Physical Activity in Puerto Rico: Recommendations for Research, Surveillance, and Policy Development

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Objectives: The objectives of this report were to 1) describe the 2015 and 2020 physical activity (PA) Country Cards of Puerto Rico (PR), including data beyond the 2020 Country Card, and 2) propose recommendations for promoting PA research, surveillance, and policy development.

Methods: A comparison of the 2015 and 2020 data from the PR Country Cards provided by the Global Observatory for Physical Activity (GoPA!) was conducted. Country Card data were collected from the World Bank, the United Nations, PubMed, and the Behavioral Risk Factor Surveillance Survey (BRFSS). This ensured that data indicators were standardized for global comparability. Local representatives facilitated data collection through a collaborative review process with GoPA! Country Card data included demographic characteristics, mortality rates, PA prevalence, surveillance data, policy, and research indicators.

Results: In 2015, the BRFSS data indicated a PA prevalence of 34% in PR, decreasing to 20% in 2020. No data on inactivity-related mortality or a national standalone plan focused on PA was available. From 2015 to 2020, research output in PR increased slightly, improving its global ranking from the 61st to the 58th position.

Conclusions: The PR Country Card is a tool to raise awareness and identify surveillance, research, and policy gaps. Recommendations include establishing a dedicated PR health monitoring system, integrating PA into PR national public health plans, and establishing an interinstitutional coalition for PA research (in PR). Multi-sector efforts from policymakers, researchers, and stakeholders are essential for meaningful progress in improving PA levels and public health in PR.

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Physical inactivity is a global pandemic, with one-third of the population not meeting recommended physical activity (PA) levels in 2022 (1,2). Being physically inactive is a leading risk factor for several non-communicable diseases (NCDs) (1). In Puerto Rico (PR), NCDs account for over half of all deaths (3,4). Historically, there was no known dedicated observatory to monitor PA at national and global levels. This prompted the creation of the Global Observatory for Physical Activity (GoPA!) in 2012, an international organization of PA researchers, epidemiologists, and public health policymakers who collect and analyze global data on PA and health (5). "Country Cards," developed by GoPA! provide data on country characteristics, PA surveillance, national policy, and research metrics (5,6,7). The website for GoPA! is found at: https://new.globalphysicalactivityobservatory.com/.

The GoPA! Country Cards, published in 2015 and 2020, provide data at the country level, informing global policymaking and intervention planning for PA promotion (5). The 2015 and 2020 editions included 139 and 164 Country Cards, respectively, with 164 local country representatives, including PR (6,7). PR is an unincorporated territory of the United States; however, the GoPA! treats the island as a standalone nation. Physical inactivity is a key risk factor for several NCDs in PR; therefore, targeting PA promotion across its 4 domains (occupational, domestic, leisure, and active transport) is essential for NCD prevention (3,4). This report aims to 1) describe PR's 2015 and 2020 PA Country Cards and relevant data beyond 2020 and 2) provide recommendations for enhancing PA research, surveillance, and policy in PR.

Methods

GoPA! created the Country Cards for its members in 2015 and followed up in 2020 to facilitate global comparability of the member countries' PA indicators (6,7). The PR Country Card data were collected from the World Bank, the United Nations, and the Behavioral Risk Factor Surveillance System (BRFSS). Local representatives were chosen based on PA and public health expertise, and information was provided and reviewed for card finalization (6,7). This brief report did not require institutional review board approval because it did not involve human subjects or access to identifiable private information.

The PR Country Card underwent a thorough review by a working group of researchers and non-academics to ensure the card's accuracy (4,5). Launched in 2016 as part of the GoPA! PA Almanac, the Country Card, aimed to showcase PR's progress in promoting PA among adults. The second set of cards, in 2020,

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introduced the PA promotion capacity pyramid, indicating a country's capacity for PA research, surveillance, and policy (5,7). The PR Country Cards include such indicators as socio-demographic characteristics, PA prevalence, surveillance, PA policy status, and research characteristics (5). PubMed is the primary database for the research indicators, which may overlook relevant evidence specific to PR, but that is in other databases. The prevalence of PA reported in the 2015 Country Cards is based on the 2010 guidelines on PA and sedentary behavior from the World Health Organization (WHO), while the 2020 Country Cards followed the updated 2020 WHO guidelines (6,7). As we approach the release of the 2025 Country Cards, the most recent PA levels (2019) reported to GoPA! align with the WHO 2020 guidelines (8). The WHO 2020 guidelines include 2 indicators, the prevalences of aerobic exercise and strength training, in the results.

