Analysis of presenting symptoms and diagnoses made at Middlemore Hospital: an audit carried out between Monday 1 August and Sunday 7 August 2016

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ABSTRACT

AIMS: Perform an audit which identifies the breadth and commonality of presenting complaints and diagnoses presenting to Middlemore Hospital over a one-week period in August 2016.

METHODS: Two thousand and eleven patients attended Middlemore Hospital over one week in winter 2016, with 53 patients excluded. Information from the remaining 1,958 patient discharge summaries were obtained and made confidential for coding purposes.

RESULTS: Of 1,958 patients, there were 78 different presenting complaints, with 444 individual final diagnoses. The five most common complaints were cough (n=158, 8.1%), chest pain (n=133, 6.8%), shortness of breath (n=92, 4.7%), finger pain (n=69, 3.5%) and collapse (n=59, 3.0%). Viral illness (n=84, 4.3%), pneumonia (n=83, 4.3%) and laceration/incised wound (n=75, 3.8%) were the three most common diagnoses. With hindsight, only 2 of the 25 most common diagnoses could be classified as severe conditions—often associated with high morbidity or mortality.

CONCLUSIONS: Numerous patients are diagnosed with mild conditions after work-up in the emergency department, however a broad diagnostic approach is required by junior clinicians given the possibility of more worrying diagnoses. An analysis of specific markers used by junior clinicians to aid differential diagnosis shows that not all signs and symptoms are required to make common diagnoses. For example, the absence of a documented fever, raised CRP or both, does not rule out significant infection in the case of pneumonia, urinary tract infection and cellulitis. This audit contributes to understanding the case-mix within the emergency department at Middlemore Hospital and allows for tailoring of service delivery and education of junior clinicians.

Rising presentations to hospitals is leading to over-burdening of healthcare professionals.[1] With this comes an increased requirement for junior staff to make more important decisions in patient care.[2] It is therefore important for junior staff, especially those working in emergency departments (EDs) to understand the presentations that currently attend and the most common diagnoses that are made.

Enhanced knowledge of what comes through the door can allow for understanding of the relationship between the main presenting symptom with the doctor's final diagnosis. Common diseases can be evaluated to identify whether key features are present or absent. This knowledge can then be used to streamline patient care and tailor service delivery, educate staff, prepare students for placements within the department and promote positive patient outcomes.

Herein, we aimed to perform an audit which identifies both the breadth and commonality of presenting complaints and diagnoses presenting to the Middlemore Hospital in a one-week period in August 2016.

Methods

Inclusion criteria

Patients attending Middlemore Hospital over the week of Monday 1 August to Sunday 7 August 2016. This included both patients who were referred to hospital from alternative health providers and who self-presented, and by any mode of transport (eg, private car, ambulance and walk-in were all counted)

Exclusion criteria

Insufficient information on discharge summary to enable coding, or patients leaving the hospital prior to being seen by a doctor.

Two thousand and eleven patients attended Middlemore Hospital over the week, with 53 patients excluded. Information (presenting complaint, final diagnosis, demographics, history, examination and investigation findings) from the remaining 1,958, patient discharge summaries were obtained and made confidential for coding purposes. Where a patient presented with more than one symptom, the most troubling symptom to the patient was coded. Ethics consent was approved by Counties Manukau District Health Board.

Results

Most common presenting symptoms

Of 1,958 patients, 78 individual presenting symptoms were found. The 20 most common presenting symptoms over the week are shown in Table 1. They accounted for 58.5% of all presentations.

Analysis of five most common presenting symptoms

The age groups and final diagnoses for the five most common presenting symptoms are shown below.

Table 1: Twenty most common presenting symptoms for patients presenting to Middlemore Hospital ED from 1 August 2016 to 7 August 2016.

Commonality	Presenting symptom	Patients	%	Accumulative %
1	Cough	158	8.1	8.1
2	Chest pain	133	6.8	14.9
3	Shortness of breath	92	4.7	19.6
4	Finger pain	69	3.5	23.1
5	Collapse	59	3.0	26.1
6	Head injury	57	2.9	29.0
7	Central/generalised abdominal pain	53	2.7	31.7
8	Leg pain	46	2.3	34.0
9	Seizure	46	2.3	36.3
10	Hand pain	44	2.2	38.5
11	Fever	43	2.2	40.7
12	Vomiting	43	2.2	42.9
13	Facial pain	41	2.1	45.0
14	Epigastric pain	40	2.0	47.0
15	Lower back pain	40	2.0	49.0
16	Wheeze	39	2.0	51.0
17	Knee pain	38	1.9	52.9
18	Headache	37	1.9	54.8
19	Rash	37	1.9	56.7
20	Flank pain	36	1.8	58.5

Cough (1)

Table 2: Age groups of patients presenting to Middlemore Hospital ED with cough from 1 August 2016 to 7 August 2016.

