



# **Evaluating the Quality of Provider-supplied Payer Typology in Hospital Discharge Data**

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# MISSION & VISION



The Utah Department of Health's mission is to protect the public's health through preventing avoidable illness, injury, disability, and premature death; assuring access to affordable, quality health care; and promoting healthy lifestyles.

Our vision is for Utah to be a place where *all* people can enjoy the best health possible, where *all* can live and thrive in healthy and safe communities.



# STRATEGIC PRIORITIES



**Healthiest People** – The people of Utah will be among the healthiest in the country.

**Optimize Medicaid** – Utah Medicaid will be a respected innovator in employing health care delivery and payment reforms that improve the health of Medicaid members and keep expenditure growth at a sustainable level.

**A Great Organization** – The UDOH will be recognized as a leader in government and public health for its excellent performance. The organization will continue to grow its ability to attract, retain, and value the best professionals and public servants.

# OVERVIEW



- The Office of Health Care Statistics (OHCS) at the Utah Department of Health has collected inpatient, emergency department, and ambulatory surgery encounter data from Utah hospitals and other facilities for several decades.
- Because almost all research and policy use cases for this data rely on accurate payer classification, ongoing analysis of current and historic payer classification approaches is very important.
- Historically, OHCS has used several different approaches for determining payer type from free-text payer strings.
- In 2018, OHCS made significant adjustments to the technical specifications used to collect the data. One major change was the addition of “payer typology” variables alongside the previously collected free-text payer strings.

# STRING-MATCHING ALGORITHMS



- Over the years, OHCS has used various approaches for determining payer classification from raw “payer strings”.
- Manually-crafted “lookup” table.
  - The most recent version of this approach had over 70,000 entries.
  - Based on staff-specific, undocumented subjective judgements over the course of years.
  - Deemed unsustainable and difficult to audit.
- Complex regular expressions.
  - Effective, but somewhat more difficult to maintain and understand.
  - Likely revisit this in the future because of the flexibility of regular expressions.
- Simple string matching.
  - HCUP provided substantial assistance in developing the initial version.
  - Current approach for classifying historic data.
  - Example SQL: `WHEN Payer_Name LIKE '%medicare%' THEN 1`

# PAYER TYPOLOGY



- Maintained by NAHDO.
  - <https://nahdo.org/sopt>
  - Previously maintained by the Public Health Data Standards Consortium (PHDSC)
- Hierarchical structure.
- Beginning in 2018, Utah hospitals and other facilities required to provide inpatient, emergency department, and ambulatory surgery discharge encounter data must include payer typology along with raw payer string.
- OHCS chose to use just the highest level.

# PAYER TYPOLOGY



**Version 9.0**  
**August 2019**

Reference to the User's Guide for Source of Payment Typology can be found at--  
<http://www.nahdo.org/Node/1043>

<b>Code</b>	<b>Description</b>
<b>1</b>	<b>MEDICARE</b>
<b>11</b>	<b>Medicare (Managed Care)</b>
111	Medicare HMO
112	Medicare PPO
113	Medicare POS
119	Medicare Managed Care Other
1111	Medicare Chronic Condition Special Needs Plan (C-SNP)
1112	Medicare Institutional Special Needs Plan (I-SNP)
<b>12</b>	<b>Medicare (Non-managed Care)</b>
121	Medicare FFS
122	Medicare Drug Benefit
123	Medicare Medical Savings Account (MSA)
129	Medicare Non-managed Care Other
<b>13</b>	<b>Medicare Hospice</b>
<b>14</b>	<b>Dual Eligibility Medicare/Medicaid Organization</b>
141	Dual Eligible Special Needs Plan (D-SNP)
142	Fully Integrated Dual Eligible Special Needs Plan (FIDE-SNP)
<b>19</b>	<b>Medicare Other</b>
191	Medicare Pharmacy Benefit Manager

# PAYER TYPOLOGY



Code	Description
1	Medicare
2	Medicaid
3	Other Government
4	Department of Corrections
5	Private Health Insurance
6	Blue Cross/Blue Shield
7	Managed Care, Unspecified
8	Self-Pay, No Charge, Charity, Refusal, Research/Donor, or No Payment
9	Workers Compensation, Foreign National, Disability, Long-Term Care, Auto Insurance, or Legal Liability
Blank/NULL	Unknown



# ANALYSIS APPROACH



- To determine the quality of the newly-added payer typology variables, OHCS compared the reported classifications to the free-text payer strings and an internally-maintained string matching payer classification algorithm.
- Separate analysis for each type of encounter—inpatient, emergency department, and ambulatory surgery.

