PHYSICAL ACTIVITY RECOMMENDATION

Children, adolescents and adults living with disability can achieve important health benefits from physical activity. Children, adolescents and adults with disability should try to meet these recommendations where possible and as able.

For children, adolescents and adults living with disability, physical activity can be undertaken as part of recreation and leisure (play, games, sports or planned exercise), physical education, transportation (wheeling, walking and cycling) or household chores, in the context of home, educational, occupational and community settings. It is important to provide all children, adolescents and adults living with disability with opportunities and encouragement to participate in physical activities appropriate for their age and ability, that are enjoyable, and that offer variety.

> Many of the health benefits of physical activity for children and adolescents, as set out in the section above, also relate to those children and adolescents living with disability. Additional benefits of physical activity to health outcomes for those living with disability include: improved cognition in individuals with diseases or disorders that impair cognitive function, including attention-deficit/hyperactivity disorder (ADHD); improvements in physical function may occur in children with intellectual disability.

It is recommended that:

- **Children and adolescents living with disability should do at least an average of 60 minutes per day of moderate- to vigorous-intensity, mostly aerobic, physical activity, across the week.**

  Strong recommendation, moderate certainty evidence

- **Vigorous-intensity aerobic activities, as well as those that strengthen muscle and bone should be incorporated at least 3 days a week.**

  Strong recommendation, moderate certainty evidence

GOOD PRACTICE STATEMENTS

- Doing some physical activity is better than doing none.
- If children and adolescents living with disability are not meeting these recommendations, doing some physical activity will bring benefits to health.
- Children and adolescents living with disability should start by doing small amounts of physical activity and gradually increase the frequency, intensity and duration over time.
- There are no major risks for children and adolescents living with disability engaging in physical activity when it is appropriate to an individual's current activity level, health status and physical function; and the health benefits accrued outweigh the risks.
- Children and adolescents living with disability may need to consult a health-care professional or other physical activity and disability specialist to help determine the type and amount of activity appropriate for them.

Many of the health benefits of physical activity for adults, as set out in the section above, also relate to adults living with disability. Additional benefits of physical activity to health outcomes for those living with disability include the following: **for adults with multiple sclerosis** – improved physical function, and physical, mental, and social domains of health-related quality of life; **for individuals with spinal cord injury** – improved walking function, muscular strength, and upper extremity function; and enhanced health-related quality of life; **for individuals with diseases or disorders that impair cognitive function** – improved physical function and cognition (in individuals with Parkinson's disease and those with a history of stroke); beneficial effects on cognition; and may improve quality of life (in adults with schizophrenia); and may improve physical function (in adults with intellectual disability); and improves quality of life (in adults with major clinical depression).

It is recommended that:

- **All adults living with disability should undertake regular physical activity.**

  Strong recommendation, moderate certainty evidence

- **Adults living with disability should do at least 150–300 minutes of moderate-intensity aerobic physical activity; or at least 75–150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week for substantial health benefits.**

  Strong recommendation, moderate certainty evidence

- **Adults living with disability should also do muscle-strengthening activities at moderate or greater intensity that involve all major muscle groups on 2 or more days a week, as these provide additional health benefits.**

  Strong recommendation, moderate certainty evidence

- **As part of their weekly physical activity, older adults living with disability should do varied multicomponent physical activity that emphasizes functional balance and strength training at moderate or greater intensity on 3 or more days a week, to enhance functional capacity and prevent falls.**

  Strong recommendation, moderate certainty evidence

- **Adults living with disability may increase moderate-intensity aerobic physical activity to more than 300 minutes; or do more than 150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week for additional health benefits.**

  Conditional recommendation, moderate certainty evidence

GOOD PRACTICE STATEMENTS

- Doing some physical activity is better than doing none.
- If adults living with disability are not meeting these recommendations, doing some physical activity will bring benefits to health.
- Adults living with disability should start by doing small amounts of physical activity, and gradually increase the frequency, intensity and duration over time.
- There are no major risks to adults living with disability engaging in physical activity when it is appropriate to the individual's current activity level, health status and physical function; and when the health benefits accrued outweigh the risks.
- Adults living with disability may need to consult a health-care professional or other physical activity and disability specialist to help determine the type and amount of activity appropriate for them.

Supporting evidence and rationale

For these guidelines for children, adolescents and adults living with disability, the comprehensive evidence synthesis undertaken by PAGAC *(35)* was used and updated. Full details of the methods, data extraction and summary evidence tables of this existing evidence on physical activity and health outcomes is available *(35)* and was reviewed by the GDG in addition to the findings of the updated search.

