



Second generation assessment instruments: the interRAI suite

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***Geriatric
Assessment
Technology:
The State of the
Art***

***L.Z. Rubenstein
D. Wieland
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K
KURTIS

interRAI Nations

Nordic Countries

Iceland, Norway, Sweden, Denmark, Finland

North America

*Canada
US*



Europe

*Netherlands, Germany, UK,
Switzerland, France, Poland,
Italy, Spain, Estonia,
Czech Republic*

Middle East

Israel

Far East/Pacific Rim

*Japan, South Korea, Taiwan,
Hong Kong, Australia, New Zealand,
China*

The Role of the Integrated Suite

- There has been no common “language” across care settings and providers to assess and plan care for patient care
- Common, standardized items and instruments are the most important single vehicle for achieving commonality of language across settings and providers
- This is the logic behind the development of the InterRAI suite of instruments and items

The *interRAI* Suite

- An integrated, scientifically sound, set of setting-specific and cross-setting assessment instruments
- Content of each instrument depends on the needs of the persons in the setting, including standardized measures of physical and mental health, the performance of basic activities, social well-being, social participation, and issues of care

The interRAI Suite tools

- Nursing Home (LTCF)
- Home Care (HC)
- Post-Acute Care (PAC)
- Assisted Living (AL)
- Palliative Care (PC)
- Independent settings in the Community (Community Health Assessment - CHA).
- In-patient Mental Health Care (MH)
- Community Mental Health Care (CMH)
- Setting for persons with Intellectual Disabilities (ID)
- interRAI will soon release a focused tool for use in Acute Care Hospitals (AC).

Stages of Development

- *interRAI* Fellows began this effort many years ago (late eighties) by creating the nursing home MDS (now the LTCF)
- *interRAI* next developed the Home Care MDS Assessment tool (now HC) in early nineties
- *interRAI* has since moved on to create a “full” Suite (family) of assessment tools
- Each assessment instrument in the Suite rests on a research foundation – reliability and validity trials, process analyses, and effectiveness studies

Integrated Health Information System: The Challenge

- The pre-Suite versions of interRAIs instruments were developed over a ten-year period:
 - At different times ... with different knowledge
 - By different expert committees
- As a result there were differences in:
 - Item wording
 - Time frames over which items were assessed
 - Coding instructions
 - Consistency with the most current research

interRAI ISD Committee Suite Development Effort

- Phase one – the first step
 - Inventory of all items in all interRAI instruments
 - Classification of items into four categories
 - Core – should appear on all instruments
 - Optional – appropriate form some instruments
 - Instrument specific – only applies to a single instrument
 - Items to drop – they just didn't work

Suite Development Effort

- Phase two
 - Harmonization of Core and Optional items
 - Review of measurement properties
 - Refinement to single standard wording for each item as it is to appear in all instruments in the Suite
 - Specification of the code responses for the standardized items
- Establishment of new standards
 - Removal of all references to client, patient, resident
 - Standard is either no term or “person”
 - Use of three day observation (assessment) period

Suite Development Effort

- Phase three
 - Redesign of all instruments
 - Each instrument committee
 - Incorporated Core items, added appropriate Optional items
 - Instrument forms approved in draft in 2003 and *interRAI* went into the field with a wide-ranging, cross-national trial
 - With the largest groups of field sites coming from Canada

Suite Development Effort

- Phase four
 - Field test completed
 - Analysis of the distributional properties of the items – did the new items behave as expected
 - Reliability of items established

Kappas for common and unique items



Instruments: All, LTCF, HC, PC, PAC

Common items Unique items

Suite Development Effort

- Feedback solicited on real-world problems with items and process in the field trial
- Cycles of review and Suite upgrade by interRAI Fellows and experts from around the world
- Discussions with field sites on proposed changes – e.g., what small set of changes/additions would make an assessment instrument “work” – e.g., PC feedback from Canada and Iceland
- Finalization of the Suite – April 2005

Development Process for the RAI Family of Instruments

RAI 2.0

RAI-HC 2.0

RAI-MH

RAI-AC

RAI-AL

RAI-PAC

RAI-PC

Identify main clinical problems

Specify triggers for each problem

Conduct reliability & validity trials

Develop assessment protocols

Develop additional applications

Conduct clinical studies

Implement in clinical settings

On-going evaluation & refinement

interRAI Long-Term Care Facility (LTCF) ©

SECTION C. COGNITION

1. COGNITIVE SKILLS FOR DAILY DECISION MAKING

Making decisions regarding tasks of daily life—e.g., when to get up or have meals, which clothes to wear or activities to do

- 0. **Independent**—Decisions consistent, reasonable, and safe
- 1. **Modified independence**—Some difficulty in new situations only
- 2. **Minimally impaired**—In specific recurring situations, decisions become poor or unsafe; cues/supervision necessary at those times
- 3. **Moderately impaired**—Decisions consistently poor or unsafe; cues / supervision required at all times
- 4. **Severely impaired**—Never or rarely makes decisions
- 5. **No discernable consciousness, coma** [Skip to Section G]

2. MEMORY/RECALL ABILITY

Code for recall of what was learned or known

- 0. Yes, memory OK
- 1. Memory problem

- a. **Short-term memory OK**—Seems / appears to recall after 5 minutes
- b. **Long-term memory OK**—Seems / appears able to recall distant past
- c. **Procedural memory OK**—Can perform all or almost all steps in a multitask sequence without cues
- d. **Situational memory OK**—Both: recognizes caregivers' names / faces frequently encountered AND knows location of places regularly visited (bedroom, dining room, activity room, therapy room)

3. PERIODIC DISORDERED THINKING OR AWARENESS

[Note: Accurate assessment requires conversations with staff, family or others who have direct knowledge of the person's behavior over this time]

- 0. Behavior not present
- 1. Behavior present, consistent with usual functioning
- 2. Behavior present, appears different from usual functioning (e.g., new onset or worsening; different from a few weeks ago)

- a. **Easily distracted**—e.g., episodes of difficulty paying attention; gets sidetracked
- b. **Episodes of disorganized speech**—e.g., speech is nonsensical, irrelevant, or rambling from subject to subject; loses train of thought
- c. **Mental function varies over the course of the day**—e.g., sometimes better, sometimes worse

4. ACUTE CHANGE IN MENTAL STATUS FROM PERSON'S USUAL FUNCTIONING—e.g., restlessness, lethargy, difficult to arouse, altered environmental perception

- 0. No
- 1. Yes

5. CHANGE IN DECISION MAKING AS COMPARED TO 90 DAYS AGO (OR SINCE LAST ASSESSMENT)

- 0. Improved
- 1. No change
- 2. Declined
- 3. Uncertain

interRAI Home Care (HC) ©

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- 1. No change
- 2. Declined
- 3. Uncertain



interRAI Long-Term Care Facility (LTCF) ©

SECTION H. CONTINENCE

1. BLADDER CONTINENCE

- 0. *Continent*—Complete control; DOES NOT USE any type of catheter or other urinary collection device
- 1. *Control with any catheter or ostomy over last 3 days*
- 2. *Infrequently incontinent*—Not incontinent over last 3 days, but does have incontinent episodes
- 3. *Occasionally incontinent*—Less than daily
- 4. *Frequently incontinent*—Daily, but some control present
- 5. *Incontinent*—No control present
- 8. *Did not occur*—No urine output from bladder in last 3 days

2. URINARY COLLECTION DEVICE (Exclude pads / briefs)

- 0. None
- 1. Condom catheter
- 2. Indwelling catheter
- 3. Cystostomy, nephrostomy, ureterostomy

3. BOWEL CONTINENCE

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- 1. *Control with ostomy*—Control with ostomy device over last 3 days
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- 4. *Frequently incontinent*—Daily, but some control present
- 5. *Incontinent*—No control present
- 8. *Did not occur*—No bowel movement in the last 3 days

4. OSTOMY

- 0. No
- 1. Yes

interRAI Home Care (HC) ©

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- 8. *Did not occur*—No bowel movement in the last 3 days

4. PADS OR BRIEFS WORN

- 0. No
- 1. Yes



interRAI Long-Term Care Facility (LTCF) ©

SECTION F. PSYCHOSOCIAL WELL-BEING

1. SOCIAL RELATIONSHIPS

[Note: Ask person, direct care staff, and family, if available]

- 0. Never
- 1. More than 30 days ago
- 2. 8 to 30 days ago
- 3. 4 to 7 days ago
- 4. In last 3 days
- 8. Unable to determine

- a. Participation in social activities of long-standing interest
- b. Visit with a long-standing social relation or family member
- c. Other interaction with long-standing social relation or family member—e.g., telephone, e-mail

2. SENSE OF INVOLVEMENT

- 0. Not present
- 1. Present but not exhibited in last 3 days
- 2. Exhibited on 1-2 of last 3 days
- 3. Exhibited daily in last 3 days

- a. At ease interacting with others
- b. At ease doing planned or structured activities
- c. Accepts invitations into most group activities
- d. Pursues involvement in life of facility—e.g., makes or keeps friends; involved in group activities; responds positively to new activities; assists at religious services
- e. Initiates interaction(s) with others
- f. Reacts positively to interactions initiated by others
- g. Adjusts easily to change in routine

3. UNSETTLED RELATIONSHIPS

- 0. No
- 1. Yes

- a. Conflict with or repeated criticism of other care recipients
- b. Conflict with or repeated criticism of staff
- c. Staff report persistent frustration in dealing with person
- d. Family or close friends report feeling overwhelmed by person's illness
- e. Says or indicates that he/she feels lonely

4. MAJOR LIFE STRESSORS IN LAST 90 DAYS—

e.g., episode of severe personal illness; death or severe illness of close family member / friend; loss of home; major loss of income/assets; victim of a crime such as robbery or assault; loss of driving license/car

- 0. No
- 1. Yes

5. STRENGTHS

- 0. No
- 1. Yes

- a. Consistent positive outlook
- b. Finds meaning in day-to-day life
- c. Strong and supportive relationship with family

interRAI Home Care (HC) ©

SECTION F. PSYCHOSOCIAL WELL-BEING

1. SOCIAL RELATIONSHIPS

[Note: Whenever possible, ask person]

- 0. Never
- 1. More than 30 days ago
- 2. 8 to 30 days ago
- 3. 4 to 7 days ago
- 4. In last 3 days
- 8. Unable to determine

- a. Participation in social activities of long-standing interest
- b. Visit with a long-standing social relation or family member
- c. Other interaction with long-standing social relation or family member—e.g., telephone, e-mail
- d. Openly expresses conflict or anger with family or friends
- e. Fearful of a family member or close acquaintance
- f. Neglected, abused, or mistreated

2. LONELY

Says or indicates that he / she feels lonely

- 0. No
- 1. Yes

3. CHANGE IN SOCIAL ACTIVITIES IN LAST 90 DAYS (OR SINCE LAST ASSESSMENT IF LESS THAN 90 DAYS AGO)

Decline in level of participation in social, religious, occupational or other preferred activities

IF THERE WAS A DECLINE, person distressed by this fact

- 0. No decline
- 1. Decline, not distressed
- 2. Decline, distressed

4. LENGTH OF TIME ALONE DURING THE DAY (MORNING AND AFTERNOON)

- 0. Less than 1 hour
- 1. 1-2 hours
- 2. More than 2 hours but less than 8 hours
- 3. 8 hours or more

5. MAJOR LIFE STRESSORS IN LAST 90 DAYS—e.g., episode of severe personal illness; death or severe illness of close family member / friend; loss of home; major loss of income / assets; victim of a crime such as robbery or assault; loss of driving license/car

- 0. No
- 1. Yes



interRAI Long-Term Care Facility (LTCF) ©

SECTION P. RESPONSIBILITY AND DIRECTIVES

1. RESPONSIBILITY / LEGAL GUARDIAN [EXAMPLE--USA]

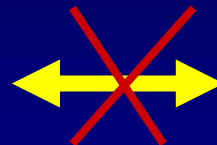
0. No 1. Yes

- a. Legal guardian
- b. Other legal oversight
- c. Durable power of attorney / health care
- d. Durable power attorney / financial
- e. Family member responsible

