



Milliman IntelliScript®
See more. Fear less.

The History of Underwriting

Doreen Acampora & Carolyn McAvinn | October 4, 2023

Who Are We?

Doreen Acampora, FALU, FLMI, CLU, ChFC

Carrier Experience

- Chief Underwriter roles
- Strategy and Underwriting Innovation
- Product Development
- Insurtech

Industry Engagement

- MUD Group- Board Member/Sponsorship Committee chair

Milliman Focus

- Clinical Services team
- Underwriting consulting services
- Underwriting training
- Product innovation

Underwriting Consultant

Milliman IntelliScript[®]
See more. Fear less.



Who Are We?

Carolyn McAvinn, FLMI, AALU, ACS, RHU, HIAA, Series 6 & 26, PMC-IV

Carrier Experience

- Underwriting / Many Hats- Six Member Companies
- Mortality Assessment / Marketing Underwriter
- Automated Engines / Accelerated Underwriting

Industry Engagement

- MUD Group- Board Member / Secretary

MIB Focus

- Sales/Member Engagement Team/Underwriting Consultant Services
- Medical Data Solutions Platform



Director, Underwriting Innovations

Discussion Items

- **Early Days of Life Insurance (CM)**
- **The Early to Mid 20th Century (CM)**
 - Challenges & Solutions
 - Mortality Trends
 - Innovation
- **The Mid 20th Century- Present Day (DA)**
 - Challenges & Solutions
 - Mortality Trends
 - Innovation
- **What Does the Future Hold for Underwriting? (DA and CM)**
 - Perspectives and Predictions
 - FAQs from our customers
- **The Future of Underwriting / An Open Discussion:**
 - The Role of the Underwriter
 - AI
 - The Regulatory Environment

Early Days of Underwriting

Early 20th Century

Early Days of Life Insurance Underwriting

The Presbyterian Ministers' Life Insurance Fund

- 1759- First recorded life insurance entity in the U.S.
- Intended for protection for widows and children of deceased ministers
- Early barriers to sales activity
 - Concept of putting monetary value on the life of a person
 - Legal constraints for women to enter contracts, including insurance policies or inheriting wealth or estates

Insurable Interest as we know today-
A wife or spouse did not fit the definition

Early Days of Life Insurance Underwriting

Life insurance was only for the healthy

- Insurance companies were locally organized & included a physician on BOD
- Underwriting medical risk was essentially pass/fail... very little documentation
- Applicants often required to appear in front of BOD to answer medicals questions

Type of Questions

Are you given to drink or other intemperance?

Are you subject to any disorder that might tend to shorten your day?

Challenges & Solutions

Early & Mid 20th Century

UW Challenges

Early 20th Century

- Pressure, Opportunity and rationalization for a customer to lie when seeking coverage
- Lack of availability of physicians in rural areas & rising fees to provide medical statements made obtaining medical status from MDs difficult
- During the Depression era, insurers were having problems based on low interest rates, falling credit rating and overly optimistic mortality table assumptions
- Policyholders needed funds and were cashing out
- Most applicants were honest, but companies were losing money because of the dishonestly of some which were driving up premiums

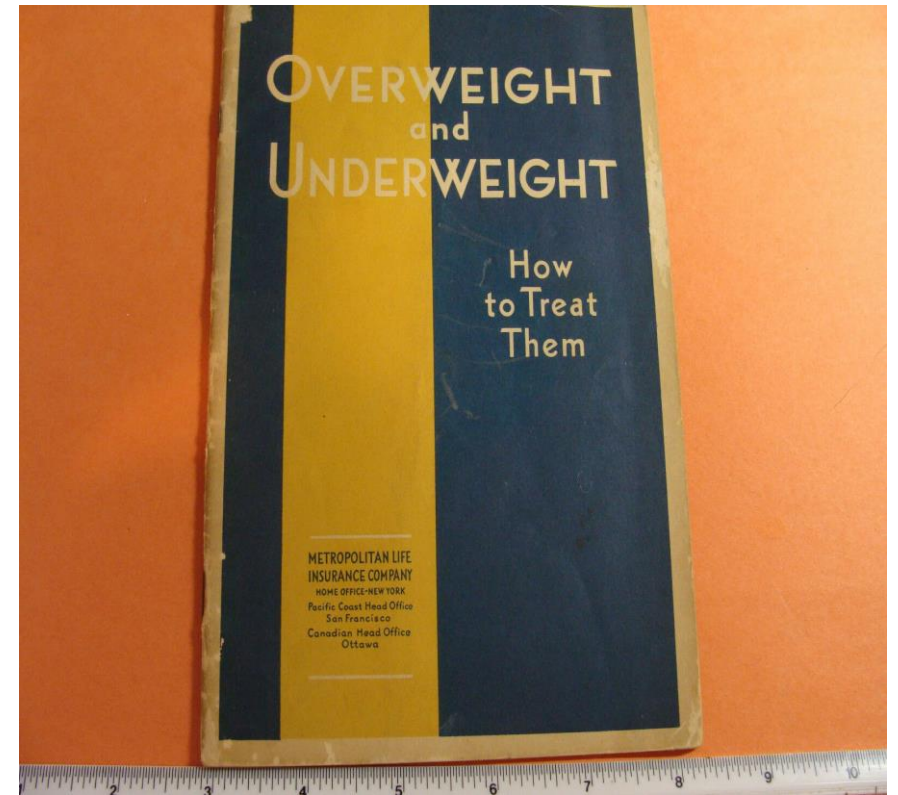
Some insurers requested statements regarding health and habits from the family doctor, neighbors, friends, relatives

UW Solutions

Early 20th Century

- Company profits were GOOD for healthy lives on the books... Desire to expand coverage for those not in perfect health
 - Use of lay underwriters to review applications
 - Health manuals first introduced during the early 20th century

- **1912**- Blood Pressure Readings
- **1918**- First Medical & Actuarial Supported Mortality Tables



Early 20th Century Advertisement

*Shorten Your Belt
Lengthen Your Life*



"Twenty pounds—in four months—twenty pounds gone! How's that?"

UP to age 30, a moderate degree of overweight helps to protect against diseases such as tuberculosis and pneumonia. But after age 30—consult the scales and watch your belt line. In older people excess fat adds to the work which the heart, liver, kidneys and pancreas are called upon to do.

Men and women over 45 who weigh 20% more than the average have a death rate that is 50% higher than the average for their age. Long continued overweight may lead to early heart disease or apoplexy. Nearly half the people who develop diabetes are very fat before the disease appears.

