

# Comparison of All-Cause Healthcare Resource Utilization Rates Between Patients With Type 2 Diabetes Who Use a Digital Diabetes Solution Versus Non-Users: A 12-Month Retrospective Cohort Study

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## INTRODUCTION

- Diabetes, a chronic condition that requires continuous management, was estimated to affect 24.7 million individuals in the United States in 2017.<sup>1</sup>
  - Estimated direct medical costs in the United States were \$237 billion.
- Digital technologies that allow for personalized intervention have been developed to improve diabetes care management.<sup>2,3</sup>
- Dario Diabetes Solution (DDS) is a digital health application for type 2 diabetes mellitus (T2DM) management.
  - DDS combines a blood glucose meter and a mobile application, allowing patients to track blood glucose levels in real time.
  - DDS automatically logs blood glucose measurements and allows the user to log meals, carbohydrate consumption, insulin intake, physical activity, and other parameters.

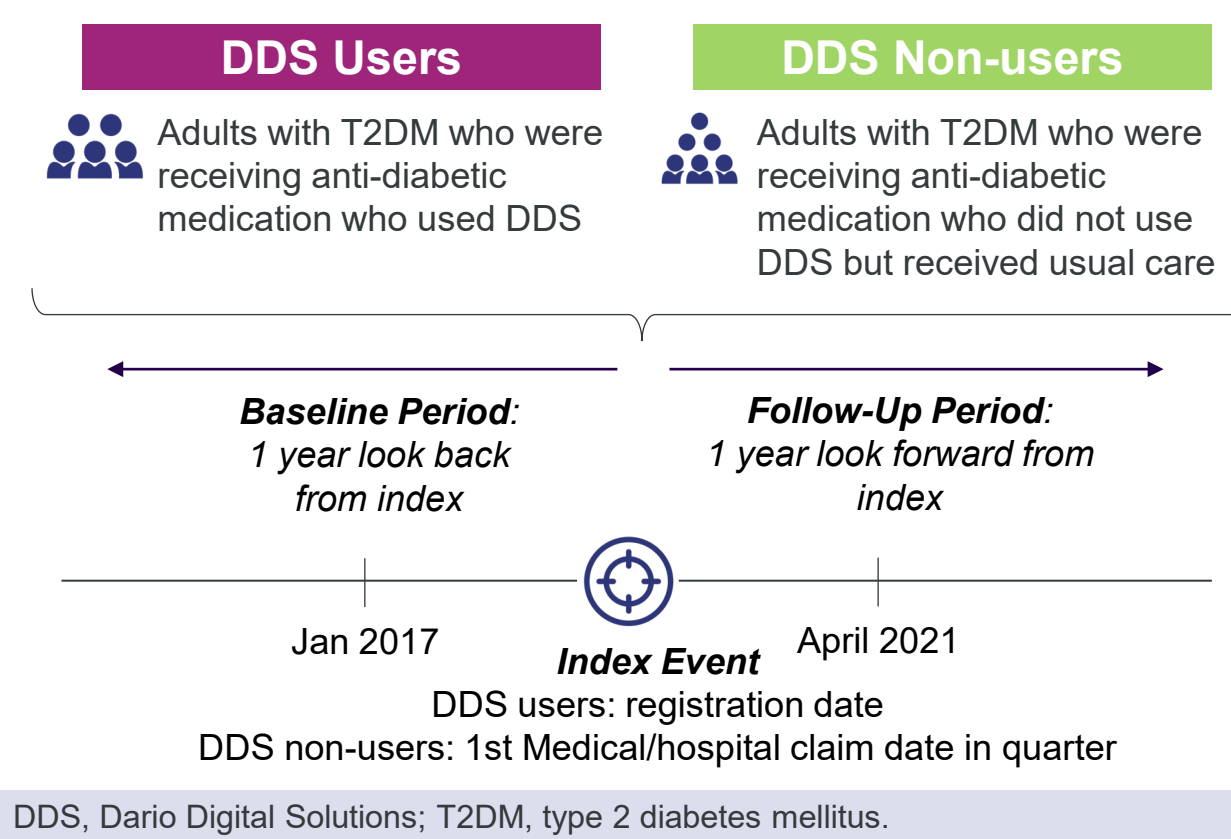
## PURPOSE

This study compared healthcare resource utilization (HCRU) by DDS users with a matched non-user cohort.

