

Oesophageal Dashboard: Transforming Clinical Data Into Actionable Insights to Enhance Standard Practice

By

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Oesophageal cancer statistics

Cases



9,354 new cases of
oesophageal cancer, 2017-
2019, UK.

Deaths



8,043 deaths from
oesophageal cancer, 2017-
2019, UK.

Survival



12% survive oesophageal
cancer for 10 or more years,
2013-2017, England.

Preventable cases



59% of oesophageal cancer
cases are preventable, UK,
2015.

Source: Cancer Research UK

Oesophageal Dashboard: What is it?

This dashboard is an interactive R Shiny application – It acts like a Smart control panel, that helps doctors who performs esophagectomy Surgery do the following:

- Track quality of care
- Spot problems early
- Understand how long patients live after surgery

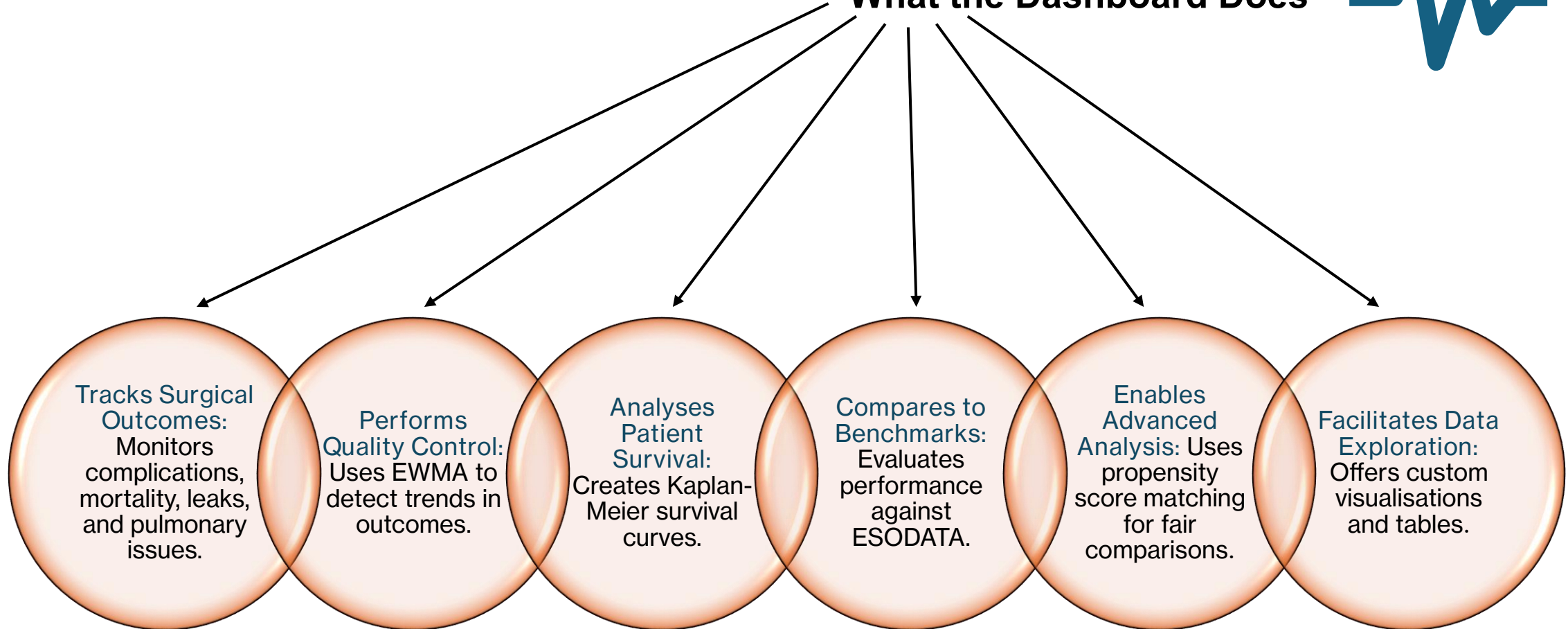
Key Users:

- Surgeons and clinical teams
- Quality improvement specialists
- Researchers and administrators





What the Dashboard Does





Dashboard Demo

<http://127.0.0.1:6163>

Dashboard Overview

UGI Decision Support Tool

Last update: August/2022

Hospital
Southampton

Case Year
All 2010

- Dashboard
- Survival Curves
- Data Analysis
- Outcome Monitoring

Version 0.6.5
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Outcomes at a Glance

