDMENT HISTORY

Amendment No.	Protocol Version No.	Date issued	Author(s) of changes	Section amended	Details of change
1	1.1	110422	MAP Alliance study team	WP1 Data Collection WP3	Number of follow ups reduced from 5 to 3 contacts. Change of initial contact with women from email to telephone
2	1.1	140422	MAP Alliance study team	Appendix A Safeguarding procedure	Inclusion of safeguarding for children of participants
3	1.2	150622	MAP Alliance study team	Minor amendments requested by NIHR WP2 Data collection	 Number of reminder contacts reduced from 4 to 2.
4	1.3	06122022	MAP Alliance study team	WP1 data collection / safeguarding WP2 Data Collection (and corresponding section in scientific and lay summaries) Project Plan (Fig.1)	Participants scoring above cut-off on PC-PTSD-5 screen to be sent useful organisations resources (p. 31; p.41) Number of reminders aligned with WP3 Maximum sample size revised Clarification that central research team member or CRN staff may collect data Amended to reflect changes to WP2

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FUNDING AND SUPPORT IN KIND

FUNDER(S)	FINANCIAL AND NON-FINANCIAL SUPPORT GIVEN
National Institute of Health Research University of Southampton, Alpha House, Enterprise Road, Southampton, SO16 7NS Telephone: 0238 059 7501 E-Mail: netsmonitoring@nihr.ac.uk	Financial support

ROLE OF STUDY SPONSOR AND FUNDER

City, University of London, is the sponsor for this research programme and will assume overall responsibility for the initiation and management of the study. City, University of London, as research Sponsor indemnifies its staff, research participants and research protocols with public liability insurance. These policies include provision for indemnity in the event of a successful litigious claim for proven non-negligent harm.

The programme is funded by the NIHR Health Services & Delivery Research. The NIHR HS&DR will monitor progress and be informed of all changes to the protocol. The NIHR HS&DR will be sent all outputs at least 28 days before publication/dissemination. All published outputs will acknowledge funding and include the following disclaimer:

'This project is funded by the National Institute for Health Research (NIHR) Health Services Delivery and Research programme (project reference NIHR133727). The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care.'

The NIHR HS&DR will have control over approval of protocol amendments. All other decisions about the study design, conduct, data analysis and interpretation, manuscript writing and dissemination of results will be made by the Chief Investigator and study management groups (see below) and will not be within the responsibility of the sponsor or funder.

ROLES AND RESPONSIBILITIES

The trial is funded by the National Institute for Health Research (NIHR) Health Services Delivery and Research Programme (NIHR133727). City, University of London will be the project sponsor and the host organisation, with Ayers as the Chief Investigator. Subcontracts will be put in place between City, University of London and other partner organisations, detailing the budget resources allocated, the responsibilities and the expected contributions of each party. There will also be site agreements between the sponsor and the NHS organisations providing data. Ethical approval has been obtained for the MAP cohort from the West of Scotland NHS Research Ethics Committee (REC) 3, the Health Research Authority (HRA) and City University of London Ethics Committee as follows:
WP1: reference 22/WS/0029; IRAS ID 312489
WP2: to be applied for
WP3: reference 22/WS/0063; IRAS ID 313535
WP4: reference 22/HRA/4584; IRAS ID 313560

The Study Steering Committee (SSC) will provide independent oversight of the project on behalf of the project sponsor. The SSC will meet in person or online a minimum of once yearly, to be decided by the Committee according to NIHR guidelines and outlined in the Charter. The SSC comprises independent members to provide oversight of the project and ensure that the project is conducted to the standards set out in the Department of Health's Research Governance Framework for Health and Social Care (79) and the Guidelines for Good Clinical Practice.

The Programme Management Group (PMG) will meet at least twice a year and will report to the SSC at their meetings. The Programme Management group includes all co-investigators

and collaborators and is responsible for ensuring milestones are achieved, overseeing progress, trouble-shooting if problems arise, planning the next stage and agreeing timelines. The PMG includes all co-applicants and collaborators to ensure we have expertise and representation from disciplines including midwifery (Cheyne), general practice (Shakespeare), perinatal psychiatry (Hollins), health visiting (Salmon), perinatal psychology (Alderdice), and health services research and mental health (Maxwell).

A Core Group will meet at least every month, and more frequently as needed, to oversee day-to-day running of the programme. The core group includes the Chief Investigator (Ayers), co-lead (Coates), lead for Scotland (Cheyne), MAP research fellows (Sinesi, Williams), research administrator (Uddin), and MAP ALLIANCE research staff (Moran, Hutton, Strange) and will draw on other expertise in the team when needed (e.g. PPI, statistics).

The Chief Investigator and co-Lead have overall responsibility for the study and will oversee all study management. The Chief Investigator and co-Lead will be responsible for monitoring of safety outcomes and reporting arrangements. The data custodian will be the Chief Investigator and/or co-Lead.

The project therefore has a clear management structure with the most appropriately qualified research team member taking responsibility for each aspect, and representation from the most relevant stakeholders.

GLOSSARY OF ABBREVIATIONS

CORE-10	Clinical Outcomes in Routine Evaluation-10
FYFV	Five-year Forward View
GAD	Generalised Anxiety Disorder
GAD-2	Generalised Anxiety Disorder 2-item scale
GAD-7	Generalised Anxiety Disorder 7-item scale
GDPR	General Data Protection Regulation
GP	General Practitioner
HRA	Health Research Authority
HS&DR	Health Services and Delivery Research
IAPT	Improving Access to Psychological Therapies
ID	Identity Document
IRAS	Integrated Research Application System
MINI	Mini International Neuropsychiatric interview
NCT	National Childbirth Trust
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NIHR	National Institute of Health Research
NSPCC	National Society for the Prevention of Cruelty to Children
MMHCA	Maternal Mental Health Change Agents
PMG	Programme Management Group
PPI	Patient and Public Involvement
PTSD	Post-Traumatic Stress Disorder
REC	Research Ethics Committee
R&D	Research and Development departments
SAAS	Stirling Antenatal Anxiety Scale
SIGN	Scottish Intercollegiate Guidelines Network
SSC	Study Steering Committee
TBC	To Be Confirmed
UK	United Kingdom
WP	Work Package

STUDY PROTOCOL

Background and Rationale

Perinatal mental health (PMH) problems affect one in five women and cost the UK £8.1 billion for every annual cohort of women, with 72% of this cost due to the long-term impact on the child [1]. The most common disorders in the perinatal period are depression and anxiety. Whereas depression has been extensively researched, research on anxiety is critically needed. Perinatal anxiety affects 15-25% of women [2]. Evidence of the impact of perinatal anxiety on women and their families includes increased risk of preterm birth, postnatal depression, and poor developmental outcomes for the infant [3-5].

Effective and acceptable support and treatment are essential to reduce the burden of PMH problems on women, their families and society. Furthermore, supporting women experiencing poor mental health during the perinatal period is likely to prevent negative health outcomes for them and their children both in the short- and long-term, with a high potential for prevention. Care pathways need to be accessible and acceptable to women, effective at getting women the support they need, and feasible for health professionals to implement.

We now have a unique opportunity to produce rigorous and relevant evidence on access to and utilisation of health services by women with perinatal anxiety. We are currently conducting the NIHR study Methods of Assessing Perinatal Anxiety (MAP; HS&DR 17/105/16) to identify and implement the most acceptable and effective method of assessing perinatal anxiety. The MAP project includes a cohort study of over 2000 women in England and Scotland followed from early pregnancy to 6 weeks after birth, with regular assessment of perinatal anxiety, depression and psychological distress. It therefore provides an existing cohort of women with and without PMH problems who have already agreed to longer-term follow-up, including the use of medical records. We propose to follow this sample over the first postnatal year to determine what care is offered to and accessed by women experiencing perinatal anxiety and associated problems and what the impact of that care is.

