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# Economic evaluation of health promotion and primary prevention actions for older people – a systematic review

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# Research questions:

- **RQ1** - What **types** of health promotion and/or primary prevention programs for older population are subjects to economic evaluation?
- **RQ2** - What economic evaluation **methods** are used in the assessment of health promotion and/or primary prevention programs for older population?
- **RQ3** - What is the **quality** of the studies on economic evaluation of health promotion and/or primary prevention programs for older population?
- **RQ4** - What are the **results** of the studies on economic evaluation of health promotion and/or primary prevention programs for older population in terms of cost-effectiveness?

# Eligibility criteria:

- Participants: population aged 65 years or older
- Intervention: health promotion and primary prevention programs
- Type of studies: full economic evaluation (*both costs and consequences assessed; the efficiency ratio not necessary*)
- Language: English, Polish, German
- Publication years: 2000 - 2015

# Data sources:

- Electronic databases (5): MEDLINE via PubMed, EMBASE, The Cochrane Library, National Health Service Economic Evaluation Database (NHS EED) and Health Technology Assessment Database via Centre for Review and Dissemination
- Websites of institutions or projects (23) related to the topic (mainly HTA and Public Health Agencies)
- Reference lists of relevant papers

# Search terms

## Population

- aged [Mesh] OR "aged" OR "elder" OR "elderly" OR "older" OR "older adult" OR "older adults" OR "older people" OR "above 65 years" OR "senior" OR "seniors" OR "pensioner" OR "pensioners" OR geriatrics [Mesh] OR "geriatrics"

