

NSW Agency for Clinical Innovation

What have the clinical networks achieved and who has been involved? 2006-2008

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Retrospective study of the quality improvement activities of and participation in a taskforce of clinical networks

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Study Team and Acknowledgements

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We thank the Network Managers and other Agency staff who were immensely helpful in responding to requests for documents, participating in interviews and reviewing data to support this research.

Executive Summary

Overview

- Clinical Networks have been established in the USA, UK, Canada, Australia and other countries to engage clinicians and hospitals to implement quality improvement activities ¹. Clinical networks are an important vehicle for the NSW Agency for Clinical Innovation (Agency) to implement innovations in NSW to improve the quality of care.
- The Agency has established clinical networks in NSW. These are groups of health professionals in specialist health care areas who voluntarily contribute within an organised structure of clinical networks to undertake a range of quality improvement activities with a focus on improving care.
- In 2008, the Agency (then the Greater Metropolitan Clinical Taskforce, GMCT) entered into a research partnership with the Sax Institute to examine the impact of clinical networks drawing on the expertise within the GMCT and national and international research experts from a range of institutions.
- In the first instance, health care leaders in NSW sought to understand who is engaging in clinical networks and what these networks do.
- The results from the portfolio of studies within the program of research will directly inform the design of clinical networks so as to optimise the way they improve quality of care and patient outcomes in NSW, nationally and internationally.

Study method

- This report contains the first study in a broader program of research. It is a retrospective descriptive study of the operational features, membership and quality improvement activities of 19 clinical networks using document review and interviews for the period 1 January 2006 – 31 December 2008. The results of this study provide answers to the following questions:
 - What are the operational characteristics of the networks?
 - What is the level of participation of members of the networks?
 - What are the characteristics of the members of the networks?
 - What quality improvement activities have the networks been involved in?

Results – summary

- *Operational characteristics:* 19 clinical networks were included in this study. As at 31 December 2008, the newest of the 19 networks had been in operation for 14 months and the oldest for 113 months.
- *Level of participation:* there were 4509 individuals connected to the 19 clinical networks. Of these, 2048 (45%) were members (i.e. governance roles or on committees). The remaining 2461 (55%) were participants in network activities, not involved in governance.
- *Characteristics of members:* the most common profession types for network members and participants were nurses (37%), medical officers (30%) and allied health professionals (20%). These clinicians worked in over a third of the hospitals in the state. The majority of medical members of the network were senior medical staff (64%).

- *Quality improvement activities:* the networks had undertaken 312 quality improvement activities with the majority focusing on: education and workforce initiatives to implement evidence based care into practice (32%); policy, system or process redesign (21%); consumer resources (13%); and models of care, protocols and guidelines (12%).

Conclusions and Implications

- These voluntary clinical networks have attracted large numbers of healthcare workers from a range of professions, in particular senior clinicians.
- A large number of quality improvement activities – tailored to issues within their operating environments – are implemented when clinicians are given the opportunity to join and direct the priorities of networks.
- The existing clinical network structure (e.g. central coordinating agency, voluntary membership and bottom-up identification of priorities) provides a functioning platform that can be harnessed to embed evidence base care in NSW.
- Embedding research within the operations of the Agency represents an opportunity to contribute to international understanding about the factors that optimise health service delivery through clinical networks, as well as to support the operations of the clinical networks in NSW.

Introduction

Clinical Networks have been established in the USA, UK, Canada, Australia and other countries to provide organisational structures to support innovations in service delivery and improve quality of care¹. There is some preliminary evidence to suggest that clinical networks can improve service delivery. However, clinical networks are not always effective and there is a need to understand how networks might best be established and supported. In the first instance healthcare leaders seek to understand who is engaging in clinical networks and what the networks do.

Clinical networks are designed to improve quality of care and patient outcomes by enabling greater clinician input into models of service delivery and a range of quality improvement initiatives.¹⁻³ In broad terms, clinical networks provide a structure for connecting professionals across institutions and areas to implement innovations in health care delivery, planning and performance. Clinical networks are also useful in facilitating the treatment of patients who require care across a range of different institutions. In Australia, between 2004 and 2008, 19 clinical networks were established in NSW through the Greater Metropolitan Clinical Taskforce (GMCT). In 2010 the NSW Agency for Clinical Innovation was formed building on the work of the GMCT with the clinical networks as its foundation. In this report, we refer to the GMCT when discussing the study period from 2006-2008 when it was in existence and to the NSW Agency for Clinical Innovation when referring to the implications of this study.

The GMCT established groups of health professionals in specialist health care services who voluntarily contribute within an organised structure of clinical networks. These networks undertake a range of activities depending on their specialist areas of interest and service needs that include the development, implementation or dissemination of guidelines or models of care that support the provision of evidenced based care.⁴ The networks were originally developed to focus on improving care in metropolitan Sydney and in more recent years began to extend their reach into regional and rural NSW. The processes and structure of the networks developed organically over this period with priority areas identified by clinicians.

The clinical network program has received international attention and early evaluations provide preliminary evidence that the activities of some clinical networks have improved patient care.^{3,4} An independent review of the GMCT stated that it has *“been very successful in engaging clinicians from a wide background across greater metropolitan Sydney and in co-operating with consumers in the planning of health services to enhance the uptake of best clinical practice models and equity of access and outcome”*.⁵

This study is the first in a broader program of research designed to evaluate the effectiveness of the GMCT (NHMRC Partnership Grant ID 571447) and its 19 clinical networks. Before exploring the effectiveness of the clinical networks, it is essential to describe what the networks do and who is involved in these activities. The aim of this study is to describe the 19 Clinical Networks for a three-year period (2006-2008) in the following areas:

- a) Operational features
- b) Membership and participation
- c) Network activities - referred to throughout this report as quality improvement activities (defined as a broad range of activities to support service redesign and clinical care)

By doing so we will provide answers to the following questions:

- What are the operational characteristics of the networks?
- What is the level of participation of members of the networks?

- What are the characteristics of the members of the networks?
- What quality improvement activities have the networks been involved in?

Background – Clinical Networks in NSW

In June 2004, the GMCT, the predecessor of the Agency for Clinical Innovation, was established. Its purpose was to provide opportunities for clinicians and interested consumers to participate in the design and execution of models of care and clinical plans in NSW and collaborate with Area Health Services and other agencies in implementing the NSW State Health Plan. It aimed to provide clinicians with a structure that facilitated research and service delivery crossing Area Health Service boundaries. A Chief Executive position was created in 2005 (filled in 2006), and membership of the Governing Committee was expanded to include the Chief Executive, Executive Director, Business Manager and a consumer representative. It is this phase of GMCT operations that is the subject of the research in this report.

Networks were developed in areas of clinical need identified through 'bottom up' consultation by the Executive of the GMCT and external parties. Networks developed as a result of perceived need by informed clinicians working with the Executive of the GMCT.

The goals of the networks are to improve health services and health outcomes by:

- Developing services based on clinical need
- Improving the quality of care and safety for patients
- Increasing equity of access and equity of outcome within the hospital system
- Enabling clinician and consumer driven planning

These goals are based on the principles enumerated in the 2004 terms of reference.

The networks provide a collaborative structure to actualise the following 10 strategies:

1. Identify the key issues for specialities
2. Develop consensus documents, such as advice and policy responses to clinical issues across the networks
3. Develop evidence-based standardised assessment and treatment protocols, models of care and benchmarks for services
4. Share staff and resources between institutions to improve patient flows
5. Seek the input of consumers in planning
6. Provide staff training
7. Develop and implement uniform data collection systems to provide clinicians with data to guide changes in practice
8. Facilitate clinical research and the dissemination of results
9. Develop patient resources
10. Take local best practices and implement them in new AHS and hospitals

