



The Australian Prevention  
Partnership Centre



THE UNIVERSITY OF  
SYDNEY

# Using citizen science to address prevention challenges

Prevention Centre Research Seminar

Dr Sam Rowbotham  
Menzies Centre for Health Policy and Economics,  
University of Sydney

27<sup>th</sup> July 2023



# Acknowledgement of country

We acknowledge Aboriginal and Torres Strait Islander peoples as the First Australians and Traditional Custodians of the lands where we live, learn and work.



# Citizen Science in Prevention Core Project Team



Dr Sam Rowbo  
(Project Co-Leader)



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(Project Co-Leader)



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# Citizen Science in Prevention Partners



**VicHealth**  
Emma Saleeba  
Sean O'Rourke  
Karen Turner



**South West Sydney  
LHD**  
Karen Wardle  
Sheree Whittaker  
Amani Sobhan  
Nicola Maitland



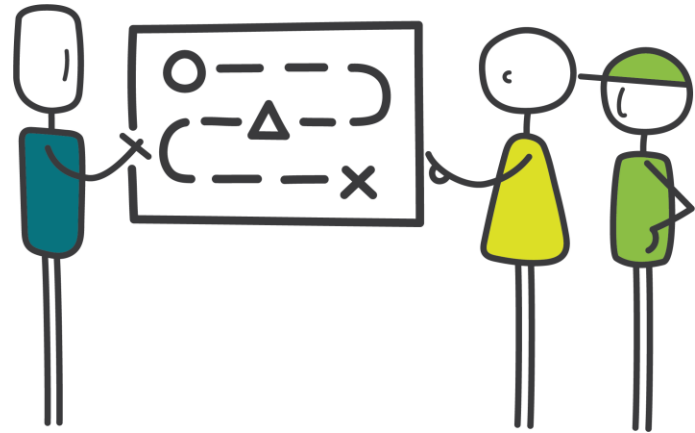
**Tasmanian DOH/  
UTAS**  
Kate Garvey  
Dr Kim Jose



**Wellbeing SA**  
Katherine Pontifex  
Prof Katina D'Onise

# Session outline

- **Introduction to citizen science**
- **Citizen science in Prevention project**
  - Overview and objectives
  - Stakeholder-led citizen science projects
  - Capacity building activities
  - Reflections
- **Panel discussion and questions**

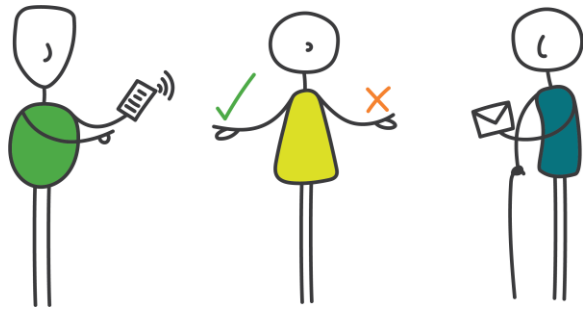


# Introduction to Citizen Science



# What is citizen science?

Research conducted, in whole or in part, by members of the public



Research ideas



Research design



Collecting data



Interpreting data



Communicating findings

# What is citizen science?

Define a question/issue

Gather information

Develop explanations

Design data collection methods

Collect samples

Analyse samples

Analyse data

Interpret data/conclude

Disseminate findings

Discuss results/inquire further

**Contributory**

**Collaborative**

**Co-created**



# Potential benefits of citizen science

## Resources

- Access to 'hard to reach' data
- New perspectives on problems and solutions
- Time, effort, and labour

