Unlocking Real World Evidence from the Electronic Health Record

Emily Castellanos, MD MPH

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Disclosures

Dr. Emily Castellanos is an employee of Flatiron Health, which is an independent subsidiary of the Roche Group.

- Stock ownership in Roche

Flatiron network of U.S. oncology clinics and academic hospitals

OUR NETWORK:

Community Oncology Clinics

Practices and MSOs

3.6M+
Active patients

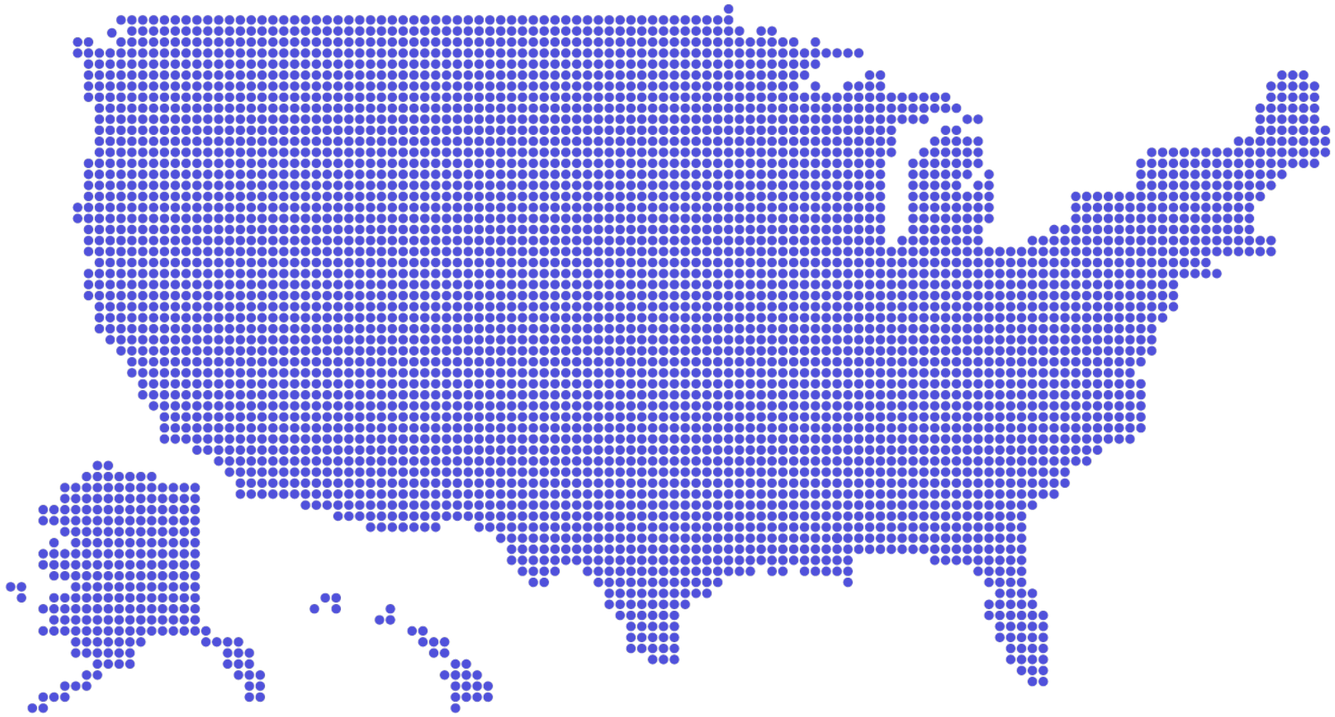
2,900+
Clinicians

Hospitals & Health Systems

Including Academic Medical Centers

300+
Cancer Clinics

800+
Unique Sites of Care



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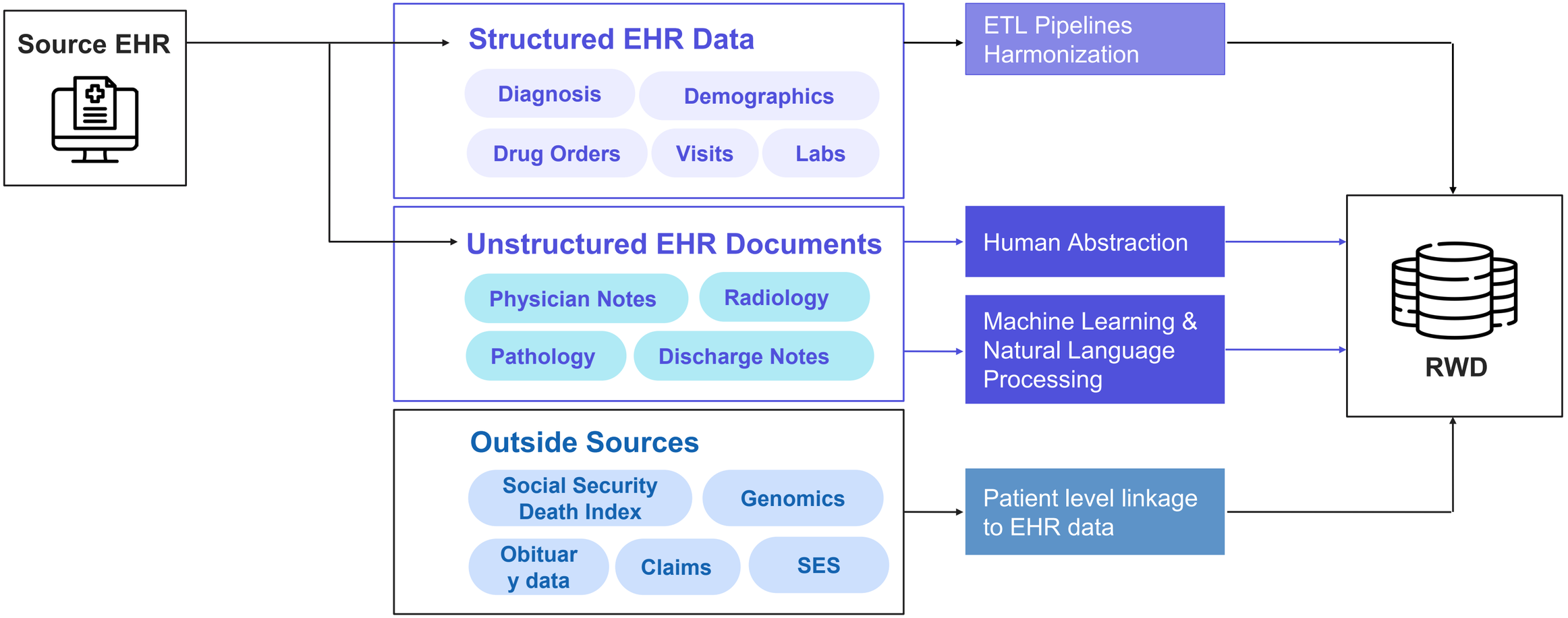
EHR-based RWD exists in structured and unstructured formats, and can be combined with non-EHR data



