



UNIVERSITY  
OF HELSINKI

# **IS THERE EVIDENCE ON EFFECTIVENESS OF PREVENTIVE INTERVENTIONS IN OLDER PEOPLE?**

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**DISCLOSURE:**  
No conflict of interest

# Take a minute to think about...

- Are you afraid of causing falls when prescribing antihypertensives to your frail older patients?
- Have you encouraged your obese 80 year-old patient to loose weight while having painful osteoarthritis?
- Do you have means to prevent older people's falls?
- Does your community offer older people's own exercise groups?
- Have you been worried about your older patient who seems to be so lonely?

# Outline of presentation

- Definitions and methodological considerations
- Evidence of prevention on risk factors in old age
- Evidence of prevention on geriatric syndromes
- Take-home-messages



**DEFINITIONS AND  
METHODOLOGICAL  
CONSIDERATIONS**

# Risk /protective factors in middle age – how far in old age do they apply?

## **RISK FACTORS**

- Age, male gender
- **Smoking**
- **High cholesterol**
- **High BB**
- **Obesity, diabetes**
- **Stress, depression**
- **Alcohol**

## **PROTECTIVE FACTORS**

- **Exercise, muscle strength**
- **Healthy diet**
- **Social activity, "social capital"**
- Genes
- Education

GRADE A =

Several high quality trials with positive findings

GRADE B =

At least one high quality trial with positive finding

GRADE C =

Lower quality RCTs /controlled trials with positive findings

GRADE D =

Case studies, epidemiological studies

- **Primary prevention** intends to avoid the development of disease.
- **Secondary prevention** attempts to treat an existing disease in its early stage before significant complications.
- **Tertiary prevention** aims to reduce the negative impact of established disease by restoring function and QOL.