## METHODS

- In this retrospective cohort study, the patient selection window was January 2017 to April 2021 (Figure 1).

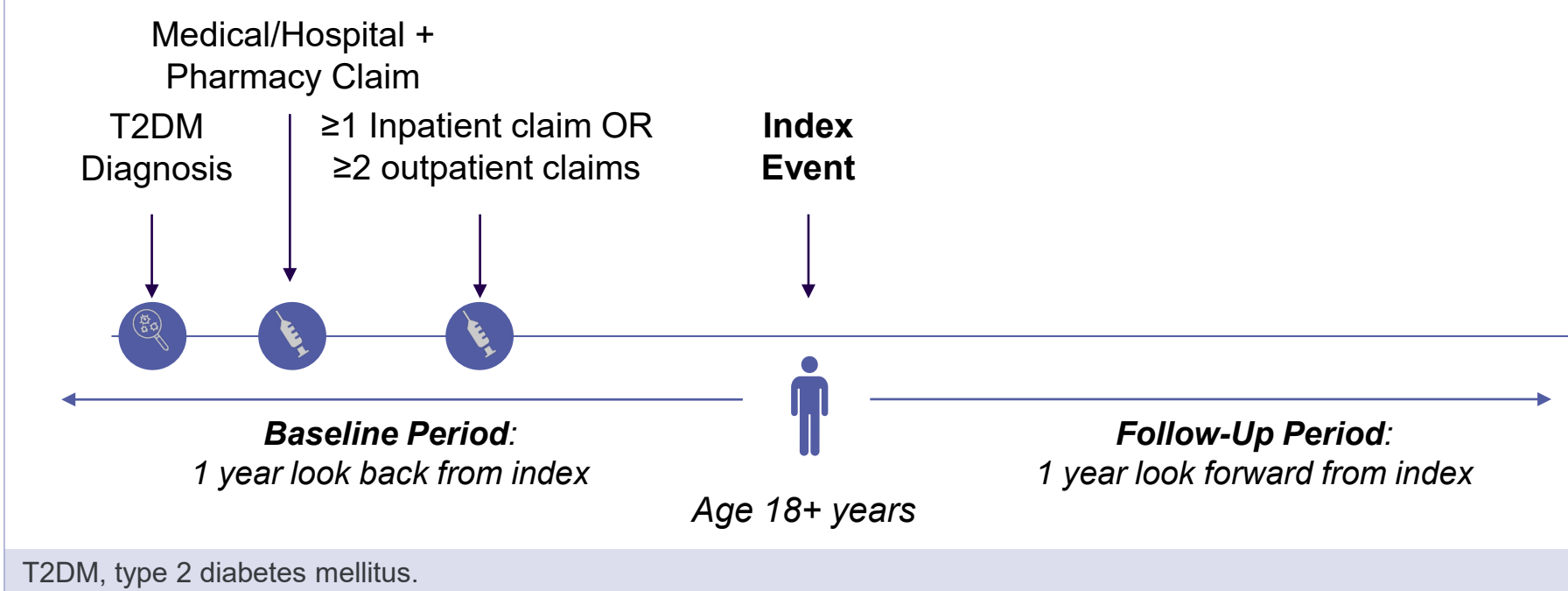
Figure 1: Study Timeline



- Inclusion criteria (Figure 2)
  - Patients ≥18 years old with T2DM
  - Patients receiving anti-diabetic medication(s) within 365 days before index date
  - Patients with access to care 12 months before and after index date (confirmed by evidence of 1 medical/hospital and pharmacy claim)
  - Patients with ≥1 inpatient or ≥2 outpatient visits at least 30 days apart during baseline period
- Excluded were patients with type 1 or other types of diabetes, and patients who used continuous glucose monitoring during the study period.

