

A Description of the Activity of Selected Hospital Emergency Departments in New Zealand

The National Primary Medical Care
Survey (NatMedCa): 2001/02

Report 8

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Executive Summary

Aims. The National Primary Medical Care Survey was undertaken to describe primary health care in New Zealand. The study covered general practices, both private and community-governed, Accident and Medical clinics (A&Ms) and Hospital Emergency Departments (EDs).

This paper provides a descriptive report on the content of the work of EDs, with some comparison to general practices and A&Ms, including the characteristics of the patients they see, the problems presented and the management offered.

Other reports and papers describe other types of practice, and will analyse differences in work content that have occurred over time or that exist between practice settings.

Methods. A sample of four EDs spread across the country was drawn, and all of these EDs agreed to participate. Each ED was asked to report on all the patients they saw during four (Monday to Sunday) weeks of the year in 2001: 5–11 February, 7–13 May, 6–12 August and 5–11 November. Data were contributed by the four EDs from their electronic data capture systems. They reported routinely collected data on a total of 15,655 visits over the four weeks.

Continuously, but over a similar period, data were gathered from representative samples of New Zealand general practices and A&Ms.

Results. The findings include the following.

ED patients

- The overall mean age of patients was 32, with the mean varying across EDs from 30 to 36.
- Older people were more frequent attendees during the day, children in the evening and young adults after midnight.
- In terms of ethnicity, New Zealand Europeans comprised 60.6% of patients, Māori 12.8%, Pacific peoples 11.7%, and other 14.9%.
- In terms of socioeconomic status, measured using the NZDep scale, 17.7% of patients were in deciles 1 to 3, 34.4% in deciles 4 to 7, and 45.9% in deciles 8 to 10 (the most deprived).

Visit characteristics

- Overall, patients reported attending an average of 2.2 times in the last year (including the attendance reported), varying across departments from 1.2 to 2.4 times.

- The busiest days were Monday and the weekend.
- In terms of triage categories, 0.6% were in category 1 (the most serious), 6.9% in 2, 40.7% in 3, 41.5% in 4, and 10.2% in 5.
- Patients in triage category 5 made up a greater percentage of patients seen in the daytime (13.6%, compared with 7.3% during the evening and night).
- The commonest categories of problem were injury/poisoning, respiratory and non-specific symptoms.
- The action/treatment most commonly coded was investigation/examination/screening.
- The overall mean ward admission rate was 40.5%, varying across EDs from 25.3% to 49.8%.
- Ward admission rates varied by triage category, with 12.1% for triage category 5, increasing to 79.8% for triage category 1.

ED comparisons

- The age, socioeconomic status and ethnicity of patients seen at each ED matched that of the population of the area.
- EDs serving populations with lower socioeconomic status saw more respiratory cases, and a higher percentage of patients were female.
- Rates of ED use appeared to be lower when the population was more dispersed. This was associated with greater acuity and more admissions.
- In one ED, a large local student population appeared to be related to a higher rate of use, more injuries and a younger than expected patient mix.

ED, A&M and general practitioner (GP) comparisons (Monday to Friday, 8 am to 6 pm)

- The mean age of GP patients was greater, and that of A&M patients lower, than that of ED patients.
- While ED utilisation was related to low socioeconomic status, patients at A&Ms and GPs were evenly spread across levels of NZDep.
- Injury was the most common category of problem at EDs and A&Ms, while respiratory problems were commonest at GPs.
- GPs and A&Ms recorded the use of anti-bacterials almost twice as frequently as EDs.
- Individuals with apparently similar problems were seen at each source of care. There was some evidence that ED patients were more acutely ill and were more likely to be presenting new problems, but coded diagnoses do not adequately indicate levels of urgency and severity.

Conclusions and implications. There are substantial difficulties in comparing data across EDs, and between EDs and community-based care. Adopting standardised coding systems would greatly assist in understanding the dynamics of primary health care.

Diagnostic data from EDs, and from A&Ms or general practices, are insufficient to distinguish the conditions treated in each. Additional measures of urgency, severity and stage of disease would be required to understand these differences.

Usage of an ED is determined by the nature of the local population and the availability of other sources of care, as well as by simple clinical need.

The New Zealand Primary Health Care Strategy presently being implemented is intended to lower barriers to community-based primary health care. A reduction in the number of people attending EDs with respiratory conditions might be an indicator that this goal is being achieved.

There are ongoing discussions concerning the provision of after-hours care and the appropriate role for GPs, A&Ms and EDs. Local solutions will differ, and will reflect the size and characteristics of the populations served.

The data provided in this report and in others in the series can be used to benchmark the mix of patients, by age, socioeconomic status and condition, for whom care needs to be provided.

1 Introduction

The National Primary Medical Care Survey (NatMedCa) aimed to describe primary medical care in New Zealand. The New Zealand Health Survey 2002/03¹ asked respondents what sources of care they had accessed: 80% indicated that they had visited a general practitioner (GP), 13.5% that they had visited an Accident and Medical clinic (A&M), and 7.3% that they had visited a Hospital Emergency Department (ED) in the previous year. EDs are accessible without referral, and Christchurch reported in 1998 that 43% of their patients were self-referred.² It is clear that EDs must be considered as constituents of the primary health care system in New Zealand.

Since 1991 the New Zealand primary health care system has undergone, and continues to undergo, significant organisational reform. Changes in the general practice subsidy regime, formation of independent practitioners' associations and the Primary Health Care Strategy of 2001 have been described elsewhere.³ A parallel business-based development has been the opening of A&Ms in some parts of the country. These offer extended hours, consultations without appointment and (to a variable extent) equipment and expertise beyond that found in typical general practice settings.

Over a similar period EDs have also undergone important reforms, driven not by government or by businessmen but by clinicians. Previously, "casualty departments" were staffed by relatively inexperienced house staff, backed-up by senior trainees and consultants whose primary responsibility was in-patient care. The development of resuscitation and other techniques for the urgent care of serious injury and life-threatening illness required the immediate availability of senior clinicians with appropriate training in emergency care.

The first full-time director of an Emergency Department in Australasia was appointed in Christchurch in 1964, and the Australasian College of Emergency Medicine was founded in 1984. Good ED practice now requires the physical presence of a Fellow of the College, an adequate staff of experienced doctors and nurses, and the close supervision of junior trainees. Investigative and in-patient services must be available to support this front-line staff. It is fair to say that EDs in New Zealand approach this ideal to varying degrees.⁴ A description of the work of EDs as they move through the process of change is as important as parallel reviews of general practice.

In principle, individuals in need can choose whether to seek care from a GP, an A&M clinic or the local ED, and the relationship between these services is complex. Individual GP surgeries usually keep office hours, and their patients are covered at other times by various forms of shared, deputised service. In smaller towns these may be a designated general practice surgery; in the cities they share many of the characteristics of A&Ms and may actually be an A&M clinic in some instances. Dedicated A&Ms are more common in Auckland and the north of the North Island than elsewhere; they may close at 10 pm, and have variable levels of capacity, including the capacity to undertake X-ray investigations. EDs are open 24 hours a day, seven days a week, are well equipped, and are backed-up by hospital in-patient services.

Thus potential patients and their families must navigate a complex and variable system. Their choice may be influenced by the nature of the problem, but also by the physical availability of services and knowledge of those services, and by customary practice. EDs are typically free to the patient so economic factors may also influence the decision.

Also, GPs or A&M staff may refer patients to the ED, either because acute hospital care is needed, or because a specialist opinion is desirable, or because an investigation not available in the community is required.

Professional opinion is divided on the appropriate use of EDs. ED staff note that significant numbers of non-urgent cases are admitted. Hospital administrators, mindful of fixed budgets, sometimes hold that patients suitable to general practice should not be seen in the ED. All agree that the ED is not a suitable source of ongoing primary health care, especially with regard to continuity of care. A review of the relevant literature⁵ found that “appropriateness” had not been defined for ED attendance, few studies had captured outcomes relative to the source of care, and the relative costs of various configurations of urgent care had not been established.

In New Zealand, various initiatives have been tried to reduce the use of EDs by non-urgent patients, including the denial of access to certain categories of patients⁶ or providing a general practice service close to or within the ED.⁷

The difficulty of resolving this issue is compounded by lack of “commensurability” between ED and GP patients. Diagnostic coding systems may not adequately distinguish levels of acuteness or degrees of need. Further, because they tend to become familiar with a certain range of problems, medical practitioners in the ED and those in general practice may well differ in their estimates of the seriousness and urgency of problems presented.

This paper describes the activities of four New Zealand EDs. It draws some tentative conclusions on the relationship between ED workload and the alternative sources of care available locally. It also makes comparisons between the work undertaken by general practices, A&Ms and EDs in New Zealand. It is hoped that these data will contribute to the debate on the ideal configuration for primary and emergency care in New Zealand localities.

It should be noted that most EDs in New Zealand, including those described here, actively work with community-based services to optimise the flow of patients between different sources of care. In the four years since the data were gathered significant changes in patient flows have occurred.

2 Methodology

2.1 Organisation

The research, funded by the Health Research Council of New Zealand, was undertaken by a project team within the Centre for Health Services Research and Policy, School of Population Health, Faculty of Medical and Health Sciences, The University of Auckland. Advice and support were provided by a research team representing the Departments of General Practice and/or Public Health at each of the four New Zealand Medical Schools.

An advisory and monitoring committee was appointed, with representation from the general public and from each of the relevant professional groups. This group has the overall task of ensuring that the data are used in the public interest.

2.2 Surveys of general practice and Accident and Medical clinics

The NatMedCa survey was carried out during 2001/02 using a nationally representative, multi-stage probability sample of private GPs, stratified by geographical location and practice type. A sampling frame of all active GPs was generated from White Pages telephone listings. Each participating GP kept a log of all patients seen and reported in detail on a one-in-four sample over each of two week-long periods, which were separated by an interval of six months. Overall, 70% of private GPs responded; further details of the methodology and results from the private GPs can be found in NatMedCa Report 1.⁸

Over the same period, all primary health care practices affiliated with Health Care Aotearoa (HCA) were invited to participate, as were a 50% random sample of all A&Ms distributed over the country. Similar data collection methods were used for the private GP and HCA practices and A&Ms, although A&Ms reported on their patients for one week only with participants spread over the year. Overall, 70% of HCA practices and 55% of A&Ms responded. Further details of the methodology and results from the HCA practices and A&Ms can be found in NatMedCa Reports 2,⁹ 3¹⁰ and 5.¹¹

Statistical weights for the GPs were calculated to take account of different sampling probabilities. The proportions and means given in this report were estimated using analytic approaches that took account of the stratified, multi-stage sampling scheme, the weights associated with each stratum, and clustering at different sampling stages.

