

Real-World Data Session: NICE Evolution Learning Systems

NICE Conference

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Evidence Generation in Oncology

Current Landscape:

- Prior to the COVID pandemic, 1 in 5 UK oncology patients partook in a clinical trial (*Cancer Research UK 2016*).
- March 2021 - 60% decrease in new oncology clinical trials compared to previous 5 years.
- It currently takes 10.3 years to bring new therapies to market¹.

1. *Clinical Development Success Rates and Contributing Factors, 2011–2020*

Unlocking the potential of real-world data:

- Understanding the best therapy for patients remains complex
- Disparities in patient outcomes persist
- Research & direct care teams are overwhelmed
- AI will influence how we utilise healthcare data
- Evidence generation needs to be agile & robust.

What does “real-world data” mean and why is it important?

Real-world data (RWD) is defined as "the data relating to patient health and/or the delivery of health care routinely collected from a variety of sources."



**ELECTRONIC
HEALTH RECORDS
(EHRs)**



**HOSPITAL CODING
AND BILLING
ACTIVITY**








DISEASE REGISTRIES



**WEARABLES (E,G,
SMART WATCHES),
PHONES ETC.**

RWD can address evidence gaps across the oncology drug life cycle

 Discovery	 Portfolio Strategy	 Clinical Development	 Regulatory	 HEOR & Market Access
<ul style="list-style-type: none">Target identification & characterisationResistance mechanism identificationUnderstand disease progressionAssess unmet medical need	<ul style="list-style-type: none">Target & investment prioritisationInform forecasting assumptionsInform go/no-go for next phaseInternal decision-making	<ul style="list-style-type: none">Clinical trial designSite selection & patient recruitmentConstruct external & hybrid controlsDiversity planning	<ul style="list-style-type: none">Understand natural history of diseaseSupport post-marketing studiesAssess real-world safety & efficacyLabel and dosing revisions	<ul style="list-style-type: none">Evaluate cost-effectivenessAssess comparative effectivenessUnderstand disease burdenHealth outcomes in underrepresented pop.

High level of variation exists in types of RWD available

Some common limitations of oncology RWD sources

- ❑ Limited data model depth and breadth
- ❑ Limited and inconsistent data collection & quality processes
- ❑ Representativeness
- ❑ Data access challenges (usually no patient-level data)
- ❑ Data recency

Data Quality Frameworks and Guidance are emerging



PCORI Sep'16



Duke Sep'18



FDA Sep'21



Duke Oct'19



NICE Jun'22



EMA Sep'22



ISPE *preprint

Quality Dimensions	Data Quality Frameworks and Guidance				
	FDA	EMA	NICE	Duke	PCORI
Relevance <ul style="list-style-type: none"> • Availability • Sufficiency • Representativeness 	✓	✓	✓	✓	
Reliability <ul style="list-style-type: none"> • Accuracy <ul style="list-style-type: none"> ○ Validation ○ Verification • Completeness • Provenance • Timeliness 	✓	✓	✓	✓	✓

