Recommendations for a sustainable severe acute maternal morbidity audit within the Health Quality & Safety Commission


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Introduction from the co-chairs

We are pleased to present this report on the transition of the severe acute maternal morbidity (SAMM) research project to the Health Quality & Safety Commission, as directed by Hon Dr Jonathan Coleman, the Minister of Health, in March 2015. This timely process has presented an opportunity to weave together the Commission’s various work streams in maternal and perinatal mortality and morbidity.

It has been encouraging to participate in a process that has seen diverse and divergent viewpoints come together with a shared commitment to the task assigned to us. Our expert advisory group, with the skilled assistance of Synergia, remained focused throughout the process of meeting and discussing the nuts and bolts of the transition, always with the wellness of New Zealand mothers and babies as our goal.

The advisory group offers a number of recommendations to the Board of the Commission in this report. We sincerely hope the important work that has been undertaken under the auspices of SAMM can be continued and expanded into a continuous quality improvement programme across district health boards throughout New Zealand.

It has been a privilege to be involved in this important process.

Dr Bev O’Keefe
Dr Vicki Culling
Co-chairs, Maternal Morbidity Expert Advisory Group
Executive summary and recommendations

Executive summary

The Health Quality & Safety Commission (the Commission) established the Maternal Morbidity Expert Advisory Group and tasked it with providing advice for a sustainable approach to bring the severe acute maternal morbidity (SAMM) audit into the Commission, within the context of maternal morbidity review, the Perinatal and Maternal Mortality Review Committee (PMMRC), the Australasian Maternity Outcomes Surveillance System (AMOSS), the Maternal Quality and Safety Programme (MQSP) and the Australian and New Zealand Intensive Care Society (ANZICS) database.

Guiding thinking on this transition was the Commission’s New Zealand Triple Aim model and the emphasis on continuous quality improvement. The advisory group was committed to agree recommendations that improve outcomes for women and babies.

The advisory group identified that, in developing a sustainable solution for transferring the SAMM audit to the Commission, its recommendations should include a wider vision for an integrated national maternal morbidity review and quality improvement system for New Zealand. The proposed solution has three parts.

1. Direction and vision for the system: A vision for severe acute maternal morbidity review and quality improvement in New Zealand, which supports the role of SAMM within the context of a wider response. The approach also supports improved district health board (DHB)-level near-miss reviews, a greater focus on closing the quality loop, integration with AMOSS and more proactive links with the National Maternal Monitoring Group (NMMG), MQSP and the national maternal quality indicators.

2. SAMM transfer and transition: Support for the transition of SAMM to the Commission beginning in early 2016, with the establishment of supporting operational infrastructure within the Commission and transition support from the University of Otago. The aim is for the transition to maintain high fidelity with the current SAMM model. Governance would be through a ‘maternal morbidity review and quality improvement’ sub-committee of the PMMRC. It is proposed current SAMM data remains with the University of Otago. Under the
Commission, new data would be collected and protected under schedule 5 of the New Zealand Public Health and Disability Act 2000, as with mortality data.

3. **Development pathway for SAMM and the system:** The sub-committee would be set up with clear objectives to support the development of SAMM the over three years within the context of the wider vision, through a series of improvement cycles informed by an independent evaluation. The improvement cycles would support the evolving effectiveness and efficiency of the SAMM audit to bring about quality and safety improvements and to integrate with the wider vision for mortality and morbidity review.

Further work is required to assess whether the Commission should develop a new database that reflects the operational (as opposed to research) requirements of SAMM. There may also be opportunities for improved integration with other review databases supported by the Commission and for leveraging greater value from the ANZICS database and the national maternal clinical indicators.

**Recommendations for the Commission Board**

The aim of these recommendations is to develop an active system with the Commission engaging with clinicians, women and their families to address preventable maternal morbidity.

A key element for success will be the ongoing engagement and support of clinicians participating in the SAMM audit panels. In transitioning the SAMM audit into the Commission, the advisory group strongly supports an operational model which focuses on both the review process and on closing the feedback loop to drive quality improvement.

The advisory group provides this report to guide transition of the SAMM audit into the Commission. It makes two key recommendations:

1. **To transition the SAMM audit to the Commission as part of a longer-term vision for an integrated national maternal morbidity review and quality improvement system.**

2. **To establish a new ‘maternal morbidity review and quality improvement’ sub-committee of PMMRC (including SAMM audit and AMOSS) to oversee maternal morbidity review and system improvement.**
1. About this report

1.1 Purpose and scope

This is a report from the Maternal Morbidity Expert Advisory Group (the advisory group) to the Board of the Health Quality & Safety Commission (the Commission) to provide advice on the establishment and future of the severe acute maternal morbidity (SAMM) audit, within the context of improving maternal morbidity review and quality improvement more generally.

The SAMM audit has been run as a research project by the University of Otago.

On 26 March 2015, the Minister of Health, Hon Dr Jonathan Coleman, issued a press release that outlined his decision to make the SAMM audit a permanent part of New Zealand’s quality and safety activities. Dr Coleman identified that the SAMM audit would sit under the Commission and that the Ministry of Health (the Ministry) would invest $2 million over the next four years into the audit programme.

Following the Minister’s announcements, the Ministry confirmed funding for the Commission to take ownership of the data and to decide how the SAMM function would be undertaken in the long term. In response, the Commission established the advisory group and charged it with: ¹

‘providing advice to a sustainable approach to severe acute maternal morbidity (SAMM) audit in the context of maternal morbidity review, PMMRC, AMOSS, the Maternal Quality and Safety Programme and the Australian and New Zealand Intensive Care Society (ANZICS) database.’

