

Comments on Draft Risk Evaluation (DRE) for Asbestos

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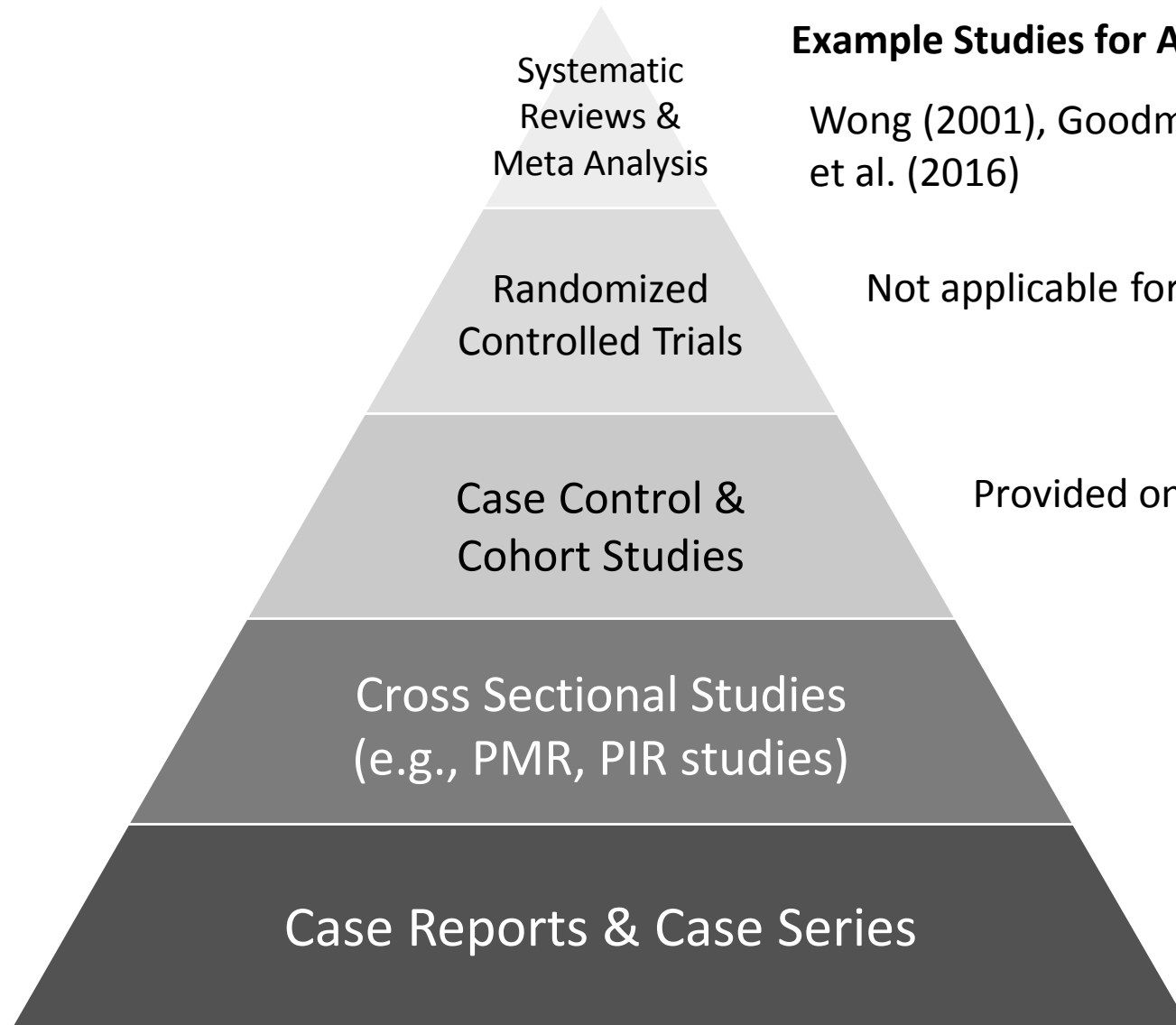
Main Comments