Current Outcomes

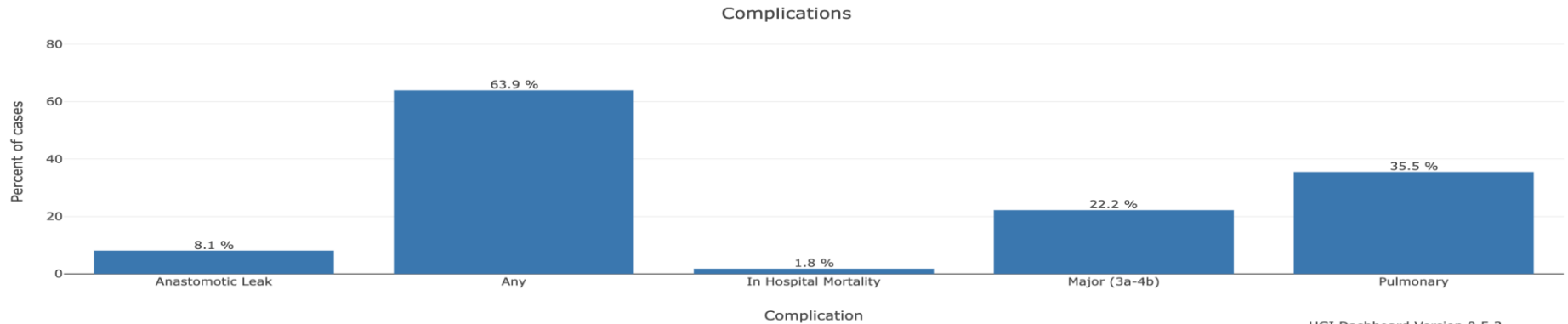
Quality Control Metrics



Comparison to Benchmark



Trend Analysis



UGI Dashboard Version 0.5.3
<https://uoscancer.shinyapps.io/Dashboard/>

Survival Analysis

UGI Decision Support Tool

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Hospital: **Southampton**

Case Year: **All** (2010)

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Survival Analysis

Survival Parameters

Outcome Measure

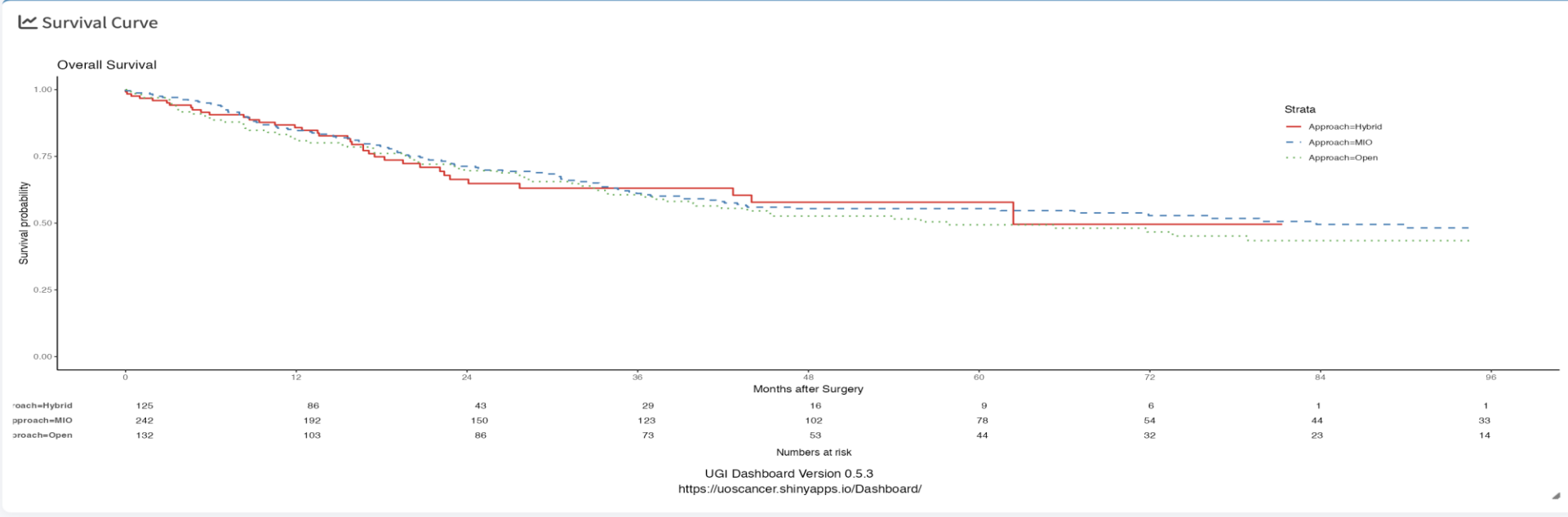
Overall Survival Disease Free Survival

Calculate P value for difference

Analysis Options

Subgroup defined by: **Approach**

Censor Time (months): **12** (range 12-96)



Quality Control Monitoring

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Quality Control Monitoring

Using Exponentially Weighted Moving Average

EWMA Controls

The Exponentially Weighted Moving Average (EWMA) is a moving average trace, designed to highlight small changes in a process mean.

As each case is added to the trace, it moves by the mean event rate of the preceding cases specified in the weighting slider (the default value is 5).

