Patterns of Cancer Recurrence and Associated Health Care Costs

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Background

- Cancer Registries
- No recurrence data
- PFS, survival from recurrence, use and costs of health services resources poorly defined
- National cancer dataset will mandate collection of this data
- Not mature for another 5-years

Local Cancer Information Systems

- PPM – Patient Pathways Manager (LTHT, University of Leeds/CR-UK)
- Central repository for all electronic data about patients
  - Imports data from all available systems (PAS, Chemo, RadioRx, etc)
  - Supplemented with annotations, MDTs, CWTs etc
- Patients
  - All cancers since 1990 (backfill from NYCRIS)
  - All chemotherapy and radiotherapy since 1995
  - All CWTs including 2-week wait referrals since 2003

Leeds Cancer Recurrence Project

•Collaboration: St James's Institute of Oncology (Leeds Teaching Hospitals NHS Trust), Leeds University CR-UK centre and NCIN

•Utilise electronic case records in PPM and linked Registry data

•Accurately define incidence and prevalence of recurrent and metastatic breast, colorectal, ovarian and prostate cancer

•Linked to Hospital HRG to estimate costs

•Develop algorithms to facilitate prediction of these events in national cancer datasets

Breast Cancer as a Model

•1,000 consecutive patients diagnosed with breast cancer (C50) from January 1999 identified from PPM and NYCRIS

•Clinicians reviewed electronic notes

• At each recurrence /progression event, date and type of recurrence, treatment and outcome recorded

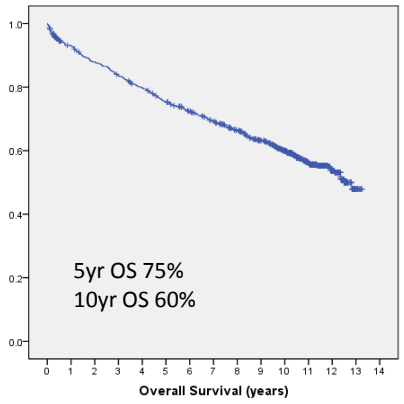
•All followed-up for at least 10-years or death if sooner

