**Solid cancer mortality in Mayak workers cohort**

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**Introduction**

Mayak PA – Russian first nuclear cycle factory. Auxiliary, Reactor, Radiochemical and Pu production plants. Workers are exposed to external gamma- and incorporated Plutonium. Current analyses use updated dosimetry “Doses-2008”

**Methods:** Cohort study; Follow-up through the end of 2008; Poisson regression in terms of Excess Relative Risk model; Solid cancers other than lung, liver and bone are included in analyses since lung, liver and bone are organs of primary deposition of Pu. Doses of exposure were lagged for 5 years.

**Results:** Background mortality modeled in terms of age attained, gender, smoking and migration status. RR for smoking: males 1.51 (95% CI 1.32 – 1.74); females 1.58 (95% CI 0.001-2.37). Migrants had about 15% lower cancer mortality compared to Ozersk residents, adjusting for that had no effect on radiation risk estimates. External dose-response: ERR/Gy = 0.11 (95% CI 0.04 – 0.19). There is no evidence of non-linearity or threshold using linear-quadratic, linear-quadratic with cell killing effect models. Pu exposure: borderline significant dose-response (0.16; 95% CI 0.003 – 0.39). About 86% of excess cases are associated with external exposure.

**Discussion:**

Previous analyses [1] used film badge doses and shorter follow-up (through the end of 1997) including 1062 deaths from solid cancers other than lung, liver and bone. That analysis found ERR for external gamma-exposure of 0.08 per Gy, which is slightly lower compared to current analyses and non-linear dose response with downward curvature at higher doses. This most probably is explained by the fact that film badge dosimeters overestimated exposure at higher doses. We do not see such curvature in risk estimates made using updated dosimetry data from Doses-2008 which were adjusted for dosimeter sensitivity [2]. Our estimate of excess relative risk per unit dose (0.11) is about 25% of that observed in LSS cohort: 0.47 [3]. It should be noted that while doses of external exposure were substantial in Mayak workers cohort, the exposure had been prorated over worker’s occupational history and occurred in wide range of doses and dose rates. In the same time [3] provides risk estimates for all solid cancers combined whereas we report effect of external exposure to solid cancers other than lung, liver and bone. Our results compare with LSS cohort in terms of dose-response shape which is linear in both analyses.

**References:**