Dangerous Trades

Case reports of International transfers of Asbestos Industry in Asia and health concerns

May 2015

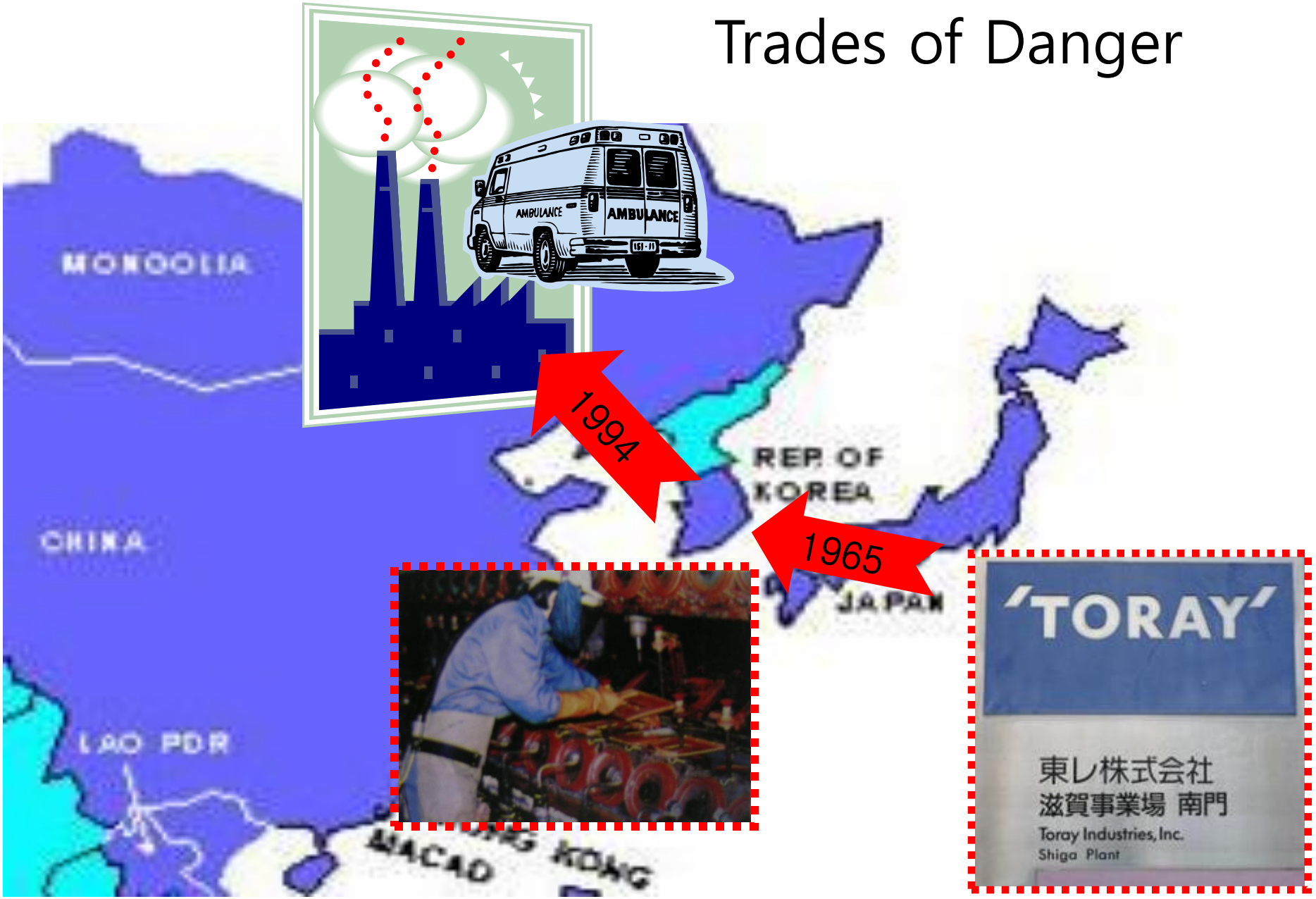
Yeyong CHOI
BANKO (Ban Asbestos Network Korea)
A-BAN (Asian-Ban Asbestos Network)
Seoul National University, Institute of Health and Environment

Questions

- Cooperates' responsibility not mineral material's
- There has been no control of toxic facilities transfers from developed country to developing country.
  - Bhopal case,
  - Asbestos factory cases

<Figure 4; After school of Sarangi Trust, which is a charity non-government organization for disabled children, an Indian mother carries her who was born at the disaster area in Bhopal, India. Photo in 2011 November by choiyeyong.>

Trades of Danger



AMERICAN JOURNAL OF INDUSTRIAL MEDICINE 56:335–346 (2013)

Trades of Dangers: A Study of Asbestos Industry Transfer Cases in Asia

Yeyong Choi, MPH,[1] **Sinye Lim,** MD, MPH, PhD,[2] **and Domyung Paek,** MD, MSc, ScD[1]*

Background *In a study of asbestos industry transfers in Asia, we examined the transfer of health and safety measures at the time of industry transfer and resulting health outcomes thereafter.*

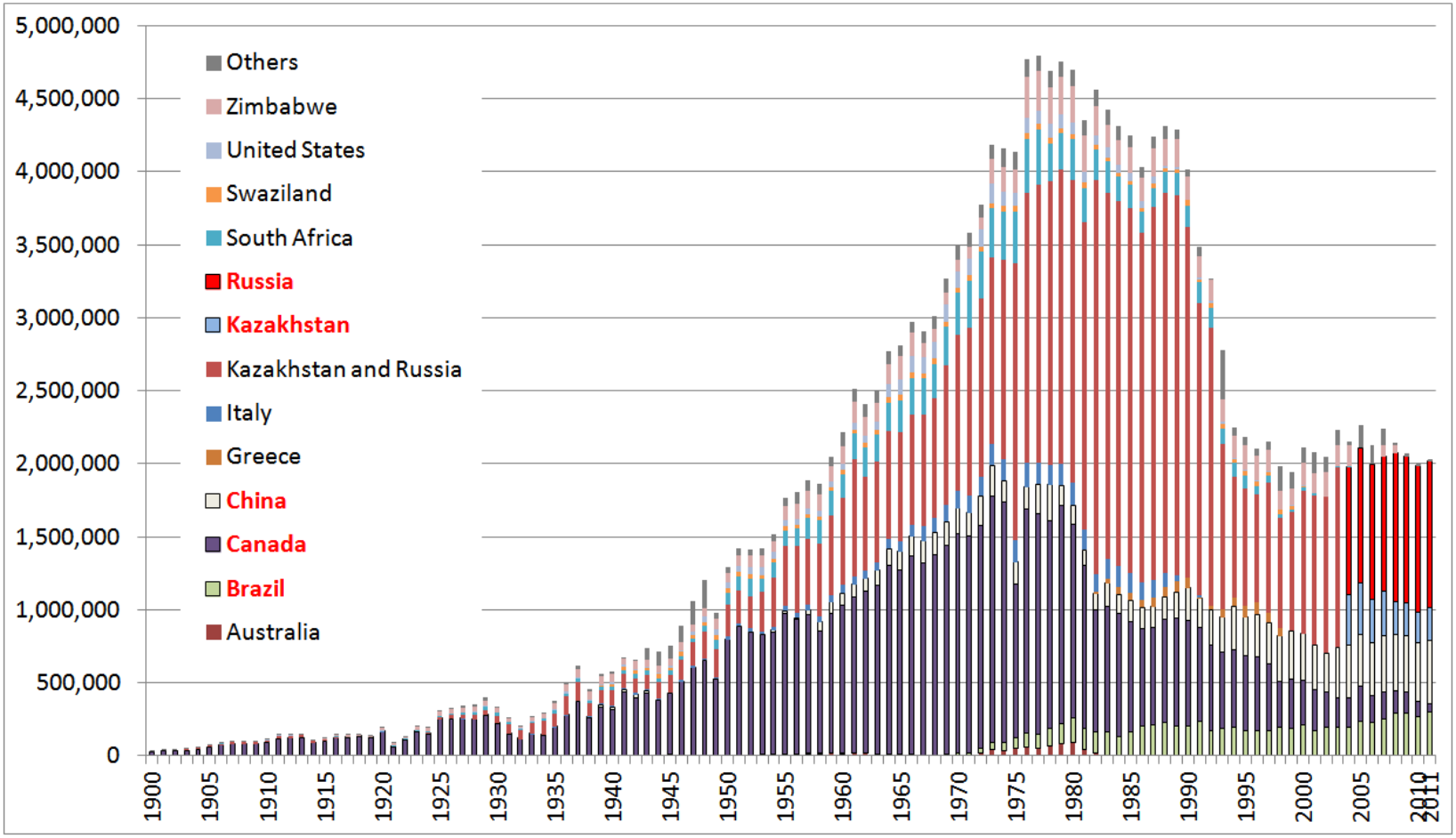
Methods *Field surveys were conducted in Japan, Germany, Indonesia, and South Korea over a 5 year period beginning in 2007. The surveys involved interviews and field assessments of health and safety conditions.*

Results *Even when there were transfers of entire engineering plant processes, we observed that the health and safety measures that should have accompanied the transfer, including technical capacities of risk assessment and management, regulatory protection, and cultural practices, were not actually transferred. According to work environment assessment records, there were differences in airborne asbestos levels of approximately 5–6 fibers/cc between the exporting and importing sides of the transfer. This amounted to a 10 years of time delay in comparable health and safety conditions. These differences resulted in repeated adverse health consequences at each factory operation site.*

Conclusions *Dangerous transfers of asbestos industry technology have occurred repeatedly over the years with the result that Asia has become the largest consumer of asbestos in the world. No effective internationally accepted safety measures have been introduced in the region. The study results support the need for both improved public awareness and international cooperation, such as sharing of substitute material technologies by the exporting countries, and provide the rationale for the creation of an Asian fund for asbestos victims.* Am. J. Ind. Med. 56:335–346, 2013.

KEY WORDS: ***asbestos; pollution export; textile industry***

<Figure 1; Trend of Asbestos Production (unit metric tonnes) 1900-2011, data source-US Geological Survey>



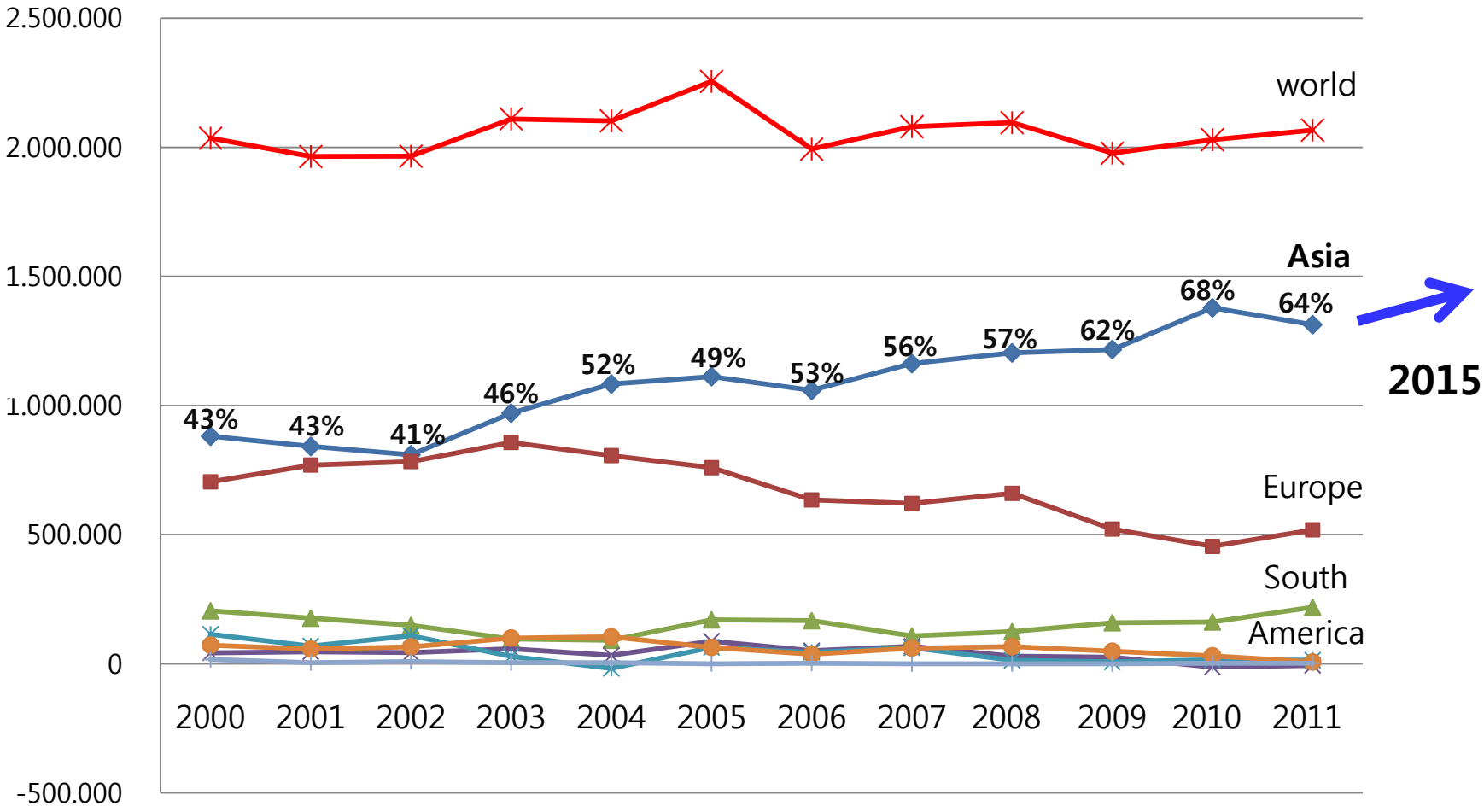


Figure 3: World and regional asbestos consumption since 2000 with the ratio of Asia. Data source: US Geological Survey.