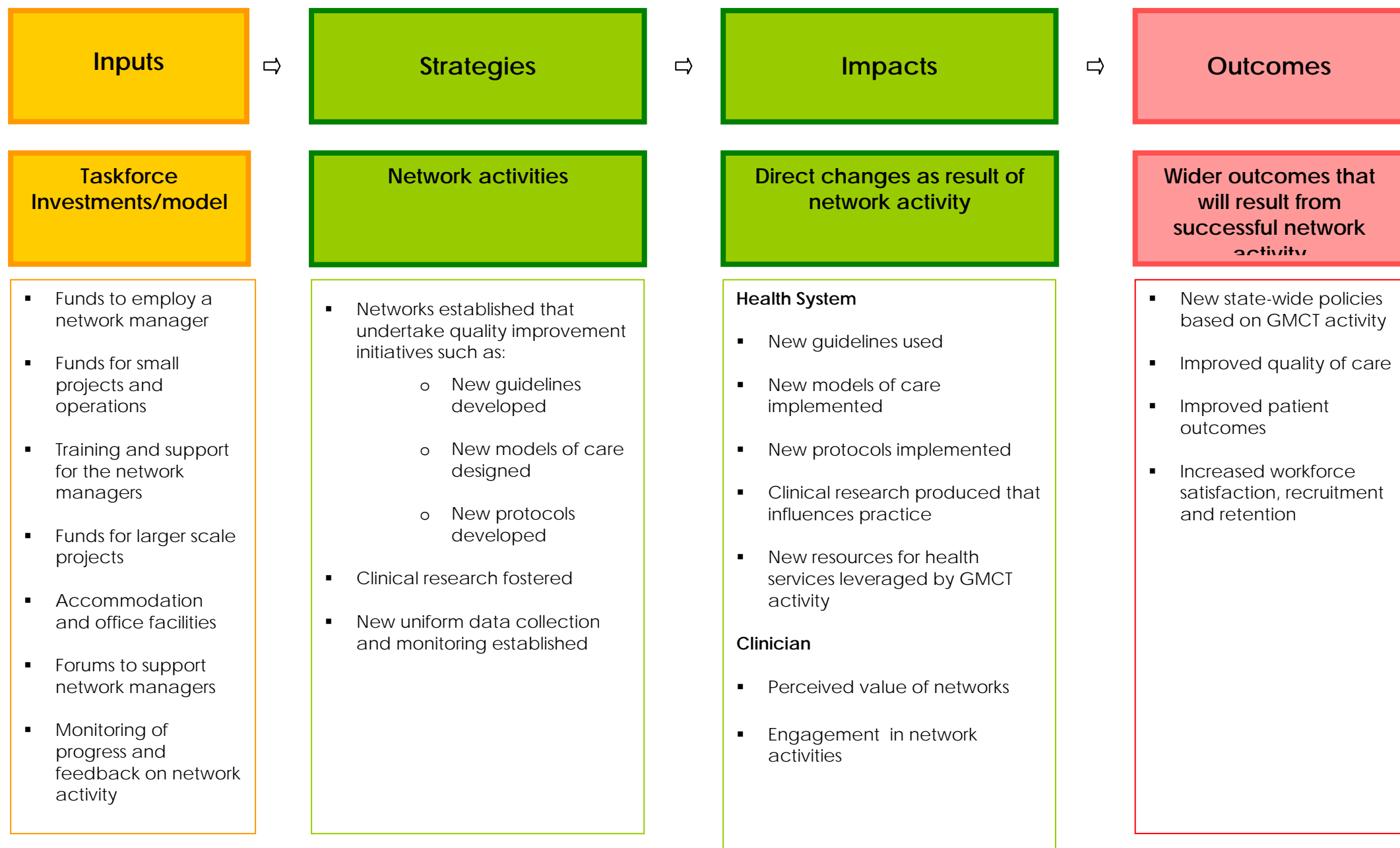
11.

Figure 5 Number of members and participants per network

Figure 5 below shows the ways in which the actions of the networks are anticipated to improve health care and health outcomes. The inputs reflect the operating model of the clinical networks. The processes, impacts and outcomes in the figure below are selective rather than exhaustive. When studying complex health interventions best practice is to strategically focus research on the activities that have been associated with changes in either process of care or health outcomes³.

Our approach to studying the logical links in the diagram below will form the basis of a whole program of research. The study reported here focuses on the activities conducted by the networks (i.e. the inputs and strategies of the networks).

Figure 1 GMCT model: inputs, strategies, impacts and outcomes



Method

Design

This report describes a retrospective descriptive study of the membership and outputs of 19 clinical networks using document review and interviews for the period 1 January 2006 to 31 December 2008.

Sample and Network Definition

The sample included 19 clinical networks managed by the GMCT. These networks are chaired by medical, nursing and allied health clinicians. Clinicians, researchers, managers, and consumers all participate as voluntary network members and assist in identifying how and where improvements can be made in particular specialty services. The networks then facilitate implementation of these changes in association with the NSW Health Department, the Area Health Services and with other associated organisations such as professional colleges, education institutions and the non-government sector.

A network was included in this study if it:

- had terms of reference and has appointed two clinical co-chairs (predominantly one medical and one other discipline or consumer representative)
- met on a regular basis with activities being managed by a dedicated network manager
- had an informal membership based on commitment and involvement
- was formed before December 2008

Procedure

The document review method was adapted from clinical audit methods and involved:

- i) Development of a priori categories of outputs for the clinical network based on the objectives of the network (see Figure 1) and iterative development with the executive of the taskforce and network managers.
- ii) Coding network annual plans and meeting minutes for evidence of activities and outputs according to the pre-determined set of categories allowing for new categories to be developed and grouped during the review and inclusion of free text annotation.
- iii) Corroborating each activity and output through interviews with key informants and physical sighting of secondary documents as corroborating evidence for activities determined as being completed within the study period. The key informants were the network managers who are responsible for the daily operations of the network which includes the coordination of meetings and documentation of meeting minutes.

Measures and Data Sources

The GMCT has kept detailed records of all meetings and initiatives and provides regular reports to the NSW Department of Health and to the Minister of Health. The range of documents was scoped for accuracy and completeness of information about activities, membership and costs.

The table below provides a summary of primary and secondary source documents that were coded in accordance with the definitions below.

Table 1 Summary of documents reviewed

Outcomes	Primary source documents	Secondary supporting documents
Activities	The executive meeting minutes of all network meetings held in the study period Annual work plans	Activity documentation of output, examples would include: <ul style="list-style-type: none"> • publications • training materials • data base manuals or software program • information booklet • DVDs
Membership	A list of the network members derived from network membership and events participation lists	

Operational characteristics: Measures

Operational characteristics of the networks were examined through the analysis of:

- Meeting minutes - to determine months of operation, number, location and regularity of meetings, participation of chairs and network managers.
- Requested reports from the GMCT Executive Director - to determine the number of employees per network.
- A self-report survey of network managers - to determine features of their networks (100% response rate).

Membership and participation outcomes: Measures

Lists of individuals who have attended meetings, events or provided resources to the networks were centrally held. These lists were organised by the researchers into network groups with additional fields that were completed by the respective network managers. Each network manager confirmed the accuracy of the lists and made amendments as well as deleting individuals who were not in the network during the study period. Individuals could be associated with more than one network and have varying degrees of involvement. We have classified them into two groups:

- Members* – actively engaged in steering the network through membership of committees or groups or by providing advice to the work of the network.
- Participants* – a named person who was involved in network activities but did not participate in any governance roles of the network.

Information provided on these individuals by the network manager (where known) included: profession; profession role; place of work by facility name and area health service; role within the network; and period of their association with the network.

Networks also provided estimates of attendances at network events. These data were aggregate group counts of attendees rather than individuals as it is impossible to accurately calculate the number of attendees, because individuals may have attended more than one event. Data will be reflected in the text where we describe estimates of event attendances.

Quality improvement activities: Measures

Based on information contained in annual work plans and network meeting minutes, all quality improvement activities associated with the networks were coded into categories using a coding manual containing inclusions and exclusions. All relevant material was coded into the development of, input into, or implementation of:

- **Models of care** – a standardised care pathway that describes the patient journey, integration of service delivery and decision options at specific care / intervention points.
- **Clinical guidelines** – standardised treatment and assessment protocols that include both broad principles and specific treatments linked to research evidence.
- **Care protocols** – a standardised set of rules for assessment and treatment of specific conditions.
- **Policy** – a statement of a decision regarding a goal in health care and a plan for achieving that goal, which is implemented or planned to be implemented in all or part of NSW Health or another agency.
- **System or processes** – a guideline or protocol to guide an activity or a service or process operating in the health system to improve quality, safety or resource efficiency and meet the network goals.
- **Education for implementation into practice** – a training and education event or program led by networks that facilitates learning with colleagues through presentations at forums, conferences and seminars either online, face to face, by telephone or via video link-up. Training also includes resources developed for clinicians that include toolkits, CDs, DVDs, websites and directories of services.
- **Advocacy** – activities that aim to influence another organisation, agency or individual to improve patient experience, health outcomes or more cost effective resource allocation in the health system. These activities, which are initiated or supported by a network or by the GMCT Executive, may take the form of a submission, policy document, policy advice, letter, or resource request.
- **Data collection monitoring systems** – network led and developed uniform data collection systems that provide clinicians and managers with data to guide changes in practice. The data can be used to inform policy, benchmarking and other initiatives.
- **Workforce improvement initiatives** – initiatives developed and led by the network to: improve coordination of staff and resources to meet patient flow; provide advice on improving workforce capability; seek funding to be directed into staff working on network priorities; achieve agreement between clinicians in the network to share resources in the patient care setting; or develop models of care as they relate to professional practice where the initiative defines professional roles and competencies.
- **Consumer Resources** – information documents, education programs, media campaigns or other resources whose target audience is the consumer and/or their carer/family.
- **Clinical research and scholarship** – defined as original empirical research, systematic literature review and scholarships indicated by peer review publications, research grants, or scholarships.
- **Quality improvement evaluation** – activities undertaken by the network where data is collected to evaluate the effectiveness or efficiency of a service, intervention, protocol or policy and the data collected is used to determine a course of action by the network and does not meet the criteria for research and scholarship (i.e. does not lead to a peer reviewed publication, research grant or provision of research scholarships).

Identified quality improvement activities were further classified into:

1. Developed and/or implemented – an activity that has a demonstrated outcome evident with a secondary document being cited.
2. Progress underway – where an activity was not completed but work was in progress and cannot be verified by a secondary document during the study period.
3. Abandoned or on-hold – an activity that may have been developed either in part or in full and was not completed to an outcome evident by a secondary document for the study period 2006-2008.

