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CASE STUDY

Impact of Social Determinants of Health on Medicare Refill Requests

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The conversation in healthcare has increasingly, and correctly, focused on Social Determinants of Health. Payers, providers, wellness organizations, regulators, and pharmacies have agreed that factors like housing, transportation, food security, or economic opportunity have a major impact on health outcomes.

Leading organizations are now working to quantify that impact and adjust programs, benefits and interventions to account for it. Research suggests SDOH factors adversely impact key priorities for virtually every type of healthcare organization, including medication adherence—a major component of Medicare plans' CMS Star Ratings and a core way that they help members manage chronic conditions. Results reported in the American Journal of Public Health, for example, reveal almost 20% of adults having some SDOH-related medication underuse[1]. And among this non-adherent group, almost 80% reported persistent (not just periodic) underuse. Kaiser Permanente is focused on serving the health needs of all its member population. In response to social challenges like those described above, they wished to understand the impact of SDOH on its Medicare members, and on their adoption/ use of a conversational AI solution to complete medication refills relating to Star measures D10, D11 and D12.

In a previous clinical pilot study published in 2018, mPulse Mobile and Kaiser Permanente Southern California demonstrated that a conversational refill solution using text messaging could increase refill rates from 30% to 44% in a partially adherent and non-adherent Medicare advantage population. The methodology and results of this research by Kaiser Permanente and mPulse Mobile are published in full in JMIR mHealth and uHealth[2].

PILOT STUDY RESULTS

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INCREASE IN REORDER RATES

96%

MEMBERS WHO SAID PLATFORM WAS EASY TO USE

2x

PHARMACY STAFF DOUBLED REFILLS PER MONTH

85%

REFILLS PROCESSED WITHIN 24 HOURS OF INITIAL REMINDER

Using the same pilot solution, mPulse and Kaiser Permanente executed a scaled-up, 2-year program with Medicare Advantage members. This would assess the capacity of conversational AI to deliver improved refill rates, enhanced member experience, and resource efficiencies at scale (>7x pilot). The study would also include an evaluation of SDOH barriers and their impact on medication adherence and refill rates. In order to perform the implementation, two proprietary technologies were utilized:

- An mPulse SDOH index (see box) was used to evaluate the impact of SDOH factors on each member. Every member was assigned an SDOH score from 0-100. The higher the score, the greater their SDOH barriers, and the lower their predicted medication adherence and refill rates.
- mPulse's Conversational AI solution, which enables the delivery of automated conversations between Kaiser Permanent's pharmacy division and the member. The solution uses Natural Language Understanding to interpret member responses and the intelligent system is able to determine the most appropriate next message to send to drive the desired medication adherence outcomes.

mPulse Mobile's SDOH Index

mPulse's SDOH Index powers Conversational AI solutions to provide a more tailored, relevant and empathetic experience for diverse populations.

How it works:
The index leverages both industry data sets (10 in total) and conversational insights to generate a dynamic score for each member from 0-100 that represents the estimated impact of SDOH factors on their likelihood to complete the program's desired action—refilling a prescription, in this case. A mix of public and private data—covering key SDOH factors like food insecurity, economic stability, and transportation access—is weighed using proprietary formulas. As members engage with the program and identify barriers to medication adherence or self-report SDOH impact, their responses help validate the Index's predictions and provide deeper insights.

How it helps:
mPulse works with clients to leverage SDOH Index data to predict outcomes from programs that engage large diverse population and to optimize the solution to help overcome disparities. Prior to program launch, SDOH analysis helps guide content development to account for likely barriers and member concerns, as well as assisting in estimating likely impact of the program across population segments. As members engage with the program and provide conversational insights about SDOH factors, mPulse and plan teams can use actionable data from the SDOH Index to optimize message flow and content to account for differences between SDOH Index groups.

Goals

The goals of the research were threefold. First, to evaluate if the strong pilot results could be replicated at scale. Second, to assess the significance of SDOH and how this affected medication adherence. And third, to determine how Medicare population members interacted with the scaled-up texting solution.

Execution

The implementation involved 99,217 Medicare Part D members. They used any of four drug classes: oral diabetes, blood pressure, statins, and direct oral anticoagulants. All members were identified as non-adherent or borderline non-adherent with their medication at the start of mPulse outreach.

Members received text message reminders in English or Spanish, and used simple numeric or complex text responses to validate identity, view medication, and complete refill requests. Requests were processed by Kaiser Permanente pharmacists and support staff via mPulse's Engagement Console. mPulse cross-referenced refill completion data with member data that included first name, date of birth, gender, spoken language, address, race/ethnicity, mobile phone number, opt-in status, and drug classification(s). Additionally, as noted earlier, members' SDOH factors were converted by mPulse into a numerical index and also analyzed with refill outcomes data.

Results

Kaiser Permanente was able to replicate the favorable pilot results using the mPulse solution, validating the promise of the Medication Adherence solution at scale while gaining key insights on SDOH factors' and Conversational AI's impact on refill rates.