Too much fat usually comes from overeating, lack of exercise, or both. It is easier to avoid excess weight than to take it off. In most instances overweight can be controlled.

Even when present for a long period of years overweight often may be reduced with safety, but each case requires individual treatment. No effort to bring about a marked weight reduction should be attempted except on the advice and under the supervision of a physician.



People who adopt an unbalanced "fad" diet, or treat themselves with reducing medicines, often suffer serious consequences. Some of these medicines contain dangerous drugs; others are practically useless for weight reduction. It may also be dangerous to begin suddenly a strenuous system of exercises in an effort to reduce. Such extreme measures may throw too great a strain on vital organs already impaired by the excess fat and cause a sudden breakdown.

Aside from overeating, lack of exercise and hereditary factors, overweight may be caused by disease or improper secretion of certain glands. Even if it is caused by an abnormal glandular condition, medical treatment can often effect a complete cure or relief.

Do you know what you should weigh? Send for the Metropolitan's booklet "Overweight and Underweight" which tells the proper weight for your age and height. In it you will find a complete program of diet and exercise which may help you to keep your weight down, or—under your physician's guidance—to reduce safely. Address Booklet Department 537-X.

Keep Healthy—Be Examined Regularly

METROPOLITAN LIFE INSURANCE COMPANY
FREDERICK H. ECKER, Chairman of the Board ~ ONE MADISON AVENUE, NEW YORK, N. Y. ~ LEROY A. LINCOLN, President
Copyright, 1917, by Metropolitan Life Insurance Company
• 149 •

Early 20th Century

- Lack of availability of physicians in rural areas & rising fees to provide medical statements made obtaining medical status from MDs difficult
 - By 1925, U.S. insurers routinely began taking non-medical exams

The mortality experience was just as good!

Mortality Trends & Innovation

Early & Mid 20th Century

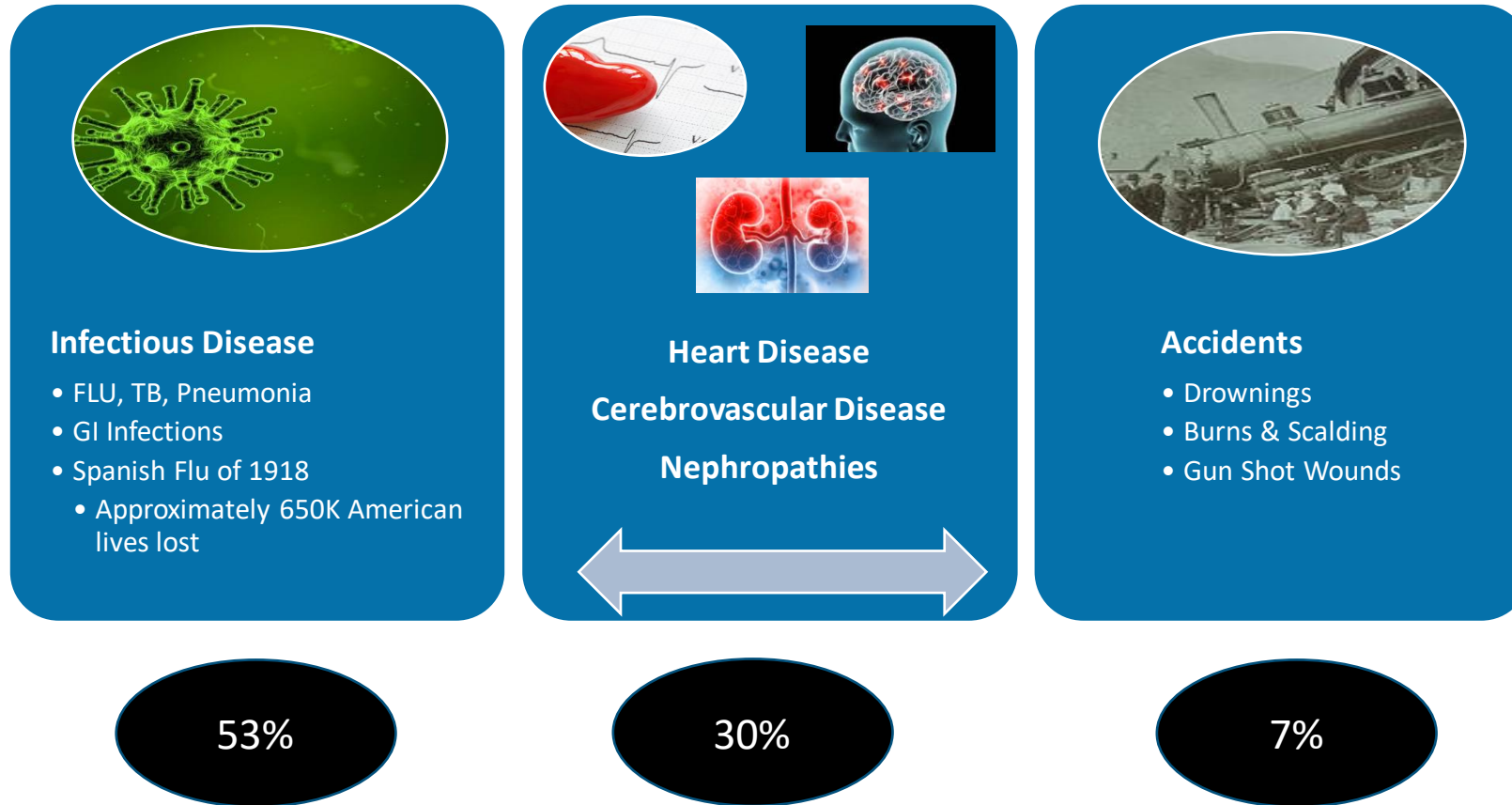
Mortality Trends:

Early 20th Century Leader Causes of Death



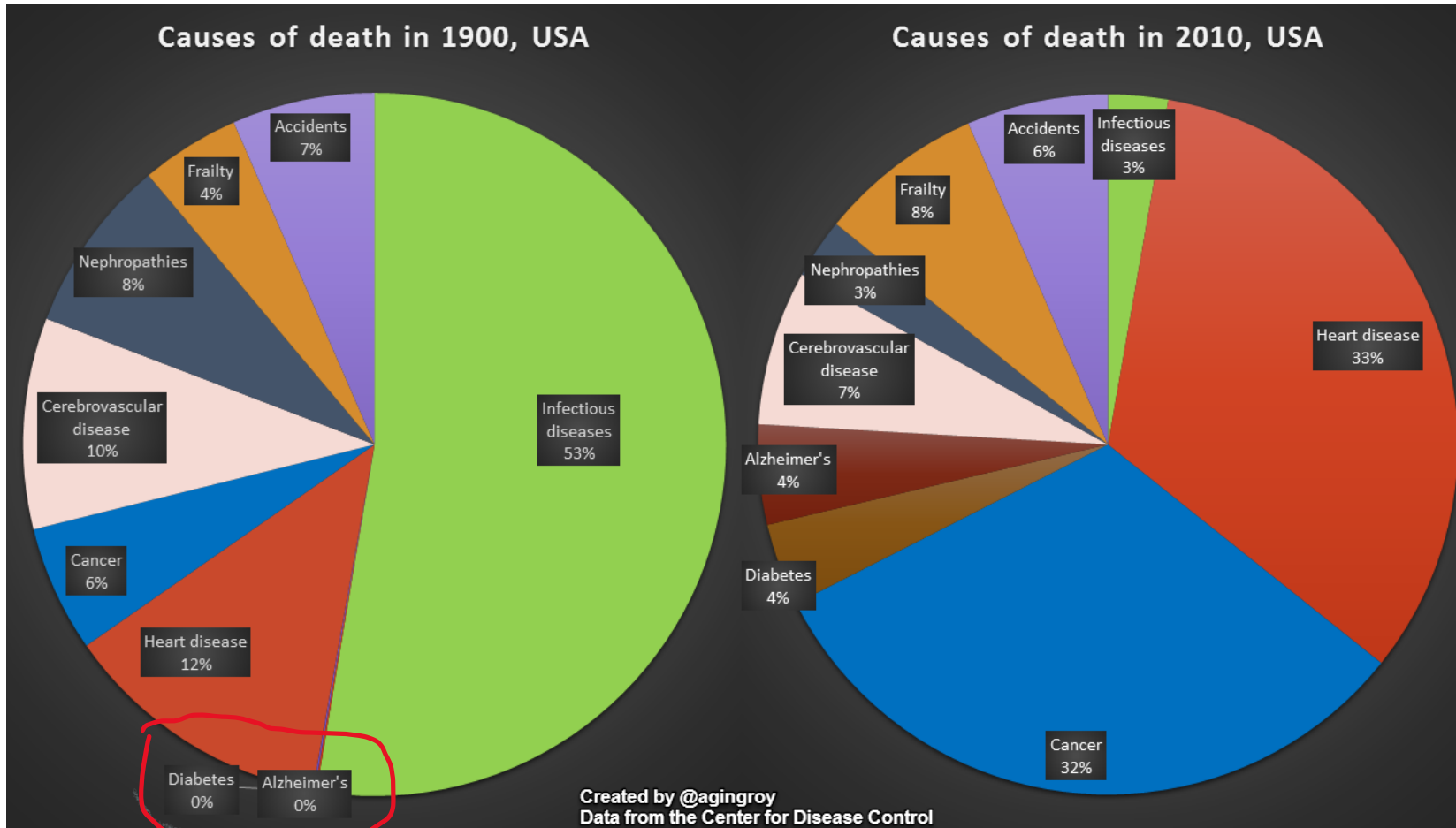
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Mortality Trends:

Early 20th Century Leader Causes of Death



Mortality Trends:

Social Issues Impact on Mortality



Has Prohibition Brought Temperance?

The death rate from alcoholism in United States has risen 300 per cent since the first year of Prohibition.

—Dr. Fred L. Hoffman, Consulting Statistician,
Prudential Life Insurance Company.

In the wage-earning population at least, the alcoholism death rate during the past eight years has been six times as high in the United States as in Canada.

—Metropolitan Life Insurance Company.

Insanity due to alcoholism has steadily increased since 1920 and has now reached the 1917 level.

(According to table of alcoholic admissions to State Insane Asylums in New York and Massachusetts by John Gebhardt, Statistician)

“Since 1920 there has been a continuous increase so that in 1929 we treated more patients for liquor addiction than in any year since 1896, with the exception of 1906 and 1907.”

—Official Report of the Keeley Cure.

Arrests for drunkenness in 1928 are estimated at 1,812,000 or 151 per 10,000 inhabitants—twice as high as 1920.

(Based on police records in 371 towns and cities tabulated by Moderation League)

ALL THE RECORDS TELL THE SAME TRAGIC STORY!

PROHIBITION HAS FAILED DISASTROUSLY!

REPEAL IS THE FIRST STEP TOWARD TEMPERANCE!

Join the
WOMEN'S ORGANIZATION FOR NATIONAL PROHIBITION REFORM



Innovation: Product Innovation

MIB was born on July 1st...
In what year?

1902

- #4 Born in Germany
- #5 Born in Ireland
- #6 Born in Sweden or Norway
- #21 Tailor
- #28 Hotel keeper, not attending bar
- #29 Wine or liquor seller, abstainer
- #30 Wine or liquor seller, non-abstainer
- #45 Has taken cure for, or has reformed from, intemperance
- #55 Has had blood-spitting
- #96 Texas, Harris County

CLASSES OF RISKS.