Age bracket	Patients	%	Accumulative %
0–1	75	47.5	47.5
2–5	21	13.3	60.8
6–12	12	7.6	68.4
13–17	4	2.5	70.9
18–34	9	5.7	76.6
35–49	7	4.4	81.0
50–64	15	9.5	90.5
65+	15	9.5	100.0

Table 3: Final diagnoses of patients presenting to Middlemore Hospital ED with cough from 1 August 2016 to 7 August 2016.

Diagnosis	Patients	%	Accumulative %
Viral illness	52	32.9	32.9
Pneumonia	39	24.7	57.6
Bronchiolitis	32	20.3	77.8
Croup	8	5.1	82.9
Asthma exacerbation	5	3.2	86.1
COPD exacerbation	5	3.2	89.2
Viral or exercise-induced wheeze	5	3.2	92.4
Acute bronchitis	2	1.3	93.7
Habitual cough	2	1.3	94.9
Bronchiectasis	1	0.6	95.6
Influenza	1	0.6	96.2
Medications	1	0.6	96.8
Metastatic disease	1	0.6	97.5
Multiple myeloma	1	0.6	98.1
Pleurisy	1	0.6	98.7
Throat foreign body	1	0.6	99.4
Thyrotoxicosis	1	0.6	100.0

Chest pain (2)

Table 4: Age groups of patients presenting to Middlemore Hospital ED with chest pain from 1 August 2016 to 7 August 2016.

Age bracket	Patients	%	Accumulative %
0–1	0	0.0	0.0
2–5	0	0.0	0.0
6–12	1	0.8	0.8
13–17	6	4.5	5.3
18–34	21	15.8	21.1
35–49	22	16.5	37.6
50–64	31	23.3	60.9
65+	52	39.1	100.0

Table 5: Final diagnoses of patients presenting to Middlemore Hospital ED with chest pain from 1 August 2016 to 7 August 2016.

Diagnosis	Patients	%	Accumulative %
Non-cardiac chest pain	41	30.8	30.8
Costochondritis	20	15.0	45.9
Non-STEMI	13	9.8	55.6
Gastro-oesophageal reflux disease (GORD)	8	6.0	61.7
Spontaneous/no cause found	7	5.3	66.9
Pneumonia	6	4.5	71.4
Rib fracture	5	3.8	75.2
STEMI	4	3.0	78.2
Atrial fibrillation	3	2.3	80.5
Gastritis	3	2.3	82.7
Rib sprain	3	2.3	85.0
SVT	3	2.3	87.2
Alcohol toxicity	2	1.5	88.7
Anxiety	2	1.5	90.2
Chest wall injury	2	1.5	91.7
Pneumothorax	2	1.5	93.2
Asthma exacerbation	1	0.8	94.0
Atrial flutter	1	0.8	94.7
Coronary artery spasm	1	0.8	95.5
Acute Heart Failure	1	0.8	96.2
Metastatic disease	1	0.8	97.0
Pulmonary embolism (PE)	1	0.8	97.7
Stable angina	1	0.8	98.5
Takotsubo syndrome	1	0.8	99.2
Unstable angina	1	0.8	100.0

Shortness of breath (3)

Table 6: Age groups of patients presenting to Middlemore Hospital ED with shortness of breath from 1 August 2016 to 7 August 2016.

Age bracket	Patients	%	Accumulative %
0–1	14	15.2	15.2
2–5	3	3.3	18.5
6–12	1	1.1	19.6
13–17	3	3.3	22.8
18–34	12	13.0	35.9
35–49	7	7.6	43.5
50–64	19	20.7	64.1
65+	33	35.9	100.0

Table 7: Final diagnoses of patients presenting to Middlemore Hospital ED with shortness of breath from 1 August 2016 to 7 August 2016.