In this report, “GPs” include those from both private and community-governed practices. A&Ms are defined as: being open seven days a week at least until 8 pm, having X-ray equipment on site, and being community- rather than hospital-based. Findings are presented on GP and A&M patient visits during “office hours” (Monday to Friday, 8 am to 6 pm).

2.3 Data collection

Data were requested on all attendances at four EDs for one week each quarter in 2001; namely, the weeks beginning 5 February, 7 May, 6 August and 5 November. Data items were confined to those that could be accessed from the electronic databases of each organisation. Comparison data from general practice and A&Ms are from the National Primary Medical Care Survey undertaken in 2001/02.

2.4 Data

A specific list of variables was originally requested from the EDs for the purpose of the survey, but not all of these were provided. The data dumps received from the four EDs involved were all formatted differently, often with different variable names for the same things and data for some of the requested variables either partially or completely missing. An ad hoc process was developed and performed on the four data sets in order to extract as many variables that were fully comparable across them as possible. The variables ultimately included in the analysis are listed and described in Table 2.1.

Table 2.1: Variables comparable for all Emergency Departments

Variable	Description
ID	Unique patient marker
ED	ED identifier (1–4)
WEEK	Observation week identifier, coded as: 1. 5/2/2001–11/2/2001 2. 7/5/2001–13/5/2001 3. 6/8/2001–12/8/2001 4. 5/11/2001–11/11/2001
DAY	Day of week of visit to the ED: 1 = Monday to 7 = Sunday
DATE	Date of visit to the ED: DDMMYYYY
TIME	Time of visit to the ED: 0.XXX proportions of day
TRIAGE	Triage category (1–5, with 1 being the most serious)
LOS	Length of stay at ED (in minutes)
DISPOSITION	What happened to the patient after they were seen at the ED
ADMITTED	Department of admission – used to correct ED3 admission rates
DOB	Date of birth of patient: DDMMYYYY
GENDER	Sex of patient
ETHNICITY	Ethnicity of the patient, as it was recorded
DOMICILE	Four-digit NZDep1996 domicile code
DECILE	Conversion of the domicile code to NZDep2001 deprivation score (1–10, with 10 representing the highest deprivation)
VISITS	Number of times the patient visited the ED in the last year, including the current visit
DIAGNOSIS	READ2 textual term for the diagnosis of the patient – only one diagnosis per patient was coded
DIAGCODE	READ2 alphanumeric code for the diagnosis of the patient
NDACT1-7	Non-drug actions (the most coded for a single patient was 7)
DRUG1-18	Drug actions (the most coded for a single patient was 18)
ATCCODE1-18	ATC (Anatomical Therapeutic Chemical Classification System) codes for the drug actions

Process. The data-cleaning process is described in some detail below, and summarised in the Appendix.

Most of the ED data sets already contained unique IDs for patients, but these were created where necessary, initially on the basis of a unique date of birth but later also on unique time of visit to account for twins seen at the same time – three instances of this were found. More specifically, the original situation with patient IDs was as follows:

- **ED1** – recorded only one row of data for each patient
- **ED2** – sometimes recorded multiple rows of data for individual patients, most commonly when they were prescribed more than one drug
- **ED3** – sometimes recorded multiple diagnoses and/or actions for patients, but the patient ID was always given
- **ED4** – sometimes recorded multiple, identical rows of data for patients, but a patient ID field was provided, albeit not very clearly.

Data classification. Most of the data sets recorded four-digit domicile codes for the addresses of patients. However, in one, codes had to be generated from the domicile descriptions. The domicile codes that were provided used the 1996 classification system; these were converted to 2001 codes so that NZDep2001 data could be used. Some codes had been retired between 1996 and 2001: where retired domicile codes were given or where there was no domicile information, the cases were left unclassified.

A diagnosis for each patient was also coded from the data sets. In most of these there were two variables describing diagnoses or similar; for example, provisional diagnosis and final diagnosis. The final diagnosis was taken as the “dominant” variable and was used for coding in the first instance; the provisional diagnosis was used for coding only if a final diagnosis was not given. The data set from ED1 also contained a “presenting problem” variable, but this was considered different from diagnosis and was not used for coding.

Data coding was performed using the READ version 2 (READ2) classification system. A significant number of visits to EDs do not result in a clear pathological diagnosis, and READ2 makes provision for symptoms, investigations, administrative functions, intended actions and other types of entry. The diagnoses were entered as free text in the ED data sets, and coding was performed using a mixture of electronic and manual processes.

The coding software, developed by Dr Ashwin Patel, attempted to assign a READ2 code to each reported diagnosis. However, 60% of cases could not be so coded due to vagaries in the text values, abbreviations, and text strings including additional information (e.g. laceration ran into door).

The uncoded diagnosis strings were reviewed by the lead author and a text term more closely matching those within the coding tool's database was suggested for each of the 2990 uncoded items. This process enabled many more of the diagnoses to be coded electronically, but there were still many values that remained uncoded. These were dealt with by interactive coding methods (finding matches or close matches through keyword searches within the software itself). These matches then had to be checked again by the lead author, who gave yet further suggestions for unsatisfactory matches. This process was repeated several times, until all of the reported diagnoses had a READ2 code attached, even if, as in 1480 of the 15,655 cases (9.5%), the code was "not coded". These included patients who had left before being assessed, cases where an impenetrable abbreviation was used and cases of missing data.

Drugs and actions were coded using similar software, as were other therapeutic actions. ED2 separated the two variables and reported pharmaceutical prescription in some detail. The other EDs combined both into "actions" and reported far less drug detail. The variables in the data sets were again in free text form, and many of them were too long to be fully coded electronically. Interactive coding outside of the software was again required, but not as frequently as for diagnoses.

2.5 Grouping diagnoses and drugs

READ is a hierarchical system and classifies reasons-for-visit and diagnoses either into pathology-based groups identified by a letter or, when specific pathology has not been reported, into numbered categories which include symptoms, proposed actions and administrative activity (see Table 2.2). Diagnoses are reported by chapter (e.g. H = respiratory system) and sub-chapter (e.g. H3 = chronic obstructive airways disease). Here the numbered codes are treated as a single category and the value of the number is used as the second-level grouper. Where a symptom was system-specific (e.g. cough), the case was assigned to the equivalent lettered category.

Table 2.2: READ2 chapter headings

Pathology-based categories	Other categories
A Infectious/parasitic	1 History and symptoms
B Cancers/neoplasms	2 Examination
C Endocrine/nutritional/metabolic/immunity	3 Diagnostic procedures
D Blood / blood-forming organs	4 Laboratory tests
E Mental	5 Radiology
F Nervous system / sense organs	6 Preventive procedures
G Cardiovascular/circulatory	7 Surgical procedures
H Respiratory system	8 Other procedures
J Digestive system	9 Administration
K Genito-urinary system	
L Pregnancy/childbirth/puerperium	
M Skin / subcutaneous tissue	
N Musculoskeletal / connective tissue	
P Congenital	
Q Perinatal	
R Symptoms	
S/T Injury/poisoning	
Z Unspecified conditions	

Drugs were classified using the Pharmacodes/ATC system (see Table 2.3). The categories are anatomically based. However, anti-bacterials, which may be used across systems, make up their own sub-group under anti-infective agents. Analgesics, which may also be used across systems, are included in drugs affecting the nervous system. In general, each group has a variety of sub-groups which may be quite disparate. We have followed the system consistently even when reassignment of drug groups might have been desirable (e.g. lipid-lowering drugs could have been put under the cardiovascular system but were left in metabolic).

Table 2.3: List of level 1 categories (Pharmacodes/ATC system)

Drug group	
1	Alimentary tract and metabolism
4	Blood and blood-forming organs
7	Cardiovascular system
10	Dermatologicals
13	Genito-urinary system
14	Systemic hormone preparations (excludes oral contraceptives)
16	Infections – agents for systemic use
19	Musculoskeletal system
22	Nervous system
25	Oncology agents and immunosuppressants
28	Respiratory system and allergies
31	Sensory organs
38	Extemporaneously compounded preparations and galenicals
40	Special foods

2.6 Ethnicity

In the present ED study, ethnicity was defined in the data capture system of each ED, all of which recorded one value for each patient. For the GP and A&M surveys, copies of the ethnicity question used in the 2001 Census were provided for use with each patient. Multiple choices were allowed, though mutually exclusive categories are reported here with prioritisation of Māori and Pacific peoples.

2.7 Ethical issues

Ethical approval, co-ordinated by the Auckland Ethics Committee, was obtained from ethics committees in all areas represented in the survey. Of particular concern was the long-term management of the data. An advisory and monitoring committee was appointed with representation from the general public and from each of the relevant professional groups. This group has the overall task of ensuring that the data are used in the public interest. Proposed analyses are provided to the group for comment, as are papers being prepared for dissemination.

2.8 This report

No statistical tests are applied in this report. Any comparative judgements that are made are indicative only and do not carry the weight of statistical significance. The tables in this report exclude missing data unless otherwise indicated. Note that percentages may not add up to exactly 100% due to rounding.

3 Recruitment and Data Collection

Approaches were made to ED1 seeking to represent a small city, ED2 as representing a large metropolitan centre and ED4 as a South Island city. The availability of a comparable data set from ED3 led to its inclusion. Data from each of these EDs should be viewed independently, and projection to the whole of New Zealand should be considered speculative.

The data dumps detailing the four weeks' activity were received by the Centre for Health Services Research and Policy late in 2003, and the analysis process began soon thereafter. Table 3.1 shows the number of patients seen by each of the EDs in each of the four weeks of observation in 2001. All EDs saw their highest number of patients in the third week of observation, which was in late winter.

