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The South African 24-Hour Movement Guidelines for Birth to 5 Years: An Integration of Physical Activity, Sitting Behavior, Screen Time, and Sleep

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Background: In December 2018, the South African 24-hour movement guidelines for birth to 5 years were released. This article describes the process used to develop these guidelines. **Methods**: The Grading of Recommendations Assessment, Development, and Evaluation-ADOLOPMENT approach was followed, with some pragmatic adaptions, using the Australian guidelines for the early years as a starting point. A consensus panel, including stakeholders in early childhood development and academics, was formed to assist with the development process. **Results**: At a face-to-face meeting of the panel, global and local literatures were considered. Following this meeting, a first draft of the guidelines (including a preamble) was formulated. Further reviews of these drafts by the panel were done via e-mail, and a working draft was sent out for stakeholder consultation. The guidelines and preamble were amended based on stakeholder input, and an infographic was designed. Practical "tips" documents were also developed for caregivers of birth to 5-year-olds and early childhood development practitioners. The guidelines (and accompanying documents) were released at a launch event and disseminated through various media channels. **Conclusions**: These are the first movement guidelines for South African and the first such guidelines for this age group from a low- and middle-income country.

Keywords: sedentary behavior, early childhood, GRADE-ADOLOPMENT, public health recommendations

In recent years, there has been a shift toward integrated guidelines for children's physical activity, sedentary behavior, and sleep. This considers the natural integration of these behaviors—referred to as "movement behaviors"—across a 24-hour period and can provide a more cohesive message for parents, caregivers, teachers, and practitioners. The 24-hour approach considers young children's development in the context of how they move throughout a typical day (a combination of sleeping, sitting, standing, and different intensities of physical activity) and acknowledges that the whole day matters.

Canada was the first country to take this integrated approach, and in 2016 released 24-hour movement guidelines for children and adolescents between 5 and 17 years of age.[1] In November 2017, Canada coreleased 24-hour movement guidelines for children (aged 0–4 y),[2] in conjunction with Australia (aged 0–5 y).[3] New Zealand also adopted the 24-hour approach for the guidelines they released in 2017.[4]

Earlier in 2017, the World Health Organization (WHO) initiated a process to develop the first global guidelines for physical activity, sedentary, and sleep behavior for the early years, and these were launched in April 2019.[5] These guidelines are responsive to the WHO Ending Childhood Obesity reports,[6,7] which highlighted the need to address 24-hour movement behaviors in early childhood for the prevention and management of obesity and noncommunicable diseases. Furthermore, these guidelines address the importance of these movement behaviors for other developmental outcomes that are important in early childhood, such as cognitive development and psychosocial health.[2,3]

These developmental outcomes are important in South Africa (SA), which is a country with a high burden of noncommunicable

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diseases, and the highest obesity prevalence in Africa,[8] with 68% of women (aged 15 y and older) being overweight or obese.[9] In SA, there is a need for obesity prevention in early childhood.[10] In 2013, 23% of 2- to 5-year-old children were reported to be overweight/obese,[11] and research from a low-income urban SA setting has shown that obesity in the preschool years is highly predictive of obesity in adolescence.[12] Despite these concerning statistics, there have been no guidelines developed for any of the 24-hour movement behaviors for any age group in SA, including the early years. Considering the WHO Ending Childhood Obesity reports' emphasis on early prevention of obesity, 24-hour movement guidelines for 0- to 5-year-old children could be considered a logical starting point, particularly in light of the progress made in countries such as Canada and Australia on 24-hour movement guidelines for the early years.

The aim of this study was to describe the process of developing the SA 24-hour movement guidelines for birth to 5 years. This process happened concurrently with the development of global guidelines for physical activity, sedentary, and sleep behaviors in the early years by the WHO.[5]

Methods

GRADE-ADOLOPMENT Process

The Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach is considered as the gold standard for the development of health guidelines. A modification of the GRADE approach, referred to as GRADE-ADOLOPMENT,[13] has been developed in recent years (with limited application, as yet) and refers to the process of adopting, adapting, or de novo developing guidelines. This approach allows guideline groups to capitalize on previous work when developing or updating guidelines. It acknowledges the need for a rigorous approach but presents a more time- and cost-effective and less duplicative solution for those developing guidelines, which can be particularly beneficial in resource-constrained environments.

For the SA guidelines, the GRADE-ADOLOPMENT approach was used; it was also the approach used by the Australian early years guideline development group to adapt the Canadian early years guidelines,[3] and the approach used for the UK early years guidelines.[14] This adaptive approach was deemed appropriate for SA, given that there may be contextual differences between SA (a middle-income country with extreme inequality and widespread poverty), and Canada and Australia (both high-income countries). Although the limitations of adaption frameworks include the need for methodological expertise and the lengthy time frame required for completion,[15] the GRADE-ADOLOPMENT approach proved to be feasible for these guidelines. Furthermore, the use of GRADE-ADOLOPMENT for these guidelines helps to address the need for the application of this framework in low- and middle-income countries (LMICs).[15]

The GRADE-ADOLOPMENT approach encourages the involvement of a range of stakeholders in the development process (in the consensus panel and consultation process).[13] Considering the novelty of these (or any) movement behavior guidelines for SA, it was believed that the involvement of multiple stakeholders would encourage stakeholder buy-in and ownership of the SA guidelines, without the need to duplicate work already completed by highly competent research groups (for the Canadian and Australian guidelines) or to "reinvent the wheel." In light of the somewhat limited resources available for the development of these SA guidelines, GRADE-ADOLOPMENT was arguably the most inclusive, pragmatic, and cost-effective approach.

A timeline and summary of the GRADE-ADOLOPMENT steps that were followed are provided in Figure 1. Some additional steps were included in the process, following the example of the Australian guideline development group.[3] Steps 1 to 7 are described (for the SA guidelines) in this "Methods" section. The results of step 7 and the remaining steps are described (for the SA guidelines) in the "Results" section.

1. Establish Leadership Group

Funding for the guideline development process was confirmed in November 2017, and the Leadership Group was established shortly after this. The leadership group comprised academic researchers with expertise in movement behaviors in children (C.E.D., S.A.T., A.Pr., and D.E.R.), including the leader of the Australian early years guideline development group (A.D.O.), who was the international advisor for the SA guidelines. Other members of the leadership group included a representative from the funding body (C.M.) and a media and marketing specialist (T.L.). The leadership group was chaired by C.E.D.