Evaluation of SDOH factors revealed that refill rates decreased with higher SDOH barriers, reported on a 0-100 scale (Fig. 1). SDOH factors were also found to drive disparities in member response to initial text reminders (Fig. 2). Responsiveness to refill reminders, and ultimately refill rates, varied by ethnicity (Fig. 3), race, spoken language, and age. This insight helped mPulse and Kaiser Permanente implement more effective text-based solutions that were tailored to different population segments and individuals.

Additionally, the SMS platform and its predictive modeling capability demonstrated a capacity to understand responses. Member text responses, including nuanced and colloquial language, were correctly understood 92% of the time, without clarification. This highlighted a capacity upside—to replace expensive human interaction with cost-efficient, Conversational AI texting that allows staff to focus on higher-value, complex interactions.

The study also validated the capacity of Conversational AI to offer member-friendly, text-based interactions at scale. Members received answers to most questions rapidly, during a single texting session, and reported a 96% satisfaction with the experience.

FIG. 1 - REFILL RATES VERSUS SDOH SCORES
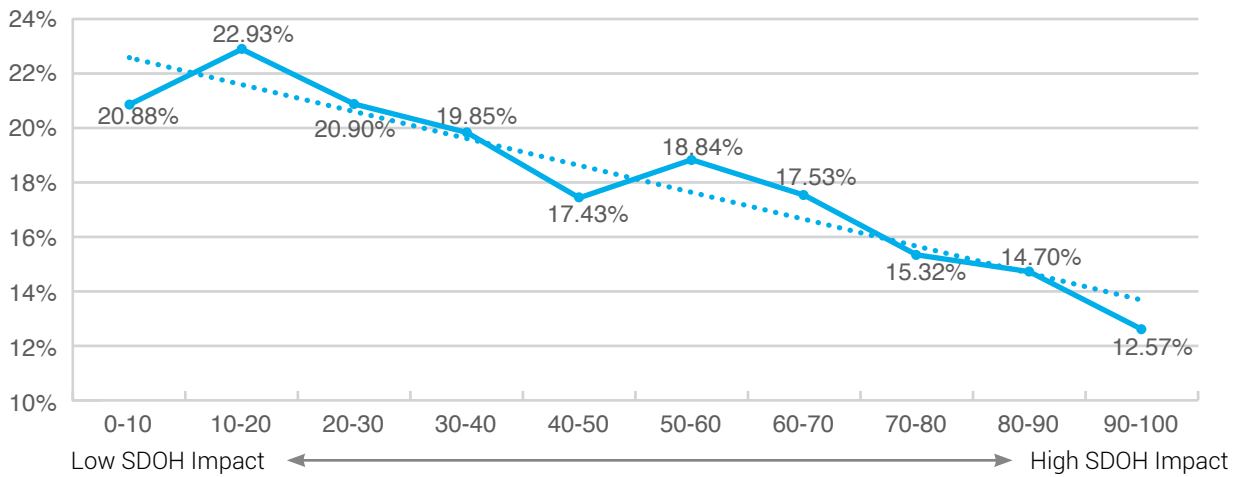

