

# Comparing Resident Engagement in Rural and Urban Kentucky Skilled Nursing Facility Settings using Bingocize®



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## Background

- **Bingocize** is a 12-week program that integrates exercises into bingo games, encouraging physical activity to enhance senior health.<sup>1,2</sup>
- Bingocize is implemented twice per week for 45-60 minute sessions, resulting in 15 total minutes of range of motion therapy.
- Rural skilled nursing facilities greatly differ from urban facilities, facing more unique challenges such as recruiting and retaining workforce, increased barriers to physical activity, limited specialized programming, and limited financial resources.<sup>3</sup>
- Programming success in rural versus urban nursing facilities depends on resource availability, trained staff, and program adaptability.<sup>4</sup>
- This research aims to compare total and active participant engagement in Bingocize® between rural and urban skilled nursing facilities in Kentucky, examining the program in 12-week cycles for a full year to assess active and unique engagement patterns across the settings.

## Key Findings

- **Urban** facilities had significantly **more unique participants** than rural facilities, but there was **no significant difference in active** participants.
- For both rural and urban facilities, **unique participation was highest in the first cycle** and then **stabilized** in later cycles.
- **Active** participation remained **stable across all cycles**, with no significant differences between rural and urban facilities.

## Methods

### Data Collection

- Attendance data collected through de-identified paper logs of 17 skilled nursing facilities participating in the Kentucky CMP Project.
- Data were entered into Qualtrics and exported to Excel.
- Eligibility criteria included facilities actively implementing Bingocize® with a minimum of 12 months of attendance data at the time of analysis.
- Facility locations cross-referenced with the U.S. Census 2010 "County Rural Lookup" records, where counties were then recategorized as either rural or urban.<sup>5</sup>

### Statistical Analyses

- Excel pivot tables used to total unique and active participant data for each site.
  - **Unique participants:** First-time attendees of Bingocize®, counted once per facility.
  - **Active participation:** Total sessions attended by each participant per month.
- Totals for unique and active participation were imported into SPSS 28.0, where rural/urban status was made the independent variable.
- Independent t-tests conducted to compare total unique and active participants between rural and urban facilities over 12 months.
- Repeated measures ANOVA performed to analyze participation data across four 3-month cycles.
- The significance level was set at  $p \leq 0.05$ .

Figure 1. Participating Kentucky CMP Project Nursing Facilities and Community Partners

