

Milliman IntelliScript

The Intersection of Prescription Drugs and Mortality

Actuaries Club of Hartford & Springfield

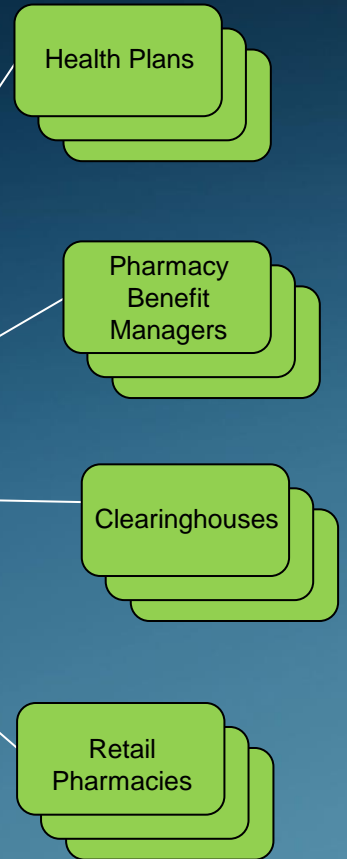
Annual meeting

May 12, 2015

Agenda

- Individual Rx histories
 - How does it work
 - Mortality study
 - RxRules engine
- Group Rx histories
 - Compare with individual
 - Group life applications
 - Individual life inforce analysis

How does Rx data gathering work?



1. Applicant signs authorization
2. Underwriter orders report
3. Data sources queried
4. Report delivered to underwriter

Rx history query information



- Prescription
 - Brand and generic name
 - Dosage and quantity
 - Date of fill



- Physician
 - Specialty
 - Contact information



- Pharmacy
 - Contact information



- Dates of eligibility
 - With or without prescriptions



- Underwriting significance indicator (risk score)



Sample screen shot

Jordan Zwagerman <u>62 Fills</u> <u>Doctors</u> <u>Pharmacies</u> Show All Details SSN 010-00-0000 DOB 8/2/1955 Age 55 Male Zip Code 17265				
Est Cost	\$0	\$1,947	\$2,204	\$0
Prior	2007	2008	2009	2010
		1 3 3 4 2 1 2 1 3 4 4	1 1 6 1 2 3 8 1 2 1 3 5	
+ COUMADIN (Warfarin Sodium)			HIGH	26 Fills
+ ATENOLOL (Atenolol)			MEDIUM	6 Fills
+ FOSINOPRIL SODIUM (Fosinopril Sodium)			MEDIUM	12 Fills
+ MONOPRIL (Fosinopril Sodium)			MEDIUM	10 Fills
+ VIAGRA (Sildenafil Citrate)			MEDIUM	1 Fill
+ AMOXICILLIN (Amoxicillin)			LOW	5 Fills
+ AMOXICILLIN/POTASSIUM CLA (Amoxicillin & Pot Clavulanate)			LOW	1 Fill
+ IBUPROFEN (Ibuprofen)			LOW	1 Fill

Individual Underwriting with Rx Histories

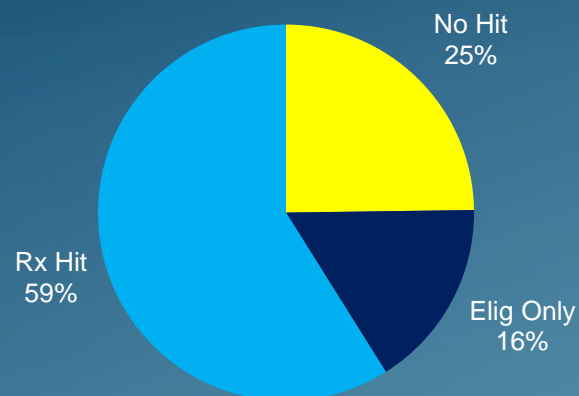
- Pay by the hit
- Results in 5 seconds
- Hit rate ~75%
 - Significant variation by client
- Widely adopted in individual life, health
 - IntelliScript: 5.0 million Rx histories in 2014