The update conducted for these guidelines identified 39 reviews published from 2017 to 2019. Of these, 27 met the inclusion criteria and informed the examination of the association between physical activity and health-related outcomes among children, adolescents and adults living with disability.

Full details of the methods, data extraction and summary evidence portfolios can be found in the Web Annex: Evidence profiles.

The evidence reviewed considered the association between physical activity and health-related outcomes in children, adolescents and adults living with disability resulting from the following health conditions: multiple sclerosis, spinal cord injury, intellectual disability, Parkinson's disease, stroke, major clinical depression, schizophrenia, and attention-deficit/hyperactivity disorder (ADHD). The four health-related outcomes examined included risk of co-morbid conditions, physical function, cognitive function and health-related quality of life, although not all outcomes were explored for each condition. The impact of environmental factors on disability in the context of physical activity was beyond the scope of these guidelines and was not analysed.

In children and adolescents (aged 5–17 years) and adults (aged over 18 years) living with disability, what is the association between physical activity and health-related outcomes?

For people living with **multiple sclerosis**, physical activity improves physical function, functional mobility, walking speed and endurance, and cardiorespiratory fitness, strength and balance. For example, high-intensity interval training over 3–12 weeks demonstrated improvements in cardiorespiratory fitness or muscle strength *(117)* and lower limb strength training found strength increased by 23.1% (95% CI: 11.8 to 34.4) over an average training period of 13.2 weeks *(118)* over an average of 13 weeks resulted in increases in strength, and dance interventions studies reported improvements in functional mobility and balance *(119)*. As well as physical health benefits, existing evidence demonstrates that physical activity can benefit cognition in people living with multiple sclerosis *(35)*. Newer research reveals that aerobic exercise has a small yet significant effect on physical, mental and social domains of health-related quality of life (including symptoms of fatigue and depressive symptoms) *(35, 120)*.

For people living with **spinal cord injury**, physical activity can improve walking function, muscular strength and upper extremity function *(35)*. Physical activity may also reduce shoulder pain, improve vascular function and enhance health-related quality of life *(35)*.

For people living with **Parkinson's disease**, physical activity can improve motor symptoms, functional mobility and performance, endurance, freezing of gait and velocity of forward and backward movement *(35, 121, 122)*. New evidence suggests that exercise can also help global cognitive function in individuals with Parkinson's disease *(123)*.

For people with a history of **stroke**, physical activity can improve physical function, notably upper limb function, sensory motor function of the lower limb, balance, walking speed, distance, ability and endurance, cardiorespiratory fitness, mobility and activities of daily living. Existing evidence suggests that physical activity may also have beneficial effects on cognition *(35)*.

For people with **major clinical depression**, new reviews *(124, 125)* supported existing evidence *(35)* that physical activity can improve health-related quality of life *(35, 124, 125)*.

For individuals with **diseases or disorders that impair cognitive function, including schizophrenia** –physical activity can have beneficial effects on cognition, working memory, social cognition and attention/vigilance *(35, 126)*. One review found that moderate- to vigorous-intensity physical activity delivered significant improvements in health-related quality of life and disability *(35, 124)*.

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For people living with **intellectual disability**, physical activity has been shown to improve physical function. The interventions reviewed largely focused on balance and strength activities over 6–24 weeks and reported significant improvement in static balance, dynamic balance and static-dynamic balance compared with controls *(35, 127, 128)*.

For children with **attention-deficit/hyperactivity disorder**, evidence, including one review of 5 RCTs involving ADHD *(129)*, demonstrates a positive association between exercise and attention, executive function and social disorders *(35, 129)*.

The GDG considered the evidence from the general population of children, adolescents and adults and concluded that as there is no reason to believe that there would be an effect modification due to impairment and that the same health physiological benefits will be conferred by being physically active. The GDG acknowledged that few studies include people living with disability, and that effect modification is seldom tested.

This evidence in the area disability, combined with the broader evidence for the general population, supported the general population recommendation being inclusive of people with disability, noting reference to "all adults", "all older adults" and "people of all abilities".

The GDG concluded that:

In individuals with spinal cord injury, there is:

- low certainty evidence that physical activity reduces shoulder pain and improves vascular function in paralysed limbs and enhances health-related quality of life; and
- moderate certainty evidence that physical activity improves walking function, muscular strength, and upper extremity function.

In individuals with diseases or disorders that impair cognitive function, including Parkinson's disease, there is:

- high certainty evidence that physical activity improves a number of functional outcomes including walking, balance, strength, and disease specific motor scores; and
- moderate certainty evidence that moderate- to vigorous-intensity physical activity can have beneficial effects on cognition.