1. Amount \$20,000 or over on same application.
 2. Amount applied for reduced by company.
 3. Granted on plan not applied for.
 4. Born in Germany.
 5. Born in Ireland.
 6. Born in Sweden or Norway.
 7. Colored.
 8. Officer in army. Exclude issued after 1896.
 9. Officer in navy.
 10. Marshal, sheriff, police, constable, etc.
 11. In city fire department.
 12. Physician.
 13. Exposed in occupation to electricity.
 14. In sawmill.
 15. Steel grinder.
 16. Puddler, foundry or rolling-mill worker, etc., not machinist.
 17. Glass worker.
 18. Potter.
 19. House painter.
 20. Printer, not publisher.
 21. Tailor.
 22. Butcher or meat dealer.
 23. Laborer.
 24. Contractor.
 25. Theatrical occupation.
 26. Traveling salesman.
 27. Cattle dealer or drover.
 28. Hotel keeper, not attending bar.
 29. Wine or liquor seller, abstainer.
 30. Wine or liquor seller, non-abstainer.
 31. Brewer or employee.
 32. Distiller or employee.
 33. Railway passenger conductor.
 34. Railway passenger trainman. Exclude prior to 1890.
 35. Railway mail clerk.
 36. Railway express messenger.
 37. Railway locomotive engineer.
 38. Railway locomotive fireman.
 39. Officer of ocean steam vessel.
 40. Officer of sailing vessel on ocean or Great Lakes.
 41. Pilot.
 42. Seaman or fisherman.
 43. Has intermittent or irregular pulse.
 44. Has pulse below 60.
 45. Has taken cure for, or has reformed from, intemperance.
 46. Has had asthma.
 47. Has had inflammatory rheumatism once.
 48. Has had inflammatory rheumatism oftener than once.
 49. Has had gout.
 50. Has had syphilis.
 51. Has had otorrhea, or running from ear.
 52. Has had hepatic colic, or gall-stone.
 53. Has had renal colic, calculus or gravel.
 54. Has had inflammation of bowels, peritonitis or appendicitis.
 55. Has had blood-spitting.
 56. Has had hip-joint disease.
 57. Has had dyspepsia, with weight A, B or C.
 58. Has had dyspepsia, with weight D.
 59. Weight A: neither parent noted as dead below 70.
 60. Weight A: one parent, or both, dead below 70.
 61. Weight A: girth of abdomen greater than chest expanded.
 62. Weight B: neither parent noted as dead below 70.
 63. Weight B: one parent, or both, dead below 70.
 64. Weight B: girth of abdomen greater than chest expanded.
 65. Weight C: parent dead below 70 of consumption, phthisis or tuberculosis.
 66. Weight C: parent dead below 70 of kidney or Bright's disease.
 67. Weight C: parent dead below 70 of heart disease.
 68. Weight C: parent dead below 70 of apoplexy or paralysis.
 69. Weight C: both parents dead below 60.
 70. Weight C: both parents reached 75.
 71. Weight D: parent dead below 70 of any lung disease.
 72. Weight D: not included under 58 or 71.
 73. Height above six feet three inches.
 74. Height below five feet.
 75. Parent, brother or sister died of cancer.
 76. Parent, brother or sister has been insane.
- Place of Residence:*
77. Alabama, Mobile County.
 78. Alabama, Montgomery County.
 79. Arkansas, Jefferson County.
 80. Arkansas, Phillips County.
 81. Colorado, Arapahoe County.
 82. Florida, Duval County.
 83. Florida, Monroe County.
 84. Georgia, Chatham County.
 85. Kentucky, McCracken County.
 86. Louisiana, Orleans County.
 87. Mississippi, Adams County.
 88. Mississippi, Warren County.
 89. North Carolina, New Hanover County.
 90. New Mexico, Santa Fé County.
 91. South Carolina, Charleston County.
 92. Tennessee, Shelby County.
 93. Texas, Bexar County.
 94. Texas, Dallas County.
 95. Texas, Galveston County.
 96. Texas, Harris County.
 97. Texas, Travis County.
 98. Virginia, Norfolk County.

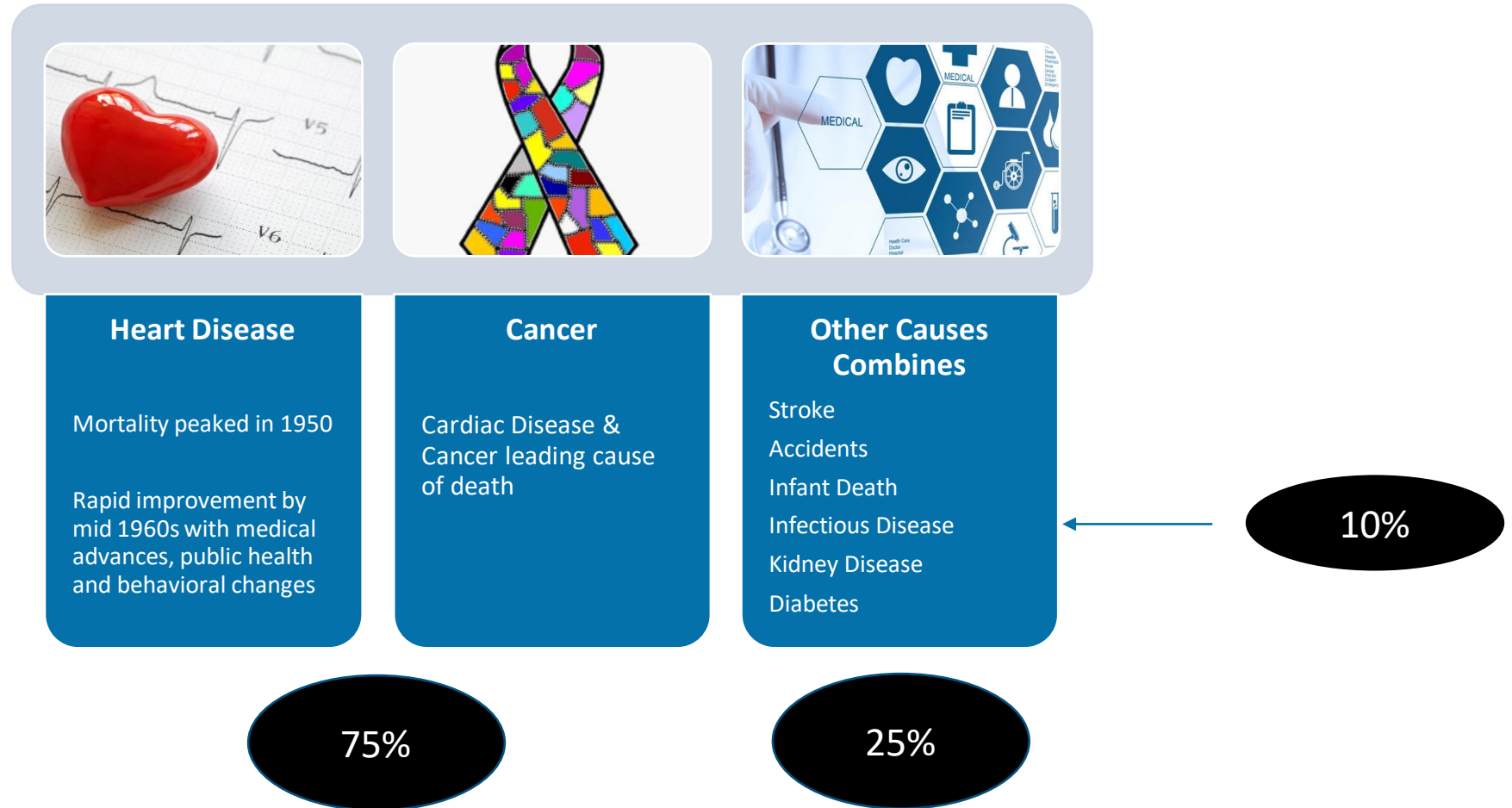
Mortality Trends:

Mid 20th Century Leader Causes of Death



Mortality Trends:

Mid 20th Century Leader Causes of Death



Mortality Trends:

Early – Mid 20th Century Annual Mortality Statistics

1900:
One in 40 Americans

2013:
One in 140 Americans

1990- 2013:
Life expectancy at birth
rose by more than 30
years

• Influencing Factors

- Demographic & Socioeconomic Group
- Educational Attainment
 - On average, individuals with college or advanced degree live more than 10 years longer than those without a high school degree
- Access to Better Nutrition
- Urban Sanitation / Water Filtration
- Development of Antibiotics

Innovation: Medical Innovation & Behavior Modification

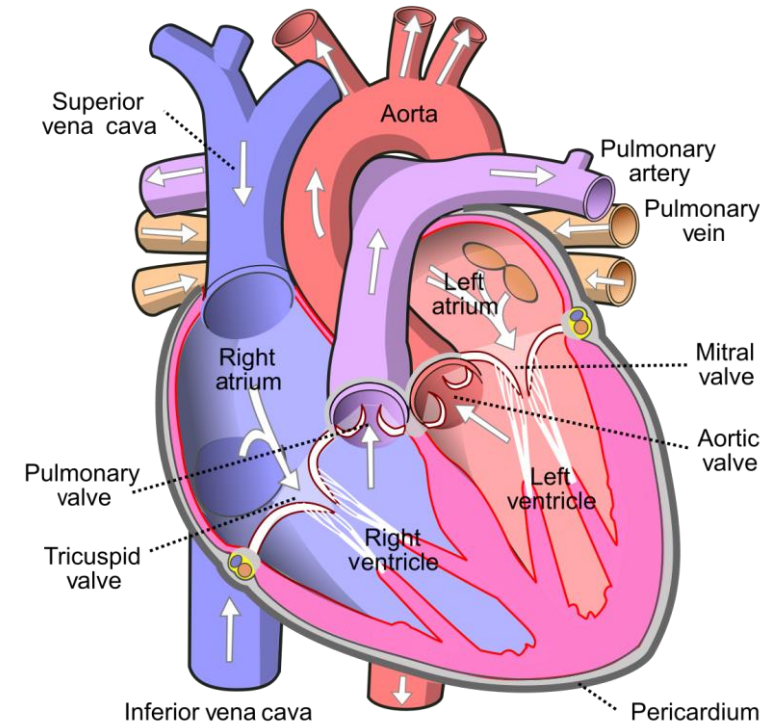
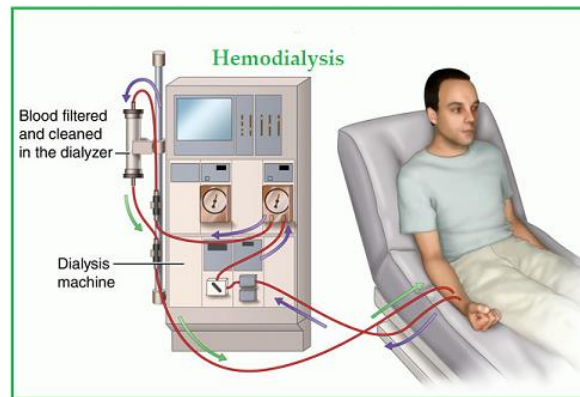


1930
Advertisement



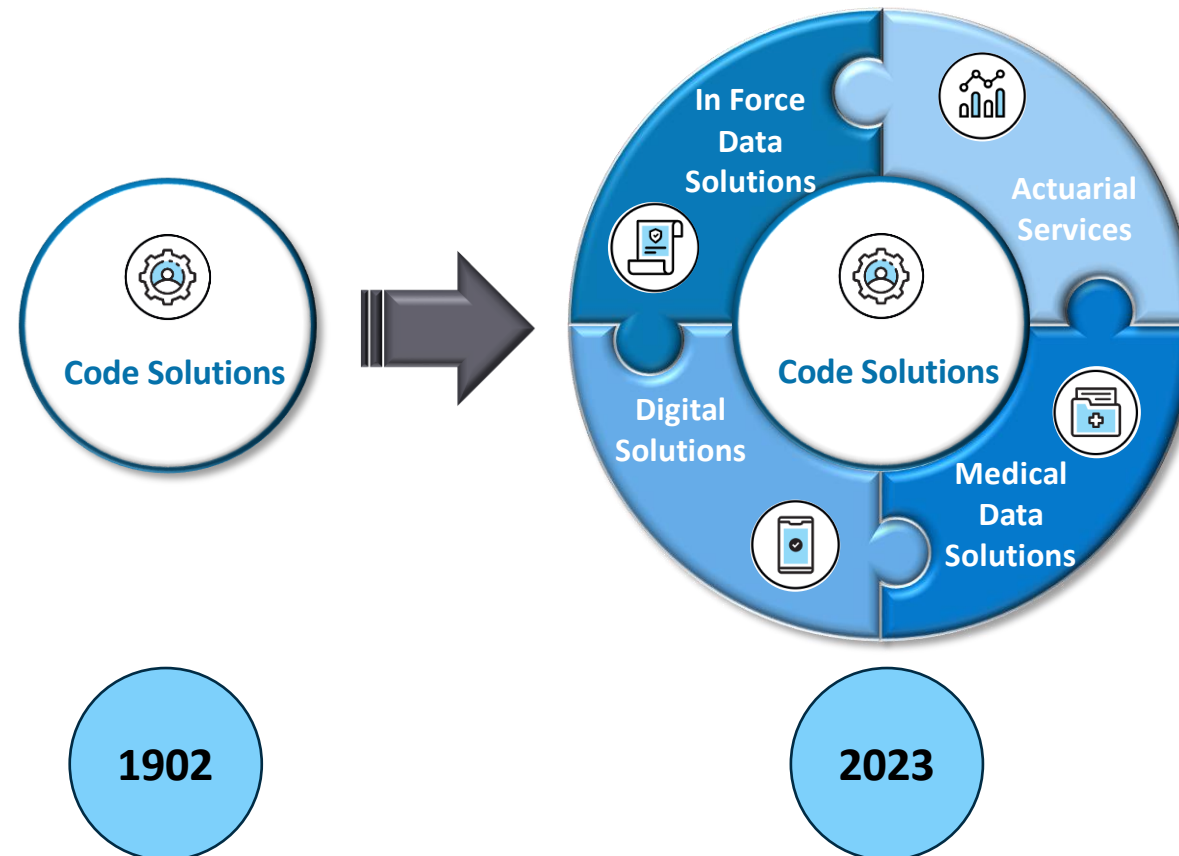
1949
Advertisement

Innovation: Medical Innovation



Product Innovation: MIB Transformation to Support Underwriting

MIB has evolved from a niche service provider to a diversified partner of choice within the insurance industry



