How the Medical Director Should Use Data Sources

Angela Bolduc, Principal and Managing Director, **Milliman**
Jean-Marc Fix, FSA, MAAA, VP-Biometric Risks, **Optimum Life Re**

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How the Medical Director Should Use Data Sources

Angela Bolduc
Principal and Managing Director
Milliman

Objectives

- Know how to interpret the various forms of data source.

- Understand what is legally permissible

- Recognize more important risk selection trends (Scores)

- Understand the value of historical claims data and their impact on risk

- Be able to do the analysis of medication patterns that reveal conditions

- Understand the future of Electronic Medical Records as Data Source

Types of Data Available Today

- Prescription Data
- Medical Claims
- MIB
- MVR
- Labs
- Credit
- Criminal

- APS
- Financial Data
- EHR
- Lifestyle / SDH Data
- Fitness / Wearables
- Genetic / Condition Testing
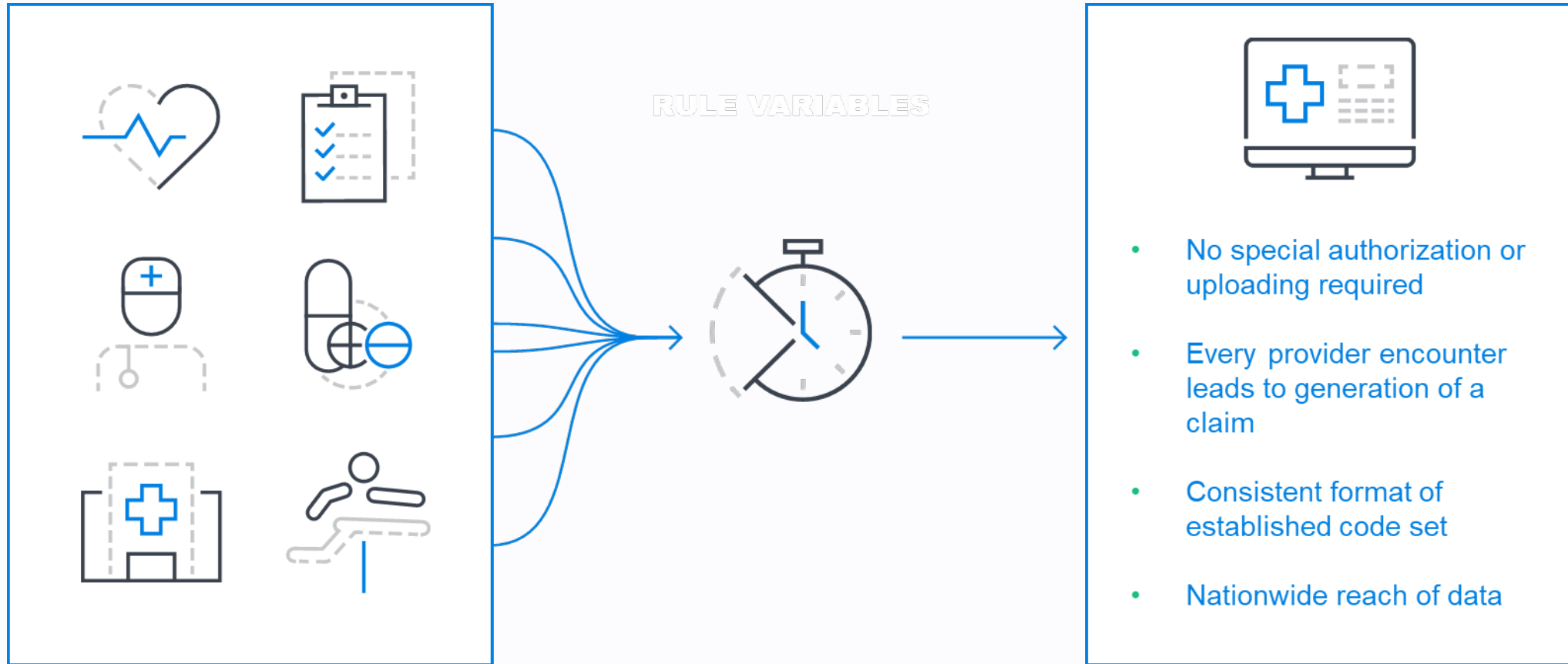- Facial Analytics

Where and how is data being used today?

