BE HE@LTHY BE MOBILE

A handbook on how to implement mAgeing

World Health Organization

ITU

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Executive Summary

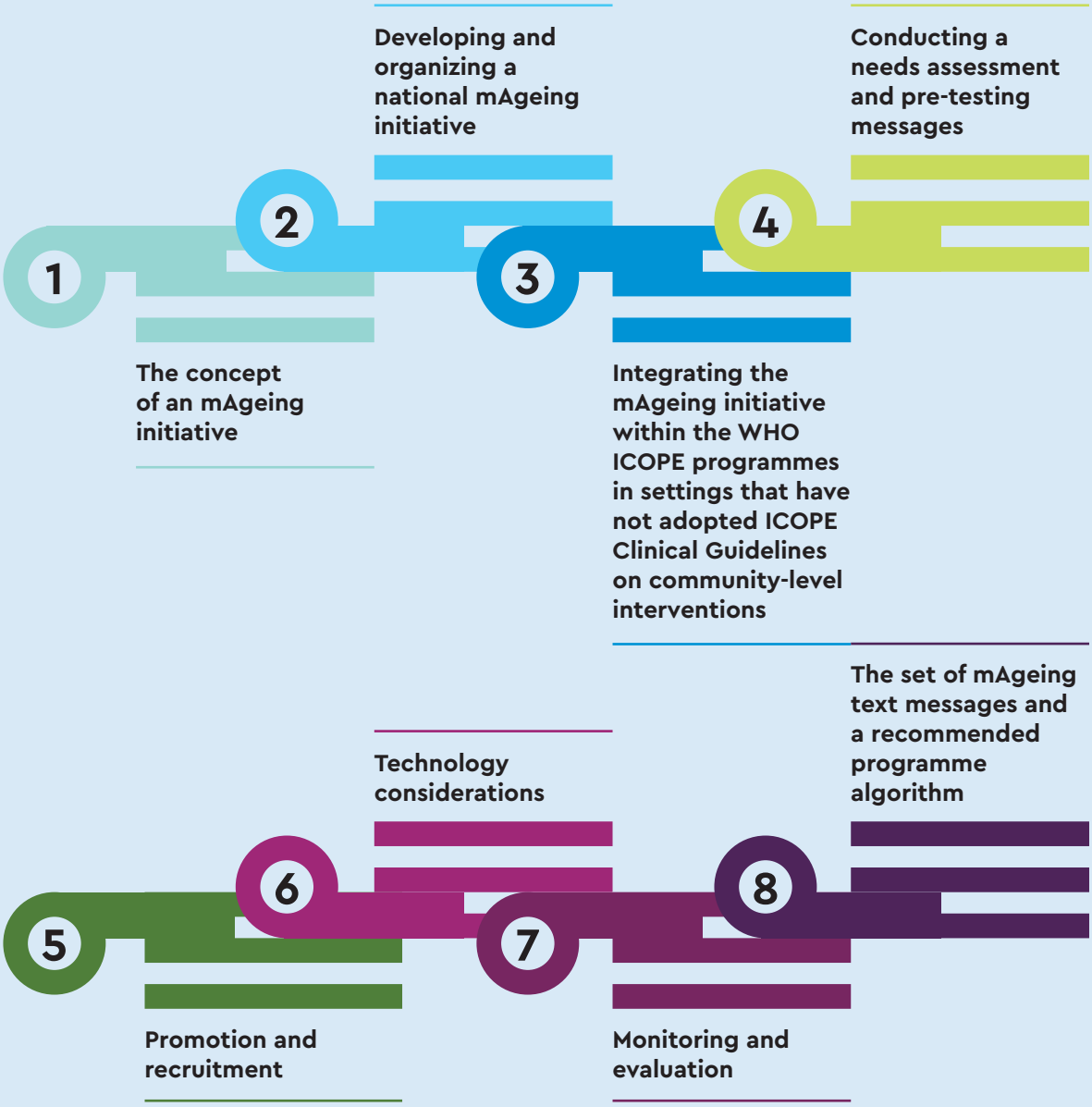
The Be He@lthy, Be Mobile initiative is a global partnership led by the World Health Organization (WHO) and the International Telecommunication Union (ITU), representing the United Nations agencies for health and information and communications technologies (ICTs). The initiative supports the scale up of mobile health technology (mHealth) within national health systems to help combat noncommunicable diseases (NCDs) and support healthy ageing.

Mobile health, or mHealth, is defined as "medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants, and other wireless devices" (1). The Be Healthy, Be Mobile initiative uses basic technologies common in most mobile phones. The BHBM initiative has overseen the development and implementation of several mHealth programmes, including mTobaccoCessation (2), mDiabetes, and mCervicalCancer. The mHealth programme-specific handbooks act as aids to policy-makers and implementers of national or large-scale mHealth programs. See Annex 1 for further information on the Be He@lthy, Be Mobile initiative.

mHealth for Ageing, or mAgeing is a new programme under the initiative, the central objective of which is to assist older persons (a person whose age has passed the median life expectancy at birth) in maintaining functional ability and living as independently and healthily as possible through evidence-based self-management and self-care interventions.

This handbook provides guidance for national programmes and organizations responsible for the care of older persons to develop, implement, monitor, and evaluate an mAgeing programme. The text messaging communication provided uses evidence-based behaviour change techniques to help older persons prevent and manage early declines in intrinsic capacity and functional ability. The mAgeing programme is based on WHO's Integrated Care for Older People (ICOPE): Guidelines on community-level interventions to manage declines in intrinsic capacity (3) which include interventions to prevent declines in intrinsic capacity and functional abilities in older people, namely: mobility loss, malnutrition, visual impairment and hearing loss; as well as cognitive impairments and depressive symptoms. The messages are designed to encourage participation in activities, and to prevent, reduce, or even partly reverse, significant losses in capacity. The content of the mAgeing programme will complement routine care offered by health care professionals by supporting self-care and self-management. All content in this handbook is based on the WHO ICOPE Guidelines and other relevant WHO recommendations. The ICOPE Guideline recommendations were reached by the consensus of a guideline development group, convened by WHO, which based its decisions on a summary of systematic reviews of the best quality evidence most relevant to community-level care for older people, as well as the most up-to-date research on the effectiveness of mHealth.

THIS HANDBOOK COVERS THE FOLLOWING TOPICS:



Background

Over the past 50 years, socioeconomic development in most regions has been accompanied by large reductions in fertility and equally dramatic increases in life expectancy. This phenomenon has led to rapid changes in population demographics the world over: the proportion of older people in general populations has increased substantially within a relatively short period of time.

Numerous underlying physiological changes occur with increasing age, and for older people the risks of developing chronic disease and care-dependency increase. By the age of 60 years, the major burdens of disability and death arise from age-related losses in hearing, seeing and moving, and conditions such as dementia, heart disease, stroke, chronic respiratory disorder, diabetes and osteoarthritis. The onset of ageing-related physiological changes and chronic disease have remained static over the last generation (4). Many health problems experienced by older people are related to chronic diseases, which can be delayed or prevented through engaging in healthy behaviours (5). While disease management remains essential to healthy ageing, health interventions should also be targeting the older person's physical and mental capacities.

The WHO's World Report on Ageing and Health defines healthy ageing as "the process of developing and maintaining the functional ability that enables wellbeing in older age" (5). The report shifts focus from typical ageing care of disease management to maximizing functional ability and preventing care dependence (6). Interventions that focus on intrinsic capacity and the environment in which an older person lives will help to ensure that health services have an impact on the outcomes most relevant and beneficial to their daily lives.

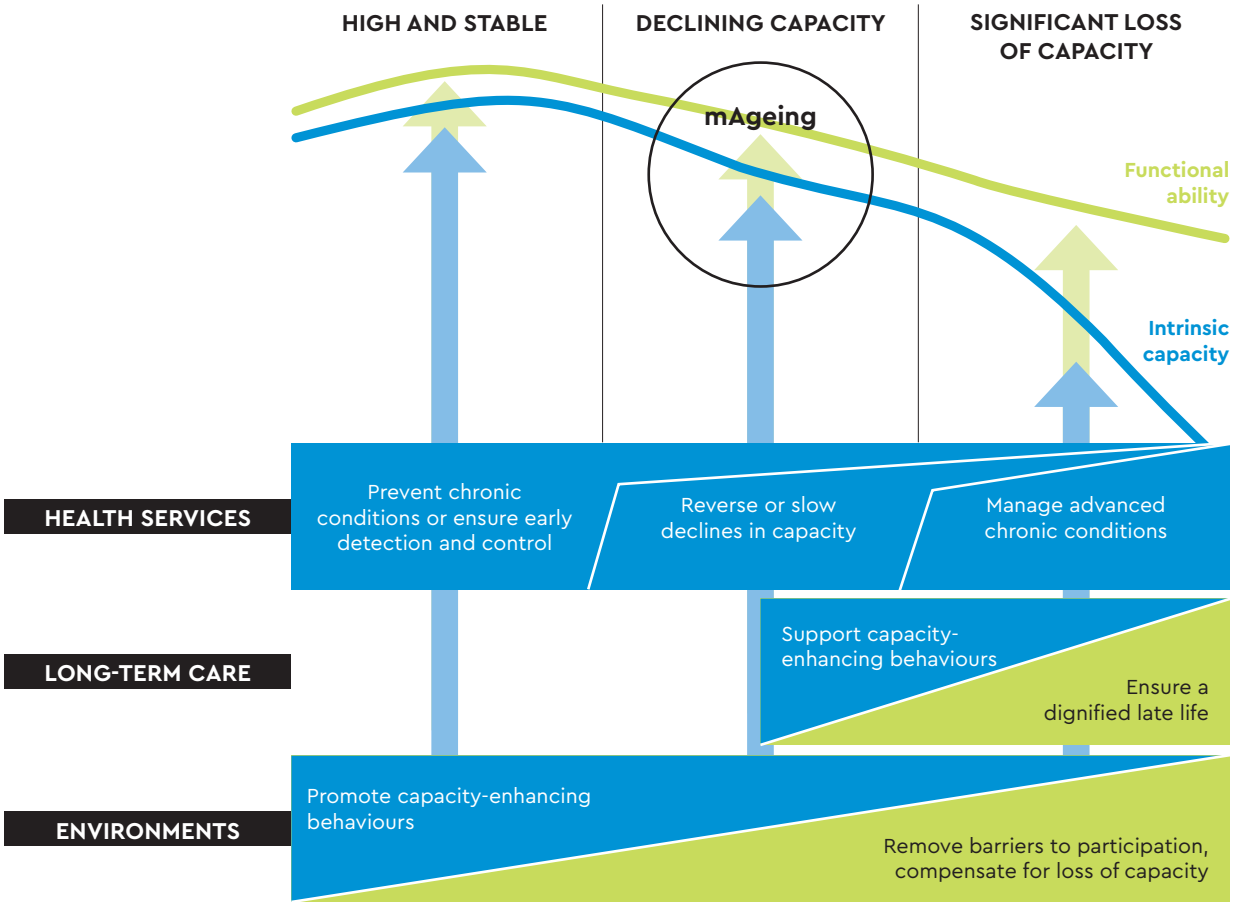
INTEGRATED CARE FOR OLDER PEOPLE

The WHO's public health framework for healthy ageing identifies three phases of the intrinsic capacity trajectories across the second half of the life course: high and stable capacity, declining capacity, and significant loss of capacity. Figure 1 shows that intrinsic capacity and functional ability declines with increasing age owing to underlying diseases and the ageing process. Intervening at an early stage of functional decline is essential as the process of becoming frail or care-dependent can be delayed, slowed or even partly reversed (7-9).

Intrinsic capacity: "the composite of all of the physical and mental capacities that an individual can draw on" (5).

Functional ability: "health-related attributes that enable people to be and to do what they have reason to value" (5).

FIGURE 1. A PUBLIC HEALTH FRAMEWORK FOR *HEALTHY AGEING*



Declines in intrinsic capacity and functional ability are, however, often overlooked by health care professionals. Early markers of decline in intrinsic capacity, such as decreased gait speed or reduced muscle strength, are often not identified, treated or monitored, which is crucial if they are to be reversed or delayed. The majority of health care professionals lack guidance or training to recognize and manage these markers in older age.

To address this and thereby improve care for older people, a new set of guidelines has been developed in line with the WHO public health framework for healthy ageing's goal of maintaining intrinsic capacity and functional ability across the life-course.

The Integrated Care for Older People (ICOPE) Guidelines offer evidence-based recommendations to health care workers on appropriate approaches to detecting and managing important declines in physical and mental capacities at the community level, and delivering interventions to support caregivers (3). The ICOPE Guidelines provide standards that can act as the basis for national guidance and for the inclusion of older people's health care in primary health care programmes, using a people-centred and integrated approach.

The physical and mental impairments highlighted in the ICOPE Guidelines on community-level interventions were selected because they represent clinically important declines in physical and mental capacities, as per the WHO framework on healthy ageing, and are strong predictors of mortality and care dependency in older age. The recommendations in these guidelines, described further in Section 2 of this handbook, must be implemented in an older person-centred and integrated manner.

The ICOPE Guidelines on community -level interventions that have currently been developed propose six actions to manage declines in intrinsic capacity in older people. The mAgeing programme only includes the first five actions and does not include caregiver support:

6 ACTIONS | to manage declines in the instrinsic capacity of older people

1. **Improve musculoskeletal function, mobility and vitality**
2. **Maintain older adults' capacity to see and hear**
3. **Prevent severe cognitive impairment & promote psychological well-being**
4. **Manage age-related conditions such as urinary incontinence**
5. **Prevent falls**
6. **support caregivers***

* Not included in mAgeing

Caregiver support: The ICOPE Guidelines on community-level interventions include recommendations on support for caregivers. The focus of mAgeing, however, is to help the older person to self-manage at home and prevent decline. Messages are therefore intended specifically for the older person. Family members or other caregivers can assist the older person with understanding and following the mAgeing messages and interventions. Consideration could be given to developing an add-on programme of messages specifically to support caregivers. Alternatively, the WHO iSupport E-Programme for Caregivers of People Living with Dementia is ready to be adapted and tested at the national level. For more information, visit: www.isupportfordementia.org

Declining intrinsic capacity is frequently expressed as common impairments in older age, such as difficulties with hearing, seeing, remembering, walking or performing daily or social activities. The actions can be implemented through self-management support. Self-management support aims to provide older people with the information, skills, tools, and motivation that they need to maximize their intrinsic capacity and maintain their functional ability, thus being able to do the things they value.