Diagnosis	Patients	%	Accumulative %
Pneumonia	13	14.1	14.1
COPD exacerbation	12	13.0	27.2
Bronchiolitis	10	10.9	38.0
Asthma exacerbation	8	8.7	46.7
Viral illness	8	8.7	55.4
Congestive heart failure	5	5.4	60.9
Bronchiectasis exacerbation	4	4.3	65.2
Iron deficiency anaemia	4	4.3	69.6
Anxiety	3	3.3	72.8
Atrial fibrillation	3	3.3	76.1
Pulmonary embolism (PE)	3	3.3	79.3
Influenza	2	2.2	81.5
Spontaneous/no cause found	2	2.2	83.7
Acute bronchitis	1	1.1	84.8
Anaphylaxis	1	1.1	85.9
Autoimmune haemolytic anaemia	1	1.1	87.0
Bronchiolitis obliterans	1	1.1	88.0
Chronic obstructive pulmonary disease	1	1.1	89.1
Empyema	1	1.1	90.2
Hypothyroidism	1	1.1	91.3
Medications	1	1.1	92.4
Pleural affusion	1	1.1	93.5
Pneumothorax	1	1.1	94.6
Post-procedure	1	1.1	95.7
Post-surgery	1	1.1	96.7
Pulmonary hypertension	1	1.1	97.8
Pulmonary oedema	1	1.1	98.9
Reflux oesophagitis	1	1.1	100.0

Finger pain (4)

Table 8: Age groups of patients presenting to Middlemore Hospital ED with finger pain from 1 August 2016 to 7 August 2016.

Age bracket	Patients	%	Accumulative %
0–1	3	4.3	4.3
2–5	7	10.1	14.5
6–12	3	4.3	18.8
13–17	10	14.5	33.3
18–34	20	29.0	62.3
35–49	15	21.7	84.1
50–64	9	13.0	97.1
65+	2	2.9	100.0

Table 9: Final diagnoses of patients presenting to Middlemore Hospital ED with finger pain from 1 August 2016 to 7 August 2016.

Diagnosis	Patients	%	Accumulative %
Laceration/incised wound	12	17.4	17.4
Phalangeal fracture—non-displaced	7	10.1	27.5
Finger sprain	6	8.7	36.2
Tuft fracture	6	8.7	44.9
Nailbed injury	5	7.2	52.2
Phalangeal fracture—intra articular	4	5.8	58.0
Phalangeal fracture—displaced	3	4.3	62.3
Traumatic amputation	3	4.3	66.7
Dorsal phalangeal dislocation	2	2.9	69.6
Flexor tendon rupture	2	2.9	72.5
Nail avulsion	2	2.9	75.4
Avulsion fracture	2	2.9	78.3
Terminalisation of finger	2	2.9	81.2
Abrasion	1	1.4	82.6
Abscess non-fingertip/felon	1	1.4	84.1
Animal bite	1	1.4	85.5
Cellulitis	1	1.4	87.0
Crush injury	1	1.4	88.4
Flexor tendon injury	1	1.4	89.9
Infected wound	1	1.4	91.3
Mallet finger	1	1.4	92.8
Osteomyelitis	1	1.4	94.2
Paronychia	1	1.4	95.7
Post-procedure	1	1.4	97.1
Subungual haematoma	1	1.4	98.6
Tenosynovitis	1	1.4	100.0

Table 10: Age groups of patients presenting to Middlemore Hospital ED with collapse from 1 August 2016 to 7 August 2016.

Age bracket	Patients	%	Accumulative %
0–1	0	0.0	0.0
2–5	0	0.0	0.0
6–12	0	0.0	0.0
13–17	3	5.1	5.1
18–34	8	13.6	18.6
35–49	3	5.1	23.7
50–64	8	13.6	37.3
65+	37	62.7	100.0

Collapse (5)

Table 11: Final diagnoses of patients presenting to Middlemore Hospital ED with collapse from 1 August 2016 to 7 August 2016.