1.2 Leadership and process

The advisory group was constituted under co-chairs Dr Bev O’Keefe and Dr Vicki Culling.

Members of the group included:

- Associate Professor Beverley Lawton (SAMM project lead)
- Norma Campbell (chair, National Maternity Monitoring Group (NMMG))

¹ See Appendix 1 for the Maternal Morbidity Expert Advisory Group’s terms of reference.
• Dr Claire McLintock (chair, Australasian Maternity Outcomes Surveillance System (AMOSS) Working Group)

• Dr Sue Belgrave (chair, Perinatal and Maternal Mortality Review Committee (PMMRC))

• Linda Penlington (consumer representation)

• Dr Annemarie Mitchell (intensivist representative)

• Dr Mike Roberts (district health board (DHB) clinical lead for quality & risk).²

The group was supported by Commission staff Karen Orsborn and Deon York, and health consultancy group, Synergia Ltd. The review process included a series of three meetings of the group between September and November 2015. The terms of reference required the advisory group to provide guidance on:

1. a sustainable review and improvement model for SAMM, within the context of best practice for undertaking maternal morbidity audit, ensuring any approach improves the quality and safety of maternity services delivered in New Zealand

2. the link between the Commission and the maternity quality programme based at the Ministry of Health

3. the link between an expanding maternal morbidity audit work stream and the work of the Perinatal and Maternal Mortality Review Committee.

1.3 Quality improvement and consumer focus

Transitioning the SAMM audit to sit under the Commission created an important contextual change from being a standalone research project to becoming an important component of a national maternal quality and safety system.

Guiding thinking on this transition was the Commission’s New Zealand Triple Aim model and the emphasis on continuous quality improvement and the simultaneous achievement of the three domains of the framework:

² Note: Dr Roberts was only able to attend the initial meeting of the group. Dr Iwona Stolarek (Medical Advisor at the Commission), who has a background in DHB clinical leadership, acted as a replacement and had input into workshops and the development of the report.
• improved quality, safety and experience of care
• improved health and equity for all populations
• best value for public health system resources.

Figure 1: The New Zealand Triple Aim

The advisory group identified that its approach to developing a solution for the SAMM integration into the Commission would be guided by ensuring that better outcomes for women and babies was always central to the discussion. There was agreement across the group about the need to close the feedback loop and ensure the findings from reviews are having an impact at the workforce.
2. Introduction and context

The SAMM audit currently exists as a research project, operating in an environment where there are a number of existing review and quality programmes operating within the health sector. These primarily include the PMMRC, operating within the Commission, with the AMOSS operating as a working group of the PMMRC. The Ministry supports the NMMG and, through the group, the establishment of maternal quality and safety plans within DHBs. DHBs also undertake their own reviews of near-miss or significant events.

2.1 SAMM audit background

Severe acute maternal morbidity is defined as ‘a very ill or pregnant or recently delivered woman who would have died had it not been luck or good care was on her side’. Maternal near-miss events provide an opportunity to explore how our health system responds to women with serious and acute conditions and identify how to make improvements.

The SAMM audit has been run as a research programme by the Women’s Health Research Centre at the University of Otago, based in Wellington under the leadership of Associate Professor Beverley Lawton.

Following a pilot at Capital & Coast DHB, the programme was trialled at four DHBs in 2011–12 prior to being rolled out across all 20 DHBs. The SAMM audit was initially resourced by the Ministry, through the office of the Deputy Director-General Māori Health, with research funding also accessed through the Health Research Council.

The aim of the audit is to identify potential preventability factors of maternal ‘near-misses’, which are described as severe acute maternal morbidity. The review of preventability factors should lead to recommendations for improvement of care systems and outcomes for women and babies. Inclusion criteria were women who were pregnant, or within 42 days of delivery, who were admitted to an intensive care unit (ICU) or high dependency unit (HDU).

The SAMM audit can be seen within the context of the World Health Organization recommendations to improve maternal health care, with the establishment of:\(^4\)

- baseline assessment (or reassessment) or maternal morbidity
- situational analysis
- interventions for improving care.

Within this context, the SAMM programme envisaged:

- establishing a national surveillance system for severe acute maternal morbidity using multidisciplinary external review
- using the outputs from the surveillance to improve the quality of care, including feedback to DHBs on specific issues or themes
- identification of common themes that can be used to inform wider systems and educational interventions
- the development of an improved collegial multidisciplinary approach to clinical review and the instigation of solutions
- contributing to a reduction in health disparities.

Operationally, the SAMM audit process with the 20 DHBs involved six panels made up of various disciplines (e.g., obstetrics, intensivist, anaesthetist, midwifery, general practice). Each panel has about 10 members and would meet four times a year.

The cases were identified by a designated nurse or midwife in each DHB. Case notes were drawn from hospitals and lead maternity carers. Case notes were de-identified and summarised. Within the panels, a member was responsible for presenting each case to the group. The panel reviewed each case using the SAMM audit tool. The tool is based on a similar validated tool, developed by Professor Stacie Geller from the University of Illinois at Chicago.

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The tool is based on identifying preventability through review of various categories of preventability. These include:

- assessment/point of entry
- diagnosis/recognition of high risk
- refer to expert
- treatment
- management hierarchy
- education
- communication
- policies and procedures
- documentation
- discharge.

