

広島統計談話会
Hiroshima Statistics Study Group

第 271 回談話会を下記のように開催致しますので
御参集下さいますようご案内申し上げます。

You are cordially invited to the 271st meeting as scheduled below.

日 時 : 2012 年 9 月 21 日 (金) 15:00 –
Date : September 21, 2012 (Fri) 15:00 –

場 所 : 放射線影響研究所 講堂
Place : RERF Auditorium

演 者 : Harry M. Cullings 博士 (放射線影響研究所 統計部 部長)
Speaker : Harry M. Cullings, Ph.D.
Chief, Department of Statistics, Radiation Effects Research Foundation

演 題 : 「原爆被爆者の寿命調査コホートにおける安定型染色体異常の探索的空間分析」
Title : “Exploratory Spatial Analysis of Stable Chromosomal Aberrations in a Subset of the
Life-Span Study Cohort of Atomic Bomb Survivors ”

要 約 :

Summary:

Stable chromosomal aberrations (CA) are an established effect of exposure to ionizing radiation, and the fraction of a person's lymphocytes bearing such aberrations is a more direct measure of such exposure than outcomes such as risk of cancer. Furthermore, the data on chromosomal aberrations are based on laboratory measurements and do not rely on individual recall and interpretation of the relevant events, as do, for example, data on acute clinical signs of radiation exposure such as epilation. These considerations suggest that CA are a good choice of outcome to address the question of whether survivors in any spatially localized areas may have received radiation doses not included in the direct doses calculated by dosimetry systems such as DS02. The work reported here includes an initial analysis of CA results for 3,011 survivors in Hiroshima and Nagasaki. A major need in such a study, as in any spatial analysis of radiation-related outcomes in RERF data, is to account for known effects of a number of covariates, particularly direct radiation dose, which has a strongly systematic spatial pattern. A complication is that the specific quantitative relationships between relevant covariates and CA need to be elucidated primarily from these same data. Another difficulty is that even after careful aspatial regression involving the known variables affecting CA, the CA are still quite over-disperse relative to the variation expected from the binomial distribution that is associated with the counting process. This has been associated with errors in survivors' estimates of direct radiation dose, which surely contribute to the over-dispersion, but could also involve variations in individual radiobiological susceptibility, or poor reproducibility of the laboratory assay, or heterogeneity due to other, unmodeled variables, possibly including indirect radiation dose. The results of the aspatial regression for covariate correction will be discussed, along with initial results of several statistical methods that were used to search for spatial patterns.