•All data collection coded within PPM itself

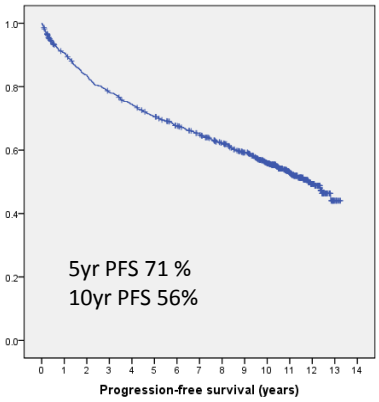
• SPSS for analysis

Overall Outcomes

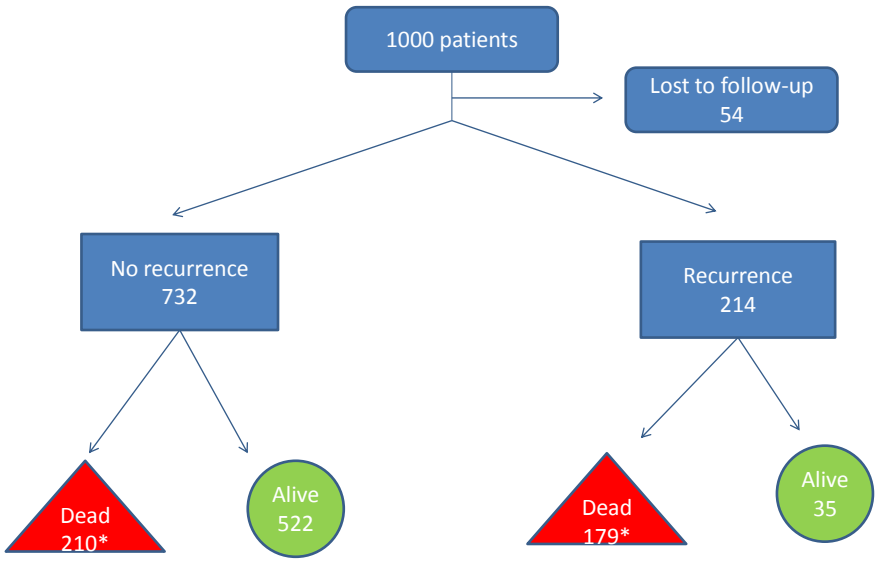
Crude overall survival



Progression-free survival

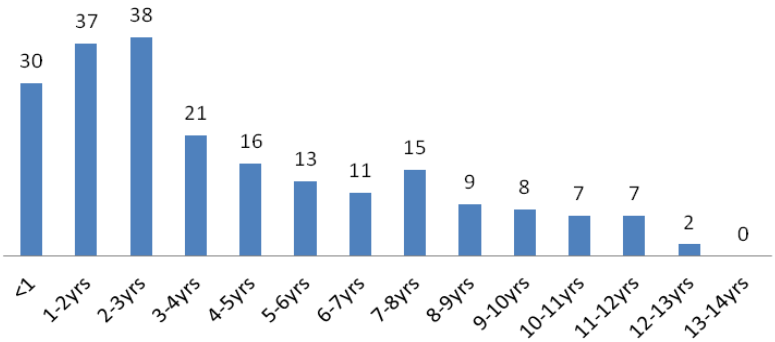


- F= 98.9%
- Mean age 62.32 yrs (47.73-77.03yrs)
- 3.9% metastatic at presentation
- ER+ 63.6%, ER- 15.1%, ER unknown 21.3%

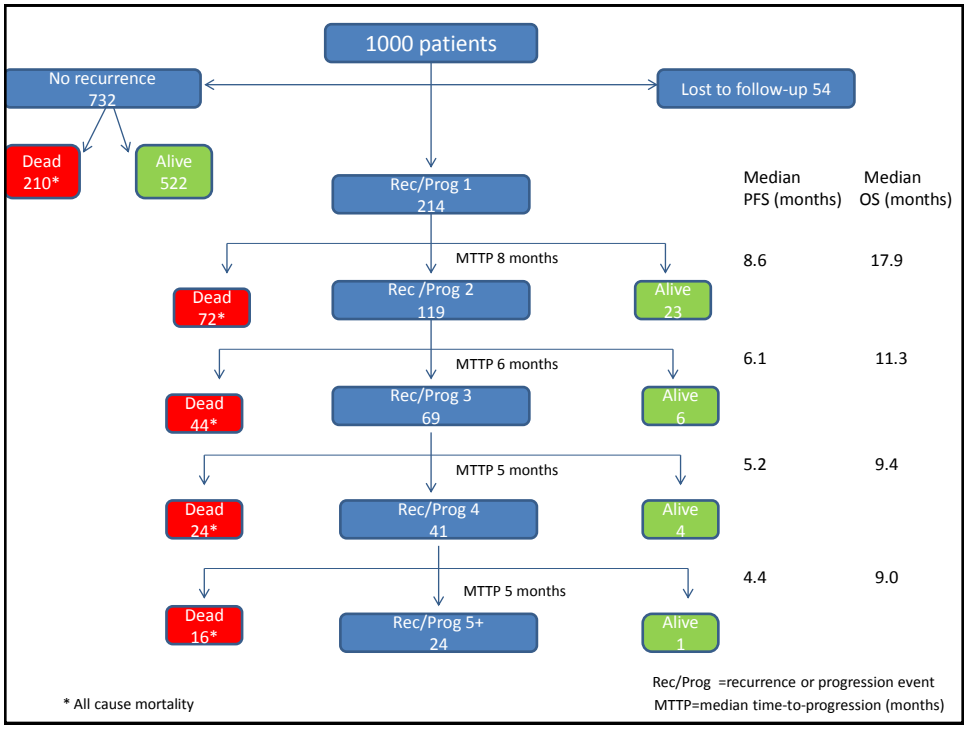


* All cause mortality

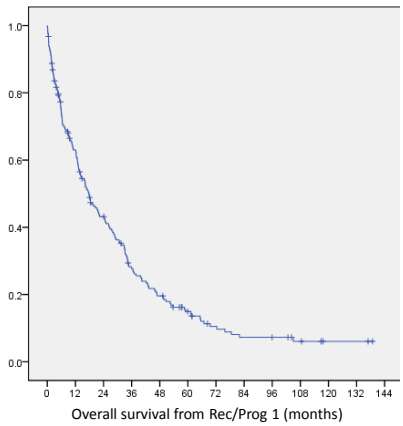
Timing of First Recurrence Events



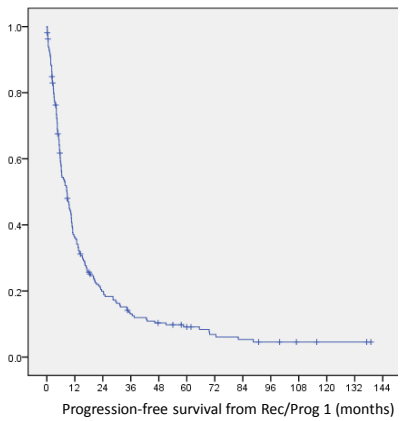
- Median time to first recurrence 39.5 months
- 49% of 1st events occur in first 3-years post-diagnosis
- ER negative patients were more likely to relapse in the first 5-years ; ER-positive patients more than 5-years post-diagnosis ($p<0.0001$)



