INTRODUCTION

Exposure to high concentrations of pollution is not the only factor that influences a community’s total health risk. In an effort to understand and address other factors, CSIR environmental health researchers initiated a household survey in a low-income community to assess the vulnerability of low-income communities to environmental pollution by finding associations between so-called vulnerability factors and environmentally-related health outcomes.

Other studies have shown that factors including socio-economic profile, social stress, location, nutrition, type of dwelling and social structures, have a bearing on susceptibility and therefore vulnerability. This survey has highlighted the need for novel methods that can more adequately address vulnerability.

While the debate on the development of new methods that can quantify vulnerability to air pollution continues, the need for informed decision-making based on credible local information is pressing13.

The challenge: to identify what is needed to reduce vulnerability of low-income communities to air pollution and thereby improve their quality of life. This requires a multi-sectoral and multidisciplinary process.

VULNERABILITY ASSESSMENT SURVEY

The goal: to identify possible associations between vulnerability factors and adverse health outcomes grouped together to form three health outcome clusters.

• A vulnerability framework drawn up to consider vulnerability issues comprised three categories: differential exposure, susceptibility and coping mechanisms (see Figure 1).
• Applied to a survey consisting of 377 households.
• Study conducted in eMbalenhle, a low-income peri-urban settlement.
• Multivariate analysis applied to establish whether it was possible to derive a more concise questionnaire.

• Health outcomes grouped together to form three health outcome clusters.

Vulnerability to air pollution: To intervene or not to intervene

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Vulnerability to air pollution can be defined as the capacity of a community to anticipate, cope with, resist and recover from the impact of a natural disaster. It can be measured at any level, including the household level. The concept of household vulnerability is central in understanding the outcomes of environmental hazards. Household vulnerability is a function of household characteristics, community characteristics and household exposure to environmental hazards.

The vulnerability assessment survey was aimed at identifying what is needed to reduce vulnerability of low-income households to environmental pollution. It identified several factors that contribute to overall vulnerability, including socio-economic profile, social behavior and environmentally-related health outcomes.

Proxy exposure measures were used to assess vulnerability. This approach involved identifying factors that influence exposure to indoor air pollution, such as the type of fuel and cooking appliance used. These measures were used to approximate exposure to indoor air pollution.

Healthy municipality committee

A process is currently underway to establish a committee to work towards a healthy municipality, defined as a process that requires strong political commitment and support together with equally strong community determination, participation and action14. This committee will play an essential role in ensuring effective implementation of acceptable interventions in the community.

Vulnerability factors must be considered

People are exposed to a wide range of environmental pollutants and risks, spatially and temporally. Each individual has different susceptibilities to the observed effects and differ in terms of access to health treatment and care. Vulnerability factors identified in this study will help to focus future research to ensure all of these issues are considered.

Strategic planning and a systematic approach, together with sustained collaboration between government, industry, the local community, as well as the scientific community, are therefore essential for successful implementation of the proposed vulnerability interventions framework.