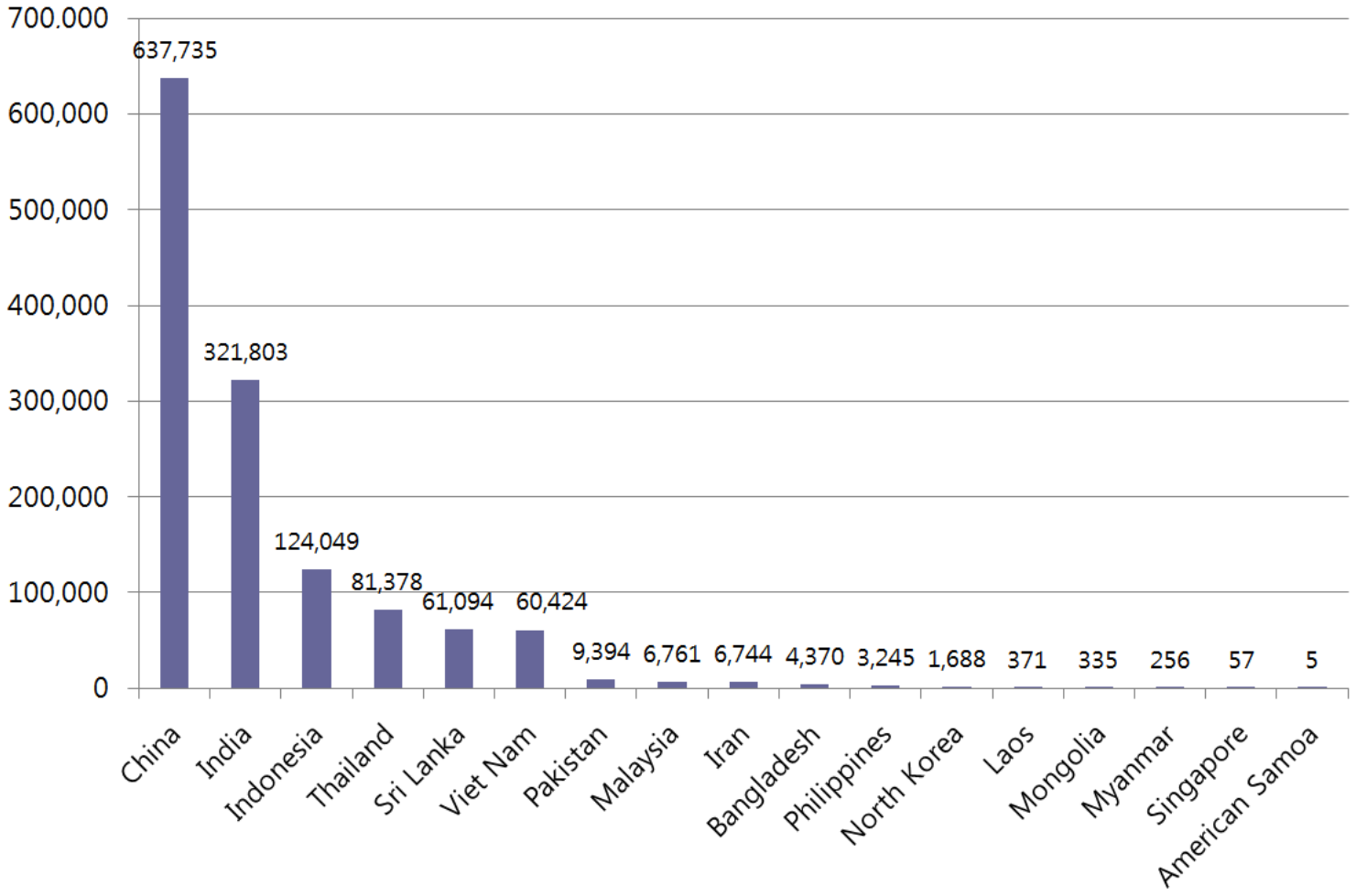


Figure 4: Asbestos consumption of 17 Asian countries in 2011.
Data source: US Geological Survey.

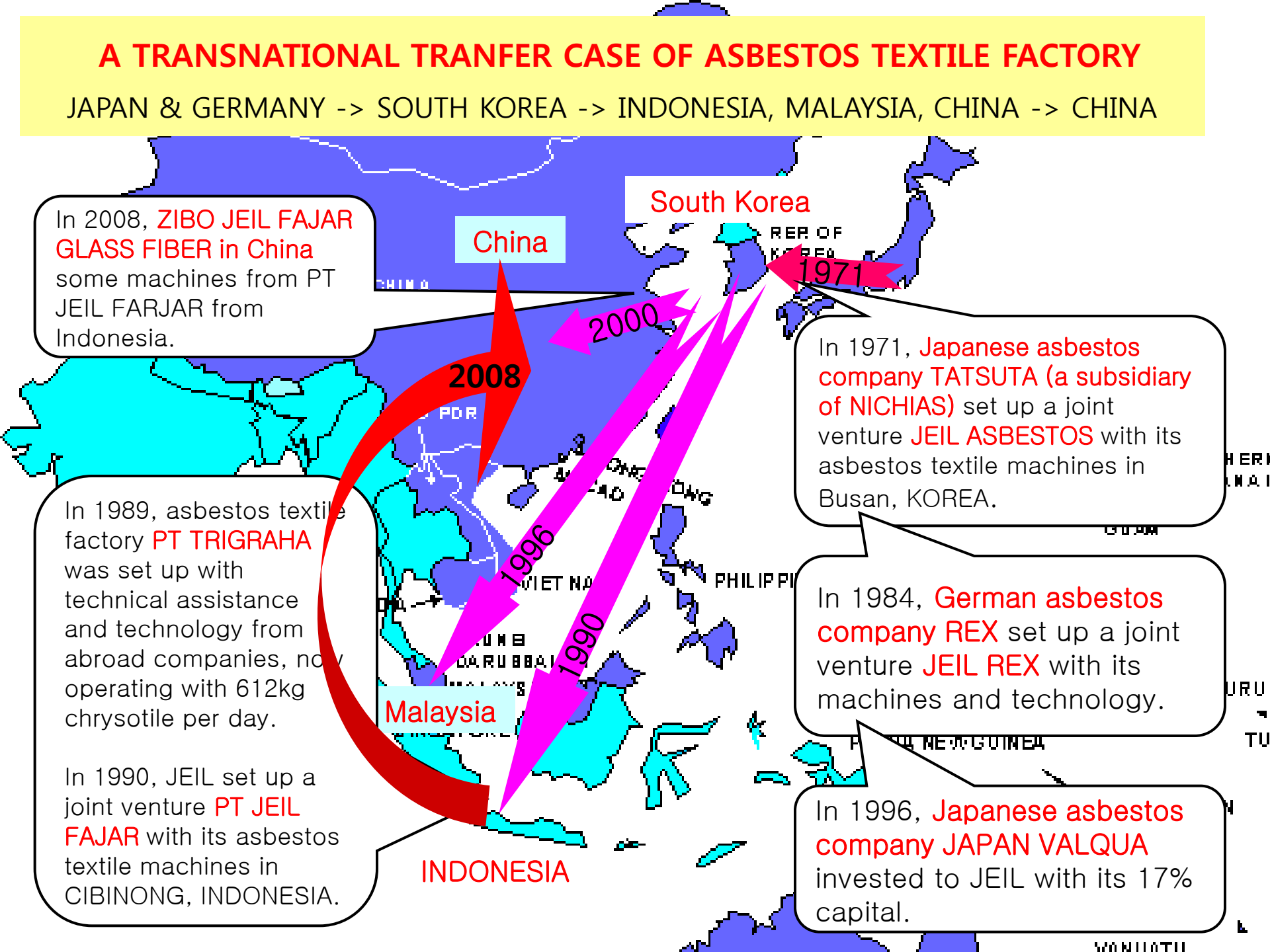
Case Report 1

NICHIAS/REX->JEIL E&S->PT JEIL FAJAR->?

Asbestos textile plants transferred Japan/Germany->Korea->Indonesia->China

A TRANSNATIONAL TRANFER CASE OF ASBESTOS TEXTILE FACTORY

JAPAN & GERMANY -> SOUTH KOREA -> INDONESIA, MALAYSIA, CHINA -> CHINA



In 2008, ZIBO JEIL FAJAR GLASS FIBER in China some machines from PT JEIL FARJAR from Indonesia.

In 1971, Japanese asbestos company TATSUTA (a subsidiary of NICHIAS) set up a joint venture JEIL ASBESTOS with its asbestos textile machines in Busan, KOREA.

In 1989, asbestos textile factory PT TRIGRAHA was set up with technical assistance and technology from abroad companies, now operating with 612kg chrysotile per day.

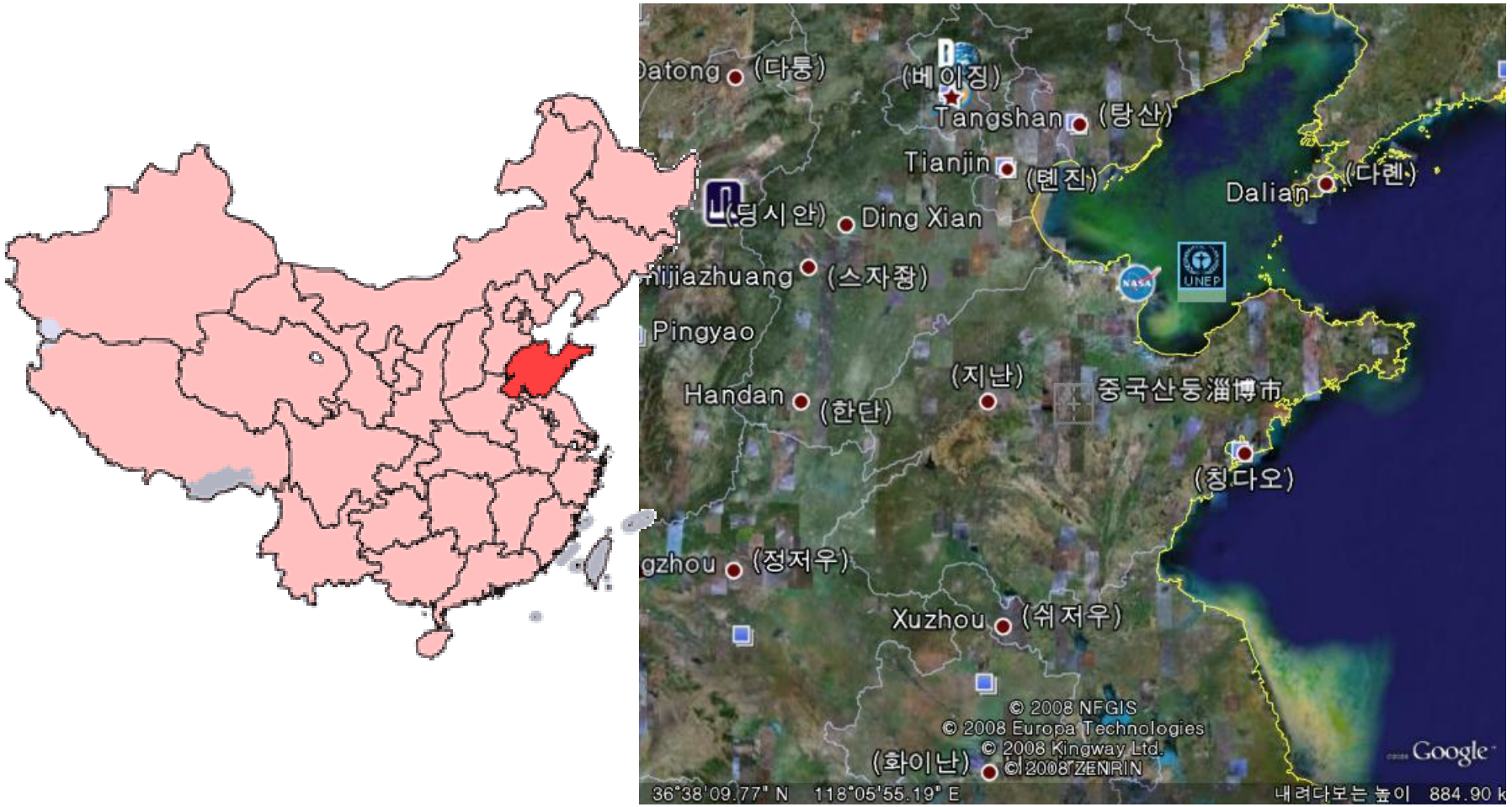
In 1984, German asbestos company REX set up a joint venture JEIL REX with its machines and technology.

In 1990, JEIL set up a joint venture PT JEIL FAJAR with its asbestos textile machines in CIBINONG, INDONESIA.

In 1996, Japanese asbestos company JAPAN VALQUA invested to JEIL with its 17% capital.

