Global Matrix of Para Report Cards on Physical Activity of Children and Adolescents With Disabilities

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This is an overview of the results from 14 countries or jurisdictions in a Global Matrix of Para Report Cards on physical activity (PA) of children and adolescents with disabilities. The methodology was based on the Active Healthy Kids Global Alliance’s Global Matrix 4.0. Data were aligned with 10 indicators (Overall PA, Organized Sport, Active Play, Active Transport, Physical Fitness, Sedentary Behavior, Family & Peers, Schools, Community & Environment, and Government) to produce Para Report Cards. Subsequently, there were 139 grades; 45% were incomplete, particularly for Active Play, Physical Fitness, and Family & Peers. Collectively, Overall PA was graded the lowest (F), with Schools and Government the highest (C). Disability-specific surveillance and research gaps in PA were apparent in 14 countries or jurisdictions around the world. More coverage of PA data in Para Report Cards is needed to serve as an advocacy tool to promote PA among children and adolescents with disabilities.

**Keywords**: youth, special education, policy, health promotion, advocacy, harmonization

The global pandemic of physical inactivity requires comprehensive and coordinated efforts at the individual, community, and governance levels (Pratt et al., 2020; Rutter et al., 2019). There are many physical, social, and mental health benefits from physical activity (PA) for children and adolescents with disabilities (CAWD) with minimum risks (Smith, Rigby, et al., 2022). Regular PA participation can lead to the creation of habits during adolescence and is important in the fight against noncommunicable diseases during the life course (Lee et al., 2012). PA habit formation during adolescence can carry forward into adulthood (Hayes et al., 2019), even for adolescents with disabilities (Stewart et al., 2013). Furthermore, regular PA can be protective from heightened experiences of mental and social difficulties, reducing the possible need for health care services (Keogh et al., 2022). Evidence of these benefits is not new, yet according to recent global surveillance studies, 81% of adolescents aged 11–17 years were insufficiently physically active (Guthold et al., 2020), and evidence from European countries suggests that levels of insufficient PA are at least as high in CAWD (Ng et al., 2017). Very few regional, national, and global surveillance systems collect data from people with disabilities or report data by disaggregation on disability status. There is a call to action to overcome this knowledge gap by establishing surveillance systems that can help researchers and policymakers to monitor the current state of PA among CAWD (Martin Ginis et al., 2021).

International comparison studies require a certain degree of harmonization to make results comparable between countries. One such approach concerning PA of children and adolescents is the Global Matrix of PA Report Cards, led by the nonprofit organization Active Healthy Kids Global Alliance (AHKGA). The Global Matrix’s first edition was published in 2014 (Tremblay, Gray, et al., 2014) where 15 countries or jurisdictions reproduced the Canadian PA Report Card (Colley et al., 2012) in their own context. This grew to 38 countries or jurisdictions in 2016 (Tremblay et al., 2016), 49 in 2018 (Aubert et al., 2018), and 57 in 2022 (Aubert, Barnes, et al., 2022). The country or jurisdiction-specific PA report cards included a summary of the latest and best representative data translated...
into grades. Currently, 10 PA indicators are graded: five representing behaviors (Overall PA, Organized Sport and PA, Active Play, Active Transport, and Sedentary Behavior); one focusing on Physical Fitness; and the remaining four concerned with sources of influence (Family & Peers, School, Community & Environment, and Government). The aims of the PA report cards are to synthesize existing evidence on PA indicators that are translated into grades through a process that engages practitioners, researchers, and policymakers. The PA report cards have been used to motivate and advocate for appropriate actions that address global levels of physical inactivity (Tremblay, Barnes, et al., 2014). Until now, only Finland (Tammelin et al., 2018), Hong Kong Special Administration Region (SAR), China (Sit et al., 2020), The Netherlands (Burghard et al., 2018), and the United States (National Physical Activity Plan Alliance, 2018) have disaggregated the evidence within their PA report cards based on disability status. Other countries may have merged existing data on CAWD with data from children and adolescents without disabilities to inform their national reports for the Global Matrix. This could be due to the lack of available disability-specific data (Martin Ginis et al., 2021) or a lack of coordination to report disability-specific data as grades.

Data on CAWD may be fragmented and inconsistent because of context, representativeness, and access (Cappa et al., 2015). For comparison purposes between countries or jurisdictions, in this paper, disabilities are defined as per the United Nations, where the definition includes “persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society” (United Nations, 2006).