Results from the review of the SAMM audit across the 20 DHBs have yet to be published; however, results from the earlier trial with four DHBs were published in 2014.5

Ninety-eight SAMM cases were assessed across the four DHBs. Of these, 38.8 percent were deemed potentially preventable, 36.7 percent not preventable but improvement in care was needed and 24.5 percent not preventable. The most frequent preventable factors were clinically related, with delay or failure in diagnosis or recognition of high-risk status (51 percent) and delay or inappropriate treatment (70 percent). Blood loss and septicaemia were the most common causes of preventable severe morbidity.

Looking ahead, the University of Otago has recommended the criteria for SAMM audit eligibility are extended beyond ICU/HDU admission to include transfusion of four or more units of blood.

In 2014, the SAMM audit was notified of 402 cases. Panels reviewed 263 of them, a rate of 65 percent. If the criteria are expanded as described above, there will be many more cases identified for review. Total cases reviewed by the SAMM audit to

November 2015 are 98 within the feasibility study database and 374 within the national database, leading to a total of 472 cases reviewed.

The SAMM audit support team inside the University of Otago includes the programme leader, project manager, database manager and administrators. The team also includes contracted hours from a midwife within each DHB to support the local data collection.

Data for the SAMM audit was collected with approval from the Multi-region Ethics Committee and conducted as a Protected Quality Assurance activity under the Health Practitioners Competence Assurance Act 2003.

As part of preparing this report, a number of participants in the SAMM audit process were interviewed and asked about their experiences in that process and what they valued about it. The participants interviewed were from various disciplines. Participants valued their involvement in the SAMM process, particularly in the following areas:

- The opportunity to be involved in constructive multidisciplinary dialogue.
- Using a tool to work systematically through contributory factors to a near-miss event.
- Reflection on their own practice and the systems and practices within their own departments.
- A sense of value in the systematic, multidisciplinary and objective nature of external reviews – with concerns voiced about the difficulty of undertaking objective reviews within small teams within DHBs.
- Improving their own skills with review and understanding of the contributory factors and trends for severe acute maternal mortality.
- Confidence to suggest improvements within their own departments or areas of practice.

When asked to identify areas where they thought there could be efficiencies in the process that would not compromise quality and value, ideas included:

- reducing the number of panels – potentially rotating the same number of clinicians through the panels (ie, all clinicians do not need to be involved in all panel meetings)
some pre-filtering of cases, for example, where there is some saturation of review/learnings with similar cases, allowing the panels to focus on areas which may generate new learnings.

Across a number of conversations, with participants and members of the advisory group, there was general comment that the SAMM audit process has not yet realised its original aim of providing a formal and consistent feedback loop to DHBs regarding key themes and improvement opportunities, and that this component would be of value. Part of the reason for this situation is that the original project is a research initiative, with the design and resourcing focused on the review component, rather than the feedback loop.

2.2 Environment of maternal review and quality functions

2.2.1 Perinatal and Maternal Mortality Review Committee (PMMRC)

The PMMRC is a mortality review committee set up in 2005 under section 59E of the New Zealand Public Health and Disability Act 2000. The PMMRC was set up by the Ministry and subsequently transferred to the Commission. It is a ‘statutory advisor’ to the Commission.

Within the PMMRC environment, information powers and protections are defined through the provisions of Schedule 5 of the New Zealand Public Health and Disability Act 2000. Data sources include lead maternity carers, hospitals, GPs, coroners and police. Data is collected through the network of PMMRC local coordinators (one in each DHB). Operational support for PMMRC, some data entry and coordination of reviews are undertaken via contracted support from the University of Auckland. Data is entered into a database supported by the University of Otago.

The PMMRC tracks all maternal deaths (up to 42 days after the baby is born) and perinatal deaths (20 weeks onwards). Each case is reviewed and the cause of death identified. Perinatal deaths are reviewed locally, with maternal deaths reviewed by a national panel.

The current PMMRC structure includes three working groups, one of maternal morbidity (AMOSS), one of maternal mortality and one on neonatal encephalopathy. The PMMRC produces an annual report for the Commission.
2.2.2 Australasian Maternity Outcomes Surveillance System (AMOSS)

AMOSS is a surveillance system designed to study a variety of rare or serious conditions in pregnancy, childbirth and post-natal phase. The AMOSS project is based at the Perinatal and Reproductive Epidemiology Research Unit at the University of New South Wales. In New Zealand, the AMOSS Working Group is part of the PMMRC.

Data is collected through the network of PMMRC local coordinators. For each condition under investigation, data collection establishes the number of women experiencing the disorder, how the disorder is managed and what the outcomes have been. Data collected is not identifiable and is limited to information recorded in clinical records. A recent focus for AMOSS has been on amniotic fluid embolism. AMOSS provides feedback to the sector as part of the PMMRC reporting process.

An important delineation between the approach of AMOSS and that of SAMM is that AMOSS identifies the epidemiological risk factors for specific rare and serious conditions, whereas SAMM’s focus is on the practice and system contributory factors for general severe acute maternal morbidity. Both types of review have the opportunity to identify important information to help address reducing maternal morbidity.

2.2.3 National Maternity Monitoring Group (NMMG)

The Director-General of Health established the NMMG in 2012 to oversee New Zealand's maternity system and, specifically, the implementation of the New Zealand maternity standards.

The NMMG acts as a strategic advisor to the Ministry on areas for improvement in the maternity sector and provides a national overview of the quality and safety of New Zealand's maternity services. The NMMG meets at least four times a year and reviews and assesses annual reports from PMMRC, DHBs (maternal quality and safety programmes) and other reports as appropriate. The chair of PMMRC is an ex-officio member of the NMMG.