중국산둥성쩌보시 中國山东省淄博市

people's government of Zibo municipality



Transfer of Danger From Germany to Korea

<Figure 13; A photo of REX asbestos textile factory in 1960s. Provided by Dr. Hinz>

Dr Hinz holding the report ‘Death production transferred’

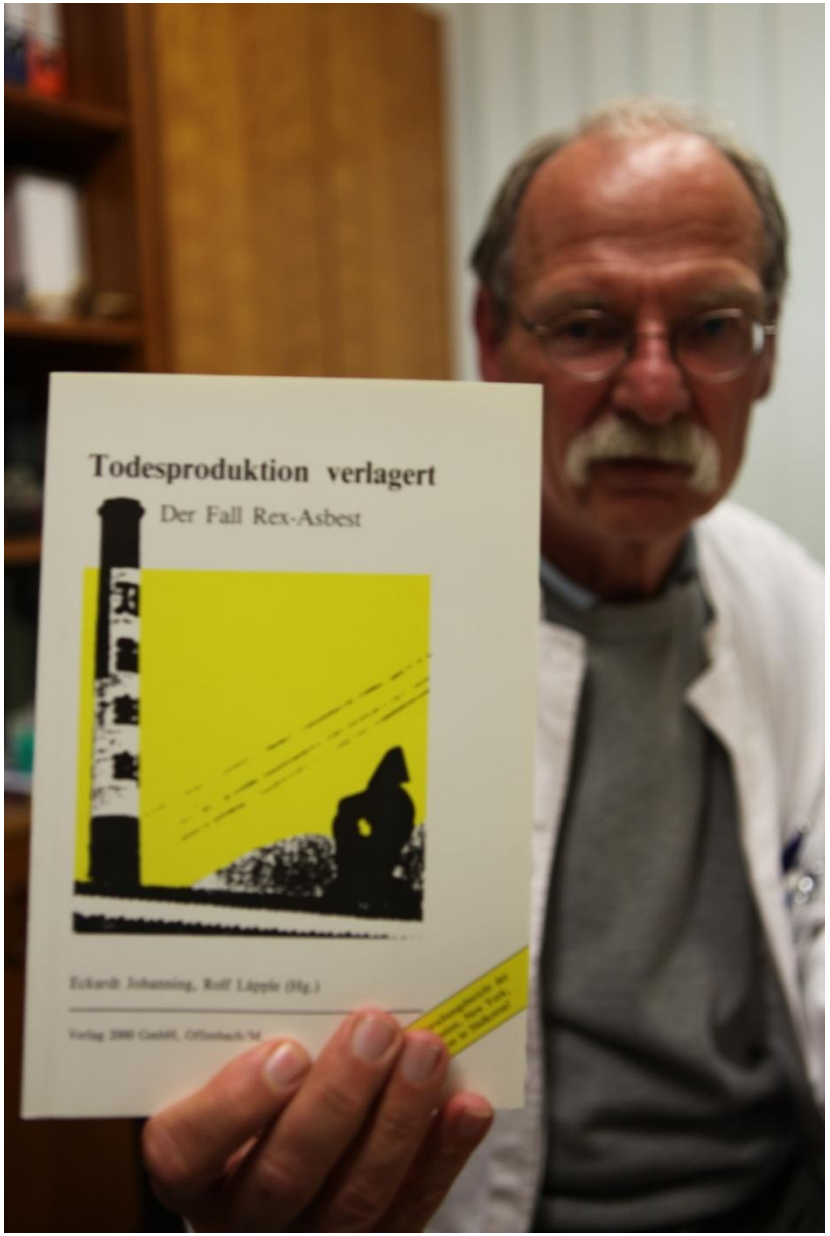
German title;

-Todesproduktion verlagert. Der Fall Rex-Asbest, Verlag 2000, 1992 죽음의 산물이 이전되다

-Todesproduktion verlagert

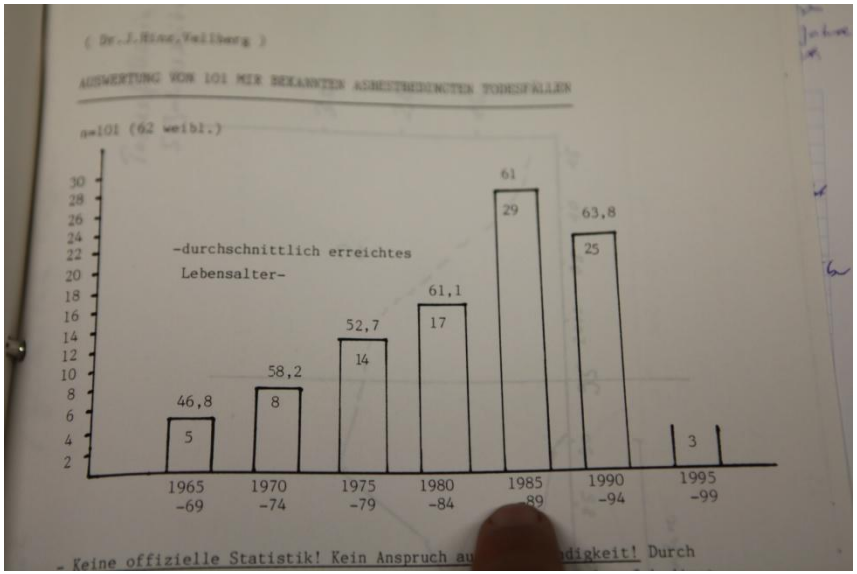
-Rex석면 사건 Der Fall Rex-Asbest

-Author, Eckardt Johanning, Rolf lapple (Ed.)

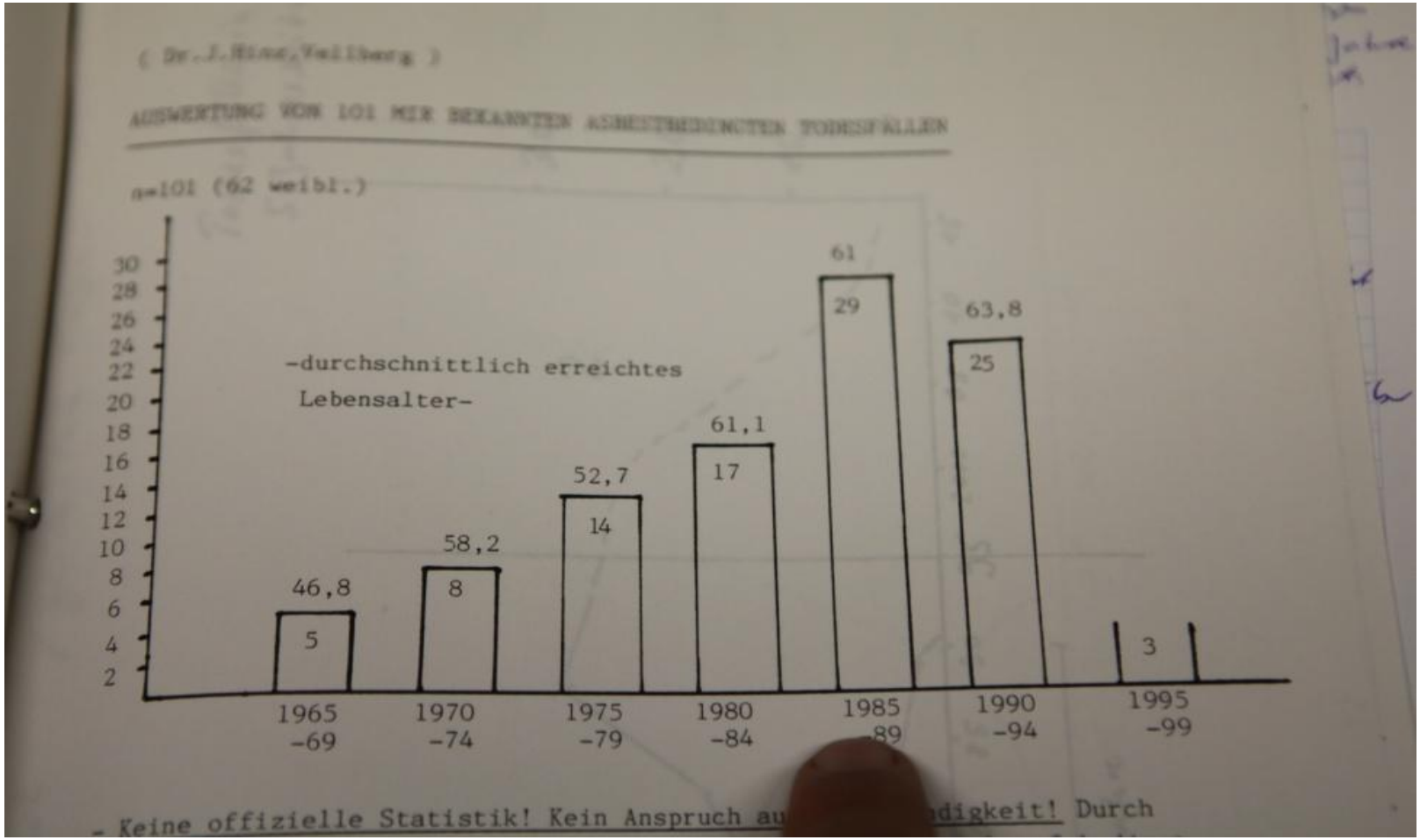


Dr Hinz showing the list of ARD patients on his folder

A graph of death toll asbestos related death at Vellberg indicate the peak 1985~1990



<Figure 12; A graph of death number of each 5 years since 1965 till 1995 of Vellberg, Germany, the place of German asbestos textile factory, made by local physitian Dr. Hinz. Photo in 2010 Sep



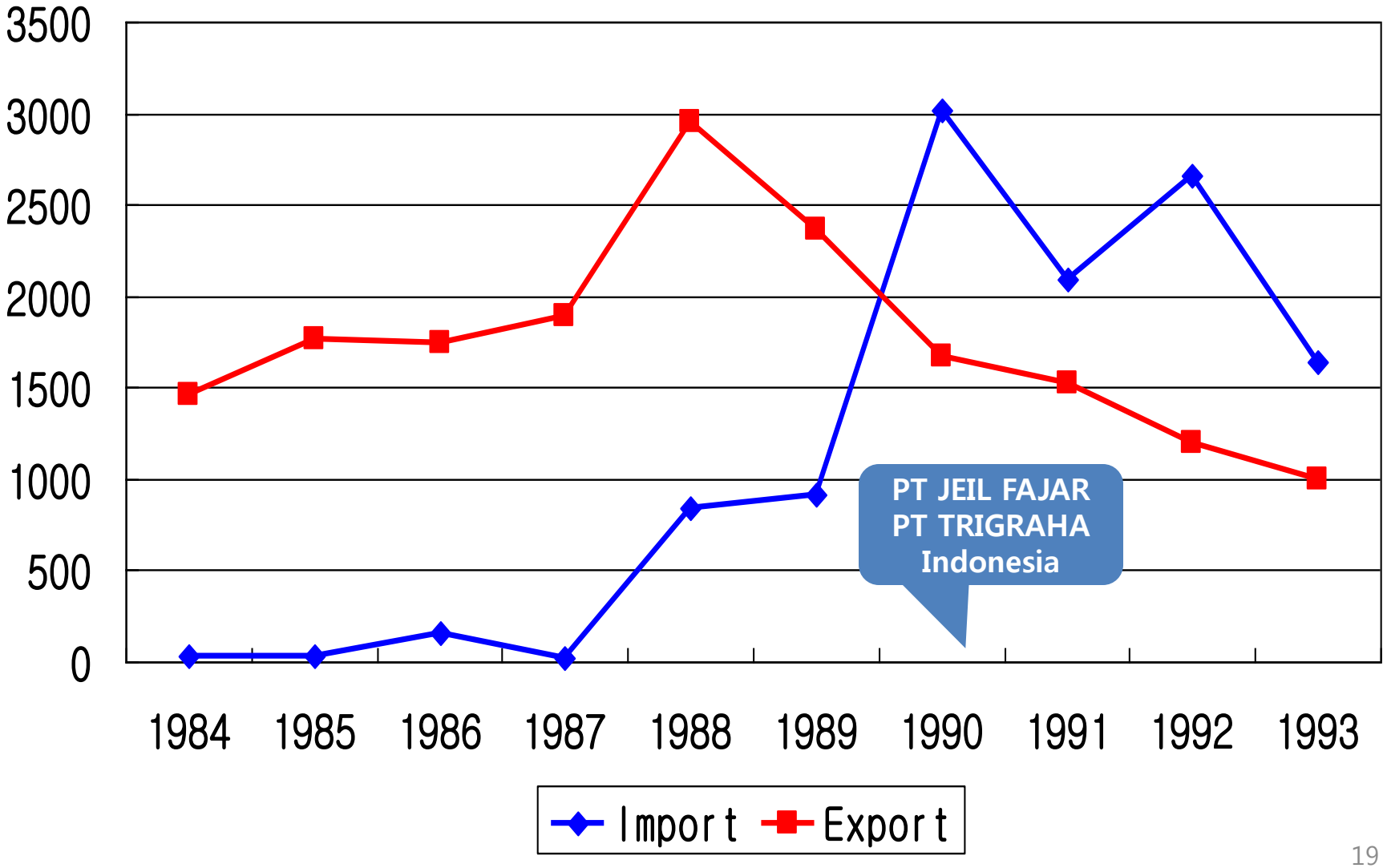
Japan TATSUTA
1951~1970

Korea JEIL E&S
1971~1990

Indonesia
PT JEIL FAJAR
1991~2010

Import and export of asbestos textile in Korea

In 1990, the biggest asbestos textile company JEIL moved its some factory to Indonesia



2007 Field Survey in Indonesia
Aug-Sep

1. Confirmation of the same machine operating traded from Korea, in Cibinong city, Indonesia.
2. High concentration(48%,98%) of chrysotile asbestos containing of the product samples of the factory.
3. Condition of environmental exposure to the locals from the factory and concerning the potential health harm.
4. Bad condition of workplaces without proper personal equipments and medical check-up through interview with factory worker and direct observing.