RATIONALE FOR mAGEING

Interventions that promote healthy behaviour change and/or disease self-management techniques and strategies have been effective in improving healthy behaviours among older adults (10, 11). Mobile technology offers a means of increasing the reach of interventions and providing content when and where people need it, as interventions can be generally accessed anywhere and at any time. Short message services (SMS) or text messages have the advantage of instant transmission at low cost to end users, and are a widely adopted and accessed technology. Evidence suggests that older adults are adopting mobile technologies. In 2016, ITU reported that in countries with available data, 85% of the population aged 25–74 years owned a mobile phone, and that fewer than half of adults over 74 years owned a mobile phone (12). As the "younger" older adult demographic, who are currently comfortable with using mobile technologies continue to age, the rates of mobile phone ownership and use by older adults will rise.

Recent systematic reviews of evidence have shown promise for the use of mHealth to manage chronic conditions prevalent among older people, such as diabetes, chronic obstructive pulmonary disease, Alzheimer's and dementia, osteoarthritis, and coronary heart disease, as well as the risk of falls (13–15). mHealth interventions have also shown promise for behaviour change interventions among older adults, such as engaging in regular physical activity (16, 17). The growing evidence base of mHealth interventions to support self-management and change healthy behaviours, along with the WHO and ITU experience thus far with the mDiabetes, mTobaccoCessation, and mCervicalCancer programmes, combined with the ability of mHealth to reach large portions of the populations, have led to the concept of the mAgeing programme.

What is the mAgeing programme?

The mAgeing programme is designed to focus on older people at risk of significant declines in physical and mental capacities (Figure 1), with messages targeting the maintenance of function and independent and healthy living through specific and actionable healthy behaviour change strategies that align with areas under the ICOPE Guidelines on community level interventions.

The goal of the mAgeing programme is to delay, slow, or even partly reverse the declines in intrinsic capacity and transition to care dependency.

The mAgeing programme is designed to be implemented as part of the ICOPE Guidelines on community level interventions. For countries or groups who choose not to adopt the ICOPE programme, an mAgeing programme can still be implemented as the older population will still benefit from the mAgeing messages. Two mAgeing streams are therefore proposed:

1. mAgeing ICOPE **2. mAgeing**

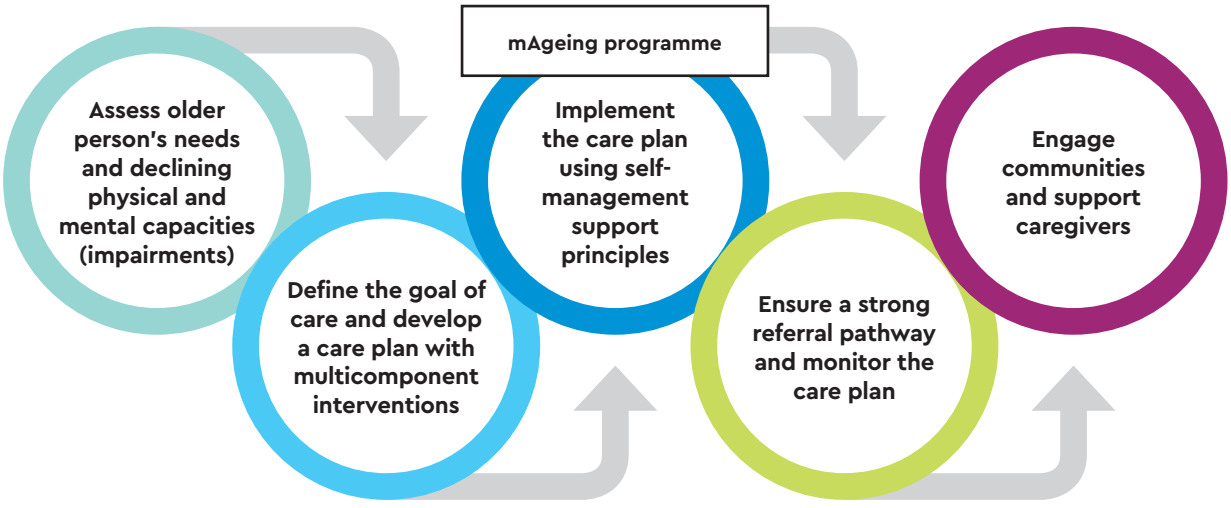
mAGEING ICOPE PROGRAMME

The ICOPE recommendations should be implemented using an older person-centred and integrated approach. The rationale and evidence base for providing older person-centred and integrated care has been detailed previously in the WHO World Report on Ageing and Health (5) and the ICOPE Guidelines on community-level interventions (3).

Important clinical elements needed when designing integrated care for older people include: a comprehensive assessment and care plan that is shared with all providers; a common treatment and care goal; strong referral and monitoring; and community engagement. Each of these elements is described in the WHO ICOPE Guidelines on community-level interventions (3).

The five steps required to deliver the ICOPE recommendations (at the clinical care level) in an integrated manner are outlined below in Figure 2.

FIGURE 2. DELIVERING ICOPE IN AN INTEGRATED WAY



In step 1, an older person undergoes a comprehensive assessment by care providers. The aim is to assess the intrinsic capacity of the older person, any associated conditions and impairments, behaviours and risks that may influence future capacity, and the person's environments. The assessment includes not only a traditional history-taking and a physical exam, but also a thorough analysis of the person's beliefs, priorities and preferences concerning his or her chronic condition and its management. This assessment is essential to develop a care plan and tailor interventions that are acceptable and appropriate for the individual concerned. It is essential that the older person is involved with decision-making and goal-setting from the outset, and that goals are set in accordance with the person's needs and preferences.

mAgeing ICOPE is designed to work in conjunction with the older person's health care provider, implemented after an individual needs assessment and the development of a comprehensive care plan. The mAgeing ICOPE programme is offered to the older person as part of ICOPE step 3: self-management support principles. The older person can be enrolled in mAgeing ICOPE to receive self-management support designed to complement and augment advice given by the health care worker. Self-management support provides older adults with the information, skills, and tools needed to maximize their intrinsic capacity and maintain their quality of life.

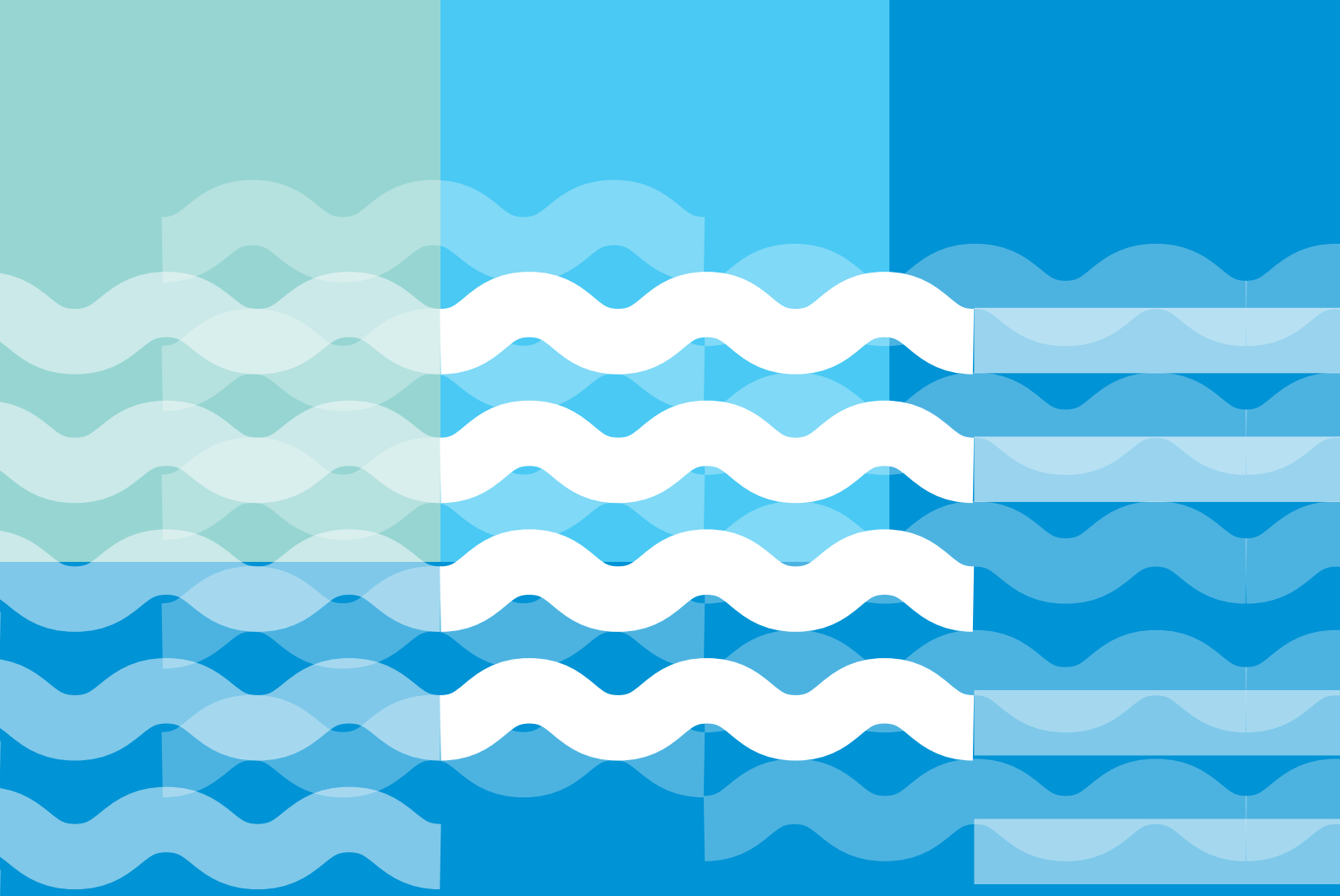
Each individual enrolled in mAgeing ICOPE will receive messages from the Healthy Living module, designed to run the duration of the programme. They will also receive the entire package of mAgeing ICOPE messages (all 5 actions), as research has shown that all actions have interconnected benefits (3). Regular strength training, for example, can not only help to reduce or prevent mobility impairments, but also to prevent falls, and can indirectly protect the brain from cognitive impairment or depressive symptoms. Individuals with chronic conditions or who are smokers can also be referred to additional and related mHealth programmes (such as mDiabetes, mTobacco Cessation, mCervicalCancer) if available. Although the health care worker, together with the individual enrolled, may decide on the order of messages received, it is crucial that messages for all five actions be delivered. The benefit of mAgeing ICOPE is that messages are person-centred and use an integrated approach specific to the community setting.

mAGEING PROGRAMME

The mAgeing programme is designed for countries or organizations that choose not to implement ICOPE but still wish to develop an mAgeing programme as per the health needs of the elderly population. A key distinction between the two programmes is that mAgeing ICOPE is to be used in conjunction with an older person's care plan. For those without care plans, the mAgeing programme content can be useful to promote healthy ageing among the general older population. Messages focus on suggestions for healthy lifestyle, ways to maintain function and live as independently and healthily as possible as one ages. As with the mAgeing ICOPE programme, everyone enrolled in mAgeing will receive the entire package of mAgeing messages (all five actions), as research has shown that all actions have interconnected benefits (3), and this reflects the goal and suggested outcome evaluation of mAgeing.

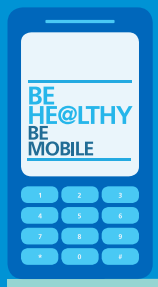
A full description of the mAgeing streams, content, and programme algorithm is outlined in Section 2 of this handbook. Either or both of the mAgeing ICOPE and mAgeing streams can be adopted depending on the country's unique needs. In some countries that adopt ICOPE, for example, there may be individuals who are unable to access ICOPE but would still benefit from the mAgeing programme. Figure 3 below illustrates how an older person can enrol in either of the mAgeing streams.

FIGURE 3. mAGEING ENROLMENT PROCESS



DEVELOPING AN mAGEING PROGRAMME

FIVE AREAS OF THE mAGEING PROGRAMME



1 Operations management

2 Content development and adaptation

3 Promotion and recruitment

4 Technology specifications

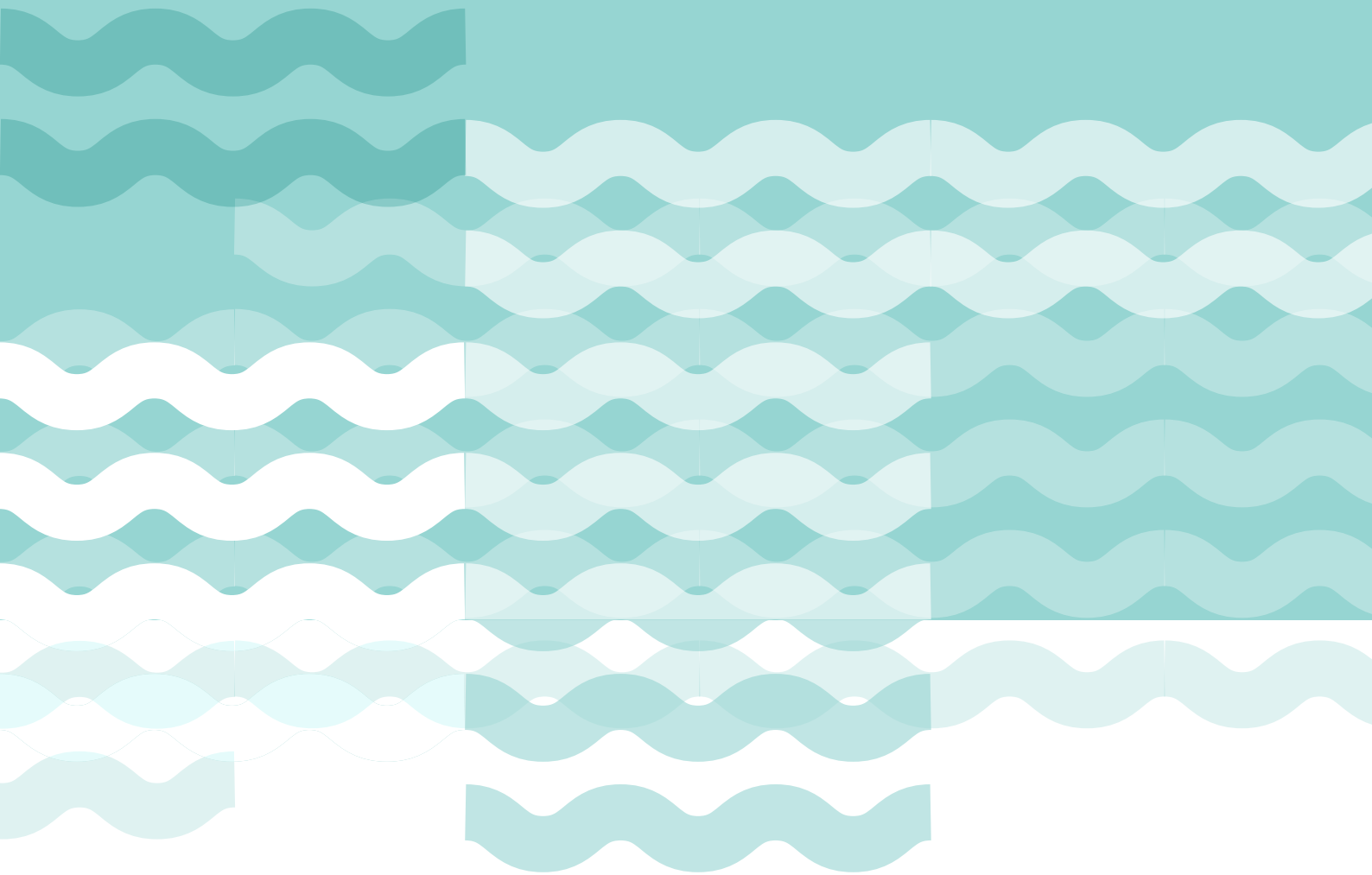
5 Monitoring and evaluation

This handbook also contains annexes that include:

- background information
- mAgeing message library and algorithm template
- mAgeing evaluation questions and survey

SECTION 1

OPERATIONS MANAGEMENT



A. mHEALTH COUNTRY NEEDS ASSESSMENT

A thorough mHealth country needs assessment is a crucial step in developing an mAgeing programme. As with any large-scale intervention, it is essential to understand the context in which it will be delivered. For the mAgeing programme to be effective, text messages need to be consistent with older persons' needs, their capabilities, priority health problems, and their motivations and preferences. Messages can support self-management by incorporating relevant and effective behaviour change techniques, which provide strategies and encouragement to overcome barriers. Supporting an older person's self-management to retain functional abilities may increase their understanding of the ageing process, encouraging them to be active participants in decision-making regarding their care plan and motivating them to engage in healthy behaviours (18). An mHealth country needs assessment will help to determine the relevant barriers and facilitators of behaviour change for older people in the context of each participating country.

