

Predicting Success with a Diabetes Digital Health Application from Early Usage Data

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Background and Objectives

- ❖ Digital health applications have the potential to improve glycemia and overall health status in people with diabetes
- ❖ However, some patients only minimally engage with these interventions and thus achieve suboptimal clinical outcomes
- ❖ The purpose of this research was to build a predictive model that, given early usage data from a diabetes digital health application, can predict:
 - which patients will persist in using the application
 - which patients will experience improvement in blood glucose (BG)

BlueStar Digital Therapy

- ❖ Retrospective data on users of BlueStar, an FDA-cleared digital therapy for Type 1 & 2 Diabetes
- ❖ BlueStar is primarily a mobile platform that facilitates self-monitoring of diabetes management and provides automated coaching, clinical decision support
- ❖ Users can log measures relevant to disease-management such as BG readings, food intake, exercise, sleep, and lab results

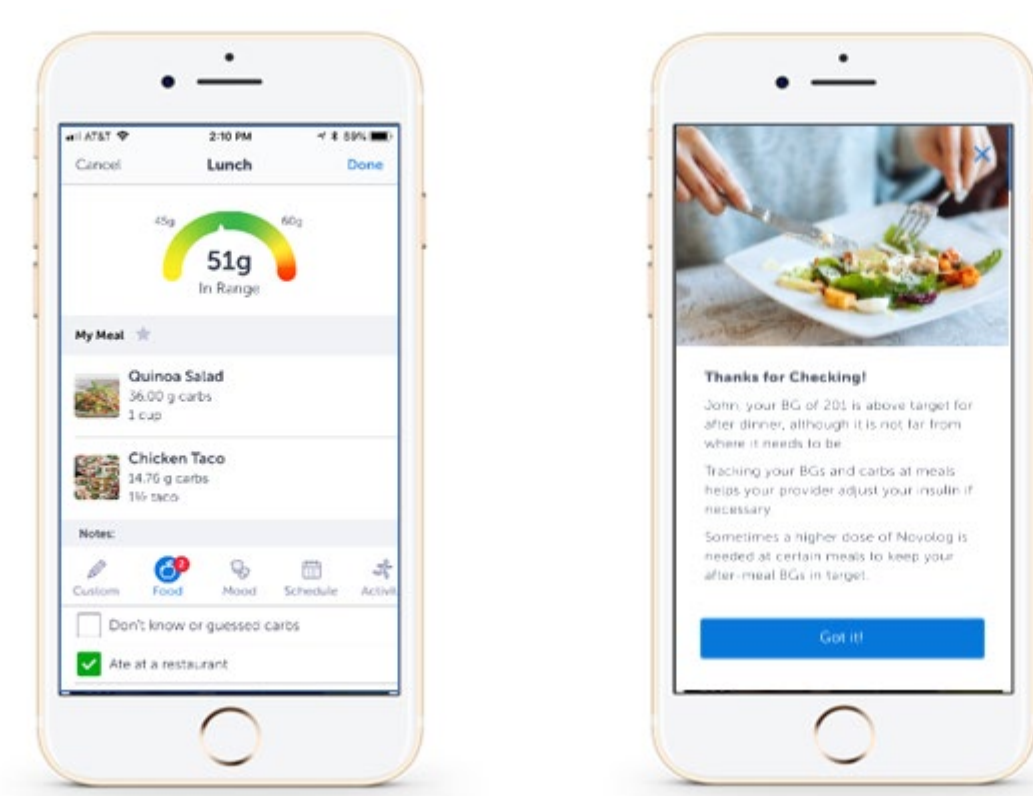


Figure 1. Screenshots of BlueStar app.

Sample and Data

- ❖ Data from 238 BlueStar users with Type 2 diabetes (54.6% men; 61.3% aged 40-59 years)
- ❖ The first 2 weeks of engagement data, as well as demographics
- ❖ Logistic discriminant analyses were performed with user persistence and a 14 mg/dL drop in either average or maximum BG as dependent variables

Results

Logistic discriminant analysis was able to predict users' consistent persistence at the 3- and 6-month timepoints with 81.6% accuracy.

