

Accurate coding: the foundation of accountable care

Jeremy Orr MD, MPH, Chief Medical Officer, Optum Analytics

Allen Kamer, Chief Commercial Officer, Optum Analytics

White Paper



The problem with patients who have conditions that go unrecognized, or “uncoded patients” is not a new one. It has been a problem for years and providers have known they need to tackle it, to improve both patient care and financial viability. Yet the problem persists. To calculate its importance, a team at Humedica quantified the rate of uncoded patients, and then analyzed its impact on utilization and outcomes. In short, the findings indicate that better coding identifies many high-risk patients and ultimately improves their care to drive better outcomes.

Thirty-seven percent of patients with major chronic conditions go uncoded

The research indicates that 37% of patients with major chronic conditions are uncoded. To arrive at this result, data was mined from over 4 million active patients with evidence of major chronic diseases. Humedica’s aggregated data identifies uncoded patients based on clinical evidence such as lab results, provider notes and medications prescribed. This allows patients to be found despite the lack of a coded diagnosis on a claim, or an entry on an electronic health record (EHR) problem list.

Based on the analysis, 37% of patients with evidence of diabetes, congestive heart failure, coronary artery disease, hypertension, or dyslipidemia are uncoded for one or more of these conditions. Put another way, about 17% of all patients in a typical medical group are uncoded for at least one major chronic condition. For a medical practice of 500,000 patients, this translates to about 83,000 patients who are uncoded for one or more of these major chronic conditions.

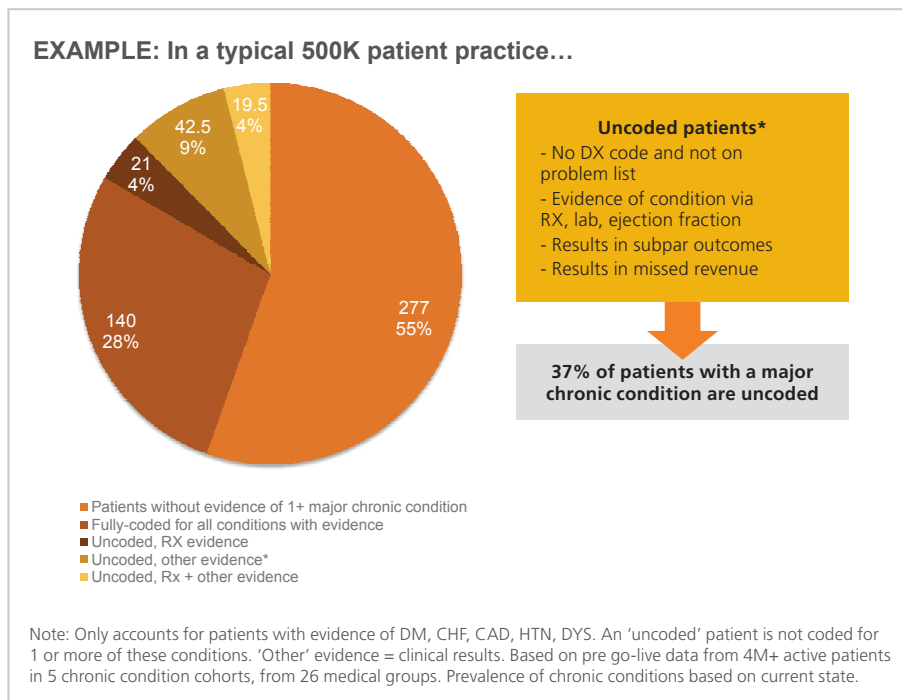


Figure 1: Typical provider group has significant uncoded patient population

The problem persists across conditions

Poor coding is a significant problem for each of the major chronic conditions analyzed. Based on the data, the incidence of uncoded patients for diabetes, chronic heart failure and hypertension is 22%. For dyslipidemia, 28% of patients are uncoded. And finally, 12% of patients with coronary artery disease lack codes.