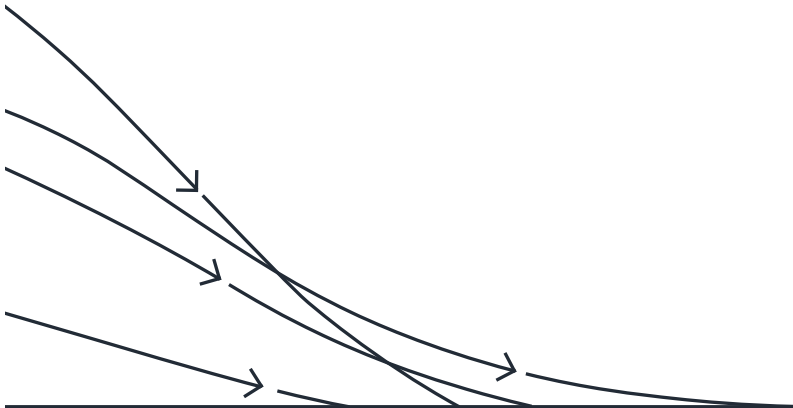
The Underwriting Evolution

Mid 20th Century to Present

ELECTRONIC DATA HAS DISRUPTED UNDERWRITING

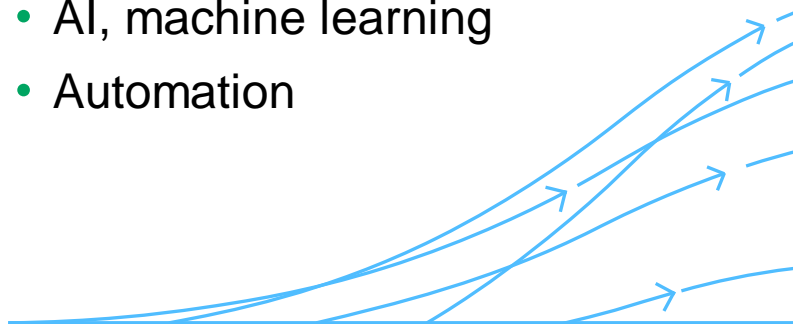
DECREASE

- APS, labs
- Cycle times
- Costs
- Abandonment



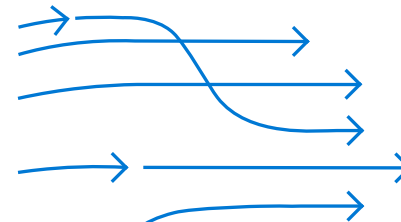
INCREASE

- Electronic requirements (Rx, MIB, MVR, medical, credit, Medical Data, EHR, Risk scores)
- Decision engines driven by data
- Predictive models
- AI, machine learning
- Automation



RESULT

- Protective value/mortality savings
- Productivity and underwriting capacity
- Insight on health conditions



BETTER CUSTOMER EXPERIENCE

UNDERWRITING IN THE PAST: FEAR OF MISSING ANYTHING!



UNDERWRITING TODAY: SEE MORE, FEAR LESS

Streamlined Processing



**Still data analysis,
just with different tools**

HIV AND COVID: TWO DISRUPTORS

HIV



COVID

- 2020 onset
- Decrease in exams/ blood
- Increase in regulations
- High mortality and morbidity impact

HIV AND COVID: TWO DISRUPTORS

HIV

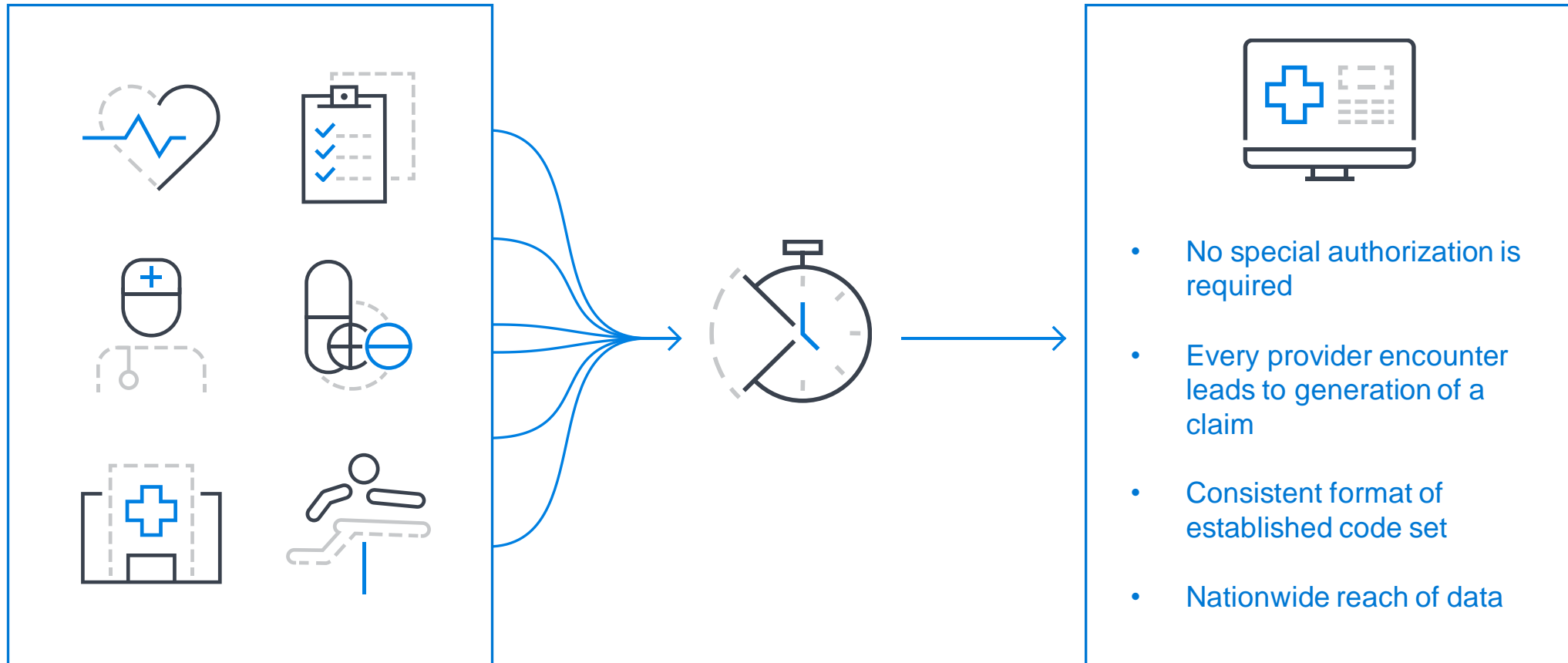
- Mid/late 1980's onset
 - Increase in exams/blood
 - Increase in regulations
 - Moderate mortality and morbidity impact
-

COVID

- 2020 onset
 - Decrease in exams/ blood
 - Increase in regulations
 - High mortality and morbidity impact
-

MEDICAL CLAIMS DATA

MEDICAL DATA PROVIDES REAL-TIME HEALTH INFO IN SECONDS.