Quality of data sources

Four quality assurance measures were undertaken to ensure that: the documents reviewed were complete; the document review produced a complete and accurate list of activities and participation; and that the coding was conducted consistently across all 19 networks:

1. The network managers received a list of all documents reviewed and confirmed that they were a complete record of minutes and network members. To independently confirm the completeness of the documents, the GMCT Executive Director confirmed that no document was withheld from review.
2. The network managers confirmed the classification of activities and their completeness.
3. Secondary supporting documents were sighted as corroborating evidence that a completed activity took place.
4. Accuracy of documents to extract activities was assessed by determining whether activities were detected or not through document review alone and/or whether other sources of information were required (interviews and secondary documents) to determine a complete and accurate list of activities.

The level of agreement between the network manager and research team about the quality improvement activities from the 19 networks was 100%. A total of 552 quality improvement activities were identified through document review and/or interview during the study period. Of these, 77% (n=427) were accurately determined through document review alone, 19% (n=102) were identified through document review but required more information from interviews to ascertain details of the activity and 4% (n=23) were identified through interview alone. Of the 312 quality improvement activities that were developed and implemented during the study period, 99% (n=308) had at least one secondary document available for sighting and the remaining 1% (n=4) did not have a secondary document available for the verification process.

The Executive Director and network managers provided final review of the results to identify points of clarification or inaccuracy.

Data management and analysis

Data were entered into Microsoft Excel spreadsheets. SAS version 9.1 was used for data analysis. Descriptive statistics (i.e. frequencies and proportions) presented in this report were aggregated across all networks.

To capture the variation in roles for individuals belonging to more than one network, the denominator for aggregate analyses presented in this report is the total number of memberships to all networks (i.e. 4522). The only exception is the description of the number of networks per individual; in this case, the number of individuals belonging to any network is the denominator.

Results

What are the operational characteristics of the networks?

As at 31 December 2008, the newest of the 19 networks had been in operation for 14 months and the oldest for 113 months (Table 2, Figure 2). There was some turnover among management and the networks had between 1 and 3 different network managers during the study period. The average amount of time dedicated by the network manager was four days per week with 74% working at GMCT offices.

A total of 255 network executive meetings were held from January 2006 to December 2008 (Table 2) with individual networks holding between 5 and 25 meetings during the study period (Figure 3). The average attendances at meetings ranged between 7 and 43 members (Figure 4). Network managers attended over 90% of executive meetings (i.e. network meetings) or appointed a representative to attend in their absence (Table 2). At least one chair attended 92% of all the meetings.

Table 2 Operational characteristics of the networks

Network Characteristics	
Network operations and resources	
Months of operation since networks' inception, Median (Range)	74 (14-113)
Months of operation during the study period, Median (Range)	36 (14-36)
Average Network Manager FTE during the study period	0.8
Location of Network Manager	
• GMCT offices	14
• Other locations	5
Meetings	
Number of executive meetings held in 2006-2008	255
Proportion of meetings attended by designated network manager ¹	92%
Proportion of meetings attended by at least one network chair	92%
Number of members attending each meeting, Median (Range)	14 (4-52)
Number of apologies from members each meeting, Median (Range)	8 (0-39)
Management of the network	
Number of network managers during the study period per network, Median (Range)	2 (1-3)

1. If the designated network manager was unable to attend, another representative from GMCT attended in their absence.

Figure 2 Months of network operation by network

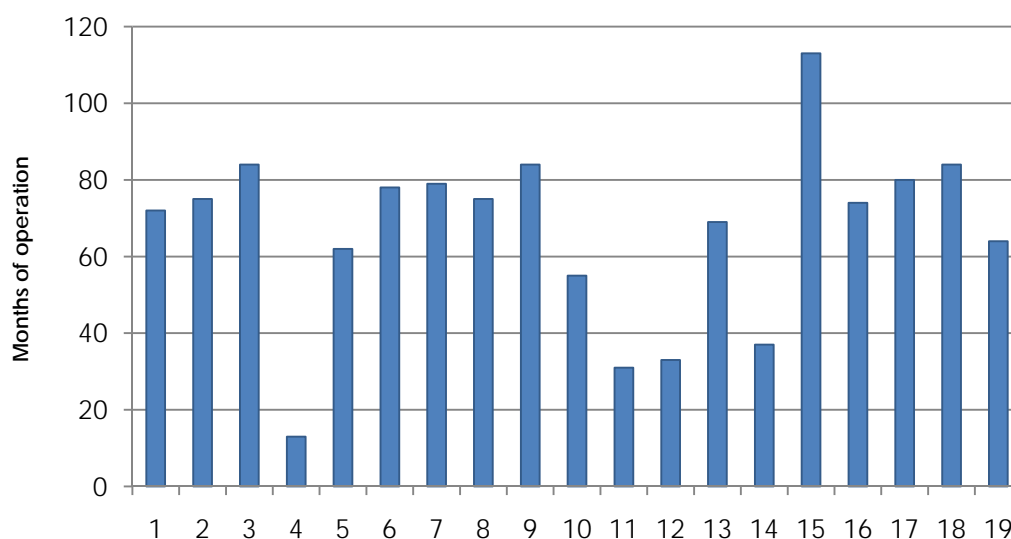
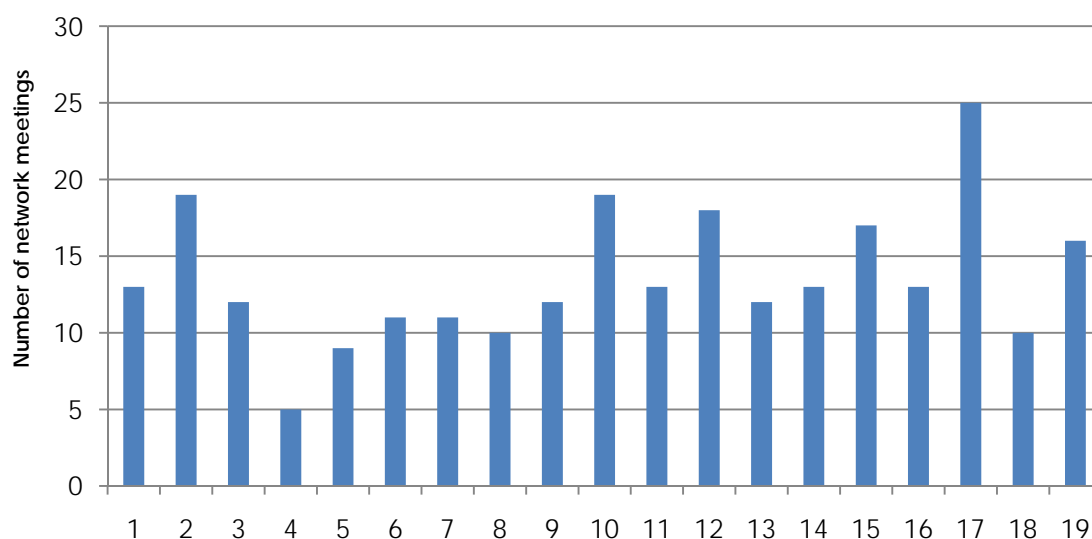
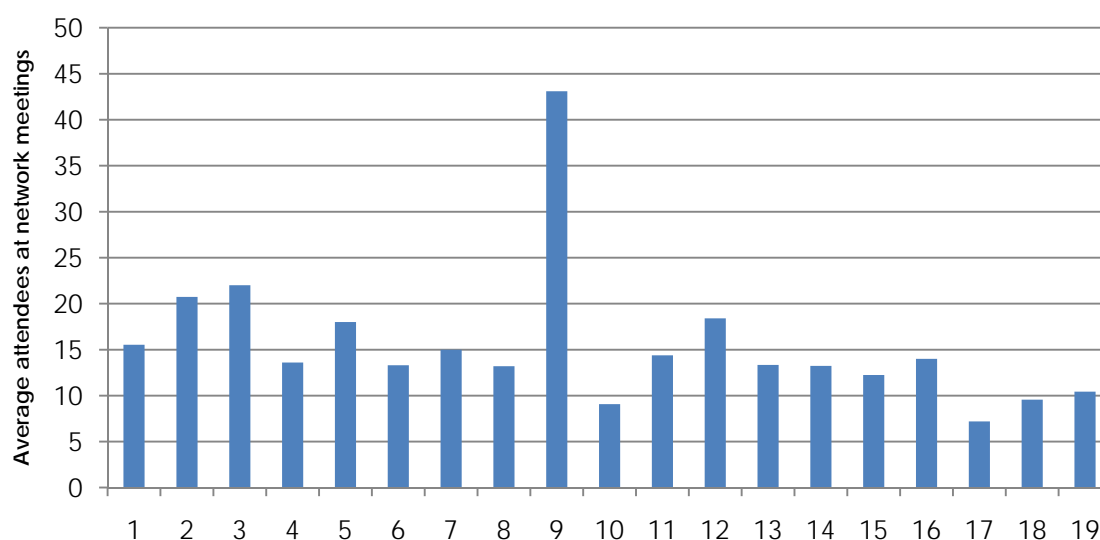


Figure 3 Number of network meetings by network**Figure 4 Average attendees at network meetings by network****What is the level of participation of members of the networks?**

In total, 4280 individuals participated in the 19 clinical networks (see Figure 5 for distribution by network). 229 of these individuals (5%) belonged to more than one network, resulting in 4509 network roles that have been described in the aggregate data (Table 3). Individuals belonged to between 1 and 8 different networks.