In individuals with a history of stroke, there is:

- moderate certainty evidence that mobility-oriented physical activity can have beneficial effects on physical function and cognition.

In individuals with diseases or disorders that impair cognitive function, including schizophrenia, there is:

- moderate certainty evidence that physical activity improves quality of life; and
- high certainty evidence that moderate- to vigorous-intensity physical activity can have beneficial effects on cognition, working memory, social cognition and attention.

In adults with major clinical depression there is:

- moderate certainty evidence that physical activity improves quality of life.

In adults with multiple sclerosis, there is:

- high certainty evidence that physical activity, particularly aerobic and muscle-strengthening activities, improves physical function, functional mobility, walking speed and endurance, and cardiorespiratory fitness, strength and balance;
- moderate certainty evidence that physical activity can have a beneficial effect on cognition; and
- low certainty evidence that physical activity improves quality of life including symptoms of fatigue and depressive symptoms.

In children and adults with intellectual disability, there is:

- low certainty evidence that physical activity improves physical function.

In children and adolescents with ADHD, there is:

- moderate certainty evidence that moderate- to vigorous-intensity physical activity can have beneficial effects on cognition, including attention, executive function, and social disorders.

The GDG further concluded that there is sufficient scientific evidence on the positive impact of physical activity on a variety of health outcomes across a broad range of impairment areas, and that the benefits of physical activity for people living with disability outweigh the potential harms.

Due to indirectness of the evidence to develop these recommendations, the level of certainty was downgraded.

SEDENTARY BEHAVIOUR RECOMMENDATION

For children, adolescents and adults living with disability, sedentary behaviour is defined as time spent sitting or lying with low energy expenditure, while awake, in the context of educational, home and community settings, and transportation. It is possible to avoid sedentary behaviour and be physically active while sitting or lying, through, for example, upper body led activities, inclusive and/or wheelchair-specific sport and activities.

In children and adolescents, higher amounts of sedentary behaviour are associated with the following poor health outcomes: increased adiposity; poorer cardiometabolic health, fitness, and behavioural conduct/pro-social behaviour; and reduced sleep duration.

It is recommended that:

› **Children and adolescents living with disability should limit the amount of time spent being sedentary, particularly the amount of recreational screen time.**

Strong recommendation, low certainty evidence

In adults, higher amounts of sedentary behaviour are associated with the following poor health outcomes: all-cause mortality, cardiovascular disease mortality and cancer mortality, and incidence of cardiovascular disease, cancer and type-2 diabetes.

It is recommended that:

› **Adults living with disability should limit the amount of time spent being sedentary. Replacing sedentary time with physical activity of any intensity (including light-intensity) provides health benefits.**

Strong recommendation, low certainty evidence

› **To help reduce the detrimental effects of high levels of sedentary behaviour on health, adults living with disability should aim to do more than the recommended levels of moderate- to vigorous-intensity physical activity.**

Strong recommendation, low certainty evidence

Supporting evidence and rationale

Sedentary behaviour was not included in *The Global recommendations on physical activity for health (2010)*.

Due to a lack of population-specific evidence, the primary evidence base for assessing the associations between sedentary behaviour and health outcomes in children, adolescents and adults living disability was the scientific literature collated and reviewed for populations without disability.

The findings from evidence on sedentary behaviours in the general population were reviewed including assessing if there was evidence that the outcomes would be any different, or would not apply to, or would be contraindicated for children, adolescents and adults living with disability.

CHILDREN AND ADOLESCENTS (aged 5–17 years) AND ADULTS (aged 18 years and over) LIVING WITH DISABILITY

Based on available evidence and expert opinion, the evidence was extrapolated to inform new WHO recommendations on sedentary behaviour for individuals living with disability for the common set of critical health outcomes, recognizing that certain population groups, such as wheelchair users, unavoidably sit for long periods of time and sitting may therefore be the norm. For these groups, sedentary behaviour should be defined as time spent with low energy expenditure, e.g. moving in a power chair or being pushed while sitting in a manual wheelchair. There is a lack of research on the association between sedentary behaviour and health outcomes in individuals living with disability. However, based on expert opinion, there are no reasons to believe that there would be an effect modification due to impairment, and therefore the same physiological health benefits will be conferred by limiting sedentary behaviour in individuals living with disability. Due to indirectness of the evidence to develop these recommendations, the level of certainty was downgraded.

The applicability of evidence on the benefit of adults undertaking more moderate- and vigorous-intensity physical activity to help counteract the potential risks of high levels of sedentary behaviour was also considered and was also extrapolated to inform recommendations for adults living with disability for the common set of critical health outcomes. Given the indirectness, the certainty of the evidence was downgraded.