Exercise, nutrition

e.g. treating hypertension to prevent CV diseases

e.g. Stroke+atrial fibrillation → warfarin



**ROOTS OF OLD AGE DISEASES  
AND DISABILITIES ARE IN  
MIDLIFE...**





Development of a disease takes 10 – 50 years



Prehypertension ► Hypertension + injury ► Hypertension + clinical disease

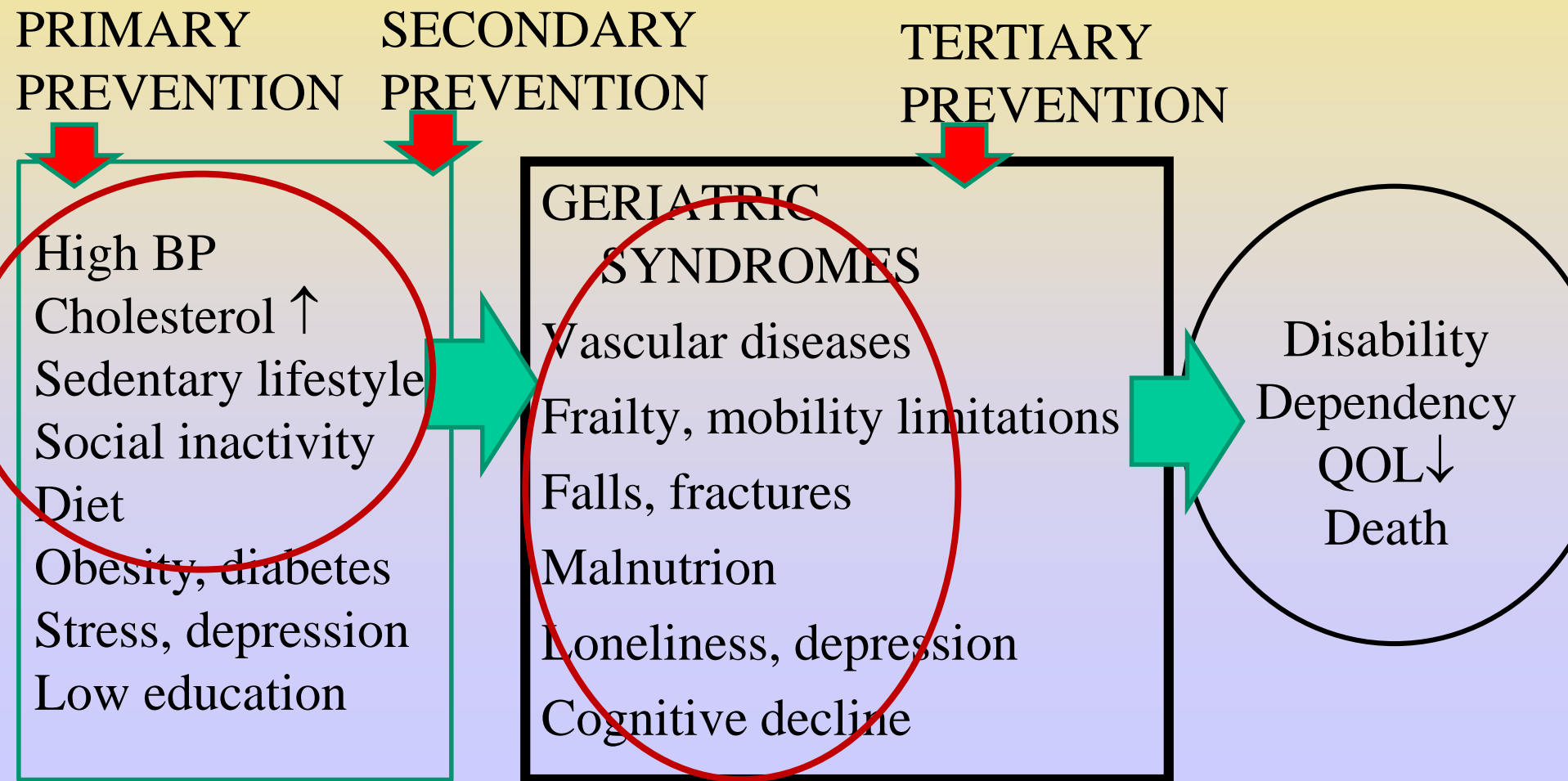


Cardiovascular risk

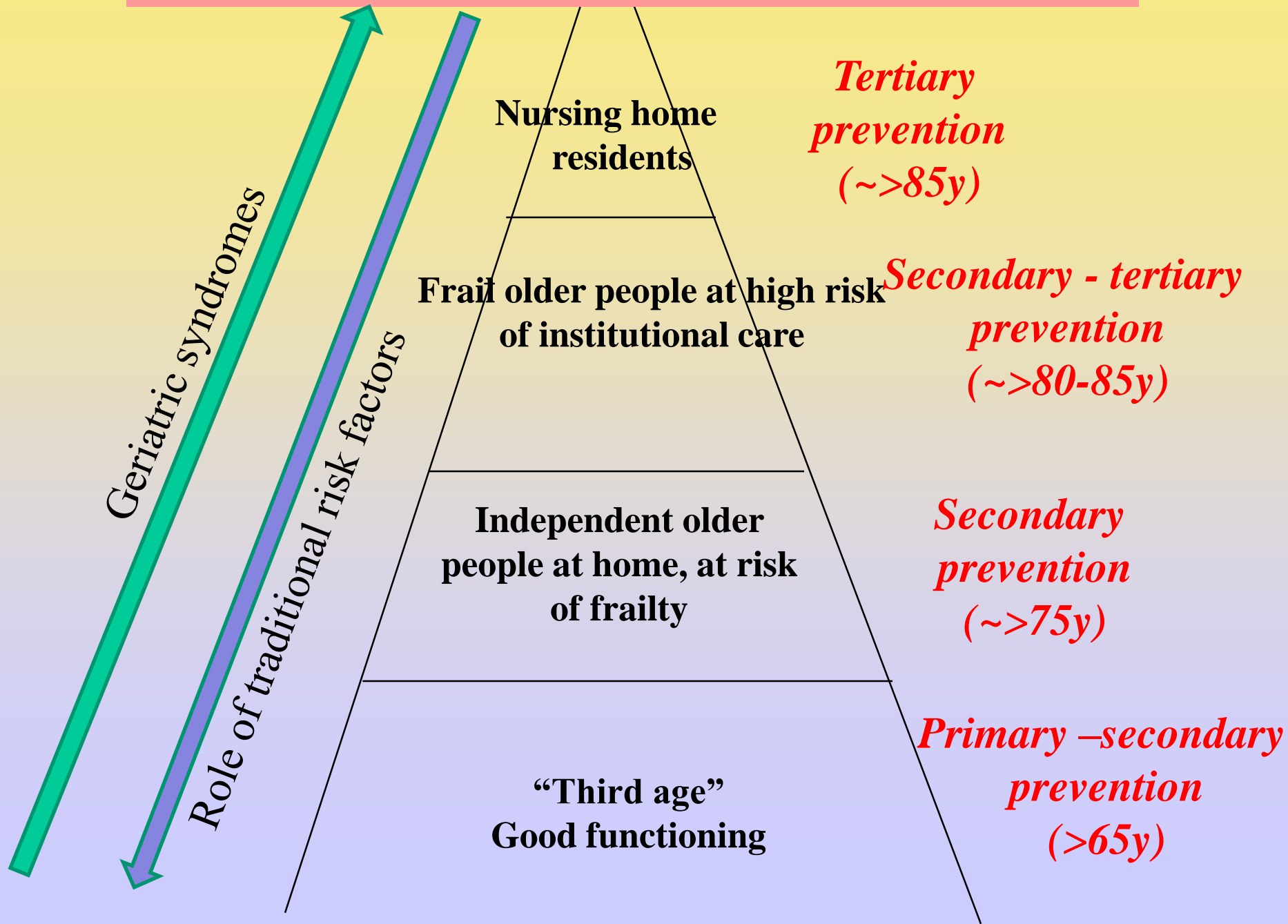


Starting treatment

# TARGETS OF PREVENTION IN OLD AGE: Risk factors and Geriatric syndromes



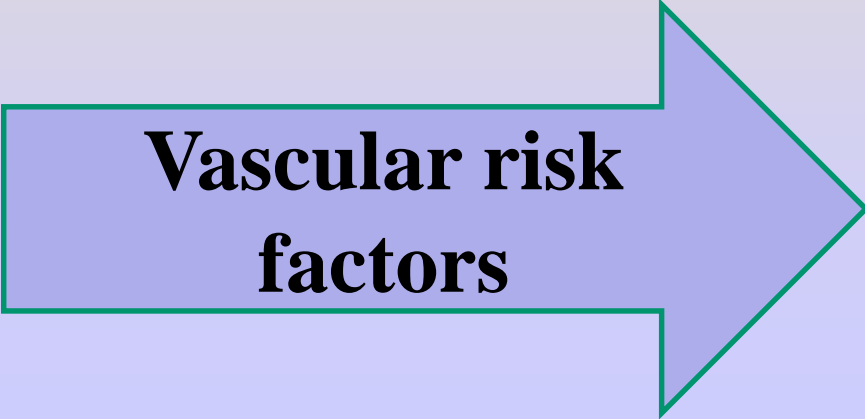
# Heterogeneous target groups in old age





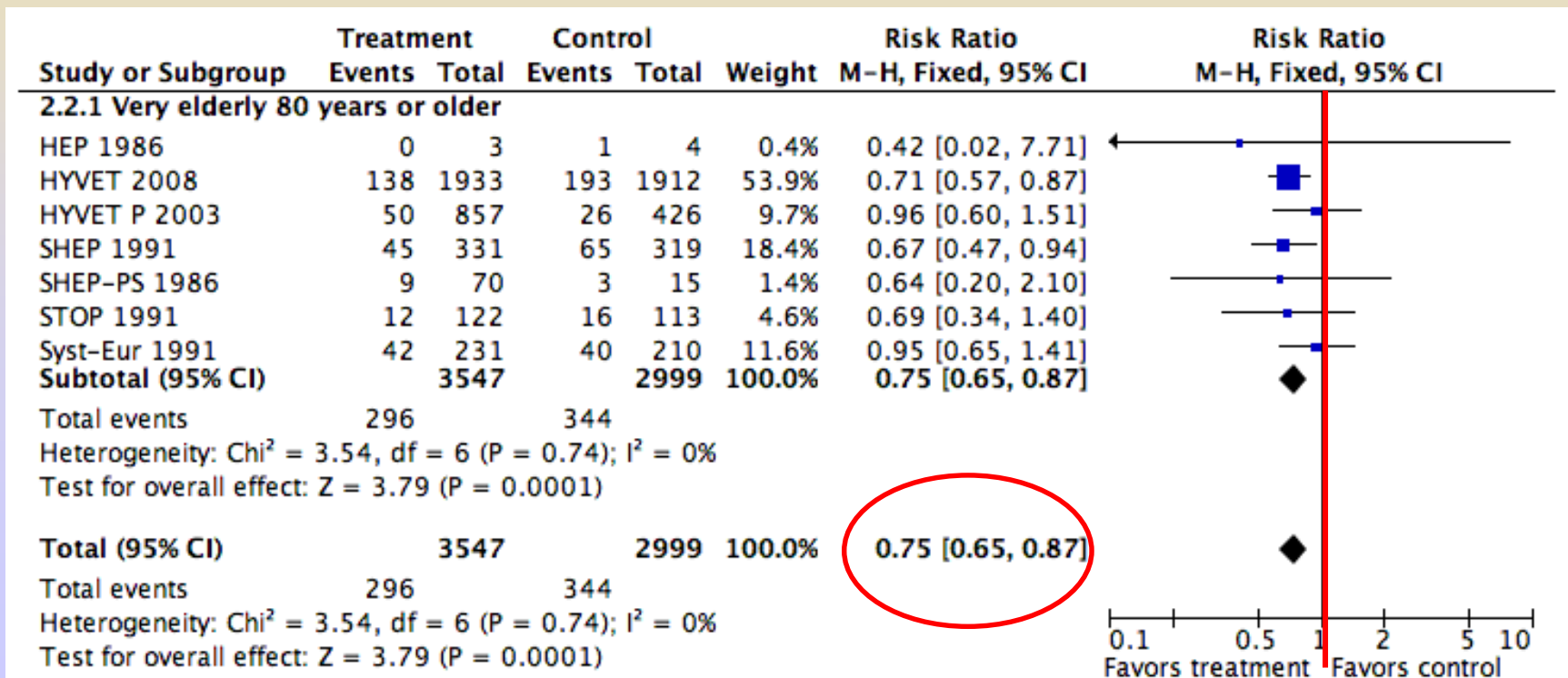
**TRADITIONAL RISK FACTORS  
– IS THERE EVIDENCE?**

**Vascular risk  
factors**

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# Strong evidence: Treatment of hypertension

- BP↑ risk for stroke, CHD and cognitive decline
- Even >80y modest lowering of sBP reduces CV-events and mortality (Musini et al. Cochrane 2009)
- NNT 31 (5y) to prevent on CV event (fatal or nonfatal)



# Further evidence...

- SPRINT trial: How low BP among old people?
- RCT (N=2637; 75y+): targets sBP <120 vs. sBP <140
- CV events HR 0.66 in <120 group vs. <140 group in 3 years follow-up
- Total mortality HR 0.67.
- No difference in outcomes among frail /non-frail subgroups
- No difference in hypotension, injurious falls

# Are statins beneficial for older people?

- Primary prevention among 60-83y-olds (N=51351)

(Roberts et al. J Gerontol 2007):

Total mortality RR 0.85

- Secondary prevention among 60-83y-olds

(N=19569) (Afilalo et al JACC 2008):

Total mortality RR 0.78

NNT 28

- Statins should be safe:
  - rhabdomyolysis 3-4/100 000 person years.
  - Myopathy (CK $\uparrow$ ) 11/100 000 person years.
  - Muscle aches ? Sarcopenia?



# Who benefits? → compare benefits/risks!

- Those with high risk (secondary prevention)
- Starting statins until age "83y"
- Do not stop a statin at age "83" if CV disease and no adverse effects
- Depends on "biological age"
- "The lower the better"

# Patient case: 86y old woman with CHD, TIA

- TIAx2 (dysphasia), CHD, HF, orthostatic HT, hallucinations when pyelonephritis
- Independent in IADL and ADL, MMSE 27/30
- Aspirin 100mgx1, isosorbidedinitrate 5mg 1/2x1, enalapril 5mg 1/2x1, ibuprofene 800mg 1x1, me
- Up mu weight 44kg, height 155cm
- Bigg