# RESULTS



- OHCS found strong concurrence between the reported typology and the results of the string matching classification algorithm for several important categories, including Medicare, Medicaid, and private insurance across all encounter types.
- We noted substantial misclassification for some smaller categories, e.g., Department of Corrections, with variation in quality across encounter types.
- Data quality varied across individual data suppliers, with smaller ambulatory surgical centers in particular struggling to classify payers.
  - Initially, blank—representing “unknown”—was accepted as an unconditional valid value, leading to very low non-empty completion rates for many small surgical centers and inpatient facilities.

# INPATIENT PAYER TYPOLOGY – REPORTED VS. IMPUTED



Payer Typology	Description	Provider Reported	Imputed	Difference
Unknown	Unknown	313	2513	<b>703%</b>
1	Medicare	78,925	79,186	<b>0%</b>
2	Medicaid	46,874	46,581	<b>-1%</b>
3	Other Government	5,604	5,674	<b>1%</b>
4	Department of Corrections	174	323	<b>86%</b>
5	Private Health Insurance	113,449	107,734	<b>-5%</b>
6	Blue Cross/Blue Shield	19,894	26,021	<b>31%</b>
7	Managed Care, Unspecified	226	0	<b>-100%</b>
8	Self-Pay, No Charge, Charity, Refusal, Research/Donor, or No Payment	16,018	13,613	<b>-15%</b>
9	Workers Compensation, Foreign National, Disability, Long-Term Care, Auto Insurance, or Legal Liability	2,724	2,556	<b>-6%</b>

# INPATIENT PAYER TYPOLOGY – REPORTED VS. IMPUTED



Payer Typology	Description	Provider Reported	Imputed	Difference
5	Private Health Insurance	113,449	107,734	-5%
6	Blue Cross/Blue Shield	19,894	26,021	31%
<b>5, 6 Combined</b>	<b>Private Health Insurance/BCBS</b>	<b>133,343</b>	<b>133,755</b>	<b>0%</b>

# INPATIENT PAYER TYPOLOGY – REPORTED VS. IMPUTED



Payer Typology	Description	Provider Reported	Imputed	Difference
Unknown	Unknown	313	2513	<b>703%</b>
8	Self-Pay, No Charge, Charity, Refusal, Research/Donor, or No Payment	16,018	13,613	<b>-15%</b>
9	Workers Compensation, Foreign National, Disability, Long-Term Care, Auto Insurance, or Legal Liability	2,724	2,556	<b>-6%</b>
<b>Unknown, 8, 9 Combined</b>	<b>Self-Pay, No Charge, Charity, Refusal, Research/Donor, or No Payment, Workers Compensation, Foreign National, Disability, Long-Term Care, Auto Insurance, or Legal Liability, Unknown</b>	<b>19,055</b>	<b>18,682</b>	<b>-2%</b>

# ED PAYER TYPOLOGY – REPORTED VS. IMPUTED



Payer Typology	Description	Provider Reported	Imputed	Difference
Unknown	Unknown	784	7,715	<b>884%</b>
1	Medicare	131,282	131,780	<b>0%</b>
2	Medicaid	145,144	146,637	<b>1%</b>
3	Other Government	19,137	19,081	<b>0%</b>
4	Department of Corrections	277	1,064	<b>284%</b>
5	Private Health Insurance	244,805	227,563	<b>-7%</b>
6	Blue Cross/Blue Shield	47,709	66,189	<b>39%</b>
7	Managed Care, Unspecified	568	0	<b>-100%</b>
8	Self-Pay, No Charge, Charity, Refusal, Research/Donor, or No Payment	95,922	88,161	<b>-8%</b>
9	Workers Compensation, Foreign National, Disability, Long-Term Care, Auto Insurance, or Legal Liability	28,990	26,428	<b>-9%</b>