The GDG concluded that:

- The evidence on sedentary behaviours in child and adolescent populations could generally be extrapolated to children and adolescents living with disability, according to their specific ability.
- The evidence on sedentary behaviours in the general adult population, including the benefit for adults of undertaking more moderate- to vigorous-intensity physical activity to help counteract the potential risks of high levels of sedentary behaviour, could generally be extrapolated to adults and older adults living with disability, according to their specific ability. However, the certainty of the evidence was downgraded due to indirectness.
- The benefits of minimizing sedentary behaviour in children, adolescents, adults and older adults living with disability outweigh the harms.

EVIDENCE TO RECOMMENDATIONS

In accordance with the GRADE process, the proposed wording of the updated recommendations, and the rating of their strength ("strong" or "conditional"), were based on consideration of the balance of benefits to harms; the certainty of evidence; sensitivity to the values and preferences of those affected by the guidelines; the potential impact on gender, social and health equity; and acceptability, feasibility and resource implications. These were considered for each population group, but given the similarity of issues and considerations discussed, are consolidated and presented here.

The strength of the recommendation was primarily based on the assessed balance of benefits to harms. Recommendations were graded "strong" if the balance of benefits to harms was assessed as substantial for the target population for the recommendation, and "conditional" if the balance of benefits to harms was small or there was important likely variability in benefits in the target population. The evidence on harms was specifically sought through the commissioning of a new systematic review. However, this was limited, as most evidence focuses on injuries and harms to elite and competitive athletes, rather than the general population. Overall, despite the limited evidence, and informed by expert opinion, it was concluded that the risk was no greater than small. The evidence generally indicated that the benefits of physical activity far outweighed the harms, and that physical activity can be an important intervention to support closing an existing health gap, particularly for disadvantaged populations.

Issues of health equity, feasibility and acceptability were also considered by the GDG and formed part of the online public consultation on the draft recommendations held between 31 March 2020 and 17 April 2020. The survey for the public consultation asked specific questions on the balance between the costs to individuals and governments of implementing the recommendations, and the potential health benefits, and whether the guidelines would improve health equity. In addition, the draft recommendations and the feedback form were sent to countries that had recently expressed an interest in developing, or had initiated the process of drafting, national guidelines on physical activity. Feedback was received from more than 420 submissions to the online consultation, and additional collation of feedback from the WHO European Regional Office, incorporating comments from WHO Collaborating Centres and Member States. The feedback from this consultation was collated, reviewed by the GDG, and used to further inform the consideration on feasibility, resource implications, and health equity through consultation with the Steering Group and the GDG.

Decisions were reached by consensus through discussion. The GDG came to consensus on each recommendation and on the strength of the recommendation; ratings and voting were not required.

ASSESSMENT OF THE CERTAINTY OF EVIDENCE

The GRADE framework was used by the GDG to examine the certainty of primary research contributing to each outcome identified in the PI/ECOs, and assessed the overall certainty of evidence taking into consideration the risk of bias, inconsistency, imprecision, indirectness of the evidence and publication bias across each outcome. GRADE tables detailing this information for each PI/ECO are available in the Web Annex: Evidence profiles. The assessment of the certainty of the evidence was based on an overall assessment across all evaluated outcomes and prioritized all-cause mortality and cardiovascular mortality as the most critical outcomes, followed by other clinical outcomes (falls, depression, cognition, health-related quality of life, etc), then intermediate outcomes (e.g. cardiometabolic markers, other metabolic markers), as well as harms. Where the evidence had not been specifically reviewed, such as for sedentary behaviour in subpopulations primarily due to a lack of evidence for these groups, the evidence for the general population was extrapolated and downgraded where this was deemed appropriate, due to indirectness.

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BENEFITS AND HARMS

The development of the recommendations included an assessment of adverse impacts or risks. Where there was limited evidence, decisions were based on the expertise of the GDG. Overall, for all populations it was concluded that the benefits of physical activity and limiting sedentary behaviour outweighed the potential harms. These guidelines are for the general population and do not address the benefits and harms experienced by athletes undertaking the types and amounts of activity necessary to improve performance-related fitness for participation in competition.

Doing some physical activity is better than doing none. If individuals are not currently meeting these recommendations, doing some physical activity will bring benefits to their health. They should start by doing small amounts of physical activity, gradually increasing frequency, intensity and duration over time. Pre-exercise medical clearance is generally unnecessary. Inactive individuals who gradually progress to undertaking moderate-intensity activity have no known risk of sudden cardiac events and very low risk of bone, muscle, or joint injuries. An individual who is habitually engaging in moderate-intensity activity can gradually increase to vigorous-intensity without needing to consult a health-care provider. Those who develop new symptoms when increasing their levels of activity should consult a health-care provider.

