



**Finnish Institute of
Occupational Health**



Onderzoek voor Beleid en Praktijk: Cochrane Systematic Reviews

Jos Verbeek



Cochrane Collaboration

- **Mission**
 - to provide up to date evidence on the effects of health care
- **Products**
 - systematic reviews of healthcare interventions
 - in Cochrane Library, Impact Factor 5,7
- **Name**
 - after Archie Cochrane, British epidemiologist
- **Organisation**
 - global network of 90 groups that collaborate to produce systematic reviews
 - involves 28.000 persons on voluntary basis and small professional staff all over the world
 - no central funding for reviews
- **Occupational Safety and Health Review Group**
 - osh.cochrane.org
 - 80 cochrane reviews about OSH topics

THE ROLE OF PERIODIC EXAMINATION IN THE PREVENTION OF COALWORKERS' PNEUMOCONIOSIS

BY

A. L. COCHRANE, C. M. FLETCHER, J. C. GILSON, and P. HUGH-JONES

From the Pneumoconiosis Research Unit of the Medical Research Council, Llandough Hospital, Nr. Cardiff

There can be no doubt that coalworkers' pneumoconiosis presents one of the most serious problems in industrial medicine in Britain, at least in respect of the numbers of men affected. From 1931 up to the end of 1949 some 36,000 men had been officially diagnosed by the Silicosis Medical Board or the Pneumoconiosis Panels of the Ministry of National Insurance as being disabled by the disease. Over 80% of these cases had arisen in the South Wales coalfield. The social consequences of the disease in South Wales have been reviewed by Hugh-Jones and Fletcher (1950). The cost of the disease in terms of compensation has been enormous and in terms of human suffering immeasurable.

The disease is one that has been shown to be due to the inhalation of coal dust (Hart and Aslett, 1942) and its ultimate control and prevention will come from dust suppression. Airborne dust concentrations underground must be reduced to levels at which they will not cause pneumoconiosis in men exposed to them throughout a normal working life.

Coal dust in some mines appears to be less dangerous than in others. But since the factors

are really no more than a provisional target for engineers engaged on dust suppression.

Since the complete suppression of all airborne dust in the mines is impracticable and safe levels of dustiness are not yet known, we believe that the introduction of a system of periodic medical examination of coal miners would be the procedure which would most quickly and economically lead to the prevention of pneumoconiosis.

All coal miners in France and in New South Wales are given a periodic medical examination, and this system is being introduced into the coal mines of South Africa and Belgium. Since the value of such an examination has recently been questioned by Meiklejohn (1950) we review the advantages it could bring in British coal mines.

The Objects of Periodic Examination

A system of periodic examinations would have three main advantages.

First, it would provide an immediate protection to the men in the interval before safe dust levels are defined and effective dust suppression achieved. This would be possible because symptoms and

R2P (Research to Practice)



- Waarom onderzoek doen?
- Één onderzoek maakt geen zomer
- Systematische Reviews essentieel
 - 1. gebruik onderzoek in praktijk:
 - evidence-based medicine
 - 2. gebruik onderzoek in beleid:
 - evidence-based policy



R2P (Research to practice)

- Onderzoek moet laten zien dat
 - huidige praktijk/beleid werkt en dient voortgezet
 - huidige praktijk/beleid werkt niet en dient gestopt/vervangen
- Sterke meningen over beleid/praktijk....
 - preventie (altijd beter dan voorkomen)
 - sociale zekerheid (goedkoper is beter)
 - gezond eten (vet is slecht)
- Goed onderzoek nodig
 - om beleid te veranderen
 - om sterke meningen te veranderen



Voorbeelden van Cochrane OSH Reviews:

Naalden, Rugpijn, Lawaai



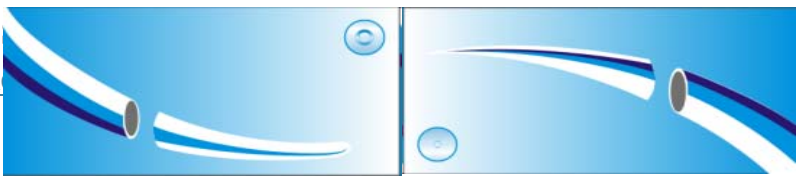
Stompe naalden om prikaccidenten te voorkomen

Am J Surg. 1996 Nov;172(5):512-6

Influence of blunt needles on surgical glove perforation and

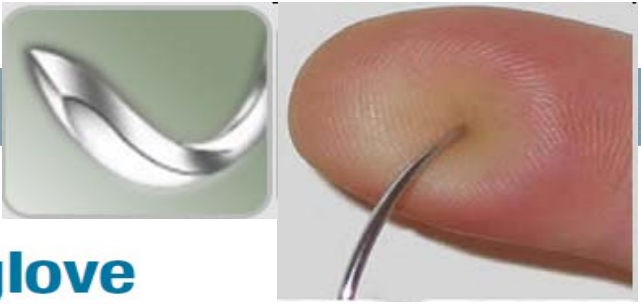
Mingoli A, Sapienza P, Sgarzini G, Luciani G, De Angelis G, Modini C, Ciccarone

1st Department of Surgery, La Sapienza University, Rome, Italy.



CONCLUSION: The risk of glove perforation is sevenfold greater if sharp needles are used. Blunt needles reduce sharp injuries and improve safety for surgeons.

RESEARCH



OBSTETRICS

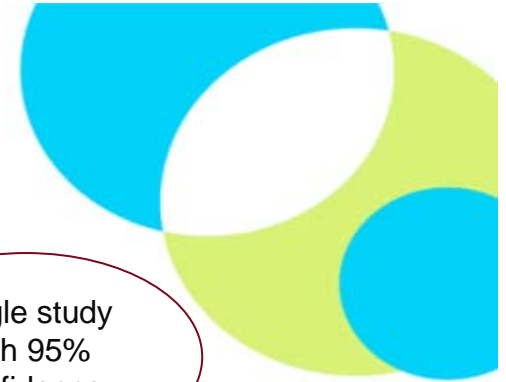
The use of blunt needles does not reduce glove perforations during obstetrical laceration repair

Lisa K. Wilson, MD; Scott Sullivan, MD, MSCR; William Goodnight, MD; Eugene Y. Chang, MD; David Soper, MD 2008

