

WHO Clinical Consortium on *Healthy Ageing* 2017

Focus: Development of comprehensive
assessments and care plans

Report of consortium meeting,
21–22 November 2017
in Geneva, Switzerland



World Health
Organization

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Abbreviations

| | |
|-------------------------|--|
| BMI | body mass index |
| CCHA | Clinical Consortium on <i>Healthy Ageing</i> |
| CRP | C-reactive protein |
| GDS | Geriatric Depression Scale |
| GP | general practitioner |
| HbA_{1c} | haemoglobin A _{1c} |
| ICOPE | integrated care for older people |
| MNA | Mini Nutritional Assessment |
| MMSE | Mini Mental State Examination |
| SPPB | Short Physical Performance Battery |
| WHO | World Health Organization |

Executive summary



The Clinical Consortium on *Healthy Ageing* met in Geneva for the 2017 meeting

The 2017 annual meeting of the World Health Organization (WHO) Clinical Consortium on *Healthy Ageing* (CCHA) was the second gathering of this international group of clinical leaders, drawn from the full breadth of the field of ageing to progress the work agreed by Member States under the 2016 WHO *Global strategy and action plan on ageing and health*. Ten priorities were set out by this strategy; those most relevant to the work of the CCHA are:

- Aligning health systems to the needs of older people (priority 5);
- Laying the foundations for a long-term care system in every country (priority 6);

- Ensuring the human resources necessary for integrated care (priority 7).

The focus of the consortium is to support WHO in developing the standards, clinical norms and guidelines necessary for the implementation of the WHO *Global strategy and action plan on ageing and health*. The scope of the CCHA is driven by the necessity to change current models of care to a more comprehensive and integrated approach, focused on the maintenance of intrinsic capacity and functional ability.

The objectives of the CCHA meeting 2017, held in Geneva on 21–22 November at the Centre de Conférences Varembe (CCV), included to:

- discuss how to operationalize the concept of intrinsic capacity in the clinical context, including discussing the components of intrinsic capacity;
- outline a process for developing a comprehensive assessment of the health and social care needs of older people; and
- draft workplans for CCHA work-streams.

The main aim of the consultative meeting in Geneva was to find ways to operationalize the concept of intrinsic capacity; in other words, to make it work in clinical practice. Within the domains of locomotor, psychological, cognition, vitality and sensory, the CCHA aimed to identify measures of intrinsic capacity that could:

- reliably capture information across three periods of intrinsic capacity – robust, declining and significant loss;
- be compared across these different levels and across different settings, and amenable to continuous monitoring as well as diagnostic assessment; and
- provide reliable and feasible use in practice.

The consultative design of the meeting included discussions and working group activities to develop a list of potentially appropriate measures to include in an intrinsic capacity assessment tool. Informing these contributions were also presentations of expert insights given by leaders in their clinical fields. The results of a survey of the measures being used in research were also shared, along with findings from a series of rapid systematic reviews to determine the psychometric properties and predictive validity of instruments reported in the literature.

The literature, the survey of clinical research and the contributions of experts all revealed a number of potential markers in use within individual clinical domains of assessment, such as the Mini Nutritional Assessment (MNA), the Short Physical Performance Battery (SPPB) and the Geriatric Depression Scale (GDS) among numerous others. Before presenting the potential options, the experts had interrogated each for its power to capture information across people's trajectories and across different health and country settings, considering their feasible as well as reliable use. The consultative nature of the meeting meant that participants further challenged these suggestions for such qualities during the subsequent rich discussions.

The second core output of the CCHA's meeting this year was to help inform the best ways of making a comprehensive assessment of an older person's health and social care needs within the integrated care for older people (ICOPE) approach. The comprehensive assessment would form the backbone of a theoretical framework drawn up by WHO for addressing the health and social care needs of older people, with a focus on intrinsic capacity and functional ability. Within this framework is:

- comprehensive assessment
- a common care goal based on the individual's intrinsic capacity and functional ability
- a care plan shared among all providers.

Numerous and varied concerns were raised by the CCHA for the qualities of a comprehensive assessment. There was considerable agreement on the priorities for such a tool, detailed in this report. Among these considerations was the call for assessments to have relevance to clinical practice such that they were feasible, acceptable and could be taken up in different settings. Assessment should also be tied to meaningful action – have practical use and not be purely of academic interest as data. Given that health states would be included, rather than just the conditions of "patients", another concern was for the assessment to be possible by less well trained people as well as by various health care professionals, and to be amenable to use by lay peers of older people as well as amenable to self-assessment.

The CCHA brought its 2017 annual meeting to a conclusion by consulting on a workplan for the year ahead. The objectives for three work-streams were developed:

- to develop a WHO intrinsic capacity tool as part of comprehensive assessment – and the meeting agreed the first task was to select its components;
- to harmonize clinical data across research on *Healthy Ageing* – to develop an evidence base and test the generalizability of instruments, among other tasks; and
- to conduct an international study of ICOPE pilots and implementation – including developing a protocol for this research.

For each of these areas, the working groups gathered to establish goals and objectives, identify potential individuals and institutions to lead the relevant work,

and to indicate resource mobilization and other matters for putting the workplans in motion.

In summary, the CCHA succeeded in making a rich and robust set of contributions for the development of a WHO intrinsic capacity tool as part of a comprehensive assessment for older people. The aim of this report is to provide a comprehensive view of what was discussed at the meeting. The group looks forward to leading a highly relevant set of tasks in 2018 to help make ICOPE work in practice and to take the *Healthy Ageing* agenda forward.

More online

A dedicated section of the WHO website provides more information about the Clinical Consortium on *Healthy Ageing*, including this and previous annual reports – at <http://www.who.int/ageing/health-systems/clinical-consortium>.

Some networking and dissemination was enabled by Twitter during the meeting in Geneva – using tweets carrying the hashtags #2ndCCHA and #ICOPE.

Subscribe to the CCHA public list on Twitter – http://twitter.com/AT_Jothees/lists/ccha.

WHO ICOPE guidelines on community-level interventions to manage declines in intrinsic capacity – <http://www.who.int/ageing/publications/guidelines-icope>.

1 Introduction

The 2017 annual meeting of the World Health Organization (WHO) Clinical Consortium on *Healthy Ageing* (CCHA) that took place in Geneva on 21–22 November was the second gathering of an international group of multidisciplinary, multi-institutional experts brought together by WHO to develop the standards, clinical norms and guidelines needed to implement the WHO *Global strategy and plan of action on ageing and health* (1).

The scope of the CCHA is driven by the necessity to change current models of care to a more comprehensive and integrated approach, focused on the maintenance of intrinsic capacity and functional ability. The CCHA will contribute to the transformation of clinical practice and provide tools to enable integrated care for older people (ICOPE) in each country. One key component of this work will be providing evidence-based guidance on appropriate approaches to detect, monitor and manage intrinsic capacity within an integrated care service delivery model. This will require:

- a clearer understanding of the biology of intrinsic capacity;
- the development of tools for its assessment and monitoring;
- the design of strategies for implementation in clinical settings; and
- research on implementation strategies of ICOPE.

Objective of the 2017 meeting

The objective of the 2017 meeting was to discuss how to assess health and social care needs for older people at the community level. Specific objectives included to discuss how to operationalize the concept of intrinsic capacity in the clinical context, including consulting on a proposed set of components of intrinsic capacity, outline a process for developing a comprehensive assessment of health and social care needs of older people, and draft

workplans for CCHA work-streams. The aim of this report is to provide a comprehensive view of what was discussed at the meeting.