Mortality study

- Application years 2005-2011 – all business lines

- 10.4M applicants
- 45K deaths
- 21.2M exposure years

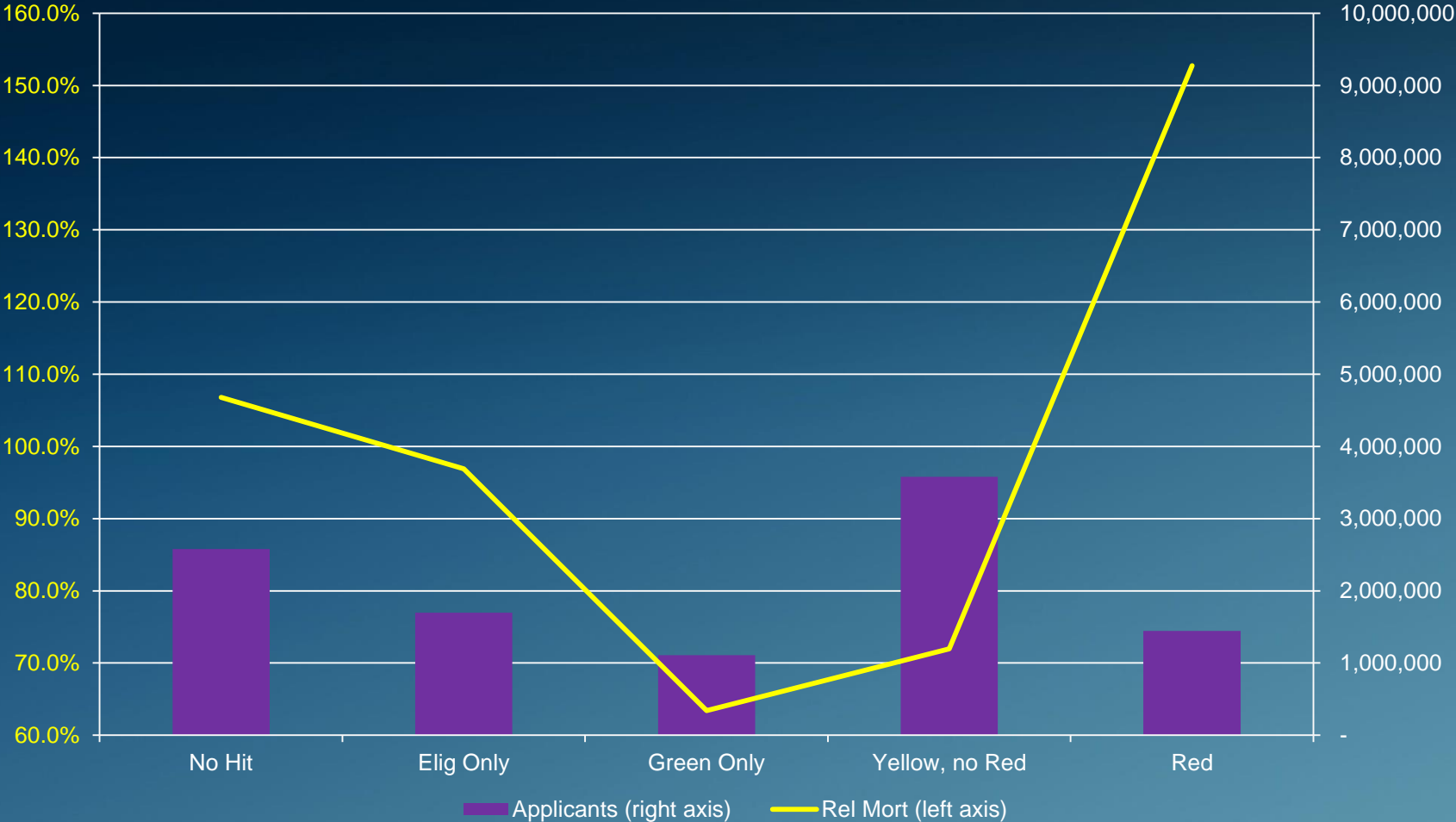
Distribution of Applicants



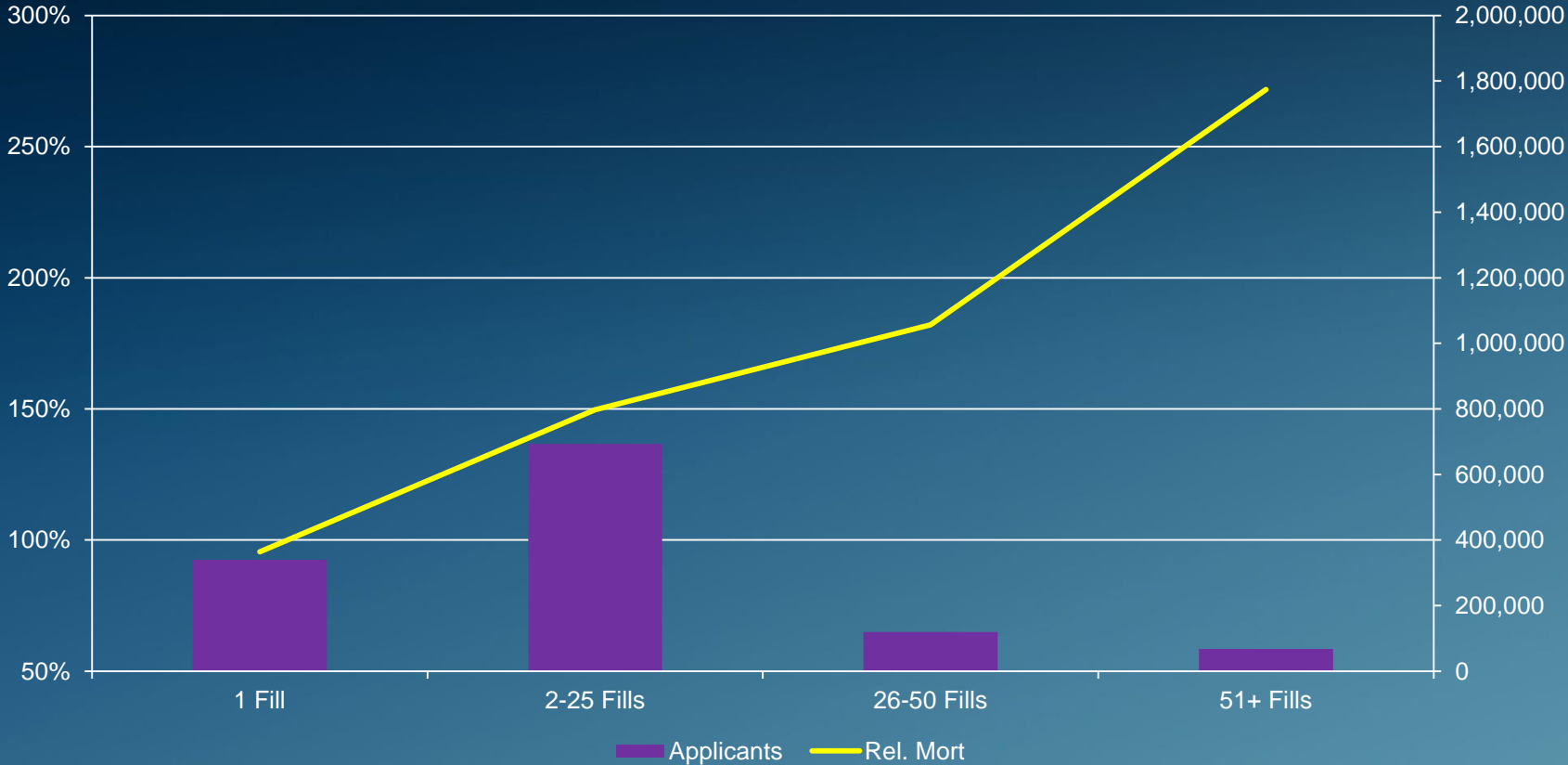
Relative mortality example

- Compares the mortality rate of a sub group vs. the overall group of 10.4M applicants
- Applicants who took the drug warfarin sodium died at a rate of 176% of the overall population of applicants
- Calculated as A/E for sub group divided by A/E for entire population of 10.4m applicants

