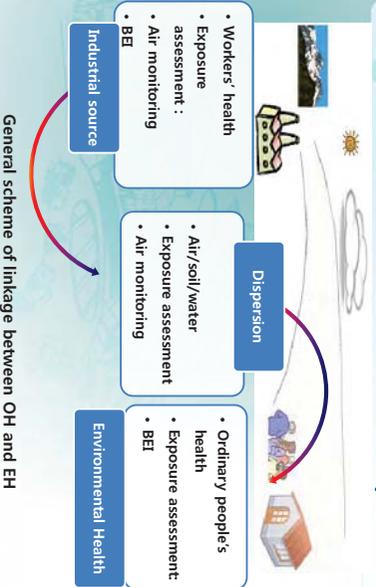


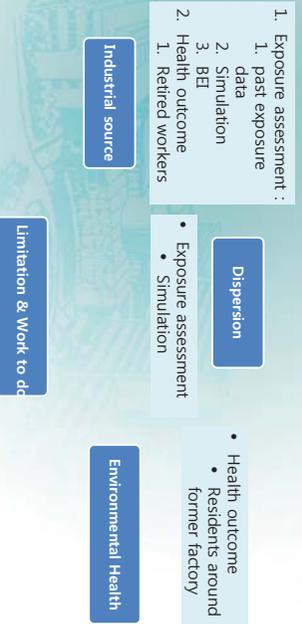
Occupational Health to Environmental Health (Procedure to estimate environmental exposure)



Asbestos : Past exposure and present outcome & occupational source and environmental outcome



Flame of this presentation : Series of studies regarding on a asbestos textile factory



Session: Asbestos: Combining Issue from past to future and from factory to civil society

Difficulties in research to dig past exposure for linking present illness in epidemiologic point of view

Dongmug Kang, Gun-Hung Kim, Yong-Sik Hwang, Ju-Young Kim
Pusan National University Yangsan Hospital,
Department of Occupational and Environmental
Medicine,
Environmental Health Center for Asbestos, Korea

BACKGROUND

Epidemiological difficulties in Asbestos problem (OEH)

- Misclassification : Long latency
 - Past exposure -> present (& future) outcome
- Distinction of exposure source : difficulty in exposure assessment
- Outcome : no specific feature than other origin (eg. Lung cancer)
- Bias : healthy worker effect
 - Selection (entrance)
 - Healthy survival effect (same to environment)

Joint study among Korea, Japan, and Indonesia (2008)



RESULT1: OCCUPATIONAL ASPECTS

Mixing



Carding



Spinning



Similar working condition of former J-chem

Weaving



Twisting



History of J-chemistry (asbestos textile factory)

- 1969 : Found
- 1970 : Setting machines for crocidolite fabrics from Datsuda Industry [subcontract of Japan asbest (Nichias)]
- 1971 – 1979 : Produce crocidolite fabrics
- 1990 : Found PT. Jell Fajar Indonesia
- 1989 - 1992 : Move into Yongsan & Indonesia
- 1996 : Joint factory in Malaysia
- 2003 : Joint factory Qingda Jein E & S China

Air monitoring : Inside & outside of factory



Ambient Air Asbestos Level in J-chemistry

ASBESTOS HAZARD EVALUATION IN SOUTH KOREAN TEXTILE PRODUCTION

Eckardt Johannig, Mark Goldberg, and Rokho Kim

International Journal of Health Services, Volume 24, Number 1, Pages 131–144, 1994
© 1994, Baywood Publishing Co., Inc.

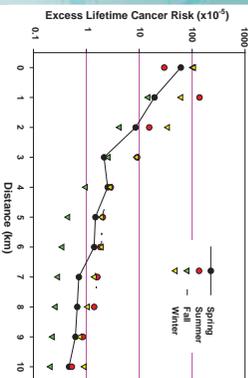
In addition, the industrial hygiene survey conducted by SNU in 1987 revealed generally poor industrial hygiene conditions in the old Jell & Rex plant. Personal monitoring conducted at the time (ten samples) revealed that workers were exposed to a geometric mean asbestos dust concentrations of **0.2 fibers** per cubic centimeter (f/cc) with a geometric S.D. of 2.44 (24).

Environmental Exposure Assessment for Excess Lifetime Cancer Risk

$$ELCR = [EPC] \cdot [PMF] \cdot [ICR]$$

where:
 ELCR = Excess Lifetime Cancer risk
 EPC = Exposure Point Concentration of asbestos fibers in air (cc) for the specific activity being assessed