Figure 2.a Prediction of 3 -Month Persistence

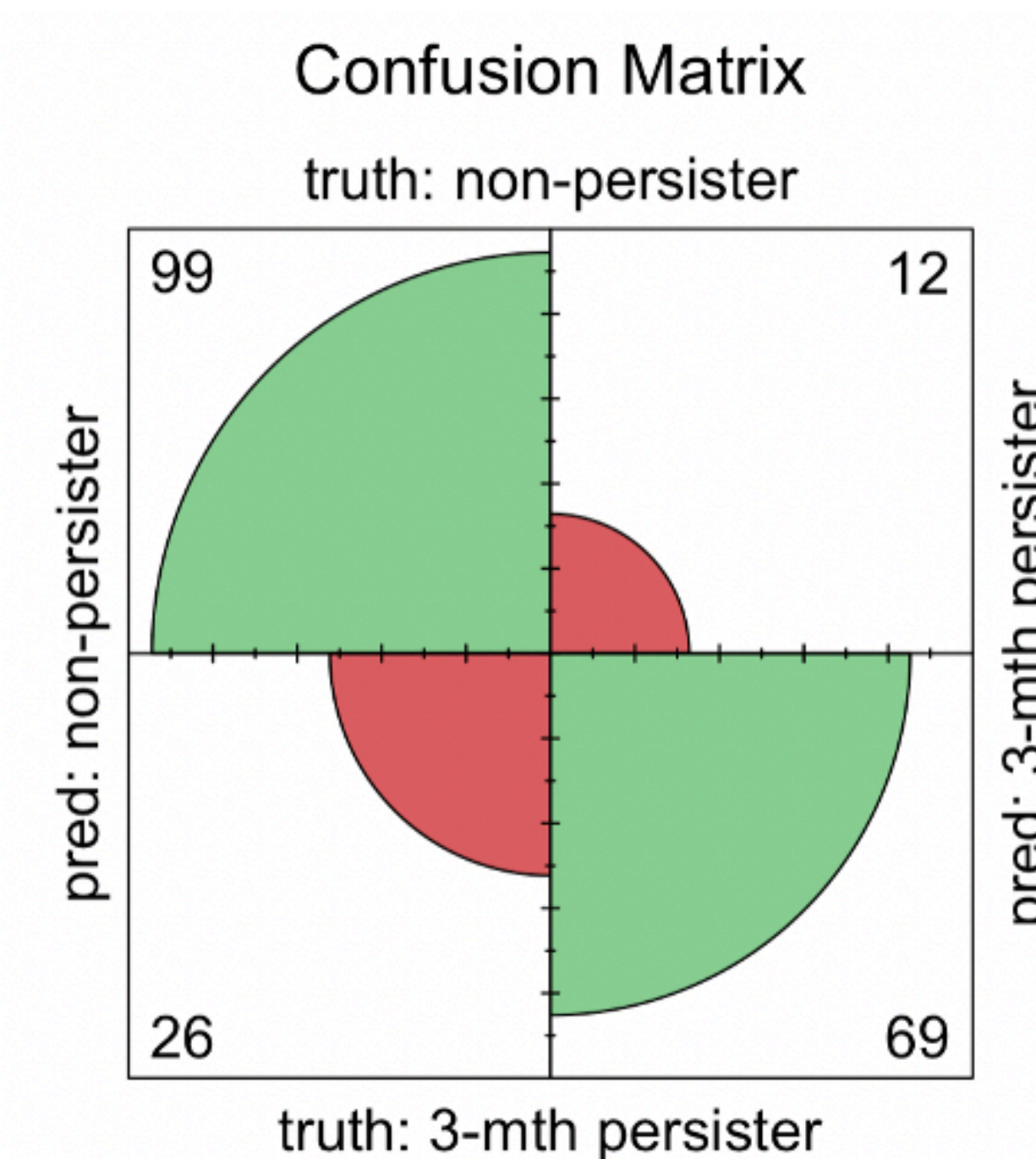
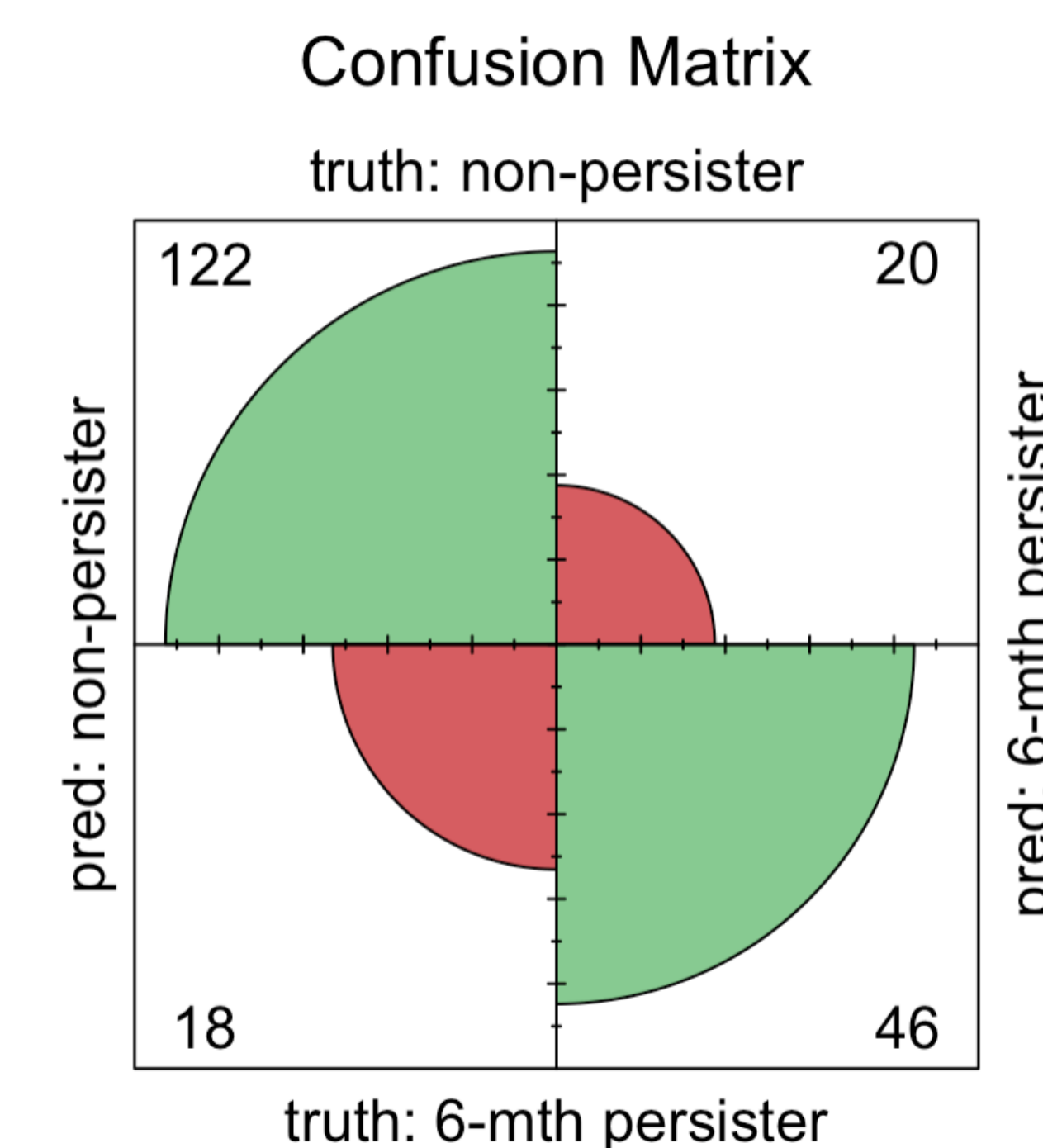


