

No more RCT's?

Validity of research

Rob de Bie

Professor of Physiotherapy Research
Director of education Faculty of Health
Caphri research School
Department of Epidemiology
Maastricht University

CEBP
Maastricht

caphri
Care And Public Health Research Institute

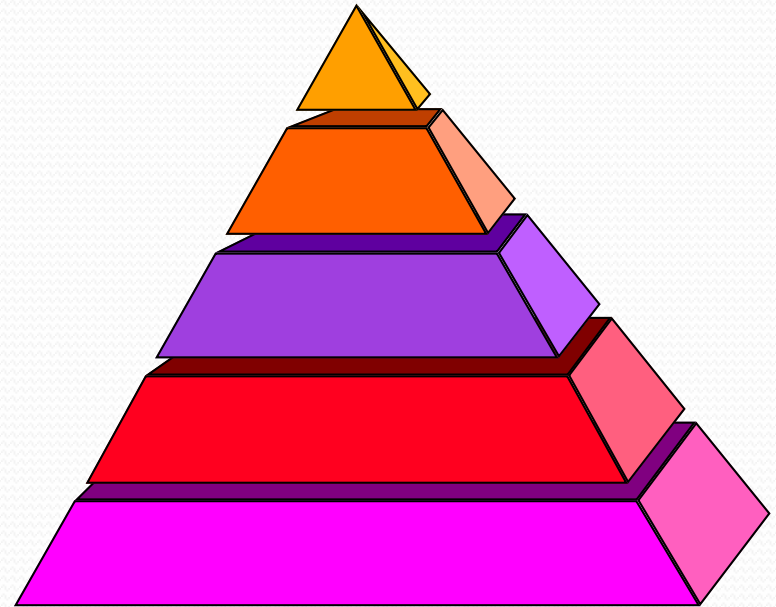
Contents

- Gold standard of research
- Why (bother with) validity?
- We think we measure study quality
- Examples of non-evidence
- A possible solution

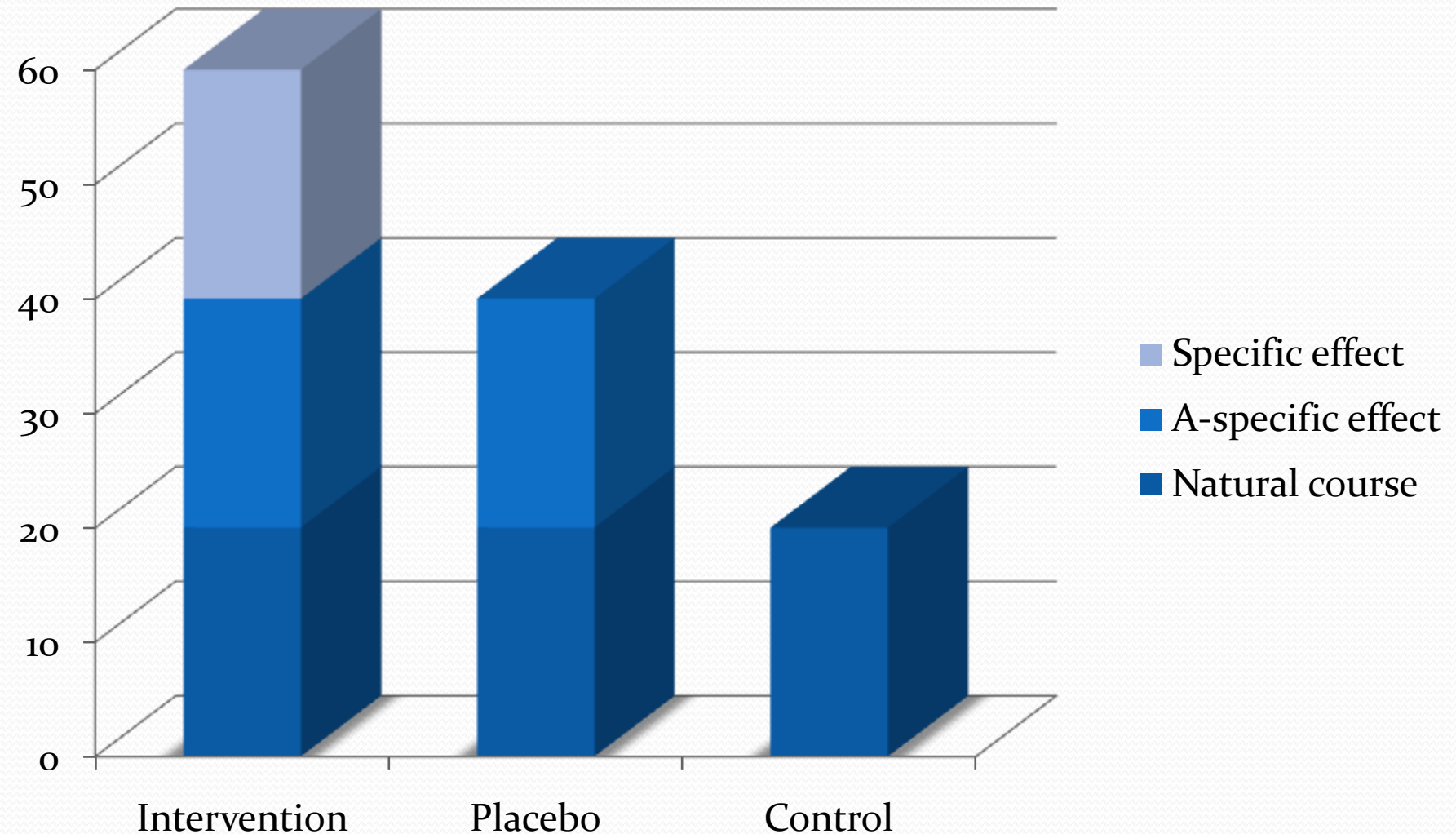


Gold standard?

- Experiment
- Cohort study
- Patient-control study
- Patient series
- Case study



Amount of improvement



Consequences of effect studies

- more negative studies > loss of faith
- loss of faith > loss of competence
- loss of competence > decreased performance
- decreased performance > ineffective treatments
- ineffective treatments > negative studies

What is validity?

- Cook and Campbell (1979) define it as the "best available approximation to the truth or falsity of a given inference, proposition or conclusion".
- Measuring what you want to measure

Why validity?

- Credibility of research and research findings at large
- Has been done what I read?
- Quality of research relevant for:
 - Primary trials
 - Reviews
 - Guidelines

When research credibility is compromised.....



SEOUL, South Korea - South Korean researcher Hwang Woo-suk resigned from his university after the school said he fabricated stem-cell research that had raised hopes of new cures for hard-to-treat diseases. *Dec 2005*

Internal/external validity

- Internal validity – research conclusions are valid for the studied population
- External validity –research conclusions are also valid for other populations (not from the current research sample) - generalisability

Previous experiences with talks about research methodology....



Definition of guidelines

Systematically developed statements which assists clinicians and patients in making decisions about appropriate treatment for specific conditions (Mann, 1996)

History (in reality)

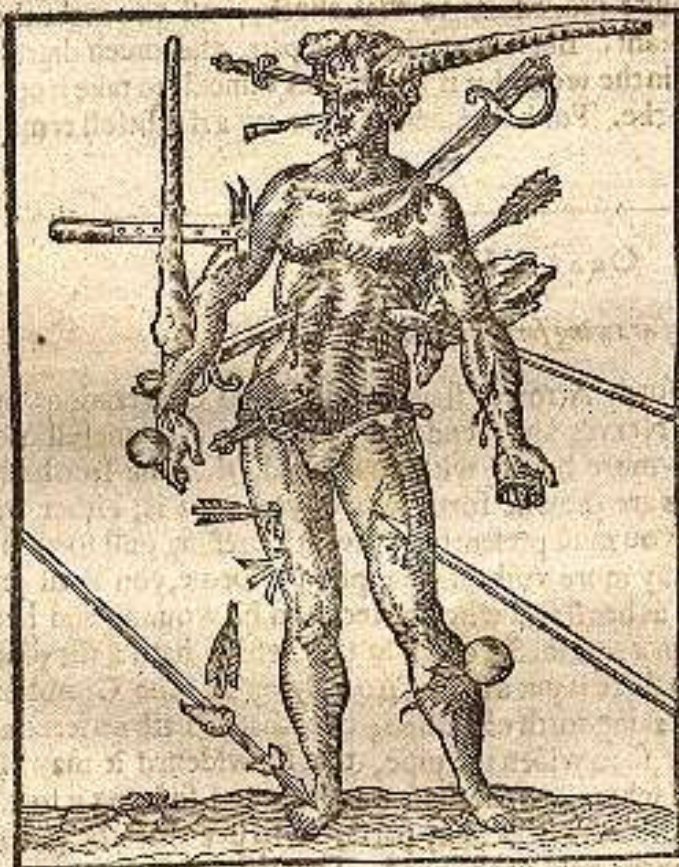
- Formalized statement of daily practice
- Organizational basis
- Describes rather the context than the intervention





Ambroise Paré: treatment on the battlefield

A hooked Instrument fit for to draw forth strange bodies, as peices of Metal, or such other things as it can catch hold of, which may also bee used in wounds made by Gunshot.



But if by chance either
rowes, Darts or Lances
winged head of any other
pon, bee run through
sticking in any part of the
dy, as the Thigh, with
on of the shaft or bally
its peices, or broken of
is fit the Chirurgion
cutting mullets from
the end of the staff
and then with his o
lets plucke forth the
you may see by this figure

More recently, (clinical) guidelines have emerged

- Consensus based
- Expert based
- Evidence based



Consensus based

- Consensus may be largely influenced by group dynamics
- Delphi method does not entirely solve this problem

Consensus = non-sensus

Consensus guidelines are **guidelies**

Expert based

- Might be even worse than consensus
- Expert bias
- Centripetal bias
- Opinion bias
- Prejudice
- External financing

Evidence based

- Guideline recommendations are based on best available evidence
- Deals with specific interventions for specific populations
- Are based on a systematic approach