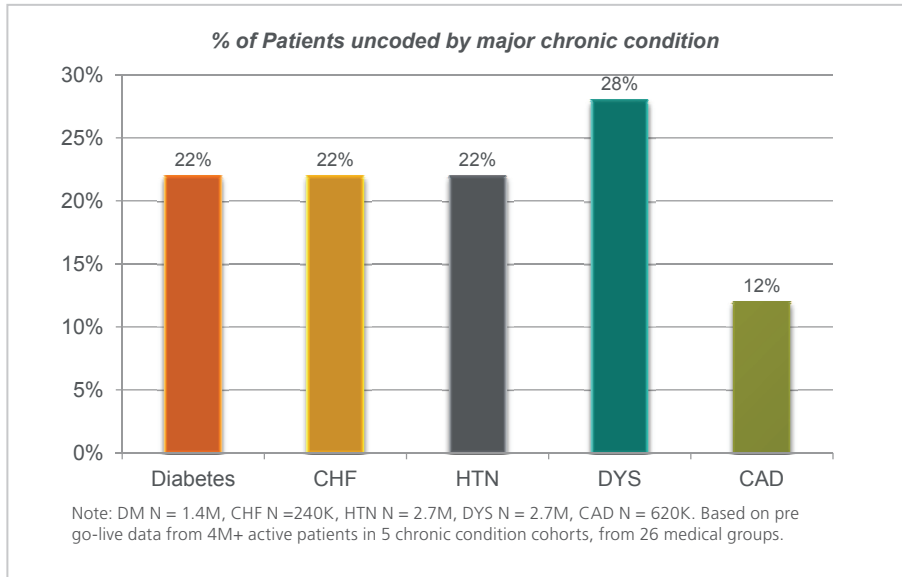


Figure 2: High rates of uncoded patients across chronic conditions

The relatively low rate of uncoded coronary artery disease patients makes sense given this diagnosis requires a major event. On the other hand, the diagnosis of dyslipidemia, based primarily on lab results, is missed more often. The fact that uncoded rates are high across conditions points to a significant opportunity for clinical analytics. Robust, condition-specific clinical algorithms for each condition can increase diagnosis rates dramatically.

Uncoded patients are relatively poorly controlled, many with comorbidities

Before analyzing the impact coding can have on utilization and outcomes, there was a need to understand uncoded patients in more detail. At baseline, uncoded patients tend to be relatively sick. Thirty percent of uncoded patients have evidence of two major chronic conditions. An added 13% have evidence of three conditions. In addition, analysis indicates many of these patients are poorly controlled.

This analysis focused on conditions that are responsive to ambulatory care interventions, specifically diabetes, hypertension and dyslipidemia. A scoring system was developed to estimate each patient’s risk level at baseline. For each condition, relevant clinical measures and their respective risk thresholds were defined. For each patient, risk level was calculated based on how many clinical measures relevant to him or her were at risk. Patients defined as “very high risk” had more than 75% of their relevant clinical measures at risk. “High risk” patients had between 50 and 75% of relevant measures at risk. “Moderate risk” patients had between 25 and 50% at risk.

Measure	At Risk
A1C	>9
LDL	>130
BP	SYS >140 & DIAS >90
HDL	<40
TRIG	>=200

Figure 3: Risk thresholds by clinical measure

Based on this methodology, 36% of uncoded patients were at-risk. Eleven percent of them fell into the highest risk category versus only 6% of coded patients. This means a significant number of uncoded patients are relatively complex. They have high risk of future problems and need higher levels of care. However, these patients access significantly less ambulatory care than coded (p-value <.0001).