Who we are

Founded	2012
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Employees	~950 full-time employees 1,500+ part-time abstractors
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Clinicians	25 oncologists (medical/clinical/ surgical) ~100 total clinicians
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Technical staff	350+ in software, IT, security, & medical informatics
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Quantitative scientists	~50 biostatisticians, epidemiologists & data scientists
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Offices	New York (HQ) San Francisco London Tokyo Berlin
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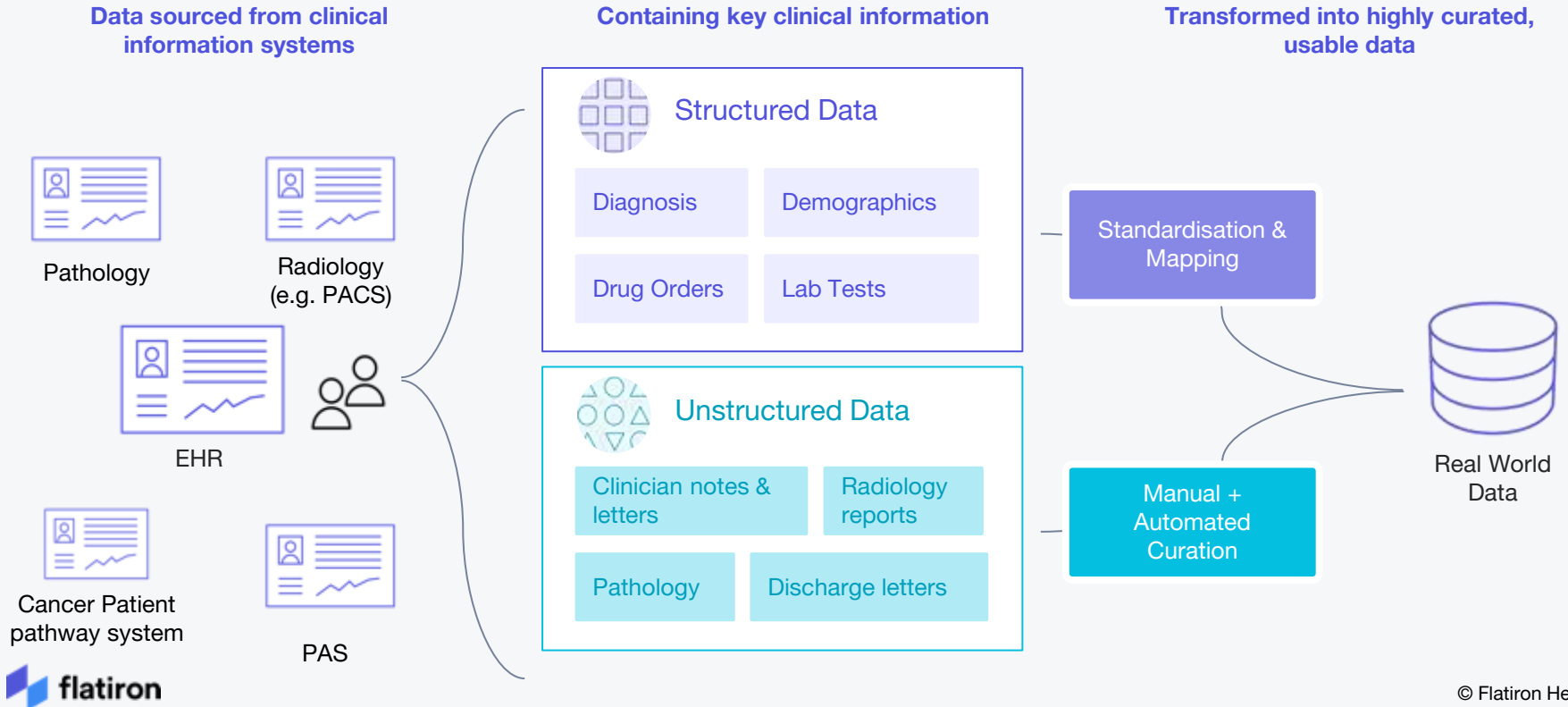


Our Mission:

To improve and extend lives by learning from the experience of every person with cancer.



Flatiron processes both structured and unstructured data to create a comprehensive picture of the patient journey



Flatiron's approach pairs clinical experts with analytical tools to transform unstructured information into usable, standardised data



EXPERT ABSTRACTORS

A network of abstractors comprised of oncology nurses, certified tumor registrars, and oncology clinical research professionals.



FLATIRON TECHNOLOGY

Machine learning technology helps trained abstractors efficiently organize and review unstructured documents to capture key data elements in predetermined forms.

Abstraction Details

- > Abstracted by Sue Smith on 4/30/17 at 10:10am
- > Physician notes and scan interpretation reviewed
- > Medical record from West Florida Cancer Clinic

Quality of Progression abstraction
=====

- > Completeness: 99%
- > Sue Smith is 96% accurate at last testing
- > Inter-abstractor agreement: 97%
- > Kappa: 0.93

- > Audit trail for any changes
- > Dataset freeze and storage

Patient	Stage at Dx	Biomarkers	2L Treatment	Progression	Date of Death
Jane Doe	II	EGFR-, ALK-, PD-L1+	nivolumab	2017-03-08	2017-04-12

Case Study Palbociclib: RWD to provide evidence in support of a label expansion for male metastatic breast cancer (mBC) patients

SITUATION

- Male patients with mBC are rarely included in RCTs given rarity of disease so there are fewer approved treatment options for them
- FDA guidance: ***“Further data may be necessary to support extrapolation of findings to males where differential safety or efficacy is a concern”*** such as there was for palbociclib

APPROACH

- Multiple sources of RWD - including Flatiron’s EHR databases, in addition to past clinical trial data were used for FDA’s evaluation of palbociclib in males
- Flatiron provided effectiveness evaluation around tumour response and safety information on targeted adverse events with palbociclib

IMPACT

- FDA approved a sNDA for palbociclib for a new indication to include male patients with breast cancer.