- Mesothelioma can and does occur in the absence of asbestos
- Multiple analytical epidemiologic studies show vehicle mechanics and users of AABL have no increased risk of mesothelioma or lung cancer
- Carolina cohorts on which DRE's inhalation unit risk (IUR) is based are not purely chrysotile cohorts

Robust Body of Epidemiologic Data Demonstrates No Increased Risk of Disease in Users of AABL

- For AABL, the EPA DRE ignores a large body of scientifically sound epidemiologic evidence that clearly indicates no risk of asbestos-related disease in cohorts exposed to low-level chrysotile asbestos
 - Studies encompass a variety of time periods, study design and data collection methods, and countries, further bolstering the finding of no increased risk
 - Toxicologic studies provide strong support for the conclusions of epidemiologic studies

Hierarchy of Epidemiologic Study Designs



Example Studies for AABL

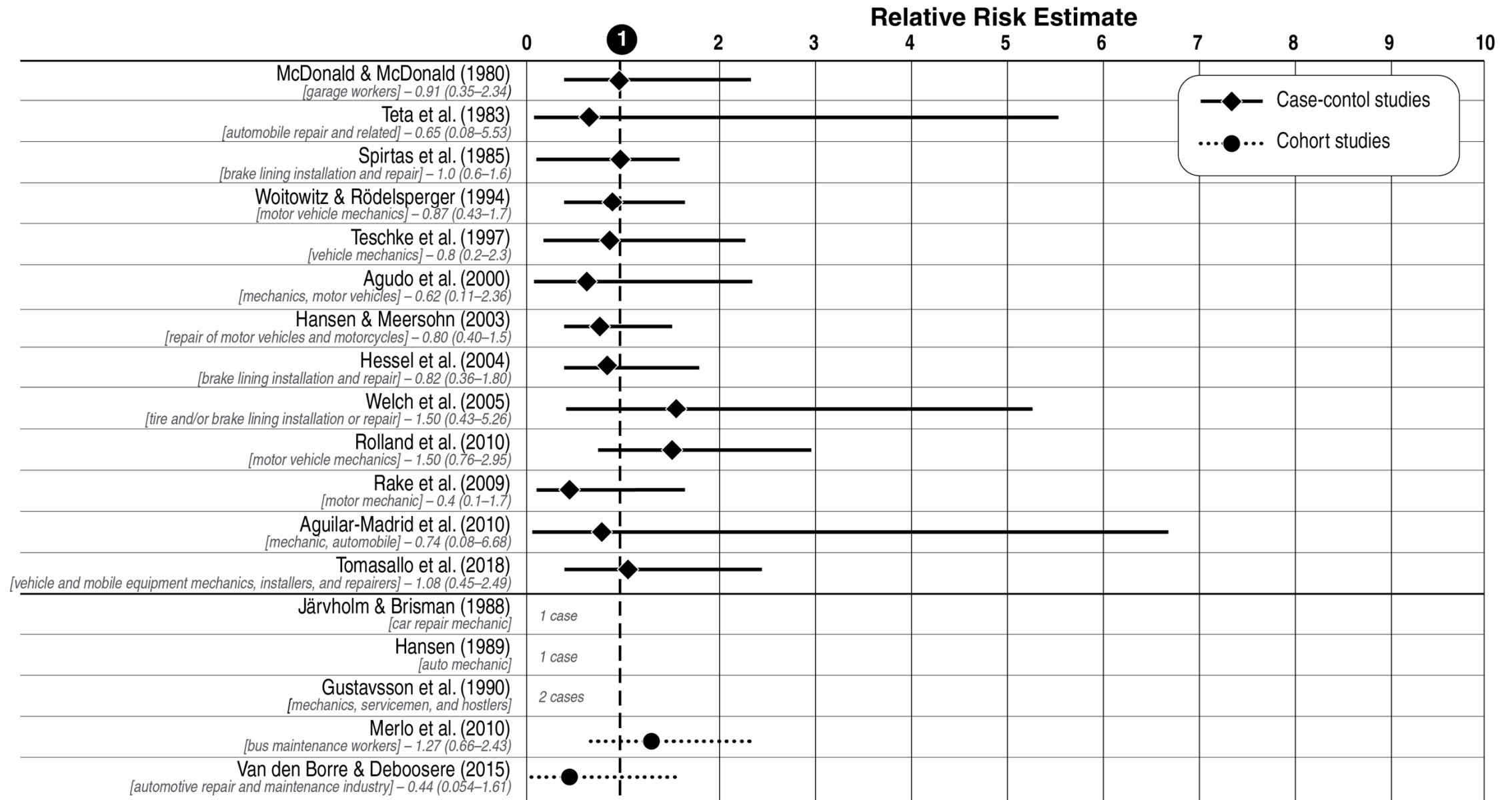
Wong (2001), Goodman et al. (2004), Laden et al. (2004), Garabrant et al. (2016)

