The webinar, "Osteoarthritis – Not Just a Nuisance Condition of Old Age: An Overview of Findings from the Canadian Longitudinal Study on Aging (CLSA)" will begin shortly.

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CLSA Webinar Series

Osteoarthritis – Not Just a Nuisance Condition of Old Age: An Overview of Findings from the CLSA

Dr. Elizabeth Badley & Dr. Anthony Perruccio

12 to 1 p.m. ET | October 12, 2017

In this webinar, Dr. Badley and Dr. Perruccio will present an overview of the prevalence of arthritis, focusing on osteoarthritis (OA). The presentation will be in two parts:

Part 1: While the most frequently studied risk factors for OA relate to biomechanical factors associated with injury or obesity, there is emerging evidence that OA might have a systemic metabolic or inflammatory component. This section of the webinar will include a brief overview of Dr. Badley and Dr. Perruccio's findings.

Part 2: Recognizing that OA is often thought of as a condition of older people that may be associated with pain and disability, leading to a need for help, Dr. Badley and Dr. Perruccio look at the receipt of care, care given to others and social engagement in the younger (45-64) CLSA participants.

Register online at http://bit.ly/clsawebinars

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clsa élcv
Canadian Longitudinal Study on Aging
Étude longitudinale canadienne sur le vieillissement

www.clsa-elcv.ca

Introducing today's speakers:

Dr. Elizabeth Badley &

Dr. Anthony Perruccio

Krembil Research Institute, University Health Network, Toronto

OSTEOARTHRTIS – Not Just a Nuisance Condition of Old Age: An Overview of Findings from the Canadian Longitudinal Study on Aging

October 12, 2017

Elizabeth M. Badley, DPhil
Anthony V. Perruccio, PhD

Krembil Research Institute and University of Toronto

Krembil Relentless.

UNIVERSITY OF TORONTO
DALLA LANA SCHOOL OF PUBLIC HEALTH

UHN Arthritis Program

General Objectives

- **To present preliminary findings of work in progress**
- **To suggest areas where further development of the CLSA questionnaires are required**

CLSA data

Baseline data: population ages 45-85

- **Tracking Sample**
  - **Self-report questionnaire**
  - **N=21,241**

- **Comprehensive Sample**
  - **Self-report questionnaires**
  - **N=30,097**

What is arthritis?

- arthritis means inflammation of the joint

Term is generally used for a family of related conditions affecting the joints (and components of the joint) and associated structures such as ligaments, tendons, and underlying bone.

Causes pain, swelling, and stiffness in the joints

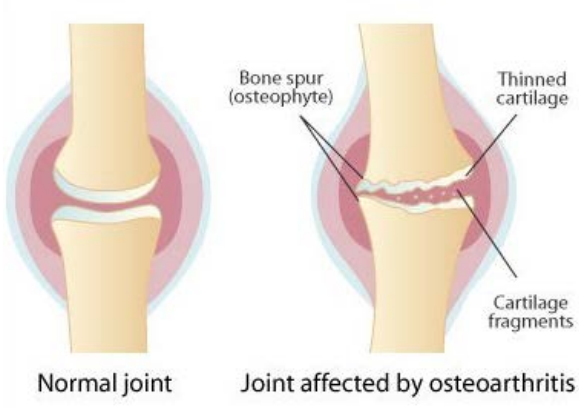
Over 100 different conditions

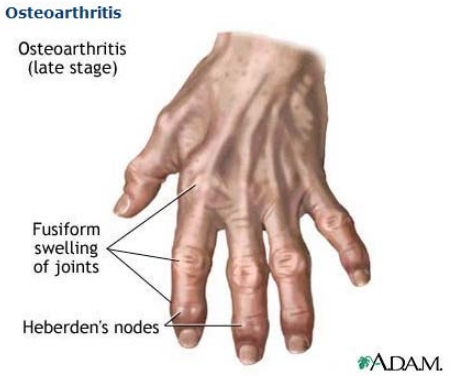
Major types of arthritis

- **Osteoarthritis: prevalence (pop age >15 yrs) ≈ 14%**
- **Gout: prevalence≈ 4%**
- **Inflammatory joint disease (rheumatoid arthritis, reactive arthritis, ankylosing spondylitis): prevalence ≈ 1-2%**
- **Connective tissue diseases (systemic lupus erythematous (SLE)): prevalence ≈ .01%**

Osteoarthritis (OA)

- **deterioration of cartilage and other structures in one or more joints**
- **leads to joint damage, pain and stiffness**
- **typically affects knees, spine, hands, hips and feet**





Importance of Osteoarthritis

- **Major cause of :**
  - **Pain**
  - **Disability (self care, mobility, employment, etc)**
- **Impact on quality of life**
- **Health care utilization**
- **Economic burden to society**
- **Mortality – increased risk of heart disease**

Etiology of Osteoarthritis

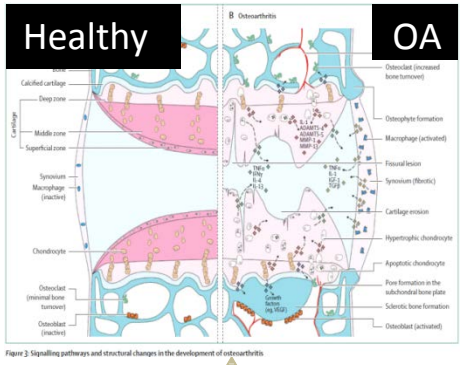
Traditionally viewed as degenerative (wear and tear) condition

Etiology of Osteoarthritis

Local Environment

Obesity
Altered joint loading
Abnormal anatomy
Inflammation
Bone remodeling
Trauma

Joint Destruction



Aging
Sex
Genetics

Matrix Destruction
Catabolic > Synthesis
Mechanical Failure

Osteoarthritis. *Lancet* 2015;386: 376–87

Etiology of Osteoarthritis

Traditionally viewed as degenerative (wear and tear) condition

However:

- **OA is associated with obesity, particularly the knee, but also the hand and hip**
- **Common co-occurring conditions with OA include hypertension, heart disease, and diabetes**
- **Many people with OA have OA in multiple joints, including upper extremity joints (e.g. hands) where mechanical factors related to joint loading are less likely to be important**

Etiology of Osteoarthritis

Traditionally viewed as degenerative (wear and tear) condition

However:

- **OA is associated with obesity, particularly the knee, but also the hand and hip**
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Emerging research

OA as a heterogeneous condition: includes

- **mechanical etiology due to joint use or injury and**
- **metabolic/systemic etiology linked to obesity and comorbidities e.g. hypertension.**

Etiology of Osteoarthritis

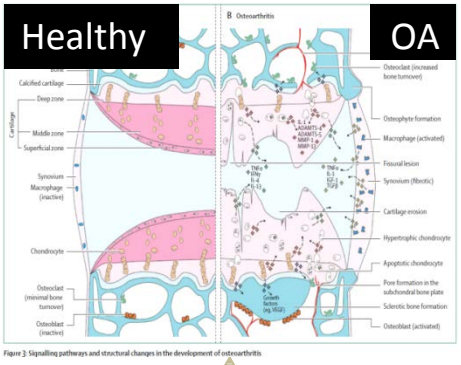
Local Environment

Obesity
Altered joint loading
Abnormal anatomy
Inflammation
Bone remodeling
Trauma

Systemic Factors

Inflammation
Obesity
Aging
Sex
Genetics

Joint Destruction



Matrix Destruction
Catabolic > Synthesis
Mechanical Failure

Osteoarthritis. *Lancet* 2015;386: 376–87

Osteoarthritis in the Population

Most population surveys focus on arthritis in general

In most of epidemiological literature on OA, focus is on specific joint, most commonly the knee.

Special feature of CLSA – asks about OA specifically by site: knee, hip and hand, with supplementary questions about relevant joint symptoms

CLSA potential for unique insights into OA

Rationale

Background

OA is often perceived as an inevitable condition of aging

Goal

To understand the impact of OA across the age range 45-85 years

Objectives

1. **Document prevalence of OA**
2. **To investigate the relationship between OA, obesity and metabolic comorbidities**
3. **To document prevalence of pain and disability in OA of the knee, hip and hand**

CLSA Arthritis questions

All participants were asked, “has a doctor ever told you that you have…”

- **Osteoarthritis in the knee**
- **Osteoarthritis in the hip**
- **Osteoarthritis in the hand**
- **Rheumatoid arthritis**
- **Any other type of arthritis**

  - **Osteoarthritis: yes to any of knee, hip or hand OA**

Joint Symptom Questions

Asked to all CLSA respondents irrespective of arthritis or OA status.

Knee

During the past 4 weeks…

1. Have you had knee pain on most days?
2. Have you had knee pain while climbing down stairs or walking down slopes?
3. Have you had swelling in the knee?

Hip

During the past 4 weeks…

1. Have you had pain in the groin or upper inner thigh on most days?
2. Have you had pain in the groin or upper inner thigh while climbing down stairs or walking down slopes?

Hand

During the past 4 weeks…

1. Have you had pain in the small joints closest to the fingernails on most days?
2. Have you had pain in the base of your thumbs just above wrist on most days?
3. Do you have enlargement in the small joints closest to the fingernails?*
4. Do you have enlargement in the base of your thumbs just above your wrist?*

* Excluded for analyses of “symptomatic OA”

Findings

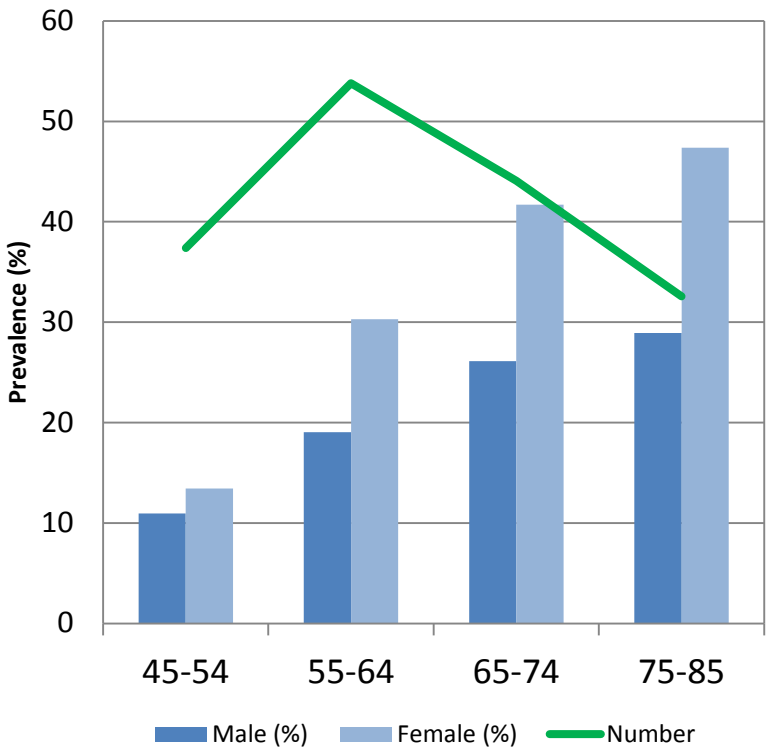
Population Prevalence: OA and other Conditions