Results

Table 1 presents the PR country profile results and data sources for 2015 and 2020. Figures 1 and 2 contain the 2015 and 2020 PR Country Cards, respectively.

2015 PR Country Card

In 2015, PR was classified as a high-income country (HIC) with 3.6 million inhabitants, having a Gini index of 0.55 and a Human Development Index (HDI) of 0.86. Non-communicable diseases accounted for 19% of all deaths; however, data on deaths attributable to physical inactivity were not available. PA prevalence among adults was 34%, with a higher rate in males (40%) than females (28%). Surveillance relied on the BRFSS, and no standalone PA plans were present for PR. Two articles on PA were published in 2013, with PR ranking 61st globally in PA research, contributing 0.11% to the field. Only 12 active PA researchers and 2 research groups were present in PR in 2013.

2020 PR Country Card

In 2020, PR remained a HIC with 3.2 million inhabitants. While the Gini index, HDI, and deaths from NCDs were unchanged from 2015, life expectancy increased to 80 years, and literacy rates rose to 92%. The urban population represented 93.6% of PR residents. Although no data on deaths from physical inactivity was available, adult PA prevalence was 20%, a higher rate in males (23%) than females (17%). The NCD plan for PR contains no standalone recommendations for PA. PR has no system aimed exclusively at monitoring PA, nor does it have any representative data on sedentary behavior. Ranking 58th, PR contributed 0.16% to global PA research. Under the PA promotion capacity pyramid, PR exhibited high research capacity (green) and medium policy and surveillance capacity (yellow).

2025 PR Country Card – Forthcoming

According to the most recent BRFSS data (2019), PA prevalence in the community in PR was 30.2%, with males exhibiting a higher rate (34.1%) than females (26.7%). Combined PA (i.e., combined aerobic PA and strength straining) prevalence was 7.3% for all adults, with males (8.9%) having a higher rate than females (5.8%). Specifically, strength training prevalence was 11.6% for all adults, with males (14.4%) having a higher rate than females (9.1%). There have been no changes in the surveillance or policy since the release of the previous PR Country Cards.

Discussion

We outline recommendations to strengthen surveillance, policy, and research for PA promotion in PR.

Surveillance

The prevalence of PA in the community in PR is below the 68.7% global average, and BRFSS data is limited by recall bias and excluded populations (9). To address the PA surveillance gap, PR needs an independent health-monitoring system with tailored indicators for tracking PA domains and sedentary behavior, alongside spatial and health data, to identify regional inequities and allocate resources effectively.

Integrating digital health tools such as wearable devices and mobile apps into existing monitoring systems could improve PA surveillance, particularly in underserved populations. Wu et al. (2023) found that mobile tracking reduced HbA1c levels in older Black and Hispanic individuals with diabetes (10). These tools provide real-time data and enhance PA measurement accuracy. However, addressing privacy and surveillance concerns and ensuring secure data handling, participant consent, and transparent communication about data use are essential to protect participants' rights.