The NMMG has established a series of national-level quality improvement work programmes, which include the development, deployment and monitoring of a set of New Zealand maternity clinical indicators.
2.2.4 DHB review activity and maternal quality and safety plans

DHBs are required to develop and implement quality and safety plans for maternity services as part of the maternity quality initiative and that align with the New Zealand maternity standards. The Ministry supports the DHB maternal quality and safety programmes through an allocation of $2.8 million per annum.

The feedback from the advisory group is that the approach by DHBs to their own internal reviews of maternal near-miss events is highly variable across the country, in terms of processes to identify events and undertake reviews and the skills to undertake a high-quality structured review.6

2.3 Perspectives on SAMM audit and strategic future for morbidity review

In responding to the terms of reference requirement to ensure SAMM is sustainable within the Commission and in the context of the broader national maternity quality infrastructure (outlined above), the following issues arose during discussion.

- **Opportunity to develop an integrated maternal morbidity system** – several of the advisory group felt it was important to look at the opportunity provided by the Minister’s decision to support SAMM to ensure there was a clear vision for how SAMM and other national maternal quality elements align in the longer term to create an effective and integrated system.

- **Desire to close the quality loop** – a consistent theme has been the need to balance investment in reviews with investment in effective feedback to close the quality loop. This element was seen as important to the future design of SAMM and as an area where there was an opportunity for improvement across the PMMRC and AMOSS.

- **Nurturing the cohort of clinical leaders** – all advisory group members agreed that SAMM has been successful in mobilising a national network of

clinicians who have participated in SAMM panels and through this have increased their skills in near-miss reviews. Many panel members have expressed an enthusiasm for the process and the impact on their own knowledge and practice. Future processes need to maintain support for this positive cohort. The advisory group also identified that clinicians are also strongly engaged in other review processes, such as those led by the PMMRC.

• **Spectrum of views of SAMM audit** – across the advisory group there was a spectrum of views of various elements of the SAMM audit. Some concerns were that the results of the 20-DHB review process have yet to be published. Findings on the earlier four-DHB reviews have been published, as discussed earlier. Other areas where there was a spectrum of views included the SAMM inclusion criteria of ICU/HDU admission and/or transfusion of four units of blood and the relative advantages/disadvantages of the SAMM audit tool compared with the tools used in the PMMRC reviews, which also address preventability and contributory factors. There was also debate around the relative merit of internal reviews of near-miss events compared with an external review, such as the SAMM audit. Discussions also covered whether the SAMM audit most effectively sits under the PMMRC or under a separate governance process. Issues regarding the best approach to data protection were raised and the relative merits of protection discussed under Schedule 5 of the New Zealand Health and Disability Act 2000 (PMMRC), or under the Protected Quality Assurance Activities (required if under separate governance).

• **Opportunity for efficiencies** – a number of advisory group members suggested there were opportunities for efficiencies in transferring SAMM from a research to an operational quality improvement function. Efficiency opportunities identified included elements such as reducing the number of panels, varying the eligibility criteria, not requiring anonymising cases if under the PMMRC, using common coordinating and support infrastructure across the PMMRC and SAMM. Some views were that resources freed up through review efficiencies could be applied into improving the quality feedback loop.

• **Continuous quality improvement for SAMM itself** – across the advisory group there was strong support for the ongoing development of SAMM to be driven via a formal process of quality improvement, with clear improvement cycles being informed by a process of independent evaluation.
2.4 Resources available to support SAMM integration

The Ministry has confirmed that funding of $500,000 per year is being made available for the years 2016–17 to 2018–19. Funding for the 2015–16 year of $500,000 was made available from the Ministry to support the continuation of the SAMM panel audit process, this review process and initiating the transfer of the SAMM audit from the University of Otago to the Commission.
3. Proposed solution for transition

The advisory group has identified a preferred option for the SAMM transition. This followed from a review of options (see Appendix 2). Three interlinked components to a viable solution were identified.

1. **Direction and vision for the system**: Develop an improved vision for a broader system-level response to severe acute maternal morbidity review and quality improvement in New Zealand.

2. **SAMM transfer and transition**: Clarify how SAMM aligns with this wider view. Be clear and specific about the transition of SAMM operationally and how it will operate as a ‘business as usual’ function on transfer to the Commission.

3. **Development pathway for SAMM and the system**: Lay out a developmental pathway, informed by evaluation and quality improvement principles, that supports SAMM development within the Commission, and alignment of other maternal quality systems, over three years and to achieve the wider vision.

The proposed approach references a strategic planning approach:

a. Identify where you are going.

b. Identify the first step.

c. Identify the pathway and process to support the journey from b. to a.
Figure 2: A conceptual view of bringing SAMM into the Commission within a future-focused vision for improving maternal quality and safety

Figure 2 shows a process for integrating SAMM into the Commission functions and into a broader maternal quality and safety vision. The advisory group believes achieving clarity about all three components will support an effective transition of SAMM that meets the purpose and requirements outlined in the terms of reference.

3.1 Vision for maternal morbidity review and quality improvement system
The advisory group proposes that SAMM is transferred to the Commission within the context of an agreed national approach to reviewing severe acute maternal morbidity and actively improving services and outcomes.