Table 3 Network members/participants¹ and their roles in the networks

Characteristics	Member N (%)	Participant N (%)	Total N (%)
Network Role²			
Members¹			
Executive Committee ³ Only	197 (4)	-	197 (4)
Executive ³ and Standing ⁴ Committee	374 (8)	-	374 (8)
Standing Committee ⁴ Only	1217 (27)	-	1217 (27)
Expert advisor	243 (5)	-	243 (5)
Participants¹		2450 (54)	2450 (54)
Missing	17 (0)	11 (0)	28 (1)
TOTAL	2048 (45)	2461 (55)	4509 (100)

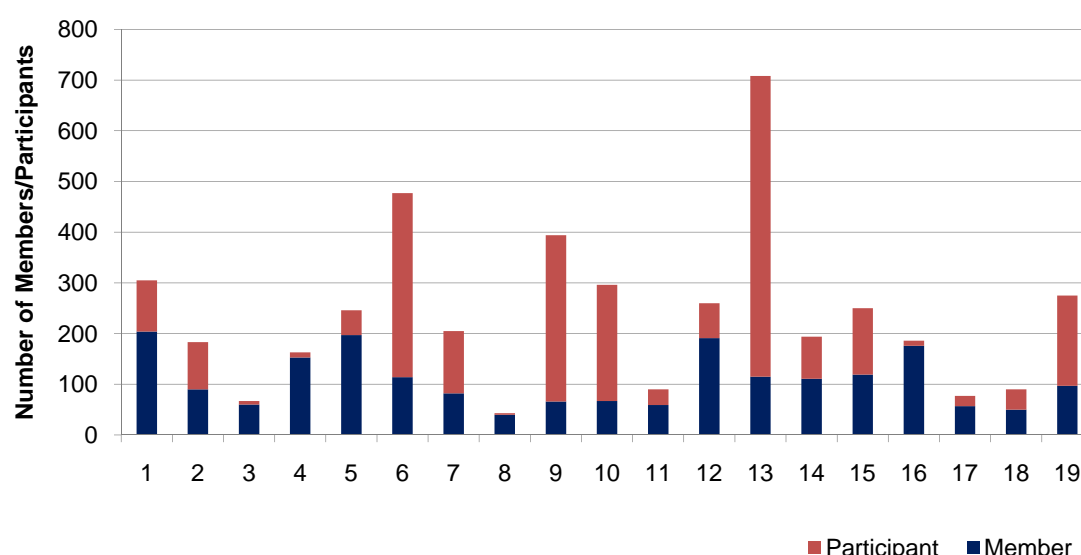
1. Members include those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network; and, Participants include those who are recipients of network activities only and did not participate in any governance roles of the network; 2. The denominator is the total number of memberships to any network; 3. Network meetings attended by core or executive members; 4. Meetings held by a network sub-committee of an executive.

Members are defined as those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network whereas participants are recipients of network activities only and do not participate in any governance roles of the network (see Appendix 1, Table 4).

Of the network members 60% were involved in a Standing Committee only, 18% were on Executive and Standing Committees, 12 per cent were Expert Advisors and 10% were on an Executive Committee only (Table 3).

The largest network had a total of 708 members and participants and the smallest had 43 (Figure 5).

We estimate that there were approximately 8267 attendances at network events over the study period (these are workshops, education sessions etc. to implement evidence based care into practice).

Figure 5 Number of members and participants per network

1. Members include those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network; and, participants include those who are recipients of network activities only and did not participate in any governance roles of the network. (Appendix 1 Table 4 provides more details.)

What are the characteristics of the members/participants of the networks?

Figure 6 shows the numbers of members and participants by Area Health Service. 81 per cent of network members and participants worked within a NSW Area Health Service, with the greatest numbers in South Eastern Sydney/Illawarra, North Sydney/Central Coast and Sydney South West (Appendix 1, Table 5). It is evident that the largest networks were those in the metropolitan areas. This is not surprising as these areas have the largest number of staff and metropolitan Sydney was the initial focus for the ACI. Among the four Sydney AHS, Sydney West has the smallest number of participants; the reasons for this are unclear.

Figure 7 shows the primary place of work for members and participants. Seventy seven per cent of network members and participants were primarily employed in hospitals, most commonly in a principal referral hospital (43%). 21 per cent worked in non-hospital organisations. Distribution was similar for both members and participants (Appendix 1, Table 5).

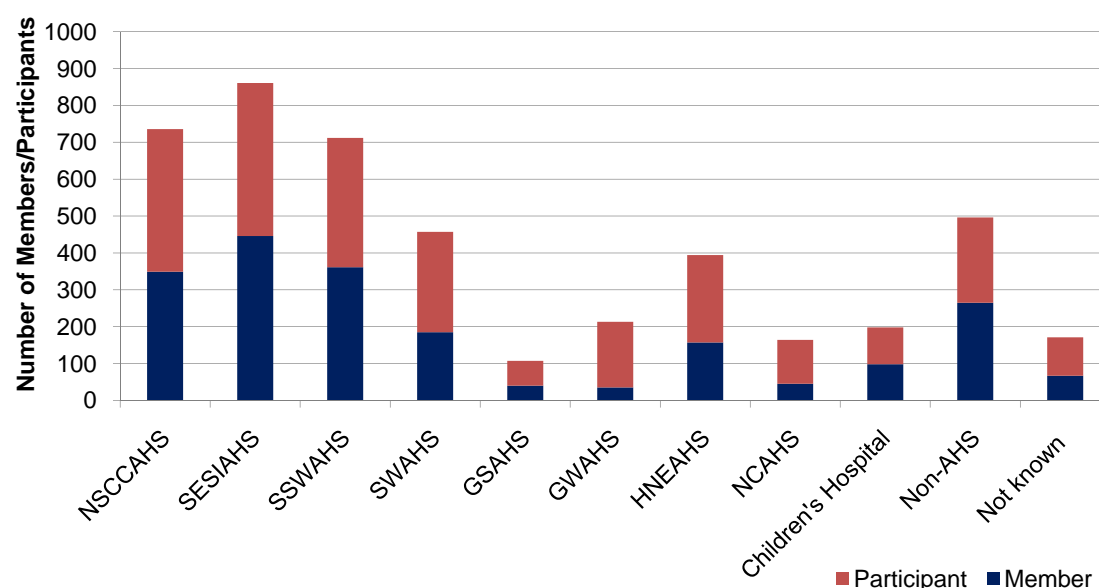
Figure 8 gives a breakdown of the number of members and participants by professional role. The most common profession types for network members and participants were nurses (37%), medical officers (30%) and allied health professionals (20%) (Appendix 1, Table 6). There was a roughly even distribution between medical officers and nurses among network participants.

Figures 9, 10 and 11 provide further detail for members and participants across the 19 networks within the different professional categories.

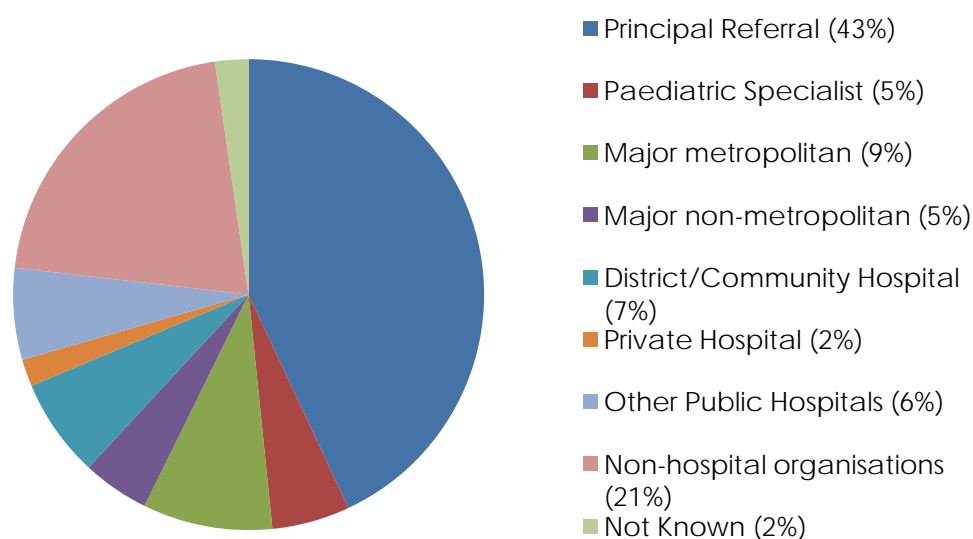
Medical officers - There was an even distribution of medical officers who were network members (15%) and participants (15%) who represented 30 per cent of the total. 64% of medical officers were consultants and/or staff specialists (Figure 9, Appendix 1 Table 6).

Nurses - Thirty seven per cent of network members and participants were nurses and of these 32 per cent were nurse clinicians (registered nurses, enrolled nurses and nurses with other clinical roles) and 27 per cent were clinical nurse consultants. Nurses were more commonly involved as network participants (23%) than members (14%) (Figure 10, Appendix 1 Table 6).