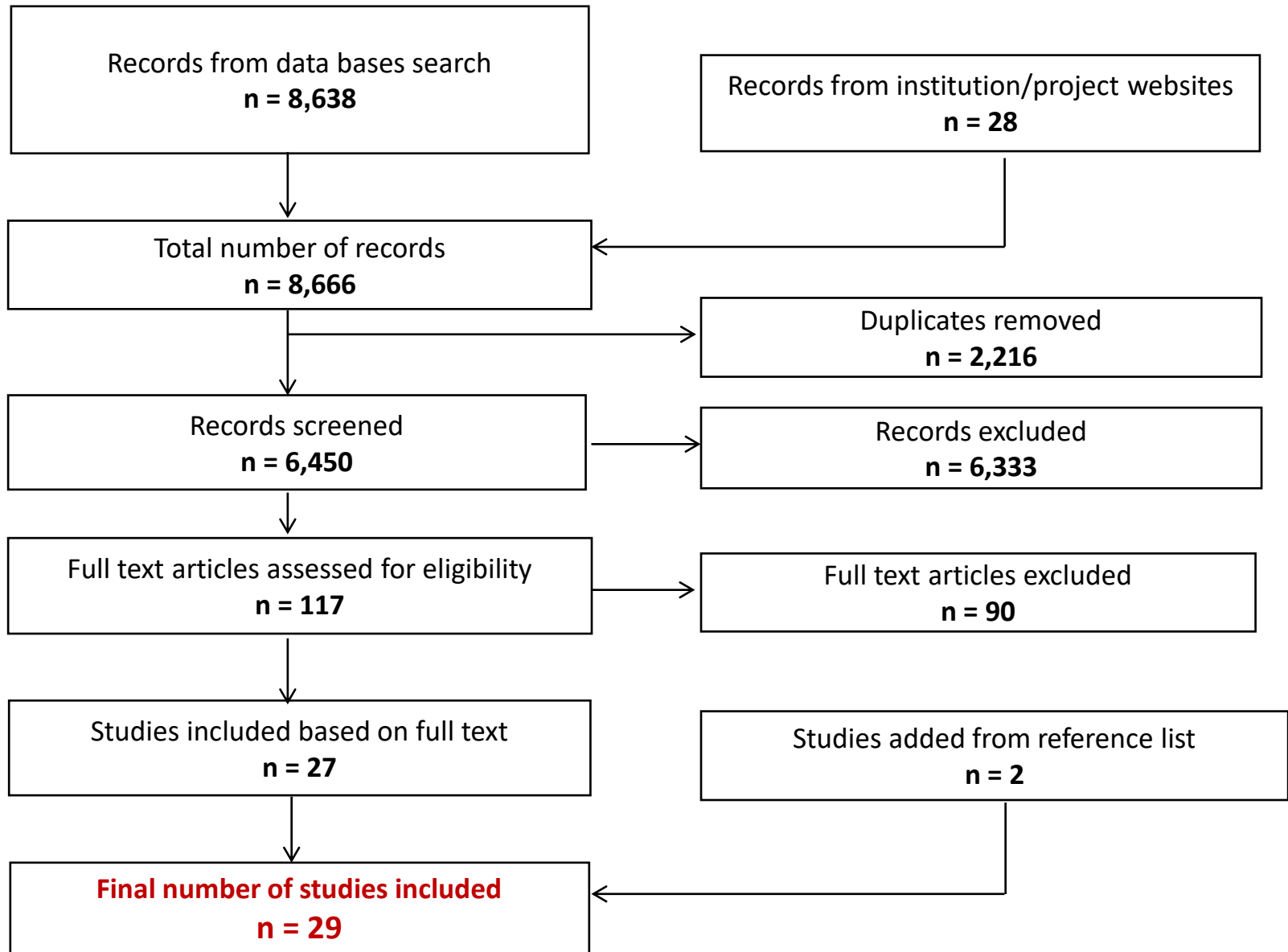
## Intervention

- health promotion [Mesh] OR "health promotion" OR "promotion of health" OR "health promoting" OR health education [Mesh] OR "health education" OR "health campaign" OR "health campaigns" OR "healthy aging" OR "positive aging" OR "active aging" OR "health communication" OR "community support" OR "community health" OR "social support" OR "social activities" OR "environmental change" OR "environmental changes" OR "health policy" OR "community service" OR "community services" OR "disease prevention" OR primary prevention [Mesh] OR "primary prevention"

## Type of study

- cost-benefit analysis [Mesh]) OR "cost benefit" OR "cost effectiveness" OR "cost utility" OR "cost analysis" OR "cost analyses" OR "cost consequence" OR "economic evaluation" OR "economic evaluations" OR "economic analysis" OR "economic analyses" OR "costs and benefits" OR "benefits and costs" OR "costs and outcomes" OR "marginal analysis"