Not applicable for AABL

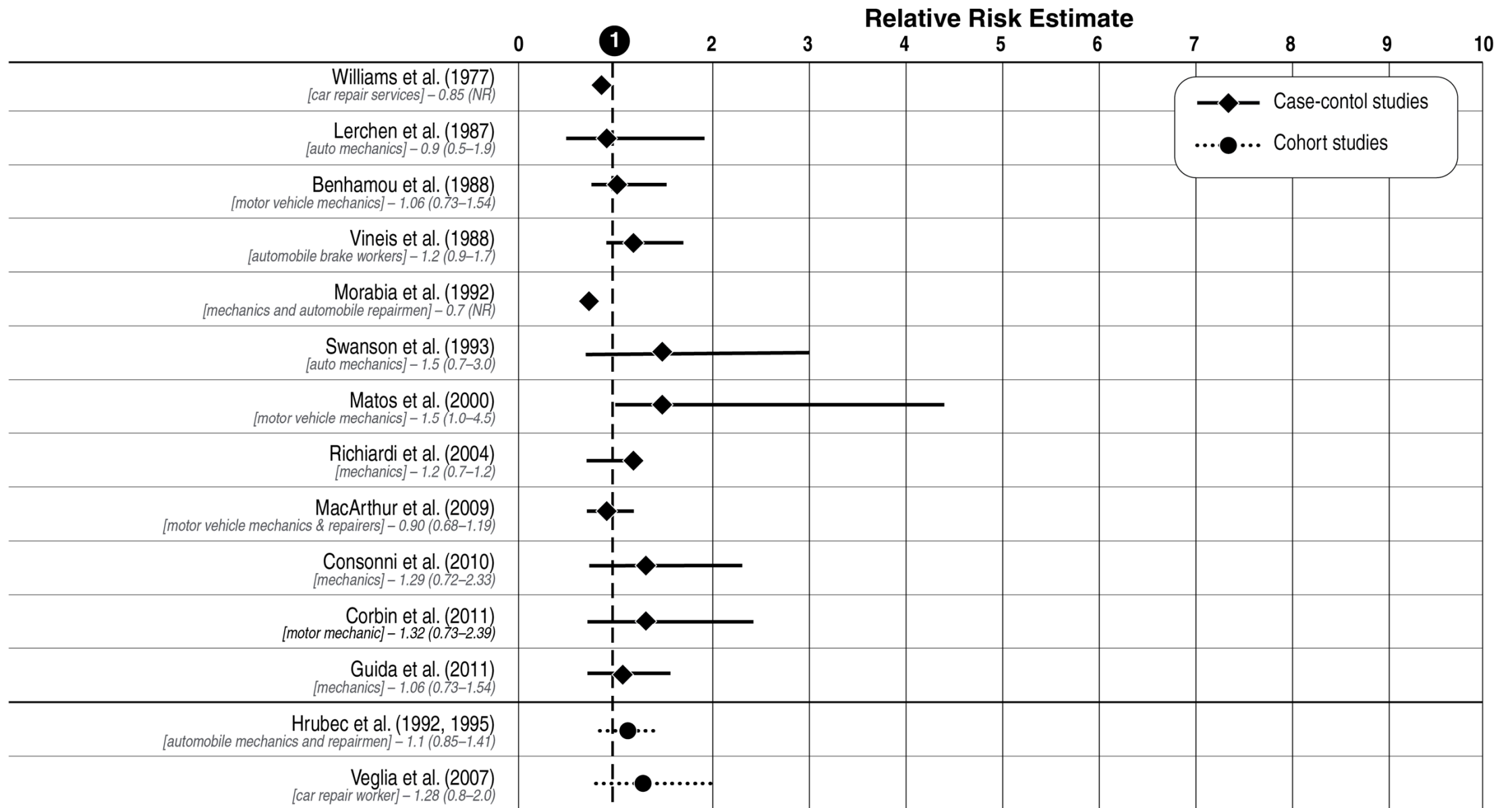
Provided on next two slides

Lemen (2004), Freeman & Kohles (2012), Kanarek & Anderson (2018)???

Multiple Studies Show Vehicle Mechanics and Users of AABL Have No Increased Risk of Mesothelioma



Multiple Studies Show Vehicle Mechanics and Users of AABL Have No Increased Risk of Lung Cancer



Studies of Mechanics and Users of AABL (taken from Garabrant et al., 2016)

Table 2. Quality scores of studies evaluating the association between mesothelioma risk and employment as a motor vehicle mechanic.

Quality criteria	Study															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overall study design: PMR/PIR/SMOR = 0; SMR/OR = 1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
Asbestos exposure: Job title (e.g. 'car mechanic') = 0; Task specific (e.g. brake repairman or IH-based) = 1	0	0	1	1	1	0	1	0	0	0	1	0	0	0	0	0
Was age taken into account adequately?: no = 0; yes = 1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
Lifetime asbestos exposure history: no = 0; yes = 1	1	1	1	1	1	1	0	1	0	1	1	0	0	0	0	0
Was any attempt made to control for confounding?: no = 0; unlikely/addressed = 1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Exposure-response analysis performed? no = 0; yes = 1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
Was latency taken into account? no = 0; yes = 1	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0
For cohort studies: follow-up <30 yr = 0; ≥30 years = 1										1		0	0	0	0	0
For case-control studies: response rate: <80% or not reported = 0; ≥80% = 1	1	1	1	0	0	1	1	0		0	0					
Information bias: possible = 0; unlikely/addressed = 1	1	1	0	0	1	0	1	1	1	1	0	1	1	1	1	0
