

Introduction

The WoundsWest Project is an Ambulatory Care Services initiative that aims to provide Western Australian (WA) health care practitioners, health consumers and the community with an evidence-based system for the prediction, prevention and management of wounds.

Once established, this wound management system will improve patient outcomes, reduce demand on Emergency Departments, hospital inpatient beds and outpatient clinics and realise significant cost savings across WA. This will be achieved by reducing preventable hospital-acquired wounds and improving the management and healing rates of all other wounds.

WoundsWest will develop and implement state-wide:

- A process for auditing the number and types of wounds found in WA Health facilities;
- An education program and evidence-based clinical guidelines in wound management;
- An electronic wound imaging and remote referral system supported by expert wound management clinicians; and
- A repository for wound data.

A crucial first step in developing the wound audit process was the undertaking of the inaugural WoundsWest state-wide wound prevalence survey in May 2007. The survey, the first of its kind to be completed in Australia, involved the 100% participation of WA acute public health services with 220 clinical staff completing a skin examination of 2,777 inpatients across 85 hospitals over a 4 week period.

This document outlines the rationale, methods and data collected in the first WoundsWest state-wide wound prevalence survey. An overview report with the key findings and recommendations and further information on the WoundsWest project can be viewed at www.health.wa.gov.au/woundswest.

'Wounds' in the WoundsWest context are defined as "a break in the skin (epidermis or dermis) that can be related to trauma (including surgical intervention) or to pathological changes within the skin and body" [1]. For this report wounds are categorised as either: acute (included surgical and traumatic wounds), burns, leg ulcers, malignant, pressure ulcers, skin tears or other wounds.

'Wound prevalence' is the proportion of patients identified with 1 or more wounds in the total cohort of patients surveyed ([See Appendix A - Definitions and keys](#)).

Executive Summary

The successful completion of the WoundsWest wound prevalence survey and delivery of all anticipated aims and outcomes of the survey (see Table 1) is a key achievement for the project and for WA Health.

The WoundsWest state-wide wound prevalence survey aimed to:

- Quantify the prevalence of wounds in consented patients (neonatal, paediatric and adult) in all WA public hospitals;
- Obtain contextual data on how organisations currently prevent and manage wounds;
- Provide data to inform strategic planning for improving the prediction, prevention and management of wounds; and
- Introduce the WoundsWest audit process and other project elements to WA Health.

In May 2007 all WA public health services voluntarily participated in this first state-wide wound prevalence survey with 220 staff approaching 2,979 patients across 85 hospitals over a 4 week period; an outcome indicative of the rising awareness and importance health professionals are placing on evidence-based wound management.

As well as accomplishing the primary aims of the survey, the completion of this major project task supports and informs the overall strategic direction of the WoundsWest project to improve wound prevention and management across the state. The survey has established the magnitude of wounds found on inpatients and in particular those that are hospital-acquired wounds. Current compliance to evidence-based clinical practice guidelines required to reduce the prevalence of preventable wounds such as pressure ulcers and skin tears was also ascertained.

Table 1. Summary of wound prevalence survey deliverables and outcomes

Wound prevalence survey deliverables	Outcome
1. Quantify the prevalence of wounds in consented patients (neonatal, paediatric and adult) in WA public hospitals	Achieved Prevalence = 49% Established baseline data from which improvement in wound prevention and management can be tracked Highlighted the magnitude of preventable hospital-acquired injuries = 19%
2. Obtain contextual data on how organisations currently manage wounds	Achieved Identified that coordinated planning is required to develop and direct resources to improve current wound management Highlighted opportunities to reduce hospital-acquired injuries through implementation of evidence-based initiatives state-wide
3. Provide data to inform strategic planning for improving the prediction, prevention and management of wounds	Achieved Reliable state and organisation-wide data provided to participating health services and WA Health to inform strategic planning for improving prediction, prevention and management of wounds Confirmed wound management forms a major component of daily service delivery for public hospitals
4. Introduce the WoundsWest audit process and other project elements to WA Health	Achieved Staff from all 85 WA public health services informed about WoundsWest with 220 staff receiving direct education on how to recognise and classify wounds according to survey criteria

¹ 'Contextual data' incorporated quantitative and qualitative information to identify factors that influenced the delivery of evidence-based wound management from an organisational perspective.

