NHS Waiting Times

Proposed deadline for initial demo: 14 August 2017

Outline

To look at factors associated with breaches in the 62 days (2 months) target waiting time to first treatment after agreement of cancer treatment plan [*http://scienceblog.cancerresearchuk.org/2016/10/13/cancer-waiting-times-whats-causing-the-delays/*].

Potential factors of association to explore:

- Medical performance of hospital/provider using "Summary Hospital-Level Mortality Indicator" [*http://digital.nhs.uk/catalogue/PUB30004*]
- Number of medical staff and nurses. Possible only refer to cancer-related staff? [*https://data.gov.uk/dataset/nhs-workforce-medical-staff*]
    - Staff involved in treatment of cancer patients [*http://www.oncology.cam.ac.uk/patients/onc-care-staff*; *https://www.cancer.org/treatment/finding-and-paying-for-treatment/choosing-your-treatment-team/health-professionals-associated-with-cancer-care.html*]
- Financial performance of hospitals i.e. are they in deficit? [*https://improvement.nhs.uk/resources/quarterly-performance-nhs-provider-sector-quarter-4-1617/*]
- Link the provider (i.e. hospital) to the deprivation of the area using "Index of Multiple Deprivation" [*https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015*]
- Lack of beds [*https://www.theguardian.com/society/2017/jan/14/health-service-in-crisis-cancer-ops-cancelled-nhs*; *https://www.england.nhs.uk/statistics/statistical-work-areas/bed-availability-and-occupancy/*]

Aim is to create an application of a model-based article demonstrated through the above topic of interest.

Data

Create a unified dataset containing information on different factors which may explain breaches in the 31-day waiting time for first treatment. Focus on the three commonly recorded cancers, Breast, Lung and Lower Gastrointestinal (Colorectal).

Data source(s)

- ~~31-day waiting time~~ 62-day (2 months) waiting time to starting cancer treatment - for ease of data combining data, analysis restricted to 16/17 Q4 [*https://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/monthly-prov-cwt/201617-monthly-prov-cwt/*]
- SHMI data imported for 2016 - "SHMI data at trust level, Jan16-Dec16 (csv).csv" [*http://digital.nhs.uk/media/31247/Summary-Hospital-level-Mortality-Indicator-SHMI-Deaths-associated-with-hospitalisation-England-January-2016-December-2016-Data-files/zip/shmi-deat-hosp-eng-jan-16-dec-16-data*]
- Patient survey data 2016 (Q59, Q55, Q47, Q44, Q37, Q30, Q29, Q25, Q16, Q12, Q6, Q2, Q1) [*http://www.ncpes.co.uk/index.php/reports/2016-reports/local-reports-1/data-tables-1/3425-trust-data-tables-1/file*]

Analysis

Fit a Bayesian GLM with a binomial distribution to model proportion of patients treated during the month who waited more than 62 days for first cancer treatment - Need to do in Python for use on the server-side

Alternatively, conduct basic Bayesian association tests.

Model-based Articles

Two scenarios:

1. Comparative scenario (how does my region compare to the rest of the UK)
2. Predictive scenario (which factors do affect waiting times)

Apart from the ground-truth models and data (including non-predictive variables that other users might find interesting) we need a list of terms and definitions to clarify the predictor/categories etc.. We also need to offer different transformations of the variables, e.g. what constitutes waiting time - time until first visit/time until assessment etc.. so that a range of models can be evaluated. It would also be good to have a list of articles and surveys written about these issues to be able to map the options.

Data Description

The core of the dataset is based on Q4 2016/17 62 day wait times for first cancer treatment
[*https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2017/05/12.-62-Day-Wait-for-first-treatment-By-Cancer-Provider-Data-CSV-279KB.csv*]

Variable Name	Description	Merged using
ods_code	Unique code to identify the Provider/NHS trust (ODS = Organisational Data Service)	https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2017/05/12.-62-Day-Wait-for-first-treatment-By-Cancer-Provider-Data-CSV-279KB.csv
nhs_trust	NHS trusts. https://en.wikipedia.org/wiki/List_of_NHS_trusts	
cancer_type	Type of cancer.	
care_path	Relates to whether patients were: - "admitted" to hospital for treatment (includes ordinary admission and day cases) - **all care (admitted and non-admitted combined)** - non-admitted which refers to outpatients and treatment in other care settings.	
numtreat_total	Total number of people receiving first treatment for cancer	
numtreat_less62days	Number of people receiving first treatment for cancer within 62 days.	
numtreat_more62days	Number of people receiving first treatment for cancer after 62 days.	
precenttreat_62days	Proportion of patients that received first treatment before 62 days.	
wait_within31	Number of people receiving first treatment for cancer within 31 days.	
wait_32to38	Number of people receiving	

