Methods and early results from an RCT to assess health impacts of home gardening with Wind River Indian Reservation families

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The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose
Introduction: Why measure health impacts of gardens?

1. Documented desire to garden in WRIR but need for support
2. Health disparities in WRIR and a need for more culturally-appropriate health interventions
Introduction: Health Disparities in Wind River Indian Reservation (WRIR)

ARDD. (2011). "Reducing Diabetes Disparities in American Indian Communities (Wind River Reservation)."


Introduction: Why measure health impacts of gardens?

1. Documented desire to garden in WRIR but need for support
2. Health disparities in WRIR and a need for more culturally-appropriate health interventions
3. Existing research (Team GROW, anecdotal evidence)
Methods: Pilot Projects in Albany County, WY and at Wind River Indian Reservation

WRIR (2013)
- 6 gardening households
- 3 control (delayed intervention)

Albany County (2013, 2016)
- 14 gardening households
- 8 control (delayed intervention)
Methods: Pilot Projects in Albany County, WY and at Wind River Indian Reservation

**Weight**

- Gardeners: +0 lbs
- Controls: +3 lbs

**Mental Health Score (SF-12)**

- Gardeners: +5 points
- Controls: -1 point
Anecdote: “A Reason to Get Up in the Morning”
Methods: Using Pilot Data

• Sample size calculations
• Added a full blood draw
• Data collections at one semi-public location
• Survey dramatically shortened with mixed modes of administration
• Information about medications and supplements
• Family-based interventions must include children
• Participation stipend amounts
Anecdote: “The Things We Cannot Change”

The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

- Yes, limited a lot
- Yes, limited a little
- No, not limited at all

a. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf

b. Climbing **several flights of stairs**

Survey Completion

0% [ ] 100% [ ]
Methods: Specific Aims

Objectives
- Establish, evaluate, and sustain home food gardening as a health intervention
- Expand public health relationships
- Develop LMS z-score curve

Aims
1. Establish a sustainable, scalable, culturally appropriate home garden intervention
2. Identify health impacts of home gardening in Native American Families via RCT

Rationale
Supporting home gardens with tribal families will become a culturally relevant and empowering health promotion strategy for tackling health disparities.
Methods: Partner Organizational Structure

Community Advisory Board

Aim 1: Gardening Intervention
- Blue Mountain Associates
  - Garden design and installation
  - Training and mentorship
  - Tool library

Aim 2: RCT on health impacts of home gardens
- University of Wyoming
  - Survey design and administration
  - Data management and analysis
  - Randomization
  - LMS z-curve
  - Medication change analysis
- ESTH and WRDF
  - Family recruitment and retention
- WY Health Fairs
  - Collect biometric and blood data
  - Individual health reports
Methods: Growing Resilience Overview

- Funding from NIH for a 5-year project
- Support new food gardens for 100 Wind River families
- Randomized to garden or to delayed-intervention control
- Adult BMI is primary outcome
Methods: Recruitment and Randomization

• Primarily conducted by Eastern Shoshone Tribal Health and Wind River Development Fund
• CAB and BMA also key to effort
• Posters, brochures, postcards
• Press releases
• Open houses
Methods: Quantitative Data Collection

• Two years of health data collection for all participants
• Pre- and post-intervention data collection (February and August)
• Control participants receive the gardening support intervention after two years of health data collection
## Methods: Quantitative Health Measures

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<th>Biometric</th>
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<th>Survey-Based</th>
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<td>• Full 32-level chemistry profile</td>
<td>• Food security</td>
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<td>• Waist circumference</td>
<td>• Hemoglobin A1C (diabetes)</td>
<td>• Physical &amp; mental wellness (SF-12)</td>
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<td>• Blood pressure</td>
<td>• Vitamin D (sun exposure)</td>
<td>• Health management</td>
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<td>• Hand strength</td>
<td>• Serum beta carotene (vegetable consumption)</td>
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<td>Children</td>
<td>• BMI</td>
<td>• Hemoglobin A1C via finger prick</td>
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Methods: Innovative Assessments

**LMS z-score curve**
- Internally consistent single health outcome measure for family interventions
- Use recent NHANES data
- Ages 5-74

**Changes in medication**
- Could overstate or mask impacts of gardens
- Quantify medication changes to estimated changes in biometric parameters
- E.g. 1000 mg Metformin twice daily equivalent to 30 mg/dL blood glucose levels
Methods: Qualitative Data Collection

Developing Sovereign Evaluation Methods
How do participants want to assess gardening and research experiences?
What research questions are we asking?

• Inform improvements to the intervention
• Assess community-level effects of the intervention
• Explore how the community wants to move forward after the research is over
• Investigate role of gardens in improving food sovereignty
• Investigate connections between gardening and historical and community connectedness
• Assess capacity development in civic and community-academic collaboration
Methods: Scalable Gardening Intervention

- Consultation on size/what kind of garden
- Assistance in garden installation (minimum of 80 square feet)
- Purchase of materials
- Ongoing mentorship
- Gardening workshops
- $200 gift card and ongoing mentorship for second gardening season
- Tool library hosted by BMA
Methods: Benefits

• Gardens!
• Adults receive $40/data collection ($20 if no blood draw), children receive $15
• Transportation and transportation stipends
• Regular health reports
Initial Results: Data Collection Sessions

- February 2016
  - 18 families
  - 34 adults
  - 24 children

- August 2016
  - 18 families
  - 32 adults
  - 23 children

Anecdote: “You’ll never get them to come back”
Initial Results: Gardening Intervention

• 8 of the 10 families requested raised bed gardens, and 2 requested in-ground gardens
• Average cost per family of materials for gardening support package = $507
• Next year will consider more in-ground gardens with soil tests
21% of the adults report living with diabetes

SF-12 survey results compared to US average:
  • Physical Health – 42% under, 42% within, 16% above
  • Mental Health – 36% under, 42% within, 21% above
Anecdote: “Growing Resilience”
Thank you!

A big thanks to the participants, and to our partners at Blue Mountain Associates, Eastern Shoshone Tribal Health, Wind River Development Fund, and Wyoming Health Fairs.

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Growing Resilience is supported by NHLBI with NIGMS at the National Institutes of Health with grant no. R01 HL126666-01. (www.growingresilience.org)

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