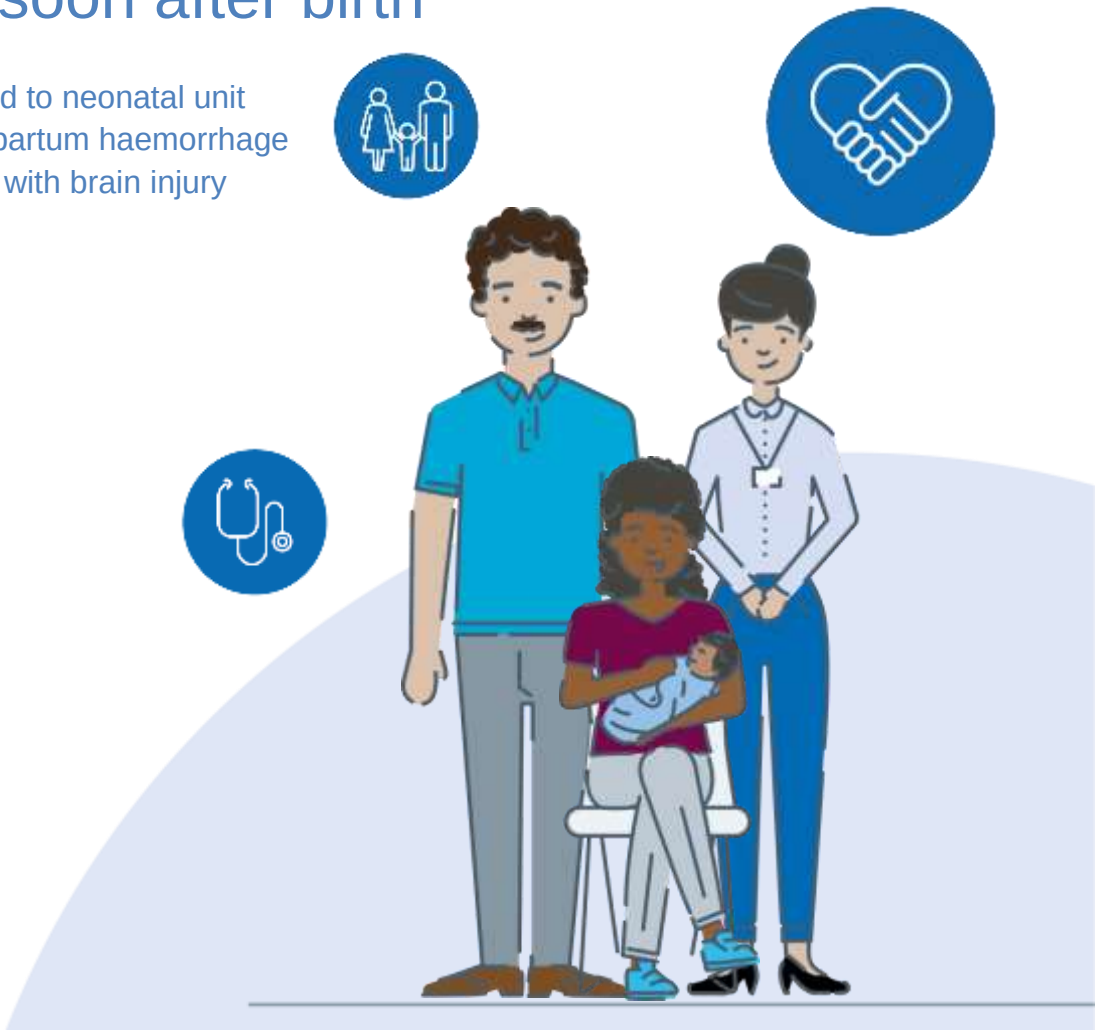
Driver diagram and change package

Improve the early recognition and management of deterioration of either mother or baby during or soon after birth

Evidenced by a reduction in (i) the proportion of babies admitted to neonatal unit with suspected sepsis, (ii) the proportion of women with a postpartum haemorrhage equal or greater than 1500mls and (iii) the proportion of babies with brain injury



