



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.¹⁻³

While originating in the natural sciences, citizen science approaches have grown rapidly in recent years across a range of disciplines, including health.⁴⁻⁶

Citizen science approaches can bring together community members, academic researchers, and policy and practice stakeholders to address complex health problems at local, state and national levels. It builds on long standing traditions of public engagement in health promotion and shares commonalities with other public engagement approaches.

What does citizen science involve?

Citizen science approaches involve working with the public ('citizen scientists') to produce research. In practice, citizen science can encompass a broad range of initiatives and activities. Depending on the aims of the project, citizen scientists may participate in some or all phases of the research process, including:

- Research project design: identifying issues or research priorities, formulating research questions, contributing to design of research methods and instruments.
- Data collection: documenting the world around them, for example by using photos or surveys to capture data on local environments.
- Data interpretation: reviewing and coding data, interpreting findings, generating solutions or recommendations for action.
- Research findings dissemination and advocacy: presenting findings to stakeholders, contributing to reports and publications, and using findings to advocate for change.

Highlights

Citizen science approaches, when used in chronic disease prevention, can:

- Connect stakeholders from the community, academia, and policy and practice to tackle complex health problems
- Provide opportunities for members of the public to participate in research and decision making that supports their health and wellbeing
- Offer methods to capture hard to reach data, gain new perspectives on problems and solutions and mobilise support for prevention research and policy.

Why take a citizen science approach in prevention?

Citizen science approaches offer opportunities for members of the public to get involved in research and decision making to support their health and wellbeing. This approach also has the potential to benefit citizen scientists, research and society ⁷, as shown in the table below.

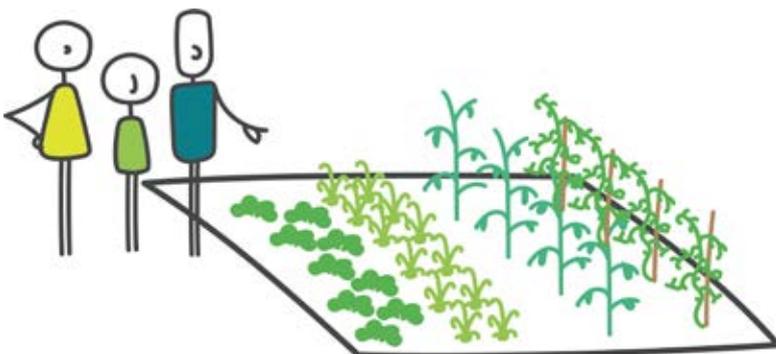
Harness resources 	<ul style="list-style-type: none">• Facilitates access to 'hard to reach' data• Provides new perspectives on problems and solutions• Harnesses the effort, expertise, skills and passion of diverse communities
Engage, educate, empower 	<ul style="list-style-type: none">• Increases public understanding of science and chronic disease prevention• Improves public support for research and policy• Empowers communities, increasing self-efficacy and social capital
Contribute to change 	<ul style="list-style-type: none">• Gives communities a stake in issues that concern them• Provides communities with evidence and tools to advocate for change• Ensures research and decision making are responsive to community needs and local contextual factors such as culture and language

When can we use a citizen science approach?

Key considerations in determining the suitability of a citizen science approach include how important community engagement is to realising project aims and objectives and potential for reciprocity, as well as capacity, resourcing, and expertise, including time to invest in applying a new approach.⁸

Citizen science approaches may be used to:

- Identify problems from the perspective of community members
- Inform planning, agenda setting and priorities for action
- Generate solutions and inform development of policies, programs or services
- Monitor and evaluate existing policies, programs or services
- Co-design and deliver prevention programs or services
- Build community capacity and partnerships to drive local change.



Examples of citizen science in prevention

Citizen science approaches have gained traction in recent years in Australia and internationally, across a variety of preventive health areas such as walkability, green space and food environments. Many of these projects engage members of the public in collecting data on aspects of their environment and bring citizen scientists together to discuss findings and identify recommendations for action.



The **Citizen Science for a Greener Adelaide project**⁹ used a citizen approach to explore perceptions and use of green spaces in Adelaide, South Australia. Community members were involved in developing, trialing and validating an audit tool to be used by community members, as trained citizen scientists, to evaluate green spaces and the built environment.



A project in the USA used **citizen science to build community awareness, support and advocacy** for a local smoke-free policy in a rural, low socioeconomic status community. Stakeholders from the local health department and a community health organisation worked with citizen scientists to collect data on air quality using wearable devices, educate the community, advocate for and successfully implement the policy.¹⁰



The **FEAST study**¹¹ used the Our Voice citizen science approach to identify factors that influence older adults' ability to access healthy foods. Citizen scientists used an app to collect photos and audio narratives of barriers and facilitators to accessing healthful foods, and subsequently met to review their findings, prioritise issues for action and advocate for and after.