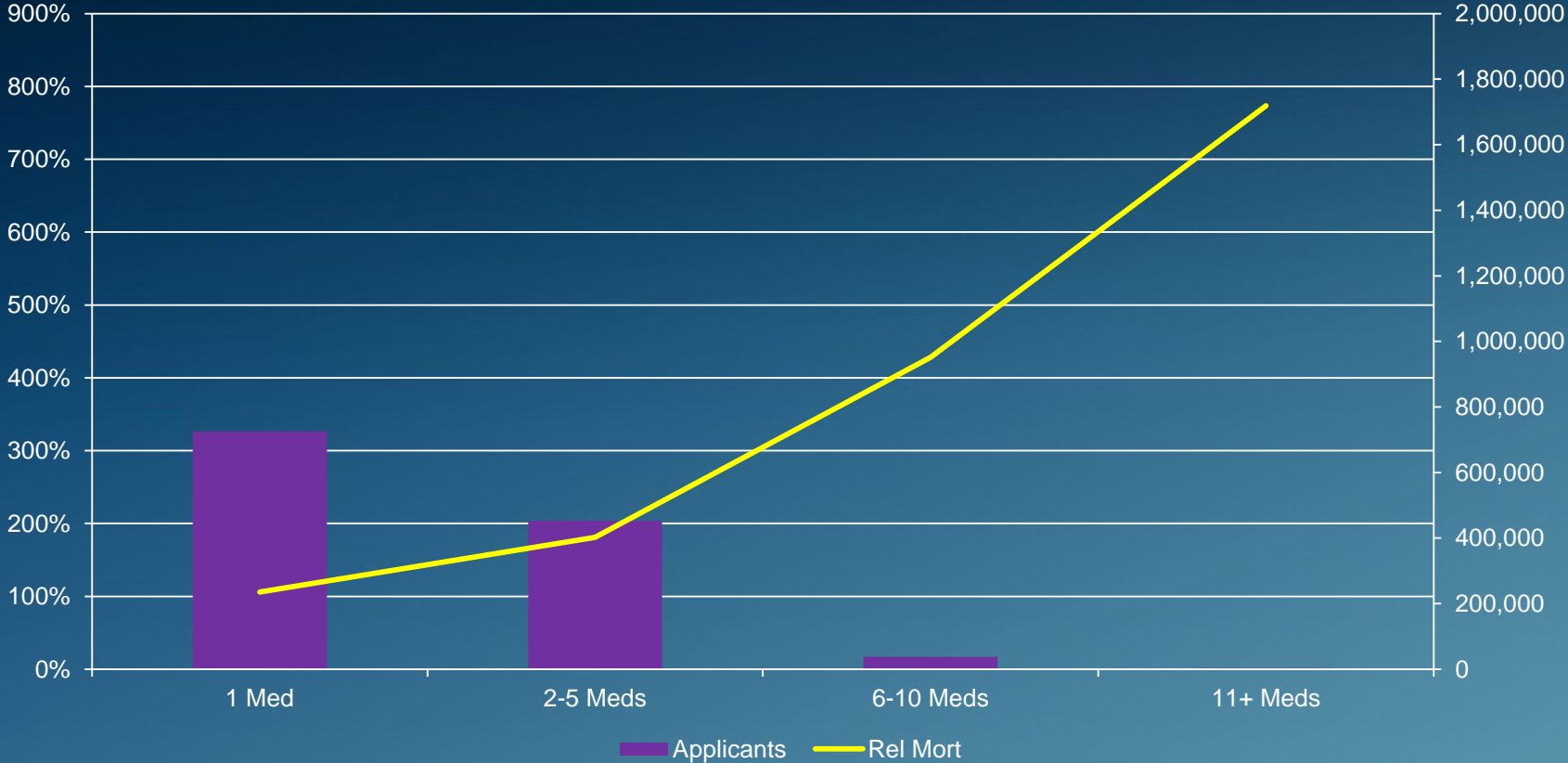
Relative mortality by status



Relative mortality by red fill count



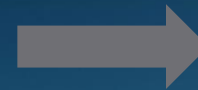
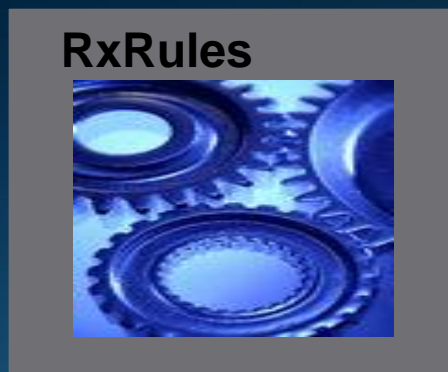
Relative mortality by distinct red medication