## METHODS (cont'd)

Figure 2: Inclusion Criteria

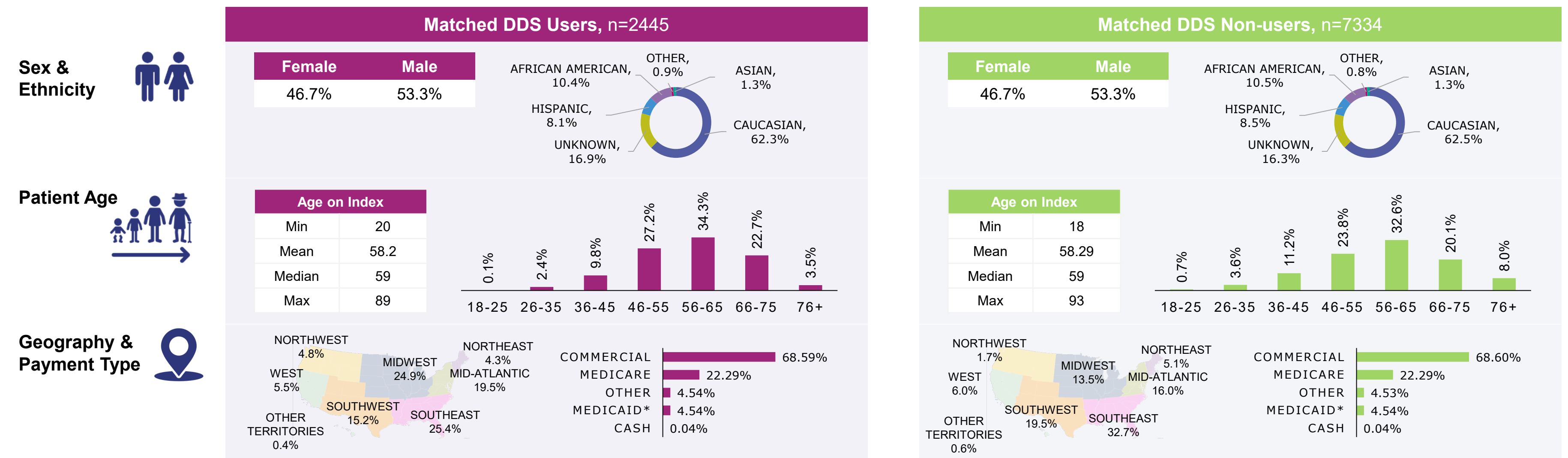


- User and non-user cohorts were sequentially matched 1:3 using exact and propensity score matching.
  - Exact matching: index quarter, sex, payer, and medications
  - Propensity matching: age, region, race and ethnicity, Charlson Comorbidity Index score, comorbidities, comedications, baseline HCRU
- Primary endpoint was all-cause HCRU (defined as either inpatient hospitalizations or emergency room [ER] visits) rates during the follow-up period.
- Data were analyzed using a generalized linear model with negative binomial distribution adjusted for baseline HCRU.
  - Incidence rate ratio (IRR) was calculated.
  - Statistical significance was determined using Wald chi-square statistics.

## RESULTS

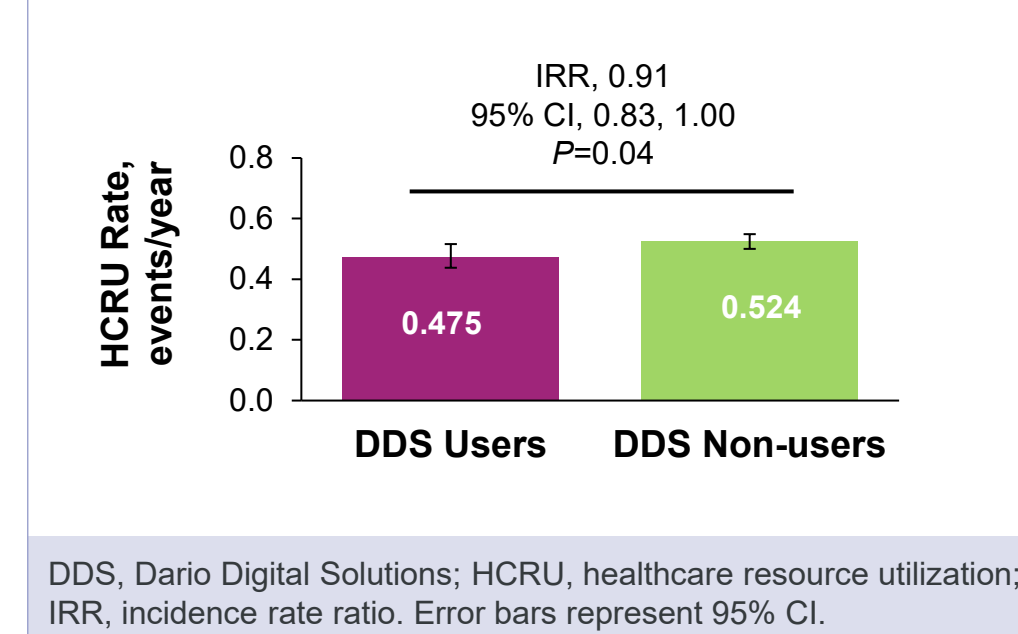
- Of 9779 patients, 2445 DDS users and 7334 DDS non-users were matched (Figure 3).