PRODUCT OF RUSSIA
U-110
NB665277
WHITE ASBESTOS CHRYSOTILE
PRODUCT OF RUSSIA
CAUTION
ОСТОРОЖНО
U-110
NB665277
WHITE ASBESTOS CHRYSOTILE
PRODUCT OF RUSSIA
U-110
NB665277
WHITE ASBESTOS CHRYSOTILE
PRODUCT OF RUSSIA
U-110

2008 Field Survey in Indonesia
24-30 Aug, Asbestos Textile companies

- **3 Countries Joint Survey; Indonesia, Japan and Korea**

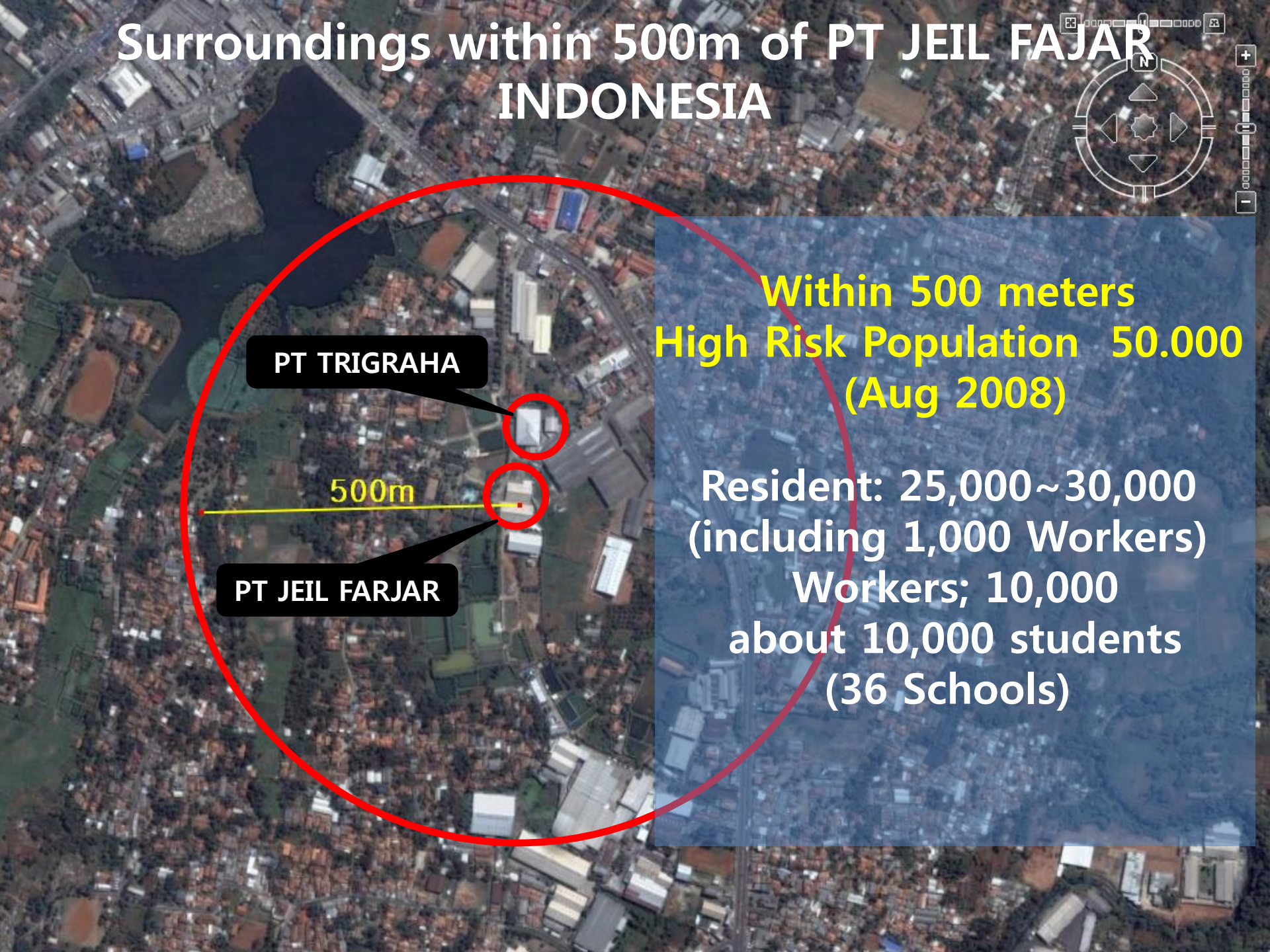
- **<PT JEIL FAJAR INDONESIA>, <PT TRIGRAHA>**
- **100 Workers of PT Trigraha & 100 Habitants**
- **Analysis Organization (Blue color)**

- **Health Monitoring;**
  - **Chest X-ray: Worker & Habitants - K3**
  - **Spirimetry: Worker & Habitants - K3**
  - **Questionnaire: Worker – K3 & CIES, Habitants – CIES & Walhi**
  - **Sputum sampling: Worker & Habitants – CIES & K3**
- **Environmental Monitoring; Pusan Uni & Mr IBE**
  - **Air monitoring**
  - **Soil monitoring**
  - **Personal worker air sampling**

No Official Report of Asbestos related victim in INDONESIA.

No Diagnosis? Unreported? Not Yet?

Surroundings within 500m of PT JEIL FAJAR INDONESIA



Within 500 meters
High Risk Population 50.000
(Aug 2008)

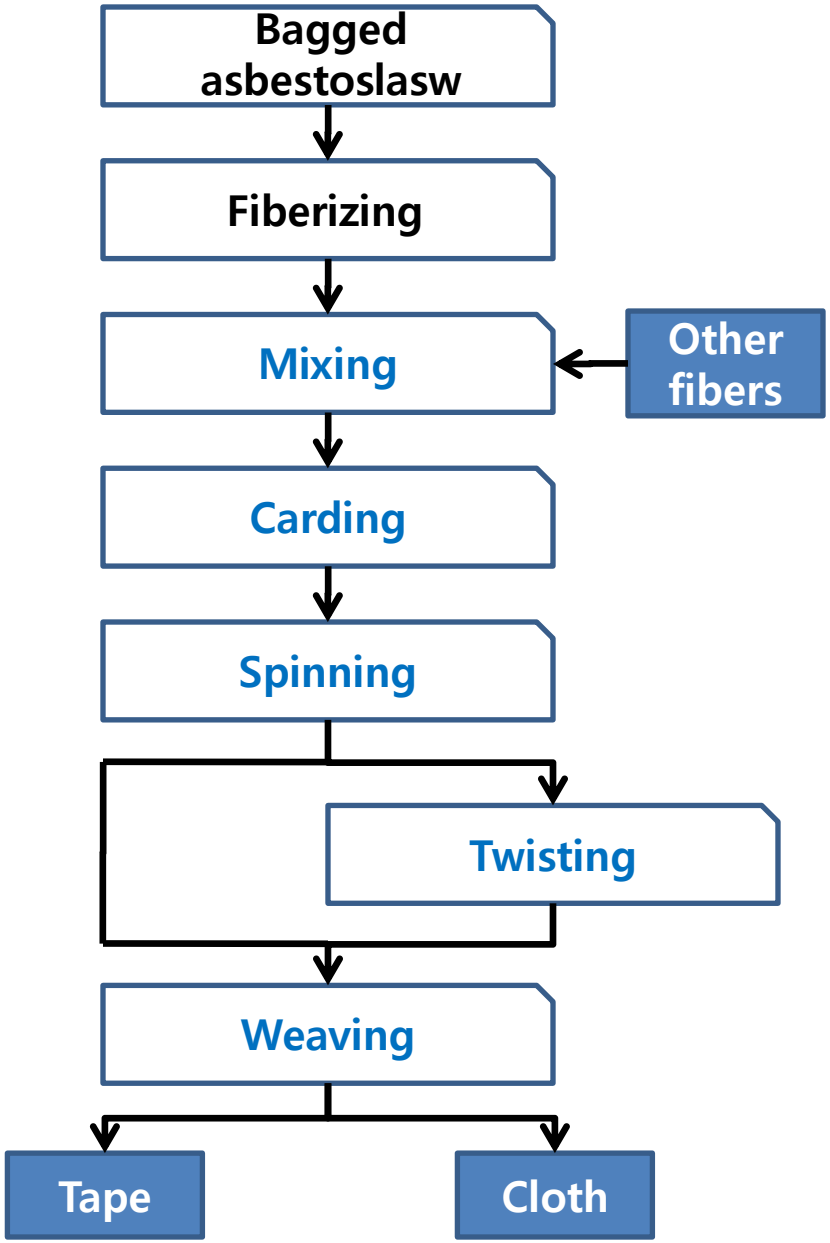
Resident: 25,000~30,000
(including 1,000 Workers)
Workers; 10,000
about 10,000 students
(36 Schools)

2008 Indonesian field survey for environmental asbestos exposure from asbestos industry

Korea Research Center for Asbestos-Related Diseases,
School of Medicine, Pusan National University

Dongmug Kang and Yongsik Hwang

Basic Steps in Asbestos Textile Process

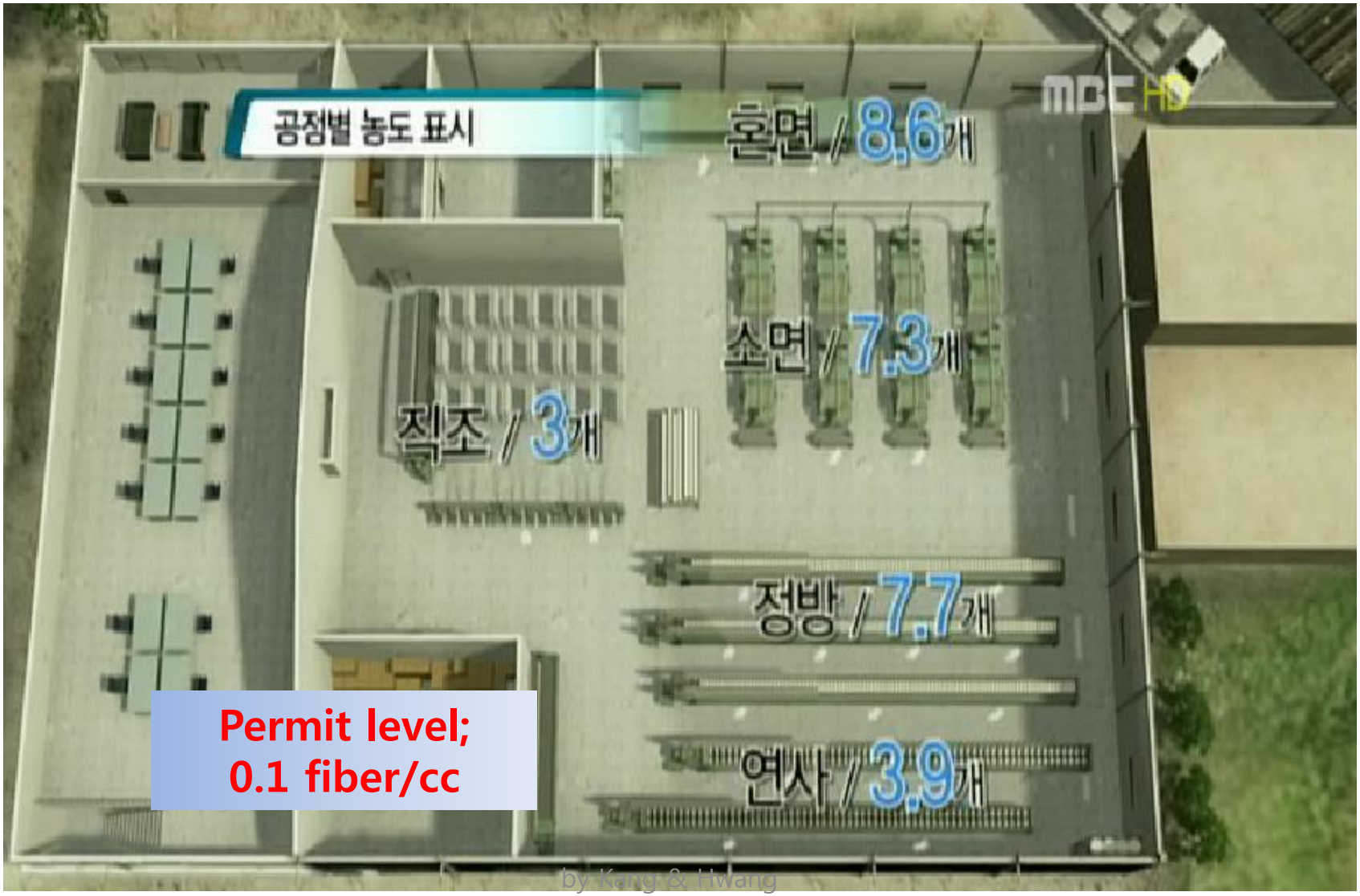


Production process

- mixing: 1MC, 2 WC
- carding: 4MC, 3 WC
- spinning: 3MC, 10 WC
- twisting: 2MC, 4 WC
- weaving: 2MC, 2 WC

- 3 shift, 21 WC/shift
- Raw material: 18 ton/month
- Asbestos 85% + PP, PE 15%
- Daily asbestos consumption: 612kg

Air monitoring inside of PT Trigraha in Aug 2008

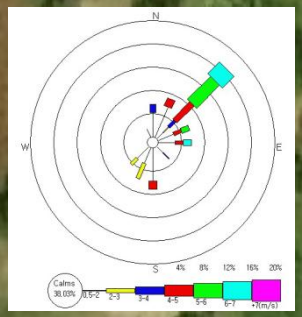


M/P	This study in Indonesia, 2008	Park and Baik (1988) in Korea		Baik and Lee (1991)	Park *etal* (1995)		
		Personal sample GM(f/cc)	Areal sample GM(f/cc)	Areal sample GM(f/cc)	Personal sample GM(f/cc)	Areal sample GM(f/cc)	AVERAGE GM(f/cc)
Mixing	8.6	4.5	8.7		0.51	0.42	0.48
Carding	7.3	3.9	6.6	4.63	1.32	2.98	1.98
Spinning	7.5	5.6	6.6	5.40	2.71	1.73	2.22
Twisting	3.9	4.8	5.2	3.98	1.48	1.85	1.65
Weaving	3.1	5.3	5.0	1.72	4.74	3.18	4.29
Winding	4.3	3.0	2.5				
Total	5.7	4.4	5.7	3.11	1.67	1.66	1.72

by Kang & Hwang

Environmental contamination around PT Trigraha

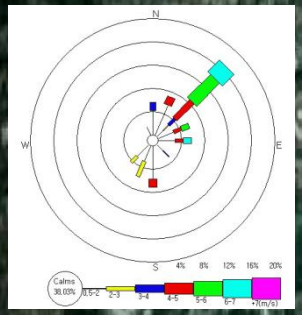
Wind Rose (August 26-28, 2008 Cibinong, Indonesia)



Permit level
10 fiber/liter

Environmental contamination around PT Trigraha

Wind Rose (August 26-28, 2008 Cibinong, Indonesia)