**KEY ISSUES:**  
**COMPREHENSIVE ASSESSMENT**  
**PATIENT PREFERENCES**  
**CONTINUITY OF CARE**

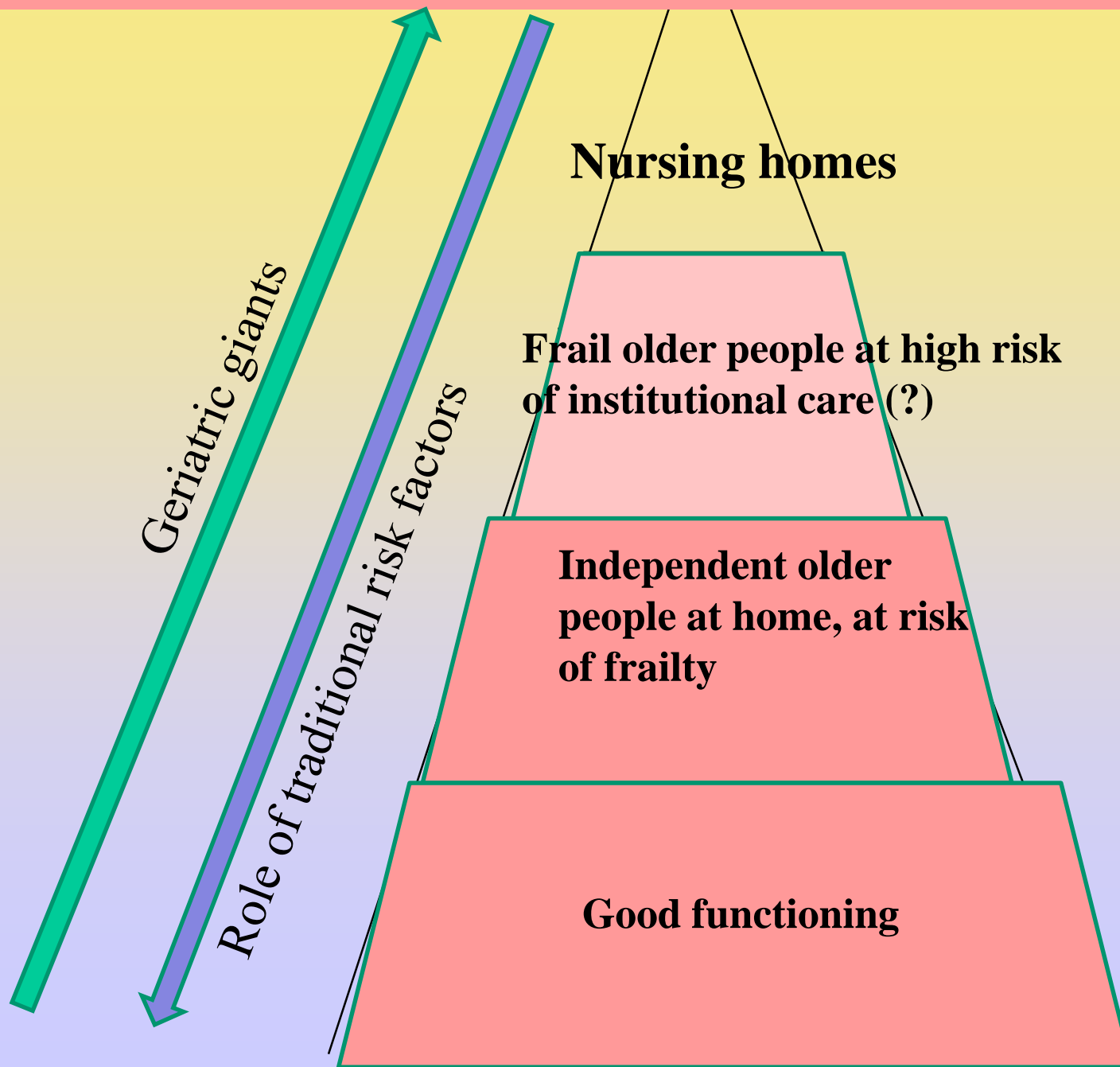
Statin,  
losartane, Vit D  
clopidogrel Stop nitrate,  
furosemide

PPI  
Stop ibuprofene

Follow-up ne

Re Stop trimetoprim ?

# Strong evidence concerns in BP and chol lowering....





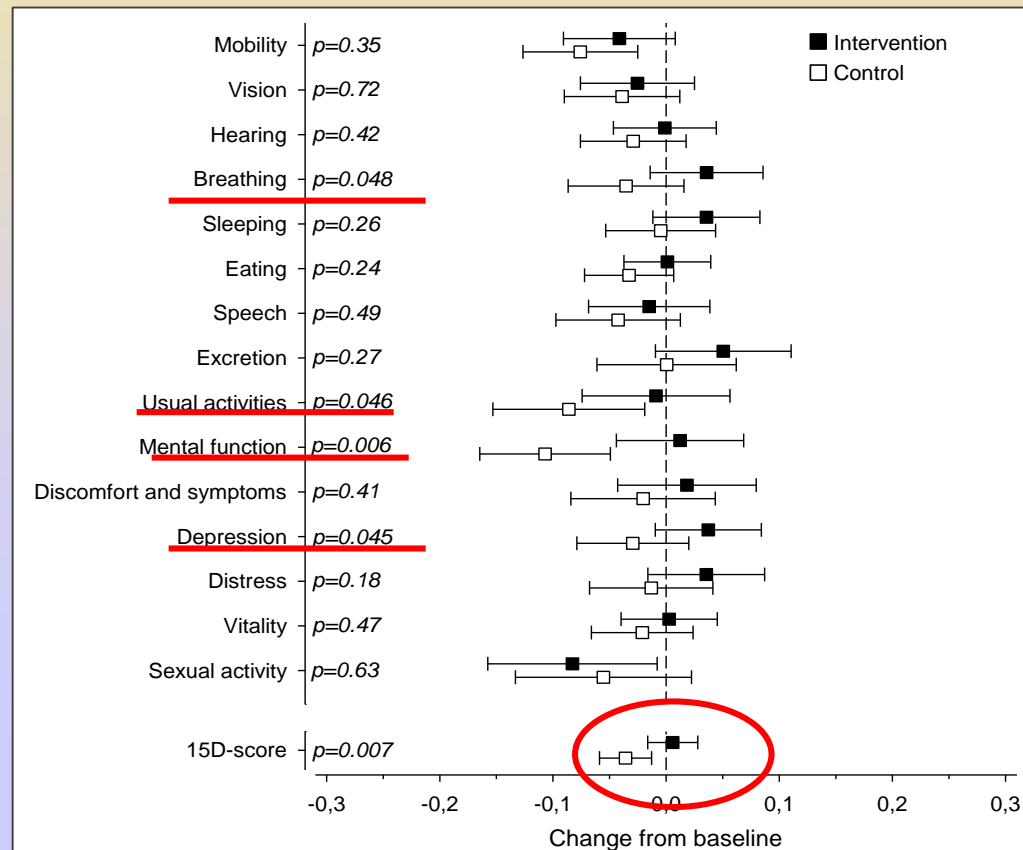
**Nutrition**

# Paradoxes of nutrition among older people...

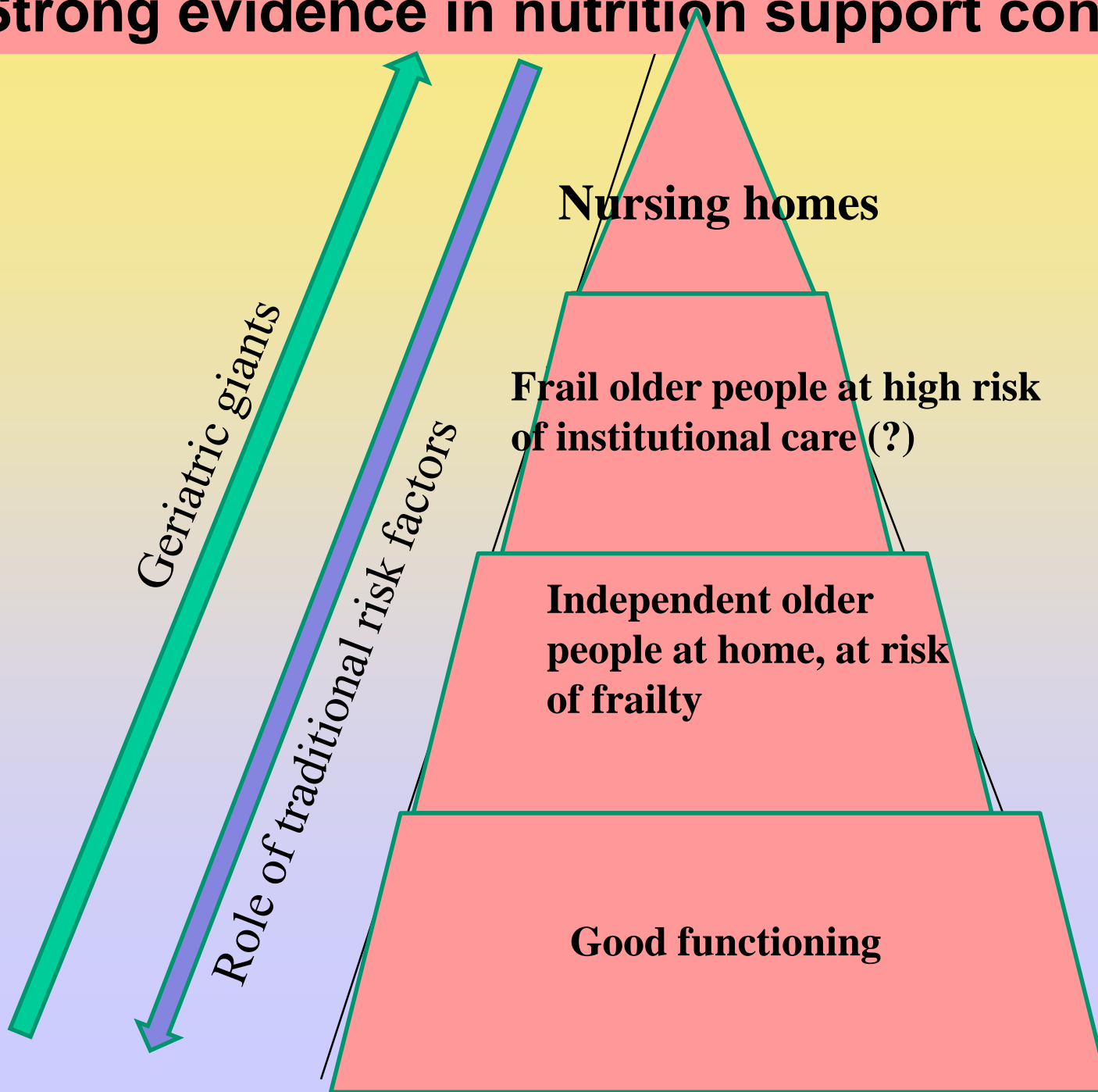
- Obesity may be risk factor among the youngest old
- >70y malnutrition is even stronger risk factor
  - Sarcopenia, frailty, disabilities, falls, fractures
  - Exposes to infections
- **Strong evidence:**
  - Protein & energy supplementation (62 trials, N>10'000) mortality RR 0.79
  - Vit D (20-25yg/d) reduces falls and fractures RR 0.81
- No evidence on other vitamin supplements