Table 3.1: Number of visits reported by each ED in each week

	ED1	ED2	ED3	ED4	All EDs
N	1489	5717	5095	3354	15,655
5–11 February	388	1358	1322	815	3883
7–13 May	357	1358	1240	872	3827
6–12 August	411	1621	1332	892	4256
5–11 November	333	1380	1201	775	3689

During later analysis it became apparent that disposition data (see section 9) for ED3 were incorrect, partly because patients transferred to the observation ward of the ED were counted as admitted. The ED was able to provide summary statistics for the relevant months and these data are presented, but are not used when calculating national averages.

4 Characteristics of Patients

Table 4.1 shows the distribution of visits by patient age, giving the percentage distribution for all patients (and for females) for each ED. In interpreting this information, the shorter duration of the < 1 and 1–4 age bands should be noted.

The overall median age of ED patients was 32; the median was higher in ED1 (35) and ED3 (36) but lower in ED2 (30). Patients under five made up 12.3% of the total, but this figure was higher in ED2 at 19.1% and lower in ED3 at 9.1%. Patients aged 15–24 made up 16.6% of the whole sample, but this group made up 24.1% of patients at ED4. Females made 49.4% of the visits to EDs 1 and 2 but 46% of visits to EDs 3 and 4.

Table 4.1: Percentage distribution of patients by age: total % (% female)

	ED1	ED2	ED3	ED4	All EDs
N	1489 (755)	5717 (2809)	5095 (2384)	3354 (1506)	15,655 (7454)
% female	(50.7)	(49.1)	(46.8)	(44.9)	(47.6)
Age (years)					
75+	11.4 (11.9)	8.3 (10.0)	13.8 (18.0)	9.5 (12.8)	10.7 (13.3)
65–74	8.0 (7.8)	5.8 (5.5)	9.8 (10.1)	7.3 (8.4)	7.6 (7.8)
55–64	9.3 (9.8)	7.2 (6.9)	7.6 (7.6)	7.1 (7.0)	7.5 (7.4)
45–54	10.8 (9.4)	9.4 (10.0)	9.9 (9.4)	9.0 (9.4)	9.6 (9.6)
35–44	11.7 (12.6)	11.4 (11.7)	11.3 (10.1)	12.3 (11.5)	11.6 (11.4)
25–34	11.9 (13.5)	14.0 (15.3)	13.2 (12.2)	13.5 (12.5)	13.4 (13.6)
15–24	15.2 (15.1)	13.8 (14.2)	15.2 (14.2)	24.1 (22.3)	16.6 (15.9)
5–14	10.8 (10.2)	10.9 (9.1)	10.1 (9.4)	11.4 (10.8)	10.7 (9.6)
1–4	6.9 (6.6)	11.5 (11.3)	6.4 (6.1)	4.4 (4.0)	7.9 (7.7)
< 1	4.1 (3.1)	7.6 (6.1)	2.7 (2.4)	1.5 (1.5)	4.4 (3.7)
Median	35	30	36	33	32

The distribution of ethnicity among patients is presented in Table 4.2. Overall, 60.6% affiliated with New Zealand European, 12.8% with Māori, 11.7% with Pacific peoples, 2.6% were distributed between Chinese and Indian affiliation, and 12.3% were given as “other”.

The percentage of New Zealand European was lower in ED1 (51.3%) and lower again in ED2 (36.7%). The Māori percentage was highest in ED1 (33.0%) and high in ED2 (19.2%). ED2 had many more Pacific people (28.5%) and more people of Indian (3.7%) and Chinese (2.0%) descent.

Table 4.2: Percentage distribution of patients, by ethnicity

	ED1	ED2	ED3	ED4	All EDs*
N	1463	5681	4876	3284	15,304
Ethnicity					
New Zealand European	51.3	36.7	76.8	81.9	60.6
Māori	33.0	19.2	4.7	4.8	12.8
Pacific	1.4	28.5	2.0	1.6	11.7
Chinese	0.07	2.0	0.5	1.0	1.1
Indian	–	3.7	0.2	0.3	1.5
Other	14.3	10.0	15.8	10.4	12.3

* 351 patients had missing data for ethnicity.

Table 4.3 summarises socioeconomic status using the NZDep2001 decile related to each patient's residential address. For all EDs, the percentage of people from the three least-deprived deciles (1, 2 and 3) was relatively low at 17.7%, while the percentage from the three most deprived (8, 9 and 10) was high at 45.9%. (Of the combined populations of the districts served by the four EDs, 28% live in NZDep 1, 2 and 3 and 34.7% in 8, 9 and 10). Those from the least deprived neighbourhoods were much less common in ED1 (3.3%) and less common in ED2 (14.0%), compared to ED3 (21.8%) and ED4 (24.2%). Conversely, those from the most deprived neighbourhoods made up a higher percentage of the workload at ED1 (63.9%) and ED2 (66.9%), compared to ED3 (25.7%) and ED4 (33.0%).

Table 4.3: Percentage distribution of patients, by NZDep2001 index

		ED1	ED2	ED3	ED4	All EDs
	N	1489	5717	5095	3354	15,655
	NZDep2001					
Low deprivation	decile 1	0.2	2.5	6.4	6.4	4.4
	2	0.7	5.0	8.5	6.8	6.1
	3	2.4	6.5	6.9	11.0	7.2
	4	6.5	4.4	14.4	4.7	7.9
	5	4.6	6.2	17.8	11.1	10.9
	6	7.9	2.9	9.1	16.7	8.3
	7	13.1	4.1	9.6	9.1	7.8
	8	19.9	14.5	12.2	20.3	15.5
High deprivation	9	20.8	18.4	9.1	8.9	13.6
	10	23.2	34.0	4.4	3.8	16.8
	Missing	0.7	1.5	1.8	1.4	1.5

5 Relationship with ED

Table 5.1 shows the mean number of visits to the ED in the previous year (including the reported visit), and the accompanying standard deviation gives an indication of spread. The figures shown for ED4 are not exact: the data that were provided gave the number of visits since 1 July 1998 (i.e. about the previous three years). These numbers were divided by the number of years since July 1998 (different for each week observed) and then rounded, keeping a minimum of one to represent the current visit.

For all EDs, patients averaged 2.18 visits in the previous year. The mean value was higher for ED2 (2.36) and lower for ED1 and ED4 (both 1.98).

Table 5.1: ED visits in the last year, including current visit

	ED1	ED2	ED3	ED4*	All EDs
Mean in last year	1.98	2.36	2.15	1.98	2.18
Standard deviation	2.18	2.36	3.77	3.35	3.08

* Numbers approximate – manipulated from the raw data as described above.

6 Visit Characteristics

Table 6.1 summarises the workload of the EDs over the days of the week. In general, Mondays and weekends were the busiest times.

Table 6.1: Percentage distribution of patients, by day of the week

	ED1	ED2	ED3	ED4	All EDs
N	1489	5717	5095	3354	15,655
Day					
Monday	17.1	15.7	14.8	14.9	15.4
Tuesday	13.7	14.1	13.3	13.2	13.6
Wednesday	13.4	14.3	13.7	13.7	13.9
Thursday	12.5	14.5	13.0	14.6	13.8
Friday	14.6	13.5	14.8	13.4	14.0
Saturday	14.5	13.4	14.6	14.5	14.1
Sunday	14.2	14.7	15.9	15.8	15.3

Table 6.2 presents workload by time of day. The distribution of patients across time appeared to be consistent across the EDs: they all saw the fewest patients between midnight and 8 am and the most between midday and 4 pm. The progressive slackening of demand by four-hour periods from 8 pm to 8 am was least marked in ED2.

Table 6.2: Percentage distribution of patients, by time of day

	ED1	ED2	ED3	ED4	All EDs
N	1489	5717	5095	3354	15,655
Time					
8 am – 12 pm	23.0	19.0	20.2	24.7	21.0
12 pm – 4 pm	26.7	23.1	24.8	26.3	24.7
4 pm – 8 pm	20.6	20.8	23.8	22.7	22.2
8 pm – 12 am	16.7	19.6	17.9	14.9	17.8
12 am – 4 am	8.1	10.8	7.8	7.0	8.7
4 am – 8 am	4.8	6.7	5.5	4.6	5.7

Table 6.3 gives the operational requirements for triage categories used by the EDs in managing their patients; these are based on urgency.

Table 6.3: Definitions of the ED triage categories

Triage	Definition
1	All of these patients need to be seen immediately
2	At least 80% of these patients should be seen within 10 minutes
3	At least 75% of these patients should be seen within 30 minutes
4	At least 70% of these patients should be seen within 60 minutes
5	At least 70% of these patients should be seen within 120 minutes

Table 6.4 shows the percentage distribution of patients in these triage categories. The mean was similar across the EDs with the exception of ED4, which had a significantly smaller proportions of patients in categories 1, 2 and 3. There was also a smaller proportion of category 5 patients visiting ED3.

Table 6.4: Percentage distribution of patients, by triage category

	ED1	ED2	ED3	ED4	All EDs
N	1489	5717	5095	3354	15,655
Triage					
1	0.7	0.8	0.7	0.2	0.6
2	8.7	6.2	9.1	4.0	6.9
3	49.8	45.4	43.7	24.3	40.7
4	31.3	36.9	41.6	54.0	41.5
5	9.4	10.8	5.0	17.4	10.2
Mean triage	3.4	3.5	3.4	3.8	3.5

Table 6.5 shows the distribution of patients' length of stay for each ED. The distributions are all fairly similar, except for that of ED2, which had a significantly longer average length of stay, and most noticeably a much higher proportion of patients staying longer than 12 hours. All of the EDs measured the length of stay as the time from "log in" to the system until the time of departure, so these values include waiting time before being seen.