Aim 1: Quantify the prevalence of wounds in consented patients in all WA public hospitals

Outcome 1:

WoundsWest has quantified the prevalence of wounds across WA public hospitals. Of the 2,777 patients examined in the survey 49% of patients had 1 or more wounds at some point during their hospital admission, 26% of patients had 3 or more wounds. Across the state 2,867 wounds were identified on 1,363 patients. For the survey, wounds were categorised as either: acute (included surgical and traumatic wounds), burns, leg ulcers, malignant, pressure ulcers, skin tears or other wounds.

Patients admitted to inpatient beds via Emergency Departments constituted the largest proportion (45%) of the surveyed population and these patients accounted for 41% of all wounds identified (n = 1,175).

The surgical specialties recorded the highest proportion of patients with wounds (72%, n = 763). The largest category of wounds identified were acute wounds (n = 1,555) equating to 31% of patients seen. Almost half of the acute wounds were suture lines (47%). Within the obstetric cohort 61% had 1 or more wounds, the majority of which were suture lines (70%) and lacerations (13%).

Wound prevalence tended to increase with age with patients 60 years and over accounting for 59% of all wounds identified.

The results highlighted that almost 19% of the total wounds were preventable hospital-acquired (iatrogenic) injuries. Two thirds of wounds in the pressure ulcer and skin tear categories were hospital-acquired. Pressure ulcer prevalence was 11% with a hospital-acquired pressure ulcer prevalence of 8% (n = 2,777). In comparison a 2006 Victorian state-wide survey of public hospitals completed using the same methodology, reported pressure ulcer prevalence of 17.6%, with a hospital-acquired pressure ulcer prevalence of 11.9% (n = 6,936) [2].

This survey has established the baseline data required to evaluate if future initiatives and interventions in WA Health facilities achieve an improvement in wound prevention and management.

Aim 2: Obtain contextual data on how organisations currently prevent and manage wounds

Outcome 2:

Contextual information gathered from all 85 health services covered the services current:

- Wound management practices;
- Data collection/reporting processes (prevalence, incidence or incident data);
- Wound prevention and management education for staff;
- Existing resources (staff and equipment); and,
- Existing strategies for improvement in wound prevention and management.

The contextual data identified that few hospitals had comprehensive strategies, resources or regular reporting of clinical risk wound data to inform initiatives or monitor the effect of interventions and sustainable improvements. Coordinated organisational clinical risk management planning is required to develop and direct resources to improve current wound prevention and management processes.

Less than one third of hospitals had senior management accountability for wound management, a wound care or pressure ulcer committee, or organisational-wide strategies for continuity of wound care. Less than half the health services provided patients and carers with literature on how to prevent or care for existing wounds.

The data highlighted opportunities to introduce policies, practices and resources that would reduce the preventable hospital-acquired wounds which represented 19% of the all wounds identified in the survey.

Aim 3: Provide data to inform strategic planning for improving the prediction, prevention and management of wounds

Outcome 3:

Both patient and contextual data can be used to inform strategic planning on a state-wide and local organisational level to reduce preventable hospital-acquired wounds and improve the management of all wounds. Reliable state and organisation-wide data was provided to WA Health and participating health services to inform strategic planning for improving prediction, prevention and management of wounds. The data has confirmed wound management forms a major component of clinical care provided on a daily basis within WA's public hospitals.

State-wide level

On a state-wide basis the information obtained from the WoundsWest survey has:

- Confirmed that wound care is a major component of daily service delivery for public hospitals;
- Assisted in prioritising the order in which the WoundsWest education modules are developed;
- Established a baseline from which to measure and track improvement in wound prevention and management;
- Highlighted areas for further investigation and improvement opportunities;
- Provided information to strengthen clinical governance¹ in wound prevention and management [3]; and
- Resulted in a successful funding application for \$2.5million in pressure reducing/relieving equipment for health services.

Effective use of all elements of the WoundsWest system will over time: increase patient safety; reduce preventable hospital-acquired wounds; and reduce wound-related Emergency Department presentations, inpatient admissions and outpatient attendances within WA Health facilities by improving access to consistent, continuous evidence-based wound care which can increasingly be delivered locally.

Organisation-wide level

For participating health services WoundsWest has provided:

- Site and ward specific data on wounds that can be used to inform strategic planning for improving wound management services, resources and staff education;
- Benchmarked data to allow comparison with organisations of a similar bed size;
- Information on the lack of or current use of evidence-based wound management protocols; and highlight and prioritise areas or patient groups for improvement; and
- Education on identifying and classifying wounds to clinical staff involved in the survey.