2. Form Consensus Panel

Stakeholders in the field of early childhood development (ECD) in SA, as well as knowledge users (including health practitioners) were identified through the networks of the leadership group. Representatives of the National Departments of Social Development, Health and Basic Education (who are responsible for various aspects of the care of 0- to 5-year-old children in SA) were invited to be members of the consensus panel (only one individual accepted the invitation, M.L.S.). These ECD stakeholders and government representatives were seen as a vital part of the process and would be able to provide insight into the acceptability and feasibility of disseminating these guidelines, given that movement behaviors are not currently a priority issue in early childhood in SA.

Other academic researchers with expertise in movement behaviors in the early years or with expertise in early childhood development were identified from the Scientific Advisory Group of the Healthy Active Kids South Africa Report Card[16] and invited to be part of the consensus panel. All those invited were given an outline of the guideline development process and informed of the consensus panel meeting that was to take place in April 2018. The leader of the expert working group for the development of 24-hour movement behavior recommendations for under 5s in the United Kingdom (J.J.R.) was invited to be an international observer for the SA guideline group. The details of the consensus panel are provided in Supplementary Table 1 (available online).

3. Identify Credible Existing Guidelines and Define Criteria for Selection of Guidelines

As part of this step, the Australian guidelines were identified as the most recently developed credible guidelines on movement behaviors for the early years. These guidelines met the following criteria for selection of guidelines:

(1) published in the last 5 years;
(2) addressed clear research questions, contained all Population, Intervention/Exposure, Comparator, Outcomes (PICOs) elements;
(3) followed GRADE or GRADE-ADOLOPMENT process;
(4) allowed for updating (access to full systematic reviews), and provided full access to search strategy; and

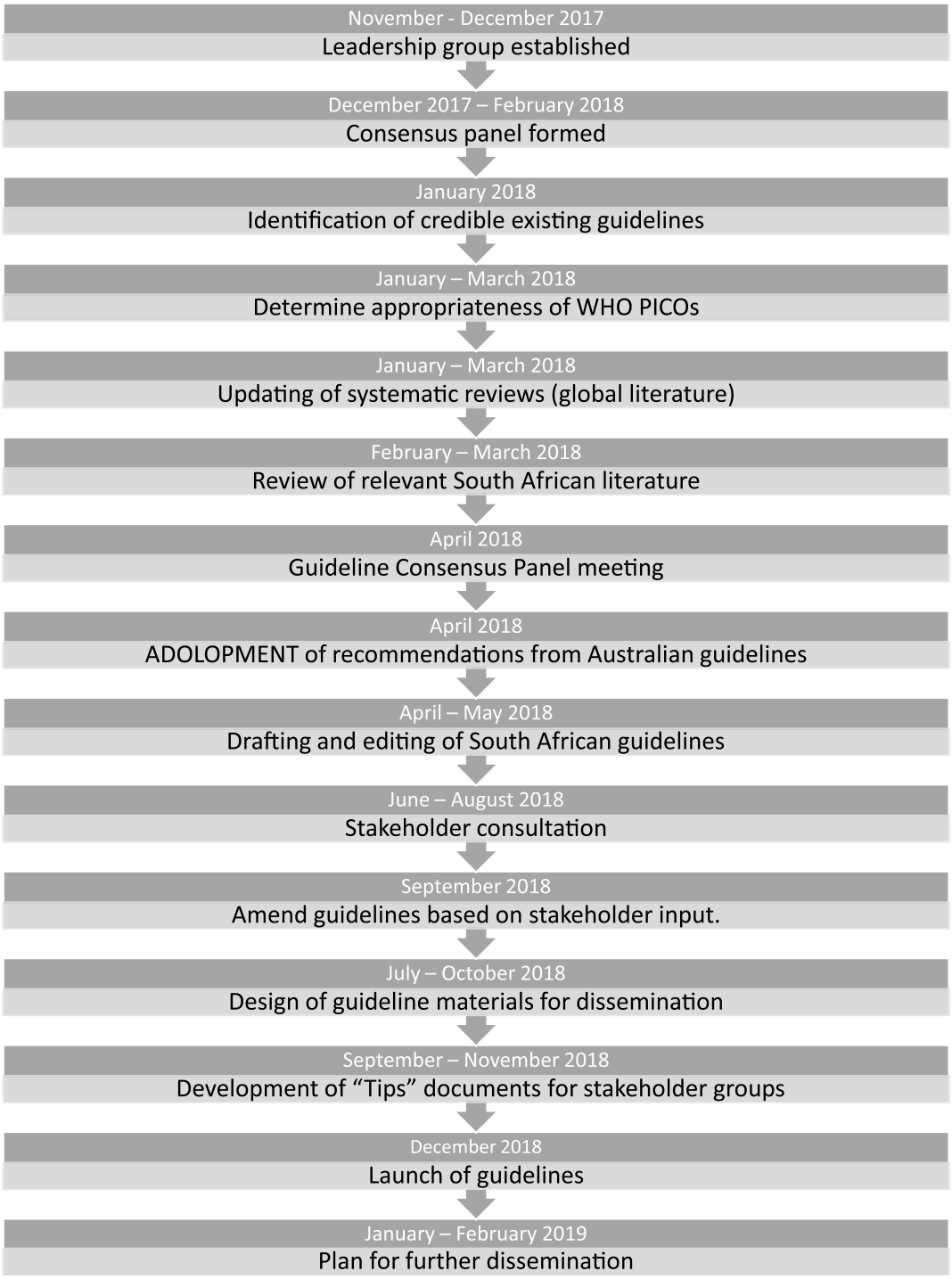


Figure 1 — GRADE-ADOLOPMENT process. PICOs indicate Population, Intervention/Exposure, Comparator, Outcomes; WHO, World Health Organization.

(5) existing and accessible GRADE tables and summaries of findings.

GRADE-ADOLOPMENT Steps Not Included

Following the advice of the Australian early years guideline development group, the following GRADE-ADOLOPMENT steps were not included, as they were deemed to be less relevant for these types of guidelines:

Step 4: Evaluate and complete GRADE Evidence-to-Decision frameworks for each recommendation and

Step 5: Determine availability, completeness, and currency of information about Evidence-to-Decision criteria.