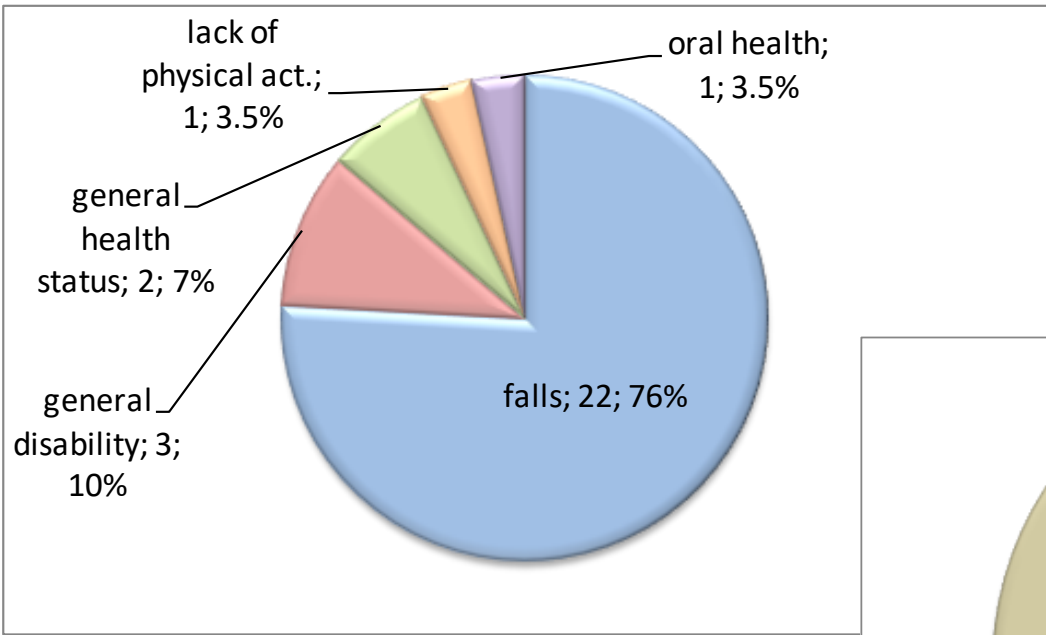
# PRISMA flow diagram



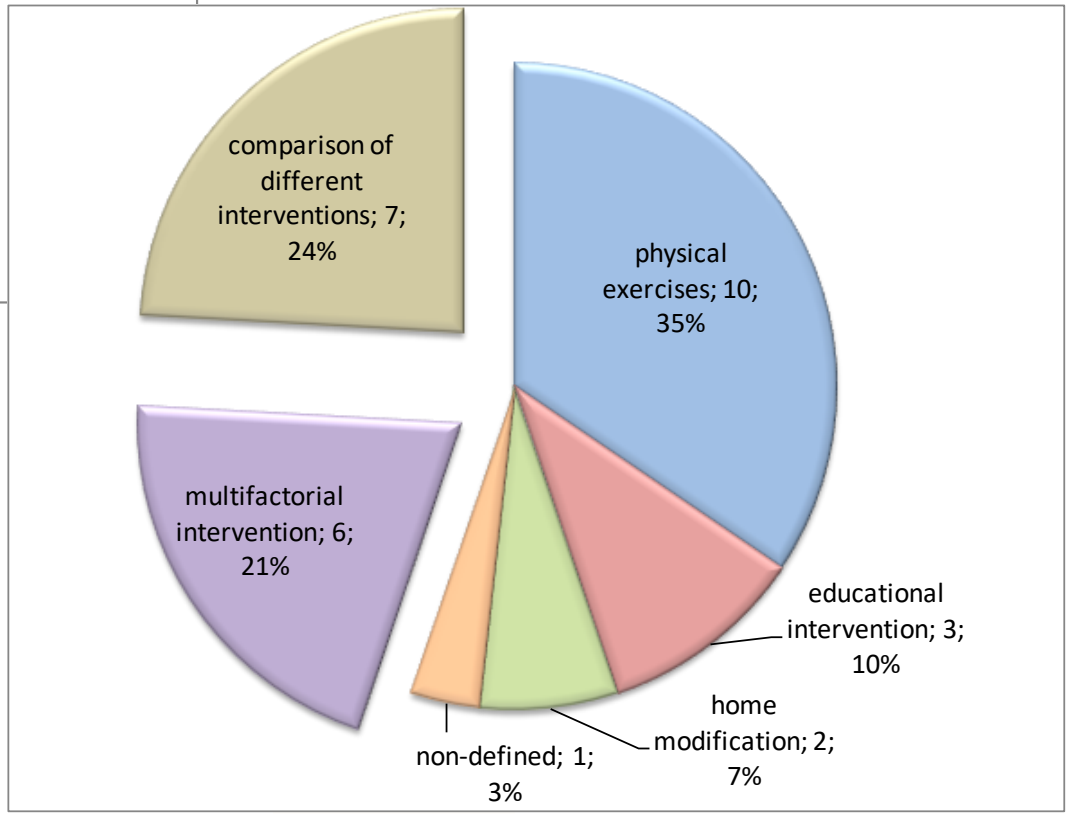
# RESULTS

# Type of programme

## Type of problem



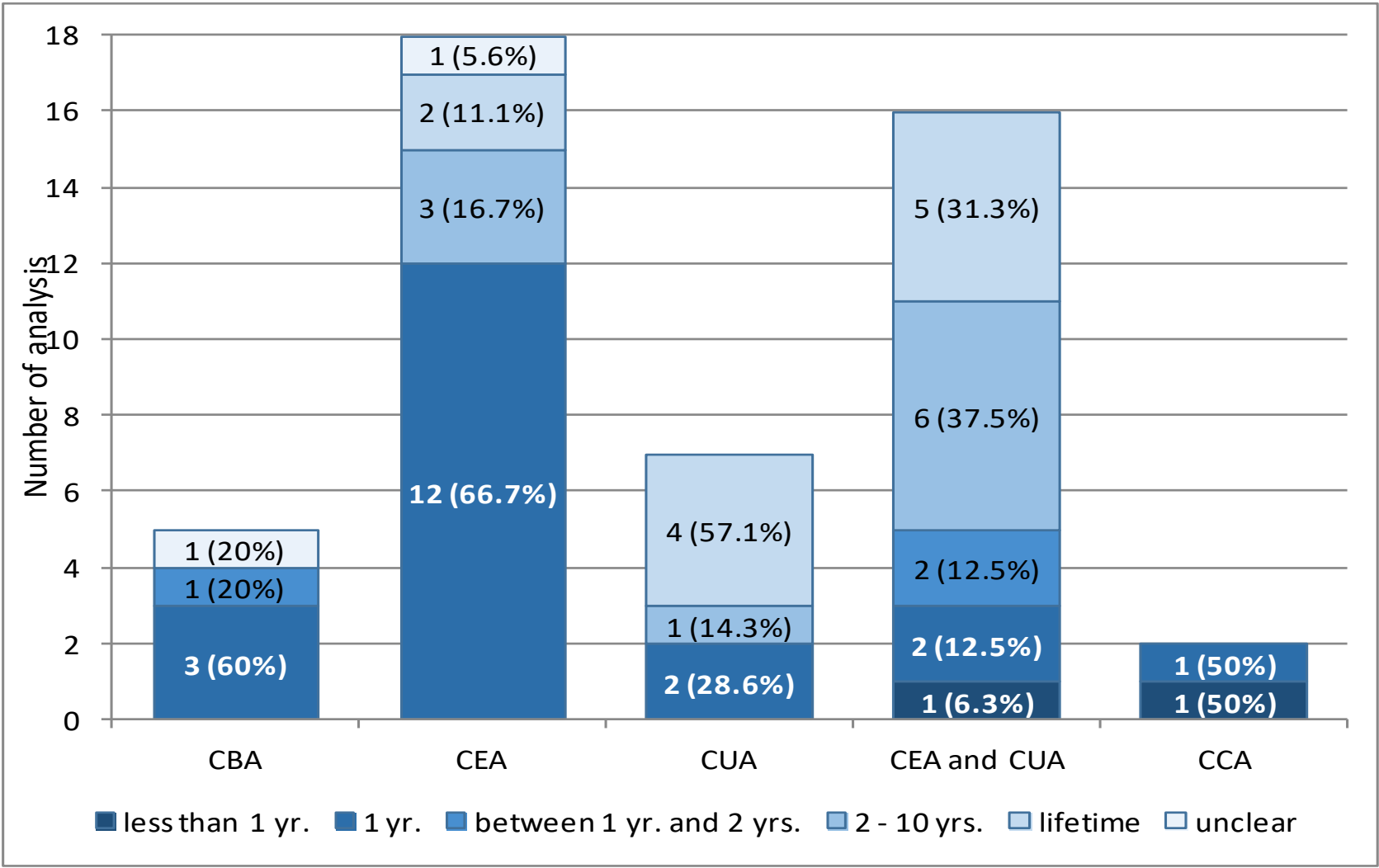
## Type of action





# Economic evaluation methods and time horizon

Results – RQ2



No. of studies: CBA=3; CEA=13; CUA=3; CEA and CUA=8; CCA=2

# Perspective of study

- Payer/provider – 15 studies (52%)
- Societal - 12 studies (41%) (Recommended)
- Unclear – 2 studies (7%)

# Type of costs measured

- Cost of intervention (all)
- Prevented costs of the medical care (21)
- Productivity costs/unpaid labour (4)
- Informal caregiver time (4)
- Costs of care in the gained life years (1)

# Type of outcome measured

Results – RQ2

- Avoidance measure: prevention of incidents (falls/fallers (15), fractures, accidents), health service utilization avoided (19)
- Utility measure: QALY (11)
- Health status measure (functionalstatus, active life, dental health) (8)
- Monetary measure (3)
- Fear of falling, social outcomes (1)

# The main limitations stated by authors (1)

Results – RQ2

Three studies do not indicate them clearly

- Costs or/and benefits identification/measurement problems:
  - not all cost and/or benefits included or not fully measured
  - costs not restricted to those related to intervention
- Uncertainty of variables due to:
  - assumptions instead of real data
  - lack/poor quality of data, data adopted from other countries/small groups or based on secondary research
  - weaknesses of methods used
  - extrapolation used (from short time or trial)

# The main limitations stated by authors (2)

Results – RQ2

- Short time horizon
- Problems with sample:
  - low participation rate/high refusal or dropout rate
  - method of sample selection/size calculation may be not proper
- Problems with generalizability and comparability:
  - specific group of participants, programme location
  - specific outcome measure
  - single intervention considered – in reality overlapping of several programmes often occurs

