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Abstract title **PROJECTED IMPROVEMENT IN LIFE EXPECTANCY ACROSS THREE TREATMENT DECADES: INSIGHTS FROM THE CHILDHOOD CANCER SURVIVOR STUDY (CCSS)**

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Background / Objectives:

Late mortality among 5-year survivors of childhood cancer from more recent eras has declined, yet how this translates into improved life expectancy is unclear. We estimated life expectancy among survivors diagnosed between 1970 and 1999 and assessed whether reduced therapeutic exposures have led to improvements over time.

Design / Methods:

We developed a microsimulation model of the lifetime course of survivors of childhood cancer. Competing risks included 1) disease- and treatment-related mortality (late recurrence, secondary cancers, cardiac, pulmonary, other causes) based on data of CCSS participants (n=24,355), and 2) U.S. background mortality rates. Model outcomes included conditional life expectancy (LE) (defined as the number of years a 5-year survivor can expect to live) and loss in LE (defined as the difference in LE between survivors and individuals without a cancer history).

Results

Conditional LE for 5-year survivors diagnosed in 1970-79, 1980-89 and 1990-99 (mean ages 12.5 to 13.1 years) was 48.5, 52.9 and 56.9 years. Compared to individuals without a cancer history, this represented a loss in LE of 16.5 (25.4%), 12.8 (19.5%), and 8.7 years (13.3%), respectively. The loss in LE varied by treatment subgroup and was highest among those treated with radiation alone or radiation with chemotherapy. Between 1970-79 and 1990-99, loss in LE remained largely unchanged for survivors treated with radiation alone (21.9 years [35%] to 21.4 years [34%]) and moderately improved for those who received radiation and chemotherapy (18.0 years [27%] to 13.5 years [21%]). In contrast, the loss in LE among survivors treated with chemotherapy alone declined from 11.7 years (18%) in 1970-79 to 4.8 years (7%) in 1990-99.

Conclusions:

Evolving treatment approaches are projected to lead to improved LE after treatment for pediatric cancer. Among survivors, radiation therapy exposure remains associated with considerable loss in projected LE, even in more recent decades.