Table 6.5: Percentage distribution of patients, by length of stay (LOS)

	ED1	ED2	ED3	ED4	All EDs
N	1489	5717	5095	3354	15,655
LOS					
≤ 1 hour	14.8	3.9	23.9	16.9	14.2
1–4 hours	66.1	40.3	49.2	63.6	50.6
4–8 hours	18.1	32.9	20.6	17.1	24.1
8–12 hours	0.9	8.0	3.8	1.9	4.7
> 12 hours	0.07	14.8	2.5	0.5	6.3
Mean LOS (minutes)	164	410	191	164	263

Table 6.6 combines all of the EDs and shows the absolute number and the percentage distribution of the triage categories at different times of the day, and the average triage category for each. The most urgent cases (triage category 1) were most frequent in relative and absolute terms between 4 pm and midnight. The least urgent problems (triage category 5) made up almost twice the percentage of the total workload in daytime hours compared to the rest of the day.

Table 6.6: Number and percentage distribution of triage categories, by time of day, for all EDs

	8 am – 4 pm	4 pm – 12 am	12 am – 8 am
N	7160	6235	2254
Triage			
1	31 (0.4)	45 (0.7)	22 (1.0)
2	457 (6.4)	435 (7.0)	190 (8.4)
3	2682 (37.5)	2698 (43.3)	992 (44.0)
4	3016 (42.1)	2609 (41.8)	876 (38.9)
5	974 (13.6)	448 (7.2)	174 (7.7)
Mean triage	3.6	3.5	3.4

Table 6.7 shows the percentage distribution of patients at different times of the day, by age group. Those over 65 made more daytime visits, young adults (15–24) presented proportionately more frequently between midnight and 8 am, while children were brought in most frequently from 4 pm to midnight.

Table 6.7: Percentage distribution of age groups, by time of day, for all EDs

	8 am – 4 pm	4 pm – 12 am	12 am – 8 am
N	7161	6235	2255
Age			
65+	22.4	15.1	14.2
45–64	18.1	16.1	16.6
25–44	24.3	24.8	27.9
15–24	15.3	16.7	20.5
< 15	19.9	27.3	20.7

Table 6.8 shows the percentage distribution of patients in triage categories by age group, and again shows the average length of stay for each division. The longer length of stay for ED2 is again evident. Older patients tended to spend longer at the EDs than did their juniors. The mean triage score decreased (cases became more urgent) with age, from 3.8 in the 15–24 group to 3.2 in the 65+ group. Children under 15 had a mean triage score of 3.5.

Table 6.8: Percentage distribution of triage categories, by age group, with average length of stay (LOS)

Age group (years)		ED1	ED2	ED3	ED4	All EDs
65+	N	289	808	1204	562	2863
	Triage 1	0.7	0.7	0.8	0.2	0.6
	2	14.5	11.5	17.3	9.1	13.8
	3	58.5	56.4	49.3	40.8	50.6
	4	23.9	27.9	31.2	44.8	32.2
	5	2.4	3.5	1.5	5.2	2.9
	Mean triage	3.1	3.2	3.2	3.5	3.2
	Mean LOS	198	582	246	234	334
45–64	N	299	946	891	541	2677
	Triage 1	1.0	0.6	1.2	–	0.8
	2	10.4	8.0	12.0	5.9	9.2
	3	51.8	50.0	44.1	27.7	43.7
	4	26.1	31.6	38.3	53.6	37.7
	5	10.4	9.7	4.4	12.8	8.6
	Mean triage	3.3	3.4	3.3	3.7	3.4
	Mean LOS	176	520	223	180	314
25–44	N	351	1453	1247	867	3918
	Triage 1	0.3	0.9	0.6	0.2	0.6
	2	6.3	4.6	6.4	3.3	5.1
	3	42.5	38.4	37.9	20.7	34.7
	4	38.8	41.6	47.1	55.0	46.0
	5	12.0	14.5	8.1	20.8	13.6
	Mean triage	3.6	3.6	3.6	3.9	3.7
	Mean LOS	157	401	206	157	263
15–24	N	226	791	776	808	2601
	Triage 1	–	0.4	0.6	0.6	0.5
	2	5.3	4.2	2.6	1.9	3.1
	3	41.2	36.9	33.8	14.1	29.3
	4	40.7	42.1	55.5	57.2	50.7
	5	12.8	16.4	7.5	26.2	16.5
	Mean triage	3.6	3.7	3.7	4.1	3.8
	Mean LOS	160	381	197	141	232
< 15	N	324	1719	977	576	3596
	Triage 1	1.2	1.0	0.3	–	0.7
	2	7.1	5.0	4.8	1.4	4.6
	3	54.0	47.5	51.5	24.7	45.5
	4	28.1	37.6	39.2	57.5	40.4
	5	9.6	9.0	4.2	16.5	8.9
	Mean triage	3.4	3.5	3.4	3.9	3.5
	Mean LOS	131	290	71	121	189

Table 6.9 shows the percentage distribution of visits by time of day for each major ethnic group. Note that Pacific people used the Emergency Department less during the day and more after midnight (this finding is relevant only to ED2; the number of Pacific people seen at the other EDs is too small to provide a reliable estimate).

Table 6.9: Percentage distribution of time of day, by ethnic group, for all EDs

	All ethnicities	New Zealand European	Māori	Pacific	Other
N	15,277	9271	1955	1791	2260
Time					
8 am – 4 pm	45.7	47.6	44.4	35.5	47.6
4 pm – 12 am	39.8	39.5	40.8	42.9	37.9
12 am – 8 am	14.4	12.9	14.8	21.5	14.6

7 Problems Identified and Managed

Table 7.1 shows the percentage distribution of diagnoses as READ chapter headings for each of the EDs. The commonest types of problem were injury/poisoning (30.4%), respiratory (9.9%), cardiovascular (9.7%) and non-specific symptoms (8.6%).

ED3 was exceptional in coding a large number of cases to actions (19.1% versus an overall mean of 7.2%) and having more uncoded cases (11.0% versus an overall mean of 4.0%). This difference is likely to be due to a different coding process rather than to substantive differences in the problems encountered. ED4 reported a much higher incidence of injury/poisoning (43.7% versus an overall mean of 30.4%). The prevalence of respiratory problems was much higher for ED1 and ED2 (mean of 14%) than for ED3 and ED4 (mean of 5%).

Table 7.1: Percentage distribution of problems managed by EDs

READ2 chapter	ED1	ED2	ED3	ED4	All EDs
Injury/poisoning	27.3	24.7	29.0	43.7	30.4
Respiratory	12.1	16.0	5.5	5.0	9.9
Cardiovascular/circulatory	11.2	8.9	11.3	8.1	9.7
Symptoms non-specific	8.9	8.9	9.9	6.0	8.6
Actions	1.5	0.9	19.1	2.7	7.2
Nervous system / sense organs	6.0	4.9	4.4	3.6	4.5
Digestive	5.8	5.6	1.3	5.2	4.1
Skin / subcutaneous tissue	3.8	3.9	1.7	2.9	3.0
Infectious/parasitic	3.4	4.8	0.5	2.7	2.8
Genito-urinary	5.4	3.1	2.3	2.4	2.9
Musculoskeletal / connective tissue	4.4	2.5	1.4	3.9	2.6
Investigations	1.8	2.0	2.4	1.6	2.0
Pregnancy/childbirth/puerperium	2.3	1.3	–	0.5	0.8
Endocrine/nutritional/metabolic/immunity	1.1	0.8	0.1	1.0	0.7
Mental	0.7	0.4	0.3	0.6	0.5
Unspecified conditions	0.4	0.3	0.08	1.2	0.4
Cancers/neoplasms	0.6	0.3	–	0.2	0.2
Blood / blood-forming organs	0.1	0.3	–	0.2	0.2
Congenital	0.07	0.05	–	0.09	0.04
Perinatal	0.07	0.03	–	–	0.02
Not coded	0.3	0.1	11.0	1.6	4.0
Missing	2.9	10.1	–	7.1	5.5
Total	100%	100%	100%	100%	100%
(N)	(1489)	(5717)	(5095)	(3354)	(15,655)

There was some differentiation of patient mix by time. Table 7.2 shows that from midnight to 8 am a smaller percentage of patients presented with injuries/poisoning. The exception is the residual “level two”, category which contains poisoning. Fewer actions (mainly minor surgery) were recorded. From midnight to 8 am there were proportionately more cases of respiratory disease, mainly asthma and infections, and digestive disease, mainly symptoms, than at other times of day.

Table 7.2: Percentage distributions of problems, by time

READ2 chapter	8 am – 4 pm	4 pm – 12 am	12 am – 8 am
Injury/poisoning	32.5	30.1	24.6
Cardiovascular/circulatory	10.6	8.6	10.0
Respiratory	8.1	9.9	15.3
Actions	7.4	8.2	4.3
Symptoms non-specific	7.3	9.4	10.8
Nervous system / sense organs	4.7	4.2	4.8
Digestive	3.7	4.0	6.0
Musculoskeletal / connective tissue	3.2	2.1	2.1
Skin / subcutaneous tissue	3.2	2.9	2.2
Genito-urinary	3.0	2.8	2.9
Infectious/parasitic	2.4	3.0	3.9
Investigations	1.8	2.3	2.2
Pregnancy/childbirth/puerperium	0.9	0.8	0.4
Endocrine/metabolic/nutritional/immunity	0.6	0.7	0.8
Unspecified conditions	0.5	0.4	0.2
Mental	0.4	0.5	0.6
Cancers/neoplasms	0.3	0.1	0.09
Blood / blood-forming organs	0.2	0.2	0.09
Congenital	0.04	0.05	0.04
Perinatal	0.01	0.03	–
Not coded	4.3	3.9	3.3

8 Treatment

Treatment was listed under the action variable by EDs. Table 8.1 shows the percentage distributions of non-drug treatments administered by the EDs in the observed weeks. These were coded using the software described in section 2.4. Patients could be coded to more than one action category (i.e. those listed in the table), but not to two subcategories in any given one.

The predominant category of action at EDs was investigation/examination/screening, which was invoked in 50.1% of visits. Approximately half of these (24.7%) were classified as investigations. There were wide differences between EDs in the non-drug treatments reported. For example, ED1 reported X-rays in 13.5% and examination in 15.1% of cases, but ED2 reported them in only 0.8% and 0.7% of cases.

It is likely that these differences represent different reporting practices which may conceal substantive differences in actual practice. It is likely that many therapeutic activities included in the work-up process were not recorded separately. Also, a variable percentage of the patients were admitted for definitive treatment and some were referred to outpatient departments.

