Predicting A&E Attendances at MDH
A Crystal Ball?

MICHAEL CIANTAR, MATTHEW CREMONA, NEVILLE CALLEJA, SANDRA DISTEFANO,
CLIFFORD DE RAFFAELE
Mater Dei A&E visits hit new high

The number of patients seeking medical attention at Mater Dei Hospital’s casualty department has hit a new high as the peak of summer hits in, this newspaper is informed.

Sources told this newsroom that there are no beds available so much so that beds in corridors are also scarce.

“Patients are burdened with having to wait for eight to 12 hours after being seen to by a doctor to be given a bed at the hospital.

Respiratory conditions are key factors in the ongoing surge.
WHY FORECAST IN HOSPITAL MANAGEMENT?

• Ageing population and increased demand for hospital services is pushing up utilisation of secondary health care resources.

• Peaks occur for a variety of reasons:
  - Seasonal influenza
  - Tourist peaks and events
  - Drops in temperature
  - Public holidays
PREDICTING ALCOHOL RELATED A&E ADMISSIONS

1. Initiative by 2 Information System Strategy students at Middlesex University
2. To relate alcohol related admissions to entertainment events in Malta
3. To develop a Facebook API which would identify such events & the number of people interested
4. To relate the two datasets & develop a model to predict future alcohol related admissions
METHODS

• Alcohol-related admissions 2012-2015 from Mater Dei Hospital
• Analysis to obtain patterns of patient intake
• Build probability model based on these patterns
• Two predictions methods tested:
  • Seasonal 3-period moving averages
  • Exponential forecasting methods
PATTERNS

• Seasonality
• Weekdays vs weekends/public holidays
• Age group
• Gender
Distribution by type of day

- Eve of PH: 22
- Pub Hol: 36
- Weekend: 27
- Weekday: 15
LIMITATIONS OF THIS EXERCISE

• Facebook API could not limit itself to activities occurring in Malta only.

• Only public events could be captured.

• Model would improve further with the inclusion of:
  • weather data and weather forecasts
  • Events publicised on websites like visitmalta.com
IMPLICATIONS

• Admissions to A&E and hospital are largely predictable.

• Modelling could lead to better planning of elective care and resources, engaging with primary care and public health (health education, infectious diseases)

• Such modelling has a role in planning for seasonal influenza peaks, especially when adding external data such as temperature and primary care influenza surveillance data to similar models.