OBJECTIVE: The objective of the study was to compare the rate of glove perforation for blunt and sharp needles used during obstetrical laceration repair. A secondary aim was to assess physician satisfaction with blunt needles.

ence between groups in patient demographics, clinical variables, severity of laceration, or experience level of the surgeon. There was no difference in the glove perforation rate between blunt and sharp needles (risk ratio, 0.70; 95% confidence interval, 0.0-0.05). There was

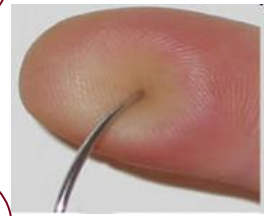
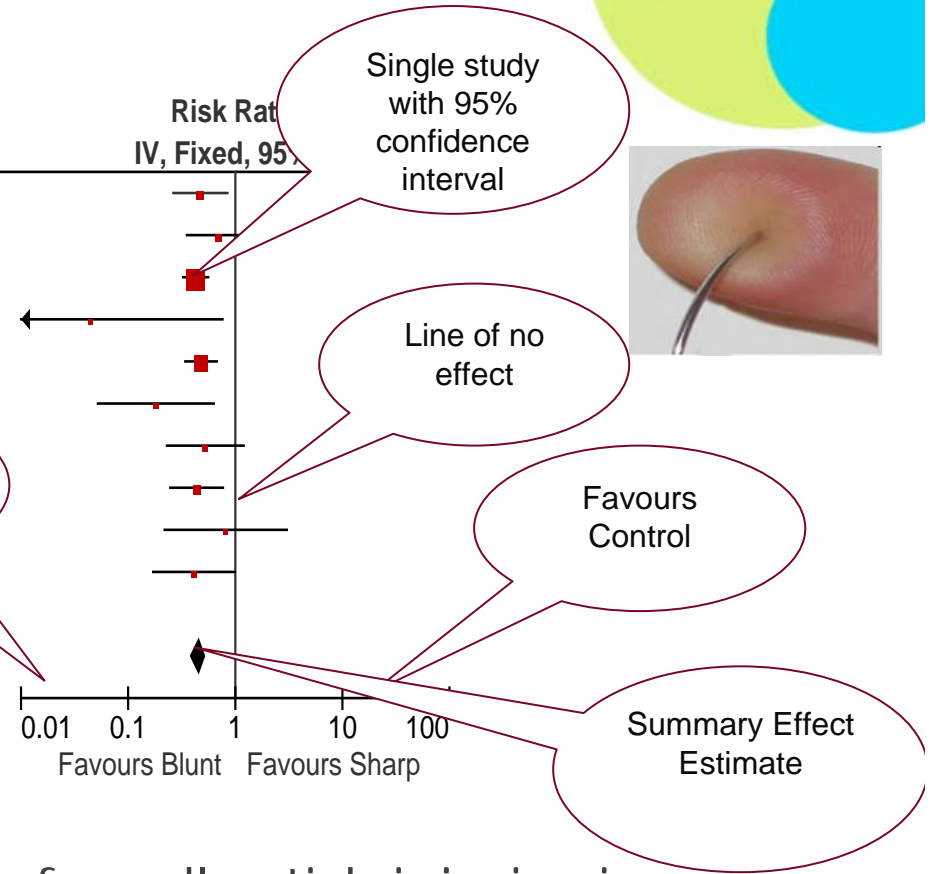




Stompe naalden om prikaccidenten te voorkomen

Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio	
				IV, Fixed, 95% CI	Year
Wright 1993	-0.7472144	0.296334	8.6%	0.47 [0.27, 0.85]	1993
Thomas 1995	-0.35667494	0.348466	6.2%	0.70 [0.35, 1.39]	1995
Meyer 1996	-0.85131877	0.138984	39.2%	0.43 [0.33, 0.56]	1996
Rice 1996	-3.11351531	1.449138	0.4%	0.04 [0.00, 0.76]	1996
Mingoli 1996	-0.73315252	0.173816	25.1%	0.48 [0.34, 0.68]	1996
Hartley 1996	-1.70552479	0.636209	1.9%	0.18 [0.04, 0.81]	1996
Ablett 1998	-0.64435702	0.421637	4.3%	0.53 [0.21, 1.31]	1998
Nordkam 2005	-0.8303483	0.290628	9.0%	0.45 [0.25, 0.80]	2005
Wilson 2008	-0.2048782	0.67082	1.7%	0.82 [0.25, 2.67]	2008
Sullivan 2009	-0.8873032	0.449089	3.8%	0.41 [0.17, 0.99]	2009
Total (95% CI)			100.0%	0.46 [0.38, 0.54]	

Heterogeneity: Chi² = 7.45, df = 9 (P = 0.59); I² = 0%
 Test for overall effect: Z = 9.03 (P < 0.00001)



- Blunt needles effectively reduce the risk of needle stick injuries in surgeons with 54%

Parantainen 2011



Hoe R2P?

- In veel ziekenhuizen geen stompe naalden aanwezig
- Dokters moeilijke doelgroep
- FDA / NIOSH /CDC aanbeveling 2012:
 - gebruik stompe naalden gebaseerd op Cochrane Review

[Home](#)[Contact](#)[Ergonomie](#)[Team](#)

Categorieen

[Ergonomie Bouw](#)[Ergonomie Dentaal](#)[Ergonomie Kantoor](#)[Ergonomie](#)[Kinderopvang](#)[Ergonomie Logistiek](#)[Ergonomie Overheid](#)[Ergonomie Productie](#)[Ergonomie Zorg](#)

Tiltraining

R-Go Solutions helpt u in het voorkomen of verminderen van lichamelijke klachten door het werk, zoals RSI of rugklachten..