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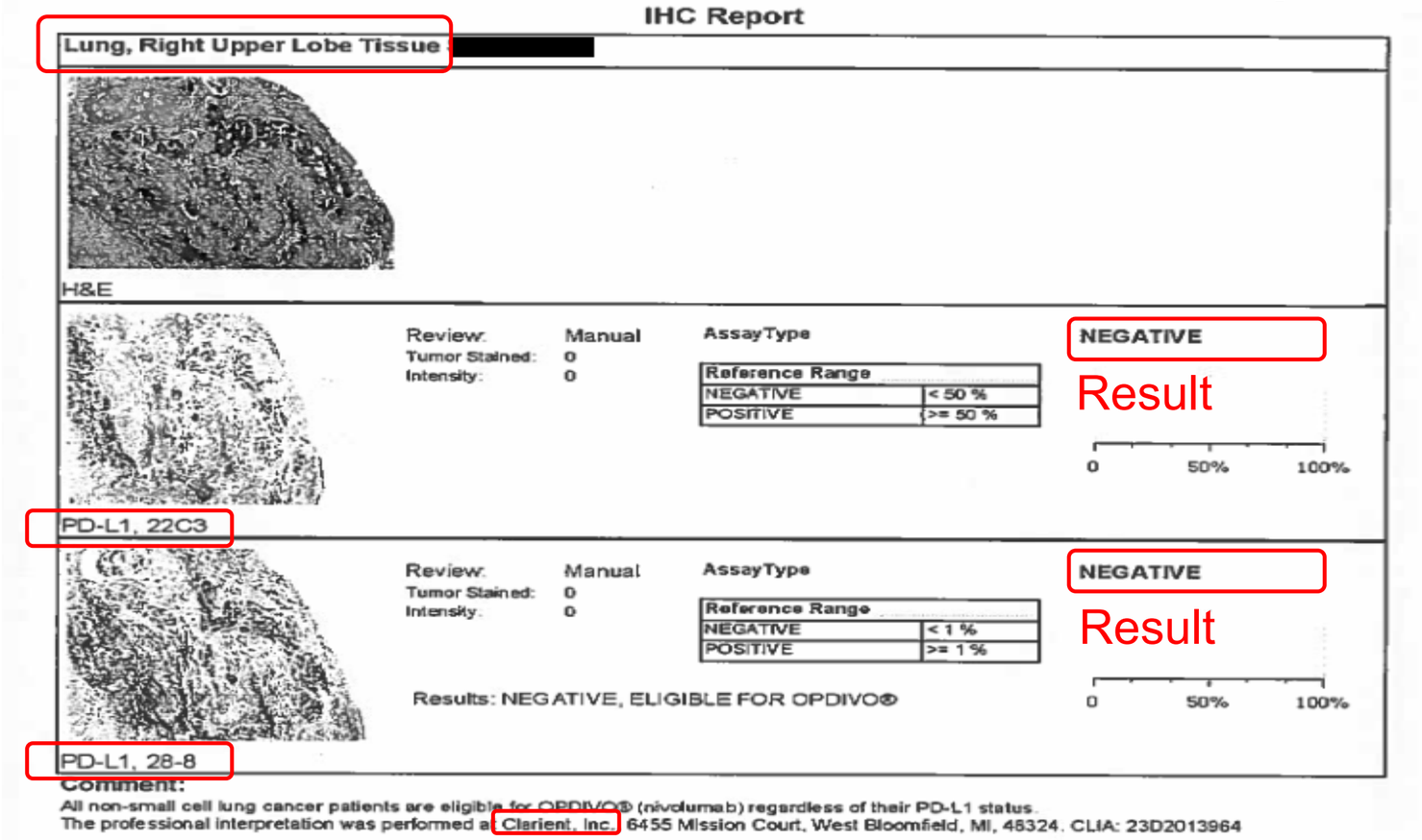
Abstraction of unstructured data can provide critical, complex clinical information, but is resource intensive

Tissue Collection Site

Section of PD-L1 Report


IHC Report

Lung, Right Upper Lobe Tissue [redacted]

H&E

Review: Manual
Tumor Stained: 0
Intensity: 0

AssayType

Reference Range	
NEGATIVE	< 50 %
POSITIVE	>= 50 %

NEGATIVE

Result

0 50% 100%

PD-L1, 22C3

Review: Manual
Tumor Stained: 0
Intensity: 0

AssayType

Reference Range	
NEGATIVE	< 1 %
POSITIVE	>= 1 %

NEGATIVE

Result

0 50% 100%

Results: NEGATIVE, ELIGIBLE FOR OPDIVO®

PD-L1, 28-8

Comment:
All non-small cell lung cancer patients are eligible for OPDIVO® (nivolumab) regardless of their PD-L1 status.
The professional interpretation was performed at Clarient, Inc. 6455 Mission Court, West Bloomfield, MI, 48324. CLIA: 23D2013964

Lab Name

Example data elements:

- Test status
- Test result
- Date biopsy collected
- Date biopsy received by laboratory
- Date result received by provider
- Lab name
- Sample type
- Tissue collection site
- Type of test (e.g., FISH)
- Assay / kit (e.g., Dako 22C3)
- Percent staining & staining intensity

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ML/AI technology can unlock scale

