

C

CALDWELL, JOHN C.

(1928–)

John C. Caldwell began an academic career later than most professional demographers, having spent nearly a decade as a secondary school teacher before starting his Ph.D. studies at the Australian National University (ANU). Since his first academic appointment (at the University of Ghana) in 1962, his research output—much of it in collaboration with his wife, Pat Caldwell—has been prolific, amply compensating for the late start. His early years as a demographer were spent at the Population Council, where he worked in various regions of Africa. Since 1970, his base has been at the ANU, where he is a professor of demography, heading the Department of Demography until 1988 and then serving as associate director of ANU's National Centre for Epidemiology and Population Health. He has engaged in extended periods of fieldwork in Africa and South Asia and has organized numerous multi-country research projects. He has served as the president of the International Union for the Scientific Study of Population (1994–1997).

Caldwell's most notable contributions to population studies have been in the fields of fertility transition and health transition. His works are cited almost *de rigueur* by those in these fields. His wealth flows theory, first set out in a 1976 article, traced the onset of fertility transition to changes in the direction of intergenerational transfers within the family. Although criticized for its lack of testability, it captured the imagination of many researchers—from the fields of anthropology and economics as well as demography—and stimulated greater attention to

field-based micro-demographic research. The theory illustrates Caldwell's willingness to theorize provocatively based on less than complete evidence, and thereby inspiring numerous research studies by others intent on testing his propositions.

Caldwell has done much to revive interest in population theory and give it a greater role in promoting research. He has also made original contributions in many areas of demographic theory. These include the focus on family relationships and family economics for explaining demographic change; the identification of education as a major factor in the survival of individuals and their children; and the significance of the position of women in determining demographic change. Since the late 1980s, he has made a major contribution to the study of the AIDS epidemic in developing countries, notably in Africa, in its social and behavioral context, and to health transition research more generally, through his editorship of the journal *Health Transition Review*.

In addition to his contributions to theory, Caldwell has also had an important impact on the methodology of population studies. The emphasis he has placed on anthropological-type field research in demography has been adopted by many other demographers, and has fostered a more symbiotic relationship between anthropologists and demographers in studying matters related to demographic change.

See also: *Anthropological Demography; Demography, History of; Health Transition; Intergenerational Transfers; Population Thought, Contemporary.*

BIBLIOGRAPHY

SELECTED WORKS BY JOHN C. CALDWELL.

- Caldwell, John C. 1982. *Theory of Fertility Decline*. London: Academic Press.
- . 1986. "Routes to Low Mortality in Poor Countries." *Population and Development Review* 12(2): 171–220.
- . 2001. "The Globalization of Fertility Behavior." In *Global Fertility Transition*, Supplement to *Population and Development Review* 27: 93–115.
- Caldwell, John C., and Pat Caldwell. 1986. *Limiting Population Growth, and the Ford Foundation Contribution*. London: Frances Pinter.
- . 1996. "The African AIDS epidemic." *Scientific American* 174(3): 40–46.
- Caldwell, John C., P. H. Reddy, and Pat Caldwell. 1988. *The Causes of Demographic Change: Experimental Research in South India*. Madison: University of Wisconsin Press.

SELECTED WORKS ABOUT JOHN C. CALDWELL.

- Schultz, T. Paul. 1983. "John C. Caldwell, Theory of Fertility Decline." *Population and Development Review* 9(1): 161–168.
- Willis, Robert J. 1982. "The Direction of Intergenerational Transfers and Demographic Transition: The Caldwell Hypothesis Re-examined." *Population and Development Review* 8(Supp.) (82): 207–234.

GAVIN W. JONES

CANCER

Cancer is the common name for a group of 100 or more chronic, progressive diseases, all characterized by abnormal and continuous multiplication of cells in a particular tissue or organ without reference to the needs of the body. This commonly gives rise to a solid mass or tumor composed of such cells (e.g., in the lung, breast, or brain), but it can also affect almost any tissue or organ, including the blood-

forming cells of the bone marrow (leukemias), the immune defense system (lymphomas), and the soft tissues, such as muscles, cartilage, or blood vessels (sarcomas). Invasion of the organ or tissue of origin by a malignant tumor—called a neoplasm, or new growth—can itself be fatal, but cancer mortality arises mainly from the tendency of most cancers to metastasize elsewhere in the body and to disable or destroy vital organs such as the brain, lung, liver, or bone marrow.

Cancer afflicts all animals as well as humans. The ultimate cause of all cancers is failed control of the growth, reproduction, or senescence (aging) of cells. This is due in turn to inherited and/or acquired damage to cellular DNA, giving rise to a malignant clone comprising all the descendant cells of the original cancerous cell. Inherited susceptibility can greatly increase the risk of developing cancer, but it appears to account for only a small proportion of all cancers, and congenital malignancy is extremely rare. Cumulative genetic damage acquired over the course of life accounts for the occurrence of most cancers. Knowledge in this domain is likely to increase rapidly with further progress in cancer genetics following the completion of the Human Genome Project.

Among the known environmental causes of cancer, use of tobacco (smoking, chewing, sucking, or inhaling) is the most important and most widely recognized. Tobacco use probably accounted for up to a third of all cancers in 2000, and a higher proportion of all cancer deaths, since it is a cause of some of the most fatal cancers—lung, larynx, pharynx, esophagus, and pancreas. Other causes include:

- Exposure to certain chemicals and other substances. For example, benzene exposure is a cause of leukemias, and exposure to asbestos produces mesothelioma of the lung lining and abdomen.
- Ionizing radiation. X-rays and γ -radiation cause solid tumors as well as leukemias.
- Solar or artificial ultraviolet radiation. Exposure produces skin cancers including melanoma.
- Obesity. Obesity increases the risk of breast and colon cancers.
- Infection by certain bacteria. For example, *Helicobacter pylori* is a cause of stomach cancer.