Osteoarthritis ranks among the most prevalent

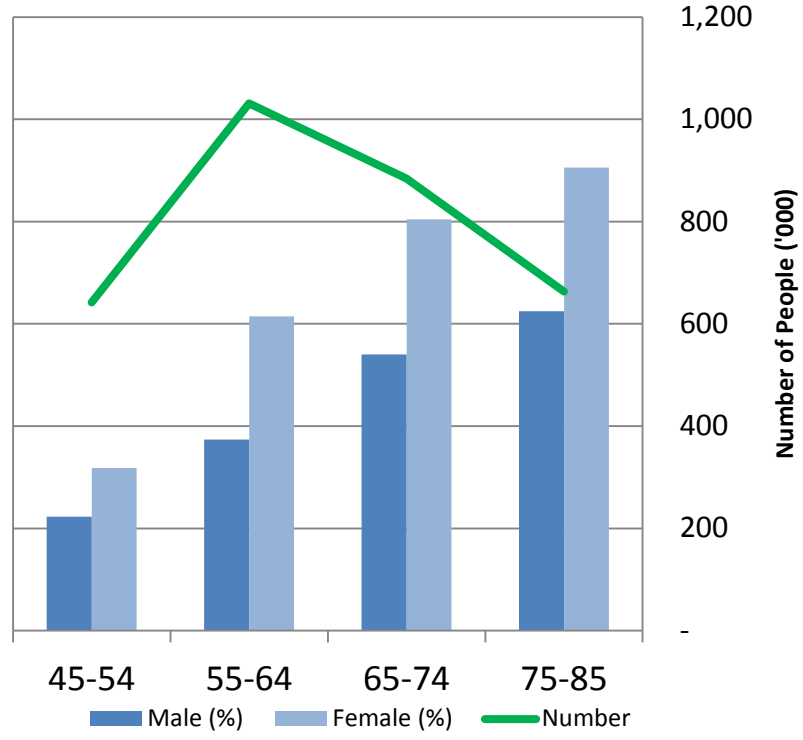
Condition	Prevalence (%)
Hypertension	38
Osteoarthritis	**26**
Back Problems	26
Diabetes	17
Mood Disorders	16
Cancer	16
Heart Disease	14
Asthma	12
Incontinence	10
Osteoporosis	9