To present an overview of PA for CAWD, this special issue in Adapted Physical Activity Quarterly (APAQ) introduces a Global Matrix of Para Report Cards on PA of CAWD or children and adolescents with chronic conditions (hereinafter referred to as Global Matrix Para Report Cards). The term “Para Report Cards” comes from the Greek preposition “Para” with the meaning of beside or alongside the AHKGA’s PA report cards. The Para Report Cards reflect the parallel work to the PA report cards in the Global Matrix 4.0 wherein the same indicators, benchmarks, and grading criteria were used, and external auditors approved the grades. As complementary initiatives, a partnership between the AHKGA and the International Federation of Adapted Physical Activity (IFAPA) was created for the dissemination of the Para Report Cards as a global matrix and plans for capacity-building activities. The purpose of this paper was to summarize the international findings of the latest and best available disability data in Para Report Cards from an international perspective through the adoption of the same methodology that has been used to create the Global Matrix 4.0.

Methods

Recruitment of Countries

This special issue was created following conversations with the AHKGA executive and the lead author during the recruitment of the Global Matrix 4.0 in the spring of 2019. Communications were sent out to contacts of 49 member countries or jurisdictions involved in the Global Matrix 3.0 and its new members (e.g., Israel
and the Philippines) about collating data to form disability-specific PA report cards. After approval from the APAQ editorial board, a call for papers was made available through the APAQ website, the AHKGA membership list, and the IFAPA communication channels. A recruitment target of at least one country in each of the seven IFAPA regions was set to gain global coverage for the Para Report Cards. At the time of the abstract deadline, there were acceptable abstracts from 16 countries or jurisdictions, with at least one in each of the IFAPA regions. By the time of reporting, two countries or jurisdictions withdrew, leaving 14 countries or jurisdictions in this Global Matrix of Para Report Cards. According to the Finnish National Board on Research Integrity (Kohonen et al., 2019), the work carried out for the Para Report Cards did not require ethical committee approval, although, in some local contexts, ethical approval may have been sought to carry out the data collection.

Adaptations to the AHKGA Methodology

In a parallel process to the Global Matrix 4.0, the grading criteria remained almost the same for each indicator as in other PA report cards (see benchmarks and grades in Supplementary Table S1 [available online]). The terminology of the benchmarks was modified where there was an explicit request for data on CAWD. A small team of researchers also discussed the benchmarks after adapting terminology for the Para Report Cards and identified one major modification and one additional disability-specific benchmark.

The one major modification was within the Physical Fitness indicator. In the Global Matrix 4.0, the physical fitness benchmarks were based on the percentage of children and adolescents who met the criteria from the Eurofit battery as specified by Tomkinson et al. (2018). For measuring Physical Fitness in CAWD, Tomkinson’s norms are not suitable (Király et al., 2019). Adapted physical fitness tests, such as the Brockport test, are available, and the benchmark was designed to encourage reports of adapted physical fitness tests (Hutzler et al., 2023). To address this issue, a note was placed in the benchmarking tool: “Note: Where normative values have not been published for a specific impairment/disability group, outline what has been modified and which tests were used (i.e., Brockport, etc.).”

An extra benchmark was created for the Community & Environment indicator. It was deemed to be important to measure “%CAWD who have access to adapted physical activity or sport equipment” as a lack of appropriate equipment or facilities is a commonly cited barrier to participation in PA among CAWD (Shields & Synnot, 2016).

Consultation With Interest Groups

Each team was asked to contact representatives of disability interest groups to coproduce or, at the very least, to confirm the results from the grading process. Involvement meant at least a reflection of what was considered appropriate in their country or jurisdiction. The interest group members could comment on the grades, and this may have led to changes for the grades per indicator. This coproduction or verification aspect was meant to encourage debate between practice, research, and policy and, in most cases, explored the strengths, weaknesses, opportunities, and threats of the Para Report Cards (Hutzler et al., 2023).
Country- or jurisdiction-specific details on the grading process and interest group involvement can be found in the respective Para Report Cards.

**Review of the Para Report Card Grades**

Researchers from each of the included country or jurisdiction Para Report Cards (see authors’ list) were required to carry out the following: (a) a synthesis of the best and most recent data sources; (b) grade the synthesized evidence using the Global Matrix 4.0 procedures as per Aubert, Barnes, et al. (2022); (c) consult with relevant disability and PA or sport interest group representatives (e.g., families, sport officials, government representatives) or derive consensus among their research team for appropriateness of the indicator grades; (d) obtain approval for the indicator grades from external auditors familiar with the Global Matrix grading process; and (e) submit and approve publication of final report card grades to this overview paper. Information given by each country or jurisdiction’s data source can be found in Supplementary Table S2 (available online). The audit submission included the proposed grade for each indicator, the evidence for the team’s decision, and the rationale for the grade. This rationale could also include notes from the interest group meetings concerning the grades. The external auditors included experts familiar with the Global Matrix 4.0 and Para Report Card procedures, who gave feedback on the grades by approving or requesting further transparency of evidence and rationale and, in some cases, reconsidering the grade. The authors had the opportunity to improve their audit submission before the approval by the auditors. Each audit file is available from the lead authors on request.