Figure 3: Demographics and Baseline Characteristics



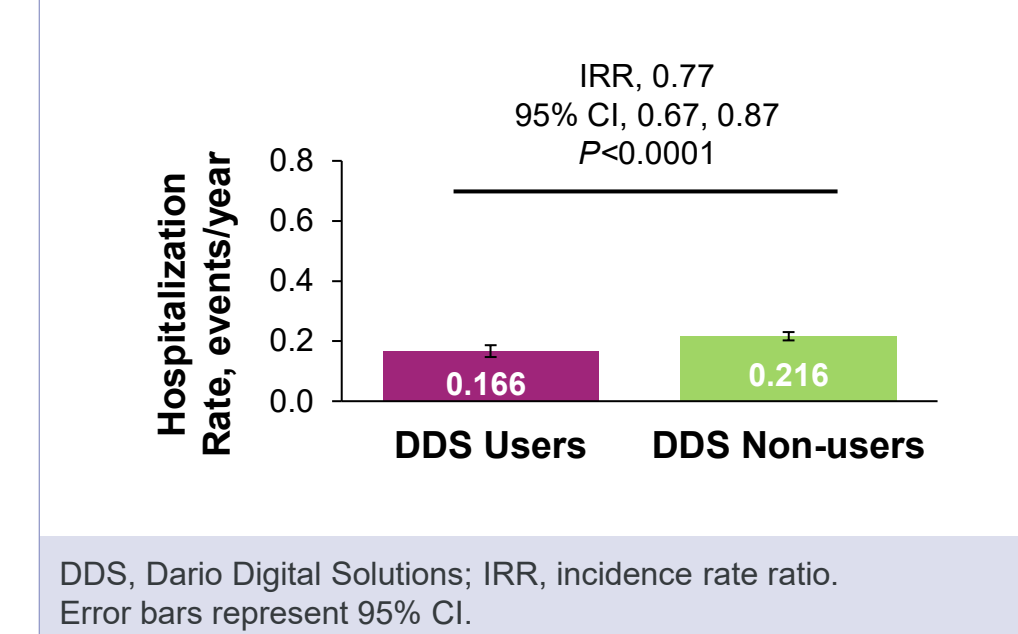
## RESULTS (cont'd)

Figure 4: All-Cause HCRU Rate (Inpatient Hospitalizations + ER Visits) at 12 Months