Permit level
10 fiber/liter


PT. JEIL FAJAR


PRODUCT OF RUSSIA
URAL ASBEST
WHITE CHRYSOTILE
U-130
130 KG
A-2
21 03.2006
9
WHITE
ASBESTOS
KUJ 9153


[재생]
MBC HD


SUZUKI


TOMBO
PT. NICHIAS ROCKWOOL
INDONESIA

2009 environmental monitoring

- Total; 22 chrysotile of 71 samples, 31%

- JULY
  - 13 detection of 41 samples; 32%
    - 1 chrysotile of 12 air samples; 8%
    - 12 chrysotile of 28 dust samples; 43%
    - No detection of 1 soil sample; 0%
  - 6 chrysotile of 7 solid samples; 86%
    - Confounding Asbestos Containing Materials such as roofing, ceiling and brake lining pad of bike shop
- OCTOBER
  - 9 chrysotile detection of 30 dust samples; 30%

Asbestos survey map of air & dust sampling around joint asbestos textile plants between Korea and Indonesia July & Oct 2009, Cibinong Indonesia

500m

500m

500m

CIBINONG
Middle and High School

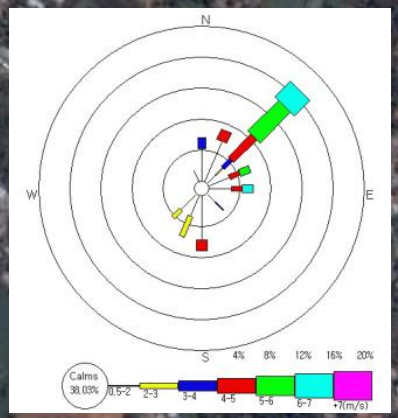
PT TRIGRAHA

RS. BINA HUSADA
Hospital

PT JEIL FARJAR

CIBINONG
Shopping center

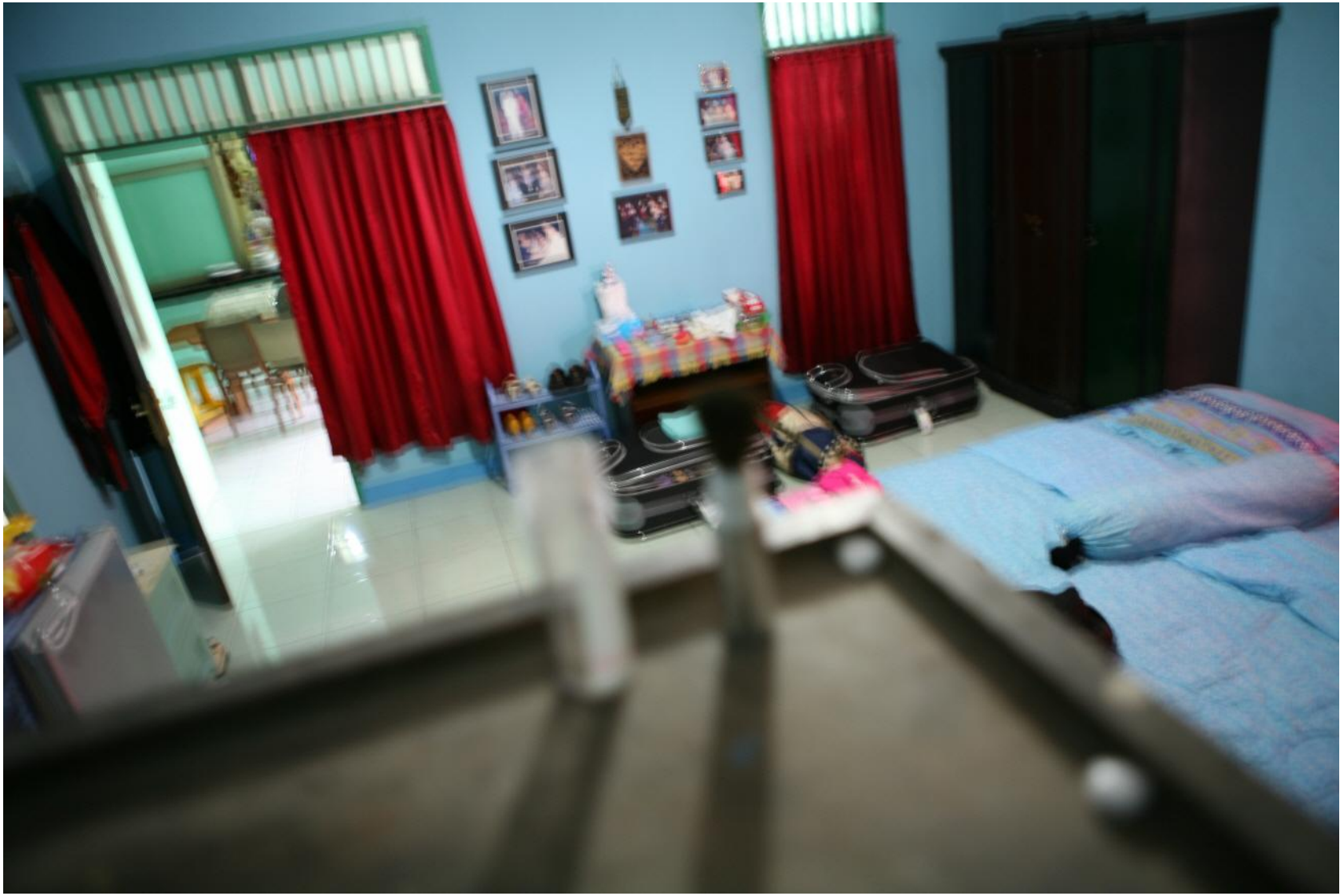
July air chrysotile
July dust chrysotile
October dust chrysotile



Personal air sampling of resident

Ventilation system of house and Asbestos exposure

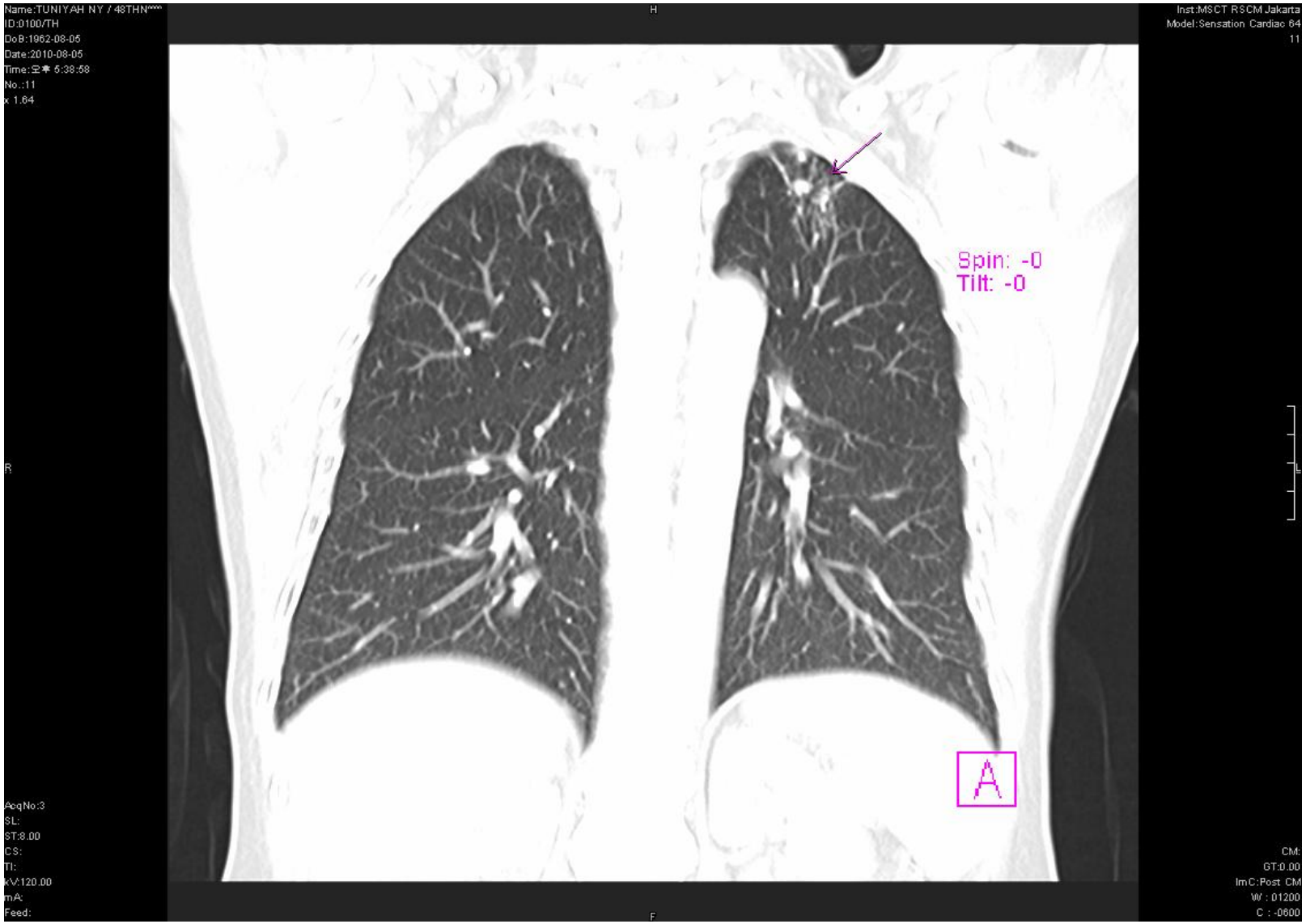
Dust sampling at a bed room

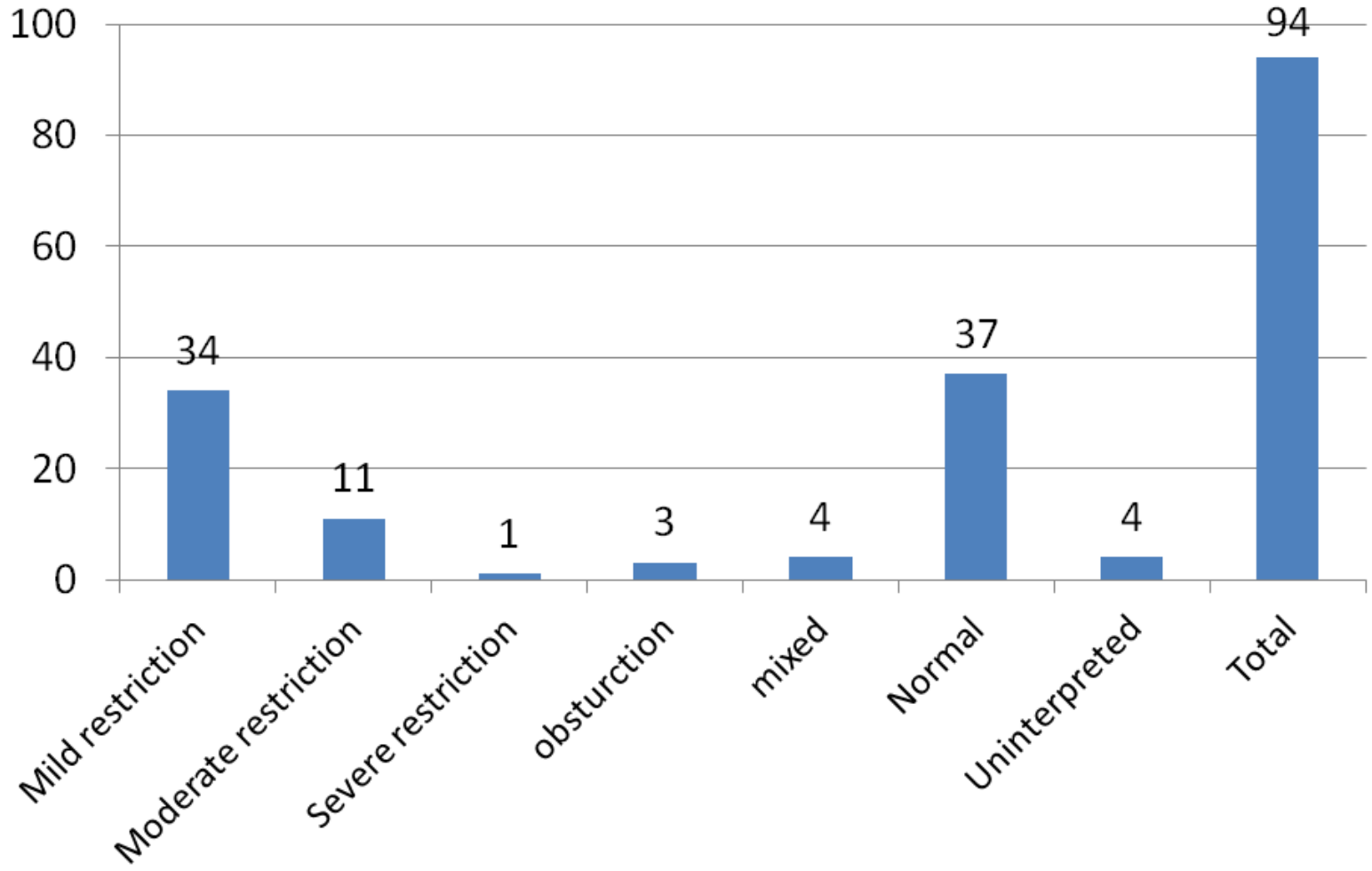


<Table 6; Radiologic Findings and Pulmonary Function Tests for workers at PT JEIL TRIGRAHA and FARJAR in Aug 5, 2010>

No	Name	Sex	Age (years)	Weight	Height	Work history		Pulmonary Function Tests and Radiologic Findings	
						years	period	FVC (L) (% Predicted)	HRCT Findings
1	T**	female	48	50	150	20	1991-2010	1.69 (76%)	1. Early Asbestosis# (3 out of 3 readers), both lower lobe 2. Healed Tuberculosis (2 out of 3 readers), left upper lobe
2	C**	female	42	40	149	20	1991-2010	1.88 (84%)	1. Early Asbestosis (2 out of 3 readers), both lower lobe 2. Bronchiectasis (2 out of 3 readers), right middle lobe
3	D**	female	43	60	149	18	1993-2010	2.19 (98%)	1. Early Asbestosis (2 out of 3 readers), both lower lobe
4	N**	male	43	75	168	18	1993-2010	2.26 (62%)	1. Healed Tuberculosis (2 out of 3 readers), right middle and lower lobe 2. Suspicious Asbestosis (1 out of 3 readers), left lower lobe
5	J**	female	42	59	146	20	1991-2010	2.26 (104%)	1. Normal

Early asbestosis findings included subpleural centrilobular thickening (dots), subpleural curvilinear lines, and interlobular thickenings (lines and bands).