Tiltraining

Werkt u in de bouw, productie, logistiek of in de zorg? Dan weet u dat fysieke arbeid gezondheidsrisico's met zich meebrengt. Zwaar tillen, lang staan of het werken in een verkeerde houding kan overbelasting veroorzaken in het lichaam. En werk gerelateerde klachten leiden vaak tot beperkingen in werk en prive. Daarom is het belangrijk om preventief te werk te gaan. Gezonde medewerkers maken immers een gezond bedrijf. R-Go Solutions kan uw organisatie ondersteunen en verzorgt o.a. 'Gezond werken' workshops. Tijdens de workshop 'Gezond werken' krijgen medewerkers handvatten om op een gezonde manier fysiek zwaar werk te kunnen doen. Deze in-company workshop kan op uw bedrijfssituatie worden afgestemd door een voortraject van observaties en gesprekken op de vloer. Het doel van de workshop is dat er bewustwording ontstaat over uw eigen rol in het voorkomen van klachten. Daarbij is het belangrijk om te leren van collega's. De workshop duurt in totaal ongeveer 2,5 uur en bestaat uit een deel theorie en een deel praktijk. Onderwerpen die naar voren komen tijdens de workshop: - Wanneer wordt werken ongezond? - Wat is fysieke belasting en welke vormen zijn er binnen de organisatie? - Hoe kun je deze belasting verminderen en zelf klachten voorkomen? - Tips voor gezond werken (zoals tilinstructies) - Praktijkopdracht



R-Go solutions kan al vanaf €570 voor u een in-company tiltraining geven.

Naam:

Bedrijfsnaam:

Telefoonnummer:

Email:

Onderwerp:



Training 'correct' tillen om rugpijn te voorkomen

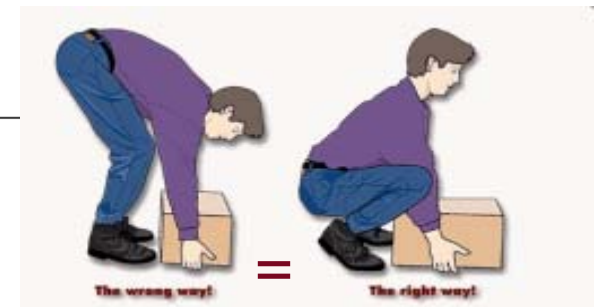
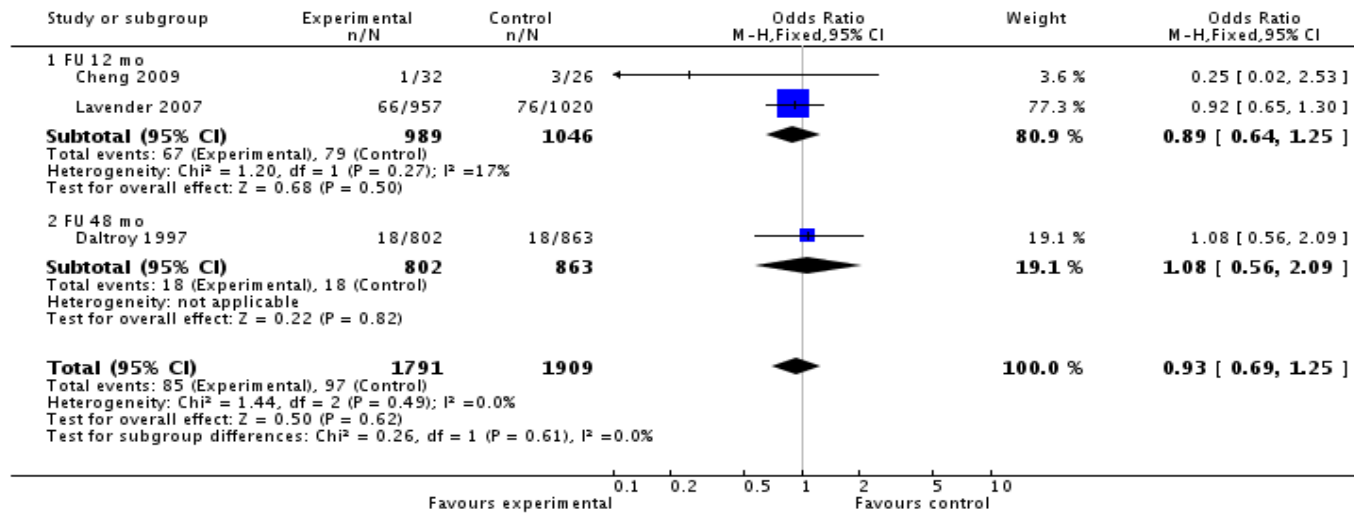
- Training 'correct' tillen wordt veel aangeboden
 - niet goed onderbouwd; niet biomechanisch en niet pedagogisch
- Cochrane Review Martimo / Verbeek:
Does training healthy workers in 'correct' lifting techniques prevent back pain?
- 9 RCTS (N=20,101) en 9 Cohort studies (N=1280)





Training in correct tillen om rugpijn te voorkomen

Review: Manual material handling advice and assistive devices for preventing and treating back pain in workers
 Comparison: 2 MMH advice versus minor advice only (RCTs)
 Outcome: 1 Back Pain



Conclusie:

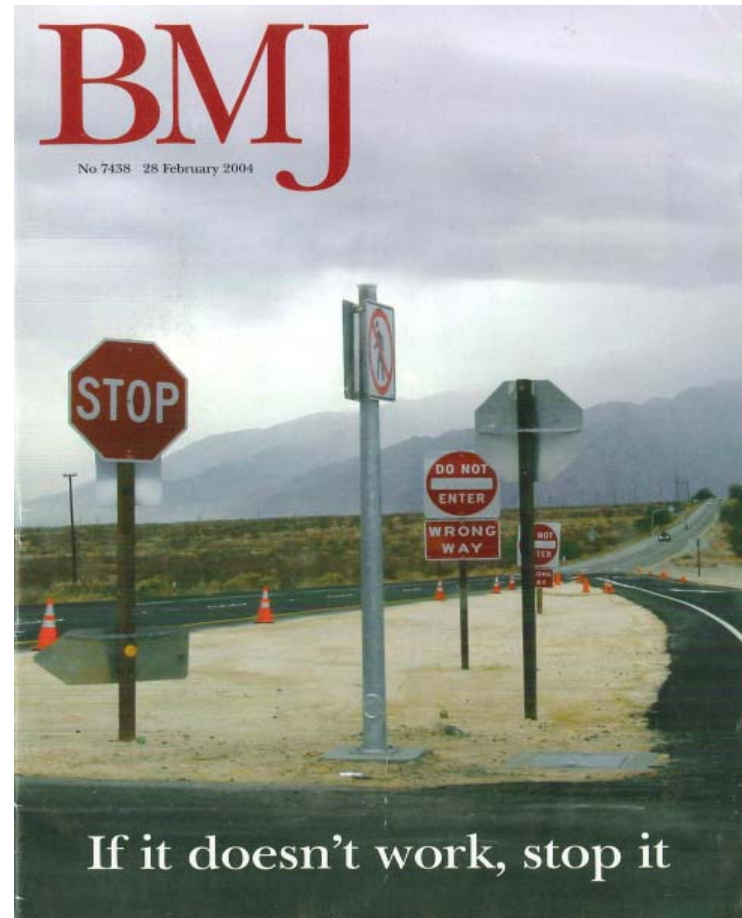
- Training in tiltechniek voorkomt rugpijn niet

Martimo 2006, Verbeek 2011



Wat te doen?