Diagnosis	Patients	%	Accumulative %
Vasovagal syncope	18	30.5	30.5
Unknown cause	8	13.6	44.1
Mechanical	6	10.2	54.2
Postural hypotension	5	8.5	62.7
Cardiovascular accident (CVA)	2	3.4	66.1
Cerebellar CVA	2	3.4	69.5
Complicated peptic ulcer	2	3.4	72.9
Hypoglycaemia	2	3.4	76.3
Myocardial infarct	2	3.4	79.7
Atrial fibrillation	1	1.7	81.4
Alcohol intoxication	1	1.7	83.1
Aortic stenosis	1	1.7	84.7
Dehydration	1	1.7	86.4
Influenza	1	1.7	88.1
Pneumonia	1	1.7	89.8
Obstructive sleep apnoea	1	1.7	91.5
Subdural haematoma	1	1.7	93.2
Tertiary heart block	1	1.7	94.9
Transient ischaemic attack	1	1.7	96.6
Urinary tract infection	1	1.7	98.3
VF or VT	1	1.7	100.0

Most common final diagnoses across all presenting complaints

There were 444 individual diagnoses made across 1,958 patients. The most common diagnoses across all presenting complaints are shown in Table 12.

Further analysis for selected diagnoses

We analysed four diagnoses to see whether specific markers were present or absent. The diagnoses chosen were those that were common and therefore had enough patients

Table 12: Twenty-five most common diagnoses of patients presenting to Middlemore Hospital ED from 1 August 2016 to 7 August 2016 across all presenting complaints.

Commonality	Diagnosis	Patients	%	Severity*
1	Viral illness	84	4.3	Mild
2	Pneumonia	83	4.2	Severe
3	Laceration/incised wound	75	3.8	Medium
4	Bronchiolitis	57	2.9	Medium
5	Unknown cause	47	2.4	Mild
6	Non-cardiac chest pain	41	2.1	Mild
7	Spontaneous/no cause found	41	2.1	Mild
8	Non-specific abdominal pain	40	2.0	Mild
9	Gastroenteritis	36	1.8	Medium
10	Asthma exacerbation	29	1.5	Medium
11	Cellulitis	28	1.4	Medium
12	Costochondritis	28	1.4	Mild
13	Minor head injury	26	1.3	Mild
14	UTI	25	1.3	Medium
15	Epilepsy	23	1.2	Mild
16	Medications	23	1.2	Medium
17	COPD exacerbation	22	1.1	Medium
18	Gastritis	22	1.1	Mild
19	Lumbago	22	1.1	Mild
20	Constipation	20	1.0	Mild
21	Vasovagal syncope	20	1.0	Mild
22	Post-surgery	19	1.0	Medium
23	Renal colic	19	1.0	Medium
24	STEMI + non-STEMI	18	0.9	Severe
25	Viral/exercise induced wheeze	17	0.9	Medium

*Severity of diagnosis was decided using past medicolegal protection case reports.

to examine the variables associated with it. The specific markers chosen were always recorded for each respective diagnosis, and are markers that junior clinicians often use to include or exclude conditions in their differential diagnoses.

Pneumonia

Table 13: Maximum CRP blood test results for patients diagnosed with pneumonia (n=83).

CRP>50	Patients	%
No	72	86.7
Yes	11	13.3

(NB: For the 11 patients with a CRP>50, the average result was 130).

Table 14: Objective fevers of >37.9°C on presentation to hospital in patients diagnosed with pneumonia (n=83).

Objective temp >37.9°C	Patients	%
No	61	73.5
Yes	22	26.5

Urinary tract infections

Table 15: Maximum CRP blood test results for patients diagnosed with urinary tract infections (n=35).

CRP>50	Number patients	%
No	31	88.6
Yes	4	11.4

Table 16: Objective fevers of >37.9°C on presentation to hospital in patients diagnosed with urinary tract infections (n=35).

Temp >37.9°C	Number patients	%
No	32	91.4
Yes	3	8.6

Cellulitis

Table 17: Objective fevers of >37.9°C on presentation to hospital in patients diagnosed with cellulitis (n=28).

Temp >37.9°C	Number patients	%
No	27	96.4
Yes	1	3.6

Renal colic

Table 18: Presence of microscopic haematuria in patients diagnosed with renal colic (n=19).

Urine RCC normal	Number patients	%
No	16	84.2
Yes	3	15.8

Discussion

Of 1,958 patients presenting to Middlemore Hospital that week, there were 78 different presenting complaints, with 444 individual final diagnoses. Across the entire population, the gender distribution was similar with a slight female (n=992, 50.7%) to male (n=965, 49.3%) predominance. The most represented age brackets were 18–34 (n=440, 22.5%) and 65+ (n=391, 20.0%) years, followed by 50–64 (n=320, 16.3%), 35–49 (n=281, 14.4%), 0–1 (n=197, 10.1%), 2–5 (n=134, 6.8%), 13–17 (n=113, 5.8%) and 6–12 (n=81, 4.1%) year brackets. This was expected given the young demographics of the Counties Manukau District Health Board,[3] and indicates that the analysed data may not be attributable to other DHBs with a population of higher than average age.

