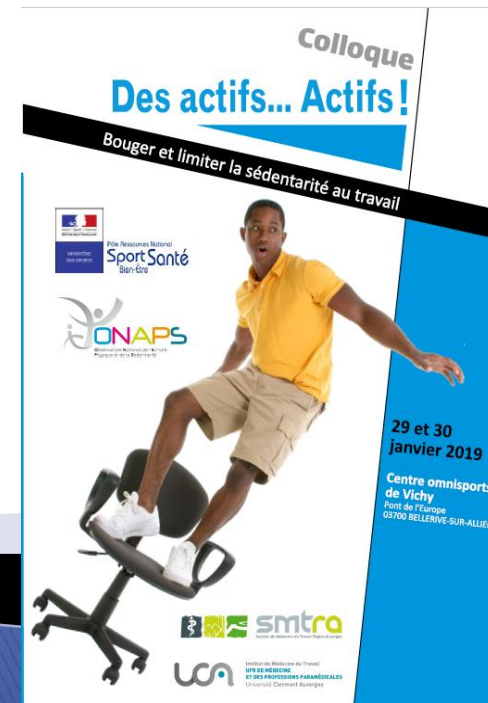


Consequences of occupational physical activity on cardiovascular events

Dr Esquirol Y, Pr Dutheil F Pr Ferrières J,

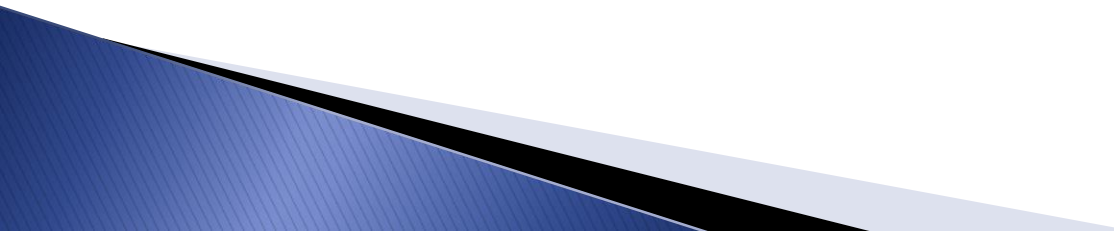
CHU Toulouse – URM 1027
Université Paul Sabatier–Inserm, Toulouse France

Colloque des ACTIFS... ACTIFS
the January 29th 2019



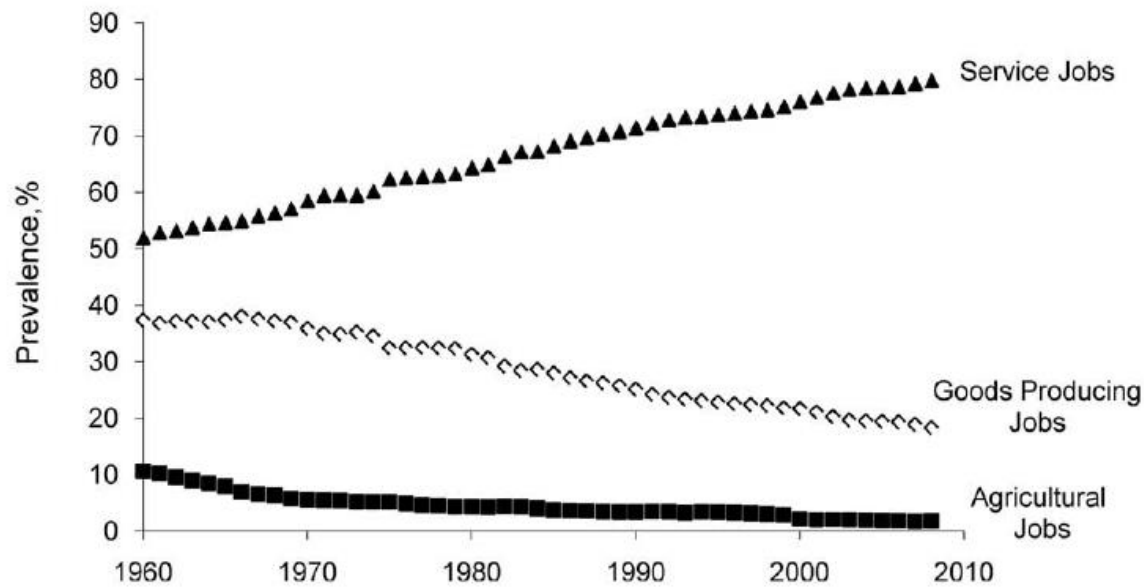
NO CONFLICTS OF INTEREST

Move at work , YES but how to do ?

