Household Air Pollution and Health: Expanding Awareness and Changing Behavior

ENABLE Project Policy Brief

November 2025

ENABLE

Ethiopian Public Health Institute

NIPH

Vital Strategies

List of Contributors

Addis Ababa University
Belay Tesfaye
Daniel Nadew

Ethiopian Public Health Institute (EPHI)
Dr. Samson Mideksa

Harari Regional Health Bureau
Andinet Tesfaye
Yaminas Abdi

Ministry of Health
Aregash Molla

Vital Strategies
Ashenafie Bereded
Dr. Sumi Mehta
Akanksha Rai
Dawit Siraw

Key Messages

- Women are primarily responsible for food preparation in households in Ethiopia.
- A significant number of women do not have knowledge of the health effects of household air pollution, which mainly results from biomass fuel burning during cooking.
- Only 45%–58.6% of households, approximately one in two practice appropriate household air pollution (HAP) exposure prevention behaviors. These practices include having a separate kitchen; keeping children under five years of age away from the cooking area; ventilating the kitchen by opening windows and doors or using a kitchen fan during cooking; using improved cookstoves; candling charcoal completely outdoors; and using clean fuels such as electricity.
- The root causes for the increase exposure levels of Ethiopian families to household air pollution include the limited awareness of the detrimental health effects of air pollution and limited behavior change communication on preventive measures supported by the health workforce.

We recommend health authorities to make a requirement for primary health care to raise awareness and promote behaviors to reduce household air pollution exposure.

Problem Statement

In Ethiopia, over 90% of households rely on polluting solid fuels for cooking, which exposes people to a high-level of household air pollution [1]. In 2022, the Ethiopian Hygiene and Environmental Health Survey (HEHS) surveyed 26,180 households across 9 regional states and two city administrations and found 85% of households exclusively use biomass fuel and 79% uses unimproved stoves (Figure 1) [2]. Women are highly exposed because they are primarily responsible for food preparation in households [2]. There are evidence based ways to reduce household air pollution from biomass fuel burning, such as using clean cooking fuel (i.e. electricity, others), separating kitchen and living space, and improving and practicing ventilation [4]. Studies in Ethiopia demonstrate that women have low awareness on the health effects of biomass fuel burning. For instance, in one study,

only 63% had a high-level perception of the risks [4]. In another study, participants scored 67% for good knowledge and 57.6% for good cooking practices [6] and a third study found only 45% of participants had good cooking practices [7].

Lack of knowledge is one of the barriers keeping people from adopting good cooking practices [8]. Cultural practices, including traditional coffee making and cooking specific local cuisine such as doro wot with charcoal, generate household air pollution, and persist due to the belief that these dishes taste better than those prepared with clean fuels, like electricity. There are misconceptions about household air pollution among women, such as: perceived low health risk; minimum risk when cooking in open space; use of smoke to prevent mosquito bites; and considering charcoal burning to be safe once the kindling process is completed.