2. ADVANCE DIRECTIVES [EXAMPLE - USA]

0. Not in place 1. In place

- a. Advance directives for not resuscitating
- b. Advance directives for not intubating
- c. Advance directives for not hospitalizing
- d. Advance directives for not tube feeding
- e. Advance directives for medication restriction



interRAI Home Care (HC) ©

SECTION P. SOCIAL SUPPORTS

1. TWO KEY INFORMAL HELPERS

a. Relationship to person

- 1. Child or child-in-law
- 2. Spouse
- 3. Partner / significant other
- 4. Parent
- 5. Sibling
- 6. Other relative
- 7. Friend
- 8. Neighbor
- 9. No informal helper

Helper	
1	2
<input type="checkbox"/>	<input type="checkbox"/>

b. Lives with person

- 0. No
- 1. Yes, 6 months or less
- 2. Yes, more than 6 months
- 8. No informal helper

Helper	
1	2
<input type="checkbox"/>	<input type="checkbox"/>

AREAS OF INFORMAL HELP DURING LAST 3 DAYS

- 0. No 1. Yes 8. No informal helper

Helper	
1	2
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

c. IADL care

d. ADL care

2. INFORMAL HELPER STATUS

0. No 1. Yes

- a. Informal helper(s) is unable to continue in caring activities—e.g., decline in health of helper makes it difficult to continue
- b. Primary informal helper expresses feelings of distress, anger, or depression
- c. Family or close friends report feeling overwhelmed by person's illness

3. HOURS OF INFORMAL CARE AND ACTIVE MONITORING DURING LAST 3 DAYS

For instrumental and personal activities of daily living in the LAST 3 DAYS, indicate the total number of hours of help received from all family, friends, and neighbors

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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4. STRONG AND SUPPORTIVE RELATIONSHIP WITH FAMILY

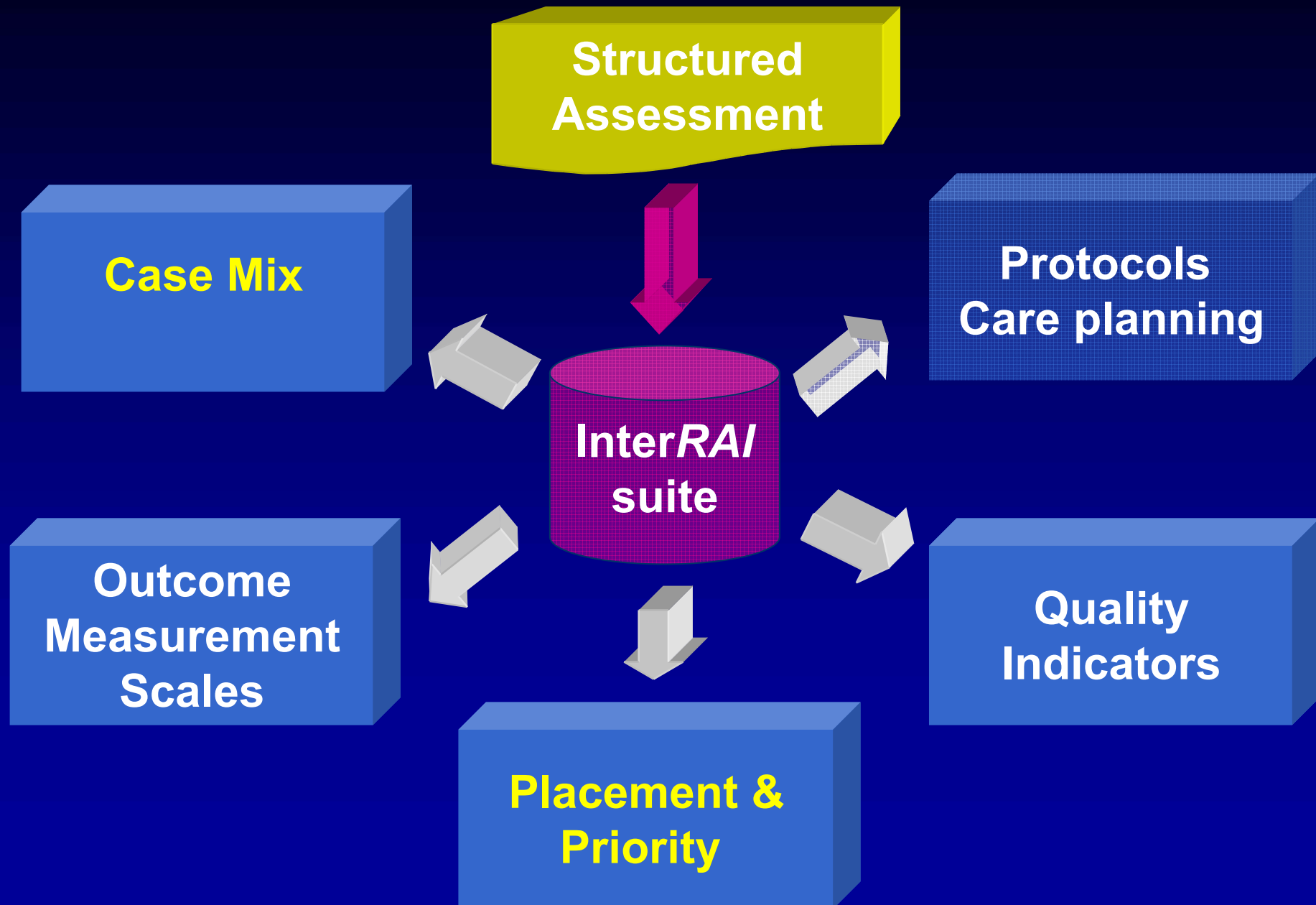
0. No 1. Yes

<input type="checkbox"/>

interRAI Implementations

- All US nursing homes
- 10 US states – home care
- Switzerland, Hong Kong (home care)
- Iceland and Estonia (nursing home, home care)
- 7 Canadian provinces
- Major trial in China
- 30+ nations currently experimenting with RAI instruments
- RAI translated into 18+ languages

Outputs from the assessment



Existing Scales

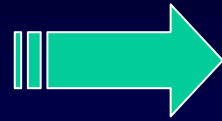
- In selecting items to be included in tools such as the new variant of the nursing home assessment instrument, *interRAI* included the items required to score
 - CMS' Quality Indicators
 - The RUG III system,
 - the CAPS
 - The many established scales that are based on the earlier generation of these assessment instruments (CPS, DRS, Pain, ADLs, IADLs, Index of social engagement, CHESS)

New Scales

- As a part of our field trial we completed a series of new validation studies
- New and refined scales resulted
 - A new delirium scale
 - A new self-report depression scale
 - Refinements to a number of scales, including the Cognitive Performance Scale and Pain Scale

Geriatric Assessment

Patient level



Make the physical exam complete

Better care plan

Population level



Database

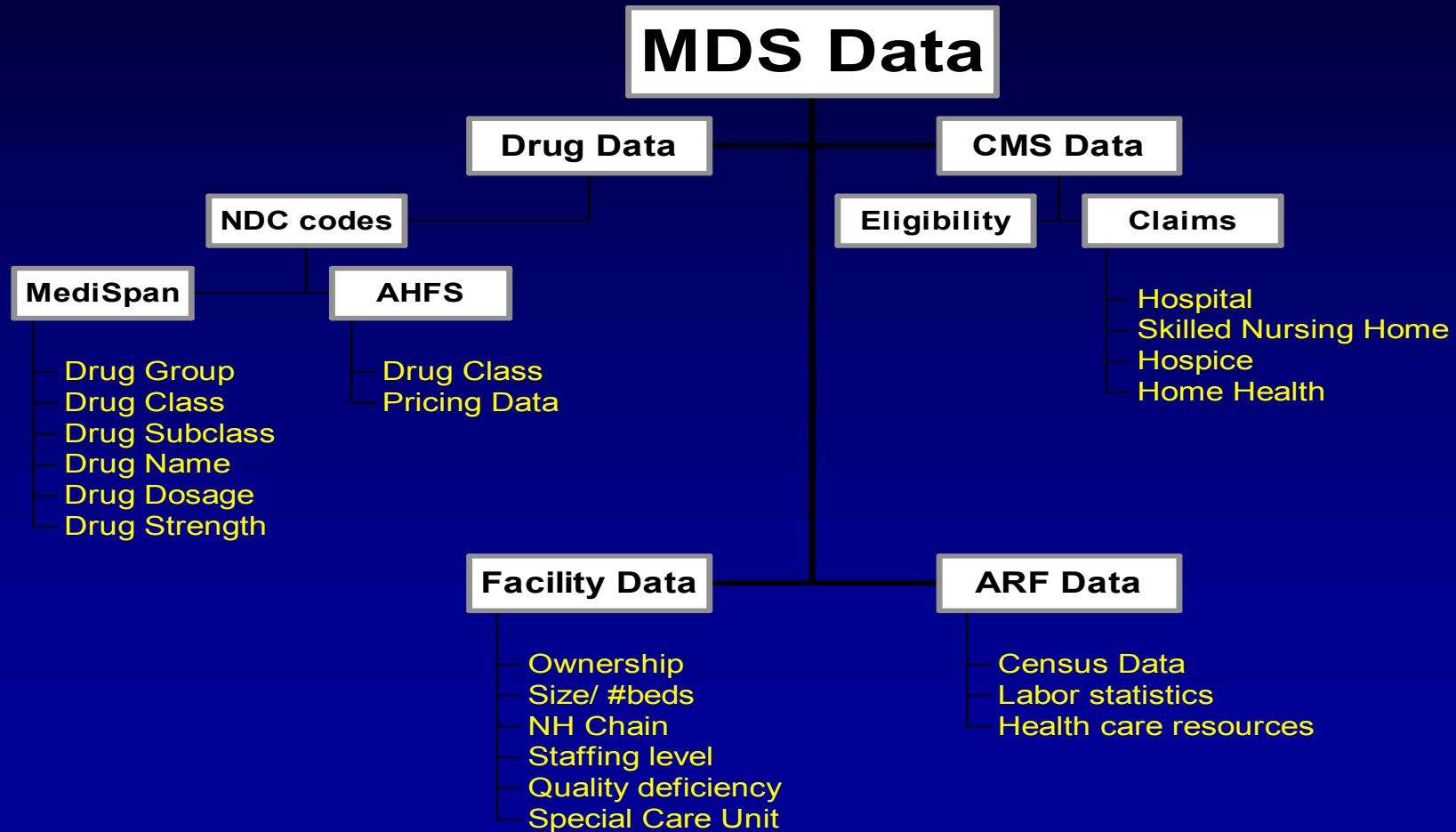
Prognostic factors

Outcome measurements

Quality control indicators

Comparisons

The SAGE database



Numbers of the SAGE database

- Longitudinal (1992-2001)
- Nearly 2.000.000 pts
- Mean age: 83 yrs (8% 95+ yrs old)
- About 5 million interRAI LTCF assessments
- About 50 million of drug records

interRAI suite

Patient level



Make the physical exam
complete

Better care plan

Population level



Database

Prognostic
factors

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measurements

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Comparisons

Pain predictors in oncological patients

	<i>Daily pain (n=4003)</i>	<i>No pain* (n=9610)</i>	<i>ODDS RATIO</i>	<i>95% CI</i>
85+ years old	1128	3540	0.56	(0.51-0.67)
Race: Afro-Americans	188	852	0.55	(0.44-0.68)
Cognitive impairment	1608	4955	0.72	(0.64-0.80)

Bernabei et al. JAMA 1998; 279: 1877-1882

interRAI suite

Patient level



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Population level



Database

Prognostic
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**Outcome
measurements**

