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Identifying Medical Spend for Older Adults with Injurious Fall Related Claims- Lessons Learned

Introduction

Falls are the number one cause of accidental injury and death among Medicare eligible older adults.¹ One in three older adults fall each year with an average frequency of twice per year.² Despite the well-known issue of fall frequency there have been significant challenges in the identification of fall related claims in Medicare data. There are three key factors influencing this difficulty: medical coding optimization completed post point of care (in which higher paying codes replace fall-related codes to improve reimbursement), increased comorbidity, and chronic disease prevalence.³ Wakely partnered with Nymbl Science to design and deploy a new gold standard methodology to overcome limitations in claims assessment for injurious falls that require medical care. The goal is to achieve parity with the current most accurate methodology (97% accuracy)⁴ of Natural Language Processing (NLP) which is not universally used by Medicare providers or Medicare Advantage plans. This alternative methodology empowers any organization to reliably understand their fall related claims (FRC) cost of care.

The Process

Nymbl conducted a comprehensive literature review to identify 10 viable methodologies for identifying fall-related medical claims. Wakely's team of experts was then able to develop a model that identified accidents and injuries with a 13% claim frequency (consistent with prior models) using the Medicare fee-for-service Limited Data Set. Wakely then introduced algorithmic coding optimization to identify severe fall related injuries that did not use a fall related diagnostic code as well as severe non-emergent fall related injuries to the model.³ This enhancement improved FRC identification by over 60%. The final model identified an average prevalence rate of 21% for years 2017, 2018, and 2019 (based on 20-million-member months of claims data per year). The NLP comparative standard found a rate of 19% in the

“The final model identified an average of 21% prevalence”

¹ Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. [Web-based Injury Statistics Query and Reporting System \(WISQARS\)](#)

² Alexander BH, Rivara FP, Wolf ME. The cost and frequency of hospitalization for fall-related injuries in older adults. *Am J Public Health.* 1992;82(7):1020–3.

³ Kim, SB, (2016). Development of an algorithm to identify fall-related injuries and costs in Medicare data. *Inj. Epidemiol.* 3, 1

⁴ Patterson, B. (2020). Comparing Strategies for Identifying Falls in Older Adult Emergency Department Visits Using EHR Data. *Journal of the American Geriatrics Society*, 68(12), 2965–2967

hospital setting alone without any post-acute claims or medical record assessment. The Nymb1 model overcomes the confounding issues in FRC identification to deliver a comprehensive actuarial tool for the full evaluation of both frequency and cost of care that relies solely on claims data.

Key Learnings

#1- FRC Frequency Increases with Age

The falls prevalence rate is 21% across Medicare eligible aged 65 and older. Furthermore, FRC frequency corresponds closely to increased age (see Figure 1).

It is important to note that this prevalence rate represents the frequency with which care is required for injurious falls (approximately one in five falls). The overall frequency of all falls is higher, and is estimated to be more than 30%.⁵

Figure 2 shows the 10 most common chronic conditions for those 65 and over (CMS). Historically falls were thought to be an episodic problem but in Learning #3, we demonstrate that is not the case for FRC. The 21% FRC prevalence rate makes it the 6th most frequent reoccurring medical claim for older adults (significantly ahead of Chronic Kidney Disease, Heart Failure and Depression). As a progressive, high cost and impactable chronic condition, falls can be seen as analogous to Heart Failure: however, falls are much more common.

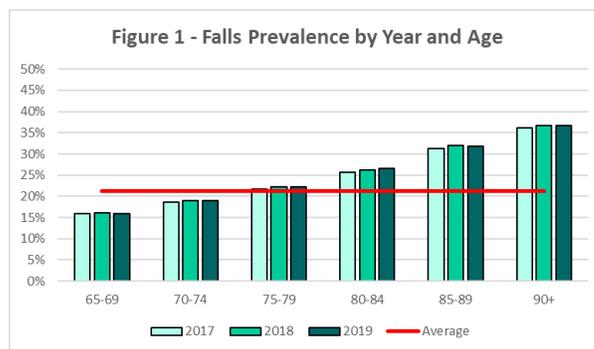
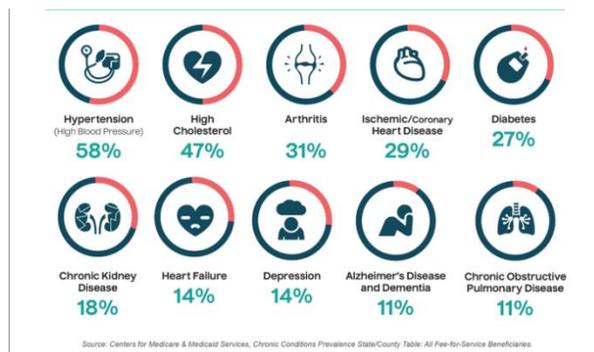


