



LabPiQture has the potential to enable carriers to improve risk selection and accelerate more of the right cases

ExamOne & Hannover Re: LabPiQture Collaborative Study

ExamOne's LabPiQture is an underwriting tool that enables life insurance carriers to evaluate applicants' mortality risk using clinical laboratory data that includes results from physician ordered laboratory testing related to preventative care, disease monitoring and other diagnostics. In addition to test results, LabPiQture returns results from 287 different predictive models aimed at identifying potential conditions based on the LabPiQture data. Recently, Hannover Re worked with ExamOne on a collaborative study to validate LabPiQture's value to the underwriting process and evaluate its potential application in accelerated and automated underwriting programs.

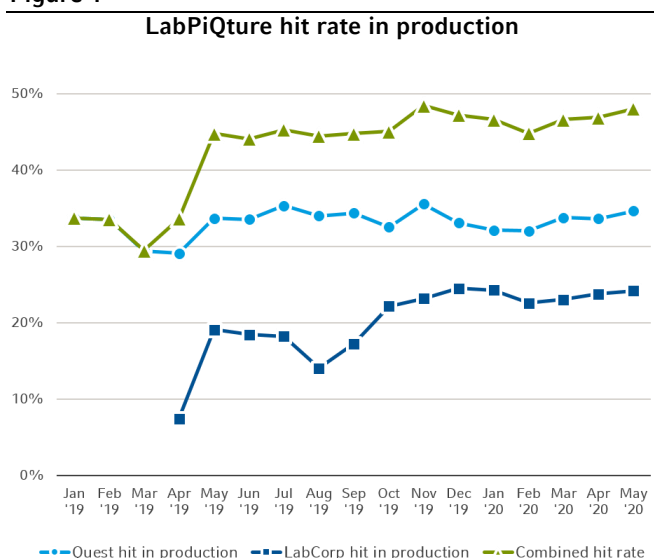
¹ The LabPiQture hit rate of 25.6% is lower than the current production hit rate of ≈50% due to the fact that this study was limited to Quest Diagnostics data whereas the production

Hit rates

The data used in Hannover Re's analysis of LabPiQture came from a subset of 372,131 life insurance applicants with a ScriptCheck hit who applied for coverage between April 2017 and November 2019. Of those applicants, 95,312 had a LabPiQture hit resulting in a hit rate of 25.6%¹. LabPiQture hit rates continue to increase with current hit rates running ≈50% of cases. Figure 1 illustrates LabPiQture hit rate by month, including recent months with LabCorp data.

environment includes LabCorp data. Additionally, the production environment utilizes more robust matching algorithms than the ad hoc testing environment.

Figure 1



Valuable data available in LabPiQture

In addition to demographic information, the data that Hannover Re analyzed included all the detailed data related to LabPiQture, ScriptCheck Rx history and paramed exam/lab testing. The data associated with the 95,312 records with LabPiQture hits included a total of 18 million individual LOINC (Logical Observation Identifiers Name and Codes)² test results representing 6,000 unique tests. Some of the LabPiQture data provided information that would be included in an insurance exam, such as a comprehensive metabolic panel (CMP) and lipid panel, while other data would not overlap, such as a complete blood count (CBC), tissue pathology and diagnosis codes.

LabPiQture details that included results for a CMP, CBC or lipid panel were prevalent in 75% of the records analyzed, and 60% had at least one CMP. Liver function tests (LFTs), kidney function tests (KFTs), serum proteins and glucose were available in 60% of LabPiQture hits. Over 50% of LabPiQture hits had information on cholesterol, and 26% had hemoglobin A1c values.

In addition to the prevalence of data available with LabPiQture hits, another benefit was having multiple test

² LOINC applies universal code names and identifiers to medical laboratory observations, diagnoses, outcomes classification and

results that could provide insight into how the results were trending. With an average of three to four separate result values returned per test, LabPiQture demonstrated a more complete view of how health was trending compared to a one-time snap shot in time with an insurance exam. Figure 2a summarizes 42 key lab tests present in the LabPiQture data, and Figure 2b shows the frequency that the result is available.