> 3.5 Million Canadians with OA aged 45-85

Osteoarthritis: Prevalence and Numbers by Age and Sex



Comprehensive sample

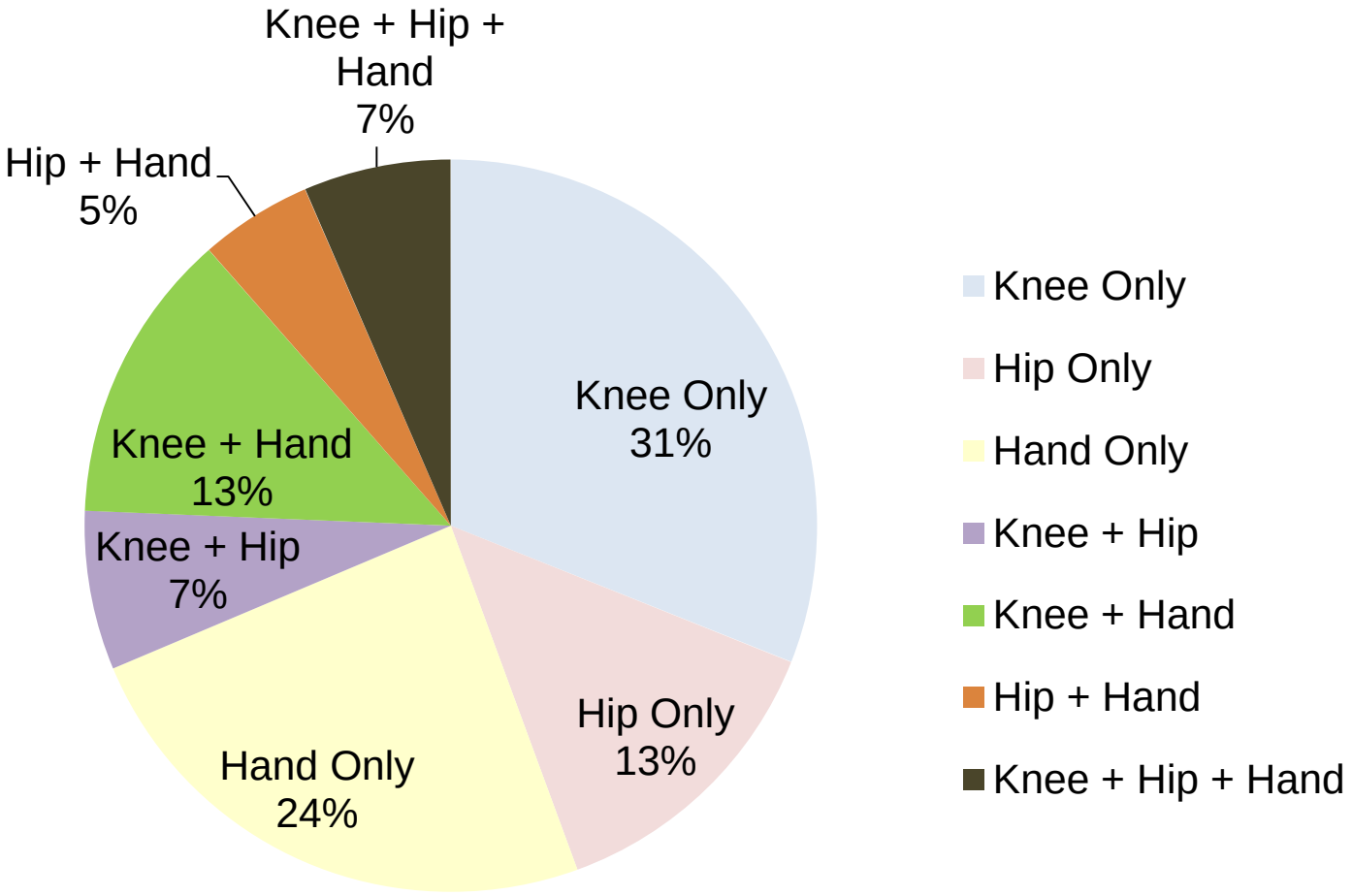


Tracking sample

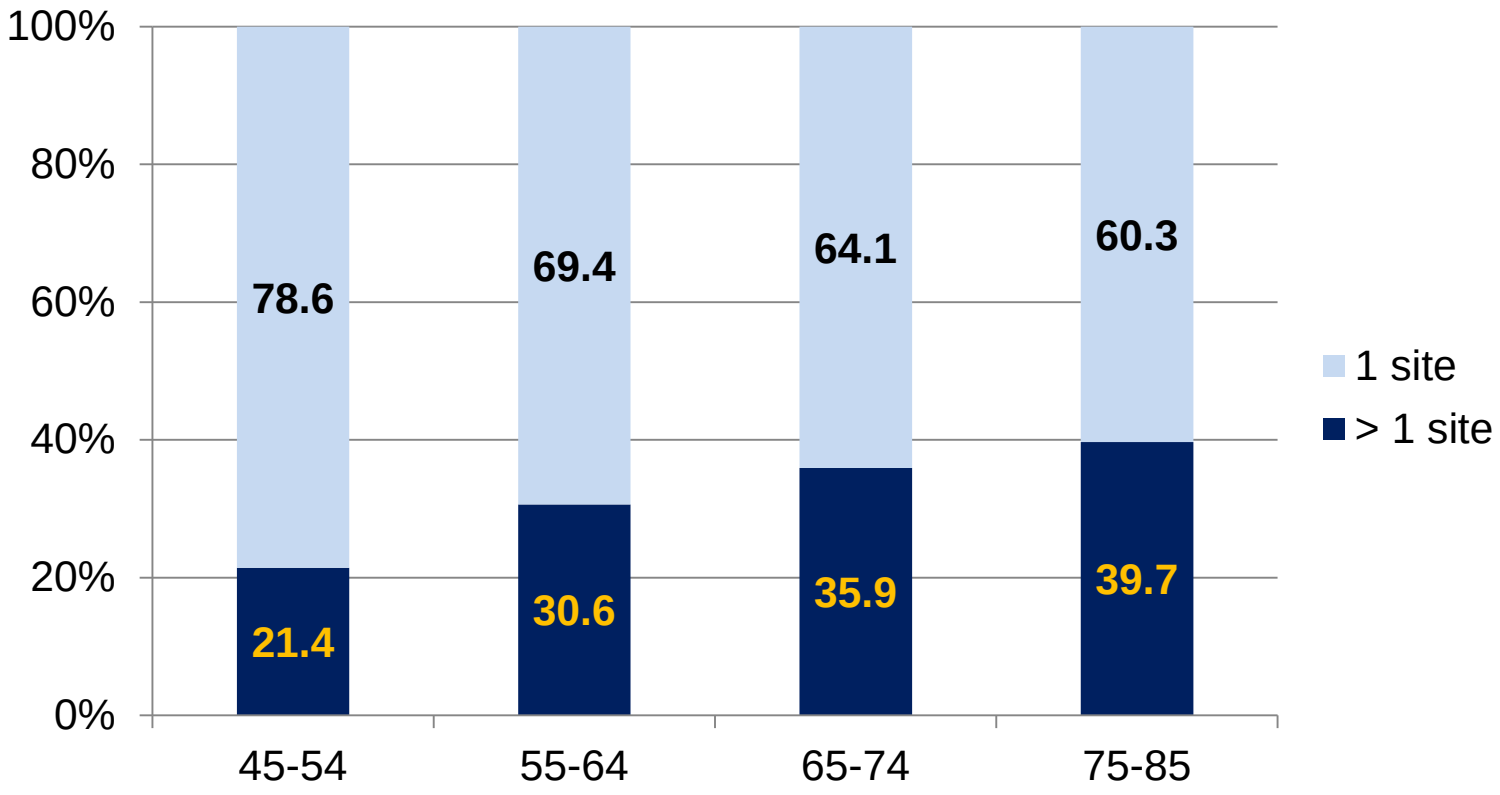
- **26% of the population**

Joints affected by OA

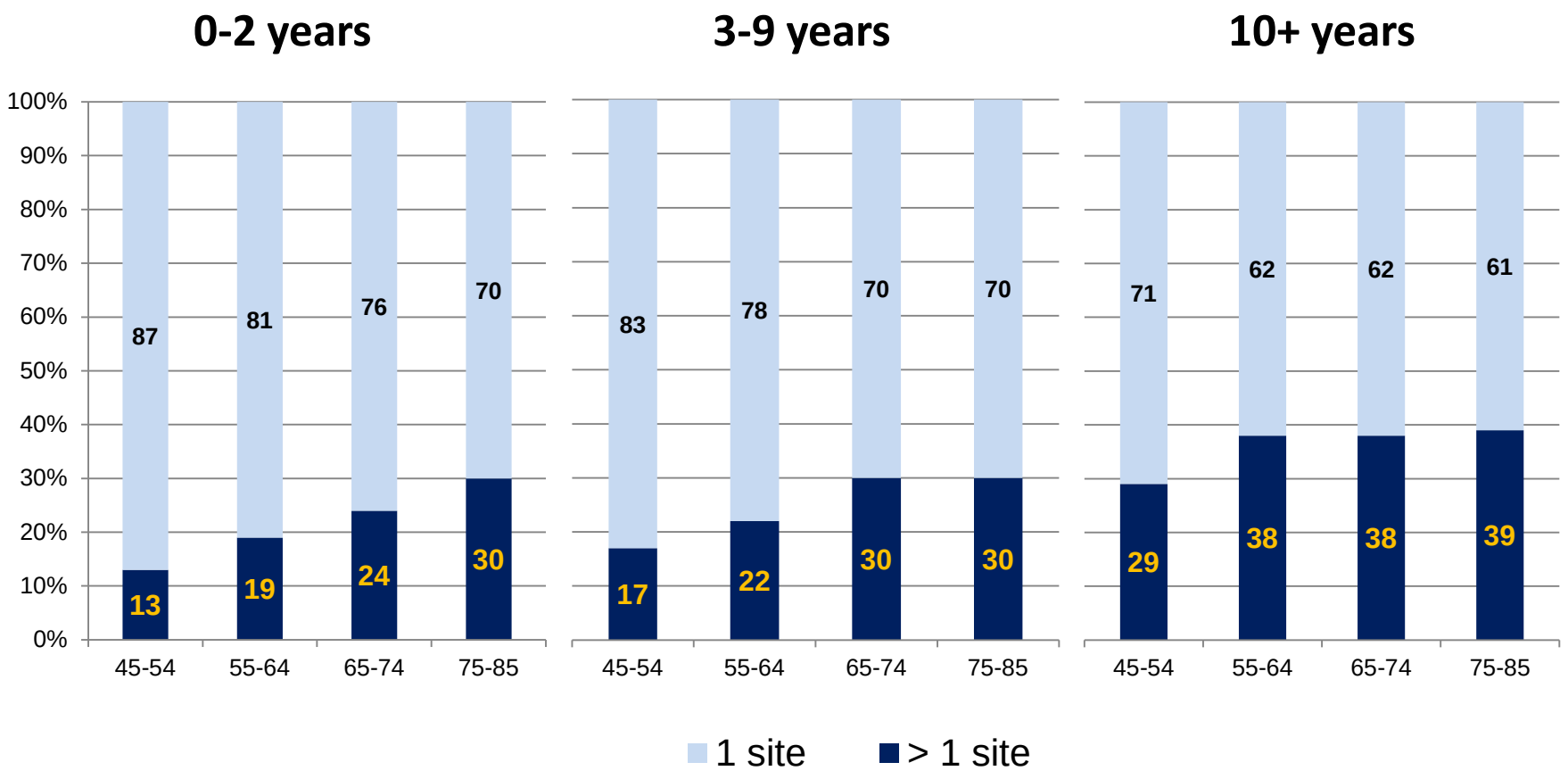
32% of CLSA respondents with OA have OA at multiple joint sites



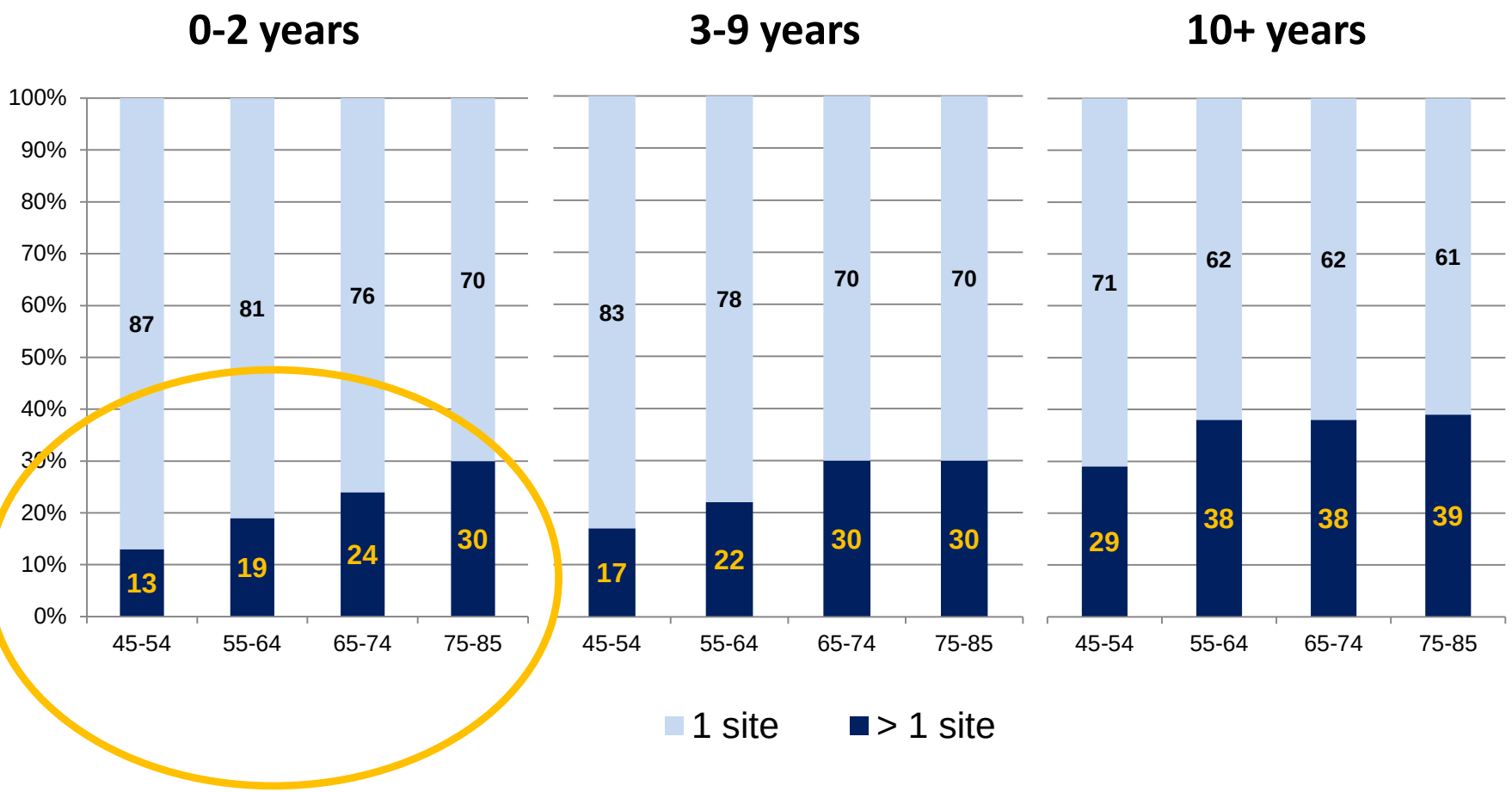
Single vs Multisite OA by Age



Single vs Multisite OA by OA Duration



Single vs Multisite OA by OA Duration



OA, obesity & metabolic comorbidities

Speculation that OA might have a systemic etiology – such as metabolic syndrome. If so:

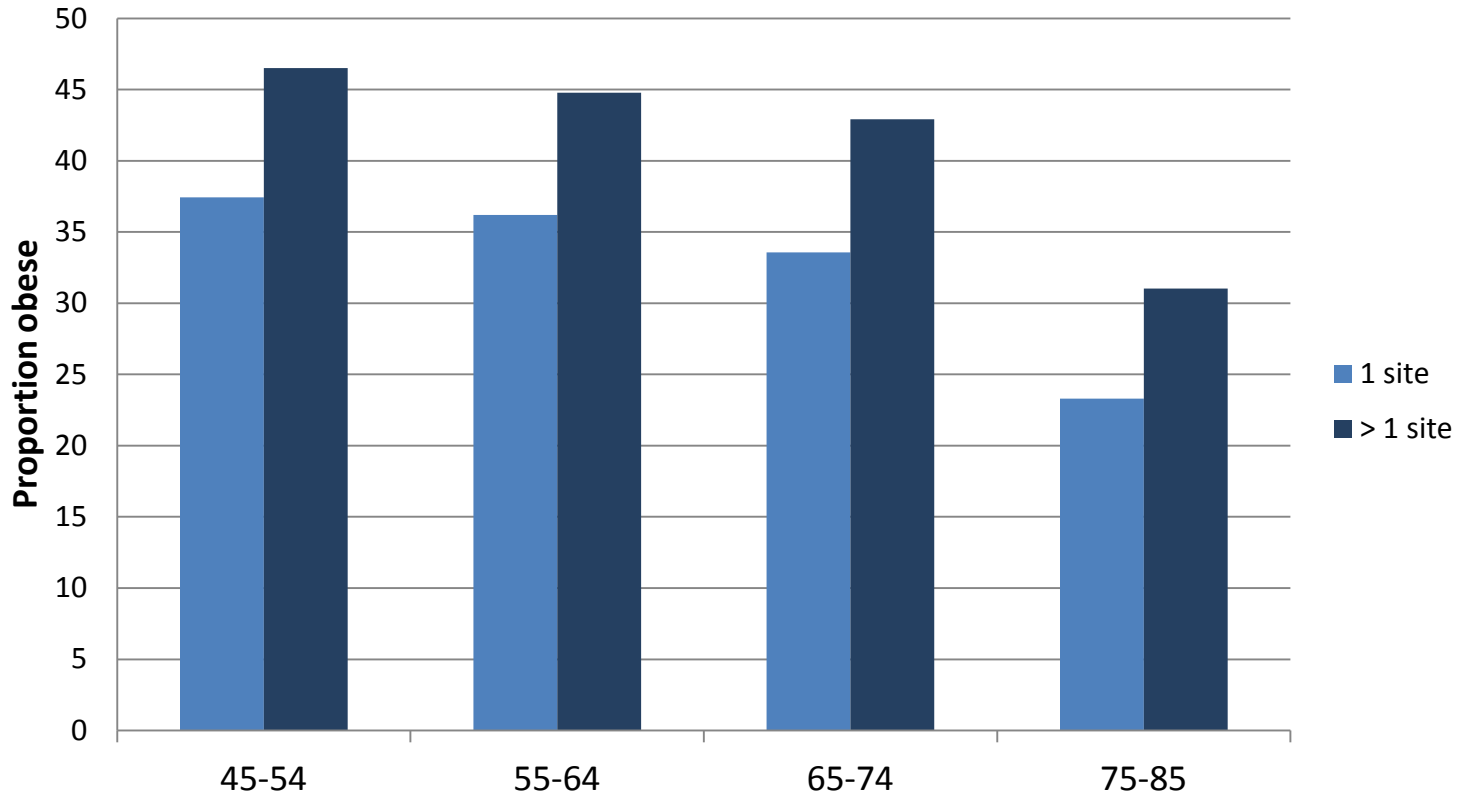
1. **The relationship between obesity and OA will be stronger for those with multi-joint OA**

2. **A higher proportion of those with multi-joint OA will report metabolic syndrome associated comorbidities (hypertension, heart disease, diabetes)**

3. **Respondents with OA compared to those without will have a greater number of metabolic associated comorbidities adjusting for sociodemographic variables and lifestyle factors**