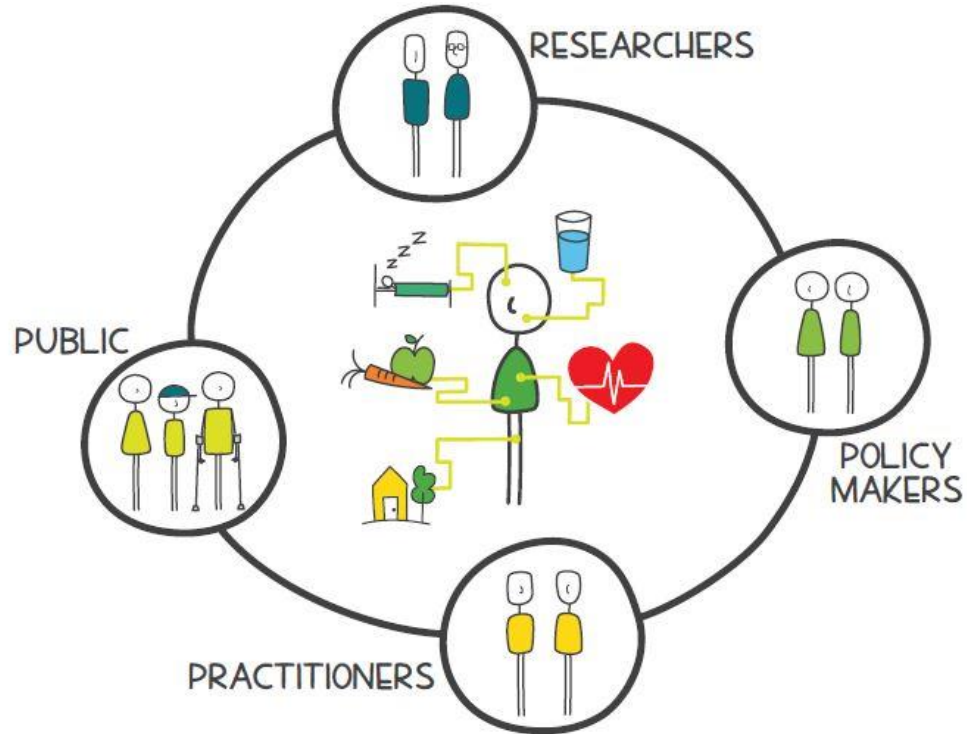
## Engagement, education, outreach

- Better public understanding of science and health
- Increased public support for research and policy
- Empowered citizens, increased self-efficacy and social capital

## Democratisation of research

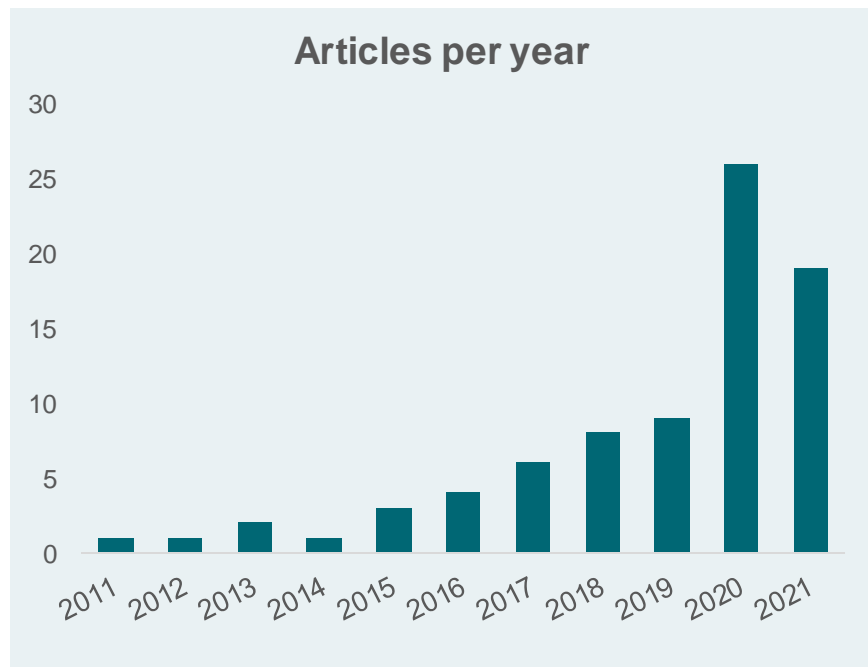
- Gives citizens a stake in issues that concern them
- Gives citizens input/control over research process
- Ensures research addresses community needs and local contextual factors (e.g. culture, language)