The production of overall (global) grades for this overview paper was carried out using Aubert et al.’s (2018) scoring guidelines wherein each grade was converted to a numeric scale. The numeric grading scale consisted of a grade F = 2, grade D− = 4, and subsequent increments of one from D = 5 through to A+ = 15 (Aubert et al., 2018). A grade of incomplete (INC) was assigned when it was considered, by the country or jurisdiction teams, that the amount of data for an indicator was lacking or insufficient to produce a grade based on the predefined benchmarks.

Average grades for each indicator were produced when over half of the countries or jurisdictions assigned a grade other than INC. Mean scores of the numeric values were rounded down before they were converted back to a letter grade. To get overall grade assignments for each country or jurisdiction, a minimum criterion was outlined by at least one grade for one behavioral indicator (Overall PA, Organized Sport and PA, Active Play, Active Travel, and Sedentary Behavior) and one sources of influence indicator (Family & Peers, Schools, Community & Environment, and Government) was available.

**Results**

There were 14 countries or jurisdictions from five of the seven IFAPA regions in this Global Matrix of Para Report Cards (Figure 1). Almost half (n = 6) were from the European region (Ireland, Lithuania, Finland, France, Poland, and Spain); three...
Figure 1 — Global overview of countries involved in the Global Matrix of Physical Activity Report Card for Children and Adolescents with Disabilities with numbers indicating the number of core indicators with assigned grades (maximum = 10).
from Asia (Hong Kong SAR, Philippines, and South Korea); two each from North America (Canada and United States) and South America (Brazil and Chile); and one in the Middle East (Israel; see Supplementary Figure S1 [available online]). The content of the Para Report Cards was informed by government policy reports (Brazil, Canada, Chile, Finland, France, Ireland, Israel, Hong Kong SAR, Lithuania, Poland, South Korea, and Spain); disability research studies (Brazil, Canada, France, Hong Kong SAR, Ireland, Lithuania, Philippines, Poland, South Korea, and Spain); and disability data that were disaggregated from national data sets (Brazil, Canada, Chile, Finland, France, Ireland, Israel, Poland, Spain, and United States). Other sources of information included disability-specific PA surveys (Canada, Chile, France, and South Korea) and special educational needs research (Finland, Hong Kong SAR, Israel, Lithuania, Philippines, and South Korea). More details of data sources that were included within each of the Para Report Cards can be found in Supplementary Table S2 (available online).

Finland had the highest overall grade (C+), and several countries or jurisdictions had the lowest grade of D− (Poland, Spain, and United States; see Supplementary Table S3 [available online]). Across the 14 Para Report Cards, 76 out of a possible 139 (55%) grades were assigned to the 10 core indicators. Hong Kong SAR did not include a grade for Physical Fitness (Sit, Huang, et al., 2022), hence a maximum of 139 grades were available. Israel’s report card had the most indicators assigned a letter grade (i.e., nine out of 10) and had an overall average grade of D+. The Philippines assigned the least grades to the indicators (i.e., two from 10) and had an overall average grade of D+. Canada, South Korea, and Spain collected additional information on other indicators outside of the core 10 (e.g., sleep). These additional indicators were not included in the overall grade assigned to these countries’ report cards. The average number of indicators that were assigned a letter grade was five per country or jurisdiction.

Figure 2 shows, for each of the 14 Para Report Cards, each indicator grade with percentages meeting benchmarks. The most common indicator that was assigned a letter grade was the Government indicator, with 13 of the 14 (93%) Para Report Cards providing a grade. There were 11 letter grades assigned to the Overall PA and Organized Sport indicators (representing 79% of the Para Report Cards). There were nine (64%) Para Report Cards that included a letter grade for the Sedentary Behavior and Schools indicators, and eight (57%) included a letter grade for the Community & Environment indicator. There were more incomplete (INC) grades than letter grades for the Physical Fitness (n = 12, 86%), Active Play (n = 11, 79%), and Family & Peers (n = 10, 71%) indicators.

