



# Accessibility and Coverage of Pharmacogenomic Tests by Private Health Insurance Companies

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## Introduction

- Pharmacogenomics (PGx) is implicated in individualized or personalized medicine.
- Although the use of PGx testing is increasing,<sup>1,2</sup> the implementation of PGx in clinical practice has been limited due partially to lack of data on clinical utility and cost effectiveness.<sup>3</sup>
- Information is limited for the public and providers regarding the accessibility and coverage of PGx testing in clinical practice.

## Objective

To assess the accessibility of coverage and the coverage determinations of clinically relevant PGx tests among the top 41 private insurance companies in the United States.

## Methods

- Selecting insurance companies:** Private health insurance companies were chosen based on top 25 ranking by market share or patient enrollment:
  - National Association of Insurance Commissioners (NAIC) 2014 market share report
  - Atlantic Information Services (AIS) Health 2014 enrollment report
  - AIS Health 2014 BCBS enrollment report
- Definition of Gene-Drug-Indication Group (GDIG):** A unique grouping consisting of a gene, its associated drug(s), and its indication(s) --e.g., CYP2C19 (*gene*) for clopidogrel (*drug*) use in cardiovascular disease (*indication*) is a GDIG.
- Selecting Relevant / Common GDIGs:** GDIGs were included if (1) mentioned  $\geq 6$  times in companies' medical policies or (2) included in PharmGKB's "Selected PGx Associations" or FDA's "Table of Pharmacogenomic Biomarker in Drug Labeling."
- Study period:** Three different time periods: Aug–Sept 2015, Apr 2016–Mar 2017, and Apr–Jun 2017
- Accessibility** was defined as below:
  - Total number of PGx policies and number of clicks required to find a PGx policy
    - Level 1: 1-3 clicks were "easily accessible"
    - Level 2: 4-6 clicks were "somewhat accessible"
    - Level 3:  $\geq 7$  clicks were "difficult to access."
- Coverage** was defined as below:
  - "Covered": tests specifically mentioned as covered or medically necessary
  - "Not covered": tests specially mentioned as not covered, not medically necessary, experimental, or investigational
  - "Unknown": tests not mentioned in medical policies
- Outcomes:** (1) number of times GDIG mentioned, (2) % of times GDIG mentioned, (3) when mentioned, number of times GDIG covered, (4) when mentioned, % of times GDIG covered, and (5) regardless of being mentioned, % of times GDIG covered.
- Data Analysis:** Microsoft Excel v. 2013 (Microsoft Corp, Redmon, WA)

## Results

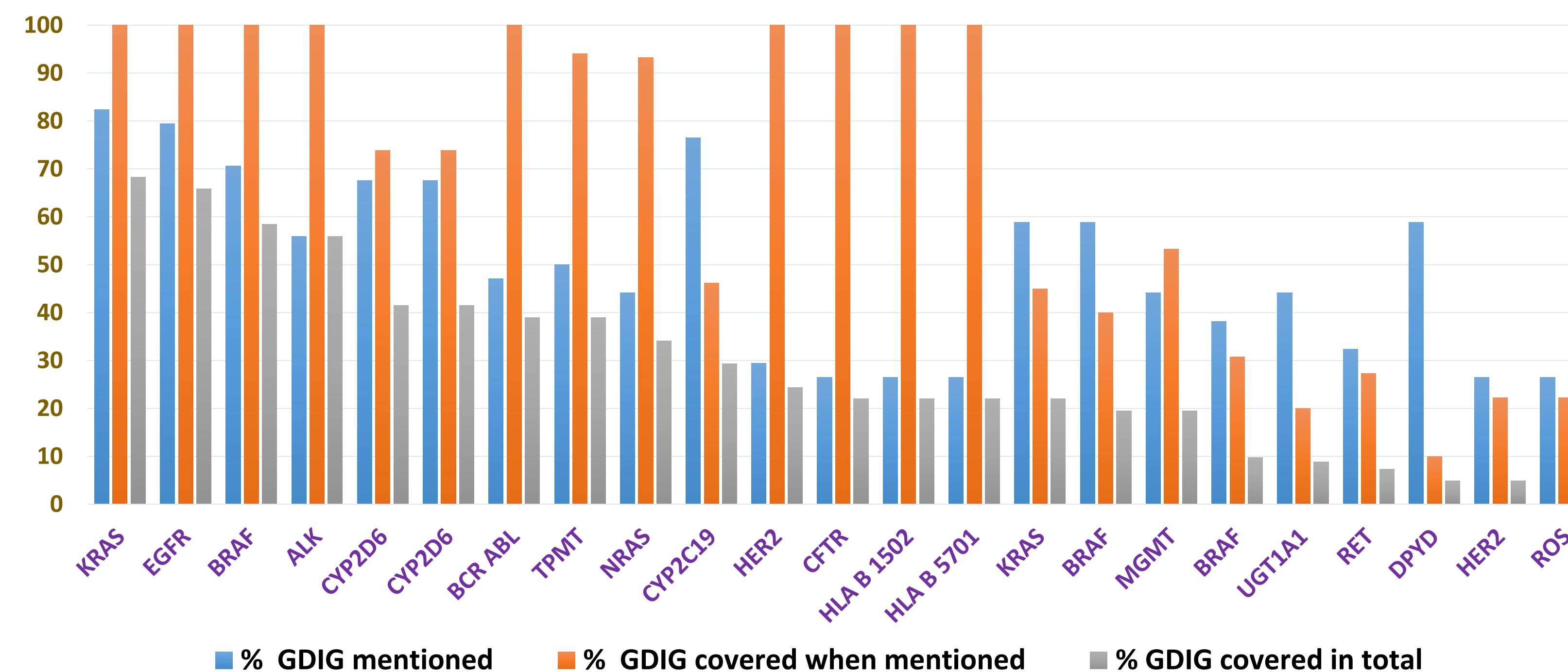
Table 1. Private Health Insurance Companies with PGx Policies and Coverage of GDIGs

