# Pelago

CASE STUDY

ROI-Validated Substance Use Management

How organizations can achieve major cost savings, confidence, and a greater than 3:1 combined return on investment with ROI-Validated Substance Use Management

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OVERVIEW

In today's economic and financial climate, strategically managing benefit costs is a top priority for organizations. That includes lowering medical claims related to substance use disorders (SUDs) by identifying and quantifying the hidden costs of SUDs.
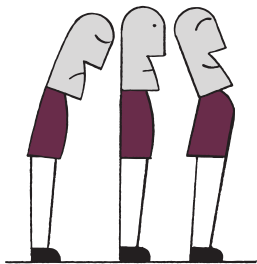
THE HIDDEN COSTS OF SUBSTANCE USE DISORDERS

Often hidden in heart and liver disease, osteoporosis, MSK, diabetes, cancer, chronic kidney disease, and mental health conditions, untreated SUDs lead to annually compounding healthcare costs, absenteeism, lower productivity, and increased turnover.

CHALLENGE

With SUDs hidden in other health conditions, demonstrating SUD cost savings and ROI can be difficult to validate in real-world settings. To assess the value and financial savings potential of an effective substance use management program, Pelago recently reviewed past-year client medical claims data of its tobacco and alcohol substance use programs using validated ROI methodology.
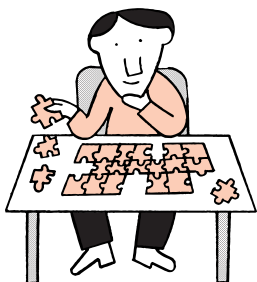
SOLUTION

Using an ROI analysis methodology developed and validated in collaboration with Milliman, Inc. — an independent risk management, benefits, and technology firm — Pelago assessed the impact of its substance use management programs on client healthcare expenses.

The analysis showed the alcohol use management program delivered an ROI of nearly 2:1, and members that participated in the nicotine cessation program generated an ROI of 10:1 with improved employee health outcomes. Overall, our member claims analysis showed a combined ROI* of more than 3.2 to 1.

Combined ROI = annual insurance cost savings per member using alcohol & tobacco apps/cost of yearly alcohol + tobacco apps paid per member

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Executive Summary

Pelago's substance use management program is a digital intervention designed by addiction scientists, psychologists, and physicians that helps members manage problematic substance use ranging in severity from a mild substance use disorder to severe addiction. To demonstrate value to current and future clients, Pelago conducted a cost-effectiveness study evaluating the impact of the Pelago substance use management program on medical care costs and utilization. The study leveraged claims data from the eligible population of commercially insured members from a healthcare industry client who could access Pelago from December 1, 2021, to February 28, 2023. This cost study's methodology, assumptions, savings feasibility, and credibility were independently reviewed by a global leader in actuarial science.

To estimate savings, the study compared Pelago members' cumulative healthcare costs and utilization at baseline (i.e., in the 12 months prior to enrollment in the program) versus 14 months post-enrollment, relative to those of a control group. Medical claims of Pelago members with tobacco and alcohol use disorders were compared to a matched control group comprising nonparticipants in the Pelago programs

with diagnoses of tobacco and alcohol use disorders in 2022. This study applied a propensity score matching method to identify a control group that was similar to Pelago members on these baseline characteristics: age, gender, geographic region, and comorbidities.

The study of 645 participants demonstrated a per-member-per-year (PMPY) medical claims reduction of $10,221 with respect to overall healthcare costs, or a 3.2x return on investment ($10,221 annual savings divided by a $3,180 Pelago program fee). The majority

$10,221	Per-member-per-year medical claims cost reduction
3.2x	Return on investment (savings/program fee)
46%	Of savings came from lower inpatient healthcare costs

of savings came from lower inpatient healthcare costs (46%). The largest reductions in health service utilization between the two groups were linked with diagnoses of alcohol use disorders, known complications of alcohol related disorders (e.g., pancreatitis) and cardiovascular disease.