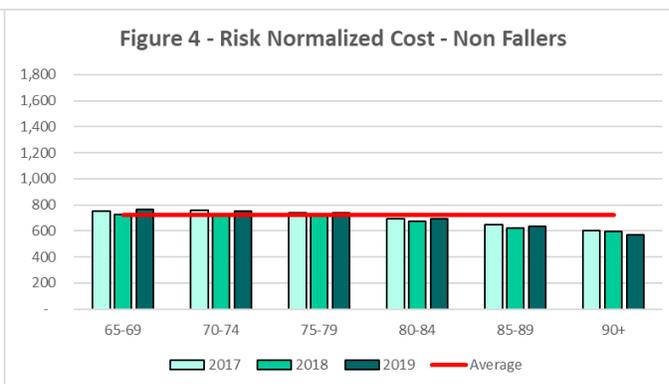
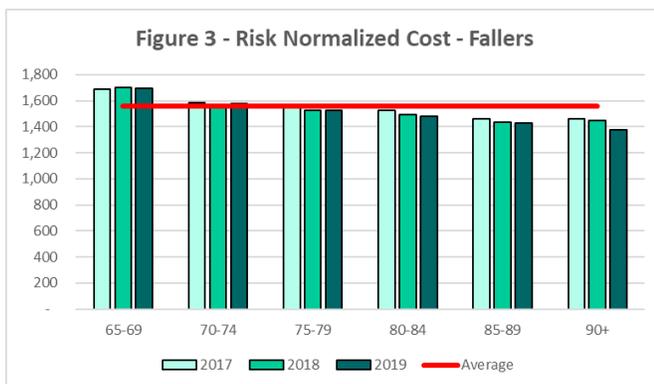
Figure 2 – Chronic Disease Prevalence



#2- The Risk Adjusted PMPM for FRC is Twice the PMPM for non-FRC Medicare Members. The Medicare portion of FRC cost in older adults is approaching that of obesity in older adults⁶ Importantly, the cost of falls is more immediate; the majority of fall related diagnoses are captured at the first instance of seeking medical care; whereas, obesity related costs are delayed for many years or decades.

⁵ Sterling DA, O'Connor JA, Bonadies J. Geriatric falls: injury severity is high and disproportionate to mechanism. Journal of Trauma–Injury, Infection and Critical Care 2001;50(1):116–9

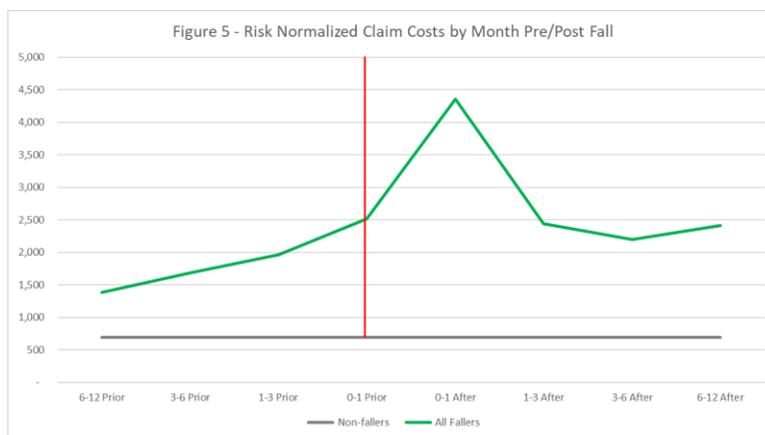
⁶ Wang YC. Severe obesity in adults cost state Medicaid programs nearly \$8 billion in 2013. Health Aff (Millwood) 2015;34:1923-1931



Using the Nymb1 model for identifying FRC, we compared average risk-adjusted claim costs for beneficiaries classified as fallers with non-fallers. Figures 3 and 4 display the PMPM of Medicare members who had a FRC in 2017-2019 compared to beneficiaries without a FRC. Both graphs are risk normalized to account for chronic disease prevalence. The PMPM cost of care for a member with FRC is twice that of those without during the same time period. This finding suggests risk adjustment models may be enhanced by considering risk of falling. Without incorporating falls risk into risk adjustment models, health plans are at risk for the excess cost.