- Stop tilcursussen
- Wijzig EU richtlijn
- Verander de last
- Moeilijk omdat..
 - commerciële belangen
 - besluitvorming arboregels

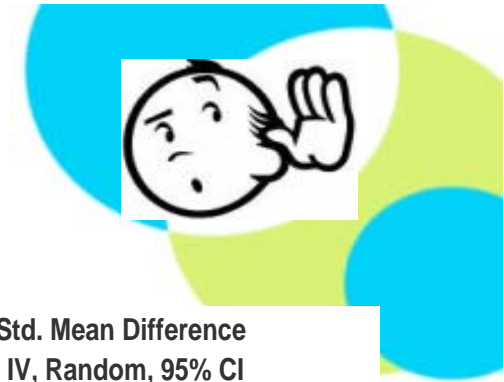




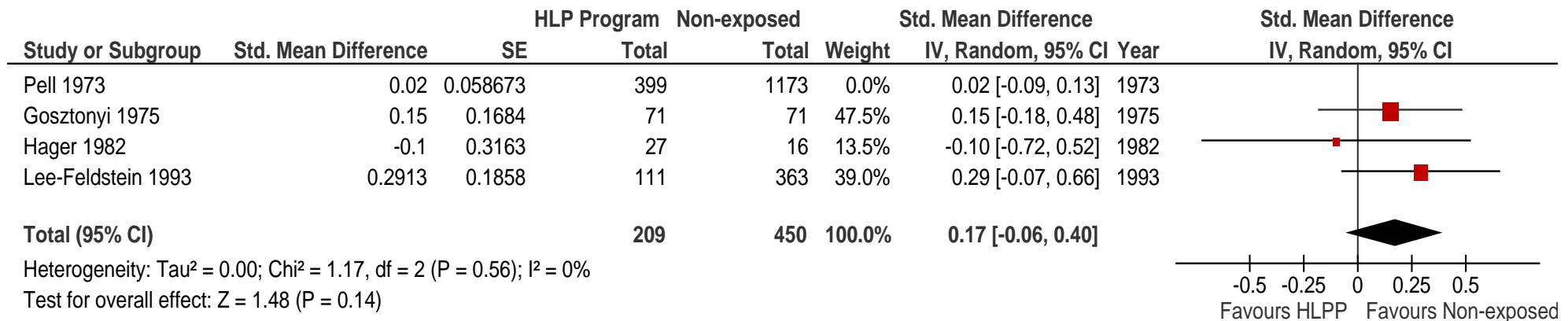
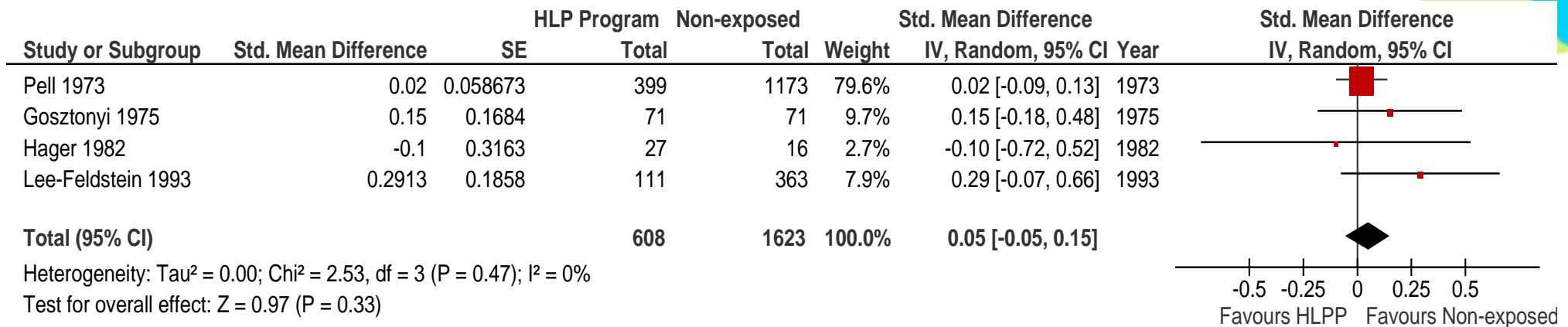
Interventions om lawaaidoofheid te voorkomen

- Lawaaidoofheid nog steeds in top-3 beroepsziekten
- Cochrane Review Verbeek
 - Effectiviteit van interventies om gehoorverlies door lawaai te voorkomen
 - Is een gehoorbeschermingsprogramma even effectief als niet blootstaan aan lawaai?
 - Wat is het effect van instructie op de bescherming met oordoppen?





Hearing loss 5 y follow-up



Conclusion:

hearing loss prevention programmes are not effective enough

Proposed OSHA approach



- "There is sufficient evidence that hearing protection alone cannot prevent workers from suffering preventable hearing loss," said Michaels assistant US Secretary of Labor for Occupational Safety and Health (Oct 2010)
- The popular assumption has been that hearing protection devices, audiometric testing, and training requirements would be sufficient to prevent hearing loss. They are often inadequate and poorly administered.
- OSHA wants to enforce the noise standard's requirements for controls above the 90 dB(A) permissible exposure level

Spark Plugs [soft] 7812

EN352-2:2002



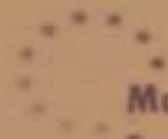
1.



2.



3.



