



National Institute of
Occupational Health

Working environment challenges for the future . The Norwegian perspective

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Examples of present and future working life/environment challenges in Norway:

- “ Work immigration and social dumping
- “ Ageing work force
- “ Changes in conditions of employment and working hours regulations
- “ Reorganizations and downsizing
- “ Long term work related sickness absence due to musculoskeletal disorders
- “ Exclusion/inclusion/early retirement/return to work
- “ Work in cold climates (exploitation of resources in arctic and subarctic regions)
- “ Many classical and new chemical/biological/physical exposures still unsolved



When looking into the crystal ball



..it is possible that one only see ones own ref lected image.



“We do not foresee any radical changes in the working environment for the next decade. Norway has a strong economy and the working life is well balanced through the Nordic model (3-party collaboration).

“Current developments are, however, likely to continue. There are still need for efforts in this field as many challenges remain to be dissolved, both from a national strategic and scientific point of view.

“We are still in great need for in-depth pathogenic basic knowledge on most of the #traditional+working environment challenges.

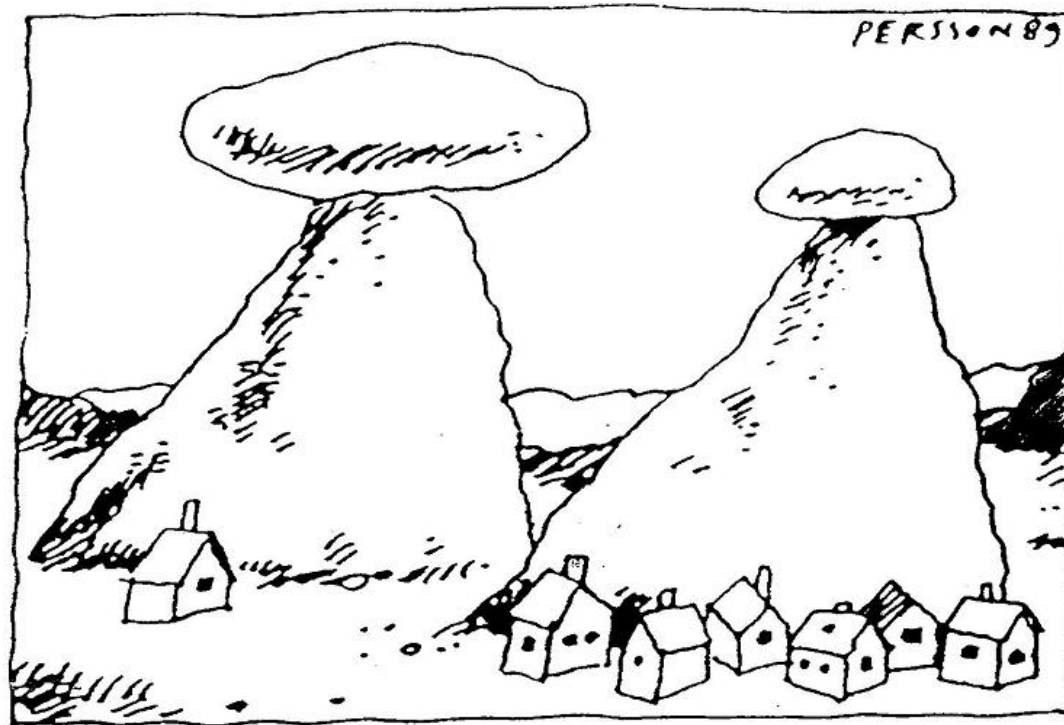
“There are a need for long-term based research institutions with financial and scientific power to work on such challenging topics, independent of short-term applied research programmes often reflecting focus on #hot+topics of immediate political interest.

“National strategies and political ambitions in this field should also reflect these gaps of knowledge.



Chemical working environment

Working environment vs. Environment - Different risk perception?