The choice of appropriate types and amounts of physical activity can be affected by pregnancy, chronic conditions, and disability, and should be undertaken as able and without contraindication. These individuals may wish to consult with a physical activity specialist or health-care professional for advice on the types and amounts of activity appropriate for their individual needs, abilities, functional limitations/complications, medications, and overall treatment plan. Light- and moderate-intensity physical activity are generally low risk and are recommended for all.

VALUES AND PREFERENCES

The values and preferences of those affected by the guidelines (in this case parents and caregivers, children and adolescents, adults, older adults, pregnant and postpartum women, people living with chronic conditions and/or disability) were considered. Overall it was concluded that there was little or no uncertainty about preferences regarding the main outcomes, including mortality and cardiovascular mortality.

The estimated potential benefits greatly outweighed any potential harms, and as such, the GDG considered the recommendations to be not preference-sensitive.

RESOURCE IMPLICATIONS

The expert opinion of the GDG, and a small body of evidence reporting on economic analyses of interventions and savings to the health-care systems from increasing levels of physical activity, informed discussion on the resource implications of the recommendations in different settings. In addition, results from the online public consultation showed that over 75% of respondents agreed, or strongly agreed, that the benefits of implementing the guidelines would outweigh the cost to the individual, and 81% agreed, or strongly agreed, that the benefits of implementing the guidelines would outweigh the cost to government.

Available evidence and expert opinion recognize that substantial health benefits can be achieved at low risk through activities such as walking, that require no specific equipment or cost to the individual. Further, it was acknowledged that other forms of physical activities, for example structured sports, cycling and exercise classes, may incur costs, which can be a barrier for some individuals, particularly those with lower incomes. Government implementation of policy and programmes to promote and enable physical activity also requires investments in areas such as human resources, policy development, provision of facilities and services and potentially, equipment, some of which is incurred by ministries of health, but also in sectors outside of health, such as sport, education, transport and urban planning. The resources required may be at more than one level of government (national, subnational and local levels) to ensure all communities have equal access to physical activity opportunities.

These investments may involve new resources, but also can be addressed by reallocation of existing budgets to reflect the prioritization of facilities and programmes towards increasing population levels of physical activity. Examples of budget reallocation include towards infrastructure for walking and cycling from the existing transport budget, and towards "sports for all" from the sports budgets. In key settings, such as schools and workplaces, low-cost interventions, combined with changes to the physical environment, can support participation in physical activity and would also contribute to reducing inequities in opportunities to be active,

experienced by some subpopulation groups. Overall, it was assessed that while there are resource implications to achieve these draft recommendations, implementation of actions is possible within current governance structures.

Further, evidence supports that substantial health savings are possible for the health-care system resulting from increasing levels of physical activity. In 2013 the global annual cost of physical inactivity was estimated at INT$ 54 billion due to direct health costs alone *(130)*; and at a national level, inactivity is estimated to cost between 1–3 % of health-care budgets *(131)*.

Within the wider context of noncommunicable disease (NCD) prevention, additional costs to government and nongovernmental organizations of guideline implementation may be minimized if recommended physical activity can be relatively easily incorporated by individuals into their lives; likewise if existing resources in primary and secondary care, schools, workplaces or transportation can be shifted, resulting in increased physical activity.

Analysis of the cost and benefits of physical activity promotion indicate positive returns on investment over 15 years, in terms of NCD prevention, in many countries where the investment cases have been conducted *(132)*. Interventions such as public education and awareness campaigns and physical activity counselling and referral are a "best buy" and a "good buy" respectively, of recommended interventions to address NCDs based on an update of Appendix 3 of the *Global action plan for the prevention and control of NCDs 2013–2020 (133)*. Overall, the GDG concluded that the benefits of implementing the recommendations outweigh the costs.

Delivering on physical activity guidelines for people with disability may require investment, such as the training of activity specialists, adapted equipment where needed, and facilities that need to be made accessible. These investments can facilitate the needs of a wide range of population groups. Evidence demonstrates a significant participation gradient between people with and without disability in relation to physical activity, due to multiple barriers regarding access, choice of activities offered, and the attitudes of others. Universal design principles should be applied to ensure full and effective participation by people living with disability. With innovation, it is possible to address many of these resource implications. Adopting universal design approaches would mitigate against these costs in the future.