# Citizen science in prevention

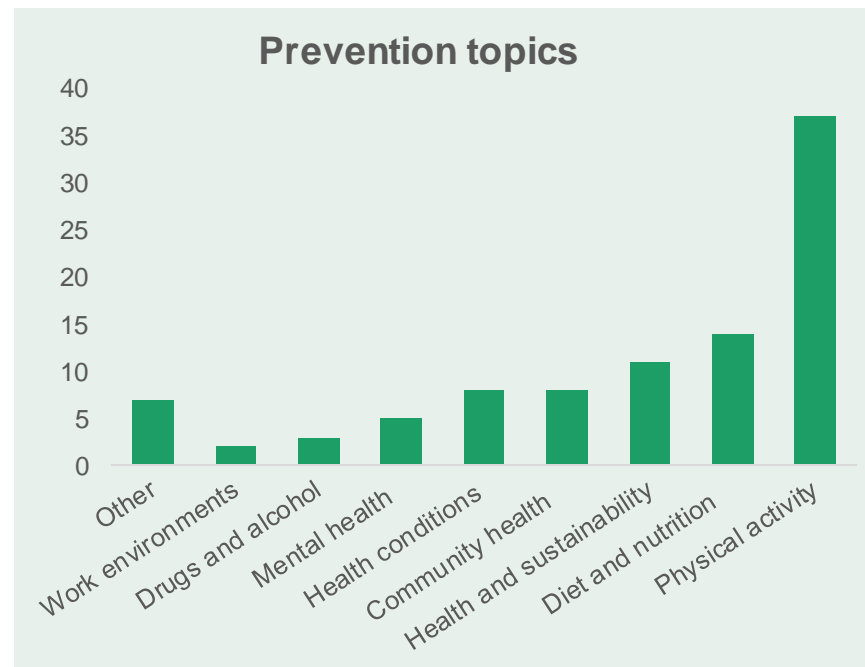


# How has citizen science been used in prevention?

■ 81 articles (76 projects)



■ Mainly physical activity or nutrition



Marks, L., Laird, Y., Trevena, H., Smith, B. J., & Rowbotham, S. A scoping review of citizen science approaches in chronic disease prevention. *Frontiers in Public Health*, 953. (2022). <https://doi.org/10.3389/fpubh.2022.743348>

# Aims of citizen science projects

Identify  
problems

Generate or  
prioritise  
solutions

Develop or  
deliver  
interventions

Monitor or  
evaluate  
interventions

Empowerment  
and capacity  
building

LONG RESEARCH

*Engaging Communities*

Using citizen science  
at the workplace

Samantha Rowland  
Janelle Rooney  
Vanessa Campbell


*Native American  
Uncovering  
Food Security*

**Engaging citizens in  
urban environments in California**

Maria Alejandra Rubio <sup>1</sup>,  
Ann W. Banchoff<sup>3</sup>, Oscar R.  
Olga L. Sarmiento<sup>1,\*</sup>

RESEARCH ARTICLE

Enhancing safe and healthy  
environments through community  
science: two pilot projects in  
density areas of  
California, USA

Nicole M. Rodriguez<sup>1</sup>, Alisa Arce<sup>2</sup>, Alic  
Abby C. King<sup>1,3,4\*</sup> 

Rodriguez et al. *BMC Public Health* (2019) 19:256  
<https://doi.org/10.1186/s12889-019-6563-1>

BMC Public Health

*J Urban Health* (2017) 94:180–189  
DOI 10.1007/s11524-017-0141-6

**FEAST: Empowering Community Residents  
to Use Technology to Assess and Advocate for Healthy  
Food Environments**

Jylana L. Sheats · Sandra J. Winter ·  
Priscilla Padilla Romero · Abby C. King



Marks, L., Laird, Y., Trevena, H., Smith, B. J., & Rowbotham, S. A scoping review of citizen science approaches in chronic disease prevention. *Frontiers in Public Health*, 953. (2022). <https://doi.org/10.3389/fpubh.2022.743348>

# **Citizen Science in Prevention Project**

# Objectives



1. Produce **new knowledge on the feasibility and impacts** of citizen science in policy and practice

2. **Build capacity** in the application of citizen science approaches among policy and practice stakeholders