The context for the CCHA's current work

In 2015, the world united around the 2030 Agenda for Sustainable Development, pledging that no one would be left behind and that every human being would have the opportunity to fulfil their potential in dignity and equality (2). The WHO *Global strategy and action plan on ageing and health* adopted by Member States in 2016 provides a policy framework to ensure that the global response to population ageing is aligned with this ambitious development agenda set by the United Nations.

The 10 priorities for the decade of *Healthy Ageing* are (3):

1. establishing a platform for innovation and change;
2. supporting country planning and action;
3. collecting better global data on *Healthy Ageing*;
4. promoting research that addresses the current and future needs of older people;
5. **aligning health systems to the needs of older people;**
6. **laying the foundations for a system of long-term care in every country;**
7. **ensuring the human resources necessary for integrated care;**
8. undertaking a global campaign to combat ageism;
9. defining the economic case for investment;
10. enhancing the global network for age-friendly cities and communities.

The CCHA will make its greatest contributions towards priorities 5, 6 and 7 in particular. It is a challenging

agenda. To achieve the transformation, WHO must work in partnership with key stakeholders, including institutions in geriatric medicine and gerontology, innovators from government and private sectors, and a wide range of experts and researchers. The CCHA provides an invaluable link to such partnerships.

Focused on the alignment of health systems to the needs of older people, and with the new challenges and

opportunities in mind, the CCHA meeting 2017 was a consultative exercise concentrated on finding ways to operationalize the concept of intrinsic capacity in primary care clinical settings, and to help with the development of a comprehensive assessment for the care needs of older people. The outputs of the meeting reported here will inform the efforts in the work-streams that will subsequently take this aim forward in greater depth.

2 Intrinsic capacity: assessing and measuring its domains and components

Implementing the concept of intrinsic capacity in clinical settings

The WHO integrated care for older people (ICOPE) *Guidelines on community-level interventions to manage declines in intrinsic capacity* were published in 2017 (4) and they form a keystone of the *Healthy Ageing* programme, providing guidance on evidence-based interventions to manage declines in intrinsic capacity in older age. They cover the domains of locomotor, psychological, cognition, vitality and sensory, along with important geriatric syndromes such as urinary incontinence and falls. These guidelines do not, however, help to operationalize the concept of intrinsic capacity clinically across the life course, because they do not explicitly offer ways of measuring and detecting declines in the overall physical and mental capacities of older people.

One of the aims of the ICOPE approach is to identify individuals experiencing declines in intrinsic capacity so that they may be targeted preventively, or for possible clinical management to avoid or delay adverse health outcomes. Most of the existing risk assessment tools will not help to achieve this, however, because of a focus on specific diseases, groups of people or particular settings. The interventions recommended in the ICOPE guidelines are expected to be implemented in an integrated care approach that includes the identification of older people in the community at risk of care dependency, followed by a comprehensive assessment and care plan.

Assessing intrinsic capacity: current strengths and limitations

Before considering the best measures of intrinsic capacity that would allow the concept to be operationalized in clinical settings for the implementation of ICOPE, the CCHA reviewed background papers that had researched the available metrics, and heard from expert presenters.

Systematic reviews

A series of rapid systematic reviews is described in a background paper by Jotheeswaran Amuthavalli Thiyagarajan and others – “Diagnostic accuracy of screening tools for non-specialist health care settings: a summary of findings from ICOPE rapid reviews”. These reviews were designed to determine the validity and reliability of screening and diagnostic instruments and to assess the psychometric properties of the valid screening tests.

The report summarizes the diagnostic accuracy and capability of the screening tools to classify older people correctly as having or not having an impairment. The paper also gives overviews of feasibility and acceptability.

Based on those scoping reviews, the following screening and/or diagnostic assessments with sufficient accuracy and predictive power (with sensitivity prioritized over specificity given the intention for more detailed follow-up assessment) were suggested across the relevant priority conditions for consideration in the intrinsic capacity assessment tool.

- Mobility impairment: Short Physical Performance Battery (SPPB) (6). The review “strongly supports the role of SPPB scores as a marker for risk stratification”.
- Depressive symptoms: the 15-item Geriatric Depression Scale (GDS-15) was, compared with other screening instruments, a cross-culturally validated screening tool that could be administered by non-specialist health professionals in primary care or community settings (8). The GDS was the most widely examined screening tool for late-life depression in primary care settings. It is available in the public domain without intellectual property barriers.
- Cognitive impairment: the Mini Mental State Examination (MMSE), an 11-item tool (7), was by far the most-studied screening tool for dementia and mild cognitive impairment.

- **Malnutrition:** the Mini Nutritional Assessment (MNA), an inexpensive screening tool requiring no laboratory investigations (5), was highly sensitive in its short form (MNA-SF), which is more suitable to primary care and community settings.
- **Vision impairment:** visual acuity card and the smartphone-based Portable Eye Examination Kit (Peek) (9) are two tests that have been validated in low-resource health care settings, and non-specialist health professionals can be trained to use them in primary care or the community.
- **Hearing loss:** whispered-voice test (10) at 2 feet is accurate for the identification hearing loss of >25 dB or >30 dB.

Expert views

Experts in each of the relevant domains presented overviews of the current diagnostic and screening tests, focusing on four qualities: (1) could the measure apply across the life course in primary care settings? (2) could it be used as a continuous variable for monitoring over time? (3) could it be used as a diagnostic test? and (4) could it be applied in different periods of the life course from robust intrinsic capacity, through declining capacity, to significant loss?

- **Vitality (Stephanie Studenski):**
 - Optimal function across the life course should capture the full range of performance. Many domains of human function and indicators of vitality are beginning to decline by the fourth decade of life.
 - Tolerance of stressors such as severe illness probably demands high physiological reserve, which can be captured with many simple measures rather than diagnoses.
 - Suggested measures of vitality included obesity (waist-hip ratio, body mass index (BMI)), lung function (forced expiratory volume), cardiovascular function (blood pressure, mean arterial pressure), cholesterol, high-density lipoprotein, kidney function (creatinine clearance, cystatin C), metabolism (glucose, haemoglobin A_{1c} (HbA_{1c})), muscle (grip strength) and haematological (haemoglobin, white blood cell count).
- **Vitality (Ung-il Chung):**
 - “ME-BYO is a concept that captures the status of our body and mind as changing continuously from healthy to sick, not as a dichotomy between the two; ME-BYO conceptualizes the whole process of this change.” The ME-BYO Index should predict the personal trajectory of intrinsic capacity, and measuring and visualizing ME-BYO status using virtual and augmented realities leads to “health personalization” and behaviour change.
 - The annual health screening of 45- to 65-year-old employees, which was important to reductions in medical costs and metabolic syndrome incidence, included questionnaires (premedical history, smoking), body measurements (height, weight, BMI, waist circumference), blood pressure, physical examination, urinalysis (sugar, protein), blood tests (triglyceride, high-density lipoprotein, low-density lipoprotein), blood glucose testing (fasting glucose or HbA_{1c}) and hepatic tests (aspartate aminotransferase, alanine aminotransferase, gamma-glutamyltransferase).
- **Musculoskeletal health (Jean-Yves Reginster):**
 - Numerous measures are available for assessing components of musculoskeletal health, the age-related decline of which leads to bone fragility and increased risk of minimal trauma fracture, mobility loss, loss of muscle strength and sequelae of functional impairment, loss of independence, decreased quality of life and increased mortality. Examples include screens for sarcopenia, osteoporosis risk and fracture risk (e.g. the FRAX tool), and tests such as gait speed, hand grip strength and the SPPB. The importance of assessing pain of musculoskeletal aetiology was also emphasized. Finally, quality of life related to musculoskeletal health may be assessed using tools such as QUALEFFO-41 for vertebral fractures, SarQoL in sarcopenia and WOMAC for hip and knee osteoarthritis.
- **Nutrition (Hélène Payette):**
 - Short, valid and reliable screening for nutrition risk is feasible and could be implemented across the life course in primary care settings. Examples include the MNA or its short form, and “Seniors in the community: risk evaluation for eating and

nutrition”, Version II (SCREEN II). Sensitivity to change of screening tools during ageing needs to be better documented. Handgrip strength is valid, reliable and sensitive for measuring changes in muscle mass and function as a proxy for protein malnutrition.

