



68° CONGRESSO NAZIONALE SIGG

Ritorno al futuro

FIRENZE, 13-16 DICEMBRE 2023  
PALAZZO DEI CONGRESSI

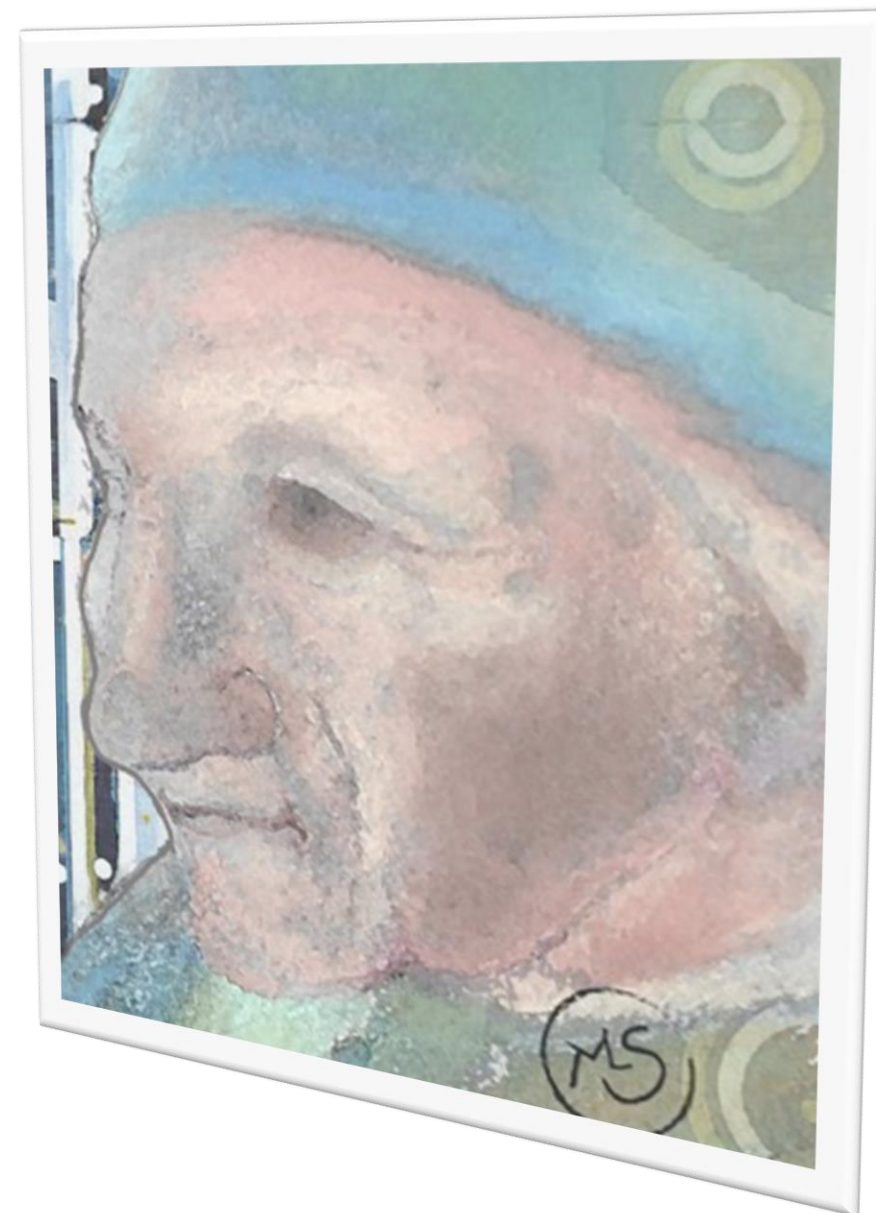


# LA CAPACITÀ INTRINSECA: DAL MODELLO CONCETTUALE ALLA CURA INTEGRATA DELL'ANZIANO

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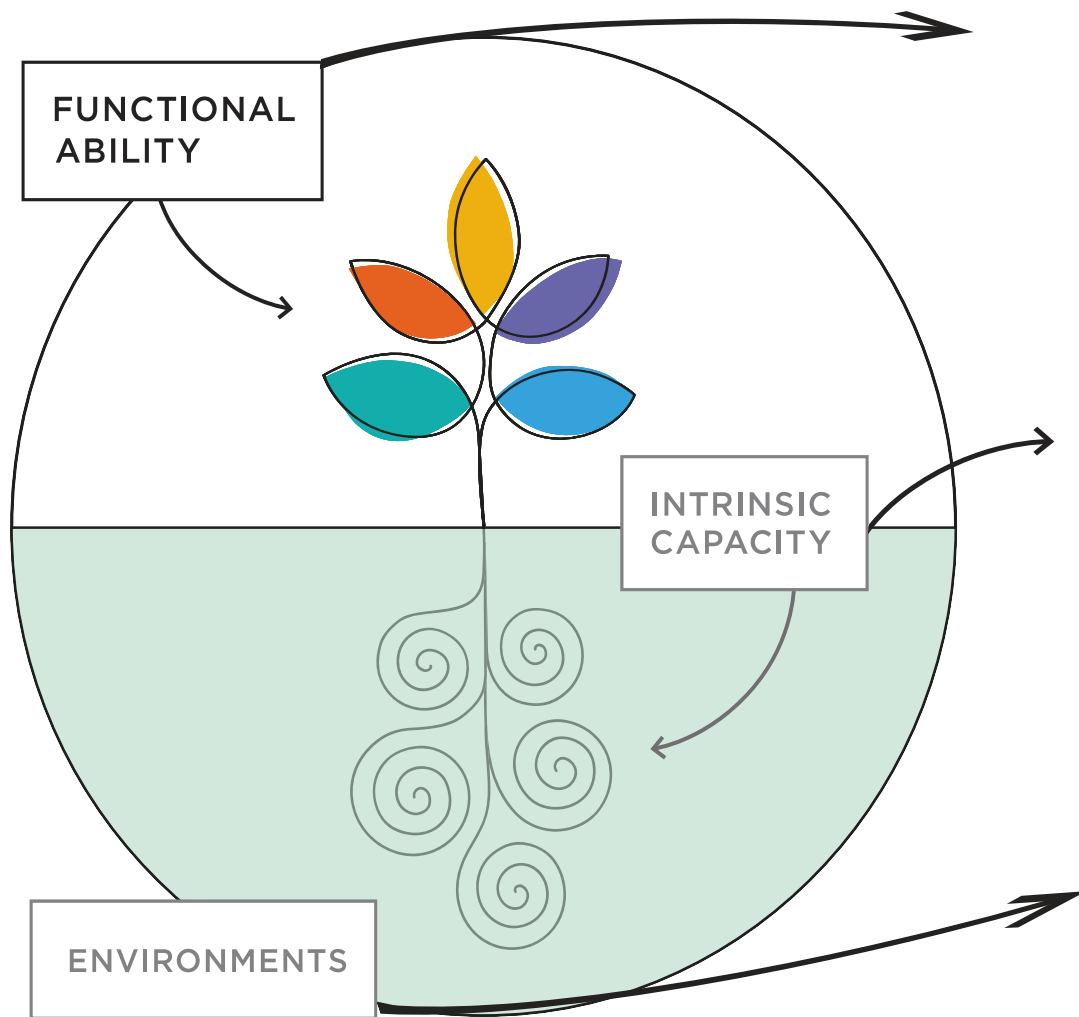
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1. Concept
2. Measurement
3. Validation and clinical application












-  Ability to meet basic needs
-  Ability to be mobile
-  Ability to build and maintain relationships
-  Ability to learn, grow and make decisions
-  Ability to contribute to society.