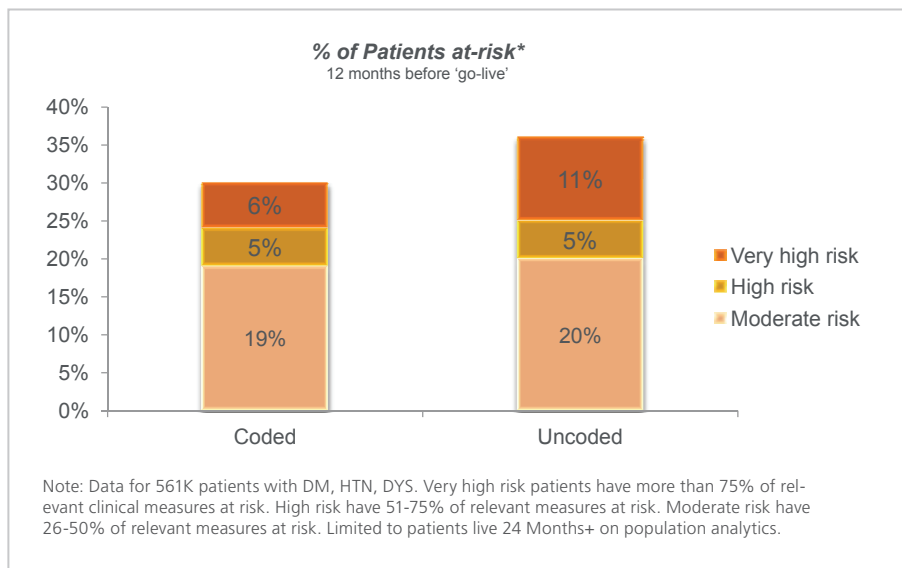


Figure 4: Uncoded patients tend to be more at-risk

Uncoded use less ambulatory care, more acute care

Despite relatively high levels of risk, uncoded patients access much less ambulatory care than coded patients. Their rate of primary care utilization is 42% lower. Total outpatient visits are 31% lower. For those visits that do occur they are billed at lower rates, as the rate of level 4 and 5 visits is 43% lower.

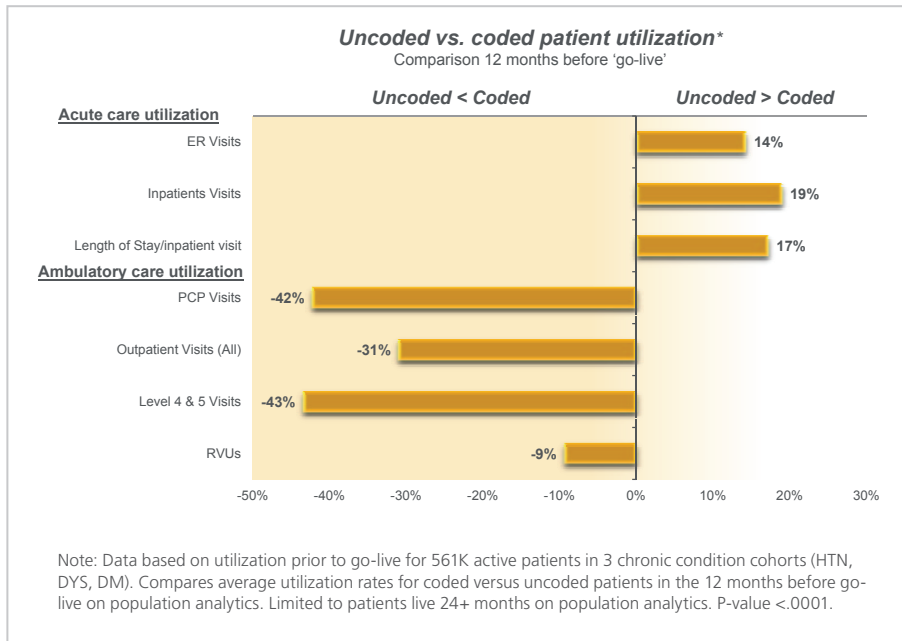


Figure 5: Uncoded use less ambulatory care, more acute care

While they utilize less ambulatory care, uncoded patients use more acute care than coded patients. Their rate of ER and inpatient utilization is 14% and 19% higher respectively. Similarly, their length of stay per inpatient visit is 17% higher. This pattern makes sense given more uncoded patients are at-risk. Hence, a significant opportunity exists for practices to identify uncoded patients and engage them with more proactive, ambulatory care in order to reduce the amount of reactive, acute care.

Strong clinical improvement after coding

While it is clear that uncoded patients are relatively high-risk, and they access less ambulatory care, the question is then what happens after they get coded? Can coding enable a positive clinical impact? We next analyzed performance on condition-specific clinical measures before and after coding, for patients that became coded versus those who remained uncoded. The results were striking.

Newly coded patients have high rates of clinical improvement

After only 12 months post “go live” with population analytics, newly coded patients showed significantly higher rates of clinical improvement. Forty-seven percent of newly coded diabetes patients improved on at least one clinical measure versus only 24% of those that remained uncoded (p-value <.0001). This difference was also statistically significant for hypertension and dyslipidemia patients. The impact may even be underestimated, as newly coded patients were not necessarily coded for the full 12 months. They were considered “newly coded” if they were coded at any time within 12 months of their group’s “go-live” access to population analytics.