SAMPLE HOSPITAL BILLING STATEMENT

The form contains the following sections:

- Patient Information:** Includes patient name, address, and insurance details.
- Procedures Billed:** A table listing medical procedures with their codes and charges.

DESCRIPTION	ICD-9-CM	ICD-10	UNIT	CHARGE
PHARMACY		110308	10	104.48
IV SOLUTIONS		110308	4	14.37
MED-SUR SUPPLIES		110308	7	200.74
STERILE SUPPLY		110308	3	46.50
SUPPLY IMPLANTS		110308	1	664.75
PATHOLOGY LAB	88302	110308	1	93.75
OR SERVICES	49568	110308	1	737.00
OR SERVICES	49560	110308	1	737.00
ANESTHESIA		110308	2	176.75
DRUG/DETAIL CODE	J2405	110308	1	41.62
DRUG/DETAIL CODE	J2765	110308	1	3.48
RECOVERY ROOM		110308	2	207.75
- Charges and Totals:** A summary section showing the total amount due.
- Insurance and Billing Information:** Details about the insurance plan and billing cycle.
- Provider Information:** Includes the provider's name, NPI, and contact details.

Hospitalization or Treatment dates

Procedures billed to major medical

- C1781: Mesh (implantable)
- 88302: Surgical pathology level 2
- 49568: Implantation of mesh
- 49560: Repair incisional hernia

Medications billed to major medical

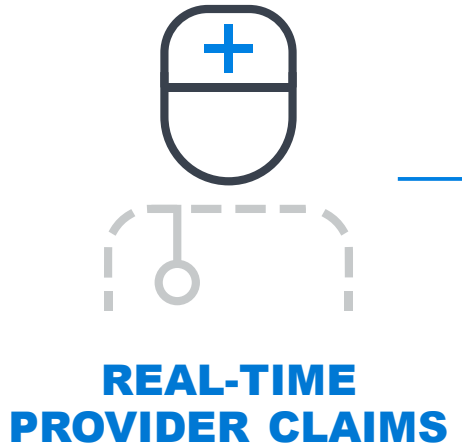
- J2405: Ondansetron injection
- J2765: Metoclopramide injection

Diagnosis Codes

- 553.21: Incisional hernia

Provider data including NPI

CLAIMS CODES REVEAL VALUABLE HEALTHCARE INFORMATION.



- ICD CODES**
Diagnosis codes | Procedure codes
- CPT CODES – CATEGORY I AND II**
Procedure codes (clinic visits, surgery, etc.)
- HCPCS CODES**
Facility-administered drugs | Medical equipment
- REV CODES**
Revenue codes (additional procedure details)
- PROVIDER**
Specialty | Contact information | Place of service

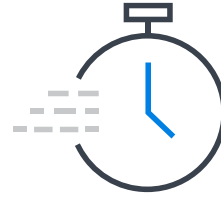
- Interpreted by Irix
- FCRA-compliant

INSTANTLY GET A COMPREHENSIVE PICTURE OF HEALTH STATUS.



IDENTIFIES CONDITIONS

- Tobacco
- Substance abuse/psychiatry
- Cancer treatment
- Morbidity-related conditions



ADDS EFFICIENCY

- Real-time data
- Interpreted by Irix
- Delivered instantly
- Fewer APS orders



WIDELY ADOPTED

- Life (FUW, SI, FE, accel.)
- Medicare Supplement
- Disability income
- Long-term care

IRIX[®] – RISK SCORE

MILLIMAN'S MORTALITY STUDY IS A RICHER SOURCE FOR INSIGHT.

Lives

42M

Life years

235M

Deaths

1.9M

Application
years

2005-
2020

NEW MORTALITY INSIGHTS CLARIFY MURKY CONDITIONS.

Relative Mortality by Dx Rule Messages in Age Bands

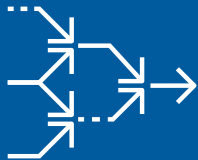
	18–29	30–39	40–49	50–59	60–69	70–79	80–85	Total
9926 Dx - Chronic kidney disease, stage 3	1,006%	914%	677%	428%	261%	169%	120%	194%
9005 Dx - Cardiac conduction disorder, other	298%	260%	199%	208%	170%	137%	109%	148%
9089 Dx - Carotid artery disease	246%	254%	237%	261%	205%	151%	112%	158%
9101 Dx - COPD	247%	355%	407%	373%	278%	194%	135%	234%
9109 Dx - Coronary artery disease	285%	425%	363%	264%	191%	145%	112%	161%
9122 Dx - Diabetes w/ other / unspecified complications	813%	728%	547%	389%	261%	182%	130%	230%
9176 Dx - Hypertensive heart disease	501%	433%	302%	232%	185%	142%	112%	161%
9798 Dx - Alcohol use, abuse, or remission	293%	376%	404%	352%	269%	190%	118%	276%

RISK SCORE IS A RISK ASSESSMENT SUPERTOOL.

