

# Engaging Patients with Diabetes via Mobile Health Technology During the Holidays



mySugr

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## INTRODUCTION

Trends observed during our usability engineering trial and the post market surveillance of mySugr Companion (FDA and CE cleared smartphone app aimed at behavioral change) prompted further investigation helping define criteria for the following study.

During the holiday time period of 2013, a sample of users (n = 2415) in both the EU and USA regions was observed comparing test frequency, blood glucose values and carbohydrate intake. The objective was to examine whether the holidays impact patient behavior and their blood glucose levels by comparing log entry values collected during a holiday with those from a non-holiday time period using mySugr Companion.

## METHODS

The periods observed were December 24-26, 2013 (holiday) and November 12-14, 2013 (non-holiday). The data is hosted, maintained and analyzed in encrypted databases on mySugr's secured servers. Frequency of blood glucose tests performed during the above-mentioned time periods has been used as a metric to indicate each participant's level of engagement in his/her ongoing diabetes therapy. Due to the large sample size, expectations are that a strong correlation is achieved using standard best practices for statistical analysis.<sup>1</sup>

The data in this study was manually entered into mySugr Companion by participants. A subsequent study will be conducted verifying the trends identified with the newest generation of mySugr products. These allow imported data from mass market blood glucose meters, among them the Sanofi iBGStar/BGStar, Roche's AccuChek, Abbott's FreeStyle, and Bayer's Contour glucometers.

## RESULTS

Results indicated a higher frequency of blood glucose testing during the holiday time period, by 30.08% (USA: +17.95%, EU: +38.69%). Carbohydrate intake was higher during the holiday time period by 34.48% overall with the following breakdown per region (USA: +25.6%, EU: +37.6%) (p < 0.001).

diabetes self-management therapy. Some regional differences were observed between the USA and EU however this unexpected upward trend was consistent in both regions despite any geographical/cultural influencing factors.

The increase in the logged consumption of carbohydrates was also consistent trend-wise from region to region. It could be explained by special holiday meals and frequent snacks/treats that people enjoyed taking pictures of and logging via mySugr. It is also the most probable cause of increased blood glucose (blood glucose average: +5.08% (p < 0.001), standard deviation: +8.29%).