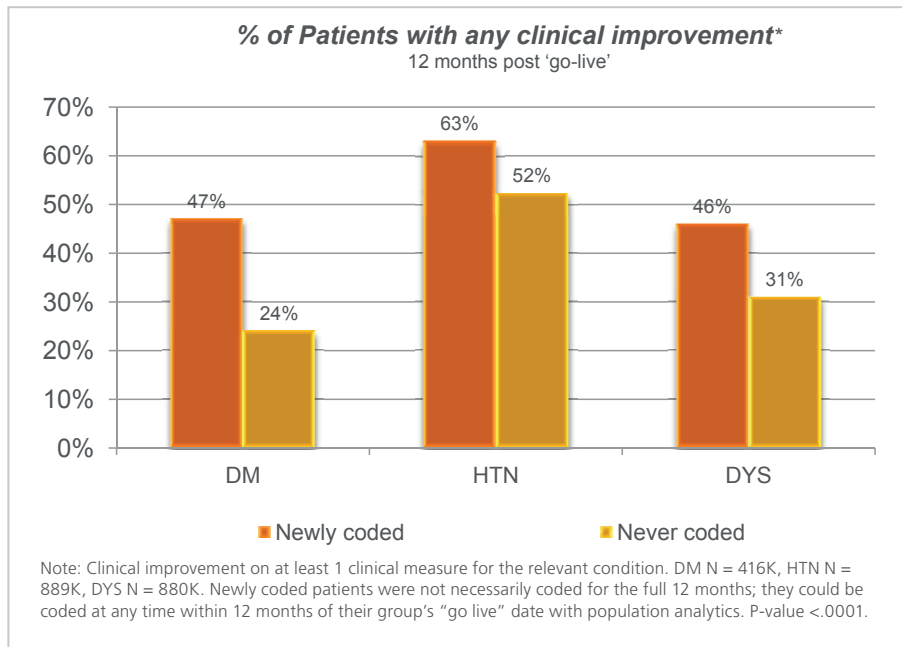


Figure 6: Coding enables high rates of clinical improvement

Newly coded patients have high levels of clinical improvement

In addition to higher rates of clinical improvement, newly coded patients also exhibit higher levels of clinical improvement. Across conditions, newly coded patients showed more improvement on relevant clinical measures than patients that remained uncoded (p-value <.0001). In diabetes, for example, of the 47% of newly coded patients with improvement in A1c, 28% saw a decrease of more than 1 point. In contrast, of the 18% of uncoded patients with A1c improvement, only 23% saw a decrease of over 1 point. This was also true for improvement in blood pressure, for both diabetes and hypertension patients. It also held for improvement in LDL for dyslipidemia patients. In this case, of patients with improvement in LDL, 23% of newly coded patients decreased by over 40 points, whereas only 11% of those who remained uncoded (but still improved on LDL) saw similar improvement.

Highest improvement seen in highest risk group

Hence, coding enables high rates and levels of clinical improvement in a short time period. Proper coding and diagnosis tends to drive patients toward proper care. In addition, there is a link between degree of improvement and how well controlled patients were to begin with. After coding, those who improved the most were those who had the most room for improvement. Sixty-two percent of patients in the group that improved the most ("high clinical improvement") were at-risk at baseline. This classification requires improvement on 2 or more relevant clinical measures within 24 months. In contrast, only 42% of those with moderate clinical improvement were at-risk, and only 34% of those who worsened were at-risk. This means better coding helps identify high-risk patients and enable significant clinical impact quickly.