Policy

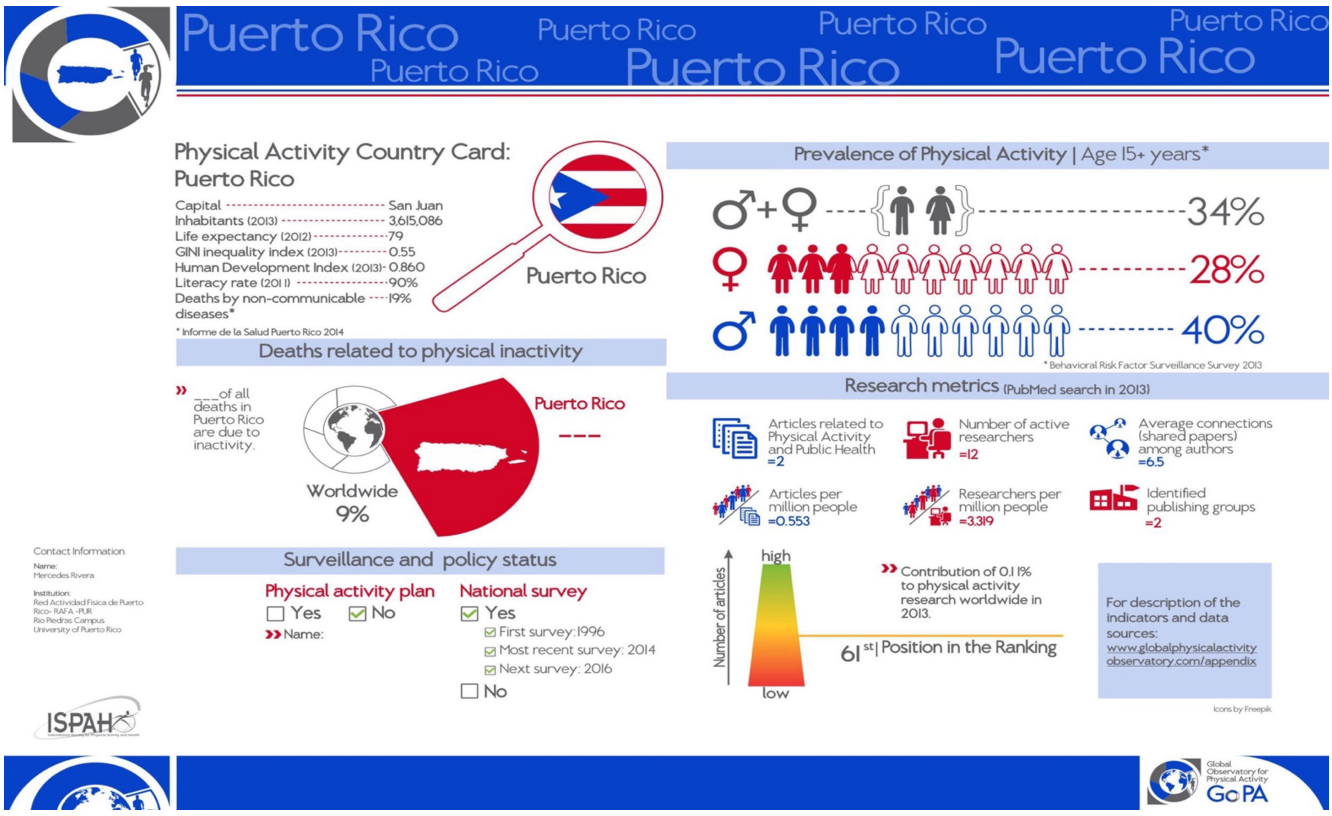
Although the health plan, *Puerto Rico Healthy People 2020 Strategic Plan*, is outdated, its purpose was to decrease NCDs with some strategies related to PA (11). For example, one proposed strategy was promoting PA at the municipal and island-wide level by creating more access to places for PA (11); however, the implementation of these strategies has yet to be evaluated. Recent policy documents include a circular letter from the PR Department of Education and the "Guide to Healthy Eating and Physical Activity for PR" (12,13). The circular letter establishes public policy regarding physical education programs in primary and secondary schools in PR. It contains 5 standards: the mastery of movement, the understanding of movement, personal physical fitness, responsible behavior, and an active and healthy lifestyle (12,13); however, it lacks data regarding PA behavior.

To address the PA policy gap, we recommend creating transparent public policies that clearly outline standalone PA initiatives within an overarching public health plan (14,15). While the PR Food and Nutrition Commission includes PA in its mission, establishing a dedicated PA commission for PR could be highly beneficial; PA strategies should involve multi-sector efforts that engage professionals across healthcare, urban planning, transportation, sports, education, and policymaking (15). To promote active transportation, policies must go beyond education and ensure safe infrastructure and traffic management to support walking and cycling (14,15).

Table 1. Puerto Rico (PR) Physical Activity (PA) Country Profile – Results and Data Sources for 2015 and 2020