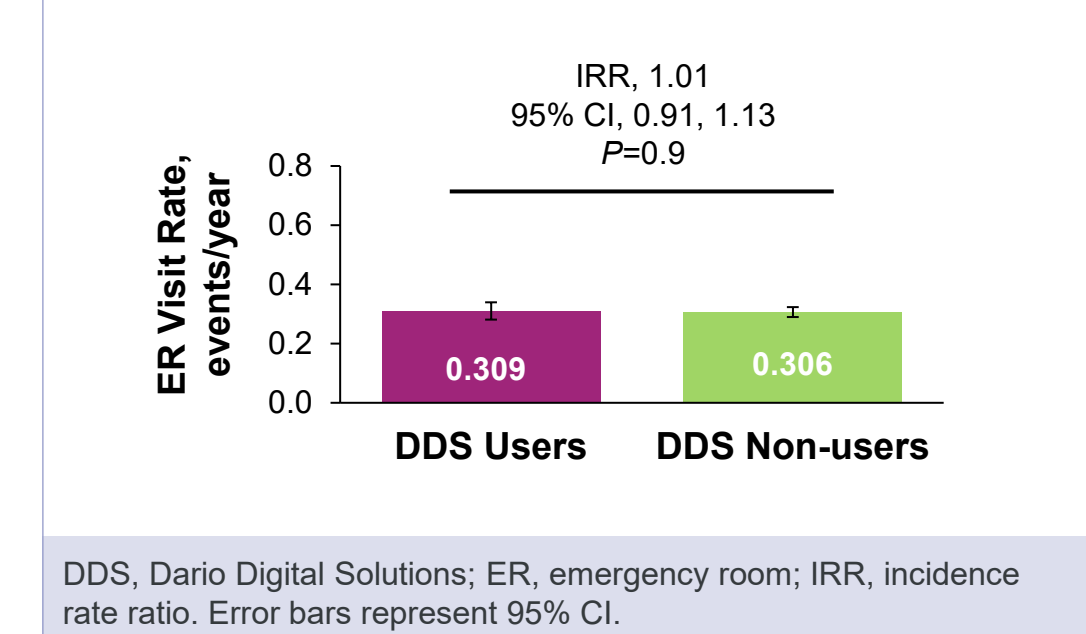
- At 12 months, mean all-cause HCRU rate (inpatient hospitalization + ER visits) was 0.475 and 0.524 events/year for DDS users and non-users, respectively (Figure 4).
  - DDS users had a 9.3% lower all-cause HCRU rate compared with non-users.
  - DDS users achieved significantly lower all-cause HCRU rate compared with non-users ( $P=0.0411$ ).
- For DDS users, ≥1 HCRU event was reported for 30.5% of patients at baseline and 28.6% during follow-up.
- For non-users, ≥1 HCRU event was reported for 29.5% of patients at baseline and 30.0% during follow-up.

Figure 5: All-Cause Inpatient Hospitalization Rate at 12 Months



- At 12 months, mean all-cause hospitalization rate was 0.166 and 0.216 events/year for users and non-users, respectively (Figure 5).
  - DDS users had a 23.5% lower all-cause inpatient hospitalization rate compared with non-users.
  - DDS users achieved significantly lower all-cause inpatient hospitalization rate compared with non-users ( $P<0.0001$ ).
- For DDS users, ≥1 inpatient event was reported for 14.8% of patients at baseline and 13.4% during follow-up.
- For non-users, ≥1 inpatient event was reported for 14.3% of patients at baseline and 16.3% during follow-up.

Figure 6: All-Cause Emergency Room Visit Rate at 12 Months



- At 12 months, mean all-cause ER visit rate was 0.309 and 0.306 events/year for users and non-users, respectively (Figure 6).
  - ER visit rates were similar in the two cohorts ( $P=0.86$ ).
- For DDS users, ≥1 ER event was reported for 22.9% of patients at baseline and 21.7% during follow-up.
- For non-users, ≥1 ER event was reported for 21.6% of patients at baseline and 21.2% during follow-up.

## CONCLUSIONS

In this retrospective matched cohort study, utilizing DDS demonstrated a significantly greater reduction in all-cause HCRU (ER and inpatient hospitalization rates) during 12-month follow-up compared with non-users receiving usual care.

- DDS users had 9.3% lower all-cause HCRU rate compared with non-users (absolute rate reduction of 0.049 events/year; IRR, 0.91;  $P=0.04$ ).
- DDS users had 23.5% lower all-cause inpatient hospitalization rates compared with non-users (absolute rate reduction of 0.05 events/year; IRR, 0.77;  $P<0.0001$ ).
- ER visit rates were similar for the two cohorts. The numeric difference of 0.003 events/year between DDS users and non-users was not statistically significant.

## REFERENCES

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## DISCLOSURES

L. Wilson, P. Potukuchi, N. Thingalaya, K.C.S. Lee, F. Lee, A. Kennedy, and E. Han-Burgess are employees of Sanofi and may hold stocks/shares in Sanofi. D. Malone is a consultant to Sanofi and received consulting fees from Sarepta, Pear Therapeutics, Avidity, Gilead, and Otsuka.

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