In conclusion, the Pelago substance use management program produced statistically significant savings and a 3.2x ROI relative to matched controls with tobacco and alcohol use disorders. The Pelago program helps organizations avoid costs from substance use disorder medical claims, especially from inpatient care. The study results can help guide organizations making decisions about benefits offerings that most effectively manage rising substance use disorder and related conditions costs.

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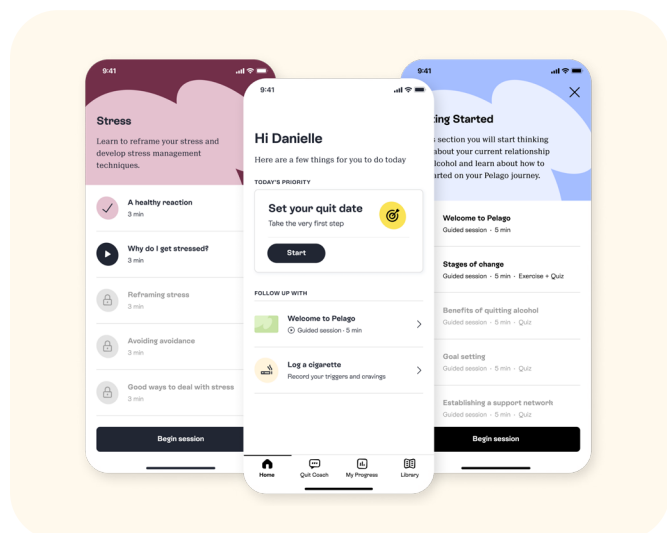
Background

Behavioral therapy and pharmacotherapy are best practices for helping people manage problematic substance use ranging in severity from a mild substance use disorder to severe addiction. Digital health approaches are among the newest methods for expanding timely access to these evidence-based treatments and can significantly reduce substance use and associated functional impairment.

Pelago is a digital program with the goal of helping members change their use of alcohol and drugs. Designed by addiction scientists, the program includes three key components.

1. SELF-GUIDED BEHAVIORAL THERAPY AND PSYCHOEDUCATION

Psychoeducation about signs, symptoms, and causes of problematic substance use and addiction; cognitive behavioral therapy exercises; and motivational content are delivered via an app on the member's own device. Members log their drinking and other substance use behavior into the app on a daily basis and receive personalized feedback about their progress to motivate and guide their continued work with their care providers.

2. EDUCATIONAL RESOURCES

The program app provides educational resources about:

- Addiction neuroscience
- Lifestyle changes
- Relapse triggers
- Mindfulness meditation
- Treatment options
- Coping
- Social support
- Medications
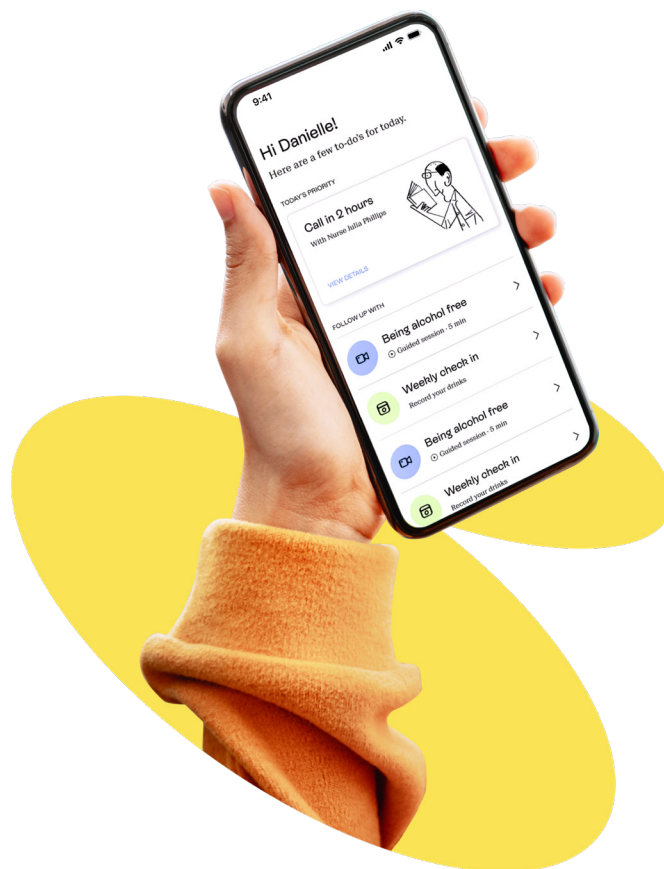
3. SUPPORT FROM A COMPREHENSIVE CLINICAL CARE TEAM