Smart Indigenous Youth^{12, 13} is using citizen science to improve Indigenous youth mental health, minimise substance abuse and prevent suicide. Youth citizen scientists provided data on their perceptions and impacts of a culturally tailored physical activity program delivered via schools in rural and remote Indigenous communities in Canada.



The **Healthy Sloterveer project**¹⁴ set out to inform local action in a disadvantaged neighbourhood in Amsterdam. Citizen scientists conducted group interviews with fellow community members to identify aspects of their neighbourhood that were health promoting or inhibiting.

Although most projects to date have used citizen science to capture data on physical environments, there is scope to use these approaches in other areas of population health. Citizen science is emerging as a promising method for capturing online exposure to unhealthy marketing, experiences of chronic conditions on wellbeing and employment,¹⁵ and the effects of the COVID-19 pandemic and associated restrictions on mental health and behaviours.¹⁶

More information

If you are interested in using a citizen science approach within your work and would like support, please contact the team at citsciprevention.project@sydney.edu.au

This resource was produced as part of our project on building capacity in the use of citizen science in prevention, find out more at preventioncentre.org.au



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References

1. Australian Citizen Science Association. 10 Principles of citizen science. 2018.
2. Wiggins A, Crowston K, editors. From conservation to crowdsourcing: A typology of citizen science. 2011 44th Hawaii international conference on system sciences; 2011: IEEE.
3. Bonney R, Cooper CB, Dickinson J, Kelling S, Phillips T, Rosenberg KV, et al. Citizen science: a developing tool for expanding science knowledge and scientific literacy. *BioScience*. 2009;59(11):977-84.
4. Silvertown J. A new dawn for citizen science. *Trends in ecology & evolution*. 2009;24(9):467-71.
5. Follett R, Strezov V. An analysis of citizen science based research: usage and publication patterns. *PLoS one*. 2015;10(11):e0143687.
6. Kullenberg C, Kasperowski D. What is citizen science?—A scientometric meta-analysis. *PLoS one*. 2016;11(1).
7. Resnik DB, Elliott KC, Miller AK. A framework for addressing ethical issues in citizen science. *Environmental Science & Policy*. 2015;54:475-81.
8. Pocock MJ, Chapman DS, Sheppard LJ, Roy HE. *Choosing and Using Citizen Science: a guide to when and how to use citizen science to monitor biodiversity and the environment: NERC/Centre for Ecology & Hydrology*; 2014.
9. Barrie H, Soebarto V, Lange J, Corry-Breen M, Walker L, editors. *Using citizen science to explore neighbourhood influences on ageing well: Pilot project*. Healthcare; 2019: Multidisciplinary Digital Publishing Institute.
10. Folkerth M, Adcock K, Singler M, Bishop EJHPP. Citizen Science: A New Approach to Smoke-Free Policy Advocacy. 2020;21(1_suppl):82S-8S.
11. Sheats J, Winter S, Padilla-Romero P, King A. FEAST: empowering community residents to use technology to assess and advocate for healthy food environments. *Journal of Urban Health*. 2017;94(2):180-9.
12. Katapally TR. Smart Indigenous Youth: The Smart Platform Policy Solution for Systems Integration to Address Indigenous Youth Mental Health. 2020;3(2):e21155.
13. Katapally TR, Bhawra J, Leatherdale ST, Ferguson L, Longo J, Rainham D, et al. The SMART study, a mobile health and citizen science methodological platform for active living surveillance, integrated knowledge translation, and policy interventions: Longitudinal Study. *JMIR public health and surveillance*. 2018;4(1):e31.
14. Den Broeder L, Lemmens L, Uysal S, Kauw K, Wekenborg J, Schönenberger M, et al. Public health citizen science; perceived impacts on citizen scientists: A case study in a low-income neighbourhood in the Netherlands. *Citizen Science: Theory and Practice*. 2017;2(1).
15. Lehmann AI, Rodgers S, Kamm CP, Mettler M, Steinemann N, Ajdacic-Gross V, et al. Factors associated with employment and expected work retention among persons with multiple sclerosis: findings of a cross-sectional citizen science study. 2020;267(10):3069-82. Illustrations created and reproduced with permission from Kylie Dunn dinkylune.com
16. Clotworthy A, Dissing AS, Nguyen T-L, Jensen AK, Andersen TO, Bilsteen JF, et al. 'Standing together—at a distance': Documenting changes in mental-health indicators in Denmark during the COVID-19 pandemic. 'Standing together—at a distance': Documenting changes in mental-health indicators in Denmark during the COVID-19 pandemic. 2020:1403494820956445.

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Published October 2021