Identifying potential overuse of non-evidence-based health care in Utah

December 2023

Utah Department of
Health & Human Services
Data, Systems & Evaluation

Utah Department of Health & Human Services
Office of Research and Evaluation
Health Care Information & Analysis Programs
Health Care Statistics program
http://healthcarestats.utah.gov/

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About the Health Care Statistics program

The Utah Department of Health and Human Services (DHHS) Health Care Statistics program (HCSP) implements the goals and directions of the Health Data Committee (HDC) and requirements outlined in U.C.A. § 26B, Chapter 8, Part 5. The program collects, analyzes, and disseminates health care data. These data help people understand cost, quality, access, and value in our health care system and allow users to identify opportunities for improvement.

The data sets under the purview of the program include:

- **Consumer Assessment of Healthcare Providers and Systems (CAHPS)**—annual customer satisfaction surveys related to health plan performance.
- **Healthcare Effectiveness Data and Information Set (HEDIS)**—annual quality measures relating to health plan performance.
- **Healthcare Facility Data (HFD)**—a collection of information about all inpatient, emergency room, and outpatient surgery/diagnostic procedures performed in the state.
- **All Payer Claims Data (APCD)**—a collection of data about health care paid for by third parties, including insurers, plan administrators, and dental and pharmacy benefits plans.

About the Utah Health Data Committee

The Health Data Committee (HDC) was created by Utah Code 26B-1-413.[1] Members are appointed by the governor, confirmed by the Senate, and represent various perspectives from industry and the community, including public health, purchasers, providers, payers, and patients. By law, members are required to have experience with health data.

[1] Utah Health Data Authority Act
https://le.utah.gov/xcode/Title26B/Chapter1/26B-1-S413.html?v=C26B-1-S413_2023050320230503

HDC mission statement (adopted 1994, amended 2020)

The mission of the HDC is to support health improvement initiatives through the collection, analysis, and public release of health care information. Through public/private collaboration, the HDC actively participates in the planning, development, implementation, and maintenance of a statewide health data reporting system, which provides accurate and independently validated information about health care in the state of Utah. The HDC implements policies to transform data into objective baseline, trend, and performance measurement information, which is made available while preserving patient privacy and confidentiality.

Contact information

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Acknowledgements

HCSP would like to thank several entities for lending their time and expertise to HCSP at the inception of the inaugural report, which was submitted December 2021. Similarly, we would like to acknowledge them again in this report. These entities include Comagine Health, the Utah Medical Association's Council of Trustees and Board of Directors, the 6|18 Workgroup, the Utah Insurance Department/Utah Health Insurance Association, the Utah Hospital Association executives, Medicaid staff, the Transparency Advisory Group, and Utah Payers Advisory Subcommittee.

This third iteration of this statutory report would have not been possible without the guidance, expertise, and efforts of those across the Data, Systems and Evaluation division, including: Lori Savoie, Ryan Christenson, and Qing Xiao. Lastly, HCSP would like to thank all members of the Utah Health Data Committee for their thoughtful insight, commitment to improve the health of Utahns, and for engaging in thought-provoking conversations that resulted in the value of this snapshot.

Members of the HDC:

Stephen Foxley, Cambia Health Solutions/Regence BlueCross BlueShield of Utah
David Cook, Comagine Health
David Crockett, Intermountain Healthcare
Jeffrey Eason, Utah Department of Health and Human Services
Charles Hawley, National Association of Health Data Organizations
Dr. Patrice F. Hirning, Intermountain Healthcare
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Terri Nehorai, Molina Health Plans
Curtis Newman, Iron Road Healthcare
Tanji Northrup, Utah Insurance Department
Alan Ormsby, AARP
Laura Summers, Kem C. Gardner Policy Institute, University of Utah
Russell Trujillo, MotivHealth

Executive summary

Overview

In 2020, the Utah State Legislature approved House Bill 195 Identifying wasteful health care spending. A part of that bill enacted UCA §26B-8-513 (UCA §26-33a-117) identifying potential overuse of non-evidence-based health care. The law requires the Utah Department of Health and Human Services (DHHS) to contract with a nationally-recognized health waste calculator, to use the calculator to analyze data in the state All Payer Claims Database, and flag entries the calculator identifies as potential overuse of non-evidence-based care. Additionally, DHHS, or a contractor, is required to:

- Analyze the data, review scientific literature about medical services that are best practice, and review literature about how to eliminate duplication in health care.
- Solicit input from Utah health care providers, health systems, insurers, and other partners regarding:
    - Duplicative health care quality initiatives and instances of non-alignment in metrics used to measure health care quality required by different health systems
    - Methods to avoid overuse of non-evidence-based health care
- Present the analysis, research, and input results to the Utah Health Data Committee.

Once the committee gets the results, members make recommendations for action and opportunities for improvement. They also recommend ways to bring the various health care quality metrics used throughout the state into alignment, and identify priority issues and recommendations to include in an annual report. DHHS then takes that information, compiles a report, and submits it for committee approval on or before November 1 of each year. Following committee approval, it is submitted to the Health and Human Services Interim Committee.

Methodology

The version of the Milliman Health Waste Calculator (HWC) used for this analysis (7.0) contains 48 measures to evaluate wasteful health care services in medical claims data. These measures address services related to diagnostic testing, screening tests, disease approach, preoperative evaluation, routine follow up monitoring, and common treatments (such as prescription drugs), which under certain circumstances, may be unnecessary. The tool is informed by various well-known sources, including the Choosing Wisely initiative of the American Board of Internal Medicine, the U.S. Preventive Services Task Force, the American Medical Associations' Physician Consortium for Performance Improvement, the United Kingdom's National Institute for Health and Care Excellence, several medical specialty society guidelines, and numerous evidence-based research papers. The HWC classifies a service as either necessary, likely to be wasteful, or wasteful.

- ***Necessary:*** confirms that data suggests appropriate services were administered by the health care provider.

- ***Likely to be wasteful:*** indicates the need to question the appropriateness of services rendered.

- ***Wasteful:*** flags a cause for concern, as the service probably should not have occurred.

Additionally, the HWC has 2 main methods to flag health waste services. The case rate method counts costs from all lines of a particular claim ID where at least 1 claim line was identified as wasteful. In other words, if 1 individual procedure is flagged as "wasteful," all other claim lines and their respective procedures are flagged "wasteful." The claim line method counts costs from only the claim line where the line has been identified as "wasteful."

We used the claim line method for this analysis, as was the case for last year's report. This gave us a chance to get closer to a "true" health waste dollar value, maintain a conservative estimate, and come up with results which may be more actionable. We also only used claims flagged "wasteful" to achieve this goal.

In 2022, HCSP asked for feedback from various partner groups about the information presented in the prior year's report. We took that feedback into consideration and used it to inform this year's report. We got feedback from:

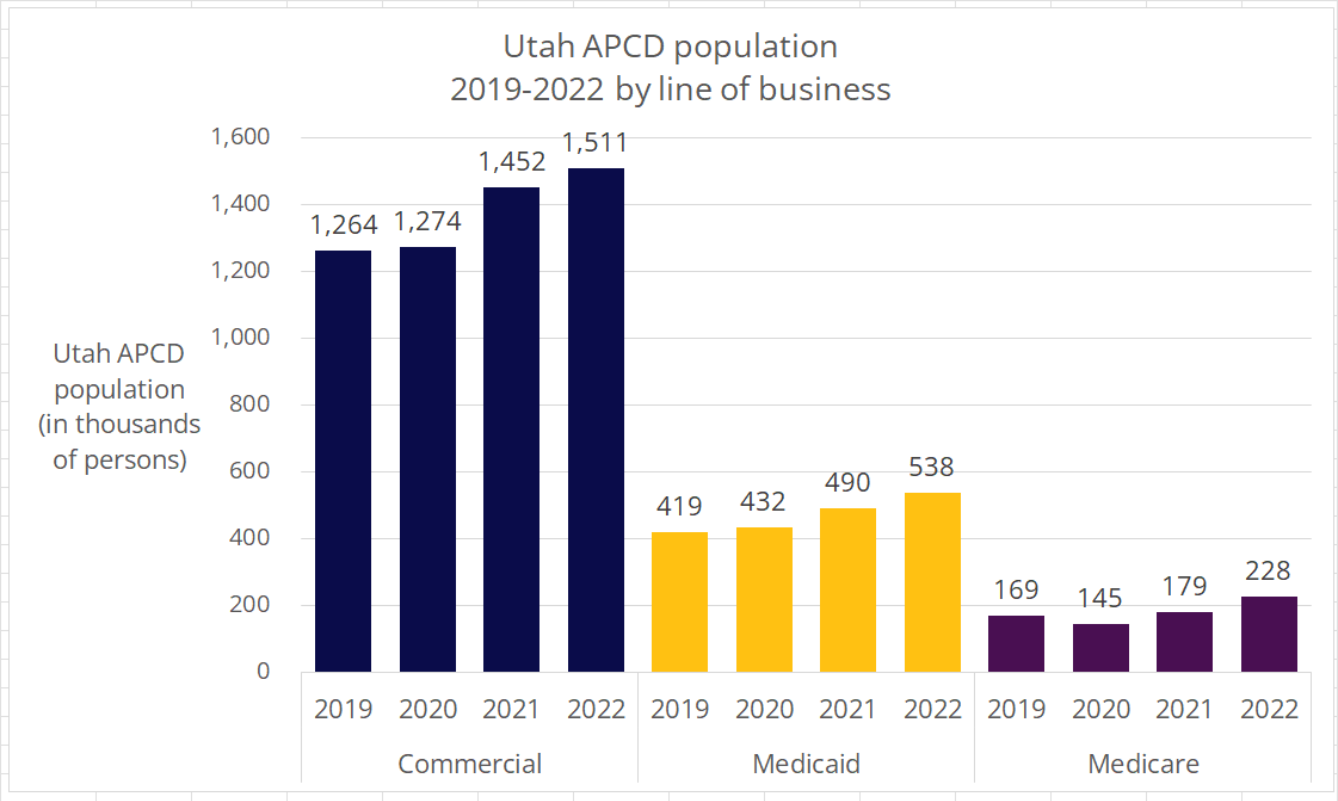
- Utah Health Data Committee
- Utah Transparency Advisory Group
- Utah Insurance Department/Utah Health Insurance Association
- Medicaid Accountable Care Organizations (ACOs) 6|18 Work Group
- Utah Payers Advisory Subcommittee
- Comagine Health Utah Community Board
- Utah Medical Association Council of Trustees
- Utah Medical Association Board of Directors
- Utah Hospital Association leadership
- Comagine Health Partnership for Value