# NuAD Trial

- 99 AD couples randomized into two arms
- Tailored nutrition guidance based on assessments in home visits, food diaries
- Protein intake increased
- Improved HrQOL
- Less falls



# Strong evidence in nutrition support concerns ....

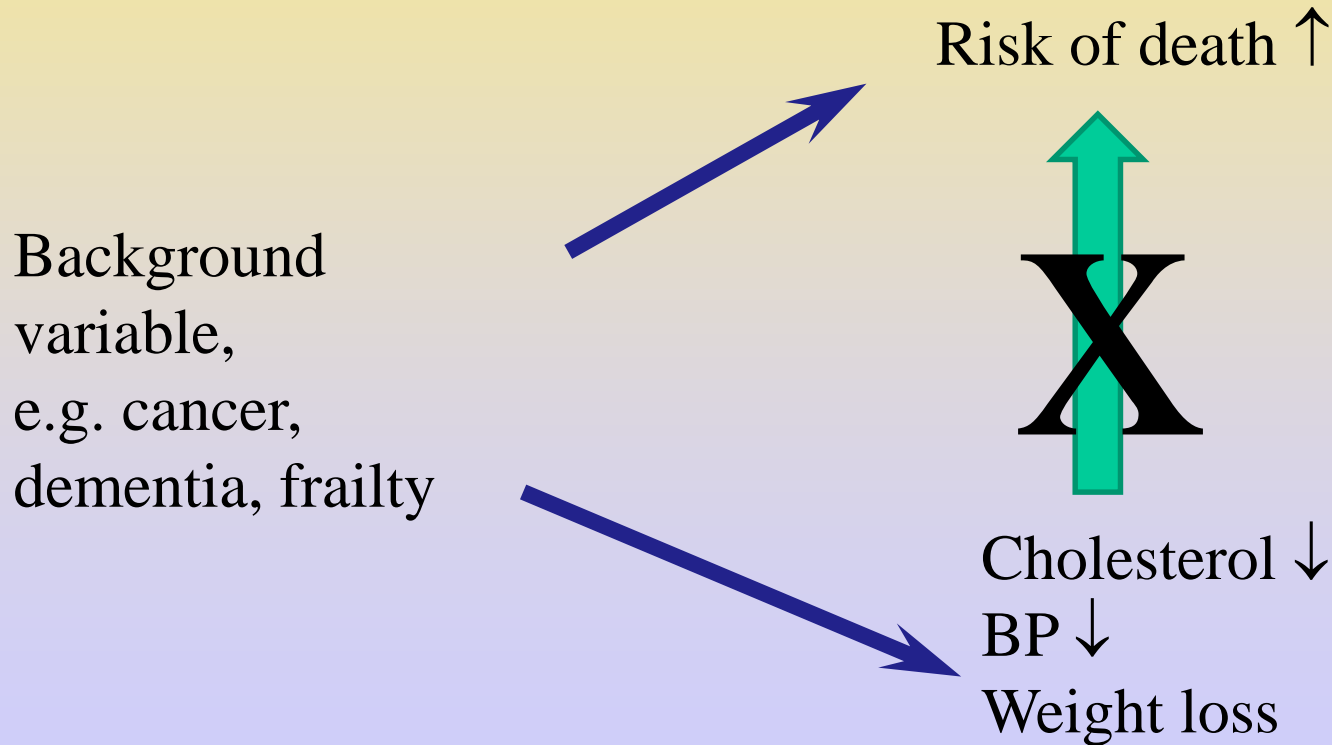




**OLD AGE PARADOXES – TO  
WHOM DO THE RISK  
FACTORS APPLY TO?**

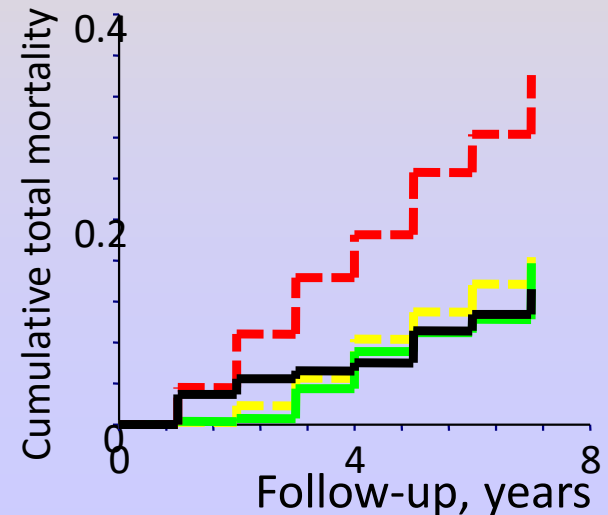
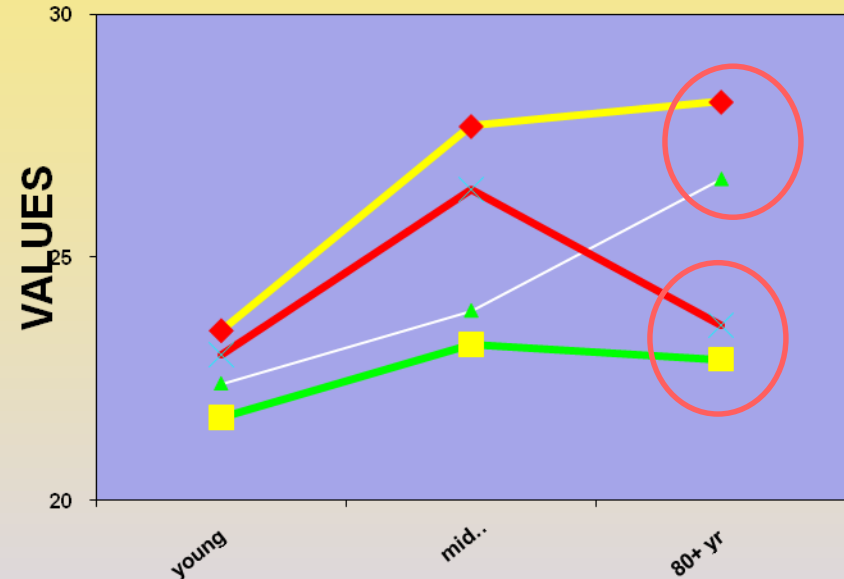


