



The ASBEST Study

Comparison of Parallel Fibre and Dust Measurements

International Agency for Research on Cancer
Lyon, France

Eleonora Feletto (1); Sara J Schonfeld (1); Monika Moissonnier (1); Sergey V Kashanskiy (2); Evgeny V Kovalevskiy (3); Joachim Schüz (1); Hans Kromhout (4)

Affiliations: (1) International Agency for Research on Cancer, Lyon, France; (2) Yekaterinburg Medical Research Center for Prophylaxis and Health Protection in Industrial Workers, Yekaterinburg, Russian Federation; (3) Scientific Research Institute of Occupational Health of the Russian Academy of Medical Sciences, Moscow, Russian Federation; (4) Institute for Risk Assessment Sciences, Utrecht University, Utrecht, The Netherlands

The Asbest Study

International Agency for Research on Cancer



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ASBEST STUDY: Occupational exposure to chrysotile in workers
in mines and processing facilities in Asbest, Russian Federation



ABOUT ASBESTOS

ABOUT THE STUDY

OBJECTIVES & DESIGN

QUALITY ASSURANCE

STUDY OVERSIGHT

CONTACT



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A historical cohort study is being conducted of cancer mortality in chrysotile asbestos miners and millers in the town of Asbest, Russian Federation. Chrysotile is the only type of asbestos that is mined today.

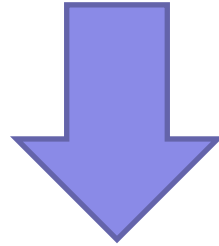
International Agency for Research on Cancer



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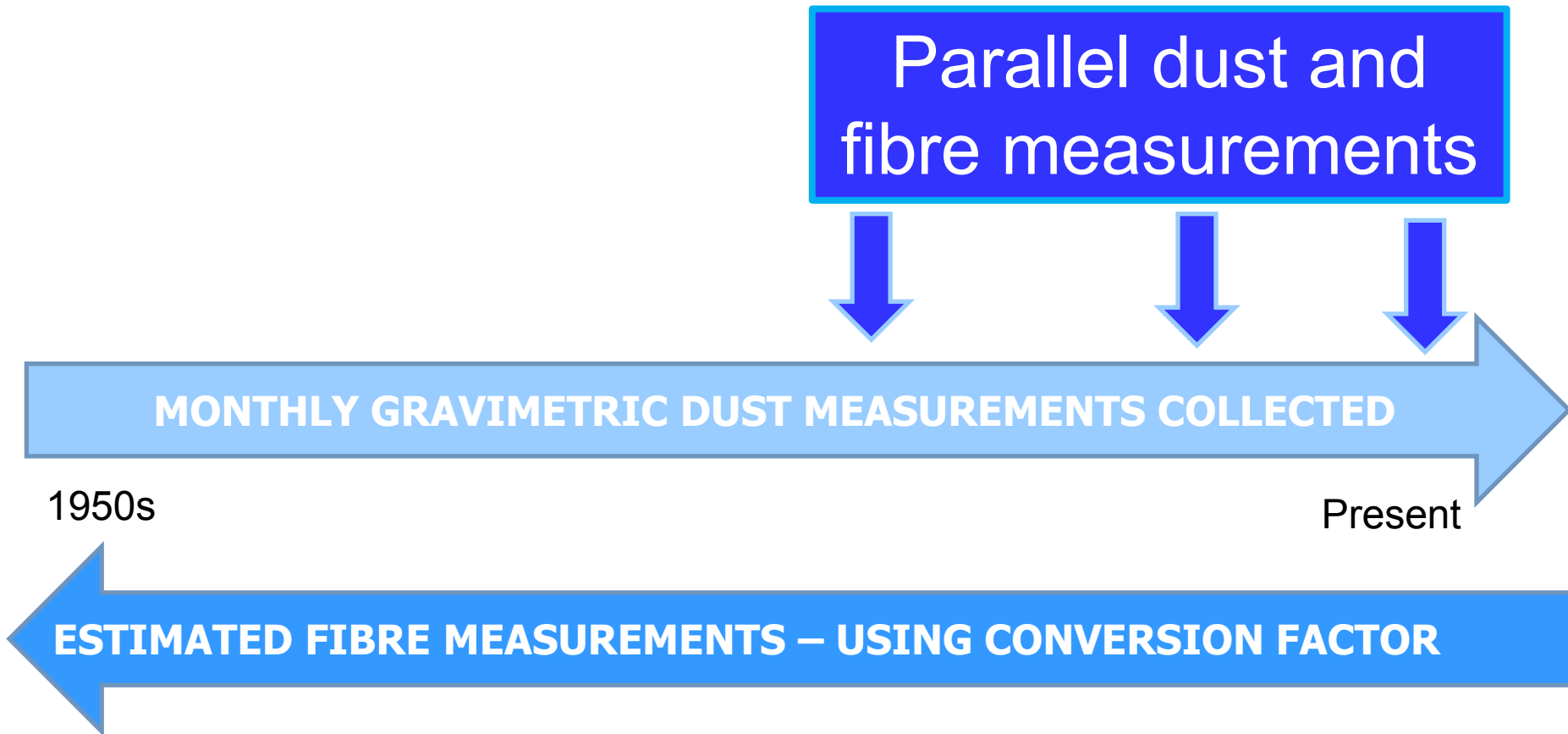
The Asbest Study