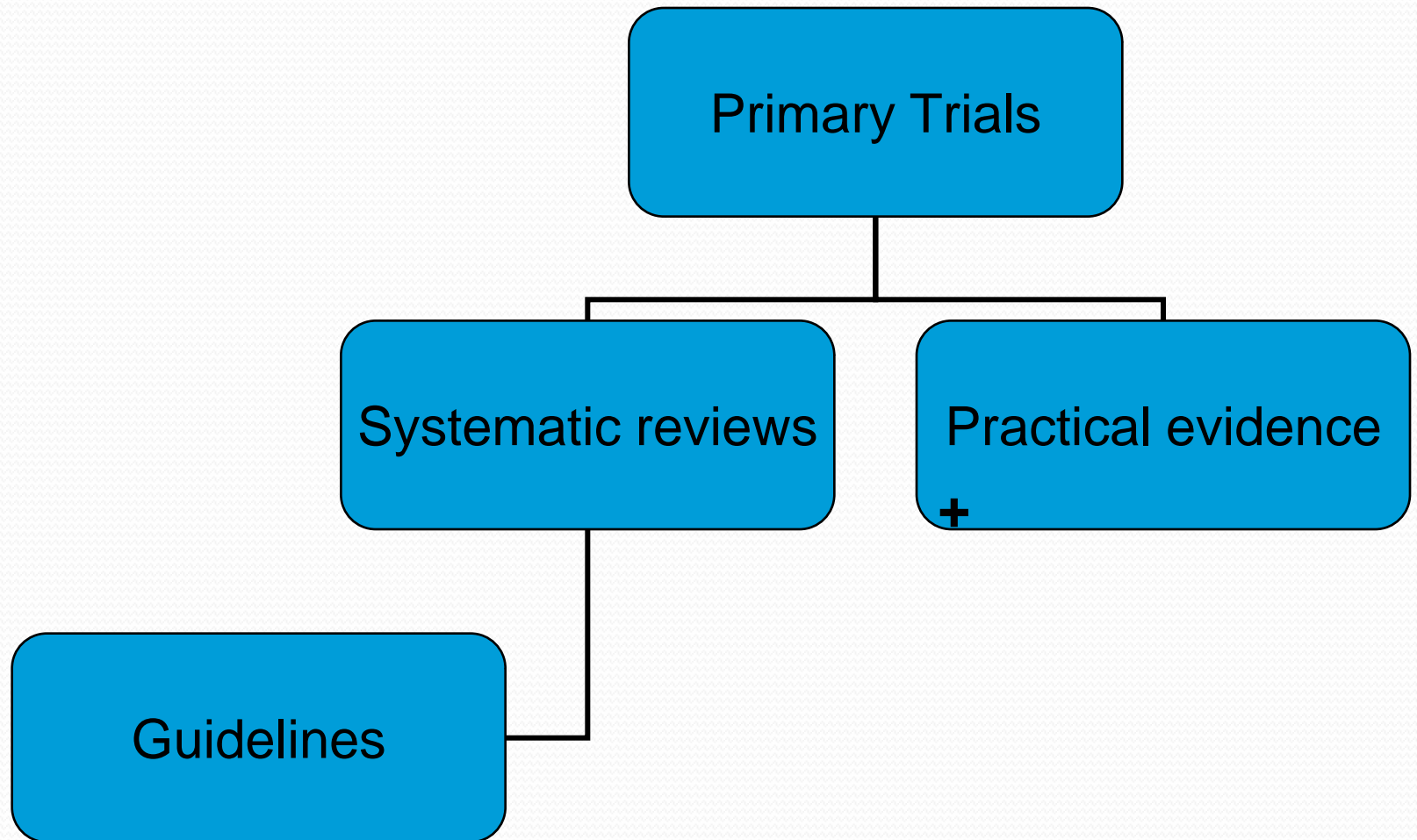
EBP is the VOODOO
of the 3rd millennium



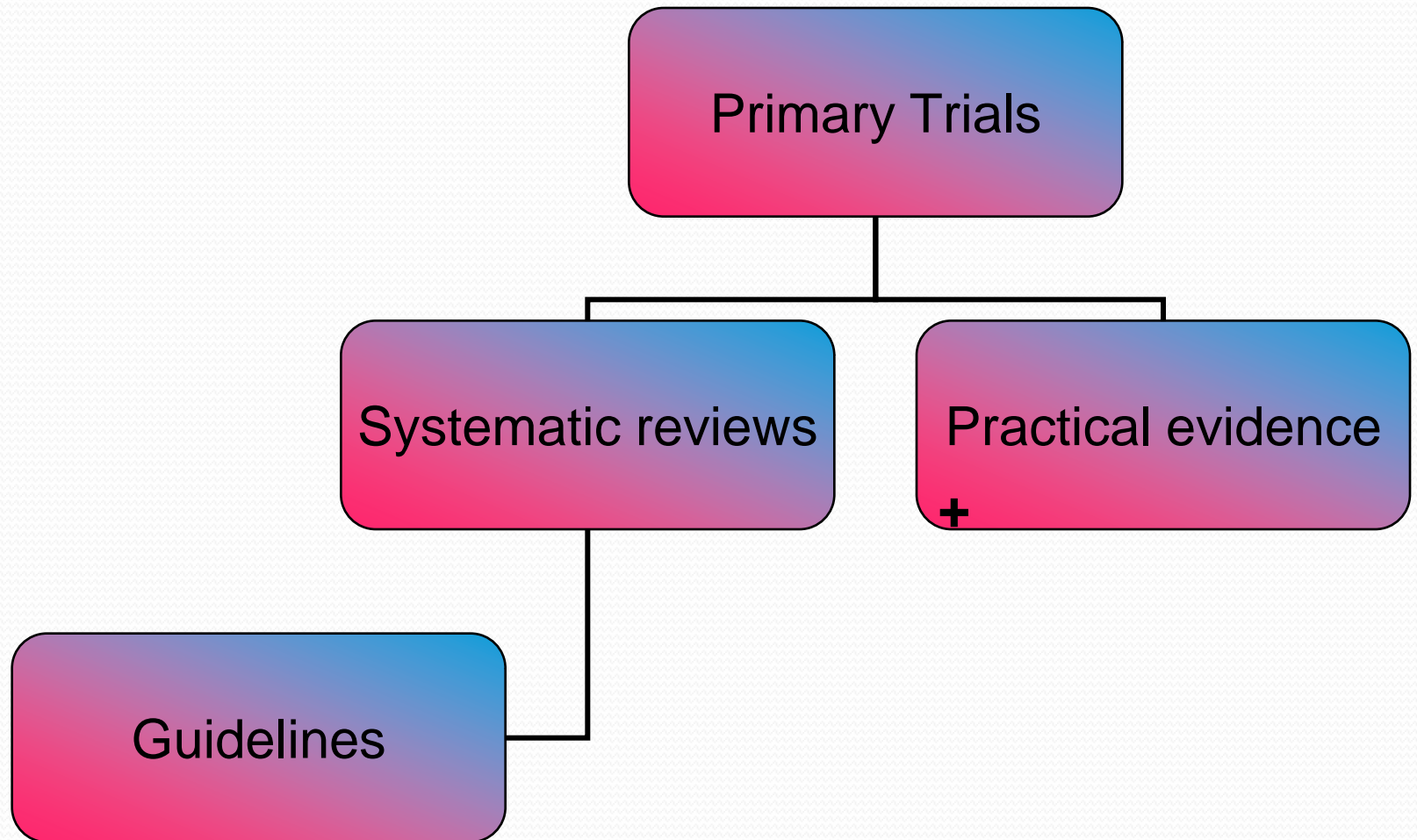
Is the evidence ...

- Good enough
- Transparent
- Credible
- Available
- Applied
- Not 'muddled' by health care insurers

The 'build-up' of evidence



The 'build-up' of non-evidence



Some trials are never done!



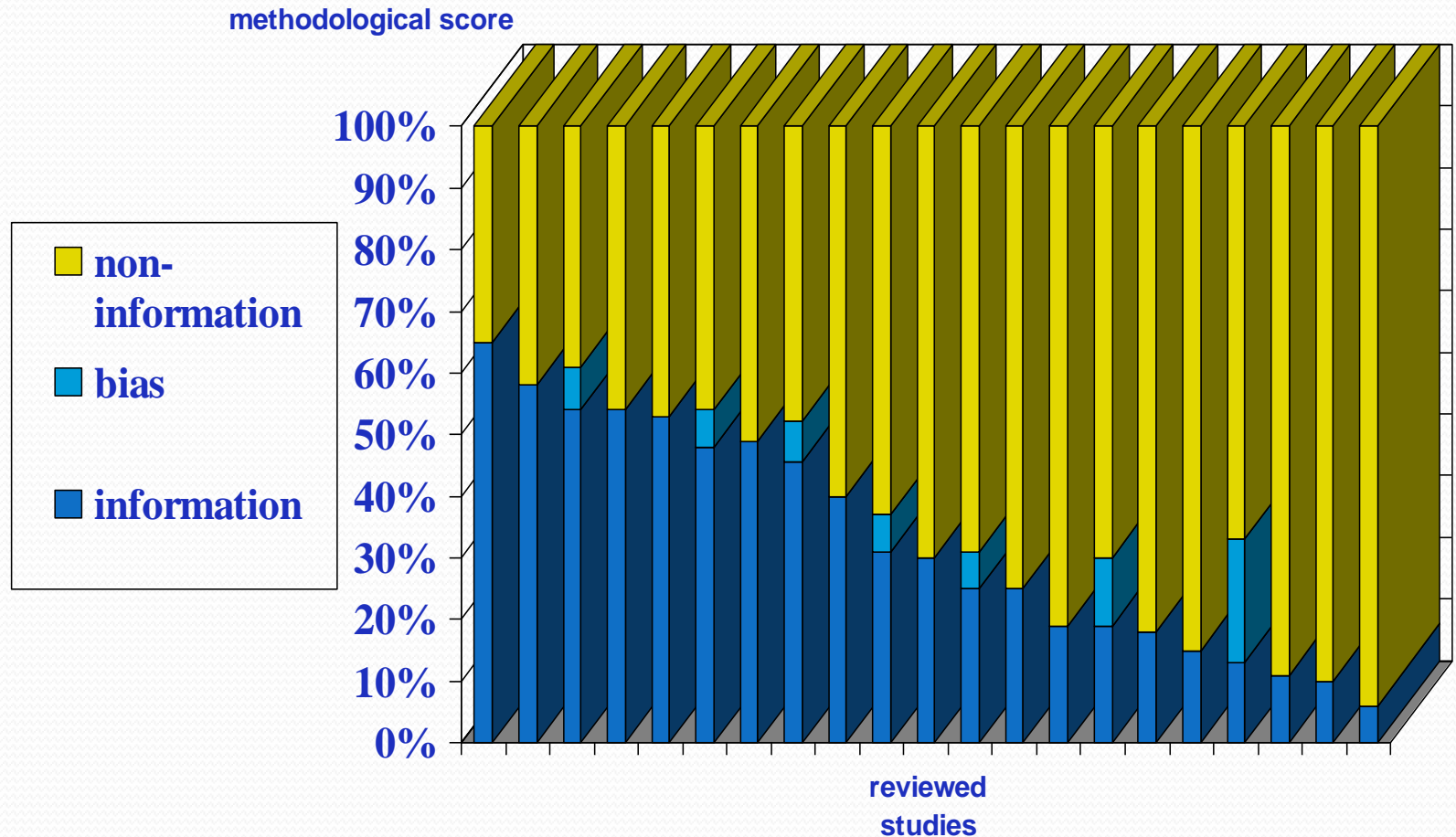
Risks of downhill skiing studied in animal research



