

Resource Summary Report

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STEPS

RRID:SCR_008742

Type: Tool

Proper Citation

STEPS (RRID:SCR_008742)

Resource Information

URL: <http://steps.sourceforge.net/STEPS/default.php>

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Description: STEPS is a package for exact stochastic simulation of reaction-diffusion systems in realistic, complex 3D geometries. Our core simulation algorithm is an efficient implementation of a variation on Gillespie's SSA, extended to deal with diffusion of molecules over the elements of a 3D tetrahedral mesh. While it was mainly developed for simulating detailed models of neuronal signaling pathways in dendrites and around synapses, it is a general tool and can be used for studying any biochemical pathway in which spatial gradients and morphology are thought to play a role. We have implemented STEPS as a set of Python modules, which means STEPS users can use Python scripts to control all aspects of setting up the model, generating a mesh, controlling the simulation and generating and analyzing output. The core computational routines are still implemented as C/C++ extension modules for maximal speed of execution.

Abbreviations: STEPS

Synonyms: STochastic Engine For Pathway Simulation

Resource Type: simulation software, software application, software resource

Keywords: reaction-diffusion, stochastic, signaling, molecular, python, software, simulator, reaction kinetics, 3d diffusion, signaling pathway, scripting, bio.tools

Funding: GOA ;
UA Belgium ;
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Resource Name: STEPS

Resource ID: SCR_008742

Alternate IDs: biotools:steps, nlx_143852

Alternate URLs: <https://bio.tools/steps>

Old URLs: <http://steps.sourceforge.net/STEPS/Home.html>

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Ratings and Alerts

No rating or validation information has been found for STEPS.

No alerts have been found for STEPS.

Data and Source Information

Source: [SciCrunch Registry](#)

Usage and Citation Metrics

We found 342 mentions in open access literature.

Listed below are recent publications. The full list is available at [RRID](#) .

Gad N, et al. (2026) Prevalence and factors associated with obesity in Rwanda: Evidence from the 2022 NCD STEPS Survey. PLOS global public health, 6(4), e0004736.

Rocha R, et al. (2026) Precipitation nowcasting with radar data for evaluating multiple horizons using U-Net-based algorithm in Eastern Amazon. PloS one, 21(2), e0342097.

Agboyibor KM, et al. (2026) Prevalence, time trends and associated factors of adult overweight and obesity in 36 countries in the WHO African region from 2003 to 2022: a study of 54 WHO STEPS surveys representing 156 million adults. BMJ global health, 11(1).

Bahra N, et al. (2026) Estimation of the Attributable Fraction of Noncommunicable Diseases Related to Physical Inactivity, Morocco. Preventing chronic disease, 23, E12.

Gooding DC, et al. (2025) Guided by the community: Insights on recruitment science from the African Americans Fighting Alzheimer's in Midlife (AA-FAIM) Project. Alzheimer's & dementia. Behavior & socioeconomics of aging, 1(2).

D K, et al. (2025) A national survey-based method for monitoring noncommunicable disease risk factors among adolescents aged 15-17 years across India. MethodsX, 15, 103535.

Rezaee M, et al. (2025) Burden of High Systolic Blood Pressure in the Eastern Mediterranean Region, 1990 to 2021: Results From the Global Burden of Disease Study

2021. Journal of the American Heart Association, 14(11), e039158.

Zhang Y, et al. (2025) Associations between education and ideal cardiovascular health metrics across 36 low- and middle-income countries. BMC medicine, 23(1), 204.

Pourabhari Langroudi A, et al. (2025) Age of tobacco smoking initiation among Iranian adults based on National and Subnational data from the 2021 STEPS survey : Short title: Tobacco Smoking Onset Age in Iran. Scientific reports, 15(1), 8504.

Amberbir A, et al. (2025) Understanding needs and solutions to promote healthy ageing and reduce multimorbidity in Rwanda: a protocol paper for a mixed methods, stepwise research study. BMJ open, 15(3), e089344.

Craig AT, et al. (2025) Integrating post-validation surveillance of lymphatic filariasis with the WHO STEPwise approach to non-communicable disease risk factor surveillance in Niue, a study protocol. PloS one, 20(1), e0315625.

Byambadorj N, et al. (2025) Protocol for evaluating the cost-effectiveness of Mongolia's sugar-sweetened beverages tax using double machine learning. PloS one, 20(6), e0324378.

Addis Z, et al. (2025) Comorbid cardiovascular diseases and predictors among adults with type 2 diabetes in Bahir Dar city, Ethiopia: a multicentre hospital-based cross-sectional study. BMJ open, 15(5), e086054.

Fernández-Niño JA, et al. (2025) A multi-country comparison between mobile phone surveys and face-to-face household surveys to estimate the prevalence of non-communicable diseases behavioural risk factors in low- and middle-income settings. BMJ global health, 10(6).

Kansiime G, et al. (2025) Prevalence, Awareness, and Factors Associated with Hypertension Among Adults in Rural Southwestern Uganda: A Baseline Survey. International journal of general medicine, 18, 3289.

Mousavi A, et al. (2025) Quality-adjusted life expectancy norms for the Iranian population. Population health metrics, 23(1), 5.

Myers MI, et al. (2025) Intracerebral Transplantation of Autologous Mesenchymal Stem Cells Improves Functional Recovery in a Rat Model of Chronic Ischemic Stroke. Translational stroke research, 16(2), 248.

Basa M, et al. (2025) Adherence to alcohol consumption-related recommendations and predictors of heavy episodic drinking among patients with NCDs during the COVID-19 pandemic. PloS one, 20(4), e0321577.

Djalalinia S, et al. (2025) Evaluation of the hypercholesterolemia care cascade and compliance with NCEP-ATP III guidelines in Iran based on the WHO STEPS survey. Lipids in health and disease, 24(1), 99.

Salabat D, et al. (2025) Cancer screening and its associated factors in hypertensive individuals: new insights from the 2021 STEPs national study in Iran. BMC public health, 25(1), 1454.