**Behavioral and Physical Fitness Indicators**

There were 11 (79%) Para Report Cards that included letter grades on the benchmarks for the Overall PA indicator, and the overall average grade was D−. The highest grade for the Overall PA indicator was C+ and was assigned to the Finland Report Card wherein 54%–59% of CAWD were meeting the benchmark. The lowest letter grade for Overall PA was an F (i.e., less than 20% of CAWD meeting the benchmark) and was assigned in the France, Hong Kong SAR, Ireland, and U.S. Para Report Cards. INC grades were reported from the Philippines, Lithuania, and Brazil.
<table>
<thead>
<tr>
<th>Score</th>
<th>Grade</th>
<th>Overall</th>
<th>Organized</th>
<th>Active</th>
<th>Active</th>
<th>Sedentary</th>
<th>Physical</th>
<th>Family</th>
<th>Schools</th>
<th>Community</th>
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<td>Play</td>
<td>Transport</td>
<td>Behaviors</td>
<td>Fitness</td>
<td>Peers</td>
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<tr>
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<td>CHL</td>
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<tr>
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<td>ISR</td>
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<td>IRL</td>
<td>FIN</td>
<td>ISR</td>
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<td>CAN, CHL, IRL, HKG, KOR</td>
<td>IRL, POL</td>
<td>ISR</td>
<td></td>
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<td>USA</td>
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<tr>
<td>2</td>
<td>F</td>
<td>FRA, HKG, IRL, USA</td>
<td>BRA, FRA, LTL, ISR, PHL</td>
<td>CAN</td>
<td>CHL, FRA</td>
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<td>ESP</td>
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<tr>
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<td></td>
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<td>ESP, HKG, POL</td>
<td>BRA, CHL, ESP, FRA, IRL, HKG, LTU, KOR, PHL, POL, USA</td>
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<td>CAN, HKG, KOR, PHIL, POL</td>
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Figure 2 — Global Matrix of Physical Activity Report Card Indicators for children and adolescents with disabilities, rank order by grade. Note. A+ = 94%–100%; A = 86%–93%; A− = 80%–86%; B+ = 74%–79%; B = 67%–73%; B− = 60%–66%; C+ = 54%–59%; C = 47%–53%; C− = 40%–46%; D+ = 34%–39%; D = 27%–33%; D− = 20%–26%; F = <20%; INC = incomplete; PA = physical activity; BRA = Brazil; CAN = Canada; CHL = Chile; ESP = Spain; FIN = Finland; FRA = France; IRL = Ireland; ISL = Israel; HKG = Hong Kong Special Administration Region China; KOR = South Korea; LTU = Lithuania; PHI = the Philippines; POL = Poland; USA = United States of America.
Letter grades on Organized Sport and PA participation were assigned in 11 (79%) of the para report cards. An overall average letter grade of D− was calculated for the Organized Sport indicator. Canada (C+) received the highest grade with 54%–59% of CAWD participating in organized sports or PA programs. In five (36%) of the para report cards, a letter grade of F (corresponding to 20% or less meeting the benchmark) was assigned (Brazil, France, Lithuania, Israel, and Philippines). An INC grade was assigned for the para report cards of Spain, Hong Kong SAR, and Poland.

Only three (21%) of the para report cards had assigned a letter grade for the Active Play indicator: grade of D+ for Israel (corresponding to 34%–39% of CAWD meeting the benchmark), grade of D for Finland (corresponding to 27%–33% of CAWD meeting the benchmark), and a grade of F for Canada (corresponding to less than 20% of CAWD meeting the benchmark). Given the limited available evidence for active play across the para report cards, the overall grade for this indicator was INC.

An average letter grade of D was calculated for the Active Transport indicator based on seven letter grades from D− to B, which corresponded to 20%–73% of CAWD taking part in active transport. There were no para report cards with a letter grade of F (corresponding to less than 20% of CAWD meeting the benchmark) for Active Transport, although there were seven INC grades for this indicator. Much of the data were limited to only transport to or from school. Meanwhile, travel to other venues, such as sports or outdoor play facilities, was lacking.

The overall letter grade for the Sedentary Behavior indicator was D−, with ranges between and F and C corresponding to 20% or less to 53% of CAWD meeting the benchmark across eight countries and jurisdictions (Chile, France, Hong Kong SAR, Ireland, Israel, Poland, Spain, and United States). Data availability was insufficient (INC) or did not reflect the benchmark in Brazil, Finland, Lithuania, Philippines, and South Korea.

The Physical Fitness indicator had an overall grade of INC. Only South Korea assigned a letter grade of D+, which corresponded to 34%–39% of CAWD meeting the fitness benchmark. There was limited or nonrepresentative data for the physical fitness benchmark in Ireland, Israel, Lithuania, and Spain, yet nothing was reported in other countries or jurisdictions.

Sources of Influence Indicators

The overall grade for the Family & Peers indicator was INC. Of the four countries or jurisdictions that assigned letter grades for the Family & Peers indicator (Chile, Finland, Ireland, and Israel), none had data on all five benchmarks. Aggregate letter grades from multiple disability-specific benchmarks were produced from data in Chile (four benchmarks), Ireland (three benchmarks), Israel (four benchmarks), and Finland (two benchmarks).

An overall average letter grade of C was calculated for the Schools indicator. There were nine countries or jurisdictions with letter grades for this indicator, the highest in France (B+) mainly due to physical education (PE) opportunities available to the high percentage of students (80%) in mainstream schools and 94% of special education schools. The lowest grade of D was received in Lithuania, Spain, and the United States. That is to say that 27%–33% of CAWD met the
benchmark across the six benchmarks; the most commonly reported was the percentage of CAWD taught by a PE specialist ($n = 7$), followed by the percentage of active school policies ($n = 5$). No data were found on the parent report benchmark. Chile reported data on four of the benchmarks, Ireland reported on three benchmarks, two from Finland, France, Israel, Lithuania, Spain, and United States, and Brazil reported data on one benchmark for this indicator.

