README for Data and Stata Do-files for "Effect of an Intensive Food-as-Medicine Program on Health and Health Care Use — A Randomized Clinical Trial"

This folder holds the Stata .do file and .csv data to replicate the tables found in the main text of:

Doyle, Joseph, Marcella Alsan, Nicholas Skelley, Yutong Lu, and John Cawley. 2023. "Effect of an Intensive Food-as-Medicine Program on Health and Health Care Use — A Randomized Clinical Trial." *JAMA Internal Medicine*.

This readme explains how to run the code, the resulting output, and the data.

Running the code

1. Save all files in one place, with all .csv and .do files at the same level.
2. Open Stata and run 01_published_tables.do

The results from all four main tables will be produced.

Output

After running the replication code in 01_published_tables.do, the results from the tables in the main text of the paper will be saved in a set of .csv files in the /output/ folder.

Table 1

The following files, when contained in the /output/ folder, correspond to results shown in Table 1 ("Characteristics of Patients at Baseline").

- T1_fullsample_baseline_overall.csv
    - This file contains the means and standard deviations (or, for indicator variables, counts and percentages) of baseline characteristic variables in the full 465-subject sample (in Table 1, column 1).
- T1_fullsample_baseline_grouped.csv
    - This file contains the means and standard deviations (or, for indicator variables, counts and percentages) of baseline characteristic variables in the full 465-subject sample, separated by treatment status ("treat now" vs. treat later; in Table 1, columns 2 and 3).
- T1_labsample_baseline_overall.csv
    - This file contains the means and standard deviations (or, for indicator variables, counts and percentages) of baseline characteristic variables in the 349-subject sample who have a 6-month HbA1c measurement on record (the "lab sample"; in Table 1, column 4).

- T1_labsample_baseline_grouped.csv
    - This file contains the means and standard deviations (or, for indicator variables, counts and percentages) of baseline characteristic variables in the 349-subject lab sample, separated by treatment status (in Table 1, columns 5 and 6).

Table 2

The following files, when contained in the /output/ folder, correspond to results shown in Table 2 (Program Engagement and Goal Attainment).

- T2_6mo_summary.csv
    - This file contains the means and standard deviations (or, for the two indicator variables, counts and percentages) for the outcome variables and program-tracking measures in Table 2 at 6 months after consent (in Table 2, columns 1 and 2).
- T2_6mo_adjusted_diffs.csv
    - This file contains the adjusted mean differences and 95% confidence intervals for outcome variables shown in Table 2 at 6 months after consent (in Table 2, column 3).
- T2_12mo_program_tracking_means.csv
    - This file contains the means and standard deviations of program-tracking measures (months with ≥ 1 site visit; number of site visits) at 12 months after consent (in Table 2, columns 4 and 5).

Table 3

The file /output/T3_biometrics.csv contains all the results shown in Table 3 (Effects of Program on Biometric Outcomes) as they appear in the text.

Table 4

The following files, when contained in the /output/ folder, correspond to results shown in Table 4 (Model Comparisons for Use Outcomes).

- T4_means.csv
    - This file contains the means and standard deviations (for indicator variables, counts and percentages) of all outcome variables shown in Table 4 at 6 months after consent, separated by treatment status (in Table 4, columns 1 and 2)
- T4_regressions.csv
    - This file contains the adjusted mean differences and 95% confidence intervals of all outcome variables shown in Table 4 at 6 months after consent (in Table 4, column 3).

Data

The data are provided in .csv format as analysis_sample.csv. The data contain the 465 subjects used for the analyses that appear in the publication. The table below describes each of the variables that appear in the data. Variables are listed in alphabetical order in the table below (but do not in the data).