1

All relevant unstructured EHR documents

2

Abstracted initial, advanced diagnosis dates

initial_dx_date: 2016-03-01
adv_dx_date: 2016-07-23

3

Filter to sentences with informative terms and assign dates

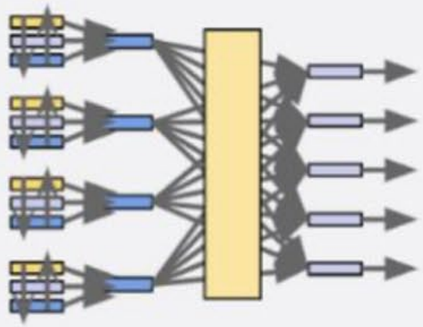
2016-10-07
"...presents with NSCLC, no evidence of metastases..."

2017-2-15
"...metastatic since Feb 15, 2017..."

...

4

Feed into deep learning architecture



*Model **learns** which phrases indicate metastatic diagnosis based on training examples*

5

Model outputs probability scores for each date, which are rolled up to a final data model

***IsMetastatic*: true**

***MetastaticDxDate:* 2017-02-15**

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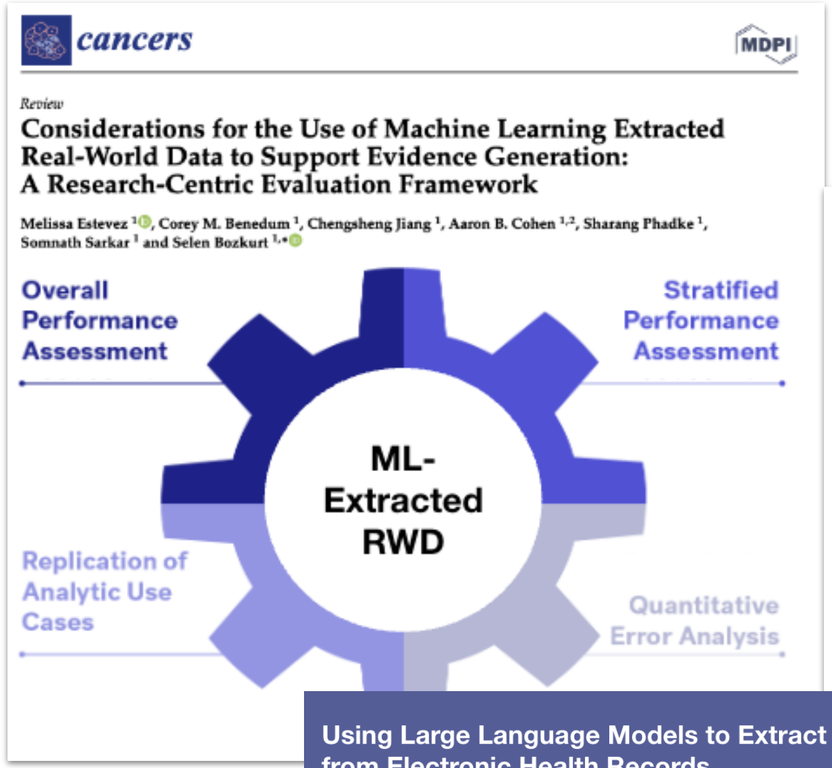