Quality control
indicators

Comparisons

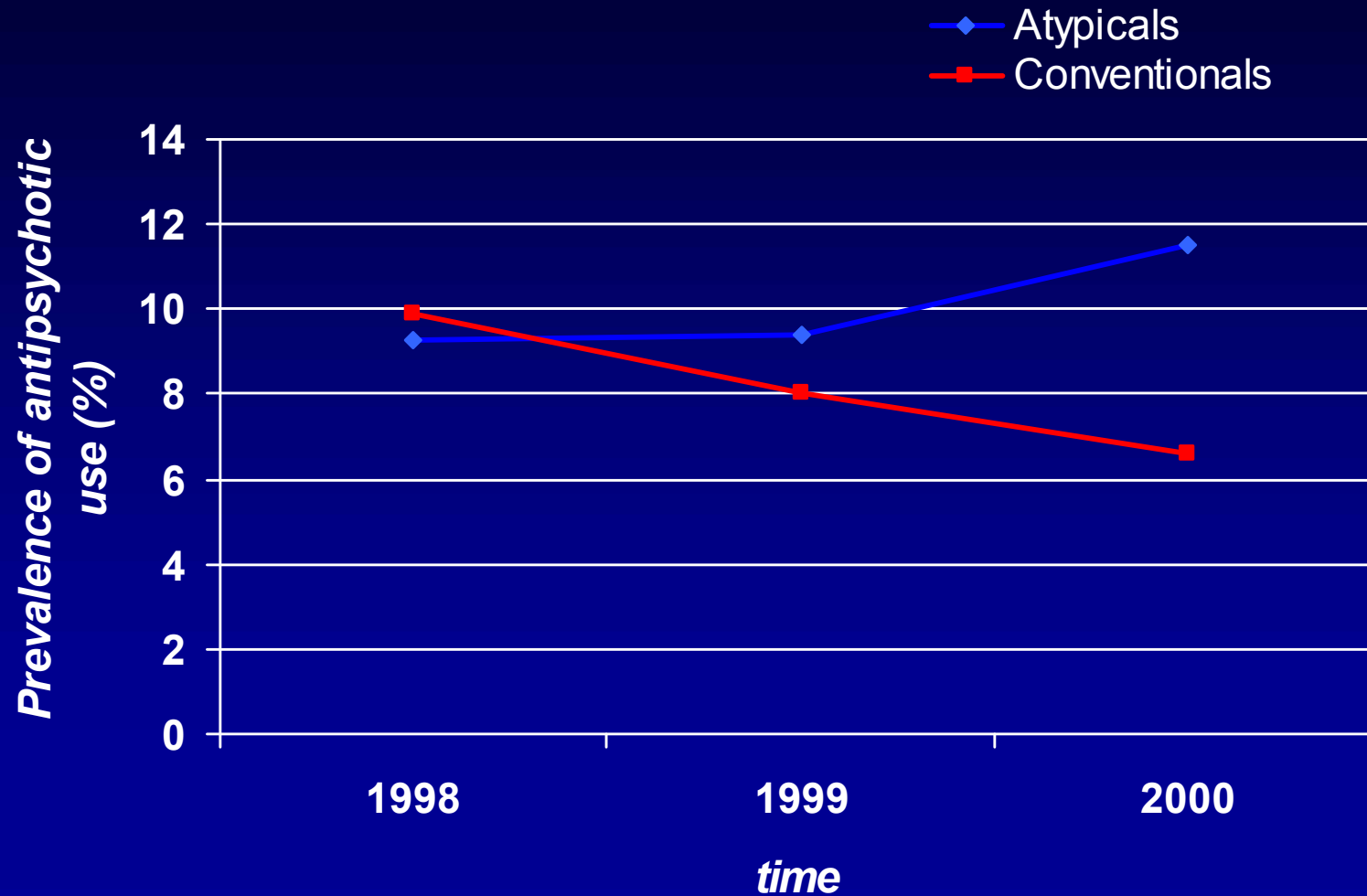
Effects of ACE Inhibitors and Digoxin on Health Outcomes of Very Old Patients with Heart Failure

No. of Events

<i>Outcome</i>	ACE		RR (95% CI)
	Digoxin (n=14890)	Inhibitors (n=4911)	
Death	4845	1504	0.89 (0.83-0.95)
CV Hospitalization	5699	1973	0.98 (0.93-1.04)
Any Hospitalization	6328	2132	0.96 (0.91-1.01)
Death or Hospitalization	8295	2725	0.95 (0.92-1.00)
Decline in physical function	3985	1208	0.74 (0.69-0.80)

Gambassi G et al. *Arch Intern Med* 2000; 160: 53-60

Temporal Trend in Antipsychotic Prescription among Ohio NH residents



*mean number of residents per year 120,105

Liperoti et al. JAGS 2004; 52: 2148-9

Crude, adjusted odds ratios and 95% confidence intervals of being hospitalized with diagnosis of ventricular arrhythmias or cardiac arrest in residents using antipsychotics on a standing order

	Crude OR	Adj. OR	95% CI
Atypical vs. no use	0.70	0.87	0.58-1.32
Conventional vs. no use	1.53	1.86	1.27-2.74
Conventional vs. Atypical	2.19	2.13	1.27-3.60

Incidence Of Reported Cerebrovascular Events In Placebo-controlled, Dementia Trials In Elderly Patients Taking Risperidone

	RISPERIDONE	PLACEBO
Study	pts w/events	pts w/events
AUS-5	9% (15/167)	2% (3/170)
INT-24	8% (9/115)	2% (2/114)
USA-63	1% (5/462)	1% (2/163)
BEL-14	0% (0/20)	0% (0/19)
Total	4% (29/764)	2% (7/466)

Risperidone used within the approved dosage range, for 4 to 12 weeks

Crude, adjusted odds ratios and 95% confidence intervals of being hospitalized with diagnosis of stroke/TIA in residents using antipsychotics compared to non users

	Crude OR	Adj. OR	95% CI
Risperidone	0.95	0.87	0.67-1.12
Olanzapine	1.37	1.32	0.83-2.11
Clozapine/Quetiapine	1.77	1.57	0.65-3.82
Conventionals	1.27	1.24	0.95-1.63

Modification of antipsychotic effect by a prior history of cerebrovascular disease on the risk of new cerebrovascular events (CVEs)

	Crude OR	Adj. OR	95% CI
CVEs history and Risperidone	1.74	1.49	0.93-2.38
CVEs history and Olanzapine	3.69	3.71	1.55-8.84
CVEs history and Conventional	1.21	1.23	0.68-2.23
Non-CVEs history and Risperidone	0.88	0.83	0.62-1.12
Non-CVEs history and Olanzapine	1.07	1.04	0.60-1.80
Non-CVEs history and Conventional	1.42	1.36	1.01-1.83
CVEs history and no antipsychotics	1.33	1.50	1.22-1.84
Non CVEs history no antipsychotics	1.00	1.00	-

Crude, adjusted Hazard ratios and 95% confidence intervals of being hospitalized for VTE among antipsychotic users
(ref. cat. non users of antipsychotics)

	Crude HR	Adj. HR	95% CI
Risperidone	1.52	1.98	1.40-2.78
Olanzapine	1.54	1.87	1.06-3.27
Clozapine/Quetiapine	2.08	2.68	1.15-6.28
Phenothiazines	0.95	1.03	0.60-1.77
Other Conventionals	0.91	0.98	0.52-1.87
Multiple antipsychotics	3.42	4.80.82	2.28-10.10

Liperoti et al. Arch Intern Med 2005; 165: 696-701

interRAI suite

Patient level



Make the physical exam
complete

Better care plan

Population level



Database

Prognostic
factors

Outcome
measurements

Quality control
indicators

Comparisons

Prevalence Quality Indicators

- **Nutrition**
 - Inadequate Meals
 - Weight Loss
 - Dehydration
- **Pain**
 - Disruptive/Intense Pain
 - Unmanaged Pain
- **Physical function**
 - No Assistive Device for Clients with Difficulty in Locomotion
 - ADL/Rehabilitation Potential and No Therapies
- **Psychosocial function**
 - Social Isolation with Distress
 - Delirium
 - Negative mood
- **Medication**
 - No medication review
- **Safety/Environment**
 - Falls
 - Any injuries
 - Neglect/Abuse
- **Other**
 - No Influenza Vaccination
 - Hospitalization

Incidence Quality Indicators

- **Incontinence**

- Failure to improve/
incidence of bladder
continence

- **Ulcers**

- Failure to improve/
incidence of skin ulcers

- **Physical function**

- Failure to improve/
incidence of decline in ADL
- Failure to improve/
incidence of impaired
locomotion in the home

- **Psychosocial function**

- Failure to improve/ incidence
of cognitive decline
- Failure to improve/ incidence
of difficulty in communication

- **Other**

- Increased health instability

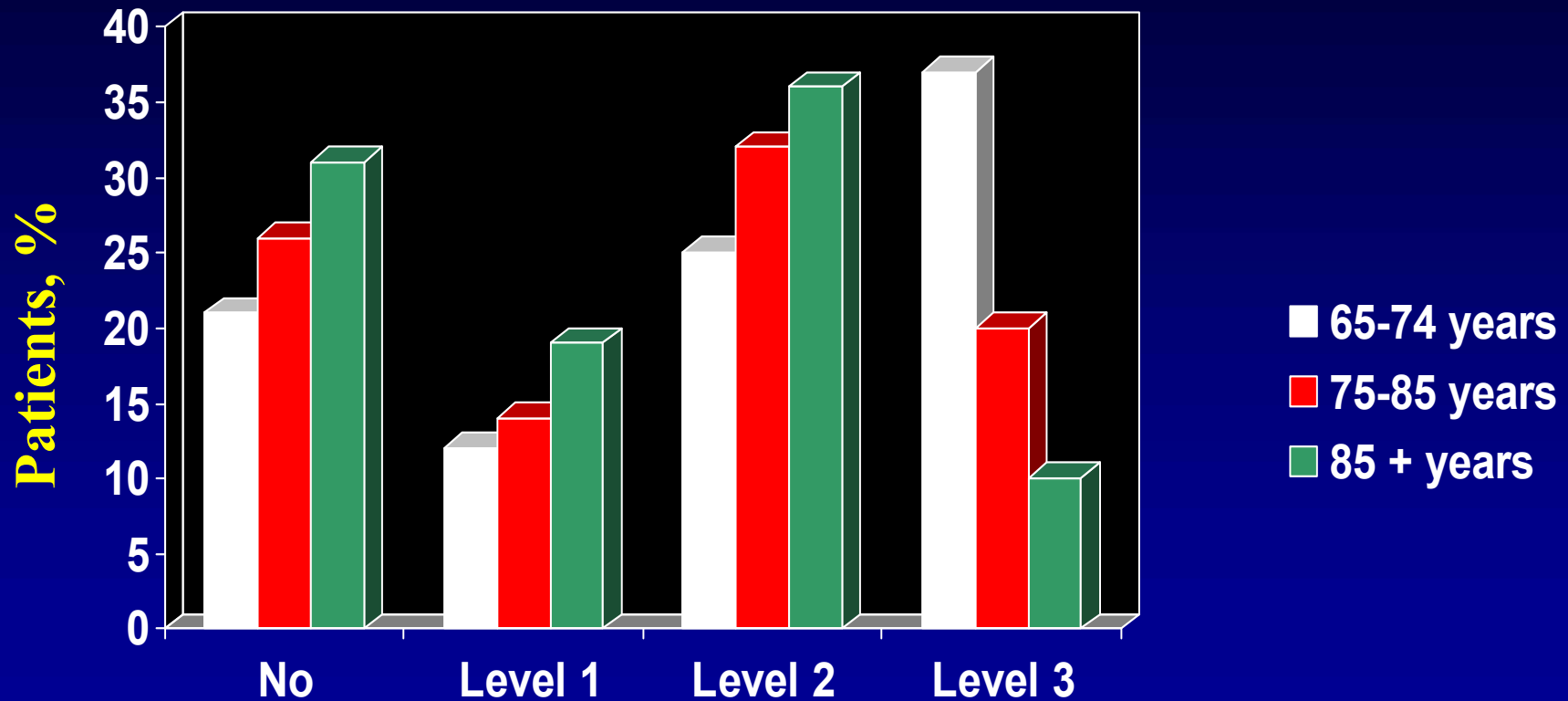
Nursing Home Quality Indicators Profile

Facility Name: ABC Manor

Report Period: 7/1/00 to 12/31/00

<u>Domain/Quality Indicator</u>	<u>Number with QI</u>	<u>Number in Denom</u>	<u>Facility Percentage</u>	<u>Peer Group Percentage</u>	<u>%ile Rank</u>	<u>Flag</u>
<u>Accidents</u>						
1. Incidence of New Fracture	1	79	1.3%	1.8%	40	
2. Prevalence of Falls	14	79	17.7%	13.3%	81	
<u>Behavioral/Emotional</u>						
3. Prevalence of Behavioral Symptoms	21	79	26.6%	21.2%	76	
High Risk	19	56	33.9%	26.4%	79	
Low Risk	2	23	8.7%	10.2%	58	
4. Symptoms of Depression	23	79	29.1%	15.1%	91	⏏
5. Symptoms of Depression without Antidepressant Therapy	13	79	16.5%	7.9%	93	⏏
<u>Clinical Management</u>						
6. Use of 9+ Medications	22	79	27.8%	27.6%	52	
<u>Cognitive Patterns</u>						
7. Onset of Cognitive Impairment	1	24	4.2%	10.3%	19	