Table 8.1: Percentage distributions of non-drug treatments by EDs

Non-drug treatments	ED1	ED2	ED3	ED4	% All EDs
Investigation/examination/screening	65.7	36.4	49.4	36.3	50.1
Investigation	32.0	35.7	22.5	26.3	24.7
Lab test	(3.6)	(0.3)	(2.3)	(5.4)	(2.6)
Scan	(2.4)	(22.0)	(1.9)	(1.0)	(2.8)
X-ray	(13.5)	(0.8)	(4.4)	(9.0)	(5.8)
Other investigation	(12.2)	(2.8)	(12.6)	(10.7)	(12.0)
Examination	15.1	0.7	0.9	9.1	3.4
Screening	18.6	–	26.0	0.9	22.0
Other procedure	23.2	20.6	34.9	23.4	31.8
Endoscopy	–	10.5	–	–	0.5
Health advice	3.7	0.7	6.7	3.6	5.8
Referral	0.1	2.8	5.5	4.7	4.6
Dressing	3.9	0.4	2.6	15.1	3.6
Minor surgery	2.8	38.5	0.3	10.4	3.1
Immunisation	0.3	0.1	0.5	2.5	0.6
Administration	0.09	–	0.1	0.08	0.1
Physical medicine	0.09	0.5	0.08	2.0	0.2
Complementary medicine	0.04	0.3	–	–	0.02
Follow-up	0.04	0.1	–	2.0	0.2
Total	100%	100%	100%	100%	100%
(N treatments)	(2248)	(754)	(12,209)	(1182)	(16,393)
(N visits)	(1489)	(5717)	(5095)	(3354)	(15,655)

Table 8.2 lists the drugs that were prescribed most often by the EDs during the observed weeks. Only ED2 had a dedicated drug variable. This was also used for coding where the actions could not be coded, but there were many cases with no drug information. The most commonly recorded drug groups were analgesics (15.8%), anti-bacterials (10.8%) and anti-thrombotic agents (5.2%).

Table 8.2: Percentage distribution: most frequently prescribed drug sub-groups

Drug sub-group (Pharmacodes/ATC Level 2)*	All EDs (N = 7816)
Analgesics	15.8
Anti-bacterials	10.8
Anti-thrombotic agents	5.2
Anti-inflammatory non-steroidal drugs (NSAIDs)	3.9
Nitrates	3.0
Anti-ulcerants	2.8
Agents affecting the renin-angiotensin system	2.7
Diuretics	2.7
Beta-adrenoceptor agonists – long-acting tablets	2.6
Corticosteroids and related agents for systemic use	2.5
Fluids and electrolytes	2.3
Laxatives	2.2
Beta-adrenoceptor blockers	2.0
Anti-diarrhoeals	2.0
Inhaled corticosteroids – metered dose inhalers	1.9
Calcium channel blockers	1.8
Diabetes	1.8
Lipid-modifying agents	1.5
Emollients and barrier creams	1.3
Anti-nausea and vertigo agents	1.3
Anti-epilepsy drugs	1.1
Anti-arrhythmics	1.0
Antacids and anti-flatulants	1.0
Anti-anaemics	0.9
Vitamins	0.8
Anti-depressants	0.7
Anti-histamines	0.6
Sedatives and hypnotics	0.6
Extemporaneously compounded preparations and galenicals	0.6
Urinary tract infections	0.6
Inhaled anticholinergic agents – metered dose inhalers	0.5
Eye preparations	0.5
Hyperuricaemia and anti-gout	0.5

* Includes drug sub-groups with frequencies $\geq 0.5\%$ of ED drug treatments.

9 Disposition

Table 9.1 summarises the percentage distribution of the “disposition” variables provided by the EDs, using three defined categories: discharged, referred to outpatients (OP) and admitted to a ward. There was a small number of values that could not be coded to one of those categories, especially in ED1, where there were some dispositions recorded simply as “other” – these were treated as missing and are not included in the tables in this section.

It should be noted that the revised disposition data from ED3 only gave the percentage of patients admitted to the ward and were not distinguished by time of day.

Overall, relatively few referrals to outpatients were made by the EDs, but there were far more made by ED1 and ED2 (mean 6.6%) than by ED4 (2.3%). Admission rates were lowest among those who presented to the ED between midnight and 8 am.

Table 9.1: Percentage distribution of disposition types

		ED1	ED2	ED4	EDs 1, 2 and 4
Overall	N	1489	5717	3354	10,560
	% discharged	48.6	53.1	72.4	58.6
	% referred to OP	7.1	6.1	2.3	5.0
	% admitted to ward	41.9	40.8	25.3	36.0
8 am – 4 pm	N	741	2411	1709	4861
	% discharged	48.7	45.9	73.0	54.9
	% referred to OP	7.7	7.6	2.2	5.9
	% admitted to ward	41.4	46.5	24.8	38.9
4 pm – 12 am	N	556	2303	1256	4115
	% discharged	45.1	54.4	71.5	58.5
	% referred to OP	6.7	5.6	2.3	4.7
	% admitted to ward	45.3	40.0	26.2	36.4
12 am – 8 am	N	192	1000	388	1580
	% discharged	58.3	67.1	72.1	67.4
	% referred to OP	6.3	3.4	3.1	3.7
	% admitted to ward	33.9	29.5	24.8	28.6

Note: Time seen was not available with revised disposition data for ED3.

Table 9.2 gives the disposition values by triage category. The overall admission rate was 40.5%; ED3 showed a higher rate at 49.8%, while the ED4 rate was lower at 25.3%. The admission rate was 79.8% for the most urgent cases and fell progressively with decreasing urgency. However, 12.1% of all triage category 5 cases were still admitted.

Table 9.2: Percentage distribution of disposition types, by triage category

		ED1	ED2	ED3	ED4	All EDs
All categories	N	1487	5717	20,421	3354	15,655*
	% admitted to ward	41.9	40.8	49.8	25.3	40.5
Triage category 1	N	10	45	168	8	99*
	% admitted to ward	90.0	71.1	91.7	62.5	79.8
Triage category 2	N	130	355	1875	135	1084*
	% admitted to ward	76.2	62.3	80.8	68.9	72.5
Triage category 3	N	741	2595	9256	814	6377*
	% admitted to ward	53.3	46.5	60.1	50.1	52.5
Triage category 4	N	466	2107	9001	1812	6505*
	% admitted to ward	23.4	34.4	32.5	18.1	28.5
Triage category 5	N	140	615	121	585	1595*
	% admitted to ward	7.9	24.4	6.4	2.6	12.1

* In calculating an average, ED3 has been weighted to correspond to the 5095 cases originally reported.

10 Comparison of Emergency Departments

Table 10.1 gives data on the demographic characteristics of each district and Table 10.2 gives information on the after-hours services available in the urban area where each ED is situated. Table 10.3 gives the demographic characteristics of the users of each ED, while Table 10.4 gives some details of the urgency, nature and management of the problems presented. In the following discussion the average score for all four EDs is given (in brackets) for comparison. It should be borne in mind here that the sample is not representative and, in particular, that there are data from only one smaller hospital.

ED1. This Hospital Emergency Department serves a rural district which in 2002 had a population of almost 145,000. Assessment and stabilisation services were available at three small hospitals in the district and more complex cases were sometimes transported or transferred to tertiary services elsewhere. Close to ED1 there was an A&M which closed at 10 pm; this had X-ray facilities and the services of a radiographer on 10-minute call. Local GPs provided after-hours care from a private clinic, which closed at 7.30 pm but had a 24-hour telephone call roster.

The patients using ED1 had a median age of 35 (versus 31.8 overall) and 33% were Māori. These characteristics match the population of the district, which has a median age of 36 and is 31% Māori. The users are economically disadvantaged, with 63.9% in the highest three NZDep deciles; 57.3% of the population of the district lives in neighbourhoods allocated to these deciles.

The annual rate of ED visits in the district was 133 per thousand (versus 173 overall). Triage categories 1 to 3 were heavily represented at 59.2% (versus 48.2%) and the admission rate for these was slightly lower than the average at 52% (versus 55.7). The admission rate for triage categories 4 and 5 (weighted average) was also slightly lower than the average at 20% (versus 25.3%). The percentage of cases classified as injury/poisoning was low, at 28.7% (versus 36.7%), while that related to respiratory disease was high, at 13.2%, compared to EDs 3 and 4.

It may be that a dispersed population is related to lower rates of use but a higher acuity of problems seen. The higher rate of respiratory disease, relative to injury, may be related to the economic deprivation of the population because of both a higher disease rate and poorer access to primary health care in 2001.

ED2. This Hospital Emergency Department serves an urban district which in 2002 had a population of more than 400,000. ED2 had several neighbouring A&M clinics. These closed in the late evening and characteristically had X-ray facilities and the services of a radiographer on call. Local GPs provided after-hours care via the A&M clinics as well as a mobile doctor service for house calls and a 24-hour telephone help service.

The patients using ED2 had a median age of 30 (versus 31.8 overall); 19.2% were Māori and 28.5% were Pacific people. These characteristics matched the population of the district, which had a median age of 30.6, 17% Māori and 19% Pacific. The users were economically disadvantaged with almost 70% in the highest three NZDep deciles; by comparison, 50.7% of the population of the district lived in areas assigned to the three highest deciles.

The rate of ED visits in ED2 was 184 per thousand (versus 173 overall), triage categories 1 to 3 made up 52.4% (versus 48.2%) of the case load and the admission rate for these was lower than average at 49% (versus 55.7%). The admission rate for triage categories 4 and 5 (weighted average) was higher than average at 32% (versus 25.3%). The percentage of cases classified as injury/poisoning was relatively low at 28.1% (versus 36.7%), while that related to respiratory disease (18.9%) was higher than that of ED1 and much higher than those of EDs 3 and 4.

It may be that the high rates of use, particularly involving the economically disadvantaged, reflect relatively easy physical access to the ED and economic barriers to other sources of care. The very high rate of respiratory disease, relative to injury, is likely to be related to the economic deprivation of the population combined with economic barriers to care.