Rx rules engine

Data Input

- Rx info
- Application data
- MIB
- MVR



UW Guidance

- **Conditions**
- **Severity**
- **Decisions**

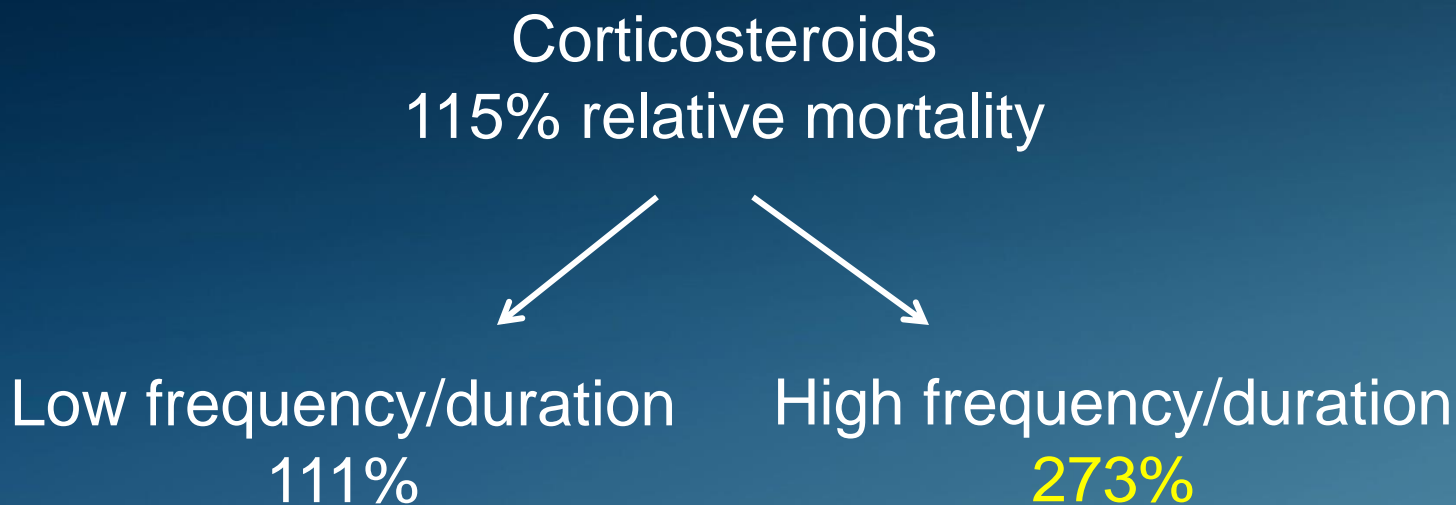
Rule Variables

- Indication / Therapeutic class
- Drug combinations
- Fill timing(date or duration ranges)
- Fill counts / patterns
- Dosage / quantity
- Physician specialty / count
- Gender / Age
- Other variables

Benefits of RxRules engine

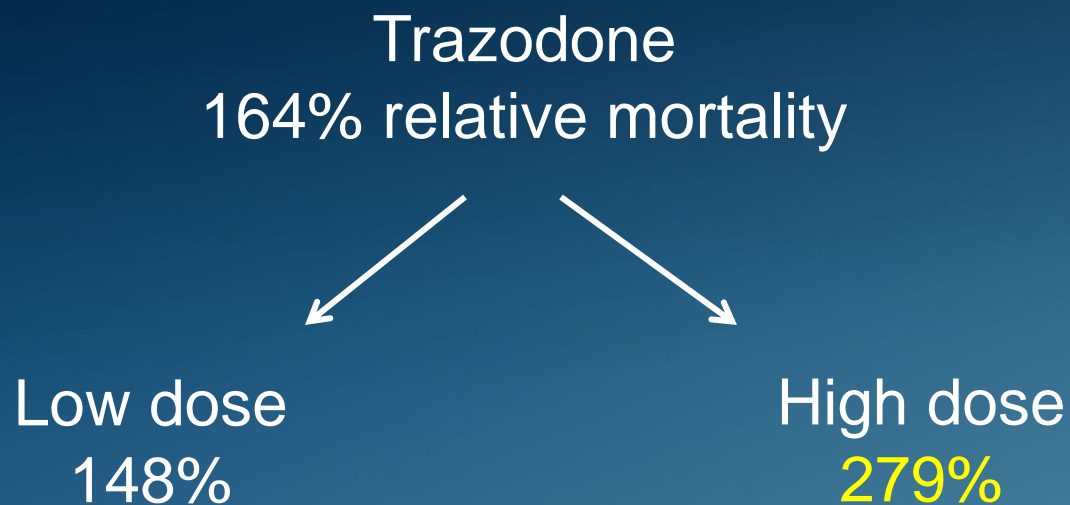
- Consistency
- Efficiency
- Decisions
- Evidence