The following elements of a future system were identified:

1. Improving outcomes for women and babies is the guiding purpose.
2. The model must drive quality and safety improvements at the workface.
3. The SAMM audit strengths of engaging and empowering clinicians to lead local improvement must be maintained.
4. The SAMM audit itself should operate within a framework of continuous quality improvement.
5. Take a systems view – shaping SAMM as a part of a joined-up system to reduce severe acute maternal morbidity.
6. Health resources must be used efficiently. There needs to be a balance between investment in reviews and an investment in improvement.
7. The Commission establishes a new maternal morbidity quality improvement sub-committee to provide leadership for the SAMM audit and support improved near-miss maternal morbidity reviews undertaken locally by DHBs, utilising guidance and tools supplied by the Commission.
8. The Commission develops synergies across the AMOSS epidemiological risk factor identification process and SAMM practice and system preventability focus.
9. The framework includes proactive links to NMMG, national maternal clinical indicators and DHB maternity quality and safety plans.
10. Establishing the SAMM audit under the PMMRC umbrella means future SAMM data will be protected under Schedule 5 of the Public Health and Disability Act 2000.
11. The approach supports World Health Organization recommendations for addressing maternal morbidity and is able to produce data (across SAMM and AMOSS) to achieve meaningful comparisons with peer nations.
12. Progress is informed by independent evaluation, to support continuous improvement and assess impact and value for money.
13. The system has the flexibility to explore and respond to emerging issues.
Figure 3 identifies:

- DHBs encouraged to undertake local reviews of near-miss events, with a framework and guidance provided by the maternal morbidity quality improvement sub-committee of the PMMRC
- near-miss events also requiring an independent SAMM audit, according to agreed criteria
- improved integration of national maternal morbidity data sets
- the sub-committee, via the PMMRC, providing insight for quality improvement to the NMMG and Ministry, and directly to DHBs
- alignment with, and leverage from, the national maternity clinical indicators to inform focus areas for review functions.
3.2 SAMM audit transition to the Commission

The preferred option is to immediately establish the new sub-committee of the PMMRC to provide oversight for the transition of the SAMM audit into the Commission and to support the development of the SAMM audit and of the wider maternal review environment until June 2019.

The sub-committee would be established with appropriately qualified appointees under the structure outlined in Figure 4.

**Figure 4: Proposed Commission structure for leading the transition and development of SAMM audit and wider maternity review system**
The sub-committee is to be established with terms of reference and objectives that include:

- **focus on system to improve outcomes for women and babies** – leading the development of a maternal morbidity review system, including SAMM, which explicitly focuses on closing the quality loop back to best practice and back to better outcomes for women and babies.

- **develop the SAMM independent reviews for near-miss cases** – support transition of SAMM into the Commission, maintaining the fidelity of the SAMM audit systems, process and panels in the transfer from the University of Otago.

- **encourage and support DHB-level near-miss reviews** – support DHBs with advice and tools to enable them to undertake their own internal reviews of maternal near-miss events. Align DHB-level activity with SAMM independent reviews.

- **support closing the loop to improve quality at the workface** – develop systems to provide feedback to improve maternal outcomes, including feedback to Ministry and DHBs, and also directly to maternal services via panel members and professional bodies.

- **support the cohort of engaged clinical leaders as part of the SAMM panels** – ensure the SAMM process maintains active and enthusiastic clinical engagement in the panel reviews, quality feedback process and development of the SAMMaudit itself. Also maintain engagement with clinicians involved with AMOSS and the morbidity review group.

- **explore increased consumer involvement in the review and improvement process** – explore and assess whether the SAMM model and the wider role of the sub-committee can support increased consumer involvement.

- **explore data needed moving from a research to operational function** – identify data requirements to support a SAMM process that operates within a quality improvement paradigm and ensure the systems, processes and delegations are put in place so data being collected under the governance of the PMMRC is being collected in accordance with the provisions of Schedule 5 of the New Zealand Health and Disability Act 2000.
• develop improved links to other parts of the maternal quality and safety system – ensure the sub-committee, through the PMMRC, has formal linkage to the NMMG, the Ministry, DHB maternity quality and safety programmes and the AMOSS review of maternal epidemiological risk

• develop improved links to quality initiatives in other parts of the Commission – identify and develop improved alignment with quality initiatives in other parts of the Commission. This may include improvement advice themes, supporting clinical leadership and management of data. Note, the diagram of the PMMRC shows future alignment of the sub-committee with the current Maternal Morbidity Working Group. The timing of this alignment has yet to be determined and may be informed by the workshop with SAMM audit panel members proposed for February 2016.

3.3 Development pathway for SAMM audit and the system

SAMM has committed funding of $500,000 per year until the 2018–19 year. During that time there is an opportunity to support the evolution of SAMM to become a sustainable part of a more integrated approach to morbidity review.

The advisory group supports the concept of undertaking a series of annual quality improvement cycles for SAMM, with clear objectives for each year of development until 2018–19. It is envisaged that the quality improvement cycles would be informed by independent evaluation. The following points outline key issues that will need to be incorporated in the development approach for SAMM and the wider maternal morbidity system.
3.3.1 Panel engagement and ongoing panel reviews
The advisory group recognises that any future development of SAMM must continue to support the engagement of the clinician panel members. As such, the first step in the development for SAMM should be a national workshop of panel members to provide feedback on results to date and seek their advice on the best way to continue to develop a sustainable SAMM model in the future, how best to close the quality loop and recommendations on appointees to the PMMRC sub-committee.

3.3.2 Governance
It is anticipated that once the SAMM audit is successfully transitioned to the Commission, the Maternal Morbidity Working Group (which currently supports AMOSS) would be amalgamated, with one group providing leadership for maternal morbidity review and quality improvement. There is the potential for this amalgamated group structure to begin operating immediately, if this were feasible.

3.3.3 Infrastructure within the Commission
The Commission will need to ensure it has internal capacity to take over leadership, coordination, data management and administrative tasks of SAMM. There will need to be a transition period in which the University of Otago provides support for establishing SAMM within the Commission, especially with the administration of the panels and with the relationships with the SAMM agents within the DHBs.