# ED PAYER TYPOLOGY – REPORTED VS. IMPUTED



Payer Typology	Description	Provider Reported	Imputed	Difference
5	Private Health Insurance	244,805	227,563	-7%
6	Blue Cross/Blue Shield	47,709	66,189	39%
<b>5, 6 Combined</b>	<b>Private Health Insurance/BCBS</b>	<b>292,514</b>	<b>293,752</b>	<b>0%</b>

# ED PAYER TYPOLOGY – REPORTED VS. IMPUTED



Payer Typology	Description	Provider Reported	Imputed	Difference
Unknown	Unknown	784	7,715	<b>884%</b>
8	Self-Pay, No Charge, Charity, Refusal, Research/Donor, or No Payment	95,922	88,161	<b>-8%</b>
9	Workers Compensation, Foreign National, Disability, Long-Term Care, Auto Insurance, or Legal Liability	28,990	26,428	<b>-9%</b>
<b>Unknown, 8, 9 Combined</b>	<b>Self-Pay, No Charge, Charity, Refusal, Research/Donor, or No Payment, Workers Compensation, Foreign National, Disability, Long-Term Care, Auto Insurance, or Legal Liability, Unknown</b>	<b>125,696</b>	<b>122,304</b>	<b>-3%</b>



# AMBULATORY SURGERY PAYER TYPOLOGY – REPORTED VS. IMPUTED



Payer Typology	Description	Provider Reported	Imputed	Difference
Unknown	Unknown	15,430	17,078	<b>11%</b>
1	Medicare	387,231	395,025	<b>2%</b>
2	Medicaid	78,459	79,136	<b>1%</b>
3	Other Government	23,349	24,806	<b>6%</b>
4	Department of Corrections	1,145	1,297	<b>13%</b>
5	Private Health Insurance	500,498	491,096	<b>-2%</b>
6	Blue Cross/Blue Shield	154,898	163,914	<b>6%</b>
7	Managed Care, Unspecified	972	0	<b>-100%</b>
8	Self-Pay, No Charge, Charity, Refusal, Research/Donor, or No Payment	30,258	21,441	<b>-29%</b>
9	Workers Compensation, Foreign National, Disability, Long-Term Care, Auto Insurance, or Legal Liability	16,261	14,708	<b>-10%</b>

# AMBULATORY SURGERY PAYER TYPOLOGY – REPORTED VS. IMPUTED



Payer Typology	Description	Provider Reported	Imputed	Difference
5	Private Health Insurance	500,498	491,096	-2%
6	Blue Cross/Blue Shield	154,898	163,914	6%
<b>5, 6 Combined</b>	<b>Private Health Insurance/BCBS</b>	655,396	655,010	0%

# AMBULATORY SURGERY PAYER TYPOLOGY – REPORTED VS. IMPUTED



Payer Typology	Description	Provider Reported	Imputed	Difference
Unknown	Unknown	15430	17078	<b>11%</b>
8	Self-Pay, No Charge, Charity, Refusal, Research/Donor, or No Payment	30258	21441	<b>-29%</b>
9	Workers Compensation, Foreign National, Disability, Long-Term Care, Auto Insurance, or Legal Liability	16261	14708	<b>-10%</b>
<b>Unknown, 8, 9 Combined</b>	<b>Self-Pay, No Charge, Charity, Refusal, Research/Donor, or No Payment, Workers Compensation, Foreign National, Disability, Long-Term Care, Auto Insurance, or Legal Liability, Unknown</b>	<b>61949</b>	<b>53227</b>	<b>-14%</b>

# NEXT STEPS



- Learn from the payer-supplied payer typology and refine string matching algorithm.
  - Example: “FLAT RATE” as a raw payer string was likely best classified under the self-pay category.
- Perform manual review on Unknown, Self-pay, and Workers Compensation/Auto Insurance categories.
  - Categories appear intermixed.
- Implement better non-empty completion rate validity checks on intake.
  - Particularly important for the smaller, independent ambulatory surgery centers.
- Review 2019 & 2020 data.

# THANK YOU!



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