The five most common presenting complaints that week were cough, chest pain, shortness of breath, finger pain and collapse.

Cough was the most common presenting complaint that week (n=158, 8.1%). The age demographic data shows that this presentation was mostly a young patient presentation, with the 0–1 year age bracket accounting for 47.5% of presentations and the 2–5 year group accounting for another 13.3%—meaning that over 60% of those with cough as the primary presenting complaint are were under six years of age. Patients over 65 only represented 9.5% of cases. The top three diagnoses found after a patient presented with cough were viral illness (n=52, 32.9%), pneumonia (n=39, 24.7%) and bronchiolitis (n=32, 20.3%). These three diagnoses made up 77.8% of all presentations of cough. As viral illness and bronchiolitis are generally more mild conditions with the mainstay of management being supportive, this data shows that the main worrying condition a clinician should rule out is pneumonia when faced with a

patient presenting with cough. Two diagnoses within the cough presentation had with only one patient, and were not necessarily obvious causes of cough; multiple myeloma and thyrotoxicosis. This data shows the importance of a broad diagnostic view for the clinician, especially if the history and examination findings do not fit with most common diagnoses.

The second most common presenting complaint was chest pain (n=133, 6.8%). Unsurprisingly, this presentation was seen more commonly in older age groups, with over 65s representing 39.1%, and 50–64 year-olds 23.3% of all chest pain presentations. There was a slight male (n=71) to female (n=62) predominance (data not shown). Six of the top 10 diagnoses made within the chest pain presentation were relatively minor diagnoses whose treatment consists of analgesia with or without antacids (non-cardiac chest pain, costochondritis, GORD, spontaneous/no cause found, rib fracture and gastritis). These, alongside other minor diagnoses such as rib sprain, anxiety/behavioural and chest wall injury made up 68.6% of all cases of chest pain presenting to Middlemore Hospital that week. However, there were also three more severe diagnoses in the 10 most common diagnoses made, with non-STEMI, STEMI and pneumonia making up a total of 17.3% of all cases of chest pain. There were also several severe diagnoses made with only one patient, such as Takotsubo syndrome and PE, showing that again a broad diagnostic approach is needed with chest pain presentations.

Shortness of breath was the third most common presenting complaint (n=92, 4.7%). This showed a bimodal age distribution with over-65 year-olds, and 0–1 year-olds, representing 35.9% and 15.2% respectfully. This contrasts the cough presentation which was a younger patient presentation. The analysis of diagnoses made under the shortness of breath category showed that the presentation of shortness of breath is more worrying than that of cough, with severe diagnoses being more common. Pneumonia was first (n=13, 14.1%), COPD exacerbation second (n=12, 13%) and asthma exacerbation (n=8, 8.7%) fourth most common in the shortness of breath category. This also shows that pneumonia can present with, and is common in, three separate presentations of cough, chest pain and shortness of breath. The breadth of diagnosis was the largest for the shortness of breath category with 28 different diagnoses made within a week. The 10 most common diagnoses made up only 76.1% of all diagnoses made, showing the other 23.9% were made across the other 18 diagnoses. Fifteen of those 18 were made up of only one patient.

The fourth most common presenting symptom was finger pain (n=69, 3.5%). This is unsurprising as Middlemore Hospital is the location for Auckland's regional plastic reconstructive and hand surgery service, and therefore receives referrals from the entire Auckland region including Auckland City and North Shore Hospitals. The most common age group was the 18–34 age group (n=20, 29%), which was also unsurprising given that this group of males often work in industries which involve machinery and hand tools with a high chance of injuries to the hand. There were 26 different final diagnoses made, 13 of which had only one patient. 92.8% of the presentations included trauma, but only 31.9% of cases had a fracture diagnosis (data not shown).

Collapse was the fifth most common presenting complaint across the week (n=59, 3.0%). This presentation was seen most often in the over 65-year-old age group (n=37, 62.7%), with no patient under 13 seen with this presentation at all. The top four diagnoses were all minor (vasovagal syncope, unknown cause, mechanical and postural hypotension) and made up 62.7% of all cases. However, the rarer causes were severe diagnoses, including cardiovascular accident, myocardial infarction and arrhythmias which can be fatal if missed, again highlighting the need for a broad diagnostic approach.