...to characterize the association between chrysotile exposure and cancer mortality



...to compare parallel dust and fibre measurements and determine if conversion factors by stage in the mining and processing of chrysotile or time period can be estimated

Why Conversion Factors



1950s

Present

Dust Measurements

- Dust measurements were collected using gravimetric samplers:
 - Filters were pre and post weighed to determine mass gain and then converted into a dust concentration (mg/m^3)
 - Stationary samplers were used at various sampling points across UralAsbest enrichment processing factories and the mine

Fibre Measurement

- Fibre measurements were collected using stationary air samplers across the factories and mine
- Fibre can be counted using a number of methods – phase-contrast optical microscopy (PCOM) was used
- This results in a count of fibres per 100 graticule fields and converted into a fibre concentration (f/cm^3)



Data Collection

1. Finnish Institute of Occupational Health
2. National Institute for Occupational Safety and Health
3. Russian Academy of Medical Sciences
4. Medical Research Center for Prophylactic and Health Protection of Industrial Workers

UralAsbest

2013(Nov/Dec)/2014(Jan, Feb, June-Sept): parallel dust and fibre measurements

UralAsbest

2007 (March-Sept): parallel dust and fibre measurements

1995 (June): parallel dust and fibre measurements

MONTHLY GRAVIMETRIC DUST MEASUREMENTS COLLECTED

1950s

Present

Method

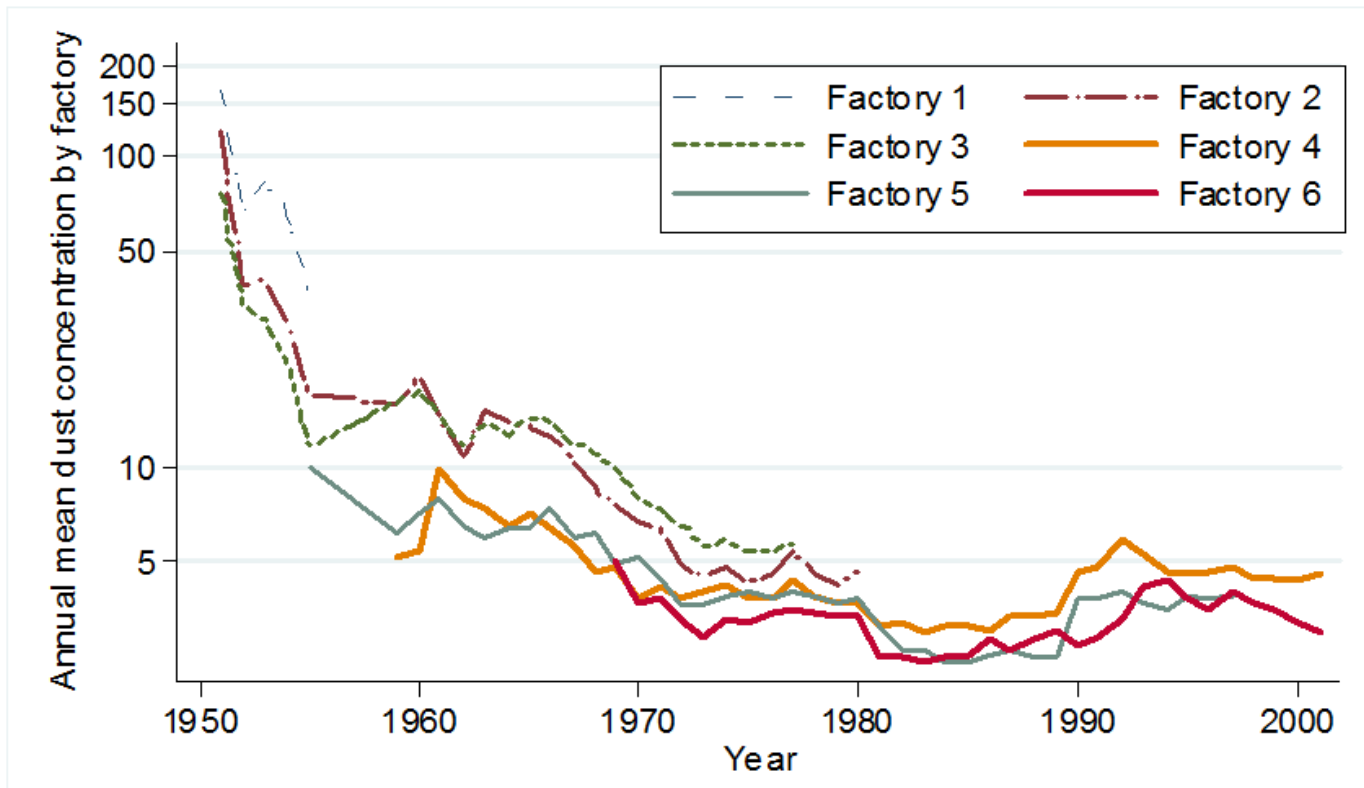
	1995	2007	2013/2014
Data available for	Factory 4 Factory 6 Mine	Factory 4 Factory 6 Mine	Factory 6 Mine
Dust counting method	GRAV	GRAV	GRAV
Fibre counting method	SRIOH: PCOM FOH: PCOM & SEM NIOSH: SEM	PCOM	PCOM
Measurement taken...	At fixed sampling points and 3-5 metres from these points	over 3-4 days at each sampling point	from each sampling point in summer and winter (1 day per season)
Number of measurements taken per sampling point	1-2 measurement	3-4 measurements each day	

Method

- A fibre to dust ratio was estimated by sampling point
- Conducted preliminary analyses to examine the association between the fibre and dust