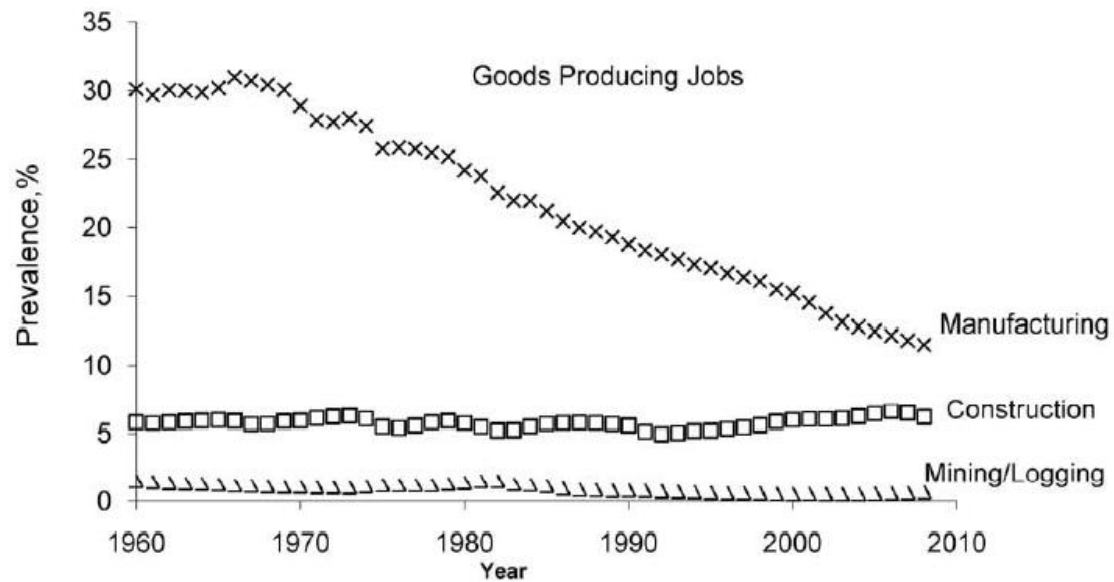
- The benefits of leisure physical activity on health are well-proved.
 - Guidance on leisure time physical activity are well established.
 - But , the major public health challenge today relates more to behavioural adherence.
 - Question : could the occupational physical activity positively contribute to health (cardiovascular events) ?
- 

EPIDEMIOLOGY

- ▶ Few data available
- ▶ Australia : office employees :
 - 79% spent mainly time sitting at work
 - 14% spent mainly time standing-up at work
 - 7 % spent mainly time walking at work
- ▶ DARES / France : increase of people sitting in front of computer 11.9% '(1994) /22.6%(2010) + + + white collars



20%



Consequences of moderate or high physical activity at work on cardiovascular events – Move at work but without excess !



The Copenhagen **Male** Study n=4846)
1970/ Follow-up : 30 y
(*Holtermann,2009*)

Cardiovascular mortality

Physical work activity

Low :	Ref
Moderate :	HR: 1.39 (1.13–1.69)
High:	HR: 1.51 (1.18–1.94)

Strenuous work (work resulting in sweating)

Seldom/never :	Ref
Occasionally	HR: 1.49 (1.25–1.77)
Often	HR: 1.80 (1.35–2.42)

BELSTRESS n= 14,337 men
1994-1998 / Follow -up : 3.15 y
(Clay, *Holtermann,2015*)

Coronary heart disease

High OPA : HR: 1.28 (0.68–2.44)

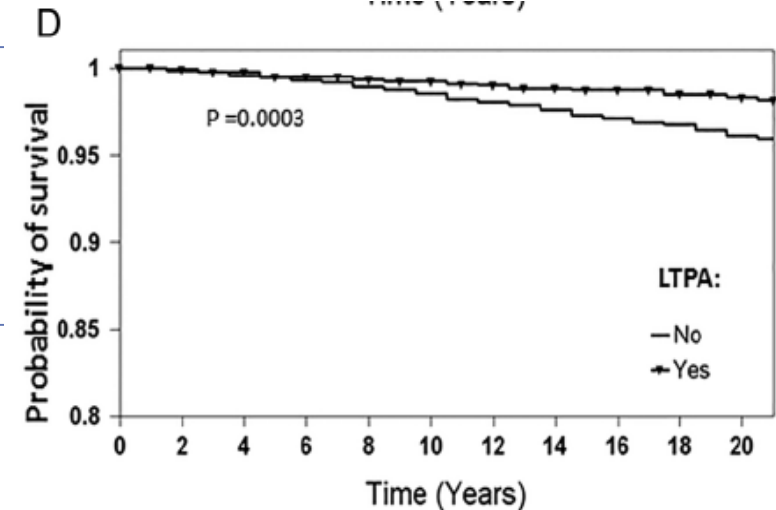
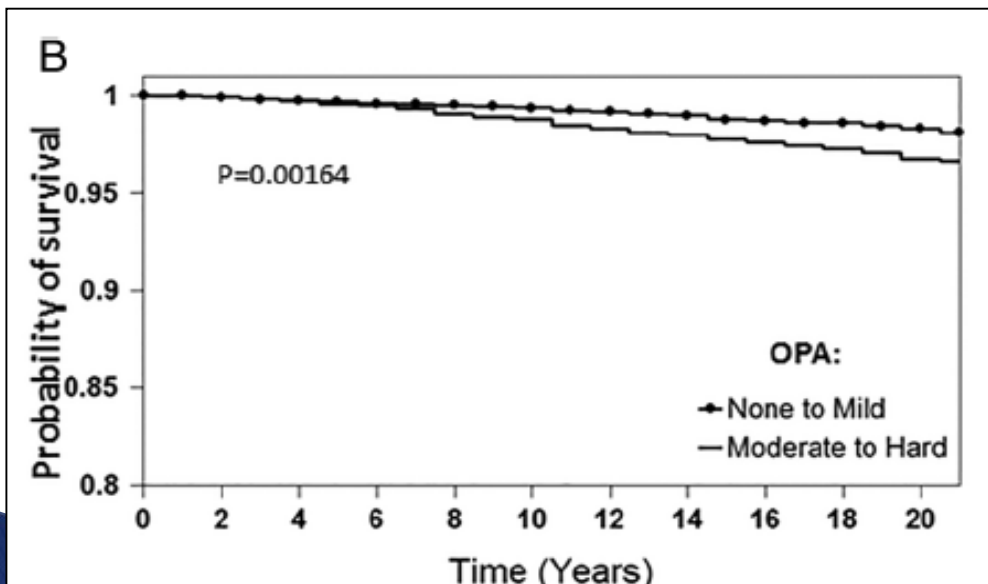
Consequences of moderate or high physical activity at work on cardiovascular events – Move at work but without excess !