-  Locomotor capacity (physical movement)
-  Sensory capacity (vision and hearing)
-  Vitality (energy and balance)
-  Cognition
-  Psychological capacity



-  Home
-  Community
-  Society and relate to products (equipment and technology)
-  Built environment (emotional support, assistance and relationships)
-  Long Term Care services

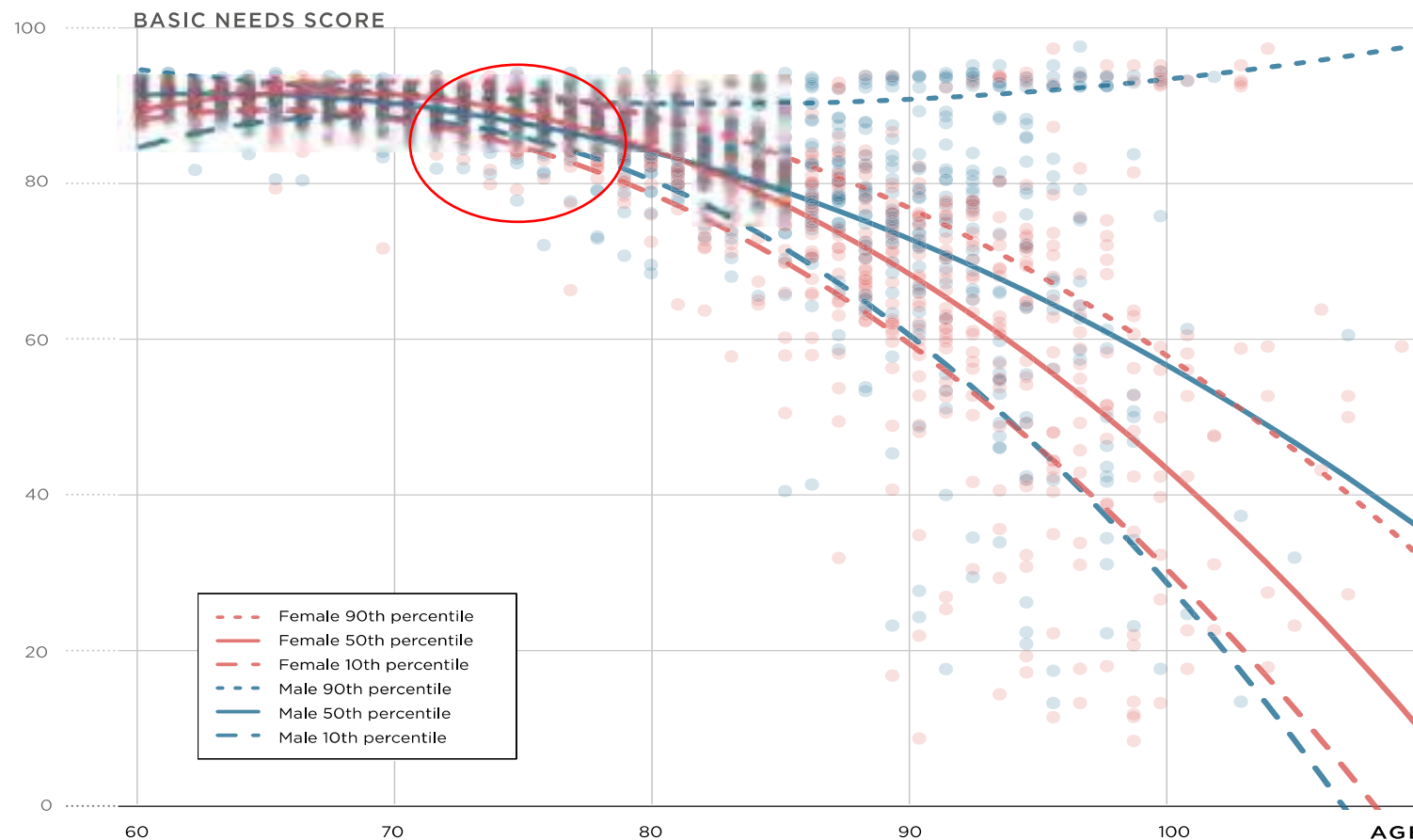


# WHERE ARE WE NOW?



Ability to meet some basic needs by age men and women, 37 countries\*

- ❑ Some 14% of older people in the analysis were shown to be unable to meet their basic needs that are necessary for a life of meaning and dignity
- ❑ On average, the highest score (80-100), should be attainable by older persons until around 75 years although there is a lot of variation within each country
- ❑ Men and women have similar abilities to meet some basic needs between ages 60 and 80 years
- ❑ After 80 years, women are likely to live alone and in poverty compared to men



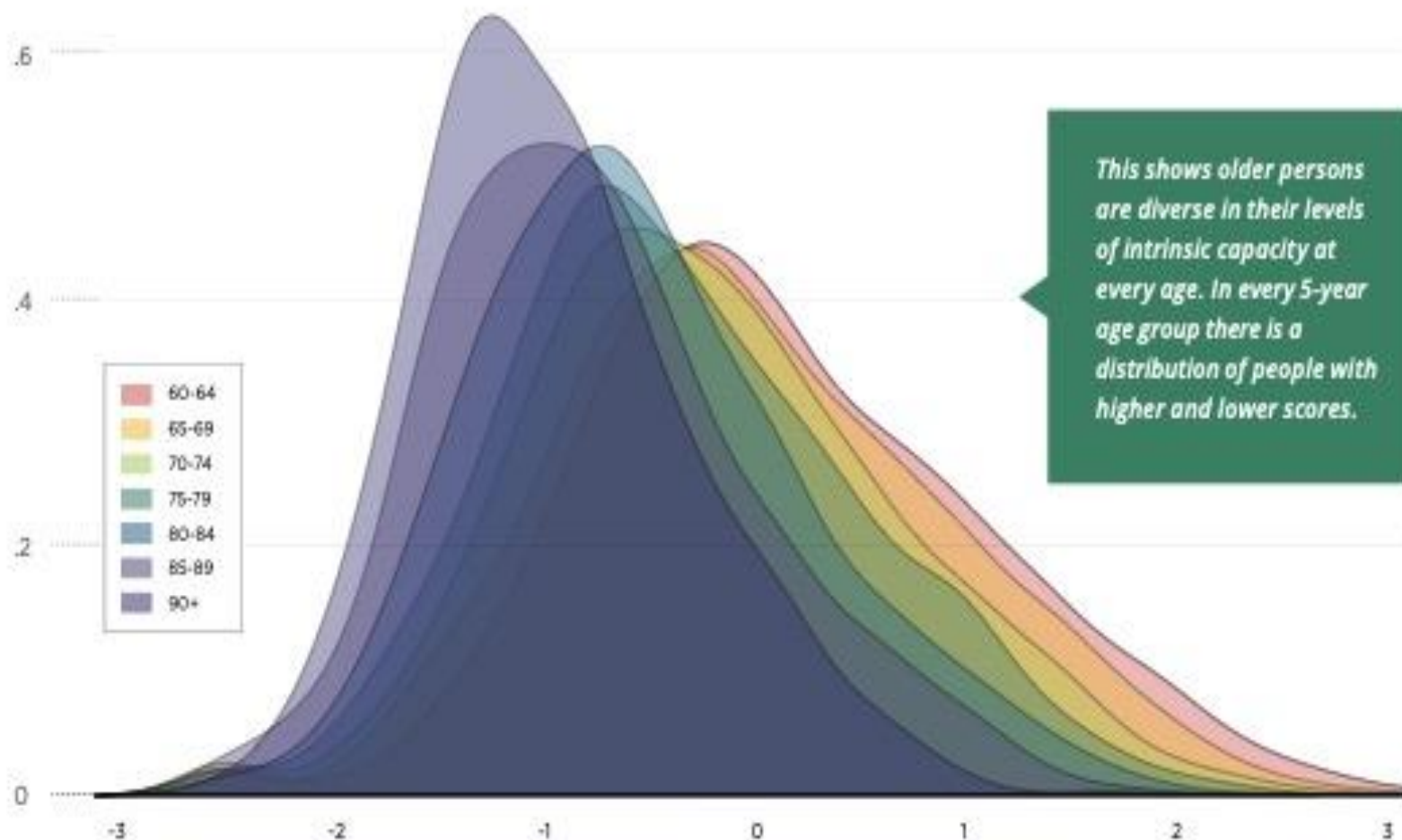
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\* Austria, Belgium, Brazil, Bulgaria, Canada, Chile, China, Costa Rica, Croatia, Cyprus, Czechia, Denmark, England, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sri Lanka, Sweden, Switzerland, and United States of America.