# Risk markers may turn upside down among >80y olds: chol, BP, obesity...

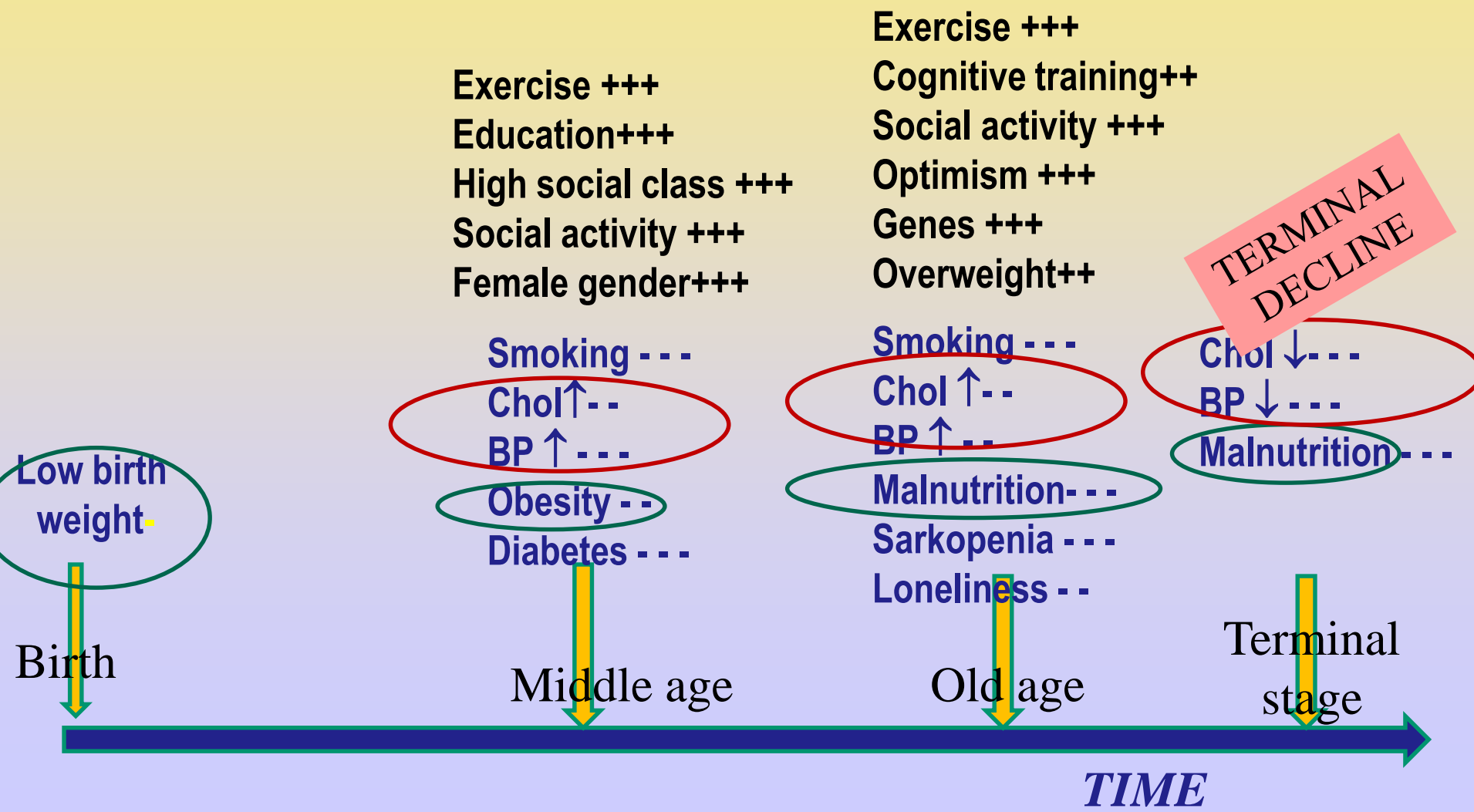


# CONCEPT: TERMINAL DECLINE

- Before death
  - BP declines
  - Cholesterol values decrease
  - ALT decreases
  - Weight loss



# RISK & PROTECTIVE factors/markers change during life span ...





**Exercise,  
physical activity**

# **STRONG EVIDENCE: Exercise realizes successful aging!**


- 121 randomized controlled trials (N=6700) on strength training in older adults (Liu & Latham Cochrane Database Syst Rev 2009):
  - Improves physical functioning (33 trials)
  - Decreases functional limitations (24 trials)
- Cohort studies: Physical activity in middle age decreases risk of cognitive decline and dementia in old age (Sofi et al. J Intern med 2011, Hamer & Chida. Psychol Med 2009)

# Exercise and cognition

- Physical exercise (12 rcts) to improve cognitive functioning (Young et al. Cochrane 2015): no clear evidence
- Exercise may improve cognition in mild cognitive impairment (Öhman et al. Dem Geriatr Cogn Dis 2014)
- Aerobic training increases size of hippocampus (Erickson 2011)

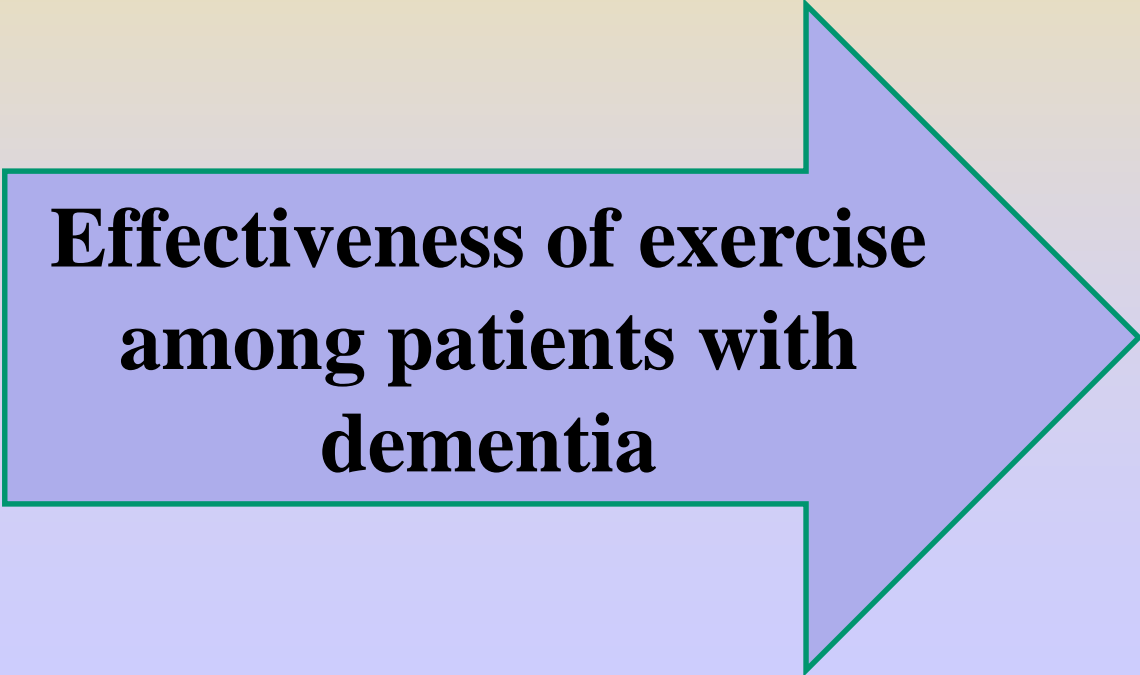
# **FINGER study** (Ngandu et al. Lancet 2015)

- Background: midlife cholesterol, BP, exercise activity, diet, smoking, obesity and education predict dementia
- 1260 older people (60-77y) at risk for cognitive decline were randomized into multicomponent intervention (exercise, healthy diet, cognitive training, BP & chol lowering) for one year vs. controls
- Among controls higher risk (OR 1.31) for cognitive decline compared with intervention



**INTERVENING GERIATRIC  
SYNDROMES – IS THERE  
EVIDENCE? EXAMPLES OF  
TERTIARY PREVENTION**





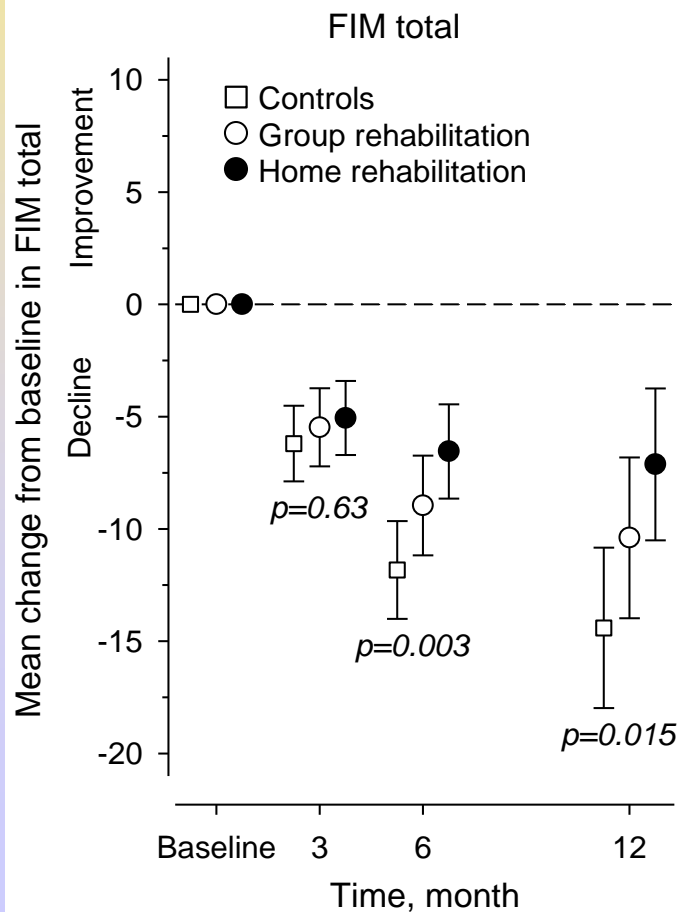
**Effectiveness of exercise  
among patients with  
dementia**