3.3.4 Alignment and closing the feedback loop
A key change between the SAMM research model and the Commission-led operational model is the emphasis on closing the feedback loop and actively driving change within maternity systems. A second element is improving alignment with AMOSS, the NMMG and DHB maternal quality and safety plans. This quality improvement and system-linking function is likely to involve dedicated roles within the Commission.

3.3.5 SAMM evaluation
The advisory group supports a quality improvement methodology being applied to the development of the SAMM audit itself. A series of annual quality cycles that could be structured along the lines of a plan–do–study–act process and informed by independent evaluation will inform decisions about the design of SAMM and how the Commission develops the wider maternal morbidity review system.

The advisory group believes the quality cycles should explore the following impact, efficiency and efficacy issues.

3.3.5.1 Impact issues
- Assess the impact the SAMM audit process is having on factors such as health care system changes and clinical knowledge and behaviours.
3.3.5.2 Efficiency issues

- Assess whether the current SAMM model could be run more efficiently without compromising value, for example:
  - there are currently six panels under the SAMM process. There may be opportunity to reduce the number of panels and still retain a valuable independent review function. One option may be to rotate clinicians through the panels so there could be a high rate of participation of clinicians from across the country, but their attendance on panels may be less frequent.
  - currently SAMM panels review all cases that meet selection criteria. A similar value may be achieved with some process of pre-filtering cases (especially where there is ‘saturation’ of learnings around similar case types) to ensure the panels are focused on cases where new learnings may be achieved.

3.3.5.3 Efficacy and value issues

- Assess whether the current methods and tools used in SAMM are the most effective in providing useful information to inform workforce quality improvement. For example:
  - assess whether the current criteria of ICU/HDU admission and transfusion of four or more units of blood delivers the most value in terms of information to inform improvement, or whether other criteria should be added or should replace these criteria as the programme evolves.
  - like any tool, the SAMM template should be assessed in terms of its role supporting the independent review panels and, potentially, DHB internal review processes for maternal near-miss events. The PMMRC may wish to explore whether there was any advantage in improved alignment across the morbidity and mortality review tools.
  - explore whether independent reviews are best undertaken at a national level or whether regional review panels may be more efficient and add more value.
• Identify the most effective methods for closing the feedback loop and providing information for DHBs and practitioners to respond to improvement themes.

### 3.3.6 Value for money

The SAMM funding is for four years. During this time, the Commission will need to undertake a value for money review to assess the overall impact and value of the SAMM audit (and possibly other maternal morbidity reviews) in order to make informed decisions about the future of resourcing post-2018–19.

### 4. Data management

#### 4.1 Collection and storage of SAMM audit data

The existing SAMM audit data was collected with approval from the Multi-region Ethics Committee and Protected Quality Assurance. The data is stored on a Microsoft Access database. Analysis is undertaken using the ‘R’ statistical package.

The database is used to store a range of data on mother and baby, including: demographic, location of care, clinical, complications and care outcomes. All relate to the identified SAMM case.

The data is entered by an administrator and extracted at points in time for analysis. The database is user-friendly and easy to use, with input screens and drop-down menus for a number of items. This supports consistency of data entry. The database could be easily moved to the Commission or replicated by the Commission in its current form.

Discussions with stakeholders indicated that, with the shift of the SAMM audit to the Commission, it would be useful to explore whether there should be changes to the data collected and stored. At this stage it is unclear what specific changes this would require but it would be sensible to utilise the learnings from the research phase to inform any changes, updates or redesign of the database.

In moving the SAMM audit to the Commission, there are two key options with the data:
• Bring the current SAMM data into the Commission and continue to use the existing database.

• Leave the database with the University of Otago and develop a new database within the Commission or collect data in an existing system.

Key issues impacting on the decision include:

• whether there is value in having the historical data (for example, for baselines and longitudinal review) or whether these issues will be addressed with papers due to be published by the University of Otago within the next six months

• whether the data, which was collected under ethics/Protected Quality Assurance Activity for research purposes, can be used by the Commission for operational quality improvement purposes

• whether the definitions of the data collected and the design of the data fields, designed for research purposes, are best suited to support the Commission’s needs

• the relative longer-term efficacy of a standalone database versus a data solution that includes integration with other morbidity and mortality databases

• the relative costs of developing a new database.

The recommended approach is to continue to explore the issues in more detail. At this point, the proposed pathway is as follows:

1. Leave the current SAMM audit data with the University of Otago.
2. Request a copy of the database structure (without data) and use this to inform development of a new data solution within the Commission, which may build from an existing database.
3. Ensure the new database is operational to support SAMM panel data by the second quarter of 2016.
4. Enter new data for SAMM under the PMMRC protection.
5. As part of the year 1 activity, begin a more strategic review of how the Commission handles its morbidity and mortality data, within the context of potentially developing a future-focused integrated data solution.
6. If the original SAMM research data is required for specific analysis at a future date, the particular data could be requested either through Protected Quality Assurance Activity or PMMRC legislation, as appropriate.

Database management skills will need to be replicated within the Commission if it is to take the SAMM support functions and infrastructure fully in-house.

4.2 Integration with the ANZICS database and national maternity clinical indicators

SAMM cases are currently identified via a process of local DHB data collection and collation practices. There is a range of historical reasons for the need to collect and collate the data at DHB level, including the lack of national, single data collection standards and processes. Over the last few years there have been changes in the data collected nationally, which may offer opportunities to improve the efficiency of identifying cases which are applicable for the SAMM audit.