6. Determine Appropriateness of PICOs

The PICOs used to guide the update of the systematic reviews for the WHO guidelines were sent to the consensus panel prior to the

consensus panel meeting to obtain feedback on the appropriateness of these PICOs for the SA guidelines. These PICOs were agreed upon by the SA consensus panel and are provided in Supplementary Table 2 (available online).

7. Updating of Systematic Reviews

The development of the SA guidelines took place in parallel with the WHO guideline development process. Three of the authors (C.E.D., J.J.R., and A.D.O.) were part of the Guideline Development Group for the WHO guidelines, and the SA consensus panel (along with the UK expert working group, led by J.J.R.) was given access to these updated systematic reviews to use for the SA guidelines.

Although the updated systematic reviews provided the evidence base for the recommendations to be included in the SA guidelines, it was considered important to review SA literature that could provide insight into any contextual adaptions to the guidelines that may be necessary. This local literature would also be relevant for the consensus panel meeting to provide an overview of research on movement behaviors in early childhood in SA, as many of the consensus panel members did not necessarily have experience working in the field of movement behaviors and would not be familiar with local research. Comprehensive searches on PubMed, Africa Journals Online, and Africa Wide (EBSCOhost) databases for evidence published in the previous 10 years (prior to March 2018) on physical activity, sedentary behavior, screen time, and sleep in children aged 0–5 years from SA were conducted. Search parameters are included in Supplementary Table 3 (available online).

Results

Updates to Systematic Reviews

The results of the WHO updated systematic reviews have been published elsewhere,[17] and a summary of results is presented in this study. Physical activity was found to be positively associated with lower adiposity (infants) and improved motor development (infants, toddlers, and preschoolers), cognitive development (infants and preschoolers), fitness (preschoolers), bone/skeletal health (preschoolers), and cardiometabolic health (preschoolers). Higher levels of sedentary behavior were found to be associated with higher adiposity (infants, toddlers, and preschoolers), poorer motor development (toddlers), poorer cognitive development (infants, toddlers, and preschoolers), and poorer psychosocial health (preschoolers). Shorter sleep duration was found to be associated with higher adiposity (preschoolers), poorer emotional regulation (infants, toddlers, and preschoolers), and poorer cognitive development (preschoolers).

Narrative Review of South African Literature

Overall, there was a paucity of literature describing the physical activity, sedentary behavior, and sleep of 0- to 5-year-old children in SA.[10] This was highlighted in the Healthy Active Kids South Africa 2018 Report Card.[16] There were a number of recent studies on movement behaviors in this age group, and although these studies were done with relatively small, localized samples, they represent the best available evidence. However, the generalizability of these findings to all SA children is limited. These studies were presented to the consensus panel and are summarized as follows.

Physical Activity. In a study of infants and toddlers (3–24 mo) using accelerometry, those aged 3 and 6 months were reported to spend 20 and 10 minutes in tummy time per day, respectively. Infants who were more mobile (ie, crawling or walking) were reported to spend more time playing outside. Boys spent more time in higher intensity physical activity and less time in lower intensity activity than girls, and time spent in higher intensity activities was higher in the older age groups (controlling for body mass index [BMI] z scores, weight, and length).[18]

Among preschool-aged children (3–5 y old) across income settings, objectively measured total physical activity (cut point defined as >25 counts/15 s[19]) was reported to be in excess of 400 minutes per day, with all children meeting the recommended 180 minutes per day of total physical activity[20]—the Australian recommendation (in 2011) when these data were published.[21] Further analyses of these data (presented to the panel; being prepared for publication) indicate that for this sample, average moderate- to vigorous-intensity physical activity (MVPA; cut point defined as ≥420 counts/15 s[19]) was 124.4 (37.5) minutes per day, and total physical activity was 457.0 (61.1) minutes per day; 96.9% of children met current guidelines published by the Canadians and Australians.[2,3] Boys were significantly more active than girls, and urban high-income children were significantly less active than urban low-income and rural low-income children. Similar findings have been reported with preschool-aged children from another low-income, urban setting: 560.5 (52.9) minutes per day of total physical activity and 90.9 (30.0) minutes per day of MVPA (objectively measured), with 83% of children meeting current guidelines.[22] Using direct observation at preschools, low-income urban children spent 11% of their time in MVPA, which was more than the 8% observed in mid-/high-income children.[23]

Various studies have looked at associations between physical activity and measures of adiposity, and gross motor skills. In preschool-aged children from a low-income, rural setting, children who were overweight/obese were almost 80% less likely to engage in MVPA (directly observed) in the preschool setting.[24] This is similar to findings from a study using the same methods with urban preschool children, although in this urban sample, underweight children were also less likely to be active.[23] Among preschool children from urban low- and high-income settings, being less physically active (objectively measured) has been associated with thinness (prevalence of 19.4% in the total sample), but not overweight/obesity, and MVPA was in fact positively associated with BMI and BMI z scores (mean BMI z score –0.04 [1.03]).[25] These studies highlight that undernutrition remains a concern in SA, particularly in early childhood, and that in SA, stunting is a persistent issue.[26] Although stunting has been found to have a limited effect on gross motor skills, it has a more pronounced effect on cognitive development in early childhood.[27]

Gross motor skills were found to be good among 0- to 5-year-old children in SA.[28–32] In the study with preschool-aged children from a low-income, rural setting, and better gross motor skills (as measured by the Test of Gross Motor Development—version 2[33]) were associated with objectively measured MVPA and vigorous-intensity physical activity. This study also found that directly observed MVPA during preschool time was positively associated with gross motor skills.[24] Another study conducted with preschool children from low-income settings reported that components of cognitive development were positively associated with gross motor skills (using the Test of Gross Motor Development—version 2), but not with physical activity.[32]

With regard to contextual factors influencing physical activity in SA settings, safety has been raised as a concern by parents, both in terms of crime and traffic safety.[21,34] However, qualitative findings suggest that although safety is a perceived issue, it does not seem to stop children from being very active or playing without supervision,[21] and children have been observed implementing their own safety precautions during games where road traffic was an issue.[34] The lack of resources and facilities, particularly in low-income settings, has also been mentioned as a constraint to physical activity.[21] But again, these constraints, such as the lack of conventional play equipment, have not always been observed to hinder play.[34]