Documentation recording patients' wound care regimens were present for 74% of wounds identified. However, pressure ulcers, skin tears, malignant and other wounds were not well documented. The use of the WoundsWest electronic wound documentation system with provision for mandatory data entry fields may assist the recording of a minimum data set of wound characteristics ensuring greater consistency in clinical assessment and communication of treatment protocols.

Based on the information provided health services can now prioritise, develop and implement a staged wound prevention and management improvement strategy to allocate scarce health resources within their organisation.

¹ The WA Health Clinical Governance Framework is an approach to "assurance and review of clinical responsibility and accountability that improves quality and safety resulting in optimal patient outcomes".

Hospital-acquired wounds and wound prevention

Preventable hospital-acquired wounds such as pressure ulcers and skin tears cause physical and psychosocial harm and incur unnecessary fiscal costs for patients and health care providers. Two thirds of the pressure ulcers and skin tears identified in the survey were hospital-acquired. Overall 19% (n = 553) of the wounds identified were preventable hospital-acquired wounds.

The prevention of avoidable hospital-acquired injuries and the application of evidence-based practice to improve wound healing rates have the potential to substantially reduce many variables impacting on the cost of patient care such as: length of stay; number of visits; dressing materials; other consumables; and human resources currently expended on wound care.

Strong organisational leadership from WA Health and health services is needed to use the survey data to plan and support comprehensive and coordinated improvements in:

- Reducing preventable hospital-acquired wounds; and
- Where wounds exist ensuring evidenced-based interventions promote rapid healing and positive patient outcomes.

An integrated interdisciplinary evidence-based approach to strategic planning is required where patients are fully informed and involved in determining treatment goals as this fosters improved patient and health provider outcomes [2, 4-9].

The use of pressure reducing/relieving equipment to prevent pressure ulcers is an evidence-based clinical practice that could be standardised across WA [10]. Few health services had an established static foam mattress replacement program (18%, n = 15) and many staff anecdotally indicated a scarcity or difficulty in consistently obtaining additional pressure reduction equipment for patients at high risk of developing pressure ulcers. The majority of pressure ulcers (84%, n = 421) were located on the pelvic girdle and lower leg. Of the 303 patients identified with pressure ulcers, no pressure reducing/relieving device was in use in 16.5% (n = 50) of these patients.

Regular reporting of pressure ulcer data for a clinical indicator such as Indicator 1.5.3 of the Australian Council on Healthcare Standards (ACHS) EQUIP 4 [11] would increase the value of data for measuring compliance and the effectiveness of intervention in preventable hospital-acquired pressure ulcers and help keep the issue on health service agendas. All Victorian public hospitals will commence quarterly collection of a pressure ulcer clinical indicator dataset (both outcome and process measures) in January 2008 [12]. Data was collected as part of a clinical risk management program by 34% (n = 29) of WA health services.

The use of a pressure ulcer risk assessment tool (RAT) is recommended as a key to shifting care from crisis intervention to preventative management [1]. Although 69% (n = 59) of health services indicated they had a policy of completing a RAT within the first 24 hours of admission, a completed RAT was identified for only 39% of surveyed patients (n = 1,149). The Braden Scale for Predicting Pressure Sore Risk was the most commonly used tool 78.5% (n = 902).

Skin tear prevalence occurred in 5.5% (n = 153) of the survey population. Whilst in many instances these injuries can be prevented there is currently a scarcity of evidence for reliably predicting patients at risk of developing skin tears. The introduction of a single skin tear classification system will create a common language to enable improved communication and continuity of care for patients with these wounds.

Aim 4: Introduce the WoundsWest audit process and other project elements to WA Health

Outcome 4:

Staff within all 85 WA public health services have been informed of WoundsWest's aims and objectives, 220 staff received direct education on how to recognise and classify wounds according to survey criteria and were deemed competent to participate as surveyors in the 2007 wound prevalence survey

Data can be a powerful tool for identifying a need, informing strategic planning to manage an issue and tracking the implementation and success of an intervention. The WoundsWest survey, the first Australian state-wide wound prevalence survey, presented the WoundsWest team with a unique logistical and communication challenge to arrange education, surveyor testing and data collection using a common methodology within 85 health services across WA.