Findings

The analysis below mostly represents an update to the figures included in the November 2022 report. In that report, the Utah Health Data Committee provided a number of ways to improve based on the results, including recommendations on how to bring the various health care quality metrics used by different entities into alignment, and priority issues and recommendations to include in future reports. The analysis acknowledges recommendations deemed feasible for HCSP to pursue, given our role and resources within the state of Utah.

In addition to the total raw dollars flagged as "wasteful," an important consideration when you compare results year to year is the population used in the analysis. The Utah APCD population changed some during this time frame due to the COVID pandemic, increasing population, and changes in payers submissions.

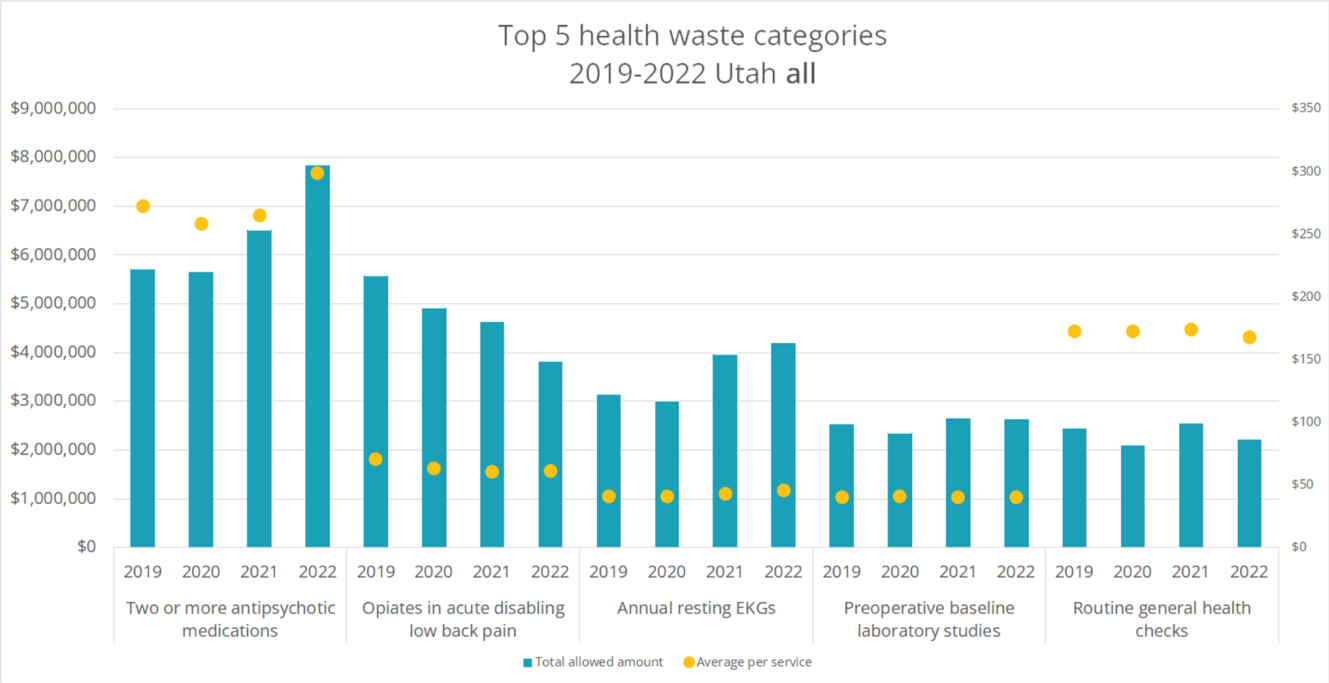
The graph below shows the population growth by line of business (LOB). Note that a person may be counted more than once if they have multiple types of insurance, changed age group, or geographic categories.



The highest population growth was seen within the Utah APCD Medicaid group between 2019 and 2022. Medicaid enrollment increased approximately by 119,000 persons or 28% from 2019 to 2022. During the same period, Medicare increased by 59,000 persons or 35%, and the commercial market saw an increase of 247,000 persons or 20%. The increase for both Medicare and for commercial was largely due to adding payers' data into the analysis.

Figures 1–7 show the top 5 measures by total dollars flagged as "wasteful." The aqua bars and y-axis on the left indicate the total amount providers were paid by insurance companies between 2019–2022 (total allowed amount). The yellow dots and y-axis on the right indicate the average cost per service. Note that due to eligibility changes, even if there are more claims and dollars flagged as "wasteful," the number of wasteful services or dollars per member may have decreased.

Figure 1: Top 5 Measures flagged as "wasteful" in the state of Utah, using 2019-2022, Utah All Payer Claims Database; Commercial, Medicare, and Medicaid

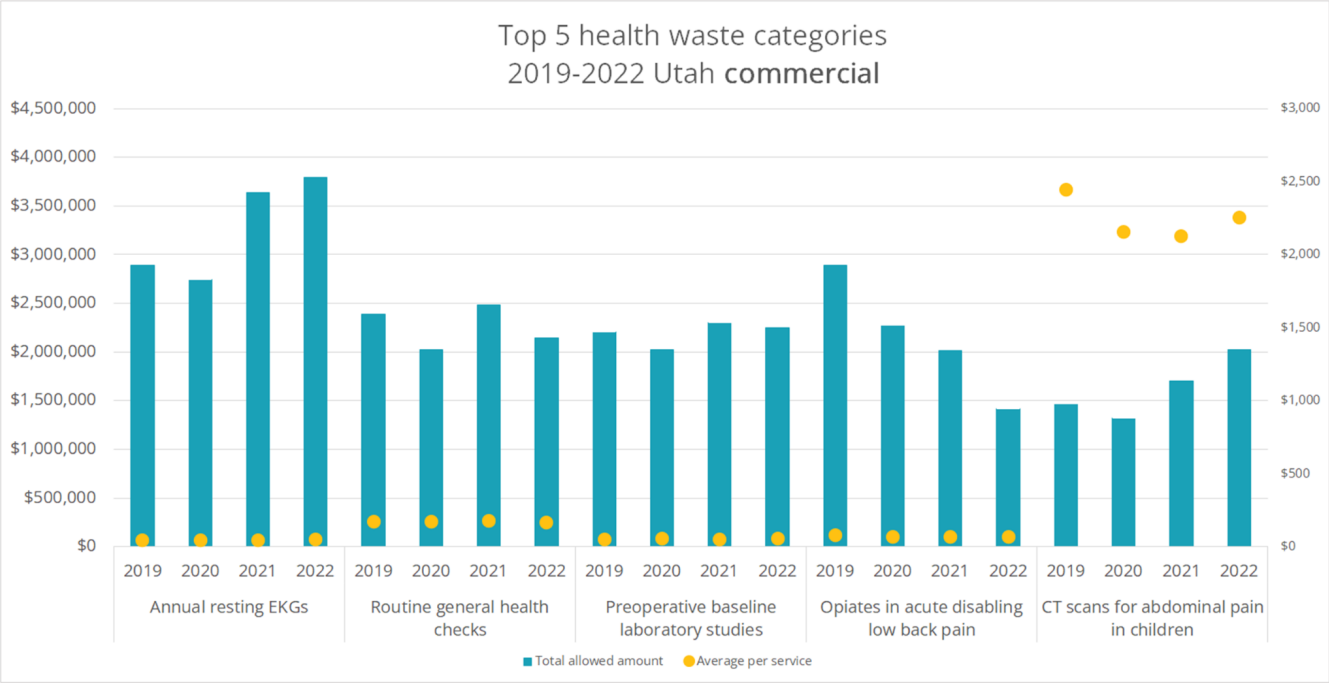


Total annual claims																			
2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Two or more antipsychotic medications				Opiates in acute disabling low back pain				Annual resting EKGs				Preoperative baseline laboratory studies				Routine general health checks			
20,929	21,837	24,509	26,212	79,098	77,659	76,728	62,494	76,948	73,410	92,407	91,213	62,314	57,250	65,890	65,630	14,192	12,113	14,673	13,233