- Cognition and mood (John Starr):
 - The cognitive tests of pictorial vocabulary, digit span, financial literacy and divergent thinking (alternative uses) can be used to assess change over time, are continuously scored, can be used as a diagnostic test, and are suitable for those who are robust, have declining capacity or a significant loss of capacity.
 - Under mood, is depression, anxiety or happiness being assessed? Each requires a different tool. The GDS, for example, is good for depression but does not pick up anxiety or elation/positive affect. Some cultures assess somatic measures more than others.
- Hearing and vision (Shelly Chadha and Silvio Paolo Mariotti):
 - Screening audiometer and validated smartphone-based hearing tests can indicate the hearing threshold in each ear separately and can be repeated regularly to monitor functional decline.
 - Visual function examinations using Snellen eye chart for visual acuity are simple with proven efficacy for identifying changes in function.

Working groups on measuring intrinsic capacity

The task for participants in each working group on measures of intrinsic capacity (five domains) was to discuss and reach a shared understanding of the components of intrinsic capacity that should be assessed

in a comprehensive assessment of health in an older person in primary care settings. The following questions were considered.

- Which component(s) of the domain can be used reliably to capture declines in intrinsic capacity in the trajectory across the three periods (robust, declining, significant loss)?
- Can these components be measured in a comparable way in people at different levels of capacity?
- For each component agreed, identify the existing reliable and feasible clinical tests for use in practice to assess/measure the component for monitoring (continuous) and diagnostic purposes (categorical).
- What are the issues that should be considered when using these clinical tests over time to assess these selected components?
- What are the issues to consider for measurement of this domain and its components in individuals with different levels of capacity across the trajectory?
- Are these clinical tests applicable to all periods of the trajectory?

Summaries of the working groups’ considerations of the strengths of each measure and any issues worthy of note, plus discussion points with the wider consortium follow below.

Components of locomotor function

In addition to proposing the components below, the working group identified two that should be excluded to assess locomotor function in clinical settings:

- Flexibility and muscle mass – while these measures were considered by the group to be possibly relevant to research in some contexts, they were of “very limited clinical relevance to functional outcomes, so these variables are not recommended for inclusion in a measure of intrinsic capacity”.

Proposed components of locomotor function

| | |
|---|--|
| Muscle performance (muscle power, muscle strength, fatigue) | <ul style="list-style-type: none"> • The same concept (power or strength) is relevant across the periods of different intrinsic capacity, although they may be measured in different ways depending on the functional ability of the person. There is little relevance at the extreme end of significant loss in intrinsic capacity – if the person is very disabled, for example • Muscle power is a more functional measure compared with strength and may be more sensitive to changes in physical performance. The epidemiological evidence for the association between strength and function is greater than between power and function; this is likely to change in the future, however, as more evidence accumulates • Muscle strength, as opposed to muscle power, is widely tested in clinical and research settings • There are important sex and ethnicity differences that may need to be taken into account in the operationalization of muscle performance • Example tests: handgrip (tested across ages, but requires the availability of a dynamometer), SPPB (but there is a ceiling effect and a lack of validation for younger ages) |
| Bone health | <ul style="list-style-type: none"> • Suitable across the three periods of intrinsic capacity, from 40 years of age (most of the data concern people above this age, so the domain may not capture the whole life course) • Strongly related to physiological reserves and to adverse health outcomes (falls and fractures, for example) • Sex and ethnicity differences need to be considered • There may be problems in some settings for measuring bone health parameters but these may be solved by using simpler instruments such as the FRAX fracture risk indicator, which has been validated across geographical locations. Other online risk calculators are also available |
| Balance | <ul style="list-style-type: none"> • May be more relevant at later trajectories and in frail individuals, but can be tested across the periods of intrinsic capacity. Relevant for measuring locomotor function • Both static and dynamic balance should be considered • Sex and ethnicity differences need consideration • The SPPB already captures balance, but measures only one aspect of it. A different tool may be needed earlier in the trajectory of intrinsic capacity for a more complex assessment of balance |
| Walking (capacity, speed, walking-related exhaustion) | <ul style="list-style-type: none"> • Useful across the different periods of the intrinsic capacity trajectory and allows a continuous evaluation • Can be measured with a binomial variable (able/unable) or a continuous one (gait speed, walking-related fatigue) • Particularly relevant domain of locomotor function: <ul style="list-style-type: none"> – relatively easily assessed – strongly related to biology – provides a continuous evaluation across the life course • Sex and ethnicity differences |
| Person-reported outcomes (particular pain, self-perception of mobility) | <ul style="list-style-type: none"> • Within a broader construct of quality-of-life measurement that considers pain • These measures could be applied across all levels of intrinsic capacity but there are sex and ethnicity differences, and measures would need to be validated for age, sex and ethnicity • May play an important role in feeding the design of subsequent interventions |

Components of psychological capacity

Not all aspects of psychological capacity followed an age-related trajectory, even for the core components of mood and anxiety. Instead of considering this quality, the group felt that the relevant point was whether the components were likely to contribute to intrinsic capacity.

There would need to be work to prioritize components after reviewing the literature for their attribution to

intrinsic capacity and functional ability. The experts also felt that while these elements were relevant across all three periods of intrinsic capacity – robust, declining and significant loss – there was “not enough psychometric work to know if all these can be measured across the range of intrinsic capacity” (e.g. dementia may preclude some components). The group had not identified a single component that would be particularly relevant for screening, but acknowledged that this was work that could be done.

| Proposed components of psychological capacity | |
|---|---|
| Mood | <ul style="list-style-type: none"> • Affective suffering and motivation may lend themselves to separate consideration, but operationally this may not be possible • Some components of mood, as with other components of intrinsic capacity, may not show any reliable age-related decline; certain aspects of mood may need to be considered |
| Life satisfaction | <ul style="list-style-type: none"> • Versus “world weariness” at the other end of the life-satisfaction spectrum away from successful self-realization • Considered important for functional ability |
| Anxiety | <ul style="list-style-type: none"> • No clear trajectory to show age-related decline |
| Self-esteem | |
| Sleep | <ul style="list-style-type: none"> • Needs objective assessment |
| Agency | |
| Coping/self-efficacy | |
| Loneliness | <ul style="list-style-type: none"> • Note that isolation is environmental whereas loneliness is intrinsic |
| Distress | <ul style="list-style-type: none"> • Including pain, which may appear in other domains, but it is an important contributing factor to overall psychological well-being, and is highly prevalent in individual older people’s reports of how they feel |
| Personality traits | <ul style="list-style-type: none"> • Popularly, these are reduced to five main personality traits (openness, conscientiousness, extraversion, agreeableness, neuroticism) although an Internet search can reveal hundreds |
| Fatigue | <ul style="list-style-type: none"> • May appear in other domains such as vitality • An important component of how people feel |

Components of cognition

Components should be identified that would be “easy, cheap, relevant to our day-to-day life and culturally relevant” for inclusion in an intrinsic capacity assessment tool. Tools would need to be useful at the level of the older person, members of the community or primary care workers who were not necessarily health care professionals. The tests need to be there not solely for their own sake but so that they can also lead to intervention. These factors led the group to identify, for example, the test for alternative uses of objects – asking

the person to identify in one or two minutes as many uses as possible of, for example, a cup. Recording the answers would be a cheap and easy way of detecting changes.

