

Environment and Cancer – research priorities

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The global burden of cancer is estimated to double in the next 20 years, with a majority of the increase occurring in the low and middle-income countries. These trends are in common with those for other non-communicable diseases, including cardiovascular disease and diabetes. Much could be achieved in terms of prevention based on implementation of current knowledge but at the same time the aetiology of many cancers remains obscure. This implies research into causes must parallel that into prevention; this combination should be one priority in the coming decade.

The majority of cancers have an environmental (broadly defined) aetiology but the precise contribution and interaction with other risk factors is difficult to elucidate. This is at least partially due to limitations in accurately measuring individual exposure, including exposures early in life. Recent advances in laboratory sciences (e.g. “omics” technologies) have been paralleled by an increased understanding of disease mechanisms (e.g. epigenetics). This provides a promising avenue for the improvement of environmental exposure assessment and an understanding of its consequences. In addition, this new generation of biomarkers can help establish the biological plausibility of exposure-disease associations, providing also a bridge from epidemiology to experimental data.

Much remains to be accomplished to provide the evidence-base for public health decisions on cancer prevention. Nevertheless, rapid advances in technology, the fresh understanding of mechanisms and the availability of large prospective cohort studies with associated biobanks provide exciting new opportunities. Prevention strategies based on these foundations demand an interdisciplinary approach whereby the term translational cancer research includes translation from the laboratory to the clinic and to the population. Such a “two-way translation” holds rich promise in combating the projected increases in global cancer burden (Wild CP, *Mutagenesis*, 24, 117-125, 2008; Wild CP, *Environ. Health*, 10, suppl. 1, S15, 2011).