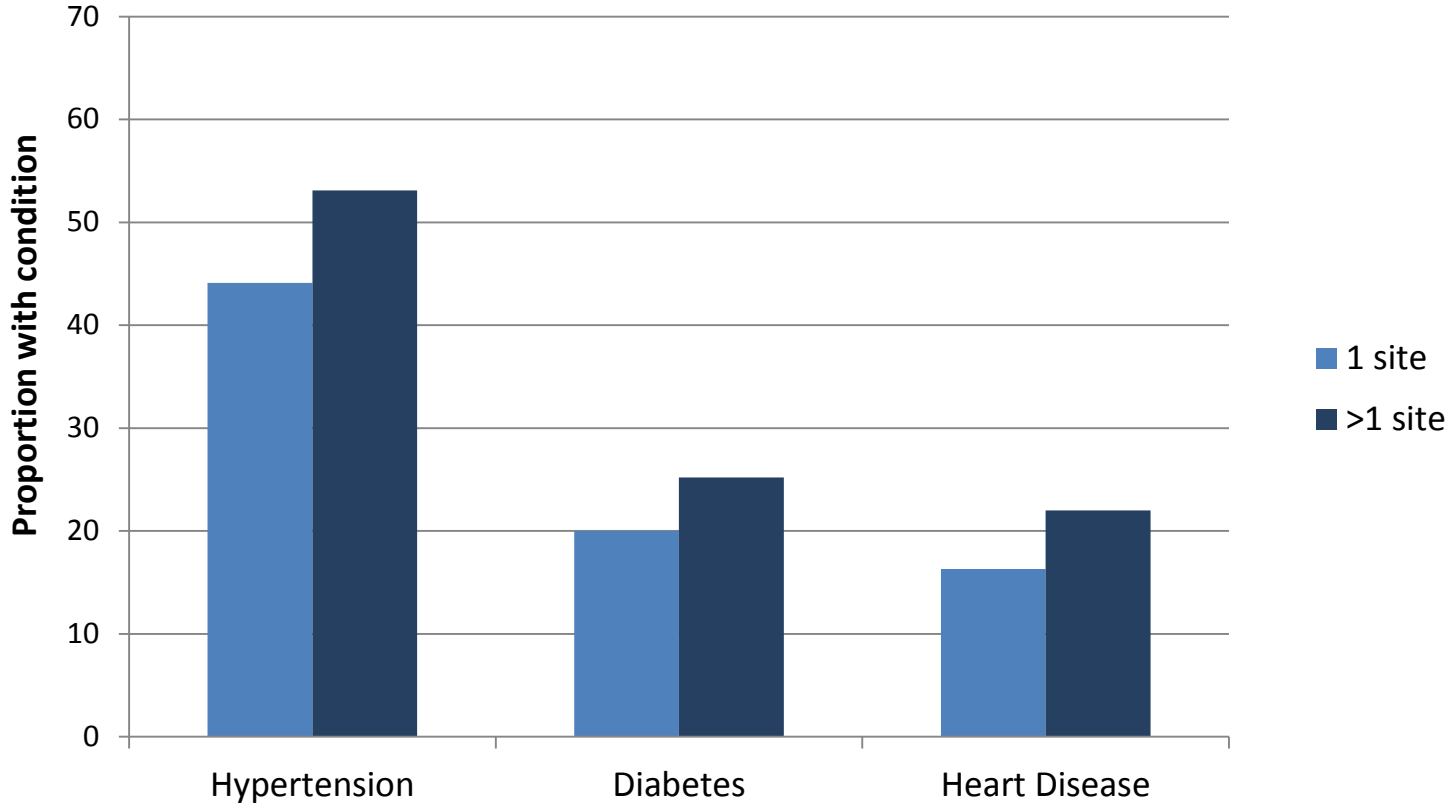
Osteoarthritis and obesity

Hx: The relationship between obesity and OA will be stronger for those with multijoint OA

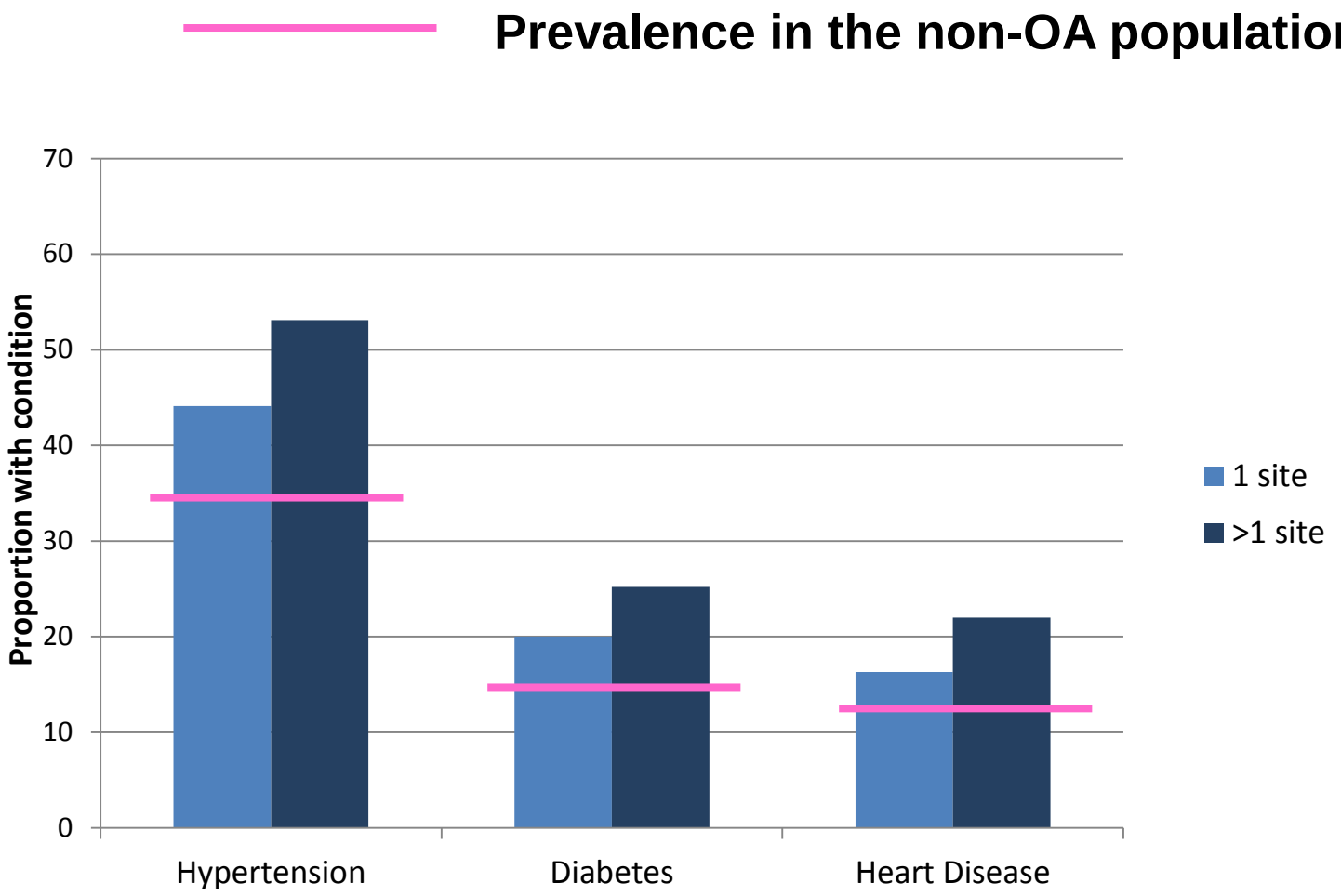


Osteoarthritis and ‘metabolic’ conditions

Hx: A higher proportion of those with multi-joint OA will report metabolic syndrome associated comorbidities (hypertension, heart disease, diabetes)



Osteoarthritis and ‘metabolic’ conditions



Factors associated with OA vs no OA

Poisson regression model

Variable	Prevalence Ratio (95% CI)
Female (ref=Male)	**1.46** (1.40, 1.52)
Age group (ref=45-54)	
55-64	**1.79** (1.68, 1.91)
65-74	**2.29** (2.15, 2.45)
75-85	**2.61** (2.43, 2.81)
Weight (ref=Normal)	
Overweight	**1.17** (1.11, 1.23)
Obese	**1.50** (1.42, 1.58)
Metabolic Conditions (ref=0)	
1	**1.07** (1.02, 1.12)
2	**1.18** (1.11, 1.24)
3	**1.16** (1.04, 1.29)
Major Conditions (ref=0)	
1	**1.29** (1.21, 1.37)
2	**1.51** (1.42, 1.61)
3+	**1.99** (1.88, 2.11)

Adjusted for education, household income, smoking status, and alcohol consumption

Factors associated with multiple vs single site OA

Poisson regression model

Variable	Prevalence Ratio (95% CI)
Female (ref=Male)	**1.06** (1.02, 1.10)
Age group (ref=45-54)	
55-64	1.06 (1.00, 1.12)
65-74	**1.10** (1.04, 1.16)
75-85	**1.11** (1.04, 1.18)
Weight (ref=Normal)	
Overweight	1.03 (0.98, 1.07)
Obese	**1.06** (1.01, 1.10)
Metabolic Conditions (ref=0)	
1	1.02 (0.98, 1.06)
2	1.03 (0.98, 1.08)
3	1.05 (0.96, 1.16)
Major Conditions (ref=0)	
1	1.01 (0.96, 1.07)
2	1.05 (0.99, 1.11)
3+	**1.12** (1.06, 1.18)