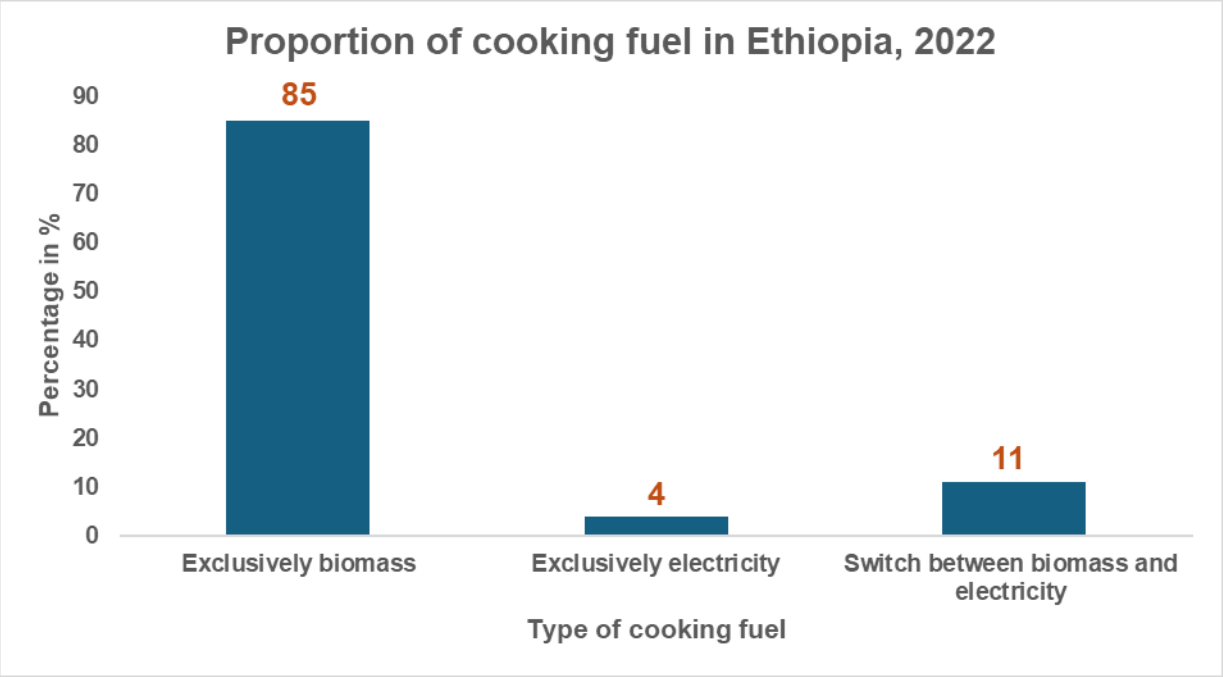

Figure 1 Proportion of type of cooking fuel among households in Ethiopia (sources: Hygiene and Environmental Health Survey, EPHI (2022))

The primary root causes of household air pollution are limited awareness generation and behavior change communication by health facilities. Core health services—such as antenatal care [10], postnatal care, the out-patient department [11], and health education sessions including community outreach are not required to provide information on household air pollution. **Increased health promotion activities by all primary healthcare**

facilities and a requirement for selected health service packages in primary care to include household air pollution-related education are needed.

Policy Recommendation

A large scale and focused public awareness campaign, accompanied by promotion of protective behaviors can empower women, families and communities to adopt behaviors that will lead to avoidance of exposure to household air pollution and better health for current and future generations. The Ministry of Health (MOH) should adopt messages that are targeted and tailored to specific areas and situations. These messages should be delivered using multiple platforms, such as house-to-house, health facilities, mainstream national media and social media. MOH should also engage community leaders and media professionals by providing thematically accurate information on household air pollution, its health impacts and prevention methods.

To bring sustainable change, there should be a mutual long-term commitment by the health, energy, and other relevant sectors. The MOH should lead a stakeholder forum so that communities have access to affordable, clean cooking fuel and practice good cooking behaviors which will ultimately result to breathing clean air.

Policy Options/Considerations for Implementation

(1) Require all Primary Healthcare Facilities to Raise Awareness and Communicate preventative measures for Behavior Change on Household Air Pollution exposure reduction

Why: While household cooking practices are among the primary determinants of high levels of exposure, the intensity and content related to raising awareness of the risks and promoting preventive measures to reduce exposure to air pollution are limited in the Ethiopian health system. Health promotion and communication is a proven, powerful tool to empower people with the necessary knowledge and skills to protect themselves. Acquired knowledge and adoption of healthy and safe cooking practices can lead to a long-lasting change, creating an opportunity for sustainable improvement for the family and the community as a whole. This approach requires minimal additional resources and can be

easily integrated into existing routine primary health services. The description of the proposed policy and its implementation is presented below.

Scope: Primary health care facilities, such as health posts, health centers and primary hospitals will be responsible. Health Extension Workers (HEWs) in health posts and Urban Health Extension Professionals in health centers, early childhood development staff in cities, and health professionals working in maternal and child health services (MCH), as well as outpatient departments (OPDs), will create awareness and communicate healthy behavior change practices to reduce individual and community exposure to household air pollution. These activities will target pregnant and lactating women, mothers with children under 5, senior citizens, people with chronic health conditions, households with lower socioeconomic status. The main venues for communication will be;

- Health facility service areas,
- House-to-house visits,
- Community gatherings (i.e. monthly Edir meetings, rural open markets, religious sites such as churches and mosques),
- Block" gatherings which were formerly known as the Women Development Army, and industries with large numbers of workers.