Name:TUNIYAH NY / 48THN
ID:0100/TH
DoB:1962-08-05
Date:2010-08-05
Time:오후 5:38:58
No.:11
x 1.64
R
AcqNo:3
SL:
ST:8.00
CS:
TI:
kV:120.00
mA:
Feed:
H
F
Inst:MSCT RSCM Jakarta
Model:Sensation Cardiac 64
11
Spin: -0
Tilt: -0
A
CM:
GT:0.00
ImC:Post CM
W : 01200
C : -0600


100
80
60
40
20
0
34
11
1
3
4
37
4
94
Mild restriction
Moderate restriction
Severe restriction
obsturction
mixed
Normal
Uninterpreted
Total

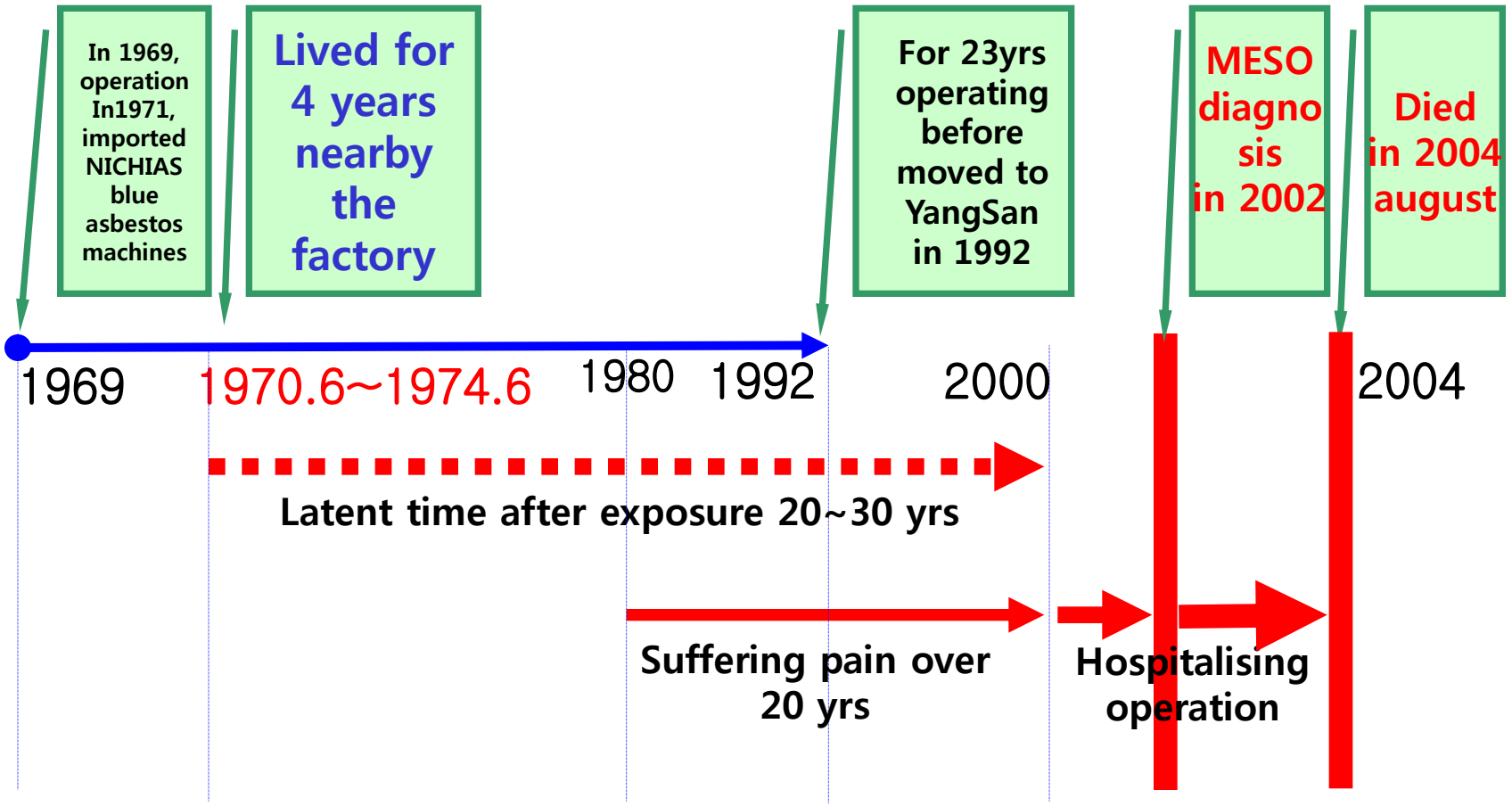
Occupational and environmental victims of the Japanese asbestos textile plant tatsuta of NICHIAS, in Nara Japan

		1965年以前	1966年～1970年	1971年～1975年	1976年～1980年	1981年～1985年	1986年～1990年	1991年～1995年	1996年～2000年	2001年～2005年	2006年～2007年6月（療養者）	合計
死亡	中皮腫	0	0	0	0	0	1	1	5	2	0	9
	じん肺	0	2	8	1	1	2	0	4	2	0	20
	肺がん											0
療養	中皮腫										1	1
	じん肺										2	2
	肺がん										1	1

竜田工業の近隣住民　中皮腫死亡者

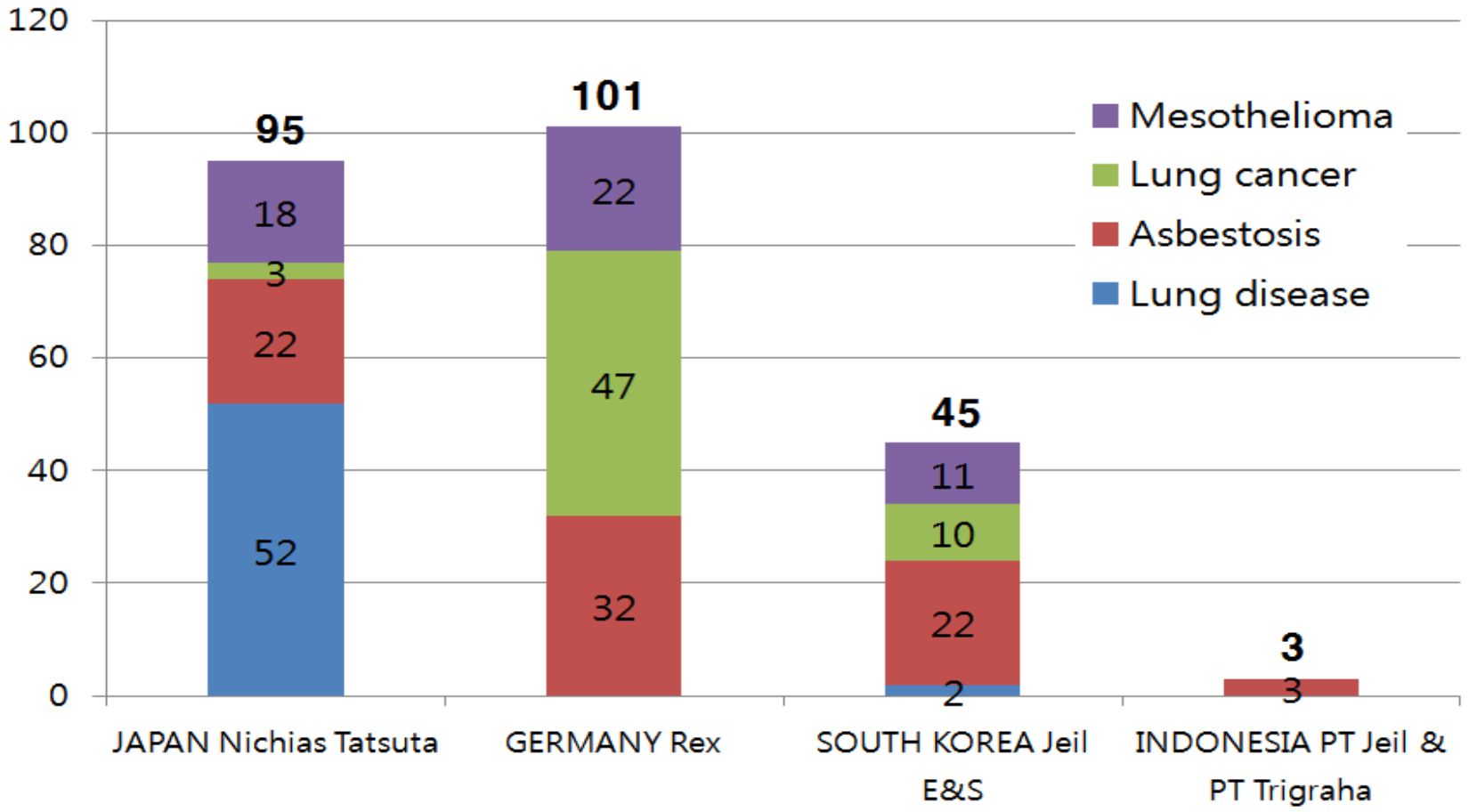
		居住歴	死亡年	居住年数	竜田工業からの距離
Aさん	女性75才	1965～1976	2001年	約10年	約320m
Bさん	女性86才	1911～1997	1997年	約86年	約30m
Cさん	女性77才	1960～1969	1989年	約8年半	約360m
Dさん	女性50才	1955～1976	2006年	約21年	約50m

Case 1; a late mesothelioma victim lived near by the JEIL Chemistry for 4 years

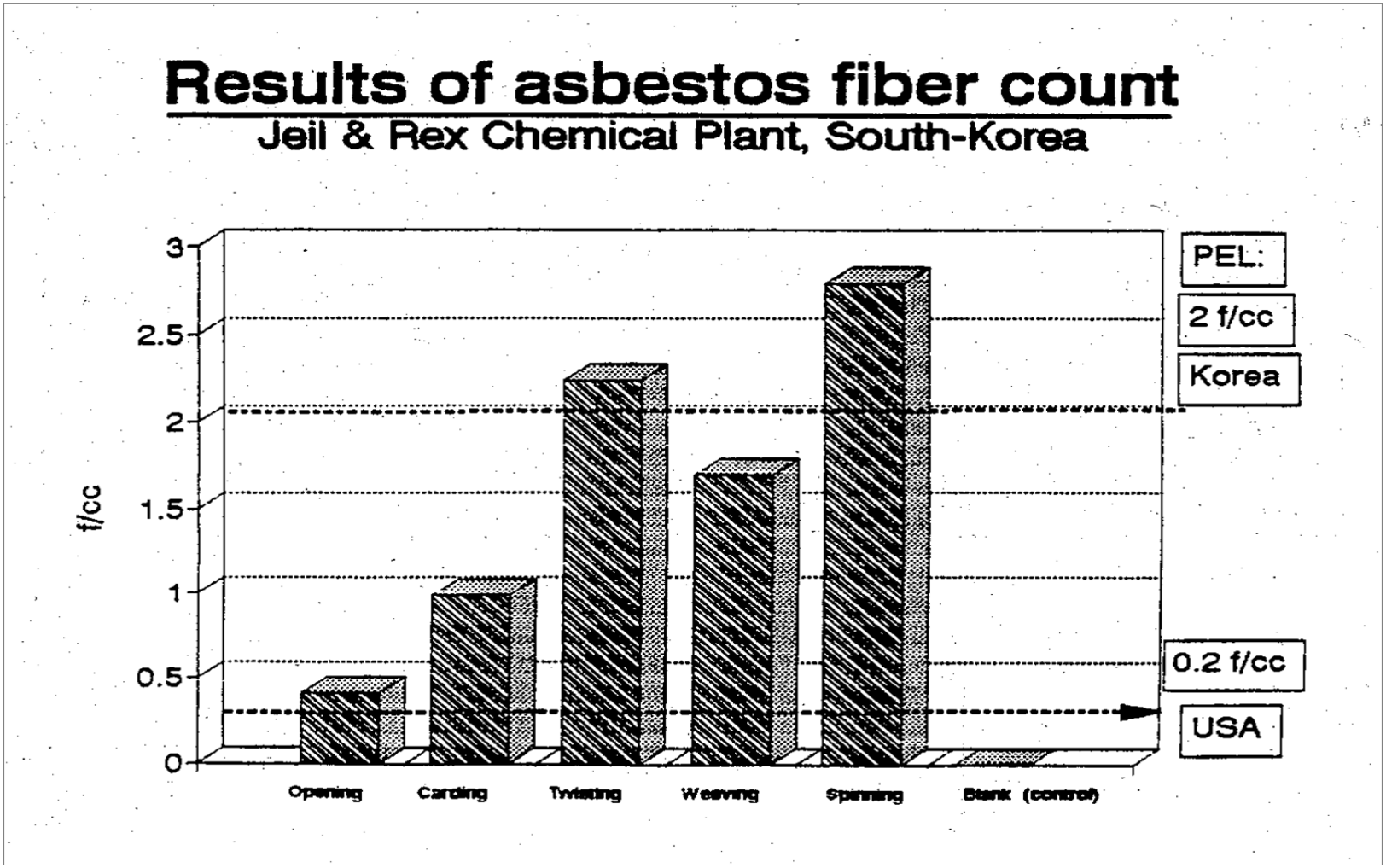


Pleasant Memory 23 May 1976 ???