The recent prioritisation and rapid expansion of specialist PMH services in the UK mean this research meets an urgent need which is likely to be sustained over the next 10 years. The need for this is evident in UK strategy and policy [6,7] and clinical guidelines [6,8] aimed at improving access to PMH services. This research addresses gaps in knowledge which will be of interest to researchers and health services nationally and internationally. It is consistent with the NHS Five Year Forward View (FYFV) aim for the UK to be a world leader in mental health research [9].

Evidence explaining why this research is needed now

At present only 30-50% of women with PMH problems are identified [10] and 7% referred to specialist care [11]. The majority of women with PMH problems therefore do not access care and this may be particularly the case for women with mild to moderate PMH problems [12,13] or those with less commonly recognised problems, such as anxiety, obsessive compulsive disorder (OCD) or post-traumatic stress disorder (PTSD) [14,15].

Improved identification and treatment will reduce the number of women with anxiety and associated disorders, increase recovery rates, and could prevent the development of chronic disorders and comorbidities. Timely treatment may also lessen the impact of anxiety and associated disorders on children which is consistent with the FYFV emphasis on prevention [9].

The literature on women's PMH care focuses on service development/implementation or women's experiences of care and is predominantly about care for depression [16] with very little research on anxiety. A recent qualitative study examining experiences of care of women with perinatal anxiety found that service level barriers (e.g. lack of time and continuity of care) and health professionals' focus on depression had a negative impact on whether women sought help for perinatal anxiety [17]. However, there is no quantitative research with nationally representative samples looking at care for perinatal anxiety.

There are many reasons why women might not access care. Women may be reluctant to report anxiety and associated disorders, with research indicating 20% of women may not respond honestly to queries about their mental health due to fear of possible repercussions [18]. These problems are worse for women living in communities characterised by social disadvantage and ethnic diversity [19]. A recent meta-review of reviews conducted by our team identified a wide range of barriers and facilitators to women accessing PMH care across individual, healthcare professional, interpersonal, organisational, political and societal levels; as well as across the care pathway [20]. Again, the evidence in this and other reviews we have conducted is nearly all focused on perinatal depression [20-22].

Health service use may be impacted by acceptability, service availability and accessibility [23,24]. Access issues include women's lack of knowledge about services, inconvenient locations or times of services, lack of access to transport or to childcare, stigma, cultural beliefs and language barriers, or perceptions that the service does not meet a woman's needs [18].

Health Resource Utilisation

To improve access to care the NHS continues to invest in specialist PMH services but there is little UK-wide research on how/whether these services are being used by women. Policy recommends integrated physical and mental health services to support women to access PMH care [25], yet women with anxiety and associated disorders in pregnancy may be more likely to access maternity services late, go to antenatal appointments less frequently, fail to have regular scans, visit an obstetrician more frequently and show a preference for elective caesarean birth [26-28]. Recently developed PMH care pathways map out the services women can expect to be referred to, depending on the severity of PMH problems [29]. Large datasets of services can inform us about women who access a particular service e.g. Improving Access to Psychological Therapies (IAPT) data. However, they cannot tell us about the majority of women who do not access services and why this might occur.

This research is necessary to understand the progress of UK clinical policies and strategy aimed at improving access to PMH services [6,7,9]. Understanding how women with anxiety and associated disorders use services can inform NHS providers in the evaluation, design and transformation of PMH services. It can be used by health services and care providers to understand the impact of care pathways on women, and how services can be developed to provide optimal care for women with PMH problems. This study will lead to recommendations for accessible, integrated care that is acceptable to women. It will assist NHS commissioners and providers in the design and transformation of services for this population group.

Methodological Issues

A significant limitation in studies of PMH case-finding is the lack of cross-checking self-report data with medical records [30]. A substantial number of women who screen positive with case-finding instruments are likely to be known to health services already. By cross-checking GP records for a subsample of women who have anxiety and associated disorders we will

be able to determine: (i) whether women visit their GP and disclose mental health problems; (ii) whether and when GPs identify PMH problems in women, and the accuracy of diagnosis; (iii) services available to treat PMH problems and use of these services via referral data; (iv) whether the number of 'cases' identified by the screening measures is inflated, as is sometimes the case in depression screening studies. It also enables us to examine anxiety and associated disorders in the context of previous medical history and treatment.

Definitions of Perinatal Anxiety

Perinatal anxiety has been variously defined. Anxiety disorders include generalised anxiety disorder (GAD), panic, phobias and social anxiety. Obsessive compulsive disorder (OCD) and stress disorders like post-traumatic stress disorder (PTSD) were also considered anxiety disorders until 2013 when they were re-classified in the revised DSM-5 psychiatric nomenclature [31]. Anxiety is also highly comorbid with depression [32]. For the purposes of this research we therefore refer to 'anxiety and associated disorders'. Evidence also shows that moderate symptoms which do not meet diagnostic thresholds can be distressing and debilitating [33] and impact on the developing fetus [34]. Research therefore needs to consider symptoms of anxiety across the spectrum, as well as clinically diagnosed disorders.

This mixed-methods research programme is therefore needed to understand the complex relationship between perinatal anxiety and associated disorders, positive or negative experiences of PMH care pathways, and responses to screening or case-finding instruments [35].

Aims and objectives

RESEARCH QUESTION: What care is offered to and accessed by women experiencing perinatal anxiety and associated disorders and what is the impact and cost of that care?

OBJECTIVES:

1. Determine the health service utilisation and self-report outcomes of women with and without perinatal anxiety and associated disorders (WP1, WP2)
2. Examine health inequalities in health service utilisation, self-report outcomes and costs of health service use (WP1, WP2, WP5)
3. Determine regional differences in health service utilisation, self-report outcomes and costs of health service use (WP1, WP2, WP5)
4. Explore women's perceptions of the care they were offered/received, acceptability of that care, preferences for optimal service provision, and regional variation in service provision (WP1, WP3)
5. Explore health service personnel's views on perinatal anxiety and associated disorders; their role and ability in managing perinatal anxiety and associated disorders; barriers to managing anxiety and associated disorders; and how to develop pathways for optimal care (WP4)
6. Determine the costs of health service use for women with and without perinatal anxiety and associated disorders from a multi-agency and societal perspective (WP5)

Project Plan

OVERVIEW: The MAP ALLIANCE project uses mixed methods research with five work packages (WP): WP1 is a longitudinal postpartum follow up of the existing MAP cohort; WP2 looks at information from GP medical records; WP3 is a qualitative study of women's experiences and WP4 is a qualitative study of health professionals' and stakeholders' views; WP5 is a health economic analysis (see Figure 1 for an overview).

SETTING: Universal and specialist services supporting women during pregnancy or postpartum in England and Scotland

WP1: HEALTH SERVICE USE, IMPACT AND COST

Aims

1. Determine the health service utilisation and self-report outcomes of women with and without perinatal anxiety and associated disorders.
2. Examine health inequalities in health service utilisation, self-report outcomes and costs of health service use.
3. Determine regional differences in health service utilisation, self-report outcomes and costs of health service use.

Secondary aims include examining the trajectory of women's antenatal anxiety in the postnatal period, and the impact of perinatal anxiety on maternal and infant wellbeing.

Design

A longitudinal follow-up of the MAP cohort at 6, 12 and 24 months after birth.

Sample

The MAP cohort is a systematic sample of 2245 pregnant women recruited in 29 NHS sites from 12 NHS Trusts and 5 Health Boards in England and Scotland respectively. Recruitment was conducted from November 2020 to November 2021. Women were eligible for inclusion in MAP if they met the following inclusion criteria: (i) aged 16 years or over (ii) less than 15 weeks pregnant at the time of recruitment (iii) able to provide written informed consent to take part in the study (iv) with a level of English sufficient to understand and complete questionnaires in lay language. The sample was recruited from Scotland (10%) and England (90%) as this reflects the relative populations and number of births in the two nations. The cohort is representative and diverse: the sample in Scotland is representative of the general population [36] whereas the sample in England has greater diversity with a greater proportion of participants from Asian, Black African/Caribbean, mixed ethnicity or other non-white groups compared to the 2011 Census [37].