The overall letter grade for the Community & Environment indicator was D+, which would suggest that 34%–39% of CAWD had communities and environments that positively influenced PA. Chile, Finland, France, Israel, and Lithuania used data from three benchmarks to inform their letter grades, Brazil and Spain used data from two benchmarks, and Ireland had 12 separate survey items on the same benchmark (safe neighborhood to be physically active) in the Community & Environment indicator. The most data available were on municipality policies promoting PA for CAWD ($n = 5$) and accessible infrastructure specifically geared toward promoting PA ($n = 5$). Disaggregated data were lacking on the accessibility of facilities in Hong Kong SAR, and any type of data on this indicator was not available in the Philippines, Poland, and South Korea. In Canada and the United States, there were some data, but they were insufficient to assign a grade.

The Government indicator appeared in 13 para report cards and had the highest overall letter grade of C+. On average, governments had achieved between 54% and 59% of the benchmark. The HEPA Policy Audit Tool (Ward et al., 2021) was used in eight report cards (Brazil, Canada, Chile, Ireland, the Philippines, Poland, South Korea, and Spain). Qualitative assessment of reviewing policy documents, reports, and consultation studies was used to create letter grades for Finland (A−), France (C+), Hong Kong SAR (C+), Israel (C), and Lithuania (C).

**Additional Benchmarks**

Some countries and jurisdictions opted to assess additional indicators, such as sleep and 24-hr movement guidelines, in their para report cards. In the absence of specific benchmarks for sleep in the Global Matrix 4.0, the recommendations suggested by the National Sleep Foundation (Hirshkowitz et al., 2015) were used in those countries. Data on the sleep indicator were included by Canada (68%–87% met the recommendation), Spain (76% met the recommendation), and South Korea (40% met the recommendation). Concerning the 24-hr movement guidelines, only Canada and Spain reported, with far less than 20% of CAWD meeting all three guidelines of PA, screen time, and sleep.

**Discussion**

International collaborations to harmonize PA data on CAWD using similar methodology as the AHKGA Global Matrix 4.0 derived this special issue of brief reports and overview papers from around the globe. It is a starting point for understanding the data available on PA of CAWD through Para Report Cards from 14 countries or jurisdictions in five of the IFAPA regions. Only 55% of possible letter grades were assigned, which was much less than the 76% of letter grades reported in the first Global Matrix that included 15 countries (Tremblay, Gray,
et al., 2014). Data availability and quality varied widely between countries or jurisdictions as well as between indicators. It has already been highlighted that data on PA of CAWD is lagging behind that from the general pediatric population (Martin Ginis et al., 2021), and with 55% coverage from this Global Matrix, the existing evidence on PA of CAWD remains lower than what was produced from the general child and adolescent population almost a decade ago.

A recent increase in data availability on the PA of CAWD may be a result of multidisciplinary work that has begun to recognize the importance of PA in this population. Most notably, the 2020 WHO PA guidelines included, for the first time, people with disabilities (Carty, van der Ploeg, et al., 2021b). This suggests that sufficient evidence may already be available to produce PA guidelines specific to CAWD. From a political angle, a special session on PA for people with disabilities at the UN Human Rights Council (HRC 46) was held on the 5th of March 2021. Furthermore, at the 13th and 14th State Parties to the Convention on the Rights of Persons with Disabilities, side event sessions were coordinated by IFAPA to raise awareness among policy makers on the range of disability-specific PA programs globally (IFAPA, 2020, 2021). The #WeThe15 human rights campaign started in 2021 through collaboration among international sports organizations, such as the International Paralympic Committee, Special Olympics International, and Invictus Games Foundation alongside the International Disability Alliance (Carty, Mont, et al., 2021). These examples indicate that PA for individuals with disabilities is receiving attention across the globe, and this could be driving data collection and dissemination. As such, this was a suitable time to pursue a special issue that focuses on the available global data on PA of CAWD.

**Para Report Card Indicators**

The Government indicator had the greatest number of grades and the highest overall grade across the 14 countries or jurisdictions. The timing of these grades is significant as there has been increased attention to policies related to PA and disabilities in various sectors in recent years (Sit, Aubert, et al., 2022). Despite the strength of the Government indicator, reports of policy implementation are lacking, particularly in relation to disability. As with the grades reported in the AHKGA PA report cards (Aubert, Barnes, et al., 2022), most Para Report Cards had higher grades for the sources of influence indicators, of which the Government indicator is one, than the behavioral indicator grades. The behavioral grades were generally lower than those reported in the general population AHKGA PA report cards, confirming that PA behaviors and environments are less favorable in CAWD than in their peers from the general population (Martin Ginis et al., 2021). Given that CAWD tend to have worse health outcomes, often due to physical conditions, greater need for health care services, and higher prevalence of mental and social difficulties (Keogh et al., 2022), it is crucial to devise strategies to enhance the sources of influence and effectively promote higher levels of PA among CAWD.