Pharmacological treatment of pain in cancer patients



analgesia
Level 1 *No narcotics*

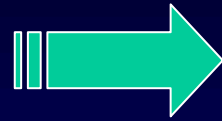
Level 2 *Weak opioids*

Level 3 *Morphine or like*

Bernabei et al. JAMA 1998; 279: 1877-1882

interRAI suite

Patient level



Make the physical exam
complete

Better care plan

Population level



Database

Prognostic
factors

Outcome
measurements

Quality control
indicators

Comparisons

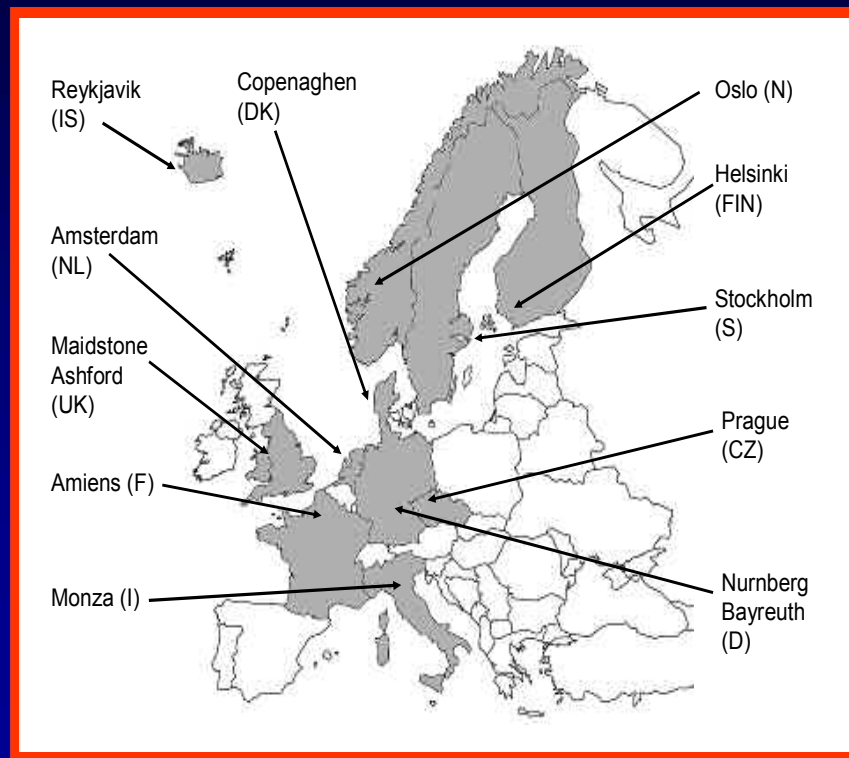


Developing an evidence-base for community care services in Europe

The Aged Home Care project ADHOC

G I Carpenter	Canterbury	V Garms-Homolova	Berlin
E Topinkova	Praque	P Jonsson	Reykjavik
M Schroll	Copenhagen	D Frijters	Utrecht
H Finne-Soverei	Helsinki	L W Sørbye	Oslo
J-C Henrard	Paris	G Ljunggren	Stockholm

R Bernabei Rome (Principal Investigator)



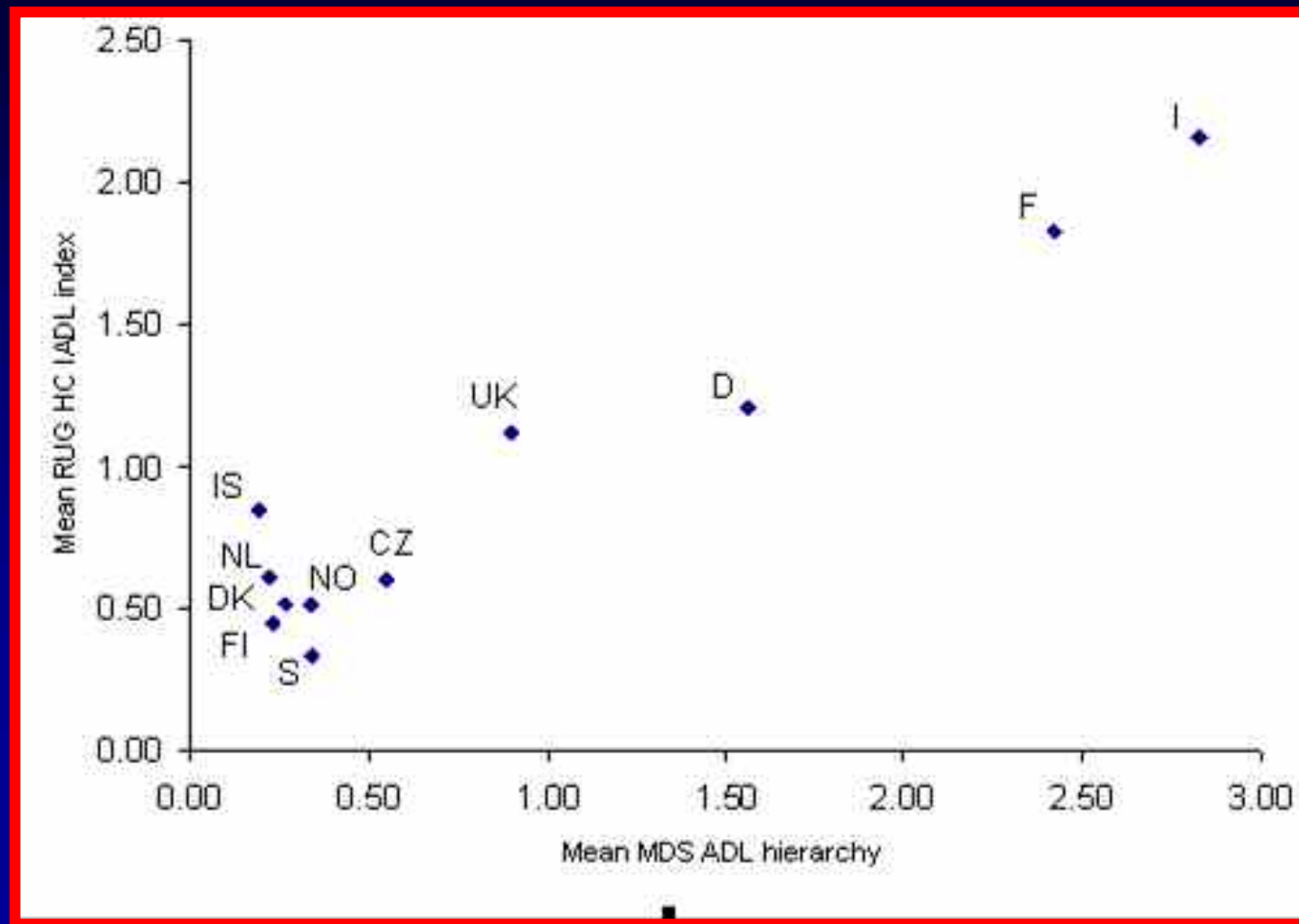
interRAI

AdHoc study

- More than 4000 subjects in Home Care in 11 European countries;
- Age \geq 65 years;
- Data collected by the interRAI HC version 2.0.

Relationship between mean MDS HC IADL index and mean MDS ADL hierarchy score by country

interRAI

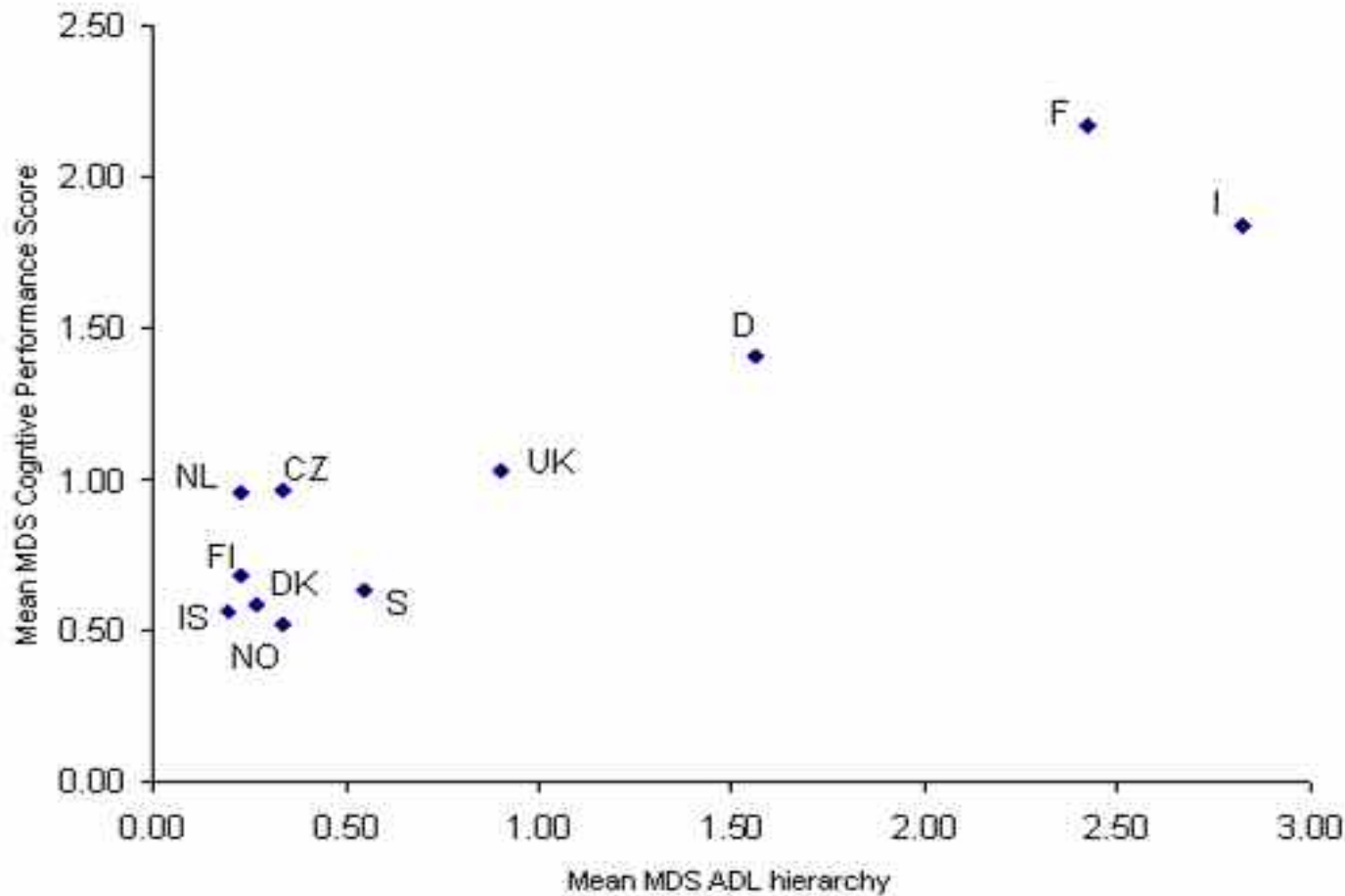


Carpenter I et al, Aging Clin Exp Res 2004;16:259-269



Relationship between mean MDS Cognitive Performance Scale and mean MDS ADL hierarchy by country

interRAI



Carpenter I et al, Aging Clin Exp Res 2004;16:259-269

JAMA Potentially Inappropriate Medication Use Among Elderly Home Care Patients in Europe

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Roberto Bernabei, MD

for the ADHOE Project Research Group

USE OF POTENTIALLY INAPPROPRIATE medications in elderly patients is a major health-care concern. It is likely to increase the risk of adverse drug events, which are estimated to be the fifth most common cause of death among hospitalized patients¹ and which account for a large number of hospital admissions and a substantial increase in health care costs.²

In the United States and Canada, epidemiological studies have documented widespread use of potentially inappropriate medications among receiving home residents (up to 40%) and

Context Criteria for potentially inappropriate medication use among elderly patients have been used in the past decade in large US epidemiological surveys to identify populations at risk and specifically target risk-management strategies. In contrast, in Europe little information is available about potentially inappropriate medication use and is based on small studies with uncertain generalizability.

