Population science in cancer

Cancer is the second leading cause of death and contributes to approximately 1 in 6 deaths globally. It has been shown that only 5–10% of cancer cases are related to genetic defects and the remaining 90–95% are connected to modifiable lifestyle or environmental risk factors (1). The five major behavioral and dietary factors of cancer deaths include tobacco use, alcohol intake, lack of physical activity, high body mass index, and low fruit and vegetable intake (2). In addition, more and more evidence support that gene-environment interactions may impact cancer incidence and prognosis. Considering this increasing evidence, it is generally accepted that cancer is preventable.

In order to prevent cancer and reduce cancer deaths, population science is an essential tool to minimize the translational gap in cancer research. It is well known there is a gap between findings generated at the lab bench and their usage at the clinical bedside. Few laboratory studies used a small number of independent samples or technical replicates of humans or animals, and their findings cannot be applied for clinical applications. This may be partially due to lack of considering population variations, especially for underserved and vulnerable populations. In order to generalize these lab findings to human beings, a large-scale population level studies (such as epidemiology studies, behavior interventions and clinical trials) are needed. The findings of population science can have an impact on biological laboratory experiments, clinical practice, public health and health policy.

The papers in this focused issue entitled "*Population Science in Cancer*" of *Translational Cancer Research* cover various topics. Several papers have not only addressed health disparity concerns but have also shown that social or physical environments can influence health outcomes. Some studies investigated associations between cancer and health related behaviors, including alcohol, smoking, and physical activity. Cancer screening, patient navigation program, and clinical trial design are also discussed. This issue can provide valuable information of different population science applications in cancer.

Footnote

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