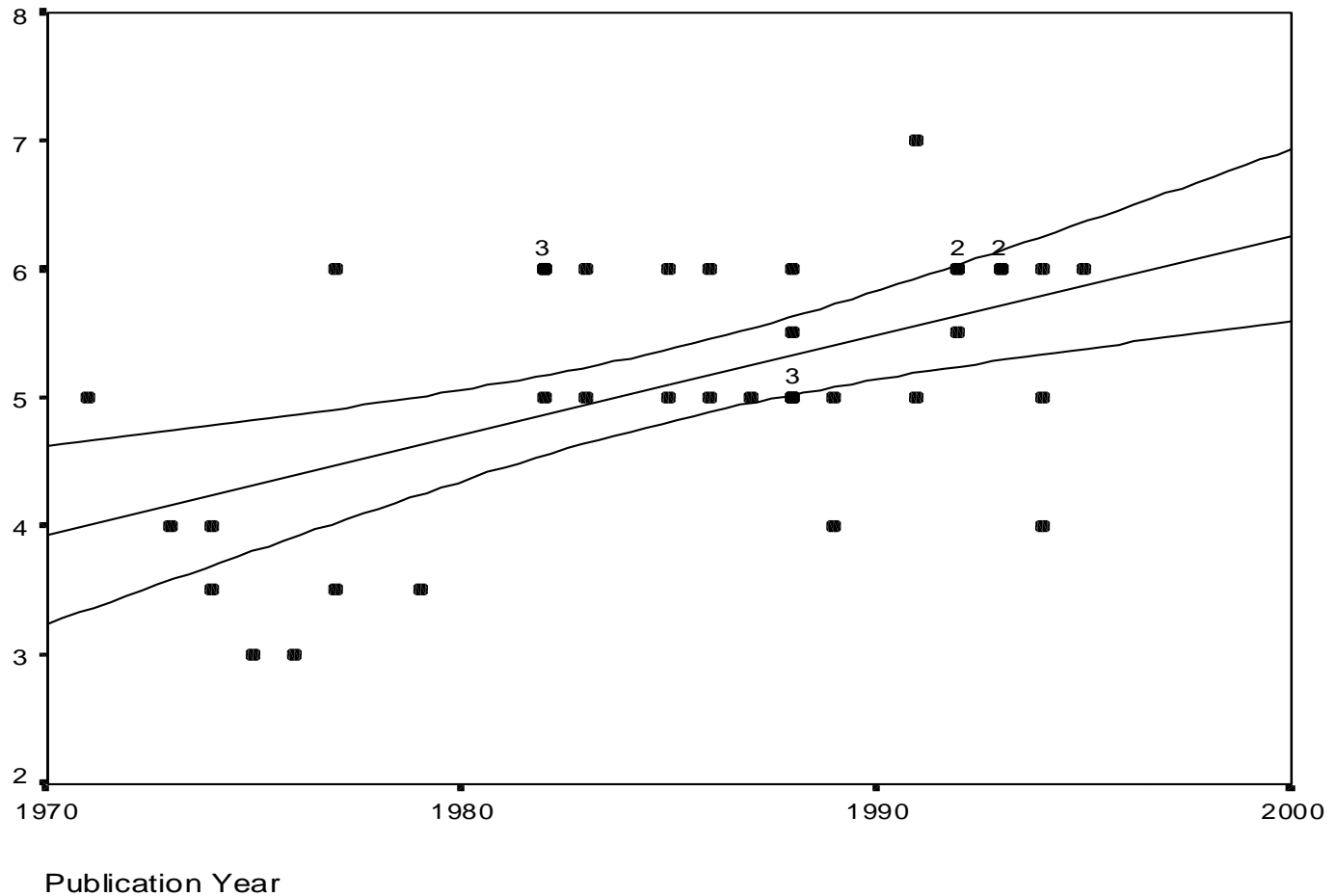
Risks of not wearing a parachute when jumping from an aeroplane

Informativeness:

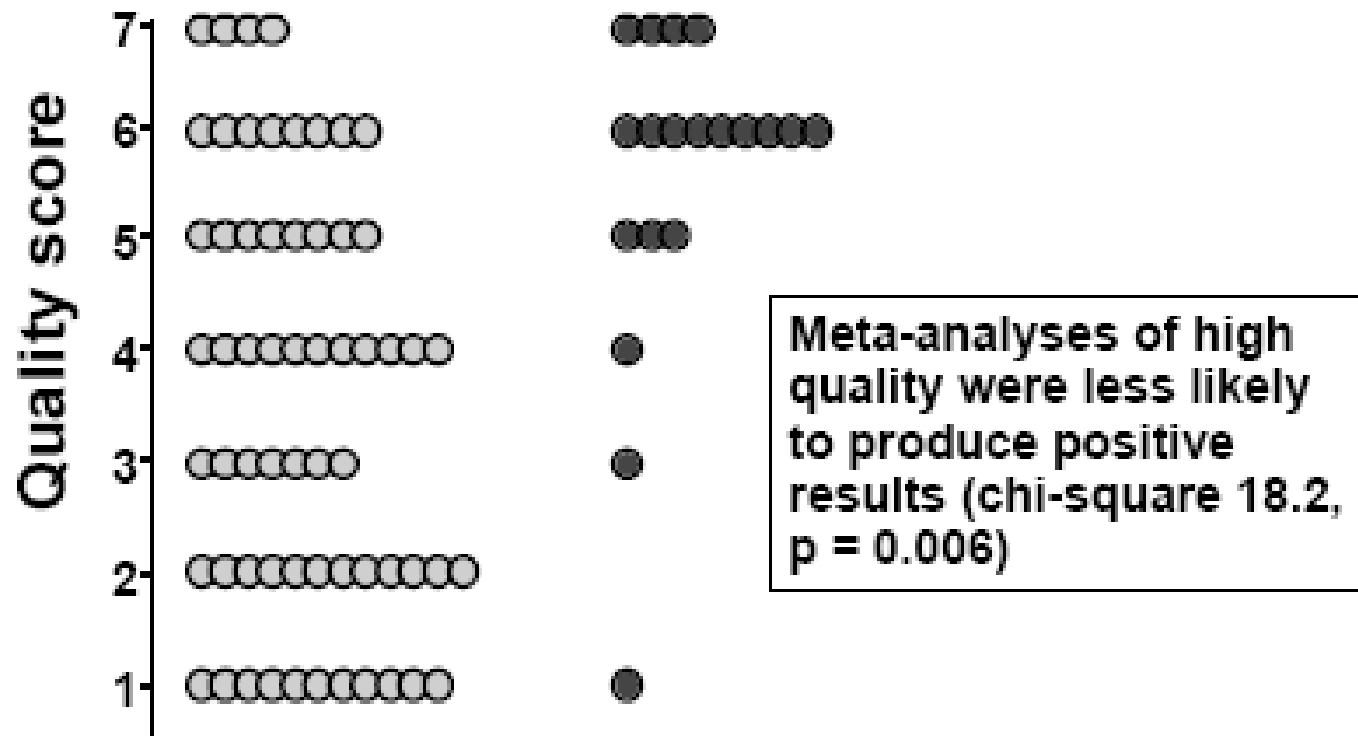
what you read is not what has been done



Quality of a trial versus publication year



Systematic reviews: quality and estimate of efficacy



Yes - works No - doesn't work

Efficacy as stated in original review

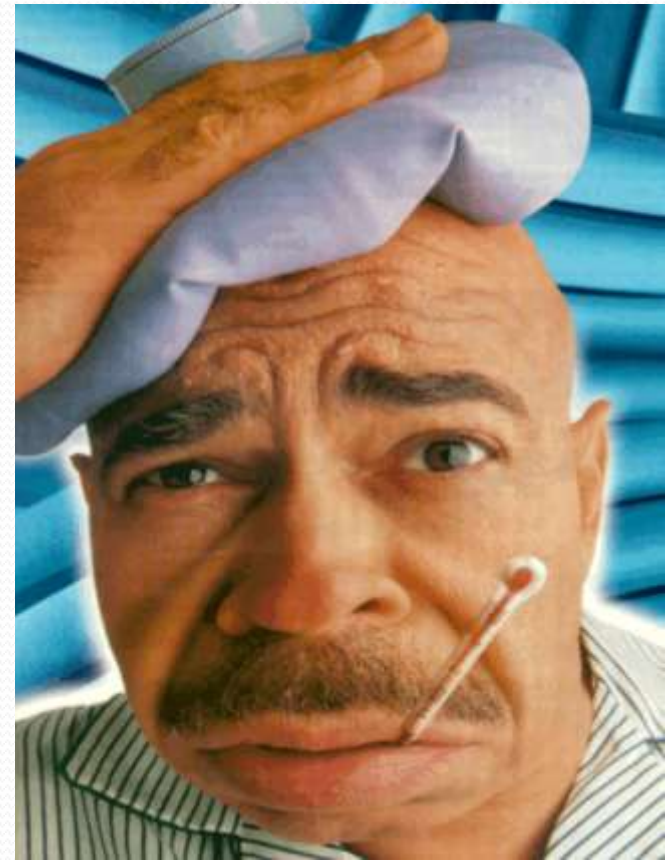
Effect shrinkage (Sutton et al, 2006)

Quality items	ES ratio	95% CI
Sum score > 5	0.62	0.37 – 0.96
Sum score > 4	0.61	0.42 – 1.06

Methodological quality items are associated with bias and a sum score threshold of higher than five is significantly associated with bias.

The better the trial...

- The less likely there will be a result
- selection bias?
- exclusion of co-morbidity?
- ceiling and floor effects?