Objective To estimate the prevalence and associated factors of potentially inappropriate medication use among elderly home care patients in European countries.

Design, Setting, and Participants Retrospective cross-sectional study of 2702 elderly patients receiving home care (mean [SD] age, 80.2 [7.2] years) whose relatives were enrolled in metropolitan areas of the Czech Republic, Denmark, Finland, Iceland, Italy, the Netherlands, Norway, and the United Kingdom. Patients were prospectively assessed between September 2001 and January 2002 using the Minimum Data Set in Home Care instrument.

Main Outcome Measure Prevalence of potentially inappropriate medication use was documented using all expert panel criteria for community-living elderly persons (Beers and McLeod). Patient-related characteristics independently associated with inappropriate medication use were identified with a multiple logistic regression model.

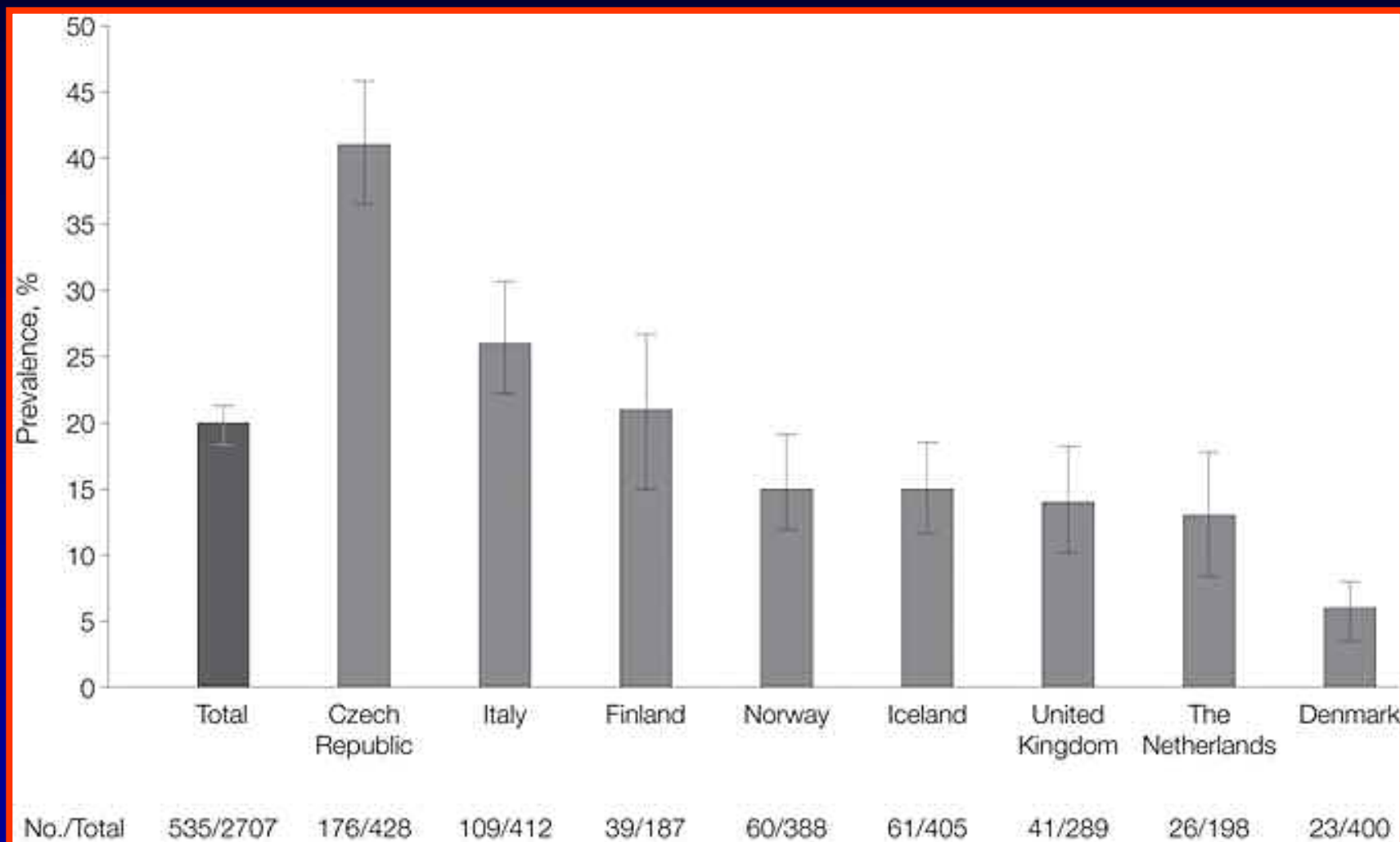
Results Combining all 9 sets of criteria, we found that 19.8% of patients in the total sample used at least 1 inappropriate medication, using older 1997 criteria it was 9.8% to 10.5%. Substantial differences were documented between Eastern Europe (41.1% in the Czech Republic) and Western Europe (mean 15.8%, ranging from 9.8% in Denmark to 26.5% in Italy). Potentially inappropriate medication use was associated with patient's prior economic situation (adjusted relative risk [RR], 1.54; 95% confidence interval [CI], 1.24-2.38), polypharmacy (RR, 1.51; 95% CI, 1.42-2.22), anesthetic drug use (RR, 1.82; 95% CI, 1.51-2.15), and depression (RR, 1.29; 95% CI, 1.06-1.59). Negatively associated factors were age 85 years and older (RR, 0.72; 95% CI, 0.62-0.82) and living alone (RR, 0.74; 95% CI, 0.64-0.85). The odds of potentially inappropriate medication use significantly increased with the number of associated factors ($P < .001$).

Conclusions Substantial differences in potentially inappropriate medication use exist between European countries and might be a consequence of different regulatory resources, clinical practices, or inequalities in socioeconomic background. Since structural measures and selected patient-related characteristics are associated with such prescribing, specific educational strategies and regulations should reflect these factors to improve prescribing quality in elderly individuals in Europe.

JAMA. 2005;294:2461-2467

www.jama.com

Prevalence of Potentially Inappropriate Medication Use Considering All Explicit Criteria Combined



Fialova, D. et al. JAMA 2005

JAMA



Prevalence and predictors of influenza vaccination among frail, community-living elderly patients: an International Observational Study

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Vjenka Garms-Homolova^c, Roberto Bernabei^a

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Received 23 December 2004; received in revised form 14 February 2005; accepted 23 March 2005

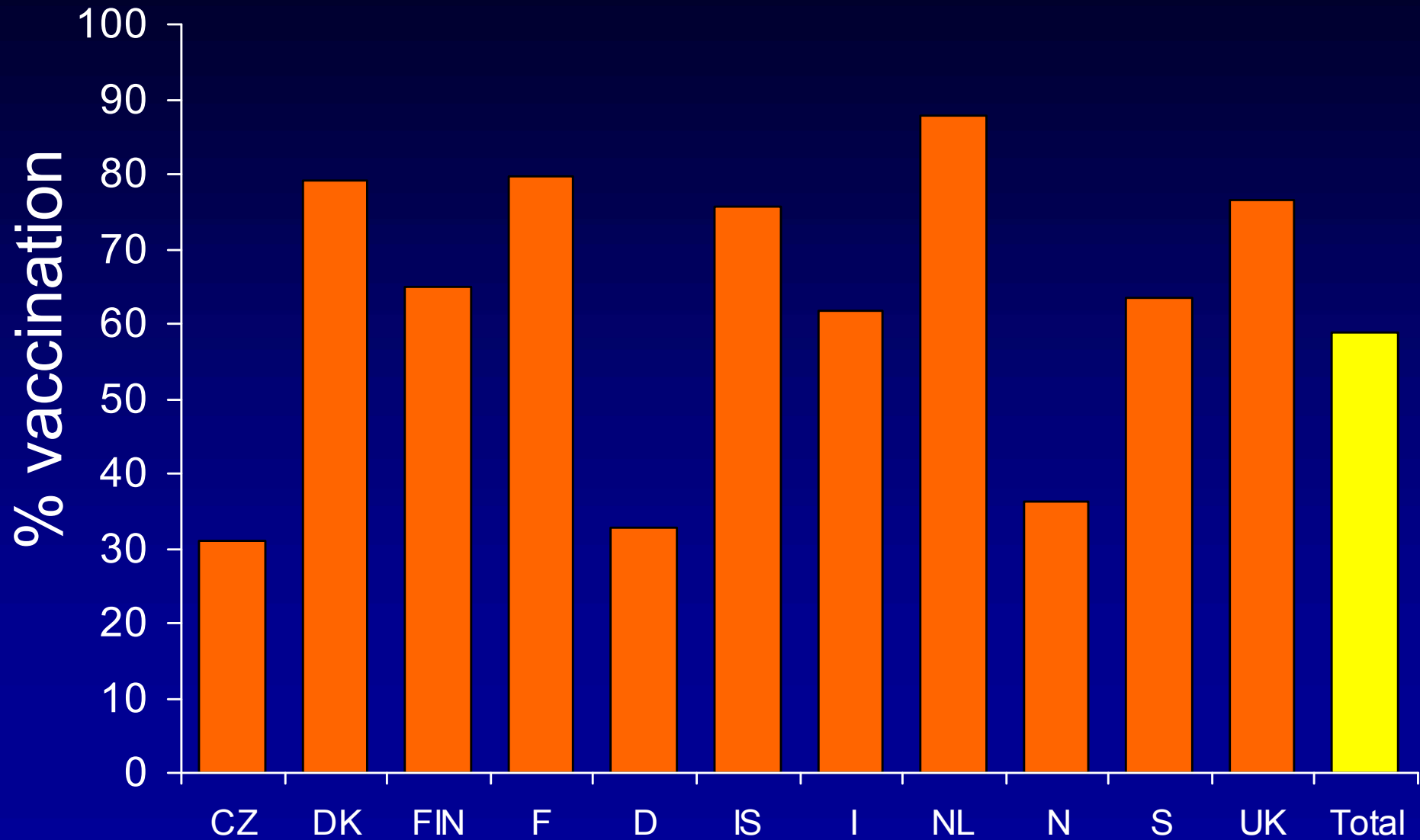
Abstract

The annual winter outbreak of influenza is one of the major cause of morbidity and mortality among frail elderly people. The aim of the present study was to identify prevalence and predictors of influenza vaccination in a large European population of frail and old people living in community. This was an observational study conducted in 11 European countries. We enrolled 3878 people 65 years and older already receiving home care services within the urban areas. All participants were assessed with the Minimum Data Set-Home Care (MDS-HC) instrument containing over 300 items, including socio-demographic, physical and cognitive characteristics of patients as well as medical diagnoses and medications received. A single question about the influenza vaccination status was used. The rate of influenza vaccination was around 59% of the studied sample. Significant geographical variations were evident in the prevalence of vaccination ranging from 31% of Prague (Czech Republic) to 88% of Rotterdam (The Netherlands). Overall, persons living alone were less likely to receive influenza vaccine as compared with those living with an informal caregiver (OR, 0.78; 95% CI 0.67–0.90). Similarly, cognitive impairment and presence of economic problems were associated with a lower likelihood of being vaccinated (OR: 0.69, 95% CI 0.59–0.80 and OR, 0.58; 95% CI 0.45–0.74, respectively). On the other hand, old age and comorbidity were associated with an higher probability of being vaccinated. In conclusion, more than 40% of subjects in this sample of home care patients in Europe did not receive influenza vaccination. Recommendations for influenza vaccination have not been adequately implemented.