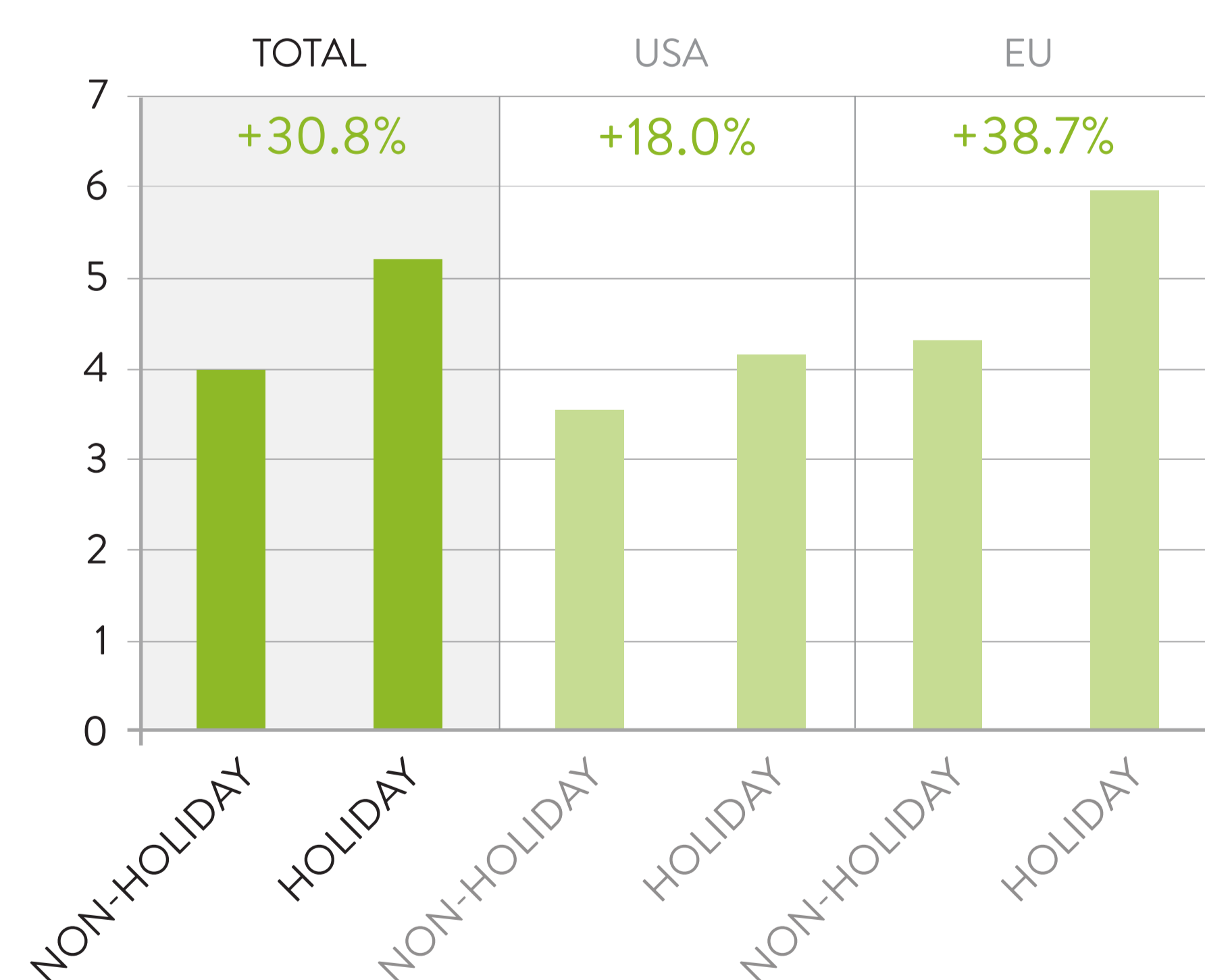
It should be noted that the self-reported dietary data (displayed here as total daily grams of carbohydrates) raises questions about carbohydrate logging behavior. It would be interesting to further explore carbohydrate logging behavior in a subsequent study including the differences observed between users in the US and the EU.

## CONCLUSION

Engaging patients and retaining that engagement is a constant challenge for diabetes healthcare professionals.<sup>3</sup> According to the data presented in this study, mHealth platforms such as mySugr can trigger more effective engagement of people with diabetes during the holidays. This may represent a strategic opportunity for educational interventions and outreach. Using such approaches (alongside traditional sessions during non-holiday times) should be considered to help people with diabetes live happier and healthier lives.