	Indicator	2015 PR Country Card	2020 PR Country Card	Data Source
Demographics	Total Population	3,615,016	3,195,153	World Bank, country data
	Life Expectancy	79	80	World Bank, country data
	Gini Inequality Index	0.55	0.55	World Bank, country data
	Literacy Rate	90%	92%	World Bank, country data
	Human Development Index	0.86	0.86	International Human Development Indicators, United Nations
	Percentage of Urban Population	-	93.6%	World Bank, country data
	World Bank Income Category	-	High Income	World Bank, country data
Mortality	Deaths From Non-communicable Diseases	19%	19%	World Bank
	Deaths Related to Physical Inactivity	-	-	Lee et al. The Lancet, 2012, Physical Activity Series
PA Prevalence	Aerobic Exercise Prevalence (Total, by Sex)	Total: 34% (95% CI = 32.0–35.2); Males: 40% (95% CI = 37.2–42.4); Females: 28% (95% CI = 26.3–30.0)	Total: 20% (95% CI = 18.1–21.2); Males: 23% (95% CI = 20.3–25.4); Females: 17% (95% CI = 14.9–18.6)	Behavioral Risk Factor Surveillance Survey (BRFSS)
Surveillance and Policy	PA Plan	No existing physical activity plan	1) Plan of Action for the Prevention and Control of Noncommunicable Diseases in the Americas 2013–2019; 2) Puerto Rico Healthy People 2020 Strategic Plan	WHO MiNDbank database of resources; Google and PubMed; country contact
	National Survey	Behavioral Risk Factor Surveillance Survey (BRFSS)	Behavioral Risk Factor Surveillance Survey (BRFSS)	Demographic & Health Survey website; WHO database; Google search; country contact
Research Characteristics	Articles Related to PA and Public Health	2	39	PubMed
	Number of Active PA Researchers	12	-	PubMed
	Average Connections Between Authors	6.5	-	PubMed
	Identified Publishing Groups of	2	-	PubMed
	Researchers per Million People	3.319	-	PubMed and World Bank
	Articles per Million People	0.553	-	PubMed and World Bank
	Country Ranking of PA Research Worldwide (out of 139 countries in 2015 and out of 176 countries in 2020)	61st	58th	PubMed and World Bank
	Country Contribution Percentage to PA Research Worldwide	0.11	0.16	Varela, Andrea Ramirez, et al. "Worldwide use of the first set of Physical Activity Country Cards: The Global Observatory for Physical Activity-GoPA!."
	PA Promotion Capacity Pyramid Classification: Research	-	High (Green)	PubMed and World Bank
	PA Promotion Capacity Pyramid Classification: Policy	-	Medium (Yellow)	Varela, Andrea Ramirez, et al. "Worldwide use of the first set of Physical Activity Country Cards: The Global Observatory for Physical Activity-GoPA!."
	PA Promotion Capacity Pyramid Classification: Surveillance	-	Medium (Yellow)	Varela, Andrea Ramirez, et al. "Worldwide use of the first set of Physical Activity Country Cards: The Global Observatory for Physical Activity-GoPA!."

Figure 1. The 2015 Puerto Rico Country Card with the Physical Activity Profile (Global Observatory for Physical Activity, 2016)



Note: That 9% of deaths are related to physical inactivity is a global estimate; the estimate for Puerto Rico is not available.

Research

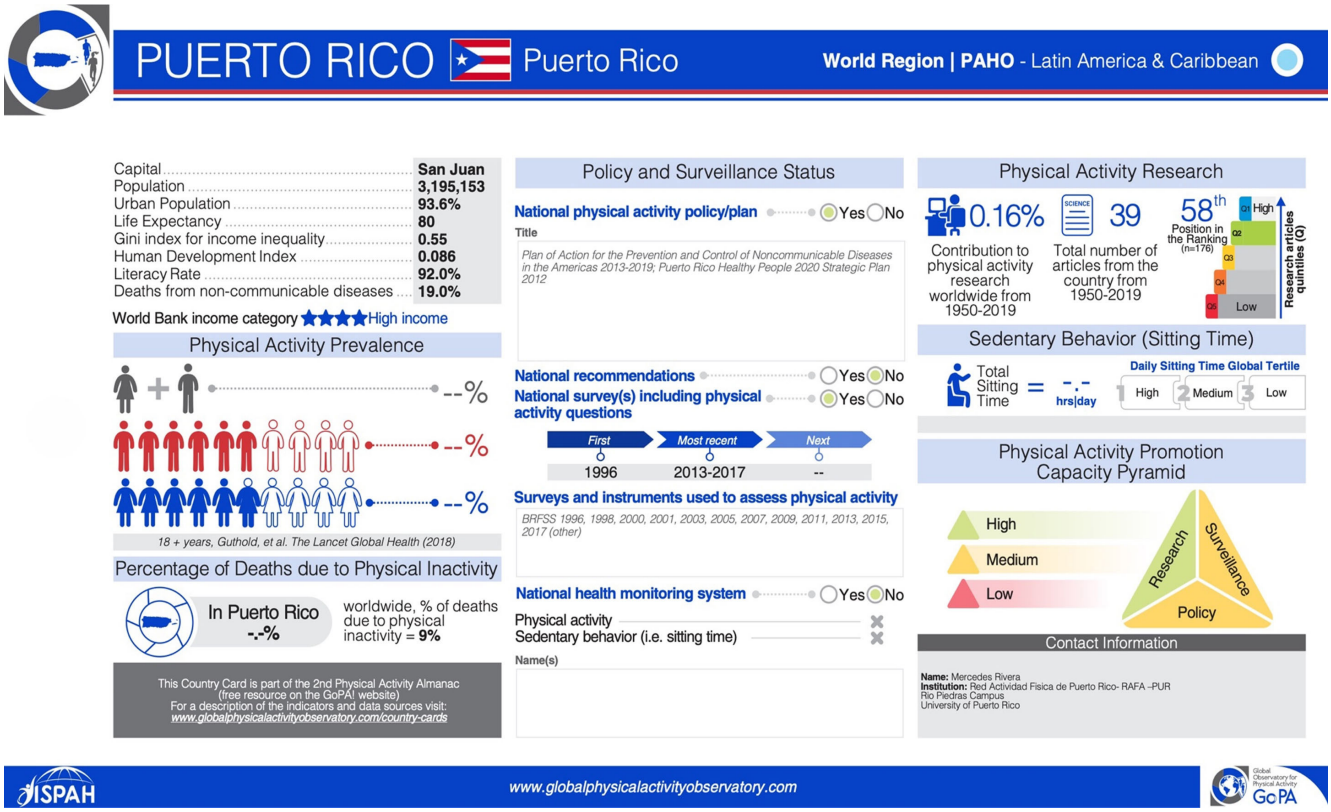
There was a minimal increase in the research contribution of PR worldwide from 2015 to the 2020 Country Card. We recommend forming an interinstitutional PA research coalition to guide evidence-based policy and interventions. Research is concentrated in high-research institutions like the University of PR's Rio Piedras and Medical Sciences campuses. This coalition would integrate initiatives across institutions, fostering collaboration and resource-sharing. Leveraging the PR Physical Activity Network could enhance multidisciplinary research and address key PA challenges. Incorporating PA courses in medical and public health curricula could build a workforce skilled in advancing PA research (3,12,13).