Channels will include: in-person communication in local languages; communication materials such as banners, billboards, flyers, booklets, and advertisement screens; mainstream mass media; and social media. The national mainstream mass media has specific airtime already allocated for messages on health. The MOH and regional health bureaus can use this opportunity or buy additional airtime to transmit messages on health. The health bureaus can also hold a press conference or issue a press release through its public relations department. The main responsibility will fall on the WASH and Environmental Health Departments at the ministry and regional health bureau level. Health bureaus, woreda health departments and health facilities can create a new social media page specific to household air pollution or use their existing pages to share short, accurate, specific and focused messages. The frequency and kinds of posts, indicators of the accessibility of these messages, and effectiveness should also be decided. The messages will cover several topics including: the sources of household air pollution, addressing misconceptions about biomass fuel burning and polluting cooking behaviors, adverse

health effects, benefits of clean cooking fuels, and prevention measures and related behaviors and techniques.

Roles and responsibilities: Various health workers will be responsible for communicating about household air pollution: urban health extension professionals (UHEPs) in cities, health extension workers (HEWs) in health posts, early childhood development staff in cities, and health professionals working in OPD and MCH departments of all primary care facilities, including health centers and hospitals. The health education focal persons in health facilities are also responsible for including content on household air pollution in education sessions.

Compliance and enforcement: Compliance is monitored at each level of the health system by:

- The Health Extension Program Unit or Family Health Team, health education focal person, and WASH and Environmental Health focal person at primary health centers and primary hospitals.
- The WASH and Environmental Health Officer at Woreda Health Office
- The WASH and Environmental Health Team—Climate Change and health focal person at regional health bureaus
- The WASH and Environmental Health Desk—Climate Change and Health focal person at MOH level.

Reporting and documentation: HEWs at health posts and focal persons at each level are responsible for reporting and documenting communication activities. Impacts will be measured separately through surveys.

Resources required: Finance for operation, procurement, and administration will be used to develop communication materials, as well as purchase printing devices and laptops. It will also be used to support integrated refresher training and other household air pollution manuals, reporting formats, recording and registration tools.

Timeline: The proposed timeline is 12 months from policy adoption to rollout of implementation.

Legal mechanisms: The WASH and Environmental Health Desk at the MOH should work with the Community Engagement and Health Extension Service Desk, Maternal and Child Health Desk, and Medical Services Lead Executive to:

- Revise service packages to be provided at primary health care facilities
- Issue a circular letter for health facilities, regional health bureaus and woreda health offices

(2) Create a Household Air Pollution Stakeholder Forum

Why: Access to and affordability of clean fuels are significant factors of household air pollution and in combination with limited awareness and lack of preventive measures, contribute to high levels of exposure. To effectively prevent household air pollution from biomass fuel burning and promotion of clean cooking fuel, a multisectoral coordination and commitment is needed from academic institutions, and health, energy, environment and trade sectors. The forum creates a formal and regular opportunity for the stakeholders to collaborate.

Scope: A national-level forum with a special attention to household air pollution, which could also be an extension of the Multisectoral Action Plan on Air Pollution already signed by eight sectors (Ethiopian Environmental Protection Authority (EPA), Ministry of Health, Ministry of Transport and Logistics, Ministry of Industry, Ministry of Urban and Infrastructure, Ministry of Agriculture, Ministry of Water and Energy and Ethiopian Metrology Institute). Its objectives are to commit to the fight against air pollution which can include advocacy and devising solutions that increase the accessibility and affordability of clean cooking fuels for households, complementing health promotion and preventive activities.

Roles and responsibilities: The stakeholder forum should be led by the MOH, while the WASH and Environmental Health Departments? should be responsible for working with other stakeholders to establish it.

Compliance and enforcement: The progress of the forum and any challenges will be evaluated at a quarterly meeting with the ministers and director generals of member sectors. The WASH and Environmental Health Desk nominee is responsible for following up and arranging these meetings.

Report and documentation: Each member sector is responsible for reporting and documenting its own activities and achievements. The MOH will prepare the consolidated report.

Resources required: Each member sector should be committed to contributing funds for clean fuel access, implementing proposed activities, advocacy, and expenses for the regular evaluations.

Timeline: Some sectors already agreed to work together on the National Multisectoral Action Plan on Air Pollution. Thus, the stakeholder forum will be a specific extension and should be created in six months' time.

Legal mechanisms: A formal agreement is needed with details of clear objectives, collaboration areas, targets, and agreed budget contribution among the selected government stakeholders. The WASH and Environmental Health Desk at the MOH should lead and follow up on the establishment of household air pollution stakeholder forum.