The MAP study included measures of anxiety, depression and general psychological distress at 15, 22, 31 weeks of pregnancy and 6 weeks after birth. Clinical interviews were conducted with a subsample of 407 women (102 at each time point).

MAP therefore provides information on anxiety disorders and associated disorders in pregnancy and 6 weeks postpartum for this subsample.

Figure 1. Optimising Care for Perinatal Anxiety: Evaluation of Health Service Utilisation, Outcomes and Costs (MAP ALLIANCE)

	WP1: Health service use, impact and cost	WP2: Records-based health service use	WP3: Women's experiences of health services	WP4: Health personnel's views on managing perinatal anxiety
AIMS	[1.1] Determine the health service utilisation and self-report outcomes of women with and without perinatal anxiety and associated disorders. [1.2] Examine health inequalities in health service utilisation, self-report outcomes and costs of health service use. [1.3] Determine regional differences in health service utilisation, self-report outcomes and costs of health service use.	[2.1] Examine health service utilisation and outcomes of women with anxiety and associated disorders in more detail. [2.2] Examine context and trajectory of PMH disorders in years prior to pregnancy. [2.3] Assess concordance of self-report data from WP1 with women's medical records.	[3.1] Explore women's perceptions of the care they were offered/received. [3.2] Explore acceptability of care. [3.3] Determine women's preferences for optimal service provision. [3.4] Examine regional variation in service provision.	[4.1] Explore health personnel's views on perinatal anxiety and associated disorders and their role and ability to manage perinatal anxiety. [4.2] Determine barriers and facilitators to managing perinatal anxiety and associated disorders in current care. [4.3] Determine health personnel's views on how to develop pathways for optimal care for anxiety and associated disorders.
METHODS	Prospective longitudinal follow-up of the MAP cohort of 1600 women recruited from NHS sites in England and Scotland. Measures of anxiety, health service use, patient reported experience (PREMs) and patient reported outcomes (PROMs) will be completed at 6, 12 and 24 months postpartum.	Data extraction from primary care records for a subsample of 40 women from WP1 who were diagnosed with anxiety or associated disorders during pregnancy and/or after birth. Data will be extracted for the previous 10 years and include frequency and reason for primary and secondary care consultations and interventions.	In-depth qualitative interviews with a purposive subsample of 60 women from WP1 to establish variation in response to factors that are likely to influence women's experiences such as: (i) women from different geographical regions where services may vary; (ii) women from ethnic minority groups; (iii) women whose PMH problems were or were not identified.	In-depth qualitative interviews with a purposive sample of 60 healthcare professionals and managers from services that work with perinatal women from different services (e.g.. maternity, primary care, health visiting, mental health services); disciplines (e.g. midwifery, general practice, psychiatry); stakeholders (e.g. commissioners); and level of experience.
OUTPUTS	[1.1] Recommendations about access to support and treatment for perinatal anxiety and associated disorders. [1.2] Identification of characteristics of women likely to miss referral, and recommendations about how to better identify these women.	[2.1] Detailed understanding of long-term health service use. [2.2] Validity of self-reported healthcare service use against medical records.	[3.1] Recommendations about acceptability of care pathways. [3.2] Recommendations for service development to provide optimal care. [3.3] Information on variation in care pathways and access to these in different regions and groups.	[4.1] Evidence on how care pathways are working, barriers to effective working and how to optimise current pathways. [4.2] Recommendations for how to develop pathways for optimal care.
CROSS PROJECT	**WP 5: Economic costs of perinatal anxiety and health service use**			
	[5.1] Aim: Determine the costs of health service use for women with and without perinatal anxiety and associated disorders from a multi-agency and societal perspective. [5.2] Outputs: Evidence on costs of perinatal anxiety and associated disorders, types of services accessed, and potential impact on society will inform health service commissioning and budgets, and provide information on the potential cost and impact on society.			

Data Collection

The majority of women in the MAP cohort provided consent to be contacted for further follow-up and these participants will be informed of MAP ALLIANCE approximately 6 months after their baby is born. They will be sent a covering letter, participant information sheet about MAP ALLIANCE and the 6- month questionnaire at the same time. Women will be asked to indicate their consent to taking part in the MAP ALLIANCE follow-up at the same time as returning the 6-month questionnaire. If they do not want to take part in the MAP ALLIANCE follow-ups they can choose not return the questionnaire and consent form and/or contact us to request they are removed from the study. Women who do not contact the study team to indicate they wish to withdraw, or who do not return the 6-month questionnaire and consent form, will be followed up with one email reminder, one telephone reminder and one text reminder. If women do not respond to any of the communications after four weeks they will be removed from the study database. Women who decide to remain in the study and who return the 6-month questionnaire will be offered the incentive of winning one of four £50 shopping vouchers. The draw will take place three months after all women have been sent the final reminder to take part.

Women who complete the MAP ALLIANCE consent form and 6-month questionnaire, will be sent further MAP ALLIANCE questionnaires at 12 months and 24 months by email or post, according to women's preference for completing the measures online or by post. Postal questionnaires are sent with a Business class reply-paid envelope so they can be returned directly to the research team. A link to online questionnaires will be sent via email with a unique log-in ID for each participant to ensure their responses at different time points are collated.

Self-reported measures will be taken of health service use, patient-reported experience (PREMs) and patient-reported outcomes (PROMs) for women and their infants as shown in Table 1. Where possible, the same measures will be used as in MAP to enable comparison across pregnancy and postpartum.

All measures will be sent to women to complete at 6, 12 and 24 months after birth. If 12- and 24-month questionnaires are not returned, participants will be contacted up to four weeks after their questionnaire was due to maximise response rates. If participants have not completed the questionnaires four weeks after they were due, they will be given the opportunity to complete a short version of core measures with a researcher by telephone. This should preserve the uniformity of the three time points and thus allow meaningful comparisons among participants.

Completion of each questionnaire will be followed by a thank you email/letter. While there are a number of standard emails/letters that the research team will use to communicate with study participants at various stages of WP1 (e.g. thank you messages after each returned questionnaire, reminders to complete subsequent questionnaires), the wording of these emails/letters will be flexible depending on the specific type of communication with women taking part in the study. This approach to follow up is the same as that used in MAP which has been well received by participants and successful at improving retention and response rates.

Both the paper and online versions of the study questionnaires will include the measures shown in Table 1.

With regard to ethical considerations and the safety of women taking part in the study, serious adverse events (e.g. infant death in the first year) will be monitored using a similar procedure to that used previously for the MAP Cohort. When questionnaires are sent out the covering letter will ask participants to let the team know if anything has happened that affects their participation in the study. If a participant reports a serious adverse event the central research team will write to them expressing sympathy and give the option of leaving or remaining in the study, asking women to contact the research team if they would like to remain in the study.

If women express severe anxiety, depression or suicidal intent in their responses the MAP safeguarding procedures will be followed (see Ethical and Regulatory Issues and Appendix A). Women will be encouraged to seek help from their GP and/or health visitor. In addition, women will be offered a resource sheet giving details of organisations who may be able to provide support. This approach has been used in MAP and appears to work well.

Table 1. MAP ALLIANCE measures

[α]These will be recorded for the mother and infant. [β]These were also measured in MAP at 15, 22 & 31 weeks of pregnancy and 6-weeks postpartum.

Health Service Use	**Patient Reported Experience Measures**	**Patient Reported Outcome Measures**
Community-care consultations and service use [α]	Quality of care	Anxiety (GAD-7; SAAS) [β]
Referrals [α]	Satisfaction with care	Depression (Whooley) [β]
Hospital consultations [α]	Acceptability of care	Psychological distress (CORE-10) [β]
Hospital stays [α]	Access to services	Health-related quality of life (EQ-5D-5L) [β]
Treatments/interventions [α]	Patient-centred care (e.g. decision making, continuity)	Perceived need for treatment [β]
Waiting times for treatment/ interventions	Personalised care	Maternal wellbeing (WEM-WBS
Medication prescription	Communication, confidence and trust	Infant feeding/sleeping/ temperament
Medication use	Support and advice	Mother-infant bond (MORS)
Use of alternative therapies or self-help	Care preferences / whether care met expectations	Infant development

Measures

Where possible measures used will be existing validated tools that have been used with women in the perinatal period. Measures used for different variables are outlined below.