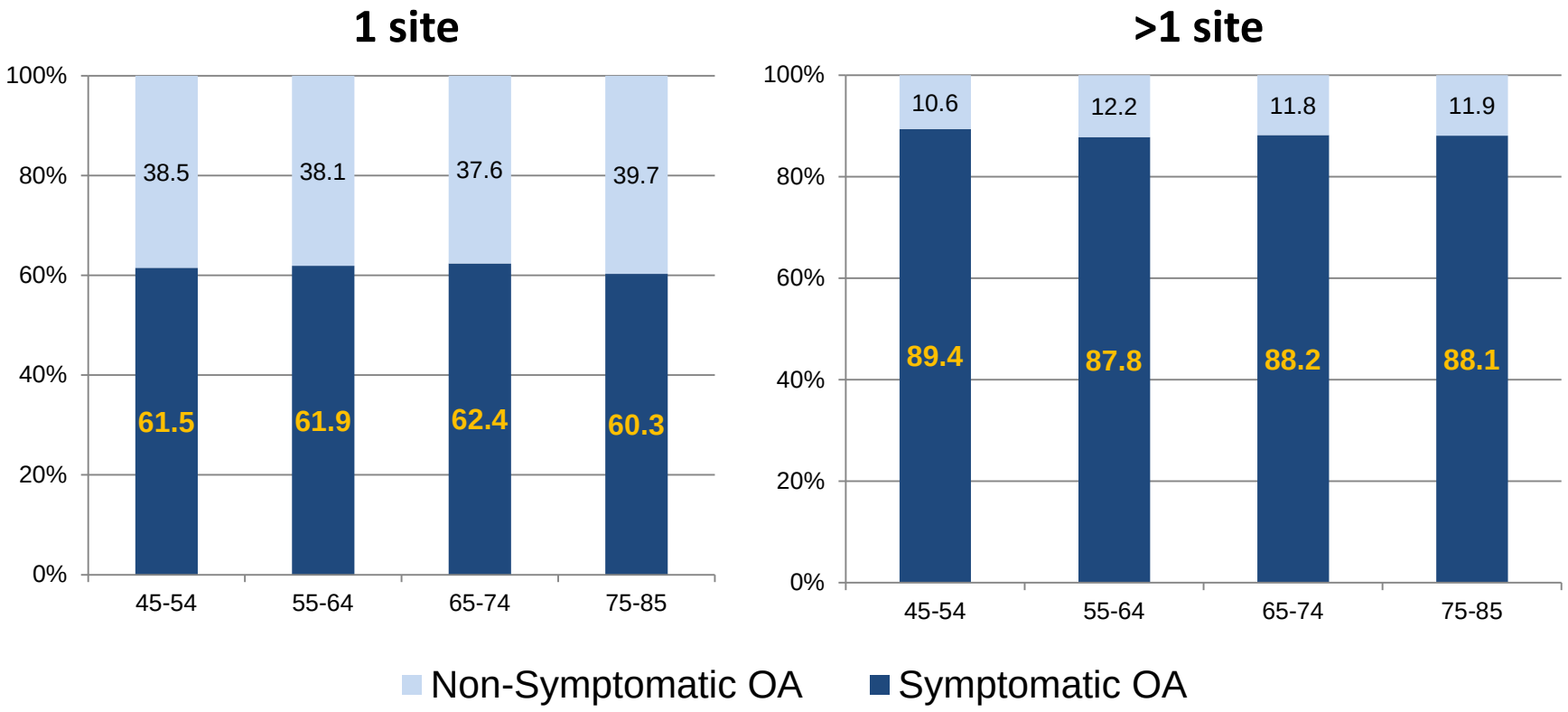
Adjusted for education, household income, smoking status, and alcohol consumption

Impact of OA

Symptomatic OA in the past 4 weeks

Overall, 69% of respondents with OA had symptomatic OA in the past 4 weeks.

- **Respondents with OA at more than 1 joint site were more likely to have symptomatic OA in the past 4 weeks irrespective of age.**



CLSA pain questions

General pain was assessed by asking all respondents:

- Are you usually free of pain or discomfort?

If no:

Pain severity was assessed:

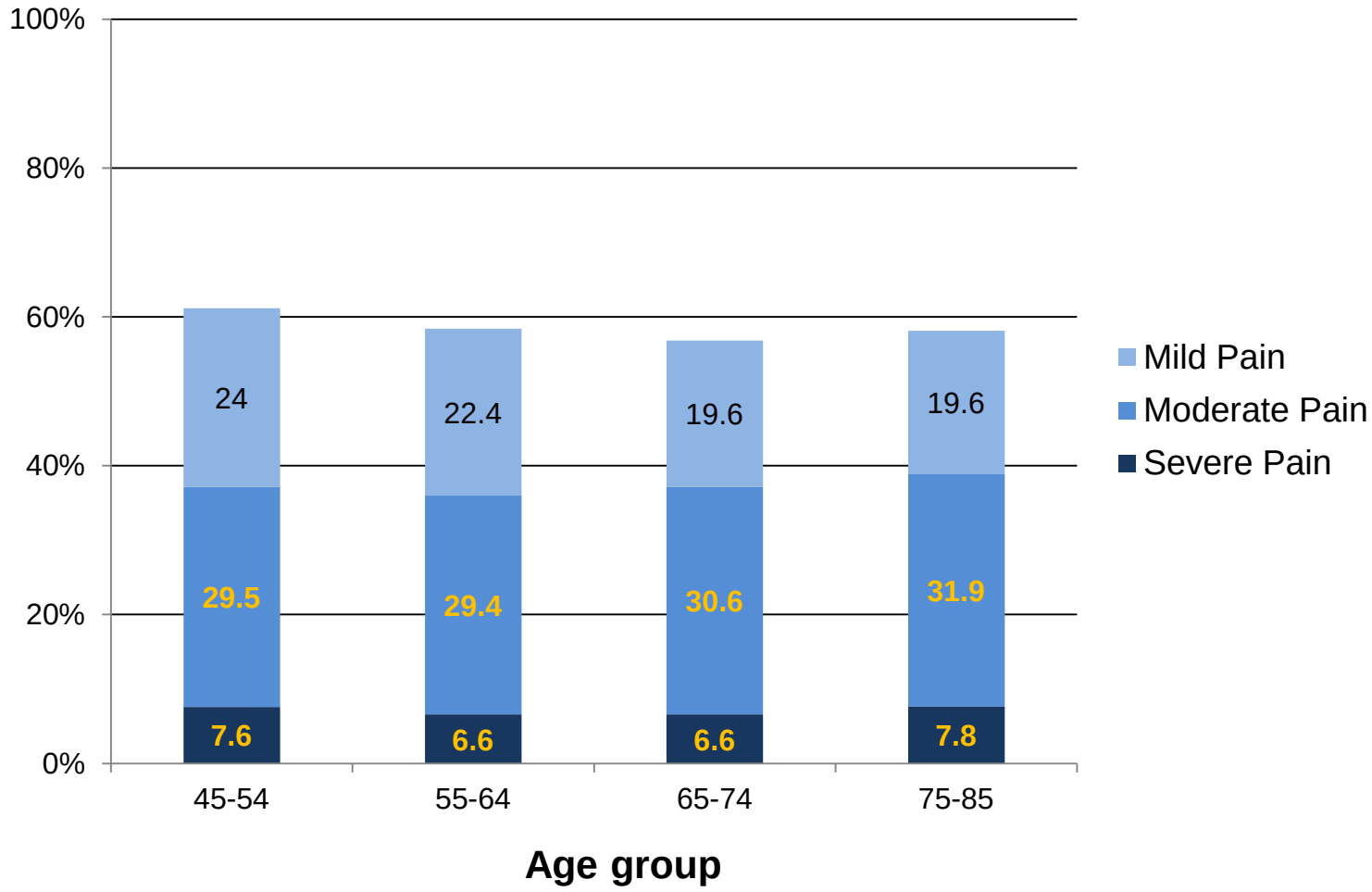
- How would you describe the usual intensity of your pain or discomfort? Would you say it is **mild**, **moderate**, or **severe**?

Limitation in carrying out activities due to pain was assessed:

- How many activities does your pain or discomfort prevent? Would you say **none**, **a few**, **some**, or **most**?

