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Clinical outcomes of weekend psychiatric hospital admission

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South London and Maudsley NHS Foundation Trust

NHS

Journal of the Royal Society of Medicine, 2012

RESEARCH

Weekend hospitalization and additional risk of death: An analysis of inpatient data

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BMJ 2015

ANALYSIS

Increased mortality associated with weekend hospital admission: a case for expanded seven day services?

Nick Freemantle and colleagues discuss the findings of their updated analysis of weekend admissions and the implications for service design

Nick Freemantle *professor of clinical epidemiology and biostatistics*[1 2], Daniel Ray *professor of health informatics*[2 3 4], David McNulty *medical statistician*[2 3], David Rosser *medical director*[5], Simon Bennett *director, clinical policy and professional standards*[6], Bruce E Keogh *national medical director*[6], Domenico Pagano *professor, cardiac surgery*[2 7]

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Healthcare Network workforce development

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Health

NHS weekend: 7-day services explained

6 September 2015 | Health

o.uk/news/business

COMMENT: It's now or never
ay NHS

DATED: 01:23, 19 May 2015

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ion of the medical Establishment, anyone might think David Cameron
National Health Service.

he opposite: an NHS providing a full range of services, seven days a
injection of taxpayers' money.

at a time when patients are 16 per cent more likely to die if they are
day than a Wednesday?

News coverage

News coverage

Relevance to mental healthcare

- According to Jeremy Hunt, the seven-day NHS will provide:

  ‘Timely consultant review when a patient is first admitted, access to key diagnostics, consultant directed interventions, ongoing consultant review in high dependency areas**, and proper assessment of mental health needs**’ [1]

[1] Seven day working: why the health secretary’s proposal is not as simple as it sounds BMJ 2015; 351:h4473 (Published 05 September 2015)

SLaM BRC Case Register

- South London and Maudsley (SLaM) NHS Foundation Trust
- Comprises pseudonymised electronic health records of over 250,000 patients receiving care from a large provider of secondary mental healthcare
- Case register is updated daily with new clinical data
- Ethical approval permits searching records for clinical research and internal audit as long as individual patients are not identified
- Individual projects approved by patient led committee
- Patients are able to opt-out of the case register at any time (retrospectively and prospectively)

Weekend psychiatric outcomes

- 45,264 psychiatric hospital admissions
  - 1st April 2006 to 31st March 2015
- Predictor: weekend admission
  - Weekend: Saturday, Sunday, UK bank holiday
- Outcomes:
  - Inpatient mortality
  - Duration of hospital admission
  - Number of readmissions in 12 months after discharge

Covariates

- Age
- Gender
- Ethnicity
- Mode of admission (whether admitted compulsorily under the UK Mental Health Act)
- Source of admission
- Length of admission

Additional outcomes

- Descriptive statistics by day of week for:
  - Number of inpatient deaths
  - Number of admissions
  - Number of discharges
  - Number of seclusions
  - Number of violent incidents