Theory

What you *think*

Cause
Construct

Effect
Construct

cause-effect construct

operationalize

operationalize

Program

program-outcome relationship

Observations

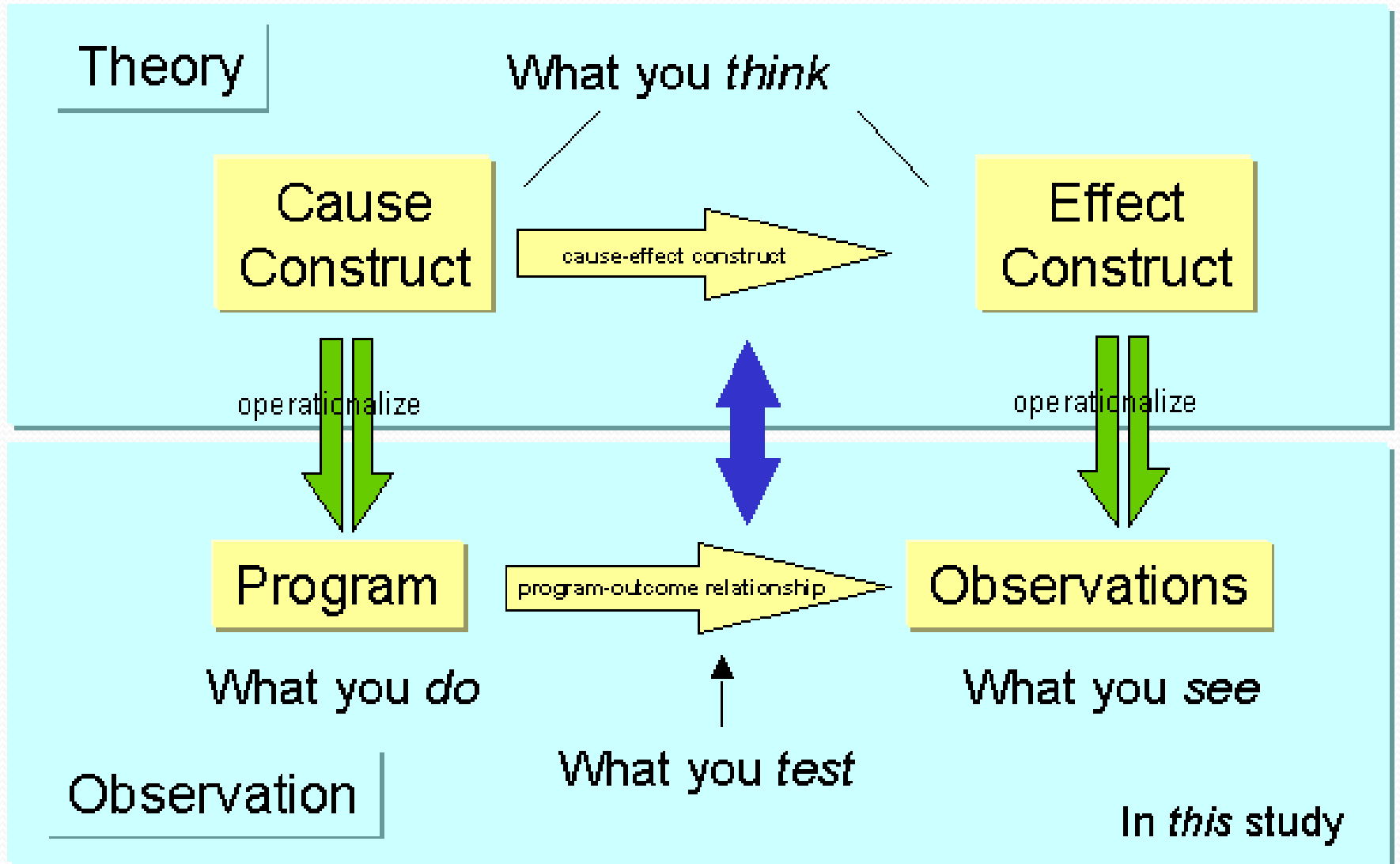
What you do

What you see

Observation

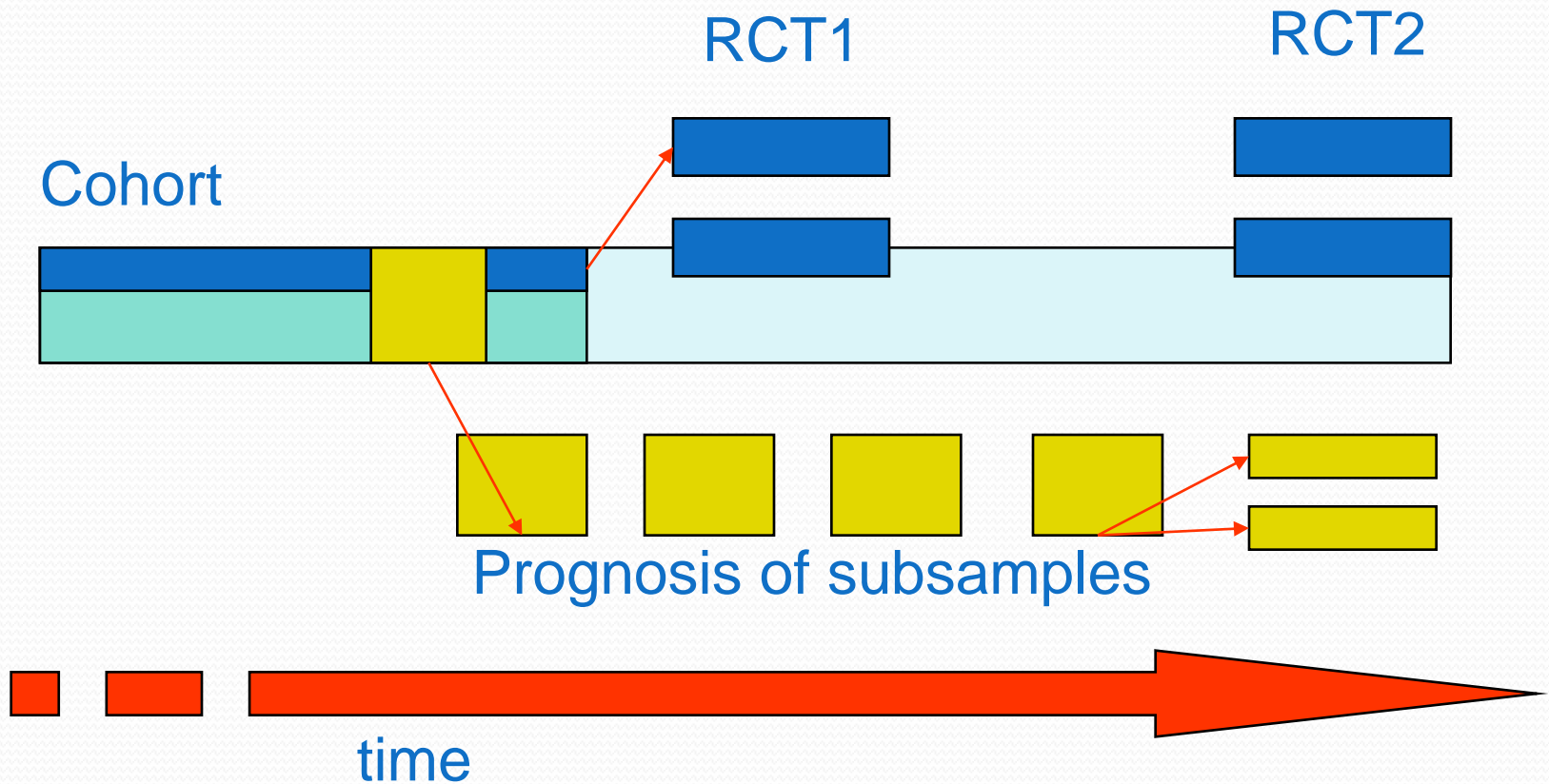
What you *test*

In *this* study



Methodological approach

Nested trial cohort studies

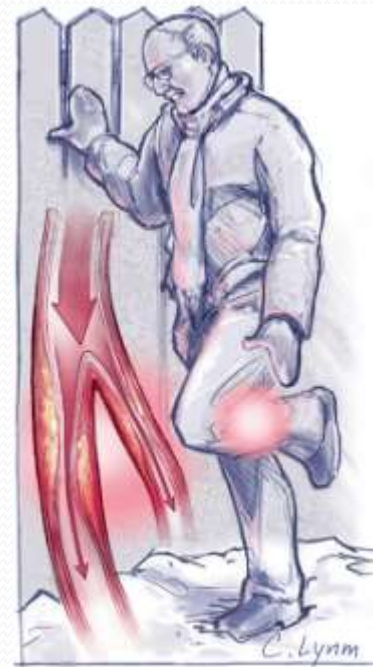


Example: intermittent claudication

- There are EB guidelines available
- There is already sufficient evidence
- There is a network of trained health care providers
- There is an integrated ICT environment ready for research

Intermittent Claudication or Peripheral Arterial Disease (PAD)

- Walking-induced pain in one / both legs
- Complaints disappear after rest
- Decreased ability to perform activities
- Rest or nocturnal pain
- Small wounds
- Calcification of nails
- Loss of hair
- Tissue loss



Epidemiological Data:

Prevalence:

1.6 % (Rutgers, 1998)

2.0 % (Kaiser, 1999)

Incidence:

2.8 per 1000 patients / yr

0.4‰ 25-44 year

10.6 ‰ > 75 year

(Lamberts 1994, Kaiser, 1999)

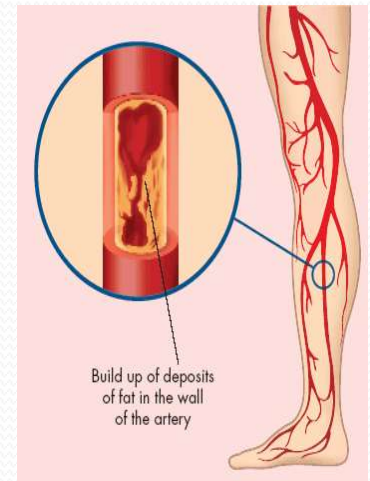


Natural Course

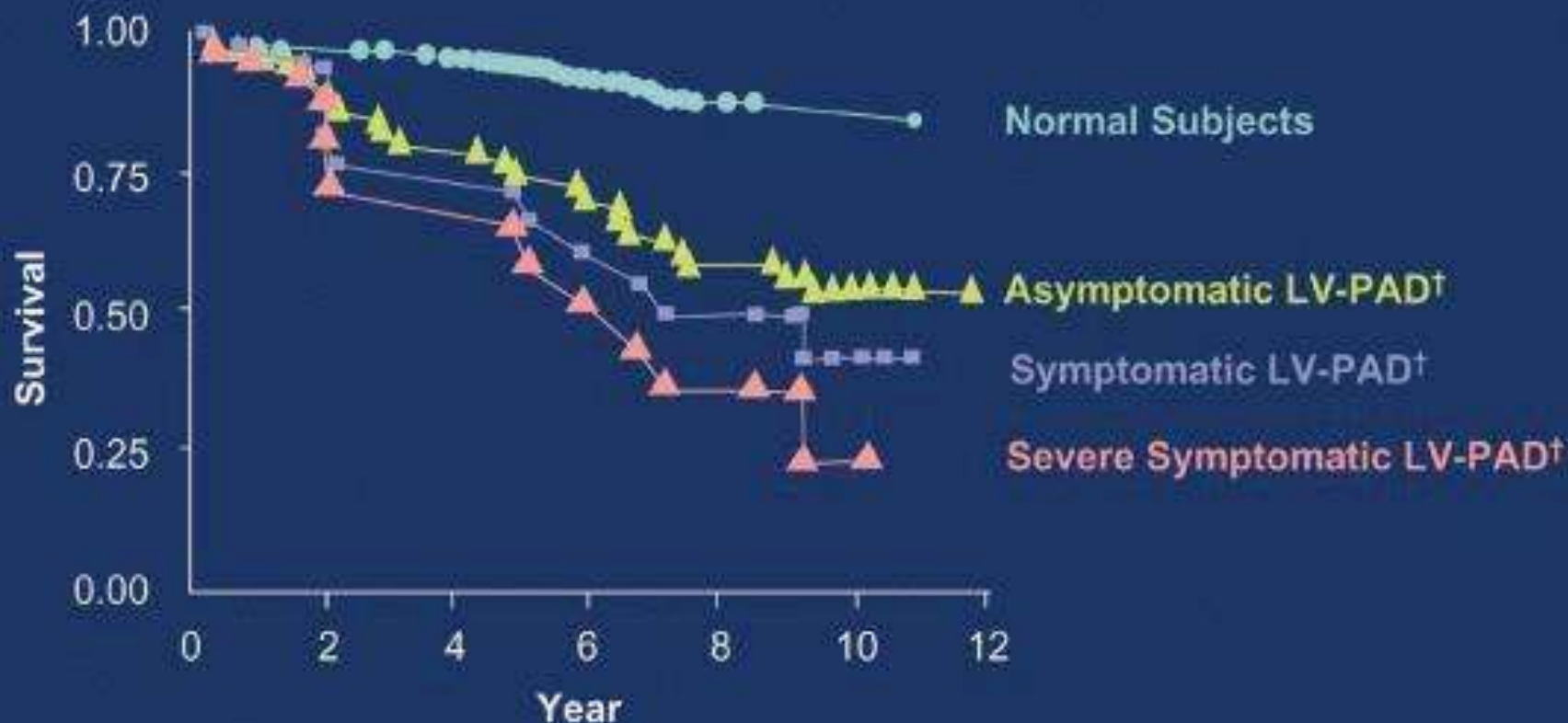
- 75%: stable or minor improvement of symptoms
- 25%: serious complaints in < 5 yr
- 2-5%: amputation

- Within 10 years:
 - 21%: stroke
 - 43%: Coronary Heart diseases

- Life expectancy < 10 yr



Peripheral Arterial Disease (PAD) and All-Cause Mortality*¹



*Kaplan-Meier survival curves based on mortality from all-causes

[†]Large-vessel PAD

1. Criqui MH. Vasc Med 2001; 6(suppl 1): 3-7.

Riskfactors

Genetic

Infection?