ED3. This Hospital Emergency Department serves a large district, which in 2002 had a population of close to 450,000 covering both rural and urban settings. More complex cases may have been transported or transferred from two secondary hospitals. Local GPs provided after-hours care from an A&M clinic, which was open 24 hours per day and had X-ray facilities and the services of a radiographer. This service was well established at the time of data collection and liaison between the GPs and the Emergency Department ensured that, where possible, patients remained in the community. Most practitioners belonged to this service but some provided alternative cover at a surgery or by phone.

The patients using ED3 had a median age of 36 (versus 31.8 overall). A total of 76.8% were New Zealand European, 4.7% Māori and 2.0% Pacific. These characteristics matched the local population, which had a median age of 35.2 and was 6.6% Māori. Females made up less than half of the ED users at 46.8%. Among the users, the economically disadvantaged were slightly over-represented with 25.7% in NZDep deciles 8, 9 and 10; only 19% of the population lived in these three deciles.

The rate of ED visits in ED3 was 148 per thousand (versus 173 overall); triage categories 1 to 3 were over-represented at 53.5% (versus 48.2%) but the admission rate for these was high at 64.0% (versus 55.7%). The percentage of patients in triage category 5 was low at 5% (versus 10.2% for all EDs). The admission rate for triage categories 4 and 5 (weighted average) was also high at 32.2% (versus 25.3%). The percentage of cases classified as injury/poisoning was relatively high at 41.4% (versus 36.7%), while that related to respiratory disease was relatively low at 8.4%, compared to those of EDs 1 and 2.

It may be that lower rates of use were associated with a dispersed population and the retention of less seriously ill patients in the community. This in turn might be related to a higher acuity of problems seen and a higher admission rate. The high rate of injury, relative to respiratory disease, suggests that ED3, with relatively low numbers of economically disadvantaged people, is less often used by people unable to access other sources of primary health care. The lower proportion of females seen may well reflect this different usage pattern. The high admission rate may reflect both greater acuity (and possibly “seriousness”) and a higher proportion of injuries.

ED4. This Hospital Emergency Department serves a district which in 2002 had a population of almost 180,000. Local GPs provided after-hours care from an A&M clinic, which was open until midnight and had X-ray facilities with the services of a radiographer.

The patients using ED4 had a median age of 33 (versus 31.8 overall); 81.9% were New Zealand European, 4.8% Māori and 1.6% Pacific. These characteristics differed from the district population, which had a median age of 41 and was 6.9% Māori. Females made up less than half of the ED users at 44.9%.

The rate of visits for the district was 245 per thousand (versus 173 overall), triage categories 1 to 3 were significantly under-represented at 28.5% (versus 48.2%) but the admission rate for these was similar to the average at 53% (versus 55.7%). The admission rate for triage categories 4 and 5 (weighted average) was low at 14% (versus 25.3%). The percentage of cases classified as injury/poisoning was high at 49.5% (versus 36.7%), while that related to respiratory disease was low at 5.8% compared to those of EDs 1 and 2.

The relatively high rate of ED visits and the low acuity and low rate of admission for patients in triage categories 4 and 5 suggest that ED4 was used by people who might elsewhere access other sources of primary health care. It may be that this is related to the large number of students living locally. This conjecture is confirmed by the relatively high numbers of those, of both sexes, aged 15–24 (see Table 4.1) and by the fact that the median age of ED users (33) is much less than that of the district population (41). Students are likely to be: under-represented on the Census, unable to afford primary health care co-payments, without a local GP, and at high risk of

injury from competitive sports. The high rate of injury, relative to respiratory problems, is reflected in the lower number of females.

Table 10.1: Demographic characteristics of district populations

	ED1	ED2	ED3	ED4
Population	145,385	404,330	447,400	178,000
Median age	36.0	30.6	35.2	41.0
% female	50.7	50.9	51.0	51.2
% New Zealand European	68.0	64.0	91.5	93.1
% Māori	31.0	17.0	6.6	6.9
% Pacific	1.1	19.0	1.9	1.1
% NZDep decile				
1, 2, 3	3.3	28.0	34.1	33.0
4, 5, 6, 7	39.3	21.3	46.9	47.6
8, 9, 10	57.3	50.7	19.0	19.4

Table 10.2: After-hours services in each district

	ED1	ED2	ED3	ED4
A&M ¹	1	Several	1	1
Closes	10 pm	Late evening	24 hour	12 am
Radiography	10 minute call	On call	On call	5 minute call
EH GP offices ²	1	Several	Yes	1
Closes	7.30 pm	Varies	10 pm	
Radiography	Yes	Some	On call	
A-H GP ³	See EH GP	Use above	= A&M	= A&M
House calls	Yes	Yes	Yes	Yes

1 A&M = Accident and Medical clinic.

2 EH GP = extended-hours general practice.

3 A-H GP = after-hours service provided by general practice.

Table 10.3: Summary of demographic differences between ED users

	ED1	ED2	ED3	ED4
Median age	35	30	36	33
% female	50.7	49.1	46.8	44.9
NZ European	51.3	36.7	76.8	81.9
Māori	33.0	19.2	4.7	4.8
Pacific	1.4	28.5	2.0	1.6
Asian and Other	14.4	15.7	15.8	11.7
NZDep decile				
1, 2, 3	3.3	14.0	21.8	24.2
4, 5, 6, 7	32.1	17.6	50.9	41.6
8, 9, 10	63.9	66.9	25.7	33.0

Table 10.4: Summary of usage patterns of each ED

	ED1	ED2	ED3	ED4	All EDs
Visits/1000 population	133	184	148	245	173
% patients 8 pm – 8 am	29.6	36.9	31.1	26.4	32.1
Triage					
1, 2, 3	59.2	52.4	53.5	28.5	48.2
4, 5	40.7	47.7	46.6	71.4	51.7
Injury/poisoning	28.7	28.1	41.4	49.5	36.7
Respiratory	13.2	18.9	8.4	5.8	12.4
% referred to OP	7.2	6.1	NA	2.3	5.0
% admitted to ward	41.9	40.8	49.8	25.3	40.5
% admitted to ward					
Triage 1	90.0	71.1	91.7	62.5	79.8
Triage 2	76.2	62.3	80.8	68.9	72.5
Triage 3	53.3	46.5	60.1	50.1	52.5
Triage 4	23.4	34.4	32.5	18.1	28.5
Triage 5	7.9	24.4	6.4	2.6	12.1

11 Comparison of ED, A&M and GP

Table 11.1 compares the gender, age and NZDep2001 distribution of users of EDs, A&Ms and GPs. The GP patient population shows a preponderance of females (58.2%), but females are in a minority at EDs (47.6%), while gender distribution is close to equal at A&Ms (50.5% female).

The median age of users of EDs was 32, while those attending GPs had a median age of 41. A&M users had a median age of 20, with those aged 14 and under over-represented and those 65 and over under-represented. The 15–24 age group was under-represented at all sources of care but especially at GPs.

The socioeconomic strata represented by NZDep2001 quintile scores were evenly represented at A&M clinics and at the GPs' surgeries. At the ED, however, quintile 1 was under-represented by a factor of two, while quintile 5 was over-represented by a factor of three. This is presumably a result of financial and other practical, barriers to primary health care for the worse off: they have an incentive to use the free care available at the ED and may delay seeking help until more acutely ill. Further, they may well experience a greater risk of injury and illness.

Table 11.1: Percentage distribution of gender, age and NZDep2001 of users of EDs, A&M clinics and general practice

	All EDs	A&Ms	GPs
N	15,655	6166*	40,396*
N female	(7454)	(3111)	(23,525)
% female	47.6	50.5	58.2
Age % (% female)			
65+	18.3 (21.1)	5.0 (6.1)	22.2 (23.2)
45–64	17.1 (17.0)	12.1 (13.0)	22.6 (22.5)
25–44	25.0 (25.0)	25.7 (25.7)	22.5 (24.6)
15–24	16.6 (15.9)	17.5 (18.2)	8.9 (9.8)
0–14	23.0 (21.0)	39.7 (47.2)	23.3 (19.4)
Median age	32	20	41
Quintile			
1	10.5	21.1	17.5
2	15.1	17.5	17.0
3	19.2	16.9	17.0
4	23.3	15.8	17.2
5	30.4	20.9	17.4
Missing	1.5	7.9	13.9
Median quintile	3.2	2.6	2.5

* “Log” data comprised socio-demographic characteristics for all patients seen during the data collection period.

Table 11.2 compares the ethnicity of users of EDs, A&Ms and GPs. New Zealand Europeans made up 75.1% of the patients of GPs but only 59.6% of those at A&Ms and 60.6% of those at EDs. Māori were under-represented at A&Ms, while Pacific people were over-represented at EDs and A&Ms. This is likely to be due to the inclusion of an ED serving a city with a high Pacific population and the clustering of A&Ms in that region.

Table 11.2: Percentage distribution of patients, by ethnicity

	All EDs	A&Ms (logs)*	GPs (logs)*
N	15,304	5419	40,189
Ethnicity †			
New Zealand European	60.6	59.6	75.1
Māori	12.8	9.0	12.2
Pacific	11.7	10.8	4.0
Asian	3.9	10.0	4.0
Other	11.1	10.6	4.7
Total	100%	100%	100%

* “Log” data comprised socio-demographic characteristics for all patients seen during the data collection period.

† Ethnicity was self-reported, with multiple categories allowed; one ethnic category was then assigned per patient according to prioritisation of Māori and Pacific peoples.

Note: 351 ED, 786 A&M, and 488 GP cases had missing data for ethnicity.

Table 11.3 compares the percentage distribution of problems dealt with by all of the EDs to those of the problems dealt with by the A&M clinics and the GPs. Only the patients seen during the normal hours of operation for GPs, Monday to Friday, 8 am – 6 pm, are shown. The table shows all of the READ2 chapter headings (first digit of the code) and the sub-chapter headings (second digit of the code) within them, where they account for at least 0.5% of the problems managed (for either population). For the ED population, only one diagnosis was coded for each patient; for the GP population, up to four diagnoses could be coded for each patient – in total there were 9272 patients seen and 15,450 problems/diagnoses coded.

For the EDs, injury/poisoning problems were the most common at 31.2% of all problems, followed by cardiovascular/circulatory at 11.3%, respiratory system problems at 7.8%, and actions and symptoms-non-specific at 7.4%.