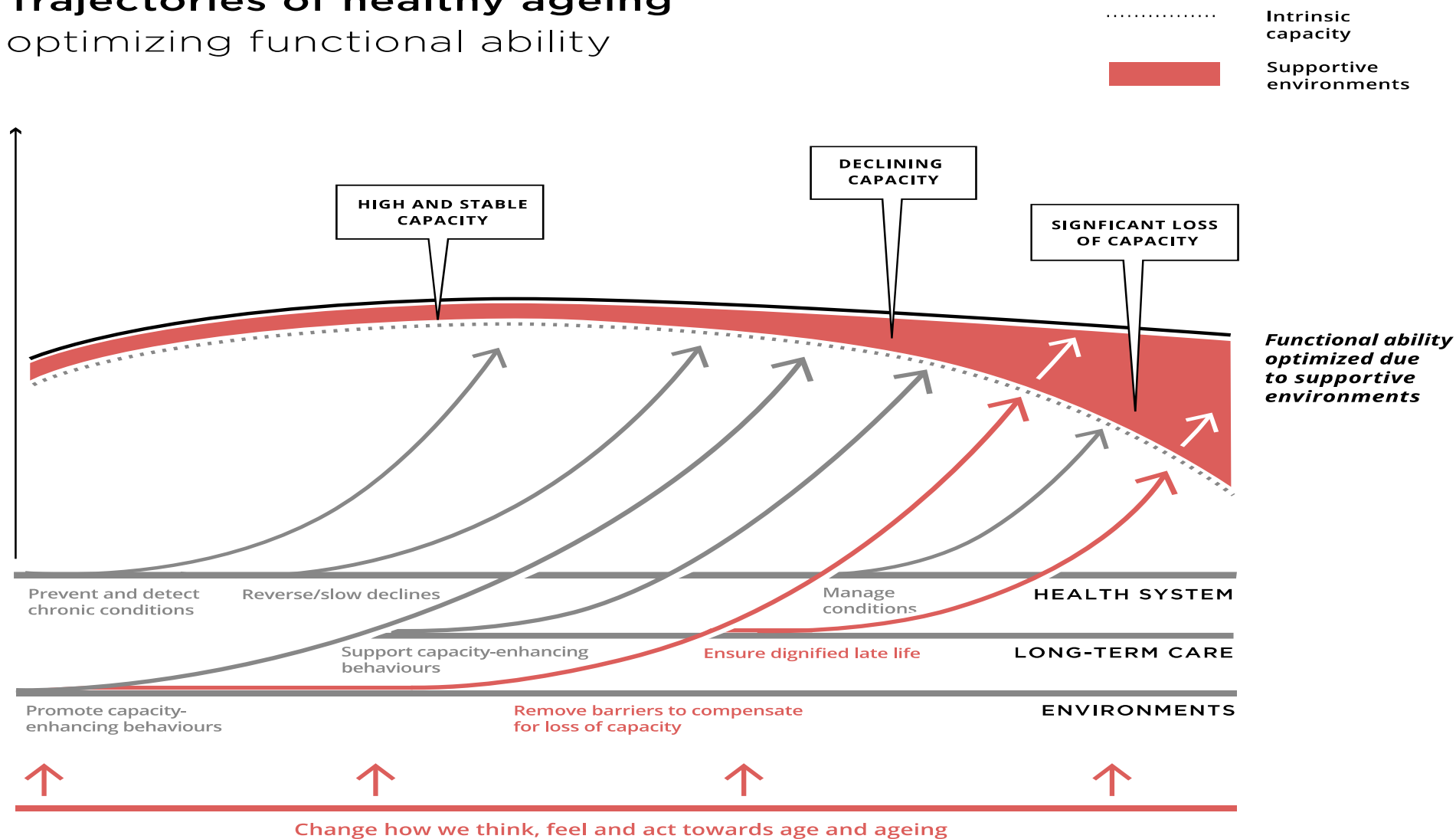
## INTRINSIC CAPACITY by AGE



Some people at the oldest ages (90+ years) have the same capacity as those at younger ages (60-64 years).



## Trajectories of healthy ageing optimizing functional ability







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## 1. Concept

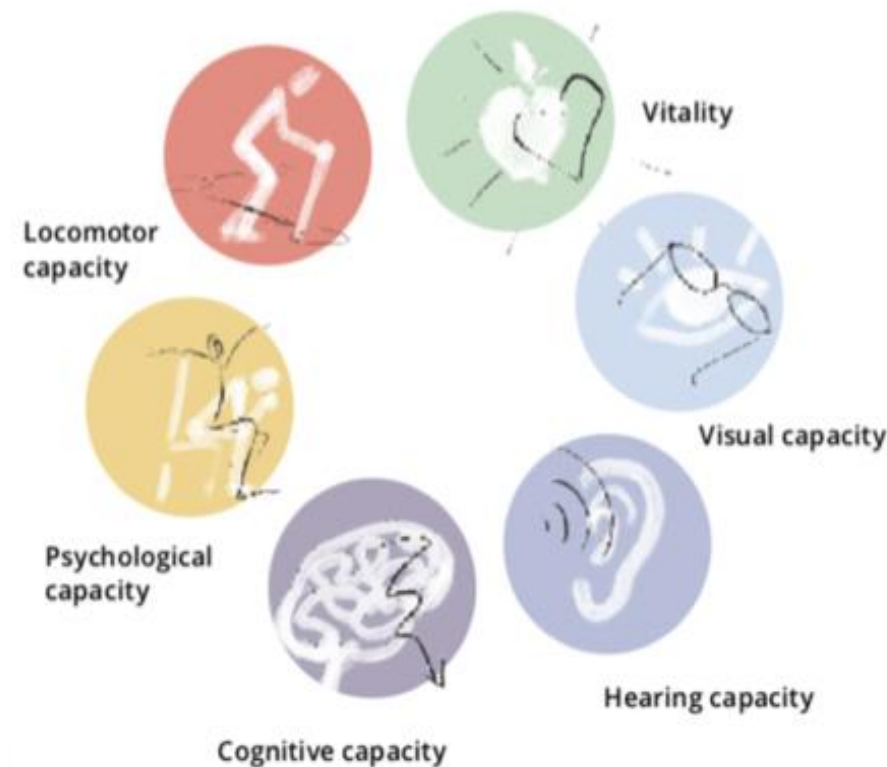
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# CONCEPT: Gap in IC construct

- ❑ Most studies do not clearly conceptualize IC or define its measurement model.
- ❑ Some studies consider IC as an aggregate measure of capacities.
- ❑ Some studies consider that the observed capacities reflect one underlying latent trait of general IC.
- ❑ Defining the proper measurement model of IC is important for the harmonized operationalization and validation processes.








## Exploring the conceptual framework and measurement model of intrinsic capacity defined by the World Health Organization: A scoping review

K. Koivunen<sup>a,b,\*</sup>, L.A. Schaap<sup>c</sup>, E.O. Hoogendijk<sup>a,d</sup>, L.J. Schoonmade<sup>e</sup>, M. Huisman<sup>a,d,f</sup>,  
N.M. van Schoor<sup>a,d</sup>

### a) Reflective measurement model



**Reflective Model:** the IC as a common underlying construct reflected by its indicators across domains

### b) Formative measurement model



**Formative Model:** the IC construct “emerges” from its five domains



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1. Concept
2. Measurement







# Integrated Care for Older People

STEP 1 SCREEN IC

STEP 2 PERSON-CENTRED ASSESSMENT IN PRIMARY CARE

STEP 3 DEVELOP PERSONALIZED CARE PLAN

(Person-centred goal setting Multidisciplinary team, Design a care plan including multi-component interventions,, management of underlying diseases, self-care and self-management)

# ICOPE

STEP 4 ENSURE REFERRAL PATHWAY AND MONITORING OF THE CARE PLAN WITH LINKS TO SPECIALIZED GERIATRIC CARE

STEP 5 ENGAGE COMMUNITIES AND SUPPORT CAREGIVERS

## SCREEN FOR DECLINES IN IC

### WHO ICOPE SCREENING TOOL

| Priority conditions associated with declines in intrinsic capacity | Tests   | Assess fully any domain with a checked circle  |
|--|---|--|
| <b>COGNITIVE DECLINE</b><br>(Chapter 4)                            | 1. Remember three words: flower, door, rice (for example)<br>2. Orientation in time and space: What is the full date today? Where are you now (home, clinic, etc)?<br>3. Recalls the three words? | <input type="radio"/> Wrong to either question or does not know<br><input type="radio"/> Cannot recall all three words |
| <b>LIMITED MOBILITY</b><br>(Chapter 5)                             | Chair rise test: Rise from chair five times without using arms. Did the person complete five chair rises within 14 seconds?   | <input type="radio"/> No   |
| <b>MALNUTRITION</b><br>(Chapter 6)                                 | 1. Weight loss: Have you unintentionally lost more than 3 kg over the last three months?<br>2. Appetite loss: Have you experienced loss of appetite?  | <input type="radio"/> Yes<br><input type="radio"/> Yes   |
| <b>VISUAL IMPAIRMENT</b><br>(Chapter 7)                            | Do you have any problems with your eyes: difficulties in seeing far, reading, eye diseases or currently under medical treatment (e.g. diabetes, high blood pressure)?                             | <input type="radio"/> Yes  |
| <b>HEARING LOSS</b><br>(Chapter 8)                                 | Hears whispers (whisper test) <i>or</i><br>Screening audiometry result is 35 dB or less <i>or</i><br>Passes automated app-based digits-in-noise test  | <input type="radio"/> Fail   |
| <b>DEPRESSIVE SYMPTOMS</b><br>(Chapter 9)                          | Over the past two weeks, have you been bothered by<br>- feeling down, depressed or hopeless?<br>- little interest or pleasure in doing things?  | <input type="radio"/> Yes<br><input type="radio"/> Yes   |