Across the Para Report Cards, there were between 10 and 12 grades for Overall PA, Organized Sport and PA, and Sedentary Behavior, yet the overall grades for these indicators were the lowest (D−). It is important to note that grades for the Overall PA indicator were higher where the 4 days a week benchmark was used, challenging international comparisons. The WHO guidelines were published
during the COVID-19 pandemic, and any plans for data collection that could have used these updated guidelines were most likely postponed. The Para Report Cards, as with the Global Matrix 4.0, use the best available evidence identified by national report card teams to inform grades. Since the release of the WHO guidelines, the English chief medical officer (CMO) published slightly different recommendations of PA for CAWD. The CMO recommendations were based on a rapid review of evidence that was based on studies involving only CAWD, broken down into physical disability, intellectual and learning disabilities, sensory impairment, and mixed disabilities. Studies on children and adolescents with cerebral palsy made up 80% of the studies on physical disabilities (Smith, Rigby, et al., 2022). The physiological effects of PA are greater between individuals with cerebral palsy and those without disabilities than between those with intellectual or learning disabilities and those without disabilities (Martin Ginis et al., 2021). This may explain the differences between the evidence-based PA recommendations produced in the United Kingdom and those from the WHO (Smith, Rigby, et al., 2022). The different methodologies used by the CMO recommendations from the ones used in the WHO guidelines have brought forth discussions on ways to promote PA to CAWD as fun, safe, and health enhancing (Carty, van der Ploeg, et al., 2021a; Smith, Rigby, et al., 2022). Having discussions on these issues would be beneficial for the creation of future benchmarks for the Para Report Cards as it would allow for the consideration of appropriate tools for comparing data between CAWD and the general population.

Regarding the Organized Sport and PA indicator, data from disability sport participation showed that five countries or jurisdictions received a letter grade of F (Hutzler et al., 2022; Pozeriene et al., 2023; Silva & Silva, 2022), indicating that less than 20% of CAWD met the benchmark. Data in other Para Report Cards could have been based on participation in a combination of three typical settings: specialized programs, reverse integration (disability sports played by people with and without disabilities), or inclusion programs (Black & Williamson, 2011). For example, data from Canada and Finland were from national surveys specific to CAWD and two nationally representative health-based surveys (Arbour-Nicitopoulos et al., 2022; Asunta et al., 2022). Organizers of sport for CAWD can vary from place to place, from community to school groups and from regional camps to national sports federation organized activities (Geidne & Jerlinder, 2016), yet this type of information on program type, frequency, and quality of participation (Evans et al., 2018) was not explored through the benchmark in its current form.

The benchmark for the Sedentary Behavior indicator was based on the commonly accepted proxy of recreational screen time limits of 2 hr/day. This recreational time may include playing computer games, using the computer, watching TV (Ng et al., 2018), or using a smartphone or other type of screen device. The low overall grade of D− is indicative of the need to address sedentary behavior among CAWD. The 2020 WHO guidelines have a recommendation to limit recreational screen time without proposing a specific time amount (Bull et al., 2020). To implement these guidelines, communication messages to reduce sedentary behaviors need to be considerate of people with physical impairments (Smith et al., 2021). Some public health campaigns have messages like “sit less, move more,” which must be modified to include universal messages, such as “move more” (Smith et al., 2021) and “every move counts” (Bull et al., 2020).
Of the other two behavioral indicators, Active Play had an overall grade of INC as only three countries or jurisdictions reported grades. In the AHKGA Global Matrix 4.0, Active Play had the most INC grades (27/57 countries or jurisdictions) of all the behavioral indicators (Aubert, Barnes, et al., 2022). According to Lynch and Moore (2016), Active Play includes both indoor and outdoor activities and is often regarded as an occupation of children in and of itself, allowing self-development. Methodological development for surveillance and grading of this indicator is needed urgently.

Just over half the countries or jurisdictions produced grades for the Active Transport indicator. None reported a grade F, suggesting, from the countries with grades, that over 20% of CAWD engage in Active Transport. CAWD may face challenges in traveling (actively or passively) to or from school without assistance, including impairment, distance to school, lack of trained drivers to assist with motorized transport, and issues related to neighborhood safety and policies (Ross et al., 2020). Hence, it would be important to investigate levels of active travel in the places where INC was graded, and those results may challenge the current findings. The grade for the Active Transport indicator was much higher in Finland (B) than in any other country or jurisdiction. This might have been because the data were limited to the proportion of students who lived within 5 km of the school. The reason for limiting data to within 5 km in Finland was that individuals who live beyond this distance from their schools are provided free transportation (Asunta et al., 2022). With a quarter of students in Finland living over 5 km from their school (Kallio et al., 2019), even without limiting the data, the grade would remain the highest among other Para Report Cards. Specific Active Transport information for CAWD is needed in areas such as accessibility, ability, and environmental structures.