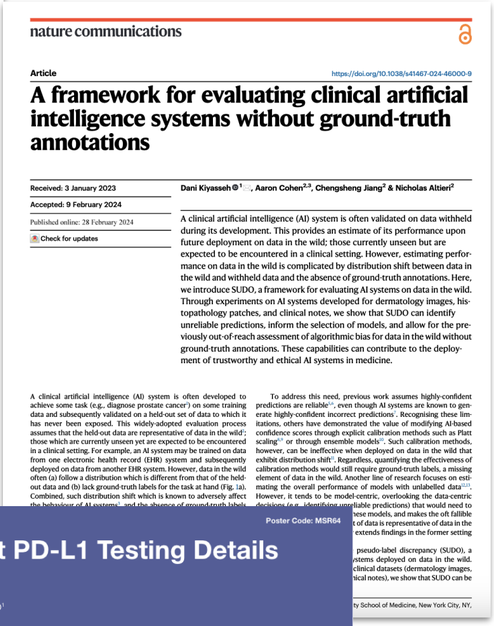
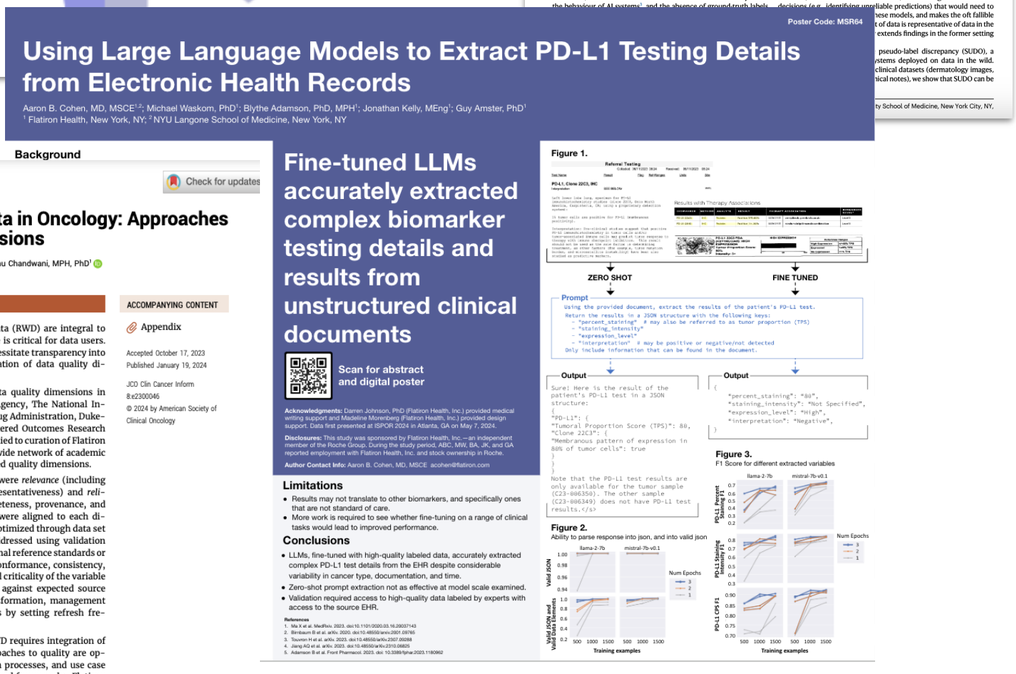
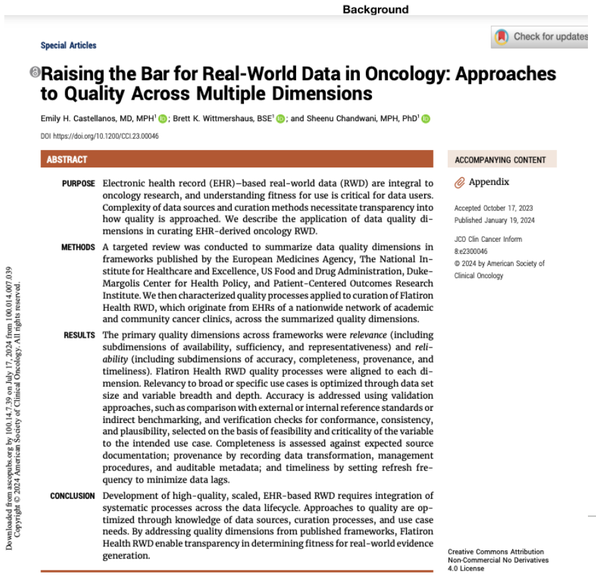
Challenges for the future

- Finding the right balance between human and technology
- Continuing to innovate by developing novel capabilities to improve accuracy and scale









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Ref: Estevez et al. Cancers 2022 ; Castellanos et al. JCO CCI 2024; Kiyasseh et al, Nature Communications 2024; Cohen et al, ISPOR Annual Meeting 2024

Thank you

Questions? Email ecastellanos@flatiron.com

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