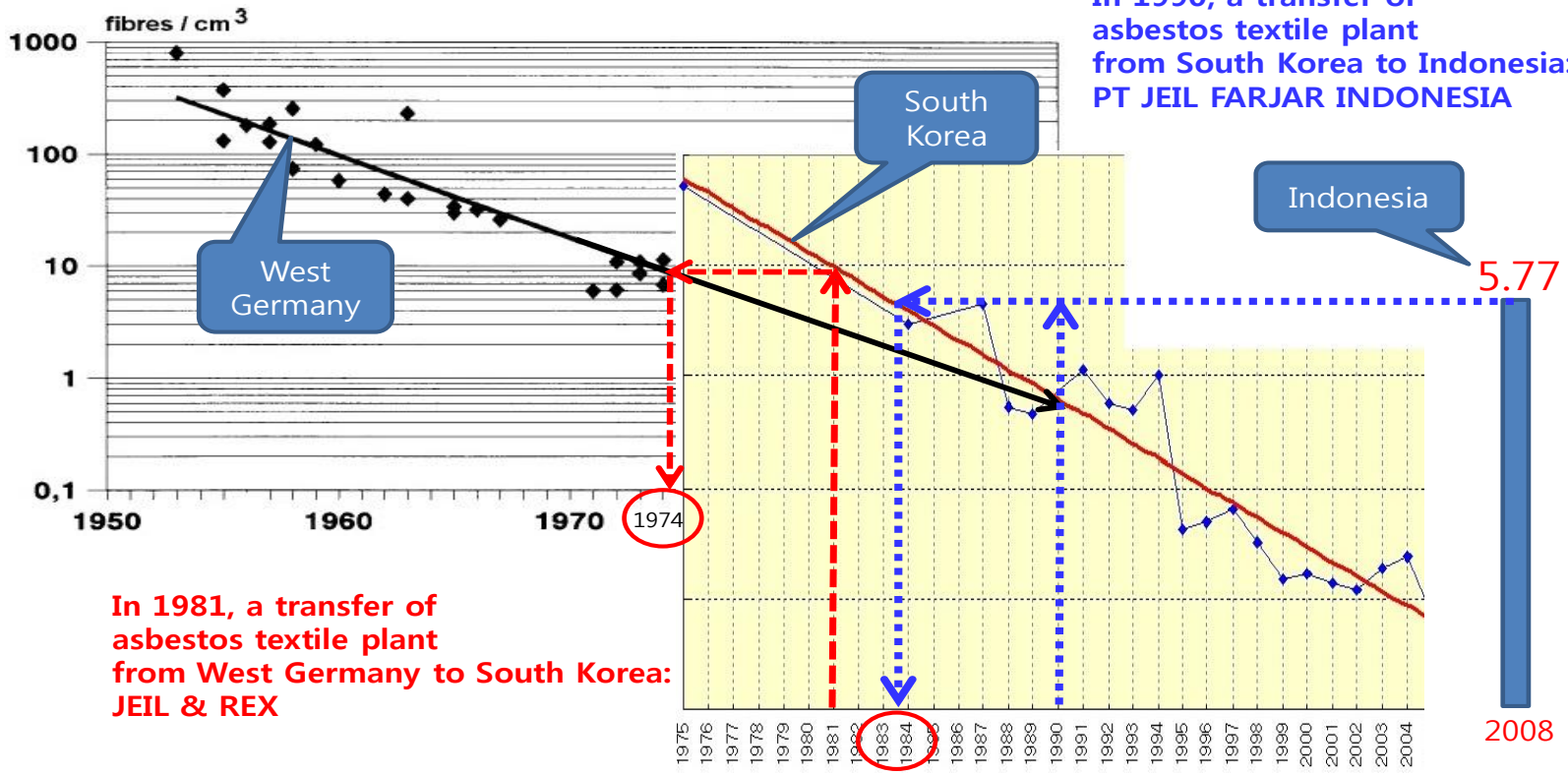
<Figure 24; Number of asbestos realted disease of the 4 asbestos factories in 4 countries which are related with the transfer of asbestos textile plant>



<Figure 11; result of asbestos fiber count of the JEIL&REX etc meassured by a joint survey team organized with US, Germany and Korean experts in 1991>



<Figure 21; Compare of 3 countries' workplace asbestos concentration, West Germany, South Korea and Indonesia>



일본		독일		한국		인도네시아	
1928	첫 석면폐 증례보고						
		1943	<행정>석면폐암 직업병인정				
1954	<행정>석면폐 첫 산재인정						
1961	<행정>석면폐암 첫 산재인정						
1968	<행정>석면사업장,배출기준, 설비의무화)						
1970	<보도>최근11년사이에 석면 방직공장에 폐암8건발생,						
1971	<행정>특정화학물질등장해예방규칙 시행(국소배기장치설치의무화) <보도> 석면사150개, 오사카중소기업69사 대상 방진대책행정지도						
1972	<기업>석면공해대책공동연구 <행정>신특화법 제정(석면농도기준설치 5개/cc),	1972	<행정>중앙석면노출작업자등록기관설립(석면가공업체,석면작업자병력관리)				
1974							
1978	<행정>중피종 첫 산재인정,						
		1979	<행정>뿜칠석면금지,작업노출기준강화1M개/m^3				
		1980	<행정>석면2그룹(매우위험한 발암물질)분류,석면표기의무				
1981	<행정>청석면농도기준0.2개/cc	1981	<행정>석면금지(석면시멘트, 건축용경보드 등)				
		1982	<행정및기업>석면시멘트산업 1990년까지 석면사용않기의무화, 5년내석면소비65%줄일것	1982	<행정>산업안전보건법 (특정화학물질에 석면포함; 작업측정의무화, 근로자특수건강진단실시)		
		1985	<행정>연방환경청 대안물질 목록편찬,			1985	<행정>청석면금지 고용주의무사항(개인보호장구,석면안전절차구비등)
		1986	<행정>실내건축석면사용금지	1986	<행정>작업환경허용기준 백석면2.0개/cc,갈석면0.5개/cc,청석면0.2개/cc,기타2개/cc)		
1988	<행정>작업장노출기준2.0개/cc			1988	<보도> 1988.5.25. 한겨레신문 기사 "악성중피종으로 1백여명 사망"제목	1988	<기업>일본니치아스 PT Nichias Rockwool Indonesia 설립
		1990	<기업> REX석면사용중단	1990	<행정> 산업안전보건법, 사용허가대상 유해물질에 추가		
		1991	<행정>작업장노출기준0.2개/cc	1991	<행정>특정대기유해물질에 포함, 특정폐기물에 추가		
		1993	<행정> 독일석면사용금지(청석면,갈석면은 이전에금지)	1993	<행정> 1993.10. 제일화학 노동자 악성중피종사망, 산재인정		
				1994			
1995	<행정>청석면,갈석면금지						
				1997	<행정>제조 등 금지유해물질에 청석면, 갈석면 추가	1997	<행정>작업환경 노출기준 2.0개/cc

<Table 3; History of Transfers of Asbestos Industry in Asia>

Period	Total Number of transfers	Exporter → Importer (No)*	Exposure Limits (f/cc) (year)†		Business Type (No)*	Export Company (No)*
			Exporter	Importer		
1960s	2	Japan → Korea (1)	No limit	No limit	Textile (2)	Nichias (1)
		Japan → Taiwan (1)	No limit	No limit		
1970s	10	Japan → Korea (8)	5.0 (1975)	No limit	Textile (7), Brake lining (1), Fallen fiber (2)	Nichias (1), Ka** Sekimen (1), Wa** Sekimen (1), Ko** Sekimen (1), Hi** Sekimen (1)
		Japan → Singapore (2)	5.0 (1975)			
1980s	16	Japan → Korea (13)	2.0 (1988)	2.0 (1988)	Textile (13), Fallen fiber (1), Slate (1)	REX (Germany, 1), Nichias (2), Ya** (1), Mi** (1)
		Japan → Indonesia (2)	2.0 (1988)			
		Germany → Korea (1)	0.2 (1991)	2.0 (1991)		
1990s	6	Japan → Indonesia (1)	2.0 (1988)	2.0 (1997)	Textile (6)	Nichias (5), JEIL E&S (Korea, 1)
		Japan → Malaysia (2)	2.0 (1988)	1.0 (1989)		
		Japan → Thailand (1)	2.0 (1988)	5.0 (1978)		
		Japan → Philippines (1)	2.0 (1988)	2.0 (1992)		
		Korea → Indonesia (1)	2.0 (1988)	2.0 (1997)		
2000s	4	Japan → Vietnam (1)	0.15 (2005)	1.0 → 0.1 (2002)	Textile (6)	Nichias (2), JEIL E&S (Korea, 2)
		Japan → China (1)	0.15 (2005)	2.0→ 0.8 (2002)		
		Korea → Malaysia (1)	0.1 (2003)	0.1 (2000)		
		Korea → China (1)	0.1 (2003)	2.0→ 0.8 (2002)		

*Number in the parenthesis is the number of transfers.

†Number in the parenthesis is regulation year.

Population at risk of asbestos exposure during their childhood and school time

case of Tatsuta in Nara, Japan
case of Jeil Chemistry in Busan, Korea
case of PT Jeil Fajar and PT Trigraha in Cibinong, Indonesia

Children… Our Children…
who have lived and studied near by the deadly asbestos factories in Japan, Korea and Indonesia

Student boys lived and studied near by Kubota factory in Osaka, Japan

Elementary students studied at a 10 meter– distance– school from the JEIL asbestos factory around 1980es in Busan, Korea

Children living near by the PT JEIL FAJAR asbestos textile factory in 2007 in Cibinong, Indonesia

What means ‘ISO certification’ for these deadly asbestos factories?

Tatsuta plant of NICHIAS in Nara, Japan with ISO 14001 & 9001, photo in 2008,

JEIL E&S plant in Yangsan, Korea with ISO 9001, photo in 2007

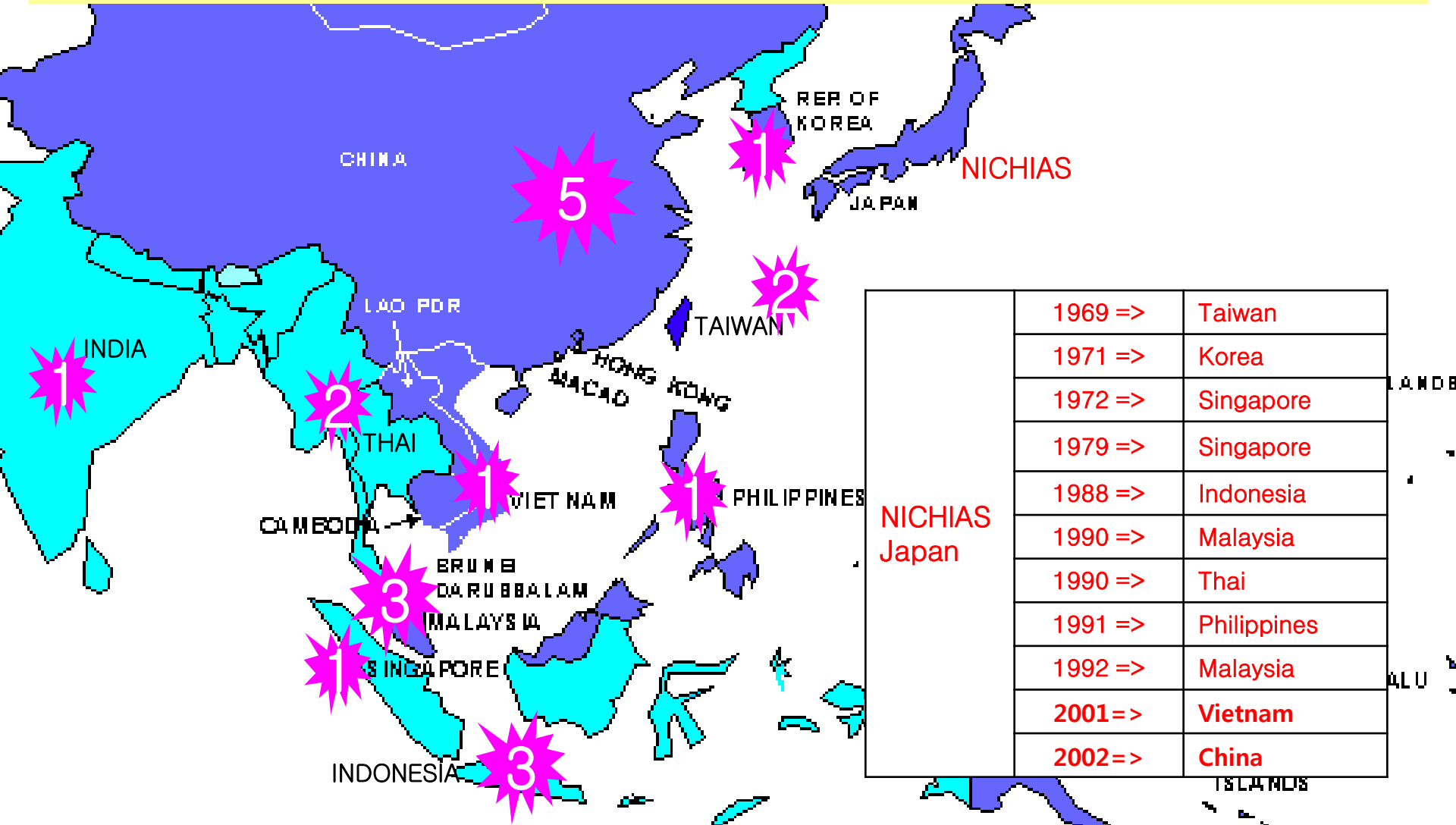
PT JEIL FARJAR plant in Cibinong, Indonesia with ISO 9001, photo in 2009

Case study 2
NICHIAS

Transfer cases of the largest Asbestos Industry in Japan and Asia

Dangerous Trades for 40yrs
by a Japanese asbestos company NICHIAS

20 asbestos factories in 10 Asian countries.