## Measurement tools and methods used for IC domains

**Table 4.** Measurement tools and methods used for IC domains

| Domain     | Measurement tools           | Description  | Validation status | References         |
|------------|-----------------------------|--|-------------------|--------------------|
| Locomotion | Chair-rise/Chair-stand-SPPB | Repetition of rising from chair measured in seconds (with or without using arm)  | Yes               | 10, 12, 13, 16, 17 |
|            | Gait/Walking speed-SPPB     | Time taken to walk a distance (3-10 m) at usual pace.  | Yes               | 10, 12-16          |
|            | Standing Balance-SPPB       | Test of standing balance that progressively gets more difficult (side-by-side stand, semi-tandem, full-tandem)                 | Yes               | 10, 13, 16         |
|            | Pick Pencil                 | Inverted time taken to lift a pencil from the floor  | -                 | 12                 |
|            | Grip Strength               | Handgrip strength of the dominant hand   | Yes               |                    |
|            | Others                      | Sarcopenia, prevalence of falls, functional impairments assessed with an activities of daily living scale, mobility/disability | -                 | 16                 |





## Measurement tools and methods used for IC domains

**Table 4.** Measurement tools and methods used for IC domains

|          |   |   |     |        |
|----------|---|---|-----|--------|
| Vitality | Question(s) about weight loss and/or appetite     | weight loss last three month and loss of appetite; weight loss $\geq 4.5$ kg in last three months as decline in vitality        | -   | 16, 17 |
|          | Peak flow test (L/min)                            | Not described   | Yes | 12     |
|          | Forced expiratory volume (FEV) using spirometer   | Three readings were taken and the highest technically satisfactory measure of FEV in 1s (FEV1) was used for assessing vitality. | Yes | 10     |
|          | Handgrip strength (kg)                            | Three measurements were taken with each hand and the maximum was recorded   | Yes | 13     |
|          | BMI   | Underweight ( $<18.5$ ) or obese ( $\geq 30$ ) = 0; overweight ( $>25$ , $<30$ ) = 0.5 or normal ( $18.5-25$ ) = 1              | -   | 12, 13 |
|          | Abdominal circumference (to nearest 0.1cm)        | -   | -   | 13     |
|          | Mid-upper arm circumference                       | $\geq 22$ cm  | -   | 15     |
|          | Phase angle derived from bioimpedance measurement | -   | -   |        |
|          | Mini nutritional assessment (MNA)                 | Max score 30; higher score better nutrition status  | Yes | 13, 15 |
|          | Biomarkers  | Dehydroepiandrosterone (DHEA) and Insulin-like growth factor (IGF-1)  | -   | 10     |



## Measurement tools and methods used for IC domains

**Table 4.** Measurement tools and methods used for IC domains

|           |   |   |                                     |        |
|-----------|---|---|-------------------------------------|--------|
| Cognition | MMSE  | 30-point questionnaire to measure cognitive impairment  | Yes (Local)                         | 14     |
|           | Modified MMSE                                       | Modified MMSE includes four additional questions to assess temporal and spatial orientation, the ability to see relations between objects, verbal fluency, and memory.  | Yes                                 | 12, 16 |
|           | Sub-parts of MMSE                                   | Two parts (1) assessment of orientation ability in time and (2) memory retention capacity.  | Yes                                 | 13     |
|           | Questions   | 1) 3 word recall 2) orientation in time and space: e.g. what is the date today? where are you now?  | No                                  | 17     |
|           | Recall, Verbal and Letter tests                     | Verbal (semantic) fluency assessed by asking participants to name as many animals as they could think of in 1min.<br>Delayed verbal memory assessed using lists of nouns presented aurally.<br>Attention assessed using a letter cancellation task. | Yes (Verbal fluency, face validity) | 10     |
|           | Community Screening Instrument for Dementia (CSI-D) | CSI-D is a screening instrument for dementia has two components, a cognitive test for non-literate/literate populations and an informant interview regarding performance in everyday living.  | Yes                                 | 15     |

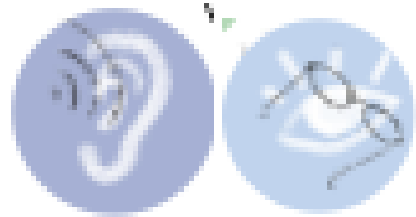




## Measurement tools and methods used for IC domains

**Table 4.** Measurement tools and methods used for IC domains

|               |   |   |               |        |
|---------------|---|---|---------------|--------|
| Psychological | Self-reported depressive symptoms                                   | Uses 2 questions: 1. Feeling down, depressed, or hopeless? 2. Little interest or pleasure in doing things?  | Not mentioned | 17     |
|               | Geriatric Depression Scale (GDS-15)                                 | 15-item of self-report measure of depression in older adults  | Yes           | 12     |
|               | Geriatric Depression Scale  | Not described   | Yes           | 16     |
|               | EuroQol-5D-use of «anxiety/depression» item                         | 3-point Likert scale: (1 = “I am not anxious or depressed”, 2 = “I am moderately anxious or depressed”, 3 = “I am extremely anxious or depressed”).   | Yes           | 13     |
|               | EURO-D depression scale   | 12-item depressive symptoms scale for older adults  | Yes           | 15     |
|               | Center for Epidemiological Studies Depression scale-CES-D           | Self-report depression scale (use of 7 or 8-item)   | Yes           | 10, 14 |
|               | Center for Epidemiological Studies Depression scale-CES-D (fatigue) | Self-report on fatigue («I felt that everything I did was an effort» and «I could not get going during the past week»)  | Yes           | 13     |
|               | Self-report sleep disturbance                                       | The frequency of delay in falling asleep, inability to stay asleep, waking up tired and disturbed sleep in the previous month   | Yes           | 10     |
|               | Self-report life satisfaction                                       | Question asked: «In general, how do you feel about your life?»  | Yes*          | 12     |
|               |   |   |               |        |
|               | Self-report locus of control  | measured with eight items, that were summed   | Yes*          | 12     |
|               | Self-report Social participation                                    | Average number of hours dedicated in the last 12 months to the following activities: providing help to other adults, church, childcare, civic activities, watching TV, sports, daily tasks, recreational activities | Not mentioned | 12     |



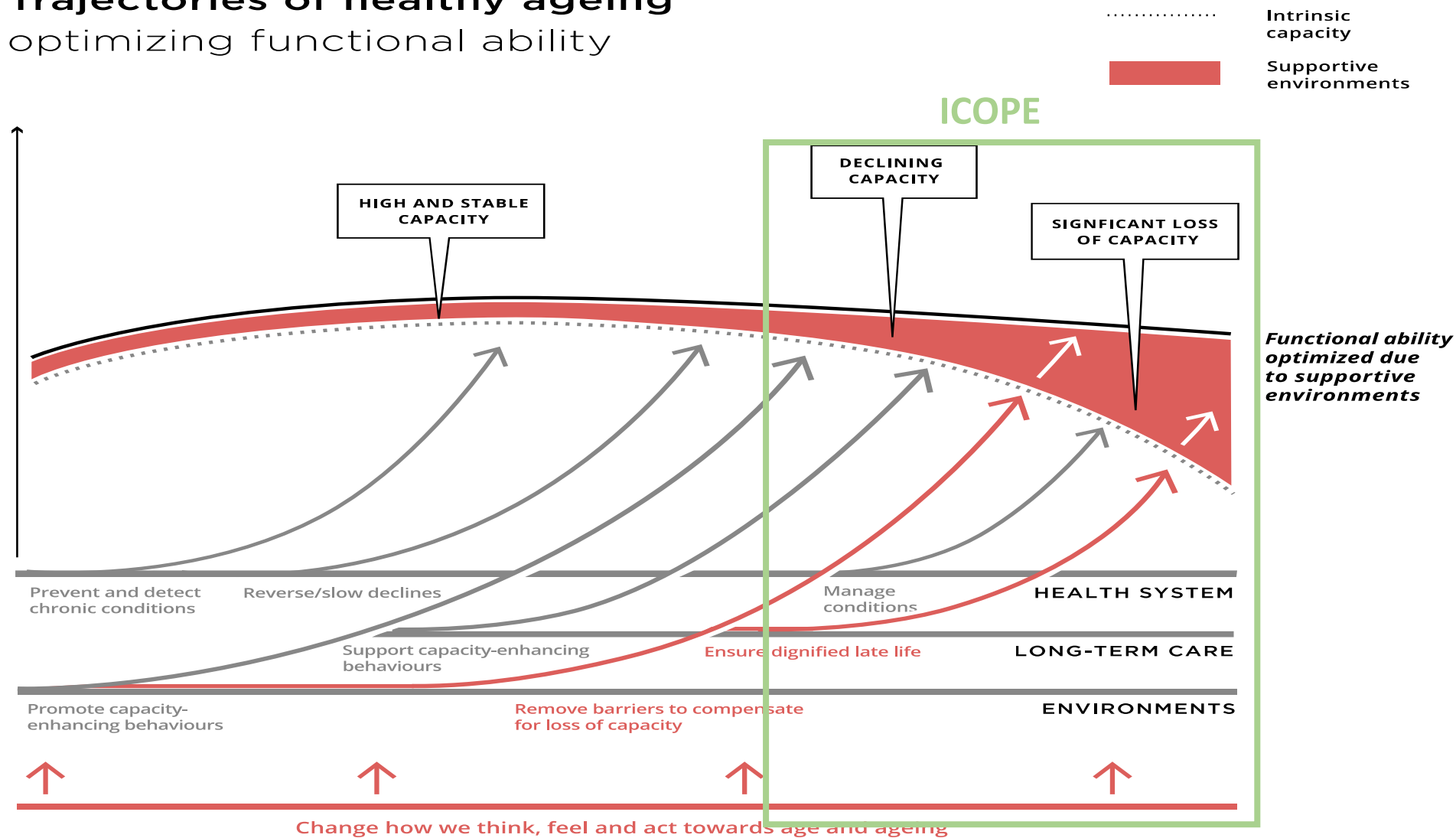
## Measurement tools and methods used for IC domains