Variable	Description
age	Subject age
age5_1	Subject aged 18-32 (≤32)
age5_10	Subject aged 73-85 (≥73)
age5_2	Subject aged 33-37
age5_3	Subject aged 38-42
age5_4	Subject aged 43-47
age5_5	Subject aged 48-52
age5_6	Subject aged 53-57
age5_7	Subject aged 58-62
age5_8	Subject aged 63-67
age5_9	Subject aged 68-72
bmi_date_0mo	Date closest to baseline when BMI was recorded
bmi_date_12mo	Date closest to 360 days after consent when BMI was recorded
bmi_date_6mo	Date closest to 180 days after consent when BMI was recorded
bmi_val_0mo	BMI recorded closest to baseline
bmi_val_12mo	BMI recorded closest to 360 days after consent
bmi_val_6mo	BMI recorded closest to 180 days after consent
consent_date	Date subject consented to study
diabetes_knowledge_score	Diabetes knowledge score (proportion of questions answered correctly)
dias_date_0mo	Date closest to baseline when diastolic blood pressure was recorded
dias_date_12mo	Date closest to 360 days after consent when diastolic blood pressure was recorded
dias_date_6mo	Date closest to 180 days after consent when diastolic blood pressure was recorded
dias_val_0mo	Diastolic blood pressure recorded closest to baseline
dias_val_12mo	Diastolic blood pressure recorded closest to 360 days after consent
dias_val_6mo	Diastolic blood pressure recorded closest to 180 days after consent

diet_improve_index	Index score for diet improvement
diet_improved_yn	Indicator variable for reporting that diet has improved from one year ago
dietician_visits_n_0mo	Number of dietician visits at baseline
dietician_visits_n_12mo	Number of dietician visits during the first 360 days after consent
dietician_visits_n_6mo	Number of dietician visits during the first 180 days after consent
drug_any_db_0mo	Indicator variable for having an active prescription for any diabetes medication at baseline
drug_any_db_12mo	Indicator variable for having an active prescription for any diabetes medication during the first 360 days after consent
drug_any_db_6mo	Indicator variable for having an active prescription for any diabetes medication during the first 180 days after consent
drug_any_db_summary_0mo	Initial specification for indicator variable for having an active prescription for any diabetes medication at baseline. The initial specification is used for Table 1 and does not explicitly include sulfonylureas or SGLT2 inhibitors (common drugs of those classes, including Canagliflozin/Invokana, are included, but less common drugs are not). On the advice of reviewers, we explicitly added more SGLT2 inhibitors and sulfonylureas to the “any diabetes medication” specification for regression/outcome analyses.
drug_glp1_0mo	Indicator variable for having an active glucagon-like peptide 1 (GLP-1) agonist prescription at baseline
drug_glp1_12mo	Indicator variable for having an active glucagon-like peptide 1 (GLP-1) agonist prescription during the first 360 days after consent
drug_glp1_6mo	Indicator variable for having an active glucagon-like peptide 1 (GLP-1) agonist prescription during the first 180 days after consent
drug_insulin_0mo	Indicator variable for having an active insulin prescription at baseline
drug_insulin_12mo	Indicator variable for having an active insulin prescription during the first 360 days after consent
drug_insulin_6mo	Indicator variable for having an active insulin prescription during the first 180 days after consent
drug_metformin_0mo	Indicator variable for having an active metformin prescription at baseline
drug_metformin_12mo	Indicator variable for having an active metformin prescription during the first 360 days after consent
drug_metformin_6mo	Indicator variable for having an active metformin prescription during the first 180 days after consent