Audit process

The WoundsWest audit process involved:

- Development of an audit methodology, tools¹ and protocols for the collection of wound prevalence data [13];
- Development of an education program for assessing the competency of audit surveyors;
- Completion of a pilot study and subsequent state-wide survey of 85 health services;
- Development of data management processes; and
- Analysis and reporting of prevalence data to inform strategic planning.

Other project elements

In order to achieve sustainable improvement in wound prevention and management, WoundsWest is also in the process of developing and providing access to:

- Evidence-based wound education;
- An electronic wound imaging and remote referral system; and
- Clinical support for staff through the WoundsWest Consultant Team (WWCT).

WoundsWest has launched its first online interactive wound education module which details basic wound assessment and management. Additional modules which cover specific information for wound categories will be progressively developed and launched. The WoundsWest Education Program can be accessed at www.health.wa.gov.au/woundswest/education.

WoundsWest will also facilitate clinical support and remote referral of complex wounds to clinicians with wound management expertise via an electronic imaging and documentation system which will be piloted at 7 sites in early 2008.

Recommendations

WoundsWest recommends that to achieve a reduction in preventable hospital-acquired wounds and improve wound healing outcomes WA Health and health services work collaboratively together to:

- Reduce hospital-acquired pressure ulcers by 10% in the next 12 months through the introduction of evidence-based pressure ulcer prevention and management strategies;
- Reduce hospital-acquired skin tears through the introduction of state-wide skin tear classification system and the investigation of evidence-based prevention and management strategies; and
- Increase access to and promote the use of the WoundsWest education program, clinical expertise and evidence-based wound care for all patients across WA.

The adoption, implementation and effect of the above recommendations will be evaluated through the second state-wide wound prevalence survey in 2008.

¹ WoundsWest partnered with Silver Chain to develop a unique mobile phone data collection application which expedited data collection and analysis by reducing documentation, minimising missing data, and electronically uploading data from each site to a central database.

Background

Wounds and wound management

Wounds are common to all health service providers world wide; whether accidental, surgical or non-surgical the management of patients with wounds places considerable demands on health resources and health budgets [14]. For instance pressure ulcers in the United Kingdom consume 4% of the nations health budget [15]. Furthermore, non-healing wounds such as pressure ulcers, leg ulcers, extensive burn injuries and malignant wounds impose significant constraints on individuals and society in terms of quality of life of affected individuals and their carers [16, 17].

The epidemiology of wounds in terms of aetiology, numbers and their affect on health service delivery has been poorly explored, particularly within Australia. Whilst some descriptive data exists pertinent to Australian health contexts the data collected has related to domiciliary care [18], residential aged care [19] or to specific wound categories such as pressure ulcers [2, 7, 8, 13, 20-22], leg ulcers [23] burns [24] or skin tears [9]. As a populace ages so does its propensity for developing age related and often chronic diseases, the secondary effect of which may lead to an iatrogenic, surgical or other wound. There was an urgent need to quantify the magnitude and type of wounds found within Australian public hospitals as comprehensive prospective data on the epidemiology of all wound types within this arena using common data collection methods has never been undertaken before in Australia.

The normal trajectory of wound healing may be interrupted by many factors such as infection or other systemic factors. It is also well recognised, however, that a fragmented approach to wound management lacking in continuity of care leads to delays in wound healing and increased social and fiscal costs [5, 6]. Conversely, an interdisciplinary evidence-based approach where patients are fully informed and involved in determining treatment goals fosters improved patient and health provider outcomes [4].

WoundsWest project

Prior to the WoundsWest wound prevalence survey, the epidemiology and magnitude of wounds in Western Australian (WA) was largely unknown. The burden that wounds impose on the WA community, whether accidental, surgical or iatrogenic requires clarification. In addition, known variations in clinical practice, poor continuity of wound management regimens, lack of equity and access to wound care products or services, and a lack of education pertaining to wounds and wound management across WA Health, can lead to poor health outcomes for patients and their families. Inconsistent wound management practices have preventable financial and resource implications for health care providers.