#3- FRC Beneficiaries Experience a Ramp up in Costs Prior to the Fall and Fail to Return to their 12-month Baseline

CMS reports that falls account for 6% of the entire Medicare budget⁷. Researchers estimate that the annual medical costs attributable to falls will increase to \$60 billion in 2023.⁸ A common misconception is that FRC spend is initiated at the date of incident. This assumption is challenged by the clear escalation of cost 3-months prior to the fall (figure 5).



⁷ Florence CS. Medical Costs of Fatal and Nonfatal Falls in Older Adults. J Am Geriatr Soc. 2018 Apr;66(4):693-698.

⁸ Houry D. The CDC Injury Center's response to the growing public health problem of falls among older adults. Am J Lifestyle Med. 2016 Jan-Feb;10(1):74-7

In fact, the increased spend in the 6-month period before the FRC is 42% of the six-month post-fall spend. Figure 5 demonstrates that cost savings from preventing the claim are much higher than previous models that looked only at the onset of the FRC. Waiting for the FRC to occur before intervening misses the opportunity to impact the claim spend ramp up. This makes the strong case to take a population wide approach to prevention efforts rather than targeting based on FRC.

While waiting for a FRC may mitigate costs in the short term, an earlier population wide approach will help prevent future costs. The well-known natural history of falling indicates an average of one to five falls prior to a FRC resulting in an increase in fear of falling (FOF) and fear avoidant behavior. Fifty percent of older adults who have not fallen have a significant FOF and as high as 92% of fallers report FOF.⁹ This is an important construct because FOF results in loss of ability for complete self-care, to age in place as well as reduced mobility, all of which increase in cost of care consistent with the pre-FRC ramp up noted in Figure 5.¹⁰

The model also indicates there is a 12-month increased PMPM. This strengthens the understanding that FRC are not an episodic but should be seen as a chronic condition that, absent intervention, will drive continued future cost of care. The current, standard, more clinically based models of care for fallers have not had any meaningful impact on care for acute or post-acute fall related needs. Research indicates that the situation has worsened since 2000.¹¹ There is also the misconception that a FRC is a one-time event. The frequency of recurrent FRC in the 12-months post an initial claim indicates that 71% experience another FRC in the subsequent 12-months.

“71% experience another FRC in 12-months”

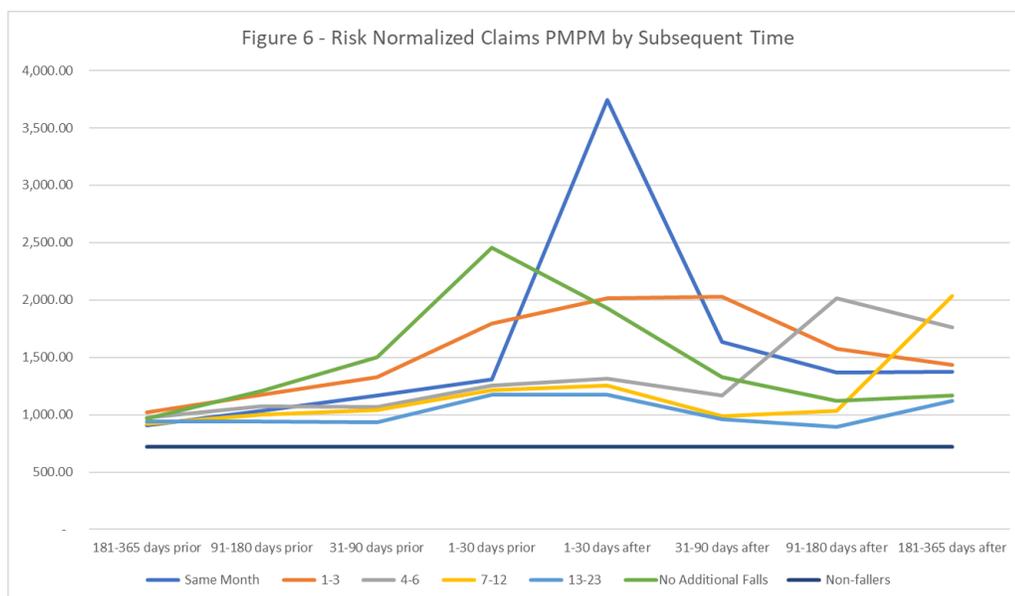
Figure 6 shows the PMPM for older adult cohorts who have a FRC. Looking forward 12-months (by quarter) we see the PMPM when there is another FRC. The greatest risk of readmission for a FRC is within the first 30 days (blue line).¹²