drug_other_0mo	Indicator variable for having an active prescription for another glucose-lowering medication at baseline
drug_other_12mo	Indicator variable for having an active prescription for another glucose-lowering medication during the first 360 days after consent
drug_other_6mo	Indicator variable for having an active prescription for another glucose-lowering medication during the first 180 days after consent
drug_sulf_0mo	Indicator variable for having an active sulfonylureas prescription at baseline
drug_sulf_12mo	Indicator variable for having an active sulfonylureas prescription during the first 360 days after consent
drug_sulf_6mo	Indicator variable for having an active sulfonylureas prescription during the first 180 days after consent
dsmt_visits_0mo	Number of diabetes self-management trainings (DSMTs) at baseline
dsmt_visits_12mo	Number of diabetes self-management trainings during the first 360 days after consent
dsmt_visits_6mo	Number of diabetes self-management trainings during the first 180 days after consent
ed_i_0mo	Indicator variable for having any emergency department (ED) claims at baseline
ed_i_12mo	Indicator variable for having any emergency department (ED) claims during the first 360 days after consent
ed_i_6mo	Indicator variable for having any emergency department (ED) claims during the first 180 days after consent
ed_or_ip_i_0mo	Indicator variable for having any emergency department (ED) or inpatient (IP) claims at baseline
ed_or_ip_i_12mo	Indicator variable for having any emergency department (ED) or inpatient (IP) claims during the first 360 days after consent
ed_or_ip_i_6mo	Indicator variable for having any emergency department (ED) or inpatient (IP) claims during the first 180 days after consent
ed_or_ip_n_0mo	Number of emergency department (ED) and inpatient (IP) claims at baseline
ed_or_ip_n_12mo	Number of emergency department (ED) and inpatient (IP) claims during the first 360 days after consent
ed_or_ip_n_6mo	Number of emergency department (ED) and inpatient (IP) claims during the first 180 days after consent
ed_or_ip_payment_0mo	Total value of emergency department (ED) or inpatient (IP) claims at baseline
ed_or_ip_payment_12mo	Total value of emergency department (ED) or inpatient (IP) claims during the first 360 days after consent

ed_or_ip_payment_6mo	Total value of emergency department (ED) or inpatient (IP) claims during the first 180 days after consent
endocrinology_visits_n_0mo	Number of endocrinology department visits at baseline
endocrinology_visits_n_12mo	Number of endocrinology department visits during the first 360 days after consent
endocrinology_visits_n_6mo	Number of endocrinology department visits during the first 180 days after consent
engagement_index	Index score for engagement and preventive care
exercise_smoking_index	Index score for exercise and smoking improvement
fruit_num	Reported number of times eating fruit in the past week
hba1c_cat_control	Baseline HbA1c category (pre-specified control)
hba1c_date_0mo	Date of qualifying HbA1c lab
hba1c_date_12mo	Date closest to 360 days after consent when HbA1c was recorded
hba1c_date_6mo	Date closest to 180 days after consent when HbA1c was recorded
hba1c_val_0mo	HbA1c result qualifying subject for program participation
hba1c_val_12mo	HbA1c result recorded closest to 360 days after consent
hba1c_val_6mo	HbA1c result recorded closest to 180 days after consent
hdl_date_0mo	Date closest to baseline when high-density lipoprotein (HDL) was recorded
hdl_date_12mo	Date closest to 360 days after consent when high-density lipoprotein (HDL) was recorded
hdl_date_6mo	Date closest to 180 days after consent when high-density lipoprotein (HDL) was recorded
hdl_val_0mo	High-density lipoprotein (HDL) result recorded closest to baseline
hdl_val_12mo	High-density lipoprotein (HDL) result recorded closest to 360 days after consent
hdl_val_6mo	High-density lipoprotein (HDL) result recorded closest to 180 days after consent
healthy_attitudes_index	Index score for healthy attitudes
hispanic	Indicator variable for subject being Hispanic
ip_i_0mo	Indicator variable for having any inpatient (IP) claims at baseline
ip_i_12mo	Indicator variable for having any inpatient (IP) claims during the first 360 days after consent
ip_i_6mo	Indicator variable for having any inpatient (IP) claims during the first 180 days after consent
ldl_date_0mo	Date closest to baseline when low-density lipoprotein (LDL) was recorded