RxRules – timing and duration matter



Corticosteroids are very common among insurance applicants

RxRules – dosage matters



RxRules – drug combinations matter

Spirolactone
276% relative mortality



With 2 out of 3 of:

Thiazide Diuretics (112%)
Ace / Angio II (ARBS) (122%)
Beta Blocker (130%)

357%

Without 2 out of 3 of:

Thiazide Diuretics (112%)
Ace / Angio II (ARBS) (122%)
Beta Blocker (130%)

212%

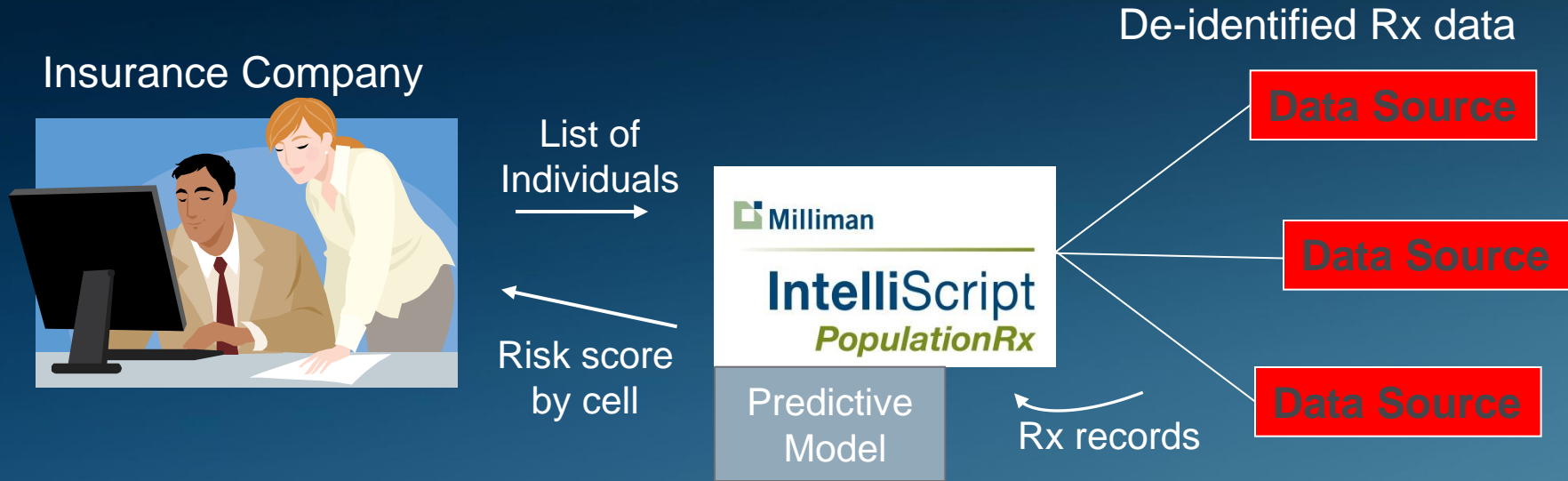
Population Rx risk scoring

- What is it
- Compare with individual Rx histories
- Group life uses
- Individual life analysis

What is PopulationRx?

- A relative risk measure for a group of lives using de-identified Rx histories
- Allows insight into mortality well before experience becomes credible
- Score is determined by a predictive model based on Rx history of individual
- No HIPAA authorization is required – no PHI

How does it work?



What information is needed?