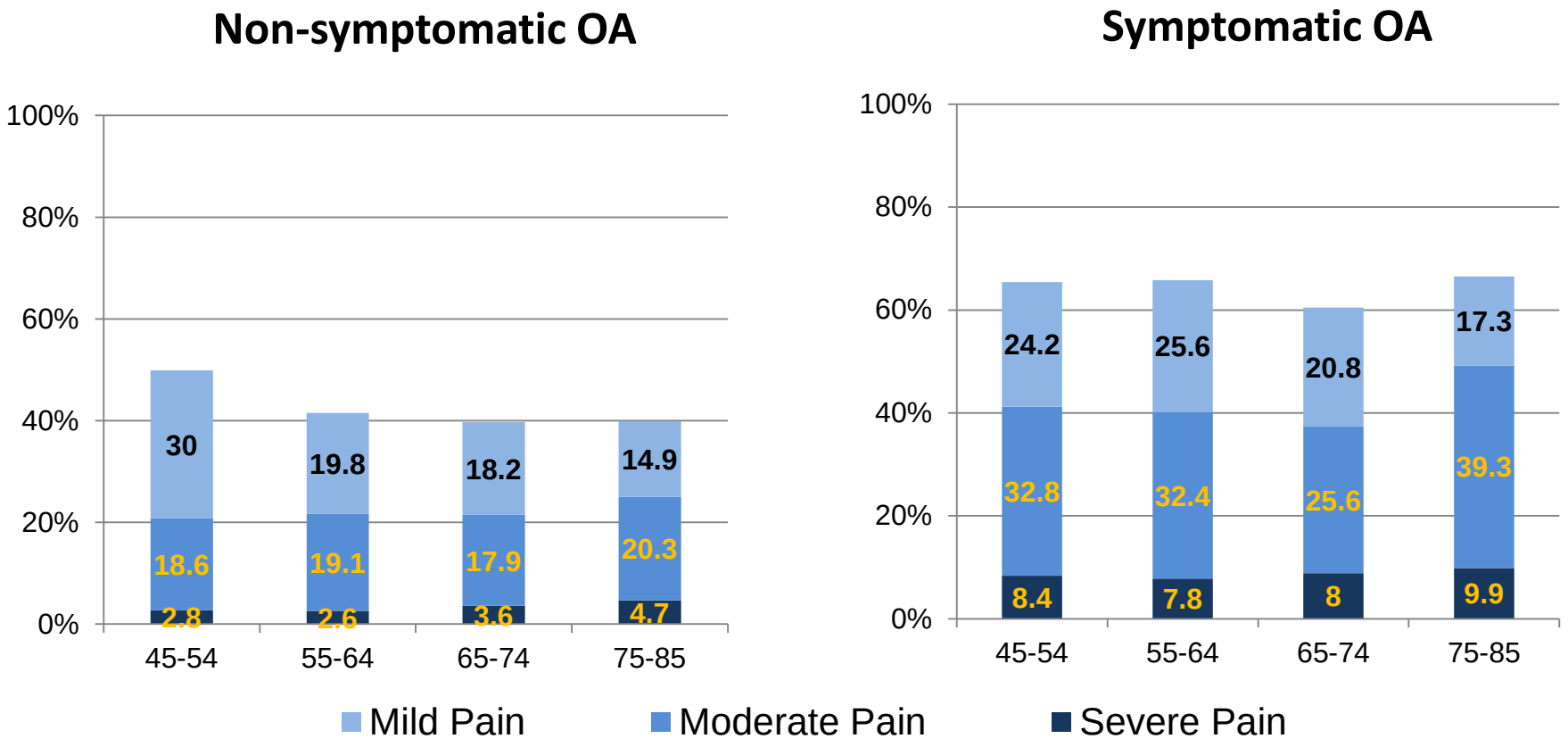
Severity of Pain in OA

Age has little influence on experience of pain



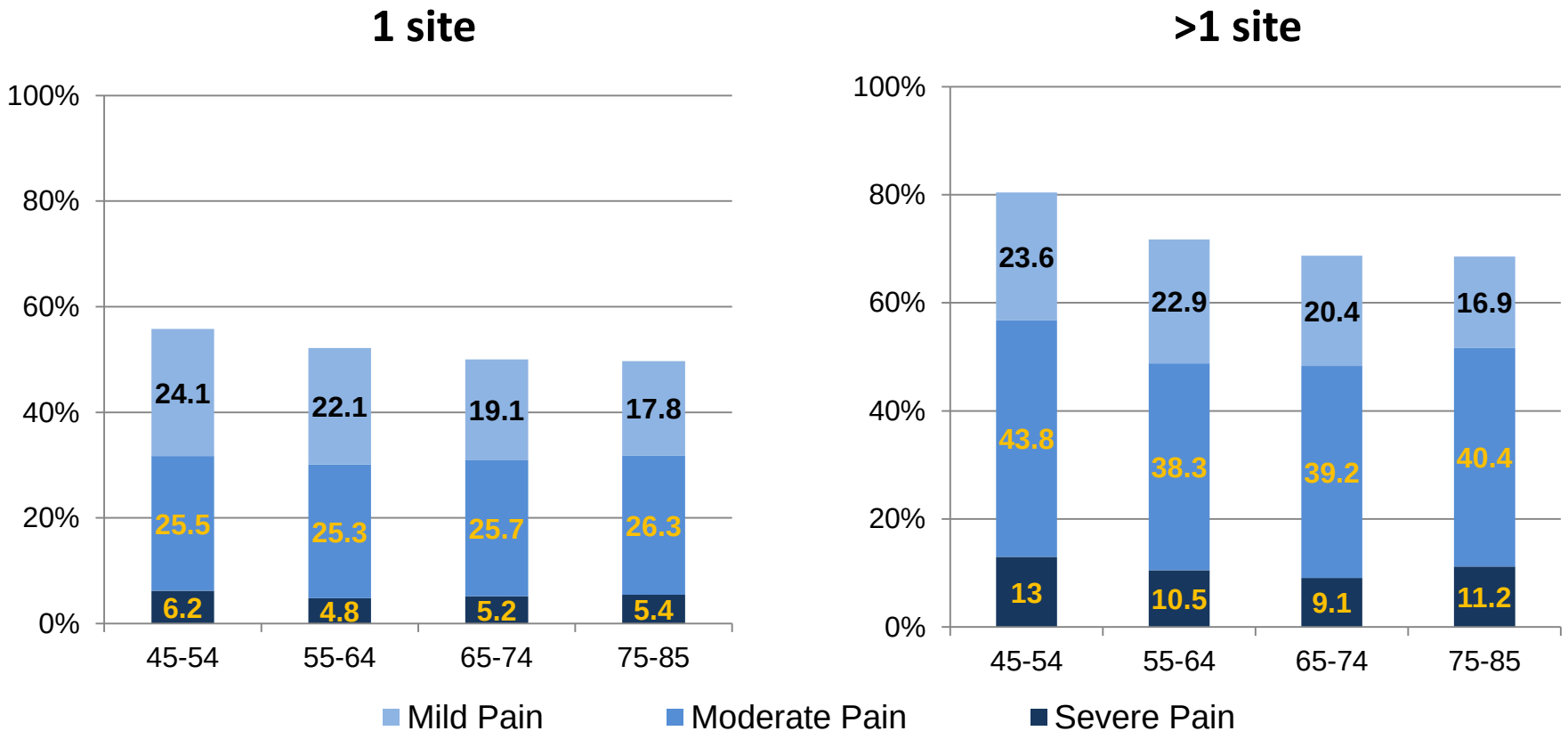
Severity of Pain among those with symptomatic vs non-symptomatic OA

Respondents with symptomatic OA are more likely to report general pain than those with non-symptomatic OA.



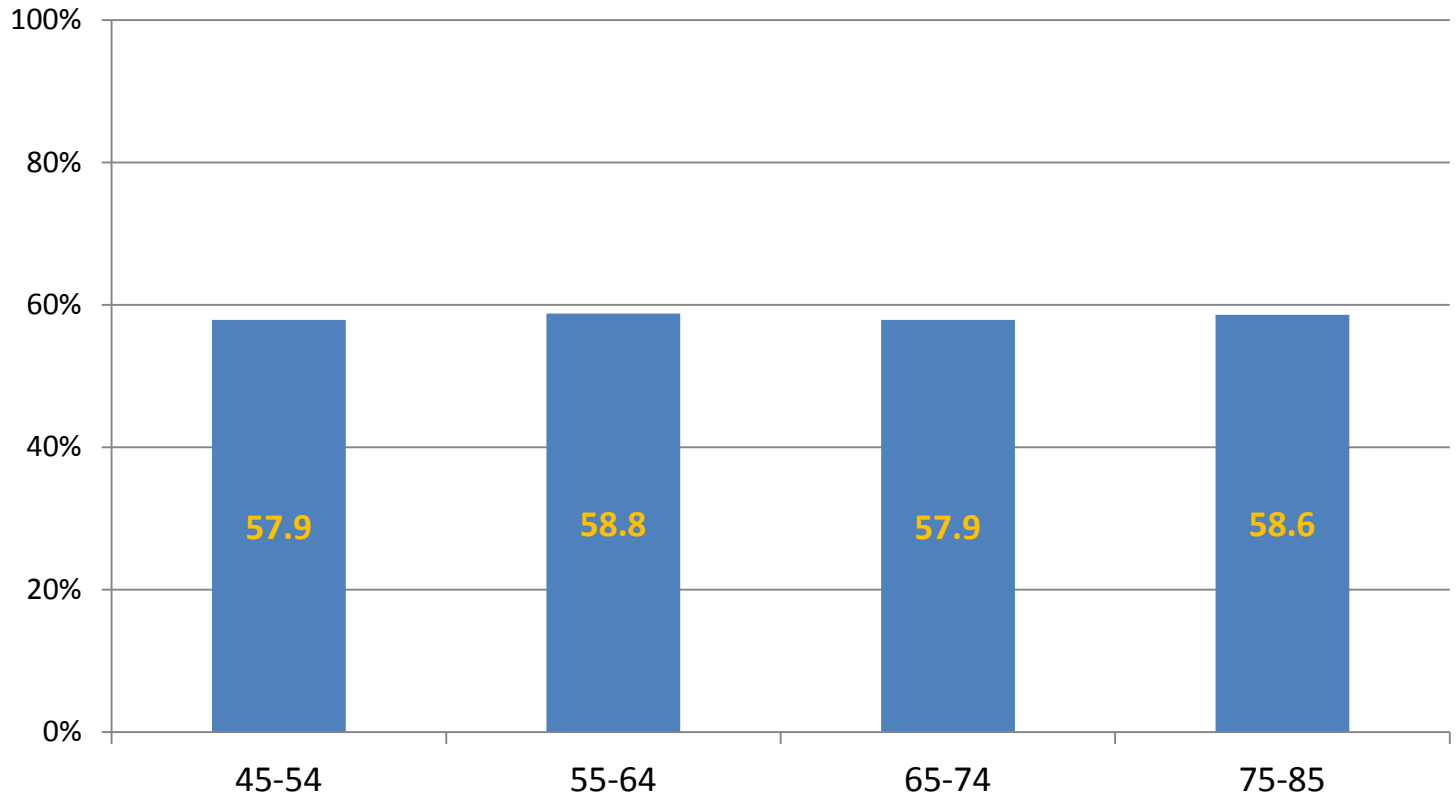
Severity of Pain among those with single vs multiple site OA

Respondents with OA at more than 1 joint site are more likely to report general pain than those with OA at only 1 joint site.



Pain resulting in limitation in carrying out activities

Among those with OA, age has little influence on whether or not pain limits participation in activities.

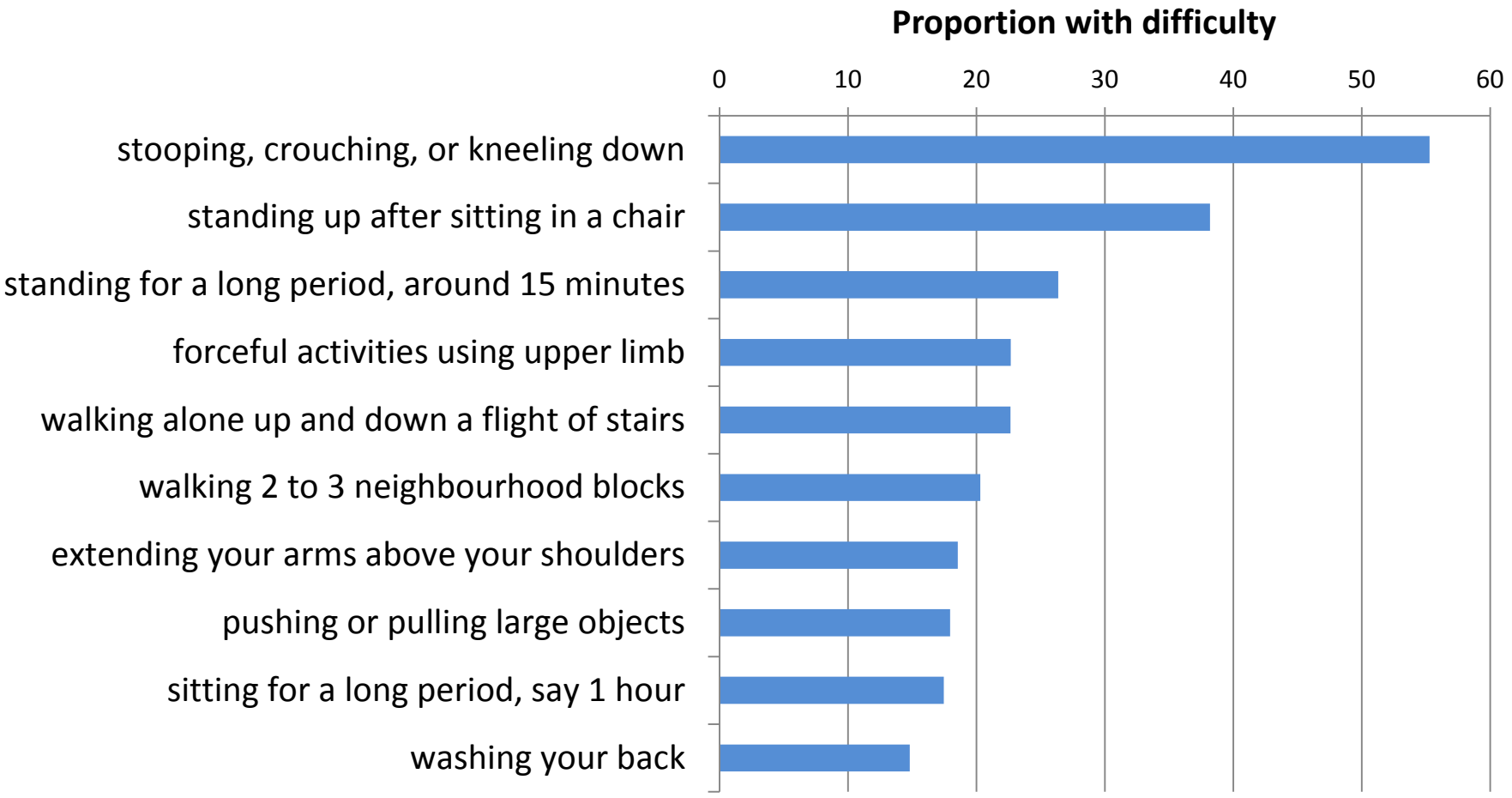


Difficulty with daily activities

Participants in the tracking sample were asked about difficulty with 14 activities.