| Domain  | Measurement tools                        | Description  | Validation status | References    |
|---------|--|--|-------------------|---------------|
| Sensory | Whisper test                             | Evaluator must stand an arm's length away behind the participant and to one side of the person. The participant or an assistant press on the tragus of the opposite ear. The evaluator then softly whispers a two-syllable word and asks the participant to repeat the word. The test is repeated on the other side of the ear using a different word. The inability to repeat the correct word(s) denotes a decline. If the Whisper test cannot be realized, two questions are asked: Did you notice a worsening of these disorders in the last 4 months or since the last evaluation? Does your family complain of an acute recent hearing loss? | Yes               | 17            |
|         | Screening audiometry                     | Threshold of 35 dB or less is a pass.  | Yes               | 17            |
|         | Automated app-based digits-in-noise test | Failure in the automated app-based digits-in-noise test will trigger further evaluation by research team   | -                 | 17            |
|         | Hearing (Self-reported hearing)          | Participants were asked to rate their hearing ability and if they had problems or deafness which interfere with their activities to some extent or may be identified by the interviewer to be deaf.  | Yes               | 10, 12, 14-16 |
|         | Self-reported Strawbridge questionnaire  | The items for audition and vision were used. Audition is coded from 1 to 12 and vision from 1 to 8, such that the lower the score is, the better the sensory ability.  | Yes               | 13            |
|         | Snellen eye test                         | Not described  | Yes               | 14            |
|         | Vision (Self-reported)                   | Participants were asked to rate their ability to see far, to read and or if they have poor eyesight that interfere with daily activities.  | Yes               | 10, 12, 15-17 |





### Trajectories of healthy ageing optimizing functional ability





1. Concept
2. Measurement
3. Validation and clinical application







# Identification of decreased intrinsic capacity: Performance of diagnostic measures of the ICOPE Screening tool in community dwelling older people in the VIMCI study

The ICOPE Screening tool is

- a simple and low-cost way to identify decreased IC in older people and provide appropriate care to reverse or slow down the decline.
- A model of care that prioritize primary and community-based care.
- support for the inclusion of services to prevent care-dependency and the creation of a partnership involving older people, primary health-care professionals, family, and community.

In process of being tested as a pilot instrument in few countries. Preliminary findings highlight its potential as an inexpensive, feasible tool, easy to be administered in settings with limited resources, which requires no specific training, and is extremely time-efficient



# The structure and predictive value of intrinsic capacity in a longitudinal study of ageing

BMJ Open

John R Beard <sup>1,2</sup>, A T Jotheeswaran,<sup>1</sup> Matteo Cesari,<sup>3</sup>  
Islene Araujo de Carvalho <sup>1</sup>

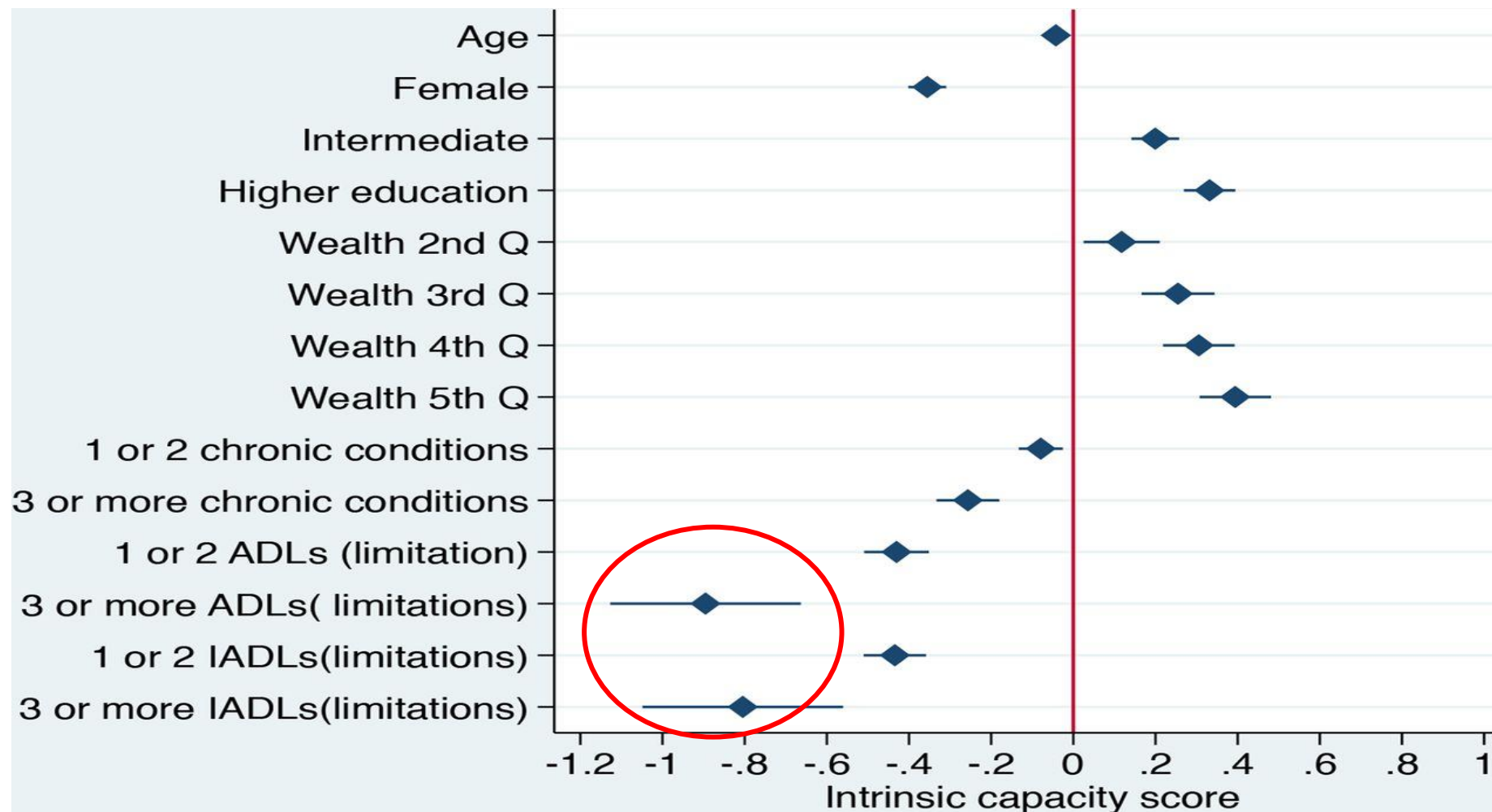
**Objectives** To assess the validity of the WHO concept of intrinsic capacity in a longitudinal study of ageing; to identify whether this overall measure disaggregated into biologically plausible and clinically useful subdomains; and to assess whether total capacity predicted subsequent care dependence.