Figure 1 illustrates commercial, Medicaid, and Medicare claims submitted to the All Payer Claims Database (APCD). The top 3 services flagged as "wasteful" from 2019-2022 are 2 or more antipsychotic medications, opiates in acute disabling low back pain, and annual resting EKGs. The claims for 2 or more antipsychotic medications grew from 20,929 (2019) to 26,212 (2022), and the total allowed amount also grew 37% from $5.7 million (2019) to $7.8 million (2022). The average cost per service for this category increased 10% from $273 (2019) to $299 (2022). The total cost flagged as "wasteful'' for the opiate measure has continued to decrease from $5.6 million (2019) to $3.8 million (2022), and the number of claims has also decreased from 79,098 (2019) to 62,494 (2022) despite the increase in eligibility. The number of claims for annual resting EKGs increased by 14,265 claims from 76,948 in 2019, and the total amount allowed also increased by 34% from $3.1 million (2019) to $4.2 million (2022). Unlike 2 or more antipsychotic medications, the average cost per service for all other 4 categories has remained fairly constant over the years.

Figure 2: Top 5 categories flagged as "wasteful" in the state of Utah, using 2019-2022, Utah All

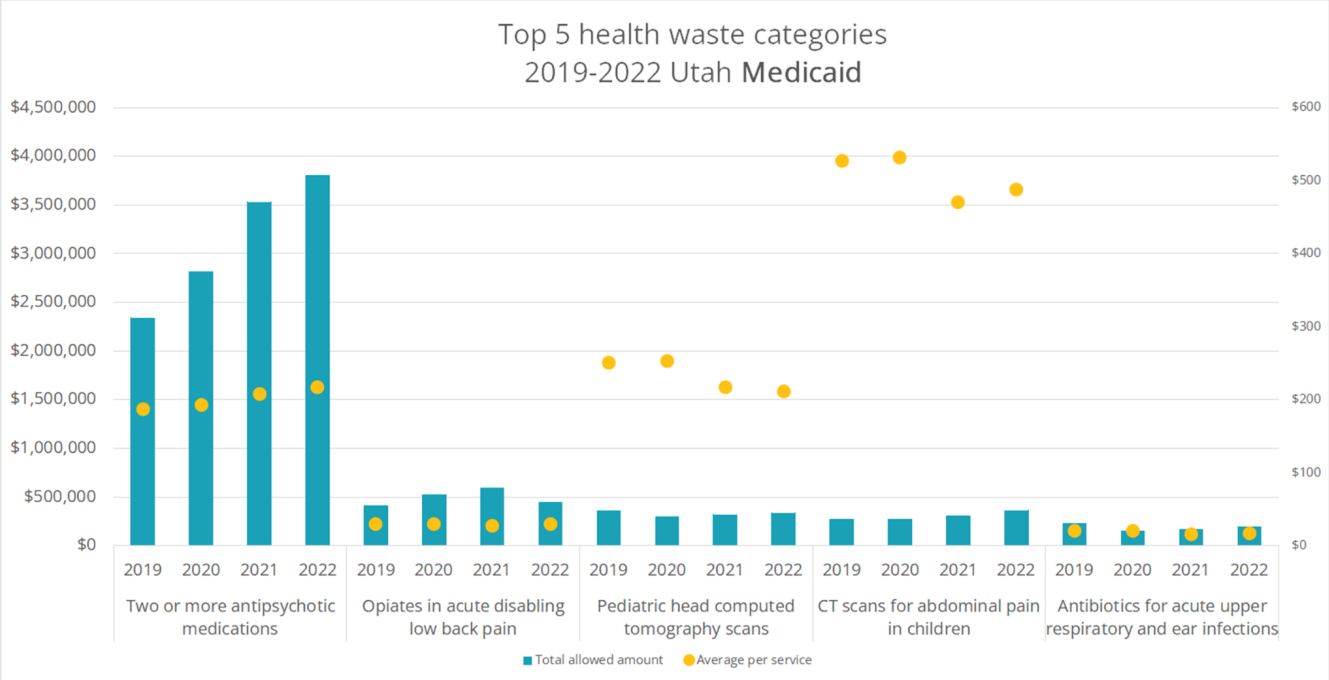
Payer Claims Database; Commercial



Total annual claims																			
2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Annual resting EKGs				Routine general health checks				Preoperative baseline laboratory studies				Opiates in acute disabling low back pain				CT scans for abdominal pain in children			
65,905	61,285	77,159	73,359	13,770	11,673	14,141	12,703	42,178	37,251	43,324	41,160	36,278	32,513	29,289	21,274	600	611	803	898

The top 3 services flagged by the health waste calculator for commercial payers are annual resting EKGs, routine general health checks, and preoperative baseline laboratory studies. Similar to Figure 1, the number of claims for the annual resting EKGs increased from 65,905 (2019) to 73,359 (2022). The claims for opiates in acute disabling low back pain have continuously decreased from 36,278 (2019) to 21,274 (2022). The total allowed amount for both categories also follows a similar pattern as demonstrated in Figure 1. The total allowed amount for routine general health checks decreased from $2.4 million (2019) to $ 2.1 million (2022), but the number of claims varies over the years. Except for CT scans for abdominal pain in children, the average cost per service for all categories remained fairly constant. In 2022, the average cost per service for CT Scans for Abdominal Pain in Children is $2,255, a decrease from 2019 ($2,444).

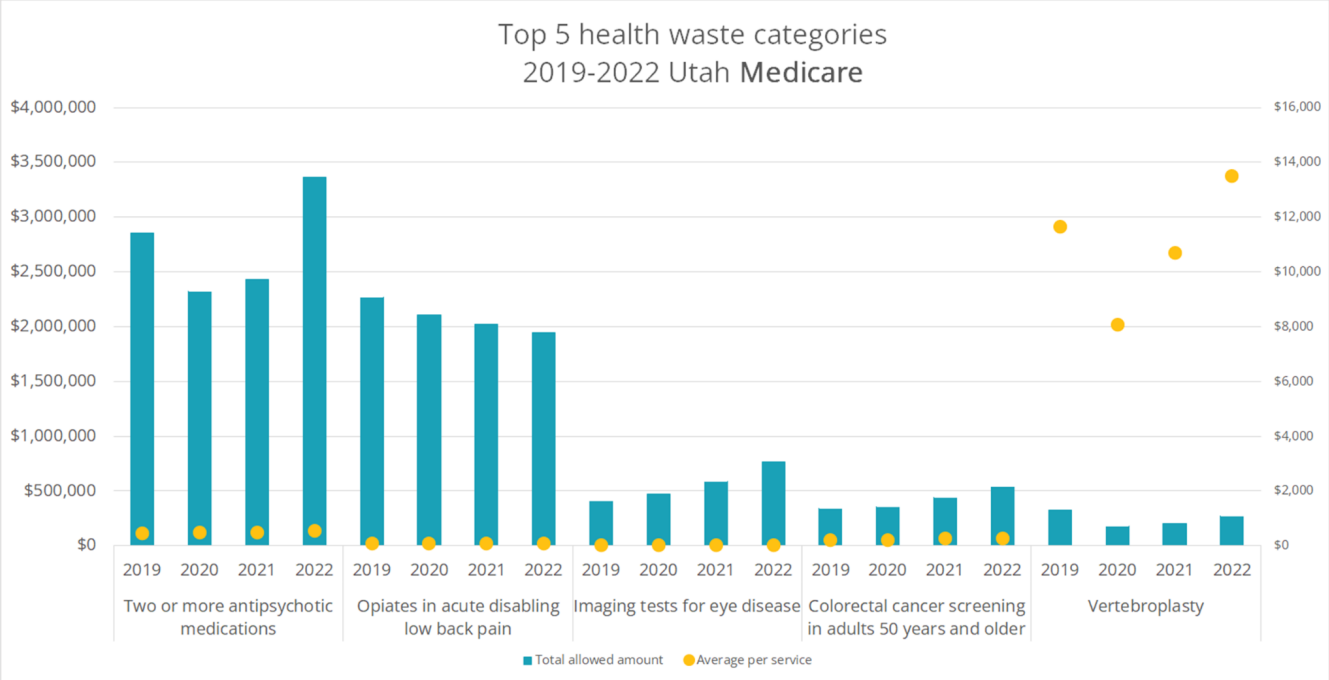
Figure 3: Top 5 categories flagged as "wasteful" in the state of Utah, using 2019-2022, Utah All Payer Claims Database; Medicaid Fee for Service (FFS) and Accountable Care Organizations (ACO)



Total annual claims																			
2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Two or more antipsychotic medications				Opiates in acute disabling low back pain				Pediatric head computed tomography scans				CT scans for abdominal pain in children				Antibiotics for acute upper respiratory and ear infections			
12,555	14,641	16,954	17,484	14,074	17,880	21,305	15,008	1,450	1,186	1,473	1,600	522	511	656	745	11,491	7,515	10,389	11,864

The top 3 services flagged for Medicaid are 2 or more antipsychotic medications, opiates in acute disabling low back pain, and pediatric head computed tomography scans. Similar to Figure 1, the claims for 2 or more antipsychotic medications increased from 12,555 (2019) to 17,484 (2022), and the average cost per service also increased from $187 (2019) to $218 (2022). Compared with the other 4 categories, in 2022, the total allowed amount for 2 or more antipsychotic medications is significantly larger. The allowed amount for this category has continuously increased from $2.3 million (2019) to $3.8 million (2022). The average cost per service for both pediatric head computed tomography scans and CT scans for abdominal pain in children decreased from 2019 to 2022, even though the count of the latter increased by 4% from 2021.