EQUITY, ACCEPTABILITY AND FEASIBILITY

In updating the 2010 recommendations the decision was taken to explicitly include consideration of vulnerable populations, such as those living with chronic conditions and/or disability. The GDG and Steering Group included members representing such groups. The GDG discussed each recommendation at length, considering whether implementing the recommendations would decrease health equity, and the issues related to implementation, to ensure that the recommendations did not worsen equity issues (for example, ensuring that there are safe facilities and opportunities accessible for all, including people living with disability, and socioeconomically and other disadvantaged people, to engage in physical activity; addressing gender and other cultural biases that could restrict access and opportunity to participate in physical activity, etc.). Of respondents to the online public consultation, 76% agreed, or strongly agreed, that implementing the guidelines can achieve a reduction in health inequity by increasing opportunities for all to be active and improve health outcomes. It was noted that supporting environments are key to enabling participation in physical activity. A comprehensive approach to the design and implementation of policies across a number of sectors will be required to address barriers to physical activity for vulnerable groups, such as socioeconomically disadvantaged women and girls, and people with disability.

People with disability experience worse health outcomes than people without disability, yet the benefits of physical activity far outweigh the harms and can be an important intervention to close this health gap. Evidence demonstrates a significant participation gradient between people with and without disability in relation to physical activity, due to multiple barriers regarding access, choice of activities offered, and the attitudes of others. For many people with disability, it should be possible to engage in various forms of physical activity without the need for adapted equipment or facilities. However, in order for people with disability to engage in physical activity on an equal basis with others, adapted equipment may need to be obtained, facilities may need to be made accessible, and activity specialists may need to be trained.

RESEARCH NEEDS

Despite the large quantity of data relating physical activity and, increasingly, sedentary behaviours to health outcomes across the life span, the GDG discussions revealed important evidence gaps, which should be prioritized to inform future guidelines. Evidence gaps across population subgroups included a lack of information on:

1) the more precise details on the dose-response relationship between physical activity and/or sedentary behaviour and several of the health outcomes studied;
2) the health benefits of light-intensity physical activity and of breaking up sedentary time with light-intensity activity;
3) differences in the health effects of different types and domains of physical activity (leisure time; occupational; transportation; household; education) and of sedentary behaviour (occupational; screen time; television viewing); and
4) the joint association between physical activity and sedentary time with health outcomes across the life course.

It was also noted that there remains limited evidence from low- and middle-income countries, economically disadvantaged or underserved communities, and in people living with disability and/or chronic disease. Many studies are not designed or powered to test for effect modification by various sociodemographic factors (age, sex, race/ethnicity, socioeconomic status) that may modify the health effects of physical activity. Such information is important for making more specific public health recommendations and for reducing health disparities in more vulnerable sectors of the population. Further details on the research gaps arising from these new guidelines can also be found in published literature *(134)*.

ADOPTION, DISSEMINATION, IMPLEMENTATION AND EVALUATION

The goal of these guidelines is to provide policy-makers, and those who develop health-care, education, workplace and community intervention programmes, with recommendations on how much time children, adolescents, adults and older adults should spend each day being physically active, and recommendations on limiting time spent being sedentary. However, developing global guidelines is not an end in itself: without dissemination and implementation, changes in physical activity levels will not be achieved.

ADOPTION

WHO undertakes a rigorous and extensive process to develop globally relevant guidelines *(21)* for use by all countries. These *Guidelines on physical activity and sedentary behaviour* provide evidence-based recommendations on the health impacts of physical activity and sedentary behaviour that national governments can adopt and use as part of their national policy frameworks. The development of global guidelines, with extensive consultation, should largely remove the need for individual countries to use resources to undertake the lengthy scientific process. Reviewing and adopting these global physical activity and sedentary behaviour guidelines provides a rapid and cost-effective method to develop guidelines tailored to local context.

Adopting the WHO guidelines at regional or national level will ensure countries provide consistent recommendations on physical activity and sedentary behaviour, which are informed by the latest and best available scientific evidence. In addition, consistency of the recommendations across countries will facilitate national surveillance, global estimates of physical activity and sedentary behaviour, and cross-country comparisons. Throughout the adoption process, consideration should be given to the need to contextualize and tailor the guidelines. Translation into the local language is one element of adoption and contextualization. Examples of physical activities may need to be changed to be locally relevant and the use of images tailored to reflect local cultures, norms and values.

A step-by-step framework to support country adoption of the Global guidelines is under development, following a series of regional workshops with relevant stakeholders. This framework can be populated with relevant national data (for example physical activity prevalence estimates), and will provide a fast-track approach to the development of a national guidelines document. These supporting resources will be available in 2021 through the WHO website.