NICHIAS Japan	1969 =>	Taiwan
	1971 =>	Korea
	1972 =>	Singapore
	1979 =>	Singapore
	1988 =>	Indonesia
	1990 =>	Malaysia
	1990 =>	Thai
	1991 =>	Philippines
	1992 =>	Malaysia
	2001=>	**Vietnam**
	2002=>	**China**

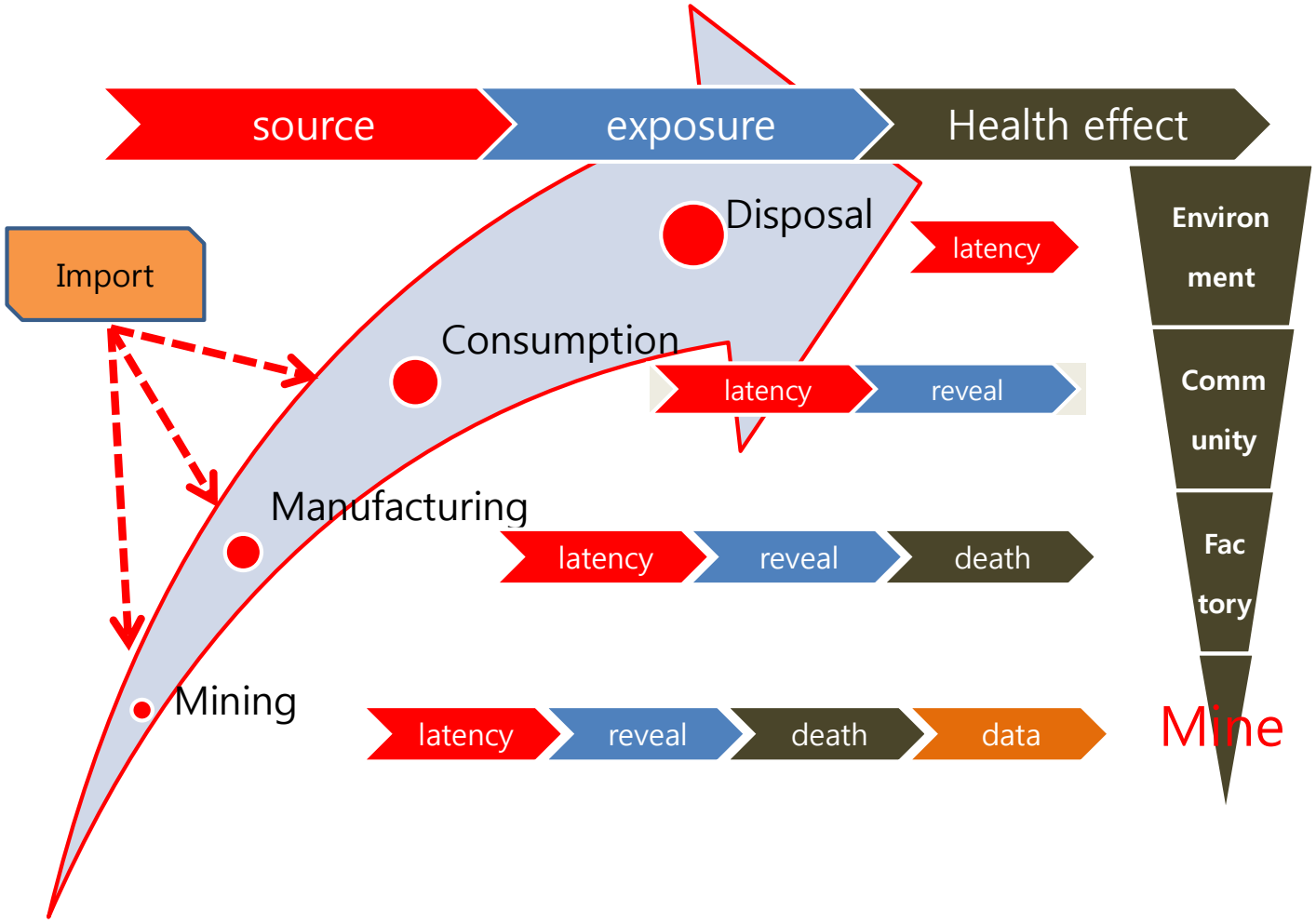
<Figure 7; In 1977 a sociologist Dr Linda's photo inside of the NICHIAS asbestos textile plant in Kaohsiung, southern part of Taiwan.>


TOMBO
PT. NICHIAS ROCKWOOL
INDONESIA

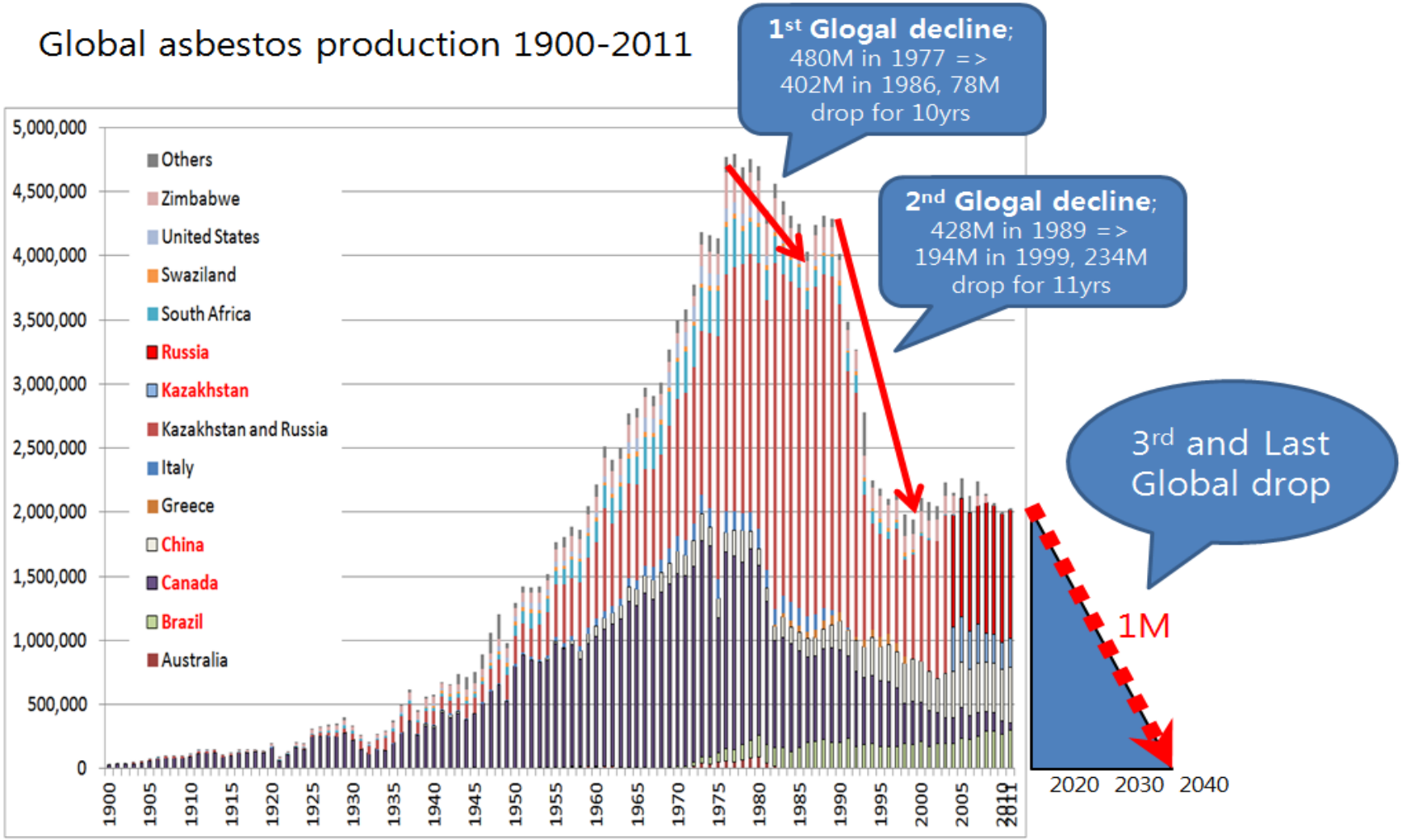
Projection of Mesothelioma incidence peak year

2080		Asian countries?
2070		
2060		
2050		
2040		Korea?
2030	France	
2020	Netherlands	Japan?
2010	UK & AUSTRALIA	
2000	US	
1990	Sweden	
1980		
1970		

<Figure 26; process of asbestos problems developing along the life cycle of asbestos>



<Figure 27; 2 global declines of asbestos consumption and future

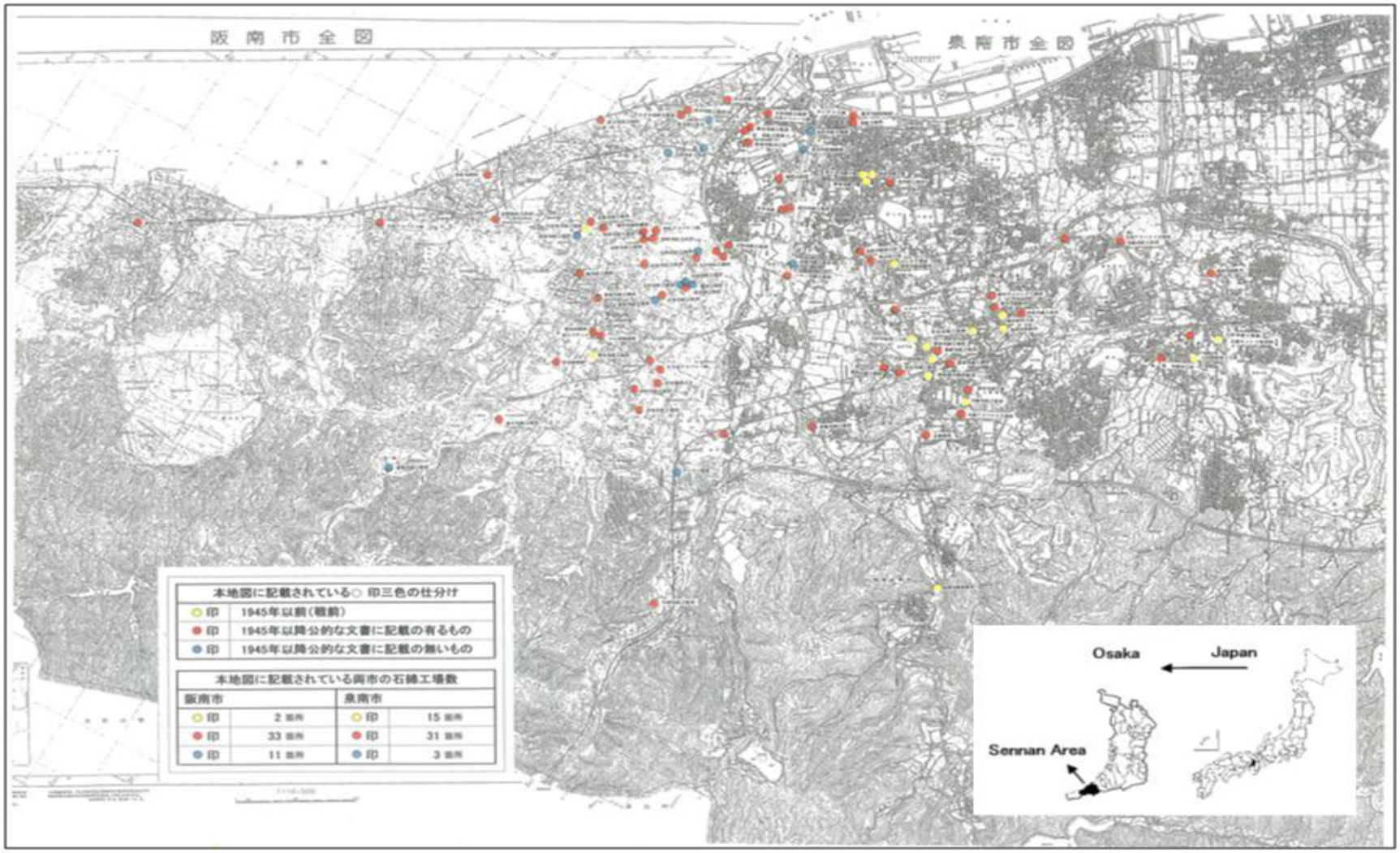


Sennan's legal victory and responsibility of Chrysotile exporters

Sennan case

- 1880~2005; around 200-300 middle and small size of asbestos industries in Osaka, Japan.
- 2005; Kubota shock
- 2006~2014; legal suit against Japanese government and won in the end at the supreme court. (for the first time in the world of the Government's responsibility for the asbestos victim workers)
- **Next step must be to ask chysotile exporter's legal responsibility like Canada(government and mine company) for Asian victims!**

<Figure 10; A mapping of asbestos factories in Sennan and Hannan area, Osaka prefecture, Japan, a box of right down indicates the location of Sennan in Japan>



A family victim case of Sennan: father(black and white photo in the middle) died of lung cancer, former worker, mother(left of photo) died of asbestosis in 2013, and a daughter(former nurse) suffering asbestosis of environmental exposure. Photo by yeyong in 2010


ASIAN BAN ASBESTOS NETWORK [A-BaN]
Jaringan Asia Menentang Asbestos
एशियन बैन एसबेस्टॉस नेटवर्क
Mạng lưới cấm Amiăng châu Á
アジア・アスベスト禁止ネットワーク
아시아 석면추방 네트워크
亚洲禁止石棉網絡
Strengthening the Grassroots Asbestos Movement in Asia!
Palakasin ang grassroot na kilusan laban sa Asbestos!
Perkuat Gerakan Akar Rumput Menentang Asbestos!
ஆஸ்பெஸ்டாஸிற்கு எதிரான அடிதள அமைப்புகளை உறுதிப்படுத்து.
एसबेस्टॉस के खिलाफ ज़मीनी लड़ाई को मजबूत करें!
Hãy đẩy mạnh Phong trào quần chúng chống Amiăng
アスベストに対する草の根の取り組みを強化しよう!
아시아 석면추방운동을 위하여!
推动亚洲反石棉基层运动!
BAN ASBESTOS IN ASIA
Ban asbestos Network Japan (BaNJAN), Ban asbestos Network Korea (BaNKO)


A-BAN
Asian-Ban Asbestos Network