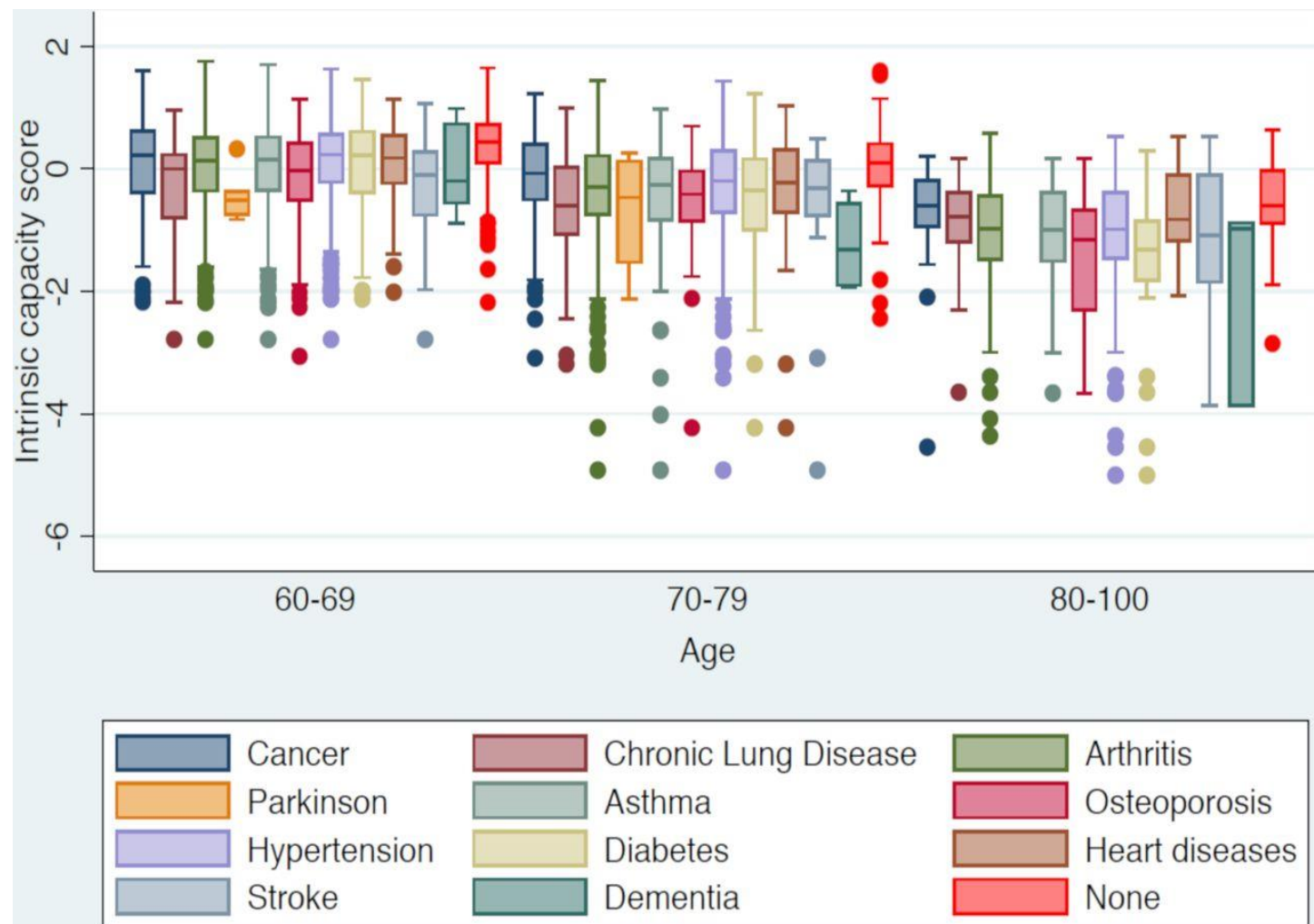
# Construct validity of Intrinsic capacity

BMJ Open





## IC score by chronic health conditions and age-group

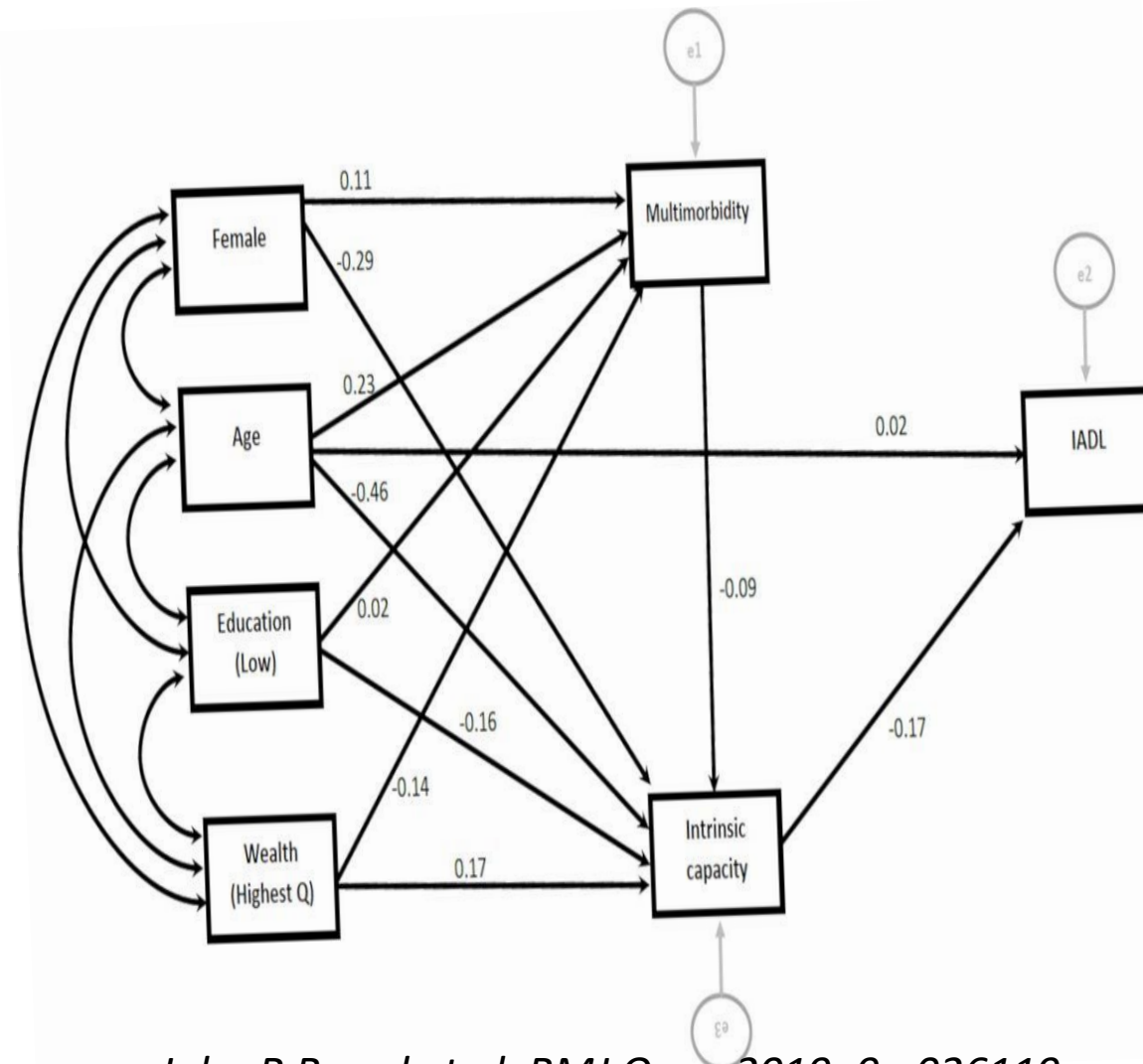
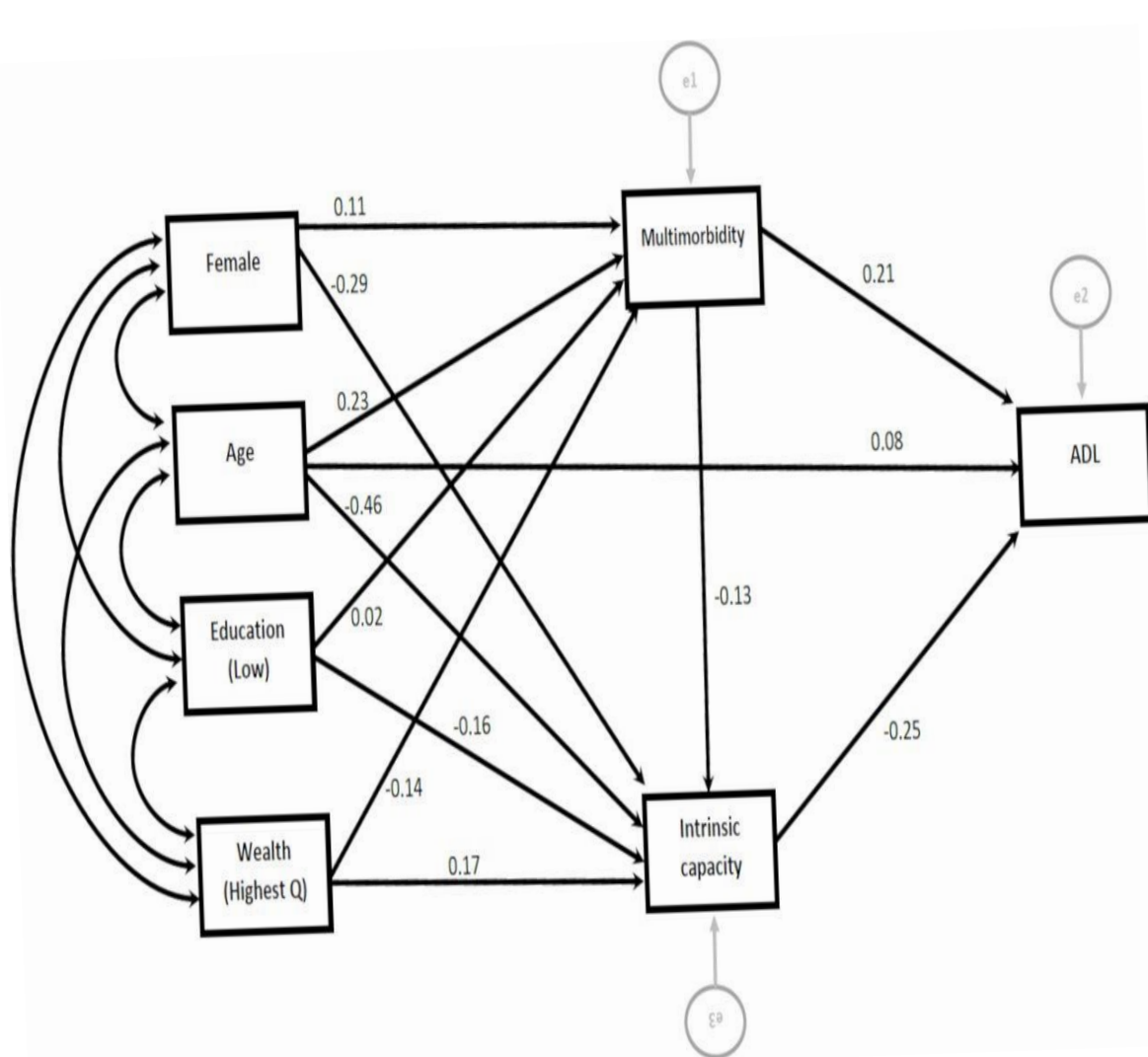