When considering adopting the guidelines it is recommended that the following ten-step process is applied:

1. Advocate for a review of current national guidelines on physical activity and the adoption of the WHO guidelines to secure government authorization.
2. Engage key stakeholders both within the health sector and other relevant sectors, such as sport, education, transport; engage relevant professional associations and scientists, with topic expertise.
3. Assess the applicability, acceptability and feasibility of the recommendations.
4. Adapt guidelines to the local context, including language, examples, and other cultural considerations.
5. Conduct an external review with target users, including policy-makers, practitioners, and the general public.
6. Establish a budget and clear plan for dissemination and communication.
7. Publish and promote the national guidelines, ideally alongside a launch event to generate publicity and interest.
8. Engage relevant professional bodies or organizations and support policy alignment and/or endorsement.
9. Implement national policies and practices to support implementation of national guidelines and behaviour change.
10. Agree a timeline for evaluation, review, and update of the guidelines.

DISSEMINATION

National physical activity guidelines are a core component of the governance structures for a comprehensive approach to increasing population levels of physical activity. National guidelines inform the development and priorities of national and subnational strategy planning and require dissemination of the correct information, to the relevant groups of people, in an appropriate way. Unfortunately, too often, national guidelines are not disseminated, and so awareness of recommendations among both professional audiences and the wider community can remain very low. Securing dedicated resources to support wide-scale dissemination is an important first step to changing awareness and knowledge about the importance of increasing physical activity and reducing sedentary behaviours.

Key audiences for dissemination of national guidelines on physical activity and sedentary behaviour include:

- **Policy-makers within and outside the health sector** (including transport, planning, education, workplaces, sport, parks and recreation), to increase:
  a. knowledge of the contribution that increasing physical activity and reducing sedentary behaviour can have in improving not only health, but also a range of diverse yet related agendas, including gender equity, human rights obligations, and sustainable development;
  b. integration of policy and programmes on physical activity and sedentary behaviour into all relevant policies; and
  c. investment in scaled-up and coordinated national and local actions.
- **Non-state actors** (including nongovernmental organizations, academic and research organizations, the private sector as well as the media and research funding agencies), to:
  a. raise awareness of the importance of increasing physical activity and reducing sedentary behaviours across all ages;
  b. encourage and ensure policy alignment; and
  c. increase collaboration and investment in policy implementation and local action.
- **Practitioners in health and non-health sectors** (including sport, education, transport, and planning) to increase:
  a. awareness and knowledge of national guidelines on physical activity and sedentary behaviours;
  b. knowledge, skills and confidence in promoting increased physical activity and reduction in sedentary behaviours; and
  c. integration of physical activity promotion into routine practice where applicable.
- **The general public and specific population subgroups**, to increase:
  a. awareness and knowledge of the guidelines on physical activity and sedentary behaviour;
  b. knowledge of how to achieve the physical activity and sedentary behaviour guidelines; and
  c. intentions and motivation to be more physically active and to reduce sedentary behaviour.

COMMUNICATION CAMPAIGNS

Different stakeholders will benefit from different materials; therefore to communicate guidelines to multiple audiences effectively, consideration must be given to the content, format, and delivery channels for guideline communication. When developing a guideline communication strategy, formative research can help determine the key audiences and understand the values, needs and preferences that influence levels of physical activity and sedentary behaviour. This should include exploration of the barriers to physical activity or to the integration of physical activity into policy and practice, as well as testing of draft messages and materials with different groups. This will help inform the key messages that are used, as well as the appropriate format(s) and channel(s) for communication. A comprehensive communication strategy will include a range of communications aimed at different audiences. Countries may need to prioritize specific groups depending on available resources (human and financial).

Communication campaigns on physical activity targeting the general public or specific subpopulations are a cost-effective intervention *(133)* and recommended in the WHO *Global action plan on physical activity 2018–2030 (14)*. National and subnational campaigns on physical activity typically establish an overarching campaign slogan (for example "Be Active" or "Move More"), and develop design elements or characters, which may include tailored messages for different audiences

(such as for young children, adolescents, adults or older adults, the less active, people living with disability or chronic conditions). Campaign messages and resources that are tailored to specific population groups are likely to be more effective than generic materials. Communication campaigns should consider the reach and effectiveness of both traditional media channels (such as television, radio, billboards, printed resources) as well as digital media channels (websites, mobile phones, Apps). Providing information on the national guidelines in a variety of formats is also useful. For example, a relatively new but increasingly common approach to communicating physical activity guidelines is through the use of infographics or short animated videos. WHO has supporting materials for developing and implementing such communication campaigns *(135)*.