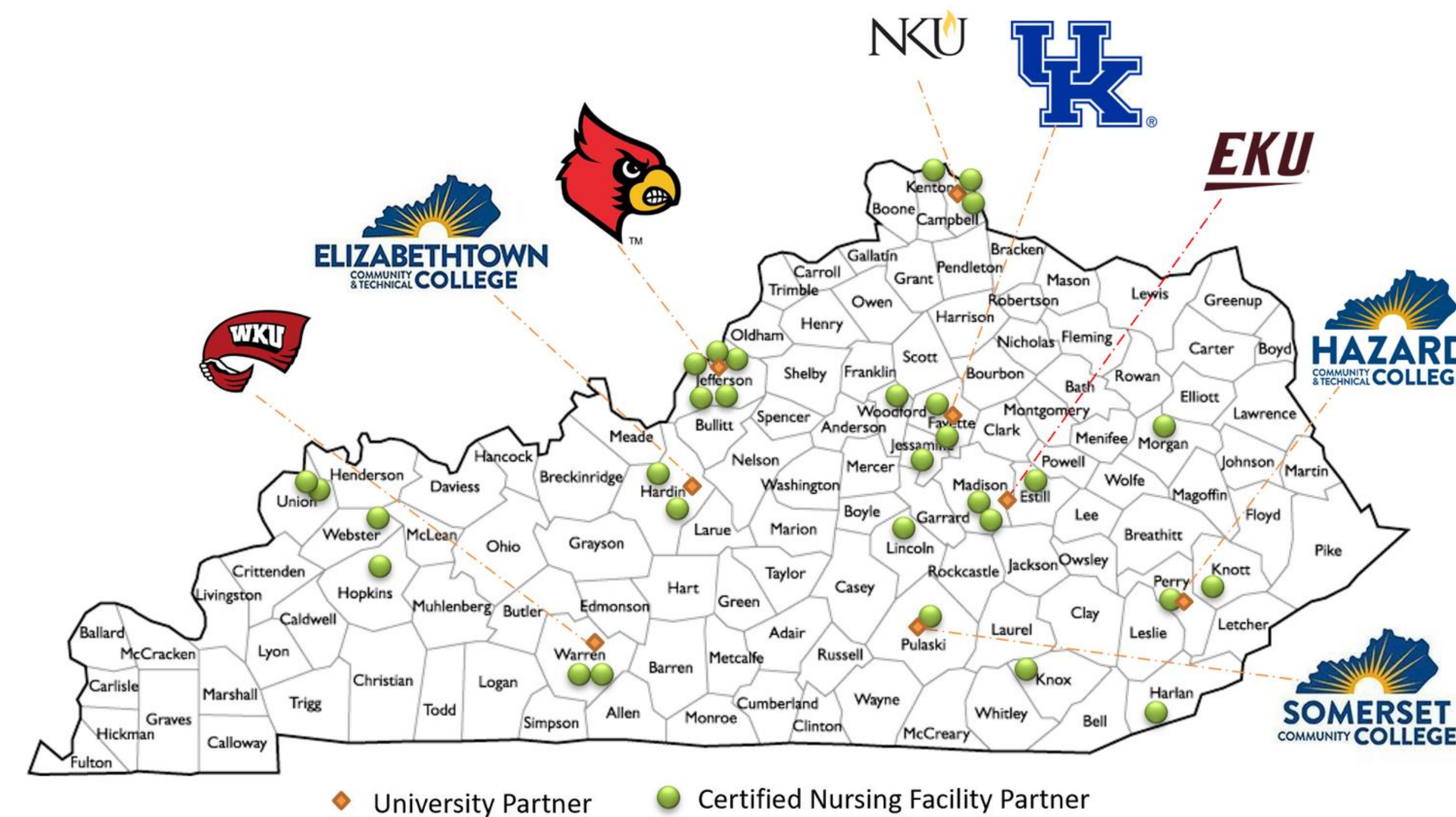


Figure 2. Trends of Unique Participants Across Cycles by Site

