

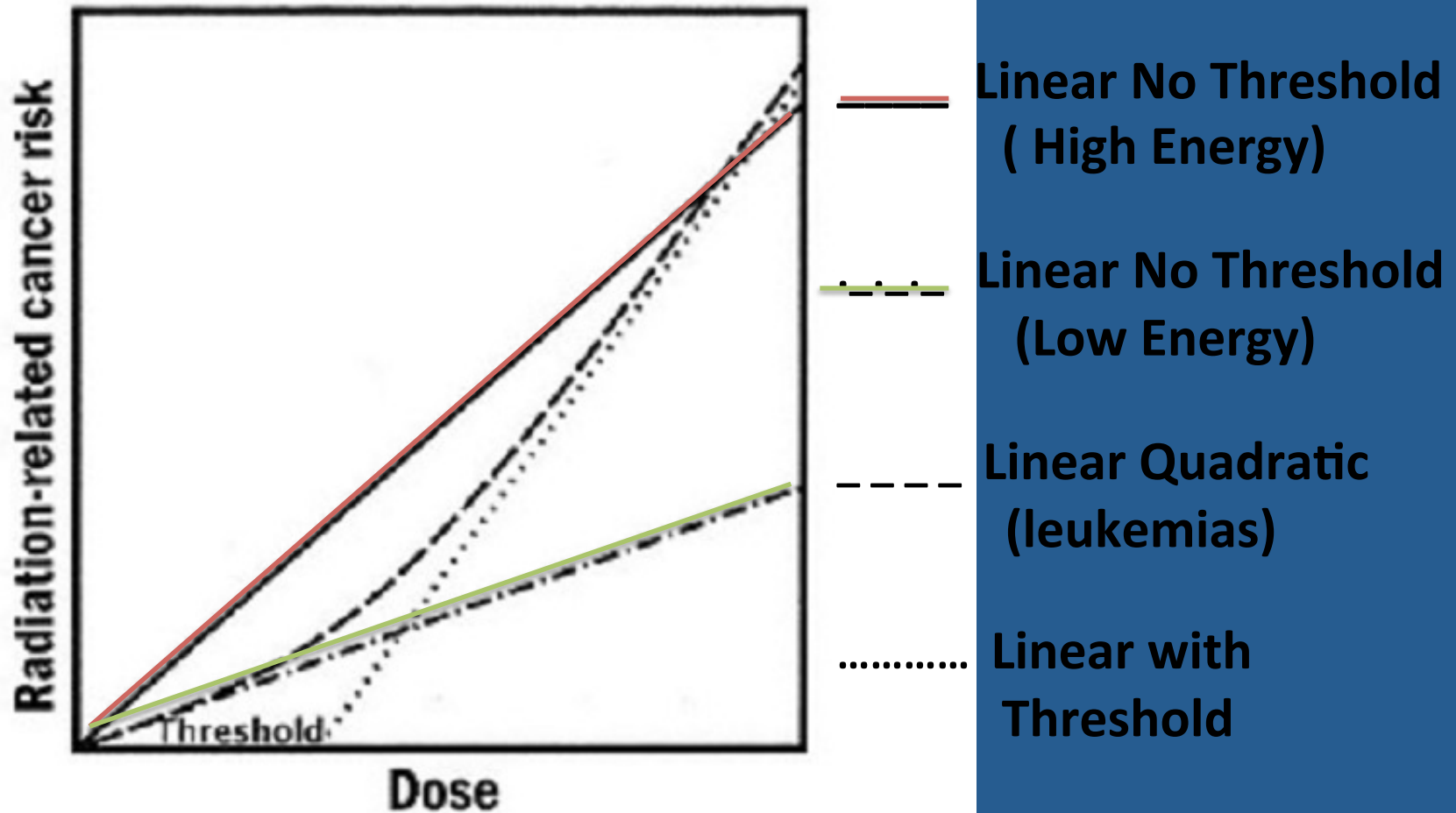
The accidents at Fukushima Dai-Ichi

Summary of Health Discussions



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WHOI-University of Tokyo Colloquium
November 14, 2012

Do we know how the amount of radiation dose affects the risk of cancer?



