What do we know about GBM Patient pathways in England ?

Matt Williams, ICHNT

David Greenberg, PHE

On behalf of the NCIN Brain CNS SSCRG

April 2016

Background

- Previously published data on GBM incidence and treatment in England 2007 – 2012

- > 10 000 pts

- Incidence & Survival

- Some treatment data

- Nothing on RT dose/ frac, surgery, chemotherapy
- These details are important
  - To lots of people

Broadbelt et al, EJC, 2015

Aims

- To develop a detailed patient cohort of GBM patients in England
- To understand treatment, and variations in treatment pathways
- Some key questions:
    - Are there variations in surgery vs. biopsy ?
    - Treatment rates, and types of treatment ?
    - Times to treatment ?

- Interesting for brain tumours, but also other sites
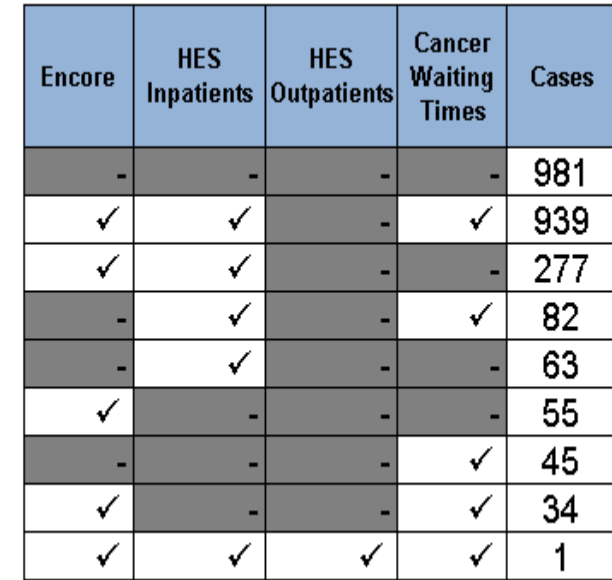- Pts often require complex, multi-disciplinary treatment

Data

- 2477 patients with cranial glioblastoma (ICD10 site C71*, ICD10-O2 morphology 9440/3. 9441/3 and 9442/3) diagnosed in 2013 in residents of England were extracted from the PHE Cancer Analysis System (CAS)

- These patients were matched with their records in:
  - Hospital Episode Statistics (HES) inpatient dataset (HESAPC)
  - Hospital Episode Statistics (HES) outpatient dataset (HESOP)
  - National Radiotherapy Dataset (RTDS)
  - Systemic Anti-Cancer Therapy Dataset (SACT)
  - Cancer Waiting Times Dataset (CWT)

Results so far

- Remains a work in progress

- However, we have identified the patients, and linked key data sources

- One of the difficult questions is how to resolve conflicting and overlapping data sources