- First name
- Last name
- Date of birth
- Gender
- Zip code – home

Comparison

Individual Rx Histories

- Require signed authorization
 - HIPAA compliant
- Full Rx detail on individual
 - PHI released
- New business UW'g
 - Individual
- Broadly adopted

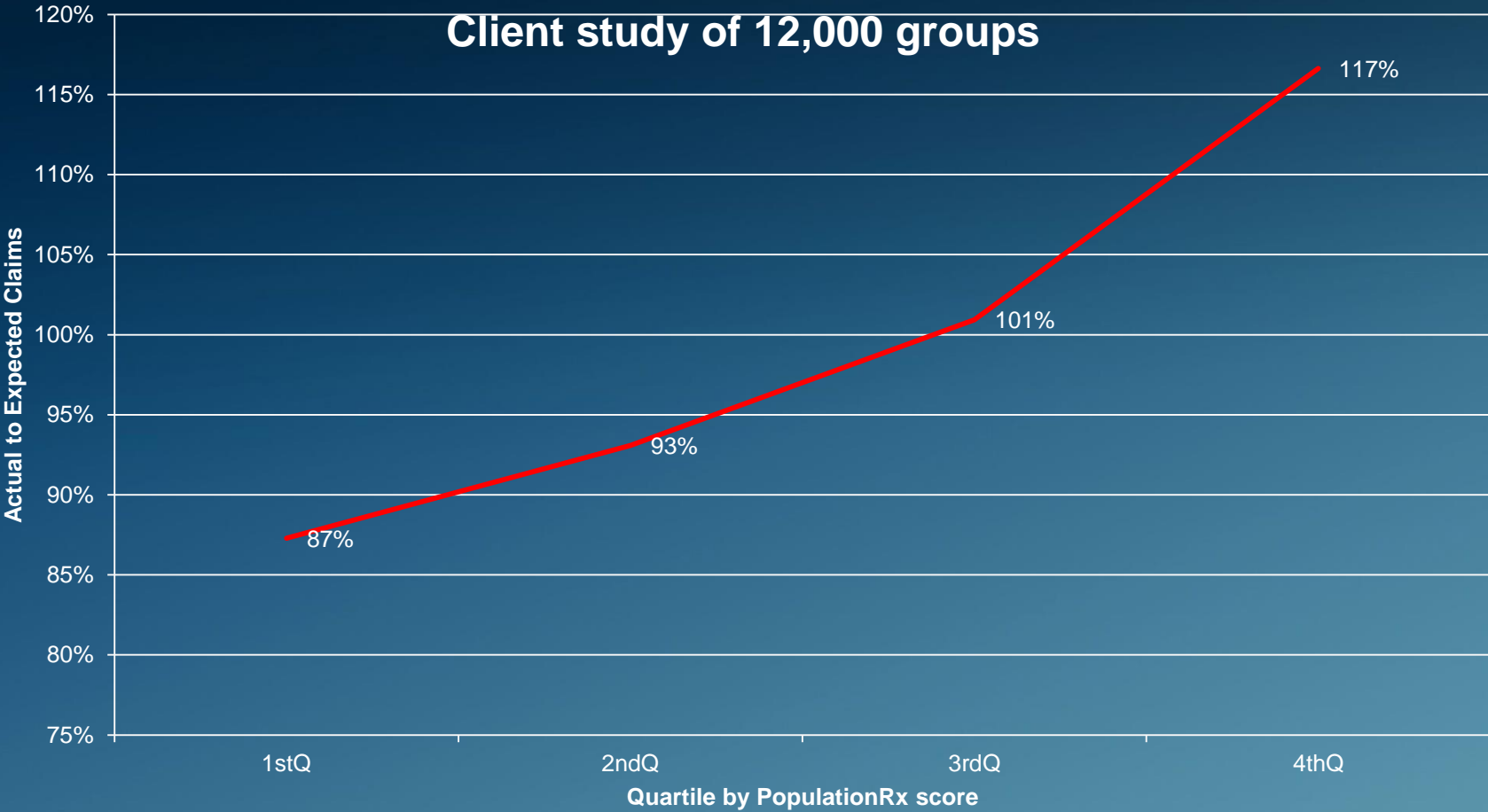
Population Rx score

- No authorization required
 - No PHI generated
- Only group risk scores returned
- New business & renewal UW'g
 - Groups only
 - Min. group size: 25 members
- Emerging technology

Improving Group Life and Group LTD returns

- Place more healthy business
- Avoid placing unhealthy business
- Retain healthy renewal business