A needs assessment is also a vehicle for consolidating information for planning, identifying gaps in knowledge, and helping with decision-making. It will also give operations management teams an understanding of the setting. The needs assessment involves visiting, observing, and interviewing key informants and stakeholders, and documenting existing resources. The data collected will inform the development and implementation of a national mAgeing programme.

The questions related to the goals and content of an mAgeing intervention, which should be considered as part of a needs assessment are set out below.

WHICH ACTIONS CAN PREVENT OR REVERSE DECLINES IN INTRINSIC CAPACITY AND FUNCTIONAL ABILITY?

Intrinsic capacity and functional ability decline with increasing age, owing to underlying diseases and the ageing process. Intervening at an early stage through behaviour change can slow, or even partly reverse, the process of becoming frail or care-dependent.

To prevent or reverse declines in intrinsic capacity and functional ability, the WHO ICOPE guidelines on community-level interventions include all of the following actions:

- engaging in **multimodal exercise** to improve mobility, musculoskeletal function, and reduce risk of falls
- promoting **oral supplemental nutrition** and **protein intake** to address undernutrition and improve muscle function
- attending **routine screening** for vision and hearing followed by provision of comprehensive care
- encouraging **home modifications** to minimize the risk of falls
- encouraging **cognitive stimulation** to prevent cognitive impairment
- encouraging **social activities** and **stress management** techniques to reduce depressive symptoms

Other considerations for the older population include medication and health care services reminders.

A good understanding of the most prevalent unhealthy behaviours in each country's specific context would help to decide the optimum emphasis and frequency of the text messages in the mAgeing programme. Identification of these behaviours can be completed as part of the literature review during the needs assessment.

WHAT FACTORS ARE LIKELY TO HELP OR HINDER BEHAVIOUR CHANGE?

Once the most prevalent and influential behaviours have been identified among the older population, it will be important to understand the **key barriers** to change in these behaviours. This needs to be explored primarily from the older person's perspective using a person-centred approach.

Some likely barriers include:

INTERNAL FACTORS

- poor health literacy
- low risk perception
- Internalized ageism
- traditional care-seeking practices
- perceived stigma
- physical and psychological addiction
- low self-efficacy

EXTERNAL INFLUENCES

- poor economic conditions
- socio-cultural and gender norms
- social stigma
- access to quality and affordable health services

A needs assessment will be able to identify the extent to which and intensity with which these barriers and facilitators influence behaviour change in the given context. A literature search should identify existing local studies and an exploratory qualitative study can identify such barriers and facilitators. Such a study would include conducting a set of interviews with older persons with declining capacity and possibly focus group discussions. In addition to talking to older people, it may be useful to interview or conduct focus groups with their caregivers and family members. The sampling strategy for such a study would need to take account of age, gender, level of decline and care dependence.

WHAT ARE OLDER PEOPLE'S DIGITAL MEDIA LITERACY AND HABITS?

Although the "digital divide" has declined between different social groupings around the world, there may still be a considerable **"digital use divide"**. This reflects an underlying gap in digital media literacy and digital engagement.

Planning considerations on the technological aspects of mHealth and their population use have already been covered in previous guidance (19). While older people may be using mobile phones (12), due consideration should still be given to their digital media literacy and practices. Special consideration should be given to creating an inclusive programme that allows users with functional limitations, such as vision, hearing, or mobility impairment, or those with low levels of digital media literacy and engagement, to take part (14).

Several tools are now available that can be used on a representative sample to appraise digital media literacy and practices across a range of domains including operational, navigation, social, creative and mobile. For instance, the eHealth Literacy Scale has been found to be a reliable and valid instrument for use in older populations (20). Countries should consider validating such instruments in their own populations as part of the needs assessment.

The digital media needs assessment is critical to programme algorithm planning as it will help guide the number of messages sent, if two-way messaging is used, and if voice messaging needs to be employed.

Table 1 lists additional considerations related to the operation and implementation of an mAgeing programme, which should be included in the needs assessment.

TABLE 1. CONSIDERATIONS FOR mAGEING NEEDS ASSESSMENT

THEME	CONSIDERATIONS
Current situation of ageing-related decline in capacity	▌Demographic data on number and percentage of older people with declining capacity and care dependency if available, including age, gender, and location (living at home or in assisted-living care) ▌What are the high risk and priority populations, and population segments?
State of ageing-related care and public health programmes	▌Ageing programme objectives, constraints, institutional and human resources, funding ▌Approaches and algorithms for identifying older people in need of care, treatment, and enhancing adherence ▌Existing or planned synergies with other chronic condition programmes e.g. chronic obstructive pulmonary disease, diabetes ▌Campaigns and health promotion strategies for Healthy Ageing ▌Composition of the health care worker network and current priority given to ageing-related care ▌Involvement of non-governmental, community and patient organizations ▌Relevant priorities of the government and the health system ▌The projected implementation of ICOPE guidelines
Target group	▌Target populations ▌Challenges and opportunities within the population ▌Literacy and language considerations ▌Mobile technology and other digital media literacy considerations ▌Functional ability issues in the use of mobile phones (e.g. dexterity, visual impairment, cognitive impairment) ▌Knowledge levels, cultural attitudes, perception of risk, current behaviour and behavioural trends relating to ageing-related decline in functional ability and chronic conditions
State of mobile communications	▌Statistics on older adults' use of mobile phones and text messaging; costs to consumers of text messaging, data and calling ▌Penetration and use of smartphones and mobile internet access ▌Description of the mobile network environment (e.g. the number of network providers, whether they provide "value-added services", including any related to health) ▌Whether unsolicited text messaging (spam) by companies is allowed or occurs ▌Whether health services use text messaging or smartphone apps ▌Cultural issues in the use of mobile phones ▌The projected evolution of the mobile phone market in the near future, particularly with respect to increased penetration of smart- or semi-smartphones ▌Regulatory issues such as spam, consent to receive programmes, cost of message transmission, restrictions on the number of messages that can be sent each day ▌Existing mHealth programmes that could incorporate mAgeing messages

Contextual, geographical, cultural and behavioural Influences	▌Individual and cultural attitudes to health care and self-management ▌Determinants and risk factors that influence the level of decline in functional ability ▌Cultural and social factors that may stop individuals from adopting a healthier lifestyle ▌Community dynamics and actors that would support successful ageing outcomes ▌Motivation and incentives for individuals to participate in an mAgeing programme ▌People who can be considered champions, "trusted advisors" and how to leverage them ▌Expected interactions of target populations with potential channels in health interventions: SMS, web, app, phone call, interactive voice response, brochure, face-to-face coaching or consultation ▌Convenience for the population ▌Cost (who will pay: the population or the government?)
Stakeholders	▌Relevant agencies, organizations, donors, companies, experts and their potential interest in supporting an mAgeing programme, including: o National and subnational/regional levels of healthy ageing experts o Funders of public health services o Ministry of Health and other relevant government departments and agencies o Private and other health and social care workers that work in ageing o Government agencies responsible for telecommunications and data protection o Telecommunication companies, mobile network providers and industry bodies or associations o Any local mobile phone service providers or companies that provide mHealth services o Older people's associations; community advisory groups o Health insurance companies; other private sector supporters, volunteers care givers o Academic researchers (public health, ageing, behaviour change, social marketing, mHealth) o Civil society organizations working for elderly health care o Existing national strategic plan or programmes for elderly health care
Promotion	▌What channel will be used to promote the mAgeing programme? ▌How people will register people into the programme? ▌If not implementing ICOPE, what recruitment strategies will be used? ▌Incentives for participation ▌Access to and availability of health care services and resources
Further research	▌Other areas in which further research is required to facilitate a successful pilot or "soft" launch and implementation; operational research.

PLANNING FOR INTEGRATION OF mAGEING WITHIN ICOPE GUIDELINES

Integrating mAgeing within ICOPE recommendations offers a mobile technology-based delivery mode to support the self-management strategies outlined in older people's care plans. It implies buy-in from health care providers who will likely be involved in promotion and recruitment of the mAgeing programme. The key is to determine how mAgeing can best be integrated into the existing or future operations of ICOPE and how it could improve outcomes for all involved. The mAgeing programme should complement, not replace, self-management advice and instruction from health care providers, such as care managers. To facilitate uptake, it may be useful to consider five characteristics that have been shown to influence the likelihood of adoption of a technological innovation, outlined below in Table 2 (21).

TABLE 2. FACILITATING IMPLEMENTATION AND UPTAKE OF THE MAGEING PROGRAMME WITHIN ICOPE RECOMMENDATIONS

Compatibility	Have we adapted mAgeing to fit in well with our ICOPE goals, objectives, operations and approaches, and those of our communities?
Relative advantage	Will mAgeing help us to do things better, such as make it easier to contact older people with results, support, reminders, etc.? Will it help us to make faster progress towards the goal of preventing decline in functional ability among older people?
Level of complexity	Have we made mAgeing easy to understand and use? Have we made good arrangements for training, support, troubleshooting, project management and oversight?
Triability	Have we organized it so that everyone can comfortably try out mAgeing before having to decide about adopting it? Has enough time and consultation among all stakeholders been planned for the pilots?
Observability of results	How easily and quickly will mAgeing produce results that can be shared with users and countries? Have the results been organized in a format that different groups will understand and relate to?

mAgeing will need to be customized to be aligned with existing strategies, procedures, human resources and activities. For example, text messages that refer older people to see their health care worker will need to provide correct information about where to go, what to do, and who to speak to. All those involved in the care pathway should be trained or briefed prior to the pilot launch and staff should be trained in how to use and integrate the programme.

B. PROGRAMME LEADERSHIP AND PARTNERSHIPS

To facilitate planning, implementation, and monitoring of interventions in the mAgeing programme, a leadership team should be established, with clear responsibilities and accountability for the programme (see figure 4). The team should include:

- a steering committee for overall direction and agreements;
- an international technical advisory group of experts to advise and support the in-country project team; and
- a national technical advisory group of in-country leaders to manage operations, technical specifications, content development and adaptation, recruitment and promotion, and monitoring and evaluation.

FIGURE 4. PROPOSED STRUCTURE OF AN mAGEING MANAGEMENT TEAM

WHO, ITU, and informal expert group

Group of ageing and mHealth experts to assist in drafting the handbook and advising on implementation

International mAgeing steering committee

With representatives from the ministries of health and telecommunications and national and international representatives of WHO and ITU, to decide the overall direction and agreements

National technical advisory group

Government sectors (including health, telecommunications, business, media, treasury and planning) to set up the legal, technical and financial framework for a sustainable programme. This group will network with a large group of potential partners such as the telecommunications and software industry, local telcoms and mobile network providers, non-governmental organizations, health professionals, academic and research organizations, health insurance groups, health service providers, civil society groups, opinion leaders, the media and others as appropriate

National operations, content, promotion, technology, and monitoring and evaluation project leaders (subset of the TAG)

Management of overall programme operations, including needs assessment, work-plan, budget and legal aspects	Development and adaptation of the content of the intervention	Management of recruitment, communications, marketing and dissemination	Management of technical aspects of programme development and implementation	Management of the development and implementation of monitoring and evaluation plans

mAGEING STEERING COMMITTEE

The Steering Committee should be responsible for presenting the mAgeing programme to governments and international agencies to disseminate activities, share lessons, engage the population and policy makers. Representatives from all government sectors involved in the programme should be part of the Steering Committee. Steering Committee membership should also include representatives from WHO and ITU headquarters, who should contribute to decisions that maintain the coherence of the Be He@lthy, Be Mobile programme and to sharing lessons learned between countries.

NATIONAL TECHNICAL ADVISORY GROUP (NATIONAL TAG)

This TAG should support, inform and advise the programme throughout its inception, development, implementation and evaluation. It should include those necessary to make decisions around funding and planning, those who will be involved in implementing, promoting and evaluating the programme, those who can contribute to the programme's long-term sustainability, and someone who understands or represents the mobile network environment in the country. Regular meetings should be held for information sharing and updates on progress. The TAG will assign roles and responsibilities to various organizations in the different phases of development, adaptation, implementation, evaluation and continuing service provision. They should encourage discussion on overall programme ownership, funding and contracts or agreements on dealing with technical and other issues. The TAG will assist the national operational team in making decisions about the target population, type of programme, programme objectives, programme design, promotion of the programme and the evaluation plan.

WHO, ITU, AND THE INFORMAL EXPERT GROUP

The international experts who helped draft the country handbook also have experience in programme implementation and will be available to advise on technical aspects, legal issues, choice of platforms for scaling up, and feasibility. Experts from international information technology organizations, health economists and business development experts can also be invited to advise on models for the programme's sustainability.

NATIONAL OPERATIONS, TECHNOLOGY, CONTENT, PROMOTION, AND MONITORING AND EVALUATION PROJECT LEADERS

These groups include the people who will develop or adapt the programme to ensure cultural relevance and technical accuracy, promote the programme, operationalize and maintain it, integrate it into the health system and health promotion services and evaluate it. This group may include Ageing and public health specialists, evaluators and statistical experts, health promoters, behaviour change and communications experts (including language translators), and consumer groups. These teams would report to or be a subset of the TAG.