The care team includes licensed drug and alcohol counselors, physicians, nurse practitioners, and health coaches. The care team develops individualized care plans and encourages members to complete in-app behavioral therapy homework exercises weekly and to adhere to the program. Physicians focus on members' physical and psychological recovery, introducing pharmacotherapy as needed.

Prior research evaluating the Pelago programs focused on clinical outcomes. Thirteen studies, including a randomized controlled trial, demonstrated Pelago's efficacy in facilitating smoking cessation, reducing alcohol and opioid use, and producing improvements in mental health, resilience, and overall functioning (Webb et al., 2020; Webb et al., 2022; Glasner et al., 2023). Collectively these studies demonstrated a 52% quit rate for

tobacco cessation, 60% reduction in alcohol use, and 68% reduction in psychiatric symptoms, including depression and anxiety.

Although evidence of the effectiveness of digital behavioral health programs with regard to clinical outcomes is growing, no studies have estimated changes in medical care costs and utilization produced by digital substance use disorder programs. This study's primary objective was to estimate the impact of Pelago's substance use management program on overall healthcare costs. A secondary objective was to identify drivers of overall cost savings by examining costs and utilization of specific service types and diagnostic indicators.

ROI Methodology

1. Method

STUDY DESIGN. To achieve the study objectives, we conducted a longitudinal study comparing Pelago members' 12 months pre- to 14 months-post enrollment changes in medical care costs and utilization to those of a propensity score-matched, nonparticipant, control group.

DATA SOURCES AND VARIABLES. We used HIPAA-compliant, de-identified data files sourced from a number of health plans and representing commercially insured lives from December 1, 2021, through March 30, 2023, across all U.S. states and territories.

We acquired all claims data for Pelago members enrolled in the substance use management program and a sample of commercially insured lives randomly drawn from the broader population in the same date range mentioned above. Data with enrollment dates and dates of service between December 2021 and March 2023 were included in this study.

Objective 1
OVERALL HEALTHCARE COSTS

For the primary study objective concerning overall healthcare costs, we used the paid amount to estimate per-member-per-year (PMPY) costs for healthcare claims in the 12-month baseline and the 14-month post periods. ("Sample selection and matching" below further explains baseline and post periods.)

Objective 2
COST AND UTILIZATION OF SPECIFIC SERVICE TYPES

For our secondary objective concerning drivers of savings, we examined cost and utilization of the following service types: outpatient, emergency department visit, provider evaluation and management (E&M) services in any setting, inpatient physical and behavioral health services, and all other treatments.

First, we categorized similar current procedural terminology or healthcare common procedure codes together. Then for cost, we aggregated paid amounts in the baseline and post periods by service type. For utilization, we determined whether a person received the service type in the baseline and post periods.

2. Demographics & Diagnoses

The data set included the following demographic information: (1) age, (2) gender, and (3) substance use disorder comorbidities. Primary ICD-10 diagnosis codes indicating tobacco- and alcohol-related disorders were identified in the claims data.

SAMPLE SELECTION AND MATCHING

SAMPLE. We grouped Pelago and control group members by specific substance use disorder diagnoses and by the month and year when members

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started Pelago. Then, we applied the remaining inclusion and exclusion criteria shown below:

Inclusion criteria for Pelago group:

- 18 years or older
- Registered for Pelago substance use management services for alcohol and/or tobacco use disorder between December 2021 and March 2022
- Continuously enrolled in a health plan 12 months before and after starting Pelago

Inclusion criteria for control group:

- 18 years or older
- Diagnosis of alcohol and/or tobacco use disorder between December 2021 and March 2022
- Continuously enrolled in a health plan 12 months before and after index event

Exclusion criteria (both groups):

- Missing demographic data
- Total SUD cost is over $300,000 or total medical spend is over $1 million in either the pre- or post-period

3. Matching

To ensure that Pelago and control group participants meeting the above criteria did not differ on baseline characteristics, we conducted the following propensity score–based matching procedures.