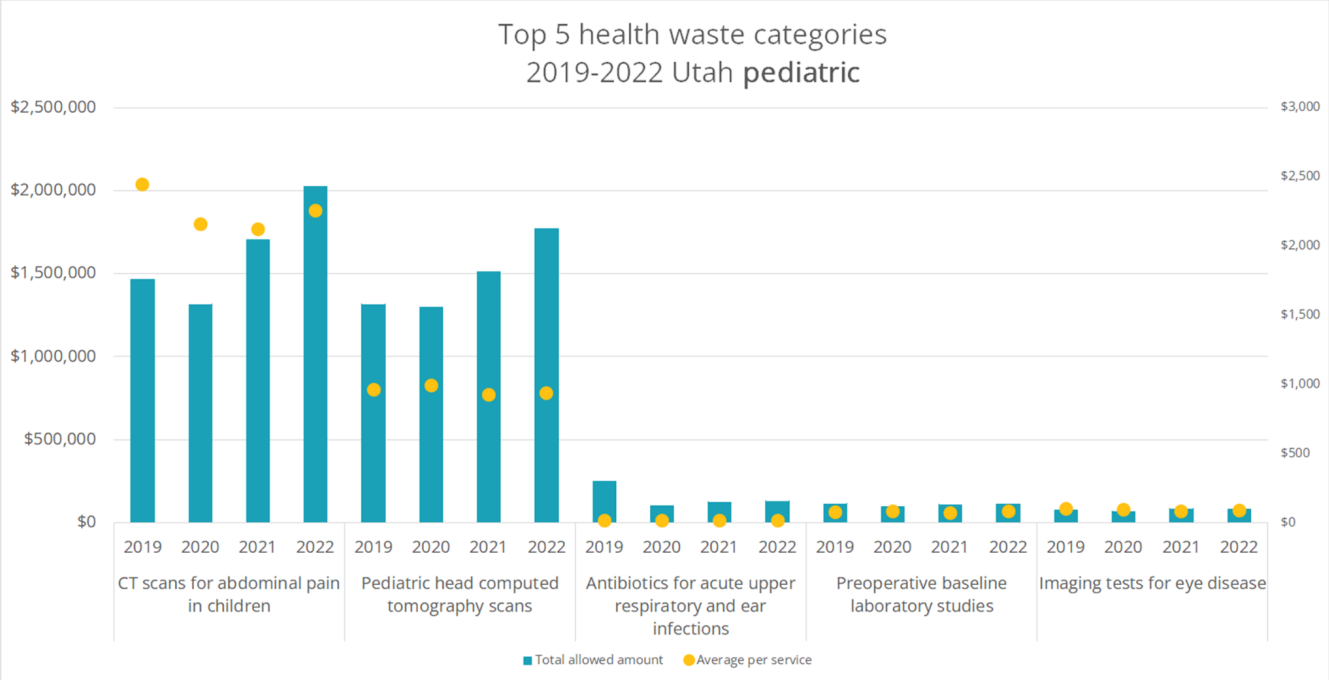
Figure 4: Top 5 categories flagged as "wasteful" in the state of Utah using 2019-2022, Utah All Payer Claims Database; Medicare



Total annual claims																			
2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Two or more antipsychotic medications				Opiates in acute disabling low back pain				Imaging tests for eye disease				Colorectal cancer screening in adults 50 years and older				Vertebroplasty			
6,134	4,780	5,111	6,136	28,746	27,266	26,134	26,212	10,941	13,142	16,140	20,372	1,635	1,590	1,674	1,900	28	22	19	20

For the Medicare population, the top 3 flagged categories are 2 or more antipsychotic medications, opiates in acute disabling low back pain, and imaging tests for eye disease. Both the 2 or more antipsychotic medications and opiates in acute disabling low back pain follow similar patterns to Figure 1, in terms of the total allowed amount and the total annual claims. However, compared with the Medicaid population, the differences in total allowed amounts for 2 or more antipsychotic medications are not as pronounced for the Medicare group. Except for vertebroplasty, the average cost per service for the categories has remained relatively constant over the years. The average cost per service for vertebroplasty continuously increased from $11,665 (2019) to $13,496 (2022), a significant positive change of 16%.

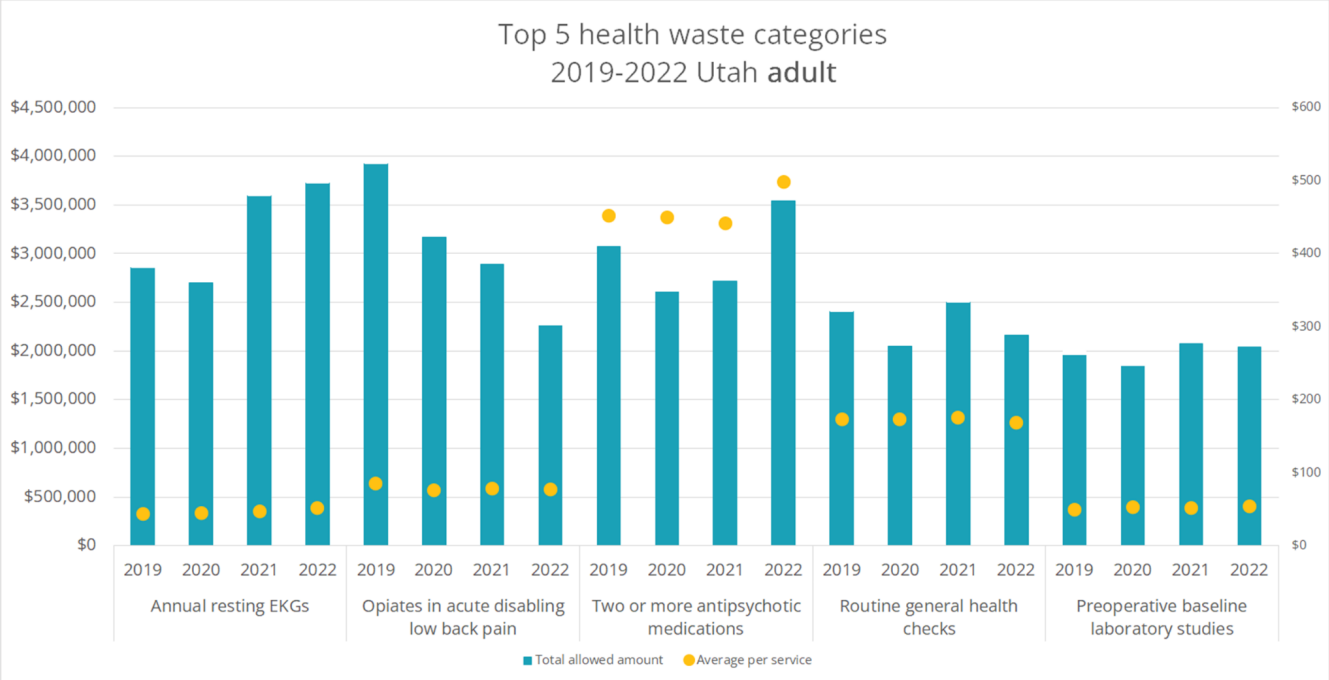
Figure 5: Top 5 categories flagged as "wasteful" in the state of Utah, using 2019-2022, Utah All Payer Claims Database. Pediatric population, ages 0-18, Commercial and Medicare only.



Total annual claims																			
2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
CT scans for abdominal pain in children				Pediatric head computed tomography scans				Antibiotics for acute upper respiratory and ear infections				Preoperative baseline laboratory studies				Imaging tests for eye disease			
600	611	803	898	1,372	1,306	1,642	1,886	13,804	5,920	6,940	7,988	1,531	1,246	1,508	1,398	763	731	998	931

The top 3 categories for pediatric patients flagged as "wasteful" are CT scans for abdominal pain in children, pediatric head computed tomography scans, and antibiotics for acute upper respiratory and ear infections. Except for CT scans for abdominal pain in children, the average cost per service for the categories has remained fairly constant over the years. The average cost per service for CT scans for abdominal pain in children decreased from $2,444 (2019) to $2,255 (2022). From 2019 to 2022, the total annual claims increased in the top 2 categories and in the fifth category (Imaging tests for eye disease), while the other 2 categories decreased.