Gender

Age

...

Smoking

Diet

Physical
inactivity

Obesity

Diabetes type-2

Hypertriglyceridemia

Hypertension

Metabolic syndrome

Interventions for PAD

- Riskfactor management
- Medication
- Behavioral – life style changes
 - Stop smoking (no. 1 target)
- Exercise training / increase walking ability
- Co-morbidity need targeted interventions (e.g. COPD, diabetes, heart diseases)
- Vascular surgery

Etalagebenen

Home | Patiënten | Professionals | Netwerken | Richtlijn | Links | Contact



INLOGGEN

gebruikersnaam

wachtwoord

LOGIN >>

[wachtwoord vergeten?](#)
[aanmelden](#)

PARTNERS



WELKOM OP DE SITE

Deze interactieve claudicatio intermittens website is bedoeld voor fysiotherapeuten, artsen, nurse practitioners en patiënten. Professionals kunnen via deze website het elektronische dossier van hun patiënten invullen en bijhouden. Het Elektronische Patiënten Dossier (EPD) vervangt het papieren dossier en bevordert de onderlinge communicatie. De patiënt kan het eigen dossier inzien en onderdelen zoals bijvoorbeeld vragenlijsten zelf invullen.

Wat zijn etalagebenen precies?

Claudicatio Intermittens (CI) wordt in de volksmond ook wel etalagebenen genoemd en wordt in meer dan 90% van de gevallen veroorzaakt door slagaderverkalking (atherosclerose). CI is een uiting van perifeer arterieel vaatlijden (PAV), waarbij sprake is van atherosclerose van of naar de slagaders van de benen. Van PAV hoeft een patiënt geen klachten te ervaren. Wanneer de patiënt met PAV klachten ervaart van pijn in één of beide benen tijdens inspanning die vervolgens verdwijnt na het nemen van enige minuten rust spreken we van claudicatio intermittens (CI).

Wat kunt u zelf doen?

De klachten zijn vervelend, maar hoeven geen ernstige gevolgen te hebben. Het is vooral belangrijk om tijdig actie te ondernemen. Een belangrijk deel van de behandeling heeft u in eigen hand. Stoppen met roken, de juiste hoeveelheid beweging en eventueel afvallen zijn de belangrijkste aandachtspunten. Verder is een goede voetverzorging belangrijk om te voorkomen dat de



http://www.enkeltsetel.nl/portal/?FFID=6900

File Edit View Favorites Tools Help Links Customize Links Free Hotmail Google Windows Windows Marketplace Windows Media

Rob de Bie Enkeltsetel CEBP

Basis Tools CRM Sitemanager Webmed

Patienten Groepen

zoek A B C D E F G H I J K L M N O P Q R S T U V W X Y Z *

Voornaam	Tussenvoegsel	Achternaam	Telefoonnummer	E-mail	Edit	E-mail pt	Brief pt
Daan	van der	Aa		daanisweg@hotmail.com			
Ben C.M.		Agterberg	0478-583643	m.agterberg@home.nl			
Richard		Andersen	06-42578274	geen email			
Miriam	van	Beem	0487-518453	-			
Sandra		Beenkens		sandrabeenkens@home.nl			
Hans	van	Beers	06-46042628	Geen patient!			
Wendy		Blijleven	06-28245613	wblijleven@quicknet.nl			
Peter		Bluemink		www			
Mark w.	Van den	Boogaard	015-3107734	mark_song113@hotmail.com			
Frank	van de	Boomen	040-2547270	f_vd_boomen@hotmail.com			

1 | 2 | 3 | 4 | 5 | 6 | >>

(m,1939-11-17,67)

dossier Claudicatio Intermittens 4. Dinsdag 14-11-2006 12:40:11

Verwijsgegevens Screening Anamnese **Onderzoek** Analyse Behandelplan Behandeling Evaluatie Afsluiting Meetinstrument

Inspanningstesten/CardioPulmonale

Is de meting vandaag verricht?

Datum van meting

Maximale loopafstand pijnvrij

Opmerking pijnvrije loopafstand

Maximale loopafstand

Opmerking maximale loopafstand

Reden van stoppen met lopen

Lokalisatie van de pijn

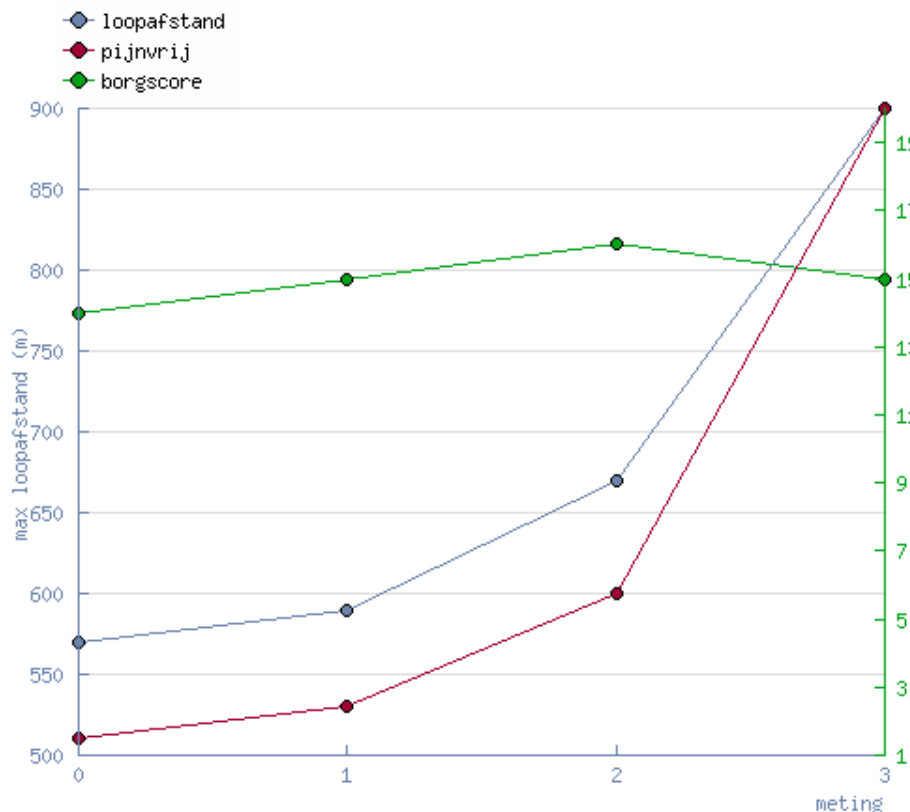
ACSM score

Opmerkingen ACSM score

Borgscore

Opmerkingen borgscore

logboek meting

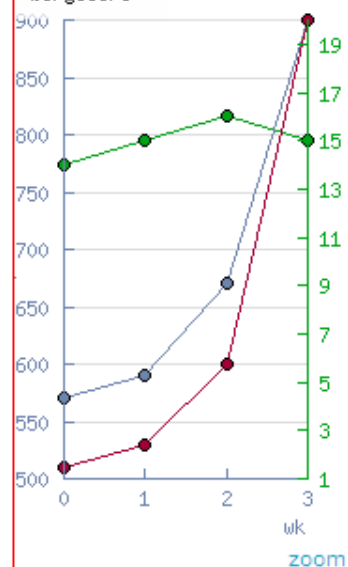


ingsondersteuning

marks

metrie

loopafstand
pijnvrij
borgscore



osticum

(m,1939-11-17,67)

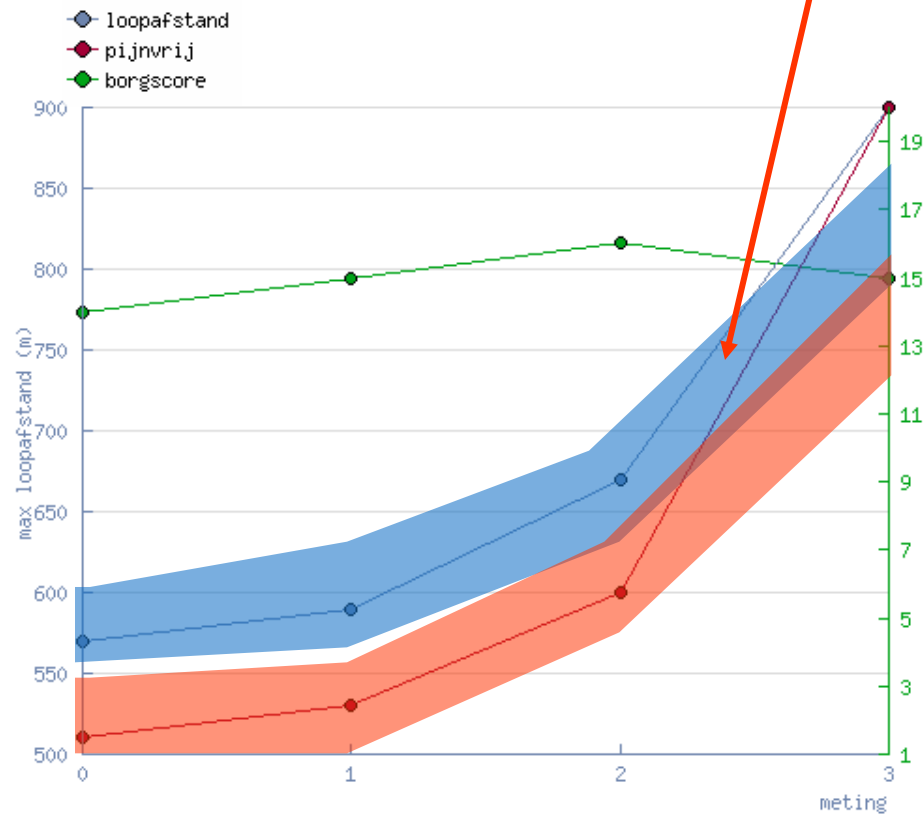
Patient progression versus matched group

dossier Claudicatio Intermittens 4. Dinsdag 14-11-2006 12:40:11

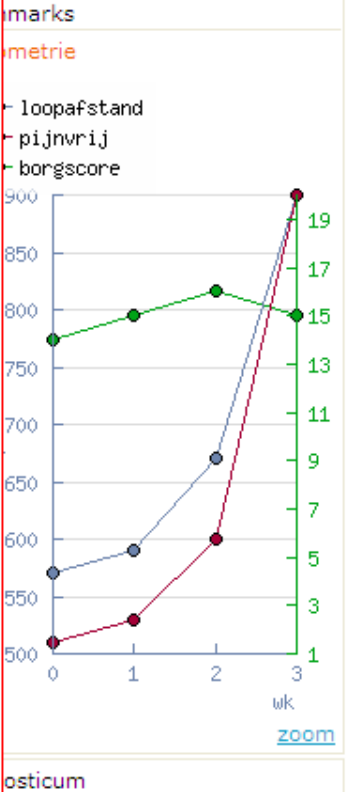
Verwijsgegevens Screening Anamnese Onderzoek Analyse Behandelplan Behandeling Evaluatie Afsluiting Meetinstrument