# FINnish ALzheimer patients' EXercise study (FINALEX trial) (RCT)...

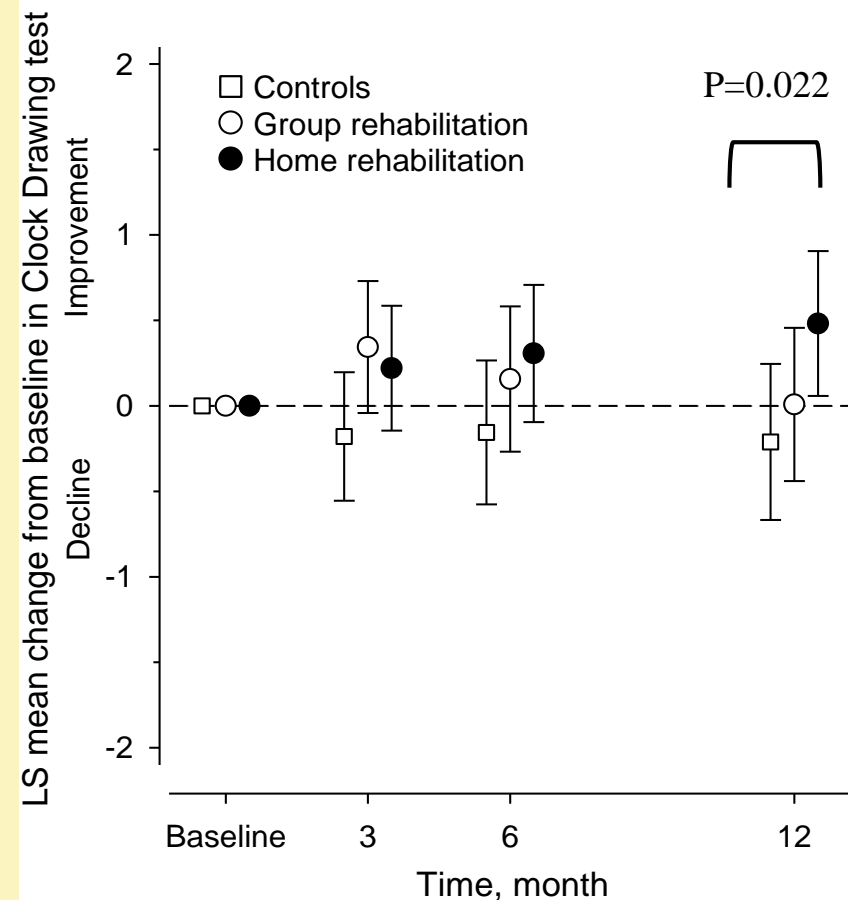
- 210 patients with Alzheimer's disease
- Randomized into:
  - Physiotherapist tailoring home-based exercise  
1hour x 2/wk for 12 months
  - Group-based exercise in day center 4hours x2/wk  
for 12 months
  - Controls in normal communal care

# FINALEX, results:

## Prevents disability



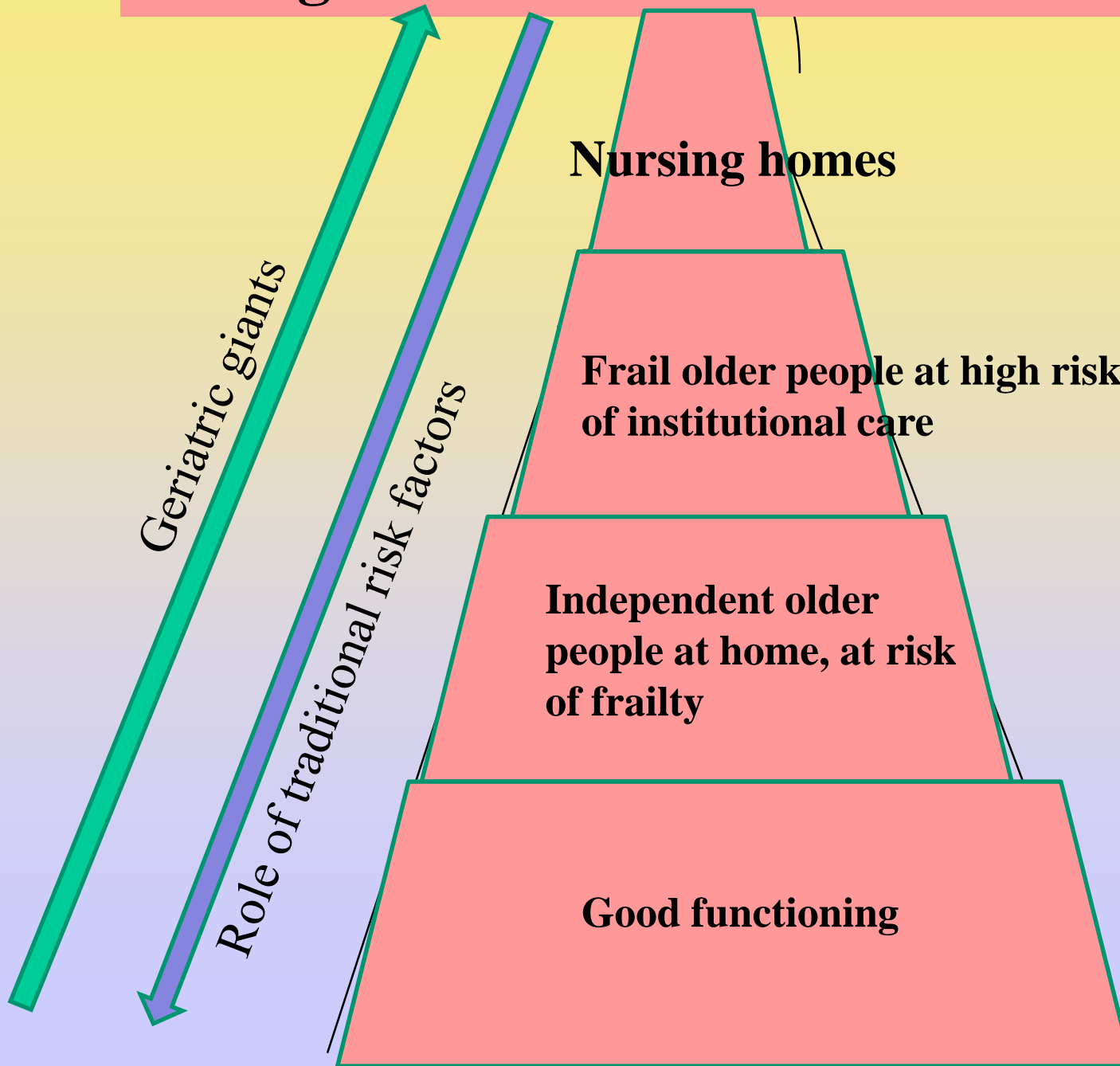
## Improves cognition



# Use and costs of health and social services

- Control group (C) **25 618€**/ person year
- Group exercise **16 567€**/ person year (p=0.031)
  - Exercise costs 7194€/person
- Home-based exercise **18 854€**/ person year (p=0.13)
  - Exercise costs 5994€/person
- Exercise intervention improved functioning without increasing health and social care costs

# Strong evidence of exercise concerns....





**Preventing falls  
and fractures**

# Preventing falls among older people...

- 111 RCTs in home-dwelling older people (N>55'000)
- Strong evidence (AGS 2011) :
  - Multicomponent interventions (morbidities, drugs, exercise, education, environment)
  - Reducing the use of psychotropic drugs (RR 0.34)
  - Optimizing the use of drugs ( RR 0.61)
  - Group exercise training (RR 0.78)
  - Individual exercise training (RR 0.66)
  - Vitamin D (RR 0.81)

