GROUP 2 CANCERS

Oral cavity and pharynx (male and female), esophagus (male and female), stomach (male), colon (male and female), rectum (male and female), gallbladder (male and female), pancreas (male and female), other respiratory except lung (male and female), ovary (female), male genital (male), bladder (male and female), urinary organs less bladder (male and female), nervous system (male and female), lymphoma and multiple myeloma (male and female), chronic lymphocytic leukemia (male and female), other solid cancers (male and female).

The risk model for cancers in this group has the same general formulation as that for Group 1 cancers. However, cancers in Group 2 have a relatively lower number of cases, and no significant correlation was found between the α parameters and the age-at-exposure and attained-age parameters γ and δ. Since, the α parameters are practically independent of γ and δ, the *ERR/Sv* (at exposure age *e* and attained age *a*) is approximated by the following equation:

$$ERR/Sv(e,a) = ERR/Sv(s,e=30,a=50) \times F(e,a)$$

where the age-dependent modifying factor *F(e,a)* is assumed to be independent of the cancer site and is described by a lognormal distribution with a mean of logarithms and a variance of logarithms given by:

$$\text{mean} = \gamma \times f(e) + \delta \times g(a)$$

$$\text{variance} = \text{var}(\gamma) \times f(e)^2 + 2 \times \text{cov}(\gamma,\delta) \times f(e) \times g(a) + \text{var}(\delta) \times g(a)^2$$

In addition to the individual solid tumors listed above, a set of risk coefficients was derived for all other solid tumors as a group. The model for this group of cancers is called the "residual cancers" risk model, and it is applied to estimate the risk from exposure to radiation for the following cancer types: bone, connective tissues, eye, endocrine glands other than thyroid, and other ill-defined sites (ICD-9 code = 195). For these cancer types, the data were insufficient to derive individual cancer models.