The advancement of PA research requires new tools (e.g., digital health tools) to help improve the measurement and accuracy of active behaviors. However, consent and privacy in participation must be ensured to safeguard participants' rights and uphold ethical standards. This report emphasizes the need to promote PA in PR and recommends actions such as establishing a health monitoring system, integrating PA into public health plans, and forming an interinstitutional coalition for PA research to prevent NCDs. The 2015 and 2020 PR Country Cards highlight gaps in surveillance, research, and policy related to PA. Multi-sector efforts are essential for advancing PA levels and reducing the impact of physical inactivity on NCDs in PR.

Resumen

Objetivos: Los objetivos fueron los siguientes: describir la Tarjeta de Actividad Física (AF) de Puerto Rico (PR) de 2015 y 2020, incluyendo datos más allá del 2020, y proponer recomendaciones para promover la investigación, vigilancia y políticas públicas de AF. Métodos: Se realizó una comparación de los datos de 2015 y 2020 de la Tarjeta de AF de PR desarrollada por el Observatorio Global de Actividad Física. Los datos se recopilan del Banco Mundial, las Naciones Unidas, PubMed y la Encuesta de Factores de Riesgo Conductual. La Tarjeta de AF de PR incluye datos de características demográficas, mortalidad, prevalencia de AF, vigilancia, políticas públicas e indicadores de investigación. Resultados: En 2015, los datos de BRFSS indicaron una prevalencia de AF del 34% en PR, disminuyendo a 20% en 2020. Datos sobre mortalidad debido a la inactividad no estaban disponibles y no se contaba con un plan nacional independiente centrado en AF. De 2015 a 2020, la investigación aumentó con un cambio mínimo en el ranking global de la posición 61 a la

Figure 2. The 2020 Puerto Rico Country Card with the Physical Activity Profile (Global Observatory for Physical Activity, 2021)



Note: That 9% of the deaths are related to physical inactivity is a global estimate; the estimate for Puerto Rico is not available.

58. Conclusiones: La Tarjeta de AF de PR es una herramienta valiosa para crear conciencia e identificar brechas en la vigilancia, investigación y políticas públicas. Las recomendaciones incluyen establecer un sistema de monitoreo de salud dedicado a PR, integrar la AF en los planes nacionales de salud pública y establecer una coalición interinstitucional para la investigación en AF. Es imperativo un esfuerzo multisectorial para lograr aumentar los niveles de AF y mejorar la salud pública en PR.

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