CLOSING THE GAP BETWEEN DIGITAL TECHNOLOGY AND PREVENTION OF DISEASE USING DATA & ANALYTICS

In 2016, the Department of Health and Human Services announced the certification of the Diabetes Prevention Program (DPP). The DPP aims to reach 86 million pre-diabetic Medicare participants in the United States through education, training, and lifestyle coaching. According to the physician payment rule recently announced, Medicare will be reimbursing both digital and in-person versions of the DPP; however, it remained unclear how the parameters for the digital version will be set. Due to the relatively short history of digital DPP, little is known regarding the mechanism of weight loss when the services are rendered through a mobile app. This will be critical for CMS to set payment mechanism by outcomes as it announced. To better understand the mechanism of weight loss by digital DPP solutions, and to help CMS make the most informed decision on the payment rule, we have collaborated with one of the few certified digital DPP.

Our analysis found that a majority of participants who used the mobile solution for more than 12 weeks lost more than 5% of their weight, which is comparable to a traditional, in-person based DPP. More importantly, we observed that the individual weight loss trajectory varied significantly across participants. We used a phase detection method to generalize the patterns. It was modeled as two linear phases with an intervening 'hinge'. In general, most of the participants showed at most one hinge point based on our modeling fitting. In the early phase, most of the engaged population experienced some level of weight loss. However, at some point in time, the weight loss either became slower, plateaued, or bounced back. Interestingly, the steeper the first phase trajectory is the earlier the hinge point comes, which might reflect ‘weight loss burnout.’ Further research will be needed to better describe this phenomenon. It was critical to have a longer first phase for successful weight loss. More importantly, weight loss trajectory and logging behavior tend to show the same abrupt hinging change in the same week which might imply the timing of intervention.

Implications to DPP stakeholders would be that regular monitoring of early weight loss and hinge point patterns would result in customized interventions aimed at maximizing the success rate.

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