Overall and progression-free survival following recurrence/progression

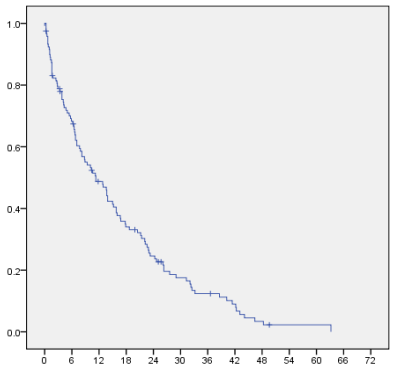


Median OS: 17.9 months
(13.0-22.5)



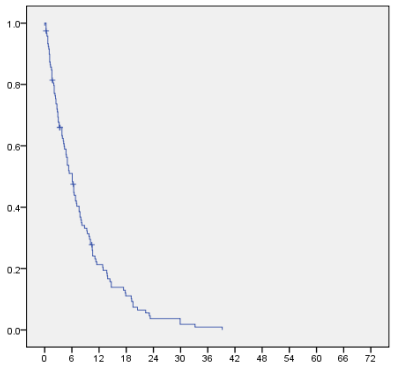
Median PFS: 8.6months
(6.5-10.7)

Overall and progression-free survival following recurrence/progression



Overall survival from Rec/Prog 2 (months)

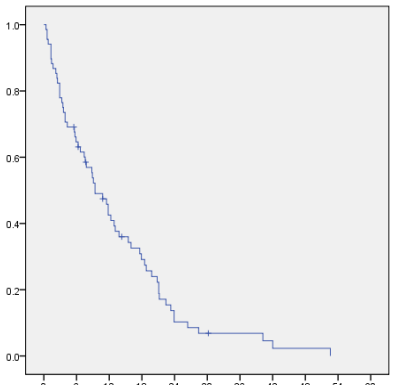
Median OS: 11.3 months
(7.2-15.4)



Progression-free survival from Rec/Prog 2 (months)

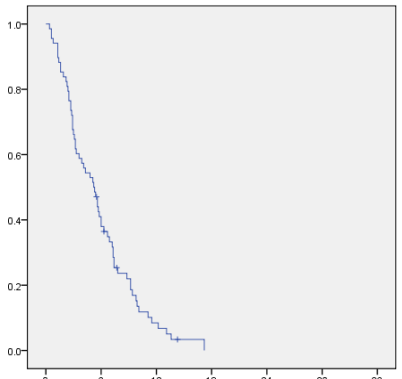
Median PFS: 6.1 months
(4.8-7.4)

Overall and progression-free survival following recurrence/progression



Overall survival from Rec/Prog 3 (months)

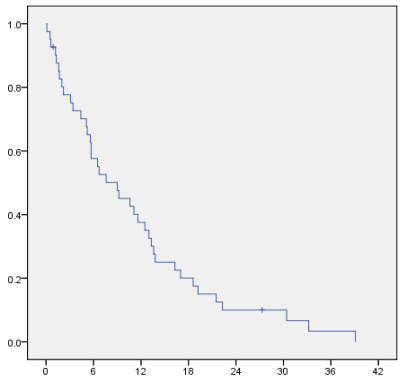
Median OS: 9.4 months
(6.5-12.2)



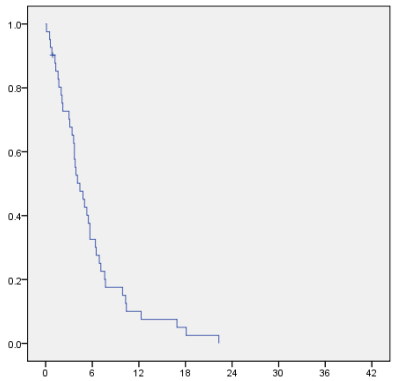
Progression-free survival from Rec/Prog 3 (months)