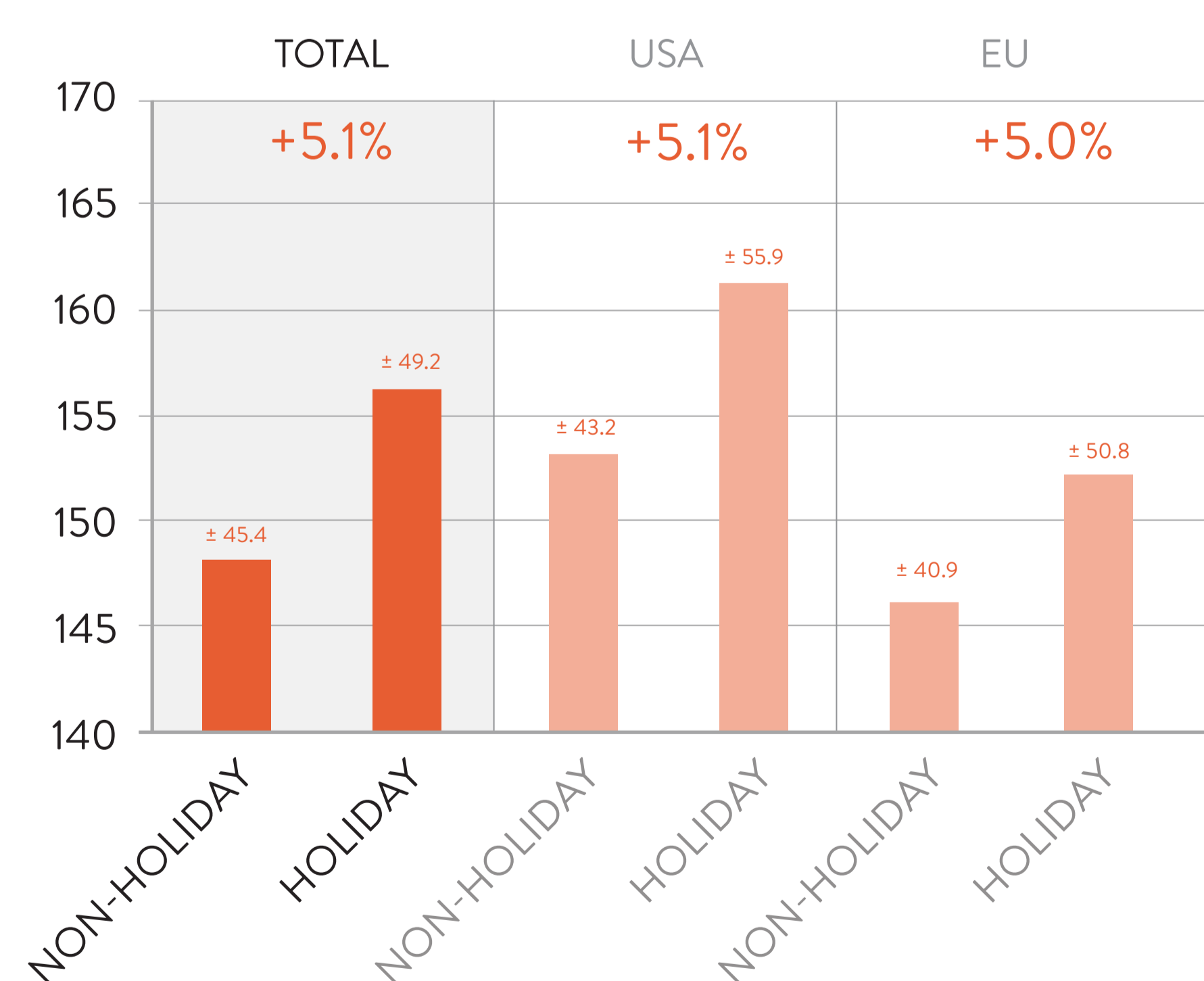
Whether it be Thanksgiving in North America or "Midsommar afton" in Sweden, holidays share important connections to people's food and lifestyle habits all over the world and introduce many changes to normal routines. Such aspects of day-to-day life including diet, exercise, and stress are important factors in diabetes management. mySugr is particularly interested in data collected during these time periods and believes its analysis will provide insight beyond traditional studies focusing on glycemic index and the pharmacokinetic profile of insulins. This will allow us to examine the impact of real life events like family dinners, walks in the park, or eating pecan pie.