Source: BEIR VII

Human Studies Support Linear Dose Response for cancer at doses above 100 mSv

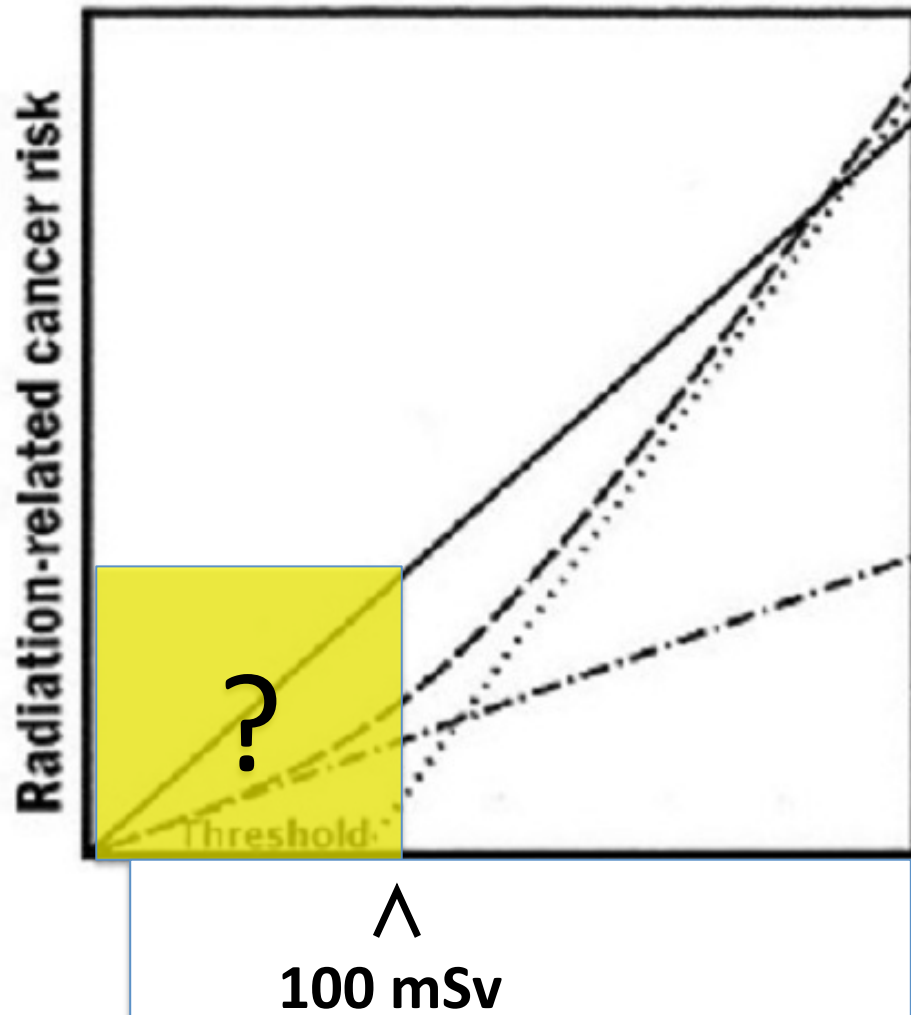
- Estimated excess lifetime risk of radiation-related cancer mortality 0.04-0.05%/100mSv
- Japanese cancer mortality risk in unexposed populations 26% (males) and 16% (females)
- Cancer mortality Risk for male exposed to 100 mSv would be ~26.05%
- Increased Risk for radiation exposed Infants and Children
- Approximately 167 Japanese workers at Fukushima-NPP1 have exceeded 100 mSv

Low Dose Radiation cancer effects (below 100mSV) are found in some human studies

Examples:

- 80% Hiroshima & Nagasaki survivors exposed to lower doses
 - Survivor studies show solid tumor dose response over 0 – 150 mGy range
 - But...high dose rate of neutron and gamma
- Some occupational studies show cancer trends at low dose:
 - Recent Chernobyl Clean-up Worker Study: increased leukemias. But worker doses at Fukushima are lower on average.
 - Techa River (Russia): Low dose exposure --increase in solid tumors and leukemia
- Studies of people living in high natural background areas **do not** show increased risk