For the A&M clinics, injury/poisoning problems were also the most common at 27.3% of all problems, followed by respiratory system problems at 20.8%, actions at 8.5% and nervous system/sense organs at 8.1%.

For the GPs, respiratory system problems were the most common at 14.7%, followed by actions at 11.3%, cardiovascular/circulatory at 9.2%, nervous system / sense organs at 8.2%, injury/poisoning at 7.1%, skin / subcutaneous tissue at 6.7%, musculoskeletal / connective tissue at 5.7% and investigations at 5.3%.

Considering the injury/poisoning category, EDs saw many cases of traumatic complications and intracranial injury, which were rare at A&M clinics. On the other hand, A&M clinics saw a higher proportion of patients with sprains and contusions. It is clear that, despite the two having similar proportions of injury patients, those seen at A&Ms were less severe than those at the EDs. General practice saw a lower proportion of injury cases and only approached ED and A&M rates for the relatively mild category of sprain (and the uncommon category of contusion). This suggests a further decline in the severity of injury cases seen by GPs.

The relative frequency of cardiovascular problems was similar at EDs and GPs, but less common at A&Ms. Cardiovascular symptoms were more common in EDs, as were non-specific cardiovascular and cerebrovascular disease. Hypertensive disease made up a much larger proportion of problems in general practice. This suggests that EDs are used more often in the early, acute and uncertain stage of cardiovascular disease, with general practice managing subsequent long-term care. A&Ms appear to treat relatively few cases of either sort.

Respiratory disease, especially chronic obstructive airways disease and acute respiratory infections, was more common in general practice, but pneumonia, influenza and respiratory symptoms were slightly more common among ED patients. This again suggests that EDs are used more often in the early stages of severe respiratory illnesses. Acute respiratory infections made up almost 14% of all problems seen at A&Ms.

Actions, particularly operations, preventive procedures and administrative activities (certification etc), were more common in general practice, but therapeutic procedures were three times as frequent in EDs. A&Ms occupied an intermediate position on each of these.

Relative to GPs, non-specific symptoms, especially abdominal, were coded more frequently in EDs and less frequently at A&Ms. This again suggests that EDs are used in the acute phase of an illness when the diagnosis remains unclear, whereas A&Ms do not appear to be used under these circumstances.

Disorders of the nervous system and sense organs, the digestive tract, the skin, musculoskeletal, genito-urinary and endocrine systems, mental illness, infectious diseases and visits for investigation were all more common in general practice than at the EDs. However, wherever symptoms alone were listed, they were more frequent in EDs.

Table 11.3: Distribution of problems managed, by READ2 chapter and sub-chapter

READ2 chapter READ2 subchapter	Percent of all problems		
	EDs (M–F, 8 am–6 pm)	A&Ms (M–F, 8 am–6 pm)*†	GPs (M–F, 8 am–6 pm)*†
Injury/poisoning	31.2	27.3	7.1
Open wound of limb	6.5	4.5	0.7
Fracture of limb	5.3	4.6	0.6
Sprains and strains of joints and adjacent muscles	4.4	5.9	2.3
Traumatic complications and unspecified injuries	3.4	–	0.2
Intracranial injury excluding those with skull fracture	1.6	–	0.2
Injury and poisoning	0.9	–	0.01
Abrasions	1.6	1.8	0.6
Foreign body (FB) in orifice	1.1	0.6	0.1
Open wound of head, neck and trunk	1.0	2.0	0.2
Contusion	0.6	2.4	0.6
Dislocations	0.6	–	0.2
Surgical and medical care complications	0.5	–	0.09
Cardiovascular/circulatory	11.3	2.4	9.2
Cardiovascular symptoms	5.2	0.6	0.5
Cardiovascular/circulatory diseases	1.1	–	0.06
Arteriosclerotic heart disease	1.4	–	1.5
Other forms of heart disease	1.3	–	1.2
Cerebrovascular disease	1.0	–	0.4
Vein, lymphatic and circulatory diseases	1.0	–	0.7
BP – hypertensive disease	0.05	1.0	4.6
Respiratory	7.8	20.8	14.7
Chronic obstructive airways disease	1.8	2.0	3.2
Acute respiratory infections	1.4	13.9	7.9
Pneumonia and influenza	2.0	2.4	1.4
Respiratory symptoms	1.6	1.7	1.2
Actions	7.4	8.5	11.3
Therapeutic procedures	6.4	3.7	1.9
Operations	0.5	1.1	2.3
Preventive procedures	0.1	3.0	5.5
Administration	0.3	–	1.1
Symptoms non-specific	7.4	2.8	3.5
Abdominal and pelvic symptoms	4.9	0.3	0.4
General symptoms	1.8	–	1.6
Ear, nose and throat symptoms	0.2	0.6	0.5
Nervous system / sense organs	4.5	8.1	8.2
Central nervous system symptoms	2.7	1.0	1.4
Disorders of eye and adnexa	0.7	1.7	1.5
Ear diseases	0.3	4.8	3.8
Other central nervous system disorders	0.4	–	0.9

* Up to 4 problems could be recorded per patient visit.

† READ sub-chapters are shown where they comprise $\geq 0.5\%$ of problems for any of the three practice settings (except for ED sub-chapters of particular interest).

READ2 chapter READ2 subchapter	Percent of all problems		
	EDs (M–F, 8 am–6 pm)	A&Ms (M–F, 8 am–6 pm)*†	GPs (M–F, 8 am–6 pm)*†
Digestive	3.7	2.8	4.4
Gastrointestinal tract symptoms	1.4	1.3	1.2
Duodenal diseases	0.6	1.0	1.5
Diseases of the intestines and peritoneum	0.5	0.3	0.5
Liver, biliary, pancreas and gastrointestinal diseases	0.5	–	0.3
Appendicitis and other disorders of the appendix	0.3	–	0.04
Skin / subcutaneous tissue	3.5	6.4	6.7
Skin and subcutaneous tissue infections	2.6	2.7	1.4
Symptoms affecting skin/integumentary tissue	0.6	0.4	0.4
Other skin and subcutaneous tissue disorders	0.2	–	2.4
Dermatitis/dermatoses	0.1	1.6	2.5
Musculoskeletal / connective tissue	3.1	3.4	5.7
Vertebral column syndromes	1.4	1.1	1.4
Rheumatism, excluding the back	0.9	1.1	1.7
Arthropathies and related disorders	0.6	0.9	2.1
Osteopathy / chondropathy / acquired musculoskeletal deformity	0.2	–	0.5
Genito-urinary	2.9	2.8	4.6
Other urinary system diseases	0.9	1.1	1.3
Urinary system symptoms	0.6	0.9	0.08
Female genital tract disorders	0.5	0.6	1.4
Male genital organ diseases	0.1	–	0.5
Infectious/parasitic	2.3	5.7	4.3
Bacterial food poisoning	0.9	1.6	0.9
Viral and chlamydial diseases	0.8	2.7	1.3
Viral diseases with exanthema	0.2	0.6	0.5
Mycoses	0.05	0.7	1.0
Investigations	2.0	3.1	5.3
Examination	1.5	1.8	1.6
Diagnostic procedures / laboratory tests / radiology	0.5	1.3	1.2
Pregnancy/childbirth/puerperium	1.0	0.7	0.3
Endocrine/nutritional/metabolic/immunity	0.6	0.9	4.1
Other metabolic and immunity disorders	0.4	–	1.7
Unspecified conditions	0.5	1.4	2.3
Health status and contact with health services factors	0.5	1.4	2.1
Mental	0.4	1.0	4.9
Blood / blood-forming organs	0.2	–	0.5
Cancers/neoplasms	0.2	1.0	2.4
Congenital	0.05	0.4	0.2
Perinatal	–	–	0.03
Not coded	4.5	0.6	0.4
Missing	5.2	–	–
Total	6460	707	15,450

Table 11.4 gives the frequency of non-drug treatments across EDs, A&Ms and GPs. The category of “investigation/examination/screening” was reported for 15.9% and 25.4% of visits at the A&Ms and the GPs respectively. The frequency was much higher at 50.1% for EDs. This difference can be partly explained by the inclusion of investigations not available in general practice such as scans and endoscopy; observation, which was not coded separately, was also much more common in the EDs. Health advice was recorded in only 5.8% of ED visits, was more common at 13.9% at A&Ms and most common at 33.8% of general practice visits. The higher levels of referral at A&Ms and GPs reflects the fact that EDs are a destination of referral.

Table 11.4: Frequency of non-drug treatments

Non-drug treatments	% all EDs	% A&M (M–F, 8 am–6 pm)*	% GP (M–F, 8 am–6 pm)*
Investigation/examination/screening	50.1	15.9	25.4
Hospital investigations			
Scan	(2.6)		
X-ray	(5.8)		
Other procedure	31.8	5.6	3.3
Endoscopy	(0.5)		
Health advice	5.8	13.9	33.8
Referral	4.6	8.8	14.0
Dressing	3.6	10.2	2.7
Minor surgery	3.1	5.8	5.7
Immunisation	0.6	1.2	1.9
Administration	0.1	2.0	5.0
Physical medicine	0.2	1.7	0.6
Complementary medicine	0.02	0.5	1.5
Follow-up	0.2	6.1	6.1
Total	100%	100%	100%
N	(15,655)	(590)	(9272)
(N treatments)	(16,393)	(423)	(10,609)

* Detailed “visit” data were collected for 1 in 4 patients seen.

Table 11.5 gives the frequency of drug treatments across EDs, A&Ms and GPs. Note that the frequency of anti-bacterial use was almost twice as high at A&Ms and GPs as at EDs (19.2% and 20.5% versus 10.8%). Use of anti-thrombotics was only recorded at the EDs. Other differences reflect the focus on acute care in the ED and management of chronic conditions in general practice.