Low SDOH Impact ← → High SDOH Impact

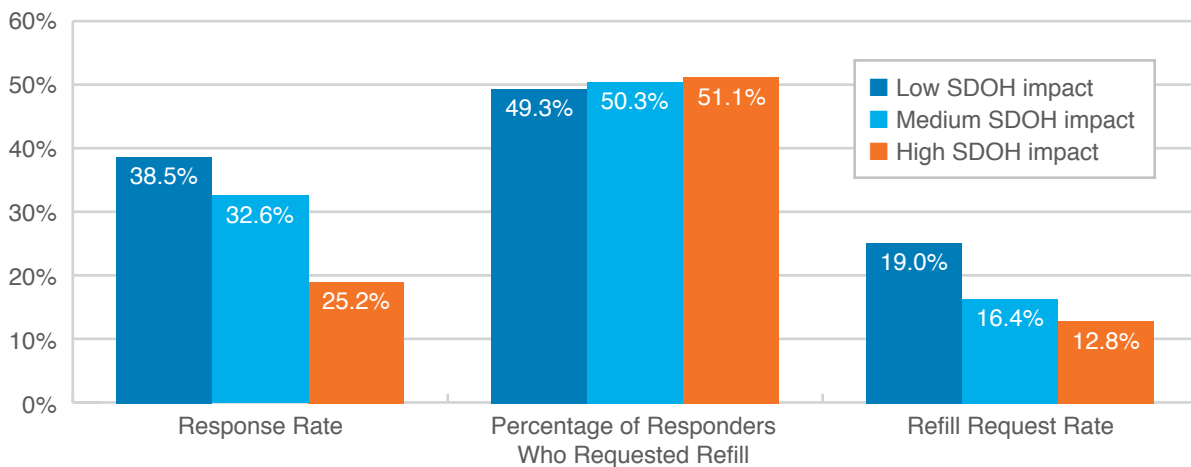## FIG. 2 - SDOH IMPACT ON RESPONSE RATES AND PERCENTAGE OF RESPONDERS WHO REQUEST REFILL
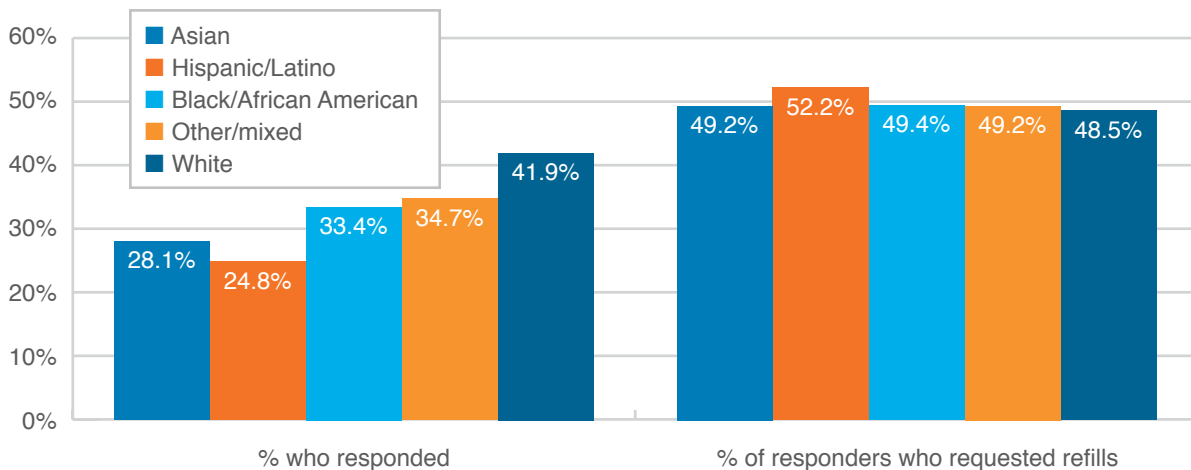

FIG. 3 - IMPACT OF RACE/ETHNICITY ON RESPONSE RATES AND PERCENTAGE OF RESPONDERS WHO REQUEST REFILL

Conclusion

Kaiser Permanente was able to demonstrate the impact of SDOH factors on their Medicare member population, and show the value of understanding/utilizing this intelligence in developing conversational texting solutions. This insight into diverse member segments and their needs, notoriously difficult to gain at scale, will permit mPulse and Kaiser Permanente to engage each member more effectively, and provide more tailored solutions.

The 2-year program also confirmed that Conversational AI texting, used at scale, can support both improved medication adherence and an excellent member experience that can favorably impact quality measures and Star Ratings. Specifically, the mPulse solution can move a large, diverse member population through an effective and satisfying text-based dialogue, to complete refill requests efficiently.

The ability of the texting solution to achieve high levels (92%) of Conversational AI accuracy highlights the ability of the platform to take the place of pharmacy staff, improving scare human-resource capacity and delivering cost and efficiency benefits.

Moving forward, by ongoing analysis of SDOH factors and members' unique behaviors, mPulse and Kaiser Permanente will continue to refine text interaction, allowing for continuous, incremental improvement in SMS dialogue, refill rates, and cost efficiencies.

This data was also published in JMIR mHealth and uHealth:
Brar Prayaga R, Agrawal R, Nguyen B, Jeong EW, Noble HK, Paster A, Prayaga
Impact of Social Determinants of Health and Demographics on Refill Requests by Medicare Patients Using a Conversational AI Text Messaging Solution: Cross-Sectional Study.

JMIR Mhealth Uhealth 2018;6(1):e30
https://mhealth.jmir.org/2019/11/e15771

This case study is the second in a series. The first case is: Improving Chronic Condition Rx Refill Rates For Medicare Population. [give website address]
https://mhealth.jmir.org/2018/1/e30/

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References
1. Piette JD et al. "Cost-related medication underuse among chronically ill adults: the treatments people forgo, how often, and who is at risk" Am J Public Health. 2004 https://www.ncbi.nlm.nih.gov/pubmed/15451750/
2. Brar Prayaga et al. "Improving Refill Adherence in Medicare Patients With Tailored and Interactive Mobile Text Messaging: Pilot Study" JMIR https://mhealth.jmir.org/2018/1/e30/

About mPulse Mobile

mPulse Mobile, the leader in Conversational AI solutions for the healthcare industry, drives improved health outcomes and business efficiencies by engaging individuals with tailored and meaningful dialogue. mPulse Mobile combines behavioral science, analytics and industry expertise that helps healthcare organizations activate their consumers to adopt healthy behaviors.

With over a decade of experience,100+ healthcare customers and more than 300 million conversations annually, mPulse Mobile has the data, the expertise and the solutions to drive healthy behavior change.

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