- Identified and De-identified data

- Marketing

- Instant Issue

- Accelerated underwriting

- Manual underwriting

- Claims
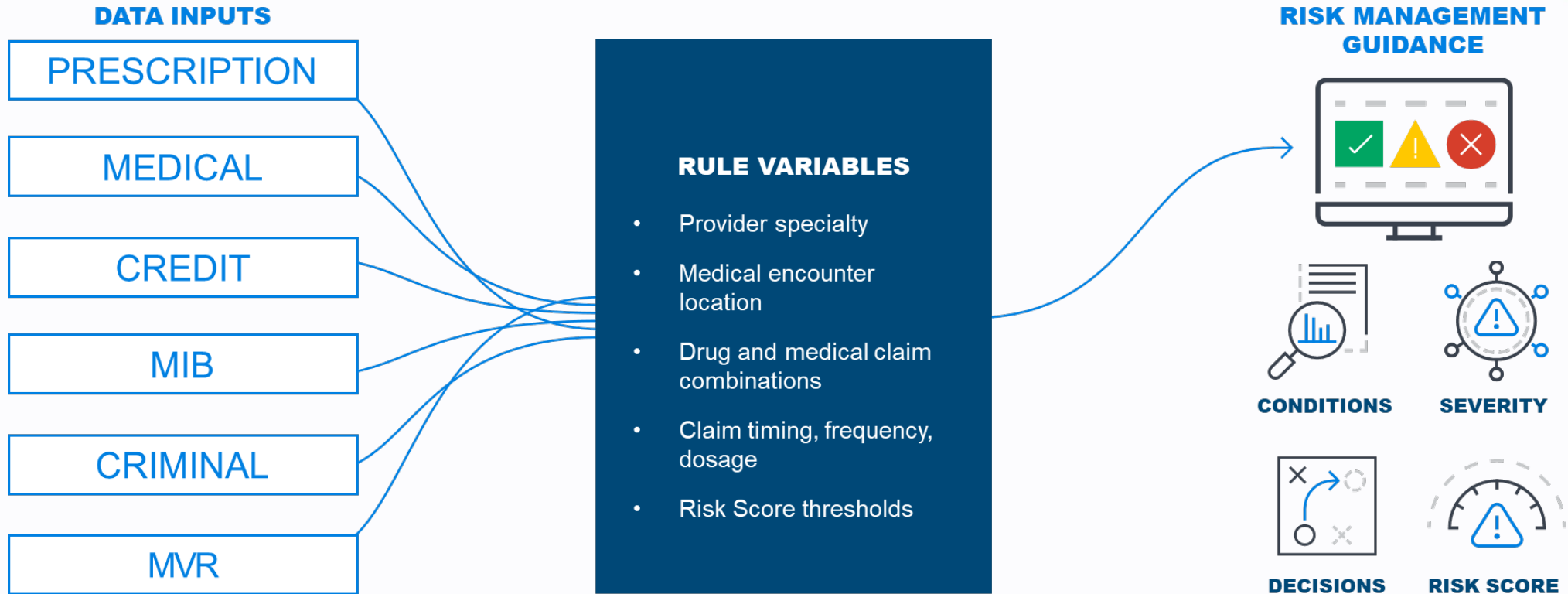
- Inforce analysis

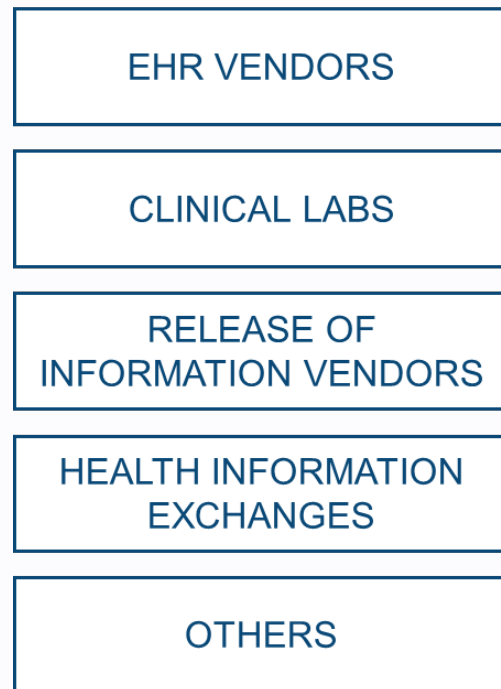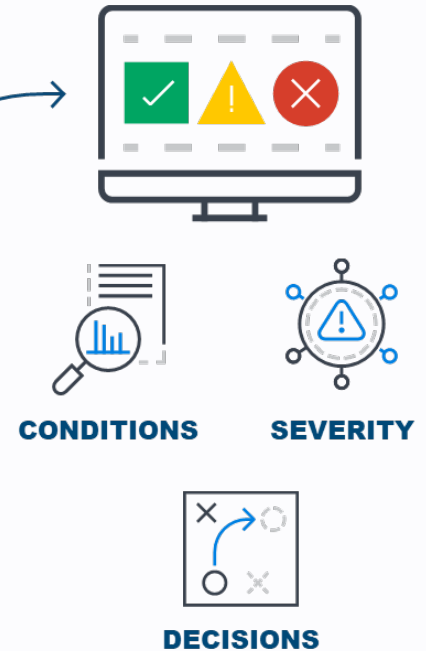- Reinstatements

Medical Claims Data Brings Value

RULE VARIABLES

- No special authorization or uploading required

- Every provider encounter leads to generation of a claim

- Consistent format of established code set

- Nationwide reach of data

Using tools to maximize value of data

DATA INPUTS

- PRESCRIPTION
- MEDICAL
- CREDIT
- MIB
- CRIMINAL
- MVR

RULE VARIABLES

- Provider specialty
- Medical encounter location
- Drug and medical claim combinations
- Claim timing, frequency, dosage
- Risk Score thresholds

RISK MANAGEMENT GUIDANCE

- CONDITIONS
- SEVERITY
- DECISIONS
- RISK SCORE

EHR Data is bringing new value to insurance.

EHI AGGREGATION

- EHR VENDORS
- CLINICAL LABS
- RELEASE OF INFORMATION VENDORS
- HEALTH INFORMATION EXCHANGES
- OTHERS

- Standardize
- Normalize
- Categorize
- Interpret

RISK GUIDANCE

CONDITIONS   SEVERITY

DECISIONS

Regulatory and compliance

- HIPAA
- FCRA
- Gramm-Leach-Bliley
- Consumer privacy laws
- Modeling regulations
- Cybersecurity

How the Medical Director ~~Should~~ Use Data Sources

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(he/il/er/él/他)
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Optimum Life Reinsurance

How the Medical Director ~~Should~~ Use Data Sources

Could

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VP, R&D-Biometric Risks
Optimum Life Reinsurance

Objectives

- Understand current selection trends
- What is available beyond labs and prescription?
- Develop new dimensions in underwriting
- Appreciate the new pitfalls
- Contribute to your company's success

The Context: Underwriting 3.0

- Moving towards precision underwriting
- More data: from 2 zetabytes in 2010 to 2 zetabytes a week in 2022[1]
- More data sources
- Better analytical tools through predictive modeling
- From rules to score
- Less access to experienced talent?

1 Zb=1 million Pb, 1Pb=1 million Gb

(1): https://explodingtopics.com/blog/data-generated-per-day

Data is Key

- Without data we cannot improve
  - our risk selection
  - our risk assessment
  - our understanding of the risks
  - our consistency?
- Accelerated Underwriting has brought actuaries, underwriters, data scientists and medical directors together
- Be aware that the data you have is seldom the data you need
- What is underlying the data?
- Right vs. good enough for the job

A Tale of Two…Data Sources

- Comparing the adoption in the industry of two technologies:

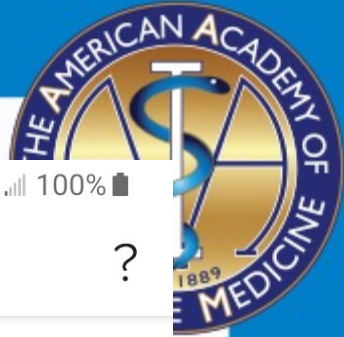 fitness tracker vs prescription history

Biometric Data

- Facilitated by IOT. Some common examples:
  - CPAP
  - Intelligent scale
  - BP monitors
- Widespread wearables
  - Medical
  - Fitness and well being

Fitness Tracker

- Why do you use a Holter?
- Following a user's activity through time
  - Steps
  - Heart rate
- Some measures can be predictive of mortality beyond the traditional lab measurements[1]

(1): https://www.businesswire.com/news/home/20201217005343/en/Gen-Re-Study-Finds-PAI-Health-Metric-Supplements-Protective-Value-of-Traditional-Life-Insurance-Underwriting

Fitness Tracker in Insurance Context

- How do you control for cheating?
    - Consistency
    - Is the effort to cheat worth it?
    - Could be detected
- What's in it for the participant?
- Underwriting is not the only use case: engagement may be a better use case
- Trade –off: unbiased* but privacy issues
- Still not widely adopted

*some technological caveats
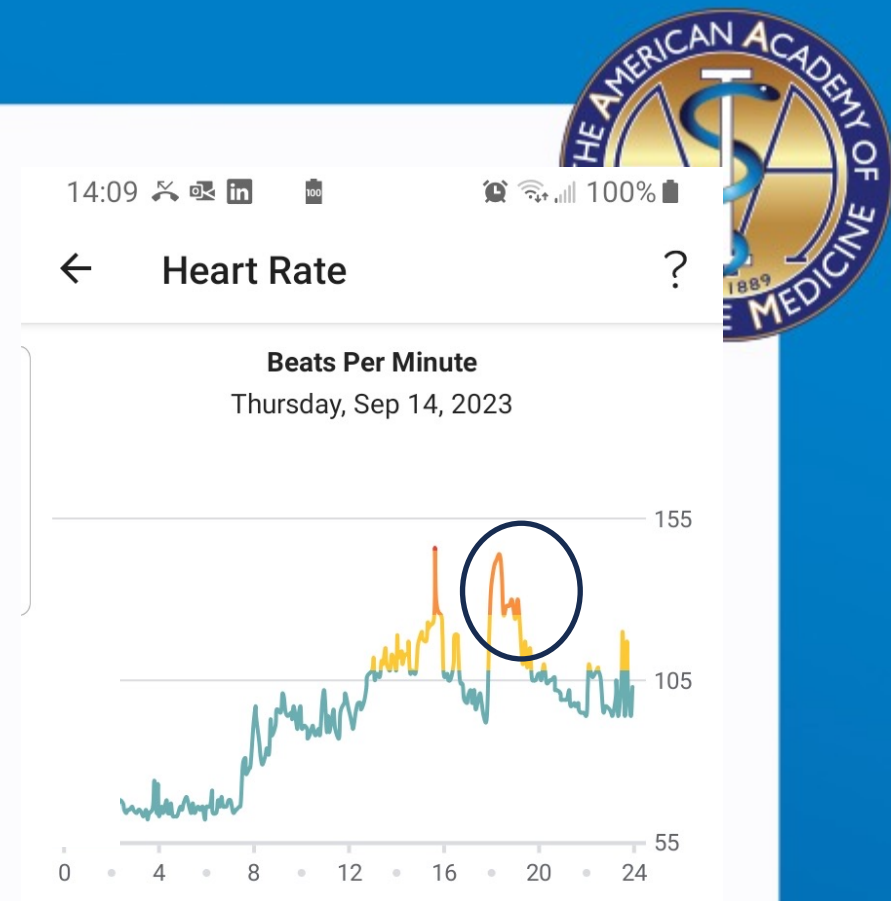
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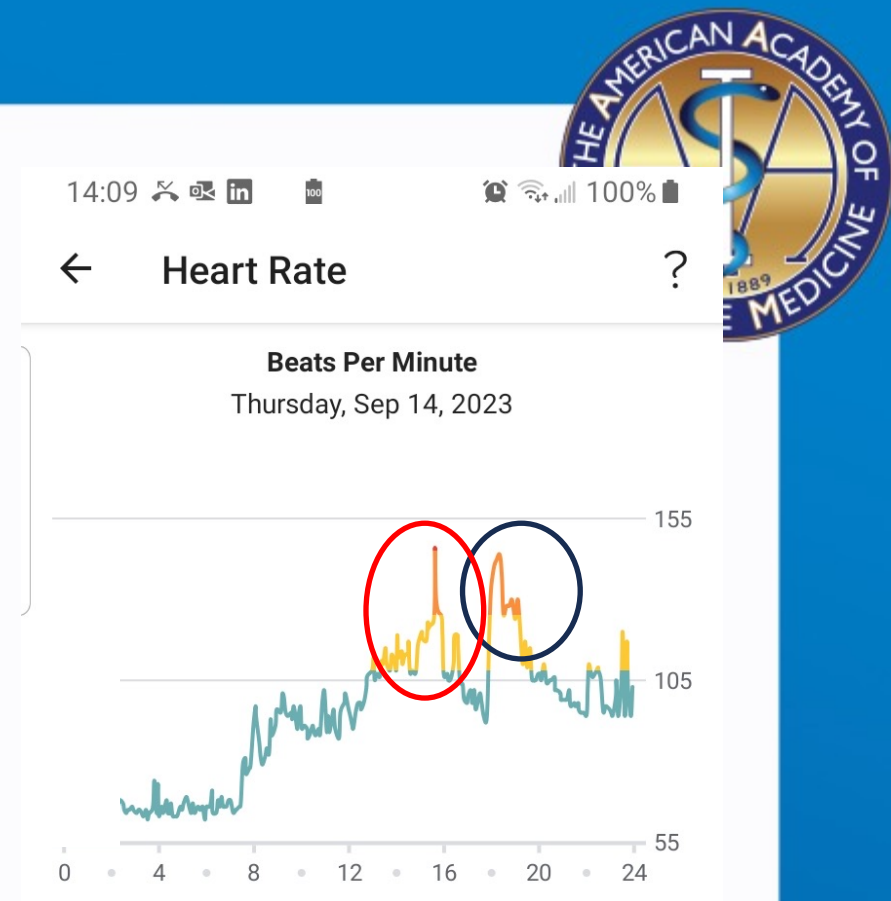
Prescription History

