



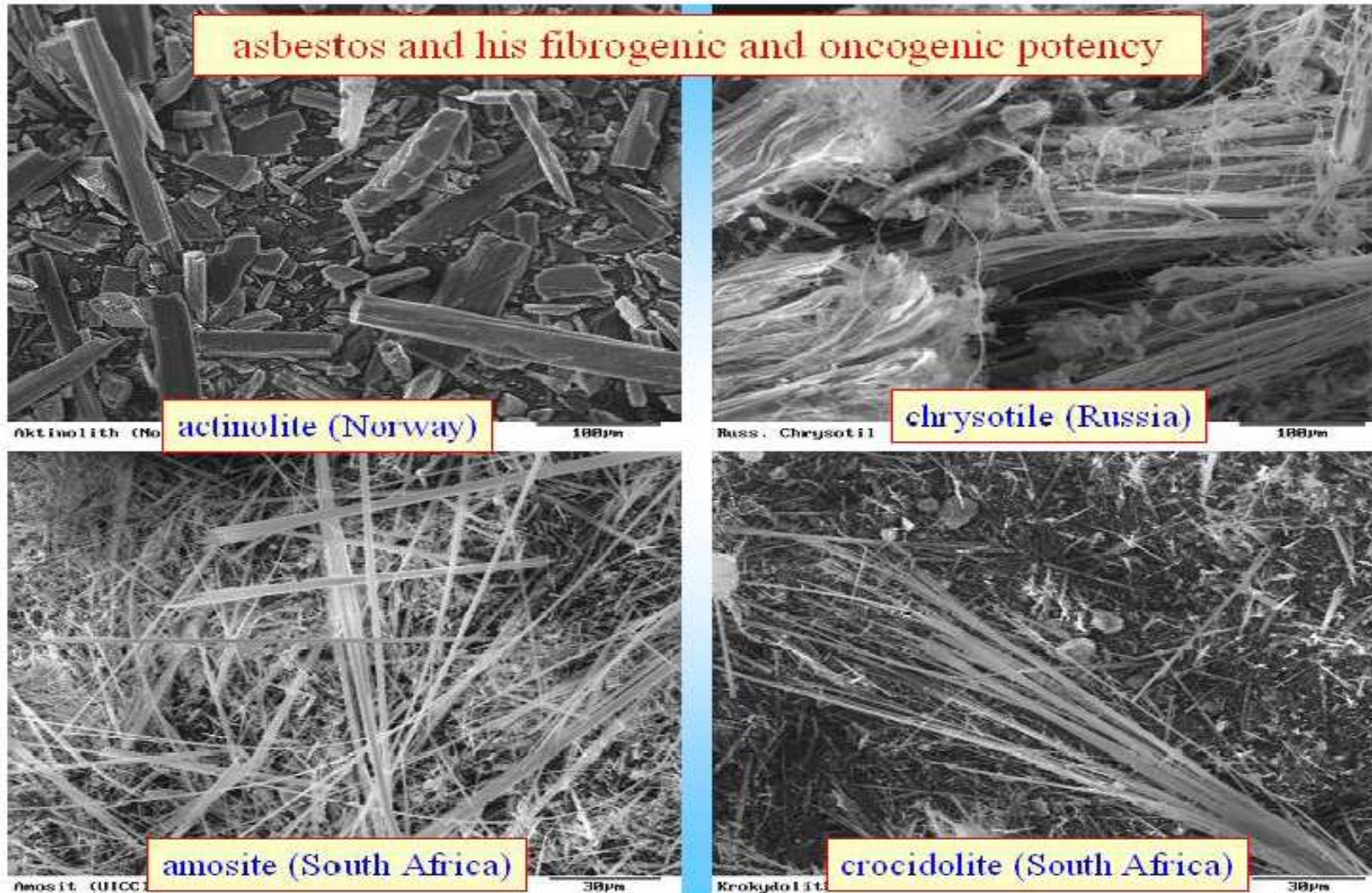
# Occupational respiratory diseases due to Asbestos

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- Preventive Strategies
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# ■ Asbestos minerals