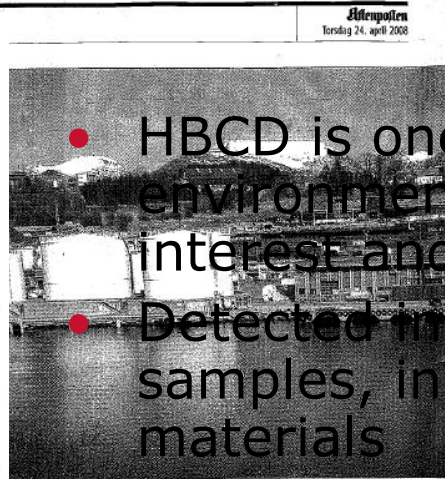




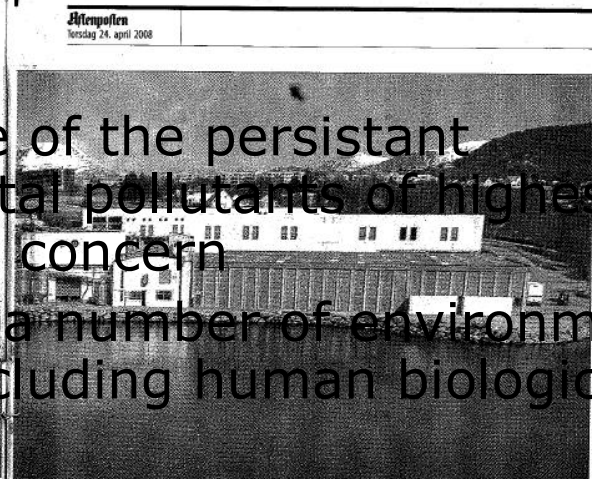
Occupational Exposure to Hexabromocyclododecane at an Industrial Plant

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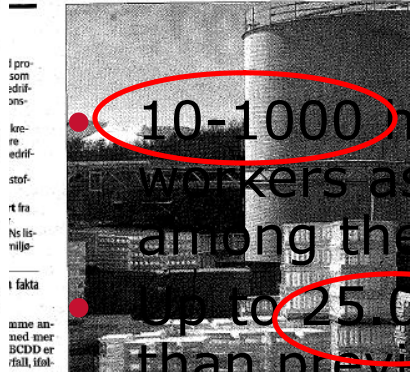
Occupational exposure to hexabromocyclododecane (HBCD) among workers at an industrial plant producing expandable polystyrene (PS) added HBCD as flame retardant has been assessed in the present study. Airborne dust samples were collected near the breathing zone of 10 male workers during three 8-h work shifts. The HBCD concentrations in the airborne dust varied from 0.2 to 150 $\mu\text{g}/\text{m}^3$ (mean 12.2 and median 2.1 $\mu\text{g}/\text{m}^3$). Two serum samples were obtained from each of the workers. The mean serum concentration was 190 ng/g lipids; the median was 101 ng/g lipids (range 6 to 856 ng/g lipids). HBCD was not detected above 1 ng/g lipids (LOD) in any samples from persons in a reference group with no occupational exposure to HBCD. The contribution of γ -HBCD to the total HBCD serum concentration was notably high (39%) compared to what has usually been observed in biological samples. There was no clear correlation of serum levels with average HBCD concentrations in the airborne dust samples collected near the subjects' breathing zone. The elevated exposure levels reported in this study compared to urban air and serum levels in general populations suggest that further and more detailed exposure assessment studies should be initiated in industries where HBCD is applied.



Årlig mellom 5000 og 7000 tonn råstoff til isolasjon som inneholder HBCDD



• HBCD is one of the persistent environmental pollutants of highest interest and concern



10-1000 ganger høyere nivåer i blodet hos arbeidere som selges i Europa

• Detected in a number of environmental samples, including human biological materials

• Very scarce information on possible health effects

• Never studied in occupational settings

• Up to 25,000 higher concentrations than previously measured in city air

• 10-1000 higher levels in blood from workers as compared to highest exposed among the normal population

• Up to 25,000 higher concentrations than previously measured in city air

Aftenposten
torsdag 24. april 2008

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Årlig mellom 5000 og 7000 tonn råstoff til isolasjon som inneholder HBCDD

jøgift, følger

i pro- som idrift- oms- kre- re edrif- stof- t fra i- Ne lis- miljø- fakta

omme an- med mer BCDD er risik, forsk-

ekspanderbar polystyren som sendes til utlandet. Årsaken er at blant annet tyske myndigheter har strengere krav til brannsik- ker isolasjon enn norske.