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Keywords: Influenza vaccination; Frail elderly; MDS-HC assessment

Prevalence of vaccination



Landi, F. et al Vaccine 2005

Predictors of influenza vaccination

Age	1.00 (0.99-1.01)
Gender (female)	1.15 (0.99-1.34)
ADL	1.00 (0.97-1.04)
IADL	1.01 (0.97-1.05)
CPS	0.94 (0.90-0.98)
Depression	0.95 (0.91-0.99)
Living alone	0.67 (0.57-0.78)
Comorbidity	1.10 (1.06-1.15)
N. drugs >3	1.13 (1.10-1.16)
Economic problems	1.04 (0.76-1.43)
Malnutrition	0.70 (0.44-1.09)
Pressure ulcer	0.95 (0.67-1.34)

Association between pain and depression among older adults in Europe: results from the Aged in Home Care (AdHOC) project: a cross-sectional study

Onder G, Landi F, Gambassi G, Liperoti R, Soldato M, Catananti C, Finne-Soveri H, Katona C, Carpenter I, Bernabei R.

Objective: To assess the association between pain and depression in a population of older adults.

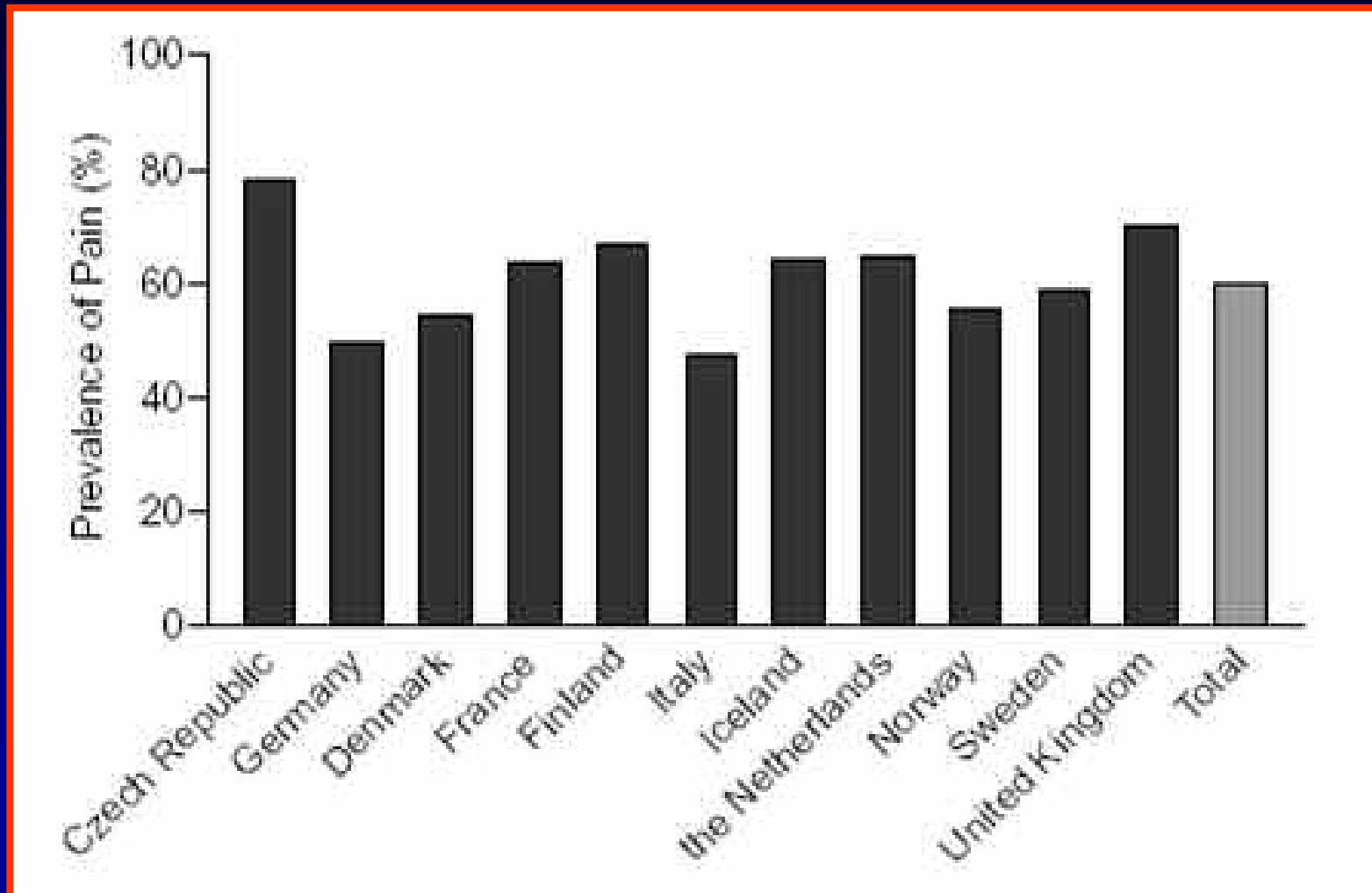
Methods: We conducted a cross-sectional study using data from the AD-HOC database, which contains information on older adults receiving home care services in 11 European countries. Pain was defined as any type of pain or discomfort manifested over the seven days preceding the assessment. Depression was diagnosed as a score ≥ 3 on the Minimum Data Set Depression Rating Scale.

Results: Mean age of 3,976 subjects entering the study was 82.3 years, and 2,948 (74.1%) were women. Of the total sample, 2,380 subjects presented with pain (59.9%), but its prevalence differed substantially among countries. Depression was diagnosed in 181 of the 1,596 (11.3%) participants without pain and in 464 of the 2,380 (19.5%) participants with pain ($p < 0.001$). After adjusting for potential confounders, pain was significantly associated with depression (Odds Ratio 1.76; 95% Confidence Intervals: 1.43-2.17). This association seemed to be modified by gender. Compared to men participants without pain, women with pain were significantly more likely to present with depression (OR 1.77; 95% CI 1.29-1.42), while no significant difference was observed for women without pain (OR 0.86; 95% CI 0.61-1.22) and men with pain (OR 1.24; 95% CI 0.86-1.79). Among women, the association of pain and depression became progressively more pronounced as pain severity, frequency and number of painful sites increased.

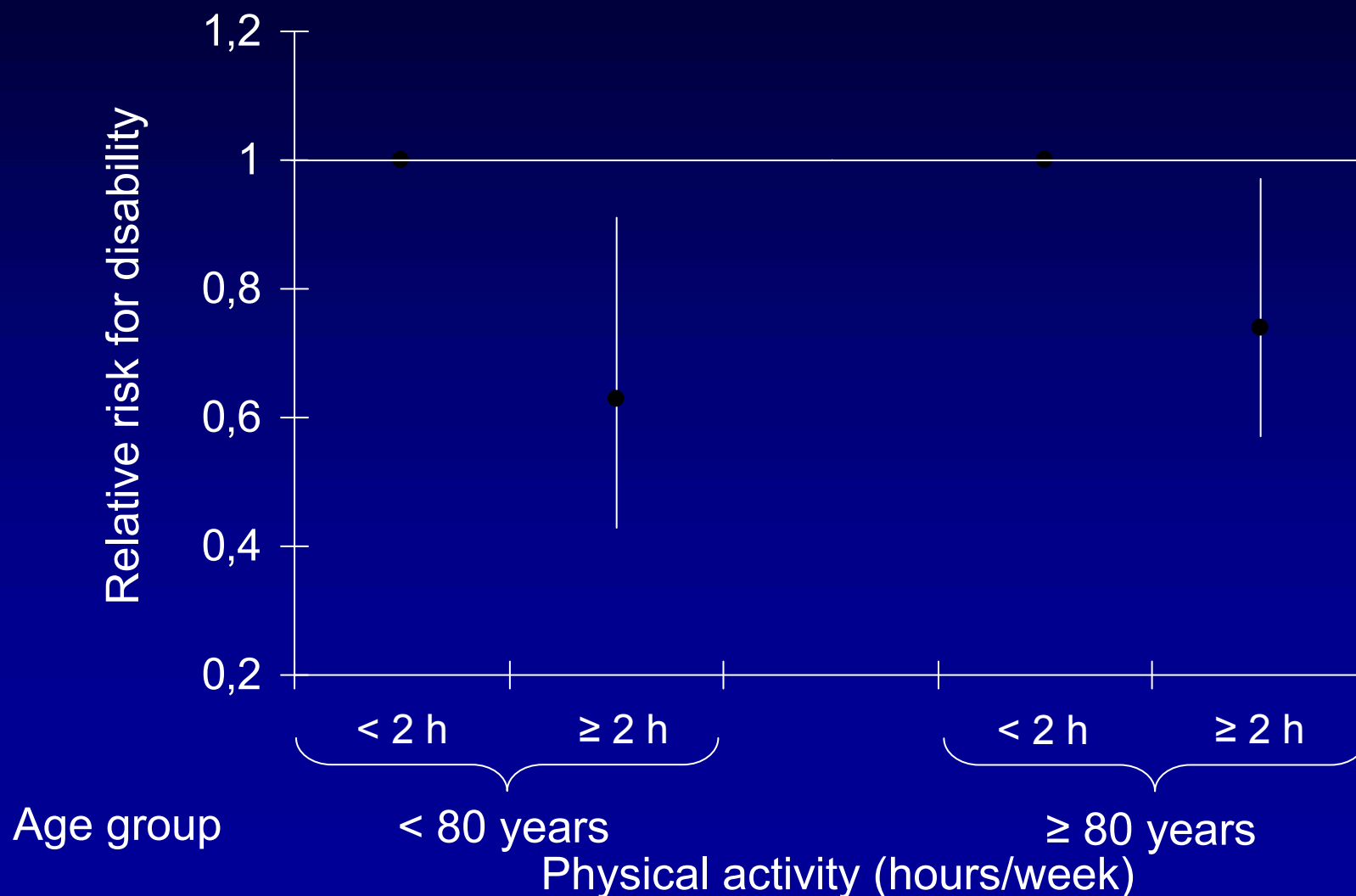
Conclusion: This study documented that in a large sample of older adults living in the community pain is associated with depression, especially among women.

J Clin Psychiatry. 2005 Aug;66:982-8

Prevalence of Pain by European Country in a Cross-Sectional Study of Older Adults



Longitudinal analysis – Physical activity and risk of disability



Landi et al. 2006; submitted

The Role of the Integrated Suite

- With the interRAI Suite in place, it will be possible to achieve
 - Better cross-sector information flow
 - Improved continuity of care
 - Comparable data in all care settings
 - Better quality data with transitions

- As explained on *interRAI*'s web site (interRAI.org), there are no royalty or other payments required for governments or care giving agencies to use these assessment tools.
- *interRAI* is pleased to be able to make them available for use throughout the world.

