

**Table S1. ICD-O morphology code summary.**

	SEER recode	ICDO version		
		1	2	3
<b><u>Acute Myeloid Leukemia</u></b>				
Acute Myeloid Leukemia	35021	9840, 9841, 9861, 9866, 9891, 9910	9840-9841, 9861, 9866, 9867, 9891, 9910	9840, 9861, 9866, 9867, 9870-9874, 9891, 9895- 9897, 9910, 9920
Other Myeloid Leukemia	35023	9860, 9862, 9864, 9865, 9870, 9880, 9890, 9892- 9894	9860, 9862, 9864, 9880, 9890, 9892- 9894, 9930	9860, 9930
<b><u>Acute Lymphoblastic Leukemia</u></b>				
Acute Lymphoblastic Leukemia	35011	9821	9821, 9826	9826, 9835- 9837
Other lymphoid Leukemia	35013	9820, 9822, 9824, 9825, 9830, 9850, 9920, 9930	9820, 9822, 9824, 9825, 9850, 9941	9820, 9832- 9834
<b><u>Chronic Myeloid Leukemia</u></b>				
Chronic Myeloid Leukemia	35022	9842, 9863, 9893	9842, 9863, 9893	9863, 9875, 9876, 9946
<b><u>Chronic Lymphocytic Leukemia</u></b>				
Chronic Lymphocytic Leukemia	35012	9823	9823	9823
Hairy Cell Leukemia	35013	9940	9940	9940
<b><u>Adult T-cell Leukemia</u></b>				
ATL	35014	(9702)	9827	9827
<b><u>Other Leukemia</u></b>				
Other acute	35041	9801	9801, 9931, 9932	9801, 9805, 9931
Aleukemic, subacute, & NOS	35043	9800, 9810, 9802-9804, 9865, 9900	9800, 9802- 9804, 9830, 9870, 9900	9733, 9742, 9800, 9831, 9948, 9963, 9964

**Table S1. ICD-O morphology code summary (continuation)**

	SEER recode	ICDO version		
		1	2	3
<b><u>Lymphoma</u></b>				
Non-Hodgkin Lymphoma	33040	9590-9591, 9600-9602, 9610-9615, 9620-9623, 9630-9633, 9640-9642, 9690-9698, 9700-9701	9590-9595, 9670-9677, 9680-9688, 9690-9698, 9700-9717	9590-9596, 9670-9671, 9673-9675, 9678-9680, 9684, 9687, 9689-9691, 9695,9698- 9702, 9705, 9708, 9709, 9714-9719, 9727-9729
Hodgkin Lymphoma	33010	9650-9662	9650-9667	9650-9667
<b><u>Multiple Myeloma</u></b>				
Multiple Myeloma	34000	9730-9731	9731-9732	9731-9732, 9734

