

Environmental Risk Factors for Esophageal Cancer in the Somali Region of Ethiopia

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Introduction

- Esophageal cancer (EC) is the 7th most common cause of cancer death worldwide
- The most common type of EC worldwide is esophageal squamous cell carcinoma (ESCC)
- ESCC is mostly found in geographically defined high-incidence regions including northern China, northeastern Iran, parts of South America, and a corridor along the east coast of Africa
- Incidence rates of EC in Eastern Africa approach 50-fold those seen in the USA and Europe
- ESCC is common in some regions of Ethiopia, such as the Somali Region
- EC is often diagnosed at an advanced stage, due to a lack of early symptoms, making the mortality rate high (5-year survival ~20% in the US and <10% in most African countries).
- Identified potential risk factors in Africa include poor oral health, alcohol, drinking hot beverages, poverty, diet, and exposure to smoke-related carcinogens such as polycyclic aromatic hydrocarbons (PAHs) among others
- According to International Agency for Research on Cancer (IARC), drinking very hot beverages at above 65°C was classified as 'probably carcinogenic to humans'

Aims

We will enroll healthy participants from the area surrounding Jijiga, in the Somali Region of Ethiopia, where there are high rates of ESCC.

We will assess:

- Temperature measurements of ingested beverages (coffee or tea) and food (porridge)
- Determine the prevalence of known demographic ESCC risk factors via questionnaire
- Collect air composition samples from wristband monitors worn by participants to assess PAH and other volatile compound exposure
- Create a biorepository to assess carcinogen exposures in the future

Site Visit to Jijiga, Ethiopia in the Somali Region of Ethiopia – May 2025

- Jijiga is the capital of the Somali Region of Ethiopia
- Data collection has not yet started
- Identify study team, pilot temperature measurements and questionnaire, identify laboratories
- Temperature measurement protocol tested and found very high temperatures for porridge ingested



Rural homes made with available materials



Location of study site: Jijiga, Ethiopia



Inside cooking huts with soot on all the inner walls



Study team discussing cooking techniques



Resident cooking porridge



Men starting to eat porridge together out of a communal dish with "smoke milk" in the middle



Kids eating porridge

	Temp C	Temp F
Still on fire, ready to serve	85	185
Poured into bowl	77	170.6
First spoonful	77	170.6
Last spoonful	76	168.8

Temperature measurements of porridge

References:

Global Cancer Statistics 2022; The Global Landscape of Esophageal Squamous Cell Carcinoma and Esophageal Adenocarcinoma Incidence and Mortality in 2020 and Projections to 2040; Global surveillance of trends in cancer survival; Environmental and life-style risk factors for esophageal squamous cell carcinoma in Africa; Carcinogenicity of drinking coffee, mate and very hot beverages

Drinking very hot beverages at or above 65°C is classified as 'probably carcinogenic to humans'. It is a risk factor for esophageal cancer.

Temperature of ingested porridge in Jijiga, Ethiopia was very high: first spoonful at 77°C (170.6°F)

Even after finishing the porridge, it did not cool down much (still 76°C)