**No indications of problems connected with the specific character of HP4OP**

# Quality assessment of study

## 1. Based on Drummond’s checklist:

Assessment criteria		Yes	No	Unclear	N/A
1.	Was a well-defined question posed in answerable form?	25		4	
2.	Was a comprehensive description of alternatives given?	24		5	
3.	Was there evidence that effectiveness had been established?	27	1	1	
4.	Were all the important and relevant costs and consequences for each alternative identified?	12	10	7	
5.	Were costs and consequences measured accurately/appropriately?	22		7	
6.	Were costs and consequences valued credibly?	20		9	
7.	Were costs and consequences adjusted for differential timing?	7	6	1	15
8.	Was an incremental analysis performed?	27		2	
9.	Was allowance made for uncertainty?	21	5	3	
10.	Did presentation/discussion of results include all issues of concern?	25	4		

Drummond, Sculpher, Torrance, O’Brian, & Stoddart, 2005

Possible answer: YES – NO – UNCLEAR – N/A (not applicable)



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# Quality assessment results (based on Drummond)

Results – RQ3

- The scoring system applied (depending on the number of „YES” and „N/A” answers)
  - good quality (9-10): **11 studies** (4 studies of max. score 10/10)
  - moderate quality (6-8): **14 studies**
  - poor quality (up to 5): **4 studies**
- In most cases the problems of quality result from a lack of/imprecise information



# Quality assessment results

2. Based on additional criteria related to the specific character of the economic evaluation of HP4OP

Criteria related to specific features of HP programs:		Yes	No	uncl.	N/A
1.	Societal perspective	12	15	2	-
2.	Equity considerations	-	29	-	-
Criteria related to the specific target group (older people)					
3.	Informal caregiver time	5	8	-	16*
4.	Productivity costs (including unpaid work)	4(2)	9	1	15
5.	Costs incurred in life years gained (unrelated to the intervention)	1	28		-
6.	“Beyond-health” benefits /Specific preferences of OP	4	24	1	-

\* 1 study is situated in a nursing home



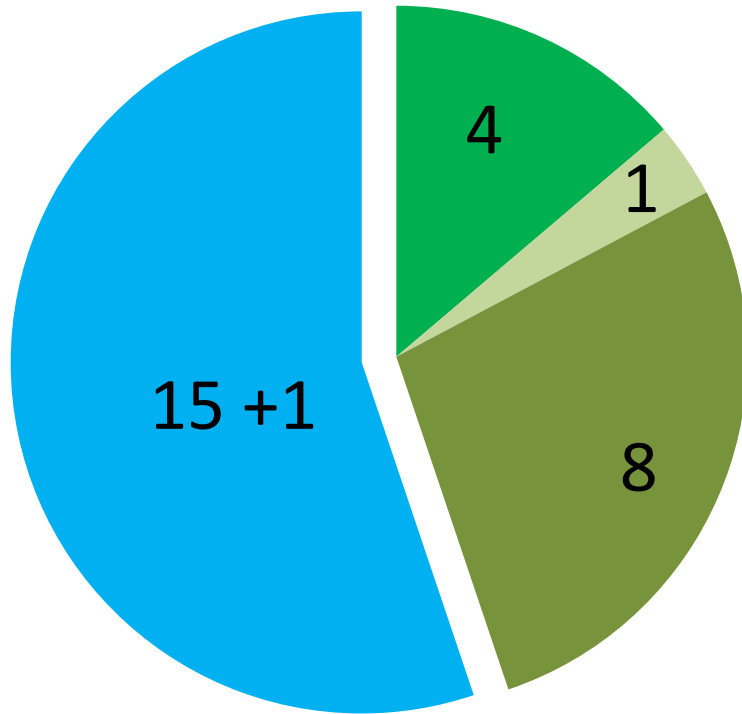
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# Quality assessment results

