Active Living through Citizen Science: a bottom up approach

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OUR VOICE Global Citizen Science Research Network
New Zealand Chapter

http://ourvoice.stanford.edu
Aim of this Introduction for the TALES Symposium

• a “bottom up” citizen science engagement approach aimed at local changes in built & social environments

• Goal: to unleash the “pent up” power of residents to activate local environmental changes that can foster/support PA and health

• Decade of research on effects of Built environment on PA
  
  • Define Citizen Science (CS)
    • Process
    • Framework
    • Concepts/Tools
  
  • Network

• Current International Projects
  • NZ Projects

• Conclusion/Future Directions
Physical Inactivity

Worldwide trends in insufficient physical activity from 2001 to 2016: a pooled analysis of 358 population-based surveys with 1.9 million participants

Summary
Background
Insufficient physical activity is a leading risk factor for non-communicable diseases, and has a negative effect on mental health and quality of life. We describe levels of insufficient physical activity across countries, and estimate global and regional trends.

Methods
We pooled data from population-based surveys reporting the prevalence of insufficient physical activity, which included physical activity at work, at home, for transport, and during leisure time, or not doing at least 150 min of moderate-intensity, or 75 min of vigorous-intensity physical activity per week, or any equivalent combination of the two. We used regression models to adjust survey data to a standard definition and age groups. We estimated time trends using multilevel mixed-effects modelling.

Findings
We included data from 358 surveys across 166 countries, including 1.9 million participants. Global age-standardised prevalence of insufficient physical activity was 27.7% (95% uncertainty interval 25.6–29.7) in 2009, with a difference across scores of more than 9 percentage points (23.4%, 21.1–25.7) in 2009. The study found that

1. Kuwait 67%
2. American Samoa 53.4%
3. Saudi Arabia 53%
4. Iraq 52%
5. Brazil 47%
6. Costa Rica 46.1%
7. Cyprus 44.4%
8. Suriname 44.4%
9. Colombia 44%
10. Marshall Islands 43.5%
11. Portugal 43.4%
12. Bahamas 43.3%
13. Barbados 42.9%
14. New Zealand 42.4%
15. Germany 42.2%
16. Nauru 42.1%
17. Malta 41.7%
18. Argentina 41.6%
19. Italy 41.4%
20. UAE 41.4%
New Zealand’s 2018 Report Card on Physical Activity for Children and Youth

Expert panel of physical activity researchers

Has anything improved since 2008?

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<th>Behaviours</th>
<th>Nationally representative survey data</th>
<th>Grade</th>
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<td><strong>Overall Physical Activity</strong></td>
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| Strategies and Investments       | Government Initiatives    | B +   |
Most efforts to improve PA and reduce SB have resulted in limited success

What are we missing?
Our Environment has changed and the way we approach/utilize our environment has changed. Urban Sprawl, Car dependent communities, Expansive, rapid, growth away from the cities, and Commercial, residential, and industrial areas are separated from one another. Technological Advancement, Demand for more and bigger roads, and we Socialise in a very different way due to Easy & Comfortable. Our Environment has changed and the way we approach/utilize our environment has changed.
#1 People’s choices and freedoms to live functional lives without the use of the car are greatly reduced.

#2 The modern urban environment is limiting people from living active and healthy lives.

Traditional older neighbourhoods were walkable

- High population density
- Good mixture of land use
- High connectivity
- Streets were calm, narrow, visually interesting, continuous foodpaths
Must reshape our environment to allow us to be Active and Healthy, making walking, cycling and wheeling the easy and attractive choice...Active...

“A NZ where it is easy to be active every day”

Vision statement for MoH

“Physical Activity is the side effect of life”

PVC Prof Richard Barker
Global Citizen Science Research Network (Abby King)

• The *Our Voice* Global Research Network was formed in 2016 with support from the Robert Wood Johnson Foundation.

• The *Our Voice Initiative* aims to increase health equity among people of all socioeconomic backgrounds and in diverse parts of the world.