Two databases are believed to be useful to support the identification of potential cases for SAMM audit:

1. ANZICS adult patient database (APD).
2. New Zealand maternity clinical indicators.

4.2.1 ANZICS APD

This database receives data submissions from ICUs throughout Australia, New Zealand and Hong Kong. These provide information about individual episodes of care in ICU. The database contains a number of items collected using a consistent coding standards and collection process. Of importance to the SAMM audit are the following items:

- Collects ‘hospital code’ – so DHBs can be identified.
- Collects ‘care unit identifier’, which enable ICU/HDUs within hospitals to be identified.
- Collects ‘pregnancy status’ (collected at time of admission to ICU/HDU).
- Collects other items such as ‘age’.
- Note: the ANZICS system does not collect NHIs but does collect a unique patient identifier (generated by the ANZICS system).
4.2.2 New Zealand maternity clinical indicators

The New Zealand maternity clinical indicators provide information on a series of maternity outcomes which relate to an optimal health outcome. A yearly report is produced, with the latest report being the fifth in the series. It presents data on women giving birth, and babies born in the 2013 calendar year. It includes six new indicators, bringing the total number of indicators to 21, and presents trends for each indicator over a five-year period.

Of the 21 indicators, two are of direct importance to the SAMM audit:

- Indicator 11: Blood transfusion during birth admission for caesarean section delivery.
- Indicator 12: Blood transfusion during birth admission for vaginal delivery.

In terms of blood transfusion, these indicators aim to identify significant blood loss that will stimulate further investigation of clinical management and intervention. Significant blood loss is not defined as it is difficult to quantify. This is slightly inconsistent with the SAMM audit identification criteria of ‘blood transfusion of four unit or more’ but may be useful at identifying potential cases.

4.2.3 Next steps

A combination across these variables has the potential to enable the unique identification of cases for the SAMM audit. Data from both collections would need to be collated into one data set, which enables DHBs to identify potential cases in order to extract notes across hospital, midwifery, etc. With a combination of demographic, hospital and pregnancy-related data, there is the potential to identify SAMM audit cases.

There are opportunities to combine data across these two data sets to identify potential cases for the SAMM audit. This can be done via running regular reports across these two data sets. This has the potential to create efficiencies for DHBs and the Commission. It also offers a standardised process which reduces any potential variance in local identification practice. Further detailed investigation of these opportunities is required.

If the criteria for SAMM cases are modified in the future, there may be further opportunities to interrogate the ANZICS APD and maternity clinical indicator databases to support ongoing efficient centralised identification of cases.
5. Financial implications

The Ministry has committed to funding the SAMM audit within the Commission for $500,000 per year until the 2018–19 year.

Cost drivers for running the SAMM audit along the lines of the current research project are:

- six panels meeting four times a year, assessing 10 cases per panel meeting
- 10–12 panel members per panel/face-to-face meeting
- staff contracted in each DHB to access case notes
- preparation and anonymisation of notes by a central project team
- a central team of project manager, database support and administration
- governance and DHB engagement costs.

It is estimated that the cost of running the SAMM panels alone under the current system is about $460,000. The year 1 costs for SAMM would also include some funding for the University of Otago to support transition of SAMM to the Commission.

5.1 Budget allocation estimates for SAMM audit within the Commission

If the SAMM audit is going to develop along the lines outlined in this report, there are implications for resourcing. As well as funding the panels, SAMM resourcing would also need to cover:

- quality improvement ‘closing the loop’ functions back to the maternity system
- independent evaluation to inform review and development of SAMM itself.

It is estimated that in order to fund the quality loop activity and independent evaluation, the level of resourcing directly available for the panels may need to be approximately $350,000–400,000 out of the $500,000 total budget.

As discussed earlier, the advisory group proposes that, at the workshop with panel members in February 2016, the issue of finding efficiencies is discussed and panel members are asked for their advice on how best to proceed.
Appendix 1: Maternal Morbidity Expert Advisory Group terms of reference

Context
1. Following announcements on the continuation of the SAMM audit by the Minister of Health, the Ministry of Health has now confirmed funding for the Commission to take ownership of the data and decide the details of how this function will be undertaken long term.

Background
2. The SAMM audit is a project currently based at Otago University Wellington (Women’s Health Research Centre) with the aim of assessing potential preventability of maternal ‘near misses’. The current project team use the following definition of SAMM: ‘a very ill pregnant or recently delivered woman who would have died had it not been that luck or good care was on her side’.  

3. Funding from the Ministry is for the first year at this stage with out-year funding being part of a joint discussion following completion of the work on the future shape of the audits and likely ongoing costs.

4. The Perinatal and Maternal Mortality Review Committee (PMMRC), the Australasian Maternity Outcomes Surveillance System (AMOSS), the Maternity Quality & Safety Programme within the Ministry of Health and the SAMM audit all review maternity data and recommend actions to improve the quality and safety of the system.

Purpose
5. The purpose of this group is to provide advice for a sustainable approach for Severe Acute Maternal Morbidity (SAMM) audit in the context of maternal morbidity review, PMMRC, AMOSS, the Maternity Quality & Safety Programme and the Australian and New Zealand Intensive Care Society (ANZICS) database.

**Key tasks**

6. The EAG will provide guidance on the following:

a. A sustainable review and improvement model for SAMM within the context of best practice for undertaking maternal morbidity audit, ensuring any approach improves the quality and safety of maternity services delivered in New Zealand.

b. The link between the Commission and maternity quality programme based at the Ministry of Health.

c. The link between an expanding maternal morbidity audit work stream and the work of the Perinatal and Maternal Mortality Review Committee.