Table 11.5: Most frequently prescribed drug sub-groups

Drug sub-group (Pharmacodes/ATC Level 2)*	% patients ED (N = 15,655)	Per 100 visits A&M (M-F, 8 am-6 pm) (N = 590)	Per 100 visits GP (M-F, 8 am-6 pm) † ‡ (N = 9272)
Analgesics	15.8	11.0	9.9
Anti-bacterials	10.8	19.7	20.5
Anti-thrombotic agents	5.2	–	–
Anti-inflammatory non-steroidal drugs (NSAIDs)	3.9	3.7	6.6
Nitrates	3.0	–	–
Anti-ulcerants	2.8	0.8	–
Diuretics	2.7	–	–
Agents affecting the renin-angiotensin system	2.7	–	4.2
Beta-adrenoceptor agonists	2.6	2.7	3.8
Corticosteroids and related agents for systemic use	2.5	0.8	2.3
Fluids and electrolytes	2.3	0.7	–
Laxatives	2.2	–	1.3
Beta adrenoceptor blockers	2.0	0.7	3.2
Anti-diarrhoeals	2.0	–	–
Inhaled corticosteroids	1.9	1.4	4.5
Calcium channel blockers	1.8	–	2.4
Diabetes	1.8	–	2.1
Lipid-modifying agents	1.5	0.7	–
Emollients and barrier creams	1.3	–	–
Anti-nausea and vertigo agents	1.3	1.5	–
Anti-arrhythmics	1.0	–	–

* Includes drug sub-groups with frequencies $\geq 1\%$ of ED visits.

† Detailed “visit” data were collected for 1 in 4 patients seen.

‡ Any number of drugs for up to 4 problems could be recorded per patient visit.

12 Conclusions

Differences between patient characteristics across Emergency Departments appear to reflect the nature of the population served and the local availability of other services. The rush of weekend injuries noted in ED4, despite the availability of X-ray facilities at the neighbouring after-hours clinic, suggests that habitual patterns of care seeking, perhaps reinforced by economic incentives, are an important determinant of workload. Similarly, the acute illnesses seen at EDs 1 and 2, which serve areas of economic disadvantage, suggest that a combination of economic and practical barriers to other sources of care exist.

High admission rates along with low triage scores (more urgent patients) at ED3 may reflect efforts to retain patients in the community where possible, as well as the availability of peripheral hospitals.

As part of their role in providing urgent care to the sick and injured, EDs in New Zealand deliver treatment to those with self-limiting illnesses and minor injuries. Prior to assessment, it may often be unclear whether the illness is life-threatening and whether the injuries are indeed minor.

Current systems of classification of diagnoses do not adequately indicate the severity of a particular problem, and measures of urgency are incommensurable between ED, A&M and GP contexts. The partitioning of diagnoses between services suggests a significant difference between their patients, but accurate determination of the most appropriate context of care would require a purpose-designed index.

The processes of data cleaning and coding detailed in this report describe the work that was necessary to arrive at a data set that allowed reliable comparisons among the four EDs. In future it would be desirable to co-ordinate data recording and standardise data coding so that comparisons could be more complete and reliable.

The delivery of urgent and after-hours care is a topic of current public discussion. There is dispute as to whether all GPs should be responsible for offering 24-hour care; there are financial barriers for people wishing to use A&M centres, which are not eligible for the increasing subsidies available to PHOs; and people with less serious problems at EDs may delay care for emergency cases, strain fixed hospital budgets and – possibly – cost more to look after than when seen in general practice.

In developing policy to resolve these issues, the following points may be drawn from this work.

- The availability of local services and details of healthcare-seeking behaviour are likely to vary considerably, and district-specific solutions will be needed.
- In particular, geographical differences (city, rural, or city and rural hinterland) will dictate different solutions. For example, the choice of an efficient solution

may depend on volume: in smaller centres two sets of professionals working, or on call, after-hours may not be justified.

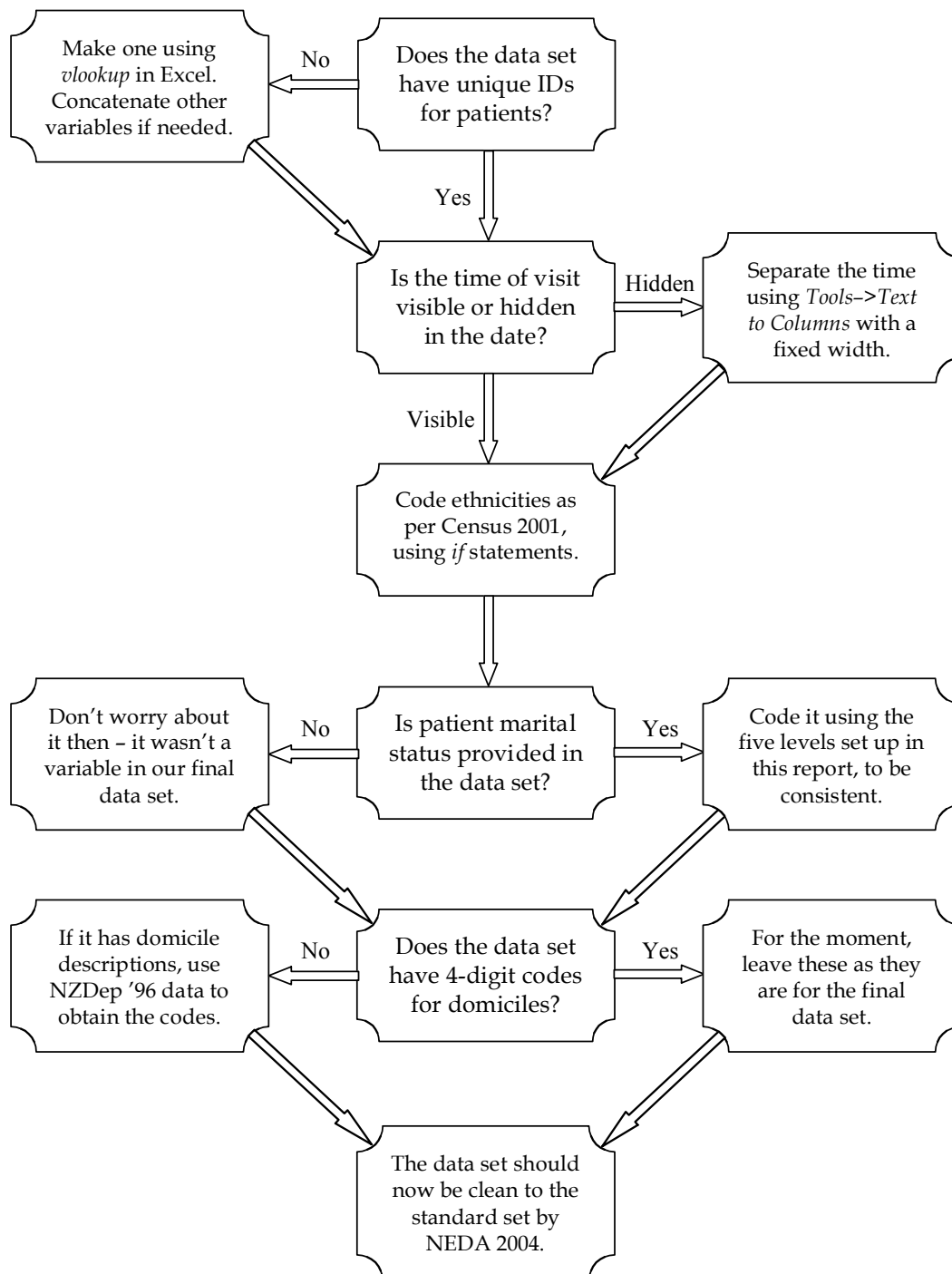
- For maximum use to be made of community-based services, financial barriers to after-hours care need to be addressed.
- Comparing and evaluating services (and combinations of services) requires the collection of consistent data and measurements of urgency and severity not available at present.
- Assessment of a service (or combinations of services) requires at least follow-up and, ideally, outcome data.
- Only when such comparisons can be reliably made will it be possible to address variations in rates of use and admission.

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Appendix: Data Processing

In order to do the analysis described herein, the data sets that were received from the four EDs had to be checked, restructured, coded, collated and documented in various ways. This was necessary to get all raw data sets into a compatible form, but some variables had to be converted to codes for the useful presentation of the results. Below is a flowchart that summarises the steps taken in preparation of the data for analysis.



Glossary and Abbreviations

Actions: actions undertaken by a GP – including prescribing, dressings, physical treatment, surgery, screening procedures, immunisation, reassurance, counselling and certification.

A&Ms: Accident and Medical clinics – these provide extended-hours primary health care cover and allow access without an appointment. The majority are situated in Auckland or Hamilton.

ATC: Anatomical Therapeutic Chemical – a system for classifying pharmaceuticals.

BP: blood pressure.

Community-governed practices: primary health care providers whose governance rests with a community body and in which the practitioners and other workers do not share profits.

ED: Emergency Department – operated at the public hospital in each large town.

GP: general practitioner.

Independent practitioners: self-employed practitioners not belonging to an IPA.

IPA: Independent Practitioners' Association – undertakes contract negotiations, administrative functions and programme development for a group of GPs.

NatMedCa: National Primary Medical Care Survey 2001/02, of which this document is the eighth report.

NEDA: NatMedCa Emergency Departments Analysis.

NSAIDs: Non-steroidal anti-inflammatory drugs.

PHO: Primary Health Organisation.

Problems: issues identified by GPs for which the patient requires assistance; they include standard (including provisional) diagnoses, symptoms, psycho-social difficulties, the need for prescription medicines, practitioner-identified issues, administrative tasks and prevention or screening.

Problem status: new – first presentation of a problem; short-term follow-up – review of a problem expected to resolve completely; long-term follow-up – review of a chronic problem; long-term with flare-up – a chronic problem with deterioration or new complication; preventive – a visit for screening or immunisation, etc.

READ: a classification and coding system for reason-for-visit and diagnosis in primary medical care, officially adopted in New Zealand.

Referral: the direction of a patient to an additional source of care.

Severity: a GP's assessment of the capacity for harm of the most severe of the patient's problems; this covers life-threatening (applies only to a new problem), intermediate and self-limiting.

Treatment: synonymous with action.

Urgency: a GP's assessment, in hindsight, of the time within which the patient should have been seen; applied to the most urgent problem detected.

Visit: an interaction between GP and patient; synonymous with consultation and encounter.

White Pages listings: the section of the telephone directory that lists medical practitioners and clinics.