

Clinical Outcomes of a Food Is Medicine Initiative for Diabetes Management in Rural Appalachia

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Abstract

Background: Rural Appalachia has a disproportionate burden of diabetes, driven by obesity and limited access to healthcare, affordable healthy food, and diabetes education. In rural Kentucky, diabetes prevalence is 23% versus 13.8% statewide, and 62% of rural US counties lack diabetes education programs. Food Is Medicine interventions aim to address these gaps through nutrition education, behavior change, and supportive resources.

Objectives: To evaluate the clinical impact of Food Is Medicine (FIM) interventions on diabetes management across a rural Appalachian health system.

Method: Evaluated a community-based diabetes program (2022–2025) across Appalachian sites. Attendance was measured as the proportion attended. Analyses included yearly, longitudinal, and multi-site cohorts. A1C change (final–initial) and meaningful improvement ($\geq 0.5\%$, $\geq 1.0\%$) were assessed. Weight and high A1C subgroups were analyzed. Statistics included paired t-tests and regression ($\alpha = 0.05$).

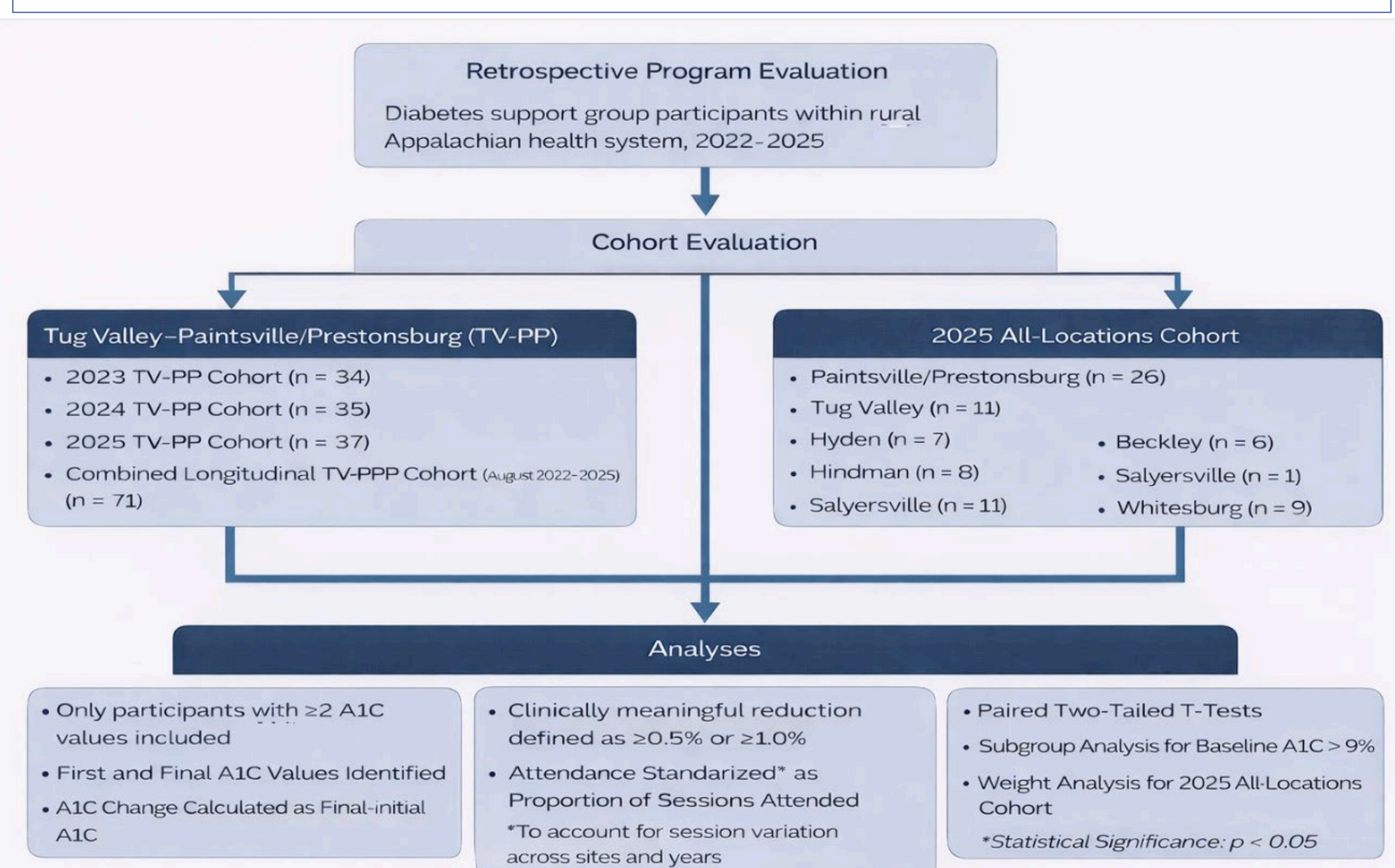
Results: The program demonstrated modest improvements in glycemic control, with a statistically significant A1C reduction observed in the 2025 all-locations cohort (-0.20% , $p = 0.012$) and a near-significant reduction in the combined longitudinal cohort. Approximately 22–27% of participants achieved clinically meaningful A1C reductions ($\geq 0.5\%$), and over half showed some improvement. Weight outcomes also showed a small but significant decrease (-2.99 lbs, $p = 0.0038$). Participants with baseline A1C $\geq 9\%$ experienced the greatest reductions, exceeding 2% on average.