C. WORK PLAN DEVELOPMENT

This section is intended as a checklist or template for developing a project workplan for use and adaptation by any country intending to implement an mAgeing programme (Table 3). Each section of the workplan is described in detail throughout the handbook.

TABLE 3. CONTENT CHECKLIST OF A WORK PLAN FOR AN mAGEING PROGRAMME

Background and context

In this section, information from the needs assessment that applies to decisions on the implementation strategy is used.

- ☐ Problem statement, describing the problem of preventing ageing-related functional decline and care dependence that the programme is intended to address
- ☐ Overview of the present situation or context of ageing-related decline and care dependence in the country
- ☐ Level of national and government commitment to the project
- ☐ Process used in project identification or formulation, information used and stakeholders involved
- ☐ Relation to previous and current programmes or activities in ageing care (e.g. ICOPE)

Operations management

In this section, planning decisions are made, a description of the programme to be implemented is created, and an operations management plan is developed that includes who will be responsible for implementing the project and for ensuring provision of the services.

- ☐ Overall project objective: for example, "to adapt the mAgeing programme for the population of X, particularly targeting Y people, and to implement it as a free national service"
- ☐ How the programme fits into national or regional strategies
- ☐ Strategy for operationalizing and promoting the programme
- ☐ How the initiative will evolve with progress in technology and become integrated into a comprehensive mAgeing and NCD model
- ☐ Roles and responsibilities in the project: project team members, responsibilities for main activities; assign a project team leader
- ☐ Overall description of project management
- ☐ Management committee (if applicable, terms of reference)
- ☐ Accountability for project implementation

Public–private partnership: a public–private partnership, in which every partner has a unique role and all are motivated by the desire to improve health by using technology, is recommended. Some of the important underlying principles to be considered include:

- ☐ A "win–win" philosophy, particularly for a long-term strategy, driven by the government with the private sector and non-governmental organizations involved in implementation
- ☐ A service free of charge to consumers to maximize public health impact (enrolment tends to be very low when consumers have to pay)
- ☐ Consideration of the environmental effects of a mobile network
- ☐ Appropriate contractual arrangements with the best providers
- ☐ Assurance that service provision is sustainable in the long term.

Content development and adaptation

In this section, a research-driven message refinement process should be implemented.

- ☐ Review of existing programme content and implementation rules

- ☐ Refinement of content through focus groups and consumer pre-testing, translation, changing the wording, removing and adding new messages, reframing messages, changing the rules in the system, and designing the registration, opt-in, and administration functions of the new programme
- ☐ Plan for updating messages

Technology

In this section, decisions are made about the considerations necessary for the infrastructure and rules of the programme.

- ☐ The type of mHealth technology and channels to be used (SMS, MMS, voice, apps)
- ☐ Availability of technology options within the public and private sectors
- ☐ Process for procurement and adaption of technology
- ☐ Dashboard development and access
- ☐ Procurement of a short code
- ☐ Negotiation with telecom regulators, aggregators and operators for pricing
- ☐ Data security
- ☐ Technology pre-testing and scale-up plans

Promotion and recruitment

In this section, decisions should be made about marketing of and enrolment in the programme.

- ☐ Promotion and recruitment plan (launch, short-term, mid-term and long-term strategy)
- ☐ Recruitment methods (by SMS, web, missed calls, third party)
- ☐ Promotion strategy (media, health workforce training, civil society outreach) adapted for various client groups (by demographics such as urban, rural, age, gender, income)

Monitoring and evaluation

In this section, decisions should be made about what will be measured by the programme, and with what frequency.

- ☐ Monitoring and evaluation plan based on the mHealth monitoring and evaluation framework
- ☐ Short-term, mid-term and long-term plans
- ☐ Reports and dissemination plans for evaluation, refinement, improvement and service provision

Estimated time frames:

Planning: 3–4 months

- ☐ Needs assessment: assuming the information is readily accessible and local researchers are available to inform the TAG
- ☐ TAG formation and planning: engaging the right partners, agreeing on the implementation plan, the promotional plan and the evaluation plan. Working groups formed. Project leader assigned.
- ☐ Behaviour change project team formed.
- ☐ Selection of programme and text message content or preparation of new text messages
- ☐ Agreement on programme and technical and transmission specifications

Content adaptation: 4–6 weeks

- ☐ Expert group consultation to review and culturally adapt content
- ☐ Consumer testing of messages before use in focus groups, online surveys, telephone interviews, etc.
- ☐ Modification of messages based on consumer feedback
- ☐ Translation (and back-translation to check for translation accuracy)

Technology adaptation: 4–6 weeks

Development of promotion and recruitment strategy and material: 4–6 weeks

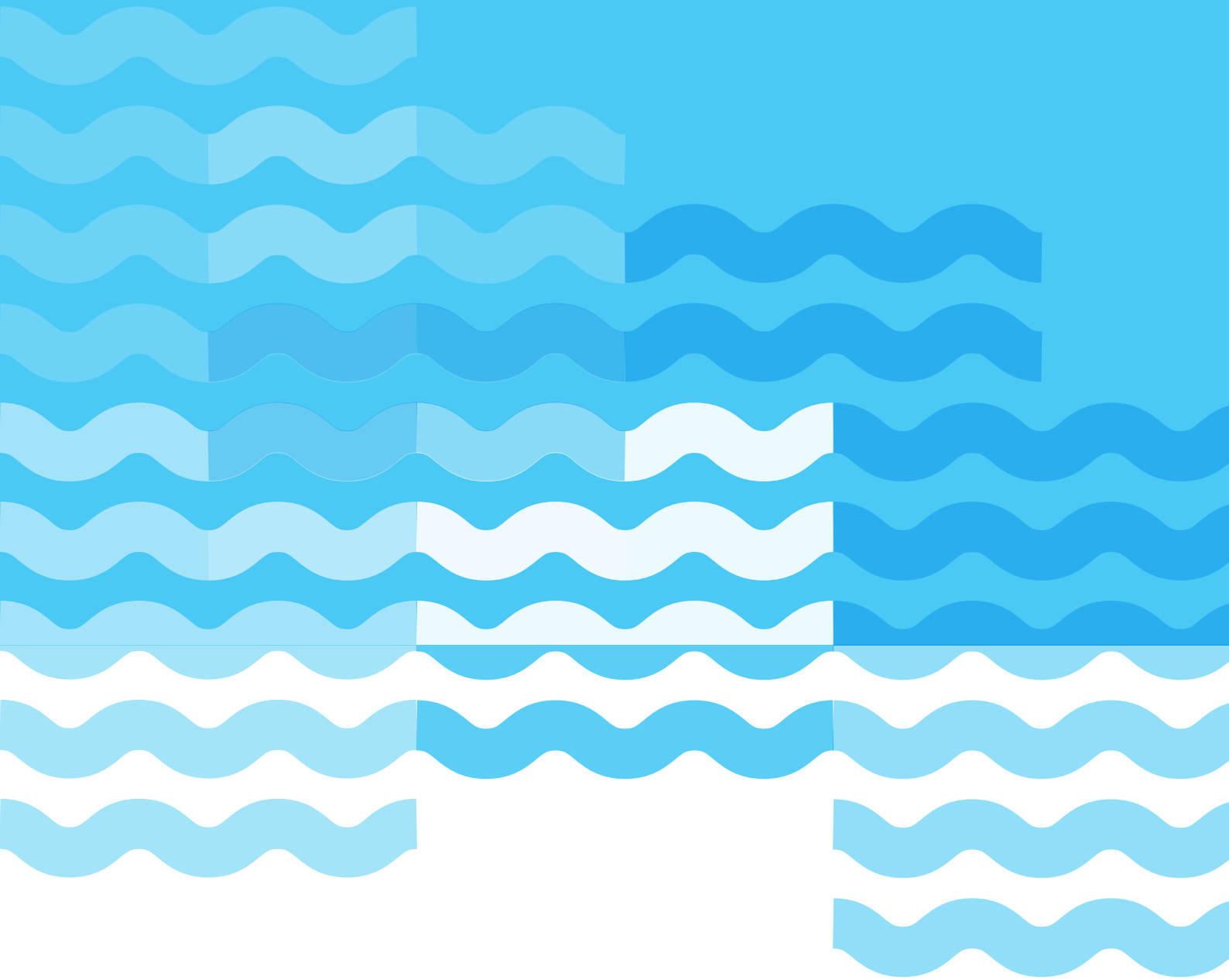
Programme implementation: within 6 months of beginning the planning

Monitoring and Evaluation:

- ☐ Monitoring: Should be real time, from the start of programme planning until the end of its implementation, using agreed indicators
- ☐ Evaluation: beginning at least as a 6-month follow-up of the initial cohort

SECTION 2

CONTENT DEVELOPMENT AND ADAPTATION



The development and pre-testing of the mAgeing programme should:

A. be informed by the existing evidence on effective mHealth intervention and WHO ICOPE Guidelines;

B. be informed by the findings of an mHealth country needs assessment; and

C. follow steps recommended for the development of health behaviour change communication interventions.

Recently, a consensus has emerged on these steps (see Figure 5) (22), which have been adapted for mAgeing.

FIGURE 5. DESIGNING A TEXT MESSAGING PROGRAMME (22)

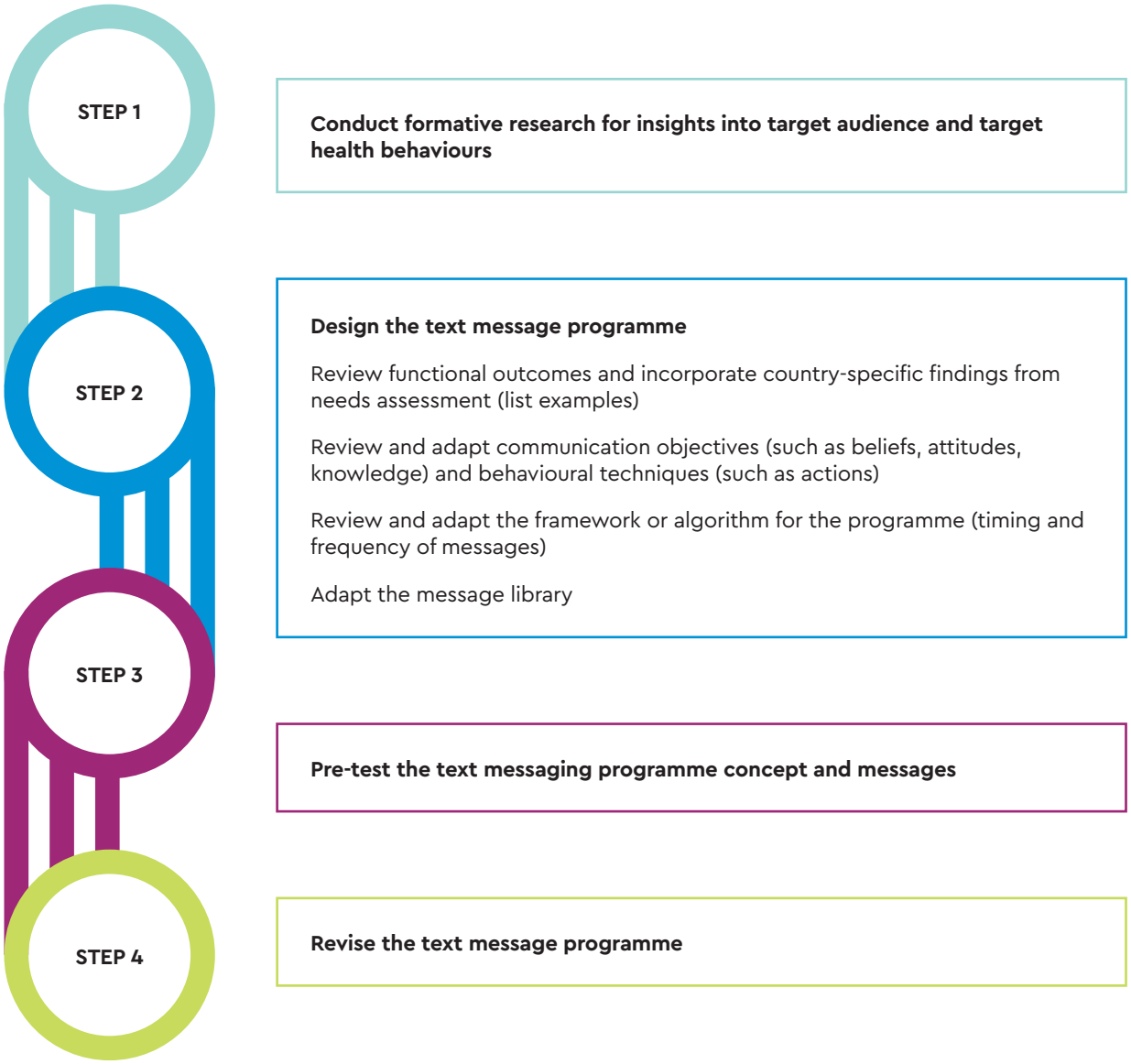


Table 4 lists key decisions that the content development team will need to consider. Each decision contains recommendations based on previous mHealth and ageing-related research, and is described in further detail below and accompanied with supporting evidence. Previous handbooks have not provided specific recommendations for programme content and delivery. Given the complexity of incorporating several self-management goals into the mAgeing programme, a greater level of detail has been included in this section of the handbook.

The full message library and programme algorithm for both streams can be found in Annex 3. Decisions must be made at the country level to determine how to develop the programme and adapt the example messages from Annex 3 based on the country-specific needs assessment.

TABLE 4. LIST OF DECISIONS FOR mAGEING PROGRAMME DEVELOPMENT AND WHO SUGGESTED ACTIONS

DECISION	WHO SUGGESTED ACTIONS
Target audience	Target people in the declining capacity subpopulation of older people
Goals of the programme	Maintain functional ability and independent and healthy living through specific and actionable healthy behaviour change strategies (see Table 6 and ICOPE Guidelines)
Behaviour change techniques used	Target: information, instruction, reminders, and self-management techniques (see full list in Annex 2)
Programme algorithm (programme duration, message type, tone, frequency, order, directionality)	▌The programme should last at least six months ▌Start with general informative messages, moving to self-management with specific behaviour change techniques, and then to maintaining behaviour change in the later phase of the programme ▌Messages should start at a high frequency for the first few weeks and subsequently decrease in frequency over time ▌Offer two-way messaging ▌Messages should be clear and direct, offering practical and relevant advice, in simple language, for older adults. Messages should emphasize the benefits of action (positive framing) over the consequences of inaction (negative framing)
Message components	Messages target the ICOPE recommendations and healthy lifestyle behaviours. To encourage behaviour change, messages incorporate relevant behaviour change techniques.
Pre-testing, piloting, refining messages	Once a first draft of messages and programme algorithm have been developed, pre-test the messages with the end-user. Refine messages after pre-testing, then conduct a pilot programme. Refine messages and algorithm after pilot program prior to national scale-up of programme (see Annex 4 for a pre-testing question template).