- ❑ Older adults with chronic conditions had statistically significantly lower IC scores than those without chronic conditions and this association was stronger in older age groups.
- ❑ The impact of different chronic conditions on the IC scores varied. The greatest impact on intrinsic capacity score was from dementia in the two older age groups.





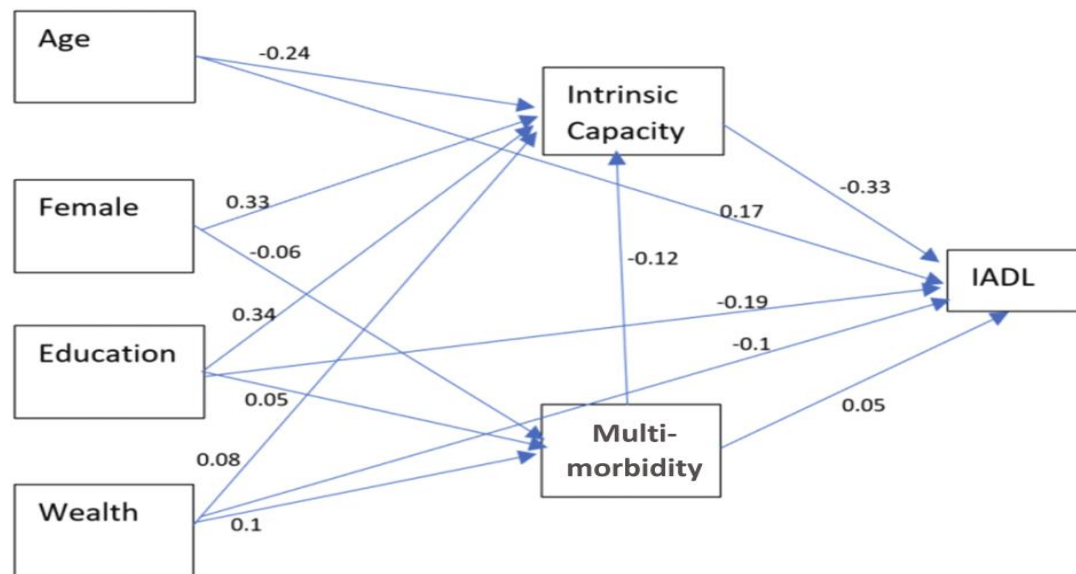
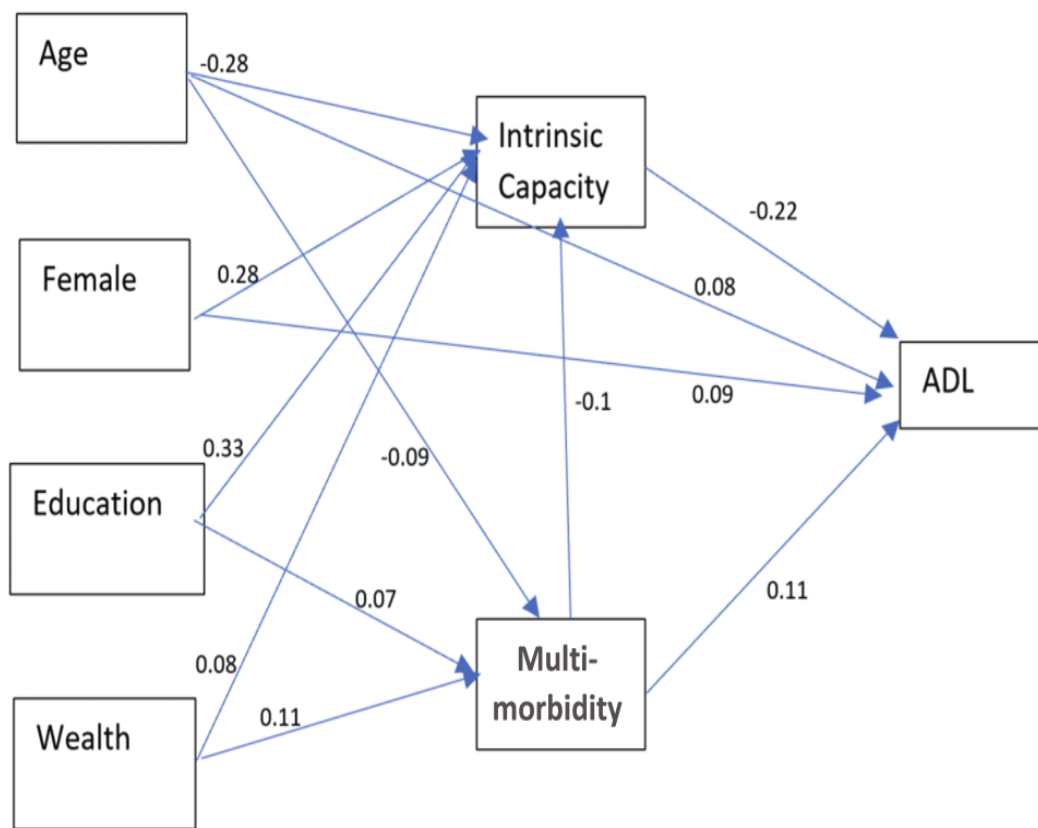
# Effect of characteristics on ADL and IADL.