Health service use measures

Health service use will be measured using items from the Client Service Receipt Inventory (CSRI) [38]. The CSRI is a tool used to collect information on the whole range of services and support that may have resource implications and that study participants may use. It is commonly adapted to suit the specific needs of each study in which it is used [39]. Items will be used to measure:

- Inpatient and outpatient hospital use for mother and baby
- Contacts with the GP, community midwife, and health visitor
- Contacts with other health care professionals as specified by participants
- Medication use
- Informal and formal support services

Patient reported experience measures

The Care Experience Feedback Improvement Tool (CEFIT) [40] will be used to measure patient experience of services and quality of care. The CEFIT includes five items measuring safety of care, timeliness of care, personalised care, care from staff, and access to care.

Items based on the NHS GP Patient Survey (GPPS) [41] will be used to measure satisfaction with care from each type of health care professional; involvement in decision-making and confidence in health care professionals .

Items from the Patient Ward Questionnaire will be used to measure courtesy and respect from health care professionals; being listened to by health care professionals; and understanding of explanations from health care professionals.

In addition, receiving support and advice, care meeting expectations, and acceptability of care will be measured using non-validated items.

Patient reported outcome measures

Anxiety, depression, and psychological distress will be measured using the same questionnaires used for the MAP study in pregnancy and postpartum. These are: general psychopathology (CORE-10) [42], depression (Whooley questions) [43], generalised anxiety (GAD-7) [44] and perinatal anxiety (SASS) [45].

PTSD will be measured using the 5-item Primary Care PTSD Screen [46]. Mental wellbeing will be measured using the 7-item Warwick-Edinburgh Mental Wellbeing Scale, short form [47]. Single items will be used to measure functional impairment and need for treatment, as per the MAP questionnaires.

General health will include measures of quality of life measured using the EQ5D5L [48]. Postnatal physical symptoms, tiredness and COVID-19 exposure and/or infection will be measured using items from the National Maternity Survey [49]. General physical symptoms will be measured using the Physical Health Questionnaire-15 [50]. Support will be measured with the ENRICHD Social Support Inventory [51].

Infant measures

Infant measures will include baby age, current baby health problems (non-validated), infant feeding, sleep, temperament and development. Infant feeding consists of items considering current breastfeeding status and whether the type of feeding met the mother's intentions, and are based on items from the National Maternity Survey. Infant sleep will be measured using two items from the Brief Infant Sleep Questionnaire [52]. Temperament will be measured using one item from the National Maternity Survey [49]. Infant development will be measured at 24-months using the Ages and Stages Questionnaire: Social Emotional, version 2 [53]. The mother-infant relationship will be measured using the Mothers Object Relations Scales, short form (MORS), a 14-item measure of the mother's perception of her baby's feelings towards her [54].

Data Analysis

Associations between anxiety and service use will be examined by looking at how severity of anxiety (mild/moderate/severe) predicts the number and type of services used (e.g. number of GP appointments, referral to secondary care, pharmacological treatment, use of IAPT and/or equivalent voluntary sector organisations). The relationship between each of these outcomes and severity of anxiety will be assessed in a model suitable for count data where there may be zero inflation such as negative binomial or Poisson regression. Severity of anxiety will be treated as a continuous variable operationalized as score on the questionnaire identified through MAP as the optimum for identifying anxiety in pregnancy. The analyses will be adjusted for socioeconomic status, age, parity, ethnic group, previous health service contact prior to pregnancy. Similar analyses will be conducted for associated disorders of depression and general distress.

Health inequalities will be compared in women with perinatal anxiety who do or do not receive referral and treatment in terms of regional variation and other characteristics such as age, ethnicity, comorbid conditions, parity, socioeconomic status etc. Analysis will be by logistic regression. We will investigate whether any differences in outcomes for women across region, ethnic group or other characteristics are mediated by access to services. Analysis will be by regression with interaction terms between sociodemographic characteristics and service use.

Sample size

For the analysis of the association between severity of anxiety and frequency of service contact using a Poisson regression model with log link function, 1500 women (assuming 94% of MAP cohort consent) will give 90% power to test the hypothesis that the coefficient b for the GAD-7 anxiety questionnaire score will be 0.05 against a null hypothesis of b=0. The distribution of GAD-7 is assumed gamma with shape parameter 1 and scale parameter 2

Outputs

WP1 will enable us to make recommendations to health services about perinatal anxiety support and treatment. In particular we will be able to identify groups of women with perinatal anxiety who are likely to miss referral to services and recommend ways these women can be better identified for support.

WP2: RECORDS-BASED HEALTH SERVICE USE

Aims

1. To examine health service utilisation and outcomes of women with anxiety or associated disorders in more detail.
2. To examine context and trajectory of PMH disorders in years prior to pregnancy.
3. To assess concordance of self-report data from WP1 with women's medical records.

Design

Data extraction from primary care records for the 10 years prior to pregnancy and first postnatal year to provide information on the context and trajectory of mental health and health service use prior to pregnancy, and to complement and corroborate women's self-reported health service use, PROMs and PREMs in WP1.

Sample

The sample will be drawn from the 407 women in the subsample who completed the Mini International Neuropsychiatric Interview (M.I.N.I, version 7.0.2) and met criteria for a current diagnosis of generalised anxiety disorder, major depressive episode, panic disorder, agoraphobia, specific phobia, social anxiety disorder, OCD, or PTSD. In MAP 21% of the sample met diagnostic criteria and of those 44 have enrolled in MAP Alliance., which means a possible sample of 44 women will be eligible. Most women consented for us to access their medical records as part of MAP but allowing for those who withheld this consent provides a maximum sample of around 44 women.

Data Collection

Eligible women will be contacted explaining the study and will be asked to indicate their consent to taking part in Work Package 2. Women who do not return the consent form, will be followed up with two reminders. If women do not respond to any of the communications after four weeks they will not be enrolled in Work Package 2.

Data collection will be via Primary Care GP practices (England) and a centralised data provision service for primary care data (Albasoft, Scotland). Data that will be requested are shown in Table 2. We will request data from women's medical records for the previous 10 years to capture information for early adulthood because anxiety disorders are particularly prevalent under 35 years of age [55], with onset of symptoms typically occurring in early adulthood [56]. In women, studies of anxiety across the lifespan suggest the majority of anxiety disorders have their onset during late adolescence and early adulthood [57]. As the average age of first-time mothers is 28.8 years and all mothers 30.7 years [58, 59] extracting data for a 10-year period should enable us to determine the onset and trajectory of anxiety disorders from late adolescence, early adulthood and the perinatal period, with associated health service use.

Codes for the data to be extracted will be identified or developed through literature reviews, consultation with clinicians and using existing sources such as the British National Formulary (www.bnf.org) [60]. First, a list of relevant symptoms, investigations, administrative codes, diagnoses, medications, and free text relevant to anxiety and associated disorders will be specified. Then a list of related codes required for data extraction will be derived. In England, each woman's GP practice will be contacted and information sharing protocols put in place. Clinical Research Network personnel or a member of the central research team will extract data for each participant. A single data extraction will be requested. In Scotland, Albasoft will operate as a trusted third party and will act as a data processor on the providers (GP practices) behalf. Albasoft will extract the required data from the GP records and process this in a form that is compliant with the data protection act (e.g. removal of identifiers). Albasoft will contract with each GP practice, providing the option for opt-out of individual practices.