Debulking surgery for GBM in England, 2013
Triangulating national data sources

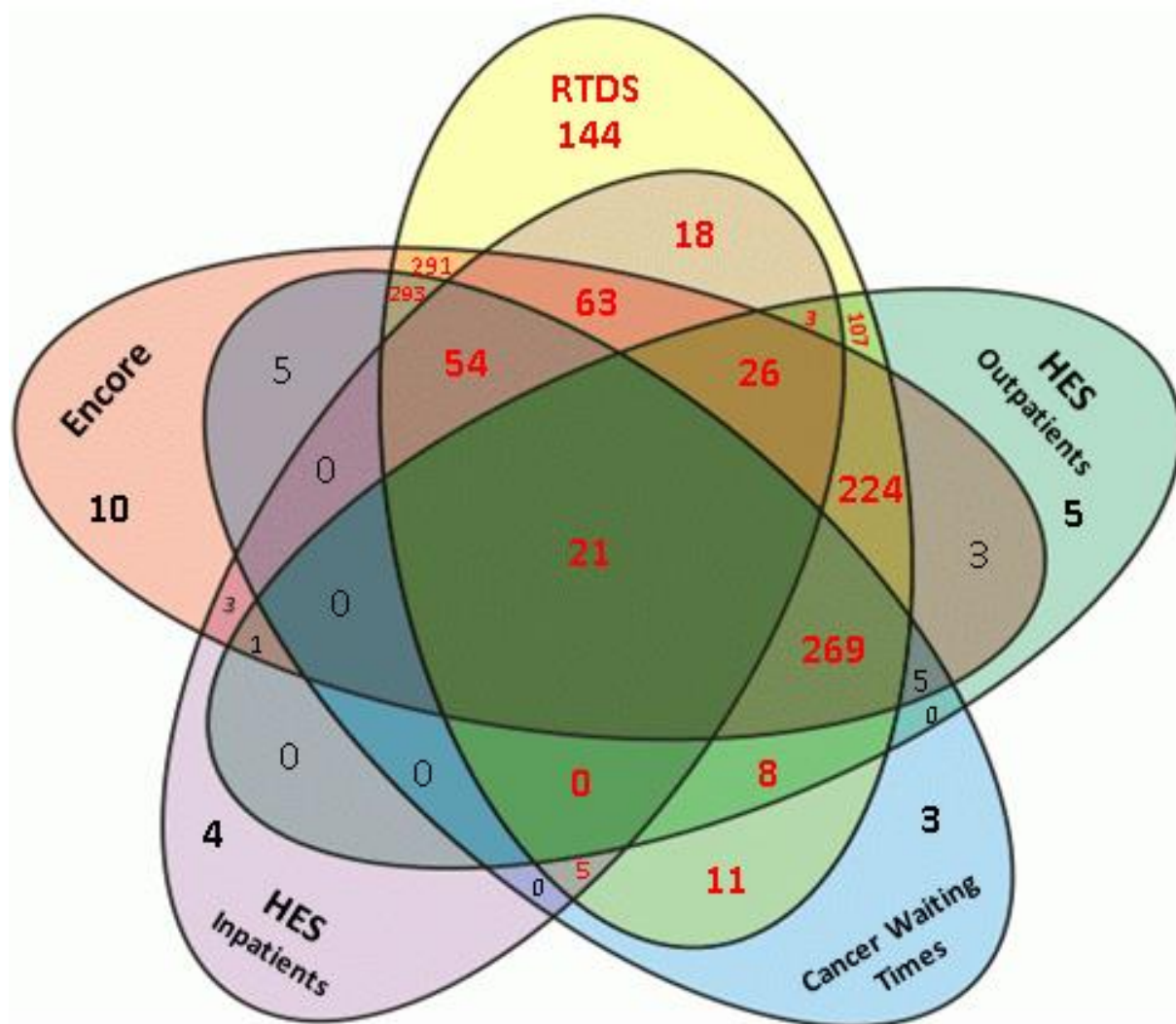| Encore	HES Inpatients	HES Outpatients	Cancer Waiting Times	Cases
-	-	-	-	981
✓	✓		✓	939
✓	✓		-	277
-	✓		✓	82
-	✓		-	63
✓		-	-	55
-		-	✓	45
✓		-	✓	34
✓	✓	✓	✓	1

40% of GBM patients had no debulking surgery

The proportion of debulking records found:
91% in **inpatient HES**;
87% in **Encore**
74% in **Cancer Waiting Times**

Reassuringly, there were almost no records of **outpatient** debulking surgery.

Encore and **inpatient HES** are the most meaningful sources of debulking surgery data.

Radiotherapy treatments for GBM in England, 2013
Triangulating national data sources

- **Number of patients in 2013 diagnosed with Glioblastoma**
- 2,477

- **GBM patients with no radiotherapy treatment recorded**
- 901 (36%)

- **Of all GBM patients with a radiotherapy record, those with a record in the Radiotherapy Dataset (RTDS)**
- 1,537 (98%)