### Blood glucose tests per day



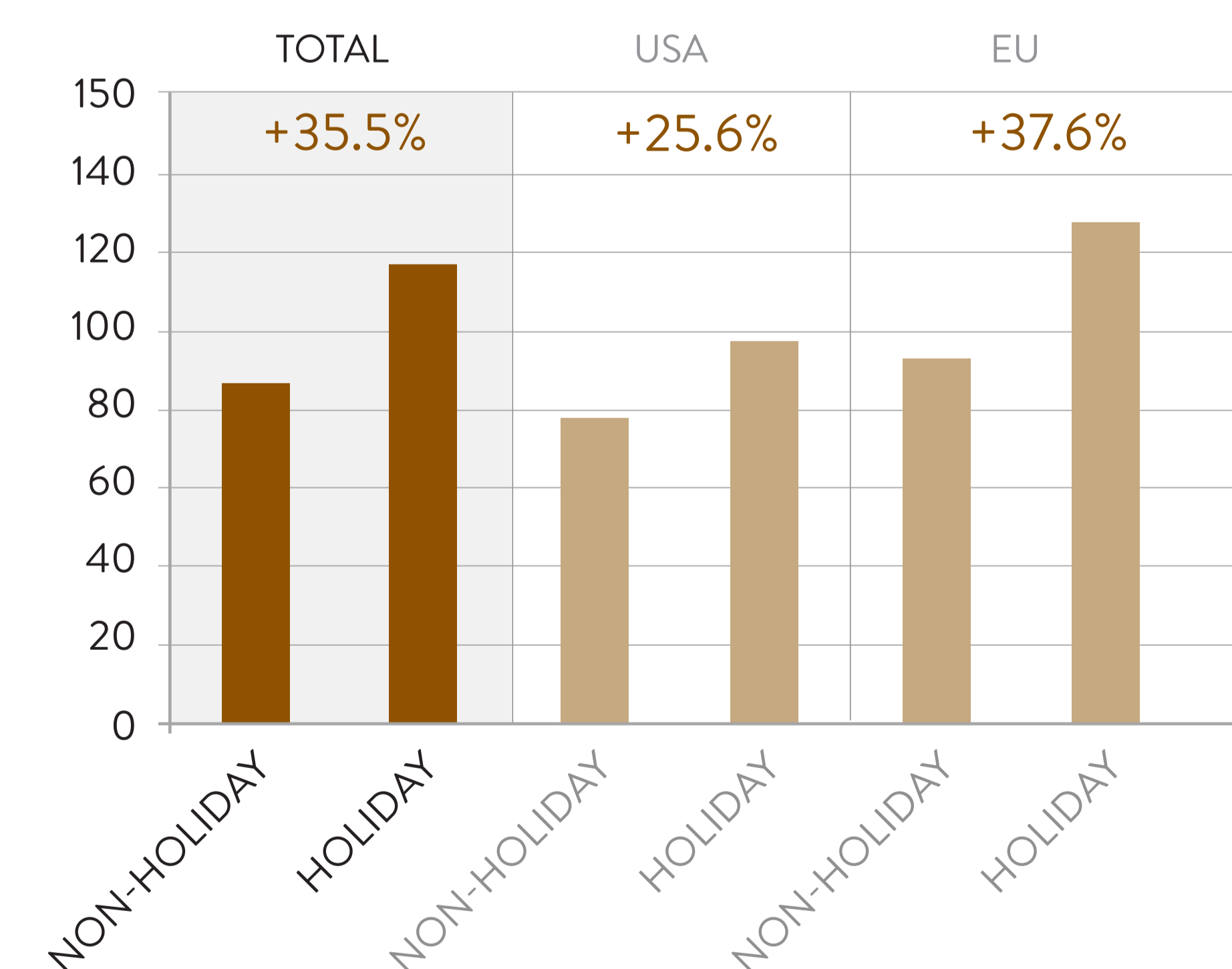
### Blood glucose average

± standard deviation [mg/dl]



### Total daily carbohydrates

in grams



## DISCUSSION

Holidays are not only a busy time but also stressful<sup>2</sup> and people with diabetes often face additional challenges around unfamiliar foods and overall disruption of their routine. However, higher frequency of blood glucose testing indicates increased patient engagement during the holidays analyzed. It was surprising to observe seemingly better compliance with

## FOR MORE INFORMATION

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<sup>1</sup> The mySugr database contains data from approximately 100 000 people with diabetes (as of December 2013)  
<sup>2</sup> Greenberg Quinlan Rosner Research, October 24, 2006, <http://www.apa.org/news/press/releases/2006/12/holiday-stress.pdf>, retrieved, 2.6.2014.  
<sup>3</sup> K.J. Rose, M. König, F. Wiesbauer, Evaluating success for behavioral change in diabetes via mhealth and gamification: mySugr's keys to retention and patient engagement. Diabetes Technology Ther. 2013;15:P-241 doi:10.1089/dia.2012.1221.  
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