Inspanningstesten/CardioPulmonale

- Is de meting vandaag verricht?
- Datum van meting
- Maximale loopafstand pijnvrij
- Opmerking pijnvrije loopafstand
- Maximale loopafstand
- Opmerking maximale loopafstand
- Reden van stoppen met lopen
- Lokalisatie van de pijn
- ACSM score
- Opmerkingen ACSM score
- Borgscore
- Opmerkingen borgscore
- logboek meting



ingsondersteuning

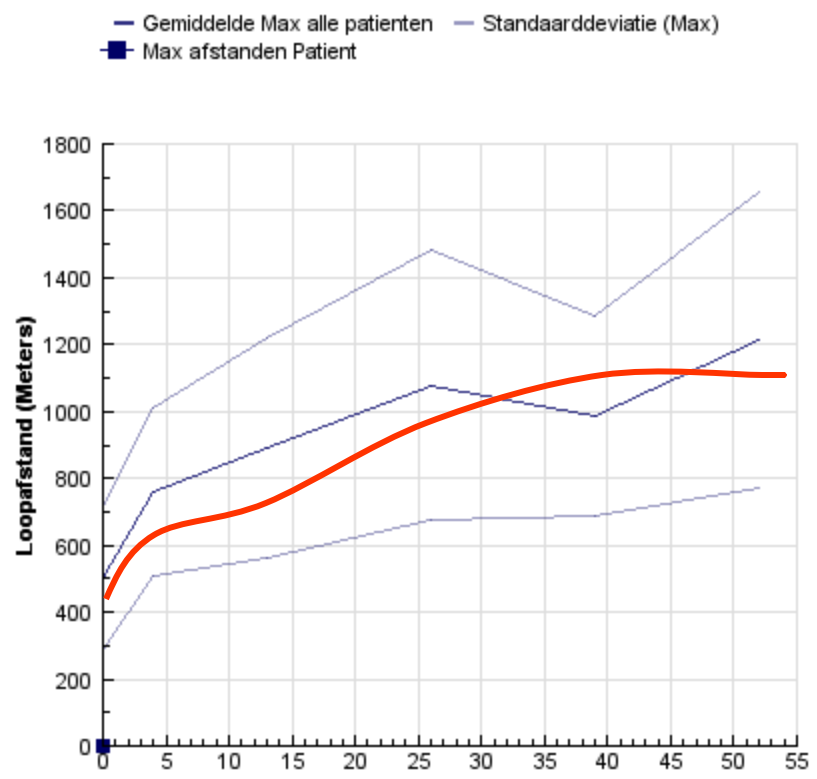


Onderstaande gegevens zijn gebaseerd op alle patiënten die een loopafstand hebben afgelegd ongeacht de metingssoort

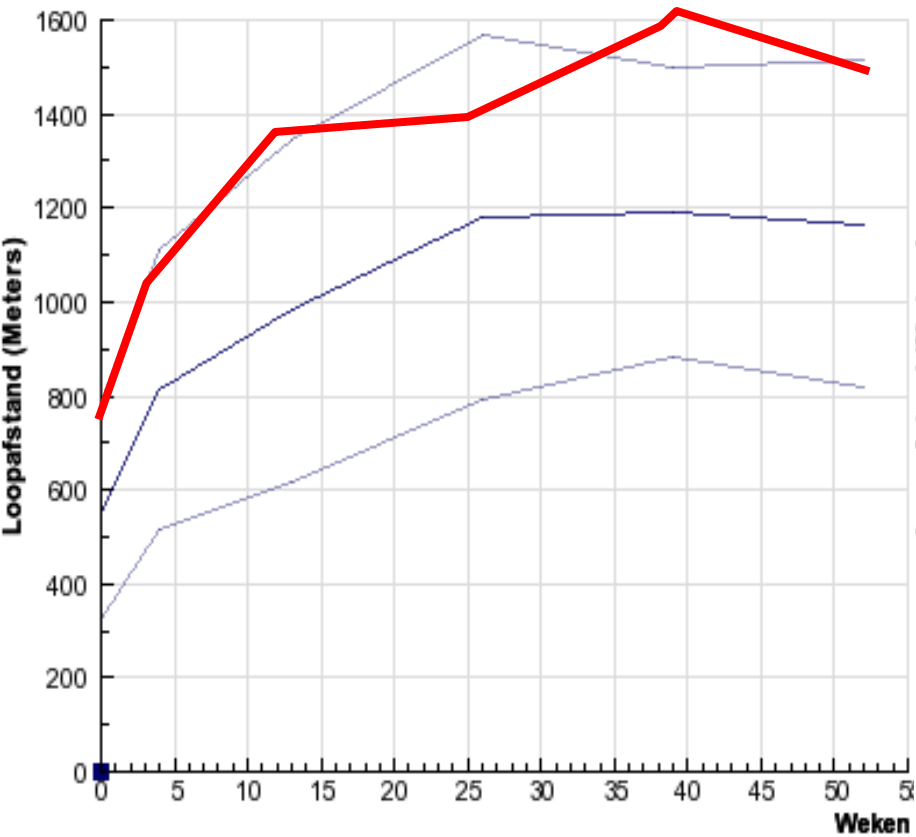
Patient Statistieken		
Type	Aantal	Percentage
Mannen	107	100
Vrouwen	0	0
Diabetici	25	23.4
COPD	28	26.2
Huidig Roker	0	0
Heeft Gerookt	107	100
Nooit Gerookt	0	0
Leeftijd Bereik	70-80	
Gemiddelde leeftijd	74.7	
Totaal aantal patiënten: 107		

- Max PV
 - Man Vrouw
 - Diabetici
 - COPD
 - Huidig Roker
 - Heeft Gerookt
 - Nooit Gerookt
 - Niet Filteren
- Leeftijd
- Van Tot
-

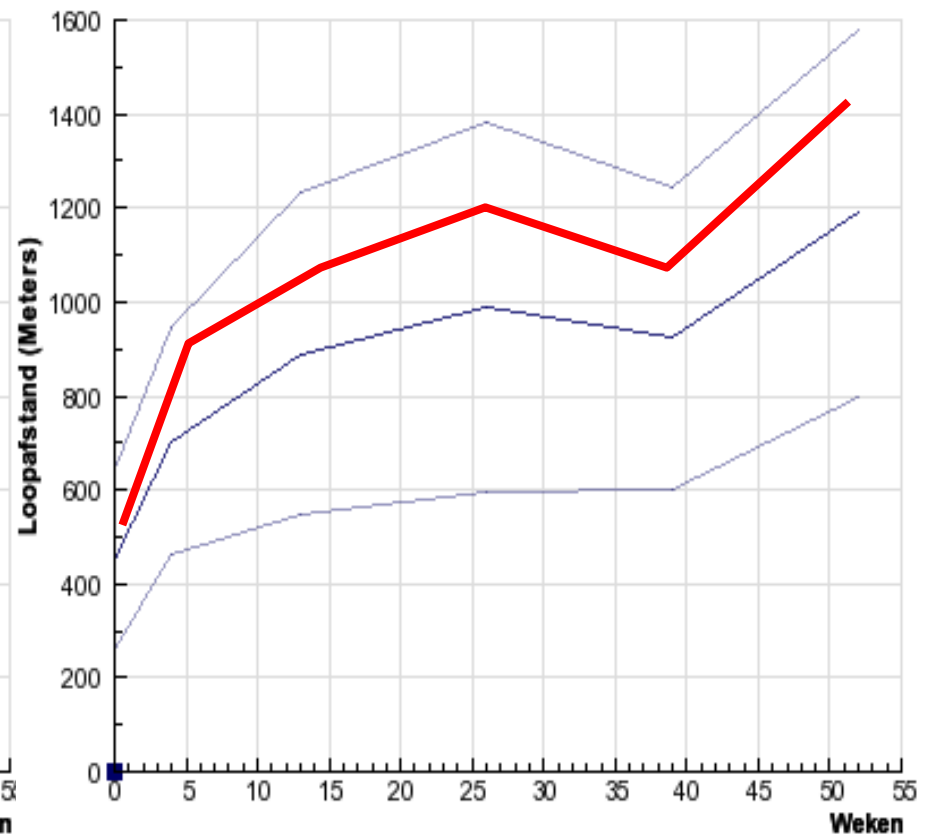
Grafiek Statistieken		
Meting	Aantal	Percentage
Baseline	107	100
Maand 1	54	50.5
Maand 2	52	48.6
Maand 3	39	36.4
Maand 4	9	8.4
Maand 5	21	19.6
Totaal aantal patiënten: 107		



Average maximal walking distance
(+ 95% CI) men (n=698)

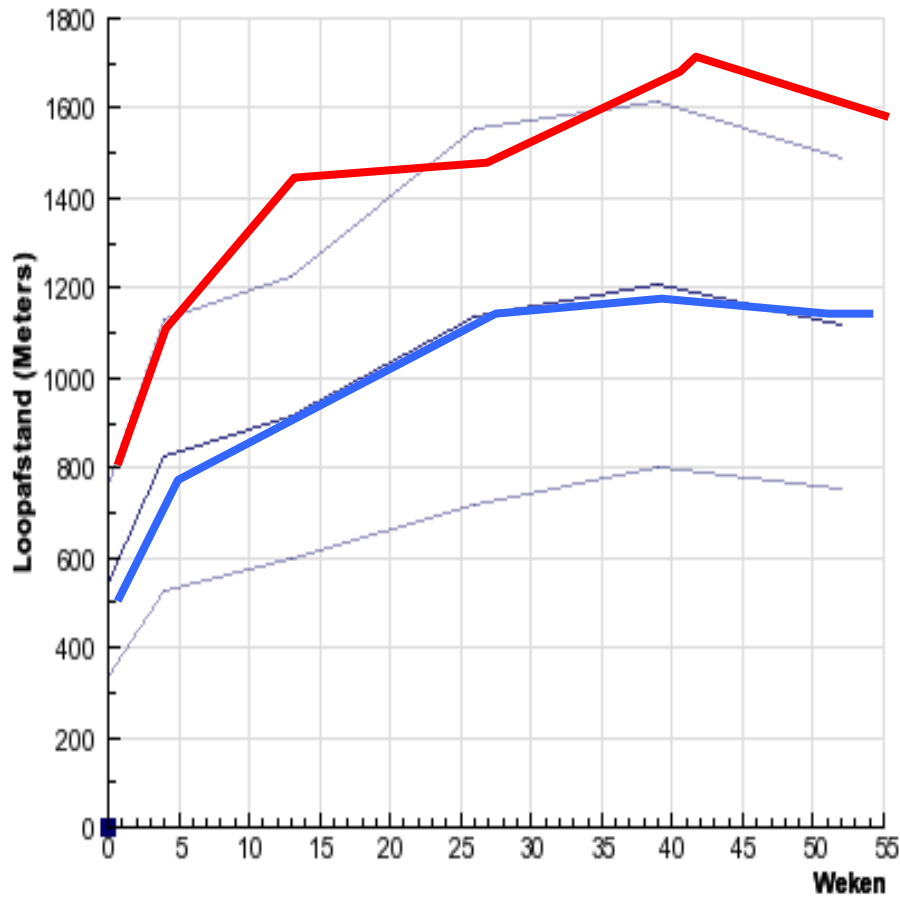


Average maximal walking distance
(+ 95% CI) women (n=408)