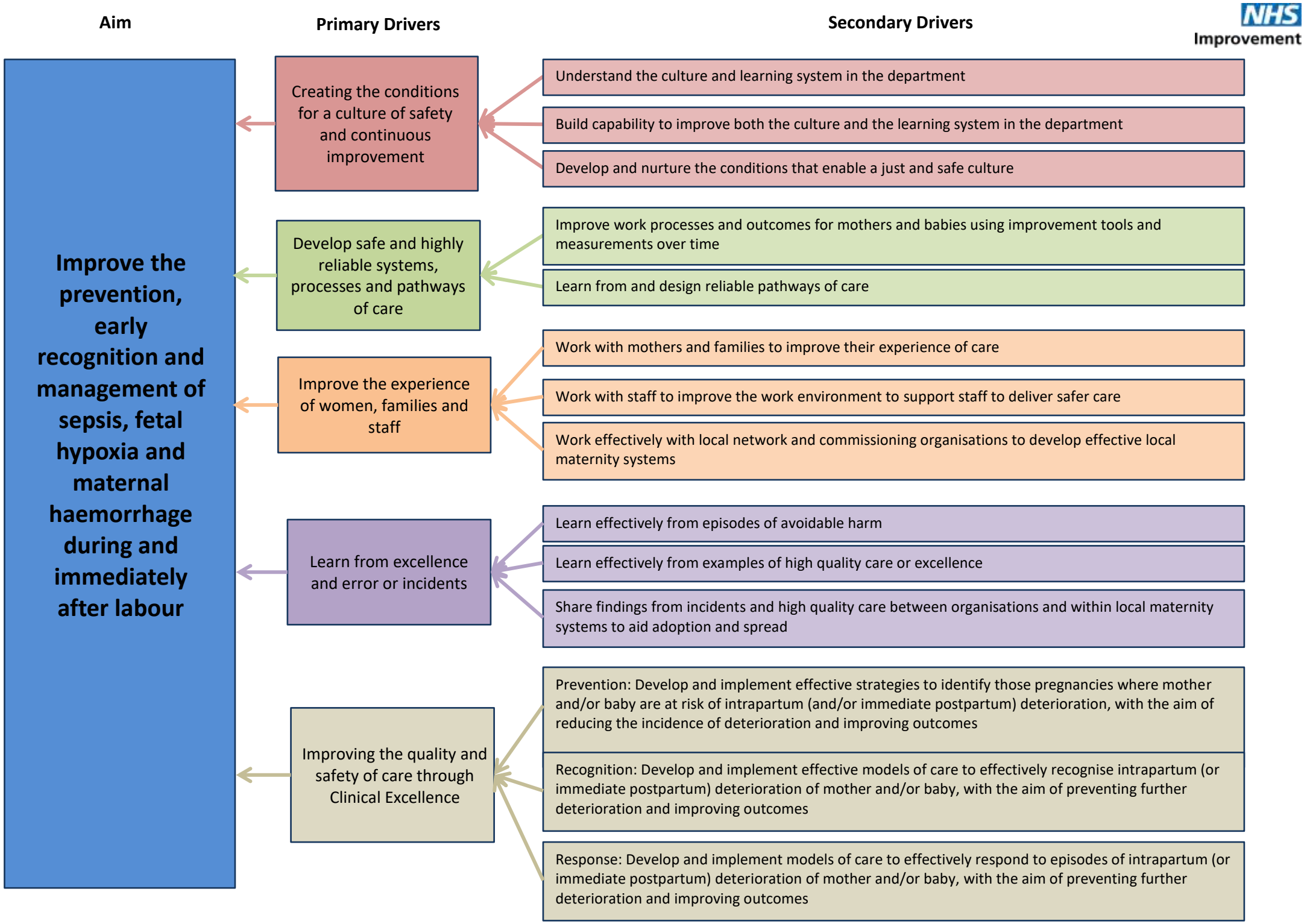
National maternal and neonatal health safety collaborative

A driver diagram is used to conceptualise an issue and to determine its system components which will then create a pathway to achieve the goal.

Primary Drivers are system components which will contribute to moving the primary outcome.

Secondary drivers are elements of the associated primary driver. They contain change concepts that can be used to create projects that will affect the primary driver.

Minimum dataset and other suggested additional measures are at the back of this document.