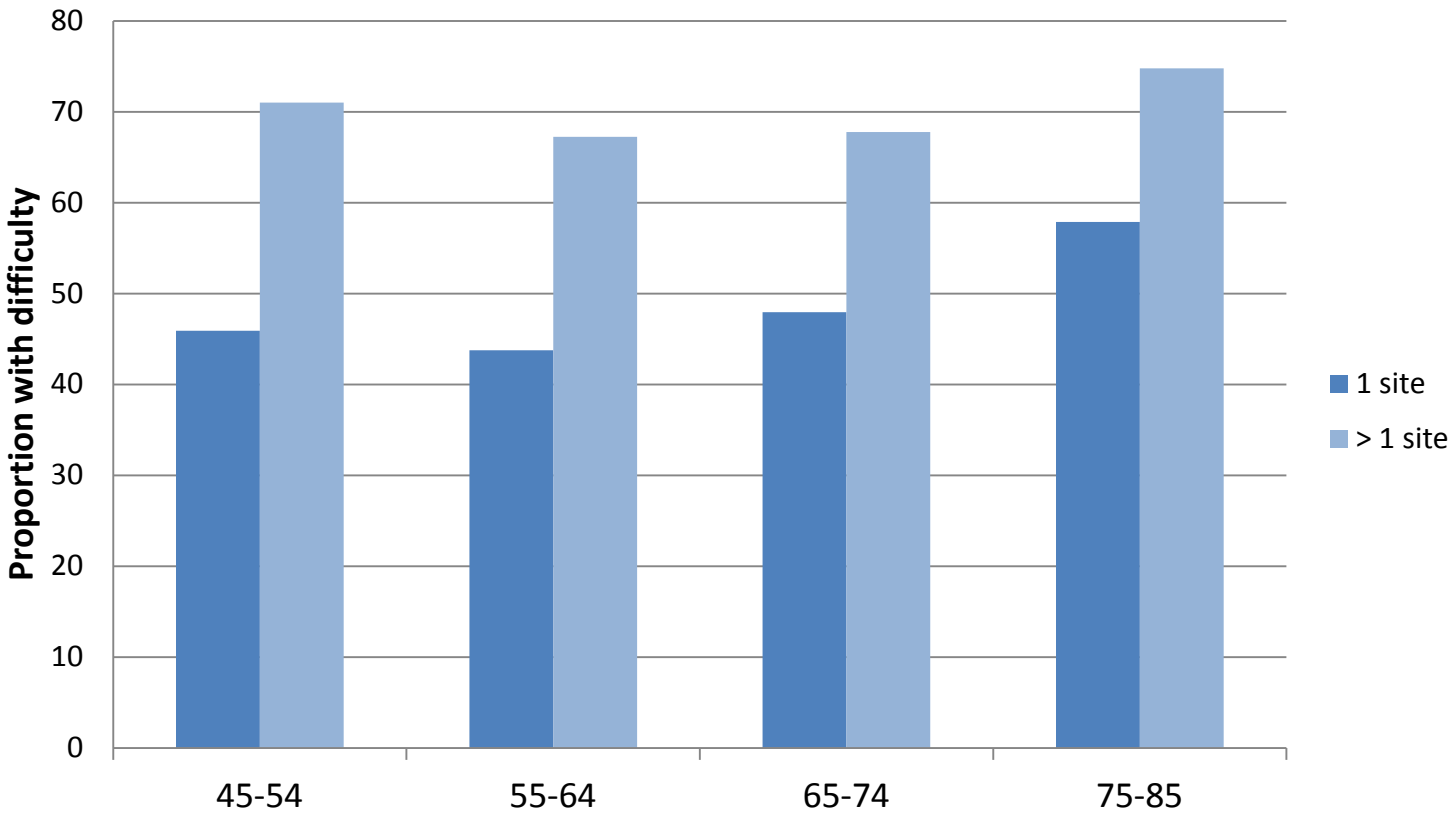
Those who replied they could not do these activities or did not do them on doctor's orders were coded as having difficulty

Difficulties with daily activities in OA: Top 10



Proportion with: 1 difficulty 76% . 2 difficulties, 57%

2+ difficulties with daily activities in OA



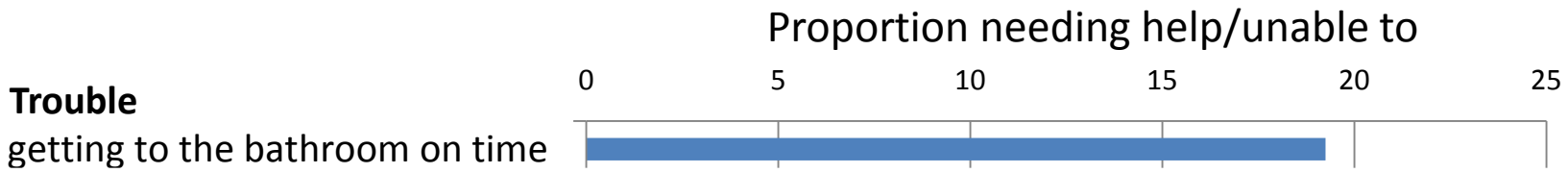
Activities of daily living: carry out without help, with help or not at all

- dress
- feed
- take care of appearance
- walk
- get out of bed
- take a bath
- use the phone
- travel
- shopping
- prepare meals
- housework
- take medicine
- handle money

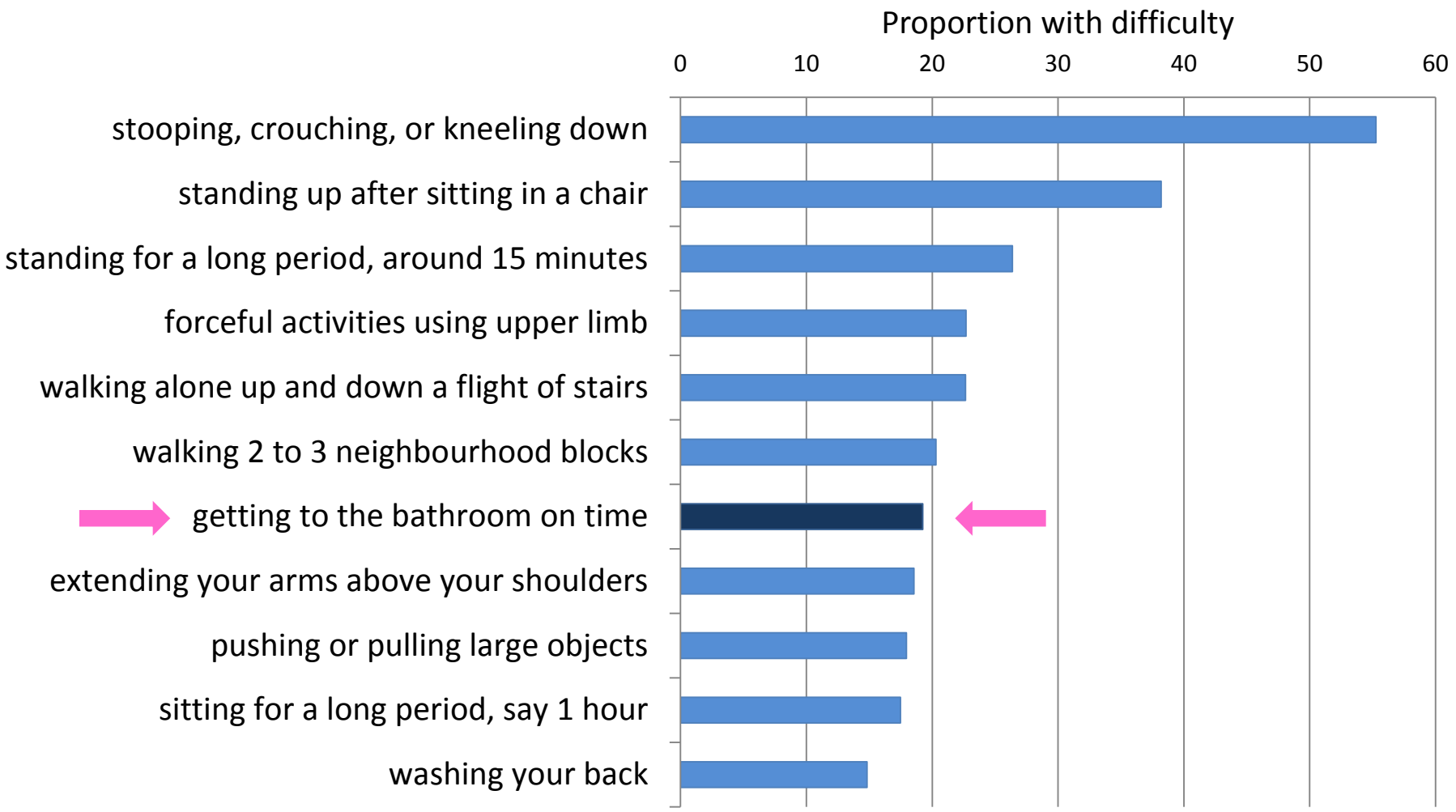
- trouble getting to the bathroom on time

OARS: Older American Resources and Services multi-dimensional functional assessment