1. First, we calculated a propensity score for each individual using a logit model with the following covariates: demographics (age, gender) and comorbidities among substance use disorders at baseline.
2. Next, we matched control group members to Pelago members on propensity score. Matching was conducted separately for each primary substance use disorder (i.e., tobacco, alcohol).

3. The final analytic sample included 645 individuals. After matching, the Pelago group and matched control group did not exhibit any significant differences in baseline demographics or clinical characteristics, medical care utilization, or costs.

4. Analysis

For our primary study objective, we calculated baseline and post-Pelago registration healthcare costs. Baseline and post-registration periods were the 12 months before and 14 months after the month of registration for the Pelago program. A two-sample t-test was conducted to evaluate post-period differences in cost between groups. A two-sided, $p<0.01$ threshold indicated statistical significance. Then, we calculated the change in cost for Pelago members and the control group (change equals post-period cost minus baseline cost). Next, we calculated savings using a difference-in-differences method, or the control group's change minus the Pelago group's change. Finally, we calculated the ROI as the annual savings divided by a $3,180 Pelago program fee. Subsequently, sensitivity analysis was conducted by selecting a random sample of individuals who matched those in the Pelago group only on the presence of a substance use disorder.

We calculated the baseline, post-registration period, change, and difference-in-differences estimates for service-specific costs and utilization for the secondary study objective.

Data analysis was performed in April 2023.
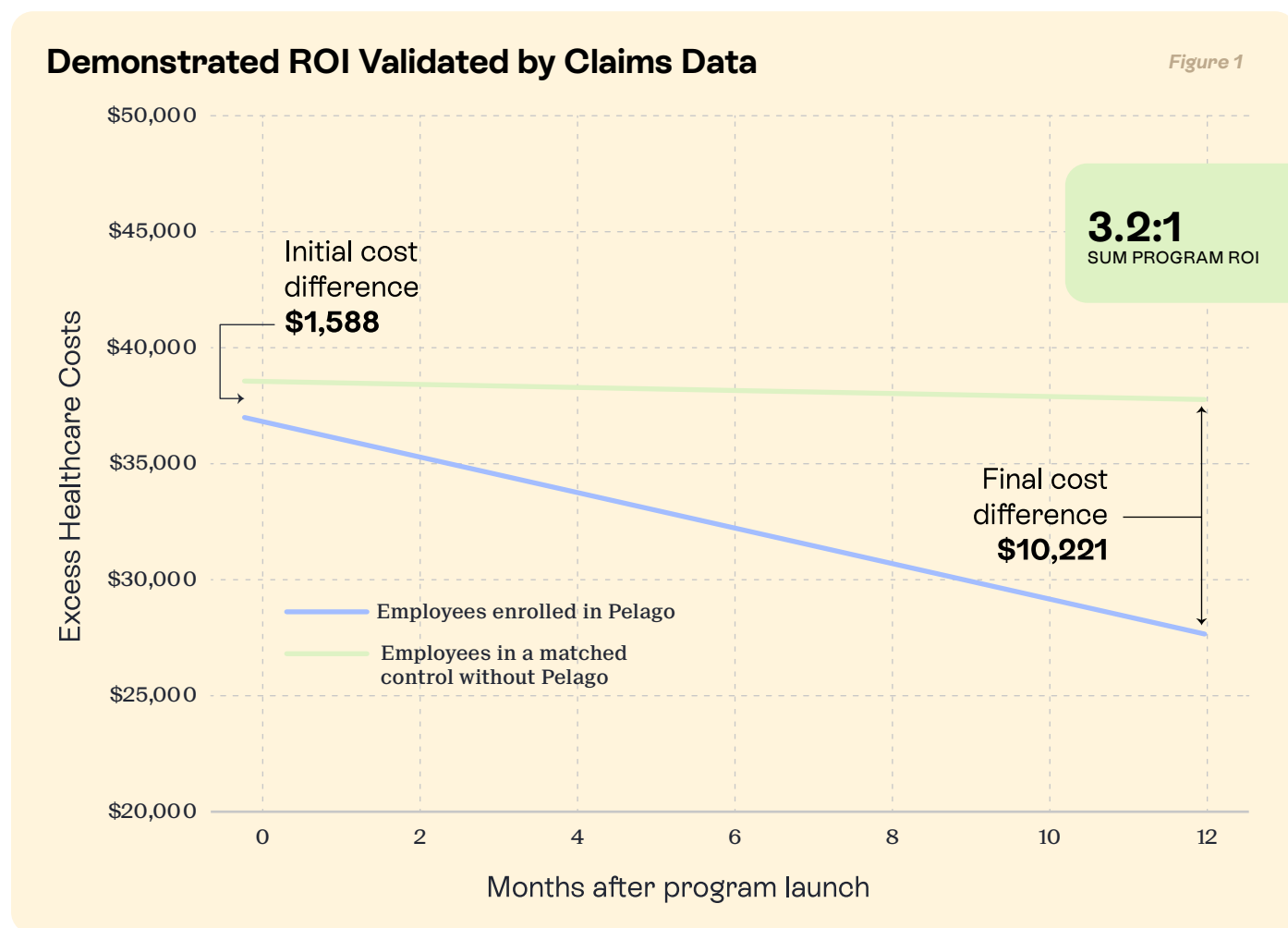
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5. Results