• In the *Our Voice* approach, community members — *Citizen Scientists* — gather and analyse community data, then share their findings with decision makers to advocate for changes in the local environment.
Our Voice: Global Citizen Science Research Network for Health Equity

(Robert Wood Johnson Foundation planning grant)

So far:
19 countries
6 continents

Project in process or completed
Planning underway
‘It Takes a (global) Village’ – Collaborating Organizations

**U.S. Collaborators:** (selected)
- Stanford University *(organizing institution)*
- Arizona State U.
- Cornell
- GirlTrek, USA
- LeadingAge, USA
- Place Labs, San Francisco, CA
- San Francisco State U., CA
- U Alaska, Anchorage
- U California, Irvine
- San Mateo Co. CA Public Health Dept.
- Santa Clara Co. CA Public Health Dept.; Somos Mayfair
- Solano Co. CA Public Health Dept.
- Tulane U. School of Public Health & Tropical Medicine, LA
- Washington University at St. Louis, Missouri

**International Collaborators:** (selected)
- Aukland Univ of Tech, New Zealand
- FA Univ of Erlangen-Nuremberg, Germany
- Federal U. of Santa Maria, Brazil
- Glasgow Caledonian U, Scotland
- Instituto Nacional de Salud Pública, Mexico
- ITRI-Taiwan; Kaohsiung Medical U., Taiwan
- JDC Israel Eshel • University of Haifa, Israel
- Mälardalen University, Västerås, Sweden
- Public Health Foundation of India
- Univ. de los Andes, Bogotá, Colombia
- Univ. of Birmingham, UK
- Univ. of Cape Town, S. Africa
- Universidad de la Frontera, Chile
- Univ. of Kwa-Zulu-Natal, S. Africa
- Univ. of Manitoba, Canada
- Université Nice Sophia Antipolis, France
- Univ. of Queensland, Australia

**Funding:** Robert Wood Johnson Foundation, US National Cancer Institute, US, Nutrilite Health Institute Wellness Fund, Stanford Discovery Innovation Fund, ITRI Taiwan, Silicon Valley Community Foundation, CA.
What do we mean by CITIZEN SCIENCE?

• A centuries old tradition of resident engagement
  • FOR the people
    • Donation of biological specimens (biomedical research)
    • “big” data for free-living, population-level surveillance of health behaviors or disease outcomes
  
  • WITH the people
    • Active data collection (natural phenomena or built environments)
  
  • BY the people
    • Participate in setting objectives; Collect & help interpret data; Solution building
Citizen Science BY the People

- Incorporates strengths of **two perspectives**: 
  
  - **Community-based Participatory Research**: residents participate in problem identification, input, and local community applications
  
  - **Citizen Science**: brings systematic, scalable methods to resident-based “real-world” data collection
Beginning with neighbourhood walks using the Discovery Tool, Citizen Scientists engage in a four-step process to build healthier communities.

Discover
Discuss
Advocate
Change
The “OUR VOICE” Citizen Science Research Initiative

- **Facilitators** of this process can be researchers, community organizations, govt. groups, or local opinion leaders or residents themselves

It starts with an easy-to-use mobile app: Stanford Healthy Neighborhood Discovery Tool


Used by residents, *irrespective of ‘tech literacy’ or language*, to assess community features that *promote or hinder* healthy living or daily well-being

Collect neighborhood info via **GPS Route tracking/ Geo-coded Photos & Audio narratives**; as few as 8-10 residents needed to get “saturation” around top barriers & enablers of healthy living
Next, in a facilitated process, Residents:

- *share* their photos & “stories” collected on their walks with other residents
- *build consensus* around high-priority yet realistic areas for change
- share their data with *key decision makers* & develop possible solutions
- *formulate action steps to activate local changes* (e.g., a safe, age-friendly walking route for Israeli seniors, with support of local businesses)
The Citizen Science-engaged Multi-level Research Model

starts with **OUR VOICE Intervention**
Residents collect data & learn how to activate environment changes in their community

leads to **Proximal Effects:**
Changes in relevant neighborhood structures, policies, social activities

goal of impacting **Distal Outcomes:**
- Individual-level health outcomes
- Neighborhood-level health outcomes (e.g., physical activity, food access)

*creates changes in Mediators* (e.g.):
- Neighborhood cohesion & trust
- Self-efficacy to effect environ. change
- Neighborhood social networks
- Advocacy skills & local information

*uses multi-dimensional Outcome Measures* (e.g.):
- Qualitative measures
- Geospatial info.
- Quantitative assessment
- Observational info. (e.g., # people walking)
Citizen Science Activities in East Palo Alto, CA

- Tested initially with low-income, ethnically diverse older adults in East Palo Alto, CA (USA)

- Older low-income Residents were able to use Discovery tool to identify neighborhood barriers to physical activity/healthy food choices, & advocate for change

- Helped in activating City planning committee & City Council to make a number of changes & investments to enhance community infrastructure for active living

Successes in E. Palo Alto, CA

City appropriated $400,000 for environmental analysis

• Created a safer walking environment through revising and repairing streetscapes & sidewalks