The component of financial literacy, meanwhile, has the “beauty of being hierarchical”, so you if an older person is unable to perform a specific task in financial literacy, it would be possible to know the next type of task that this person might not be able to perform.

“Prehabilitation” is thus focusing on the next steps early enough to enable intervention.

Offering a few different specific tests would enable choice along the lines of the cultural context. This approach of providing a “toolbox” would allow different people, including those with very little training, to choose an appropriate component. It would not then be just professionals who would be able to use cognitive measures of intrinsic capacity.

One of the experts said that, in any health care system, it was going to be very difficult to be able to actually intervene in a health professional’s practice against the measurement of intrinsic capacity. It would be more relevant for a tool to measure intrinsic capacity either by

self-management or by trained individuals without requiring the expertise of a health professional. “That might be the biggest contribution we can make here, to produce a tool for measuring intrinsic capacity that can be done sequentially such that when individuals and/or the professionals see that there is a deterioration above what would be the norm, that it allows for an intervention.”

Another expert supported calls for the tool to make use of only selected measures that could be validated, and not instruments that would be “layered and layered on top of one another”, creating an unreliable tool as a result of having too many items.

| Proposed components of cognition | |
|---|--|
| Memory | • Tested with the Mini Mental State Examination (MMSE) |
| Verbal fluency | • Education can affect this |
| Letter cancellation test | |
| Digit span test of short-term verbal memory | • Requires numeracy |
| Financial literacy | |
| Alternative uses test | |

Components of vitality

The group liked the term vitality because it was a positive term (rather than exhaustion, weakness or fatigue), and had a lot of “face validity” in terms of being what people who felt down would say. It is important to differentiate between subjective, predominantly questionnaire-based measures and objective physiological measures that might be looking at the vitality of systems or organs. The group said that correlation between subjective and objective measures “may be modest at best” because they could be measuring different things, and that there would be overlap with other domains, such as psychological function.

There are quite a lot of measures available for vitality. There should be a self-assessed measure and objective physiological tests. A member of the consortium asked whether there should be two domains for measuring vitality, one for metabolic, physiological variables and a second for psychological ones. Some of the participants

felt that there probably should be both, and “they do capture different things”. There could be a psychological self-reported domain versus an objectively measured one. Subdomains and “sub-subdomains” should be avoided, however.

The vitality domain has a cross-cutting quality for intrinsic capacity. It could be seen as overarching to some extent, with overlaps into the other domains considered by the working groups.

Experts were concerned about the size of the vitality domain, with a risk that it would “overwhelm” the other domains in terms of the proportional predictive power. There is a larger amount of multidimensional information in the vitality domain, whereas the others were less multidimensional. The group agreed there were some domains, such as cognitive, that were stronger and more predictive but that the domains could still make sense conceptually for being combined within an overall score.

Proposed components of vitality

| | |
|---|--|
| Fatigue, exhaustion versus zest for life, motivation, endurance | <ul style="list-style-type: none"> Alternative terms include: <ul style="list-style-type: none"> life energy, energy balance, energy reserves behaviour, physiological reserve resilience (partial, noting environmental factors) miscellaneous |
| Psychological resilience, ability to cope with change and obstacles | <ul style="list-style-type: none"> Some obvious questionnaire items such as ability to cope should be measured |
| Lung function (e.g. "Do you get short of breath?") | <ul style="list-style-type: none"> Ability to do physical activity without exhaustion is related to cardiorespiratory function, "so we would want the fairly simple test" of forced expiratory volume but also cardiovascular vitality measured by a choice of things – blood pressure, pulse pressure, arterial stiffness, cardiac output, heart rate response to activity |
| Haemoglobin | <ul style="list-style-type: none"> Haemoglobin levels at the bottom end of anaemia cause exhaustion, but there may not be much correlation in the middle of the spectrum |
| Weight loss, weight gain and obesity | <ul style="list-style-type: none"> Weight loss would be important both as a marker and a predictor and would be associated with a lack of vitality |
| Nutrition and food intake, metabolic balance (HbA _{1c}) | <ul style="list-style-type: none"> Debate over weight gain. Some people thought it should be included. Others thought it should not be included versus obesity and its effect on ability to be vital For energetic balance from a metabolic point of view the simplest potential measure was HbA_{1c} |
| Sleep (quantity, quality) | <ul style="list-style-type: none"> Smartphone technology could lead in five years to good sleep laboratory-validated measures of sleep quantity and, more importantly, sleep quality |
| Inflammation (e.g. C-reactive protein (CRP)) | <ul style="list-style-type: none"> The idea of low-level systemic inflammation probably was important in relation to vitality. It may simply be a biomarker of chronic morbidity affecting vitality. The group also said there were simple blood-based measures such as CRP |
| Sexual function (behavioural questionnaire, hormone assessment) | <ul style="list-style-type: none"> Sexual function or sexual vitality could be measured through behavioural questionnaires as well as sex hormone levels |
| Muscle function (grip strength) | <ul style="list-style-type: none"> Muscle function was also covered by the working group on locomotor function, including simple measures such as limb muscle circumference and grip strength |
| Oral health | <ul style="list-style-type: none"> Chewing, swallowing, sense of taste |

Components of sensory capacity

The group considered the vision and hearing subdomains of sensory capacity as relevant for monitoring intrinsic capacity across the life course. Both are strong determinants of the functional ability of older adults, especially when they coexist, and health

conditions affecting hearing and vision are highly prevalent (diabetic retinopathy, cataract, glaucoma). Cost-effective interventions are available across high- and low-income settings, and simple and accurate screening and diagnostic tests are available.

Proposed components of sensory capacity

Vision and hearing

- Test for vision: the Amsler grid is reliable and feasible. For monitoring purposes, near vision may be more appropriate
- Test for hearing: the two options are the whispered-voice test or tuning fork and audiometry/screening audiometry (via smartphone technology)
- Other sensory functions (e.g. olfactory) may not be that crucial for the functional ability of older adults

Potential issues identified by the group included:

- There may be some minor variability in terms of the results and how individuals from different countries perform. This can be managed when standard clinical protocols are developed and followed
- Self-reported measures are not sensitive enough to capture change over time within individuals
- Audiometry may be challenging to administer in some settings, although the assessment can be delivered via an electronic platform
- Standardization – for example, different mobile instruments might provide different results based on the resolution of the screen
- Training and supervision: high-quality data may be difficult to achieve when instruments are administered by non-specialist health professionals, although sufficient training and supervision can feasibly improve the quality of administration
- Existing cut-off points may not be sensitive enough to monitor change over time. Existing thresholds need to be revisited

The group tried to identify data that would be acceptable to clinicians at points of referral, and not present new kinds of data. So too for population-monitoring data, to avoid a parallel system

Further discussion points about intrinsic capacity assessment in general

Summary measures and overall trajectories

WHO presented an overview of the plans for developing a framework to measure intrinsic capacity. There was a number of potential outcomes. One was having enough information to reach a “summary measure” of intrinsic capacity – having some sense of an individual’s overall trajectory and where the state of their intrinsic capacity currently sat. But clinicians also needed the information to be divided into domains of intrinsic capacity, enabling them to respond in a practical way. Further, the summary information would also need to be available to go back to as an outcome. It would then be possible to evaluate, “Are we really impacting on the person’s overall trajectory?” Having thought of the domains independently, the subsequent step would be to ask if there were summary measures (perhaps even a single measure would be enough) – or were there measures

that spanned a couple of domains? Or would there be a need to “fall back” on the domains where there were very reliable tests that worked?