There was only one grade for the Physical Fitness indicator, and this was possible due to a national program by the Korean Paralympic Committee. In South Korea, CAWD visited one of the 11 fitness centers around South Korea between 2018 and 2021 to complete testing (Lee et al., 2022). Physical fitness for people with disabilities has been growing over several decades, with important developments, such as norms for specific impairment groups (e.g., Buell’s norms for people with visual impairments in 1982) and adapted tests, such as the Brockport Physical Fitness Test (Winnick, 2011) and adapted tests for national physical fitness systems (Király et al., 2019). At a national level, there are several challenges for monitoring physical fitness levels. This was highlighted by the Hong Kong SAR team wherein no consensus was reached on the parameters for defining physical fitness among CAWD, and so the team did not search for evidence (Sit, Huang, et al., 2022). Even in the general AHKGA Global Matrix 4.0, 54% of countries or jurisdictions reported INC for Physical Fitness (Aubert, Barnes, et al., 2022). Valid and reliable fitness testing among CAWD presents significant complexities that make large-scale assessment challenging. This is a major weakness of the current Physical Fitness indicator (Hutzler et al., 2023).

The Family & Peers indicator was based on two population groups (family members and peers) with five benchmarks, yet there were grades from only four countries or jurisdictions. The Para Report Card grades were either higher than (Chile and Ireland) or the same as (Finland and Israel) in the general report cards at the country level (Aubert, Verdot, et al., 2022; Hutzler et al., 2022; Ng et al., 2022). These findings highlight the importance of family and friends in childhood functioning, particularly among CAWD (Rosenbaum & Gorter, 2012), as well
as the extra effort from parents of CAWD to support their child in PA (Goodwin & Ebert, 2018). The data were only collected from countries with very high human development index ratings; researchers in low- to middle-income countries may face challenges in collecting this type of data. Involvement from family members in these areas may be disrupted by issues such as stigma associated with children with disabilities (Keogh et al., 2022). The lack of evidence in this area demonstrates the need for data collection that involves family and peers of CAWD.

The Schools indicator consisted of six benchmarks, with grades from 10 countries or jurisdictions. This high number could be partly because the Kazan Action Plan was signed by the ministers responsible for PE and agreed to disaggregate indicators by disabilities on the contribution of PE to the sustainable development goals (UNESCO, 2017). Countries or jurisdictions have different educational provisions for CAWD (Keogh et al., 2022), such as general schools, special education classes, or designated or separate classes. As such, harmonization of school data was particularly challenging given the different education systems. It has been reported that approximately 72% of CAWD globally have access to PE (Hardman et al., 2014), yet from the Para Report Cards, only France reported a grade that reflected this level (Aubert, Verdot, et al., 2022). The benchmarks for the Schools indicator could also come from different data sources, such as self-reports, proxy reports, and school administration data.

The Community & Environment indicator was graded in eight countries or jurisdictions using seven benchmarks. The physical environment benchmarks mainly reflected perceived neighborhood safety. Some data used to assign grades were not disaggregated by disability status as it was assumed that CAWD live in the same neighborhoods as the general population (López-Gil et al., 2023). Some countries opted to grade this indicator as INC when there were insufficient data on accessibility of environments for CAWD to engage in PA (Arbour-Nicitopoulos et al., 2022; Stanish et al., 2023).

CAWD experience many environmental or physical barriers to PA, including lack of appropriate equipment (Shields & Synnot, 2016). As such, an additional disability-specific benchmark was created on the “percentage of CAWD with access to adapted PA or sport equipment.” No countries or jurisdictions were able to report on this benchmark. Developing measures to assess this benchmark is needed. Specific data in this area would help to inform the construction of spaces and places and provide equipment that promote meaningful participation in PA by CAWD. The high degree of variation in community-based PA policy implementation across the Para Report Cards, as evidenced by the range of grades, points to the need for collaboration between communities and local government. Improved access to safe and inclusive spaces for CAWD is necessary, and partnerships among families, community providers, and local governments may support this work.

Since 24-hr movement behaviors cover the whole day (i.e., 24-hr period), PA, sedentary behavior, and sleep are codependent and should be examined simultaneously (Dumuid et al., 2018). Additional behavioral monitoring of sleep would improve our understanding of the extent to which 24-hr movement guidelines are met by CAWD, and this was possible for only three Para Report Cards (Arbour-Nicitopoulos et al., 2022; Lee et al., 2022; López-Gil et al., 2023). Some international research exists on 24-hr movement of CAWD (Li et al., 2022), and further inclusion within future Para Report Cards may lead to improved global efforts to improve PA.
Comparisons Between Para Report Cards and Global Matrix 4.0

Overall, the grades on the Para Report Cards were lower than those in the Global Matrix 4.0 (Silva et al., 2022), corroborating evidence to support that PA levels are lower among CAWD than in the general population (Martin Ginis et al., 2021). These differences highlight the added risk of physical inactivity among CAWD as well as to population health (Smith, Rigby, et al., 2022). Data comparisons between the Para Report Cards and Global Matrix 4.0 PA Report Cards should be made with caution, particularly where there were large data gaps specific to CAWD. CAWD should be directly involved in efforts to address these findings. Good practice examples might include coproducing research, sense checking with panels of individuals with lived experiences of disability, and codesigning infographics that are accessible to CAWD (Smith, Netherway, et al., 2022).