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Engineered in Germany



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Fin-00250 Helsinki



4 019444 006659

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Effect van instructie bij oordoppen



- 1 RCT
- Parks 1991 at NIOSH
 - Stapsgewijze instructie versus gebruiksaanwijzing producent
 - 40 werknemers, 3 weken follow-up, gehoordrempel met en zonder bescherming
 - **Instructies vergrootten de bescherming gemiddeld met 10 dB (wat ongeveer de helft van het maximum is)**
- Waarom is er geen wetgeving die instructie verplicht stelt?



HOE R2P TE VERBETEREN?



Resultaten Reviews beter implementeren

- Implications for practice and research
- Plain language summaries
- Summary of findings table
- Policy briefs
- Time window



R2P: Evidence-based medicine

- Verzekeringsgeneeskundigen positief over gebruik evidence
- Onderzoek Rob Kok
 - niet alleen attitude positief
 - willen/kunnen EBM ook leren
 - na cursus beter/meer gebruik in de praktijk
 - voortzetting in helpdeskproject
- Gebruik evidence in richtlijnen



R2P > R4P Onderzoekers

- Prikkels universiteit
 - Nature april 2012: perverse incentives in science
 - Taleb: op de universiteit daar leren ze vogels vliegen
 - Meer nadruk op inhoud
 - gebruik in praktijkrichtlijnen
 - gebruik in beleid
 - Beter gebruik bestaande kennis
 - introductie, discussie artikel
 - betere kwaliteit systematische reviews
 - Betere aanbieder van bestaande kennis
 - Perosh OSH evidence database: www.perosh.eu

OSH

European research institutes
strengthening European
occupational safety and health

The partnership for European Research in Occupational Safety and Health (PEROSH)



PEROSH coordinates and cooperates on European research and development in occupational safety and health. It is a high-level research network aiming at improving the quality and dissemination of working life research via joint collaboration on priority topics, sharing of knowledge and resources and a proactive dialogue with the EU, national and international partners. The network comprises 11 Occupational Safety and Health (OSH) institutes, all playing key roles in their national affiliations to governments/authorities and health and accident insurance systems.



necessary in the long run to ensure a healthy
working life for Europe's workforce, and to secure

Workplaces of the Challenges for Health

PEROSH members
safety and health topics
and in, and what they
face challenges in the
of OSH. A second
future research
that will be

OSH Evidence - Systematic Review Clearinghouse on Occupational Safety and Health

The Clearinghouse of Systematic Reviews aims at
bringing together the results of systematic reviews
that have been conducted in the field of
occupational health and safety. We go beyond
systematic reviews of intervention studies and also
include systematic reviews of etiological studies,
prognostic, diagnostic and prevalence studies.

[Read More...](#)

News

- Job vacancy for a Coordinator for P (23-10-2012)
- Call for papers: In Research Conference on allergies (24-07-2012)
- Newsletter N°8 - (14-06-2012)
- International work between research Reviews to Inform (11-06-2012)
- Conference "World Active Ageing at V Helsinki (10-04-2012)
- New paper: Sustainable future - European occupational safety (20-03-2012)

Database of OSH evidence, systematic review clearinghouse

Here you can find answers to your question by type of question (intervention, etiology etc), type of worker involved, type of intervention or exposure or type of outcome involved. By clicking on the number of reviews you get access to the full references and documentation.

Related Pages

- OSH evidence, systematic clearinghouse methods
- OSH Evidence - Systema Clearinghouse on Occup Safety and Health
- How to contribute to the evidence, systematic review clearinghouse database?

Question	Question Type	Type of workers	Intervention	Exposure	Prognosis	Outcome	Reviews
Does physical work lead to coxarthrititis?	Etiology	Any		Physical work		Osteoarthritis	7 reviews
What factors predict prognosis of sick leave in workers with musculoskeletal disorders?	Prognosis	Musculoskeletal Disorders			Any	Sick Leave	13 reviews
What is the impact of work-related (physical) load on the development of knee osteoarthritis in the workforce?		Working population (after career entry)		work-related (physical) load		Knee osteoarthritis	9 reviews
Which interventions can prevent back pain in workers exposed to biomechanical load	Intervention	Workers between 16 - 80 years of age exposed to biomechanical load	Work- and worker-directed interventions to reduce biomechanical load (excluding return-to-work	Biomechanical load		Incidence, intensity and duration of back pain, frequency of episodes	11 reviews



R2P > R4P Beleidsmakers

- Evidence-based policy
 - evidence-based policy of policy-based evidence?
 - evidence draagt bij aan transparantie van beleid
 - verantwoordelijkheid voor beleid
 - niet bij experts
 - wat zijn relevante beleidsvragen?
 - kan niet politieke waan van de dag zijn



Conclusie

- Goede systematische reviews cruciaal voor R4P
- Betere afstemming nodig..
 - vraag en aanbod
 - onderzoek en praktijk
 - beleid en onderzoek
- KCVG biedt fantastische mogelijkheden



Workshop

- Alles staat of valt met kwaliteit review
- Review cases in kleine groepjes
- Vier cases:
 1. welk onderzoek kan betekenisvol worden samengevat?
 2. te verschillend om samen te vatten
 3. statistische heterogeniteit
 4. levels of evidence
- 10.15 – 11.00 Aan de slag
- 11.00 – 11.30 Pauze
- 11.30 – 12.00 uur Nabespreking / Samenvatting



Nabespreking



Oefening 1

1. Ear muffs vs plugs for preventing hearing loss (STS) in construction workers
2. Legislation versus no legislation for reducing noise exposure (dB) in mines
3. Worker training in ear plug use vs no training for reducing noise exposure (dB) in metal sheet workers
4. Subsidies for employers vs no subsidies for reducing noise exposure (dB) in offshore oil platforms
5. Stronger ear plugs vs lighter ear plugs for preventing hearing loss (STS) in farmers
6. Magnesium vs placebo for preventing hearing loss (STS) in noise-exposed workers
7. Inspections and penalties for preventing noise exposure (dB) in construction industry
8. Occupational health advice to decrease noise exposure (dB) in small companies



Oefening 1

1. *Hearing Protection for workers*

- Ear muffs vs plugs for preventing hearing loss (STS) in construction
- Stronger ear plugs vs lighter ear plugs for preventing hearing loss (STS) in farmers
- Worker training in ear plug use vs no training for reducing noise exposure (dB) in metal sheet workers