International Applications

- 30+ nations currently experimenting with RAI instruments
- RAI translated into 18+ languages
- inter RAI : cross-national consortium of researchers, clinicians, and policymakers
 - Mission: use assessment to understand and improve care of elderly and disabled persons
 - Currently: 46 members

- The *interRAI* Suite grows out of the prior generation of well tested MDS assessment tools
- The Suite draws on a common Core set of items, with unique content depending on the setting within which an assessment tool will be used
- The *interRAI* Suite is designed for use both within discrete care environments (e.g., nursing homes, home care) as well as for systems in which the client is followed from one care setting to the next (i.e., vertically integrated systems)

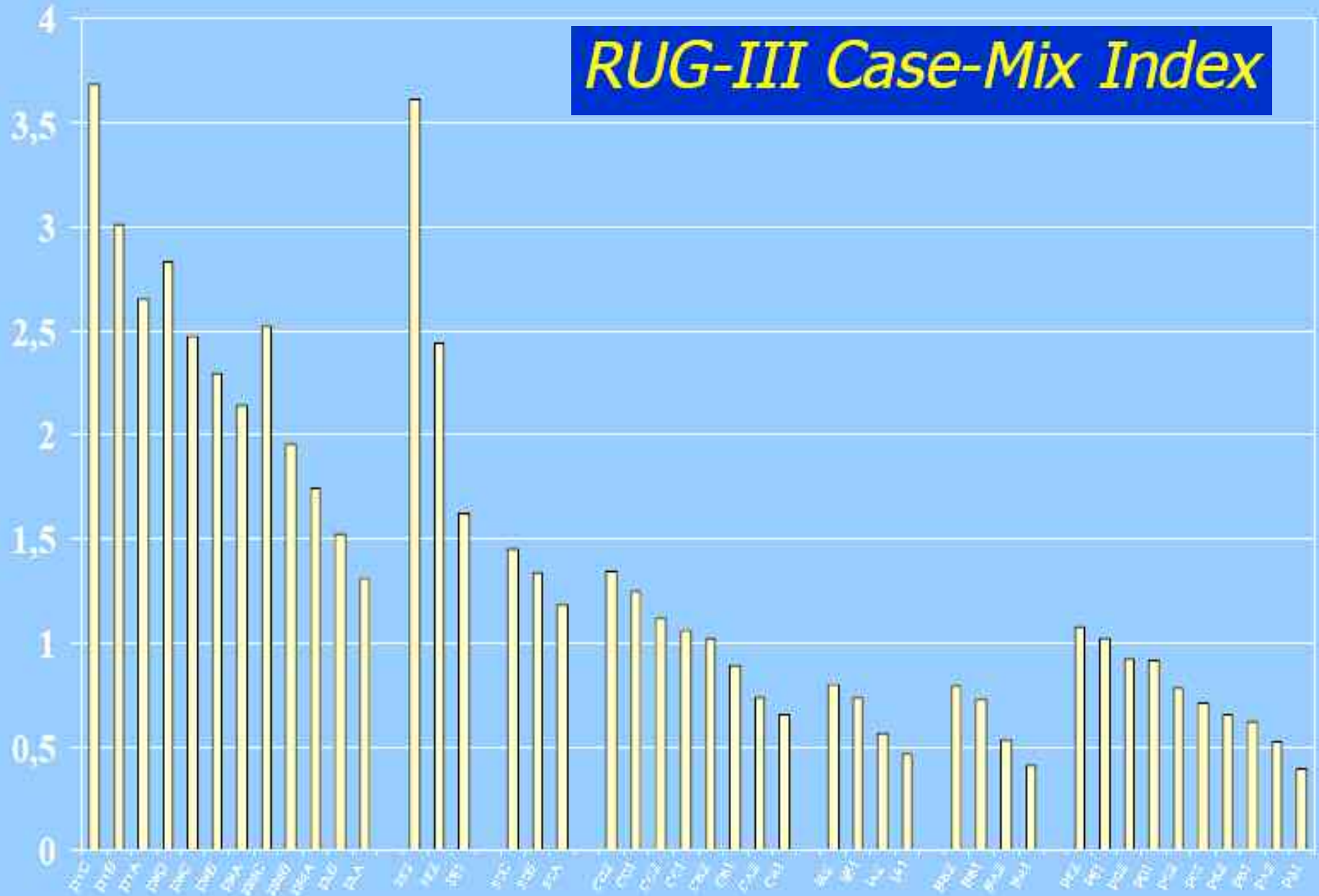
Case Mix (RUG)

Main Groups	Code	Description	ADL	RUG N
Rehabilitation	RUC	Rehabilitation Ultra High	ADL 16-18	1
	RUB	Rehabilitation Ultra High	ADL 9-15	2
	RUA	Rehabilitation Ultra High	ADL 4-8	3
	RVC	Rehabilitation Very High	ADL 16-18	4
	RVB	Rehabilitation Very High	ADL 9-15	5
	RVA	Rehabilitation Very High	ADL 4-8	6
	RHC	Rehabilitation High	ADL 16-18	7
	RHB	Rehabilitation High	ADL 9-15	8
	RHA	Rehabilitation High	ADL 4-8	9
	RMC	Rehabilitation Medium	ADL 16-18	10
	RMB	Rehabilitation Medium	ADL 9-15	11
	RMA	Rehabilitation Medium	ADL 4-8	12
	RLB	Rehabilitation Low	ADL 9-15	13
	RLA	Rehabilitation Low	ADL 4-8	14
Extensive Special Care 3	SE3	Extensive Special Care 3	ADL >6	15
	SE2	Extensive Special Care 2	ADL >6	16
	SE1	Extensive Special Care 1	ADL >6	17
Special Care	SSC	Special Care	ADL 17-18	18
	SSB	Special Care	ADL 15-16	19
	SSA	Special Care	ADL 4-14	20

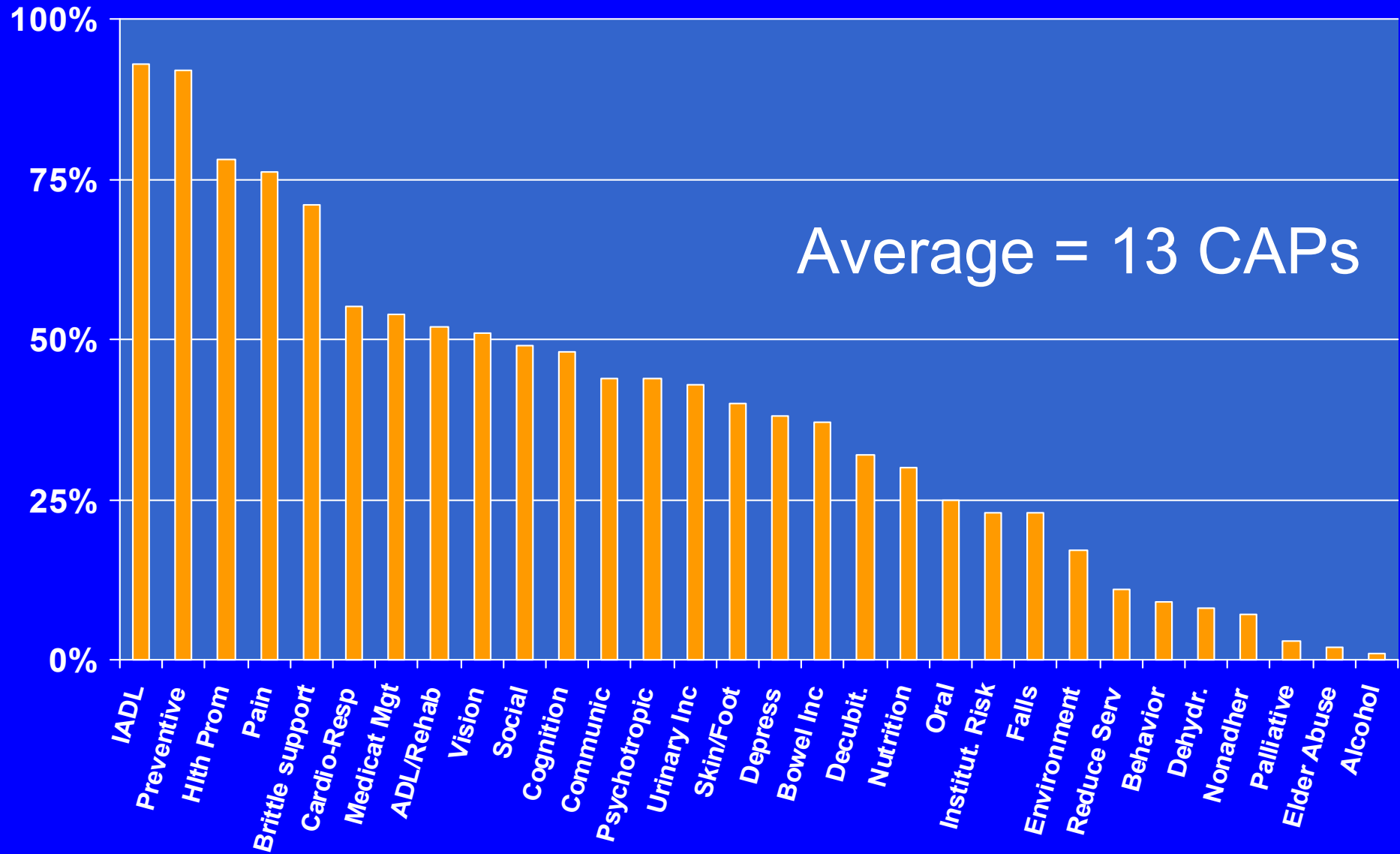
Case Mix (RUG)

Clinically Complex	CC2	Clinically Complex with depression	ADL 17-18	21
	CC1	Clinically Complex	ADL 17-18	22
	CB2	Clinically Complex with depression	ADL 12-16	23
	CB1	Clinically Complex	ADL 12-16	24
	CA2	Clinically Complex with depression	ADL 4-11	25
	CA1	Clinically Complex	ADL 4-11	26
Cognitive impairment	IB2	Cognitive impairment + Nursing Rehabil.	ADL 6-10	27
	IB1	Cognitive impairment	ADL 6-10	28
	IA2	Cognitive impairment + Nursing Rehabil.	ADL 4-5	29
	IA1	Cognitive impairment	ADL 4-5	30
Behaviour Problem	BB2	Behaviour Problem + Nursing Rehabil.	ADL 6-10	31
	BB1	Behaviour Problem	ADL 6-10	32
	BA2	Behaviour Problem + Nursing Rehabil.	ADL 4-5	33
	BA1	Behaviour Problem	ADL 4-5	34
Physical Function Reduced	PE2	Physical Function Red. + Nursing Rehabil	ADL 16-18	35
	PE1	Physical Function Reduced	ADL 16-18	36
	PD2	Physical Function Red. + Nursing Rehabil	ADL 10-15	37
	PD1	Physical Function Reduced	ADL 10-15	38
	PC2	Physical Function Red. + Nursing Rehabil	ADL 9-10	39
	PC1	Physical Function Reduced	ADL 9-10	40
	PB2	Physical Function Red. + Nursing Rehabil	ADL 6-8	41
	PB1	Physical Function Reduced	ADL 6-8	42
	PA2	Physical Function Red. + Nursing Rehabil	ADL 4-5	43
	PA1	Physical Function Reduced	ADL 4-5	44