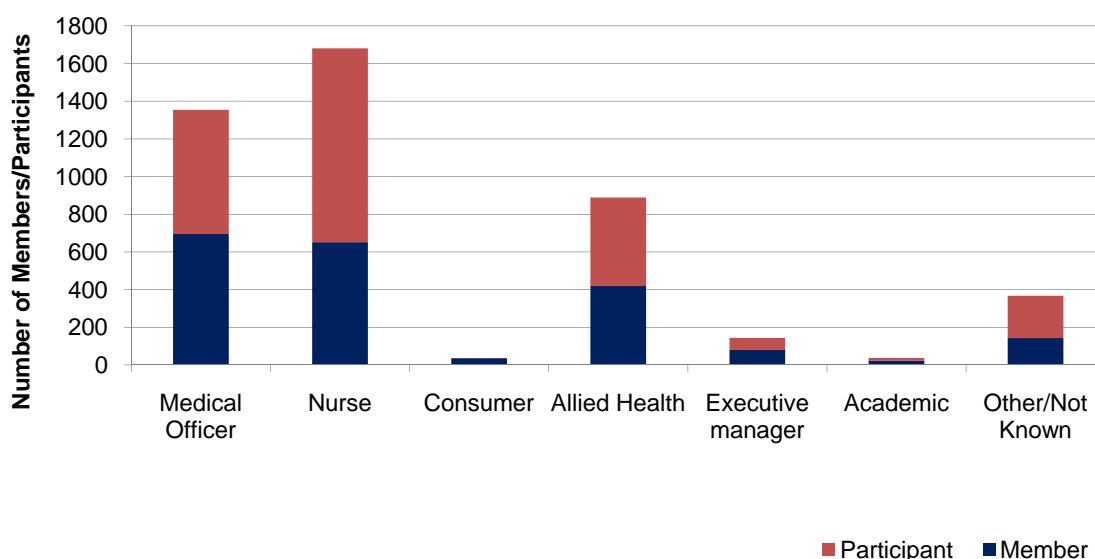
Allied health - Allied health was the third predominant profession type representing 20 per cent of the total and of these more than half were senior clinicians (Figure 11, Appendix 1, Table 6). For this purpose allied health professionals were broadly defined to include the following categories: health information officer, occupational therapist, social worker, physiotherapist, speech pathologist, dietician, radiation therapist, nuclear medicine technologist, radiographer, audiologist, podiatrist, dental therapist, dentist, pharmacologist and psychologist.

Figure 6 Number of members/participants by Area Health Service

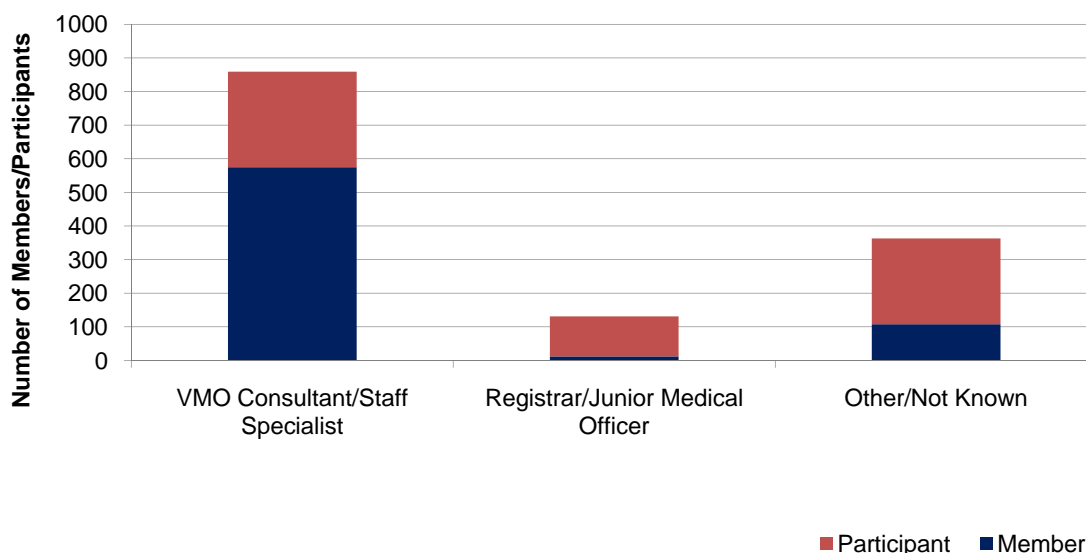
1. Members include those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network; and, participants include those who are recipients of network activities only and did not participate in any governance roles of the network; NSCCAHS=North Sydney/Central Coast Area Health Service (AHS); SESAHS= South Eastern Sydney/Illawarra AHS; SSWAHS=Sydney South West AHS; SWAHS=Sydney West AHS; GSAHS=Greater Southern AHS; GWAHS=Greater Western AHS; HNEAHS= Hunter/New England AHS; NCAHS=North Coast AHS; Children's Hospital=The Children's Hospital, Westmead; Non-AHS=NSW Health, Private Practice, University, Community/Government organisations, other. (Appendix 1 Table 5 provides more details)

Figure 7 Proportion of members/participants by Primary Place of Work

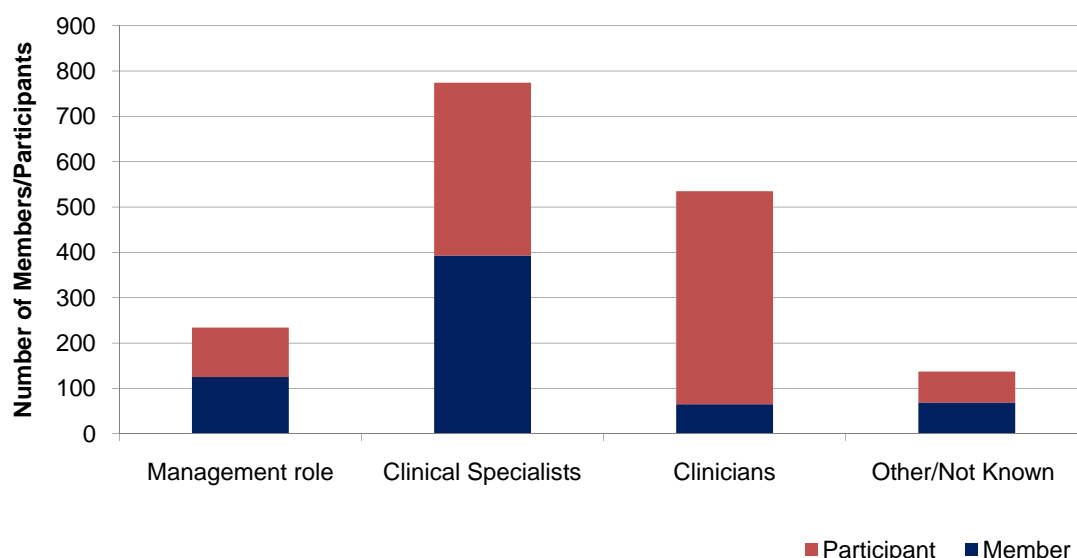
1. Members include those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network; and, participants include those who are recipients of network activities only and did not participate in any governance roles of the network. (Appendix 1 Table 5 provides more details)

Figure 8 Primary professional roles of members/participants

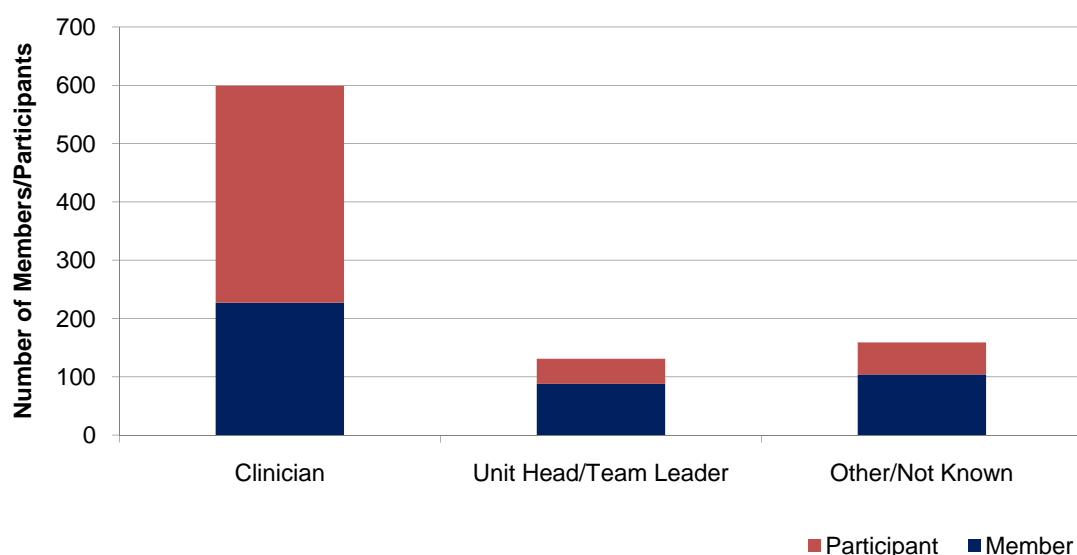
1. Members include those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network; and, participants include those who are recipients of network activities only and did not participate in any governance roles of the network; 2. Participants were mostly identified from network contact lists and, for the most part, attended network events and received communication only. The data originated from the GMCT central mailing lists and was amended by the network manager for each individual network. As many participants were contacts only, network managers did not know the details of their professional roles in all cases. 3. Members and participants could fall into multiple categories (e.g. clinical nurses who also had adjunct academic appointments). For the purposes of this graph they were counted as their 'primary' role. (Appendix 1 Table 6 provides more details)

Figure 9 Primary roles of members/participants who are medical officers

1. Members include those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network; and, participants include those who are recipients of network activities only and did not participate in any governance roles of the network; 2. Participants were mostly identified from network contact lists and, for the most part, attended network events and received communication only. The data originated from the GMCT central mailing lists and was amended by the network manager for each individual network. As many participants were contacts only, network managers did not know the details of their professional roles in all cases; 3. Other/Not Known includes general practitioners and academics. (Appendix 1 Table 6 provides more details).