2. *Incentives for employers/firms*

- Legislation versus no legislation for reducing noise exposure (dB) in mines
- Subsidies for employers vs no subsidies for noise exposure (dB) in offshore oil platforms
- Inspections and penalties for noise exposure (dB) in construction
- OSH advice to decrease noise exposure (dB) in small companies

3. *Drugs to prevent hearing loss in workers*

- Magnesium vs placebo for preventing hearing loss (STS) in noise-exposed workers

Need for intervention classification

- Preferably classification should...
 - be mechanism based
 - have a practical meaning
 - have consequences in resource use





Criteria for intervention classification

- Outcome
 - that the intervention aims to reduce
 - exposure, worker behaviour, occupational disease, disability, injury
- Mode of action
 - environmental, behavioural, clinical
- Level or point of action
 - individual, group, societal level (legal)
- Complexity
 - simple, multi-component, multi-actor
- Target Group
 - workers, students, specific occupations
- Place of delivery or setting
 - hospital, primary care, workplace
- Moment of application
 - preventive (without request for help), treatment
- Mode of delivery
 - verbal, written, web-based, media



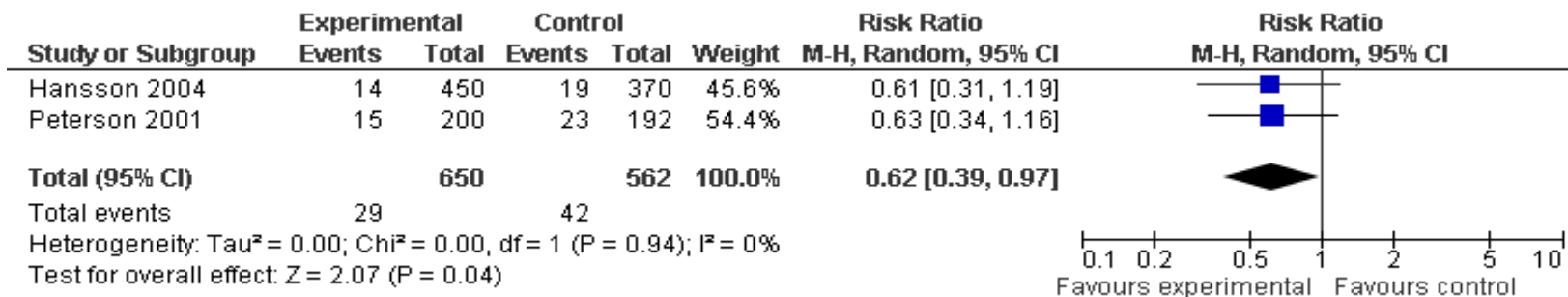
Oefening 2

- Worker training to prevent injuries
- Outcome: Reported Injuries
 - Peterson 2001 found after one year follow-up:
 - intervention: 15 injuries / 450 workers
 - control: 19 injuries / 370 workers
 - RR 0.61 (95% CI 0.3 to 1.2)
 - author's conclusions: non-significant outcome
 - Hansson 2004 found after one year follow-up:
 - intervention: 15 injuries / 402.000 working hours
 - control 23 injuries / 386.000 working hours
 - RR 0.63 (95% CI 0.3 to 1.2)
 - author's conclusions: non-significant outcome
- No quantitative analysis possible we combined studies qualitatively:
 - conclusion: based on two studies with a non-significant outcome we found no evidence of effectiveness



Oefening 2

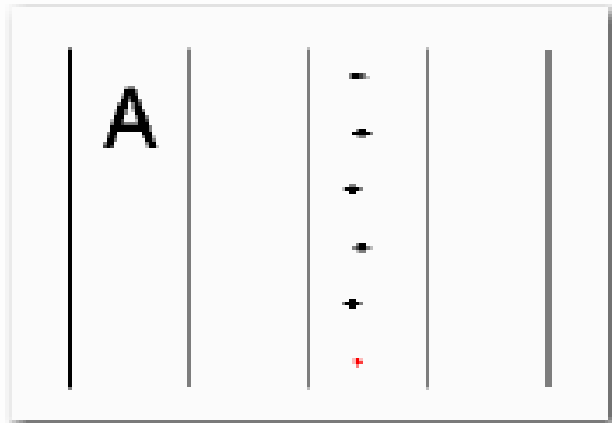
- Recalculate all outcomes on similar scale
 - 2000 working hours = 1 working year (US)
- Combine in meta-analysis



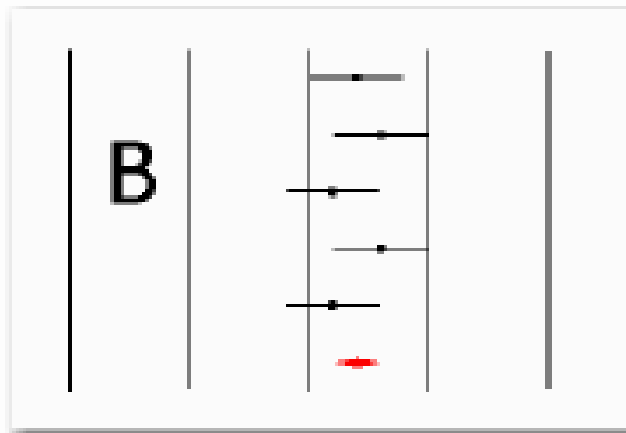
- Review Conclusion:
 - the intervention reduces injuries with 38%