The 25 most common diagnoses made across the week are shown in Table 12. Viral illness (n=84, 4.3%), pneumonia (n=83, 4.3%) and laceration/incised wound (NB: both lacerations and incised wounds were grouped together and unable to be separated due to coding methodology) (n=75, 3.8%) were the three most common diagnoses. The inclusion of many respiratory conditions in the top 10 was expected given the audit took place in the middle of winter. We classified severity of all diagnoses made based on past medicolegal protection case reports. Only 2 of the top 25 diagnoses, pneumonia and STEMI/Non-STEMI, could be classified as severe and life-threatening. Eleven of the top 25 were classified as medium, which

reflected that these diagnoses sometimes caused morbidity and occasionally mortality, but also could have limited symptomatology and be self-limiting if a milder exposure.

The remaining 12 were classified as mild, which was defined as a diagnosis in which no cause was found, never caused death, rarely caused significant morbidity and was often self-limiting. Almost half of the top 25 diseases diagnosed at the emergency department fell into this category.

Junior doctors and students doing ED at Middlemore can expect to see a lot of patients on their rotations, as this hospital currently has the highest volumes of patients attending across Australasia with over 400 patients presenting daily.[4] This analysis shows that for the wide range of presenting complaints that they will be exposed to, a large proportion of patients are ultimately diagnosed with mild conditions; however, there is a significant requirement for a broad diagnostic approach by all clinicians so that severe conditions are not missed.

Some data is missing from our analysis which would be useful to include in future audits. Examples are; whether a patient was admitted to a specialty or not, and the total time that the patient spent in the emergency department (although captured in the Patient Management System (PMS), they were not recorded in this audit). These variables would be useful information to obtain, to see how many admissions were due to non-severe conditions, and whether severe diagnoses were seen quicker than those with milder conditions. The former could suggest how often other factors play a part in the decision to admit a patient or not, and the latter could look at the efficiency and effectiveness of the department to give timely care. The next stage could be to analyse a much larger dataset from one or more years, to understand whether the audit reflected the usual presentation and disease pattern. With the increase in access to big data, improved data recording and the ability to run computer programmes over large and complex data sets, a further analysis would be very doable, and the authors are keen to do this in the near future.

Moreover, this was a retrospective study and we did not follow up any of the admissions from the week to see if they were re-admitted later in the year; there was the chance that some patients had an alternative more severe diagnosis made subsequently after evolution of their pathology, but were missed from this analysis.

Our audit, alongside any additional information from future audits, does allow for tailoring of service delivery at CMDHB, perhaps by optimising appropriate use of general practitioners and alternative urgent care clinics. However, this information needs to be analysed with caution as doctors at such services have limited investigations at their disposal and severe conditions were only ruled out in this study with the benefit of hindsight. There are also complex socio-economic factors which should also be taken into account when considering why patients present to the emergency department.

We analysed four final diagnoses, to see whether specific markers were present or absent. Only 11% and 26.5% of patients with a diagnosis of pneumonia (n=83) had a CRP greater than 50, or an objective fever above 37.9°C respectively on their admission. This was 11.4% and 8.6% respectively for patients with a diagnosis of urinary tract infection (n=35). Only 1 of 28 cases of cellulitis had a documented fever above 37.9°C on their admission (3.6%), and 3 of 19 cases of renal colic did not show microscopic haematuria (15.8%). The former findings are important for medical students and junior doctors when assessing patients acutely; the absence of a documented fever, raised CRP or both, does not rule out significant infection. The finding of 15% of confirmed renal colic cases not having microscopic haematuria is consistent with the literature on the sensitivity of this finding.[5]

The results of this audit show the most common presenting complaints, with respective age brackets and breadth of final diagnosis, for patients presenting to Middlemore Hospital from 1 to 7 August 2016. Specific analysis of common diagnoses show that not all signs and symptoms are required for diagnosis. This information can be used to educate medical students and resident medical officers, prepare them for placements and remind them of the importance of a broad diagnostic approach. It will also contribute to understanding the case-mix within the Middlemore emergency department to allow for tailoring of service delivery, effective patient flows and enhancement of positive patient outcomes.

Competing interests:
Nil.
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