Sedentary Behavior. A small number of studies have investigated time spent in sedentary behavior, including screen time. In the study on infants and toddlers previously mentioned , 94% of children exceeded the recommendation of no television time based on maternal report, with a median of 30 minutes at 3-, 6-, and 12-months old, and 25 minutes at 18-months old. Total time spent restrained per day varied between age groups, and at 3, 6, 12, and 18 months was (median) 133, 150, 100, and 75 minutes per day, respectively. This included being strapped to the back of a caregiver (median of 30 min at 3-, 6-, and 12-mo old),[18] which during early childhood is a common practice in SA and has been found to restrict opportunities to crawl, impacting on neurological development.[35,36]

In the studies using direct observation, urban preschool children were found to spend 73% of their time in preschool being sedentary.[23] Time spent sedentary was 71% in rural, low-income preschools.[24] Other findings presented to the panel (paper in review) reported that screen time, assessed using a parent questionnaire, was significantly higher in preschool-aged children from urban high-income settings (1.71 [1.18] h/d) in comparison with urban low-income (0.77 [0.90] h/d) and rural settings (0.45 [0.37] h/d). Overall, 81.9% met the screen time guideline of <1 hour per day,[2,3] but only 33.3% of the urban high-income children met the guideline versus 74.0% and 96.5% of low-income urban and rural children, respectively. The low levels of screen time in the rural setting are most probably due to limited access to screens (reported from questionnaire data). A high proportion (81.7%) of parents reported that they believed their child's screen time would not affect his or her health, which highlights the importance of educating parents about the risks of screen time.

Sleep. The infant and toddlers' study assessed nocturnal sleep using parent-completed sleep diaries (measured as time in bed) and found that infants and toddlers aged 3 and 6 months were getting 10.38 hours of time in bed on average (range 7.48–13.43 h).[18] Although this does not account for naps during the day, this is substantially less than what is recommended for 0- to 3-month-old infants (14–17 h) and 4- to 11-month-old children (12–16 h) in a 24-hour period.[2,3]

In the study of preschool children in a low-income, urban setting, objectively measured nocturnal sleep duration was found to be low (9.28 [0.80] h per night), and although daytime naps (1.42 [0.31] h) increased 24-hour sleep duration (to 10.17 [0.71] h per night), 38% were still classified as short sleepers according to current guidelines for preschool-aged children (10–13 h[2,3]). Bedtimes were late in this sample of preschool children: 21 h 29 ± 00 h 49 on week nights and 21 h 57 ± 01 h 20 on weekend nights. This study found that 54.9% of participants complied with available physical activity and sleep guidelines (from Canada and Australia) but found no associations found between sleep and adiposity variables.[22] One might speculate that this was due to the limited variation in adiposity measures in this group.

In the study of preschool-aged children across settings, sleep was assessed using objective measures, and these findings were presented to the panel (paper in review). Children were reported to sleep for an average of 10.48 (0.78) hours per night, and 73.7% met current sleep guidelines. Urban low-income children slept significantly less than rural and high-income children (9.91 [0.68] h per night vs 10.76 [0.61] h per night and 10.76 [0.68] h per night, respectively). Urban low-income children were 1.88 times less likely to meet sleep guidelines than urban high-income children. For every 1-hour less sleep, children were 1.41 times more likely to fall into a higher BMI *z* quartile. In the parent questionnaire study previously mentioned (presented to the panel), parents reported that children slept 11.6 (1.3) hours per night. Overall, 73.7% met the sleep guideline. Few children (8.7%) slept <10 hours per night, and 9.4% slept >13 hours per night. Only children from low-income urban (16.1%) and rural (7.1%) settings exceeded 13 hours per night.

An important contextual consideration for young children's sleep in SA is the sharing of beds and/or rooms in low-income settings, particularly as the population density ranges between 6000 and 40,000 people per square kilometer in the areas included in the studies presented above.[37] These areas are generally a mix of "informal" housing, such as shacks, as well as brick and cement houses, some of which are provided by the government to previously disadvantaged individuals. These government houses are often, at best, 45 m^2 in size, with most houses being smaller than 30 m^2. They generally consist of a single open-plan room, which functions as the bedroom, lounge, and kitchen, making it less than ideal for sleeping.[38]

8. Consensus Panel Meeting and 9. ADOLOPMENT of Recommendations From Guidelines

The consensus panel met on April 11–12, 2018, in Cape Town, SA. The aims of the consensus panel meeting were to (1) review, discuss, debate, and interpret findings from the global and local systematic reviews; (2) review and adopt/adapt the preamble and recommendations from the Australian guidelines; (3) discuss the consultation with stakeholders; (4) discuss the launch and dissemination of the guidelines; and (5) identify research gaps. All these aims were achieved except for the identification of research gaps, as time did not allow for any substantial discussion of this point.

Overall, the consensus panel agreed that the recommendations (from the Australian guidelines) would be feasible and acceptable in SA, and there was consensus that such guidelines were relevant and important in SA. The Australian guidelines were largely adopted, and there were no suggestions to change the actual recommendations based on the available South African literature reviewed.

Suggestions for adaptation (modification) of the recommendations from the Australian early years' guidelines were mainly to the wording of the guidelines to make them more understandable for a wider South African audience, especially since English is not the home language of the majority of South Africans. The following changes were agreed on by the SA consensus panel:

(1) Refer to sedentary behavior (only familiar to academics) as "seated" or "sitting behavior."

(2) Replace "restrained" with "being strapped in and unable to move."