Radiotherapy treatments for GBM in England, 2013
Interpretation

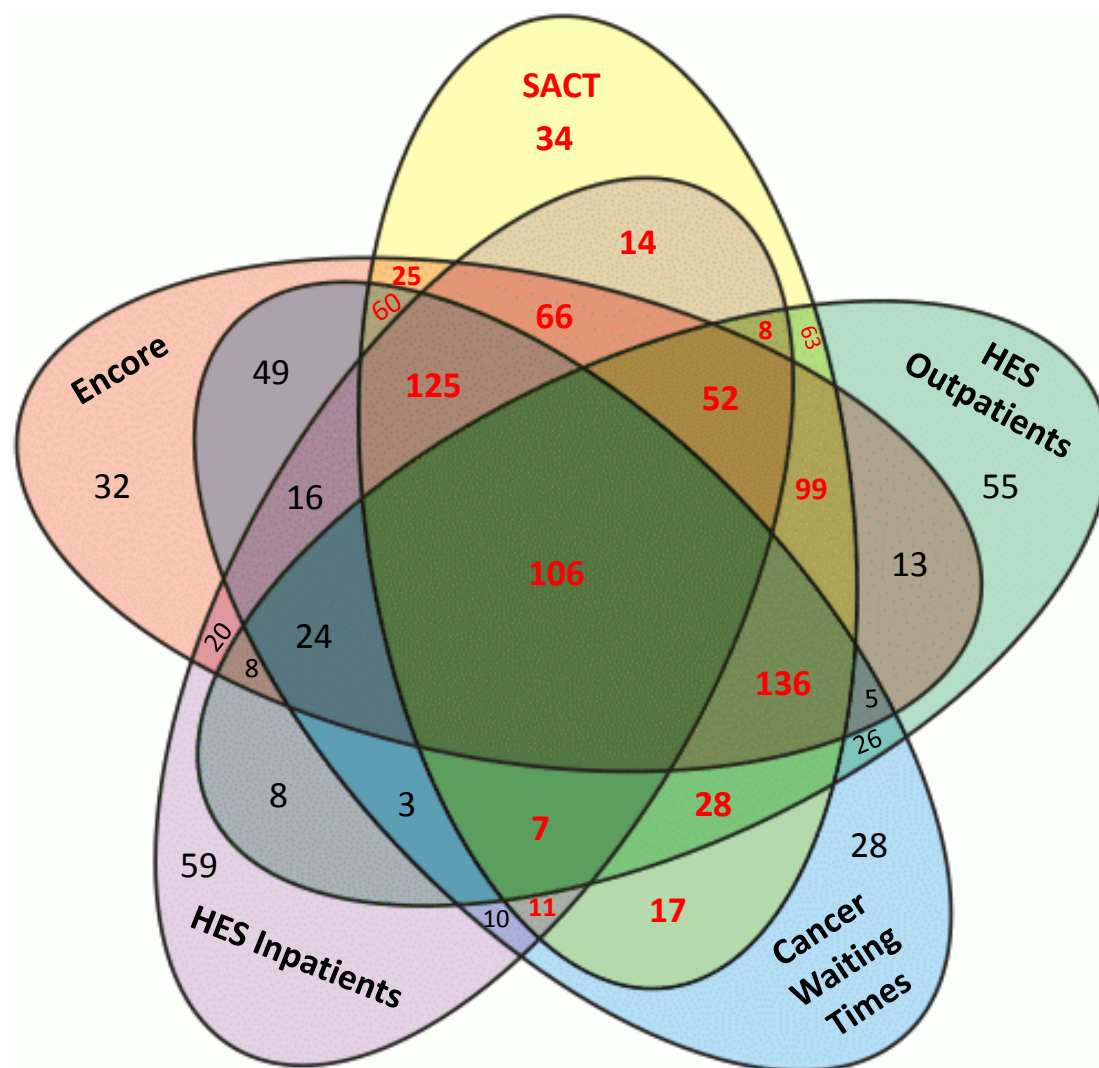| Encore	RTDS	HES Outpatients	HES Inpatients	CWT	Number of cases
-	-	-	-	-	901
✔	✔	-	-	✔	293
✔	✔	-	-	-	291
✔	✔	✔	-	✔	269
✔	✔	✔	-	-	224
-	✔	-	-	-	144
-	✔	✔	-	-	107
✔	✔	-	✔	-	63
✔	✔	-	✔	✔	54
✔	✔	✔	✔	-	26
✔	✔	✔	✔	✔	21
-	✔	-	✔	-	18
-	✔	-	-	✔	11
✔	-	-	-	-	10
-	✔	✔	-	✔	8
✔	-	✔	-	✔	5
✔	-	-	-	✔	5
-	✔	-	✔	✔	5
-	-	✔	-	-	5
-	-	-	✔	-	4
✔	-	✔	-	-	3
✔	-	-	✔	-	3
-	✔	✔	✔	-	3
-	-	-	-	✔	3
✔	-	✔	✔	-	1