RUG-III Case-Mix Index

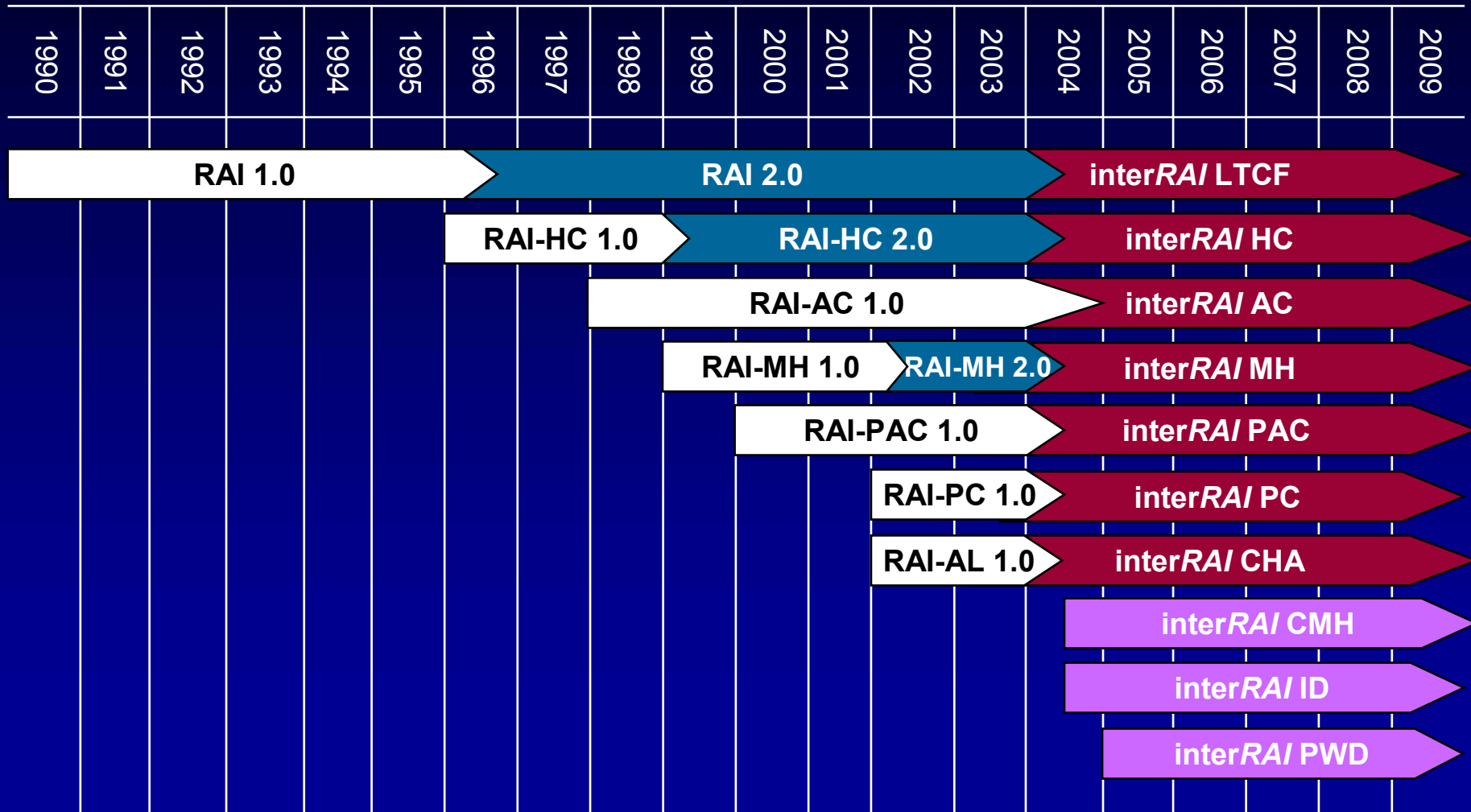


CAP Frequencies (MI Choice Waiver)



- Continuity of care across care settings and direct-care providers is a basic goal of the Suite
- Continuity is essential to:
 - Quality of care
 - Proper Incentives for providing high quality care, in terms of:
 - Determination of the appropriate level of care
 - Adequate and appropriate reimbursement for care

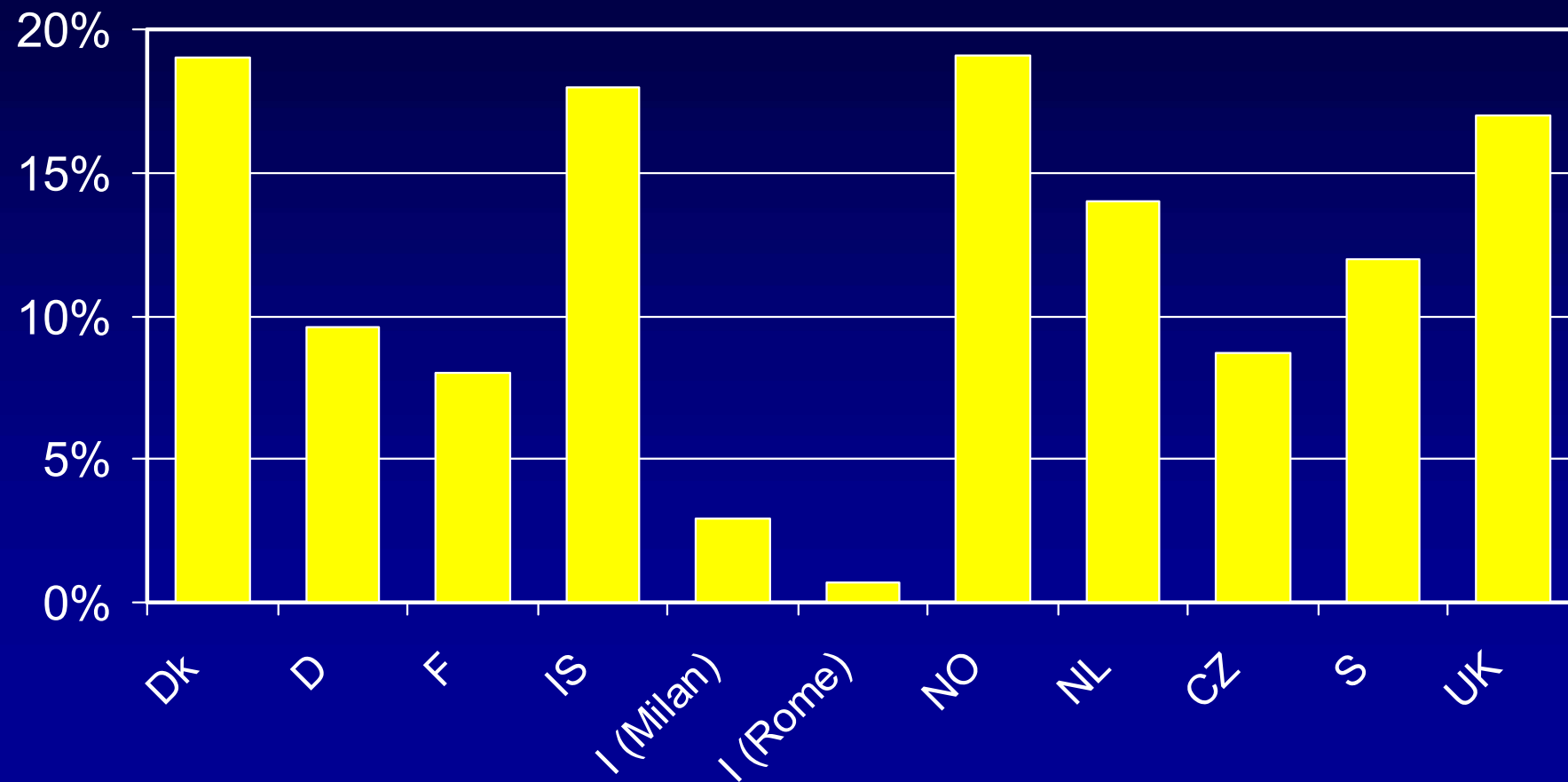
Developmental Time Line for *interRAI* Suite



Examples of Areas Assessed

- Cognition
- Communication
- Mood
- Behavior
- Psycho-social well-being
- Functional Status
- Continence
- Disease diagnosis
- Health conditions
- Nutritional status
- Skin condition
- Activity pursuits
- Social supports
- Medications
- Treatments

> 65 in Home Care in Europe



InterRAI Related Papers

- Liperoti R, Pedone C, Lapane KL, Mor V, Bernabei R, Gambassi G. Venous thromboembolism among elderly patients treated with atypical and conventional antipsychotic agents. *Arch Intern Med.* 2005 Dec 12-26;165:2677-82
- Liperoti R, Gambassi G, Lapane KL, Chiang C, Pedone C, Mor V, Bernabei R. Cerebrovascular events among elderly nursing home patients treated with conventional or atypical antipsychotics. *J Clin Psychiatry.* 2005 Sep;66:1090-6.
- Onder G, Landi F, Gambassi G, Liperoti R, Soldato M, Catananti C, Finne-Soveri H, Katona C, Carpenter I, Bernabei R. Association between pain and depression among older adults in Europe: results from the Aged in Home Care (AdHOC) project: a cross-sectional study. *J Clin Psychiatry.* 2005 Aug;66:982-8.
- Extermann M, Aapro M, Bernabei R, Cohen HJ, Droz JP, Lichtman S, Mor V, Monfardini S, Repetto L, Sorbye L, Topinkova E; Task Force on CGA of the International Society of Geriatric Oncology. Use of comprehensive geriatric assessment in older cancer patients: recommendations from the task force on CGA of the International Society of Geriatric Oncology (SIOG). *Crit Rev Oncol Hematol.* 2005 Sep;55:241-52. **Review.**
- Landi F, Onder G, Carpenter I, Garms-Homolova V, Bernabei R. Prevalence and predictors of influenza vaccination among frail, community-living elderly patients: an international observational study. *Vaccine.* 2005 Jun 10;23:3896-901.
- Onder G, Landi F, Liperoti R, Fialova D, Gambassi G, Bernabei R. Impact of inappropriate drug use among hospitalized older adults. *Eur J Clin Pharmacol.* 2005 Jul;61:453-9.
- Sorbet LW, Finne-Soveri H, Ljunggren G, Topinkova E, Bernabei R. Indwelling catheter use in home care: elderly, aged 65+, in 11 different countries in Europe. *Age Ageing.* 2005 Jul;34:377-81.
- Liperoti R, Gambassi G, Lapane KL, Chiang C, Pedone C, Mor V, Bernabei R. Conventional and atypical antipsychotics and the risk of hospitalization for ventricular arrhythmias or cardiac arrest. *Arch Intern Med.* 2005 Mar 28;165:696-701.
- Fialova D, Topinkova E, Gambassi G, Finne-Soveri H, Jonsson PV, Carpenter I, Schroll M, Onder G, Sorbye LW, Wagner C, Reissigova J, Bernabei R; AdHOC Project Research Group. Potentially inappropriate medication use among elderly home care patients in Europe. *JAMA.* 2005 Mar 16;293:1348-58. 14

Outcome measures available

- Activities of Daily Living (ADL)
- Independent Activities of Daily Living (IADL)
- Cognitive Performance Scale (CPS)
- RUG-III summary
- Changes in Health, End-stage disease, signs and Symptoms scale (CHESS)
- Index of Social engagement
- Depression rating scale
- Pain Scale

interRAI Mission Statement

interRAI believes that standardized assessment provides crucial information about the needs of the elderly population which is rapidly growing world-wide. Comprehensive evaluation, including functional, psychosocial and environmental needs, is the key to care planning decisions resulting in quality care for the individual and information for wider policy issues.

Characteristics of Patients Enrolled in Randomized Clinical Trials on CHF

	ACE-i	ACE-i vs AR-AT1	AR-AT1	β-block.	Anti-Aldost.	Digoxin
	Metanalysis Pts 12763	ELITE II Pts 3150	VAL-HeFT Pts 5011	Metanalysis Pts 9711	RALES Pts 822	DIG Pts 3397
Age	61±11	71±7	67±10	61±10	65±12	63±11
Males (%)	81%	70%	71%	73%	73%	78%
NYHA III-IV	no IV	48%	40% (III)	46%	95%	33%
Comorbidity	no	no	no	no	no	no
Disability	no	no	no	no	no	no

CHF patients comparability

	All trials (n=12,763)	ELITE II (n=3150)	SAGE (n=86,094)
Age (years)	61±11	71±7	85±8
Males	81%	70%	27%
EF	29±7	31±7	n/a
NYHA 3-4	no class 4	48%	86%
CAD	54%	58%	57%
HTN	35%	49%	55%
NIDDM	18%	24%	27%

Target CHF Population in Randomized Clinical Trial vs. Clinical "Real World"

	RCTs	Real World
Age (years)	50-65	≥75
Gender	M>F	F>M
Diagnosis	CHF main diagnosis	Comorbidity
Therapy	Focused on CHF	Polypharmaco-therapy
Compliance	Optimal	Variable, often low