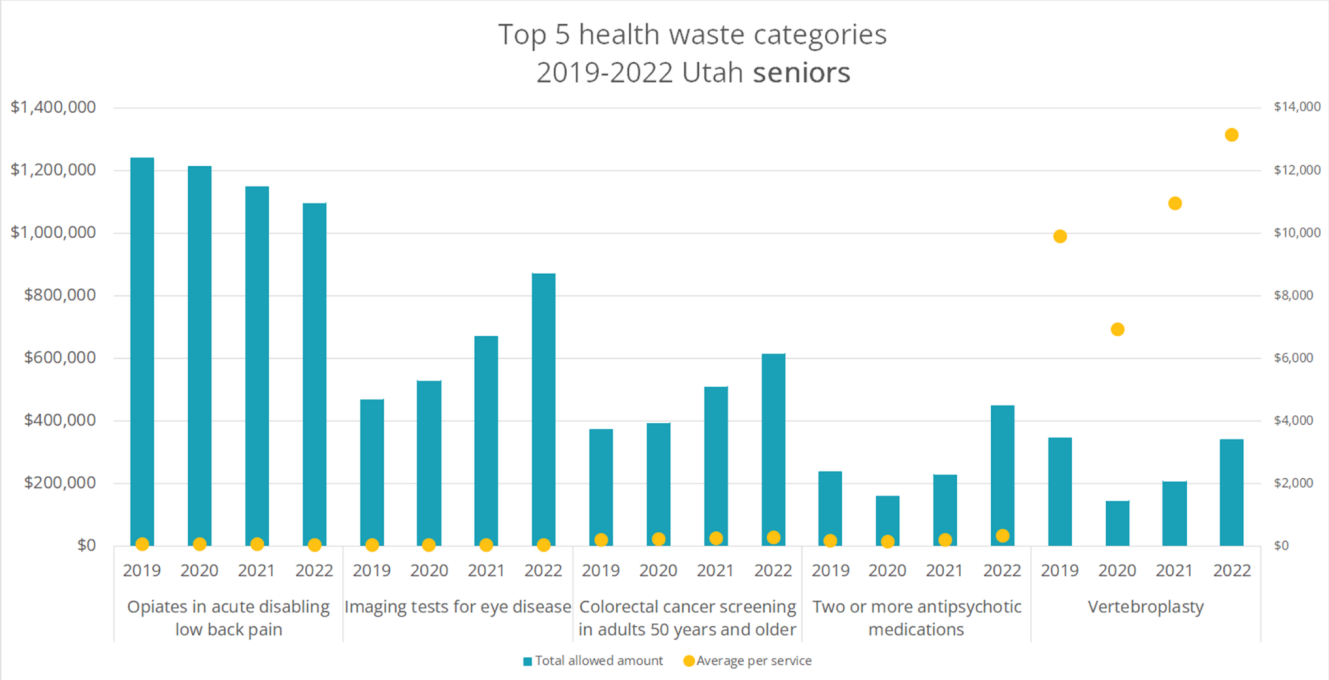
Figure 6: Top 5 categories flagged as "wasteful" in the state of Utah, using 2019-2022, Utah All Payer Claims Database. Adult population, ages 18-64, Commercial and Medicare only



Total annual claims																			
2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Annual resting EKGs				Opiates in acute disabling low back pain				Two or more antipsychotic medications				Routine general health checks				Preoperative baseline laboratory studies			
65,372	60,743	76,382	72,655	45,723	41,396	36,711	29,262	6,795	5,814	6,158	7,109	13,847	11,812	14,226	12,798	39,232	34,989	39,999	37,880

Analyzing the top 5 health waste categories for adults in both commercial and Medicare groups, the top 3 services flagged are annual resting EKGs, opiates in acute disabling low back pain, and 2 or more antipsychotic medications. Except for the 2 or more antipsychotic medications, the average cost per service for all 4 categories has remained fairly constant over the years. The average cost per service for 2 or more antipsychotic medications has a similar pattern as in Figure 1, steadily increasing from $453 (2019) to $499 (2022), reflecting a change of 10%. Compared to Figure 1, all the other 4 categories have similar patterns in terms of the total allowed amount and total annual claims.

Figure 7: Top 5 categories flagged as "wasteful" in the state of Utah, using 2019-2022, Utah All Payer Claims Database. Senior population, ages 65+, Commercial and Medicare only.



Total annual claims																			
2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Opiates in acute disabling low back pain				Imaging tests for eye disease				Colorectal cancer screening in adults 50 years and older				Two or more antipsychotic medications				Vertebroplasty			
19,244	18,355	18,692	18,214	11,707	13,825	17,484	21,902	1,700	1,648	1,860	2,103	1,246	1,093	1,166	1,326	35	21	19	26

The top 3 categories flagged for seniors are opiates in acute disabling low back pain, imaging tests for eye disease, and colorectal cancer screening. Similar to the Medicare population, the average cost per service for vertebroplasty increased from $9,911 (2019) to $13,143 (2022), reflecting a change of 33%. The average cost per service for the top 3 categories has remained quite constant over the years. Total annual claims for opiates in acute disabling low back pain decreased from 19,244 (2019) to 18,214 (2022). The percentage change of the total allowed amount from 2019 to 2022 varies across categories, ranging from a 12% decrease (opiates in acute disabling low back pain) to an 89% increase (2 or more antipsychotic medications).

Tables 1–3 show the dollars and service flagged as "wasteful" by line of business and local health district (LHD)[2] in 2022. The Summit and Wasatch LHDs were combined due to cell size considerations.

Table 1: Commercial health services flagged as "wasteful" by Utah local health district in 2022

Utah local health district	Total allowed amount	Average cost	Total number of services
Salt Lake	$7,672,281	$80	96,380
Utah	$4,791,538	$83	57,487
Southwest	$2,932,113	$127	23,087
Davis	$2,418,462	$78	31,034
Weber-Morgan	$1,729,436	$85	20,465
Bear River	$1,644,087	$110	15,001
Central Utah	$1,090,484	$137	7,949
Summit and Wasatch	$996,106	$109	9,107
TriCounty	$837,878	$188	4,447
Tooele	$670,857	$109	6,160
Southeast	$570,757	$195	2,931
San Juan	$119,618	$208	574
Grand total	**$23,896,984**	**$96**	**248,861**

[2] https://ibis.health.utah.gov/ibisph-view/pdf/resource/UtahSmallAreaInfo.pdf

Table 2: Medicaid health services flagged as “wasteful” by Utah local health district in 2022

Utah local health district	Total allowed amount	Average cost	Total number of services
Salt Lake	$2,832,612	$105	27,079
Utah	$868,560	$70	12,488
Southwest	$692,967	$91	7,653
Davis	$535,072	$71	7,533
Weber-Morgan	$516,021	$76	6,762
Bear River	$413,394	$85	4,853
Central Utah	$353,908	$102	3,454
TriCounty	$318,499	$89	3,572
San Juan	$218,528	$248	882
Southeast	$191,603	$91	2,095
Tooele	$165,175	$78	2,122
Summit and Wasatch	$61,170	$94	648
Grand total	**$7,167,506**	**$91**	**79,141**

Table 3: Medicare health services flagged as "wasteful" by Utah local health district in 2022

Utah local health district	Total allowed amount	Average cost	Total number of services
Salt Lake	$3,499,383	$86	40,818
Utah	$1,292,284	$72	17,870
Southwest	$1,119,949	$67	16,742
Weber-Morgan	$786,752	$70	11,292
Davis	$727,867	$71	10,279
Bear River	$615,560	$82	7,540
Tooele	$280,904	$84	3,329
TriCounty	$166,044	$82	2,014
Summit and Wasatch	$152,541	$78	1,947
Southeast	$146,791	$50	2,908
Central Utah	$99,902	$78	1,279
San Juan	$26,974	$206	131
Grand total	**$8,914,951**	**$77**	**116,149**

Table 4 below shows all of the services flagged as “wasteful” in 2022. Remember the Milliman Health Waste Calculator is a tool to measure “waste'' but may not have the complete picture due to the nature of claims data, unreported patient health issues, rebates or other write offs, and incomplete Utah population. The goal of this tool is to provide high level focus areas for possible improvement and a general estimate of potential savings.