Woitowitz, 2003

## Imports (+ production) of asbestos in Europe from 1950 to 1990 in metric tons

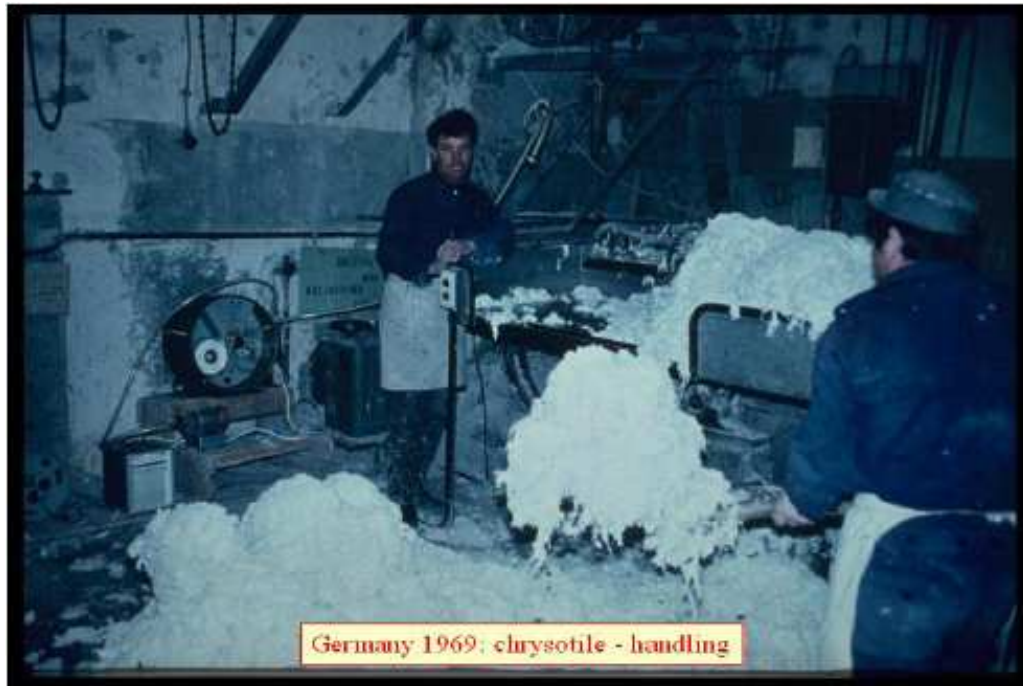
Country	1950	1960	1970	1980	1990
GDR	13,858	35,000	52,015	74,400	15,692
GFR	80,000	132,634	175,612	392,978	
Austria	3,496	12,767	34,155	20,241	6,167
Belgium & Lux.	21,856	53,990	54,839	47,880	26,514
Denmark	9,986	17,440	28,633	13,713	800
Spain	4,384 (+ 42)	14,453 (+ 4)	77,677	66,944	39,609
Finland	988 (+ 10,949)	4 446 (+ 9,556)	7,744 (+ 13,626)	5,040	-
France	33,560 (+ 7,456)	68,592 (+ 25,583)	151,848 (+ 710)	127,123	63,672
Greece	178 (+ 30)	48	17,811	14,180	2,299 (+ 65,993)
Italy	6,265 (+21,434)	29,607 (+ 51,123)	62,402 (+118, 618)	86,550 (+ 157,794)	63,438 (+ 3,862)
Ireland	-	-	-	8,413	5,533
Netherlands	6,935	21,725	20,063	19,042	6,252
Norway	2,676	6,918	7,982	103	-
United Kingdom	111,261	170,893	154,636	94,640	16,022
Sweden	10,246	17,107	18,830	1,195	595
Switzerland	4,298	8,695	17,721	21,029	1,341

Source: Worldwide Asbestos Supply and Consumption Trends from 1900 to 2000, Robert L. Virta, U.S. Geological Survey, Open-File Report 03-83

## ■ History of asbestos

### ■ Listed occupational diseases in Germany

- |                               |      |
|-------------------------------|------|
| ■ Asbestosis                  | 1936 |
| ■ Lung cancer (w. asbestosis) | 1942 |
| ■ Mesothelioma                | 1977 |
| ■ Laryngeal cancer            | 1997 |



Picture: Weitowitz 2003

## ■ General Ban on Asbestos

<b>Date</b>	<b>Country</b>
1981	Norway
1986	Denmark and Sweden
1989	Switzerland
1990	Austria
1991	Netherlands
1992	Finland and Italy
1993	Germany
1996	France
1998	Belgium
1999	United Kingdom
2000	Ireland
2002	Spain and Luxembourg
2005	Greece and Portugal



## ■ Occupational diseases due to asbestos

- Asbestosis
- Lung cancer
- Mesothelioma
- Laryngeal cancer

- All numbers in following slides: EUROPEAN FORUM of the Insurance against Accidents at work and Occupational Diseases, April 2006; Asbestos-related occupational diseases in Europe - Recognition - Figures - Specific systems