Selection bias: possible = 0; unlikely/addressed = 1	0	1	0	1	1	1	0	0	1	0	0	1	1	1	1	0
Cases based on pathology review: no = 0; yes = 1	1	1	1	1	1	1	0	1	0	1	1	0	0	0	0	1
Total score	7	7	8	8	10	6	6	5	6	5	4	3	3	3	3	2

1, (McDonald and McDonald, 1980); 2, (Teta et al., 1983); 3, (Teschke et al., 1997); 4, (Hessel et al., 2004); 5, (Rake et al., 2009); 6, (Agudo et al., 2000); 7, (Hansen and Meersohn, 2003); 8, (Aguilar-Madrid et al., 2010); 9, (Merlo et al., 2010); 10, (Rolland et al., 2010); 11, (Woitowitz and Rodelsperger, 1994b); 12, (McElvenny et al., 2005); 13, (Milham, 2011); 14, (NIOSH, 2011); 15, (Health and Safety Executive, 2013); 16, (Roelofs et al., 2013).

Misuse of Hill Criteria

- Lemen (2004) is based solely on case series and does not establish statistical association between exposure to chrysotile from AABL and mesothelioma risk
- Kanarek & Anderson (2018) dismiss all the case-control studies based on perceived methodological deficiencies; likewise, they dismiss all meta-analyses, including Garabrant et al. (2016), in a single sentence:
 - **“There have been review articles, re-analyses of previous studies and meta-analyses that conclude there is no hazard of mesothelioma among workers whose work includes brake repair, which are compilations of studies that were not designed to answer that question...”**
- These authors then go on to misuse the Hill criteria without having established a statistical association between exposure to AABL and mesothelioma
- The Hill criteria were specifically designed to distinguish causal associations from statistical associations; they *cannot be applied* in the absence of a statistical association