Figure 10 Primary roles of members/participants who are nurses

1. Members include those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network; and, participants include those who are recipients of network activities only and did not participate in any governance roles of the network; 2. Participants were mostly identified from network contact lists and, for the most part, attended network events and received communication only. The data originated from the GMCT central mailing lists and was amended by the network manager for each individual network. As many participants were contacts only, network managers did not know the details of their professional roles in all cases; 3. Clinicians include registered nurses, enrolled nurses and any other nurses with clinical roles. (Appendix 1 Table 6 provides more details)

Figure 11 Primary roles of members/participants who are allied health professionals

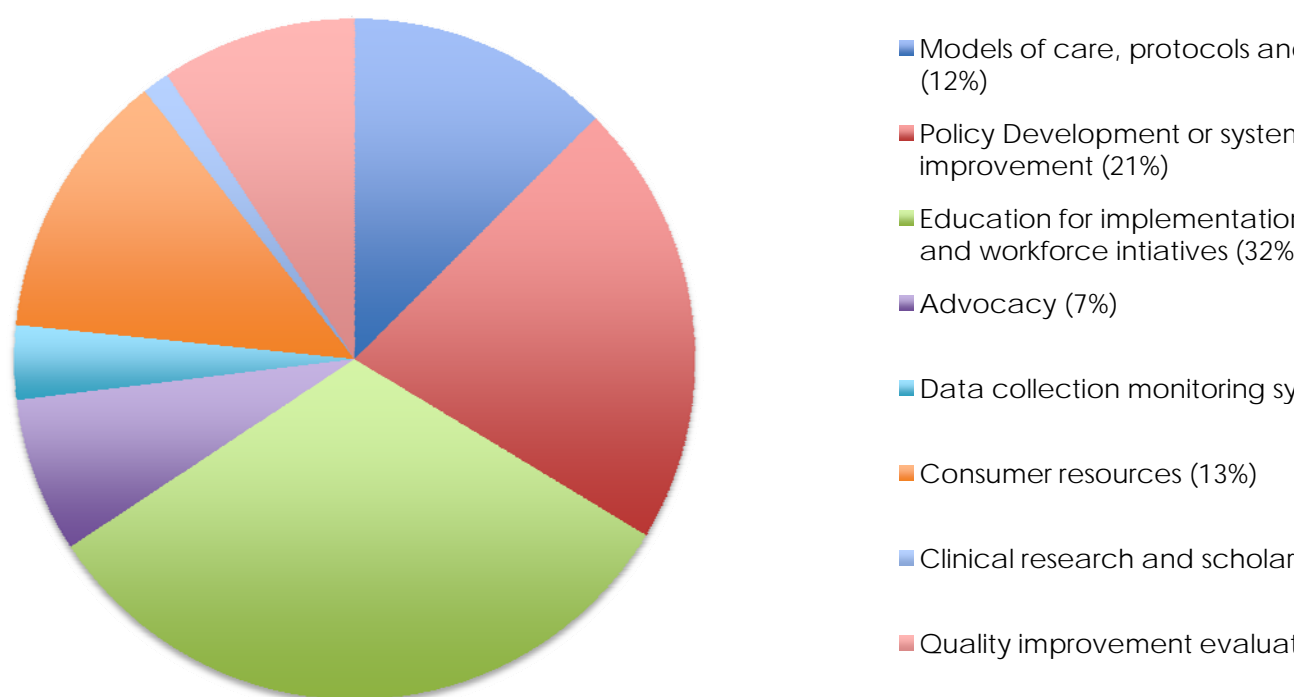
1. Members include those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network; and, participants include those who are recipients of network activities only and did not participate in any governance roles of the network; 2. Participants were mostly identified from network contact lists and, for the most part, attended network events and received communication only. The data originated from the GMCT central mailing lists and was amended by the network manager for each individual network. As many participants were contacts only, network managers did not know the details of their professional roles in all cases; 3. For this purpose allied health professionals include the following categories: health information officer, occupational therapist, social worker, physiotherapist, speech pathologist, dietician, radiation therapist, nuclear medicine technologist, radiographer, audiologist, podiatrist, dental therapist, dentist, pharmacologist and psychologist. (Appendix 1 Table 6 provides more details)

What quality improvement activities have the networks been involved in?

The 19 networks were involved in a total of 552 quality improvements activities during the three-year period from 1 January 2006 to 31 December 2008. Of these, 312 were developed and/or implemented during the study period and are reported on here and more fully in the individual network reports. Of the remaining 220 activities, progress was underway for 162 and 78 had been abandoned or put on hold (See Appendix 1, Table 7).

The most common type of quality improvement activities developed and/or implemented during the study period were: provision of education for implementation into practice and workforce initiatives (32%); development of policies, systems or processes (21%); consumer resources (13%); and models of care, clinical guidelines and care protocols (12%) (Figure 12, Appendix 1 Table 7).

Figure 12 Quality improvement activities completed during the study period (N=312)



For more details see Appendix 1 Table 7.

Full details of these activities are included in individual network reports (provided separately to networks). Vignettes below provide examples of network activities.

Vignettes

The vignettes below are examples of real activities undertaken by five networks to give a flavor of the range of the activities undertaken by the networks.

The research team worked with the Executive Director and Network Managers to identify these examples of how the networks operate.

Respiratory Network - Innovation to improve evidence-based practice nationally for lung disease

The Respiratory Network was established in 2006 to promote high quality care and to improve equity of access to, and outcome from, acute respiratory medical services and sleep services for adult and paediatric respiratory patients across greater metropolitan NSW.

The Australian Lung Foundation's Chronic Obstructive Pulmonary Disease (COPD) Action Plan encourages GPs to devise a care plan for the management of this chronic disease within an evidence-based framework.

The Respiratory Network coordinated the development of an electronic version of the COPD Action Plan for users of Medical Director and other commonly used electronic patient information management systems.

The electronic COPD Action Plan was made available nationally and free of charge, in the form of an easily downloadable software 'patch', developed at no cost by the North East Valley Division of GPs

Cardiac Network - Improving the standards for the care and treatment of cardiac conditions

The Cardiac Network, established in 2002, is a group of cardiologists, cardiothoracic surgeons, nurses, allied health staff, scientists and technicians who regularly provide expert advice to the NSW Health Department. The network both drives initiatives and reviews and formulates health policy.

The Cardiac Network developed a care protocol for cardiac monitoring in adult patients with a primary cardiac diagnosis to promote quality standardised approaches and eliminate variation in the provision of cardiac monitoring throughout NSW. The care protocol outlines the requirements on the indications for monitoring and the duration of therapy. This care protocol was written as a NSW Health Policy Directive entitled *Cardiac Monitoring in Adult Cardiac Patients in Public hospitals in NSW* and it was published in September 2008. The document may be accessed at

www.health.nsw.gov.au/policies/pd/2008/PD2008_055.html

Renal Network - Clinician input to planning dialysis services for NSW

The formation of the Renal Services Network in 2002-03 was driven by clinician concerns regarding growth in demand for kidney dialysis services and the ability of the NSW Health system to meet the demand. The Network developed a draft plan for standards of care for NSW and submitted it to NSW Health Statewide Services Development Branch.

Since 2005 representatives from the Network and GMCT Executive have contributed to the NSW Renal Services Planning Working Group, chaired by the Deputy Director-General of NSW Health, and provided clinical and strategic input to the planning of dialysis services. A relationship developed with NSW Health resulting in the release of the *NSW Renal Dialysis Service Plan to 2011* in September 2007. Several initiatives were developed by NSW Health to support the implementation of the plan, and the various working groups had major representation from the network.

Significant outcomes include: better understanding of whole-of-state issues for NSW Health; a statewide approach to planning and funding dialysis services; development of networks of renal clinical services with improved efficiencies in purchasing contracts and service delivery; recognition by NSW Health of their role in prevention activities in order to reduce or delay demand for dialysis services; increased profile and support for home-based dialysis programs to relieve the burden of demand on the health system; and greater transparency between renal units as representation

Transition Care Network - Training and education materials for health professionals and consumer resources for parents, carers and patients

The Transition Care Network, established in late 2002, plays an important role in helping young people with chronic diseases and disabilities make the often difficult transition from family focused paediatric care to adult health services. Health is just one of many transitions faced during late adolescence – leaving school, studying or entering the workforce, leaving home and forming intimate relationships to mention a few.