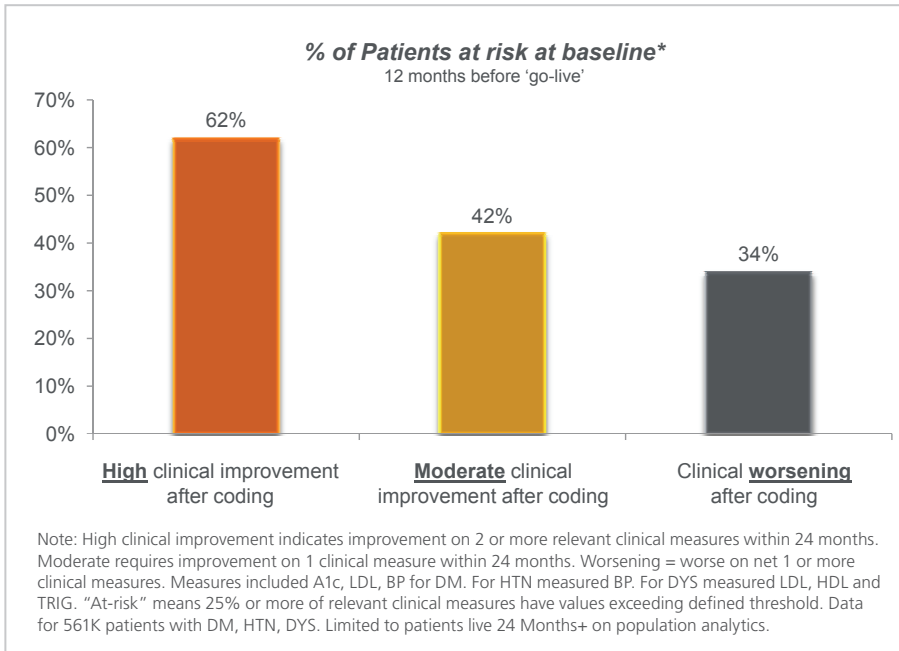


Figure 7: After coding, highest improvement in highest risk groups

Utilization is 'right-sized' to achieve the clinical improvement

If coding enables more clinical improvement, what specifically drove this improvement? Based on the analysis, utilization in both inpatient and outpatient settings spiked in the first 12 months. This occurs as patients become more integrated into the health system or practice, and their care is 'right-sized' relative to their need. In contrast, utilization decreased significantly for uncoded patients. Their use of the health system was low to start with, and it decreased further.

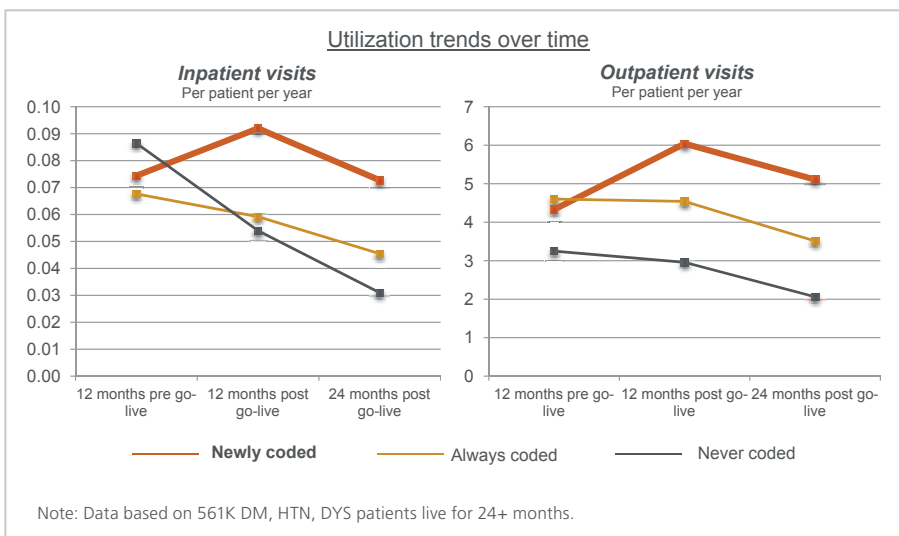


Figure 8: Utilization spikes and then begins to taper for newly coded patients

In the second year, utilization begins to taper for newly coded patients. However, it remains high relative to patients that had always been coded. This makes sense given newly coded patients tend to be relatively high-risk patients. Similarly, they also have a relatively high rate of comorbidities. Sixty-five percent of newly coded patients had comorbidities at baseline compared to 59% of those who were already coded. Sicker patients with higher levels of risk demand higher levels of care. Coding helps providers find those patients and deliver appropriate care.

Improvement linked to successful ‘right-sizing’ of care

Amongst the newly coded, those who improved the most were those whose utilization increased the most. Newly coded patients who improved on 2 or more relevant clinical measures increased their rate of outpatient use by 0.9 visits per year on average. In contrast, those who experienced the most clinical decline increased outpatient use by only 0.2 visits.