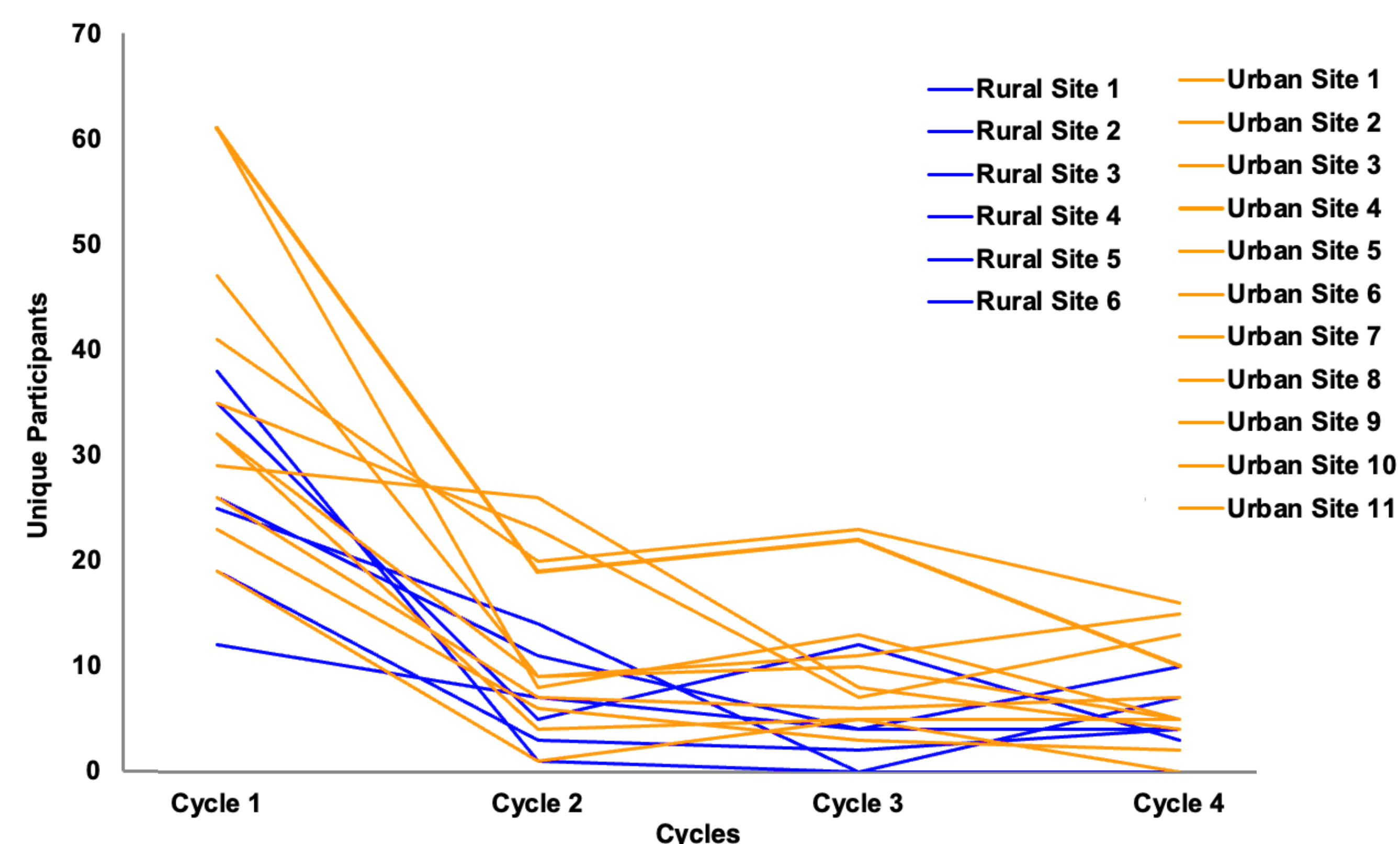
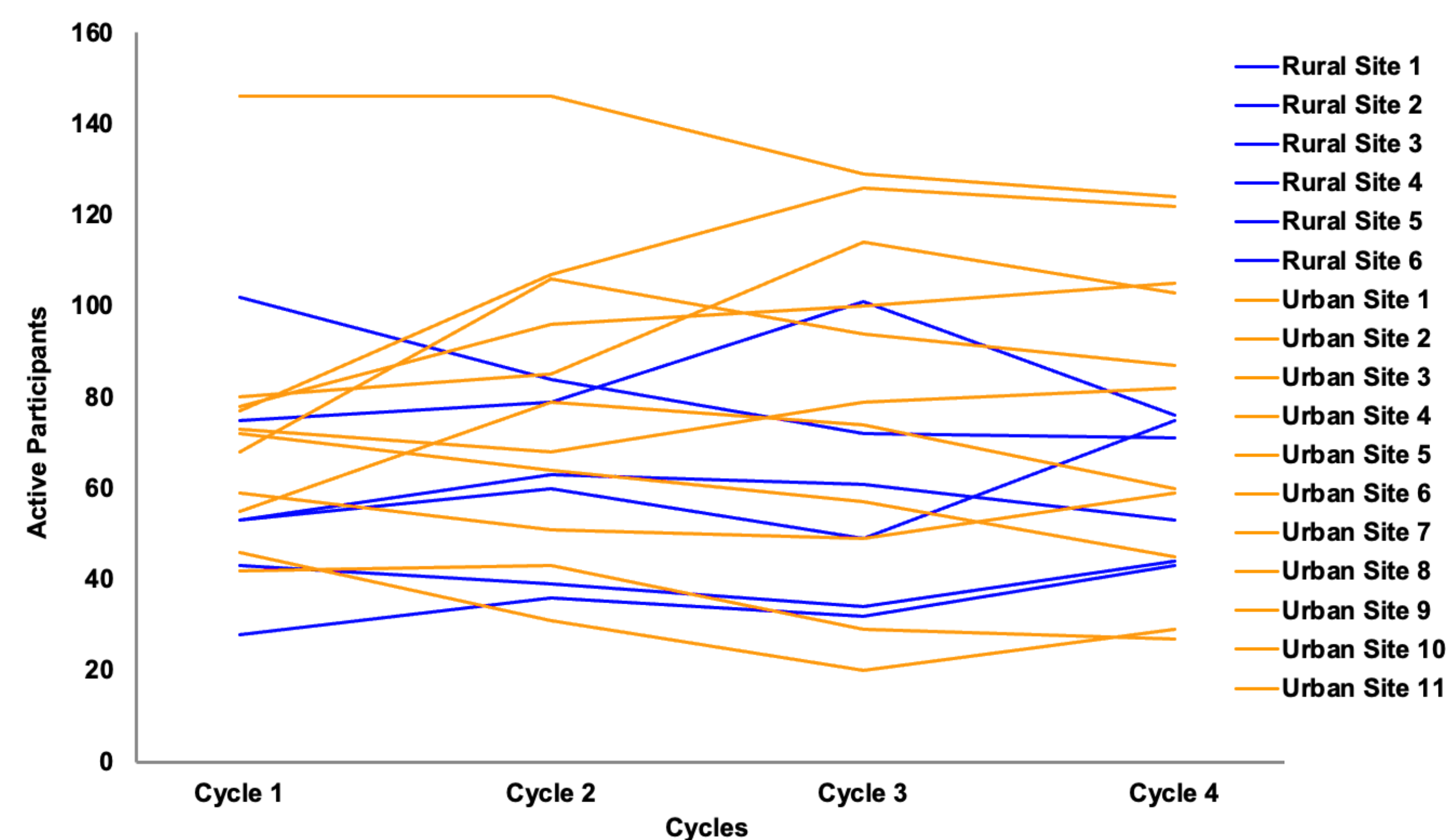