EPA 2008a



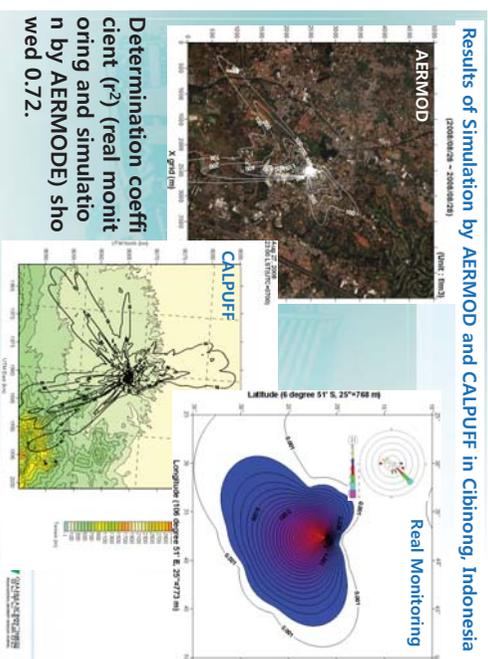
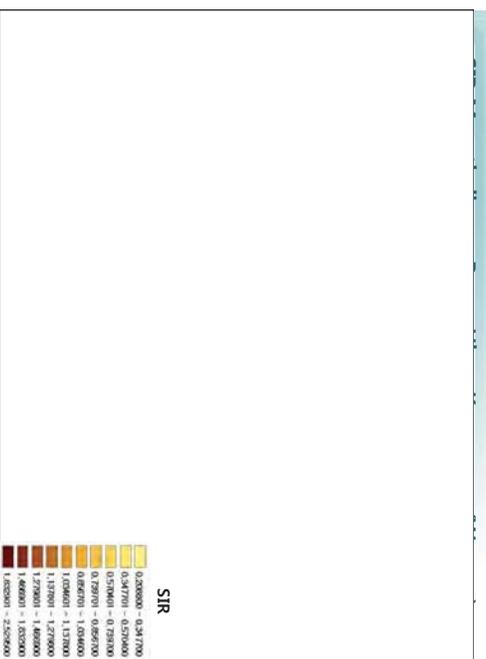
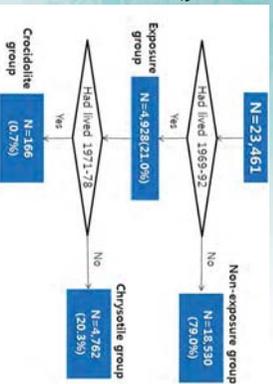
Yearly mean ELCR is appeared by 1.14×10^{-5} in 6km distance, and appeared by 11.8×10^{-5} in 2km.

LIMITATIONS & FUTURE PLAN

Possible bias : misclassification

- Rapid developing country
 - Moving home to find job
 - Problem when final address is a surrogate of environmental exposure
- Misclassification control is important

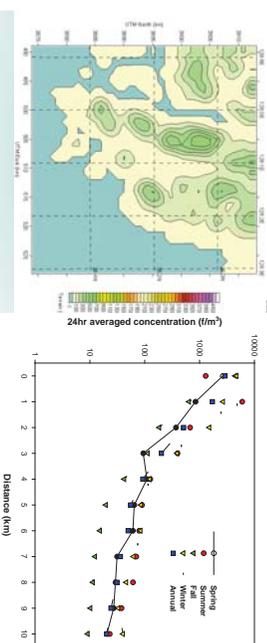
Table: Magnitude of misclassification estimated from resident registration system

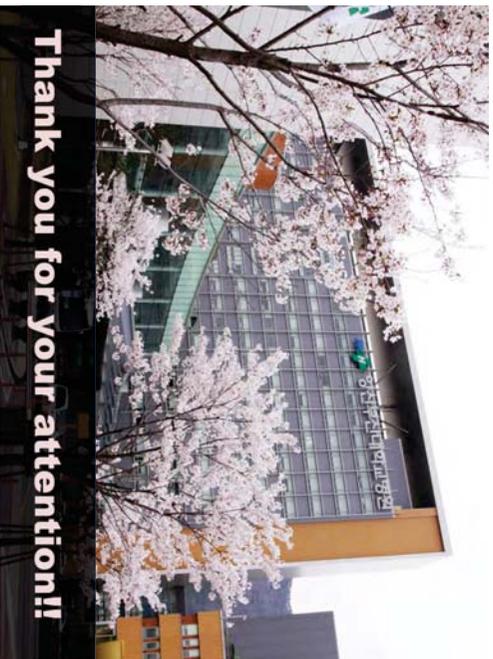


Emission input data of volume pollution source

| Source Name | X(km) | Y(km) | Effect. Ht.(m) | Base Elev. (m) | Initial sigma y (m) | Initial sigma z (m) | Emission Rates |
|-------------|---------|---------|----------------|----------------|---------------------|---------------------|--------------------|
| V1 | 507.721 | 3895.16 | 5 | 3 | 15 | 5 | 5.56×10^7 |

Emission Rates were 5.56×10^7 /sec
 Base map for CALPUFF simulation





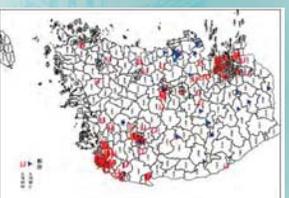
Ongoing study : cancer registry data & residential history

- J-Chem radiu 500m : 21,787 people
- Geo-coding: (WGS84)
- Cancer registry data & Mapping
- Possible misclassification

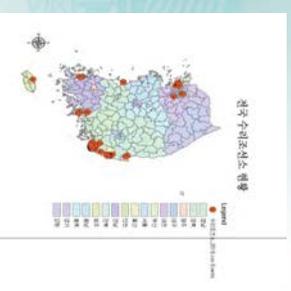


Exposure source DB construction

Mine & Factory



Ship repair



Detailed occupation & residential history are essential



Future plan

- National asbestos exposure source DB
- Simulation study : environmental exposure
- Epidemiologic study to link between env. Asbestos exposure & diseases
 - Starting point: Busan area
- MM registry
 - Gives detailed occup. & envir. exposure history