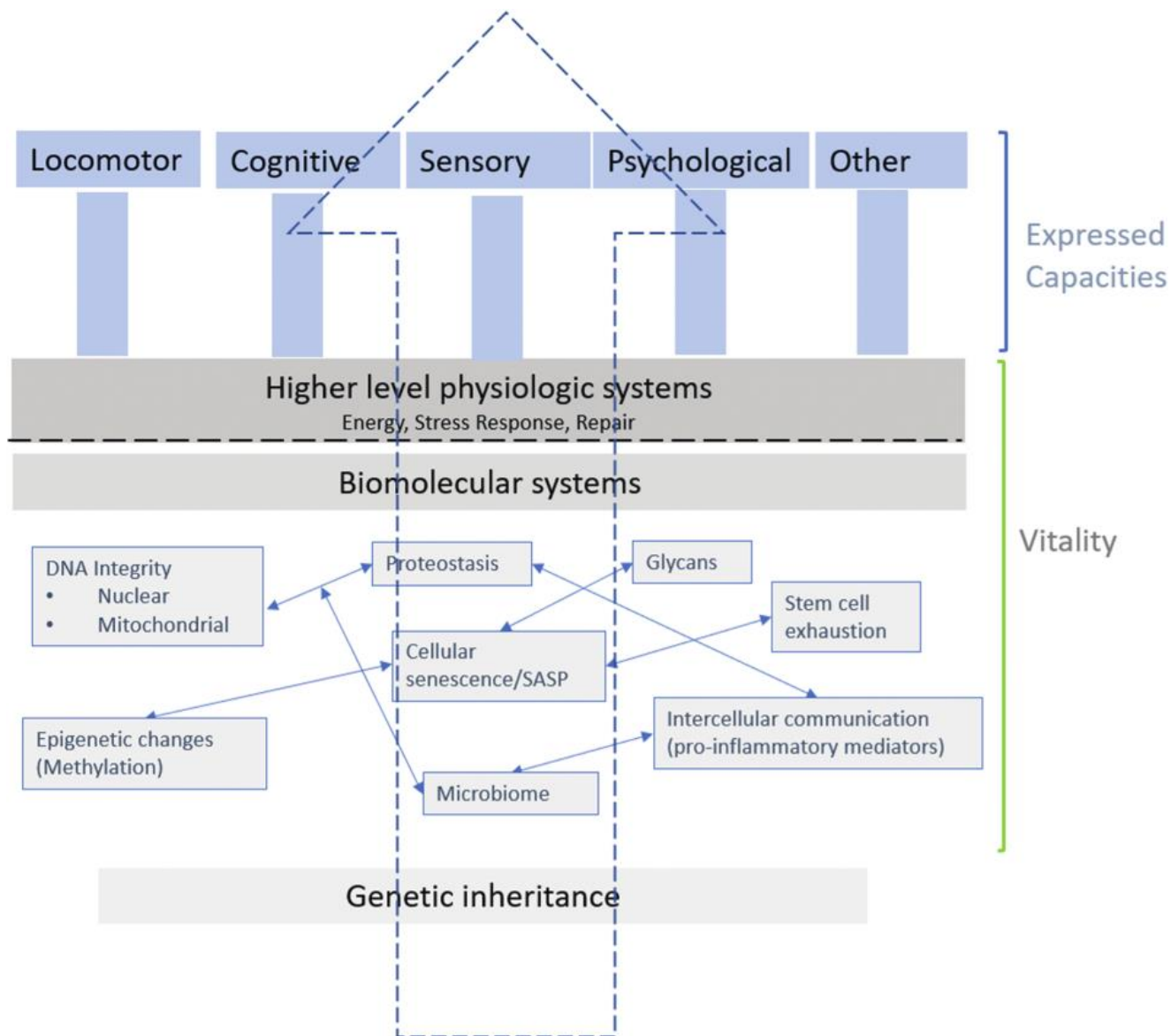
## Intrinsic Capacity: Validation of a New WHO Concept for Healthy Aging in a Longitudinal Chinese Study

Pathways to Care Dependence

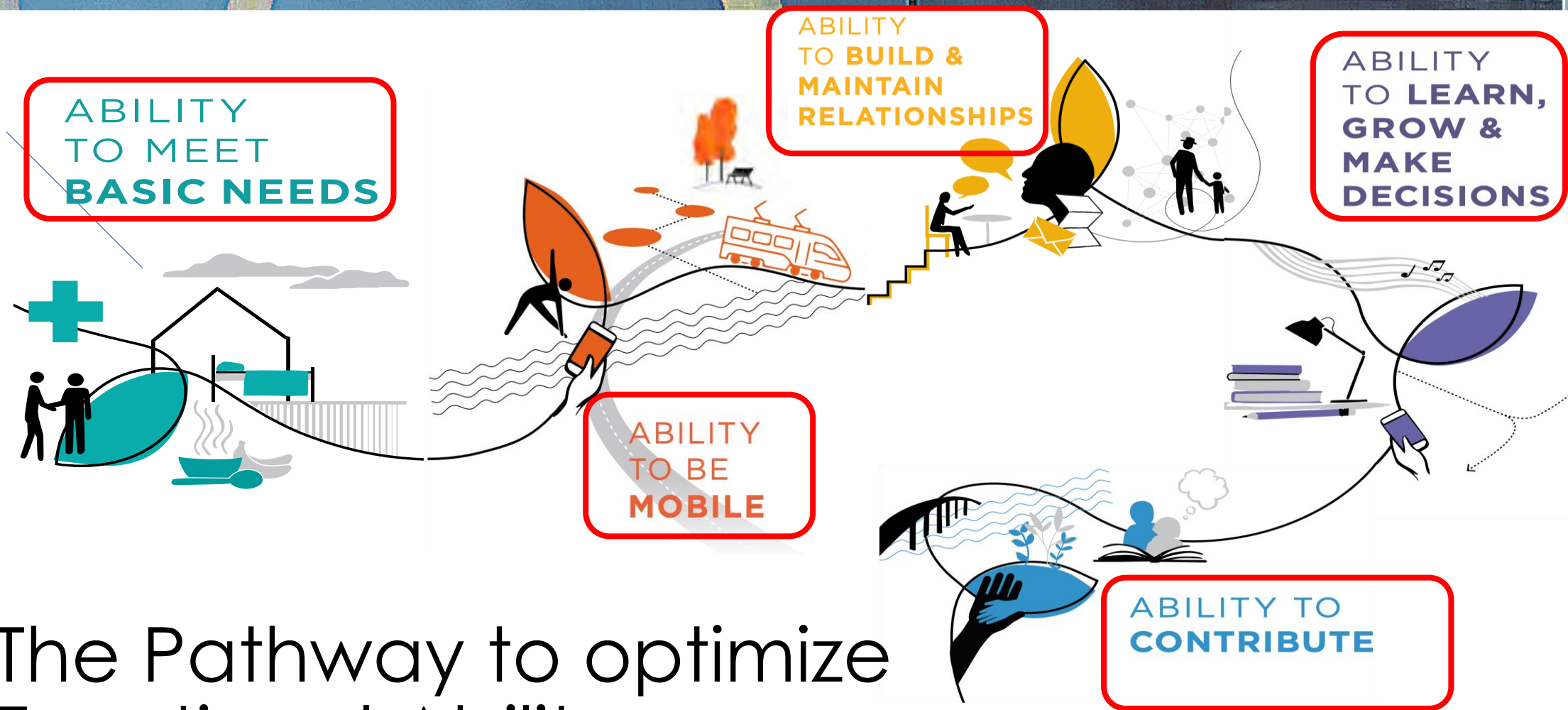


IC predicted the declining performance in ADL and IADL both directly and indirectly.





- ❑ Monitoring of intrinsic capacity could allow clinicians to flag when capacity trajectories in the second half of life are deviating from normal, an approach similar to the way child development charts currently guide pediatric practice.
- ❑ The use of capacity trajectories can also allow for better comparison of the impacts of interventions for different conditions and how different subpopulations may respond to specific interventions.



## The Pathway to optimize Functional Ability





# Strengths

- ❑ The IC is a new conceptual model for 'Healthy Ageing'. Rather than considering healthy ageing from the perspective of the presence or absence of disease, this functioning-based approach is oriented around building and maintaining the ability of older people to be, and to do, the things they have reason to value.
- ❑ The decline in IC is potentially reversible
- ❑ Monitoring individuals for changes in intrinsic capacity in the context of their environment will provide a holistic method of tracking the functioning of older adults at both a population and individual level, providing an opportunity to address any reversible factors of decline.
- ❑ WHO ICOPE guidelines enable person-centered assessment and implementation of pathways and interventions in primary care to manage declining intrinsic capacity in older populations



## ... and Weaknesses

- ❑ IC should be a positive construct. However, most IC studies lack the data to measure capacities and use deficits instead or data on 'absence of deficits'
- ❑ There are no rigorous, peer-reviewed studies reporting the effectiveness of implementing IC for clinical care of older adults compared to usual care
- ❑ We do not yet know whether implementing CI is cost-effective
- ❑ it needs to be clarified—with supporting evidence—what the concept adds to already existing constructs such as resilience and frailty





## Future Directions for IC

- ❑ further clarification on the underlying general construct of IC is needed, as well as mixed method research involving the perspectives of healthcare professionals, older adults and their caregivers.
- ❑ Small pilot studies on the effectiveness of the ICOPE approach are needed instead of large-scale implementation studies.
- ❑ The ICOPE has the ambition to reorient public health and clinical practice towards a more effective person-centred and holistic approach and to prevent the decline of intrinsic capacity.