Hence, those who saw the highest levels of improvement were those who both had the most room for improvement, and whose utilization rose to meet their higher level of medical need. This has strong implications for accountable care. If practices can identify high-risk patients, shift their care to ambulatory settings, and ‘right size’ their care successfully, clinical outcomes will improve.

Population analytics enables practices to easily find uncoded patients

Population analytics enables practices to easily find uncoded patients by quickly displaying chronic condition populations based on clinical and coded evidence. This can be done at the physician and practice level, enabling practices to see trends and find at-risk patients with minimal effort.

Swift and significant reduction in uncoded patients

Earlier analysis indicated that 37% of patients with a major chronic condition were uncoded at baseline. This rate decreased to 23% after 24 months for practices live with population analytics. For a practice with 500K patients, this means moving from 83K to 50K uncoded patients, a decrease of nearly 40%

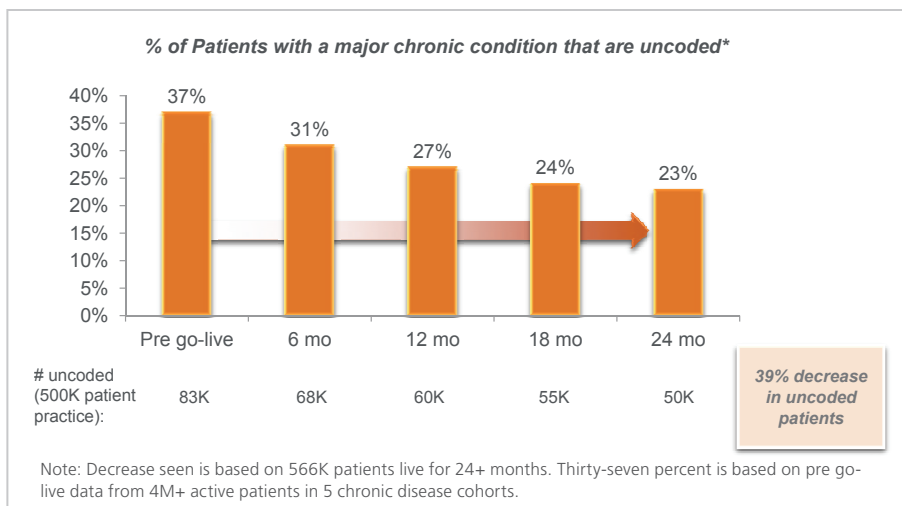


Figure 9: High rates of coding improvement can be made quickly

Practices were able to significantly improve coding in all of the major chronic conditions. For diabetes, the rate of uncoded patients was nearly cut in half, decreasing from 17% to 9% over 2 years. Significant reductions were also seen for hypertension and dyslipidemia, whose uncoded rates went from 27% to 19% and 32% to 18% respectively.