## Consideration of informal care-giver time:



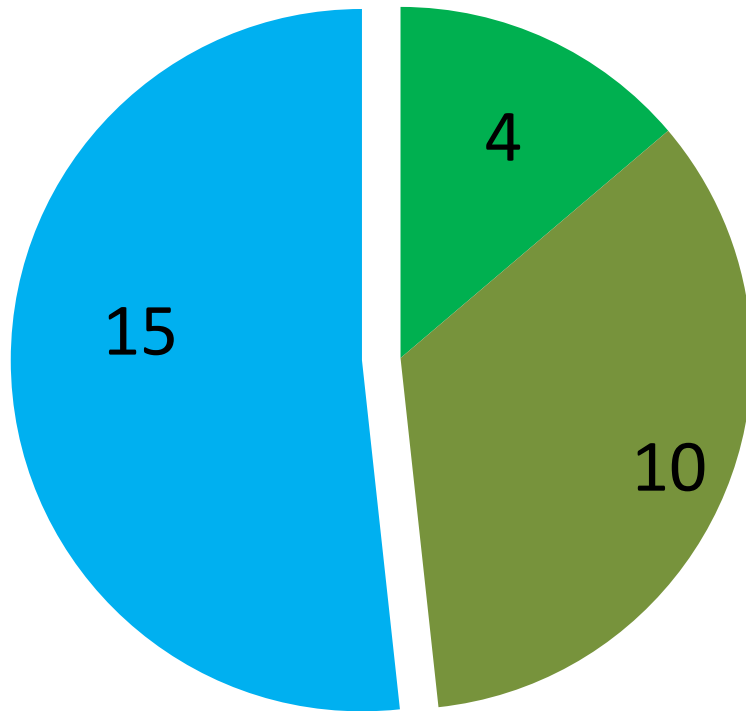
**4 studies:** as part of **direct** health care costs (avoided)

**1 study:** as part of **indirect** costs of the intervention (*partly*)

**(1 study:** mentions exclusion of informal care as limitation)

# Quality assessment results

## Consideration of productivity costs



### 4 studies:

consider productivity effects as part of participants' costs

(1 study mentions exclusion of senior's time or production as limitation)

1 study considers **costs** for long-term care and health care **in gained years** in one version of their evaluation

# Quality assessment results

## Social or Beyond-health benefits:

1 study includes additional social indicators:

„self-efficacy for exercise“ & „social network-size“

4 studies include „fear of falling“

4 studies mention that cost-effectiveness may be underestimated, because of positive externalities

## Specific preferences / aggregated indicators:

Only QALYs are used that do not consider divergent preference structures of older people

1 CBA uses WTP for morbidity/mortality avoided  
(literature based)

# Findings of studies

Results – RQ4

Main findings of study	Quality of study		
	good	moderate	poor
The intervention considered to be cost-effective or cost-saving (10)	5	4	1
Cost-effectiveness dependent on acceptable threshold or other assumptions; introducing of intervention left to consideration (5)	2	2	1
The positive effect or cost reduction indicated, but lack of clear message concerning cost-effectiveness (5)	1	4	
One of the analysed intervention considered to be the most favourable (3)		2	1
The intervention considered not to be cost-effective; the effect not significant; the positive effect recognised only partially (6)	3	2	1