CORDIS n= 4819 males 1985–1990.

Follow-up/ 22 years (Harari, 2015)

Cardiovascular mortality

OPA Moderate or Hard :1.49 (1.07- 2.07)



Health paradox effect

(Holtermann, 2012)

Well-balanced tasks

during the working day

(Esquirol, 2012)



Consequences of moderate or high physical activity at work on cardiovascular events



BELSTRESS (Clay,
Holtermann, 2015)

Coronary heart disease

High OPA : HR: 1.28 (0.68–2.44)

LOW OPA + MODERATE TO HIGH REF
LPA

LOW OPA + LOW LPA



LIMIT SIGNIFICANT

HIGH OPA + LOW LPA



NO SIGNIFICANT

HIGH OPA
+ MODERATE- HIGH LPA



SIGNIFICANT HR : 3.82[1.41-10.36]

Consequences of moderate or high physical activity at work on cardiovascular events



The Copenhagen **Male** Study (n=4819)

Year : 1970/ Follow-up : 30 years

Coronary mortality

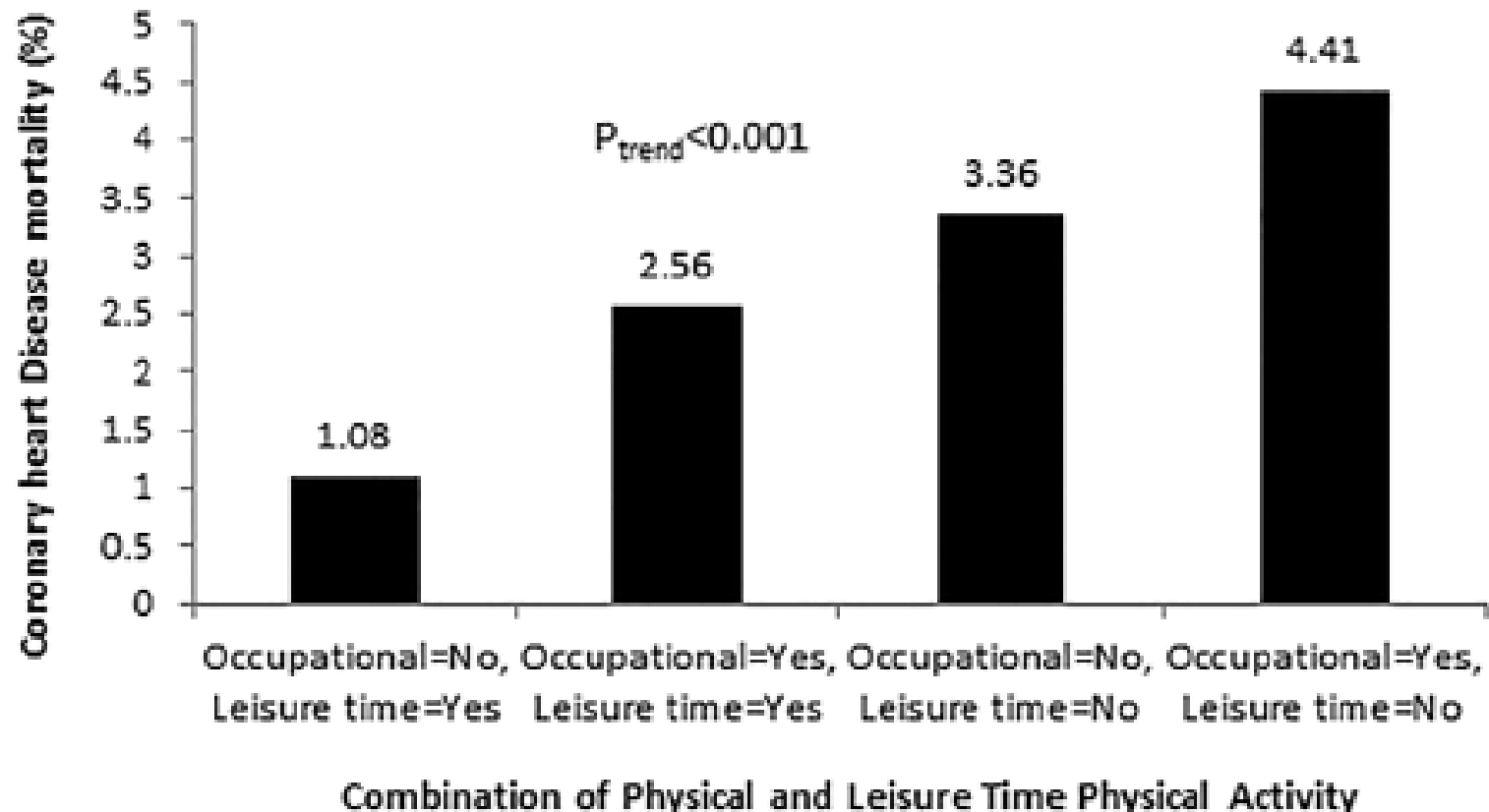
(CLAY, Holtermann, 2016)