Må stenge. Blir stoffet for- budt i Norge, betyr det kroken på døren for HBCDD. Myndighetene vil trolig avvikle produksjonen direkte i Norge.

«Hvis vi ikke lager råstoffet med flammehemmer, har ikke vi mulighet til å eksportere det», sier bedriftens leder. Han mener det er et større velt på brannhemning.

Norske myndigheter har skarpe- re krav til miljø. Slikt er det som er viktig for bedriften.

«Soknag» Jeg tror det vil være en god investering for en norsk bedrift å sette i gang med å produsere slike isolasjons- stoffer på egen hånd.

FNs liste
Stockholmkonvensjonen om organiske miljøgifter er den viktigste avtalen for å regulere miljøgifter globalt.

Den trådte i kraft i 2004 og over 100 land har undertegnet avtalen.

Konvensjonen omfatter i dag litt over ti organiske miljøgifter, blant annet PCB og dioxiner.

Fleren av stoffene er foreslått tatt inn i avtalen og vurderes da av en ekspertkomité.

«Soknag» Jeg tror det vil være en god investering for en norsk bedrift å sette i gang med å produsere slike isolasjons- stoffer på egen hånd.

Brødr. Sunde A/S

I 2006 hadde selskapet en omsetning på 808 millioner og et resultat på nærmest 77 millioner.

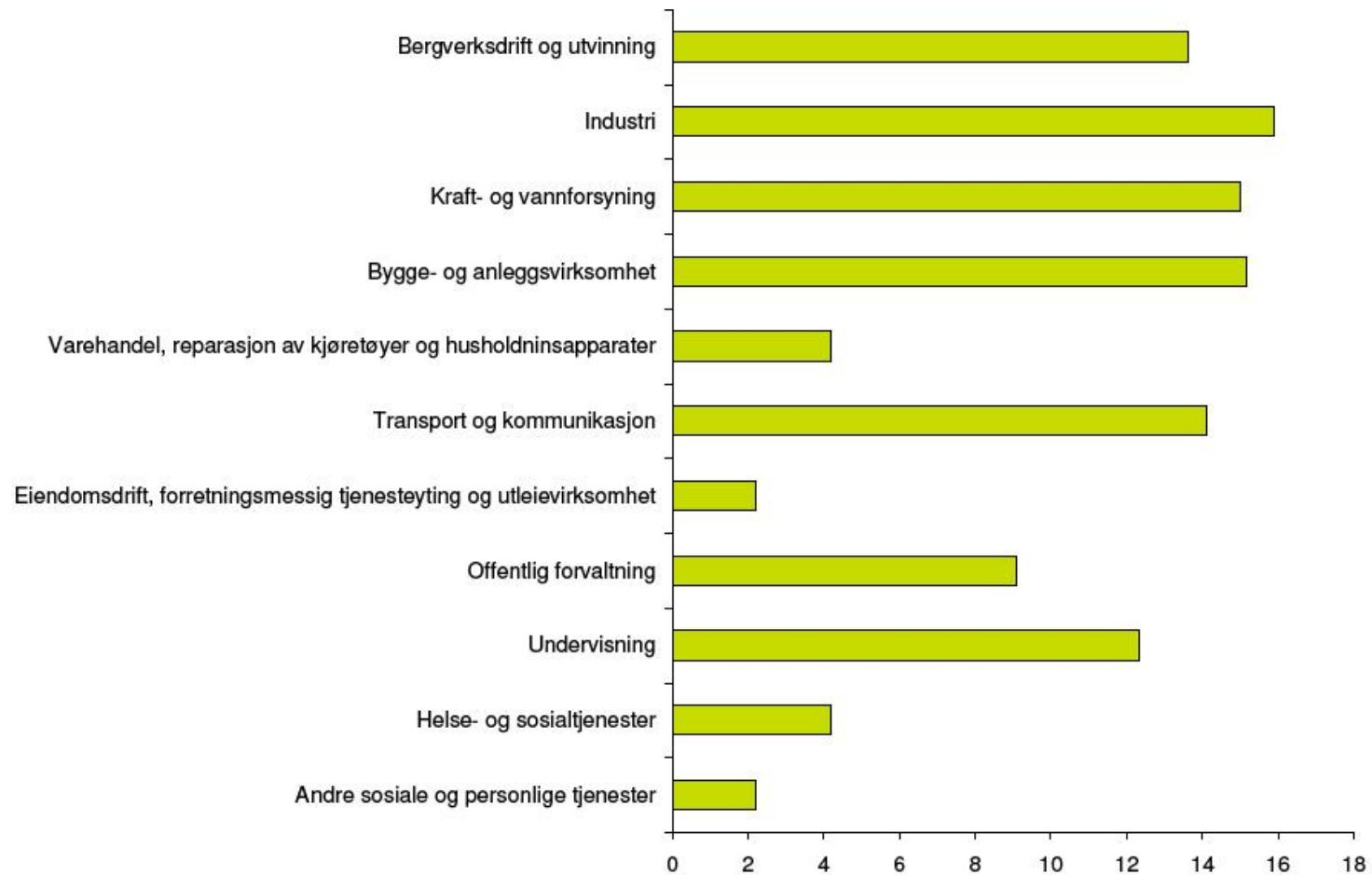
Selskapet ble etablert i 1919. I 1999 ble selskapet kjøpt av Brødr. Sunde (28) og Karl Johan Sunde (58).