Extracting and analysing data

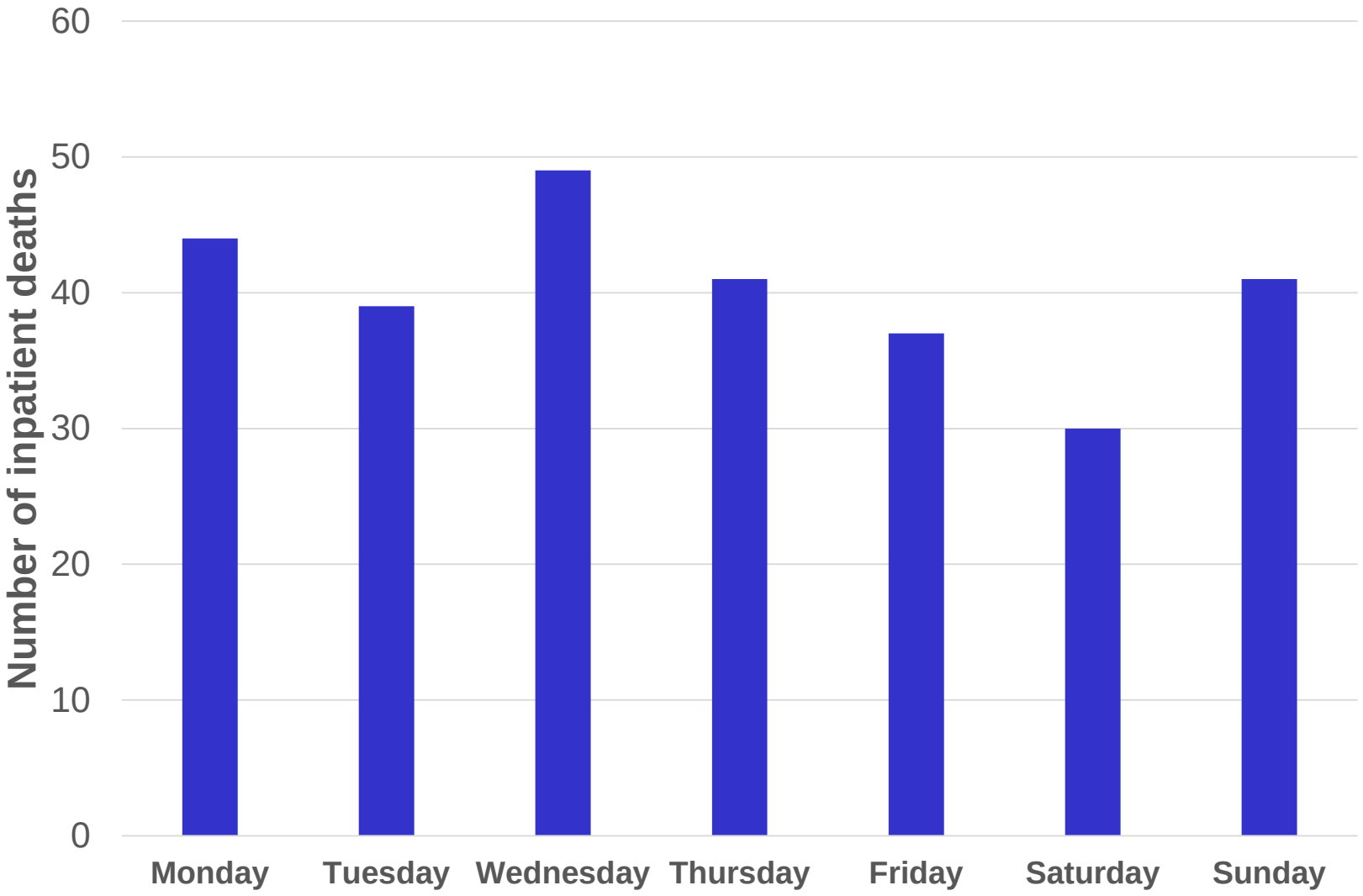
- Data from SLaM BRC Case Register are extracted using Microsoft Structured Query Language (SQL)
  - Clinical Record Interactive Search tool (CRIS)
- A unique identifier for each patient allows data from different parts of the case register to be joined, recoded and analysed while still pseudonymised
- Strict data security – can never leave NHS firewall
- Data comprise:
  - Structured text fields (e.g. demographics)
  - Unstructured “free” text (e.g. clinical notes/letters)