Conclusions: The program demonstrated improvements in A1C and weight, with the greatest benefit observed in participants with poorly controlled diabetes. These findings support the effectiveness of community-based diabetes support programs and their potential for broader implementation.

Introduction

Food Is Medicine includes interventions developed by the U.S. Department of Health and Human Services started in response to reduce nutrition-related chronic diseases and food insecurity in 2023. They include a broad range of approaches that promote health, support healing, and reduce disease burden by providing nutritious foods, education, human services, and policy-level interventions through collaboration between health care systems and communities. Given the high prevalence of diabetes in Eastern Kentucky, diabetes support groups, using Food Is Medicine interventions, were implemented across ARH hospitals, with participant A1C and weight tracked longitudinally. Real-world evidence describing clinical outcomes among diabetes support group participants in rural health systems remains limited. It is hypothesized that participation in diabetes support groups improves A1C and reduces weight among adults with diabetes.

Methods

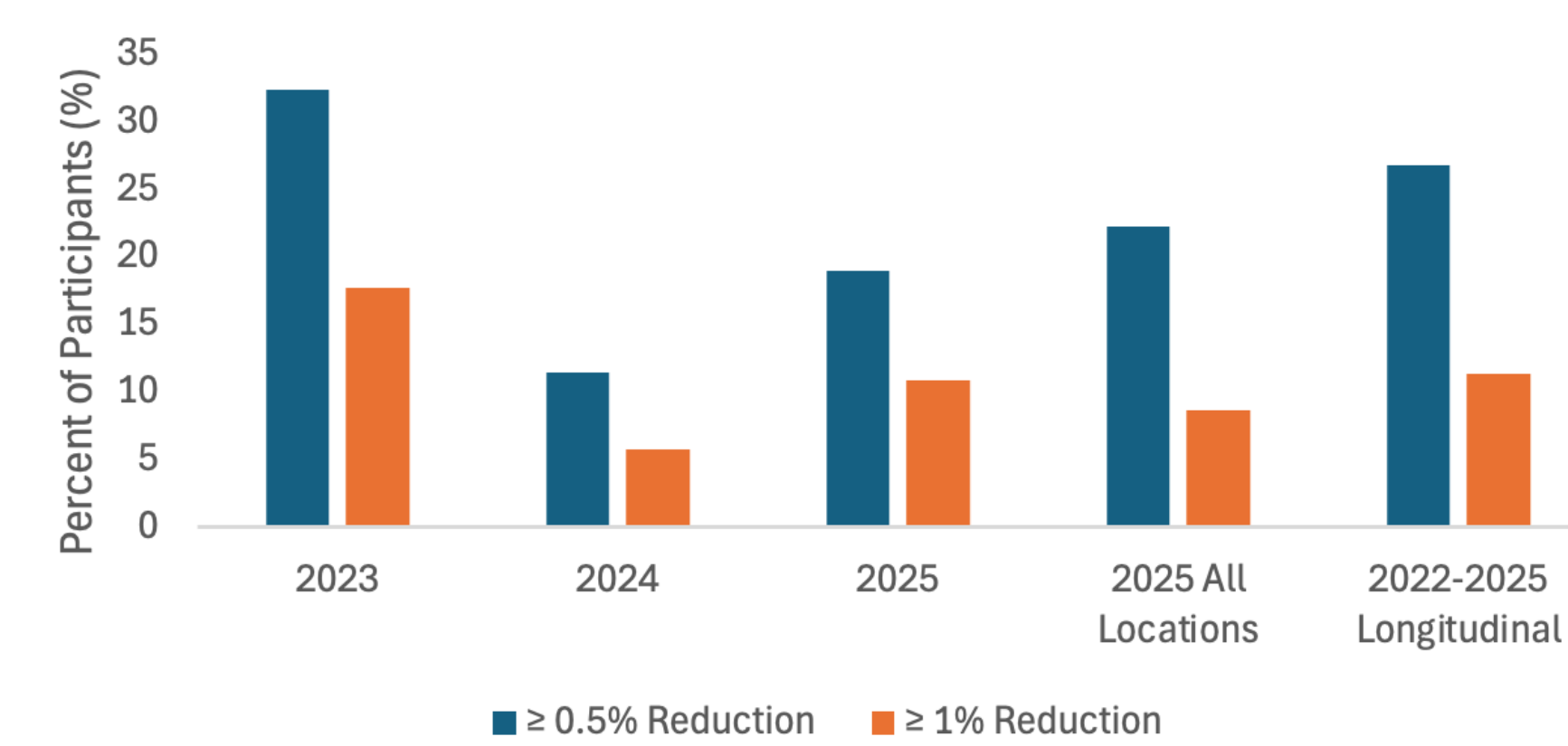


Results

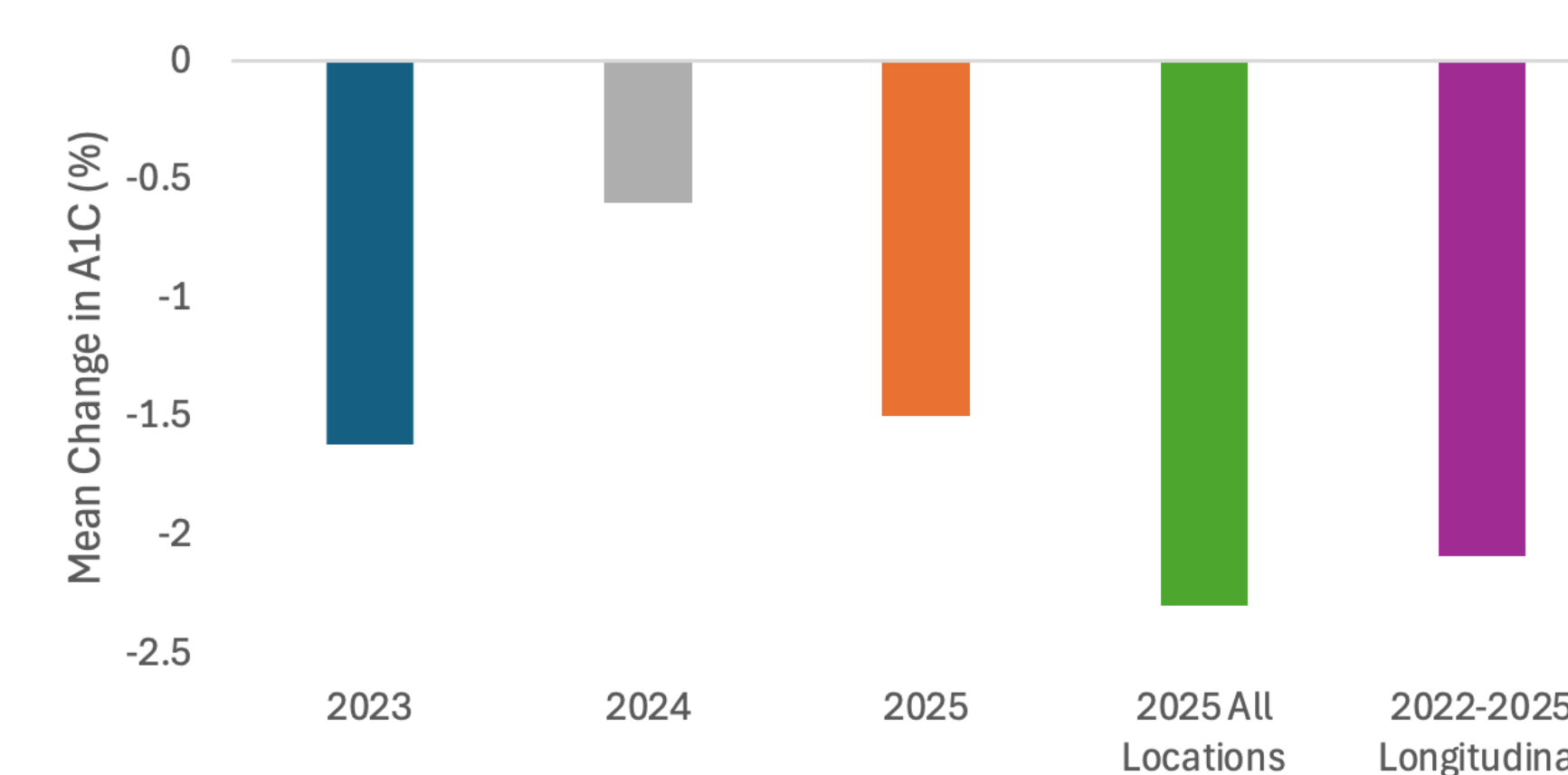
Primary Statistical Outcomes

COHORT	N	MEAN FIRST A1C	MEAN FINAL A1C	MEAN ΔA1C	T-STAT	P (TWO-TAIL)	COHEN'S D
2023	34	7.153	6.850	-0.303	1.7067	0.0973	-0.293
2024	35	6.680	6.700	0.020	-0.1923	0.8487	0.032
2025 TV-PP	37	6.557	6.416	-0.141	1.3976	0.1708	-0.230
2025 ALL LOCATIONS	81	6.596	6.397	-0.199	2.5672	0.0121	-0.285
2022–2025 LONGITUDINAL	71	6.970	6.715	-0.255	1.9692	0.0529	-0.234

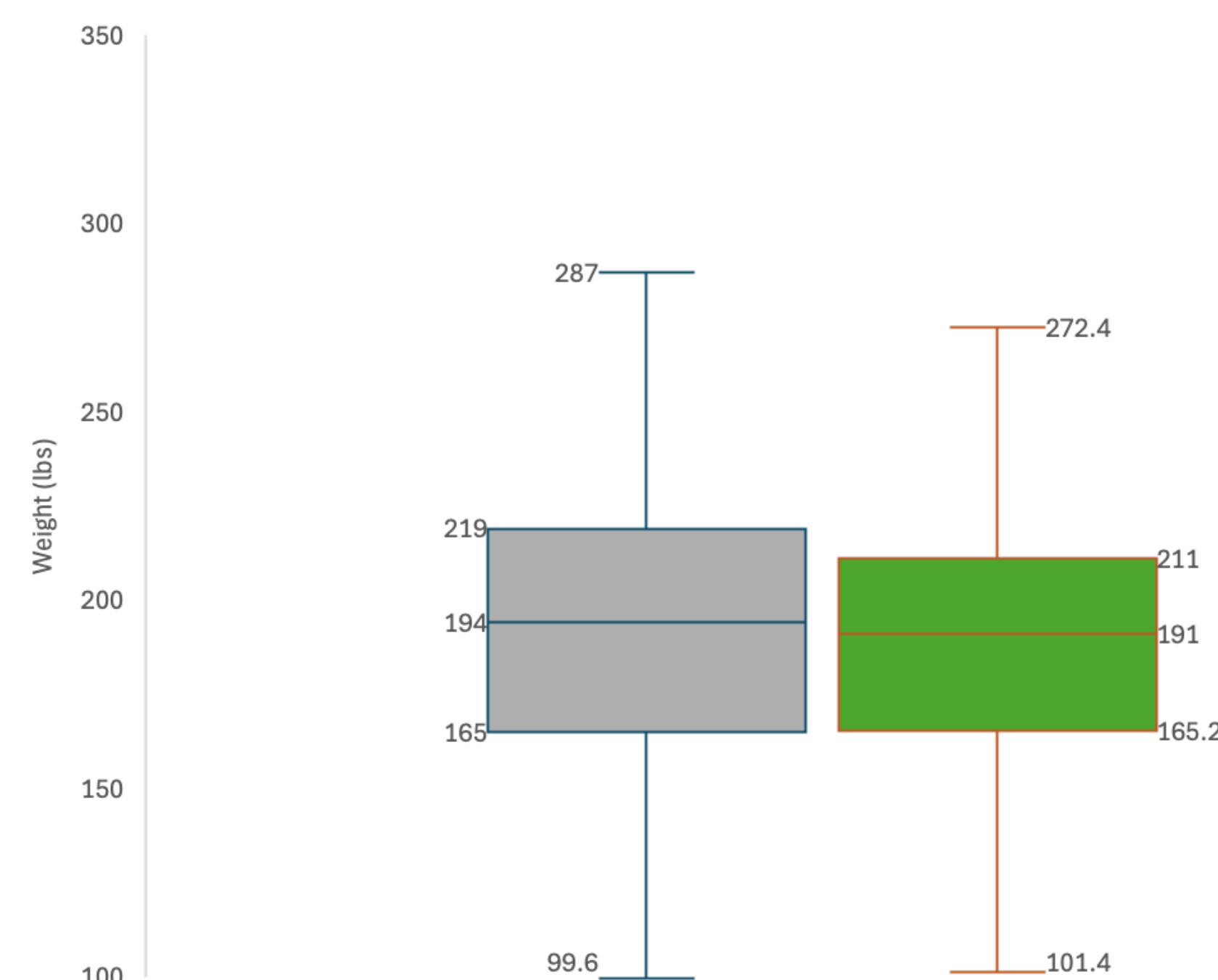
Participants Achieving Clinically Meaningful A1C Reduction by Cohort



