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The global epidemic of chronic kidney disease: a call for action

Elizabeth Whelan

While the Ebola and Zika viruses have made national and international headlines in recent months, another epidemic of larger magnitude is quietly devastating agricultural communities in developing countries worldwide. In Central America, the death toll from a mysterious type of chronic kidney disease (CKD) is estimated to be 20 000 in just 10 years.[1] Unlike the CKD seen in developed countries, which is typically linked to hypertension and diabetes, this disease appears to be multifactorial and disproportionately afflicts young men of working age. In El Salvador, CKD is the second leading cause of mortality among men of working age.[2] Similar excesses have been reported in other parts of Central America,[3] as well as in Sri Lanka,[4] India[5] and Egypt.[6] Occupation is believed to be the driving factor. According to the leading hypothesis, heat stress and dehydration from strenuous work such as manual cutting of sugar cane, perhaps in a synergistic association with exposure to environmental toxins, result in kidney damage that leads to permanent loss of function.

Manual sugarcane cutting involves high cardiovascular demand comparable to that experienced by endurance athletes, except that cane cutters are exposed to 'daily' demands for the entire harvest season. The risk for the disease is exacerbated by the pay structure of the work, in that cane cutters are paid according to how much cane they cut, creating a disincentive to take breaks for rest and water. A particularly disturbing characteristic of this type of CKD is that, in its early stages, people show no symptoms. It is a silent killer. By some accounts, the disease has existed in parts of the world for decades, but the death rate has accelerated with industrial-scale agriculture expansion and global climate change.

Public health researchers are alarmed. The search for causal mechanisms is occurring at a rapid pace with research underway by an unprecedented international scientific network of epidemiologists, nephrologists, exposure scientists and other experts. However, we cannot wait for all the answers before taking action to interrupt the deadly pattern of this disease. In a recent issue, Bodin *et al*[7] report early results from the Worker Health and Efficiency (WE) Programme, indicating that relatively simple measures to address heat stress and dehydration are feasible and effective even in harsh working environments, and it appears that implementing these measures is possible without a sacrifice of productivity. This research team is to be commended for their carefully designed study, where they are implementing two types of interventions: (1) an adaptation of OSHA's heat stress guidance (Water.Rest.Shade.);[8] and (2) novel ergonomic improvements including a redesigned lighter machete. We look forward to future reports from this research team, providing a full assessment and some answers about a possible causal mechanism. Despite the straightforward nature of the interventions and cooperation from the mill owner, the research team faced serious barriers in implementation including scepticism from mill staff, communication challenges and security concerns that initially jeopardised participation.

The global public health community has repeatedly demonstrated its ability to marshal intellectual resources to attack large-scale epidemics, as illustrated by the massive response to the Ebola outbreak in the past year, and the current focus on the Zika virus. In the case of CKD, there is no obvious culprit such as a virus. Even without a defined causal mechanism, it is imperative that we act now to put in place what are very simple preventive measures, such as those under study by the WE Programme. Clearly, this epidemic does not fit a traditional disease paradigm, and is an enormous challenge for countries that are already struggling with poverty, security concerns and limited public health capacity. It is also incumbent on us to improve the working conditions for individuals who labour to satisfy the global appetite for sugar and other cheap agricultural commodities. Cane cutters work for low wages in dangerous conditions with limited opportunities to improve their situation. We should be supporting reasonable transitions to mechanised harvesting while preserving worker health and economic opportunities.

The International Labour Organization (ILO) constitution sets forth the principle "that workers should be protected from sickness, disease and injury arising from their employment". Together with the WHO, the ILO has elaborated that the main focus in occupational health is on: (1) the maintenance and promotion of workers' health and working capacity; (2) the improvement of the working environment and work in a way that is conducive to safety and health; and (3) the development of work organisations and working cultures in a direction that supports health and safety at work, and in doing so also promotes a positive social climate and smooth operation, possibly enhancing the productivity of the undertakings.[9] Efforts such as the WE Programme are showing that these goals are within our reach.

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