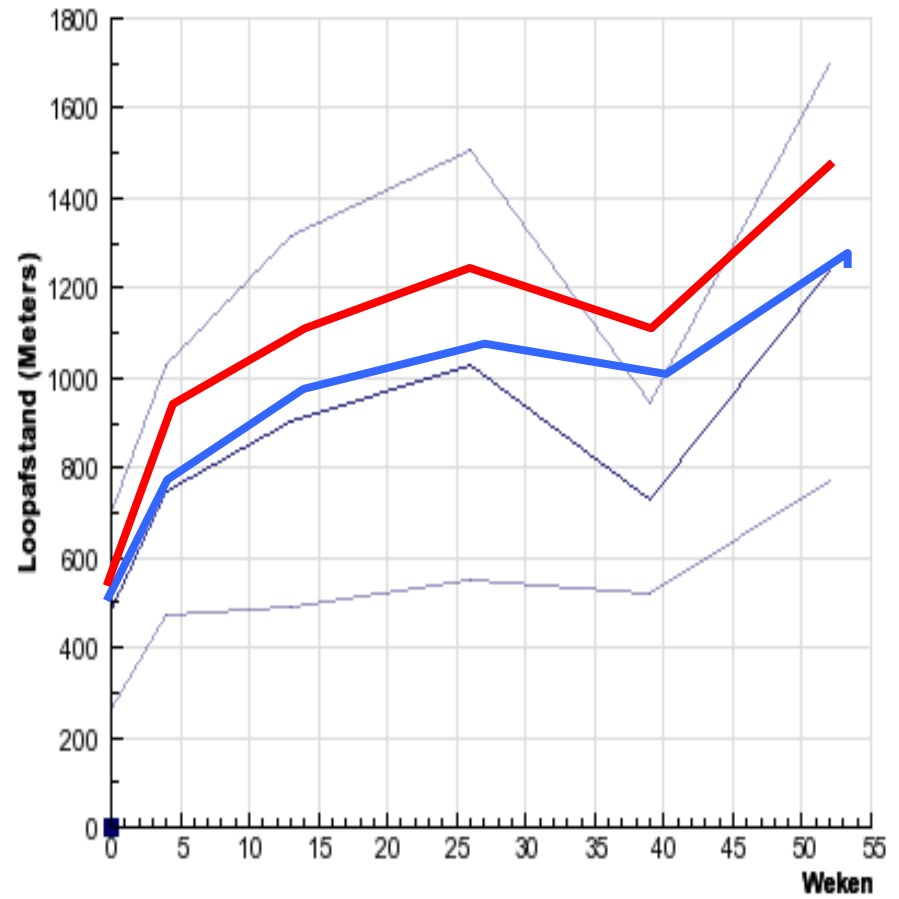


— no co-morbidity

Average maximal walking distance (+ 95% CI) smoking men

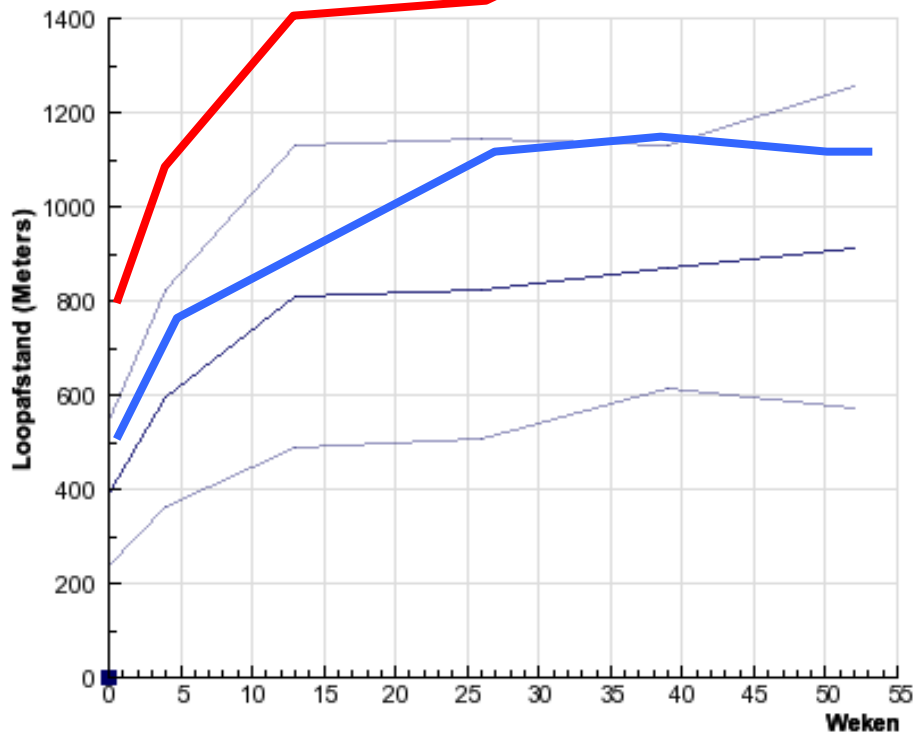


Average maximal walking distance (+ 95% CI) smoking women

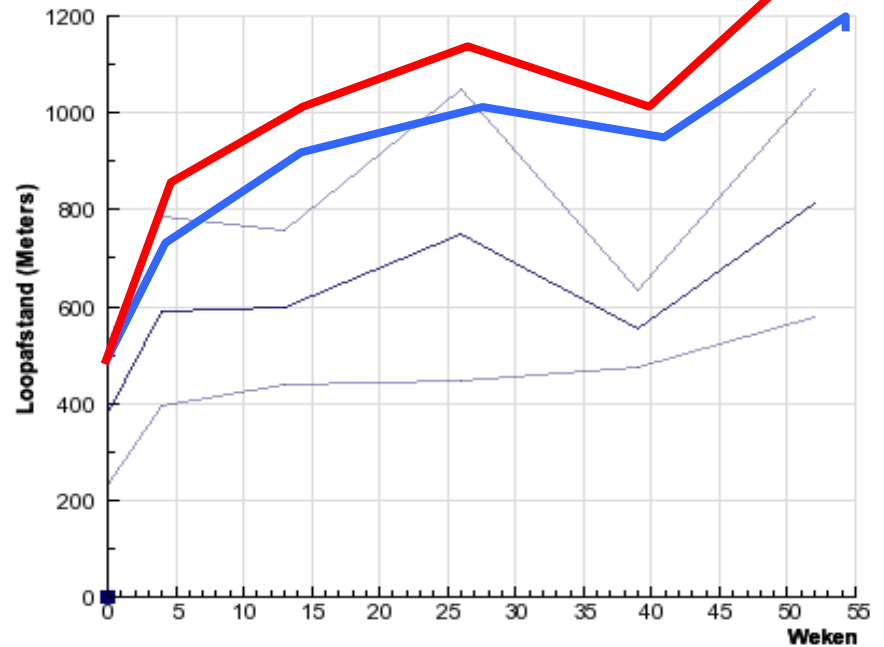


- no co-morbidity
- whole cohort

Average maximal walking distance (+ 95% CI) men with COPD



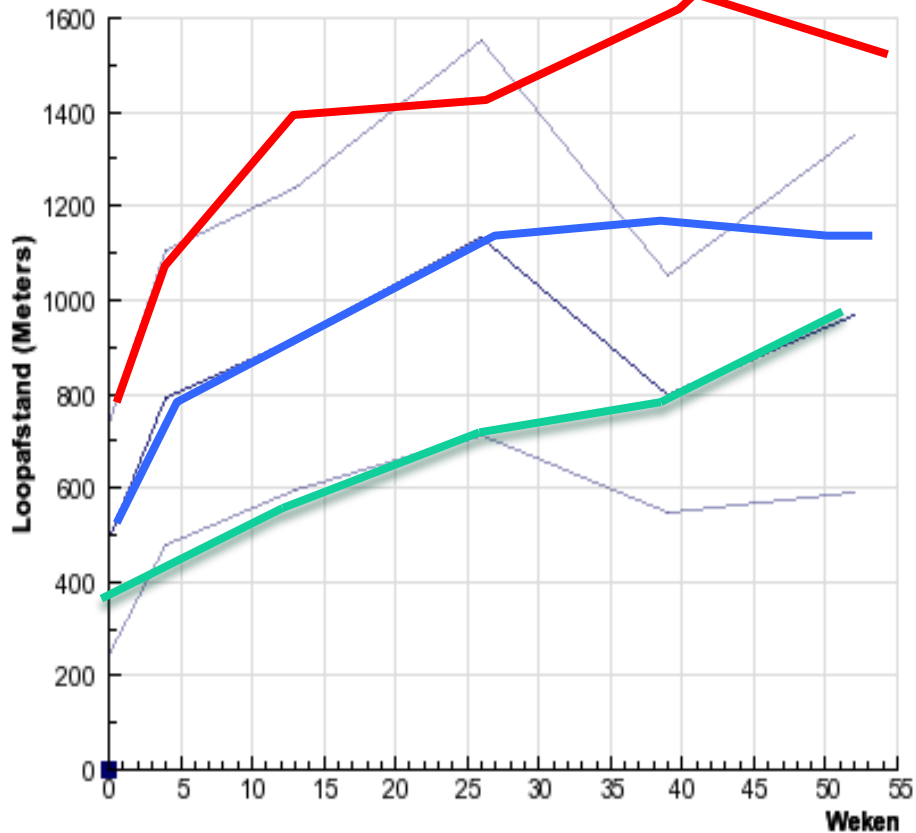
Average maximal walking distance (+ 95% CI) women with COPD