Mean A1C Reduction Among Participants With Baseline A1C ≥ 9



Distribution of Participant Weight Before and After Program Participation for 2025 All Locations Cohort



Discussion

Discussion: This Food Is Medicine–based diabetes support initiative was associated with modest but meaningful improvements in clinical outcomes across a rural Appalachian health system. The strongest glycemic effect was observed in the 2025 all-locations cohort, where A1C decreased significantly, while the combined longitudinal cohort also showed improvement that approached statistical significance. More than half of participants in the longitudinal and 2025 all-locations cohorts experienced some reduction in A1C, and approximately one-quarter achieved clinically meaningful reductions of at least 0.5%. These improvements in A1C suggest that diabetes support groups can improve outcomes in adult patients with diabetes. Weight also decreased significantly in the 2025 all-locations cohort, supporting the program’s impact beyond glycemic control alone. Participants with baseline A1C $\geq 9\%$ experienced the greatest improvement, suggesting that the intervention may be especially beneficial for individuals with poorer baseline diabetes control. Attendance showed a directional relationship with improved A1C outcomes, particularly in the 2025 TV-PP cohort, although this association did not consistently reach statistical significance.

Limitations: This study was a retrospective program evaluation rather than a randomized controlled trial, so causation cannot be established. Sample sizes were modest in several yearly and subgroup analyses, which may have limited statistical power. A1C and weight measurements were not available for all participants, and repeated measures occurred at variable time intervals. The Tug Valley–Paintsville/Prestonsburg site served as the primary longitudinal site, while the 2025 all-locations cohort included multiple sites with different implementation timelines and attendance opportunities. Weight was only available in the 2025 all-locations cohort, limiting comparisons across years. In addition, attendance alone may not capture all factors influencing outcomes, including medication changes, dietary differences outside of program participation, and other clinical or social determinants of health.

Future Studies: Future studies should include larger multi-site samples, more standardized follow-up intervals, and analyses of site-level differences, virtual versus in-person participation, and high-risk subgroups. Additional work should also evaluate whether longer participation duration is associated with greater improvement in A1C and weight outcomes.

References

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- Centers for Disease Control and Prevention. (2024, July 24). *Diabetes self-management: Rural policy brief*. Centers for Disease Control and Prevention.

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