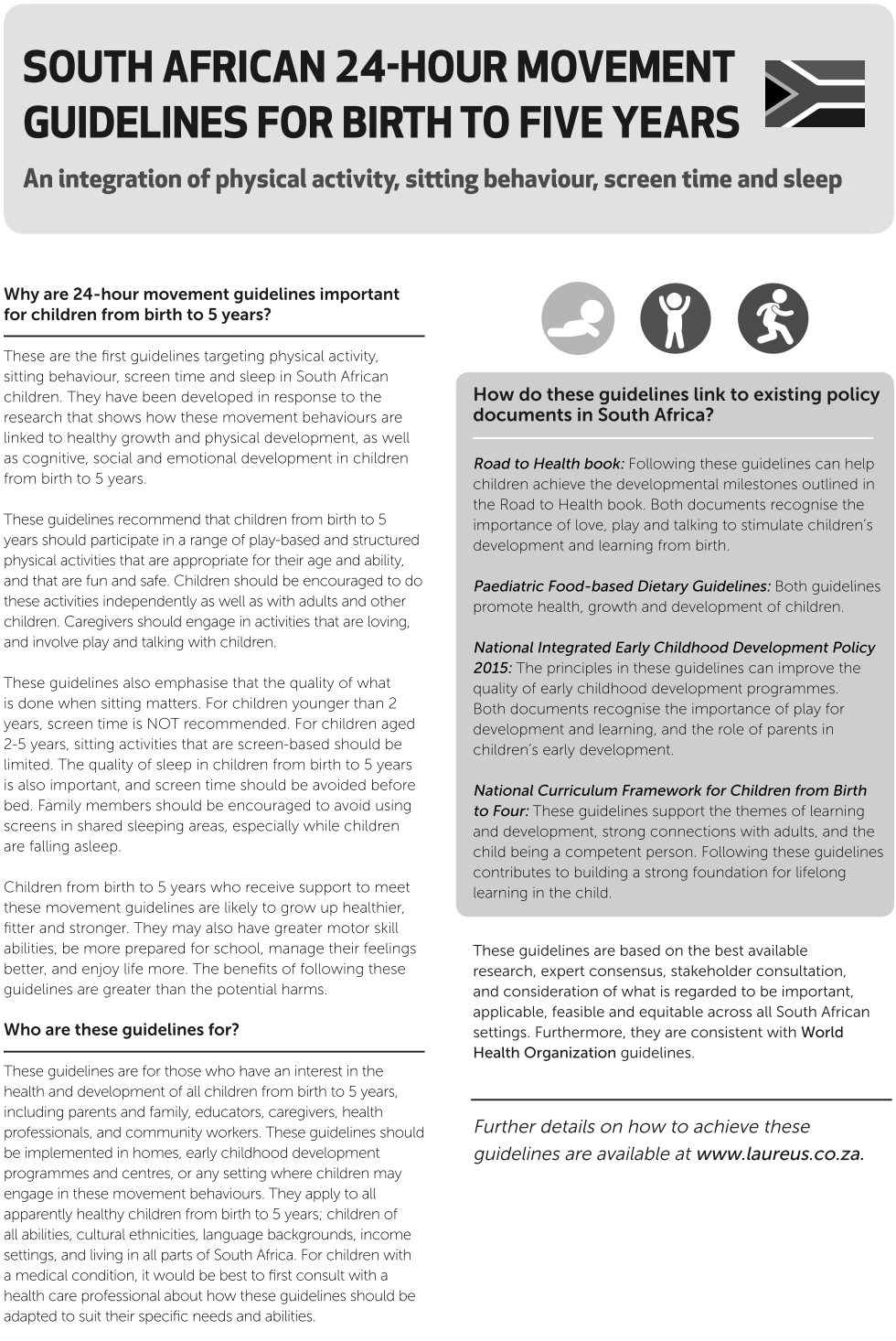
(3) Remove any references to car seats, as much effort is put into promoting the use of car seats in SA. (Many cannot afford

them, and they are not commonly used.) Any mention of reducing time in car seats could be open to misinterpretation.

(4) Replace "stroller" with "pram," which is the more common term in SA.

There was also extensive discussion about the preamble and what this should include. All suggestions for the guidelines and preamble were recorded (by S.A.T.), and collated (by S.A.T., C.E.D., and A.D.O.) into the first draft.

Following the example of the Australian guidelines, it was agreed that the stakeholder consultation would involve the distribution of an online survey for those with access to Internet and that focus groups would be conducted with stakeholder groups for whom Internet access is a challenge. Target groups for the online survey that were agreed by the panel included parents/caregivers, expectant mothers, ECD practitioners, health professionals, academics, and government representatives. For the focus groups, it was agreed that these should target parents/caregivers, ECD



SOUTH AFRICAN 24-HOUR MOVEMENT GUIDELINES FOR BIRTH TO FIVE YEARS

An integration of physical activity, sitting behaviour, screen time and sleep

Why are 24-hour movement guidelines important for children from birth to 5 years?

These are the first guidelines targeting physical activity, sitting behaviour, screen time and sleep in South African children. They have been developed in response to the research that shows how these movement behaviours are linked to healthy growth and physical development, as well as cognitive, social and emotional development in children from birth to 5 years.

These guidelines recommend that children from birth to 5 years should participate in a range of play-based and structured physical activities that are appropriate for their age and ability, and that are fun and safe. Children should be encouraged to do these activities independently as well as with adults and other children. Caregivers should engage in activities that are loving, and involve play and talking with children.

These guidelines also emphasise that the quality of what is done when sitting matters. For children younger than 2 years, screen time is NOT recommended. For children aged 2-5 years, sitting activities that are screen-based should be limited. The quality of sleep in children from birth to 5 years is also important, and screen time should be avoided before bed. Family members should be encouraged to avoid using screens in shared sleeping areas, especially while children are falling asleep.

Children from birth to 5 years who receive support to meet these movement guidelines are likely to grow up healthier, fitter and stronger. They may also have greater motor skill abilities, be more prepared for school, manage their feelings better, and enjoy life more. The benefits of following these guidelines are greater than the potential harms.

Who are these guidelines for?

These guidelines are for those who have an interest in the health and development of all children from birth to 5 years, including parents and family, educators, caregivers, health professionals, and community workers. These guidelines should be implemented in homes, early childhood development programmes and centres, or any setting where children may engage in these movement behaviours. They apply to all apparently healthy children from birth to 5 years; children of all abilities, cultural ethnicities, language backgrounds, income settings, and living in all parts of South Africa. For children with a medical condition, it would be best to first consult with a health care professional about how these guidelines should be adapted to suit their specific needs and abilities.

How do these guidelines link to existing policy documents in South Africa?

Road to Health book: Following these guidelines can help children achieve the developmental milestones outlined in the Road to Health book. Both documents recognise the importance of love, play and talking to stimulate children's development and learning from birth.

Paediatric Food-based Dietary Guidelines: Both guidelines promote health, growth and development of children.