Expected Impacts

A health system that champions integrating clean air services into routine health facility activities, empowering communities to adopt good cooking behaviors, reduce household air pollution exposure, and protect health. Furthermore, a household air pollution stakeholders forum with a commitment to increase access to affordable, clean cooking fuel and further reduce household air pollution exposure and its health impacts.

ENABLE

This policy brief is part of the Enabling Environments for Noncommunicable Disease (NCD) Risk Reduction in Ethiopia (ENABLE) Project. It aims to reduce the burden of NCDs in Ethiopia by reducing the lifelong prevalence of major NCD risk factors among pregnant women in low- and middle-income countries through multi-level actions to promote healthy diets, physical activity and reduce air pollution in a clean and supportive urban environment.

Funded by the European Union

The ENABLE project is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the Health and Digital Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

References

1. Ethiopian Public Health Institute (EPHI) [Ethiopia]], ICF. Ethiopia Mini Demographic and Health Survey 2019: Final Report. Rockville, Maryland, USA: EPHI and ICF. 2021 [cited 28 Sept 2025]. Available: https://dhsprogram.com/publications/publication-FR363-DHS-Final-Reports.cfm

2. Ethiopian Public Health Institute (EPHI). The Ethiopian Hygiene and Environmental Health Survey (HEHS). 2022. Available: (Unpublished)

3. Health and Energy Platform of Action (HEPA). [cited 28 Sept 2025]. Available: https://www.who.int/initiatives/health-and-energy-platform-of-action

4. Kumar P, Abbass RA, Adelodun AA, Aghamohammadi N, Andrade M de F, Asfaw A, et al. Mitigating exposure to cooking emissions in kitchens of low-middle income homes - A guide for Home Occupants, Owners, Builders & Local Councils. 2023; 24. doi:10.15126/900568

5. Habtamu D, Abebe B, Seid T. Health risk perceptions of household air pollution and perceived benefits of improved stoves among pregnant women in rural Ethiopia: a mixed method study. 2023 [cited 28 Sept 2025]. doi:10.1136/bmjopen-2023-072328

6. Girsha WD, Abebe AD, Habtewold EM, Komicha MA. Indoor air pollution prevention practices and associated factors among household mothers in Olenchiti town, Oromia, Ethiopia. PLOS ONE. 2024;19: e0296706. doi:10.1371/journal.pone.0296706

7. Natnael T, Hassen S, Kinfe B, Yirdaw AT, Yimer SA, Kassa Y, et al. Indoor air pollution prevention practices and associated factors among mothers with under-five children in peri-urban areas of Dessie city, Northeastern Ethiopia. Sci Rep. 2025;15: 24745. doi:10.1038/s41598-025-10483-3

8. Shine S, Tamirie M, Kumie A, Addissie A, Athlin S, Mekonnen H, et al. Pregnant women's perception on the health effects of household air pollution in Rural Butajira, Ethiopia: a phenomenological qualitative study. BMC Public Health. 2023;23: 1636. doi:10.1186/s12889-023-16578-8

9. Azanaw J, Chanie GS. Spatial variation and determinants of solid fuel use in Ethiopia; Mixed effect and spatial analysis using 2019 Ethiopia Mini Demographic and Health Survey dataset. PLOS ONE. 2023;18: e0294841. doi:10.1371/journal.pone.0294841

10. FMOH. National Antenatal Care Guideline-2022.pdf. Available: https://www.moh.gov.et/sites/default/files/2024-07/National%20Antenatal%20Care%20Guideline_2022.pdf

11. FMOH. Ethiopian Primary Healthcare Clinical Guidelines (EPHCG)-2021.pdf. Available: https://hakimethio.org/wp-content/uploads/2024/09/EPHCG-2021.pdf

Acknowledgements

We would like to thank the Ethiopian Ministry of Health (MOH) and the Ethiopian Public Health Institute (EPHI) for their vital technical guidance and leadership throughout the development of this policy brief. Our gratitude also extends to the regional health bureaus, including the Addis Ababa Regional Health Bureau, Harari Regional Health Bureau and Oromia Regional Health Bureau, as well as Addis Ababa University, and GEOHealth project for their active engagement and support throughout the process. We especially acknowledge the dedicated contributions of the Policy Accelerator team members from each institution, whose commitment and expertise were helpful in shaping the content and the relevance of this policy brief. We are also grateful to Carisse C. Hamlet and Aaron Schwid of Vital Strategies Policy and Programs team for their technical support and ongoing guidance throughout the project.