Group life results by quartile

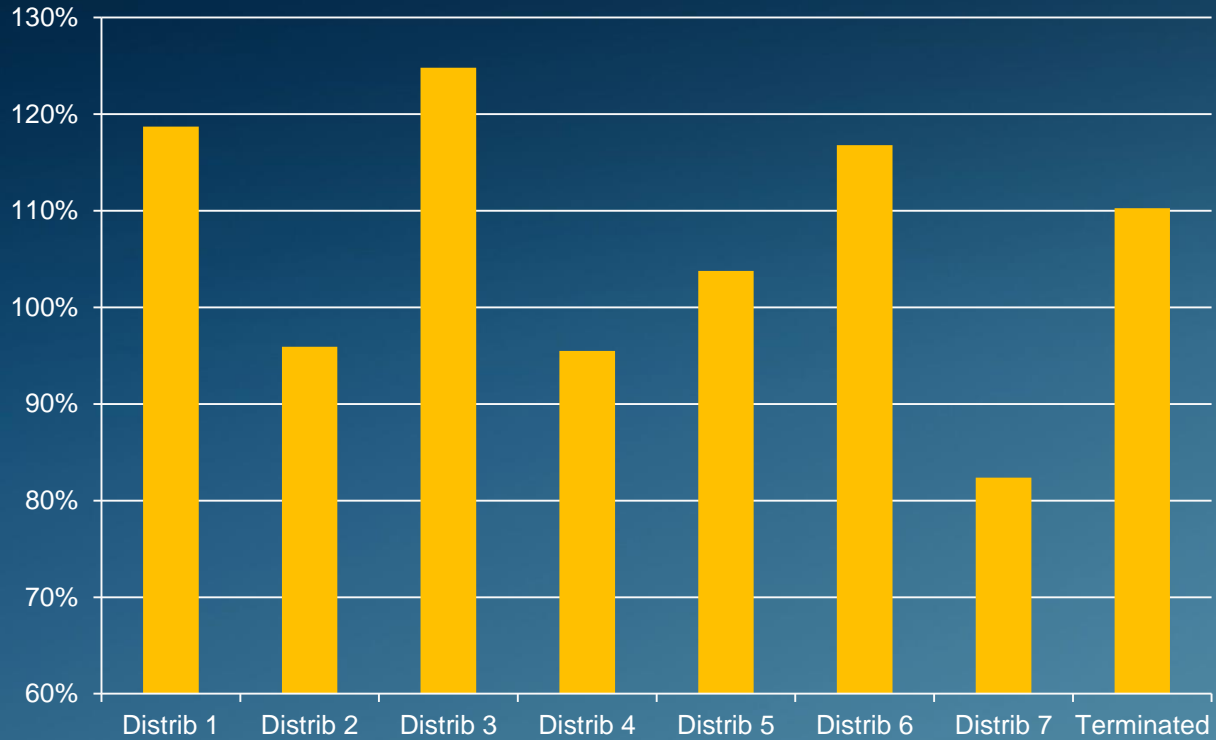


Inforce Management – PopulationRx

- Compare mortality for blocks of business, e.g. by distributor
- Monitor EOLP term mortality
 - Optimize EOLP premium increase for lapse/mortality
- New product monitoring

Study – Distribution

Normalized Risk Score by Distributor



Example – EOLP term measurement

- Actively monitor spike lapse mortality impact



Example – new product monitoring

- Actively monitor mortality of new product
 - E.g., expect mortality to be 10% higher than baseline product

	PopulationRx Score	
Product Cell	Baseline Product	New Product
Age1, face1, riskclass1	1.5	1.6
Age2, face2, riskclass2	1.8	2.0
Age3, face3, riskclass3	1.2	2.0
...		

Individual Life Uses of PopulationRx

- Determine how fast “preferred” is wearing off
- Evaluate change in underwriting guidelines well before experience would allow
- Evaluate individual underwriters
- Evaluate term conversion business
- Compare not takens to placed business
- Help guide M&A assumptions

Summary of PopulationRx applications

- Brings value to group underwriting
 - New business acquisition and renewals
 - Multiple types of products
 - Life, COLI, Executive Benefits, LTD
- Powerful Inforce analysis
 - Individual life
 - Special projects

Contact Info

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