**Table S2. Summary of preferred models\***

ERR	EAR
<b><u>Leukemia other than CLL or ATL</u></b>	
Background $2.30 \cdot \exp(-0.68 \cdot s - 0.42 \cdot c + 0.08 \cdot b - 0.08 \cdot b^2 + 3.32 \cdot a + 1.26 \cdot a^2)$	Background $2.63 \cdot \exp(-0.81 \cdot s - 0.30 \cdot c + 0.10 \cdot b - 0.12 \cdot b^2 + 3.58 \cdot a + 1.46 \cdot a^2)$
Excess risk $(0.79 \cdot d + 0.95 \cdot d^2) \cdot \exp(-1.09 \cdot a - 0.81 \cdot \text{lt}40)$	Excess rate $(1.06 \cdot d + 1.09 \cdot d^2) \cdot \exp(0.41 \cdot e - 1.45 \cdot a - 0.65 \cdot c - 0.42 \cdot s)$
<b><u>Acute Myeloid Leukemia</u></b>	
Background $1.86 \cdot \exp[-0.91 \cdot s + 0.17 \cdot b - 0.18 \cdot b^2 + 4.21 \cdot a + 1.58 \cdot a^2 - 1.01 \cdot (s \cdot a) - 0.17 \cdot (s \cdot a^2)]$	Background $1.97 \cdot \exp[-1.06 \cdot s + 0.17 \cdot b - .17 \cdot b^2 + 3.98 \cdot a + 1.24 \cdot a^2 - 0.31 \cdot (s \cdot a) + 0.59 \cdot (s \cdot a^2)]$
Excess risk $(1.11 \cdot d^2) \cdot \exp(0.17 \cdot e + 0.25 \cdot e^2 - 0.89 \cdot a)$	Excess rate $(1.59 \cdot d^2) \cdot \exp(2.59 \cdot a + 1.43 \cdot a^2)$
<b><u>Acute Lymphoblastic Leukemia</u></b>	
Background $0.10 \cdot \exp(1.70 \cdot a)$	Background $0.10 \cdot \exp(1.70 \cdot a)$
Excess risk $(2.40 \cdot d) \cdot \exp(-0.92 \cdot s - 3.51 \cdot a)$	Excess rate $(0.23 \cdot d) \cdot \exp(-0.92 \cdot s - 1.81 \cdot a)$
<b><u>Chronic Myeloid Leukemia</u></b>	
Background $0.22 \cdot \exp(-0.06 \cdot s + 1.38 \cdot a + 1.75 \cdot (s \cdot a))$	Background $0.25 \cdot \exp(-0.28 \cdot s + 1.60 \cdot a + 1.38 \cdot (s \cdot a))$
Excess risk $(5.24 \cdot d) \cdot \exp(-1.50 \cdot c - 1.59 \cdot \text{lt}25 - 1.42 \cdot a55)$	Excess rate $(0.68 \cdot d) \cdot \exp(-1.49 \cdot c - 1.63 \cdot \text{lt}25 - 0.20 \cdot a55)$ men $(0.57 \cdot d) \cdot \exp(-1.49 \cdot c - 1.63 \cdot \text{lt}25 + 2.10 \cdot a55)$ women
<b><u>Adult T-cell Leukemia (Nagasaki only) – no dose response</u></b>	
Background $0.97 \cdot \exp(0.29 \cdot b + 4.07 \cdot a)$	Background $0.97 \cdot \exp(0.29 \cdot b + 4.07 \cdot a)$

**Table S2. Summary of models (continuation)**

ERR		EAR	
<b><u>Non-Hodgkin Lymphoma</u></b>			
Background		Background	
$4.19 \cdot \exp(-0.54 \cdot s + 0.31 \cdot b - 0.05 \cdot b^2 + 6.85 \cdot a + 4.70 \cdot a^2 - 10.55 \cdot sa1 - 18.51 \cdot sa2)$		$4.10 \cdot \exp(-0.52 \cdot s + 0.31 \cdot b - 0.05 \cdot b^2 + 6.67 \cdot a + 4.05 \cdot a^2 - 6.02 \cdot sa1 - 17.05 \cdot sa2)$	
Excess risk		Excess rate	
$(0.10 \cdot d) \cdot \exp(-10.69 \cdot a40)$ 0	men women	$0.54 \cdot d$ 0	men women
<b><u>Hodgkin Lymphoma – no dose response</u></b>			
Background		Background	
$0.16 \cdot \exp(-0.85 \cdot s - 0.38 \cdot b + 0.66 \cdot a)$		$0.16 \cdot \exp(-0.85 \cdot s - 0.38 \cdot b + 0.66 \cdot a)$	
<b><u>Multiple Myeloma – no dose response</u></b>			
Background		Background	
$1.33 \cdot \exp(0.16 \cdot b - 0.12 \cdot b^2 + 7.75 \cdot a + 2.54 \cdot a^2 - 25.58 \cdot sa2)$		$1.33 \cdot \exp(0.16 \cdot b - 0.12 \cdot b^2 + 7.75 \cdot a + 2.54 \cdot a^2 - 25.58 \cdot sa2)$	

**Model covariate definitions:**

c = 0 for Hiroshima and 1 for Nagasaki

s = 0 for men and 1 for women

b = (birth year – 1915) / 10

a = ln(age / 70); a40 = ln(age / 40); a55 = ln(age / 55)

d = weighted bone marrow dose (Gy)

e = (1945 – birth year – 30) / 10

lt25 = ln(time since exposure / 25); lt40 = ln(time since exposure / 40)

sa1 = [ln(age / 40)]<sup>2</sup> · (age < 40); sa2 = [ln(age / 70)]<sup>2</sup> · (age > 70)

† See analysis log file included with supplement for more details on model parameterization and more precise parameter estimates