Much more education and awareness about the needs of these young people are needed both in paediatric and adult health services. The Transition Care Network has developed many resources to highlight the importance of early transition planning and to provide information and support for young people, their families and paediatric and adult health care professionals across the multidisciplinary team. A range of fact sheets have been developed along with checklists to encourage self responsibility, and emergency cards tailored to specific conditions such as spina bifida.

All resources are available on the Transition Care website www.health.nsw.gov.au/gmct/transition along with patient stories and links to transition services. A newsletter with relevance to all involved in transition is published twice per year and members of the Transition Network facilitate and attend regular education forums for professionals, young people and their parents/carers.

Gastroenterology Network – Advocating for funds to improve care

The main objective of the Gastroenterology Network, established in 2005, is to promote high quality care for patients with gastroenterological diseases, reduce inequities in access to services and improve outcomes. The Network has built strong collaborative relationships amongst clinicians and with NSW Department of Health, the Cancer Institute NSW, the Clinical Excellence Commission, the NSW Institute of Medical Education and Training and the Rural Health Priority Taskforce.

Prior to the commencement of the network, national bowel screening had not been introduced in NSW due to a lack of capacity and funding to perform follow up procedures. The Network was a strong advocate for the screening program and its rollout identified a range of issues for the Network to address. The Network has provided funding for the development of training courses for gastroenterologists, part-scholarships for gastroenterology and hepatology nurses and is working in collaboration with NSW Department of Health to advocate for the purchase of a State-wide Endoscopy Information System.

Neurosurgery Network - Fostering collegiality

Since its inception in 2001, the Neurosurgery Network has established five clinical groups that span thirteen service delivery sites. Each clinical group has multidisciplinary representation on the Network Executive Committee. The role of the consumer on the Executive Committee is active and highly valued. The network executive committee plays an integral role in creating and maintaining effective relationships between the clinical groups.

The focus of the network is an unwavering commitment to improving neurosurgery services in NSW by responding to clinical need, patient safety, and high quality service delivery. Most importantly, services are planned by and for clinicians and consumers for equity of access and outcome for patients who need neurosurgical services. This commitment is reflected by the efforts of the members of the network to transform previously disparate individual, inwardly focused silos of service into a network that seeks to collaborate to improve neurosurgical services for the state.

Discussion

These voluntary clinical networks have attracted large numbers of healthcare professionals from a range of professions (medicine, nursing and allied health) with a large proportion of those being senior clinicians. Over three hundred quality improvement activities tailored to issues within the network members' operating environments have been implemented within NSW. These two main results highlight that the ACI's clinical networks have worked with clinicians to implement strategies to deliver on their objective *"to engage doctors, nurses, allied health professionals, the wider community, public health organisations, managers, industry, scientists and academia in the process of identifying high quality, safe and cost-effective ways to care for patients within the NSW public health system"*.¹⁷

Braithwaite and Goldstone in their description of these networks in the Lancet (2004) argued that their innovative model held great promise for improving quality in the NSW Health system but that it was too early to tell whether they were successful. The results of this study suggest that the networks have continued along the successful trajectory projected by two previous independent reviews of networks in 2003⁶ and 2005⁵ and the NSW Health "embracing change report" (2004)⁷. Since those reviews and over the study period 2006 - 2008 there has been four more networks developed and the productivity and reach of the networks have been extended. The present study extends those reviews by quantifying a census of activities conducted by the networks and providing a detailed profile of members for the period 2006-2008. Moreover, this study is not a review or consultation like the previous reports^{5,6,7} rather, it is a descriptive foundational piece of research to support a wider program of research into the effectiveness of the clinical networks (NHMRC 571447). This study has objectively documented the membership and activities of the networks and provides a useful baseline from which to monitor changes to the membership and activities henceforth.

Engaging clinicians in clinical networks

Finding ways to engage clinicians in the governance of health systems is a goal of Australian and international health care reform endeavors⁸. However, it has proved difficult to develop and implement structures within large health systems to encourage clinical leadership and engagement in innovations. The clinical networks in NSW have successfully engaged over 4000 professionals in network activity and had over 8000 attendances at network events. A striking feature of the profile of the network members are the large number of senior medical, nursing and allied health staff who have been directly involved with the network (over two thirds for all categories). This senior clinical leadership is likely to have been a key factor influencing the number of activities adopted by the networks.

The length of operation of the network (that ranged from 14 – 113 months) and the size of the clinical specialty are likely to be factors that influence size of the network membership (ranged from 43 to 709). Reflecting the history and remit of the networks that were originally set up to target the Sydney metropolitan area, the vast majority of network members were based in metropolitan hospitals. Clinicians connected to the networks work in about one third of the hospitals in the state of NSW. This information about who has been involved in the networks will be extended in our next study will build on this work by exploring attitudes, perceptions and depth of engagement of these members.

Network quality improvement activities

The Gaston and Rice review (2003)⁶ observed that the strengths of the networks have to be sustained. These strengths were identified as the *"knowledge and skills to engage in the development of clinical policy, clinical service networks, clinical networks and clinical protocols, and advise on clinical advancements and emerging best practice."* (p. 9). The mix of activities that the networks have engaged in reflect the objectives and strategies of the taskforce and demonstrate that the strengths have been sustained over the period 2006-2008. The majority of the activities were focused on developing, commenting on and implementing: models of care, protocols, guidelines, policies for the health system. In order

to embed these into the system the largest proportion of that activity has been involvement in training and education sessions with the wider clinical community concerning these new models. The networks are catalytic organisations that are able to explore and test out ideas. These types of organisations would be expected to trial ideas that would then be put on hold or abandoned as part of the development process and this is reflected in 7% of all activities that were started being abandoned.

The vignettes of specific network activities provide examples that give a flavour of the breadth of the activities reported in the pie charts. Common threads across all the vignettes that illustrate the way the networks have worked are that:

- issues addressed were driven by clinician concerns or ideas about how to improve care
- ground swell of engaged and collegiate clinicians in the network made the activities happen
- innovation and opportunism were exploited to capitalise on opportunities in the wider environment.

It is difficult to directly compare the number of these activities with the performance of other networks as they have different models and to our knowledge there is no other directly comparable data published. South Australia's eleven clinical networks and Victoria's eight clinical networks have been in operation since 2007 and there is no published data on their activities. Eleven clinical networks have been in operation in Queensland since 2008. Western Australian clinical networks note on their website that their 14 networks have completed 70 projects between 2005 to mid 2010.¹⁶ Our next study will build on this work by examining the implemented projects and the impacts of these network activities.

Study Strengths and Limitations

This is the first extensive study into Australian networks that covers three years of endeavours. The robust document review method involved identifying activities through documents and triangulating those data with corroborating evidence from verification interviews and sighting of secondary evidence. A limitation of this study is that the data sources for the study were existing documents and contact information systems that were not designed for the purpose of research. Quality control checks of the network activity data with network managers and secondary document sources provide confidence in these data (see section quality of data sources). However there was no way to corroborate the membership data that was in some cases an email list with network managers providing additional information based on their knowledge of their members. The membership data in this report provides a general gauge of network members and their profiles and is not overly reliable. Moreover these data do not capture duration of membership or participation in the networks that would be useful indicator of depth of engagement and sustainability. The Agency may wish to consider how it manages the data for its members and monitors activities of networks according to the categories reported herein.

Next steps for the program of research

Clinical networks are increasingly being viewed as an important strategy for increasing evidence based practice and improving models of care.^{9,15} It is argued that clinical networks provide 'bottom up' views on the best ways of tackling complex healthcare problems and can facilitate or champion changes in practice at the clinical interface.^{9, 10} The results of this study lend weight to that argument and add to the existing evidence that clinical networks can be effective in engaging clinicians in: service redesign;^{11, 12} developing and implementing protocols;^{11, 13} developing and implementing guidelines;^{11, 14} and knowledge sharing.¹³ This descriptive study and past studies provoke a number of questions including:

- What impact have these activities had on system and patient outcomes?
- What factors might contribute to the variation in network success?
- How clinical networks can best be established, organised and implemented to maximise their impact on patient care and service delivery?

Addressing these questions is very timely within the NSW context, given the widespread interest in and implementation of networks. This study provides a foundation, describing the activities and members of the networks that will be further developed for a large scale study more evaluative study (NHMRC Partnership Grant ID 571447) that is due for completion in December 2012). The results in this report indicate what activity has been undertaken. The next step for the program of research that will be undertaken as part of the NHMRC study is to assess the success of these activities in terms of their implementation and potential impact on patient care and the wider health system. This study will provide robust answers to the questions posed above.

Conclusions - what this means for clinical networks in NSW

The results of this descriptive study focusing on the years 2006-2008 suggest that the structure of these clinical networks (e.g. central coordinating agency, voluntary membership and bottom-up identification of priorities) provides a functioning platform that can be harnessed to embed evidence based care in NSW. Over the three year period from 2006-2008, a large number of quality improvement activities tailored to issues within the network members operating environments have been implemented when clinicians are given the opportunity to join and direct the priorities of networks.