BASELINE CHARACTERISTICS

Over half (65%) of the people in the Pelago and control groups were female, with a mean age of 39.9 (SD=14.7, median age=38.4 years).

OVERALL HEALTHCARE COSTS

Figure 1 shows that the Pelago substance use management program produced a 3.2x ROI with $10,221 of medical claims reduction per Pelago participant per year compared to the control group.

The outcome of the sensitivity analysis was an ROI slightly higher (though not statistically different) from the initial ratio at 3.36:1, with a baseline cost difference between the Pelago and control group participants of $1,562 versus a final cost difference of $10,424 (t=2.99, p=.005; replicated using a non-parametric Wilcoxon signed-rank test, Z= 2.31, p=.017). This provides insight into the stability of the cost-effectiveness ratio. Figure 2 displays the relative proportion of cost savings driven by reductions in physical versus behavioral health costs. The largest driver of cost savings is in the physical health domain.

Demonstrated ROI Validated by Claims Data

Figure 1

3.2:1
SUM PROGRAM ROI

Initial cost difference **$1,588**

Final cost difference **$10,221**

Employees enrolled in Pelago

Employees in a matched control without Pelago

Excess Healthcare Costs

$50,000
$45,000
$40,000
$35,000
$30,000
$25,000
$20,000

0   2   4   6   8   10   12

Months after program launch

49% higher medical claims costs in inpatient care among controls, relative to Pelago

We examined cost and utilization of specific service types to better understand how Pelago achieved lower overall costs.

Figure 3 shows the amount saved for each service type. Of the $10,221 savings (described above), $4,678 (46%) was from inpatient care costs, $4,019 (39%) was from outpatient care costs, and $1,422 (14%) was from emergency services costs.

Discussion

This empirical study found that cost savings for the Pelago group was $10,221, which is 3.2 times more than the $3,180 program cost. The Pelago group had statistically significantly lower overall healthcare costs in the 14-month post period versus the control group. Leveraging a medical claims database, this study of N=645 participants offered real-world evidence of the impact of a digital substance use management program on medical care costs and utilization in an employee population in the healthcare industry. We applied a propensity score–matching method based on baseline covariates to construct a statistically comparable nonparticipant control group. As a result, we were better able to compare the two groups and account for baseline characteristics that could have affected outcomes.