There were 57 countries or jurisdictions that formed the Global Matrix 4.0 (Aubert, Barnes, et al., 2022); around a quarter put together a task force to disaggregate their grades by disability and collaborated to create this Global Matrix of Para Report Cards. Some of the data were gathered from the same sources used for the Global Matrix 4.0. For example, national surveys included items on disability status, so results on individuals with disabilities could be presented. In other cases, data from targeted surveys on CAWD were used. Under the Convention of the Rights of Persons with Disabilities, general data should be disaggregated by disabilities (United Nations, 2006). With over 180 ratifications of this convention globally, data may already be available, yet resources to report findings may be lacking. It is important to note that without breaking down data by disability type, overall grading may already include the experiences of individuals with disabilities. This can lead to under- or overreporting of grades in the general report without explicitly considering the unique needs and challenges of this population.

Strengths and Limitations

The major strength of this project is that participating countries or jurisdictions followed similar procedures to the Global Matrix 4.0, which allows for some comparisons. Specifically, parallel activities took place, such as recruitment of teams within the AHKGA, using similar benchmarks (and adjusting to reflect CAWD where required) and grading ranges, external auditing of the grades, and reporting the synthesis in a Global Matrix of Para Report Cards.

The project also has some limitations and recommendations for future efforts to harmonize global PA data among CAWD. First, 45% of potential grades from 14 countries or jurisdictions were INC, which is considerably higher than the first Global Matrix published almost a decade ago wherein 24% of grades were INC (Tremblay, Gray, et al., 2014). This highlights the limited data that exist for CAWD and the need for improved instruments and targeted efforts for data collection. Between-country or jurisdiction differences need to be evaluated with caution as the number of grades varied from two to nine, and approaches to data collection, inclusion, and analyses may have differed slightly. Only five of the seven IFAPA regions were able to provide letter grades according to these protocols. Another recognized limitation is the generic nature of the grading
criteria as applied to CAWD. Originally developed for children and adolescents in the general population, the benchmarks were largely unchanged and did not reflect the unique abilities and heterogeneity of CAWD. Grades would be more actionable if they were designed from a disability-specific knowledge base. Finally, different types of disability may need to be considered in future evaluations. At present, this paper provides the PA status of CAWD in a combined way with minimal breakdown by disability groups and other demographic factors.

This Global Matrix of Para Report Cards did not ignore the heterogeneity within the disability population. At country levels, people with disabilities and, where possible, CAWD were involved in the process of converting data to, and agreeing on, grades. It has been demonstrated that CAWD can, and should, be involved in data collection where possible. Many countries or jurisdictions that took part in the Global Matrix of Para Report Cards cross-referenced data with interest groups that were able to represent CAWD. More details can be found in the brief reports as well as the SWOT analysis paper (Hutzler et al., 2023).

This is the first Global Matrix of Para Report Cards that provides an overview of the status of PA behaviors and influences among CAWD across regions. Details of country- or jurisdiction-specific Para Report Cards can be found in this special issue. With the increased participation in the AHKGA, a recent formalized partnership between IFAPA and the AHKGA, and greater awareness of the disparities of PA among CAWD, it is anticipated that future Para Report Cards will play a role in advocacy and research.

**Summary**

There were 14 countries or jurisdictions from five of the seven IFAPA regions that provided Para Report Cards in this special issue. This is a major advance in the global knowledge of PA for CAWD, particularly in terms of comparability of PA indicators between countries or jurisdictions. This Global Matrix of Para Report Cards sets a point of reference for further work. More countries or jurisdictions around the world, particularly in low- to middle-income countries, may need the tools to engage in data collection and dissemination of findings specific to PA of CAWD. Discussion about data provision, benchmarks, and indicators for CAWD have been presented to encourage international efforts to collect and report data that allow for disaggregation by disability status.

The Para Report Cards initiative may lead to comparisons within and between countries or jurisdictions over time. Such comparisons can help program designers and policymakers adopt, adapt, and share good practices to promote health and active living for CAWD. The overall average grades were low for the behavioral indicators, suggesting an urgent need for intervention.

**Note**

1. The definitions of children and adolescents can be found from the adolescent health literature (see Sawyer et al., 2018). The term “CAWD” is used throughout this special issue to refer to data that are specific to CAWD or children and adolescents with chronic conditions, and it is not intended to place a label on individuals with disabilities.
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