Availability of health services

A concern that was expressed frequently at the meeting was for assessment to be linked to intervention; it would not be ethical to screen for declines in intrinsic capacity if health services to address specific problems were lacking. Service development would need to take place where necessary before screening tools could be introduced.

Cultural concerns

Experts stressed a need – “sooner rather than later” in the process of developing a tool to measure intrinsic capacity – to consider the culture of health systems and other factors that may impinge on the feasibility and acceptability of the testing approaches. A kind of strategic decision needed to be made, if there was

something that was clearly not going to work around much of the world – “does that mean we just forget about it, or would we hold onto to it” because there was value in some settings? Experts identified the cognitive domain, for example, as having particular sensitivity to culture and language.

Gamification

Some participants raised the prospect of involving gaming experts so that there could be some gamification for some of the measures of intrinsic capacity, thus making them more feasible and accessible.

Staged development

Others called for some caution over the level of ambition for developing the tool, and that some experience of what worked and did not work needed to be gained without first waiting a long time for a fully comprehensive instrument to be developed.

Beyond health care

Tools being considered for the measurement of intrinsic capacity were not necessarily going to be the same as those currently being used by clinicians, aside from those for screening vision and hearing. But one expert said there was no need to “square the circle” on this, and that clinicians could be left to use the tools they were accustomed to, while these measures would be used in research and via older people’s self-assessment, or that of the trained non-professionals close to them. A tool to monitor intrinsic capacity would thus provide additional information. Another consortium participant added that the tool was fundamentally different in being not for the health care providers, but for alerting the health professionals to intervene.

Survey of intrinsic capacity markers used in research

The results of a WHO online survey for current clinical research on *Healthy Ageing*, carried out between July and September 2017, were presented (Yuka Sumi):

- 15 questions had been sent to 49 researchers, with a response rate of 65%;

- most respondents had been currently engaged in research on *Healthy Ageing*, with many engaged in clinical research; and
- the research involved 56 different countries and numerous projects.

The main body of the questionnaire then probed this research on whether it included biological, functional or clinical objective markers. Such markers were included in research for 87% of respondents, who were asked which domains were assessed and what kind of data were collected.

Even though there was some degree of standardization allowing, for example, the SPPB to become so widely used, most of the data were inconsistent and not standardized. The GDS, for example, was used both for vitality and psychological function. There was no consistency on metrics used to assess different aspects of the health of older adults, underlining the importance of the consortium’s efforts to harmonize data used in clinical research. For the walking test, for example, one respondent used the 6 min fast walking test whereas others used the 400 m walk test.

Responding to the survey findings, participants pointed out that in the cognitive domain, it was not always a problem that different tests were being used. So long as they were structured to cover similar items, they may be comparable.

The next step following the survey was to agree on core indicators and metrics for standardization across different research settings – work now set in motion by this meeting of the CCHA. A set of core indicators needed to be agreed.

A specific area in which there was “quite a degree of international consensus” and standardization was in falls prevention research. It would nonetheless be useful to identify at least the domains that would be helpful to:

- describing the case mix for clinical studies; and
- standardizing how the health of older people was characterized when talking about interventions designed to have an impact on the trajectory of intrinsic capacity.

3 Comprehensive assessment of older people's health and social needs

The second day of the 2017 annual meeting of the WHO CCHA was devoted to the development of comprehensive assessment of the health and social care needs of older people.

The CCHA also agreed a workplan for 2018 (see the next section), which included providing direction for the work-streams needed to develop tools for intrinsic capacity as part of comprehensive assessment.

The *World report on ageing and health* published by WHO in 2015 described the micro-level integration of clinical care that would be needed for the new approach of ICOPE (11).

Integration at the clinical care level is especially important for older people and should include (12):

1. a comprehensive assessment;
2. a common treatment or care goal based on the individual's intrinsic capacity and functional ability; and
3. a care plan that is shared among all care providers.

In a paper distributed to the CCHA ahead of the meeting, published in the *Bulletin of the World Health Organization* in May 2017, Islene Araujo de Carvalho and coauthors summarized some of the evidence behind the need to develop a comprehensive assessment (12).

- Basing goals on intrinsic capacity is more effective than prioritizing the management of specific chronic diseases since it avoids unnecessary treatment, polypharmacy and side-effects.
- Comprehensive assessments and care plans allow clinical management to be harmonized across different care providers, united around the common goal of maintaining intrinsic capacity.
- The benefits of assessments and plans for older people with, for example, declines in intrinsic capacity, include:

- admission to hospital being associated with a minimized potential risk and harms, with successful discharge home also being facilitated; and
- hospital discharge to long-term care being followed-up, with an essential link being made between health and social care, but also between hospital- and community-based resources.
- Case management is supported by evidence in systematic reviews – it improves intrinsic capacity, various aspects of medication management and the use of community services. It also improves health outcomes in older people and has clinical benefits for people with several chronic illnesses.
- Structured programmes supporting self-management have been shown to improve a wide range of outcomes in older adults, including physical activity, self-care, chronic pain and self-efficacy.
- Home-based interventions have positive effects.
 - A review of 64 randomized trials found that home visits were effective when they included multidimensional assessments and were done at least five times, with the greatest overall effects being improvements in physical functioning and reductions in emergency department visits, hospital admissions, lengths of hospital stay and numbers of falls.
 - To be effective, home-based services must be complemented by strong links to primary health care services, include follow-ups, and be restricted to people at a low risk of death.

A model for comprehensive assessment

A theoretical model for monitoring, maintaining and maximizing intrinsic capacity has been proposed by WHO. The details for it, such as what measures might be included in the monitoring of intrinsic capacity, have

been provisional, and they are the subject of the CCHA's expert input and the further effort planned for the work-streams.

The combination of intrinsic capacity assessment and clinical assessment would be used to create a comprehensive care plan. The maximal intrinsic capacity for each individual as they move from mid-life into older age should result from the implementation of evidence-based, multicomponent interventions for intrinsic capacity that accompany the treatment of any underlying conditions.

The consortium's considerations for a comprehensive assessment

The comprehensive assessment that WHO has sought to develop is different from the specialist geriatric comprehensive assessment. The WHO tool would be available to primary care physicians and general practitioners (GPs), and would probably be suitable for use in a middle-income country as a starting point. The consortium discussion was held to identify the objectives and structure of a comprehensive assessment and when, in which context and by whom it should be used.

- There were repeated calls within the consortium for assessment to be associated with intervention. Similarly, as opposed to being merely a data-collection initiative, assessment should lead to transformation. There should also be guidelines for interventions that enable action to be taken against any assessments of declined intrinsic capacity. Finally, areas should be identified in which assessment would be most likely to make an impact.
- Complexity was also raised in the respect of how the tool should be flexible to a range of older people, with various levels of complexity. The stage of assessment also informed complexity; initial screening would be simpler than the next steps of further assessment.
- The diversity of settings should be accounted for, meaning that a tool that worked in one place needed to be scalable for use also in very different settings in terms of, for example, resource or remoteness.
- Some concerns were raised about the likely take up of a tool by clinicians who often had high workloads – the amount of time needed to make assessments should be a key consideration. Another concern was to make use of existing instruments where available and appropriate.
- Terminology was also important, and the example of the term “frailty” was used to illustrate this. This term had taken a long time to gain recognition but was now accepted – and worked globally. The use of positive terms was also raised as important, given that the assessments were being aimed at all people, whether their intrinsic capacity was good, declining or there was significant loss of capacity.
- When engaging governments in the uptake of a comprehensive assessment tool, it is important to remember that their concern would be less about the number of items in the tool, and more about the cost and the end goals.
- As well as primary care professionals and others, specialists outside of the ageing field could also help to disseminate the concept of intrinsic capacity and its assessment.
- On a related interdisciplinary matter, the question of collaboration was also addressed, by which other health and allied professionals should widen the focus away from purely the medical profession. Insights as to the components that should be assessed could also come from, for example, dietitians, psychologists, physiotherapists and social workers.
- The use of assessment should be ongoing, not one-off, and should address earlier periods of the life course as well as later ones (as was the case for one programme already implementing the ICOPE approach), and could further be tied to the whole trajectory of the life course.
- In some settings, ahead of person-centred care, there was first a need to establish “CRC” – compassionate, respectful and caring health care, which was not always the given. Such qualities were not universal, and the meaning of person-centred care was dependant on the setting – the term could be subject to considerable cultural variation, which should be accounted for.