Table 4: All measures and totals flagged as “wasteful” in Utah in 2022

All measures and totals flagged as “wasteful” in Utah in 2022	Total allowed amount	Average cost	Total number of services
Two or more antipsychotic medications	$7,831,913	$299	26,212
Annual resting EKGs	$4,192,885	$46	91,213
Opiates in acute disabling low back pain	$3,810,102	$61	62,494
Preoperative baseline laboratory studies	$2,624,469	$40	65,630
CT scans for abdominal pain in children	$2,391,005	$1,454	1,644
Routine general health checks	$2,218,150	$168	13,233
Pediatric head computed tomography X-ray scans	$2,112,182	$606	3,488
Imaging tests for eye disease	$1,872,220	$50	37,423
PSA	$1,414,182	$27	52,110
Lower back pain image	$1,272,715	$265	4,797
Headache Image	$1,227,830	$793	1,549
Colorectal cancer screening in adults 50 years and older	$1,176,087	$409	2,876
Renal artery revascularization	$994,682	$9,384	106
Repeat CT for kidney stones	$982,457	$1,127	872

All measures and totals flagged as "wasteful" in Utah in 2022	Total allowed amount	Average cost	Total number of services
Arthroscopic lavage and debridement for knee OA	$858,263	$3,684	233
25-OH-Vitamin D deficiency	$792,687	$46	17,083
Cervical cancer screening in women	$757,251	$60	12,630
Antibiotics for acute upper respiratory and ear infections	$747,047	$15	49,102
Coronary angiography	$727,912	$5,687	128
Cardiac stress testing	$514,722	$693	743
Vertebroplasty	$448,364	$14,011	32
Syncope image	$411,816	$610	675
Imaging for uncomplicated acute rhinosinusitis	$389,439	$460	847
Preoperative EKG, chest X-ray and PFT	$339,723	$84	4,024
ED CT scans For dizziness	$328,037	$630	521
NSAIDs for hypertension, heart failure, or CKD	$318,900	$24	13,383
Electroencephalography (EEG) for headaches.	$184,320	$874	211
CT head/brain for sudden hearing loss.	$114,995	$316	364
Preop cardiac echocardiography or stress testing	$91,806	$651	141
Immunoglobulin G/immunoglobulin E testing	$81,024	$117	691

All measures and totals flagged as "wasteful" in Utah in 2022	Total allowed amount	Average cost	Total number of services
Coronary artery calcium scoring for known CAD	$62,344	$1,889	33
Antidepressants monotherapy in bipolar disorder	$59,796	$36	1,650
Imaging of the carotid arteries for simple syncope	$58,656	$343	171
Dexa	$56,703	$145	390
Multiple palliative radiation treatments in bone M	$50,266	$1,733	29
Cough and cold medicines in children <4 years	$44,252	$16	2,842
Diagnostics chronic urticaria	$12,829	$79	162
Antibiotics for adenoviral conjunctivitis	$4,752	$15	320
MRI for rheumatoid arthritis	$4,269	$328	13
Postcoital test for infertility	$549	$39	14
Oral antibiotics for uncomplicated acute TTO	$538	$18	30
PFT prior to cardiac surgery	$26	$26	1
Bleeding time testing	$13	$7	2
Grand total	**$41,582,174**	**$88**	**470,112**

Limitations

While this report provides numerous insights regarding health waste in Utah, there are several limitations to consider.

These limitations include:

- We did not conduct a risk adjustment on the population. Different populations by line of business, geographic location, demographics, and health needs use the health care system in different ways. This analysis did not take those factors into consideration.
- The COVID pandemic may have impacted member eligibility and the way health care was used during this period. We did not conduct an analysis to measure the impact of COVID.
- No pharmacy rebate amounts are available for commercial and Medicare. Medicaid ACOs opioid pharmacy rebates were assumed to be the same as the Medicaid FFS. These rebates averaged 63.3% less than reported cost. This 63.3% rebate was applied to all ACO opioid prescriptions.
- The focus is on claims Milliman flagged "wasteful," which may differ from other assessments of health waste.
- At the epicenter of this analysis is the claim line methodology, in lieu of the case rate method. This results in a lower estimate than other health utilization assessments.
- The APCD only contains claims submitted to the state, and does not include data for all Utahns. At present, the APCD contains claims data for approximately 60% of the population who were eligible for at least a portion of the calendar year. As a result, any payments outside the claim system are not reflected in this analysis. For example, cash paying patients, some self-funded plans, or those who are uninsured are not captured in the APCD.
- Not all patient diagnoses and health conditions are captured in the APCD. Due to the nature of claim billing, not all health conditions and history are recorded on the claims. For example, a patient may have had chronic back pain for several months, but either didn't seek care, or care was not submitted to the APCD.
- The APCD relies on the accuracy of the data entered and provided to the state. There is a possibility, for example, for those who enter data for services rendered by providers, to make mistakes. These mistakes that are not correctly adjusted, within the sphere of medical billing, would be unknown to the state.

Analysis key takeaways

The following list represents some of the major key takeaways from the analysis of the health waste calculator data:

- Of the 48 measures available in the Milliman Health Waste Calculator tool, HCSP identified 43 measures with “waste” in Utah in 2022. The total health waste across these measures amounted to approximately $41.6 million. This represents about 21% of total care spent for the 43 measures (denominator approximately $203M).
- In 2022, the top 3 health “waste” measures across the state were:
    - Two or more antipsychotic medications (26,212 claims flagged, approximately $7.8M)
    - Annual resting EKGs (91,213 claims flagged, approximately $4.2M)
    - Opiates in acute disabling low back pain (62,494 claims flagged, approximately $3.8M)
- Across the years 2019 to 2022, the opiates in the acute disabling low back pain category is among the top 2 “waste” measures for Medicaid only, Medicare only, adult populations, and seniors; for commercial only, that category is fourth.
- In 2022, for the pediatric non-Medicaid population, the top 3 notable health “waste” measures were:
    - CT scans for abdominal pain in children (898 claims flagged, approximately $2.0M)
    - Pediatric head CT scans (1,886 claims flagged, approximately $1.8M)
    - Antibiotics for acute upper respiratory ear infections (7,988 claims flagged, approximately $130K)
- In 2022, the top 5 local health districts with the most “waste'' were: Salt Lake ($14 million), Utah ($7 million), Southwest ($4.7 million), Davis ($3.7 million), and Weber- Morgan ($3 million).
    - Among the top 5, the average cost per service for all except Southwest was between $76 and $85. Southwest’s average was $100.
    - The average cost per service for the remaining LHDs, which were mostly rural, was $110.

Scientific literature about eliminating duplication in health care

Prior studies estimated that approximately 30% of health care spending in the U.S. may be considered a waste, such as “failure of care coordination” or “overtreatment or low-value care” (33). Among the many contributors, the duplication of medical testing is an important financial burden to the health care system. Some experts estimate that at least $200 billion is wasted annually on excessive testing and treatment (33). According to Slater et al., it is not unusual that patients “traipse among the 5 boroughs of New York City” in order to receive head computed tomography scans for headaches and cardiac scans for chest pain “ at various institutions, one after another” (32). While private insurance reviews commonly detect instances of redundancy, many state Medicaid programs lack the capability to identify such behavior in real-time (32).

Duplication of medical testing occurs when there is a lack of coordination between 2 institutions with their own electronic medical record system. Past studies have shown that the lack of accessibility to paper records for transferred patients led to duplication of testing. However, even with the wide dissemination and use of electronic health records (EHR) in hospitals, the transferred patients still face duplication of testing due to the presence of incompatible electronic medical record systems between hospitals along with incomplete transfer of electronic medical records between hospitals. Lack of interoperability to share information generated in different electronic systems of medical records contributes to duplicative testing (1, 32).

A retrospective study done by Stewart et al., looked at duplicate testing among transferred patients and found that the lack of interoperability in the EHR was one of the main reasons that lead to duplicate testing (1). The authors suggest that EHRs across systems should be interoperable with the availability of integrated decision support. In the study, they examined patients with adult congenital heart disease (ACHD) who were provided treatment in 2 Boston hospitals. It found that 20% of cases had at least 1 duplicate test not clinically indicated and around 32% had a duplication of testing repeated within 12 hours. Despite the close collaboration and proximity of the 2 hospitals, there existed evidence of duplication of testing among the sample of 85 patients. According to the researchers, “Fifty percent of the patients with duplicative testing had more than 1 test duplicated” (1). The study suggests incomplete record transfer among incompatible electronic medical record systems can lead to potentially costly duplicate testing behaviors. As a result, interoperable systems with integrated decision support could help minimize duplication of testing at the time of patient transfers (1).

Similarly, research by Walker, van Walraven, Balas, and other groups studied the benefits of fully integrated and interoperable EHRs and found that they were more effective in reducing duplication compared to stand-alone electronic health records (3-5). Also, a RAND Corporation study showed that around 63% of outpatient paper chart pulls in a hospital were duplicate efforts and could potentially be eliminated with the implementation of integrated information technology (2).

Research by Horng et al., found that, in addition to the incompatibility between the EHRs of different hospitals, physicians who cared for patients in the same hospital even ended up ordering duplicative tests on patients when they cared for them simultaneously (6). Studies on the assessment of unintentional duplicate orders by clinicians showed that EHRs allowed teams of clinicians to care for patients simultaneously, but an unintended consequence was the duplicate orders of tests and medications (6). Besides, without proper visual aids and systems in place to prevent the duplicative ordering of tests, the physicians of different specialties who saw patients in the emergency room had a higher propensity to order duplicate tests (6).

Slater et al., argue that many physicians have succumbed to the ease of electronic ordering and most patients feel they have been given short shrift if they leave the office without more tests and more meds. When consultation times are short, there is less time to explain the pros and cons of an intervention; it is simpler just to order it (32).

Research by Bates et al., argues that the main purpose of EHRs is to facilitate communication, provide decision support, and monitor patients. However, the presence of EHRs may have unintended consequences increasing the likelihood that health care professionals overlook existing orders and duplicate work (7, 8, 9, 10). In some cases, physicians may actually request duplicate orders, especially in the case of laboratory values or radiology reports to confirm the diagnosis (11). Duplicate orders may also be markers of poor communication between clinicians who care for the same patient or even indicate that an order has been placed for the wrong patient. Hence, it is vital to differentiate the orders that have been voluntarily placed by physicians for the reconfirmation of diagnosis and duplicative orders that have been placed by mistake (11).