Consequences of moderate or high physical activity at work on cardiovascular events



C

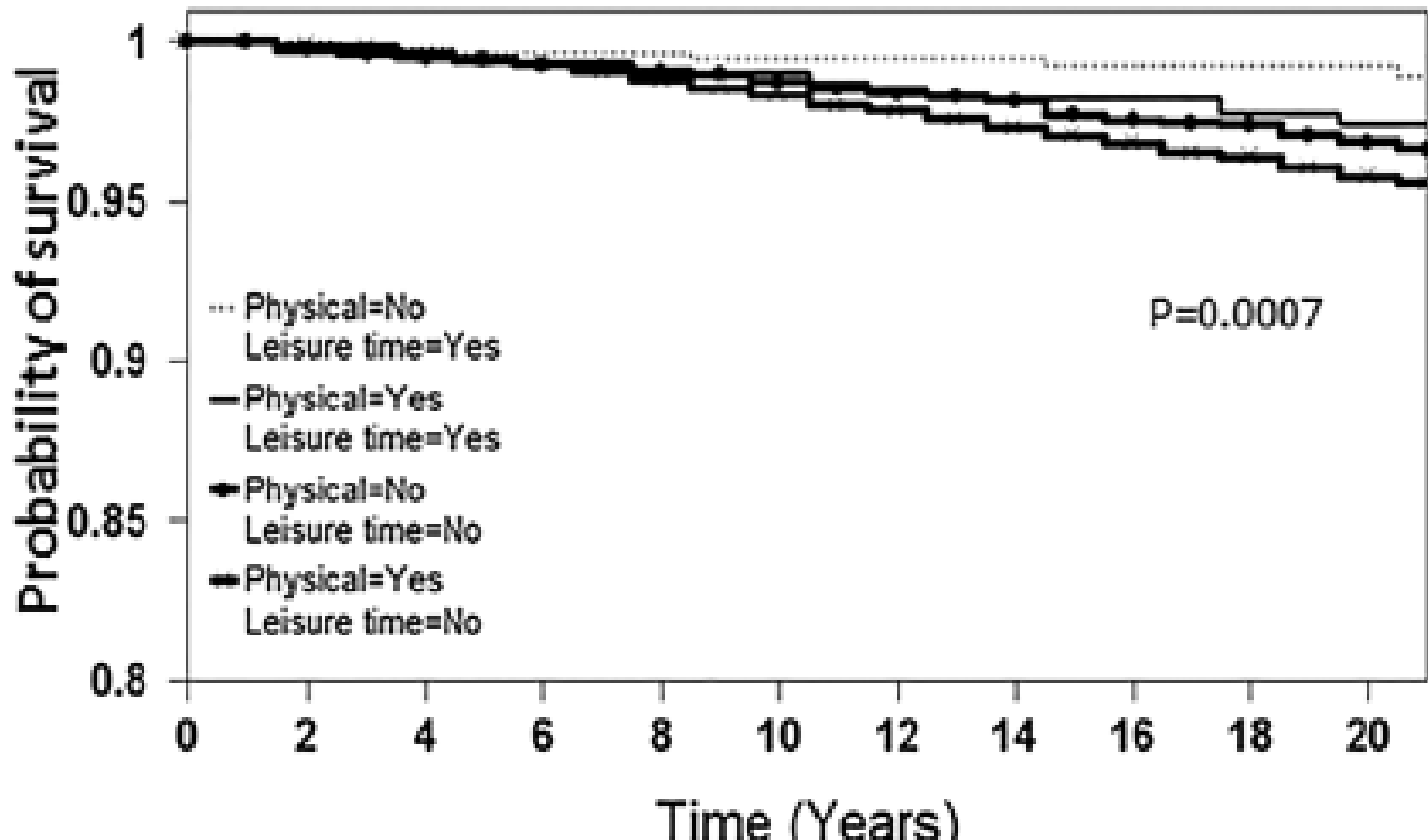
Combination of Physical and Leisure Time Physical Activity