3. **Establish a network** of stakeholders with an interest in citizen science

# Citizen Science in Prevention project

## Stakeholder-led CS projects

1. Advice and support for four stakeholder led citizen science projects
2. Cross-project discussion and learning
3. Developmental evaluation approach

*(Objectives 1, 2, 3)*

## Capacity building activities

Building capacity of a broader group of policy and practice stakeholders through:

1. Citizen science resources
2. Community of Practice
3. Tailored advice and training

*(Objectives 2, 3)*

## Exploring the potential for citizen science in preventive health research, policy and practice

1. Scoping review of citizen science in prevention
2. Alignment between citizen science and community engagement in public health
3. Policy and practice stakeholder perspectives and experiences with citizen science in prevention
4. Case study of citizen science implementation and institutionalisation in policy

*(Leah PhD)*

## Evaluation

Mixed methods evaluations of 1) stakeholder-led projects and 2) capacity building activities. Key data sources included:

1. Interviews
2. Surveys
3. Meeting notes and informal discussions with project teams
4. Webpage analytics, session attendance records

*(Objectives 1, 2)*





# **Stakeholder-led citizen science projects**

# Stakeholder-led citizen science projects

## Stakeholder-led citizen science projects

### Wellbeing SA

Evaluating a  
community garden  
initiative

### Tasmania DoH

Auditing rural  
walkability

### VicHealth

Monitoring online  
marketing by  
unhealthy industry

### South Western Sydney LHD

Evaluating urban  
regeneration

## Objectives

- To examine the **impact and feasibility of citizen science approaches** in policy and practice contexts
- To **build capacity** in the use of citizen science approaches in policy and practice settings

## Evaluation

Developmental evaluation (Patton, 2010)

- Baseline and follow up interviews with project partners and implementers
- Interviews with citizen scientists
- Meeting observations/notes and informal discussions

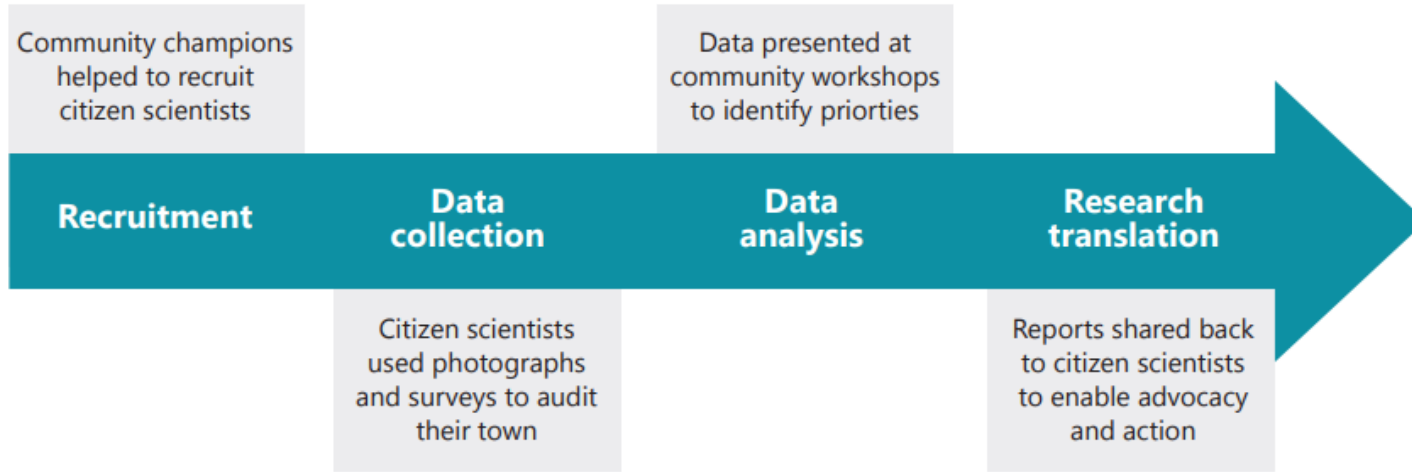
# Wellbeing SA: Evaluating a community garden initiative

Citizen scientists answered questions using a tablet while walking around different areas of the community garden with a small number engaging in a discussion at the conclusion of the primary data collection session