National Integrated Early Childhood Development Policy 2015: The principles in these guidelines can improve the quality of early childhood development programmes. Both documents recognise the importance of play for development and learning, and the role of parents in children's early development.

National Curriculum Framework for Children from Birth to Four: These guidelines support the themes of learning and development, strong connections with adults, and the child being a competent person. Following these guidelines contributes to building a strong foundation for lifelong learning in the child.

These guidelines are based on the best available research, expert consensus, stakeholder consultation, and consideration of what is regarded to be important, applicable, feasible and equitable across all South African settings. Furthermore, they are consistent with World Health Organization guidelines.

Further details on how to achieve these guidelines are available at www.laureus.co.za.

Figure 2 — Final preamble and guidelines.

practitioners, and community workers in low-income settings. An additional suggestion was made by the national government representative on the panel to arrange a meeting with national government and nongovernmental representatives in ECD.

With regard to dissemination, language was discussed as a key issue (SA has 11 official languages), and low levels of literacy are common in low-income settings. The advice from those who had experience with translating documents for national dissemination was that the main guidelines (text) document would not be understandable to a large proportion of the population (but would still be necessary to produce) and that those who would read it would be able to understand it in English. Any translation that should be done would need to include all the 10 other official languages, to be inclusive of all language groups. It was strongly suggested that the guidelines be disseminated in a form that was as visual as possible. This should include pictures that are simple and culturally appropriate for all SA children and should depict activities that do not require significant resources. Another suggestion from panel members was to have some practical suggestions of how these guidelines could be achieved.

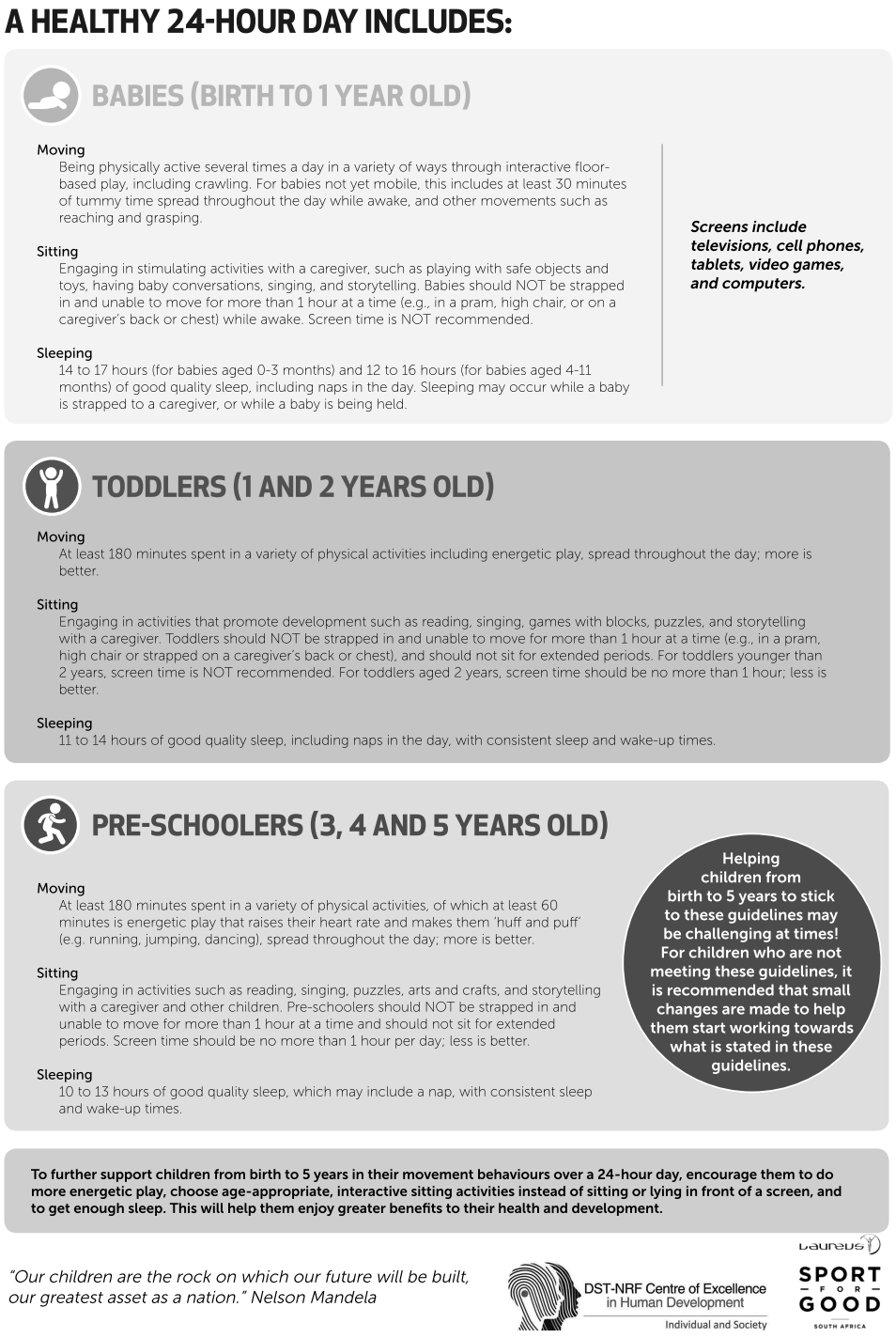


Figure 3 — Guidelines infographic.

Panel members discussed ways in which the guidelines could be disseminated through their existing networks and that relevant media channels for dissemination should be explored, where feasible and affordable, given the funding available. All were in agreement that an event should be arranged to launch the guidelines.

10. Drafting of SA Guidelines

In the week subsequent to the consensus panel meeting, the first draft of the guidelines and preamble was circulated to the panel, and they were asked to provide input within 2 weeks. All comments were collated (by S.A.T., C.E.D., and A.D.O.) in preparation for stakeholder consultation.

11. Stakeholder Consultation

The stakeholder consultation process and results are described elsewhere.[39] This process included an online survey (completed n = 197 participants); 9 focus groups with parents and caregivers, ECD practitioners and community health workers (n = 70); and a meeting with stakeholders from government and nongovernment organizations (n = 15). Overall, stakeholders agreed with the guidelines although issues including, but not limited to, safety and nutrition of children were highlighted. Training and provision of educational materials were identified as key in the dissemination and implementation of the guidelines.