In addition we will link information from medical records with information from MAP (sociodemographic details, current and lifetime history of anxiety and associated disorders) to give a more detailed picture of recent and lifetime mental health.

Table 2. Data from medical records

Health Service Use [α]	**Context and Outcome Measures**
Primary care consultations with GP	Mental health diagnoses (current)
Referrals	Mental health diagnoses (past 10 years)
Hospital consultations	
Hospitalisation	
Treatments/Interventions	
Medication prescription	

[α] Frequency and reason for consultations, referrals etc. will be extracted.

Data Analysis

Descriptive statistics for health service use will be provided. We will examine frequency and type of service use by type of anxiety and associated disorders, and by perceived need for treatment. The relationship between time of onset of disorders and health service utilisation will be examined using discrete time event history analysis stratified by health service use prior to pregnancy. This will allow us to explore the timeliness of support provided to women.

Concordance between self-report and administrative records will be assessed using adjusted Cohen's kappa for categorical and intraclass correlation coefficient for continuous measures.

Outputs

Results of this WP will provide a detailed understanding of mental health and health service use over a longer period of time than the perinatal period. This WP will also add to the methodological literature on the validity of self-reported healthcare use against medical records.

WP3: WOMEN'S EXPERIENCES OF HEALTH SERVICES FOR PERINATAL ANXIETY

Aims

1. Explore women's perceptions of the care they were offered/received.
2. Explore acceptability of that care.
3. Determine women's preferences for optimal service provision.
4. Examine regional variation in service provision.

Design

Qualitative semi-structured interviews.

Sample

Women from WP1 will be eligible if they had anxiety, depression or general distress in pregnancy or postpartum. Purposive sampling will be used in order to establish variation in response to factors that are likely to influence women's experiences such as: (i) women from different geographical regions where services may vary; (ii) women from ethnic minority groups; (iii) women whose PMH problems were/not identified; (iv) women who did/did not receive treatment. To ensure all these groups are represented in enough detail the sample size is expected to be around 60.

Data Collection

Women from the MAP cohort who scored above the cut-off on self-report measures of anxiety, depression or general distress in pregnancy (MAP) or postpartum (WP1) will be eligible to take part. Women within this group who have agreed to be interviewed (as part of MAP) will be identified and a sampling matrix used to ensure that women invited to take part are geographically representative (e.g. England/Scotland; urban/rural areas) and include women from ethnic minority groups.

Women will be telephoned to inform them about the study and, if interested, will be emailed or sent a letter of invitation, information sheet and consent form. They can return the consent form if they wish to take part.. Those who agree will be asked to re-consent prior to the interview. Interviews will be conducted at a time and place suitable to participants and can be done in person, by telephone or online.

Interviews will be conducted by an experienced qualitative researcher using an interview schedule to examine women's experiences of the identification and management of their anxiety, depression or distress, experience of referral(s), attendance and engagement with services, and the acceptability of services. Questions relating to whom the women sought as a first point of contact (e.g. GP, health visitor, midwife etc.) will be asked to build a pathway to diagnosis, which will be costed by the study health economists in WP5. Questions regarding confounding factors that may have contributed to or caused anxiety in the perinatal period will also be asked to assist WP5 to ascertain if the cohort were using services primarily due to anxiety directly related to pregnancy, birth or the infant, or due to other circumstances. This will include historical confounders such as adverse childhood experiences. Finally, we will ask about women's preferences for treatment, the inclusion of family/partners and informal carers in treatment, and their views on what an optimal service would look like. Interviews will be able to be conducted in non-English languages if required and will be translated into English for analysis.

At the end of the interview women will be thanked for their time, and will be sent a £20 voucher for taking part. If women are currently distressed and report that they have not accessed treatment for their PMH they will be given information about their local PMH services and how to access these. Recordings will be transcribed verbatim, anonymised, and checked for accuracy. Identifiable information will be removed.

Data Analysis

Data will be analysed using framework analysis which is suitable for studies where qualitative data is examined within and between different subgroups. A combined inductive-deductive approach will be used which enables specific research questions to be addressed as well as identifying unexpected or new themes related to women's experiences and views on PMH healthcare. One researcher will do the coding and a selection will be checked for reliability. Data will be analysed using NVivo software. Regular meetings of the research team where problematic issues are documented, discussed, and resolved will ensure credibility.

Outputs

WP3 will enable us to make recommendations about the acceptability of the care pathways women have experienced, recommendations for future service development, and information on variation in care pathways and access to these in different regions and groups.

WP4: HEALTH SERVICE PERSONNEL'S VIEWS ON MANAGEMENT OF PERINATAL ANXIETY

Aims

1. Explore health service personnel's views on perinatal anxiety and associated disorders and their role and ability to manage these.
2. Determine barriers and facilitators to managing perinatal anxiety and associated disorders in current care.
3. Determine health service personnel's views on how to develop pathways for optimal care for perinatal anxiety and associated disorders.

Design

Qualitative semi-structured interviews.

Sample

People will be eligible if they work in or commission health services used by pregnant or postpartum women. Purposive sampling will be used to ensure representation of health professionals and managers from different services (e.g.. maternity, primary care, health visiting, mental health services); disciplines (e.g. midwifery, obstetrics, health visitors, general practice, nurses, psychiatry, psychology and liaison support); stakeholders (e.g. commissioners); and level of experience. To ensure all these groups are represented the sample size is expected to be around 60.

Data Collection

Eligible health professionals, managers and commissioners of services in England and Scotland will be identified and approached by clinical research network research staff. Possible participants will be given information about the study and if they are interested in taking part will provide informed consent.

Interviews will be conducted at a time and place suitable to participants and can be done in person, by telephone or online. Interviews will be conducted by an experienced qualitative researcher using an interview schedule to examine health service personnel's perceived knowledge and ability to manage perinatal anxiety and associated disorders (e.g. OCD, PTSD). Interviews will explore how services identify and diagnose anxiety and associated disorders in

pregnancy and the first year after birth; the care pathways available and how management of these disorders differs depending on severity of symptoms; confidence in managing anxiety and associated disorders; training needs; issues around treatment and service availability; perceived impact of the management of anxiety and associated disorders on women and on health professionals; and perceived changes needed to provide an optimal service. At the end of the interview health service personnel will be thanked for their time.

Recordings will be transcribed verbatim, anonymised, and checked for accuracy. Identifiable information will be removed.

Data Analysis

Data will be analysed using framework analysis which is suitable for studies where qualitative data is examined within and between different subgroups. A combined inductive-deductive approach will be used which enables specific research questions to be addressed as well as identifying unexpected or new themes related to health service personnel's views on management of perinatal anxiety and associated disorders. One researcher will do the coding and a selection checked for reliability. Data will be analysed using NVivo software. Regular meetings of the research team where problematic issues are documented, discussed, and resolved will ensure credibility.

Outputs

WP4 will inform health services about how current care pathways are working, barriers to effective working, and how to optimise these pathways. This WP will also provide recommendations for how to develop pathways for optimal care.

WP5: ECONOMIC COSTS OF PERINATAL ANXIETY AND HEALTH SERVICE USE

Aims

Determine the costs of health service use for women with and without perinatal anxiety and associated disorders from a multi-agency and societal perspective.

Design

Embedded health economic measures in WP1 and WP2 to assess the economic cost of perinatal anxiety and health service use, health inequalities and regional variation in costs.

Data Collection

In WP1 women will complete a bespoke client service receipt inventory based on our previous perinatal research [61] to record contacts for them and their baby with health and social care services. We will specifically ask about consultations relating to perinatal anxiety and associated disorders, and about any other sources of anxiety in order to address any confounders of other sources of anxiety or associated disorders. We will also use information gathered from interviews conducted in WP3. Our wish is to isolate out consultations and associated costs of these consultations relating to perinatal anxiety and associated disorders over and above consultations and associated costs of anxiety occurring in this population that may be a result of other causes.