- **RTDS** and **Encore** were by far the most common data sources to find GBM patient radiotherapy treatment information.

- There is a notably higher completeness of data in RTDS as compared with Encore. In 2013, there are few cases that have a radiotherapy record in Encore but do not have one in RTDS.

- RTDS should hold data on doses, fractions, intent, etc., so for more detailed analysis , it would be advisable to use 2013 RTDS.

Chemotherapy treatments for GBM in England, 2013
Triangulating national data sources

- **Number of patients in 2013 diagnosed with Glioblastoma**
- 2,477

- **GBM patients with no chemotherapy treatment recorded**
- 1,270 (51%)

- **Of all GBM patients with a chemotherapy record, those with a record in the Systemic Anti-Cancer Therapy dataset (SACT)**
- 851 (71%)

Chemotherapy treatments for GBM in England, 2013
Interpretation

Encore	SACT	HES Inpatients	HES Outpatients	CWT	Number of cases
-	-	-	-	-	1270
✓	✓	-	✓	✓	136
✓	✓	✓	-	✓	125
✓	✓	✓	✓	✓	106
✓	✓	-	✓	-	99
✓	✓	✓	-	-	66
-	✓	-	✓	-	63
✓	✓	-	-	✓	60
-	-	✓	-	-	59
-	-	-	✓	-	55
✓	✓	✓	✓	-	52
✓	-	-	-	✓	49
-	✓	-	-	-	34
✓	-	-	-	-	32
-	-	-	-	✓	28
-	✓	-	✓	✓	28
✓	-	-	✓	✓	26
✓	✓	-	-	-	25
✓	-	✓	✓	✓	24
✓	-	✓	-	-	20
-	✓	-	-	✓	17
✓	-	✓	-	✓	16
-	✓	✓	-	-	14
✓	-	-	✓	-	13
-	✓	✓	-	✓	11
-	-	✓	-	✓	10
-	-	✓	✓	-	8
-	✓	✓	✓	-	8
✓	-	✓	✓	-	8
-	✓	✓	✓	✓	7
-	-	-	✓	✓	5
-	-	✓	✓	✓	3

- **Encore** and **SACT** have higher data completeness than other data sources and are the most likely data sources to hold more detailed information on chemotherapy.