Australian research has shown that the implementation of evidence-based wound management can reduce the prevalence of wounds and improve healing outcomes. A national study in 2001 demonstrated the effectiveness of implementing clinical guidelines in reducing pressure ulcer prevalence and improving doctors' and nurses' clinical care of patients with pressure ulcers when implemented in conjunction with an education programme [13]. In Victorian public hospitals, which used a similar survey methodology, pressure ulcer prevalence was reduced by 30% through the implementation of recommendations arising from three consecutive annual prevalence surveys [7, 8, 25]. Similarly, a multi-centred study across Australia using guidelines, education and digital imaging of pressure ulcers obtained a 40% reduction in pressure ulcers in residential aged care facilities [20]. These same principles when applied to the management of neuropathic foot ulcers in Aboriginals in the Kimberley region led to a significant decrease in leg amputations [23].

WoundsWest sought to translate the evidence from these research studies into general clinical practice within all health settings in WA thereby improving patient health outcomes through a state-wide initiative, which would contribute to a reduction in the overall burden of disease and on hospital inpatient and outpatient wound related services by preventing hospital-acquired injuries and facilitating rapid healing for all wounds through evidence-based clinical practice.

WoundsWest project aim

The WoundsWest Project aims to provide WA health care practitioners, health consumers and the community with an evidence-based system for the prediction, prevention and management of wounds.

The Project is divided into 3 subprojects: Survey, Education and Information Technology (IT). [Appendix B](#) contains a project overview which outlines all project stages and major tasks and governance structure. Additional information can be viewed at www.health.wa.gov.au/woundswest.

Survey subproject

A key task for the Survey subproject was to develop and implement an audit process which would facilitate the identification of the epidemiology of wounds within WA. A state-wide wound prevalence survey was selected as being the most suitable method to obtain this information. The WoundsWest state-wide wound prevalence survey aimed to:

- Quantify the prevalence of wounds in consented patients (neonatal, paediatric and adult) in all WA public hospitals;
- Obtain contextual data¹ on how organisations currently prevent and manage wounds;
- Provide data to inform strategic planning for improving the prediction, prevention and management of wounds; and
- Introduce the WoundsWest audit process and other project elements to WA Health.

The successful completion of the survey involved:

- Development of an audit methodology, tools² and protocols for the collection of wound prevalence data [13];
- Development of an education program for assessing the competency of audit surveyors;
- Completion of a pilot study and subsequent state-wide survey of 85 health services;
- Development of data management processes; and
- Analysis and reporting of prevalence data to inform strategic planning.

In addition to this report and an overview report, all hospitals who participated in the survey receive individual reports containing benchmarked data specific to their organisation.

Pilot wound prevalence survey

A Pilot Wound Prevalence Survey was completed in 3 metropolitan, 5 rural and 1 remote hospital. The purpose of the Pilot Survey was to test and review the: audit methods and tools; planning and implementation processes; and, outcomes of the survey methodology. This included testing and evaluating the:

- Education program for surveyors
- Surveyor competency test
- Survey protocol and guidelines
- Data fields to be collected
- Data collection tool
- Uploading and initial analysis of the data
- Reporting of methods and results.

The Pilot Survey involved educating 28 surveyors and surveying 310 patients across 9 sites. Staff were tested for competency in wound classification, evaluations were completed for the education sessions and surveyors at all sites were debriefed at the end of each survey. Additional details on the evaluation and data collected during the pilot were outlined in the WoundsWest Stage 1 Report which was presented to the WoundsWest Advisory Committee in April 2007.

Following evaluation of the Pilot Survey minor adjustments were made to the survey protocols and data collection tools in readiness for the state-wide survey.

¹ 'Contextual data' incorporated quantitative and qualitative information to identify factors that influenced the delivery of evidence-based wound management from an organisational perspective.

² WoundsWest partnered with Silver Chain to develop a unique mobile phone data collection application which expedited data collection and analysis by reducing documentation, minimising missing data, and electronically uploading data from each site to a central database.

Methodology

WoundsWest modified and used the pressure ulcer prevalence survey methodology first developed by Prentice in 2000 [13] and subsequently used by the Victorian Quality Council (VQC) and Department of Human Services Victoria to undertake three annual state-wide pressure ulcer prevalence surveys in Victoria [7, 8, 25]. WoundsWest used the same eligibility criteria for patients, the same train, test and tabulate process but incorporated additional wound field categories in terms of data collection to identify all wounds and not just pressure ulcers. Much of the documentation used by WoundsWest was based on documents developed by Prentice and the VQC.