To determine wider societal costs, women will be asked whether their anxiety has altered plans to return to work, or affected household/family responsibilities. We will make sure that the demographic data collected as part of this study will enable us to capture and cost wider societal impacts of perinatal anxiety and associated disorders. These will be compared with women without perinatal anxiety or associated disorders. Information from WP2 will be used to look at all healthcare costs over the previous 10 years in a subsample.

Data Analysis

Analyses will include a cost of illness approach which will describe, itemise, value and sum the costs of perinatal anxiety [62]. We will report on the frequency and costs of health service use for women with and without anxiety, and whether there are any differences between these groups [63,64], over the 12-month observation period of the study. We will explore frequencies and costs over the previous 10 years to determine any differences in patterns of service use prior to pregnancy [63,64]. We will produce costs using the most up to date national reference costs for the NHS [65]. Costs for non-health sector productivity losses from time off work relating to perinatal anxiety and associated disorders will be quantified by exploring social return on investment repositories such as the Housing Association’s Charitable Trust and Global Value Exchange [66,67]. We will take into account market forces factors and differences in costs relating to the health care systems of England and Scotland [68,69].

We will draw on our experience of cost benefit analysis and social return on investment in order to include wider societal costs relating to productivity losses e.g. from women not returning to work following a birth, perhaps due to perinatal anxiety and depression, and for lost volunteering activity and social value losses relating to lost volunteering activities, wider family carer activities, well-being activities, and community cohesion activities [70].

Outputs

WP5 will contribute to the main outputs across the research as well as a specific output on patterns of resource use by women with and without perinatal anxiety and associated disorders. We will explore if a cost of pathway to diagnosis paper can be produced using information from WP3 & WP4 in order to assist healthcare planning and policy. We anticipate that WP5 will inform health service commissioning and budgets, providing information on the cost of perinatal anxiety and associated disorders and health services utilisation, as well as costs of different types of service accessed and potential impact to society.

ETHICAL AND REGULATORY COMPLIANCE

The research will not be initiated before the protocol, consent forms and participant information sheets have received approval / favourable opinion from the Research Ethics Committee (REC), the respective National Health Service or other healthcare provider's Research & Development department, and the Health Research Authority if required. Applications for ethical approval for WP1, WP2, WP3 and WP4 will be made to the REC and Health Research Authority following the award of the grant.

Should a protocol amendment be made that requires REC approval, the changes in the protocol will not be instituted until the amendment and revised informed consent forms and participant information sheets (if appropriate) have been reviewed and received approval / favourable opinion from the REC. A protocol amendment intended to eliminate an apparent immediate hazard to participants may be implemented immediately providing that the REC are notified as soon as possible and an approval is requested. Minor protocol amendments only for logistical or administrative changes may be implemented immediately; and the REC will be informed.

Research will be conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki, 1996; the principles of Good Clinical Practice and the UK Department of Health Policy Framework for Health and Social Care, 2017 [71]. GDPR regulations will be adhered to.

Ethical Issues

This project does not involve medical intervention so major ethical issues are unlikely to arise. However, it is likely that a proportion of women who participate in the research will report anxiety or depression, and a small proportion will report suicidal ideation. MAP and MAP Alliance procedures to respond to this are given in Appendix A.

Women who report clinically significant symptoms in questionnaire assessment in WP1 will be contacted to say their questionnaire responses suggest they might be suffering from anxiety or depression and they will be strongly encouraged to talk to their GP and/or health visitor about this. If women do not feel comfortable discussing this with their GP or health visitor we will also provide them with a list of other support organisations, including the NCT helpline and psychological services (IAPT) they can access through self-referral. Clinically significant symptoms reported by questionnaire will be defined according to established cut-offs used for the GAD-2 [44]; Whooley questions [43]; and Primary Care PTSD Screen for DSM-5 [72]..

Women who report suicidal ideation in questionnaire assessments will be contacted by email or phone within 24 hours of the MAP research team receiving the questionnaire to conduct a suicide risk assessment. If women report suicidal ideation in WP3 interviews the risk

assessment will be conducted at that time or within 24 hours depending on current context and circumstances. Action will be taken on the basis of the risk assessment and consultation with study clinicians as to whether a referral to specialist services is appropriate. In all instances a risk assessment form will be completed.

In WP1 measures are taken at three time points so women who report anxiety, depression or suicidal ideation will be monitored across time points and contacted as necessary to ensure they are accessing support or treatment as needed.

PATIENT AND PUBLIC INVOLVEMENT (PPI)

This project has been developed with PPI representatives from the National Childbirth Trust (NCT) in England (McMullen) and the Maternal Mental Health Change Agents (MMHCA), a group of women in Scotland with lived experience of perinatal mental ill health. We also work closely with the PPI Research Advisory Group at the Centre for Maternal and Child Health Research, City University (advisors) and will be setting up a MAP ALLIANCE advisory group of volunteer participants in MAP and MAP ALLIANCE who would like to be more closely involved in the research oversight and dissemination.

These organisations and groups will continue to ensure we have PPI input from participants, perinatal women generally as well as those affected by anxiety and other perinatal mental health problems. The research team have collaborated with the NCT and MMHCA for a number of years so have very good, productive and valuable relationships. Representatives from the NCT and MMHCA will co-ordinate PPI input throughout the research and will lead the Dissemination phase of the project. PPI members have been, and will continue to be involved in the project at every step including training researchers and practitioners, input into research materials, supporting recruitment, analysis and interpretation of the data, and dissemination.

DISSEMINATION AND IMPLEMENTATION

To ensure uptake of the recommended assessment method we have a 5-month output and dissemination phase at the end of the research programme which will be led by the PPI representatives with input from the clinical and service leads in England and Scotland. The first part of this phase will focus on outputs. These will be made available online so that services and individuals can access them easily. The second part of this phase will focus on engagement and facilitation activities to facilitate uptake and implementation of perinatal assessment in relevant healthcare services across the UK.

Outputs

This study will lead to recommendations for accessible, integrated identification, care and treatment that is acceptable to women. The work packages in this research programme will provide the following key outputs:

- Recommendations about access to support and treatment for perinatal anxiety and associated disorders (WP1).
- Identification of characteristics of women likely to miss referral, and recommendations about how to better identify these women (WP1).
- Detailed understanding of long-term health service use (WP2).
- Validity of self-reported healthcare service use against medical records (WP2).
- Recommendations about acceptability of care pathways (WP3).
- Recommendations for service development to provide optimal care (WP3).

- Information on variation in care pathways and access to these in different regions and groups (WP3).
- Evidence on how care pathways are working, barriers to effective working and how to optimise current pathways (WP4).
- Recommendations for how to develop pathways for optimal care (WP4).
- Evidence on costs of perinatal anxiety and associated disorders, types of services accessed, and potential impact on society will inform health service commissioning and budgets (WP5).

It is hoped these combined outputs will enable the development of targeted guides for services in terms of existing care, recommendations for change, and implementation. Guides will detail how current care pathways are working and how to optimise these pathways. We could also include information on key facilitators to change identified by the complementary MATRIx project.

Dissemination and implementation

Findings will be disseminated widely to researchers, clinicians, policy makers, the public and other stakeholders in various ways. The first 3 months of the dissemination phase will focus on finalising outputs and developing targeted materials for different audiences (e.g. policy, commissioners, health professionals, public) and service contexts (e.g. maternity, primary care). These will include infographics and eight short videos or case studies involving participants or women from participatory communities highlighting key findings and recommendations in English and other languages. These will be made available online on a dedicated project website so services and individuals can access them easily.

