

BACKGROUND

High rates of overweight and obesity in U.S. adults increases the risk of serious health problems¹. Obesity management methods include eating healthy, increasing physical activity, and interventions such as bariatric surgery and the emergent incretin-based therapies. Digital health tools, using FDA-cleared, AI-driven automated coaching have shown improvement in health, including decreases in weight, blood pressure and A1C for people with diabetes, as well as cost savings.²

SPECIFIC AIMS/PURPOSE

This research sought to determine if a modeling approach could estimate the economic impacts associated with fractional improvements in BMI based on both delta BMI achieved and starting BMI in users of a digital health tool (Welldoc, Columbia, MD).

METHODS

Model construction

Total healthcare costs for people at different BMI levels were obtained from the study of Thorpe et al.³ The annual cost of medical care was averaged for each of four BMI ranges: 30-32, 33-35, 36-40, and 40-45. Note that costs associated with the two lowest bands were extrapolated linearly. See Figure 1.



Figure 1: Mean annual cost savings per BMI band



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A Novel Approach to Estimating Cost Savings and Return on Investment (ROI) for Weight/BMI Changes with Digital Health

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Patient population

AOM cohort

80% female

Age distribution

N=3604

Starting and ending weights for 4759 individuals who used the digital health tool for 6 months were used to calculate shifts in BMI. Note that deidentified data was collected according to Welldoc's data and privacy policies. Real world data was obtained at baseline, 3 months, and 6 months. Two cohorts were constructed: those individuals taking anti-obesity medications (AOMs) and those who were not.

Figure 2: Population demographics

RESULTS

A shift matrix was developed that showed fractionally, the portion of patients in each starting BMI band that shifted to another band at 3 months and 6 months. There was a significant "shiftdown" in BMI for both AOM and non-AOM cohorts. See Figure 3.

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Figure 3: Weight outcome summary: stacked bar view



- 100% increase in BMI <27 kg/m2
- Majority of shift coming from BMI >36 demonstrating improvement for those most in need
- Increase in the BMI 27-29 band demonstrating shift towards "nonobesity"





- 400% increase in BMI <27 kg/m2
- Majority of shift coming from BMI >33

The shift matrix was combined with the healthcare cost data to arrive at fractional health savings. Note the significant "shift-down" in cost in both AOM and non-AOM cohorts. See Figure 4.



months

CONCLUSIONS

Modeling tools can help health plans and systems to quickly gauge the economic impact and ROI associated with digital health engagement for people with obesity, perhaps as a precursor or as an adjunct to more costly treatment pathways for obesity management (e.g., incretin therapies, bariatric surgery). Future analyses will examine the role of engagement with digital health tools in driving favorable weight outcomes.

REFERENCES

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Figure 4: Economic outcome summary per patient

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months

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