Aim
Primary Drivers
Secondary Drivers
NHS Improvement
Improve the prevention, early recognition and management of sepsis, fetal hypoxia and maternal haemorrhage during and immediately after labour
Creating the conditions for a culture of safety and continuous improvement
Understand the culture and learning system in the department
Build capability to improve both the culture and the learning system in the department
Develop and nurture the conditions that enable a just and safe culture
Develop safe and highly reliable systems, processes and pathways of care
Improve work processes and outcomes for mothers and babies using improvement tools and measurements over time
Learn from and design reliable pathways of care
Improve the experience of women, families and staff
Work with mothers and families to improve their experience of care
Work with staff to improve the work environment to support staff to deliver safer care
Work effectively with local network and commissioning organisations to develop effective local maternity systems
Learn from excellence and error or incidents
Learn effectively from episodes of avoidable harm
Learn effectively from examples of high quality care or excellence
Share findings from incidents and high quality care between organisations and within local maternity systems to aid adoption and spread
Improving the quality and safety of care through Clinical Excellence
Prevention: Develop and implement effective strategies to identify those pregnancies where mother and/or baby are at risk of intrapartum (and/or immediate postpartum) deterioration, with the aim of reducing the incidence of deterioration and improving outcomes
Recognition: Develop and implement effective models of care to effectively recognise intrapartum (or immediate postpartum) deterioration of mother and/or baby, with the aim of preventing further deterioration and improving outcomes
Response: Develop and implement models of care to effectively respond to episodes of intrapartum (or immediate postpartum) deterioration of mother and/or baby, with the aim of preventing further deterioration and improving outcomes

Creating the conditions for a culture of safety and continuous improvement	
Secondary drivers	**Change concepts and change ideas for PDSA testing**
Understand the culture and learning system in the department	• Raise awareness of safety culture within the department / organisation • Undertake an assessment of local safety culture to gain an understanding of the departmental culture and learning system i.e. how learning is systematically used to continually improve, and repeat surveys at intervals to evidence change • Share findings and debrief with staff • Undertake informal listening exercises with staff to add to the understanding of the local culture and learning system • Seek the opinion of women and their families
Build capability to improve both the culture and the learning system in the department	• Raise awareness of improvement science as a means to systematically enable improvement and change i.e. to understand 'how' to implement evidence based practice • Build capability of improvement science , including human factors with a critical mass of staff • Ensure teams use improvement science to test ideas of change before implementation and spread • As part of the local improvement plan, use the findings from the safety culture assessments and listening events to develop and test changes to improve the safety culture • Ensure leaders act as the guardians of the learning system and support teamwork and psychological safety, and the process of learning into improvement on a continuous cycle • Leaders, managers and team members to use learning boards to communicate and share the process of improvement • Build on the work of your board level maternity safety champion and improvement leads, with all staff acting as safety champions • Develop a departmental improvement infrastructure; a virtual or real space, where improvement leads and others supporting improvement work can meet, have safety improvement conversations, where the improvement plan is reviewed and improvement activity is planned and reviewed regularly. • Build safety and improvement conversations in staff IPRs to help focus on the knowledge, skills and behaviours required to nurture a safety culture and continuous learning, including leadership for safety • Ensure measurement over time is used to communicate the progress of improvement projects • Develop a resource of improvement ideas, case studies and tools that will provide further opportunities to build capability through staff knowledge, skills and behaviours • Raise awareness amongst all staff of the cultural aims of the department and the plan to achieve them • Communicate improvement success and failures within the department and MNHSC Local Learning System local learning system • Ensure that patient safety and development of the learning system is everyone's responsibility
Develop and nurture the conditions that enable a just and safety culture	• Develop a shared vision and ambition for the department • Develop teams to work more effectively; ensure shared understanding and anticipation of needs and problems and agreed methods to manage these, including how to resolve conflict • Develop transparency and sharing between the workforce and leadership teams by publically sharing data relating to the safety and reliability of care, decision making and the process of improvement and learning • Create an environment where people feel confident, comfortable and have opportunities to raise concerns that will be actioned and can ask questions without redress • Individuals held to act in a safe and respectful manner and given the training and support to do so • Leaders at all levels to visibly prioritise safety and role model behaviours • Leaders at all levels to engage with the improvement leads and projects by visiting the site/s to regularly monitor, and review the progress; via learning boards, improvement walk rounds, drop ins and listening events • Leaders to understand the progress of improvement projects and to facilitate the removal of barriers where relevant. • Teams should agree to a common set of behaviours and expectations, and for any deviation to be identified and challenged • Teams should use standardised communication tools such as SBAR in team handovers and at transition points of care • Teams to use briefings or huddles to anticipate potential safety issues and agree how to monitor and respond • Teams use debriefs to learn from excellence and harm, after clinical interventions and at the end of shifts • Teams understand situational awareness and use it to improve safety in the working day and during high risk interventions