*‘They told me things I wasn’t expecting to hear, I was surprised by the things they valued so I think it gave insights and certainly it was that whole hard to reach data, you wouldn’t get it unless you went directly to the people who were the users of the garden’ (Project lead)*

# Tasmania DoH: Auditing rural walkability



*Generating local knowledge in context for action is very powerful ... the idea that the community themselves generated the knowledge and can use that for advocacy is part of what drove this project. (Project lead)*



# VicHealth: Monitoring online marketing by unhealthy industry

Citizen scientists captured screenshots of unhealthy digital marketing over 7-10 days and shared advertising model information from their Facebook account



Data collection

Data analysis

SMS chat and focus group discussions allowed citizen scientists to clarify findings for researchers and reflect on the data collected

*'There's something really special about this citizen science project and the types of impact it's having ... so it's not just about citizen science as a process that can draw out certain results but a process that may be able to draw out behavior change or attitudinal change' (Project lead)*



# SWSLHD: Evaluating urban regeneration





# Stakeholder-led citizen science projects



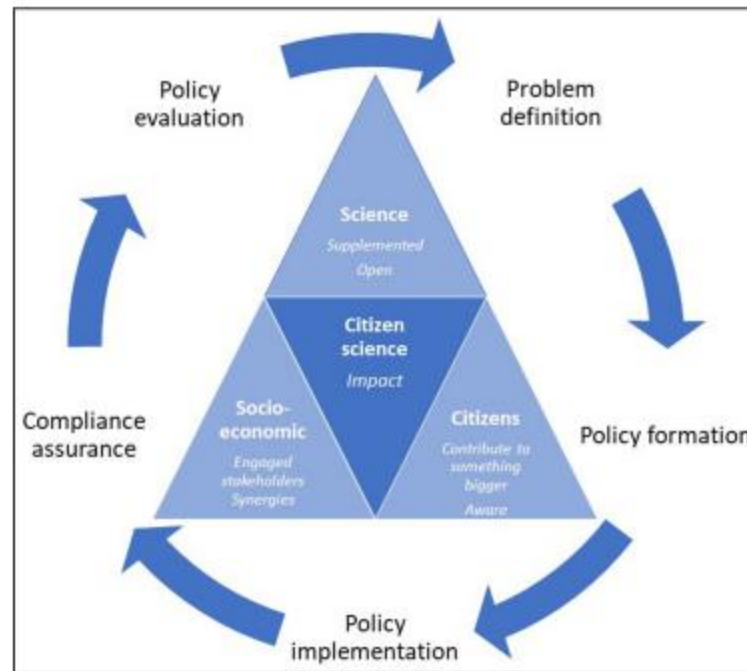
**Wellbeing SA:** Evaluating a community garden initiative



**Tasmania DoH:** Auditing rural walkability



**VicHealth:** Monitoring online marketing by unhealthy industry



Turbé, et al. (2019). Understanding the citizen science landscape for European environmental policy: an assessment and recommendations. *Citizen Science: Theory and Practice*, 4(1).



# Reflections on citizen science in practice

- Meaningful engagement with community
- Situated and contextual knowledge about how community interact with and experience their worlds (rich and novel data)
- Hearing different voices
- Sustained interest in and commitment to citizen science approaches in prevention
  - Positive reception from colleagues and managers
  - Incorporation of citizen science into organisation strategic plans
- Longer term or larger scale projects more likely to be cost-effective
- Importance of partnerships and collaboration

# Reflections on citizen science in practice

*Get a really good team behind you... someone with community experience, someone with contacts in the community, someone with managing and running a project, and then someone with the big picture oversight. You need a bit of everything... Someone with some knowledge of citizen science would be good too, but I think if you have a really good team, you can just learn it and apply it to it too*

*I think it's a challenging thing to do but ... it generates really useful data and is a really good process for community ... I feel like I'm quite the advocate for it now and I'd love to see it being used in other projects. People just need to go in with eyes open and an understanding of some of the potential challenges.*

*I say do it, and have a buddy. Make sure you're linked up with someone else doing it as well, because I think it's easier to learn together*

*I think it's a great approach... but it's definitely not cheaper, quicker and easier. So don't embark on it thinking you're going to save money or save time. But I think you just use that money and you use your resources in a different way... I think that did give some power back to the community members. They weren't just data collecting for us ... it was a mutual relationship, they were going to get something out of it that they as a community, either as an individual or groups could use.*

# Case study resources

## Citizen science for prevention case study series

This case study series aims to support the use of citizen science approaches by highlighting examples of how these approaches have been applied in practice and sharing key learnings.