Results

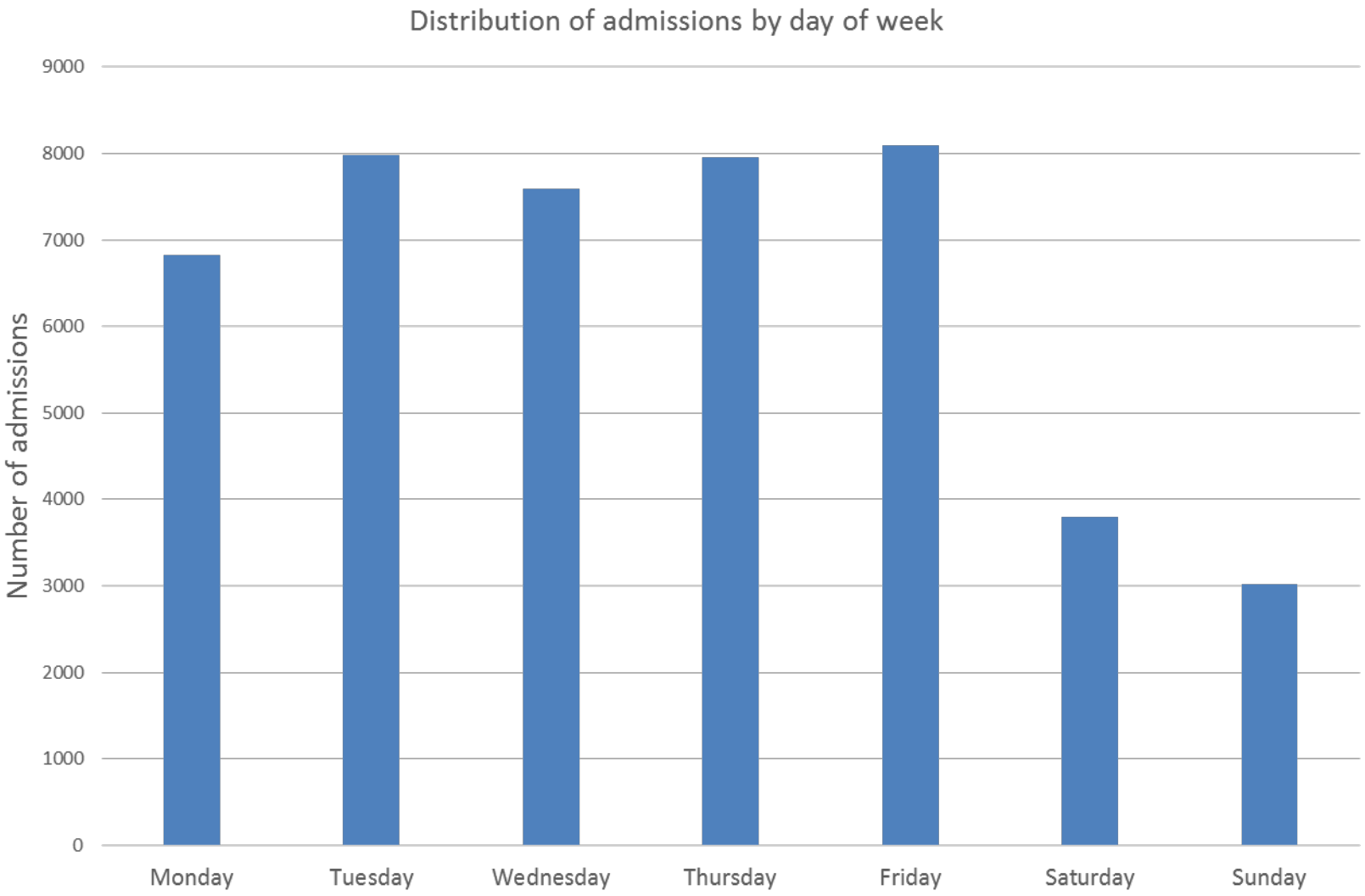
Factor	Group	Number in sample	Percentage admitted on a weekend	Unadjusted odds ratio	95% confidence interval, p value	*Adjusted odds ratio	95% confidence interval, p value
Age	16-25 years	4730	15.8%	0.98	0.89 to 1.07, p=0.66	0.88	0.80 to 0.97, p=0.01
	26-35	9448	19.1%	1.23	1.14 to 1.32, p<0.001	1.15	1.07 to 1.24, p<0.001
	36-45	11218	16.1%	Reference		Reference	
	46-55	10667	15.9%	0.98	0.92 to 1.06, p=0.66	1.02	0.95 to 1.10, p=0.61
	56-65	4548	16.0%	0.99	0.90 to 1.09, p=0.87	1.02	0.93 to 1.13, p=0.65
	>65	4653	11.2%	0.65	0.59 to 0.73, p<0.001	0.68	0.61 to 0.75, p<0.001
Gender	Female	20816	16.5%	1.05	1.00 to 1.10, p=0.06	1.06	1.01 to 1.12, p=0.02
	Male	24448	15.8%	Reference		Reference	
Ethnicity	White	25959	15.1%	Reference		Reference	
	Asian	2124	15.8%	1.05	0.93 to 1.19, p=0.44	1.00	0.89 to 1.14, p=0.95
	Black	14801	17.6%	1.20	1.31 to 1.26, p<0.001	1.13	1.06 to 1.19, p<0.001
	Other ethnic group	2380	18.4%	1.26	1.13 to 1.41, p<0.001	1.14	1.02 to 1.27, p=0.02
Mode of admission	Admitted voluntarily	32935	16.2%	Reference		Reference	
	Admitted compulsorily	12329	15.9%	0.98	0.92 to 1.03, p=0.42	0.85	0.80 to 0.91, p<0.001
Source of admission	Home	18262	8.1%	Reference		Reference	
	Acute hospital	14668	25.1%	3.79	3.55 to 4.05, p<0.001	3.76	3.52 to 4.01, p<0.001
	Other psychiatric hospital	4112	21.5%	3.10	2.83 to 3.40, p<0.001	3.09	2.82 to 3.39, p<0.001
	Criminal justice system	1983	19.9%	2.81	2.49 to 3.18, p<0.001	2.88	2.53 to 3.27, p<0.001
	Other	6239	13.9%	1.83	1.67 to 2.00, p<0.001	1.75	1.60 to 1.92, p<0.001