Develop safe and highly reliable systems, processes and pathways of care	
Secondary drivers	**Change concepts and change ideas for PDSA testing**
Improve work processes and outcomes for mothers and babies using improvement tools and measurements over time	• Develop a local measurement plan that aligns with the local improvement aim(s) and the MNHSC national driver diagram • Identify project measures that monitor the effects of the changes being made by the improvement team over time, and enable learning as part of a PSDA cycle • Collect and share project measures with department staff, women and families using an agreed method; learning boards, safety crosses and web based platforms • Ensure data accurately records women's status and movement through the care process is captured and used to inform learning
Learn from and design reliable pathways of care	• Apply best evidence and reduce unwarranted variation with the goal of failure free operation over time. To ensure all women and babies are consistently provided with safe reliable high quality care • Process map the whole pathway of care in order to understand the current process steps and their potential complexities, but also to establish any duplication and processes which do not add value to the pathway. These will form the basis of change ideas for PDSA testing • Reduce any other 'waste' using lean principles to streamline the processes and pathway of care • Undertake demand and capacity modelling to improve flow and inform a redesign approach through the maternity and neonatal service • From learning above, simplify the pathway to reduce duplication and waste and activities which do not add value to the woman, family or the organisation • Design and develop pathways of care by working in partnership with women and the wider multidisciplinary team and test this by using the model for improvement approach

Improve the experience of women, families and staff	
Secondary drivers	**Change concepts and change ideas for PDSA testing**
Work with mothers and families to improve their experience of care	• Using a range of approaches to better understand the perspectives and experiences of women and their families; surveys, listening events and focus groups • Engage with couples and families to co design and make improvements to pathways and processes • Engage with project team members to ensure that women and their families are part of the process to redesign and review new processes and pathways • Undertake with women and their families an informal assessment/ listening event of the local culture in relation to the improvement aim • Work with women to Improve awareness, identification and management of improvement project aim
Work with staff to improve the work environment to support staff to deliver safer care	• Canvass staff opinion, what could be done better, what do we do well, what change ideas could we test • Undertake with staff an informal assessment/ listening event of the local culture in relation to the project aim. • Provide staff with the opportunity and a range of ways that they can be involved in the project. • Work with staff to Identify and acquire physical resources, educational needs and identify links with outside organisations required by staff to be able to make improvements • Engage with staff in peer organisations via the Learning system to share learning • Work with all the project team members to ensure that staff are part of the process to redesign and review new processes and pathways

Learn from excellence and error or incidents	
Secondary drivers	**Change concepts and change ideas for PDSA testing**
Increase learning from episodes of avoidable harm via robust investigation and system learning	• Engage staff within the team and risk/governance departments to map the current process for reporting, investigating and learning • Work with key stakeholders to develop a reliable reporting processes that align with national guidance and enables all staff to record episodes of harm at all times of day/out of hours • Regular review of investigations to ensure multidisciplinary team involvement and compliance with national guidance • Agree standards/training requirements for staff undertaking investigations (competency framework) • Develop a register of all staff who have received the appropriate training to undertake investigations • Ensure all investigations and action plans consider and seek to address underlying system and human factors • Ensure there is an ability to develop learning from multiple incidents and other qualitative sources of safety reporting • Develop a standardised approach for communicating with women and families • Ensure all women and families are offered choice and are adequately supported and prepared to participate in any local reviews. • Develop reliable processes and fail-safe mechanisms for ensuring investigations are carried out on time • Develop reliable processes for communication and sharing learning with the multidisciplinary team • Ensure regular review to assess whether learning has been embedded and sustained over time • Agree approach for examining trends and measuring safety • Agree approach for presenting/displaying learning from incidents over time
Increase learning from examples of high quality care or excellence	• Develop reliable reporting processes so all staff are able to record examples of high quality care at all times of day/out of hours • Develop effective and timely feedback loops to acknowledge best practice and support staff in identifying the factors which contributed to the delivery of high quality care • Develop a reliable process for exploring the underlying the conditions, systemic and human factors which contributed to an event being well managed • Ensure all staff groups are communicated with and understand the reason and need for change • Ensure all staff, where appropriate are able to access peer support, coaching and/or mentoring to make the changes necessary to improve care provided to women & babies • Agree approach for disseminating and sharing learning from episodes of high quality care
Increase learning from incidents and high quality care between organisations and within local maternity systems	• Agree communication processes within local learning system • Agree methods for measuring organisational/system learning • Ensure communities of practice include representation from service users • Agree processes for communication and engagement with local maternity voice partnerships