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Appendix 1 - Data Tables

Table 4 Network participation¹

Characteristics	Member N (%)	Participant N (%)	Total N (%)
Membership Characteristics²			
Network 1	204 (5)	101 (2)	305 (7)
Network 2	90 (2)	93 (2)	183 (4)
Network 3	60 (1)	7 (0)	67 (1)
Network 4	153 (3)	10 (0)	163 (4)
Network 5	197 (4)	49 (1)	246 (5)
Network 6	114 (3)	363 (8)	477 (11)
Network 7	82 (2)	123 (3)	205 (5)
Network 8	40 (1)	3 (0)	43 (1)
Network 9	66 (1)	328 (7)	394 (9)
Network 10	67 (1)	229 (5)	296 (7)
Network 11	59 (1)	31 (1)	90 (2)
Network 12	191 (4)	69 (2)	260 (6)
Network 13	115 (3)	593 (13)	708 (16)
Network 14	111 (2)	83 (2)	194 (4)
Network 15	119 (3)	131 (3)	250 (6)
Network 16	176 (4)	10 (0)	186 (4)
Network 17	57 (1)	20 (0)	77 (2)
Network 18	50 (1)	40 (1)	90 (2)
Network 19	97 (2)	178 (4)	275 (6)
TOTAL	2048 (45)	2461 (55)	4509 (100)

1. Members include those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network; and, Participants include those who are recipients of network activities only and did not participate in any governance roles of the network; 2. The denominator is the total number of memberships to any network; 3. The denominator is the number of individuals that belong to any network.

Table 5 Characteristics of members/participants¹ of the networks

Characteristics	Member N (%)	Participant N (%)	Total N (%)
Area health Service²			
North Sydney/Central Coast	349 (8)	387 (9)	736 (16)
South Eastern Sydney/Illawarra	446 (10)	415 (9)	861 (19)
Sydney South West	361 (8)	351 (8)	712 (16)
Sydney West	185 (4)	272 (6)	457 (10)
Greater Southern	40 (1)	67 (1)	107 (2)
Greater Western	35 (1)	178 (4)	213 (5)
Hunter/New England	157 (3)	237 (5)	394 (9)
North Coast	45 (1)	119 (3)	164 (4)
The Children's Hospital, Westmead	98 (2)	100 (2)	198 (4)
Not based in an AHS – NSW Health	82 (2)	22 (0)	104 (2)
Private practice only	52 (1)	62 (1)	114 (3)
University	30 (1)	20 (0)	50 (1)
Community/Government	58 (1)	35 (1)	93 (2)
Other	43 (1)	92 (2)	135 (3)
Missing	67 (1)	104 (2)	171 (4)
TOTAL	2048 (45)	2461 (54)	4509 (100)
Primary place of work²			
HOSPITALS			
Principal referral	1000 (22)	935 (21)	1935 (43)
Paediatric Specialist	119 (3)	122 (3)	241 (5)
Major Metropolitan	148 (3)	252 (6)	400 (9)
Major non-Metropolitan	57 (1)	150 (3)	207 (5)
District	57 (1)	197 (4)	254 (6)
Community	4 (0)	47 (1)	51 (1)
Private	20 (0)	64 (1)	84 (2)
Other	120 (3)	163 (4)	283 (6)
NON-HOSPITAL ORGANISATIONS	486 (11)	453 (10)	939 (21)
Missing	37 (1)	78 (2)	115 (2)
TOTAL	2048 (46)	2461 (54)	4509 (100)

1. Members include those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network; and, participants include those who are recipients of network activities only and did not participate in any governance roles of the network; 2. The denominator is the number of memberships to any network.

Table 6 Primary professional roles of network members/participants¹

Characteristics	Member N (%)	Participant N (%)	Total N (%)
Profession Type^{2,3}			
Medical Officer	695 (15)	659 (15)	1354 (30)
Nurse	652 (14)	1028 (23)	1680 (37)
Consumer	36 (1)	1 (0)	37 (1)
Allied Health	419 (9)	470 (11)	889 (20)
Executive manager – non-health professional	80 (2)	64 (1)	144 (3)
Researcher / academic	23 (1)	15 (0)	38 (1)
Other/Not Known	143 (3)	224 (5)	367 (8)
TOTAL	2048 (45)	2461 (55)	4509 (100)
Medical Officer Role³			
VMO Consultant	49 (4)	32 (2)	81 (6)
Staff Specialist	217 (16)	120 (9)	337 (25)
VMO/ Consultant and Staff Specialist	309 (23)	132 (10)	441 (33)
Clinical academic	7 (1)	4 (0)	11 (1)
Academic / researcher non-clinical	4 (0)	3 (0)	7 (1)
Registrar	11 (1)	113 (8)	124 (9)
Junior Medical Officer	1 (0)	6 (0)	7 (1)
General Practitioner	10 (1)	12 (1)	22 (2)
Other/Not Known	87 (6)	237 (18)	324 (24)
TOTAL	695 (51)	659 (49)	1354 (100)
Nurse Role³			
Director of Nursing	2 (0)	3 (0)	5 (0)
Area Manager	10 (1)	4 (0)	14 (1)
Nurse Manager	113 (7)	102 (6)	215 (13)
Clinical Nurse Consultant	295 (17)	155 (9)	450 (27)
Clinical Nurse Specialist	54 (3)	89 (5)	143 (9)
Clinical Nurse Educator	30 (2)	107 (6)	137 (8)
Academic / researcher	6 (0)	9 (1)	15 (1)
Nurse practitioner	14 (1)	30 (2)	44 (3)
Clinician ⁴	65 (4)	470 (28)	535 (32)
Other/Not Known	63 (4)	59 (4)	122 (7)
TOTAL	652 (39)	1028 (61)	1680 (100)
Allied Health Role³			
Discipline specific advisor	3 (0)	1 (0)	4 (0)
Clinical specialist	14 (2)	10 (1)	24 (3)
Academic / researcher	12 (1)	0 (0)	12 (1)
Department head (small unit 5-25 FTE)	34 (4)	21 (2)	55 (6)
Unit head or team leader (medium unit 10-30 FTE)	19 (2)	11 (1)	30 (3)
Unit head or team leader (large unit >40 FTE)	35 (4)	11 (1)	46 (5)
Senior clinician	163 (18)	331 (37)	494 (56)
Clinician in private practice	3 (0)	4 (0)	7 (1)
Clinician non-management role	44 (5)	26 (3)	70 (8)
Other/Not Known	92 (10)	55 (6)	147 (16)
TOTAL	419 (47)	470 (53)	889 (100)

1. Members include those actively engaged in steering the network through membership of committees and groups or by providing advice to the work of the network; and, participants include those who are recipients of network activities only and did not participate in any governance roles of the network ; 2. The denominator is the number of memberships to any network; 3. Participants were mostly identified from network contact lists and, for the most part, attended network events and received communication only. The data originated from the GMCT central mailing lists and was amended by the network manager for each individual network. As many participants were contacts only, network managers did not know the details of their professional roles in all cases; 4. Registered nurses, enrolled nurses and nurses with other clinical roles.

Table 7 Quality improvement activities implemented by the clinical networks by activity classification, 2006-2008.

Activity Classification				
	Developed /implemented N (%)	Progress underway N (%)	Abandoned /on hold N (%)	TOTAL N (%)
Models of care				
Developed +/-or disseminated without evaluation	15 (3)	7 (1)	4 (1)	26 (5)
Clinical guidelines				
Developed +/-or disseminated without evaluation	9 (2)	9 (2)	1 (0)	19 (4)
Care Protocols				
Developed +/-or disseminated without evaluation	14 (3)	11 (2)	8 (1)	33 (6)
Policy Development				
Developed +/-or disseminated without evaluation	9 (2)	7 (1)	1 (0)	17 (3)
Reviewed +/-or disseminated another party's without evaluation	21 (4)	8 (1)	4 (1)	33 (6)
System or process				
Initiated and other agency runs service	31 (6)	20 (4)	5 (1)	56 (11)
Support for other agency's activity	5 (1)	1 (0)	0 (0)	6 (1)
Education for implementation into practice				
Developed	65 (12)	18 (3)	11 (2)	94 (17)
Partnered with others	11 (2)	5 (1)	2 (0)	18 (3)
Advocacy	23 (4)	17 (3)	11 (2)	51 (9)
Data collection monitoring systems	11 (2)	6 (1)	6 (1)	23 (4)
Workforce improvement initiatives	25 (5)	13 (2)	9 (2)	47 (9)
Consumer resources				
Consumer resources Information				
Developed +/-or disseminated without evaluation	32 (6)	9 (2)	2 (0)	43 (8)
Consumer resources Education				
Developed +/-or disseminated without evaluation	5 (1)	2 (0)	1 (0)	8 (1)
Consumer resources Media				
Reviewed +/-or disseminated another party's without evaluation	3 (1)	0 (0)	0 (0)	3 (1)
Clinical research and scholarship	4 (1)	11 (2)	5 (1)	20 (4)
Quality improvement evaluation	29 (5)	18 (3)	8 (1)	55 (9)
TOTAL	312 (57)	162 (29)	78 (14)	552 (100)

Percentage totals do not all tally exactly to 100% due to rounding.