Human Epidemiology Shows Increased Cancer Risk Above 100 mSv



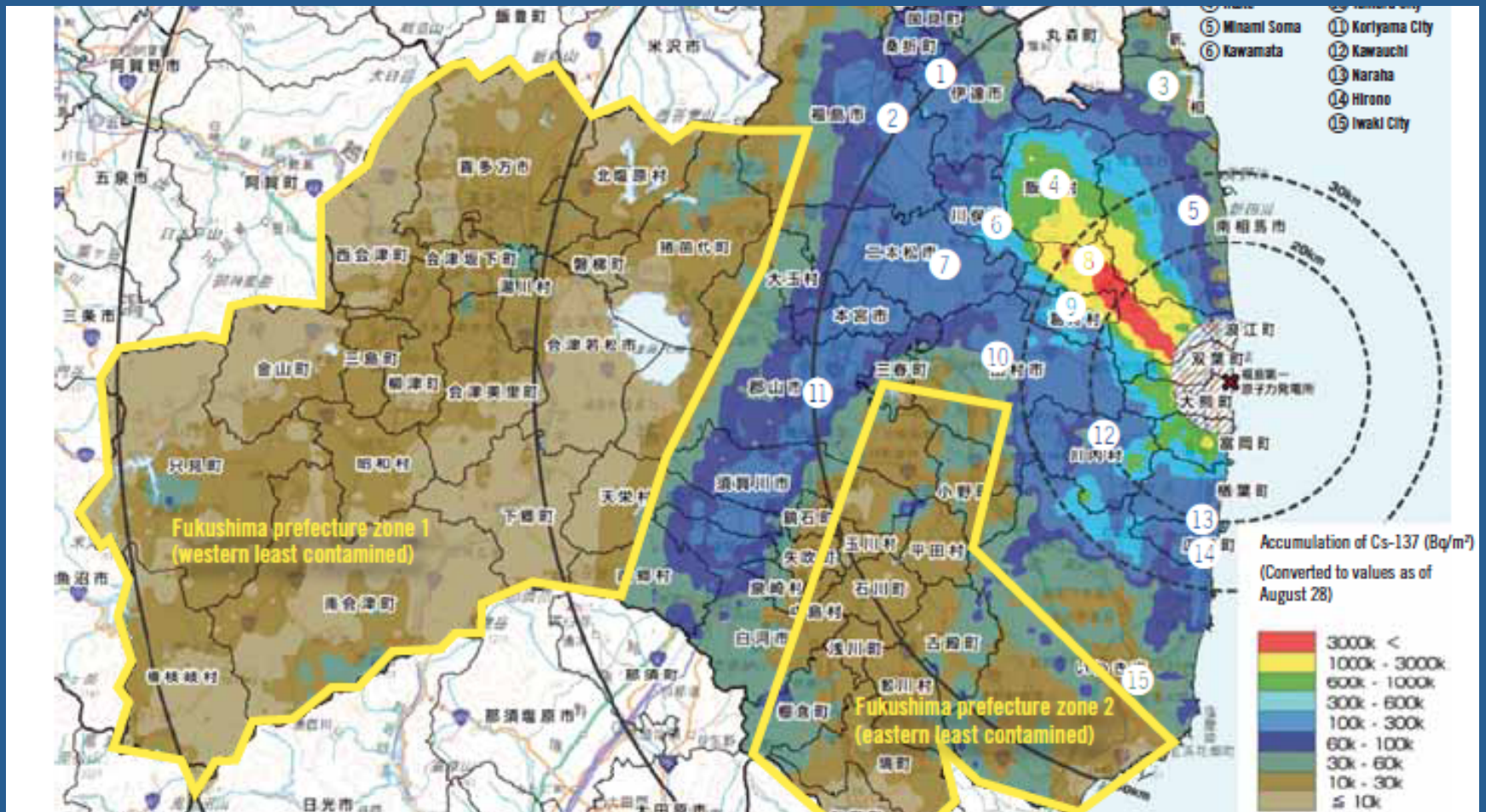
— Linear No Threshold
(High Energy)

- · - · - Linear No Threshold
Low Energy)

- - - Linear Quadratic
(leukemias)

..... Linear with Threshold

WHO Preliminary Dose Reconstruction Whole Body—All Key Radioisotopes



High Areas: 10-50 mSv effective dose—mostly external
 Lower areas: 1-10 mSv effective dose---mostly internal

What does this mean for People living near Fukushima NPP1?

- Radiation-related cancer risk is very low overall
- Thyroid cancer risk also low, but this is the most likely type of cancer to occur due Iodine 131 exposure
- It may be difficult to measure any increase in cancer rates due to the limitations of epidemiologic methods
- Most panelists agreed that a study should be done, including:
 - careful dose assessment
 - considering psychological effects of the disaster
- Preventing additional significant exposures is important

Symposium Discussion on Health Issues

- Radiation release has caused psychological distress
 - Public wants open communication from Government
 - Independent verification of facts
 - Rebuilding trust is paramount
- Difficult for individuals to obtain and understand information about their exposure situation
- Challenge for scientists to communicate complex information about radiation dose and risk