Improving the quality and safety of care through Clinical Excellence	
Secondary drivers	**Change concepts and change ideas for PDSA testing**
Prevention: Develop and implement effective strategies to identify those pregnancies where mother and/or baby are at risk of intrapartum (and/or immediate postpartum) deterioration, with the aim of reducing the incidence of deterioration and improving outcomes	Sepsis • Ensure effective documentation and handover of risk factors for sepsis • Improve information for women and families of signs and symptoms in mother or baby needing urgent attention and who to contact • Develop and implement educational strategies for women and families on hygiene, infection prevention and recognition of signs of infection • Implement RCOG GBS guidance and NICE guidance on early onset neonatal infection: antibiotics for prevention and treatment • Support skin to skin contact and early breastfeeding • Improve integration of haematology services Postpartum Haemorrhage • Optimise maternal haemoglobin in cases where there is an increased risk of significant blood loss at the time of delivery • Implement risk assessment for increased risk of PPH at the onset and during labour • Implement strategies to manage the third stage of labour as per NICE guidance • Implement training and determine staff roles in early PPH management • Improve integration of haematology services • Target post-graduate maternity, obstetric, haematology and anaesthetic training to promote 4-stage PPH protocol and POC testing Fetal Hypoxia • Ensure all staff who care for women in labour have undertaken annual training and competency assessment on cardiotocograph (CTG) interpretation and use of auscultation • Develop and implement strategies for ongoing systematic risk assessment and care planning during pregnancy and labour, including formal fetal risk assessment on admission in labour irrespective of place of birth, to determine most appropriate fetal monitoring method
Recognition: Develop and implement effective models of care to effectively recognise intrapartum (or immediate postpartum) deterioration of mother and/or baby, with the aim of preventing further deterioration and improving outcomes	Sepsis • Implement universal use of maternity specific early warning scores (e.g. MEWS, MEOWS)[I] • Implement the use of neonatal early warning charts for babies at risk • Establish effective pathway for the identification and management of suspected maternal sepsis • Educate parents about signs and symptoms of sepsis for the early recognition of sepsis in mothers and babies (especially once at home) Postpartum Haemorrhage • Implement the use of measured blood loss (instead of estimating it) - for all women • Educate staff in ROTEM analysis and ROTEM and MOH protocols Fetal Hypoxia • Implement the use of a structured proforma to record CTG reviews, e.g. a 'CTG sticker' • Ensure reviews of fetal monitoring always consider risk factors such as persistently reduced fetal movements before labour, fetal growth restriction, previous caesarean section, thick meconium, suspected infection, vaginal bleeding or prolonged labour • Introduce a buddy system to pair up more and less experienced midwives during shift to maximise continuity of career and provide accessible senior advice and fresh eyes, with protocol for escalation of any concerns
Response: Develop and implement effective models of care to effectively respond to episodes of intrapartum (or immediate postpartum) deterioration of mother and/or baby,	Sepsis • Implement Sepsis 6/Bufalo care bundle • Implement RCOG GBS guidance and NICE guidance on early onset neonatal infection: antibiotics for prevention and treatment • Educate and promote standardised approach to uterotonics Postpartum Haemorrhage • Ensure all appropriate staff receive multi-professional training in PPH management

with the aim of preventing further deterioration and improving outcomes	• Ensure early senior obstetrician, anaesthetist and midwife review in cases of PPH (of over 1500mls) • Ensure prompt use of uterotonics +/- surgical intervention • Ensure early venous access established and investigations started for all PPHs over 1000mls <u>Fetal Hypoxia</u> • Implement appropriate training to enable staff to run POC (Blood gas and ROTEM) • Implement decision making based on holistic assessment with consultant involvement, including fetal blood sampling where possible • Ensure prompt escalation processes are in place for suspected fetal compromise • Ensure neonatal team aware of at risk babies and involved in/updated on reviews during labour • Implement neonatal resuscitation training for all relevant multi-professional staff