***Adjusted for age, gender, ethnicity, mode of admission (whether admitted compulsorily under the UK Mental Health Act) and source of admission**

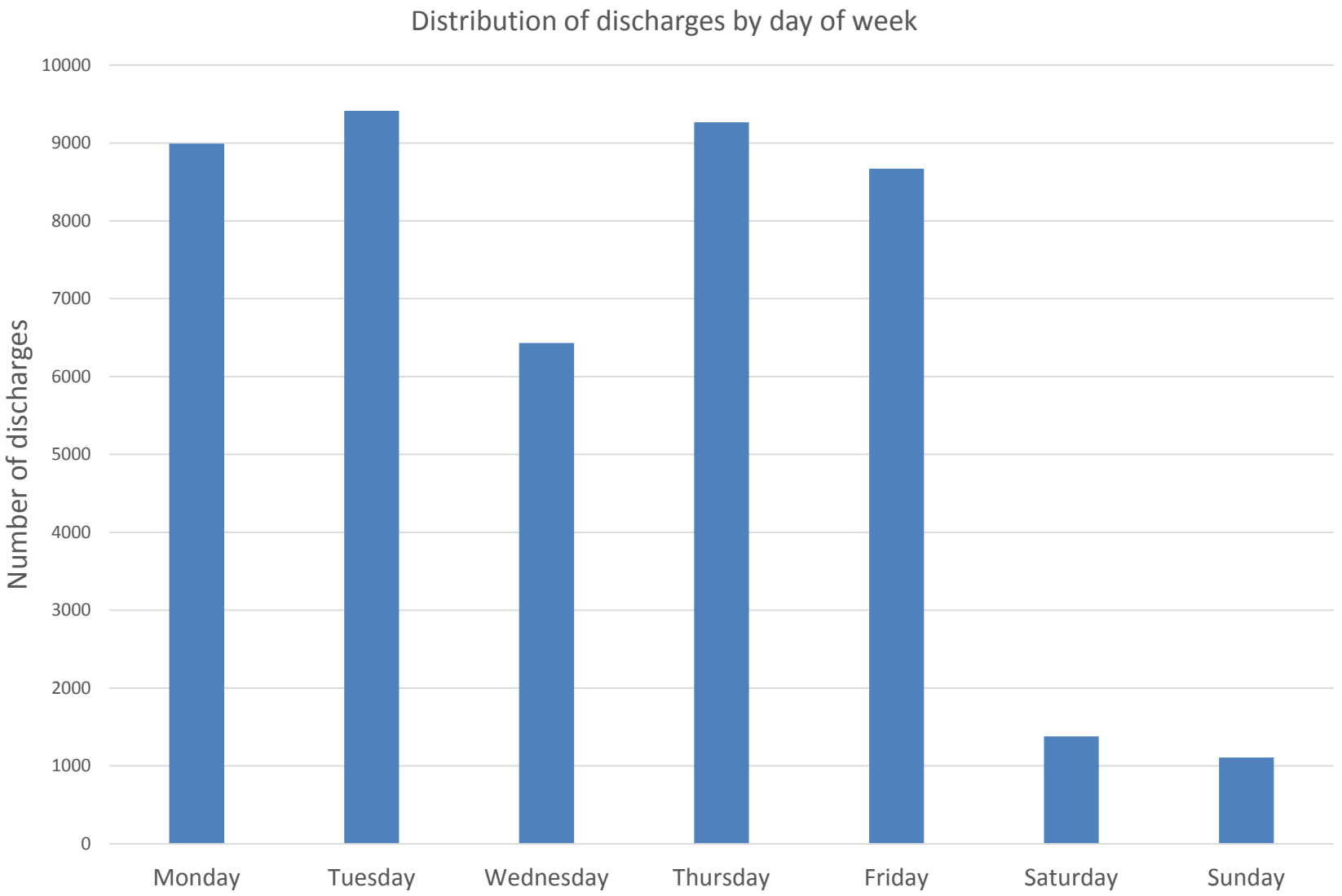
Results – inpatient deaths



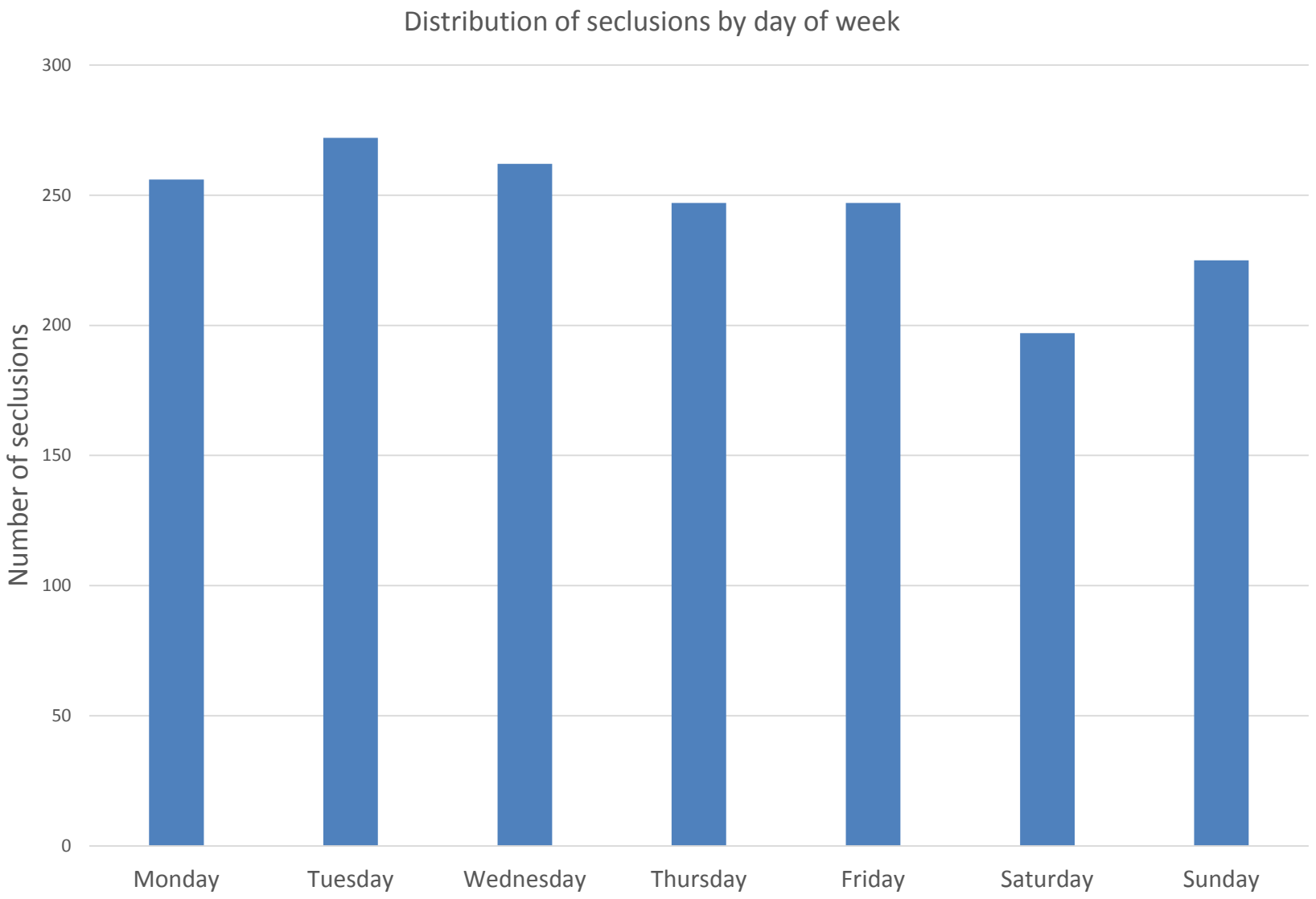
Results – admissions



Results – discharges



Results – seclusion



Results

Day of week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	χ^2 GOF
*Number of inpatient deaths (%)	44 (15.7%)	39 (13.9%)	49 (17.4%)	41 (14.6%)	37 (13.2%)	30 (10.7%)	41 (14.6%)	281 (100.0%)	5.2 (p=0.52)
*Number of admissions (%)	6821 (15.1%)	7982 (17.6%)	7595 (16.8%)	7958 (17.6%)	8094 (17.9%)	3794 (8.4%)	3020 (6.7%)	45264 (100.0%)	**4266.7 (p<0.001)**
*Number of discharges (%)	8993 (19.9%)	9414 (20.8%)	6432 (14.2%)	9268 (20.5%)	8671 (19.2%)	1378 (3.0%)	1108 (2.5%)	45264 (100.0%)	**12741.0 (p<0.001)**
+Number of seclusions (%)	256 (15.0%)	272 (15.9%)	262 (15.4%)	247 (14.5%)	247 (14.5%)	197 (11.6%)	225 (13.2%)	1706 (100.0%)	**15.8 (p=0.02)**
++Number of violent incidents (%)	149 (14.9%)	125 (12.5%)	147 (14.7%)	148 (14.8%)	155 (15.5%)	137 (13.7%)	140 (14.0%)	1001 (100.0%)	4.1 (p=0.66)

*Between 1st April 2006 and 31st March 2015 in any hospital ward
+Between 1st April 2006 and 31st March 2013 in a psychiatric intensive care unit
++Between 1st April 2008 and 31st March 2013 in a psychiatric intensive care unit

Results