Selskapet produserer og distribuerer sine produkter fra syv land i Europa.

Årlig produserer fabrikkene i Norge og Sverige ca. 70 millioner tonn råstoff som blir eksportert til produksjon av fisketredskaper til produkter av plast og gips.

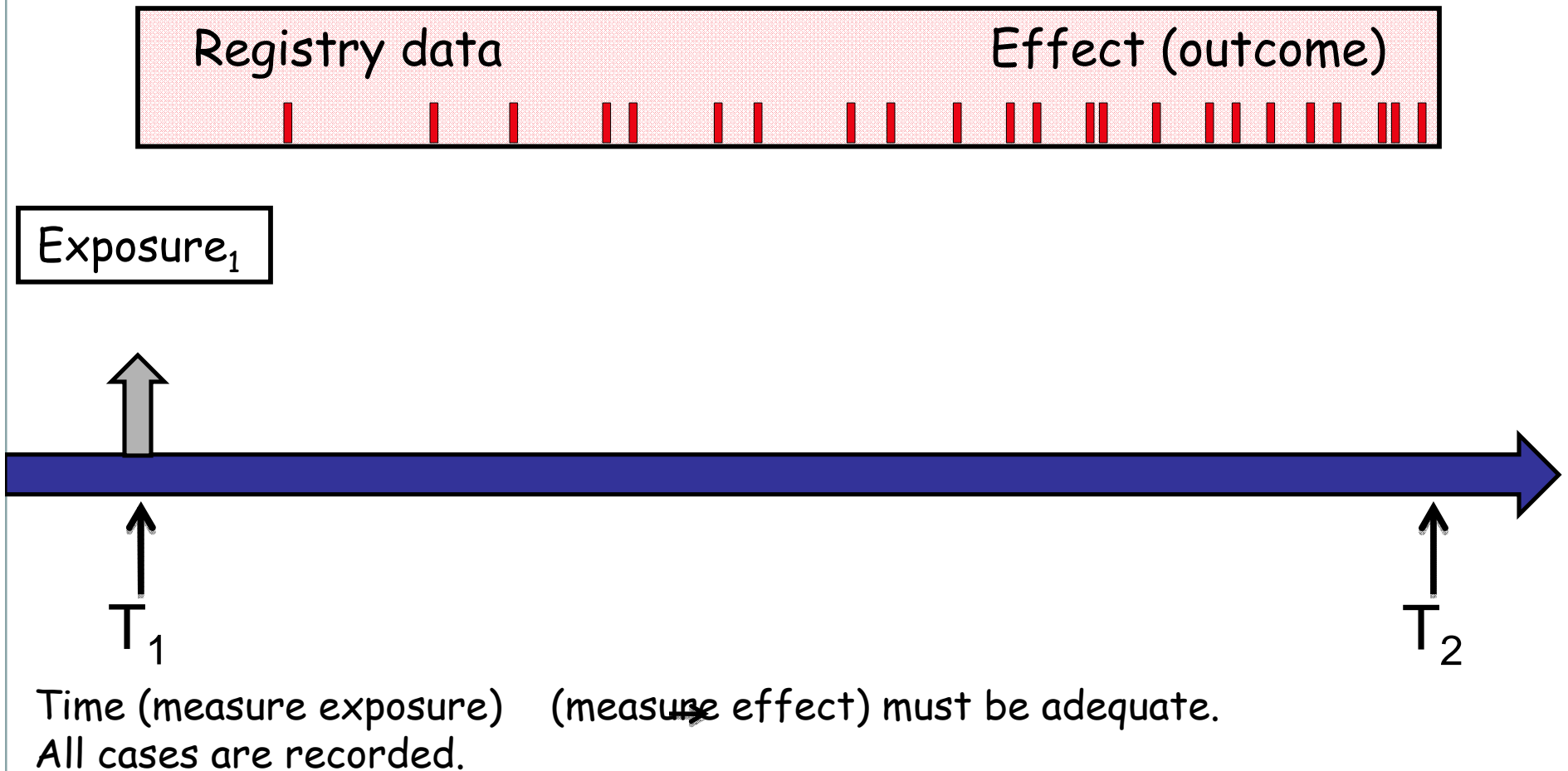


Chemical exposure measurements above TLV values



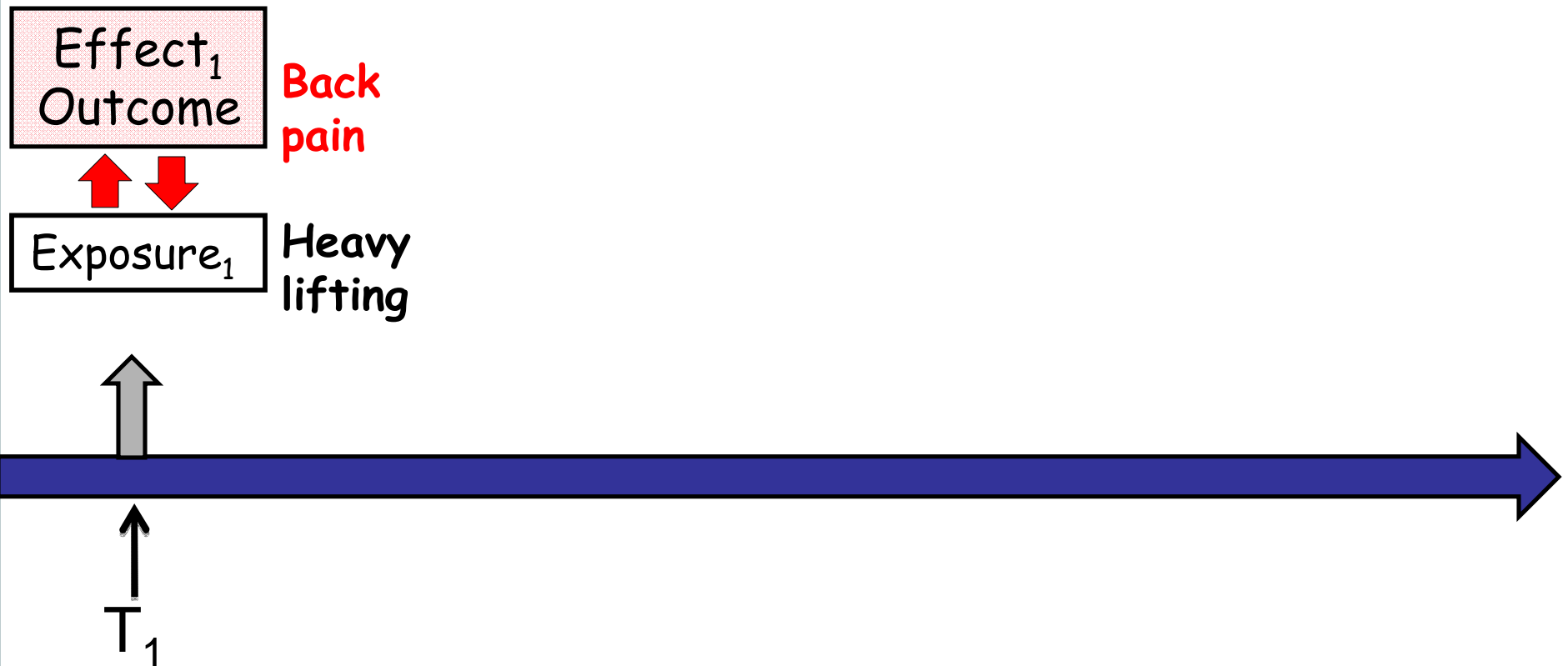
Hard end points: diagnosis, pension, death (0,1)