A. TARGET AUDIENCE AND PROGRAMME GOALS

Intervening at an early stage of functional decline is essential because the process of becoming frail or care-dependent can be delayed, slowed or even partly reversed (7-9). The mAgeing programme will initially focus on older people in the period of declining capacity (Figure 1), with messages targeting the maintenance of functional ability and independent and healthy living through specific and actionable healthy behaviour change strategies that align with areas addressed by the ICOPE Guidelines on community-level interventions. The goal of the mAgeing intervention is to delay, slow, or even partly reverse the trajectory of declining intrinsic capacity.

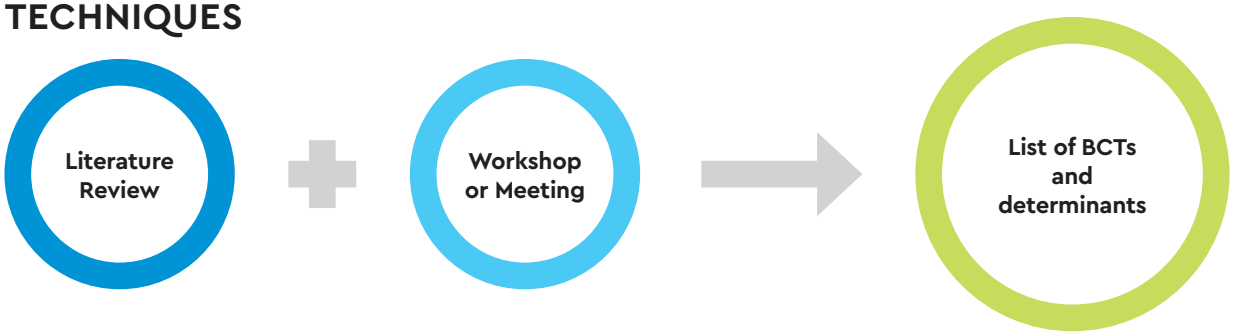
B. SELECT BEHAVIOUR CHANGE TECHNIQUES

As part of the needs assessment, the Steering Committee should have agreed on a set of target behaviours and specific determinants (barriers and facilitators) to behaviour change, through relevant literature reviews and consulting with experts. The next task is to agree on the behaviour change techniques (BCTs) required to modify these behaviours. As highlighted in Figure 6, a BCT that is likely to modify a particular behaviour has to influence its determinant.

A taxonomy of BCTs likely to influence target behaviours and their determinants has emerged in recent literature (24). A literature review can help to determine which BCTs have been most effective among older people, and which can be supplemented by holding a workshop or small group meeting with an expert panel. The Steering Committee can then use the inventory of BCTs in Annex 2 to match with specific behavioural determinants. The output from this exercise, which can be completed in a Steering Committee workshop, will be a set of techniques that are most likely to be effective in changing target behaviours (see Figure 7).

FIGURE 6. BEHAVIOUR CHANGE PROCESSES WITH AGEING-RELATED EXAMPLE FOR MOBILITY (23)

FIGURE 7. STEPS TO CREATE A LIST OF BEHAVIOUR CHANGE TECHNIQUES



If the desired outcome is to improve mobility, for example, (see Figure 6) one of the required behaviours would be to engage in regular strength or resistance training. To encourage this, self-efficacy or self-confidence to do regular strength training may be required. A technique that can increase self-efficacy is to provide graded tasks, where easy-to-perform tasks are prescribed at first, and the level of difficulty is subsequently increased, but in achievable increments. An example of a message targeting graded tasks, and ultimately improved mobility is:

Try to walk or do other physical activity for 30 minutes each day to stay healthy. If you are new to exercise, start at a slow place and try to add a minute each day.

Annex 2 provides a list and description of BCTs that may be relevant, based on Michie et al.'s taxonomy (24). The list was compiled from reviews of BCTs used in a physical activity application for ageing adults (17), and box 6.9 from the World Report on Ageing and Health (5). Each message in the message library (Annex 3) has been paired with a corresponding BCT to ensure that the mAgeing programme has a theoretical framework.

Internet- and mobile-based interventions that are based on theory have been shown to be more effective than those that are not (25, 26). The combination of theory and the ICOPE recommendations creates a useable framework to underpin an mAgeing programme, which is necessary when there is a variety of stakeholders and health care delivery is changing (13).

C. DESIGN THE FRAMEWORK OF THE PROGRAMME

DURATION OF THE PROGRAMME

Recent reviews of mHealth interventions have found no clear conclusions on the optimal length of programmes, due to the low number of randomized controlled trials and heterogeneity of mHealth interventions (15, 27). Research shows it can take six months of engaging in a new behaviour to move into the maintenance stage of behaviour change (28, 29). Two mHealth trials delivering text message-based interventions to older adults (mean age ~60 years old, N=294) with coronary heart disease, found that most participants considered 24-weeks to be the appropriate length for a programme [30, 31].

SUGGESTION

The programme should last at least six months.

TIMING AND FREQUENCY OF MESSAGES

As with the duration of mHealth programmes, few systematic reviews drew strong conclusions on effective message algorithms (27). Despite this, a few have made recommendations on the number and frequency of messages, although all agree that this area still needs further investigation. Evans et al. reported that a higher number of messages received resulted in greater behaviour change but gave no indication of the optimal number of messages per week (32). One review found message frequency that is customizable or declines in frequency over time was more effective than fixed frequency (a low or high number of fixed messages) (33). Another systematic review found that sending at one message at least every three days appeared effective to change behaviours (15).

SUGGESTION

Messages should start at a high frequency for the first few weeks, which should gradually decrease in frequency over time, with at least one message every three days for the duration of the programme.

ORDER OF MESSAGES

There is little evidence in literature regarding the optimum order of messages. Marr et al. recommend placing positive content before negative content, which may be more relevant for individual message framing (34). Other behaviour change and exercise prescription (30, 31) programmes begin with more introductory and general messages, with messages subsequently becoming more specific. The messages could be more informational for the first few weeks, followed by specific instruction and self-management techniques. Specific behaviour change goals should start slowly and progress gradually as the programme continues. The second half of the programme can include messages that focus on maintaining these newly adopted behaviours and reinforcing the long-term benefits.

SUGGESTION

Start with general informative messages, moving to self-management with specific behaviour change techniques, and then to maintenance in the later phase of the programme.

REPETITION OF MESSAGES

Although multiple behaviour change has not been studied sufficiently, particularly among older adults, a growing body of evidence points to the effectiveness of changing multiple rather than single behaviours (35, 36). A few studies examining the effectiveness of changing multiple behaviours sequentially rather than simultaneously. A recent review found no clear pattern, suggesting that both sequential and simultaneous multiple health behaviour changes are effective (35).

SUGGESTION

We recommend grouping messages into "impairment" themes, with general healthy living messages interspersed within each theme. See Table 6 below and the message template (Annex 3) for further clarification. To avoid repetition and participant boredom each message should be unique.

TIME OF DAY MESSAGES DELIVERED

One systematic review suggested that the time of day when messages are delivered should be tailored, as customizable interventions were most successful (33). Having a choice of delivery time was also important to participants enrolled in mHealth studies for CVD self-management; however, most chose to receive messages in the 9am–12pm time slot (30, 31).

SUGGESTION

Where possible, allow users to choose when they wish to receive messages. If tailored programmes are too costly, deliver messages around a time of day when participants are most receptive (midday: neither too late nor too early).

DIRECTIONALITY OF MESSAGES

Head et al. found that two-way messaging was more effective than one-way (33). Despite this, many one-way mHealth interventions have been effective in changing behaviours (37, 38).

SUGGESTION

Encourage two-way messaging, if feasible.

MESSAGE FRAMING

Many studies on message framing have shown that positive framing is more effective and acceptable, as positive messages are benefit- rather than consequence-oriented (39). Positively framed messages resulted in greater behaviour change, as older adults preferred and remembered positive messages rather than negatively framed messages (34, 40). It is important to note that message framing preferences can vary between populations and should be tested in the pre-testing and piloting phases. How the population reacts to certain framing of health and life goals should be tested, as this will help determine how to best frame messages in the programme. Consideration should be

given to whether the population is motivated by the potential benefits of certain behaviours ("regular exercise builds muscles and helps to prevent falls") or by reducing the consequences of inaction ("if you socialize with others you are less likely to suffer from depressive symptoms?")

In message framing:

DO USE (34, 39)

✓ Positive and encouraging tone

✓ Reminders

✓ Cultural practices

✓ Direct, simple and concise language

✓ One idea per message

✓ Correct spelling and grammar

DO NOT USE

x Authoritarian and stern tones

x Immediate commands

x Oversimplification

x Very informal "textese" ("ur", "l8r", "b4")

Advice should be clear, practical, and realistic for the intended user (34). Specific content should be targeted towards things that older adults find relevant (41), as tailored and targeted messages are more effective at changing behaviour (33).

To ensure that the language is at an appropriate level, literary testing of messages in respective languages is recommended (using tools such as Google Web Corpus or Lexile Analyzer) (41). Muench et al. (39) found that individuals with a lower level of education were more likely to prefer the inclusion of an emoticon than those with a higher level of education. There were no preferences in terms of punctuation, such as the number of exclamation marks or use of capital letters compared to messages with no visible emphasis.

SUGGESTION

Messages should emphasize the benefits of action (positive framing) over the consequences of inaction (negative framing). They should also be clear and direct, offering practical and relevant advice, in simple language for older adults. Message content and tone should be pre-tested with end-users as part of the pre-testing and piloting phase.

D. MESSAGE CONTENT

This section describes some key topics and functions that the mAgeing message library could address. As described in the introduction, we suggest linking the mAgeing programme to ICOPE Guidelines on community-level interventions, and on preventing decline in intrinsic capacity and functional ability. Further detail on the recommendations and considerations, with supporting evidence, can be found in the WHO ICOPE Guidelines on community-level interventions (3). Since it is foreseeable that some countries will choose not to implement ICOPE, two different streams of the mAgeing programme have been outlined: mAgeing ICOPE and mAgeing.

Both streams are based on the key recommendations from the ICOPE Guidelines on community-level interventions with a few differences outlined below in Table 5.

TABLE 5. mAGEING STREAM DIFFERENCES

STREAM COMPONENTS	mAGEING ICOPE	mAGEING
General healthy living module: ▌Includes basic information from each ICOPE action, with a focus on physical activity, balanced diet, medication adherence, stress management, seeking help, maintaining social relationships ▌Messages serve to change behaviours related to the prevention of conditions associated with ageing	✓	✓
Five actions to maintain intrinsic capacity	✓	✓
Information, advice, prompts, and encouragement to change or maintain specific behaviours	✓	✓
Reference to "health care workers/providers" and "care plans"	✓	x
How to implement the key actions at home from the ICOPE Guidelines included in the care plans	✓	x
"Actionable" messages with specific recommendations*	✓	x

*mAgeing messages will not include specific actionable items as the older person may not be under the direct supervision of a health care worker.

Table 6 describes the content and suggested message frequency for each module. For a table of which type of message will be sent on which day in the 24-week programme, see Appendix 3.7.

TABLE 6. DESCRIPTION OF mAGEING MODULES

MODULE	DESCRIPTION	SUGGESTED ALGORITHM	EXAMPLE MESSAGE
General healthy living	Overarching theme, messages include information on each strategy to help change lifestyle behaviours (e.g. physical activity, balanced diet, managing stress, medication adherence, seeking help)	2–3 messages per week for 24 weeks	It is important to take your medications exactly as your doctor prescribed them. To help remember, set your mobile phone alarm to alert you when it is time.
Improve musculoskeletal function, mobility and vitality	Encouragement to take part in multimodal exercise, including progressive resistance training and other exercise components (balance, flexibility and aerobic training) to prevent or treat frailty	4 messages per week for 3 weeks	An exercise group or a friend can help keep you motivated. It's even more fun when you walk together!
	Oral supplemental nutrition and dietary advice, such as eating recommended servings of protein, to treat or prevent undernutrition, frailty and promote vitality	4 messages per week for 3 weeks	Plan your meals in advance. Planning will help make sure you have healthy food to eat when you need it

Maintain older adults' capacity to see and hear	Information and encouragement to receive routine screening in the primary care setting and timely provision of comprehensive eye care	4 messages per week for 1.5 weeks	Your eye care professional can help you with vision problems that happen as we age. Stay up to date with regular visits to get the treatment you need
	Information and encouragement to receive routine screening, as well as hearing loss management strategies, such as provision of hearing aids and simple communication techniques	4 messages per week for 1.5 weeks	If you find it hard to hear, watching peoples' lips as they talk can help. With time and practice it will get easier
Prevent cognitive impairment and promote psychological well-being	Strategies to improve cognitive and social functioning, such as cognitive stimulation techniques, social engagement, and adequate sleep. Cognitive stimulation intervention can be offered to older people with cognitive decline, with or without a formal diagnosis of dementia	3 messages per week for 4 weeks	Being around others makes for a healthy mind. Try social or group activities like playing cards, doing an exercise class, or eating meals with others
	Strategies to prevent low mood. Older adults who are experiencing depressive symptoms can be offered brief, structured psychological interventions, in accordance with WHO mhGAP intervention guidelines	3 messages per week for 4 weeks	Join social activities you used to en joy. Visit with family, friends, or neighbours, join a group or go to a community event
Manage age-associated conditions such as urinary incontinence	Prompted voiding intervention for the management of urinary incontinence can be offered for older people with cognitive impairment. Pelvic floor muscle training, alone or combined with bladder training and self-monitoring, should be recommended for older women with urinary incontinence (urge, stress and mixed).	3 messages per week for 2 weeks	Pelvic floor muscle training exercises can be done 2–3 times per week. Start with 3 sets of 10 contractions. Make sure to relax between each set
Prevent falls	Recommended strategies for preventing falls in older people: Medication review and withdrawal (of unnecessary or harmful medication) Multimodal exercise (balance, strength, flexibility and functional training) Following a specialist's assessment, home modifications that remove environmental hazards that could cause falls Multifactorial interventions integrating assessment with individualised and tailored interventions	3 messages per week for 4 weeks	Strength and balance training can be as easy as walking up 1–2 flights of stairs instead of using the elevator. Small changes add up!

The design of the programme and BCTs selected may vary depending on which programme and content is implemented. A detailed library of the text messages for both streams is provided in Annex 3. **The text library will need to be tailored to the specific needs, culture and language of a given population group.** The following paragraph provides a few examples of how to customize messages.