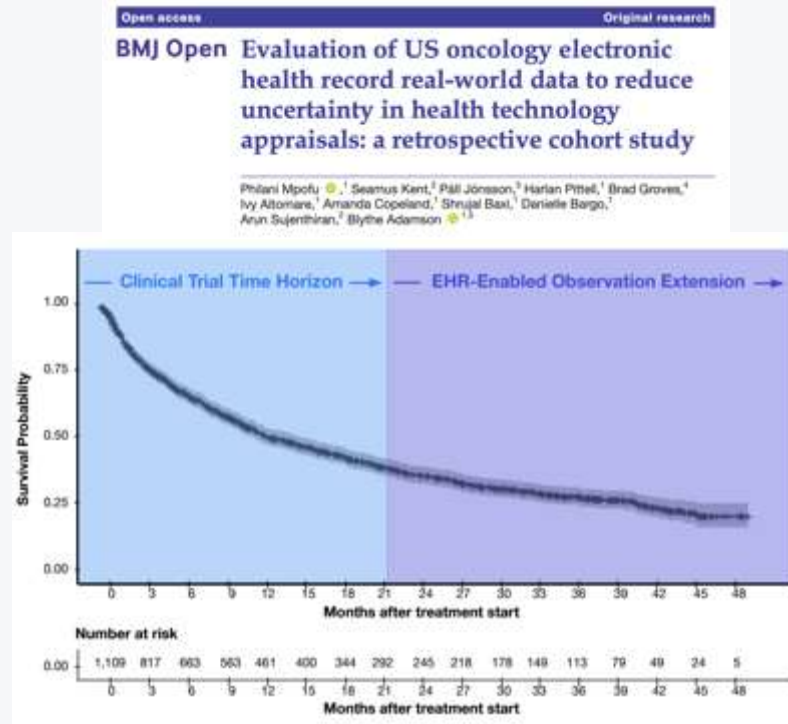
U.S. FDA Approves (palbociclib) for the Treatment of Men with HR+, HER2- Metastatic Breast Cancer

Approval of expanded indication based predominately on real-world data



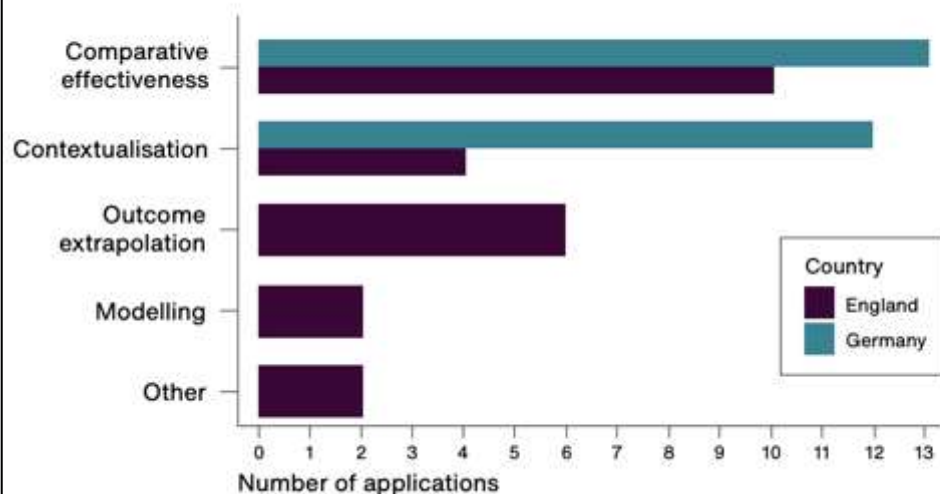
The potential role of EHR-derived data in reducing uncertainties common in HTA assessments dates

NICE Appraisal	NICE TA531 (published 18 Jul 2018)
Drug (Indication)	Therapy: First-line PDL-1 monotherapy Disease: NSCLC Patient subset: PD-L1+
NICE ERG Uncertainty	“Uncertainty around the overall survival extrapolation even at 2 years is the main source of uncertainty in the cost-effectiveness analyses.”
Study Objective	Use real-world (RW) data to: 1) contextualize earlier, trial-based estimates of long-term survival; 2) describe duration of therapy in the RW setting