Companies with unique policy*	No. Clients Covered (AIS)	No. Clicks required	Total No. Policies retrieved	# GDIGs mentioned	% GDIGs mentioned	# GDIGs covered	% GDIGs covered	% GDIGs covered in total
United Health Care	45,143,484	5	2	14	41.2	4	28.6	11.8
Anthem, Inc.	32,552,343	7	6	17	50	9	52.9	26.5
Aetna	22,266,424	5	5	30	88.2	16	53.3	47.1
Health Care Service Corporation	14,952,494	4	1	24	70.6	16	66.7	47.1
Cigna Health Group	13,826,255	4	3	19	55.9	11	57.9	32.4
Humana	9,848,257	4	6	29	85.3	13	44.8	38.2
Health Net	5,924,000	3	4	24	70.6	14	58.3	41.2
Highmark Health	4,728,381	7	20	25	73.5	15	60	44.1
BCBS Michigane	4,410,293	NA	13	26	76.5	11	42.3	32.4
Independence Health Group, Inc.	4,163,140	4	11	12	35.3	7	58.3	20.6
Horizon BCBS New Jersey	3,740,335	6	13	26	76.5	8	30.8	23.5
California Physicians Service	3,549,479	NA	12	25	73.5	9	36	26.5
Carefirst Inc. Group	3,329,229	5	6	11	32.4	3	27.3	8.8
BCBS Alabama	2,927,554	4	13	27	79.4	9	33.3	26.5
Wellcare Group	2,831,316	5	4	20	58.8	11	55	32.4
BCBS North Carolina	2,825,601	5	8	23	67.6	5	21.7	14.7
BCBS Massachusetts	2,823,147	5	14	27	79.4	9	33.3	26.5
BCBS Tennessee	2,574,169	6	9	14	41.2	6	42.9	17.6
BCBS Minnesota	2,370,234	7	7	13	38.2	5	38.5	14.7
Medical Mutual of Ohio	2,139,865	4	1	4	11.8	0	0	0

\* Abbreviated table including the top 20 companies with accessible, unique PGx policies and included in the AIS top 25 enrollment ranking

Figure 1. Coverage of Common Genes among Unique Medical Policy

(abbreviated figure including 23 GDIGs)



## Accessibility

- A total of 41 insurance companies were included in the study. There were 13 national companies, 7 regional, and 21 state, covering over 200 million people. This represents about 65% of the entire U.S. population.
- A total of 223 medical policies mentioning PGx tests were retrieved, representing 34 unique policy sets from 41 companies.
- Only 33 companies had their policies accessible on their website and only 4 companies had the policy in a single document.
- The average number of clicks required to locate the policy was 4.9 clicks (S.D. = 1.5, Level 2 difficulty; range 3 - 8).

## Coverage

- On average, GDIGs were covered approximately 50% of the time when mentioned, but were only covered <20% of the time in total.
- When mentioned in a policy, 9 GDIGs were uniformly covered and 11 GDIGs were uniformly not covered.
- Cancer was the predominant indication for which a majority of the GDIGs were indicated (n = 24/34, 70.6%).
- On average, insurance companies covered approximately 40% of GDIGs mentioned in their policies (range 0 – 70%).

## Conclusion

- Medical policies addressing common PGx tests were not readily accessible on websites of the top, private health insurance companies.
- Coverage determinations for common, clinically relevant PGx tests varied by insurance company and GDIG.
- A more user-friendly medium is desired for a direct retrieval of PGx test coverage information, especially for patients as they choose their health insurance.

## References

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## Disclosures

The authors of this study do not have any potential conflicts of interest to disclose.