Minimum dataset **Mandatory collection via MatNeo Improvement portal**		
Primary Driver	Secondary Driver	Metric
Creating the conditions for a culture of safety and continuous improvement	Understand the culture and learning system in the department	• Proportion of staff undertaking a culture survey
	Build capability to improve both the culture and the learning system in the department	• Number of staff received training in: *Insert subject*
	Develop and nurture the conditions that enable a just and safety culture	• Number of cultural components implemented
Improve the experience of women families and staff	Work with mothers and families to improve their experience of care	• Proportion of improvement projects that women are involved with
	Work with staff to improve the work environment to support staff to deliver safer care	• Proportion of projects where there is full multidisciplinary team involvement beyond the improvement leads
Develop safe and highly reliable systems, processes and pathways of care	Develop a collaborative measurement plan that measures improvement and demonstrates impact over time	• Proportion of improvement projects reporting measures
	Learn from and design reliable processes and pathways of care	• Proportion of pathways reliably implemented
Learn from excellence and error or incidents	Increase learning from episodes of avoidable harm via robust investigation and system learning	• Number of harm incidents /number of learning activities post harm
	Increase learning from examples of high quality care or excellence	• Number of excellence incidents/ number of learning activities post harm
	Increase learning from incidents and high quality care between organisations and within local maternity systems	• Number of incidents shared external to the organisation
Implement the clinical interventions that achieve the intended outcome	Prevention: Develop and implement effective strategies to identify those pregnancies where mother and/or baby are at risk of intrapartum (and/or immediate postpartum) deterioration, with the aim of reducing the incidence of deterioration and improving outcomes	• Proportion of women receiving appropriate antibiotic prophylaxis in labour • Proportion of women receiving risk assessment for PPH at the onset of labour
	Recognition: Develop and implement effective models of care to effectively recognise intrapartum (or immediate postpartum) deterioration of mother and/or baby, with the aim of preventing further deterioration and improving outcomes	• Proportion of women who are screened using a sepsis screening tool • Proportion of births where blood loss is directly measured • Proportion of births where a CTG sticker is used for all fetal monitoring reviews
	Response: Develop and implement effective models of care to effectively respond to episodes of intrapartum (or immediate postpartum) deterioration of mother and/or baby, with the aim of preventing further deterioration and improving outcomes	• **Proportion of babies admitted to neonatal unit with suspected sepsis** • **Proportion of women with a postpartum haemorrhage equal or greater than 1500mls** • **Proportion of babies with brain injury**

**metric in bold, indicate metric(s) that support the aim statement for each clinical driver*

Additional Metrics **Suggested additional collection via Life QI**		
Primary Driver	Secondary Driver	Metric
Creating the conditions for a culture of safety and continuous improvement	Understand the culture and how we learn in this department	• Number of listening events held • Number of actionable changes tested
	Build capability to improve both the culture and the learning system in the department	• Number of safety walk rounds/board rounds completed • Number of staff trained in safety culture awareness • Number of improvement projects • Progression of mean trust progress assessment scale • Number of staff using improvement methodology • Number of projects where senior/exec/board leadership is actively involved • Number of staff who have had safety and quality improvement as part of their PDR/CPD plan • Proportion of projects that share data over time through the learning board
	Develop and nurture the conditions that enable a just and safety culture	• Number of staff trained in team working for safety • Number of huddles with multidisciplinary team present • Number of safety walk rounds/board rounds completed • Proportion of times that safety briefing occurs • Proportion of times that safety de brief occurs • Number of times SBAR is used
Improve the experience of women families and staff	Work with mothers and families to improve their experience of care	• Proportion of women and their families invited to contribute to the project • Number of occasions progress is reported to women and their families
	Work with staff to improve the work environment to support staff to deliver safer care	• Number of staff engagement events held • Proportion of staff that report being part of the project or know how to contribute if they wanted • Number of occasions progress communicated to staff • Proportion of staff trained in*improvement project aim
Develop safe and highly reliable systems, processes and pathways of care	Develop a collaborative measurement plan that measures improvement and demonstrates impact over time	• Number of occasions that project measures are collected • Number of occasions that project measures are uploaded as required to national or local system • Number of occasion in a month that measures are shared with wider team
	Learn from and design reliable processes and pathways of care	• Number of occasions a process in the testing phase * is implemented accurately • Number of new processes that are tested for reliability • Number of pathways mapped • Number of projects achieving reliability
Learn from excellence and error or incidents	Increase learning from episodes of avoidable harm via robust investigation and system learning	• Proportion of occasions care/intervention is omitted within the pathway • Number of occasions dissatisfaction is reported by women or their families • Number of occasions that staff report harm • Proportion of staff trained to report harm • Number of harm investigations that are investigated • Number of near misses reported
	Increase learning from examples of high quality care or excellence	• Number of times women report satisfaction/excellence within the pathway • Number of episodes of excellence reported by staff in relation to the pathway • Proportion of staff informed/trained how to report excellence • Proportion of excellence episodes that are investigated
	Increase learning from incidents and high quality care between organisations and within local maternity systems	• Number of times learning is shared outside the trust