Figure 2a

Key lab results available in the LabPiQture data

Liver function tests	Lipid profile
AST	Total cholesterol
ALT	HDL
GGT	Cholesterol ratio
ALP	Triglycerides
Bilirubin	Measurements
	Height
Kidney function tests	Weight
Serum creatine	Blood pressure
eGFR	Viral markers
Sugar metabolism	Hepatitis B
Serum glucose	Hepatitis C
A1c	HIV
Urine findings	CBC
Urine creatinine	Hematocrit
Urine microalbumin	Hemoglobin
Urine protein	Platelets
Protein/creatinine ratio	RBC count
MALB/creatinine ratio	WBC count
	Eosinophils
Serum proteins	Monocytes
Albumin	Lymphocyte
Globulin	Neutrophils
	Basophils
Drugs	Other
Marijuana	PSA
Cocaine	Hemoccult screen
Cotinine	NT ProBNP

patient care data. The purpose is to assist in the electronic exchange and gathering of laboratory and clinical results.

Figure 2b**Frequency of key lab results available in LabPiQture**

Test name	% of LP hits with this information	Average # of tests values when information is present
Hematocrit	61.8%	3.7
Hemoglobin	61.8%	3.7
RBC count	61.5%	3.7
WBC	61.3%	3.7
Platelets	61.2%	3.8
Serum creatinine	61.0%	4.1
Serum glucose	60.0%	4.1
Albumin	60.0%	4.1
ALT	60.0%	4.1
AST	59.8%	4.1
ALP	59.5%	4.0
Bilirubin	59.4%	4.0
Eosinophils	57.6%	3.4
Monocytes	57.6%	3.4
Lymphocyte	57.5%	3.4
Neutrophils	57.5%	3.4
Basophils	57.5%	3.4
Globulin	55.4%	4.0
Cholesterol	54.0%	3.6
HDL	52.9%	3.5
Triglycerides	52.8%	3.6
Chol/HDL ratio	52.0%	3.5
eGFR	49.3%	3.6
Hemoccult screen	27.8%	2.5
A1c	26.0%	3.1
Hepatitis B	17.9%	1.5
PSA	17.2%	2.9
Hepatitis C	15.7%	1.4
HIV	10.3%	1.6
Urine creatinine	9.5%	2.9

Potential condition predictive models

LabPiQture’s 287 different potential condition models added another useful dimension in assessing underwriting risk. Some of the predictive models identified ICD10 codes related to conditions that would likely be identified in insurance exams or fluids, such as lipid disorders or diabetes. Other predictive models were not as likely to be correlated with adverse exams or labs and thus represented an opportunity for additional protective value. Notable conditions with high importance and low correlation to blood chemistry profile (BCP) included:

- Cancer, malignant neoplasm, etc.
- Sleep apnea
- Depression
- Cognitive issues, dementia, Alzheimer’s, etc.

Accelerated underwriting, predictive models & automation

In accelerated underwriting, where the goal is to identify a subset of applicants who have a lower likelihood of adverse findings from exams and lab testing, LabPiQture was shown to provide both positive and negative signals for underwriting triage. An example of a positive signal would be cases with LabPiQture hits where the results were normal on multiple occasions, increasing the confidence to accelerate. Alternatively, LabPiQture data that indicates abnormal test results or potential impairments are examples of negative signals suggesting the need for additional testing or a different underwriting path. Hannover Re’s analysis demonstrated that LabPiQture data can be incorporated into a customized predictive model to increase acceleration and decrease mortality slippage. When deployed in accelerated/automated underwriting programs in combination with other third party data sources, LabPiQture can support holistic underwriting decisions. hr | ReFlex, Hannover Re’s automated underwriting solution now includes LabPiQture among its third party data sources.

Summary

In summary, based on Hannover Re’s analysis, LabPiQture’s value in underwriting goes beyond protective value and lower mortality. LabPiQture has the potential to enable carriers to accelerate more of the right cases by providing both positive and negative signals for the underwriting triage decision. It also includes tools (such as the potential

condition models) and data that life insurers can use to further refine and enhance their automated underwriting programs with more sophisticated rules for complex cases. LabPiQture is currently available as a third party data source in hr | ReFlex, Hannover Re's automated underwriting solution. Contact Hannover Re to learn more about this study and the potential benefits of integrating LabPiQture and/or hr | ReFlex into your accelerated/automated underwriting programs.

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