### Reports

#### Reflections on using citizen science to monitor unhealthy industry digital marketing to young people

This project used a citizen science approach to generate insights into the tactics unhealthy industries are employing through targeted advertising to young people on social media.



### Reports

#### Reflections on using citizen science to evaluate the accessibility of the community gardens project

This project used a citizen science approach to understand the perceptions of community garden users to inform the design of future community gardens.



### Reports

#### Reflections on using citizen science to improve active living in rural Tasmania

This project used a citizen science approach to promote active living in rural Tasmania.

The Australian Prevention Partnership Centre

CITIZEN SCIENCE IN PREVENTION

CITIZEN SCIENCE CASE STUDY  
OCTOBER 2022

## Reflections on using citizen science to monitor unhealthy industry digital marketing to young people

**Overview**

- This research project used a citizen science approach to generate insights into the tactics unhealthy industries are employing through targeted advertising to young people on social media, and young people's understanding and attitudes towards these advertisements and their regulation.
- Young Victorians (204 individuals aged 16-25 years) were engaged as citizen scientists to collect, share, and reflect on examples of unhealthy advertising from their social media feeds. This included advertisements from alcohol, gambling and unhealthy food or fast food and sugary drink industries.
- Successful recruitment and engagement of citizen scientists was attributed to appropriate recognition of their contributions in the form of a \$100 gift card, having a young adult as a peer provide instructions to young citizen scientists in onboarding videos and maintaining communication with citizen scientists throughout the data collection period.
- A phased recruitment approach supported the inclusion of a diverse sample, allowed for data collection processes to be refined and ensured sufficient support for and engagement with participating citizen scientists.
- Project findings will be used to increase public support for change, and to engage research and policy partners in a coordinated approach to influence the reform of the current regulatory environment for digital marketing of unhealthy products.

HOW DID WE USE CITIZEN SCIENCE?    WHAT DID WE LEARN    WHAT'S NEXT

**Capacity building**

# Capacity building

## Capacity building activities

Stakeholder-led  
citizen science  
projects

Community of  
Practice

Resources

Information and  
training

## Capacity building evaluation

### Objectives

- To examine the **reach** of and engagement with capacity-building activities
- To explore **satisfaction** with capacity-building activities in terms of relevance and usefulness
- To examine **impacts** of capacity building (on knowledge, attitudes, skills and behaviour, and organisational practices)

### Data collection

September 2020 – December 2022

- Website and newsletter analytics
- End of project survey (via CoP mailing list) (n = 30)
- CoP post-session surveys
- Baseline and end of project interviews with project partners

# Capacity building activities

## Community of practice


- Currently 104 members
- 10 sessions (3 roundtables, 7 seminar sessions)
- Attendance: 25-88 per session (~480 attended/registered)

## Community of practice: Co-creating physical activity supportive environments

Toowoomba Healthy Towns is a citizen science initiative which aimed to give citizens a voice and support them to advocate for healthy, walkable and cycling communities in Toowoomba and Oakey, Queensland.

Community of practice: Co-creating physical activity supportiv...