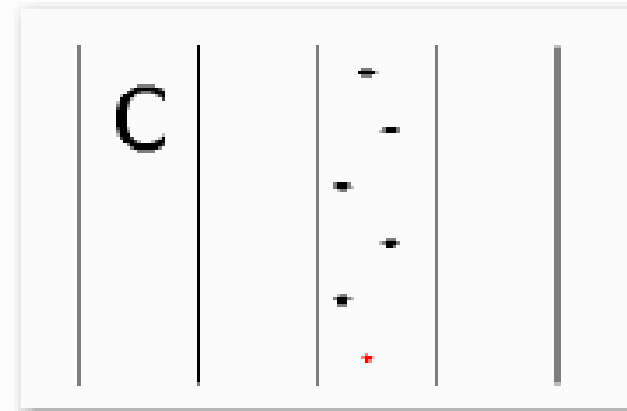
Statistical heterogeneity



Between-studies σ^2 is low
because total σ^2 is low



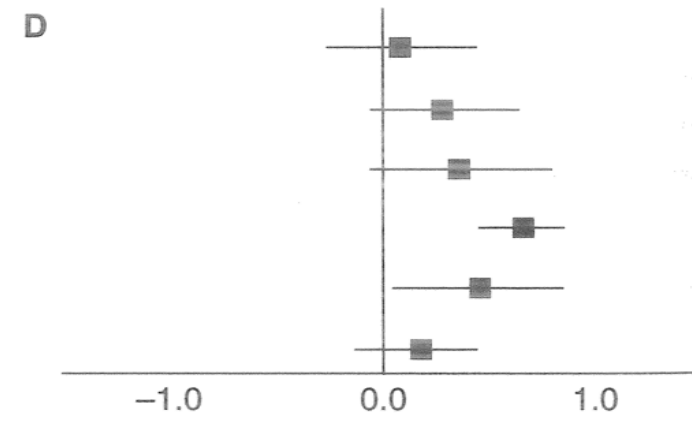
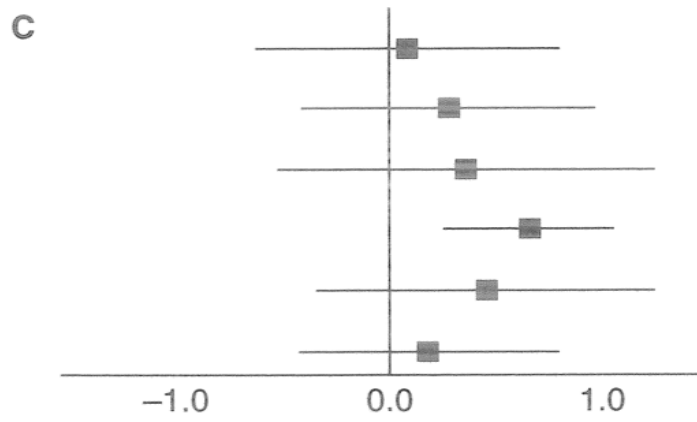
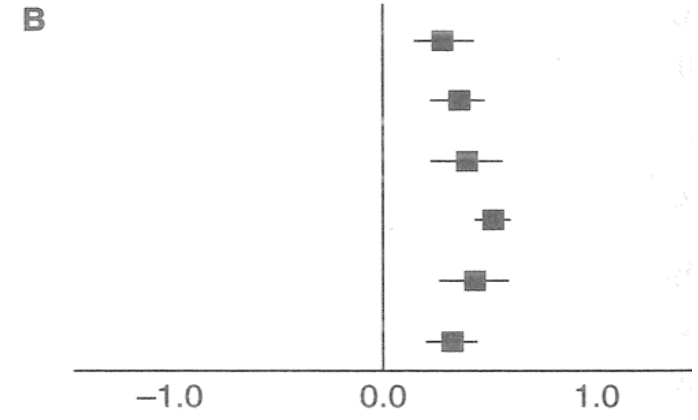
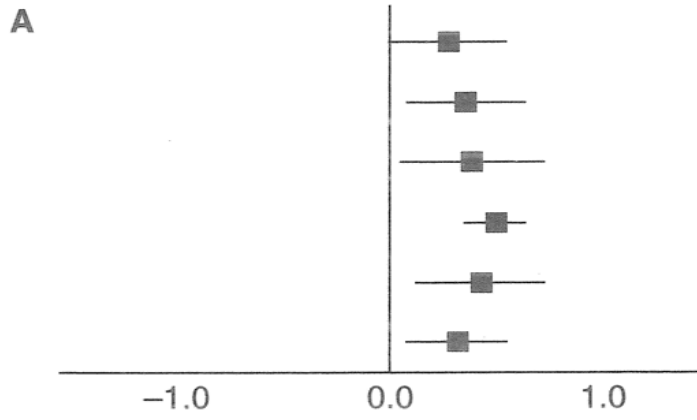
Between-studies σ^2 is low
because within-studies σ^2 is high



Between-studies σ^2 is high
because total σ^2 is high
And within-studies σ^2 is low

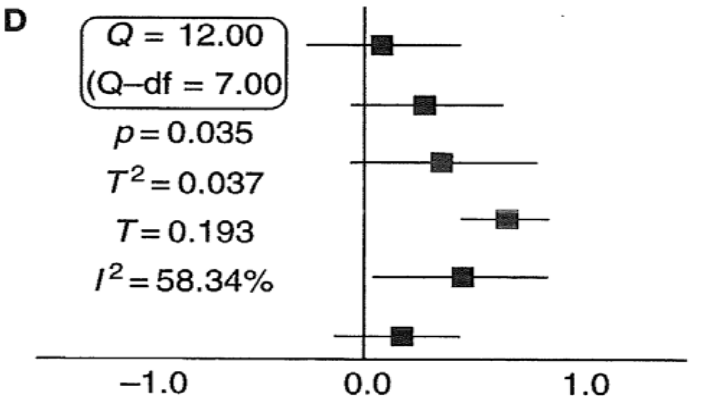
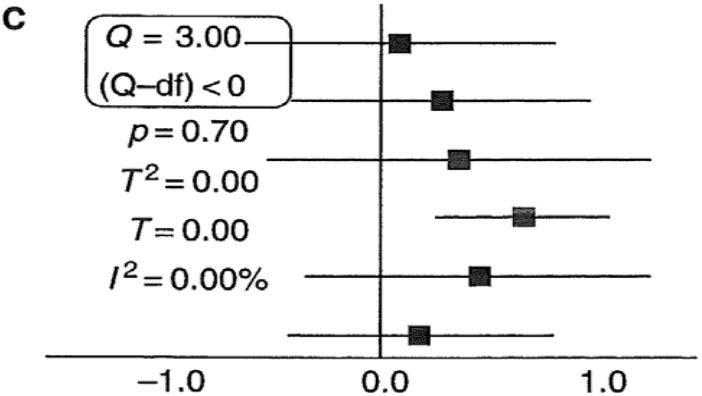
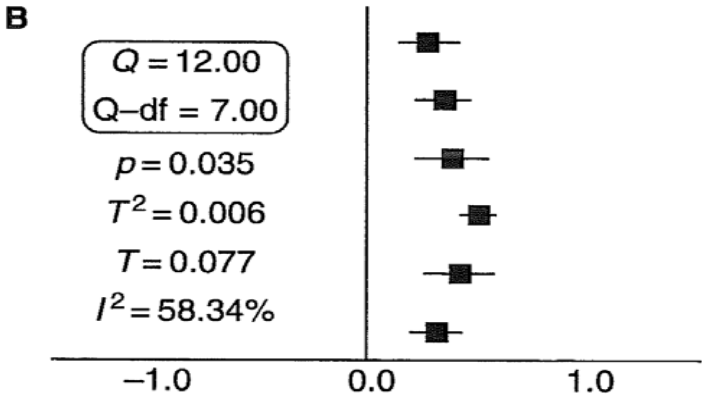
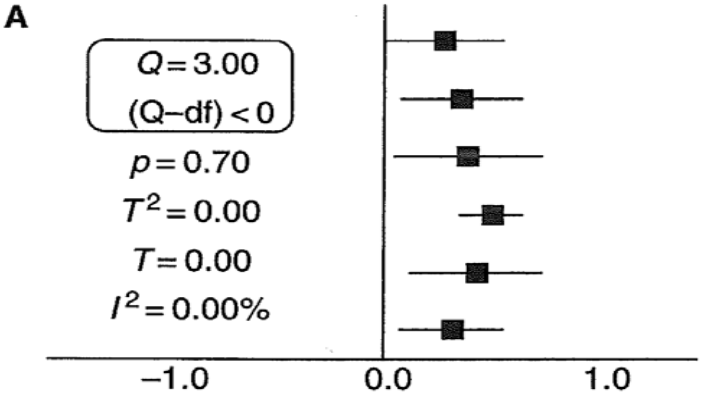