## ■ Asbestosis, recognised cases

Year	Germany <sup>10</sup>	Austria	Belgium	Denmark	Spain	Finland	France	Italy	Norway <sup>11</sup>	Switzerland
1980	118	7	72	0	-	-	116	225	-	0
1985	173	8	144	2	-	-	153	143	-	13
1990	379	10	122	12	30	-	181	210	-	9
1991	502	13	207	48	30	-	-	302	-	7
1992	663	14	268	71	16	-	-	375	-	8
1993	1,295	16	211	85	18	-	250	406	-	12
1994	1,606	13	203	45	24	-	151	382	-	10
1995	2,185	13	250	35	23	-	135	346	-	10
1996	2,078	10	247	22	22	107	172	353	-	7
1997	2,079	8	230	19	29	79	165	367	-	7
1998	2,170	19	230	17	53	93	201	399	-	9
1999	2,120	9	88	17	16	72	294	432	65	8
2000	1,765	12	75	21	17	74	368	426	33	7
2001	1,946	12	47	28	43	57	432	304	13	6
2002	1,929	17	54	23	16	55	452	286	42	14
2003	1,978	-	51	30	9	48	406 <sup>12</sup>	271	45	10

NB: some of these cases also appear in the statistics of recognised cases of pleural plaques (see Table 8)

<sup>10</sup> As from 1993, recognition as occupational disease possible without functional disorders.

<sup>11</sup> These figures represent here the cases recognised for a non economical loss (physiological damage). There should be added a dozen cases per year which have been refused on this basis, but recognised as occupational diseases (for benefits in kind).

<sup>12</sup> Semi-definitive data



## ■ Asbestosis

- Pulmonary fibrosis caused by the inhalation of asbestos fibres
- The risk of asbestosis and its seriousness depend on the level and length of exposure.
- In over half of the cases, the medical condition remains stable, but it can progress toward respiratory failure.
- Every case of asbestosis involves an increased risk of lung cancer.

## ■ Asbestosis, diagnostic criteria and recognition

- X-rays,
- ILO criteria
  
- Generally in Europe an extensive history of asbestos exposure is also required for compensation

## ■ Lung cancer, recognised cases (due to asbestos)

Year	Germany	Belgium	Denmark <sup>13</sup>	Spain <sup>14</sup>	Finland	France	Italy	Norway	Switzerland
1980	20	3	-	-	-	13	-	-	-
1985	43	2	-	-	-	0	-	-	-
1990	132	7	-	0	-	13	0	-	0
1991	200	6	26	0	-	-	0	-	0
1992	266	6	56	0	-	-	0	-	0
1993	436	12	63	0	-	50	0	-	0
1994	597	3	46	0	-	59	1	-	1
1995	796	13	42	0	-	93	21	-	0
1996	743	11	26	0	83	140	35	-	0
1997	643	19	33	1	88	188	45	-	0
1998	719	16	33	0	84	280	29	-	1
1999	755	16	35	2	76	438	52	72	2
2000	681	27	44	5	69	557	66	99	1
2001	738	30	27	3	91	668	118	87	0
2002	727	47	35	13	64	744	118	110	0
2003	739	40	47	6	59	1,018 <sup>15</sup>	189	97	1

13 Before 1991, all cases of lung cancer were registered under the same statistical code, without any indication of the causal agent.

14 In Spain, cases of mesotheliomas and cases of asbestos-related lung cancer are both registered under the same statistical code.

15 Semi-definitive data



## ■ Lung cancer (asbestos related)

- Can be caused by several factors
- Predominant: Tobacco smoking
- Estimation: About 10 % of lung cancer caused also by asbestos exposure
- Effect of asbestos exposure plus tobacco smoking is synergistic (multiplicative effect!)

## ■ Lung cancer diagnostic criteria and recognition

### ■ In most countries two different pathways to recognition

- Either lung cancer in connection with asbestosis („bridging symptom“)
- Or intense exposure is proved (Helsinki criteria or threshold of 25 fibres/ml/year)

#### Helsinki Criteria (asbestos exposure)

- at least 1 year if major exposure (job in an asbestos-cement factory, demolition work involving definite exposure to asbestos or direct handling of asbestos).
- from 5 to 10 years if moderate exposure (for example, work in the docks in a confined space, regular work in contact with asbestos-cement roofs, plumbing work implying regular exposure to asbestos and the work of mechanics having to change truck brake linings frequently; work performed indoors counting for more than work performed outdoors, direct exposure for more than indirect exposure).
- or exposure calculated as at least 25 fibres/cm<sup>3</sup> per year, i.e. an exposure equivalent to at least 1 fibre/cm<sup>3</sup> over 25 years or 2 fibres/cm<sup>3</sup> over 12 and a half years