Model	Death during admission+		Length of admission*		Number of readmissions+	
	Odds ratio	95% CI, p value	B coefficient (days)	95% CI, p value	Incidence rate ratio	95% CI, p value
Univariate	0.46	0.30 to 0.71, p<0.001	-26.0	-29.5 to -22.5, p<0.001	1.22	1.17 to 1.28, p<0.001
Multivariable	0.79	0.51 to 1.23, p=0.30	**-21.1**	**-24.6 to -17.6, p<0.001**	**1.13**	**1.08 to 1.18, p<0.001**

+Multivariable analysis adjusted for age, gender, ethnicity, mode of admission (whether admitted compulsorily under the UK Mental Health Act), source of admission and length of admission
***Multivariable analysis adjusted for age, gender, ethnicity, mode of admission (whether admitted compulsorily under the UK Mental Health Act) and source of admission**

Summary of results

- Weekend psychiatric admission was associated with:
  - Shorter duration of admission
  - Increased risk of readmission
  - No significant difference in risk of inpatient mortality
- This finding contrasts with previous studies in acute hospitals where weekend admission is typically associated with increased likelihood of inpatient mortality
  - Possibly explained by different clinical characteristics of patients admitted to a psychiatric hospital at the weekend (e.g. younger, fewer medical comorbidities)

Interpretation

- Shorter admissions/increased risk of readmission: younger patients, poor access to community support, possible exposure to alcohol/illicit substances
  - Crisis admission – quick resolution and discharge from hospital
  - BUT, not dealing with root cause of admission leading to increased risk of readmission – “revolving door”
- Fewer weekend compulsory admissions:
  - MHA assessment requires a lot of resources and often involve several days/weeks of planning (i.e. not always unscheduled)
- Source of admission:
  - Fewer admissions directly from home at the weekend as no community mental health services
  - More patients present via A&E/acute hospitals/police at the weekend

Interpretation

- Fewer weekend admissions but much fewer weekend discharges:
  - Often patients need social care set up in order to be discharged from hospital. Typically, this cannot happen at the weekend so very few patients are discharged on Saturday/Sunday.
  - Could this be changed?
  - Does this need to be changed?
- Reduced weekend seclusion:
  - Same number of violent incidents at the weekend
  - But fewer ward staff. Seclusion requires significant human resources to initiate and maintain.

Implications

- What do we mean by “seven-day mental health services”?
- Do we need more hospital and community services at the weekend?
- If so, should we reduce provision during the week?
- To what extent are healthcare outcomes determined by external factors (e.g. variation in social/occupational activity across the week, access to social care etc)?