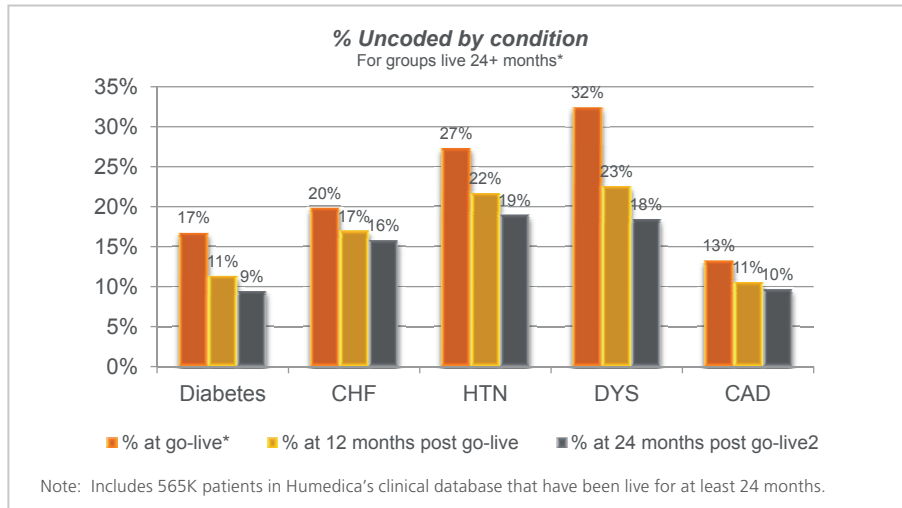


Figure 10: Significant decreases in uncoded patients across conditions

Of course, variation exists amongst practices in their operational focus and capabilities. Of the practices live with population analytics for 24 months, all practices decreased their rate of uncoded patients. The largest improvement seen was a 23-percentage point decrease, from 52% to 28% uncoded. The lowest was 8-percentage points, for a group that started with an uncoded rate of 35%. On average, practices decreased their rate of uncoded patients by 14-percentage points over 24 months.

How better coding supports accountable care

All of this highlights the importance of population analytics. A robust analytics platform that brings together clinical and claims data makes it easy for practices to find uncoded patients. Coding improvement helps providers prepare for accountable care. Better coding identifies patients that are often high-risk and helps ensure they receive the higher levels of care they need. This will eventually rebalance care in favor of ambulatory over acute settings, leading to better outcomes and lower costs in the long run.

Reference:
Humedica MinedShare database of nearly 40 million treated patients.



Jeremy Orr MD, MPH
Chief Medical Officer, Optum Analytics

Jeremy is the Chief Medical Officer of Optum Analytics, and is responsible for driving clinical input into Humedica's analytics. Leveraging his clinical expertise, Jeremy is leading the effort to build benefits for healthcare providers to deliver patient care, supporting product strategy, and leading a team of subject matter experts. Jeremy originally joined Humedica in 2012 as the Physician Director of Provider Solutions. Prior to Humedica,

Jeremy was the founder and provider of Frontier Family Medicine, a medical practice, in Colorado. He also was an Assistant Professor and Clinical Faculty at the University of Colorado School of Medicine, where he taught inpatient and outpatient practice and was selected by Residents as Teacher of the Year in 2011. Jeremy has more than 20 years of population health experience, including outcomes research, large data-set investigation, chronic disease management, and provider operations. He has lead implementations of a variety of EMRs, served as physician lead for meaningful use, and was twice named a "Top 100 Physician" by Kaiser Permanente. Jeremy received his MD from the University at Buffalo and his MPH in Epidemiology and Biostatistics from Tulane University.



Allen Kamer
Chief Commercial Officer, Optum Analytics

Allen is one of Humedica's co-founders and presently serves as General Manager & Vice President Provider Markets. Previously he was Humedica's Vice President Corporate Development & Marketing, responsible for the company's partnerships, marketing, and new business opportunities. Prior to Humedica, he was a Director at Leerink Swann, a leading health care investment bank, where he helped develop the business plan and

raise capital to launch Humedica. With nearly 20 years of health care experience, Allen held management positions at Biogen and Biogen Idec, including Director of Decision Support. In that role, he managed a team responsible for the company's forecasting, market research, managed care analyses, sales force design and compensation plans for the Neurology and Dermatology business units. Prior to joining Biogen, Allen co-founded MORPACE Pharma Group, a forecasting and consulting firm for the pharmaceutical industry. There he led the company's integration of secondary data sources, demand forecasting, and the development of a global physician panel. Allen began his career as a reporter for The Pink Sheet, covering pharmaceutical industry issues at the FDA and Capitol Hill, and also previously worked at Decision Resources managing multiple publications. He received his bachelor's degree from Brandeis University.

About Optum

Optum is an information and technology-enabled health services company serving the broad health care marketplace, including care providers, health plans, life sciences companies and consumers and employs more than 30,000 people worldwide. For more information about Optum and its products and services, please visit www.optum.com.

About Humedica

Humedica, an Optum company, is the foremost clinical intelligence company that provides private cloud-based business solutions to the health care industry. Humedica's sophisticated analytics platform transforms disparate clinical data into actionable, real-world insights. Powered by the largest and most comprehensive clinical database, Humedica solutions move beyond claims data to offer a more complete, longitudinal view of the patient population. Through its award-winning solutions, Humedica, which is headquartered in Boston, empowers its partners and customers to make confident, value-based decisions about patient care in a rapidly changing healthcare market.



1380 Soldiers Field Road
Boston, MA 02135
617-475-3800
www.humedica.com
info@humedica.com