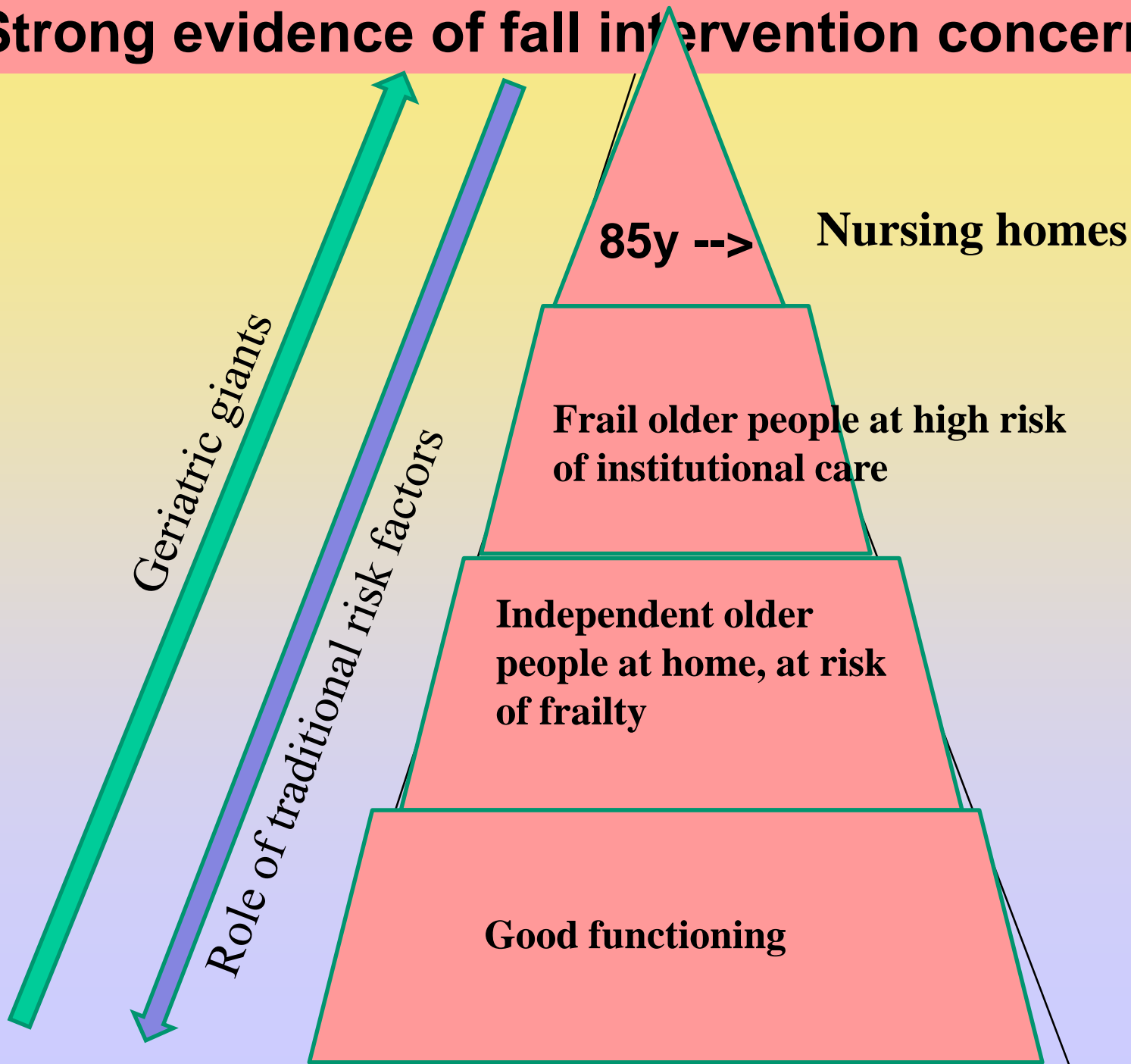
# FINALEX, effects on falls...

	<b>Group based exercise (N=62)</b>	<b>Home-based exercise (N=63)</b>	<b>Controls (N=66)</b>	<b>P-value<sup>1</sup></b>
<b>Falls, total no</b>	<b>101</b>	<b>83</b>	<b>171</b>	
<b>Incidence rate</b>	<b>1.86</b>	<b>1.35</b>	<b>3.07</b>	<b>0.0052</b>

<sup>1</sup> Tested with Poisson's regression model



# Strong evidence of fall intervention concerns ....

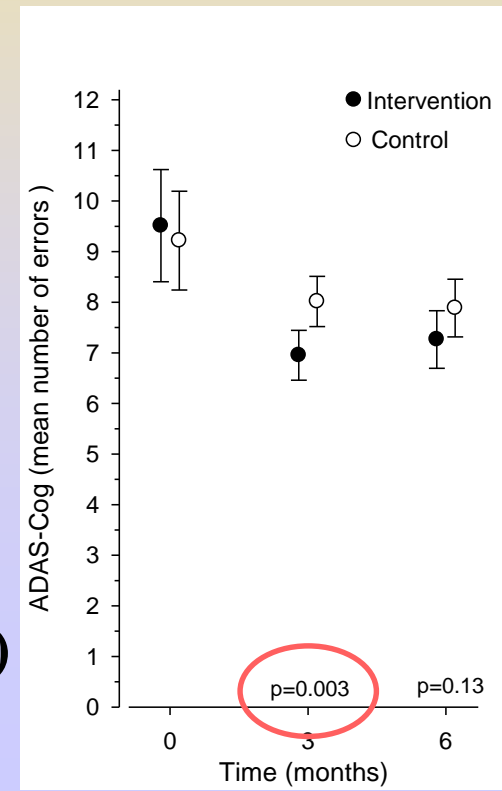


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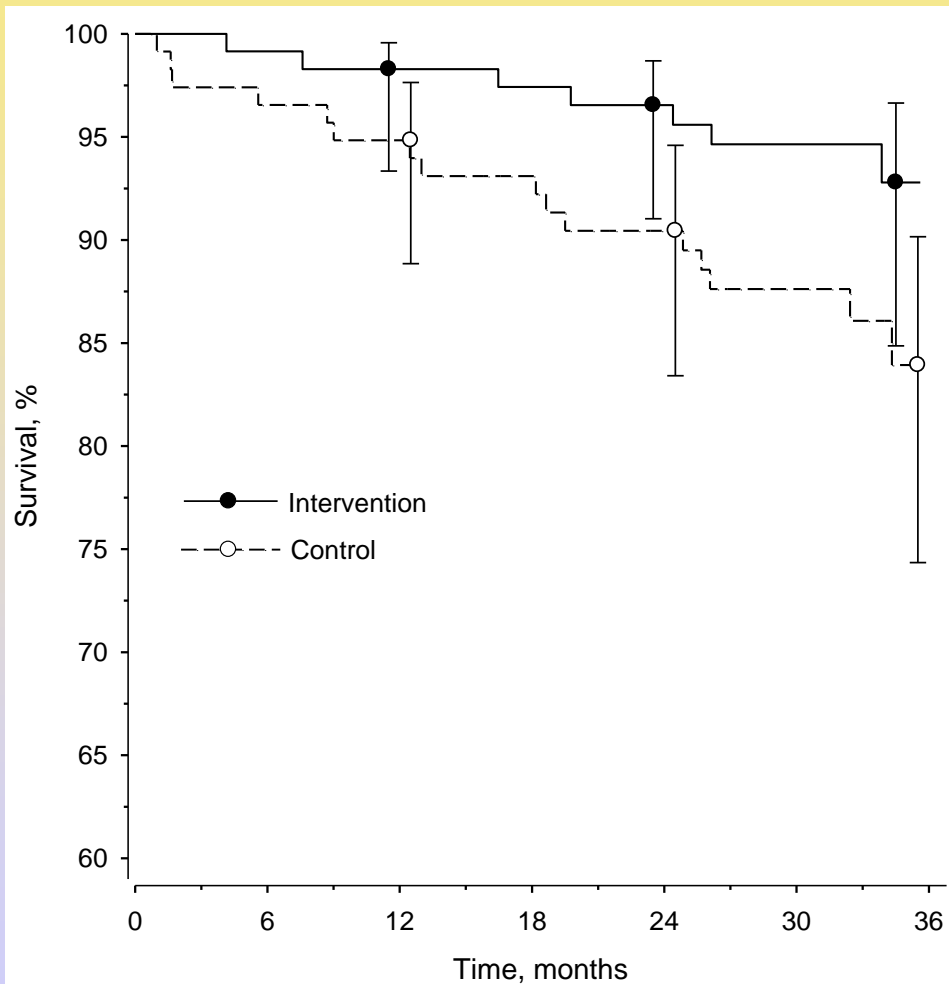
**Loneliness**

# Loneliness predicts cognitive decline, disabilities and death...

- **Participants:** lonely older people (RCT; N=235, mean age 80)
- **Intervention:** psychosocial group intervention to empower older people, support their self-management skills and active agency. Facilitation of peer support + group dynamics.
  - 8/group . 1 day/wk for 3 months
  - Contents: art activities, exercise, writing, interaction
- Results:
  - More friends, QOL improved,
  - cognition improved
- **Use of health services decreased 34% (p=0.020)**