Acknowledgements

- BRC Nucleus (SLaM):
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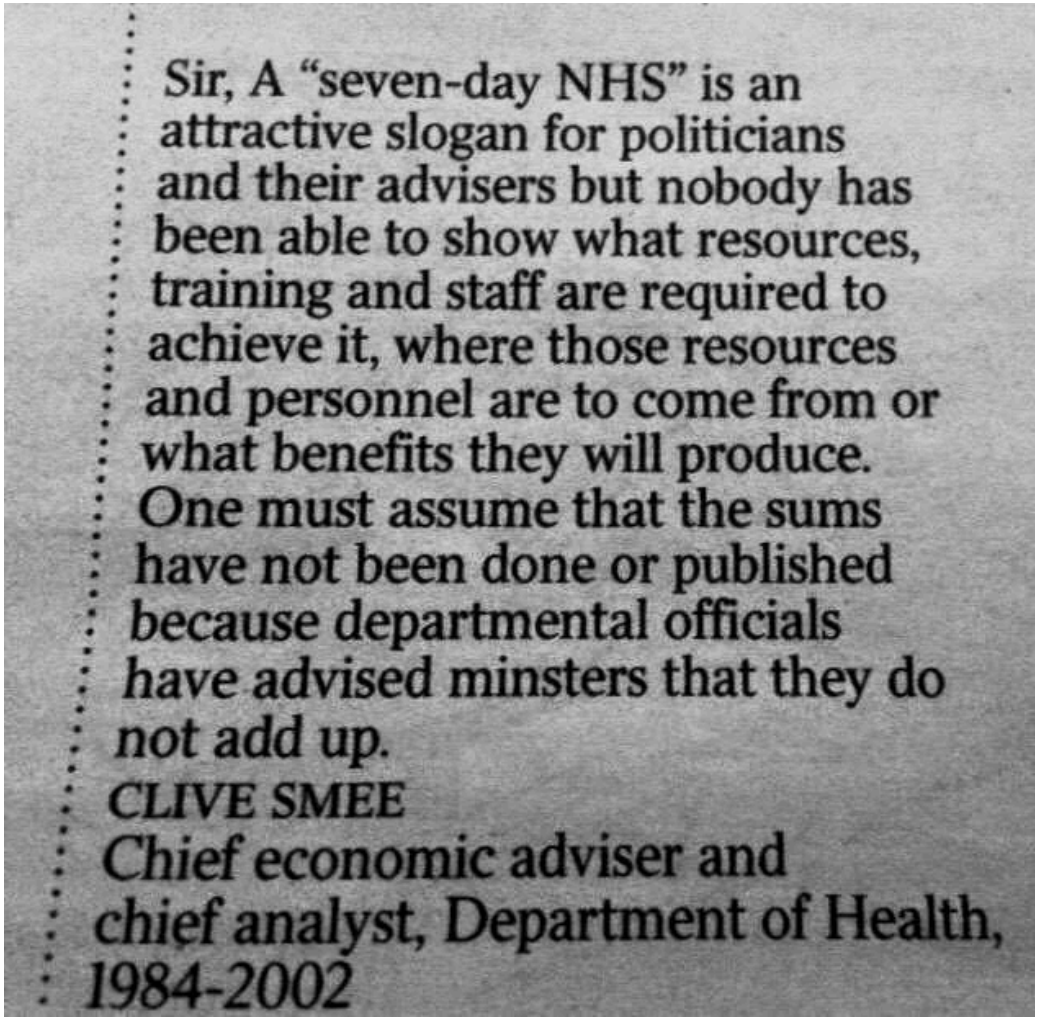
  - Philip McGuire

NHS National Institute for Health Research

MRC Medical Research Council

Presentation available from: http://doctor.rpatel.co.uk/presentations

Where next for a “seven-day NHS”?



Sir, A “seven-day NHS” is an attractive slogan for politicians and their advisers but nobody has been able to show what resources, training and staff are required to achieve it, where those resources and personnel are to come from or what benefits they will produce. One must assume that the sums have not been done or published because departmental officials have advised minsters that they do not add up.

CLIVE SMEE
Chief economic adviser and chief analyst, Department of Health, 1984-2002