Oefening 3



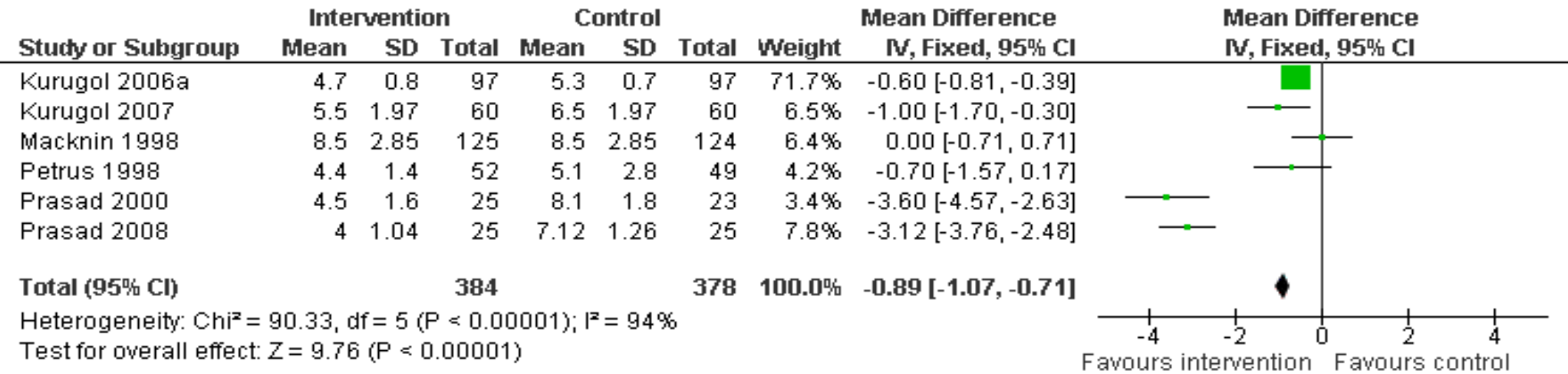


Oefening 3





Zinc for Common Cold





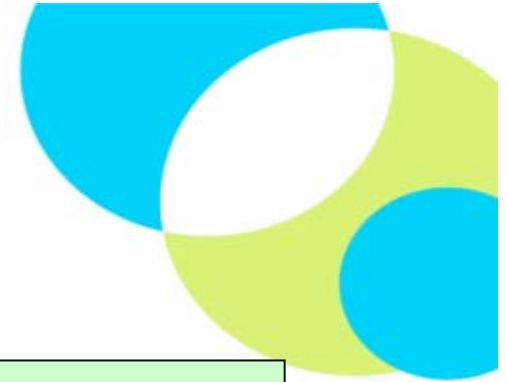
Statistical heterogeneity



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Flowchart

Verbeek, Ruotsalainen, Hoving SJWEH 2012

List of included studies

Check the conceptual similarity of the items 1 to 7 and in that order

- 1. Interventions / Exposure
- 2. Control condition
- 3. Participants
- 4. Study Design
- 5. Outcome
- 6. Follow-up time
- 7. Effect Size (RR, MD)
- Transform ES if necessary

- 1. If a little dissimilar, consider making subgroups
- 2. If quite dissimilar consider narrative synthesis
- 3. If very dissimilar consider describing studies separately
- 4. Always report and pool different study designs separately

Perform Meta-Analysis

Check / Explain Remaining Statistical Heterogeneity



Oefening 4

- Because the studies were too heterogeneous to combine them in a meta-analysis we used a levels of evidence synthesis (best evidence synthesis) to combine them
- **Data synthesis:** The selected studies were very heterogeneous in types of interventions, types of complaints, study population and outcomes measures, and therefore meta-analyses were not performed. Findings were reported narratively.
- **Levels of evidence:** For a more qualitative approach to synthesise the findings from included studies, so-called 'levels of evidence' were used (Ostelo 2002; Van Tulder 1997; Van Tulder 2001).
- Levels of evidence:
 1. Good evidence - provided by generally consistent findings in two or more high-quality studies
 2. Moderate evidence - provided by generally consistent findings in one high-quality study and one or more low-quality studies, or by generally consistent findings in two or more low-quality studies
 3. Limited or conflicting evidence - only one study (either high or low quality), or inconsistent findings in two or more studies
 4. No evidence - no studies. (Henken 2007)
- Are the authors correct?



Oefening 4

- Levels of evidence leiden tot invalide conclusies
 - vooral bij niet-significante resultaten in primaire studies
 - Hartivgsen 2004 review of stress en rugpijn
 - strong evidence of no effect
 - in meta-analyse duidelijk verband stress rugpijn