**Discover:**  
Take photos of things that help or hinder walking and cycling


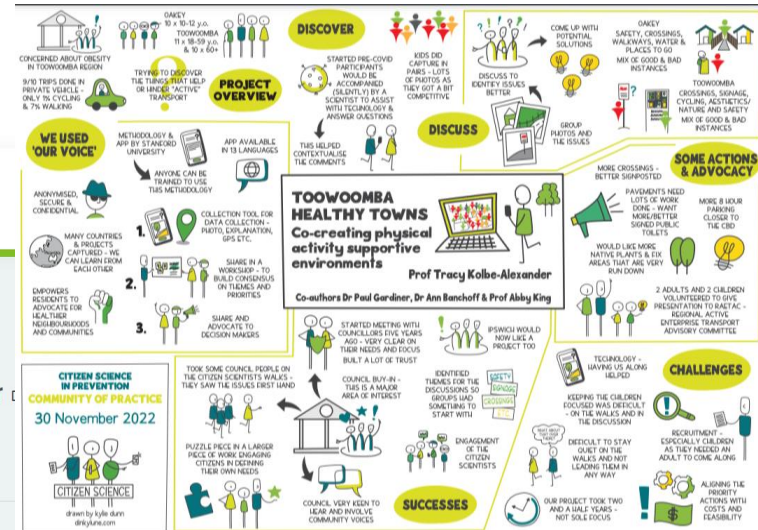


**DETAILS**

DATE	TYPE
30 Nov 2022	Videos

**Prevention experts**

**Associate Professor Tracy Kolbe-Alexander**  
Centre of Health Research, University of Southern Queensland

# Capacity building activities

## Resources

- 'What is citizen science?' explainer video (1675 views)
- Citizen science factsheet (174 views)
- Citizen science case studies (153 views)

## Explainer video: What is citizen science?

This video provides a brief and engaging introduction to citizen science approaches in prevention, and is aimed at anyone interested in finding out more about what citizen science is and the opportunities and benefits of these approaches in research, policy and practice in prevention.



## Citizen science for prevention case study series

This case study series aims to support the use of citizen science approaches by highlighting examples of how these approaches have been applied in practice and sharing key learnings.

	<b>Reports</b> <b>Reflections on using citizen science to monitor unhealthy industry digital marketing to young people</b>  This project used a citizen science approach to generate insights into the tactics unhealthy industries are employing through targeted advertising to young people on social media.
	<b>Reports</b> <b>Reflections on using citizen science to evaluate the accessibility of the community gardens project</b>  This project used a citizen science approach to understand the perceptions of community garden users to inform the design of future community gardens.
	<b>Reports</b> <b>Reflections on using citizen science to improve active living in rural Tasmania</b> 



## FACT SHEET



## Introduction to citizen science in prevention

### What is citizen science?

Citizen science is a research approach that actively involves members of the public in the research process, with the aim of generating new knowledge to address real-world problems.<sup>1,2</sup>

While originating in the natural sciences, citizen science approaches have grown rapidly in recent years across a range of disciplines, including health.<sup>3,4</sup>

Citizen science approaches can bring together community members, academic



Citizen science approaches, when used in chronic disease



# Capacity building activities

## Information and training

- Presentations/workshops for external groups (10 sessions)
- Discussions with local councils, research groups, LHDs
- One-day workshop (11 attendees)



## Applying citizen science approaches in public health

4<sup>th</sup> July 2023

Wiser Healthcare Network

Dr Sam Rowbotham, University of Sydney



# Reflections on capacity building

## Satisfaction

- Activities and resources were relevant to work
- Increased awareness, interest in and knowledge about citizen science
- Improved understanding of benefits, impacts and challenges of citizen science

## Impacts

- Many respondents had either embarked on or were actively seeking opportunities to use citizen science
- Participants reported sharing information about citizen science with colleagues and advocating for its use

*“Before, I was aware of citizen led movements for change but felt underconfident to use them or discuss with colleagues”*

*“I think it's an excellent initiative and I hope it continues and grows”*

*“Personally, I have become a big advocate of citizen science approaches in preventive health, and I spruik it every chance I get”*