4 Consortium workplan for 2018

One of the objectives of the 2017 meeting of the WHO CCHA was to agree a workplan for the year ahead. The working groups convened to identify the priorities for each of the following three work-streams proposed for the CCHA in 2018:

1. develop a WHO intrinsic capacity assessment approach to be used in the context of a comprehensive assessment of the health and social care needs of older people in primary care settings;
2. harmonize clinical data across research; and
3. conduct an international study of ICOPE pilots and implementation.

For each of those streams, the working groups sought to:

- agree the proposed goals and objectives as set out below;
- define the main activities needed in 2018 towards achieving the goals and objectives;
- indicate potential members (individuals and organizations) of the working groups;
- identify a potential focal person or institution to host and oversee the work-stream with WHO; and
- outline the resources needed and how they might be mobilized.

Developing the WHO intrinsic capacity assessment as part of comprehensive assessment

Goal: to develop an intrinsic capacity assessment tool for use in the context of a comprehensive assessment of health and social care needs for older people.

Objective: to identify the steps needed for the development of appropriate approaches to detect, monitor and manage intrinsic capacity within an integrated care service delivery model.

This group agreed that the most important priority was to build a new instrument to assess intrinsic capacity. The recommended aims of this instrument were mainly (a) to detect declines in intrinsic capacity, (b) to monitor trajectories and (c) to trigger subsequent actions. The group recommended a two-step process.

1. Measurement of intrinsic capacity should be the first step in the evaluation of older people.
2. The assessment of intrinsic capacity should trigger action (e.g. need for comprehensive assessment). According to the findings of the assessment, the evaluation should end or should trigger other actions, depending on the characteristics of the person and their setting (nation, region, setting of care).

The group agreed the following were important considerations for the tool:

- define the target – should the target of the tool be defined by age, functional status or, for example, clusters of comorbidities?
- identify who should administer the instrument and where;
- ideally develop a full/expanded instrument and a short version; and
- the domains and components of the tool should be taken from pre-existing instruments to assess intrinsic capacity.

Main activities for 2018

The group identified three main tasks to develop an intrinsic capacity assessment tool:

1. select the components or items of intrinsic capacity by reviewing existing tools;
2. decide the targets and settings for the tool's implementation; and

3. design a pilot study to validate the tool in terms of feasibility, accuracy and effectiveness in detecting people at risk of developing functional declines and other adverse outcomes.

Two working groups were proposed to do the work in parallel: one to build the instrument and the other to design the pilot study.

Potential working group members

The first group, tasked with identifying the tool's components, should be composed of a small number of technical experts who could work quickly.

The second group, to design a pilot study, should be larger, composed of people representing some of the stakeholders concerned with *Healthy Ageing*.

The following institutions were among those suggested for providing experts and others:

- Canadian Frailty Network
- Government of China
- CIBER of Frailty and Healthy Aging (CIBER FES), Madrid, Spain
- European Union Geriatric Medicine Society (EUGMS)
- International Association of Gerontology and Geriatrics (IAGG)
- InterRAI
- Spanish Ministry of Health
- WHO collaborating centres.

Potential focal institutions and resource mobilization

- China, Germany, Japan and Spain
- IAGG and EUGMS.

Harmonizing clinical data across research

Goal: to bring together clinical studies related to *Healthy Ageing* that would provide evidence for strategies and clinical guidelines.

Objective: to develop an interactive platform for clinical data sharing and analysis.

The working group, in agreeing the goal and objective, proposed the following.

- Use data harmonization to provide an evidence base for the best choice of indicators used in a clinical population that could then be rolled out across the ICOPE pilots and implementation.
- Harmonization is only one aspect; it is important within a domain when there are multiple measures to look at the literature to evaluate psychometric properties, reliability, sensitivity to change, validity, acceptability, time and cost, and the merit of short versus long forms.
- The purpose of harmonization would be to test the generalizability of instruments across regions, clinical conditions and settings. "In other words, what works in North America may not work in sub-Saharan Africa." Ideally, data sets would be sampled from across different geographical regions of the world, different clinical conditions ("What works in a diabetes population may not work in a cognitively impaired memory clinic setting"), and such things as primary versus secondary care clinical settings.
- "The hope would be that the instrument that we think is attractive using real data would be shown to have, not identical effect estimates because there would be too much heterogeneity, but would be shown to have generalizability across the world, across different clinical settings and for different conditions."

Main activities for 2018

The working group mainly talked about existing studies but was aware that there was ongoing research, too, that might not be published and would be more challenging to find. The work-stream should:

- identify key studies – not a systematic review, as there is no need for it and there are too many studies, but "purposeful sampling" against explicit inclusion criteria;
- use inclusion criteria that include adequate sample size, length of follow-up, ideally multiple measures for the domain – two or more (albeit no study would include all the available measures for comparison, when methods such as network meta-analysis would become useful for indirect comparisons) – outcomes, regions, different clinical populations;

- review published literature, with randomized controlled trials considered particularly valuable for their control arms and cohorts; and
- use a network of key informants to identify potential studies, including people in the consortium “who are very well connected”, although being multidisciplinary is important, to include not only geriatricians but also GPs and others who may have a better insight on key studies.

The working group felt that this was “quite a lot of work” for one or two institutions to take on. The group said the logistics would be quicker if:

- a steering group with principle investigators having particular interests in each domain could be identified – a multi-institutional collaboration of such interests forming the steering group; and
- these people agreed to work in parallel, yet against the same standard methodology agreed by the whole group.

For analysis of the findings, there would need to be:

- statistical harmonization – this could be done internally by the above group or groups with expertise in statistical harmonization such as Maelstrom Research in Canada, which could be subcontracted; and
- a technical report on the work to recommend the optimal choice of measures for piloting.

Resource mobilization

It is often difficult, the working group agreed, to attract funding to methodological projects from national or international research-funding bodies. In addition to the funding challenge, the group identified a tight time frame and the need to recognize the amount of time that could be demanded for reaching agreements over data sharing.

There would be good interest from technical partners, however, if WHO could mobilize the resource. Good ideas documented in proposals drawn up with strong partners empower WHO to go to partners and countries for resource mobilization.

International studies of ICOPE pilots and implementation

Goal: to develop a multinational study on the implementation of the WHO integrated care approach.

Objective: to develop a methodology and framework for the implementation of international studies on integrated care.

Main activities for 2018

The stage had not yet been reached for a multicentre study, but it had been reached for a body of international work to inform implementation, including from the following.