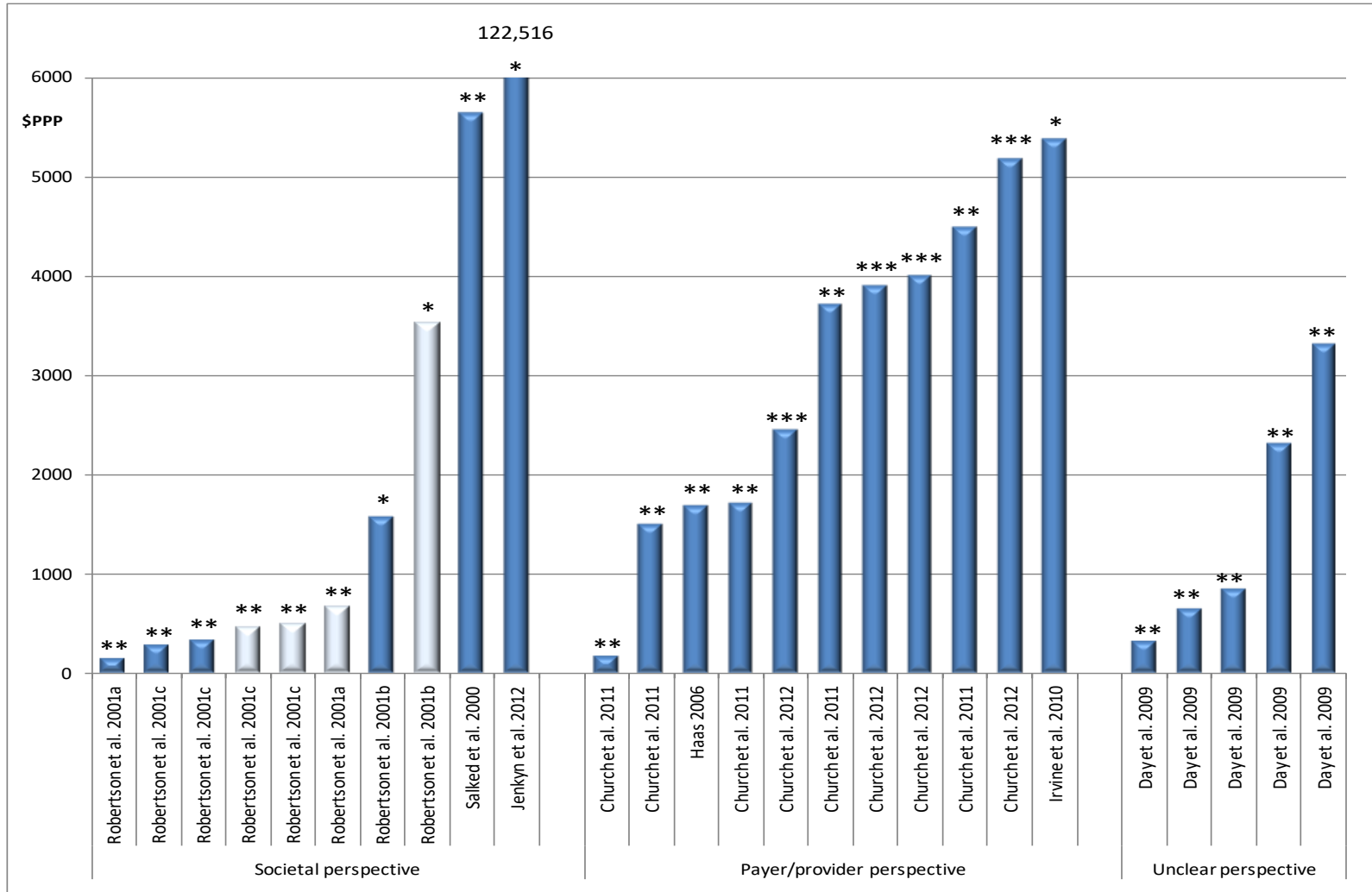
# Cost-effectiveness of interventions

Results – RQ4

- Very limited possibility of the results comparison – need to be treated with caution! (no standardized methods of analysis, different scope of costs and outcomes taken into account, different interventions, different quality of study,)
- No deeper comparative analyses performed

# Attempt to results comparison – fall prevention

Results – RQ4



*The dark ones: falls in general; the light ones: falls resulting in moderate and serious injury*

*One asterisk - a study with good quality, three asterisks – poor quality, without asterisks - moderate quality*

- The range of cost per prevented fall: 161 \$PPP – 122,516 \$PPP
- The highest value 21 times higher than the previous one

# Conclusions (1)

- **Low number** of studies with economic evaluation of HP for the older population
- Economic evidence focuses on **fall prevention** - a significant gap in availability of full economic evaluation studies for other health problems being characteristic for population 65+ (e.g. mental health problems).
- **Specific requirements** of the economic evaluation of health promotion interventions **for older people** are seldom taken into account or at least mentioned as limitation.

It seems that the authors often do not realize the differences in the requirements for evaluation of clinical intervention and health promotion interventions.

**The methodological approach dedicated for HP4OP in economic analyses is needed.**



# Conclusions (2)

- Very diverse quality of studies – in most cases a problem with real research quality assessment due to lack of information (*only less than 40% of studies (with good quality) could be taken into account in results analysis*)
- Lack of clear presentation of analyses - a standard presentation scheme should be used.
- The comparison and generalization of results is very limited:
  - Differences in methods applied
  - Diverse quality of the studies
  - The health promotion and primary prevention interventions can be delivered in numerous ways

# Thank you for your attention