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Evaluating community and household assistance for reducing plastic waste burning with enhanced waste management (CARE) in Malang, Indonesia

Submission date 24/09/2025	**Recruitment status** No longer recruiting	[X] Prospectively registered [_] Protocol
Registration date 29/09/2025	**Overall study status** Ongoing	[_] Statistical analysis plan [_] Results
Last Edited 21/11/2025	**Condition category** Other	[_] Individual participant data [_] Record updated in last year

Plain English summary of protocol

Background and study aims

Indonesia generates a large volume of plastic waste each year, with a significant portion openly burned—a common practice in both households and community settings. The problem is further compounded by imported plastic waste, which adds pressure to domestic waste management systems.[1] In East Java, particularly in Banyuwangi and Malang, this has led to significantly degraded air quality. A 2020 report by the Ministry of Environment and Forestry found that PM2.5 levels in these areas exceeded World Health Organization (WHO) safety guidelines, reaching 1.4 times the recommended threshold. One of the most striking cases was documented near a tofu factory in Tropodo, where plastic waste is burned as fuel. Eggs collected from the vicinity contained the second-highest dioxin levels ever recorded in Asia—90 times higher than Indonesia's regulatory limit.[2] Dioxins and fine particulate matter from plastic burning are well-documented contributors to a range of non-communicable diseases (NCDs), including chronic obstructive pulmonary disease (COPD), cardiovascular diseases, and various cancers. These findings underscore the urgent need for targeted interventions to reduce plastic waste burning as a critical step toward improving air quality and protecting community health.

This study aims to evaluate the impact of the Community and Household Assistance for Reducing Plastic Waste Burning with Enhanced Waste Management (CARE) intervention on waste management practices, including household plastic waste burning

Who can participate?

This study will be implemented in 12 purposively selected villages in East Java Province, Indonesia, comprising six intervention villages in Malang District and six control villages in Banyuwangi District. The selection of villages was guided by a set of criteria to ensure comparability and reduce contamination between arms. These criteria include rural classification, similar levels of population density, predominant employment types (e.g., agriculture or home industry), lowland geographical characteristics, and existing waste management infrastructure such as operational waste banks or waste bank cells. From these 12

villages, a total of 1,374 households (687 households per district) will be recruited to participate in the study.

What does the study involve?
CARE will consist of three core components: regulation at the village level, waste management facilities, and education and training of community members and environmental kaders (kader lingkungan). The co-designed intervention will be delivered by a multidisciplinary intervention team responsible for its design, implementation, and monitoring. It includes academic researchers from the University of Brawijaya, local government stakeholders such as the District Environmental Authority, sub-district and village officials, as well as waste management practitioners and environmental kaders. The kaders serve as primary implementers at the community level, delivering training, managing waste bank operations, and engaging households through existing social and religious forums.

What are the possible benefits and risks of participating?
Benefits:
- Participating households will benefit directly from improved waste management (e.g access to waste banks, better collection systems)
- Community members will receive education and training on safer waste practices, which may reduce exposure to harmful pollutants from plastic burning.
- Over time, reduced open burning is expected to contribute to better local air quality and associated health improvements.

Risks:
The study has minimal risk of participation since the intervention is non-invasive.

Where is the study run from?
Six villages in Malang and six villages in Banyuwangi, Indonesia.

When is the study starting and how long is it expected to run for?
March 2025 to September 2027

Who is funding the study?
National Institute for Health and Care Research (NIHR) (UK)

Who is the main contact?
NIHR GHRC Indonesia Team, globalhealth@ub.ac.id

Contact information

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Public, Scientific, Principal investigator

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Study information

Scientific Title
Evaluating Community and household Assistance for Reducing plastic waste burning with Enhanced waste management (CARE) in Malang, Indonesia

Acronym
CARE

Study objectives
Aims:
To evaluate the impact of the CARE intervention on waste management practices, including household plastic waste burning.

Objectives:
1. To explore whether the development and implementation of village-level waste management regulation is effective in reducing plastic waste burning
2. To assess whether the development and implementation of waste management infrastructure, including neighbourhood and village waste banks improve waste management

practices in the community.
3. To assess the effectiveness of training and awareness generation activities on plastic waste management and waste burning practices.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 14/04/2025, Health Research Ethics Committee Faculty of Medicine Brawijaya University (Jalan Veteran, Malang, 65145, Indonesia; +62 341569117; sekr.fk@ub.ac.id), ref: 77.1 /EC/KPK/04/2025

Primary study design
Interventional

Study design
Quasi-experimental design

Study type(s)
Prevention

Health condition(s) or problem(s) studied
Prevention of non-communicable diseases (NCDs) -including chronic obstructive pulmonary disease (COPD), cardiovascular diseases, and various cancers- triggered by plastic waste burning through Community and household Assistance for reducing plastic waste burning with Enhanced waste management (CARE) intervention.

Interventions
The Community and Household Assistance for Reducing Plastic Waste Burning with Enhanced Waste Management is a comprehensive intervention designed to address the environmental and health risks associated with plastic waste burning in rural communities. CARE will consist of three core components: regulation at the village level, waste management facilities, and education and training of community members and environmental kaders (kader lingkungan). The co-designed intervention will be delivered by a multidisciplinary intervention team responsible for its design, implementation, and monitoring. It includes academic researchers from the University of Brawijaya, local government stakeholders such as the District Environmental Authority, sub-district and village officials, as well as waste management practitioners and environmental kaders. The kaders serve as primary implementers at the community level, delivering training, managing waste bank operations, and engaging households through existing social and religious forums.

Intervention Type
Other

Primary outcome(s)
The reduction in household plastic waste burning measured as a binary variable (yes/no) after 1 year of intervention implementation.

Key secondary outcome(s)
1. Improved knowledge and skills to sort and manage plastic (both environmental kaders and community members), measured using validated questionnaires.

2. Increased plastic waste collection through use of waste banks or community collection points, measured by the proportion of the intervention households utilising the waste banks, after 1 year of intervention implementation.
3. Reduction in PM2.5 level in the neighbourhood, measured using Airly Open Air Model O-1PST, after 1 year of intervention implementation.

Completion date
30/09/2027

Eligibility

Key inclusion criteria
This study will be implemented in 12 purposively selected villages in East Java Province, Indonesia, comprising six intervention villages in Malang District and six control villages in Banyuwangi District. The selection of villages was guided by a set of criteria to ensure comparability and reduce contamination between arms. These criteria include rural classification, similar levels of population density, predominant employment types (e.g., agriculture or home industry), lowland geographical characteristics, and existing waste management infrastructure such as operational waste banks or waste bank cells. In this cluster-based quasi-experimental trial, villages serve as the clusters that were allocated to intervention or control, while households within these villages will serve as the units of analysis.

Participant type(s)
Other

Healthy volunteers allowed
No

Age group
Not Specified

Sex
All

Total final enrolment
0

Key exclusion criteria
No exclusion criteria is applied in this study. Household that is not consented to participate in this study will not be included in the study.

Date of first enrolment
01/03/2026

Date of final enrolment
30/06/2026

Locations

Countries of recruitment

Indonesia

Study participating centre
University of Brawijaya
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Sponsor information

Organisation
National Institute for Health Research

ROR
https://ror.org/0187kwz08

Funder(s)

Funder type
Government

Funder Name
National Institute for Health and Care Research

Alternative Name(s)
National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	version 4.0	06/07/2025	26/09/2025	No	Yes
Participant information sheet	version 5.0	21/11/2025	21/11/2025	No	Yes