## ■ Mesothelioma, recognized cases

Year	Germany	Belgium	Denmark	Spain <sup>16</sup>	Finland	France <sup>17</sup>	Italy	Norway	Switzerland
1980	36	0	0	-	-	20	-	-	0
1985	135	12	0	-	-	25	-	-	11
1990	291	25	1	0	-	65	1	-	29
1991	301	35	31	0	-	-	0	-	32
1992	334	42	60	0	-	-	0	-	29
1993	406	38	61	0	-	89	1	-	31
1994	486	50	49	0	-	111	10	-	34
1995	498	35	56	0	-	154	40	-	37
1996	519	46	54	0	25	180	83	-	36
1997	554	60	67	1	32	190	105	-	45
1998	582	63	58	0	37	205	160	-	48
1999	620	33	71	2	36	300	218	56	35
2000	652	65	91	5	27	279	227	62	63
2001	683	59	57	3	36	311	330	27	60
2002	735	76	55	13	38	360	331	40	64
2003	788	92	47	6	34	421 <sup>18</sup>	389	34	54

16 In Spain, cases of mesotheliomas and cases of asbestos-related lung cancers are both registered under the same statistical code.

17 Malignant primitive mesotheliomas and other pleural primitive tumours.

18 Semi-definitive data



## ■ Mesothelioma

- Malignant tumor that usually develops on the pleura
- Caused almost exclusively by prior exposure to asbestos
- Exposure may have occurred several dozen years before the diagnosis and may have been of low level.
- Rarely also appearing in the peritoneum or the pericardium

## ■ Mesothelioma diagnostic criteria and recognition

- Hard to diagnose.
- Medical imaging (X-rays, Computed Tomography) and histological examination (biopsy).
- Sometimes pleural fluid is sampled and analysed.
- In some countries there are groups of specialised pathologists called “Mesothelioma panels”, who perform the assessments of all suspected cases countrywide.
- In all the countries in Europe: even modest exposure (a few weeks) to asbestos dust is sufficient for recognition.

## ■ ..and

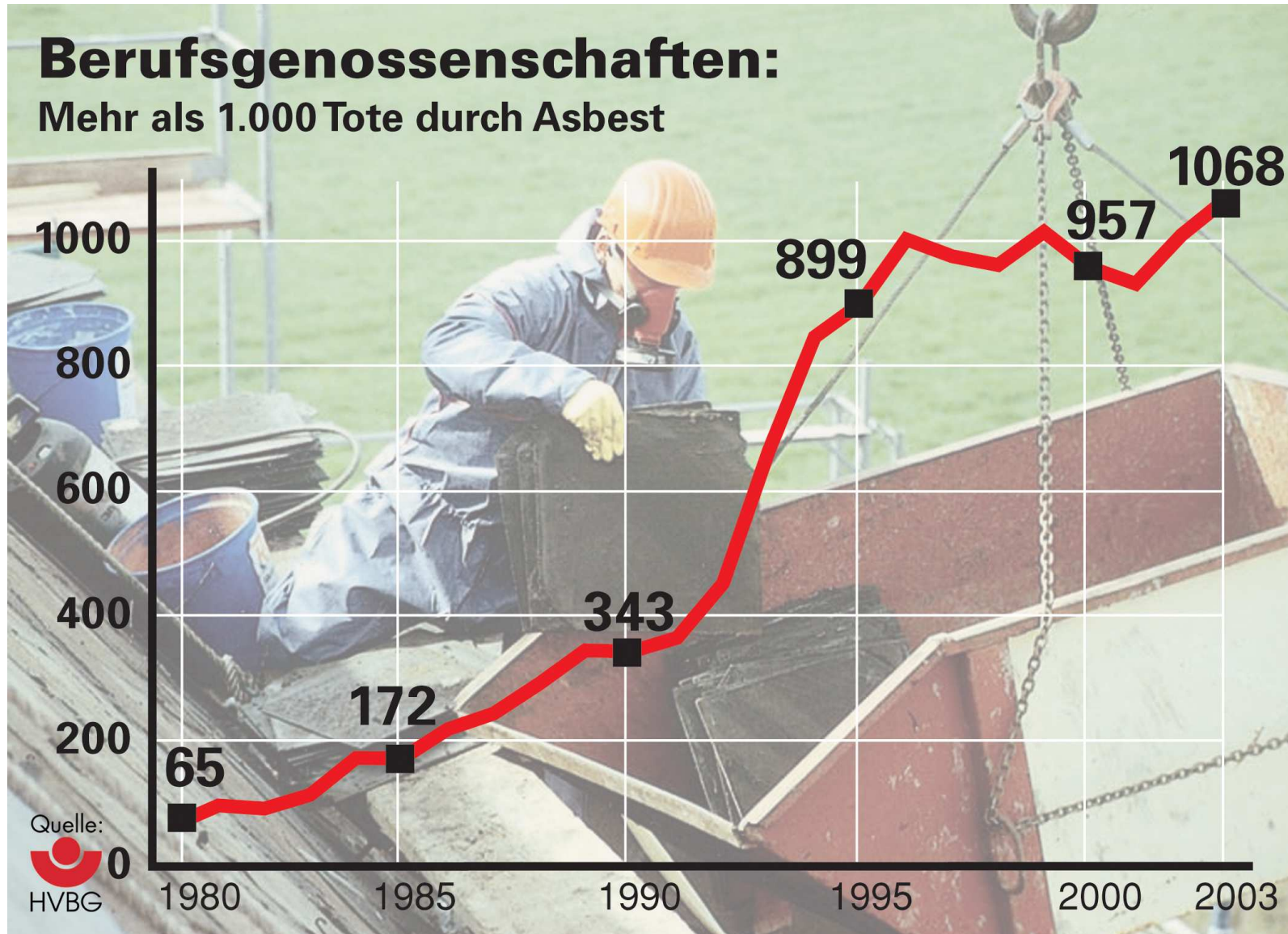
### ■ Pleural plaques:

- Localised fibrosis regions on the pleura
- Considered as an asbestos "exposure markers",
- In some cases they result in pains or even a slight reduction in respiratory capacity

### ■ Some types of cancers other than mesothelioma and lung cancer (e.g. laryngeal cancer)

- Also suspected of being caused by asbestos but not (yet) universally (no scientific consensus in Europe).

# Individual suffering: cases of death by asbestos in Germany)



## ■ Economic effects (some examples)

### ■ Germany:

- 2003 more than 314 million € spent for financial compensation due to asbestos by the insurance
- From 1999 to 2004 these costs increased by 40 %
- Estimation of total costs until 2020: several billion €!

### ■ France:

- In a governmental report in 2004 the total costs for 2000 to 2020 were estimated as between 27 and 37 billion €
- For 2003 the compensation fund amounted to about 600 million € (social security insurance plus early retirement schemes)

### ■ United States

- Compensation is a question of going to court individually
- Currently about 50.000 persons annually sue companies for individual compensation
- More than 20 companies have gone bankrupt already as a consequence.
- Insurance companies have published that until 2000 more than 20 billion \$ have been paid by them and more than 30 billion by companies directly
- Estimations amount to 200 to 300 billion \$ demanded compensation as a total

## ■ Preventive strategies

- **Replacing crocidolite or amosite by chrysotile is NOT an effective strategy as chrysotile WILL cause lung cancer as well**
- Because of the specific dangers of mesothelioma development ordinary primary preventive strategies (personal protective equipment) are not feasible
- Only in the cases where currently no reasonable way of setting exposure to „zero“ exists (like in the asbestos removal trade) classical technical prevention on a very high level and with fairly high economical costs must be applied (and the costs should be considered in the economical calculation).
- „Secondary prevention“ (like systems of regular medical investigation of suspected victims) should be implemented
- An example for this type of system is the German ZAS (Central Registration Agency for Employees Exposed to Asbestos Dust)

## ■ ZAS (Central Registration Agency for Employees Exposed to Asbestos Dust)

- More than 480000 persons registered in Germany in 2003
- About 62000 of them were still exposed
- About 230000 had been exposed to asbestos in the past
- Persons are regularly invited to medical investigations with a high degree of acceptance
- Currently research is performed to allow for higher specificity (identification of „high risk groups“)
- However, there is NO cure for mesothelioma, a bad prognosis for lung cancer, and a significant decrease in quality of life for asbestosis



## ■ Conclusion

- The story of asbestos is a long and harmful one.
- **There is no alternative to a complete ban of asbestos – as soon as possible.**
- Only the question of **when** it is imposed and **how high the costs are until then** is an open one!

Thank you for your attention!