Figure 2.b Prediction of 6 -Month Persistence



Logistic discriminant analysis was able to predict a clinically significant drop in BG at the months 3 and 6 timepoints with 79.8% accuracy.

Figure 3.a Prediction of 3 -Month BG Drop

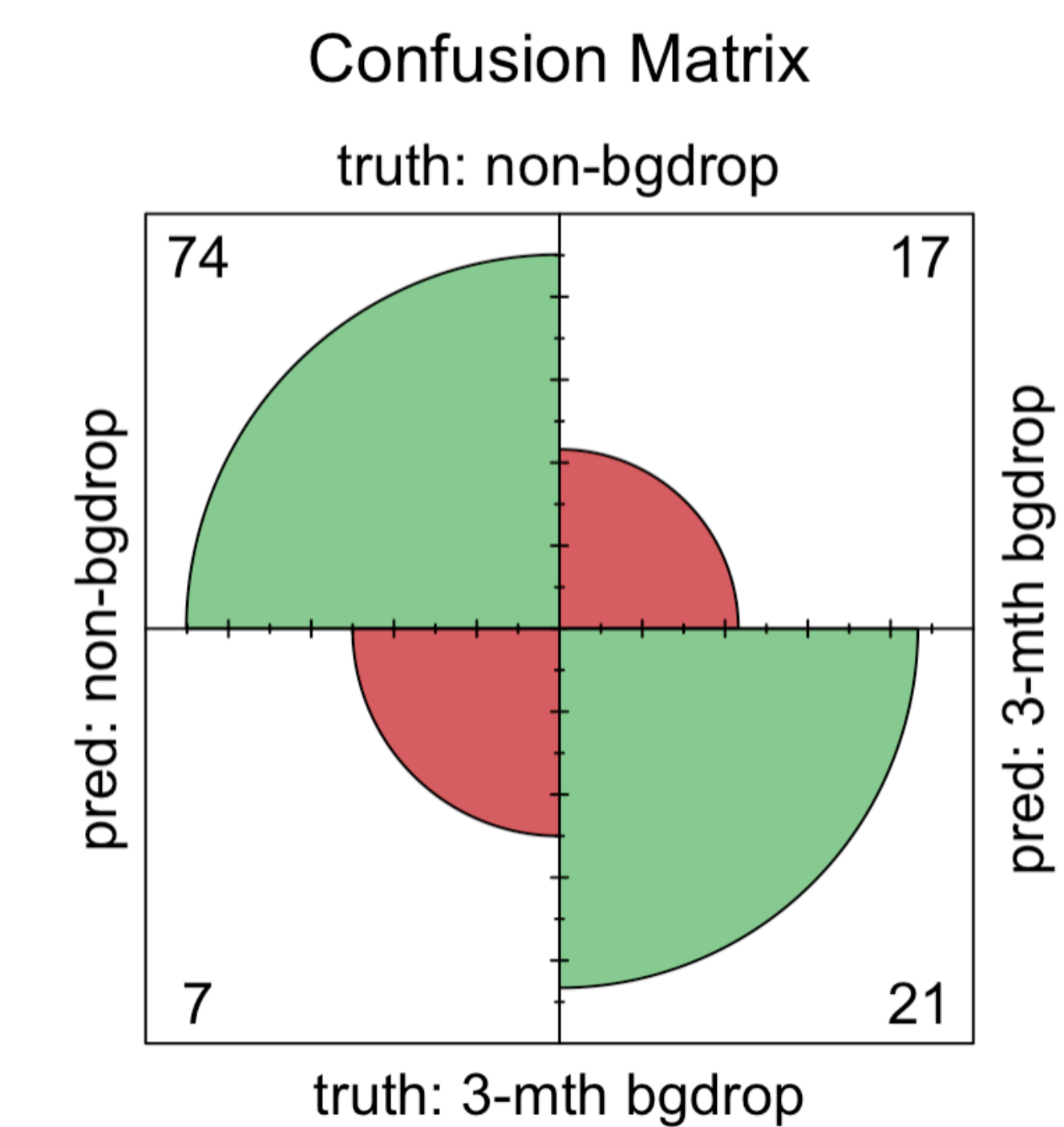
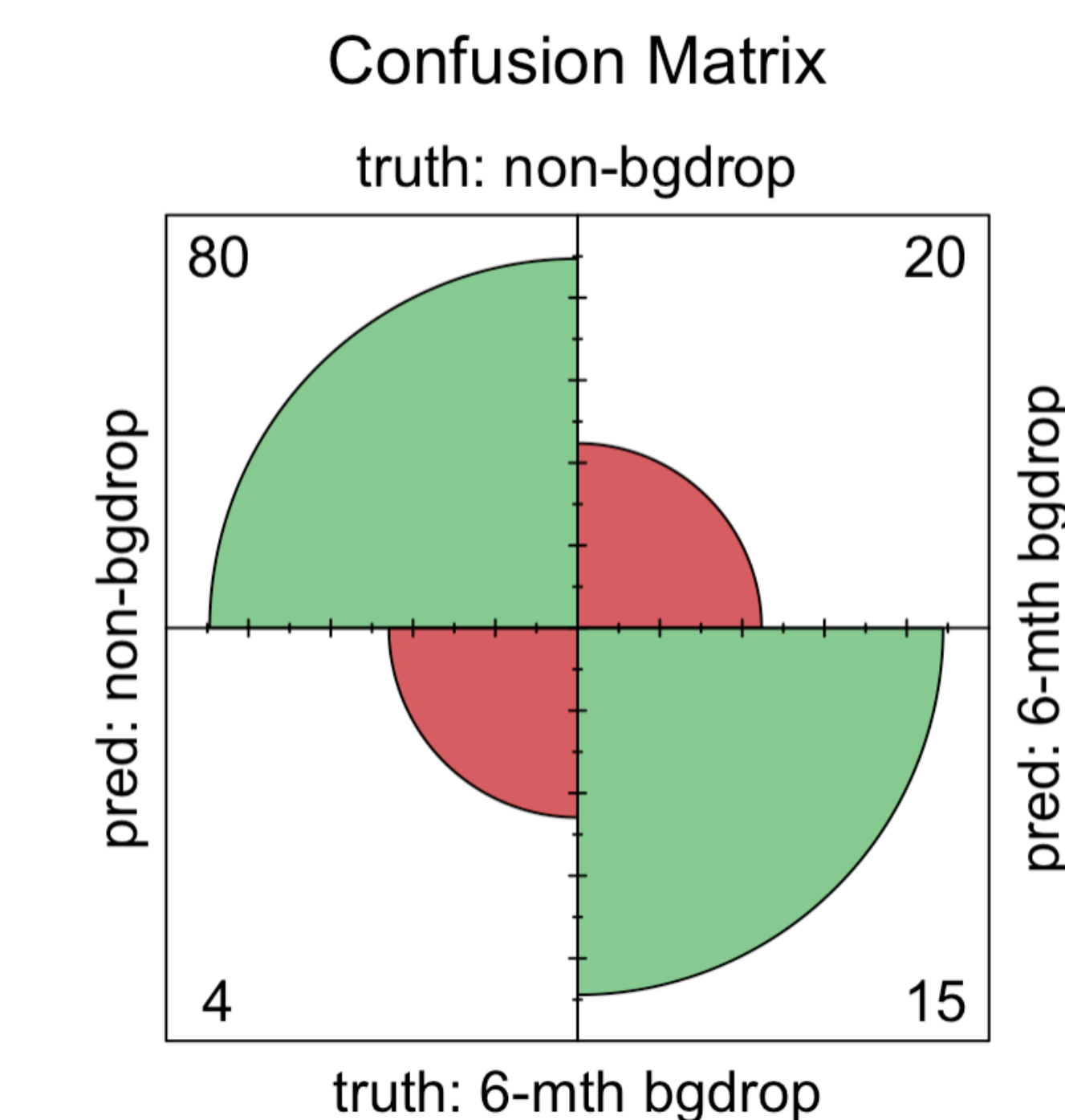


Figure 3.b Prediction of 6 -Month BG Drop



Conclusions

- ❖ It is possible to predict which users will persist in using a diabetes digital health application and/or experience an improvement in BG from just 2 weeks of initial usage data
- ❖ Early identification of patients unlikely to succeed in a digital health protocol provides an opportunity to target these users with additional interventions to get them on track