Figure 3. Trends of Active Participants Across Cycles by Site



## Results

### Independent T-Tests

- **Urban sites** (M = 66.64, SD = 26.88) had significantly more unique participants (M = 41.00, SD = 11.75);  $t(15) = -2.199, p = .044$ , Cohen's  $d = -1.12$ .
- **No significant difference in active participants** between urban (M = 307.82, SD = 126.46) and rural (M = 237.67, SD = 81.09) sites;  $t(15) = -1.219, p = .242$ , Cohen's  $d = -0.62$ .

Assumptions of equal variance were met for both comparisons.

### Repeated Measures ANOVAs

#### Unique Participants

- The number of unique participants significantly changed across cycles ( $F(3, 45) = 45.105, p < .001, \eta^2p = 0.750$ ).
- **No significant interaction between Time and Geographic Type** ( $F(3, 45) = 0.948, p = .426, \eta^2p = 0.059$ ).
- In post-hoc comparisons, urban sites had more unique participants than rural sites rural across all cycles. **Cycle 1 unique participation differed significantly from Cycles 2–4** ( $p < .001$ ), but unique participation in Cycles 2–4 did not differ ( $p > 0.05$ ).

Normality was violated. Greenhouse-Geisser corrections applied (Mauchly's Test,  $p < .001$ ). Homogeneity of variance violated (Levene's Test,  $p < .05$ ).

#### Active Participation

- There were **no significant main effects or interactions**.

Violation of sphericity (Mauchly's Test,  $p = .044$ ); Greenhouse-Geisser corrections applied. Homogeneity of variance violated in Active Cycle 4 ( $p = .031$ ).

## Discussion and Conclusions

- Urban facilities have more unique participants, which we suspected might be due to greater bed capacity; however, an additional independent t-test showed no significant difference in bed capacity between rural and urban facilities.
- The decline in unique participation after the first cycle suggests typical attrition as the program's novelty fades or suggests a need for refinement to better maintain engagement.<sup>6,7</sup>
- After this decline, unique participation stabilized for the latter cycles. Further, active participation remained stable across cycles. This shows Bingocize's ability to sustain residents' interest over time regardless of rural or urban status.
- The smaller standard deviation in active participation at rural facilities (SD = 81.09) compared to urban facilities (SD = 126.46) suggests a core group of participants. This may be due to limited activity programming in rural facilities, making Bingocize a reliable choice for engagement.<sup>3</sup>
- Offering programming like Bingocize that sustains engagement and provides physical and mental benefits to participating residents is **critical in improving quality of life for the aging population**.

## References

## Funding



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Ickes, M., Campbell, M. Promoting Health Across the Lifespan Among Kentucky Certified Nursing Facility Residents Through Bingocize®, an Evidence-based Health Promotion Program. (\$1,200,000). July 1, 2022 – June 30, 2025