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## Award Lecture

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### **Poverty, affluence and cancer**

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It is generally acknowledged that poverty is among the greatest health risks. On a population level, this is reflected by high infant mortality, early morbidity and low life expectancy. Malnutrition makes people susceptible to a variety of diseases, including cancer. In developing countries, approximately 23% of all malignant neoplasms are caused by, or associated with, chronic infections; the most widespread include hepatitis B and C (liver cancer), and *Helicobacter pylori* (stomach cancer). Human papilloma virus (HPV) DNA is now identified in >99% of cervical cancers, establishing this class of oncogenic viruses as the sole cause of a disease that in many countries remains the major cause of death from cancer in women. New approaches to early detection and treatment are urgently required. Although vaccination against HPV infection is expected to be introduced within the next 3–5 years, experience with hepatitis B vaccination has shown that effective implementation may be delayed by lack of funds and poor health service infrastructure.

In highly developed countries, only 12% of cancers are caused by chronic infections but the overall cancer burden is usually more than twice that of poor countries. The higher cancer risk of the affluent populations of North America, Western Europe and Australia is mainly due to the earlier onset of the tobacco epidemic and the adverse health effects of a Western life style characterized by a highly caloric diet, rich in fat, refined carbohydrates and animal protein, combined with low physical activity. This has led to overweight and obesity prevalence on an unprecedented scale. In most European countries, more than 50% of men are already overweight (BMI > 25) and 10–20% are obese. It has been estimated that world-wide, already more people are overweight than suffering from malnutrition (BMI < 18.5). Most common cancer organ sites in affluent societies include breast, prostate, colon, endometrium, gallbladder, kidney, and, more recently, oesophagus (adenocarcinoma). An estimated 39% of endometrial carcinomas are due to excess weight, which amounts to 14,000 new cases per year in the European Union. High serum levels of IGF-1 reflect Western nutrition and appear to reflect the risk of developing breast, prostate and colon cancer. High prevalence rates of cardiovascular diseases, hypertension and non-insulin dependent diabetes (NIDDM) add to the disease burden and current trends indicate that many newly industrialized countries will retrace the path to illness and death associated with the Western lifestyle, including tobacco smoking. Such countries in transition often carry a double burden of diseases caused by traditional exposures (e.g. infections, high salt intake) in addition to those resulting from acquisition of the Western lifestyle.

On the other hand, cancer management and survival rates greatly improve with increased national expenditure on health care (as a percentage of the GNP). Even among highly industrialized European societies, the survival of cancer patients is strongly influenced by socio-economic conditions and is inversely correlated with parameters such as unemployment rate and infant mortality.