Consequences of moderate or high physical activity at work on cardiovascular events

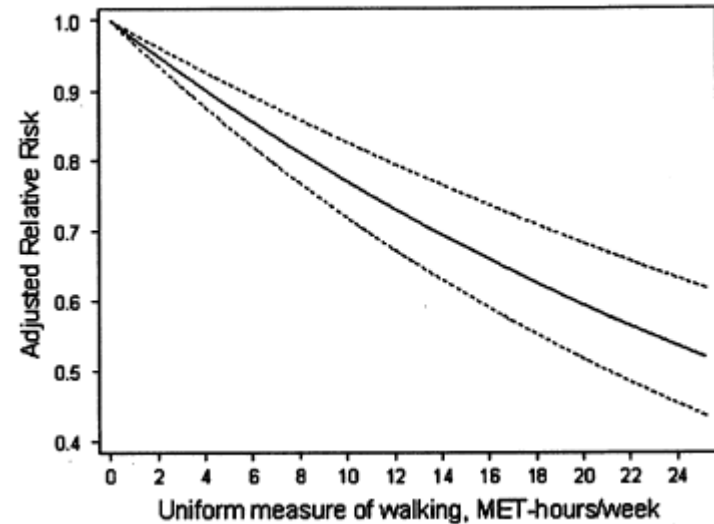
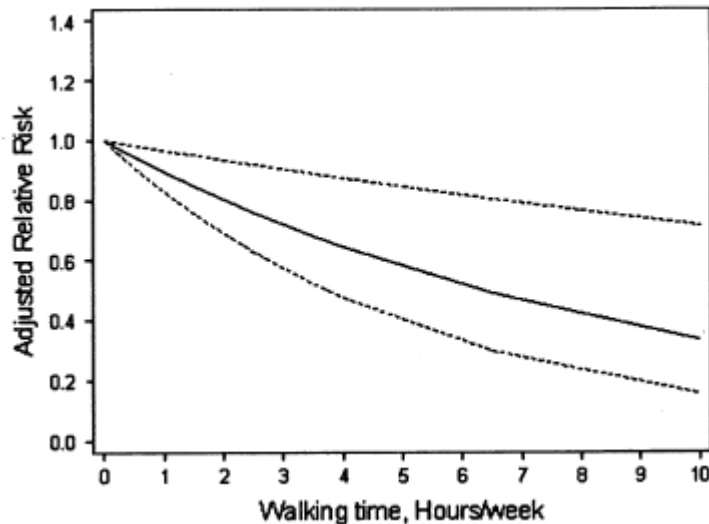


D



Consequences of Walking at work on cardiovascular events

- ▶ A dose-response meta-analysis : 11 cohorts (until 2007) CVD



- Increase of total time spent to walking during a day (including occupational and non-occupational activities) reduce the cardiovascular risks with dose-response effect .
- walking 30 min/ day during 5 days/week decrease the cardiovascular risk by 19 % !

Zheng H and al.. Quantifying the dose-response of walking in reducing coronary heart disease risk: meta-analysis. European journal of epidemiology. 2009;

Standing and walking at work

- Walking at work :
 - Few studies specifically conducted at the workplace
 - Stamatakis, 2013 : *When you're at work are you mainly sitting down, standing up or walking?*
5380 ♀ 5788 ♂ General population ≥ 40 yo at baseline follow-up 12 years

All-cause Mortality

♀ HR: 0.68 (0.52–0.89)

♂ HR: 0.97 (0.78–1.19)

CVD mortality

♀ HR: 1.53 (0.72–3.24)