Survey population

All (n = 85) WA public hospitals with acute inpatient beds (excluding mental health) were invited to participate; 100% agreed to be involved. No eligible patients were available on survey day in 17 hospitals leaving 68 sites to contribute patient data. Surveys were completed in 15 metropolitan and 53 country sites. Metropolitan sites represented 82.5% of the surveyed patient population (n = 2,458) and country sites 17.5% (n = 521). Metropolitan sites ranged from 9 to 517 beds and country sites from 1 to 85 beds. Additional demographic data on the survey population is noted in [Appendix C](#).

Inclusion and exclusion criteria

All adult, paediatric and neonatal inpatients of public hospitals on site on the day of the survey (including qualified newborns and Emergency Department patients flagged for admission) were included in the survey. Psychiatric, unqualified newborns (a well newborn accompanying its mother but not admitted as a patient), hospital in the home, day surgery and day procedure patients were excluded.

Education and survey process

All public hospitals were asked to nominate an onsite co-ordinator to liaise with WoundsWest project staff to prepare for the survey and to recruit clinical staff to act as surveyors.

Prior to attending an education session, all surveyors were provided with a 'Surveyor's Toolkit' which contained general information on the survey, pressure ulcer and skin tear classification systems, the survey protocol and patient information.

WoundsWest recruited 32 staff to form a Core Team. From the Core Team 11 people with expertise in wound management education delivered education on acute wounds, burns, leg ulcers, pressure ulcers, skin tears, malignant and other wounds at 33 locations across the state: 10 metropolitan and 23 country. A session within this education was devoted to the survey protocols and guidelines.

Surveyors were tested for their understanding of pressure ulcer and skin tear definitions and classification systems used in the survey and ability to classify clinical slides of pressure ulcers and skin tears. A total of 31 questions were set with a pass level of 26 correct responses (84%) required. Two opportunities were provided to pass the competency tests. For all surveyors who participated in the surveys 80% (n = 220) passed the competency assessment on the first testing and 100% passed the second test.

Surveyors were instructed that in the presence of reactive hyperaemia patients should be repositioned off the affected area and re-checked 30 minutes later for evidence of a Stage 1 pressure ulcer. Any wound of dubious or unknown aetiology and any finding of 5 or more pressure ulcers on one patient were to be discussed and checked with the site coordinator and/or a member of the WoundsWest Core Team.

Core Team members (n = 32) were also required to undergo surveyor education and competency testing plus additional training on the mobile phone data entry process. To improve consistency of data collection members of the Core Team travelled to all participating health services and partnered with hospital staff to approach and survey patients in teams of two. The Core Team travelled over 17,000 kms during the survey.

All surveyors were asked to complete a written evaluation of the education session and were debriefed at the completion of surveying at each hospital. Following completion of the prevalence survey a final evaluation and debriefing session was also held with the Core Team. All feedback captured through these sources will be used to streamline future surveys.

Contextual information

All health services were asked to respond to an online contextual data questionnaire with the aim of generating information about factors that contribute to or influence wound management in WA health services. The data was collected using a combination of quantitative and qualitative questions and was completed by the WoundsWest site co-ordinators.

As site co-ordinators were employed in a diverse range of roles in their organisations the coordinators were encouraged to seek information from others in their organisation to complete the questionnaire. However, as the information was self-reported it is likely to contain a subjective component with the role, level of responsibility and organisational knowledge of the site coordinator affecting responses.

Data collection and analysis

Data was collected using a mobile phone enabled Java application developed for WoundsWest by Silver Chain using NetBeans (2006 IDE 5.5.1 Build 200704122300 Sun Microsystems Inc. Santa Clara CA).

Data was uploaded to a Microsoft Office Web Components Pivot Table (2003 Version 11.0.0.8001 Microsoft Corporation, Seattle WA 2003). Data was verified, processed and exported using Microsoft Access database (2002 Version 10.2627.2625 Microsoft Corporation, Seattle WA, 2003).

Some data analysis and reporting was provided by Ms Jenny Lalor, SPSS Advisor, Curtin University of Technology using SPSS 15.0 for Windows (2006 Release 15.0.0 SPSS Inc. Chicago, Illinois).

Data for individual hospitals and State-wide reports were prepared using Microsoft Access (2002 Version 10.2627.2625) and Microsoft Excel (2000 Version 10.2614.2625 Microsoft Corporation, Seattle WA, 2003).

Contextual data provided by individual site co-ordinators of each health service were collected via an online form and exported into Microsoft Excel (2000 Version 10.2614.2625 Microsoft Corporation, Seattle WA, 2001).