**Composition**

7. The EAG will have members with relevant expertise and be co-chaired by Dr Bev O'Keefe and Dr Vicki Culling. The EAG will be no greater than eight (8) members and comprise:

a. SAMM project lead – Associate Professor Beverley Lawton

b. Chair, National Maternity Monitoring Group – Norma Campbell

c. Chair, Perinatal and Maternal Mortality Review Committee – Dr Sue Belgrave

d. Chair, Australasian Maternity Outcomes Surveillance System Working Group – Dr Claire McLintock

e. DHB Clinical Lead for Quality and Risk – Dr Mike Roberts (Note – could not attend several meetings)

f. Consumer representation – Linda Penlington

g. Intensivist representation – Dr Annemarie Mitchell.

**Meetings**

8. There will be three (3) meetings of the EAG that will cover the following:

a. August

i. Overview and current operation of the SAMM audits as well as PMMRC, AMOSS, serious adverse events and the maternity quality & safety programme and the link between these.
b. September

ii. Development of options for ongoing maternal morbidity review, including consideration of options that require i) full integration with existing model and no extra funding, ii) some additional activities and funding as well as transferring the SAMM audit process directly to the Commission with associated costs. Consideration of data to be further collected, data storage, prioritisation of cases for review, review methods and reporting processes.

c. October

iii. Final report and recommendations

9. Findings will be presented to the Commission’s board at its November 25–26 2015 meeting.

Quorum

10. At least five (5) members, including the chair, will be required to meet quorum.

Secretariat support

11. The Commission will require secretariat support for the EAG, including arranging flights and accommodation if required, providing meeting space, preparing agendas and minutes.

12. Meetings will usually be held in Wellington. Actual and reasonable expenses for activities required by the EAG of its members (eg, travel, accommodation, literature searches) will be met from the Commission’s budget, provided prior approval is received.

Management of conflicts of interest

13. Members must perform their functions in good faith, honestly and impartially and avoid situations that might compromise their integrity or otherwise lead to conflicts of interest. When members believe they have a potential conflict of interest on a subject that will prevent them from reaching an impartial decision or undertaking an activity consistent with the functions of the EAG, they must declare that conflict of interest and withdraw themselves from the discussion.
Appendix 2: Options and issues with transition

In assessing the options for the transition of SAMM from the University of Otago into the Commission, the terms of reference identified three options should be explored:

- **Option 1**: Transferring the SAMM audit process to the Commission with associated costs.
- **Option 2**: Consideration of options that require integrating existing systems with some additional review, analysis and reporting.
- **Option 3**: Full integration with existing review activities such as PMMRC, AMOSS and DHB local reviews with a sustainable funding model.

The advisory group met in a workshop situation and explored the advantages and disadvantages of each option. These are summarised below.

**Option 1: Transferring the SAMM audit process to the Commission with associated costs**

Option 1 was interpreted as being a model in which SAMM sat under its own governance outside the PMMRC. In this model SAMM would also be operationally separated from the PMMRC functions, and data would need to be obtained and managed under the Protected Quality Assurance Activity framework.

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<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tr>
<td>The SAMM model and approach would have strong focused governance, leadership and visibility within the Commission, with ongoing support for a validated process. Strong clinical engagement would be maintained, with an increased future focus on closing the quality loop. It was expected some cost efficiencies could be achieved in areas such as panel size and reduced overheads.</td>
<td>The option may cement a disconnect between the SAMM audit and the other maternal morbidity quality improvement structures within the Commission. There may be reduced opportunities for efficiencies in being aligning with the PMMRC infrastructure and leveraging from the PMMRC links and feedback systems to the Ministry and DHBs.</td>
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**Option 2: Consideration of options that require integrating existing systems with some additional review, analysis and reporting**

Option 2 was interpreted as maintaining the core SAMM audit model with efforts to integrate this within the PMMRC structure, systems and infrastructure. In this model governance would be via a new PMMRC sub-committee responsible for maternal morbidity review and quality improvement.

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<th>Advantages</th>
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<td>SAMM data could be protected under PMMRC supporting legislation (not requiring Protected Quality Assurance Activity).</td>
<td>This option could lead to a reduction in the successful SAMM focus on engaging with clinicians, if a transition to the PMMRC were poorly handled and there was reduced leadership for the panel process.</td>
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<td>There are potential efficiencies through better use of infrastructure to support SAMM and PMMRC.</td>
<td>There is a risk of less focus on specific morbidity preventability factors if immersed in wider PMMRC agenda, without clear governance leadership and infrastructure support.</td>
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<td>This option would facilitate improved linkage to DHBs and to NMMG and PMMRC feedback systems, which could be used to help close the quality loop. Strong governance would support ongoing evolution and development of SAMM.</td>
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Option 3: Full integration with existing review activities, such as PMMRC, AMOSS and DHB local reviews with a sustainable funding model

Options 3 was interpreted as utilising existing systems and structures to support a form of severe acute maternal morbidity audit but one that would require considerably less resource. In this model, more emphasis is placed on supporting improved DHB reviews with significantly reduced independent panel reviews.

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<th>Advantages</th>
<th>Disadvantages</th>
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<td>There would be a significant reduction in costs and improved leverage of existing PMMRC relationships, staff and systems.</td>
<td>Many of the benefits of the SAMM audit process would be lost, such as multidisciplinary independent review, use of specific and validated tool, development of key national themes and feedback to DHBs.</td>
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<td>There would also be improved emphasis on helping DHBs to fulfil their own quality and safety responsibilities.</td>
<td>The system may be beholden to local DHB management priorities and near-miss reviews may not happen in some districts.</td>
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