12. Amend Guidelines Based on Stakeholder Input

Various amendments to the preamble and guidelines were suggested during the stakeholder consultation process, and these are also described in detail in the study of Tomaz et al.[39] The final preamble and guidelines are provided as Figure 2. An infographic, provided as Figure 3, was designed to depict the recommendations within the guidelines. The infographic was reviewed and modified (by C.E.D., S.A.T., C.J.C., and D.E.R.) to ensure it was appropriate and comprehensible. Particular attention was paid to the neutrality of the pictures within the infographic, from the perspectives of gender, ethnicity, and socioeconomics. Furthermore, it was also important for this infographic to be suitable and appealing for all key stakeholder groups—all those who have an interest in the health and development of children from birth to 5 years. This could include parents and family, educators, caregivers, health professionals, and community workers. Neither the consensus panel nor the stakeholders consulted expressed the need for different versions of the infographic for different stakeholder groups. In response to the input of the consensus panel and stakeholders consulted, the infographic has been translated into all 11 SA official languages.

Based on the suggestion for including practical suggestions of how to achieve these guidelines for key stakeholder groups, 2 additional documents were developed among panel members (coordinated by S.A.T.): "Using the guidelines at home: some tips for parents," and "Using the guidelines at ECD facilities: some tips for practitioners." These are provided as Figures 4 and 5, respectively. Color versions of all documents are available on request from the lead author.

13. Launch and Disseminate Final Guidelines

The SA 24-hour movement guidelines for birth to 5 years were launched in December 4, 2018, at the Nelson Mandela Children's Fund Head Office in Johannesburg. The launch was attended by representatives of national government (Department of Basic

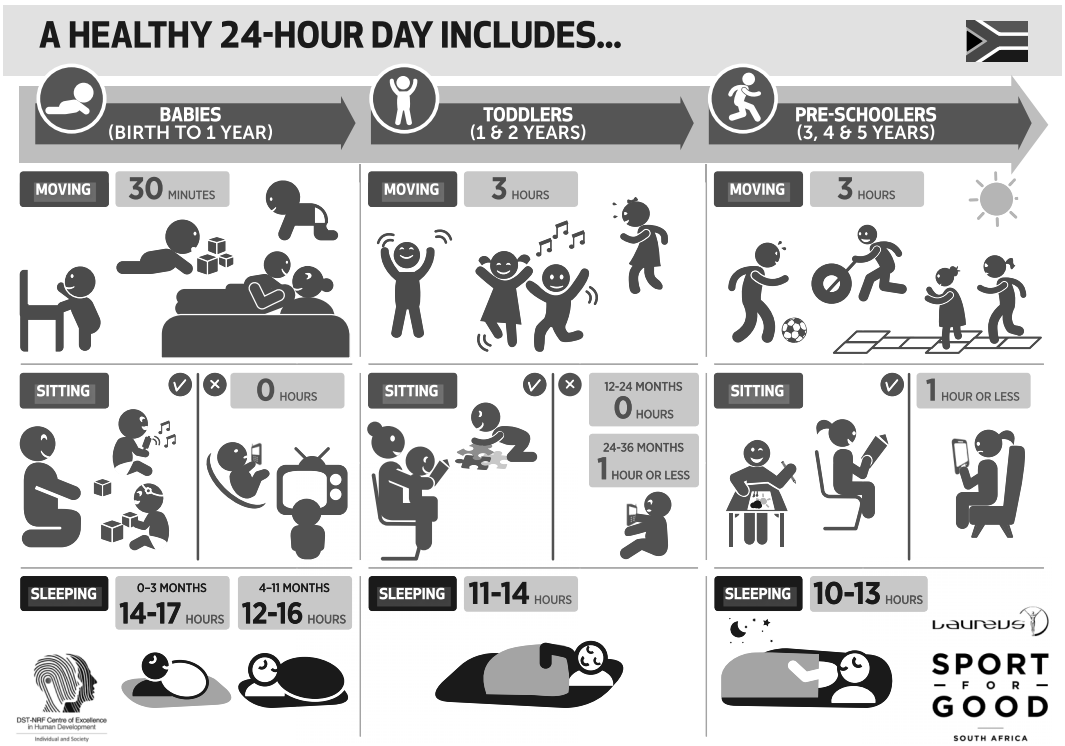


Figure 4 — Using the guidelines at home: some tips for parents.