Multiple methods have been recommended to help reduce duplicate health care service. According to Ratwani et al., strategies to reduce duplicate orders include additional training for users, downstream workflow mitigation such as screening by pharmacy, laboratory, radiology departments, or interruptive alerts (12). However, other studies showed that interruptive alerts could also disrupt processes, which might lead to more errors (12, 13, 14, 15, 16).

A study by Hripcsak et al., also evaluated the impact of health information exchange (HIE) to see if it was useful in reducing duplicate work and leading to high-quality and efficient care (19). The study showed that a superficial view might suggest that HIE was effective in improving health care quality and efficiency; however, a deeper and more rigorous evaluation of the effect on quality might be needed and unintended consequences must be closely monitored (19). When information is shared across hospitals, there is the possibility of sharing clinical documents that have duplicate or even conflicting information. Care must be taken to ensure the validity and correctness of the clinical information before it is shared across hospitals or through HIE (20). A system to automatically consolidate information across multiple clinical summary documents developed by the HIE network could be used to reduce information overload. Benefits of the HIE network tool include 1) prevent duplication, 2) improve interoperability among information systems, and 3) provide clinicians with information that is easier to use, understand, and more searchable due to its integration of homogenous information into 1 section (20).

Another way to improve data sharing among hospitals comes through the horizontal integration of the hospital industry that has been gaining momentum in the U.S. Horizontal consolidation is the process of hospitals merging and acquiring similar provider organizations. When the integration of hospitals or health systems occurs, the electronic exchange of patient information is usually highlighted as a consolidation benefit (17). However, it may not be the single solution to improve health information exchanges between hospitals to lead to improved care coordination and a reduction in duplication.

For example, a study by Holmgren and Ford done at the Harvard Business School on assessing the impact of health system organizational structure on hospital electronic data sharing, showed that interoperability engagement varied greatly across hospitals in different health systems. Health care facilities with more centralized health systems were more likely to be interoperable. Hospitals in 1 system type that featured centralized insurance product development but diverse service offerings across member organizations had significantly higher odds of being engaged in interoperable data sharing in the multivariable regression results (17). The study showed the incentives to share data varied greatly across organizational strategies and structures, and there was always heterogeneity in health system interoperability. Horizontal integration in the hospital industry may not actually bring significant gains in interoperability unless consolidation takes a specific business alignment form. Besides, with consolidation, there is the possibility that reduced market competition will lead to higher prices, working against the cost savings of deduplication obtained from better data-sharing (18).

Health Level Seven (HL7) is an international standards development organization that creates standards for exchanging clinical and administrative data among health care information systems

(21-23). In 2011, the Centers for Medicare and Medicaid Services (CMS) established the Medicare and Medicaid EHR incentive program to encourage eligible professionals, eligible hospitals, and critical access hospitals to adopt, implement, upgrade, and demonstrate meaningful use of certified EHR technology. The CMS EHR incentive program rules adopted HL7 as the sole standard for exchanging summary care records (24).

Scientific literature review of other state's use of health waste information

Washington State's Washington Health Alliance used the Milliman Health Waste Calculator to identify health care waste and low-value health care services. In a 2018 report, it found that 36% of spending on the health care services examined went to low-value treatments and procedures that amounted to an estimated $282 million in wasteful spending (25). A 2017 study estimated that approximately 500,000 people in Washington State received 1 of these low-value services, and 93% of overuse was attributed to 11 common tests, procedures, and treatments (26).

Washington Health Alliance released the most recent report in December 2023 which covers the period from 2020 to 2022. It states that, in Washington, 48 common treatment approaches were overused and 40% of the health care services were determined to be low value (likely wasteful or wasteful). Of the approximately 2.2 million services examined for the commercially insured, nearly 40% were considered low-value and nearly all of them were labeled as wasteful versus likely wasteful. In addition, these low-value care services impacted an average of 196,727 individuals per year at an estimated cost of $126 million over the 3 year period (26,33). The report says the top 5 areas of low-value care spending over the reporting period are: PICC stage III–V CKD, prostate-specific antigen test, 25-OH-Vitamin D deficiency, coronary angiography, and annual resting EKG (33).

The measurement year used for the results in this report includes services delivered from January 1, 2020, through December 31, 2022. Although the report explicitly identifies the various categories of waste using the Milliman Health Waste Calculator in Washington State and declared the call for action to address changes to reduce health care waste, no information on the steps taken to reduce the health care waste using the results of the report was identified in the report or in the currently available literature (33).

Another tool is the Lost Lives and Dollars calculator. Using Leapfrog's groundbreaking Lives and Dollars Lost risk calculator, employers and purchasers can: 1) estimate the number of avoidable deaths among their covered lives; 2) identify the hidden surcharge paid for each inpatient admission due to hospital acquired complications; and 3) calculate how much of their total health care spending goes to medical mistakes (30). Specifically, the Lost Lives and Dollars Lost calculator helps estimate the dollars wasted. For example, for some employers, the dollars lost to medical errors can represent up to 30% of their overall health care spending. By shifting employees to "A"

hospitals through improved benefits plan design, employers can decrease these hidden surcharges and protect their employees and dependents from harm (30).

Another analysis was done in 2014 in Virginia using the All Payer Claims Database. The analysis identified 44 low-value health services. Virginia All Payer Claims Database showed $586 million in unnecessary costs (26). Among these low-value services, those that were low and very low cost ($538 or less per service) were delivered far more frequently than services that were high and very high cost ($539 or more). Low- and very-low-cost low-value services (those costing less than $539 per service) were administered more than 13 times more frequently than more expensive low-value services. The combined costs of the former group were nearly twice those of the latter (65% versus 35%) (26). To quantify the low-value care, Virginia also used the Milliman MedInsight Health Waste Calculator (26). Of the total statewide costs in Virginia, 2.1% were identified as unnecessary (26). The study recommended that changing any physician practice pattern (including the delivery of routine and low-cost services) is notoriously difficult and even a modest decrease in the use of low- and very-low cost low-value services could lead to savings (26).

Also in Virginia, the Virginia Center for Health Innovation (VCHI) has been using the Milliman MedInsight Health Waste Calculator to create peer comparison reports using the Virginia All Payer Claims Database (APCD). The goal is to produce a 25% reduction in 7 provider-driven low-value care measures and prioritize as many as 6 consumer-driven measures in the future (35, 36).

Another white paper report studied the utilization and spending on low-value medical care across Colorado, Connecticut, Utah, and Wisconsin (27). The APCDs of the different states had access to an exclusive or limited number of datasets such as Commercial Claims data, Medicaid data, Medicare FFS data, and Medicare Advantage data (27). Colorado had access to all 4 data, while Connecticut's APCD had access to only commercial and Medicare Advantage data; Utah and Wisconsin had access to commercial, Medicaid, and Medicare Advantage data (27).

The spending on low-value care for commercial plans for 2019 showed that among the 4 states, waste as a proportion of total health spending was highest in Utah (2.66%), followed by Wisconsin (2.36%), Colorado (2.10%), and Connecticut (1.93%) (27). Patient out-of-pocket costs contributed substantially to total low-value care expenditures, ranging from 15.11% (Connecticut) to 20.70% (Colorado) (27). Total spending on top 10 low-value care services was highest in Wisconsin (81%), followed by Connecticut (78%), Utah (77%), and Colorado (75%) (27). Commercial plan spending on services with a waste index (a frequency-based measurement of a service) greater than 80% was measured. Among the 4 states that paid for services with a waste index >80%, it was highest in Wisconsin with 53%, followed by Utah (51%), Connecticut (45%), and Colorado (40%) (27).

People in commercial plans paid between 15.11% and 20.7% on the 48 low-value care services in Colorado, Connecticut, and Utah, totaling $94.4M in spending. In Colorado and Utah, specifically, patients paid out-of-pocket for one-fifth of the total waste spending in commercial markets. For high-volume services, patients paid a similar portion—15.95%–21.77% of commercial spending on these services in their states (27).

Another assessment of low-value care in Colorado was done by the Center for Improving Value in Healthcare (CIVHC). They created an affordability dashboard which provided a high-level analysis of several key cost drivers and insights into potential ways to improve the affordability of health care in Colorado. CIVHC engaged with Milliman MedInsight to use the Colorado All Payers Claims Database to measure low-value care (28). CIVHC not only published the low-value care in Colorado report in March 2020, but continues to update the low-value care analysis on its affordability dashboard that is available for the public to view (28). The interactive report analyzed claims from 2017 to 2020 and these findings can help consumers, providers, and payers identify opportunities to reduce low-value care (28). CIVHC's analysis found that in 2020, Coloradans received more than 1 million unnecessary and potentially harmful low-value care services resulting in $134 million in excess cost for Coloradans and health insurance companies. Compared to 2019, the number of low-value care services and total spending decreased, yet the percent spending that was identified as low-value care of the services evaluated, increased by 9% (28). Across all payers, the top 10 services by spending accounted for 77% of the state's total low-value care spending. In 2020, more than 1 million low-value care services were provided, leading to a spending of $134 million or 11% of the total spending. The average cost for a low-value care service was $130. However, the top service by spending, peripheral catheters in late stage kidney disease patients, cost more than $14,000 per incidence and has a high risk of harming patients (28).