Longitudinal study (prospective design)



Soft end points: disorders, symptoms

Cross-sectional design



Impossible to conclude on cause - effect.

Reporting behavior, appraisal of pain affects perception of exposure.

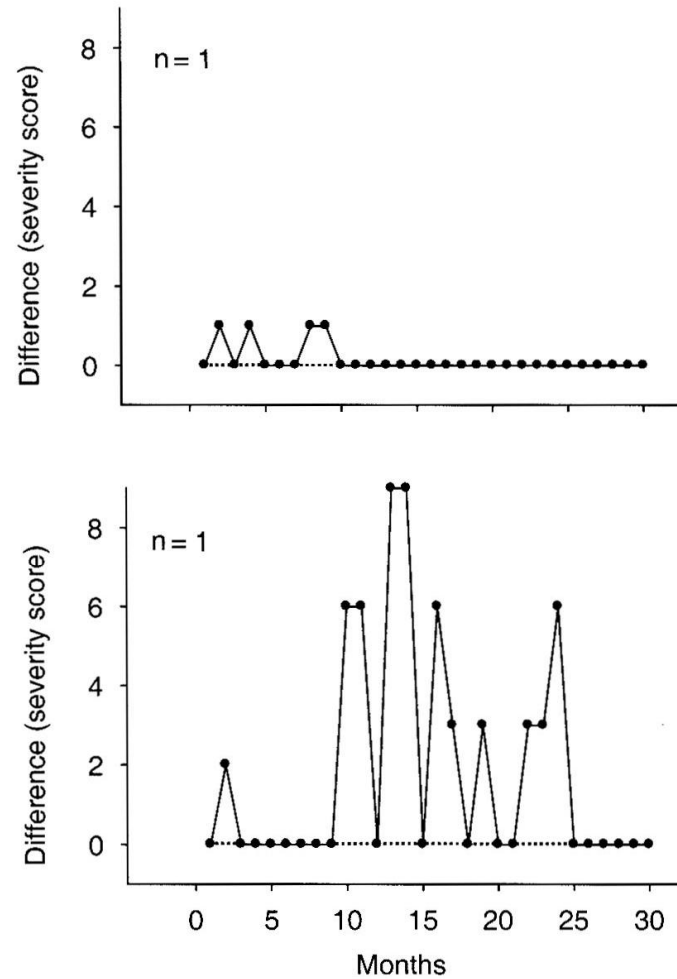
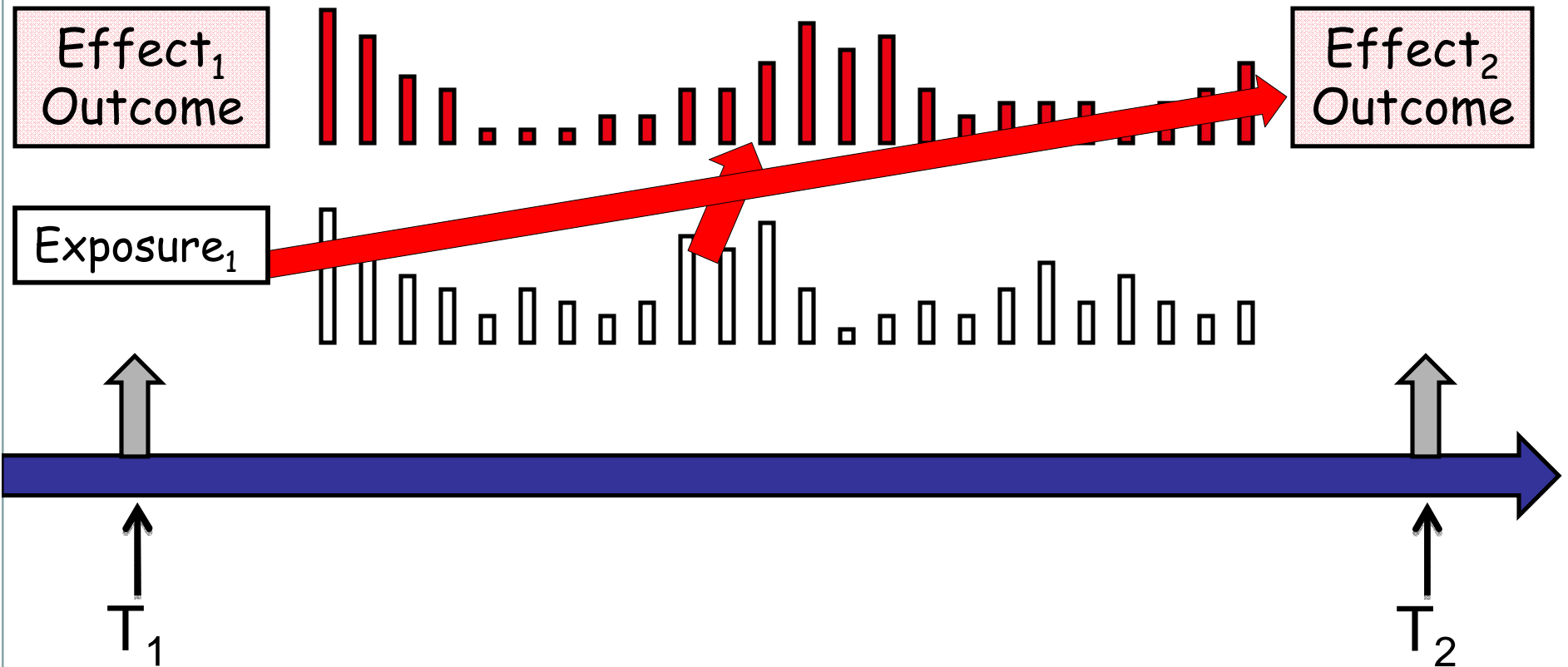


Fig. 1. Variation in reported lower back pain over an extended period for two participants showing different patterns. The complaint-severity differences (vertical axis) between current and previous month for 31 consecutive monthly reports are given. Dotted lines represent zero.

Soft end points: disorders, symptoms

Time relations - mechanisms?



Time exposure - effect crucial. Correct time resolution?
Effect related to exposure at T_1 subsided at T_2 ?



Concluding remarks

Longitudinal studies are necessary to conclude on risk factors for health, absence, and exit from work.

Knowledge of mechanisms is necessary to design studies that measure exposures, mediators, and effects at optimal time points,
to design studies that answer questions pertaining to work as causal factor.