# Risk of death decreased in 3 years...

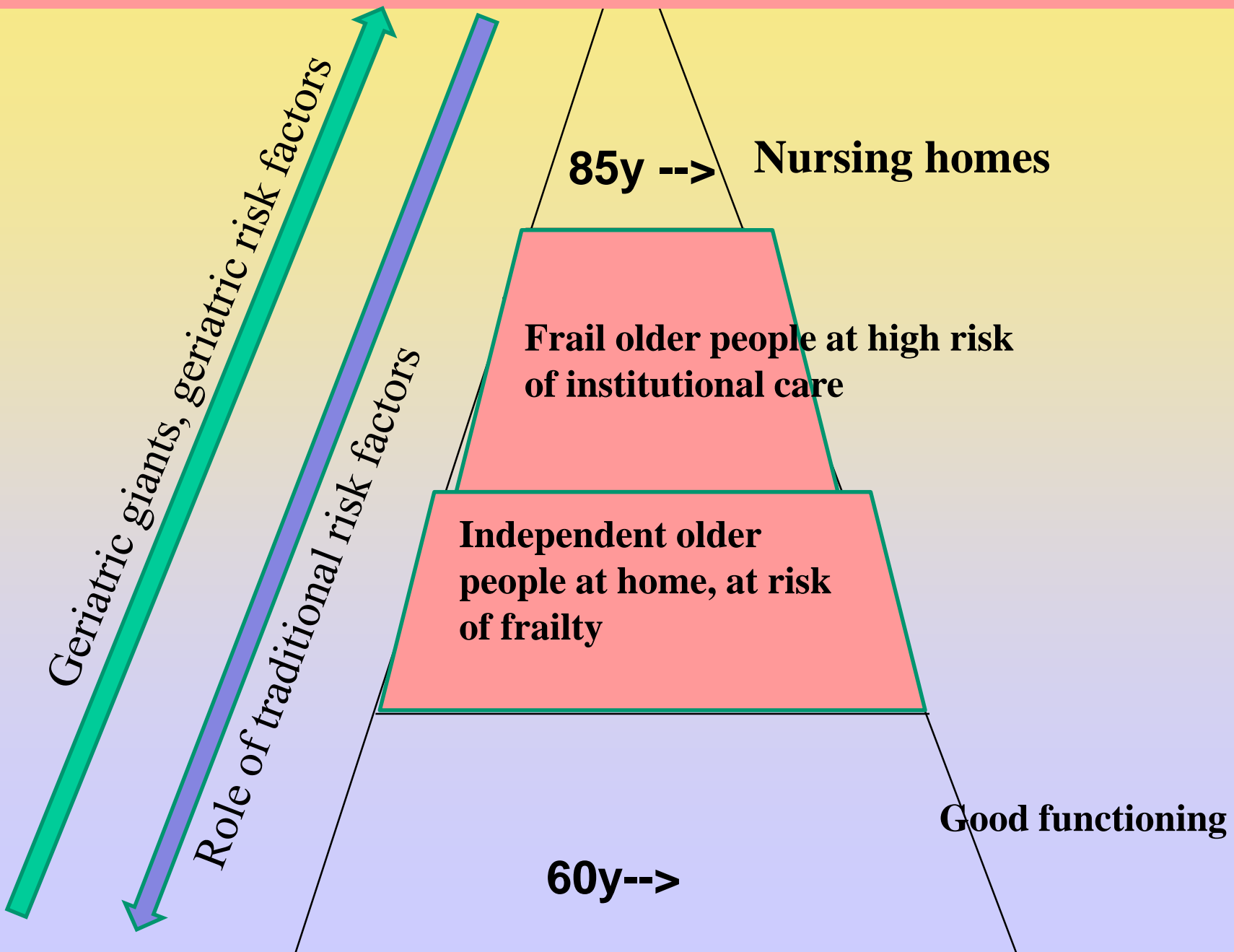


Mortality

HR 0.39 (95% CI 0.15 to 0.98)

P=0.044

# Grade B evidence of group intervention concerns ....



85y --> Nursing homes

Frail older people at high risk of institutional care

Independent older people at home, at risk of frailty

Good functioning

60y-->

*Geriatric giants, geriatric risk factors*

*Role of traditional risk factors*

**ESSENTIAL CONCEPTS  
IN PREVENTIVE  
INTERVENTIONS→**

**Not only WHAT but  
HOW!**

# Prevention relies on patient's active agency!

- Being a bystander in life and not having meaningful roles →
  - no motivation to take care of yourself

# Self-management

- Self-management is patient's ability to organize his/her life under the influence of a chronic disease, to engage in activities and to use knowledge to protect and promote health.
- Evidence in asthma, heart failure, diabetes...



# Self management concepts

- Patient **empowerment** → to be an active agent of your own life
- **Self-efficacy, mastery**
  - Problem solving skills, self-awareness to make own decisions and take responsibility for them
  - Planning one's own actions, make objectives for them and make plans for the future

# How to support self-management?

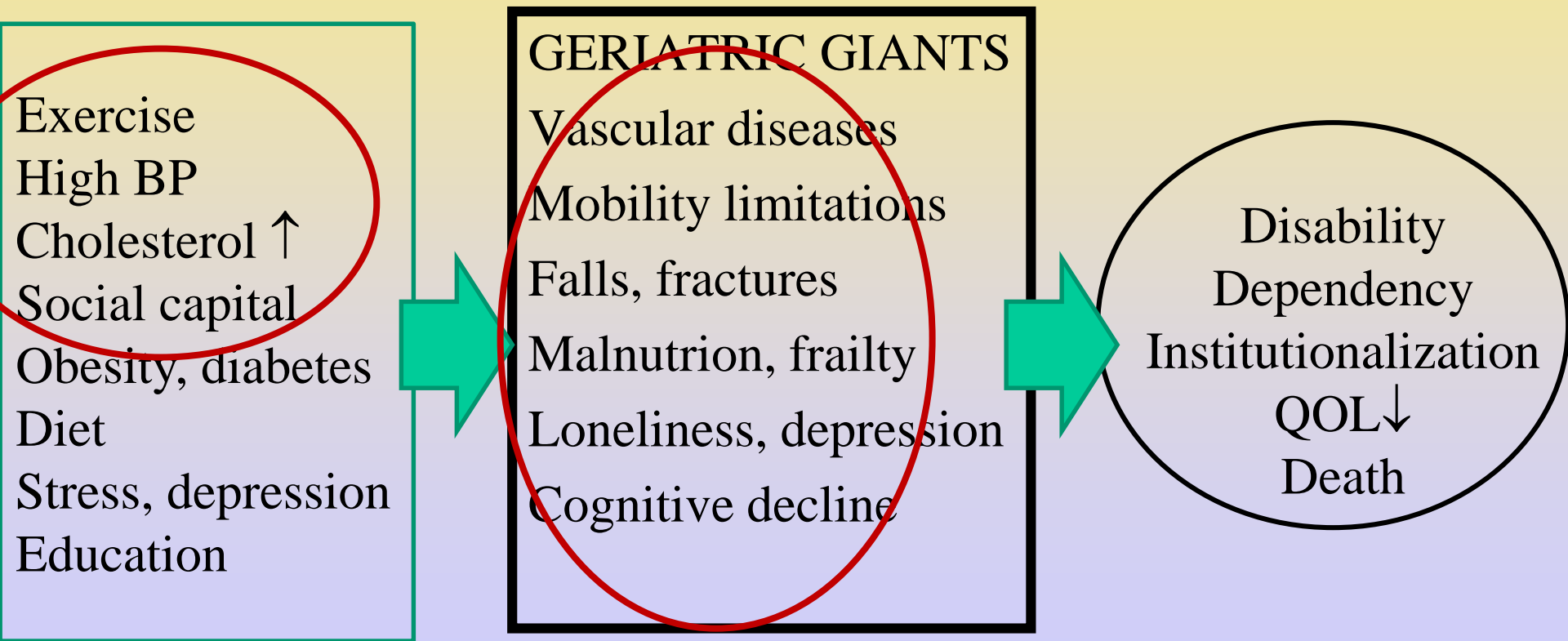
- Patient-centeredness, support autonomy
- Optimism: Point out strengths + resources → Positive feedback
- Partnership! Patient gets a feeling of an equal relationship with professionals: dares to ask questions, feeling of self-efficacy
- Coaching! Ability to find information and to solve problems



**CONCLUSIONS AND  
TAKE HOME MESSAGES**

# TARGETS OF PREVENTION IN OLD AGE:

## Risk factors and Geriatric syndromes



# Take home messages

- There is **plenty of evidence on prevention** targeted on both risk factors and geriatric syndromes
- **Target** your intervention on those who benefit
- Take into account your **patient's preferences** – prevention relies on **empowerment, motivation, active agency!**

# Optimizing drug treatment in institutional care

- Wards in assisted living facilities were randomized → nurses received training in harmful drugs for older people vs controls
- N=227
- Less falls
- Improved QOL