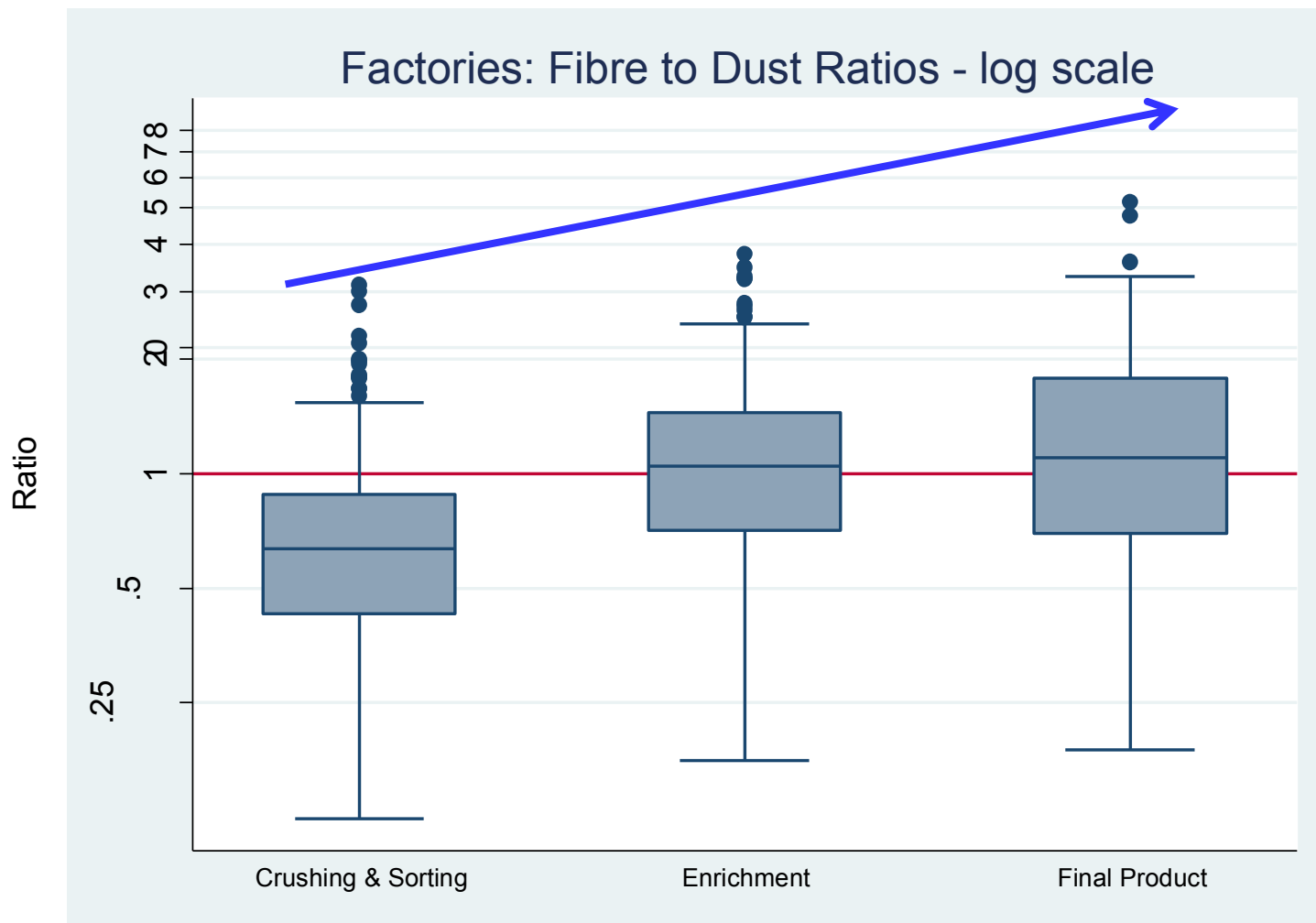


Results: Gravimetric dust concentrations* (mg/m³): 1951-2001



* Geometric means of monthly averages. Line thickness proportional to number of measurement points.

Results: Factories



Results: Mine

- The overall fibre to dust ratio in the mine was similar the factory



Results: Modelling of Ratios

- There was an indication that ratios differed by time period
- Preliminary results suggest variability across units
- It appears that the fibre to dust ratio is dependent on dust concentration

Conclusions

- We are still conducting analyses to determine whether conversion factors can be derived for use in the cohort study and how these findings will be applied to the larger study



Study Team



International Agency for Research on Cancer, Lyon, France

Joachim Schüz (Lead) *Section of Environment and Radiation*

Sara J Schonfeld

Valerie McCormack

Monika Moissonnier

Kurt Straif

Section of IARC Monographs

Scientific Research Institute of Occupational Health of the Russian Academy of Medical Sciences, Moscow, Russian Federation

Igor Bukhtiyarov (Lead)

Evgeny Kovalevskiy

Institute for Risk Assessment Sciences, Utrecht University, The Netherlands

Hans Kromhout

Yekaterinburg Medical Research Center for Prophylaxis and Health Protection in Industrial Workers, Yekaterinburg, Russian Federation

Sergei Kashanskiy

Scientific Advisory Board

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