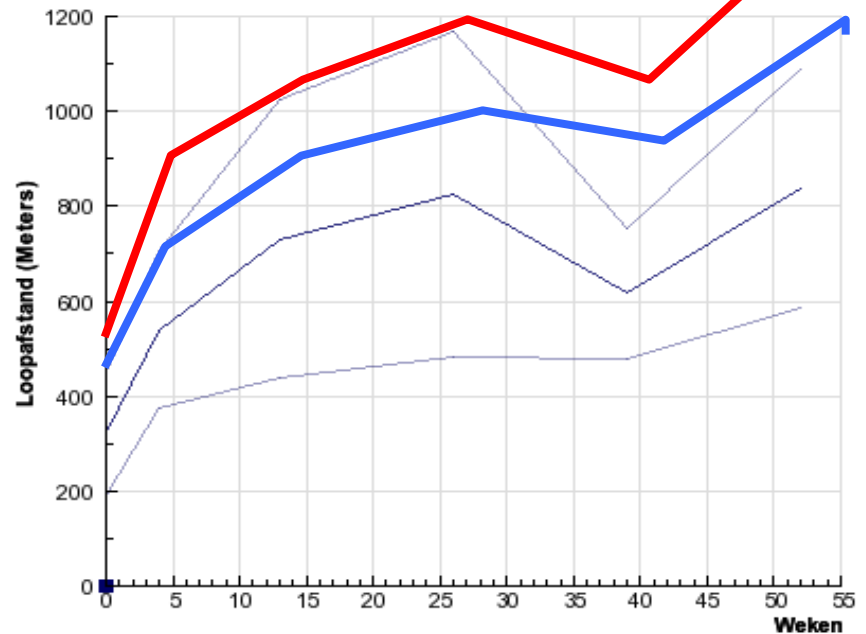
— no co-morbidity

— whole cohort

Average maximal walking distance
(+ 95% CI) men with diabetes

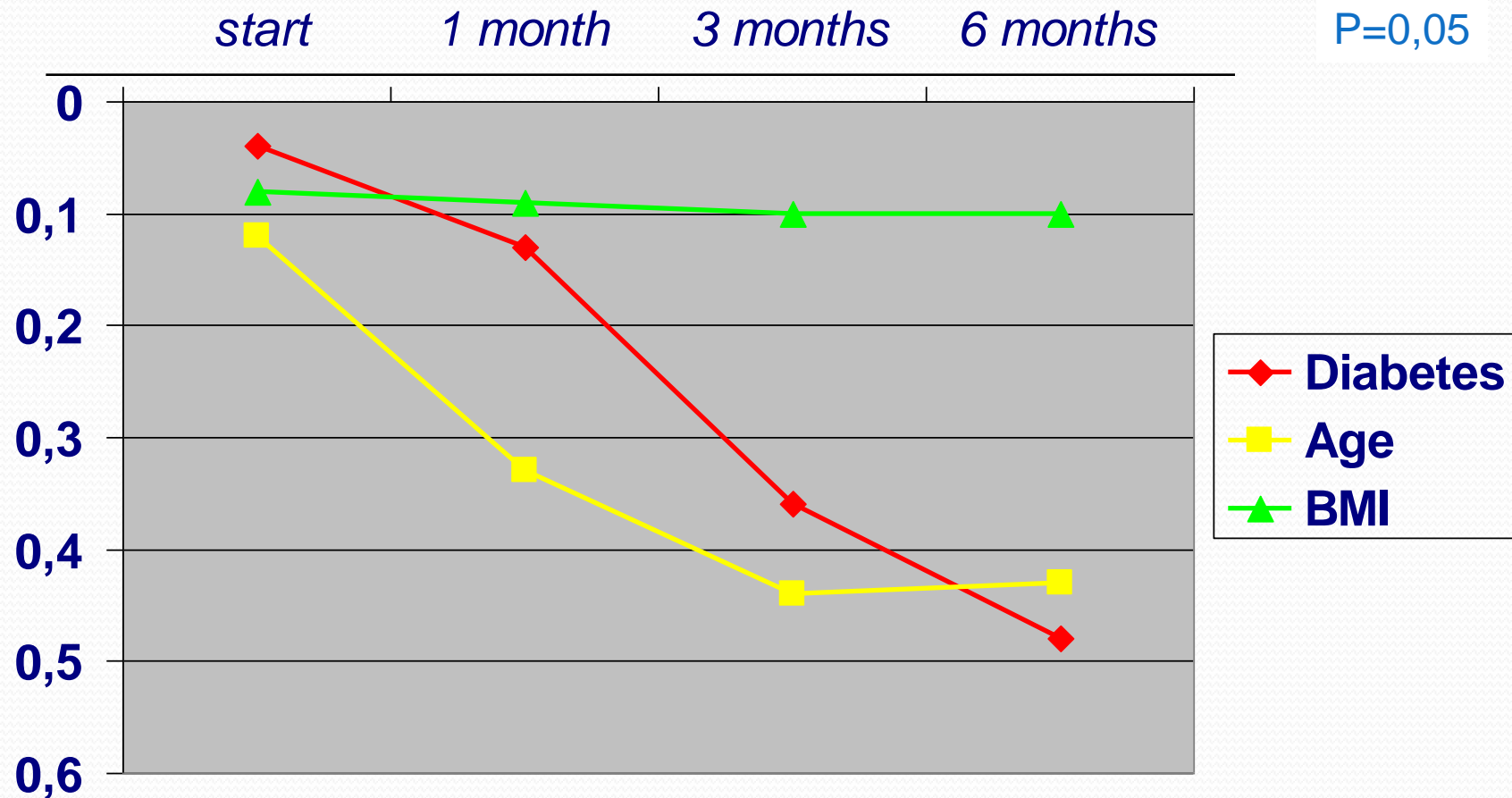


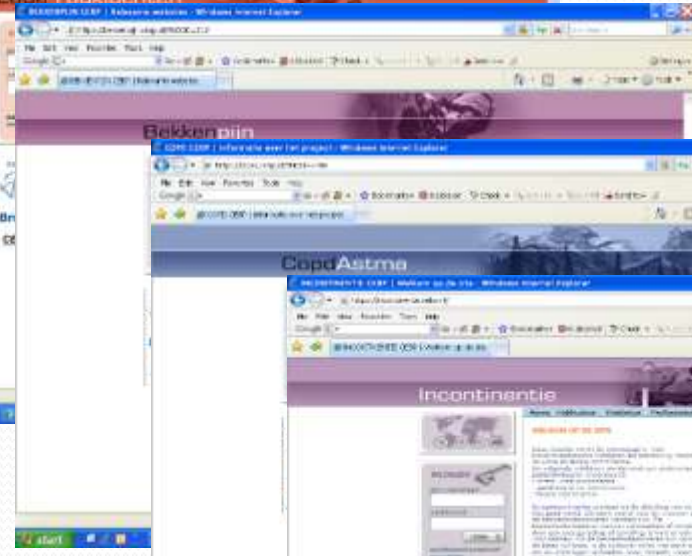
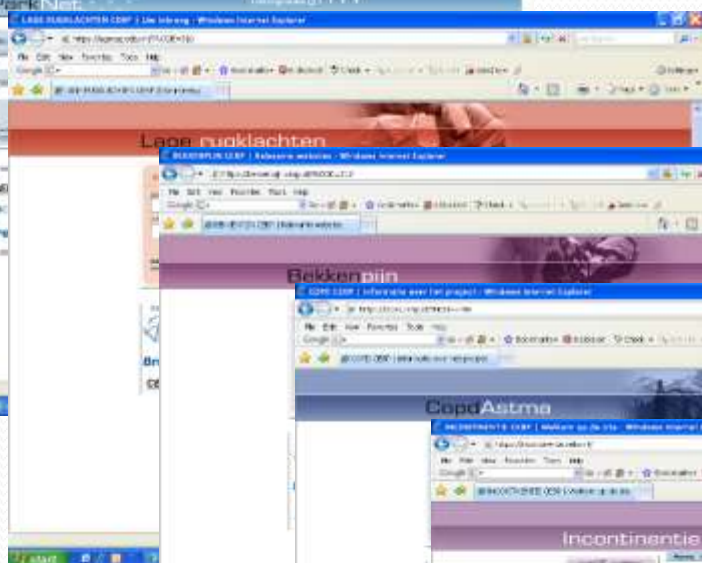
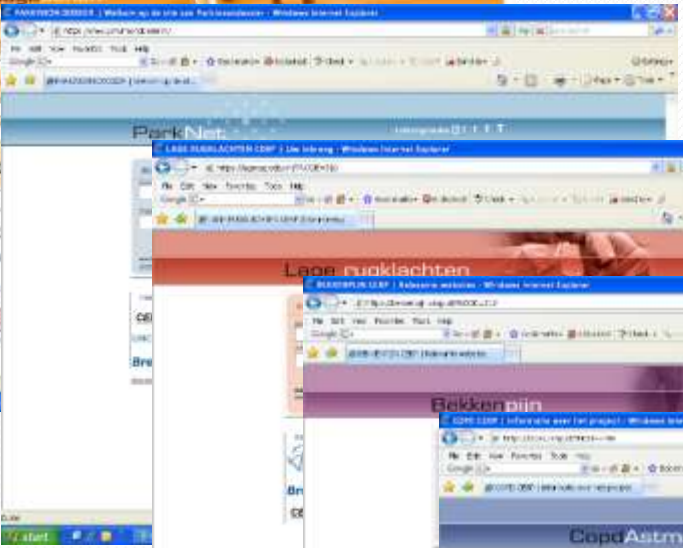
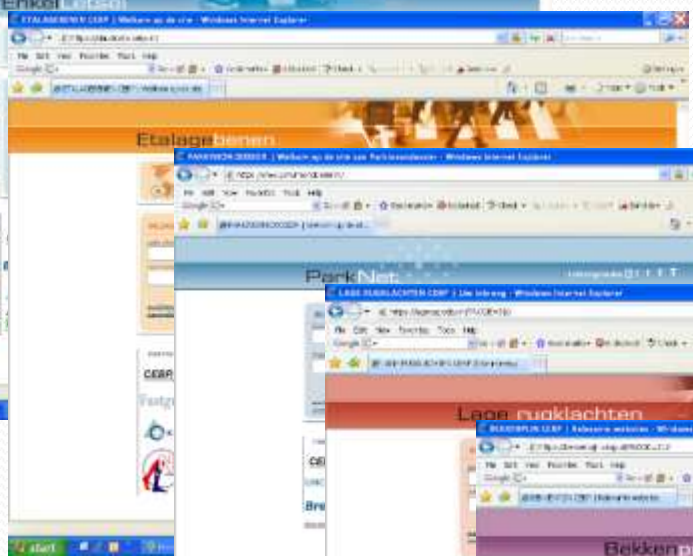
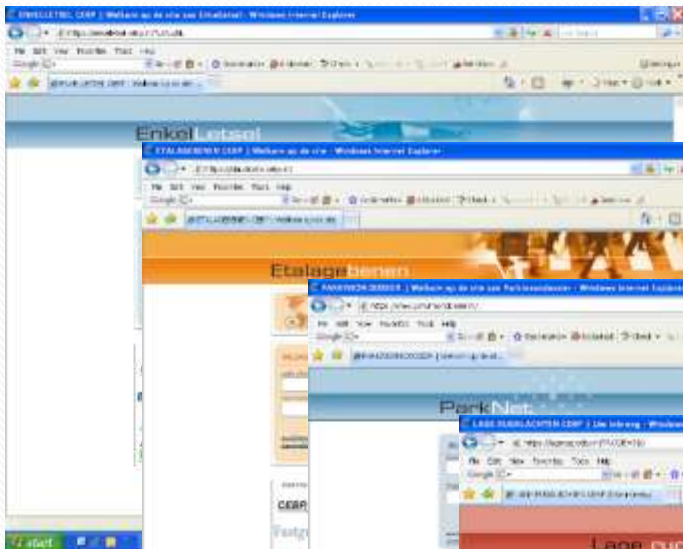
Average maximal walking distance
(+ 95% CI) women with diabetes



- no co-morbidity
- whole cohort

Shift in prognostic factors





CEBP
Maastricht

caphri
Care And Public Health Research Institute



Thank you!

Further info: www.cebpc.nl