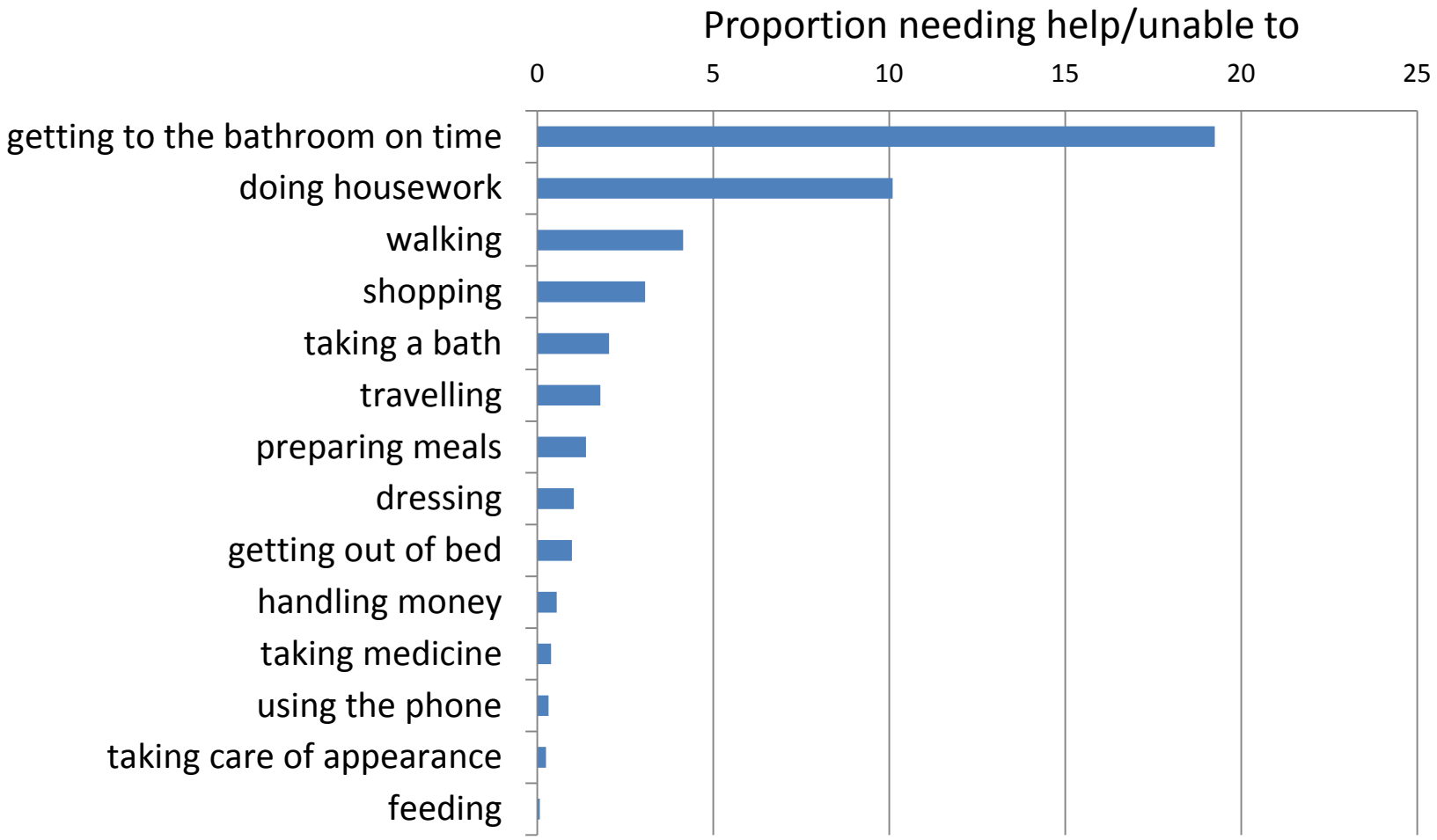
Activities of daily living in OA



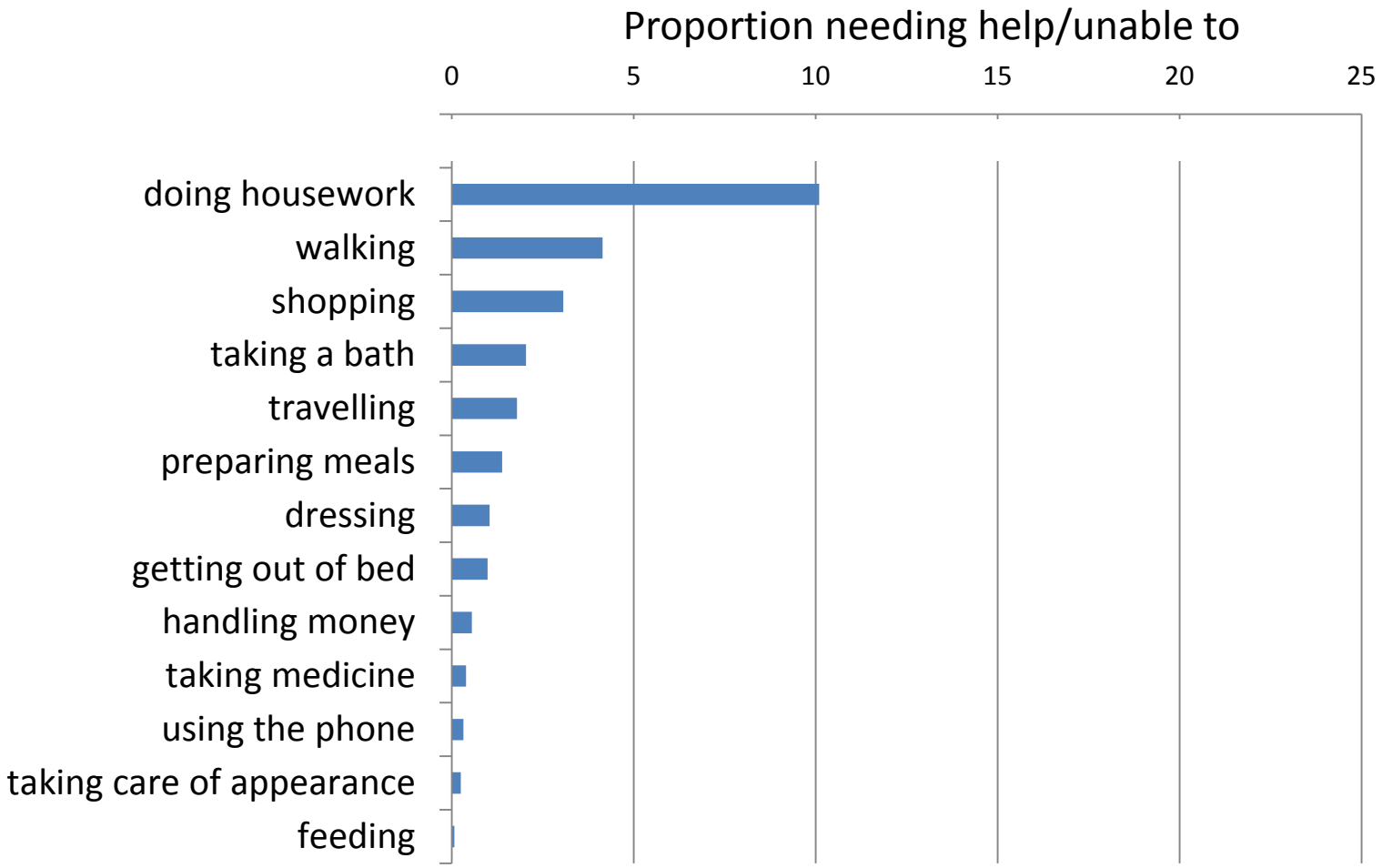
Difficulty with daily activities in OA



Activities of daily living in OA

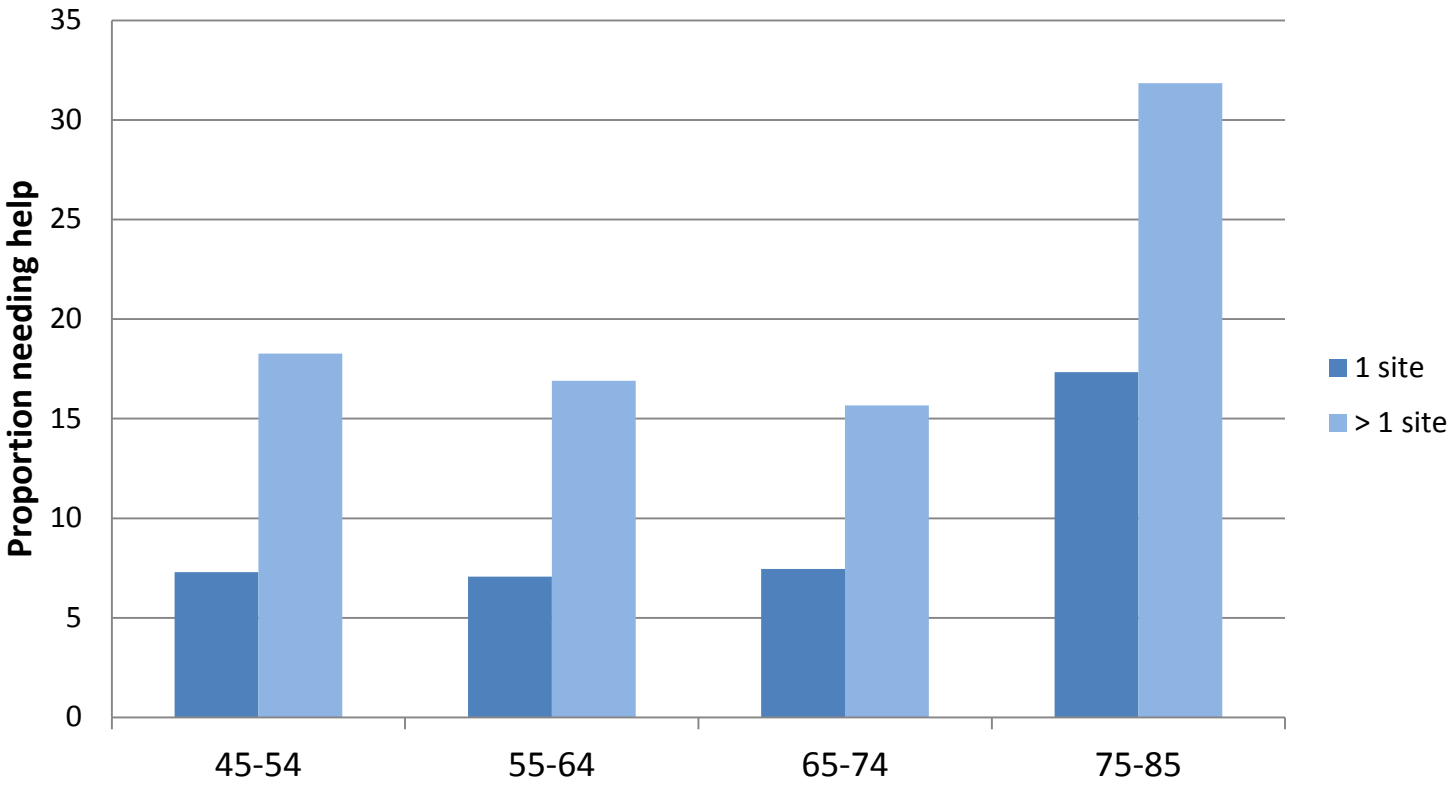


Activities of daily living in OA



14% report needing help or being unable to do
8% if housework excluded

Needing help with at least one ADL (among people with OA)



Excludes trouble getting to the bathroom on time

Summary and Conclusions

- The majority of people with OA below the age of 65
- Some evidence for a metabolic/systemic component to OA
  - How we conceptualized metabolic syndrome was crude. Further studies will include biologic measures from the physical measures component.
- Little difference by age in the proportion with symptomatic OA, severity of pain, difficulty with activities or needing help
  - Raises question about implications for aging with OA, including implications of living many years with pain, disability, and multi-morbidity
- People with multi joint OA generally worse off
  - More attention needs to be paid to OA as a multi-joint condition

Implications for future cycles of CLSA

- **OA in 3 sites misses OA in other joints. Suggest ask questions about:**
  - **OA in other joints including the back**
  - **Include a homunculus (or list) asking about symptoms in all major joints**

- **Need to ask about difficulty with ADL and IADL (not just needing help).**
  - **Ask ADL and IADL difficulty questions to tracking and comprehensive samples so we can study the evolution of dependence (and frailty), and relate this to physical measures**
  - **Modify the OARS questions to add a difficulty response option?**

- **Better pain measures (relevant to many conditions)**
  - **Discomfort is not the same as pain**
  - **People may respond differently to general versus site specific pain**
  - **Consider including site of pain, quality of pain, temporality etc**

Future directions of our research

A Biopsychosocial Approach to Understanding the Impact of Osteoarthritis on Social Participation

CIHR secondary analysis grant

- **Conceptual framework: WHO International Classification of Functioning, Disability, and Health**
- **Goal to deconstruct the relationship between OA and social participation considering several domains:**
  - **site of joints involved in OA, pain, activity and mobility, and**
  - **whether contextual personal (e.g. gender, age) and environmental factors (e.g. social support) modify these relationships.**

Major issue is how to operationalize participation.

Acknowledgments

Funding

Research Associates

- **Dov Millstone**
- **Calvin Yip**

Questions?

Upcoming CLSA Webinars

“They are older now: a snapshot of self-identified Veterans in the Canadian Longitudinal Study on Aging (CLSA)”

Dr. Christina Wolfson

November 13, 2017 | 12 p.m. EST

Register: bit.ly/clsawebinars