- Historical SACT data (2010-2012) coverage is highly incomplete and only reaches similar levels to that in Encore in 2013. However, there are a sizeable proportion of cases that have a record of chemotherapy in only one of these two data sources.
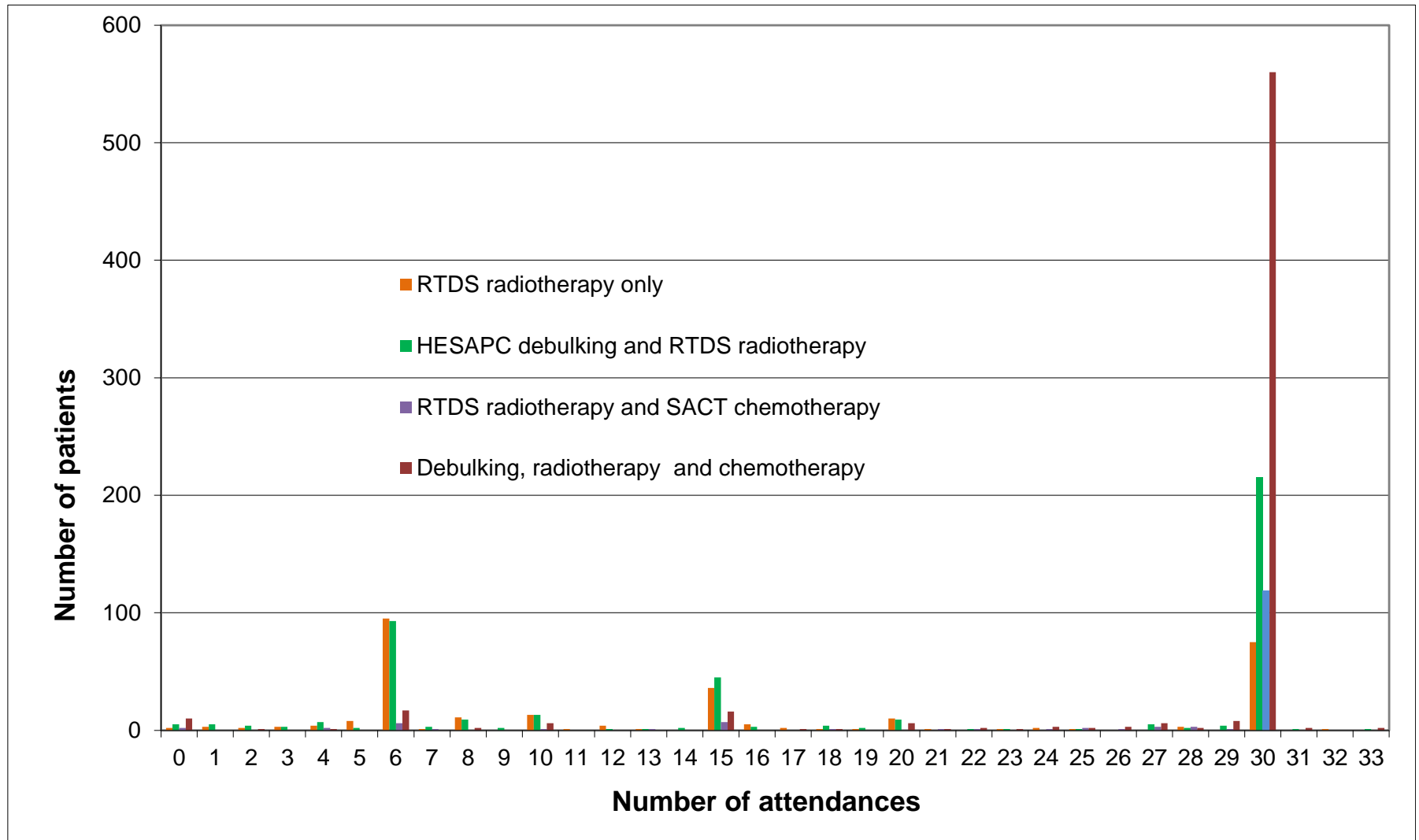
- Encore data are highly incomplete for the chemotherapy drug(s) administered, with more than 2800/3960 chemotherapy records having no information or 'unknown' drug. So for a more detailed, but probably incomplete, analysis of chemotherapy treatment patterns, SACT data for 2013 can be used.

Integrating data

- We know that patients often need multi-disciplinary treatment

- Clear 'gold-standard'
  - 60Gy/ 30# with chemotherapy
  - Common variations
    - 30Gy/ 6#
    - ~40Gy/ 15#

Radiotherapy attendances for Glioblastoma diagnosed in 2013 in residents of England
Patients treated with combinations of debulking surgery, radiotherapy and chemotherapy

Preliminary conclusions

- We can link multi-modality treatment data
  - But it is non-trivial
  - Not automatic
  - Requires some assumptions

- This is where data represents services
  - GBM treatment is a good example of multi-modality care
  - We can (and have) 'done' single treatment studies
  - But complex oncology care is harder

Way forward

- Complete 2013 & 2014 cohort
- Finalise linkage, and decide on final in/out criteria for treatment
- Provide some preliminary analyses of 'whole pathway' treatments
- Use that data to answer key clinical questions
- Link with other data
  - Imaging - DIDs