

APPENDIX

Calculation of Lifetime Risk and Its Uncertainty

IREP calculates an estimate (Assigned Share, or AS) of the extent to which a given cancer diagnosed after a given exposure history might be attributed to that history (45). AS is easily converted to excess relative risk [$ERR = AS/(1 - AS)$], an estimate of the *additional* cancer risk (as a multiple of background cancer risk) attributable to radiation in an exposed population of the same age and sex and with the same exposure history. For the present paper, age- and site-specific values for ERR were obtained from IREP for each year of age after exposure and converted to excess absolute risk ($EAR = ERR \times$ age-specific U.S. baseline rate) (46). A summary lifetime EAR estimate was computed as the life-table-weighted sum of the age-specific EAR values using standard U.S. life-table survival probabilities (44) and converted to a summary ERR by dividing by the appropriate lifetime baseline rate. Organ-specific, linear-model dose-response coefficients used by IREP are based primarily on atomic bomb survivor data (45). Thus estimated ERR/Gy pertains to high-energy γ rays, and a radiation effectiveness factor (REF) of one is assigned to photons with energies of 250 keV or higher. For photons of lesser energies, IREP assumes an energy-dependent, uncertain REF [ref. (45), Table IV.H.1].