

A record-based case-control study of natural background radiation and the incidence of childhood leukaemia and other cancers in Great Britain during 1980-2006

(Kendall *et al.*, *Leukemia* 2012 (in press))

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Childhood Leukaemia Risk

- The average annual dose from natural background radiation to the red bone marrow of a child living in Great Britain is ~1.4 mSv.
- Recently developed risk models predict that ~15% of childhood leukaemia incidence in Great Britain is attributable to natural background radiation.
- A case-control study with at least 8000 cases is required to have a power of 80% of detecting this predicted risk (Little *et al. Radiat Res* 2010; **174**: 387-402).

Case-control Study

Kendall et al. Leukemia 2012 (in press)

- 27 447 cases of childhood cancer (from the National Registry of Childhood Tumours) diagnosed in Great Britain during 1980-2006, and 36 793 matched controls.
- 9058 cases of childhood leukaemia matched with 11 912 controls.
- Cumulative (birth to diagnosis) exposures to background γ -radiation and radon estimated for maternal residence at birth of the child.

Results

Kendall *et al.* *Leukemia* 2012 (in press)

- **Gamma-rays** (RR per mGy)

	Cases	RR	95% CI	P
<i>Total Leukaemia</i>	9058	1.09	(1.02, 1.17)	0.01
Not Leukaemia	18 389	1.02	(0.98, 1.06)	0.38

- **Radon** (RR per 10³ Bq/m³ years)

				Cases
RR	95% CI	P		
Total Leukaemia	9058	1.12	(0.88, 1.43)	0.35
Not Leukaemia	18 389	1.06	(0.91, 1.24)	0.43

Results

Kendall *et al.* *Leukemia* 2012 (in press)

- **Gamma-rays** (RR per mSv RBM dose)

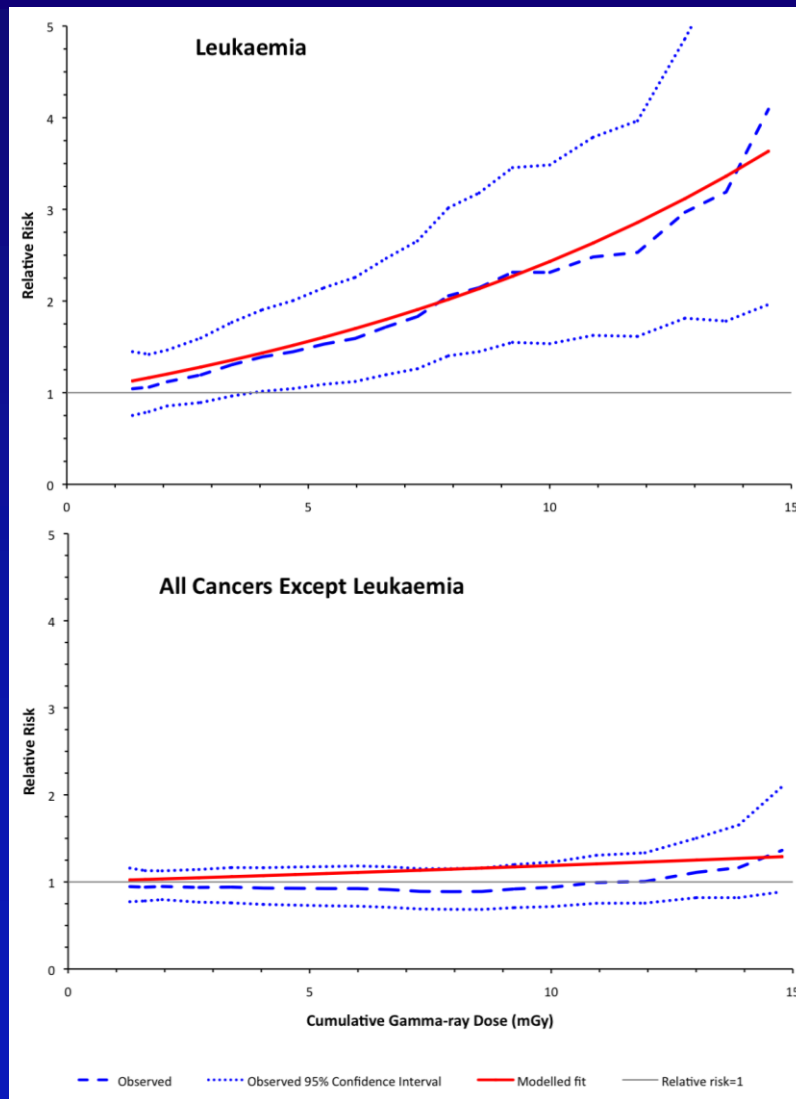
	RR	95% CI	P
<i>Total leukaemia</i>	1.12	(1.03, 1.22)	0.01

- **Radon** (RR per mSv RBM dose)

	RR	95% CI	P
Total leukaemia	1.03	(0.96, 1.11)	0.35

Natural Background γ -radiation

Kendall *et al. Leukemia* 2012 (in press)



Childhood Leukaemia Risk

Kendall et al. *Leukemia* 2012 (in press)