⁹ Schoene, D. (2019). A systematic review on the influence of fear of falling on quality of life in older people: is there a role for falls?. *Clinical interventions in aging*, 14, 701–719

¹⁰ Liu, M. Fear of falling is as important as multiple previous falls in terms of limiting daily activities: a longitudinal study. *BMC Geriatr* 21, 350 (2021)

¹¹ Facts About Falls. Centers for Disease Control and Prevention. Found on the internet at <https://www.cdc.gov/falls/facts.html>

¹² Hoffman, G. J. (2019). Posthospital Fall Injuries and 30-Day Readmissions in Adults 65 Years and Older. *JAMA network open*, 2(5), e194276.



A powerful finding is that 23% of all older adults with a FRC have a repeat FRC between 30 and 365 days of the initial claim. Importantly, for all cohorts, the subsequent FRC are more costly than the initial claim.

Conclusion

The unique Wakely model, using only Medicare claims data, demonstrates that FRC are reliably discovered at a rate consistent with other gold standard methodologies. Critical learnings from this analysis are that fall related spend begins well before the injurious FRC and does not return to baseline for at least 12-months. Because 71% of older adults with a FRC have a subsequent FRC within 12 months, the pattern of FRCs is more consistent with a chronic medical condition versus an episodic event and should be addressed as such. The 21% average prevalence rate places older adult falls as the 6th most common chronic condition. While that rate increases with age, it is just as costly for all age groups on a risk-adjusted basis. The immediacy of the costs associated with FRC (versus many other chronic conditions) means savings can be realized within the first year of prevention efforts. The significant pre-incident FRC spend highlights the desirability of offering fall risk reduction tools and interventions prior to the onset of an injurious claim and validates the need for a preventative, population wide deployment strategy addressing prevention to reduce overall risk.

Wakely STORY

Five decades. Wakely began in 1969 and eventually evolved into several successful divisions. In 1999, the actuarial arm became the current-day Wakely Consulting Group, LLC, which specializes in providing actuarial expertise in the healthcare industry. Today, there are few healthcare topics our actuaries cannot tackle.

Wakely is now a subsidiary of Health Management Associates. HMA is an independent, national research and consulting firm specializing in publicly funded healthcare and human services policy, programs, financing, and evaluation. We serve government, public and private providers, health systems, health plans, community-based organizations, institutional investors, foundations, and associations. Every client matters. Every client gets our best. With more than 20 offices and over 400 multidisciplinary consultants coast to coast, our expertise, our services, and our team are always within client reach.

Broad healthcare knowledge. Wakely is experienced in all facets of the healthcare industry, from carriers to providers to governmental agencies. Our employees excel at providing solutions to parties across the spectrum.

Your advocate. Our actuarial experts and policy analysts continually monitor and analyze potential changes to inform our clients' strategies – and propel their success.

Our Vision: To partner with clients to drive business growth, accelerate success, and propel the health care industry forward.

Our Mission: We empower our unique team to serve as trusted advisors with a foundation of robust data, advanced analytics, and a comprehensive understanding of the health care industry.

Learn more about Wakely Consulting Group at www.wakely.com

Nymbi STORY

Nymbi's Origin: Nymbi was founded on the idea that balance training is the key to preventing falls for a large portion of our population. Our founder, Dr. JP Farcy, built a team of leaders in the field and has proven a correlation between a person's balance and how a digital experience can reach a previously unreachable audience to reduce falls.

The combination of physical exercise and concurrent cognitive challenges (dual-tasking) is key in improving balance for this important population segment. Using this combination of modern technology and scientific foundation in dual-tasking, Nymbi empowers older adults to live thriving, independent lives.

Nymbly Team of Experts. Nymbly has strategically pulled together a team of experts across the industry to ensure technological innovation meets top older adult care standards. We are a team of strong individual contributors, with success coming from uniting across departments and organizations to enable innovation.

Leading Outcomes and Engagement: Through innovative technology, Nymbly leads digital health solutions engagement, with 1 and 3 eligible users engaging with our tools. Of those older adults who use Nymbly, 75% of users report they are more confident with their balance.

Our Vision: When older adults think about their health, we want them to think of Nymbly.

Our Mission: Empowering older adults to lead thriving, independent lives

Learn more about Nymbly Science at nymblyscience.com