Similarly, the state of Oregon also used the Milliman Health Waste Calculator to identify health care waste and low value health care (29). Of the evaluated services, 40% were found to be low value (3,796,638 services) at a cost of $529,767,584. An average of 804,328 distinct individuals received at least 1 low-value service in each of the 3 years. The top 15 most utilized services accounted for 97% of all low-value services identified, affecting 2.9 million people, with $293,561,410 spent (29).

References

1. Stewart BA, Fernandes S, Rodriguez-Huertas E, Landzberg M. A preliminary look at duplicate testing associated with lack of electronic health record interoperability for transferred patients. J Am Med Inform Assoc. 2010 May-Jun;17(3):341-4. doi: 10.1136/jamia.2009.001750. PMID: 20442154; PMCID: PMC2995707.
2. Girosi F, Meili R, Scoville RP. Extrapolating evidence of health information technology savings and costs. Santa Monica, CA, USA: Rand Corporation, 2005
3. Walker J, Pan E, Johnston D, et al. "The Value Of Health Care Information Exchange And Interoperability''. Health Affairs: Web Exclusives: 2005;W5-10-W5-18. 8.
4. van Walraven C, Taljaard M, Bell CM, et al. Information exchange among physicians caring for the same patient in the community. CMAJ 2008;179:1013e18.
5. Balas A, Al Sanousi A. Interoperable electronic patient records for health care improvement. Stud Health Technol Inform 2009;150:5
6. Horng S, Joseph JW, Calder S, et al. Assessment of Unintentional Duplicate Orders by Emergency Department Clinicians Before and After Implementation of a Visual Aid in the Electronic Health Record Ordering System. *JAMA Netw Open.* 2019;2(12):e1916499. doi:10.1001/jamanetworkopen.2019.16499
7. Bates DW, Gawande AA. Improving safety with information technology. *N Engl J Med*. 2003;348(25):2526-2534. doi:10.1056/NEJMsa020847
8. Tolley CL, Slight SP, Husband AK,Watson N, Bates DW. Improving medication-related clinical decision support. *Am J Health Syst Pharm*. 2018;75(4):239-246. doi:10.2146/ajhp160830
9. Magid S, Forrer C, Shaha S. Duplicate orders: an unintended consequence of computerized provider/physician order entry (CPOE) implementation: analysis and mitigation strategies. *Appl Clin Inform*. 2012;3(4):377-391. doi:10.4338/ACI-2012-01-RA-0002
10. Wetterneck TB,Walker JM, Blosky MA, et al. Factors contributing to an increase in duplicate medication order errors after CPOE implementation. *J AmMed Inform Assoc*. 2011;18(6):774-782. doi:10.1136/amiajnl-2011-000255
11. Hickman TT, Quist AJL, Salazar A, et al. Outpatient CPOE orders discontinued due to "erroneous entry": prospective survey of prescribers' explanations for errors. *BMJ Qual Saf*. 2018;27(4):293-298. doi:10.1136/bmjqs-2017-006597
12. Ratwani RM, Trafton JG. A generalized model for predicting post completion errors. *Top Cogn Sci*. 2010;2(1):154-167. doi:10.1111/j.1756-8765.2009.01070.x

13. Kesselheim AS, Cresswell K, Phansalkar S, Bates DW, Sheikh A. Clinical decision support systems could be modified to reduce 'alert fatigue' while still minimizing the risk of litigation. *Health Aff (Millwood)*. 2011;30(12):2310-2317. doi:10.1377/hlthaff.2010.1111
14. Fant C, Adelman D. Too many medication alerts: how alarm frequency affects providers. *Nurse Pract*. 2018;43(11):48-52. doi:10.1097/01.NPR.0000544279.20257.4b
15. Carspecken CW, Sharek PJ, Longhurst C, Pageler NM. A clinical case of electronic health record drug alert fatigue: consequences for patient outcome. *Pediatrics*. 2013;131(6):e1970-e1973. doi:10.1542/peds.2012-3252
16. Glassman PA, Simon B, Belperio P, Lanto A. Improving recognition of drug interactions: benefits and barriers to using automated drug alerts. *Med Care*. 2002;40(12):1161-1171. doi:10.1097/00005650-200212000-00004
17. A Jay Holmgren, Eric W Ford, Assessing the impact of health system organizational structure on hospital electronic data sharing, *Journal of the American Medical Informatics Association*, Volume 25, Issue 9, September 2018, Pages 1147–1152, Available from: https://doi.org/10.1093/jamia/ocy084
18. Cooper Z, Gibbons S, Jones S, McGuire A. Does hospital competition save lives? Evidence from the English NHS patient choice reforms*. Econ J 2011; 121 (554): F228–60.
19. George Hripcsak, Rainu Kaushal, Kevin B. Johnson, Joan S. Ash, David W. Bates, Rachel Block, Mark E. Frisse, Lisa M. Kern, Janet Marchibroda, J. Marc Overhage, Adam B. Wilcox. The United Hospital Fund meeting on evaluating health information exchange. Journal of Biomedical Informatics, Volume 40, Issue 6, Supplement, 2007, Pages S3-S10.
20. Masoud Hosseini, Josette Jones, Anthony Faiola, Daniel J. Vreeman, Huanmei Wu, Brian E. Dixon, Reconciling disparate information in continuity of care documents: Piloting a system to consolidate structured clinical documents,
Journal of Biomedical Informatics, Volume 74, 2017, Pages 123-129.
21. M. Hosseini, M. Ahmadi, B.E. Dixon, A service oriented architecture approach to achieve interoperability between immunization information systems in Iran, in: AMIA Annu Symp Proc., 2014, pp. 1797–1805.
22. Office of the National Coordinator (ONC), 2014 Edition Release 2 Electronic Health Record (EHR) Certification Criteria and the ONC HIT Certification Program; Regulatory Flexibilities, Improvements, and Enhanced Health Information Exchange, The U.S. Department of Health and Human Services, 2014.
23. Health Level Seven website. "About HL7". cited; Available from: http://hl7.org/about/index.cfm.
24. Medicare and Medicaid programs; electronic health record incentive program stage 2, Final rule, Federal register, 20 Sep 4;77(171), pp. 53967-4162.

25. First, Do No Harm. Calculating Health Care Waste in Washington State. Washington Health Alliance. February 2018. Available from: https://wacommunitycheckup.org/media/47156/2018-first-do-no-harm.pdf
26. Low-Cost, High-Volume Health Services Contribute The Most To Unnecessary Health Spending. John N. Mafi, Kyle Russell, Beth A. Bortz, Marcos Dachary, William A. HazelJr., and A. Mark Fendrick. Health Affairs 2017 36:10, 1701-1704
27. Utilization and Spending on Low-value Medical Care Across Four States. VBID Health. May 2022. Available from: https://vbidhealth.com/wp-content/uploads/2022/05/Utilization-and-Spending-on-Low-Value-Medical-Care-Across-Four-States-VOL2.pdf
28. Low Value Care in Colorado 2017-2020. Center for Improving Value in Healthcare. Available from: https://civhc.org/wp-content/uploads/2022/06/Low-Value-Care-Issue-Brief_Final.pdf
29. Better Health for Oregonians: Opportunities to Reduce Low-Value Care. July 2020. Oregon Health Leadership Council. Available from: http://www.orhealthleadershipcouncil.org/wp-content/uploads/2020/07/Oregon-Low-Value-Care-Report-Final-July-2020.pdf
30. The Leapfrog Group: Lives & Dollars Lost Calculator. Available from: https://www.leapfroggroup.org/employers-purchasers/lives-dollars-lost-calculator
31. Unnecessary medical tests, treatments cost $200 billion annually, cause harm. Kaiser Health News. Available from: https://www.healthcarefinancenews.com/news/unnecessary-medical-tests-treatments-cost-200-billion-annually-cause-harm
32. Slater EE. Health Care Reform: Cost and Waste. Am J Med. 2023 Oct;136(10):953-954. doi: 10.1016/j.amjmed.2023.05.016. Epub 2023 June 25. PMID: 37369271.
33. Shrank WH, Rogstad TL, Parekh N. Waste in the US Health Care System: Estimated Costs and Potential for Savings. JAMA. 2019 Oct 15;322(15):1501-1509. doi: 10.1001/jama.2019.13978. PMID: 31589283.
34. Unnecessary Care Costs Millions. Dec. 2023. Washington State Health Waste Calculator. Washington Health Alliance. Available from: https://wahealthalliance.org/wp-content/uploads/2023/12/Unnecessary-Care-Costs-Millions.pdf
35. Smarter Care Virginia, Examining Low-Value Care in Virginia. Available from: https://trialbulletin.com/lib/entry/ct-04053335
36. Smart Care Virginia Project Overview. Available from: https://www.vahealthinnovation.org/scv/