Median PFS: 5.2 months
(3.7-6.7)

Overall and progression-free survival following recurrence/progression



Overall survival from Rec/Prog 4 (months)

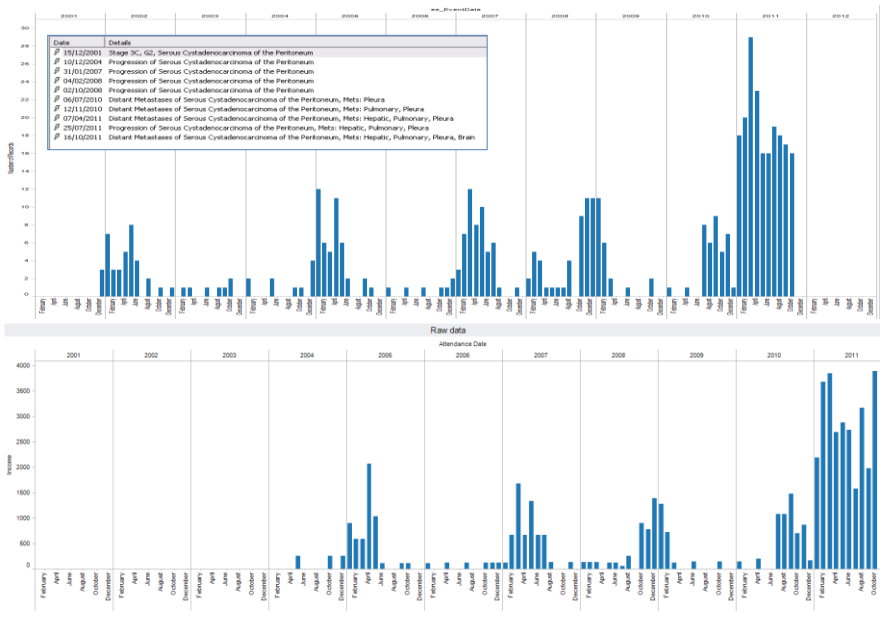


Progression-free survival from Rec/Prog 4 (months)

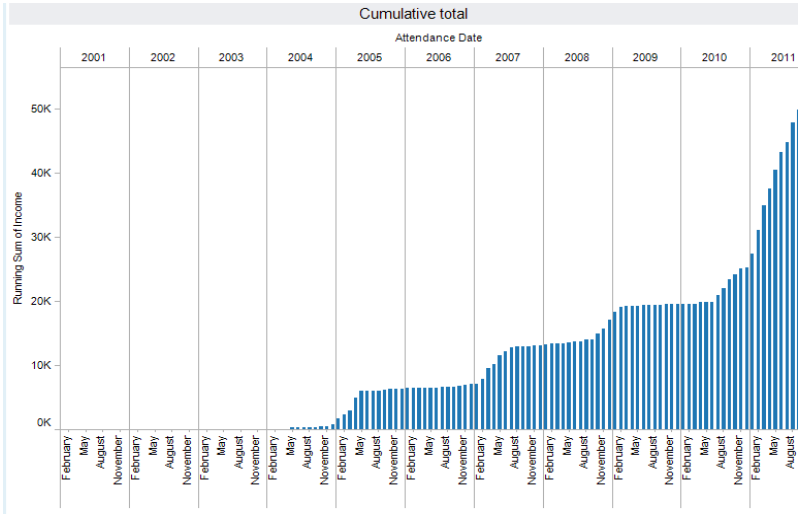
Median OS: 9.0 months
(3.9-14.1)

Median PFS: 4.4 months
(2.9-5.9)

Costs of Treatment



Costs of Treatment



Future Work: Automated Approach

•A model to develop and test algorithms that can automatically identify the occurrence of a recurrence or progression event

•Utilises:
1. Coded data fields in PPM (clinical database)
2. NLP to detect patterns within free text (clinic letters/annotations)

•Collaboration with NCIN and The University of Leeds

•Test on the cohorts collected for breast, colorectal, ovarian and prostate cancers in Leeds and validate with further local PPM data

•Subsequent utilisation in existing National Cancer Datasets

Summary

•Cancer recurrence relatively common

•Little previously known

•Information extracted from comprehensive hospital records can help:
1. support management of future patients
2. determine allocation of health-care resources.

•Can be used to develop algorithms to facilitate automated prediction of recurrence/progression

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