	first treatment for cancer within 32 to 38 days.	
wait_39to48	Number of people receiving first treatment for cancer within 39 to 48 days.	
wait_49to62	Number of people receiving first treatment for cancer within 49 to 62 days.	
wait_63to76	Number of people receiving first treatment for cancer within 63 to 76 days.	
wait_77to90	Number of people receiving first treatment for cancer within 77 to 90 days.	
wait_91to104	Number of people receiving first treatment for cancer within 91 to 104 days.	
wait_104plus	Number of people receiving first treatment for cancer after 104 days.	
shmi_ind	This variable is calculated from the ratio between the actual number of patients who die following hospitalisation at the trust (**observed_deaths**) and the number that would be expected to die on the basis of average England figures (**expected_deaths**), given the characteristics of the patients treated there. It includes deaths which occur in hospital and deaths which occur outside of hospital within 30 days (inclusive) of discharge. The SHMI gives an indication for each non-specialist acute NHS trust in England whether the observed number of deaths within 30 days of discharge from hospital was 'above expected' (SHMI value>1) or 'lower than expected' (SHMI value<1). Breast cancer = diagnosis category group 18 Colon cancer = diagnosis category group 10 Lung cancer = diagnosis	"SHMI data at trust level, Jan16-Dec16 (csv).csv" - http://digital.nhs.uk/media/31247/Summary-Hospital-level-Mortality-Indicator-SHMI-Deaths-associated-with-hospitalisation-England-January-2016-December-2016-Data-files/zip/shmi-dat-hosp-eng-jan-16-dec-16-data Documentation for diagnosis groups and methodology - http://www.content.digital.nhs.uk/media/10628/SHMI-specification-January-2012/pdf/SHMI_Specification_January2012.pdf

	category group 15	
beds_day	The total number of available beds (day only) for general and acute	https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2013/04/Beds-Open-Day-Only-Web_File-Final-Q4-2016-17-58169.xlsx
beds_night	The total number of available beds open overnight for general and acute	https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2013/04/Beds-Open-Overnight-Web_File-Final-Q4-2016-17-94685.xlsx
_Anaesthetics _Clinical_oncology _Emergency_Medicine _General_medicine_group _Radiology_group _Surgical_group	NHS workforce staff (medical only) by speciality group for all grades. Numbers are reported in FTE.	https://data.gov.uk/dataset/nhs-workforce-medical-staff - 4/2017 Medical Staff
clinstaff_grade*	Grade of medical staff only from lowest (1) to highest (10).	
_Nurse_HealthVisitors _STT _Support_Clinical _Support_STT	Nurses & health visitors Scientific, therapeutic & technical (STT) staff Support to doctors, nurses & midwives Support to ST&T staff NHS workforce staff (non-medical) by speciality group for all grades. Numbers are reported in FTE.	
hee_region_code	Health Education England regions	
ytd_plan	Year-to-date (YTD) planned financial balance of trust	https://improvement.nhs.uk/uploads/documents/M12_201617_provider_sector_performance_report_-_Fin_Accts_-_FINAL.pdf
ytd_actual	Year-to-date (YTD) actual financial balance of trust	
planactual_diff	ytd_plan minus ytd_actual	
ytd_plan_miss	1 = trust did not reach planned YTD balance, 0 = trust reached or did better than forecasted	
deficit	1 = trusts that are in deficit i.e. with a negative balance, 0 = trusts not in deficit	

hospitalN	Number of hospitals in trust.	https://data.gov.uk/dataset/hospitals
unadj_score_Q*	Unadjusted scores by cancer and trust for questions in the National Cancer Patient Experience Survey. Score methodology in spreadsheet along with the full questions.. Potentially interesting questions in survey: Q59, Q55, Q47, Q44, Q37, Q30, Q29, Q25, Q16, Q12, Q6, Q2, Q1	http://www.ncpes.co.uk/index.php/reports/2016-reports/local-reports-1/data-tables-1 http://www.ncpes.co.uk/index.php/reports/2016-reports/local-reports-1/data-tables-1/3425-trust-data-tables-1/file
cat_*	These are categorised versions of the numeric variables above. “Much lower than average” = below lower quartile “Slightly lower than average” = between lower quartile and median “Slightly higher than average” = between median and upper quartile “Much higher than average” = above upper quartile	