• Improved access to local senior center

Helped seniors develop a *local community garden*

Local orgs. taught seniors how to *garden & cook vegetables*

Resident reports of *enhanced social cohesion*

Education, Environment & Policy impacts of North Fair Oaks citizen scientists

- Alerting waste management authorities about illegal dumping of trash & other items (e.g., mattresses) from other neighborhoods
- Helped form a Community Advisory Board to provide ongoing guidance on best practices to improve community health
- Developed a bilingual Community Resource Guide that included contact details for local safety & service providers
- Worked to involve staff from the nearby Health Center to encourage program sustainability
Other Proximal Effects of Our Voice projects

Safer, more user-friendly city-wide ‘open streets’ recreational programs (Colombia)

- Increased age-friendly walking routes to destinations (Israel)
- Identified under-utilized spaces for potential recreational use by seniors (Taiwan)
- Created safer ways to walk/bike to school (USA) & healthier school environ. (Colombia)
- Developed strategies for improving control of stray/roaming dogs (Mexico)
- Identified strategies for healthier food access in urban & rural areas (US, Colombia)
- Enacting local park improvements to increase community physical activity & greater park utilization (US, Colombia)

Now Testing *Distal Effects* of the *Our Voice* citizen science model — *Steps for Change Trial* (NIH R01CA211048)

**QUESTION OF INTEREST:**
Can citizen science activities help augment & sustain effects of physical activity interventions in under-resourced communities?

**OUTCOMES:** PA, health-related outcomes at individual & neighborhood levels
Additional Target Areas for Change being explored

- Barriers to *cycling to work* in low-income workers [Temuco, Chile]
- Understanding living conditions of those who are *homeless* [Colombia]
- Teaching *civic engagement* among school children [South Africa]
- Tackling *gender-based violence* on U.S. college campuses
- Enriching *university campuses* for PA & healthy eating [New Zealand]
- Making urban environments safe for *frail older adults* [Australia]
- Solution-building around *affordable housing & public transit* [SF Bay area]
Aim

- To empower the students
- To identify the main barriers and facilitators for healthy environments on campus
- To facilitate the advocacy process
Auckland, New Zealand
- Urban areas
- University-Four campuses
- 61 participants
- 69% female
- 486 photographs and audios
Enablers and Barriers to Healthy Environments around the world from the Youth perspective—New Zealand

**Importance of Aesthetics**

**Wide Spaces**

**Access to buildings between classes**

**Wasted space on campus**

“I have to walk ... all the way round there, all the way past the education, all the way just to basically cross the field. It drives me nuts!”

“Maybe have some sort of hands on activities. Be on your way to class and maybe you just want to take a break and ‘I thought I would just play table tennis ...’”
Phase 3:
Students meet to set priorities

- Pictures reviewed and discussed
- Reached consensus on priority topics and proposed feasible solutions
- Engaging with student union to advocate for change
Observations

- Meaningful and sensible process
- Empowerment and visibility of individuals and groups
- Portable, transferable and applied to any setting
- Engaging
- Ownership and having a voice
- Pictures are a thousand words
- Decision makers open to the idea
Together, this growing body of Research shows that:

Residents ages 9 to 90 from diverse backgrounds & circumstances, can:

- gather & analyze data around local community features that influence their health
- & successfully advocate for healthier neighborhoods & communities

• Their role as a “change agent” also can enhance personal & group efficacy, community engagement, & lead to future advocacy efforts

King et al., TJACM, 2016; Winter et al., J Immigrant Minority Health, 2015
Take home messages

There is an added value of following a citizen science approach in promoting age and activity friendly environments.

Has provided an easy to follow framework that can be applied in any context, any population and in any country successfully.

How do you think citizen science could fit into your agenda/initiative?
Other planned projects

1. Active living through Citizen Science: A community-intergenerational approach
2. Future scientists and community leaders-Intermediate School
3. Mauriora and urban wellbeing: A holistic approach to neighbourhood transformation
4. Kaupapa Maori and Urban active living
5. Feasibility
Our Mantra

• “Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it’s the only thing that ever has”.

  Margaret Mead

Our Website: http://ourvoice.stanford.edu

https://www.youtube.com/watch?v=sYcYXh51BI0
Thank you

- Research Fellows
- Auckland University of Technology, New Zealand
- Our Voice-Citizen Science Global Research Network
- Team at Stanford University
International Society of Behavioral Nutrition and Physical Activity

• We are hosting
• International conference in Auckland
• Expecting 500+ delegates
• June 24-26, 2020
• Abstract submissions later this year
• Policy and Environments stream

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