Original message: Being around others makes for a healthy mind. Try social or group activities like playing cards, doing an exercise class, or eating meals with others.

Customized: Being around others makes for a healthy mind. Going to the mosque 5 times a day keeps you active, social, and closer to God.

Original message: Eat foods high in fibre, like green leafy vegetables (spinach, kale, rocket) and limit starchy ones like potatoes and rice.

Customized: Eat fibre rich foods like lentils and chickpeas and restrict starchy ones like potatoes, rice, and tapioca.

E. PRE-TESTING, PILOTING AND REFINING THE MAGEING PROGRAMME

Once a good plan of the mAgeing programme has been developed, it should go through iterative stages of pre-testing, piloting, and refinement.

PRE-TESTING THE TEXT MESSAGES

The draft text messages should be pre-tested through interviews or focus group discussions with potential users. It is important that such interactions should include representatives from various sub-groups within the target audience. During these interactions, the facilitator or interviewer should explain the purpose and content of mAgeing to the participants and provide them with the message library, asking them to rate the messages on content, clarity, and persuasiveness. Testing should assess message comprehension, language, message framing and tone. It is important to consider the literacy demands of the target population. Messages that are unclear or inappropriate for the target group should be rewritten either by or with the participants. Older people with cognitive or visual impairments could have the messages read to them by support people, family members, or friends.

PILOT (ALL VERSIONS OF THE PROGRAMME, IF POSSIBLE)

Once the messages have been pre-tested and refined, the mAgeing pilot programme should be launched. This could last for approximately 2–4 weeks and involve 25–50 users. This pilot should be evaluated using two sets of data: users' self-reported experience and their real-time engagement with the programme. Users' experience can be collected either through face-to-face or phone-based interaction or through web-based and internet-based surveys. The key questions to ask include: the user's experience of taking part in the mAgeing programme; clarity, quantity, timing and frequency of messages; what was good about the programme and what was not; completion or non-completion the programme; and any effect on their attitude or target behaviour(s). Users' real-time engagement can be evaluated using mobile phone company records of messages delivered and opened (if available). Depending upon the complexity of the programme, these data can provide information on the extent of client engagement. Measures used in the monitoring and evaluation phase of the mAgeing programme can also be tested during the pilot stage.

REFINE AND OPTIMIZE THE PROGRAMME

Once mAgeing has been pre-tested and piloted, it should go through a refinement process addressing all of the key issues highlighted during the pilot, before its ultimate launch. Messages may need to be reviewed and updated on a regular basis. The programme plan should identify someone responsible for maintaining and updating the message library. Having some degree of flexibility and keeping the programme fresh may help to keep the audience engaged. Once the programme is launched, someone on the team should also be receiving the messages in real time to monitor that the correct messages are being sent, on schedule.

SECTION 3

PROMOTION AND RECRUITMENT

A. PROMOTION AND RECRUITMENT CONSIDERATIONS FOR mAGEING ICOPE

Promotion and recruitment methods are a key difference between the mAgeing ICOPE and mAgeing streams. As mAgeing ICOPE is tied into ICOPE Guidelines on community-level interventions, which include an assessment and the creation of a personalized care plan, mAgeing ICOPE is designed to work within the five actions recommended to improve intrinsic capacity. Promotion of mAgeing ICOPE would likely occur through the older person's health care worker. The health care worker would also recruit and register the older person into the programme. A broader promotion plan will need to be formalized among health care workers, to ensure that they are aware of the programme and are actively encouraging their patients to register for mAgeing.

The following section refers to considerations for promoting mAgeing ICOPE to health care workers, as well as considerations for promoting mAgeing in countries or among populations that have chosen not to implement ICOPE.

B. PROMOTION AND RECRUITMENT CONSIDERATIONS FOR mAGEING

A nationwide or population-specific strategy to promote outreach and recruitment into the programme should be considered early in the planning stages, taking account of the considerations.

- Who is the target audience and what access do they have to media or promotional strategies?
- What is the level of community engagement and number of volunteers or health care workers who may assist in promoting mAgeing?
- Who does the public consider to be the "owner" of the programme and the data? The operational model will likely direct the promotional campaign.
- Regarding existing health programme promotion strategies and synergies, which organizations or notable personalities are currently involved in mass media campaigns for healthy ageing or prevention services, and can those campaigns be linked or leveraged? Which mHealth programmes have previously been implemented in the area? Can lessons be learned about which promotional techniques are effective?
- How will people register with or sign up to the programme: directly by text message, online, by telephone, in person, or through a third party?
- How much data will be collected at baseline to allow tailoring and ensure follow-up?
- Regarding the local mobile network environment: is sending unsolicited text messages is allowed? This violates network codes of conduct in some countries. This may also be an important consideration in the potential effectiveness of or engagement in the programme: Will the fact that a population has been desensitized to receiving unsolicited health-related text messages influence their willingness to read mAgeing text messages?
- What incentives, if any, will be used to encourage participation?
- How effective is mobile messaging for outreach and promotion? How and to what degree can the marketing and promotional campaigns of the stakeholder agencies, including technical partners, such as telecommunications companies, be leveraged. This could allow for campaigns whereby consumers can self-issue health messaging: a health promotion or social marketing programme with posters and radio advertisements, through community settings and places of gathering or through social media, where mobile numbers are available for texting, and automated health information can be sent to the self-issuer.
- Regarding the timing of the campaign, whether a soft launch prior to starting the promotional campaign should be considered to ensure that all processes are working well before the official registration start date.
- What is the cost of radio and TV advertising? These can be important methods for promoting the programme and, in many countries, can be very expensive. Initial underestimation of promotional costs is common and can be difficult to remedy later.

SECTION 4

TECHNOLOGY SPECIFICATIONS

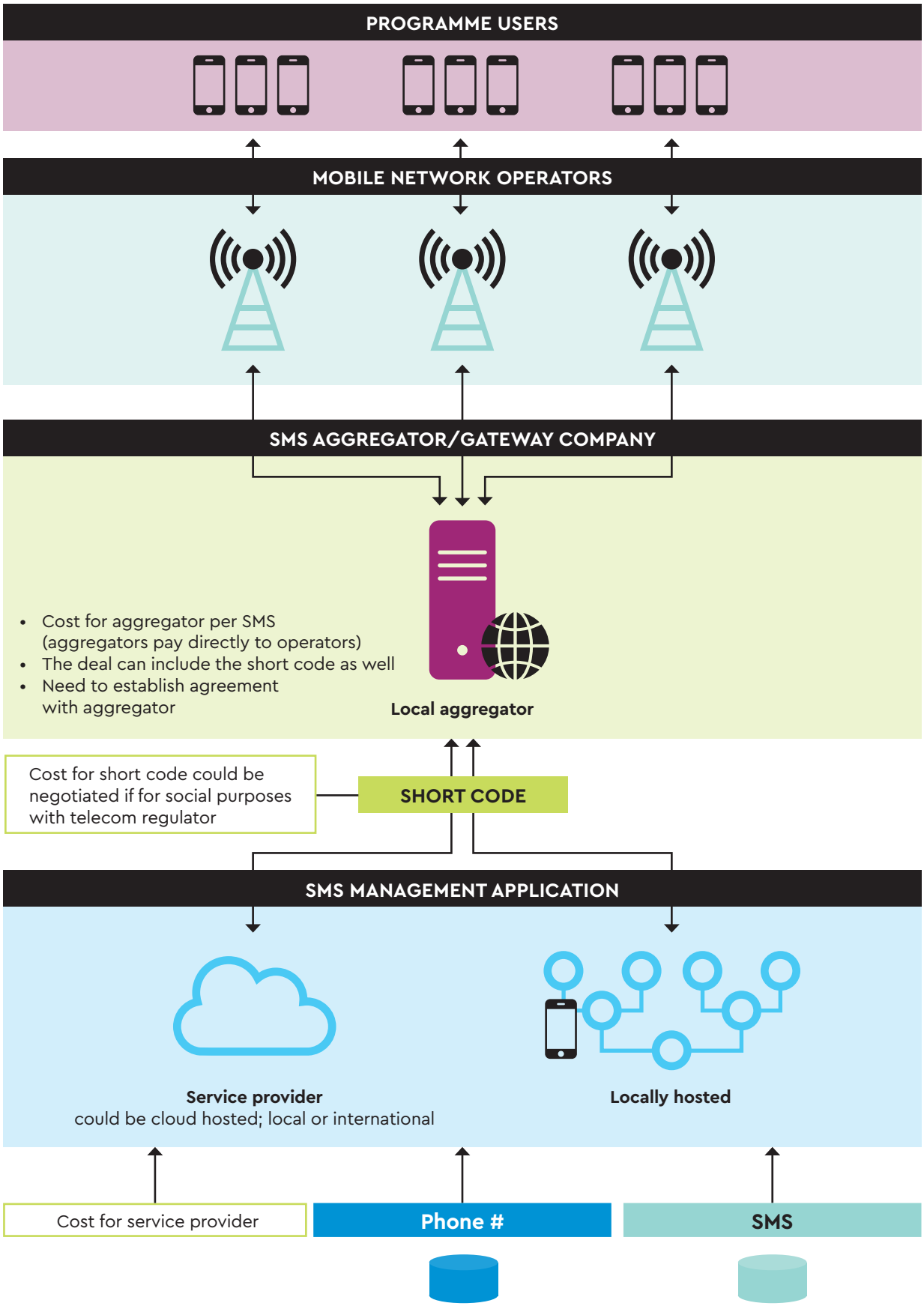
The following technical aspects of an mHealth programme must be considered by the national TAG from the start, in collaboration with local partners:

- type of mHealth technology and channels to be used (SMS, MMS, voice over internet (VOIP)/interactive voice response (IVRS), apps (messaging apps))
    - o Platforms that allow video could be particularly useful for demonstrating content in action, such as exercise content or skill-building, such as sending video messages demonstrating correct strength training form or how to cook
- availability of technology options within the public or private sectors
- process for procuring and adapting technology
- dashboard development and access
- procurement of a short code
- negotiation with telecommunications regulators, aggregators and operators for pricing
- data security
- technology pre-testing and scale-up plans.

It is important to note that mobile communications network environments differ from country to country. Their specificities should be considered at the planning stage by including technical experts in TAG membership (such as representatives of telecommunications companies, operators, telecom regulatory authorities, government departments responsible for information, communication and technology, cellular associations) or individuals who are knowledgeable about the communications network in the country. Network operators, telecommunications companies or industry organizations can help set up the programme and advise on its sustainability.

Some providers may consider supporting such a programme to be good publicity or a useful addition to the services they offer. Without their support, the programme can be delivered through a contractual arrangement with an "aggregator" or "gateway" company that has established relations with all telecommunications companies and networks (Figure 8). This can be a cost-effective way to deliver messages to many participants, regardless of their mobile carrier or location, without establishing these interfaces individually. Although the aggregator adds a further cost, this decreases as the scale of the programme increases; using an aggregator can therefore be more cost-effective than attempting these activities "in-house", unless capacity and infrastructure already exist.

FIGURE 8. TWO-WAY SMS SYSTEM WITH AGGREGATOR AND SHORT CODE



When thinking about the technical aspects of an mHealth programme, the TAG may also consider the following questions:

- **Partnerships:** What sort of arrangement with telecommunications companies or the aggregator will best suit long-term implementation of the programme?
- **Communicating messages:** Should voice messages, video messages, interactive messaging, or interactive voice response systems be used? What are the capacity, cost-effectiveness and reach of the available technologies in the country?
- **Free access:** How can we ensure that the programme is free and available to all consumers regardless of their carrier, network or location?
- **Market research:** Which telecom system is most appropriate in the country, based on reach (subscribers), coverage, costs, security, and sustainability? Who owns the data? What are the privacy regulations and how will data be protected, kept secure? Is there good interoperability with health systems? What are the considerations for data protection and how should a central database best be maintained?
- **Sustainability:** What are the operating costs of the programme, such as per message, and how will these affect the scale of the programme?
- **Contracts:** In establishing contractual arrangements with partners, what are the considerations regarding intellectual property, security and privacy of mobile phone numbers, testing, expectations of involvement in monitoring and evaluation and service agreements? Who will hold the contractual arrangements, and what support will be given for maintenance and any other problems?

The TAG should also consider logistics and the functional plan, and should finalize the functional specifications in collaboration with technical partners who will build the appropriate systems and interfaces and test internal and user acceptance. Table 7 provides an overview of the roles of the various stakeholders to be taken into acocunt when planning the technological aspects of an mHealth programme.

TABLE 7. ROLE OF STAKEHOLDERS IN SETTING UP mHEALTH TECHNOLOGY

STAKEHOLDER	ROLE
Ministry of Health	Official owner and custodian of the programme, part of the governance body Assess and identify needs, develop and validate content Contract service providers or build in-house infrastructure/ platform Sign cooperation agreements with all operators and/or Service provider Fund or partially fund the programme Can host the mHealth platform/database and own the short code Manage the promotion and marketing campaigns

Telecommunications Ministry **eGovernment entity (if applicable)**	▪ Policy making to enable m-services in terms of regulations and policies ▪ Fund (partially) the programme, part of the governing body ▪ Provide technical expertise to Ministry of Health ▪ Possibly host the platform ▪ Facilitate dialog between Ministry of Health and ICT stakeholders ▪ Support the negotiation of preferential prices for m-services
Telecommunication Regulatory Authority	▪ Verify eligibility for short code acquisition ▪ Allocate short code ▪ Facilitate dialogue between Ministry of Health and ICT stakeholders ▪ Fund or partially fund the programme
mHealth service providers (if Ministry of Health or eGov does not have a platform)	▪ Provide SMS management application/platform ▪ Manage the platform and run SMS campaigns ▪ Provide 24/7 technical support ▪ Deals with telecom operators can possibly manage the short code
Telecom operators	▪ Deliver SMS to end users ▪ Set the cost of SMS and agree on special tarifs with Ministry of Health if possible ▪ Facilitate interfacing with service providers and/or local aggregator ▪ Support the promotion of the service
Local aggregator	▪ Provide interface with all operators and manage relationship and invoicing process ▪ Provide reporting on services delivered/failed ▪ Possibly own and manage the short code
Data Privacy Commission	▪ Set the rules for data protection ▪ Enforce the application of data protection regulations ▪ Authorize mHealth services providing they respect data privacy ▪ Authorize the case of data storage outside of country
WHO and ITU	▪ Provide technical expertise and share knoweldge from other countries ▪ Help convene stakeholders

Further guidance on the IT technology involved in setting up and delivering mAgeing and its operational management of the programme can be found in the mTobaccoCessation planning and implementation document (19).