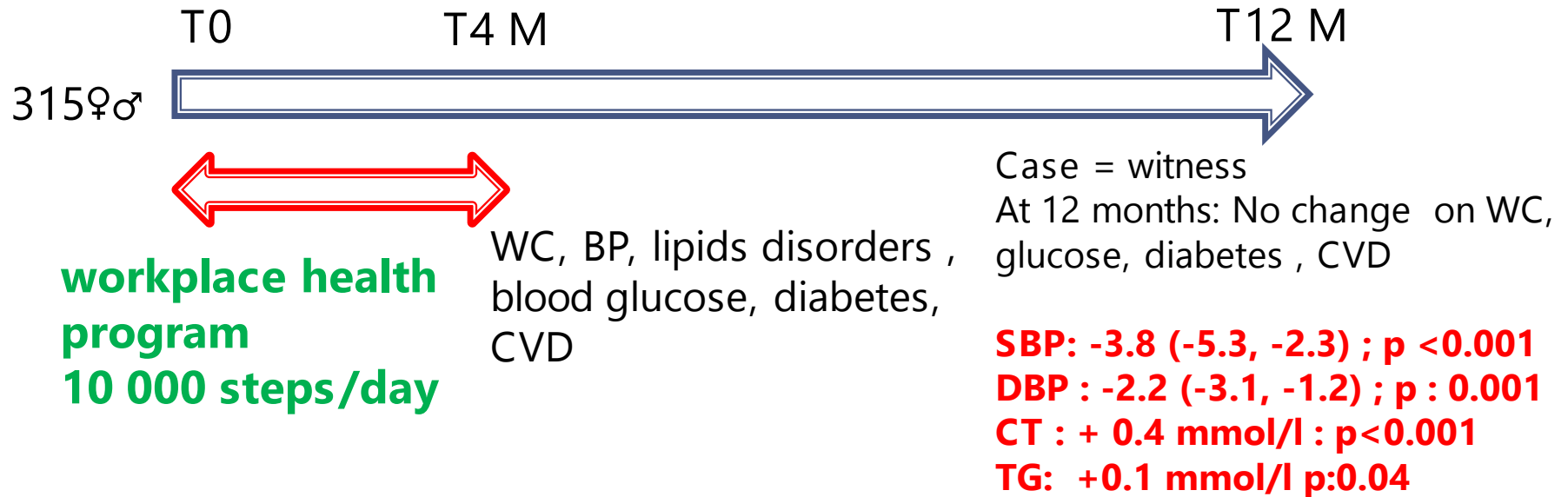
♂ HR: 0.98 (0.66–1.45)



Walking
/standing
Ref: sitting

- InterHeart china Case-control study: 2909 AMI
At work : sedentary (ref) / Walking / Walking , climbing, lifting
No **significant association** with AMI after all adjustments

► Interventional study:

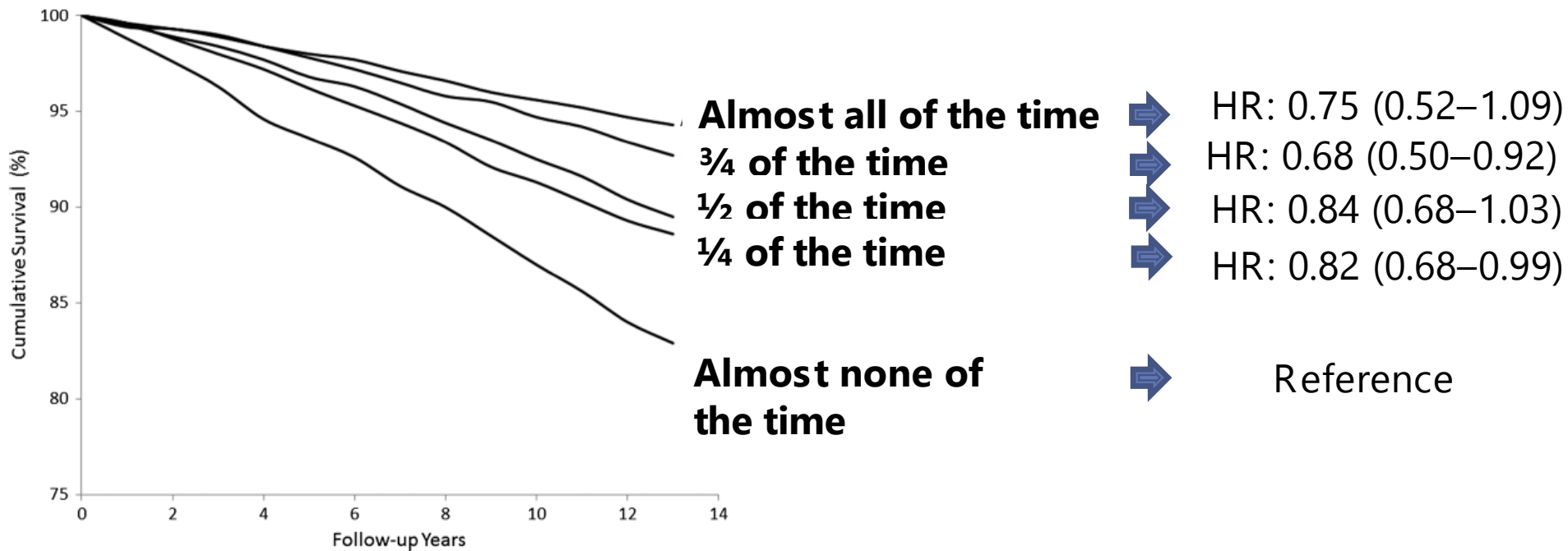


*Workplace pedometer interventions for increasing physical activity.
Freak-Poli RL, Cochrane Database Syst Rev, obesity 2013*