- Longitudinal data sets that could give an idea of such things as the prevalence of the levels of intrinsic capacity in populations and the rates of change. These sets may also indicate examples of the tools in use.
- A number of natural experiments of implementation are already happening that, while not using a defined tool labelled as dealing with intrinsic capacity, are consistent with the general notion of intrinsic capacity – “for example, population-based, multi-domain, goal-orientated”.
- To use these existing studies in a systematic way for new knowledge, a “realist” perspective may be most helpful for understanding facilitators and barriers to the implementation but also the uptake, adherence and acceptability of interventions at the individual level.
- Learning could come from natural experiments if common data sets could be found for pooling of knowledge so that whereas the population case mixes and the interventions might differ slightly, a common description for them and for some of the outcomes would be helpful.
- Consistency would be helpful for the measures as they emerged of functional ability, of both domain-specific and total intrinsic capacity, but also for measures of impact.
- There may be some overlap to be discussed between this work-stream and the one developing the WHO intrinsic capacity tool – should there be relatively small-scale, interim work to establish the feasibility, acceptability, time needed and other factors that would begin to inform the training and competences

needed to introduce a tool? Such work would be relatively small scale and need relatively light resources.

- Some of the natural experiments may be indicating the use of thresholds for intervention. The CCHA discussions had led to a view that thresholds would have to be set. The natural experiments would indicate the effect of thresholds in terms of resources and, potentially, impacts.
- In summary, relatively small-scale early piloting could take place, but the bigger task for the work-stream would be in a systematic approach to obtain information from the work that was already taking place, and in clarifying the methodology across the areas as a priority for 2018.

Potential focal institutions and working group members

The group identified potential countries with institutions that could coordinate the work since they had already been involved in implementing relevant studies. The group suggested that a representative from each could become the members of the working group:

- Canada (David Price, McMaster University)
- China (Ninie Wang, Pinetree Care Group)
- France (Bruno Vellas, G rontop le, Toulouse University Hospital)
- India (A.B. Dey, All India Institute of Medical Sciences (AIIMS))

- Kanagawa, Japan (Hiroshi Yamada, Kanagawa prefectural government)
- Mexico (Luis Miguel Guti rrez-Robledo, National Institute of Geriatrics)
- Thailand (Arunee Laiteerapong, Chulalongkorn University)
- United Kingdom of Great Britain and Northern Ireland (Martin Prince, King's College London)
- Spain (Leocadio Rodriguez Ma as, University Hospital of Getafe)
- Australia (Elsa Dent, Torrens University Australia)
- Viet Nam (new site).

Resource mobilization

The group's suggestions for funding the work-stream were:

- make use of the existing resources of the institutions listed above, but also encourage their applications for funding of projects in collaboration with WHO;
- National Institute on Aging, United States of America; and
- Horizon 2020 (The EU Framework Programme for Research and Innovation).

The first priority for the working group was to define a research protocol. As a short cut to producing a protocol, the group could explore available sources from the field of health service and system implementation science for adaptation.

5 Concluding remarks

The CCHA meeting revealed a considerable amount of concurrence between the systematic work that had been done to identify the potential markers of intrinsic capacity, the views presented by individual experts working in the specific domains that would be measured, and the contributions that were added through the sets of discussions and proposals. There were also numerous insightful warnings, lessons and caveats offered for notes in developing a tool for the assessment of intrinsic capacity over the life course. The

meeting also succeeded in developing a set of qualities that should be held by a tool to comprehensively assess the health and social care needs of older people, including its objectives, structure and operators. Finally, a clear set of instructions were offered for the work that now needed to be done to develop these tools for the operationalization of the metrics of intrinsic capacity in clinical practice and for the comprehensive assessment of older people's health and social care needs.

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Annex 1: Participants

The following international experts, WHO staff and support personnel were in attendance at the 2017 annual meeting of the CCHA held in Geneva, all providing their invaluable, rich insights and feedback.

Experts

Nasser Al-Daghri, Dean, College of Science, King Saud University, Riyadh, Saudi Arabia
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Jane Barrat, Secretary General, International Federation on Ageing (IFA), Toronto, Ontario, Canada

Yoav Ben Shlomo, Professor of Clinical Epidemiology, Population Health Sciences, University of Bristol, Bristol, United Kingdom

Roberto Bernabei, Director, Department of Aging, Neurosciences, Head-Neck and Orthopaedics, Catholic University of the Sacred Heart, Rome, Italy

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Hélène Payette, Professor, Research Center on Aging, University of Sherbrooke, Sherbrooke, Québec, Canada

Ian Philp, Professor of Global Ageing, University of Stirling, Stirling, United Kingdom

David Price, Professor and Chair, Department of Family Medicine, McMaster University, Hamilton, Canada

Martin Prince, Professor of Epidemiological Psychiatry, Department of Health Service and Population Research, King's College London, United Kingdom
Co-Director, Centre for Global Mental Health, King's College London, United Kingdom

Jean-Yves Reginster, Professor, Department of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium
Director, WHO Collaborating Center for Public Health Aspects of Musculoskeletal Health and Aging, University of Liège, Liège, Belgium

Leocadio Rodriguez Mañas, Head, Geriatrics Department, University Hospital of Getafe, Getafe (Madrid), Spain

Cornel Sieber, Director, Institute for Biomedicine of Aging, Nuremberg, Germany

Alan Sinclair, Director, Foundation for Diabetes Research In Older People, Diabetes Frail, Luton, United Kingdom

John Starr, Professor of Health and Ageing, Alzheimer Scotland Dementia Research Centre, University of Edinburgh, Edinburgh, United Kingdom

Stephanie Studenski, Director of the Longitudinal Studies Section, National Institute on Aging, Bethesda, United States

Bruno Vellas, Head, Gérontopôle, Toulouse University Hospital, Toulouse, France
Director, WHO Collaborating Center for Frailty, Clinical Research and Geriatric Training, Gérontopôle, Toulouse University Hospital, Toulouse, France

Renuka Visvanathan, Professor, Project Lead, Centre of Research Excellence in Frailty and Healthy Ageing, University of Adelaide, Adelaide, South Australia, Australia
Director, Aged and Extended Care Services, Medical Directorate, The Queen Elizabeth Hospital, Central Adelaide Local Health Network, Adelaide, South Australia, Australia

Ninie Wang, Founder and Chief Executive Officer, Pinetree Care Group, Beijing, China

Hiroshi Yamada, Director, Healthcare New Frontier, Promotion Headquarters Office for International Strategy, Kanagawa Prefectural Government, Japan

Other invitees

Markus MacGill, Science Writer and Editor, Green Ink Publishing Services Ltd., Worcester, United Kingdom

WHO staff

Jotheeswaran Amuthavalli Thiyagarajan, Technical Officer (Epidemiologist), Ageing and Life Course, WHO, Switzerland

Islene Araujo de Carvalho, Senior Policy and Strategy Adviser, Ageing and Life Course, WHO, Switzerland

John Beard, Director, Ageing and Life Course, WHO, Switzerland

Andrew Briggs, Consultant, Ageing and Life Course, WHO, Switzerland

Shelly Chadha, Technical Officer, Management of Non-communicable Diseases, Disability, Violence and Injury Prevention, WHO, Switzerland

Amanda Marie Hinkley, Consultant, Ageing and Life Course, WHO, Switzerland

Dena Javadi, Technical Officer, Alliance for Healthy Policy and Systems, WHO, Switzerland

Silvio Paolo Mariotti, Senior Medical Officer, Prevention of Blindness, WHO, Switzerland

Alana Margaret Officer, Senior Health Adviser, Ageing and Life Course, WHO, Switzerland

Juan Pablo Pena-Rosas, Coordinator, Nutrition for Health and Development, WHO, Switzerland

Anne Margriet Pot, Technical Officer, Ageing and Life Course, WHO, Switzerland

Ritu Sadana, Lead Specialist, Ageing and Life Course, WHO, Switzerland

Yuka Sumi, Medical Officer, Ageing and Life Course, WHO, Switzerland

Enrique Vega Garcia, Unit Chief Healthy Life Course, Pan American Health Organization/WHO (PAHO/WHO), Washington (DC), United States

Annex 2: Consortium partners, steering committee and secretariat

The World Health Organization WHO CCHA is a multidisciplinary, multi-institutional network of experts supporting WHO to develop the standards, clinical norms and guidelines needed to implement the WHO *Global strategy and action plan on ageing and health*. The scope of the CCHA is driven by the necessity to change current models of care to a more comprehensive and integrated approach that is focused on the maintenance of intrinsic capacity and functional ability.

