Study to unlock answers to diseases with unknown causes

Despite the enormous advances made by modern medicine, there are several diseases today whose causes are still unknown. These diseases are generally referred to as diseases of unknown aetiology (Dua), and as recent as 2020, an estimated 76% of unknown disease outbreaks remained undiagnosed.

Source: Pexels

This is according to a recent study by renowned medical geologist and research professor in the Faculty of Natural Sciences at Mangosuthu University of Technology (MUT), Theophilus Davies.

The study, titled *The position of geochemical variables as causal co-factors of diseases of unknown aetiology* has called for greater consideration to be given to the contribution of geo-environmental factors in a multi-factor explanation and diagnosis of Dua.

Published in the *SN Applied Sciences – A Springer Nature Journal*, Davies' study comes at the back of a 2018 World Health Organization study on worldwide cancer mortality which identified 10 diverse environmental risk factors, including "some with links to the geological environment, such as air pollution and ionising radiation exposure".

What makes Davies' study novel and groundbreaking is that it expands the scope of explanation of what causes diseases of unknown origins and their diagnoses to include geo-environmental factors by drawing on his research expertise in the area of medical geology, a field of study which Davies co-founded.

Bringing to light what's in our food

In the study, Davies explained that it was important to bring medical-geology expertise to light because this field of study is instrumental in providing credible explanations on the "exposure and transfer mechanisms of geochemicals to the food-chain and humans", along with "the nature of related ecotoxicological and health effects that are produced".

Davies' study identified eight geo-environmental and related co-factors that can significantly contribute to the resolution of causation of Dua if they are properly considered.

Covid-19 variants in Africa were introduced from abroad, study finds

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This list, explained Davies in the study, included: "the immune-modulatory effect of geochemical variables that underline nutritional and potentially toxic element perturbations in metabolic processes"; damage to DNA along with the synthesis of reactive oxygen species caused by the imbalance of trace elements/metals and/or metalloids in the metabolism; and air, soil and water pollution from a diversity of sources.

The impact of the geo-environment on health

It also included "geogenic dust particles from mining, ore processing and vehicular transportation on untarred roads"; over-exposure to radiation and radionuclides in soil, water and air during mining and ore processing; seasonal variations and geographical patterns; "climate change and geoclimatic effects"; and "factors of geopathic stress and heat stress."

The study laid out details of various factors that impact the link between geo-environmental factors and diseases. These include the geochemical variables and diseases; geochemical variables and the immune system; and disease risk mapping.

"In order to promote immune-immediate health for life, we must consider the importance of our exposure to geo-environmental variables and the dynamics of pathogen invasion in immune programming," concluded Davies.