SECTION 5

MONITORING AND EVALUATION

Monitoring is the *routine* tracking of an intervention's performance using data collected on a regular and ongoing basis on specified indicators. This information is used to assess the extent to which an intervention is achieving its intended targets on time and on budget.

Evaluation is an *episodic* assessment of either a completed or ongoing programme or intervention, to determine the extent to which its stated objectives were achieved efficiently and effectively.

Monitoring and evaluation have similar aims: to provide information to inform decisions, improve outcomes and achieve objectives.

While monitoring routinely gives information on where a project is at any given time relative to respective targets for implementation, evaluation gives evidence of why targets and outcomes are, or are not, being achieved, and the extent to which changes can be attributed to the intervention. The data to be collected in a monitoring project should be used in the planning process.

WHY DO WE NEED TO MONITOR AND EVALUATE mAGEING?

The benefits and risks of implementing mAgeing at scale, as well as its cost-effectiveness need to be evaluated in a robust manner. Assessing the processes and contextual factors that influence the implementation of mAgeing programmes will help future efforts in a given country, as well as help others understand how the programmes work, for which target group they work best, and under which circumstances.

Data from monitoring and evaluation will provide donors, policy-makers and other-decision makers at all levels with the relevant information to formulate policies, set priorities, plan, design and implement mAgeing projects, and allocate the resources to do so.

A. DEVELOPING A MONITORING AND EVALUATION PLAN

A detailed Monitoring and Evaluation Handbook for mHealth programmes (42), which has been developed under the Be He@lthy, Be Mobile initiative, is recommended as a reference point to develop the mAgeing monitoring and evaluation framework. Planning for monitoring and evaluation should be part of mAgeing programme development, and implemented as soon as possible after the final programme launch. It is especially important to collect baseline data, either before or in the early stages of the programme's launch, as this will allow for pre-post programme effectiveness analysis.

As a guide for planning the evaluation process, the Monitoring and Evaluation Handbook proposes a framework or logic model (see Figure 6) that may be expanded and adjusted to the context of the programme, and to the aspects that are considered to be its key objectives and goals. An illustrative example of the mHealth logic model is shown in Figure 9. For the purposes of simplifying the different interrelated areas of mHealth programmes, this logic model has been divided into two domains: the person-centred domain and the programme-centred domain. An example mAgeing logic model is provided in Figure 11.

FIGURE 9. LOGIC MODEL: FRAMEWORK FOR MONITORING AND EVALUATION OF mHEALTH PROGRAMMES AT SCALE

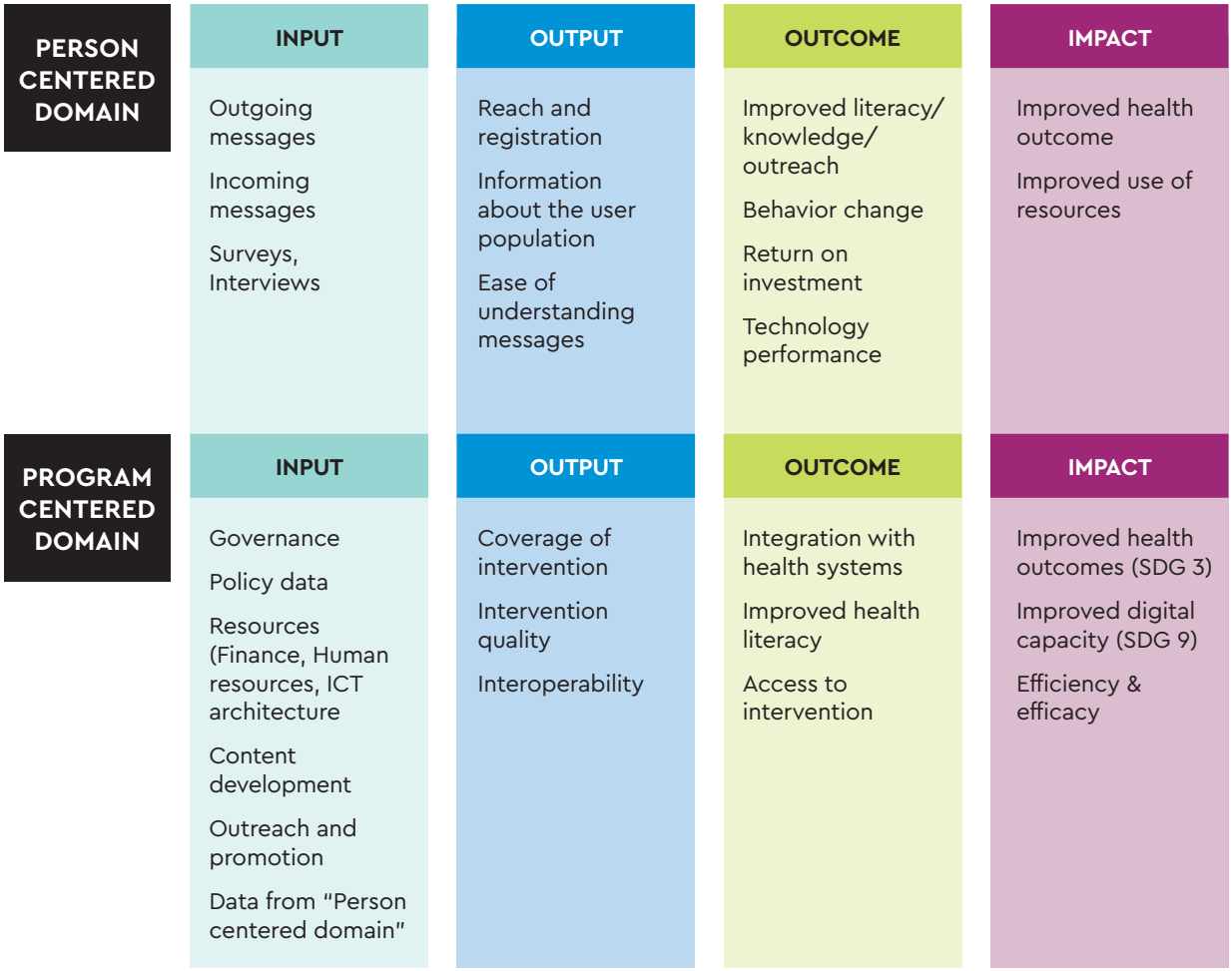


TABLE 8. MONITORING AND EVALUATION STEPS AND CONSIDERATIONS

Table 8 lists the steps suggested for planning the monitoring and evaluation of an mHealth intervention:

STEPS	KEY CONSIDERATIONS
1. Determine the purpose of monitoring and evaluation	▌Does the mAgeing platform operate at optimum level? ▌Are the messages easy for users to understand? ▌How effective is the marketing campaign in reaching new users? ▌How many people out of the target population did the programme reach? How many stayed for the programme's duration? ▌Are users improving their knowledge, behaviours, attitudes, or functioning due to the mAgeing programme? Are users increasing their use of health services?
2. Select indicators*	**Output** ▌Reach and registration ▌Information about the user population ▌Ease of understanding the messages **Outcome** ▌Improved literacy/knowledge/outreach ▌Behaviour change ▌Return on investment ▌Technology performance
3. Develop a monitoring and evaluation plan	▌What is to be monitored and evaluated? ▌What are the activities are needed for monitoring and evaluation (training, staffing, fundraising)? ▌Who is responsible for monitoring and evaluation activities? ▌When will monitoring and evaluation to take place? ▌How will monitoring and evaluation be carried out? What measures will be used? ▌How will user requests for data be minimized to prevent user data-overload or fatigue? ▌What resources and approvals are required and from whom (ethics, data-security)? ▌How will data be analysed and distributed?
4. Collect baseline data	**Demographic data:** ▌Minimal collection of socio-demographic and/or ageing-related characteristics, such as age, gender, ethnicity, activities of daily living,level of care dependency, and other factors **Baseline data:** ▌Must relate directly to the indicators that have been previously identified in the monitoring and evaluation plan (physical activity and eating behaviour, theoretical constructs such as self-efficacy)

***Data collection and processing takes resources. It is therefore recommended to focus on a set of indicators that are important, feasible and cost-effective to collect, process, and analyse. A sample set of indicators can be found in Annex 5.**

Process evaluation: the periodic assessment of the implementation of a programme in relation to planned activities and overall objectives.

Outcome evaluation: this type of evaluation is concerned with determining if, and by how much, a programme's activities achieved its intended targets.

B. SPECIFIC DATA COLLECTION METHODS

MONITORING

- A routine reporting mechanism should be set up to monitor core indicators and key deliverables. Countries with web-based platforms may present the monitoring report as a data dashboard. Determine which report indicators can be automated, the frequency of data collection, and the format for data analysis.

- Decide who will use the monitoring reports (programme managers, stakeholders) and reflect on what questions they need answered, what decisions they make and how much time they can commit to reviewing the numbers.

- Managers should review progress in participation, technical errors and message activity regularly. At the beginning of programme implementation, daily monitoring of outgoing messages is recommended. Weekly or monthly monitoring should subsequently be conducted and timed around activities and outputs.

EVALUATION:

- While the process evaluation (monitoring) should be done regularly (weekly or monthly), the outcome evaluation frequency can be done pre-post intervention. For example, baseline data are collected before launching mAgeing (pre), and the same measures can be applied at various intervals, such as 3-months and 6-months post-mAgeing launch. To understand long term effects, it is recommended that another assessment be conducted 6-months to a year after the mAgeing programme has finished.

- A simple way to collect data from users is to use the existing mAgeing platform. For instance, survey questions with simple yes, no or numerical answers can be sent to mAgeing users at regular intervals, such as before and after each "module" of text messages. The immediate delivery of survey questions by mobile phone can improve reliability of responses. For further clarification see Figure 10 and refer to Annex 5 for survey question ideas.

MOBILE PHONE SURVEY QUESTION 1:
In the past week, on how many days did you do your strength training exercises?

Respond with a number from 0–7.

FIGURE 10. EXAMPLE QUESTION AND ADMINISTRATION OF A SURVEY QUESTION DELIVERED BY MOBILE PHONE

TABLE 9. METHODS AND DATA FOR mHEALTH EVALUATION

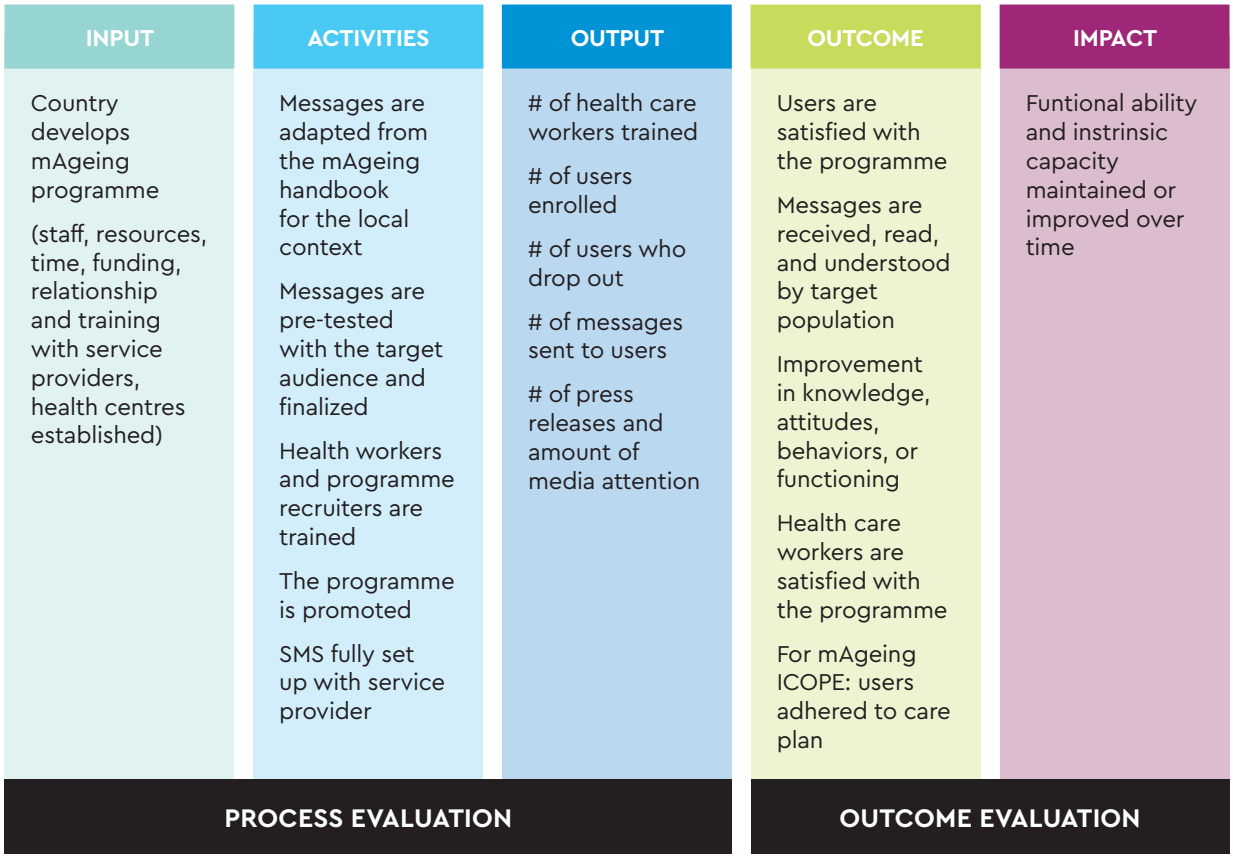
METHOD	PURPOSE	CONSIDERATIONS AND EXAMPLES
Survey	▌Assess the knowledge, behaviours, attitudes, and/or functioning of registered users for mAgeing	▌Can be administered on the Web or on a mobile device (recommended) or by an interviewer over the phone or in person ▌Should be short as possible and employ multiple-choice questions or yes/no wherever possible (see Annex 5 for examples) ▌mAgeing ICOPE stream could consider using the following assessment: "COPE_ Community Health Worker Assessment"
Focus group	▌Deepen understanding of users Assessmentol, and explore the factors that may affect usersng assessment: sment: r by an interviewer over the phone or in personon, etc.	▌Conducted by a facilitator in groups of 5–8 people ▌Can also be used to brainstorm ideas for increasing registration, improving the programme and enhancing desired outcomes
Interview	▌Interviews with users: qualitative feedback on their experience, perceptions and satisfaction with the mAgeing programme. ▌Interviews with programme implementers: information on perceived strengths, weaknesses and needs related to the programmeogramme and enhancing desired outcomesuestions Figure and test internal and user acceptance.	▌For qualitative methodology of focus groups and interviews, refer to: Patton MQ_. Enhancing the quality and credibility of qualitative analysis. Health Services Research. 1999;34(5):1189-1208.
Objective measure of outcomes	▌Collect data on clinical outcomes. Health care workers can administer objective measures, such as the chair stand test, gait speed, a simple vision test, and the whispered voice test[1], at baseline (comprehensive needs assessment) and again at follow up appointments.	▌Literature searches can help identify objective assessment methods for relevant health behaviours. ▌Examples include devices such as accelerometers or pedometers to measure physical activity, but also appointments made and held, exams conducted, community health worker contacts, workshops attended, clinical and bio markers, such as weight and mobility tests, like gait speed and chair stand test[2]. ▌If it is not feasible to collect objective measures on all participants, the measures could be used on a sub-sample of the mAgeing user group, which can be generalized to the total sample if matched demographically.
Cost-analysis	▌Compare the cost per user of the mHealth approach with traditional approaches of reaching people in similar ageing programmes.	▌Collect costs on items such as development and planning, staff, marketing and technology.