Partners

The CCHA works closely with the following partners:

- Kanagawa Prefectural Government, Japan
- WHO Collaborating Centre for Frailty, Clinical Research and Geriatric Training, Toulouse University Hospital, Toulouse, France
- WHO Collaborating Centre for Public Health Aspects of Musculoskeletal Health and Ageing, University of Liège, Liège, Belgium.

Steering committee

The steering committee of the CCHA is made up of the following members, in alphabetical order:

- Islene Araujo de Carvalho, WHO, Switzerland
- John Beard, WHO, Switzerland

- Matteo Cesari, Milan University, Italy
- Cyrus Cooper, University of Southampton, UK
- Luis Miguel Gutierrez Robledo, Instituto Nacional de Geriatria, Ciudad de México, Mexico
- Jean-Pierre Michel, Geneva University Hospitals, Switzerland
- Jean-Yves Reginster, WHO Collaborating Centre for Public Health Aspects of Musculoskeletal Health and Aging, University of Liège, Liège, Belgium
- Leocadio Rodriguez Mañas, University Hospital of Getafe, Spain
- John Rowe, Columbia University, USA
- Bruno Vellas, WHO Collaborating Centre for Frailty, Clinical Research and Geriatric Training, Geronotopôle, Toulouse University Hospital, France.

Secretariat

The secretariat of the CCHA comprises:

- Constance de Seynes, WHO Collaborating Centre for Frailty, Clinical Research and Geriatric Training, Geronotopôle, Toulouse University Hospital, France
- Yuka Sumi, WHO, Switzerland.

Annex 3: Agenda

The 2017 annual meeting of the WHO CCHA took place in the Centre de Conférences Varembe (CCV), located at 17 rue de Varembe, 1211 Geneva, Switzerland. The

agenda followed over the two days of 21–22 November 2017 was as below.

| Day 1. Understanding intrinsic capacity and its domains | |
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| Morning | |
| Introduction and objectives of the meeting | |
| Chaired by the CCHA Steering Group | |
| Meeting welcome, participant introductions and meeting objectives | Led by Islene Araujo de Carvalho, WHO |
| The CHHA's role and responsibilities | Presentation by Yuka Sumi, WHO |
| Plenary discussion | |
| Panel 1. Implementation of the concept of intrinsic capacity in clinical settings | |
| Chaired by Islene Araujo de Carvalho, WHO, and Leocadio Rodriguez Mañas, International Association of Gerontology and Geriatrics Global Aging Research Network (IAGG GARN) | |
| Progress on the Healthy Ageing concept and metrics of intrinsic capacity | Presentation by John Beard, WHO |
| Vitality across the life course | Presentations by Stephanie Studenski, US Department of Health & Human Services National Institute on Aging (by video link) and Ung-il Chung, University of Tokyo |
| Plenary discussion | |
| Afternoon | |
| Panel 2. Assessing the domains of intrinsic capacity in primary care settings: limitations and strengths of current diagnostic and screening tests | |
| Chaired by Olivier Bruyère, European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (ESCEO), and John Beard, WHO | |
| Assessing locomotor function | Presentation by Jean-Yves Reginster, ESCEO |
| Assessing nutrition | Presentation by Hélène Payette, Sherbrooke University |
| Assessing cognition and mood | Presentation by John Starr, University of Edinburgh |
| Assessing hearing and vision | Presentation by Shelly Chadha and Silvio Paolo Mariotti, WHO |
| Question-and-answer session | |
| Working groups: How to measure intrinsic capacity using biological and functional biomarkers in primary health care settings | |
| Group 1: Locomotor function | Led by Matteo Cesari, Milan University, and Andrew Briggs, WHO |
| Group 2: Psychological well-being | Led by Finbarr Martin, King's College London, and John Beard, WHO |
| Group 3: Cognition | Led by John Starr, University of Edinburgh, and Yuka Sumi, WHO |
| Group 4: Vitality | Led by Islene Araujo de Carvalho, WHO |
| Group 5: Sensory capacity | Led by Shelly Chadha and Jotheeswaran Amuthavalli Thiyagarajan, WHO |
| Feedback from working groups | |

Day 2. Developing a comprehensive assessment of older people's health and social care needs

Morning

Panel 3. Developing a comprehensive assessment

Chaired by Islene Araujo de Carvalho, WHO, and Jean-Yves Reginster, ESCEO

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| Update on the comprehensive (geriatric) assessment | Presentation by Matteo Cesari, Milan University |
| Considering functional ability in the context of a comprehensive assessment | Presentation by Alana Margaret Officer, WHO |
| Person-centred goal setting in the context of comprehensive assessment | Presentation by Dena Javadi, WHO |
| Developing person-centred integrated care plans | Presentation by Finbarr Martin, King's College London |
| Plenary discussion. Critical reflections | |
| Assessing long-term care needs | Presentation by Anne Margriet Pot, WHO |
| Approaches for assessing cognitive reserves, capacities and abilities | Presentation by John Starr, University of Edinburgh |
| Plenary discussion. What should be included in a comprehensive assessment? | |
| <ul style="list-style-type: none"> • What are the objectives and structure of a comprehensive assessment? • When, in which context and by whom should a comprehensive assessment be used? | |

Afternoon

CCHA work-streams

Chaired by Bruno Vellas, Toulouse University Hospital, WHO Collaborating Centre, and Islene Araujo de Carvalho, WHO

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| Clinical research data: results of survey of markers used in current clinical research on Healthy Ageing | Yuka Sumi, WHO |
| Experience of ICOPE pilots and implementation | Hiroshi Yamada, Kanagawa Prefectural Government, Japan |

Working groups: CCHA work-stream priorities

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|---|---|
| Group 1: Development of WHO tools for intrinsic capacity and comprehensive assessment | Facilitated by Leocadio Rodriguez Mañas, IAGG GARN, and Islene Araujo de Carvalho, WHO |
| Group 2: Harmonizing clinical data across research | Facilitated by Jotheeswaran Amuthavalli Thiyagarajan, WHO, and Jean-Yves Reginster, ESCEO |
| Group 3: ICOPE pilots and implementation | Facilitated by Finbarr Martin, King's College London, and Ung-il Chung, University of Tokyo |

Feedback from the working groups

The way forward and closure of the meeting

Chaired by the CCHA Steering Group

Annex 4: Background papers

Four background papers were distributed to the Clinical Consortium on Healthy Ageing ahead of the meeting. These papers are available at the WHO website – see <http://www.who.int/ageing/health-systems/clinical-consortium>.

Thiyagarajan AT, Cesari M, Kumar S, Kralj C, Martin FC, Chadha S, Beard J, de Carvalho IA. Diagnostic accuracy of screening tools for non-specialist health care settings: a summary of findings from ICOPE rapid reviews.

de Carvalho IA, Martin FC, Cesari M, Sumi Y, Thiyagarajan JA, Beard JR. Operationalizing the concept of intrinsic capacity in clinical settings.

Araujo de Carvalho I, Epping-Jordan J, Pot AM, Kelley E, Toro N, Thiyagarajan JA et al. Organizing integrated health-care services to meet older people's needs. *Bull World Health Organ.* 2017;95:756–63.

Philp I, Tugay K, Hildon Z, Aw S, Jeon Y-H, Naegle M, Michel J-P, Namara A, Wang N, Hardman M. Personalized assessment to integrate care for older people.

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