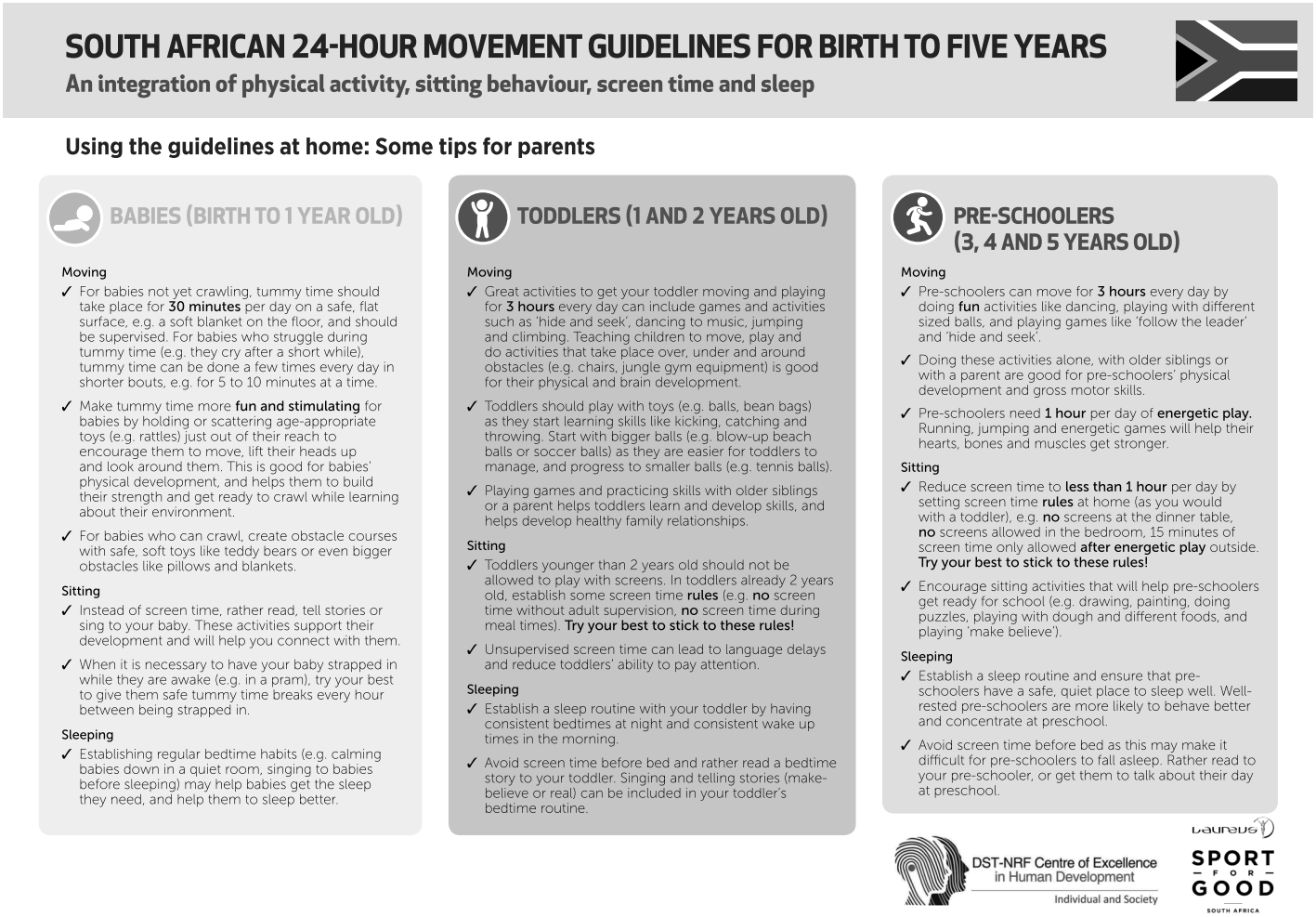


Figure 5 — Using the guidelines at ECD facilities: some tips for practitioners.

Education and Department of Health), nongovernmental organizations, the media, funding partners, the health sector, and academia. A preschool from a low-income community was also invited to attend so that the guidelines were launched not just "about" children, but "with" them as well. Short addresses were provided by the program specialist: child survival and development at the Nelson Mandela Children's Fund; a representative from the Department of Health (Child, Youth and School Health Directorate); an ambassador for the Laureus Sport for Good Foundation South Africa; the chair of the SA guideline consensus panel (C.E.D.) and the centre manager of the DST-NRF Centre of Excellence in Human Development. A panel discussion (with audience participation) was also held, and panel members included the director of ECD at the National Department of Basic Education, a trustee of the Laureus Sport for Good Foundation South Africa, a pediatrician (T.N.), and the marketing and communications manager at the Innovation Edge.

Details of the media dissemination associated with the launch are provided in Supplementary Table 4 (available online). Further plans are underway for wider dissemination of the guidelines at a community level, particularly within low-income settings, in partnership with community-based organizations that work with parents/caregivers and ECD practitioners around SA.

Discussion

To our knowledge, SA is the first LMIC to produce 24-hour movement guidelines for this age group. The relatively novel GRADE-ADOLOPMENT approach, in a slightly adapted format, proved to be a feasible and appropriate approach for the development of the SA 24-hour movement guidelines for birth to 5 years. Furthermore, SA was able to retain the integrated nature of these guidelines and present recommendations for physical activity, sedentary behavior (including screen time), and sleep in one set of guidelines. Adaptations to the Australian guidelines were relatively minimal and related mainly to ensuring the content was locally relevant and understandable for end users. Along with these efforts to contextualize the guidelines for SA, it is also evident that the process of development had additional value for creating a sense of local ownership of the guidelines. These lessons learnt are important for any future movement guideline development in SA, as well for other LMICs that are considering developing their own guidelines for 24-hour movement behaviors in the early years or in other age groups.

This article contributes to the growing evidence of the acceptability of the 24-hour approach, at least for the early years, and further evidence is provided from the stakeholder consultation

papers for the SA[39] and Australian[40] guidelines for the early years. The findings in these 2 papers indicate that a broad range of stakeholders from 2 very different countries were largely positive about this approach. In addition, the acceptability of the 24-hour approach to the WHO is encouraging.[41] There is, however, a need for further international evidence of the acceptability of this 24-hour approach and its advantages over other approaches (such as separate guidelines for behaviors), particularly since certain countries have chosen not to adopt this approach, including the United States.[42] In the United Kingdom, although the 24-hour approach was used by the expert working group, the UK Health Departments did not ultimately adopt this approach for their final recommendations.[14]

The use of the updated systematic reviews made available by the WHO is a strength of this process. The novelty of this process in SA is another strength of this initiative, as well the range of stakeholders who were involved in the process. The "ownership" of these guidelines by all stakeholders, rather than a particular institution or government department, is also a strength. Although the widespread adoption of these guidelines is an ongoing process, this at least suggests an approach that creates a favorable environment for the future development of evidence-based guidelines in SA.

A weakness was the limited availability of SA literature upon which to adapt the guidelines, although this is improving. Furthermore, although the recommendations are applied to all children of all abilities, there is little research into movement behaviors of children with disabilities. Research into the promotion of health movement behaviors within this group of children must be promoted, and the results included in the in any update of the guidelines so that recommendations can be provided for those caring for children aged less than 5 years with disabilities. Furthermore, in comparison with other high-income countries that have engaged in guideline initiatives, the SA initiative was smaller in scope and had fewer human resources dedicated to the project (linked to limited funding availability). Despite these constraints, the SA 24-hour movement guidelines for birth to 5 years are an example of a successful and pragmatic application of the GRADE-ADOLOPMENT approach. In this LMIC, where early years movement behavior research is limited in comparison with high-income countries, this guideline development process translated global and local evidence and brought together a range of academic and nonacademic stakeholders to place movement behaviors in the broader context of early childhood development, which is frequently stated as a priority in SA. This engagement provides a platform for future activities and partnerships to positively influence research and practice in this field in SA.

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