Figure 2

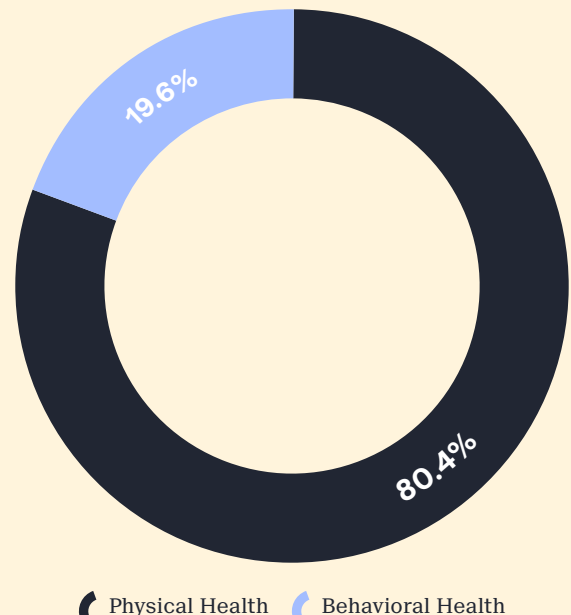**Cost Components: Physical Health & Behavioral Health**
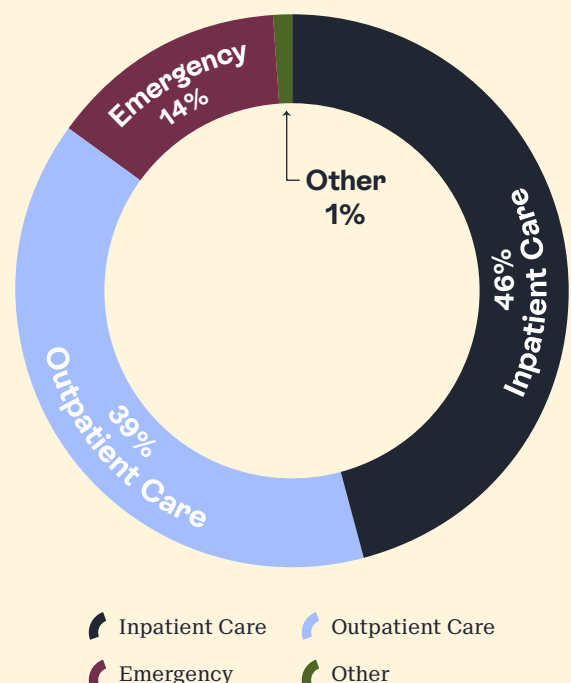
19.6%

80.4%

● Physical Health   ● Behavioral Health

Figure 3

Distribution of Cost Savings

Emergency 14%

Other 1%

46% Inpatient Care

39% Outpatient Care

● Inpatient Care   ● Outpatient Care
● Emergency   ● Other

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Everyone Deserves Access to Effective Substance Use Treatment

ABOUT PELAGO

Pelago is revolutionizing substance use management. To date, Pelago has helped more than 750,000 members manage their substance use and improve their lives. The company is on a mission to break down barriers to substance use care that works, delivering its virtual clinic to employers, health plans, and members.

Pelagos' Substance Use Management Platform. The only complete solution providing clinical support across the care continuum, reducing unnecessary rehab admissions and ensuring post-discharge outpatient follow-up care.

FEATURED CUSTOMERS

Over 750k Lives Improved

100+
Employers utilizing

2.5M+

100%

DOLLAR TREE · hp · MetLife · AEO

CORNING · Citizens Financial Group, Inc. · BEACON HEALTH SYSTEM · TRACTOR SUPPLY CO

Hewlett Packard Enterprise · General Mills · RICE UNIVERSITY · Securitas

PHILIPS · GE APPLIANCES a Haier company · YOKOHAMA · AT&T

Visit **www.pelagohealth.com** to learn how we can support you in addressing substance use in your organization, or email **sales@pelagohealth.com**