Use of Flatiron US data in HTA submissions

Figure 1 | Flatiron RWE in NICE and IQWiG submissions from 2017-2023 YTD



RWE in HTA

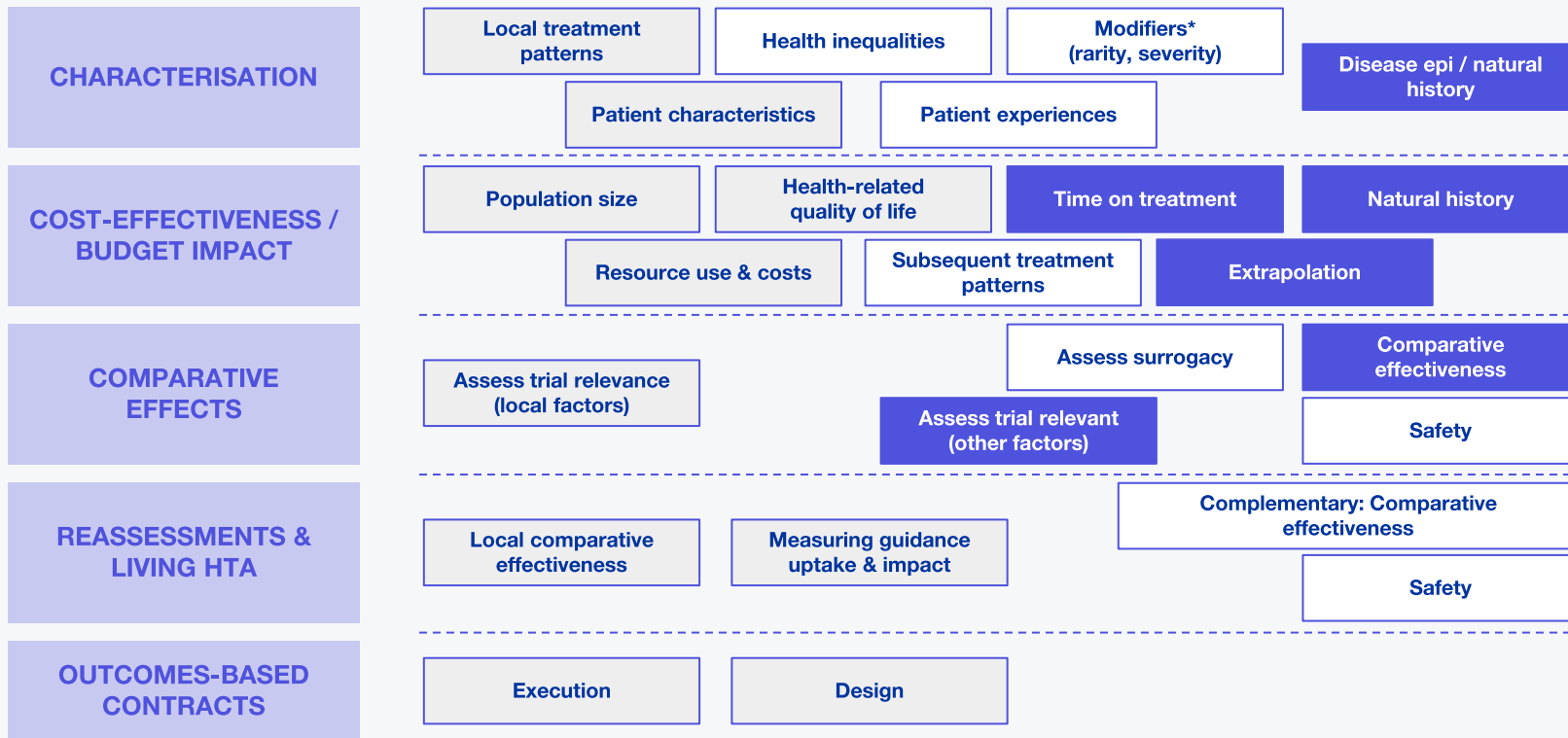


DATA USE



ESSENTIAL

SUITABLE



Transforming cancer research and outcomes across the UK through RWD

Scale UK Network



NEWS & PRESS
Flatiron Health Announces New Partnership in the UK
 The Leeds Teaching Hospitals NHS Trust



1 hospital live
 5 hospital negotiations

NHS Trusts

across the UK, treating high volume of cancer patients with local standard of care

Established Quality Standards

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Flatiron UK Patient Voices Panel



Chris Carrigan



Lesley Shannon



Bob White



Linda Galbraith



Dolapo Ogunleye



Helen Bulbeck