Consequences of Standing time on cardiovascular events

All-cause mortality across categories of **daily standing time** in 16,586 men and women 18–90 yr of age, in the Canada Fitness Survey - 12.0 yr of follow-up. (KATZMARZYK, 2014)

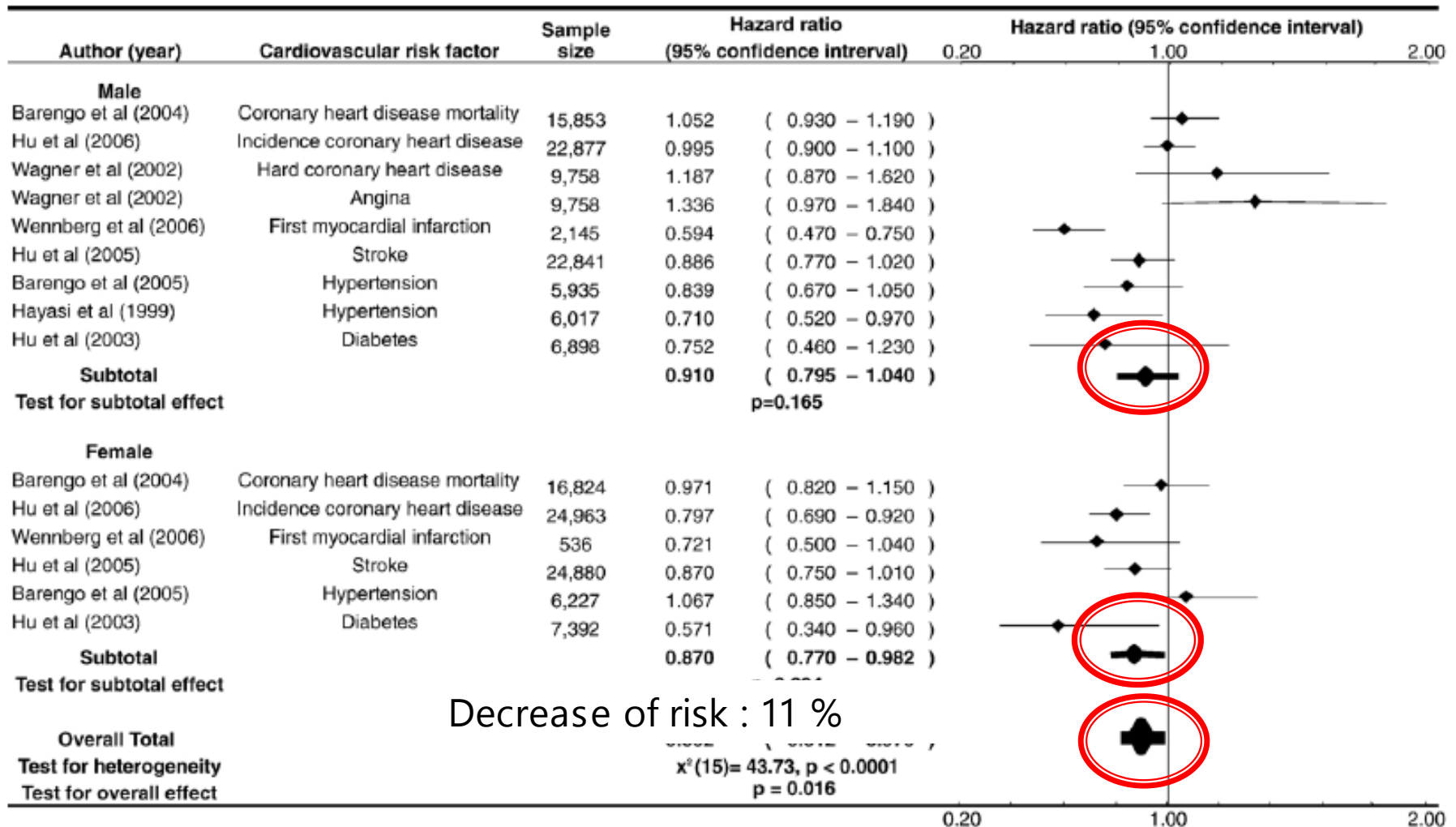
Cardiovascular mortality across categories of daily standing time



Consequences of commuting to work and cardiovascular outcomes

Active commuting and cardiovascular risk: a meta-analytic review. Hamer M, Prev Med. 2008

8 Studies (2007)



Commuting to work and cardiovascular outcomes Prevention

How many time spent to commuting to go from or to work every day?

30 minutes / day : decrease by $\approx 20\%$ CVD risk (HU, 2007)

Yes , but are you ready to do ?

N= 3653 USA Adults

Questionnaire

43% think walking a mile or more or for 20 minutes or more is reasonable

(*Watson, 2015*)

And , **YOU**
Employers ?