Stratifies risk
within a given
medical
condition



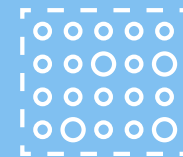
Evidence-
based and
data-driven



Detects
unintuitive
patterns



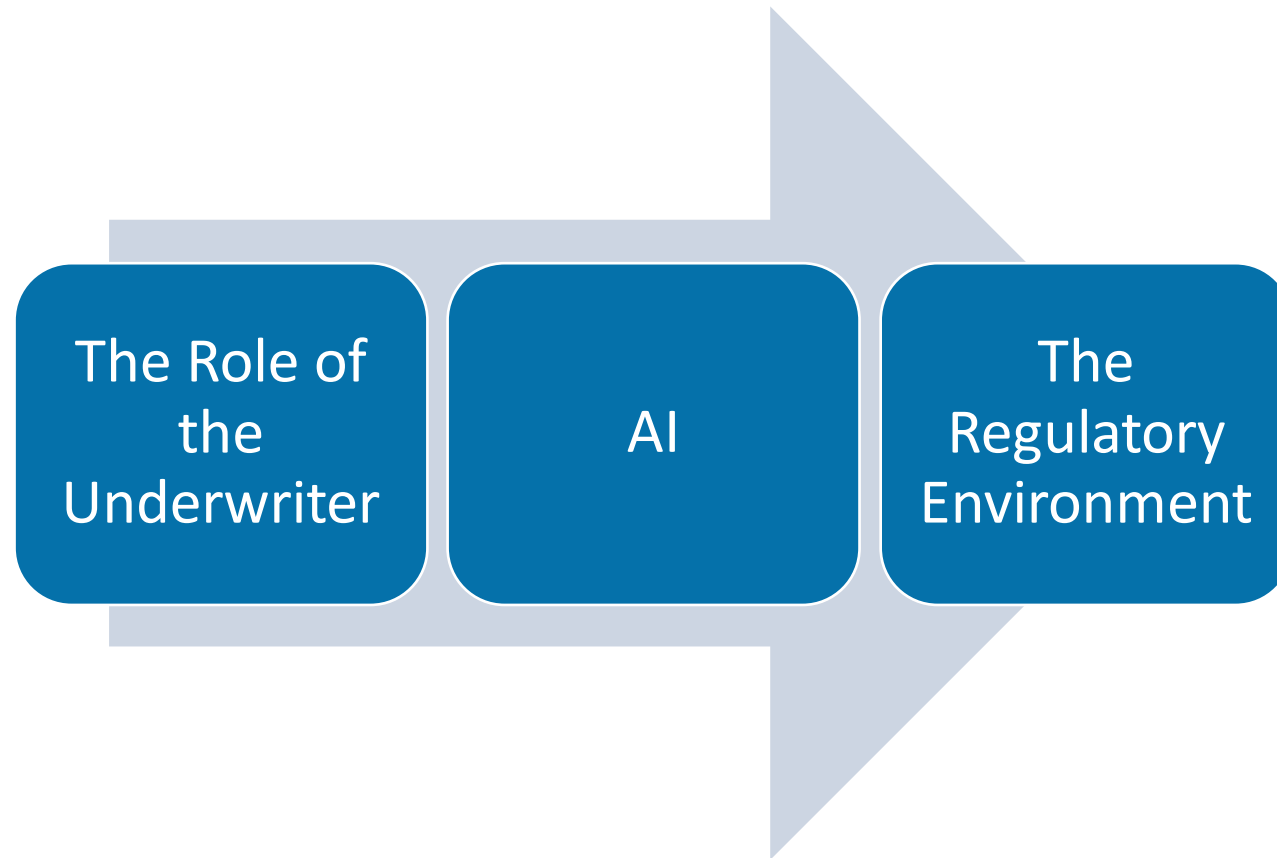
Quickly and
consistently
interprets large
amounts of
data



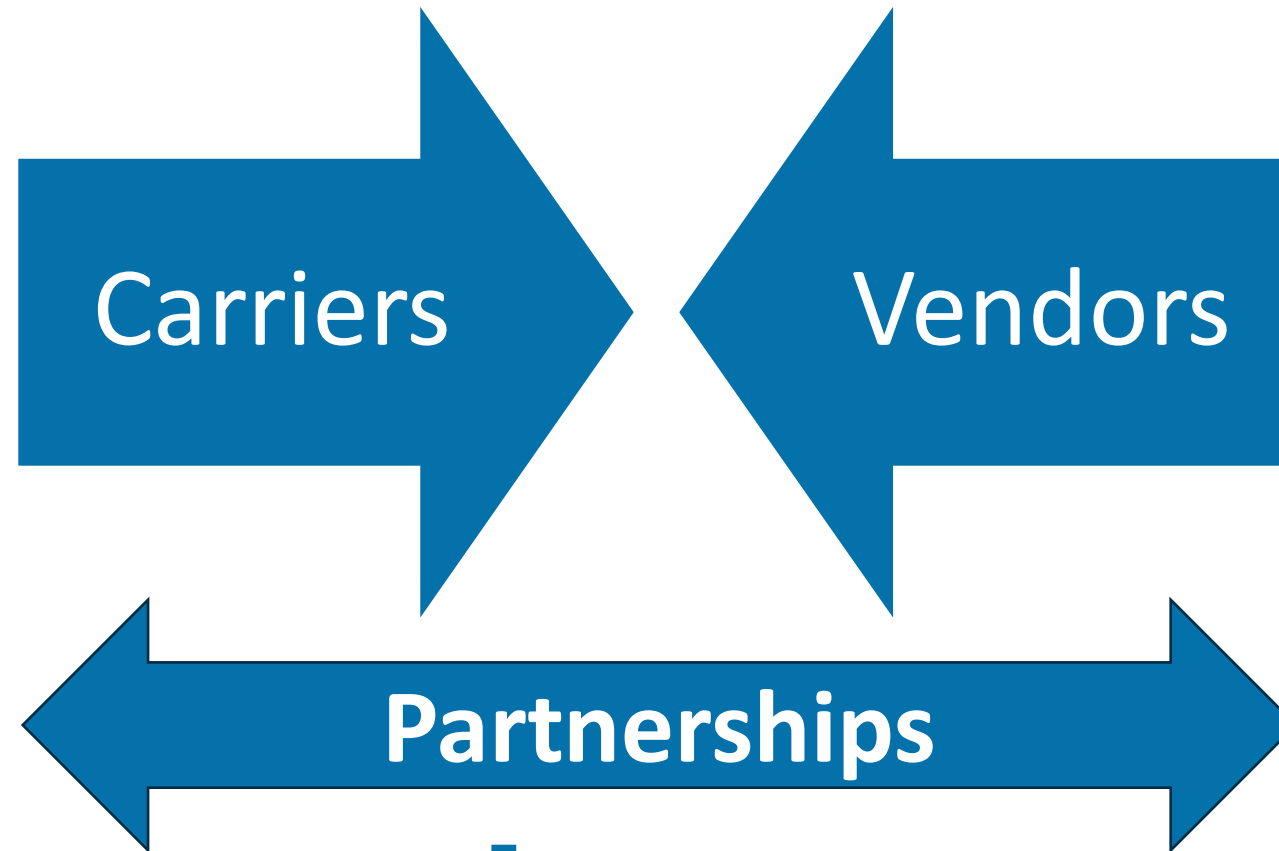
Facilitates
point-of-sale
decisions,
additional
distribution
channels, and
new product
offerings



The Future of Underwriting: An Open Discussion



The Future of Underwriting: We Identify & Build Solutions Together



Milliman IntelliScript®