The academic and research community are likely to be interested in the scientific report which details the epidemiological evidence on which the guidelines are based. However the specific details of the underlying research is unlikely to be of interest to other more general audiences. Policy-makers may prefer a summary of the science, or even a short briefing document. Other audiences, such as health and non-health professionals, are more likely to favour different types of resources, for example a brochure or factsheet about the guidelines, or about how to integrate physical activity promotion into routine practice (for example in patient consultations in a health-care setting, or when developing building or transport plans for urban environments). Different professionals will require resources that are tailored to their role. Health professions, in particular, may benefit from a suite of resources to reflect the diverse population groups that they work with.

IMPLEMENTATION OF POLICY AND PROGRAMMES

National guidelines on physical activity and sedentary behaviour, in isolation, are unlikely to lead to increases in population levels of physical activity and should therefore be seen as one element of a policy and planning framework. It is critical that national guidelines are disseminated to key audiences and supported by a sustained national communication strategy that will lead to increased awareness and knowledge about the multiple benefits of regular physical activity and reducing sedentary behaviours. However, in order to achieve sustained behaviour change, these actions must be supported by policies that create supportive environments that enable and encourage people to be active, along with increased local, appropriate opportunities for people to participate in physical activity. Policies and programmes must consider and be adapted to the local context, in terms of both the health system and the complex multisector institutions that have an interest in, or opportunity to support, physical activity promotion. Action should be taken using a "whole of government" approach and consider the "system" of policies and multiple actions that can, through engagement of a wide range of stakeholders, support more people to be physical active across multiple sectors and settings. Using a "systems" approach that is aligned with a sustained communication strategy ensures that increased demand for physical activity, generated through effective communication, is matched by the provision of environments and opportunities for people to be physically active.

The WHO *Global action plan on physical activity 2018–2030* set a target to reduce physical inactivity by 15% by 2030, and outlined 20 recommended policy actions and interventions *(14)*. These included recommending that all countries implement sustained national public education and awareness campaigns and the integration of physical activity counselling programmes into primary and secondary health care. Other recommendations included the creation of appropriate environments for physical activity, including walking, cycling and wheeling, for all population groups and the provision of more opportunities and programmes for physical activity in schools, workplaces and sports clubs and venues. Implementation across all 20 recommendations may not be feasible in the short term in all countries, but should be viewed as a long-term goal. To identify an appropriate and feasible set of immediate actions, WHO Member States should conduct a situational analysis of current policy and practice. This will enable multisector collaboration and help identify areas of strength as well as gaps and opportunities, and can be used as the basis for developing or updating national and subnational plans.

These new WHO guidelines support expanding the scope of actions to include additional groups, such as people living with disability or chronic conditions, and women who are pregnant or postpartum. Policy will need to support appropriate programme delivery and practice that recognizes community needs and the diversity of groups and contexts. A number of sector-specific toolkits are under development to support implementation of the ACTIVE technical package *(135)*; these will provide each sector with guidance on how to promote physical activity, for example through schools, through primary health care, or by improving provision for walking and cycling. The ACTIVE toolkit, as well as other WHO regional and national resources will support implementation of these physical activity and sedentary behaviour guidelines.

SURVEILLANCE AND EVALUATION

The WHO *Global recommendations for physical activity for health* have been used as benchmarks for population health monitoring and surveillance since 2010. The changes introduced to the recommendations in these updated guidelines will have some implications for surveillance systems and assessment instruments currently used to monitor national levels of physical activity. The publication of these new guidelines will call for a review of current instruments and reporting protocols to inform any adjustments and recommendations on future reporting against the new guidelines. Instruments, such as the Global Physical Activity Questionnaire and Global Student Health Survey, will be reviewed and protocols updated to align with these new guidelines; supporting guidance to all countries will be provided in 2021.

The WHO NCD Country Capacity Survey (CCS) is the main instrument used to monitor global progress on NCD policy implementation, and is conducted every two years. The CCS includes specific questions on population surveillance systems on physical activity for each age group covered by these WHO guidelines on physical activity and sedentary behaviour, and since 2019, on the existence of national physical activity guidelines. WHO Member States are requested to upload documentation to support their response. In 2019, of the 194 WHO Member States, 78 (40%) reported having physical activity guidelines *(136)*. A detailed document analysis of responses to the CCS in 2019 was carried out, and identified that only two thirds of the 78 Member States (52/78) with national guidelines include statements on how much physical activity their populations should do; and of these, only 42 countries aligned fully with the 2010 WHO *Global recommendations on physical activity for health (1)*. Data from the 2021 and subsequent surveys will provide information on uptake of these updated guidelines.

UPDATING

These guidelines will be updated after ten years, unless advances in the science of how physical activity is assessed using device-based measurement, and the rapidly evolving science on sedentary behaviour, prompt an earlier update.