- Objective : to promote walking to work by employers
- 29 Employers
- Conclusion : exploration of obstacles at the individual, organizational and societal level (*Audrey, 2015*)

Workplace interventions to reduce Time sitting

a recent meta-analyses !

Workplace interventions for reducing sitting at work. Shrestha N & al. Cochrane Database Syst Rev. 2016 Mar 17;3

Outcomes : **time spent sitting at work per day**

20 studies, 2180 participants

a

9 studies physical workplace changes

2 studies policy changes

7 studies information and counselling

2 studies interventions from multiple categories

- A sit-stand desk alone / to no intervention reduced sitting time at work per workday with between 30 minutes to 2 hours 3 – 6 months



- Treadmill desks combined with counselling reduced sitting time at work -29 minutes 12 weeks' follow-up.



- Pedalling workstations combined with information did not reduce inactive sitting at work considerably -12 minutes

Inconsistent results

Low number of participants

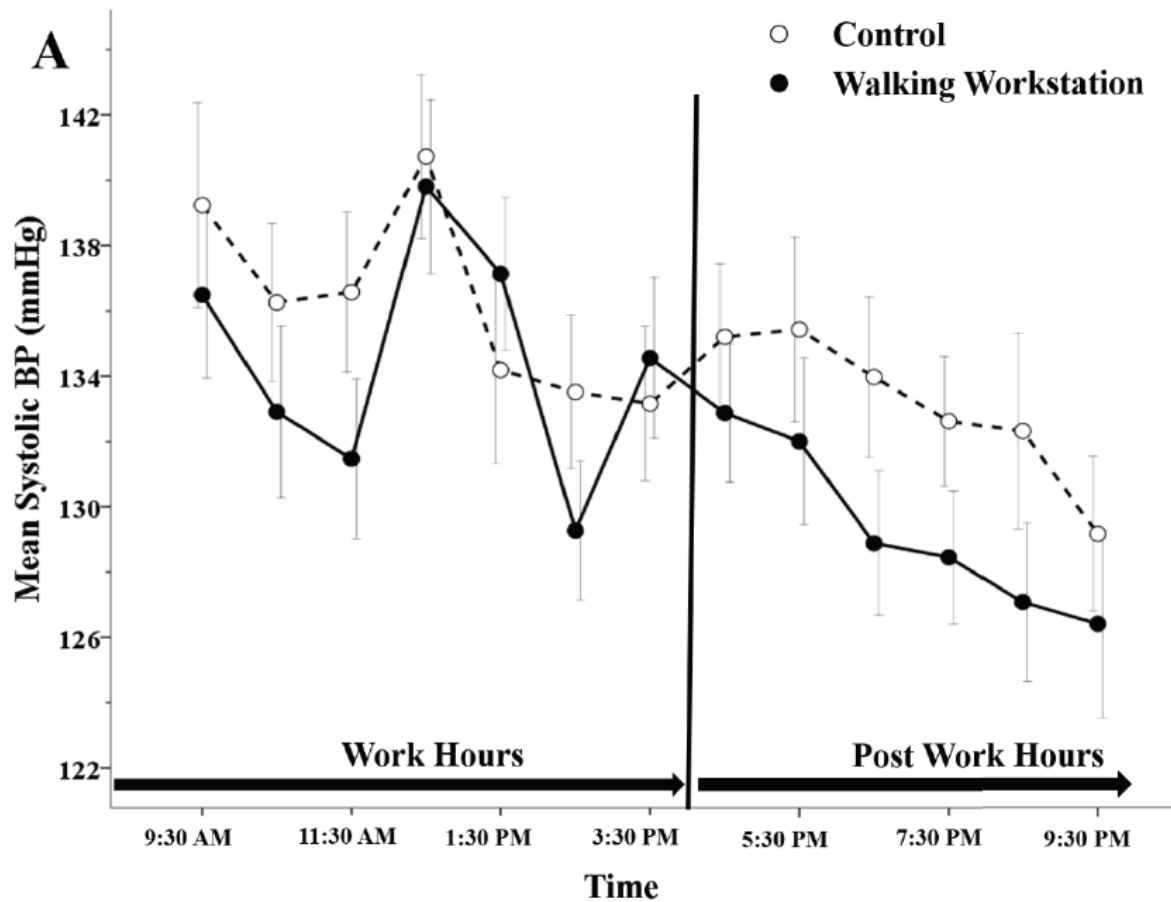
Quality of methods used are discussed

No evaluation on cardiovascular events

No longer follow-up

So far / Recommendation

- Cross-over study : 10 participants Positive effect on SBP and DBP of 2.5 hours during 8-hours working day (*Zeigler ZS, 2016*)



Conclusion

- ▶ Benefit effect of HIGH OPA \neq Benefit effect High LPA
- ▶ Well- balanced of occupational tasks during working day
- ▶ Preventive measures are available and can be implemented
- ▶ but, Need further researches of consequences on CVD
 - Assessment of OPA and LPA
 - Assessment of preventive strategies in work environment