ldl_date_12mo	Date closest to 360 days after consent when low-density lipoprotein (LDL) was recorded
ldl_date_6mo	Date closest to 180 days after consent when low-density lipoprotein (LDL) was recorded
ldl_val_0mo	Low-density lipoprotein (LDL) result recorded closest to baseline
ldl_val_12mo	Low-density lipoprotein (LDL) result recorded closest to 360 days after consent
ldl_val_6mo	Low-density lipoprotein (LDL) result recorded closest to 180 days after consent
male	Indicator variable for subject being male
months_with_visits_12mo	Number of months with ≥ 1 site visit during the first 360 days after consent
months_with_visits_6mo	Number of months with ≥ 1 site visit during the first 180 days after consent
never_eat_out_yn	Indicator variable for reporting never eating fast food, takeout, or at a restaurant
nf_payment_0mo	Total value of nursing facility (NF) claims at baseline
nf_payment_12mo	Total value of nursing facility (NF) claims during the first 360 days after consent
nf_payment_6mo	Total value of nursing facility claims during the first 180 days after consent
op_i_0mo	Indicator variable for having any outpatient (OP) claims at baseline
op_i_12mo	Indicator variable for having any outpatient (OP) claims during the first 360 days after consent
op_i_6mo	Indicator variable for having any outpatient (OP) claims during the first 180 days after consent
op_n_0mo	Number of outpatient (OP) claims at baseline
op_n_12mo	Number of outpatient (OP) claims during the first 360 days after consent
op_n_6mo	Number of outpatient (OP) claims during the first 180 days after consent
op_payment_0mo	Total value of outpatient (OP) claims at baseline
op_payment_12mo	Total value of outpatient (OP) claims during the first 360 days after consent
op_payment_6mo	Total value of outpatient (OP) claims during the first 180 days after consent
oth_payment_0mo	Total value of other claims at baseline
oth_payment_12mo	Total value of other claims during the first 360 days after consent

oth_payment_6mo	Total value of other claims during the first 180 days after consent
race	Subject race
race_nonhisp_black	Indicator variable for subject being non-Hispanic and Black
rural_site	Indicator variable for subject being assigned to rural site
self_efficacy_index	Index score for diabetes self-efficacy
sex	Subject sex
site_visits_12mo	Number of site visits during the first 360 days after consent
site_visits_6mo	Number of site visits during the first 180 days after consent
subject_id	Unique identifier for each subject
sweet_drink_num	Reported number of times drinking sweetened beverages in the past week
sys_date_0mo	Date closest to baseline when systolic blood pressure was recorded
sys_date_12mo	Date closest to 360 days after consent when systolic blood pressure was recorded
sys_date_6mo	Date closest to 180 days after consent when systolic blood pressure was recorded
sys_val_0mo	Systolic blood pressure recorded closest to baseline
sys_val_12mo	Systolic blood pressure recorded closest to 360 days after consent
sys_val_6mo	Systolic blood pressure recorded closest to 180 days after consent
total_chol_date_0mo	Date closest to baseline when total cholesterol was recorded
total_chol_date_12mo	Date closest to 360 days after consent when total cholesterol was recorded
total_chol_date_6mo	Date closest to 180 days after consent when total cholesterol was recorded
total_chol_val_0mo	Total cholesterol result recorded closest to baseline
total_chol_val_12mo	Total cholesterol result recorded closest to 360 days after consent
total_chol_val_6mo	Total cholesterol result recorded closest to 180 days after consent
total_payment_0mo	Total value of all claims at baseline
total_payment_12mo	Total value of all claims during the first 360 days after consent
total_payment_6mo	Total value of all claims during the first 180 days after consent
treat_now	Indicator variable for receiving the intervention immediately after consent (beign in the "treatment group")
trigly_date_0mo	Date closest to baseline when triglycerides were recorded

trigly_date_12mo	Date closest to 360 days after consent when triglycerides were recorded
trigly_date_6mo	Date closest to 180 days after consent when triglycerides were recorded
trigly_val_0mo	Triglycerides result recorded closest to baseline
trigly_val_12mo	Triglycerides result recorded closest to 360 days after consent
trigly_val_6mo	Triglycerides result recorded closest to 180 days after consent
vegetables_num	Reported number of times eating dark green vegetables in the past week
weight_date_0mo	Date closest to baseline when weight was recorded
weight_date_12mo	Date closest to 360 days after consent when weight was recorded
weight_date_6mo	Date closest to 180 days after consent when weight was recorded
weight_val_0mo	Weight recorded closest to baseline
weight_val_12mo	Weight recorded closest to 360 days after consent
weight_val_6mo	Weight recorded closest to 180 days after consent
weight_visits_n_0mo	Number of weight loss/management visits at baseline
weight_visits_n_12mo	Number of weight loss/management visits during the first 360 days after consent
weight_visits_n_6mo	Number of weight loss/management visits during the first 180 days after consent