Additional Metrics **Suggested additional collection via Life QI**		
Primary Driver	Secondary Driver	Metric
Implement clinical interventions that achieve the intended outcome	Prevention: Develop and implement effective strategies to identify those pregnancies where mother and/or baby are at risk of intrapartum (and/or immediate postpartum) deterioration, with the aim of reducing the incidence of deterioration and improving outcomes	• Proportion of women with documented evidence of fetal risk assessment on admission in labour Locally: progress against implementation plans (see care bundle for measures). Nationally: proportion of trusts which have implemented all four elements of the Saving Babies Lives care bundle
	Recognition: Develop and implement effective models of care to effectively recognise intrapartum (or immediate postpartum) deterioration of mother and/or baby, with the aim of preventing further deterioration and improving outcomes	• Proportions of women and babies with sepsis risk factors with documented evidence that these have been communicated on handover • Proportion of admitted women for whom (1) an early warning score chart was used, and (2) was used in line with guidance (for frequency, completeness, scoring, escalation) • Proportion of babies at risk for whom (1) a neonatal early warning score chart was used, and (2) was used in line with guidance • Proportion of women who gave birth, with whom infection prevention and recognition has been discussed • Proportions of women and babies with sepsis risk factors or suspected sepsis who have been managed as per pathway • Proportion of women who gave birth whose blood loss was measured – among all birth episodes and/or stratified by vaginal and caesarean birth • Proportion of relevant staff who have successfully completed mandatory annual training on CTG interpretation and auscultation, by staff group • Proportion of women who had electronic fetal monitoring and who had structured reviews as per guidelines • Proportion of babies with risk factors for developing hypoxia, where there is documented evidence that these have been considered at CTG reviews
	Response: Develop and implement effective models of care to effectively respond to episodes of intrapartum (or immediate postpartum) deterioration of mother and/or baby, with the aim of preventing further deterioration and improving outcomes	• Proportion of women who gave birth who had a confirmed diagnosis of sepsis whilst in the care of the maternity service (not just coded as having had a temperature in labour) • Proportion of babies born who had a confirmed diagnosis of sepsis whilst in the care of the maternity or neonatal service • Proportion of women who gave birth who were admitted to ITU • Proportion of women who gave birth who had a hysterectomy • Proportion of women who gave birth who had a blood transfusion (although this is also influenced by changing practice in use of blood products) • The proportion of women in labour for whom a caesarean section is being considered for suspected fetal compromise who are offered fetal blood sampling to inform the decision; the proportion of women in labour in whom a fetal blood sample was attempted and a fetal blood reading was made; proportion of women who had an emergency CS with consultant involvement; women's satisfaction with decision making process in case of emergency CS or instrumental birth (P; local audit/survey - see NICE QS 32) • Decision to delivery time category 1 caesarean section (P; local audit. Potential for national benchmarking if MSDS data complete enough) • Proportion of at risk babies (may be difficult to determine denominator) with documented evidence of communication with neonatal team

Change Packages, Case studies and resources		
Primary Driver	Secondary Driver	
Implement clinical interventions that achieve the intended outcome	Prevention: Develop and implement effective strategies to identify those pregnancies where mother and/or baby are at risk of intrapartum (and/or immediate postpartum) deterioration, with the aim of reducing the incidence of deterioration and improving outcomes	• RCOG GBS guideline (https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg36/) • NHS-E Still birth bundle (https://www.england.nhs.uk/mat-transformation/saving-babies/) • Obs CYMRU. Obstetric bleeding strategy for wales (http://www.1000livesplus.wales.nhs.uk/obs-cymru) • Sepsis 6
	Recognition: Develop and implement effective models of care to effectively recognise intrapartum (or immediate postpartum) deterioration of mother and/or baby, with the aim of preventing further deterioration and improving outcomes	
	Response: Develop and implement effective models of care to effectively respond to episodes of intrapartum (or immediate postpartum) deterioration of mother and/or baby, with the aim of preventing further deterioration and improving outcomes	