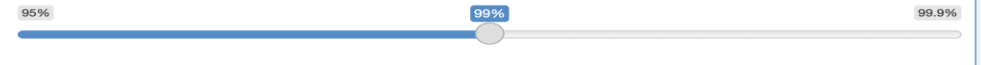
The control limit (red line) is set to confidence intervals of the mean expected rate as defined in the limit slider (defaults to 99% CI).

For quality control purposes the graphs below display the most recent 100 cases. The mean rate observed in the previous cases is used as the benchmark rate. If the trace is consistently above the limit line, then consider the possibility of a systematic problem

Weighting (number of cases)



Confidence Limits



EWMA Analysis

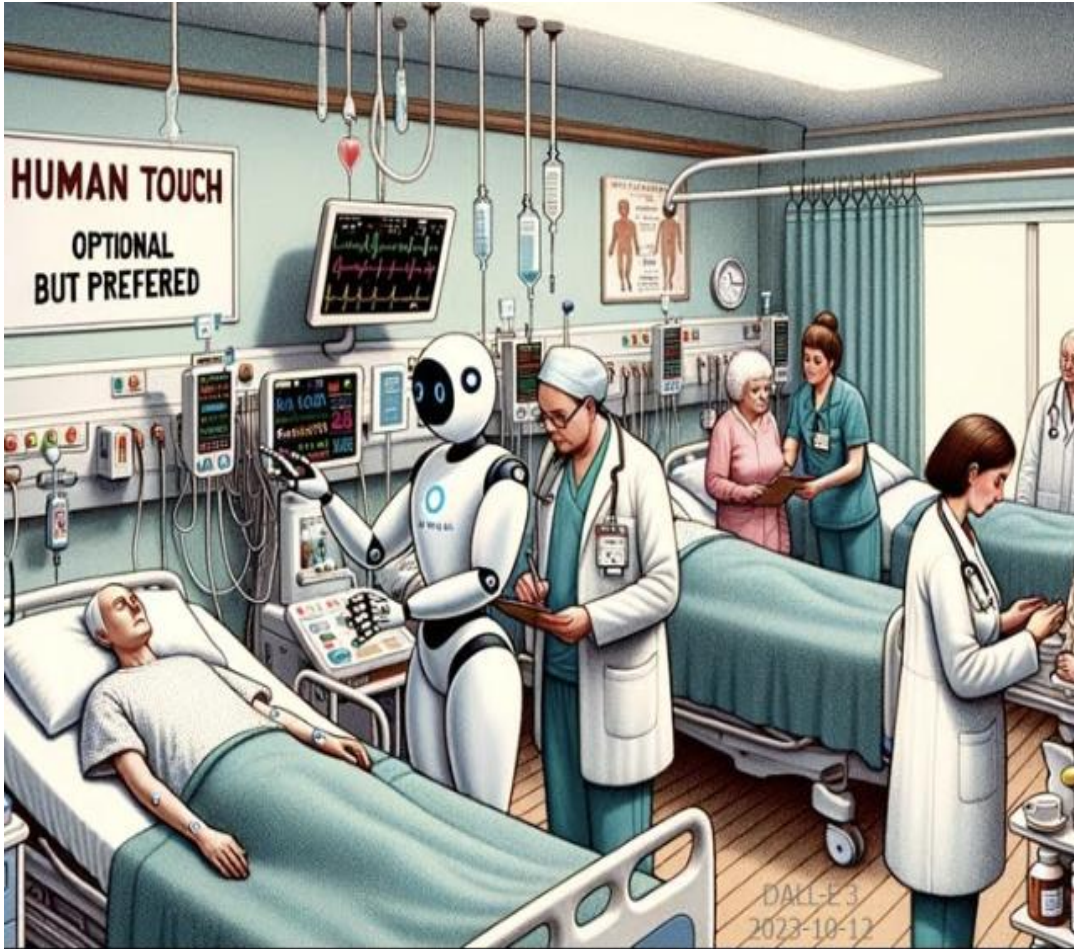
- Major Complication**
- Mortality
- Anastomotic Leak
- Pulmonary

Major Complications (CD3a-4b)



UGI Dashboard Version 0.5.3
<https://uoscancer.shinyapps.io/Dashboard/>

Future Clinical Potential



Precision Medicine:

- AI-powered treatment pathway optimization
- Multi-modal data integration (imaging, genomics)

Quality Improvement:

- Real-time alerts for quality deterioration
- Automated research dataset generation

Advanced Analytics:

- Enhanced ML algorithms (neural networks)
- Natural language processing for clinical notes

Clinical Impact & Value



Evidence-Based Practice:

- Data-driven decision making for surgical teams
- Continuous quality monitoring and assurance
- Early identification of quality issues

Educational & Research Value:

- Training resource for surgical teams
- Platform for clinical research studies
- Framework for quality improvement initiatives