**Outputs**

# Publications

## Published or submitted

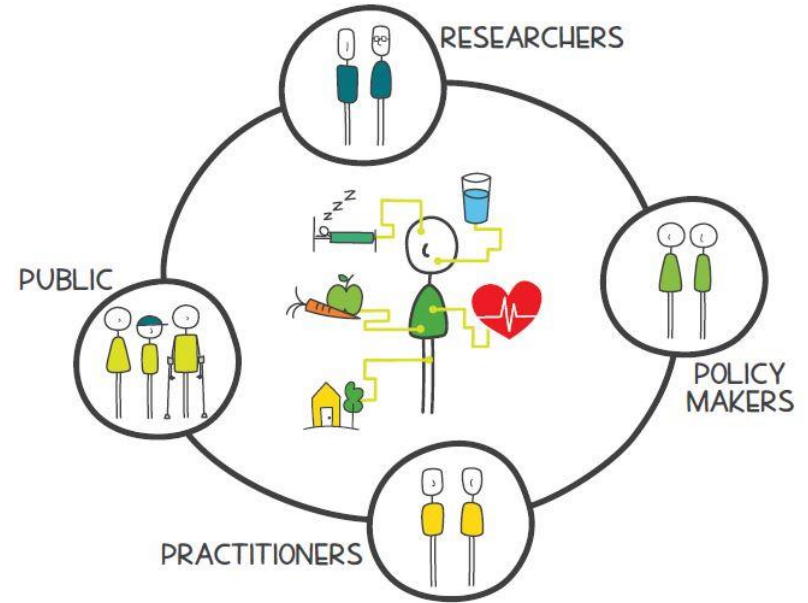
- Marks, L., Laird, Y., Trevena, H., Smith, B. J., & Rowbotham, S. (2022). A scoping review of citizen science approaches in chronic disease prevention. *Frontiers in Public Health*, 10, 743348.
- Rowbotham, S., Laird, Y., Marks, L., Walker, P., Pontifex, K., Sobhan, A., ... & Smith, B. (2022). Building capacity to apply citizen science approaches in policy and practice for public health: protocol for a developmental evaluation of four stakeholder-led projects. *Citizen Science: Theory and Practice*, 7(1).
- Rowbotham, S., Walker, P., Marks, L., Irving, M., Smith, B. J., & Laird, Y. (2023). Building capacity for citizen science in health promotion: a collaborative knowledge mobilisation approach. *Research Involvement and Engagement*, 9(1), 1-9.
- Marks, L., Smith, B. J., Mitchell, J., Laird, Y., & Rowbotham, S. (2023). The case for citizen science in public health policy and practice: a mixed methods study of policymaker and practitioner perspectives and experiences. *Health Research Policy and Systems*, 21(1), 1-15.
- Laird, Y., Marks, L., Smith, B.J., Walker, P., Garvey, K., Jose, K., O'Rourke, S., Pontifex, K., Wardle, K., Rowbotham, S. (under review). Harnessing citizen science in chronic disease prevention: perspectives of policy and practice stakeholders in Australia.

## In progress

- Feasibility and impacts of applying citizen science in health promotion: Reflections from four policy and practice-led citizen science projects (in preparation)
- How can we build capacity for citizen science in public health policy and practice? Evaluation of the Citizen Science in Prevention capacity building initiative (in preparation)
- Lessons from engaging citizen scientists in health promotion research: Find those interested in the topic, consider methods that minimise participant burden, communicate well and ensure reciprocity (in preparation)
- Piloting a citizen science approach to auditing rural walkability in Tasmania (in preparation)
- Evaluation of a citizen science workshop for policy and practice stakeholders in health promotion (in preparation)
- A case study of citizen science implementation in policy (in preparation)

# Partnerships

- Invited collaborations on approx. 9 grant applications with citizen science component
- PhD student (citizen science and healthy housing)
- Collaborators on 3 new LHD-led projects



# Final reflections

# Overall reflections

- Sustained interest in and commitment to citizen science approaches in prevention
- Information, advice and support was valued by stakeholders at various stages of their 'citizen science journey'
- Factors enabling further uptake of citizen science include:
  - Partnerships and peer-support
  - Evidence of feasibility and impacts
  - Organisational support
  - Infrastructure





# Get in touch



[citsciprevention.project@sydney.edu.au](mailto:citsciprevention.project@sydney.edu.au)

<https://preventioncentre.org.au/research-projects/harnessing-the-power-of-citizen-science-for-prevention/>

## FUNDING PARTNERS



ADMINISTERED BY



# EXPLORE

[preventioncentre.org.au](http://preventioncentre.org.au)



## Panel discussion

**Looking forward, what do you see as the main opportunities and challenges for citizen science in prevention?**



# Questions?





The Australian Prevention  
Partnership Centre  
Systems and solutions for better health