- Quick adoption
- Improving hit rate but data elements gathering is fragmented
- Fits the traditional underwriting paradigm
- Discover additional uses (e.g. list of doctors seen)
- Lead to mortality scoring
    - Understand the versions of the scores
    - Check performance on your own data

…And the Medical Director?

- Have an opinion – be informed
- Share your opinion – be in the loop
- Listen to the opinion of others – be a team player
- The question is not yes or no
- The real question is often how to maximize the value and minimize the drawbacks.

Other Insurance or Financial Sources

- Historical lab values
- Credit attributes data
- Other traditional sources of UW support in insurance
- Electronic health records (EHR)
- New medical lab technology
  - Liquid biopsies
  - Epigenetics
- Key question: where does the data come from?

(1): https://www.soa.org/resources/research-reports/2023/innovations-affecting-underwriting/

Population Resources

- Registries like SEER for cancer
- Population resources
  - Human Mortality Database (HMD)
  - CDC WONDER causes of deaths
  - CDC WISQARS fatal injuries
  - NCHS BRFSS behavioral
  - Explore https://data.cdc.gov/
- Surveys especially from NIH and CDC - like NHANES

New Dimensions in Underwriting

- Speed
- Simplicity
- Capture the data for increasing sophistication
- Individualized
- Leverage some underwriting values to the customers' benefit
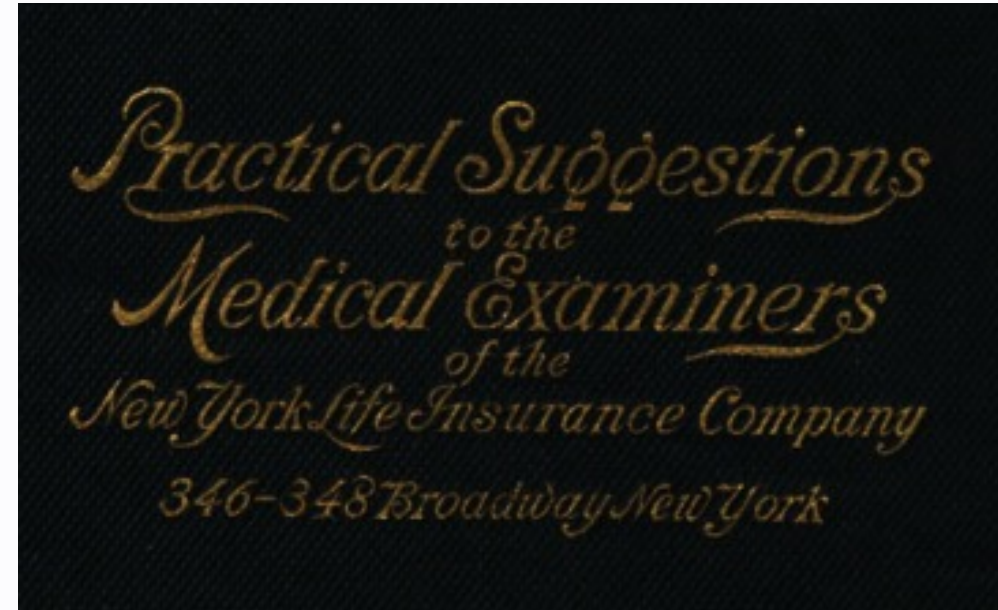- Engagement

The Pitfalls

- Basis risk
  - Understand the difference between your applicant pool and the source's population
- Not a vacuum: replace or add?
- Insurance effects
  - Antiselection
  - Sentinel effect
- Usability
- Understandability
- Explainability

The Medical Director's Skill Set

- Knowledge
- Perspective
- Critical thinking
- Understanding the caveats
- Focus on causal – but not always good for underwriting
- Understanding the (biological) mechanics
- Understanding the cost/benefit tradeoff

Practical Suggestions to the Medical Examiners of the New York Life Insurance Company 346-348 Broadway New York

The Medical Director's Role in the Data World

- Be informed of scientific and industry developments
- Identify relevant data sources
- Understand limitations of data
  - Applicability aka basis risk
  - Technical limitations (i.e. reporting delay)
  - Bias potential (i.e. BMI)
- Understand the role of the new data in the underwriting process
- Be aware of legal ramifications: unfair bias and privacy
- Participate (i.e. ACORD and EHR, ACLI)
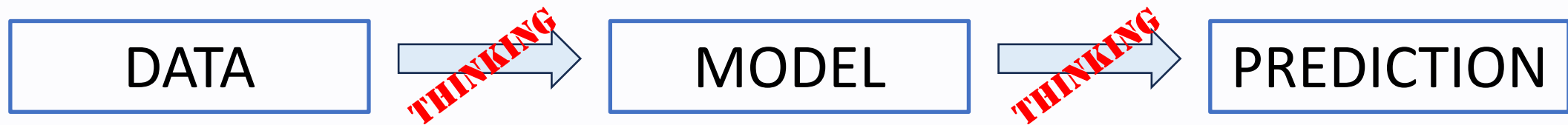- **Common sense and plausibility**

The Process from a Data Scientist Perspective

DATA $\rightarrow$ MODEL $\rightarrow$ PREDICTION

The Process from the Best Perspective

DATA $\longrightarrow$ THINKING $\longrightarrow$ MODEL $\longrightarrow$ THINKING $\longrightarrow$ PREDICTION

Your Allies

- Build your network
- Within your company
  - Your underwriters
  - Your actuaries
  - Your data scientists
  - Establish credibility and openness
- Within the industry
  - Reinsurers
  - Vendors
  - Peers
  - Associations: AAIM, CLIMOA, ACLI medical, AHOU, ALU, SOA

Questions?