The final 2 months will focus on engagement and facilitation activities to facilitate uptake and implementation of recommendations regarding perinatal anxiety identification and care pathways in relevant healthcare services across the UK. These include:

- Dissemination event for stakeholders, commissioners, service managers and health professionals working with perinatal women.
- Disseminating results to the public through social media and press releases.
- Dissemination through clinical networks i.e. the National Managed Clinical Network for Perinatal Mental Health in Scotland and England.
- Dissemination to perinatal mental health leads at the Royal Colleges of Psychiatrists, Midwives, General Practitioners, and Obstetricians and Gynaecologists.
- Dissemination to NHS England’s perinatal mental health team.
- Dissemination to the Scottish Government Health and Social Care Directorate Mental Health Division.
- Dissemination to services and service users through Maternity Voices Partnerships or Maternity Services Liaison Committees.
- Dissemination to third sector organisations e.g. the Maternal Mental Health Alliance, NSPCC, NCT, Children in Scotland, Aberlour Child Care Trust.

Dissemination for participant and public engagement will be achieved by working with a PPI group of MAP/MAP Alliance participants on participant engagement, raising public awareness and dissemination. This group is a new and valuable addition to MAP and MAP Alliance. A member of the MAP Alliance research team will be our dissemination lead so that dissemination and public engagement is woven throughout the project. We will also ensure good public engagement and dissemination by creating accessible materials, including:

- A dedicated WIX website with greater functionality and search engine optimisation so members of the public can find information on MAP and MAP Alliance easily.

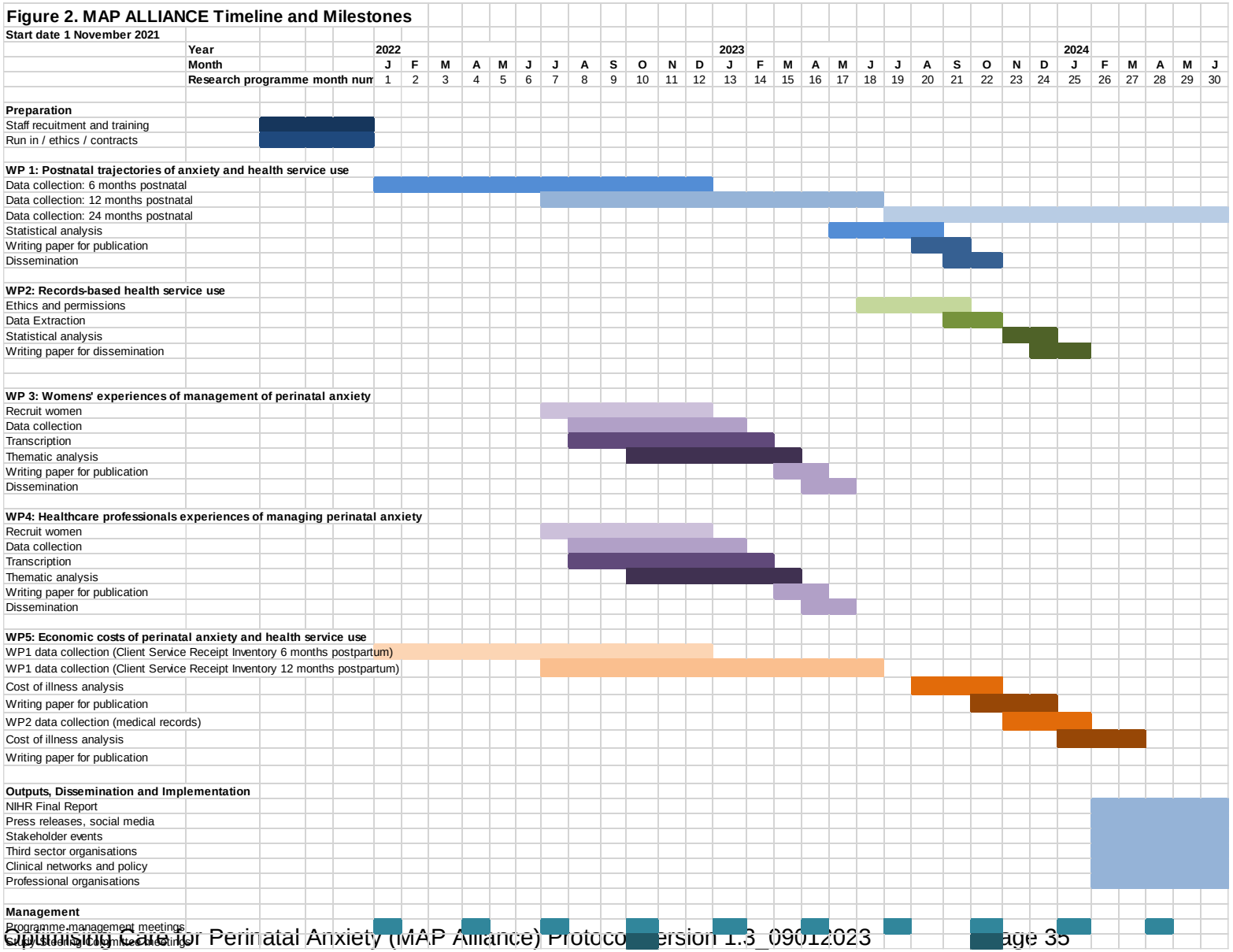
- E-zines for participants in MAP/MAP Alliance to raise awareness and increase engagement.
- 4 short videos about the project and project results that can be embedded in our and other websites and platforms such as YouTube to raise awareness.
- Translated versions of these videos to reach communities for whom English is not their first language. These videos will involve MAP participants or women from these communities.
- The creation of infographics summarising the project, results and recommendations, tailored to different audiences.
- Key outputs will be translated into four different languages for participant communities.
- Working with key individuals and organisations such as pregnancy apps and high profile bloggers to disseminate findings and recommendations using the videos, infographics, blogs or press releases.

Providing videos and infographics for our PPI partners to show and distribute at events such as the Baby Show (https://www.thebabyshow.co.uk/) and NCT antenatal classes. The research team is well placed to ensure wide spread dissemination to the NHS and wider population, and to facilitate engagement and uptake in healthcare services. Representatives from the NCT and MMHCA will co-ordinate dissemination of research findings to the public through social media, seminars and press releases. The NCT and MMHCA have active and successful campaigns for perinatal mental health (e.g. the NCT's Hidden Half campaign) so are very experienced at disseminating information and raising public awareness. The research team also has a strong clinical background with significant roles in local and regional healthcare services. Liaison with NHS services and clinical input to the project will be provided by our clinical leads for England (Shakespeare) and Scotland (McCann). Each member of the team will also ensure the results are disseminated widely within their own hospital, trust or speciality. The research team are also well connected with professional, third sector, and policy organisations so will use these connections to ensure wide-spread dissemination e.g. the all-party parliamentary group 1001 Critical Days; NHS England perinatal mental health team; National Managed Clinical Networks for Perinatal Mental Health; Maternal Mental Health Alliance; relevant Royal Colleges (Psychiatrists, GPs, Obstetricians, Midwives); the Institute of Health Visiting; NSPCC; Tommy's Charity, Family Action and many others.

RESEARCH TIMETABLE

The project timeline is 30 months from January 2022 to June 2024. There is a 3-month pre-award period of work setting up the study e.g. approving contracts, recruiting staff and obtaining ethical approval. In the first 18 months we will complete WP1, WP3 and WP4. From 18 to 25 months we will complete WP2. WP5 runs across the whole project. The Gannt chart is shown in Figure 2.

Figure 2. MAP ALLIANCE Timeline and Milestones



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APPENDIX A

MAP and MAP ALLIANCE SAFEGUARDING PROCEDURES

Ethical considerations and safety of study participants

This study is with postpartum women and does not involve medical intervention so major ethical issues are unlikely to arise. Most of these women will be healthy. However, there are a few naturally-occurring circumstances that mean women may be vulnerable so we have procedures in place to safeguard these women and their children:

1. Women with clinically significant mental health symptoms
2. Women who report suicidal ideation
3. Women who experience serious adverse events such as pregnancy loss, stillbirth and maternal death
4. Children of women who disclose risk of/harm to their children.

Data monitoring and safeguarding procedures for each of these groups is outlined below.

1. Reporting clinically significant mental health symptoms

It is likely that a proportion of women who participate in the research will report clinically significant symptoms. A number of measures and procedures are in place in order to keep participants' discomfort and distress to a minimum, and signpost women identified as experiencing clinically significant symptoms to appropriate sources of support.