1 http://www.who.int/pbd/deafness/activities/hearing_care/trainer.pdf?ua=1

2 https://www.cdc.gov/steadi/pdf/30_second_chair_stand_test-a.pdf

Figure 11 illustrates an example logic model for mAgeing process and outcome evaluations. Stakeholders in each participating country should be consulted when defining potential evaluation questions and identifying relevant programme outcomes and measures. For other logic model examples, see the links below.[3]

FIGURE 11. EXAMPLE LOGIC MODEL FOR mAGEING EVALUATION



C. DISSEMINATION

Once monitoring and evaluation activities and reports have been completed, dissemination should take place through the appropriate channels. The list below describes some key considerations for dissemination:

- Findings should be disseminated in an audience-friendly and timely manner through:
  - formal and informal networks via meetings, newsletters and other forums
  - local newspapers and radio programmes
  - professional conferences via discussion papers or posters
  - journals (professional or lay)*
  - electronic media, such as web pages and e-mail.

*Note that it can be more effective to publish the evaluation results in an academic journal prior to releasing results to the public. Greater confidence can be placed in the results of an mAgeing programme once the findings have been through a rigorous peer-review process.

3 http://www.publichealthontario.ca/en/eRepository/Focus_On_Logic_Models_2016.pdf; https://www.cdc.gov/oralhealth/state_programs/pdf/logic_models.pdf; https://www.k4health.org/toolkits/measuring-success/logic-model-guides-and-examples

Conclusion

This handbook provides guidance for national programmes and organizations responsible for the care of older persons in developing, implementing, monitoring, and evaluating an mAgeing programme, with the central objective of assisting older persons to maintain functional ability and live as independently and healthily as possible, through evidence-based self-management and self-care interventions. The main components in developing and implementing an mAgeing programme are: operations management; content development and adaptation, promotion and recruitment, technology specifications and monitoring and evaluation. The content of the mAgeing programme is based on the WHO's *Integrated Care for Older People: Guidelines on community-level interventions to manage declines in intrinsic capacity* and will complement existing health care services and routine care offered by health care professionals.

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ANNEX 1

The Be He@lthy, Be Mobile initiative

Leveraging the potential of mobile phone text messaging, the Be He@lthy, Be Mobile initiative started in 2012 as a joint initiative between WHO and ITU. It was established in direct response to the United Nations General Assembly's call for concerted action on noncommunicable diseases (NCDs) in 2011. Using innovative multisectoral partnership models, BHBM works to design, deploy and scale-up NCD prevention and management services which can be run using mobile phones. It is currently working with governments in 10 countries across a range of income groups and disease areas.

As of the end of 2017, over 2.1 million people have registered for the India mTobaccoCessation service, and over 100,000 are using the mDiabetes service launched by the government six months later. Senegal also saw over 100,000 people sign up to receive tips via SMS messages on managing diabetes during Ramadan fasting. In Zambia, where the First Lady launched the country's first mHealth programme to raise awareness on cervical cancer (mCervicalCancer), hundreds of thousands of women and men have received SMS messages about cervical cancer screening and awareness.

Overall, the Be He@lthy, Be Mobile initiative has met its original aim of helping governments scale up mHealth programmes and building the global evidence base for mHealth for NCDs, and will continue to implement and evaluate programs and share lessons learned.

For more information on Be He@lthy, Be Mobile, please visit: http://www.who.int/ncds/prevention/be-healthy-be-mobile/en.

ANNEX 2

List of behaviour change techniques included in the mAgeing programme

CONTRUCT	MICHIE BCT [24]	BCT NO.
Information	Goal setting (behaviour)	1.1
	Information about health consequences	5.1
	Information about emotional consequences	5.6
	Credible source	9.1
Reminders	Prompts/cues	7.1
Instruction	Instruction on how to perform a behaviour	4.1
	Information about antecedents	4.2
	Graded tasks	8.7
	Reduce negative emotions	11.2
	Restructure physical environment	12.1
	Restructure social environment	12.2
Self-management	Goal setting (behaviour)	1.1
	Problem solving	1.2
	Action planning	1.4
	Self-monitoring of behaviour	2.3
	Social support (unspecified)	3.1
	Social support (practical)	3.2
	Social support (emotional)	3.3
	Monitoring of emotional consequences	5.4
	Behaviour substitution	8.2
	Habit formation	8.3
	Social reward	10.4
	Verbal persuasion about capability	15.1
	Social reward	10.4

ANNEX 3

The mAgeing example message library is available upon request. To request the mAgeing message library, please contact:

Sameer Pujari at
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ANNEX 4

Pre-testing template

Pre-testing content with the target audience can assess whether materials are understandable, culturally appropriate, attention-catching, memorable, and relevant (Siegel & Doner Lotenberg, 2007). After adapting the mAgeing messages, countries can pre-test using focus groups, interviews, expert reviews or surveys, and then revise the messages according to the pre-testing results. Good planning at each stage should mean there are not too many surprises. In the end, if the reader understands the aim of the message, then it is intuitive and appropriate. If not, it will need to be revised, and possibly re-tested.

Examples of pre-testing questions:

- What is the main idea of the message or mAgeing programme?
- What, if anything, was particularly liked?
- What, if anything, was particularly disliked?
- Was anything offensive? (What? Who would it offend?)
- Was anything hard to understand? (What?)
- Was anything hard to believe? (What? Why?)
- Who are these messages for? Who would benefit the most out from it?
- What, if anything, should be changed, added, or deleted?
- Why option would be most likely to induce the desired action?
- What is the message telling you?
- What should you know or do after reading this message?

ANNEX 5

Examples of evaluation questions

5.1 EXAMPLES OF MOBILE PHONE DELIVERED SURVEY QUESTIONS

Asking simple questions by text message is a quick and easy way to collect data on mAgeing programme outcomes at various stages in the course of the programme. To simplify the two-way messaging process, responses should be limited to Yes/No or numerical. Be specific in the question about what type of response is required. Consider ways to review incoming responses and collate the data received.

Example messages:

Improve musculoskeletal function, mobility and vitality

- Did you do your walk today? Reply with 1 for yes or 2 for no
- In the past week, on how many days did you walk? Reply with a number from 0 to 7
- Have you done strength training exercise at least 2 days in the past week? Reply with 1 for yes or 2 for no
- Have you done any balance training this week? Reply with 1 for yes or 2 for no
- Have you eaten 5 servings of fruit and vegetables today? Reply with 1 for yes or 2 for no
- Have you eaten 3 servings of milk or dairy products today? This means milk, cheese, or yogurt. Reply with 1 for yes or 2 for no
- Are you eating 3 meals each day? Reply with 1 for yes or 2 for no
- Are you staying steady at a healthy weight? Reply with 1 for yes or 2 for no

Maintain older adults' capacity to see and hear:

- Have you had a vision check in the past year? Reply with 1 for yes or 2 for no
- Have you had a hearing check in the past year? Reply with 1 for yes or 2 for no

Prevent severe cognitive impairment and promote psychological well-being

- Are you able to remember important details like where you live and the names of close family members? Reply with 1 for yes or 2 for no
- Do you usually feel energetic and interested in your daily activities? Reply with 1 for yes or 2 for no
- Are you doing and enjoying the same activities you used to do? Reply with 1 for yes or 2 for no

Prevent falls

- Have you had a fall in the past year? Reply with 1 for yes or 2 for no

5.2 EXAMPLES OF IN-PERSON DELIVERED SURVEY QUESTIONS

The following survey is designed to be administered by a health care worker in person or by telephone. Ideally, a baseline survey would be conducted before starting the mAgeing programme and a follow-up survey at the end of the programme, for a pre-post programme outcome analysis.

If the survey is administered in person, other measures could be added, such as measuring the older person's activities of daily living or clinical outcomes. The following page provides an example survey that could be used to evaluate mAgeing outcomes. It also includes questions to measure mAgeing programme satisfaction after an older person has completed the programme.

Evaluation Questionnaire for the mAgeing programme[5]

Health Care Worker to complete: _____

Printed name: _____

Signature: _____

Date: _____

DATA COLLECTION PERIOD (SELECT ONE):

- ☐ Pre-programme (baseline)
- ☐ Post-programme (follow up)

SURVEY INFORMATION SHEET

The purpose of this form is to collect outcome information for eligible mAgeing participants.

Health care worker: Ask the participant the following questions EXACTLY as they are worded. Do not explain the question any further to them. If they are confused, read the question out again. Where possible do not read out the answers – but tick the most appropriate answer.

FOR PAPER FORMS ONLY

- Answer all questions. DO NOT LEAVE BLANK SPACES
- Tick circles. Write numbers in boxes.
- If the data are unavailable, put an asterisk "*".
- If the data are not applicable, put a dash "-".

5 Questions have been adapted from "Community Health Worker Assessment and Improvement Matrix (CHW AIM): A Toolkit for Improving Community Health Worker Programs and Services. Tool for conducting assessment and improvement for community health worker practice" by Crigler, et al. 2011. (http://www.who.int/workforcealliance/knowledge/toolkit/54/en/).

PART 1: DEMOGRAPHICS

2. Date of assessment: _____

3. Name or User identification number of older person (mAgeing participant):

_____

4. Address/contact details of mAgeing participant: _____

5. Gender:

- ☐ Female
- ☐ Male
- ☐ Other
- ☐ Prefer not to answer

6. Age: _____

7. How did you register for the mAgeing programme:

- ☐ I registered by myself (self-register)
- ☐ A health care worker helped me register
- ☐ A friend or family member registered me

8. Does someone provide care for you?

- ☐ Yes
- ☐ No

PART 2: ICOPE ACTION SPECIFIC QUESTIONS

Improve musculoskeletal function, mobility and vitality

9. Are you able to leave your home on your own?

- ☐ Yes
- ☐ No

10. Are you able to get out of a bed, a chair, or a wheelchair without the assistance of another person?

- ☐ Yes
- ☐ No

11. Are you able to get out of a bed or a chair, but unable to go out of your home?

- ☐ Yes
- ☐ No

12. Have you lost any weight without trying over the last 3 months?

- ☐ No
- ☐ Yes, weight loss greater than 3kg
- ☐ Yes, weight loss between 1 and 3kg

13. Has food intake declined over the past three months due to loss of appetite, digestive problems, chewing or swallowing difficulties?

- ☐ Yes
- ☐ No

Maintain older adults' capacity to see and hear:

14. Do you have eyesight problems?

- ☐ Yes
- ☐ No

15. Do you have hearing difficulty or deafness?

- ☐ Yes
- ☐ No

Prevent severe cognitive impairment and promote psychological well-being[6]

[NOTE: Cognitive decline interpretation - one positive answer below may suggest probable case of cognitive decline]

16. Have you noticed a general decline in your cognitive functioning (e.g. memory)?

- ☐ Yes
- ☐ No

17. Have you noticed a change in your ability to think and reason?

- ☐ Yes
- ☐ No

18. Do you often forget where you have put things or what happened the day before?

- ☐ Yes
- ☐ No

[NOTE: Depressive symptoms interpretation - two positive answers below may suggest probably case of depression]

19. Are you basically satisfied with your life?

- ☐ No
- ☐ Yes

20. Have you often been bothered by having little interest or pleasure in doing things?[7]

- ☐ No
- ☐ Yes

21. Do you often feel helpless?

- ☐ No
- ☐ Yes

6 Sheikh, J. I., & Yesavage, J. A. (1986). Geriatric Depression Scale (GDS): Recent evidence and development of a shorter version. Clinical Gerontologist: The Journal of Aging and Mental Health, 5(1-2), 165-173.

7 Kelvin K. F., et al. Comparison of diagnostic performance of Two-Question Screen and 15 depression screening instruments for older adults: systematic review and meta-analysis. The British Journal of Psychiatry, Feb 2017.

22. Do you prefer to stay at home rather than going out and doing new things?

- ☐ No
- ☐ Yes

23. Do you feel pretty worthless the way you are now?

- ☐ No
- ☐ Yes

Manage age-related conditions such as urinary incontinence

24. During the last three months, have you leaked urine (even a small amount)?

- ☐ No
- ☐ Yes

Prevent falls

25. Have you fallen in the last 6 months[8]?

- ☐ No
- ☐ Yes

26. Are you walking slower or making other adjustments due to a fear of falling doing everyday activities[9,10]?

- ☐ No
- ☐ Yes

mAgeing post-programme satisfaction:

The following questions are to be asked only during the post-programme (follow-up assessment):

27. How many of the text messages did you read? (Select 1 only)

- ☐ None, I didn't receive any
- ☐ None, I didn't read any
- ☐ Some (less than half)
- ☐ Most (more than half)
- ☐ All or nearly all of the messages

28. Did you share any of the messages with others? (Friends, partner, family members, etc)

- ☐ No
- ☐ Yes

29. What did you think about the number of messages we sent?

- ☐ Too few, I would have like more
- ☐ The right amount
- ☐ Too many messages

8 Rubenstein LZ (2006). Falls in older people: epidemiology, risk factors and strategies for prevention. Age and Ageing, 35-S2:ii37-ii41

9 Parry SW, Bamford C, Deary V, Finch TL, Gray J, MacDonald C, et al. Cognitive-behavioural therapy-based intervention to reduce fear of falling in older people: therapy development and randomised controlled trial - the Strategies for Increasing Independence, Confidence and Energy (STRIDE) study. Health Technol Assess Winch Engl. 2016 Jul;20(56):1–206

10 Division of Aging and Seniors (2005). Report on senior's fall in Canada. Ontario. Public Health Agency of Canada

30. What did you think about the length of the programme (24 weeks)?

- ☐ Too short
- ☐ The right length
- ☐ Too long

31. Did you have any technical problems with the programme? (e.g. could not read texts)

- ☐ No
- ☐ Yes

32. Would you recommend the programme to others?

- ☐ No
- ☐ Yes

33. Did taking part in the programme help you stay well or improve your health?

- ☐ No
- ☐ Yes

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