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JOURNAL OF  
HEALTH  
ECONOMICS

Journal of Health Economics 23 (2004) 737–759

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# An economic analysis of life expectancy by gender with application to the United States

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Received 26 July 2001; received in revised form 5 June 2003; accepted 14 November 2003

Available online 28 January 2004

## Abstract

This paper presents an economic model to explain the behavior of life expectancy of both sexes. It explicitly examines the relationship between the gender gap in life expectancy and the gender gap in pay. It shows that as the latter narrows over the course of economic development, the former may initially expand but will eventually shrink. Simulation results from our model accord with the behavior of life expectancy for both sexes since the 1940s in the United States.

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*JEL classification:* I12; J16; J22; O10

*Keywords:* Life expectancy; Gender; Economic development; Fertility

## 1. Introduction

Longevity reflects the quality of life and well being of a society. Over the past century, there has been continuous growth in life expectancy at birth around the world. The significant improvement in longevity is a result of better living and working environments, maternal and preventative care, educated populations, and higher incomes, among other factors. With rare exceptions, women persistently live longer than men.

The situation in the United States provides an interesting example. On the one hand, women have always lived longer than men in the US. On the other, both male and female

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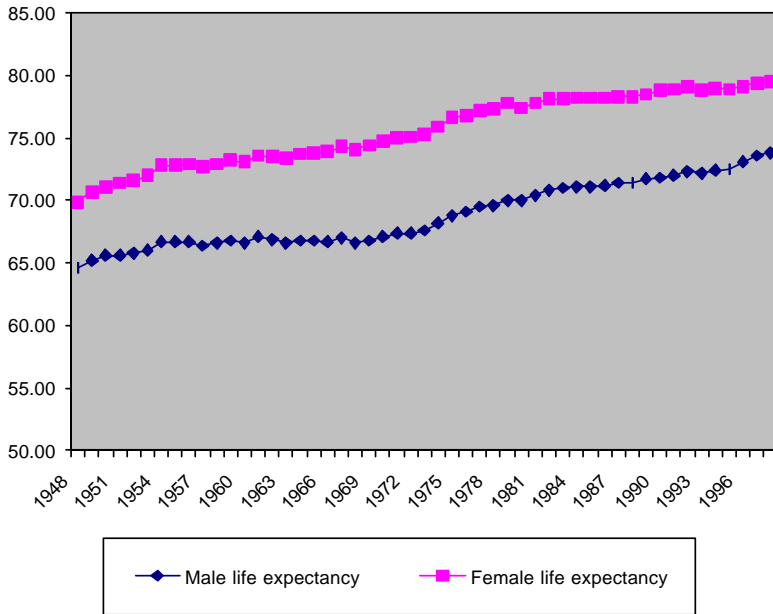


Fig. 1. Life expectancy by sex in the US.

life expectancies have risen greatly, but the difference between the two exhibits both an increasing and declining pattern. Such patterns, as depicted in Figs. 1 and 2, allow us to study life expectancy in its entirety.<sup>1</sup>

Life expectancy at birth for the whole population in the US rose from 67.2 years in 1948 to 76.7 years in 1998. The gender gap in life expectancy widened between 1948 and 1975, from 5.3 to 7.8 years. In 1979, however, the gap began to narrow, and has continued to narrow from an initial 7.8 to 5.8 years in 1998. For the past two decades, life expectancy for men grew much faster than for women. One explanation, offered by Waldron (1976), for the expanding gap prior to the 1970s was the increase over the same period in male mortality due to ischemic heart disease and lung cancer, both of which were related to cigarette smoking among men. However, in the late 1970s mortality due to lung cancer rose among women. At the same time, there was a decrease in heart disease mortality among men. Hence, the drop in the life expectancy gap suggests behavioral changes between the two sexes.

The gender differential in longevity has for many years been a subject of interest for social scientists. Sociologists and anthropologists explain the differential by adopting the evolutionary theory of sexual selection against a socio-cultural background (Carey and Loperato, 1995). Epidemiologists explore the relationship between life expectancy and socio-economic factors, such as wealth inequality and social status by gender (Wilkinson, 1996). Medical professionals approach the issue by investigating gender-differentiated

<sup>1</sup> The life expectancy data are obtained from publications of the National Center for Health Statistics, various issues, the National Vital Statistical Report (2001) and the Demographic Yearbook, the UN (1993).

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