The participant information sheet (PIS) makes it clear to potential participants that the questionnaires and interview will be looking into their experience of psychological symptoms and they can withdraw from the study at any time. Specifically, the PIS states that "... some women may become distressed if they are reminded of any emotional difficulties when completing questionnaires. If this is the case, you will find contact details of some helpful organisations at the end of this information sheet. We also recommend that you speak with your GP or health visitor."

Women who report clinically significant symptoms based on a score above cut-off on the measures currently recommended by NICE to screen for anxiety and depression in the perinatal period (the GAD-2 or Whooley questions) or on the PC-PTSD-5 will be contacted by the research team and encouraged to talk to their GP or health visitor. In case women do not feel comfortable discussing this with their GP or health visitor we will also provide them with a list of other support organisations, including the NCT helpline and psychological services (IAPT) they can access through self-referral (see Useful Organisations sheet V1_060222.).

Women with severe symptoms will be monitored over time so that if their symptoms are chronic or worsening the research team can contact them if they are concerned. A named clinician is also available in England and Scotland to discuss any concerns and agree the appropriate course of action.

2. Reporting of suicidal ideation

One of the measures, the CORE-10, includes a question about suicidal ideation. Women who report any suicidal ideation will be contacted within 24 hours by email or phone to conduct a suicide risk assessment (see Risk assessment form V1.2_140420). Action will be

taken on the basis of the risk assessment and consultation with the study clinicians as to whether a referral to their GP or specialist services is appropriate. In all instances a risk assessment form will be completed.

All cases of women who report suicidal ideation will be reported and discussed at Core Research Team meeting held weekly which include a senior psychologist and senior midwife. Cases for concern will be discussed and reviewed by study clinicians.

Monitoring mental health and suicidal ideation over time

In the MAP and MAP Alliance study, measures are taken three times in pregnancy and four times after birth. This means women who report severe mental health symptoms or suicidal ideation can be monitored across time points and contacted where necessary to ensure they are accessing support or treatment as needed. The content of these contacts will be flexible dependent on each woman's circumstances and any previous contact we have had with her (so we can check, for example, whether she has reported the same or different problems previously and whether she is already accessing treatment or was intending to). If there is cause for concern this will be discussed with the core team and study clinicians to decide the best course of action.

3. Women who experience serious adverse events

During pregnancy and birth there are naturally occurring serious adverse events that might arise, such as miscarriage, infant or maternal death. To ensure these women are identified after recruitment all participants will be monitored through the following procedures. Two weeks before follow-up questionnaires are sent, central research staff will contact site staff with a list of women due to be sent the questionnaire. Site staff will check participant medical records for pregnancy loss, stillbirth or maternal death. If pregnancy loss or stillbirth has occurred the central research team will write to women to express sympathy and give the options of leaving or remaining in the study, asking women to contact the research team if they would like to remain in the study. We will also include a resource sheet giving details of organisations who may be able to provide support. This approach was agreed in collaboration with our PPI colleagues and has been effectively used in previous studies.

If maternal death has occurred this will be noted and there will be no further contact with women.

For the follow ups 6 or more months after birth it is possible that serious adverse events occur such as infant death. Hospital sites would not be informed of these late infant deaths so when sending the questionnaires to women 6+ months after birth the cover letter will say “if anything has happened that may affect your participation in the study, we would like to hear from you. Alternatively, women can choose not to respond to the invitation to take part, or to subsequent questionnaires and reminders at 12- and 24- months, whether or regardless of whether they initially consented at six months. Additionally, women are given the contact details for the Research Team, via mail, email or telephone, with each reminder and are encouraged to get in touch with any concerns.

4. Children

The participant information sheet sets out the limits to confidentiality, including the participant’s disclosure of risk of harming themselves or others, which includes their child(ren). Participants are therefore aware that disclosure of significant harm or potential for significant harm to their baby (or other child/ren) will lead to the research team having to inform relevant people of this disclosure.

Harm to child(ren) is not asked about directly either on the questionnaires or in the interviews with women. However, it is possible that such a disclosure might occur if a woman takes part in an interview for Work Package 3, and/or within the free text box on the questionnaires that states: 'If there is anything else you would like to tell us or comment on regarding the last six months, or how you are feeling, please add it here'.

In the event that a woman discloses harm to her child/ren, the Chief Investigator (or if unavailable, a senior member of the research team) will call the woman to discuss the disclosure within 24 hours of receiving the questionnaire containing the disclosure at the University. During the call to discuss the disclosure, the researcher will also ascertain whether the woman is already in contact with support services including social services, and encourage her to contact them for support. The researcher will remind the participant of the limits to confidentiality within the research study as set out in the participant information sheet, and will explain the need to pass information onto relevant people regarding the disclosure. Details of the participant's disclosure and of this telephone conversation and actions taken will be logged.

The chief investigator will notify the University's Safeguarding Lead (Chris Barnes, Safeguarding@city.ac.uk) and the School of Health Sciences Safeguarding Leads (Anthony.Copeland.1@city.ac.uk; Judy.Brook@city.ac.uk) immediately following the call.

If the woman is uncontactable by phone within 24 hours of the research team receiving the disclosure within her questionnaire, then the chief investigator will notify the University's Safeguarding Lead, and the School of Health Sciences Safeguarding Lead. If, for any reason, the Safeguarding Leads are not available (e.g., at a weekend or out of office hours), then the Chief Investigator will notify the local authority duty social worker within 24 hours.

If the disclosure is made during an interview, the researcher will ascertain whether the woman is already in contact with support services including social services, and encourage her to contact them for support. The researcher will remind the participant of the limits to confidentiality within the research study as set out in the participant information sheet, and will explain the need to pass information onto relevant people regarding the disclosure. As soon as the interview ends, the researcher will inform the Chief Investigator, who will notify the Safeguarding Leads, as detailed above. Details of the participant's disclosure and of the conversation at interview and actions taken will be logged. All such events will be discussed at fortnightly research team meetings.

The research team will comply with City, University of London's Safeguarding policy (https://www.city.ac.uk/__data/assets/pdf_file/0004/578650/Safeguarding-at-City-April-2017_Under_Review.pdf), and will comply with government guidance as set out in 'Working together to safeguard children' (2018) for participants taking part in England (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/942454/Working_together_to_safeguard_children_inter_agency_guidance.pdf), and 'National Guidance for Child Protection in Scotland'(2021) for participants based in Scotland (https://www.gov.scot/publications/national-guidance-child-protection-scotland-2021/).

All researchers have completed the NIHR's Good Clinical Practice training, and are familiar with the safeguarding policies and guidance detailed above.

Data monitoring and Governance

Paper copies of the questionnaires will be reviewed on the day they are received by the research team for indicators of severe mental health symptoms or suicidal ideation by a

study team member. Online questionnaire data will be reviewed daily for indicators of severe mental health symptoms. An automated flag will be set on the question about suicidal ideation so the research team are sent an email alert as soon as any participant answers that they have experienced suicidal ideation. These will be acted on immediately. The number of cases identified and the discussions and action taken will be logged by the research team. All contacts and actions related to mental health concerns and the outcomes of these contacts will be recorded in the study management database.

Serious adverse events will be similarly recorded and acted on as soon as the research team are notified by site staff that a serious adverse event has occurred.

The Core Research Team will continue to have weekly or fortnightly team meetings and data management and safeguarding issues will be reviewed at every meeting. Regular reports to the study team will include an update on rates of severe mental health symptoms, suicidal ideation and severe adverse events.

In the longer Programme Management Group meetings there will be a fuller report on data monitoring including:

- Report on number of women referred for additional support for anxiety, depression and/or suicidal ideation
- Questionnaire response rate by observation time point
- Report on questionnaire missing data rates

These meetings will ensure all safeguarding issues are monitored regularly and in a consistent manner.