Comparison of self-reported and accelerometer measured physical activity in five African-origin populations

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Background

- PA is important for NCD prevention
- Physical inactivity contributes to NCD occurrence
- WHO target: ↓global physical inactivity by 15% by 2030
- WHO relies on self-reported PA, using the GPAQ, but studies have shown that there may be overreporting using these tools.

AIM: compare self-reported and objectively measured PA, by determining the extent to which participants are classified as meeting PA guidelines by both measures, and identifying participant characteristics associated with the difference between self-reported and objectively measured PA


US
Very high
Ghana
Lower middle
Seychelles
High
Jamaica
High
South Africa
Middle
Baseline: 2010 – 2011
Follow-up: 2017 – 2019
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ARCTIC OCEAN
Greenland
(Denmark)
Svalbard
(Norway)
United States
Russia
Iceland
Norway
Sweden
Finland
Estonia
Latvia
Lithuania
U.K.
Ireland
Kazakhstan
Mongolia
China
Japan
India
Iran
Mexico
Caribbean
Central America
Guyana
Suriname
French Guiana (France)
Brazil
Bolivia
Paraguay
Chile
Argentina
Uruguay
Senegal
The Gambia
Guinea-Bissau
Guinea
Sierra Leone
Liberia
Cote d'Ivoire
Ghana
Togo
Benin
Nigeria
Niger
Chad
Equatorial Guinea
Gabon
Dem. Rep. of Congo
Uganda
Rwanda
Burundi
Tanz.
Angola
Zambia
Zim.
Namibia
Bots.
South Africa
Lesotho
Malawi
Mozambique
eSwatini
Madagascar
Australia
New Zealand
Papua New Guinea
Indonesia
Timor-Leste
Solomon Islands
New Caledonia
Fiji
Philippines
Malaysia
Sri Lanka
Taiwan
Vietnam
Laos
Cambodia
Thailand
Nepal
Bhutan
Pakistan
Afghanistan
Turkmenistan
Uzbekistan
Kyrgyzstan
Tajikistan
Turkey
Cyprus
Syria
Iraq
Kuwait
Qatar
Lebanon
Israel
Jordan
Armenia
Georgia
Azerbaijan
Ukraine
Belarus
Poland
Germany
France
Netherlands
Belgium
Denmark
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Moldova
North Korea
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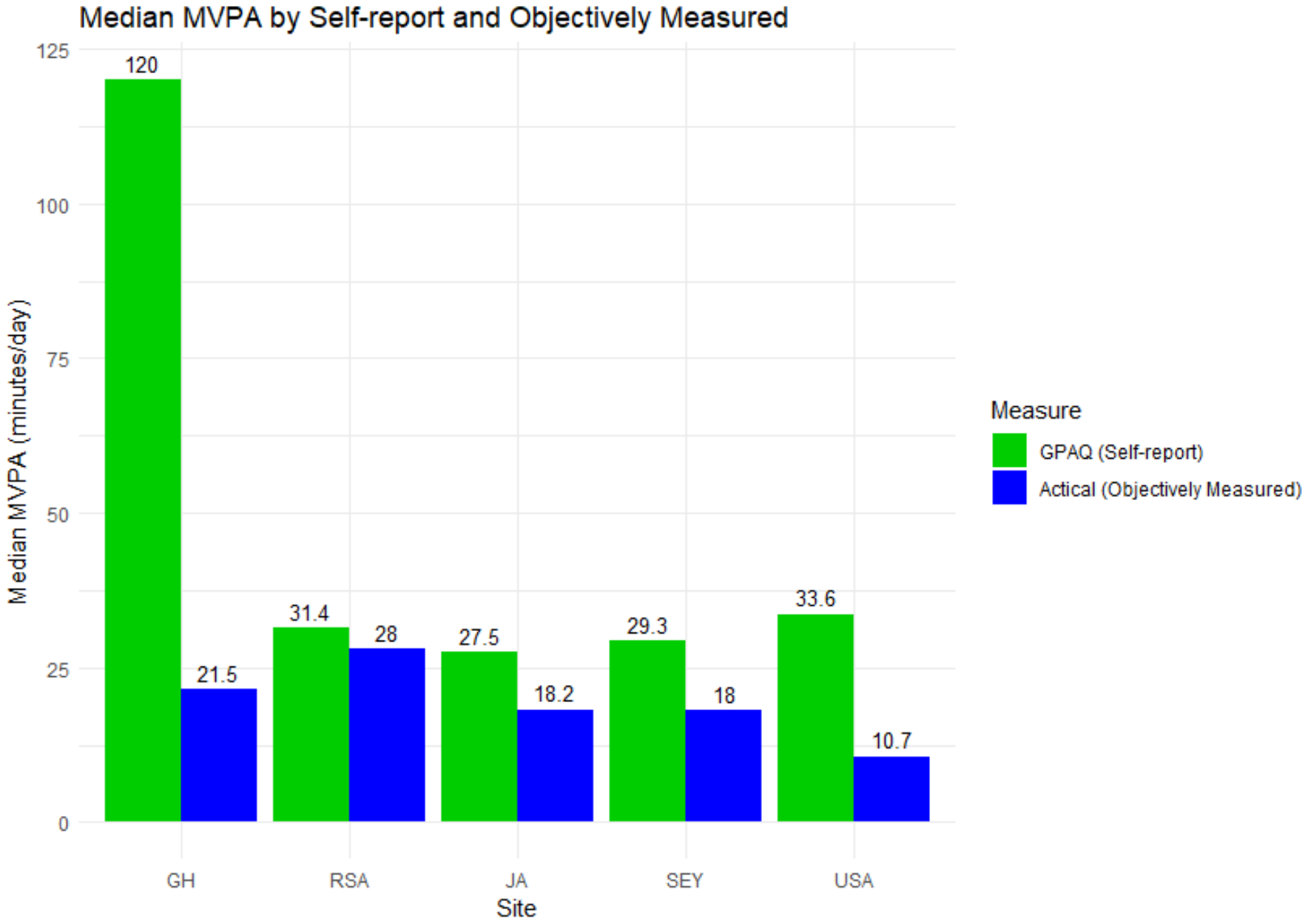
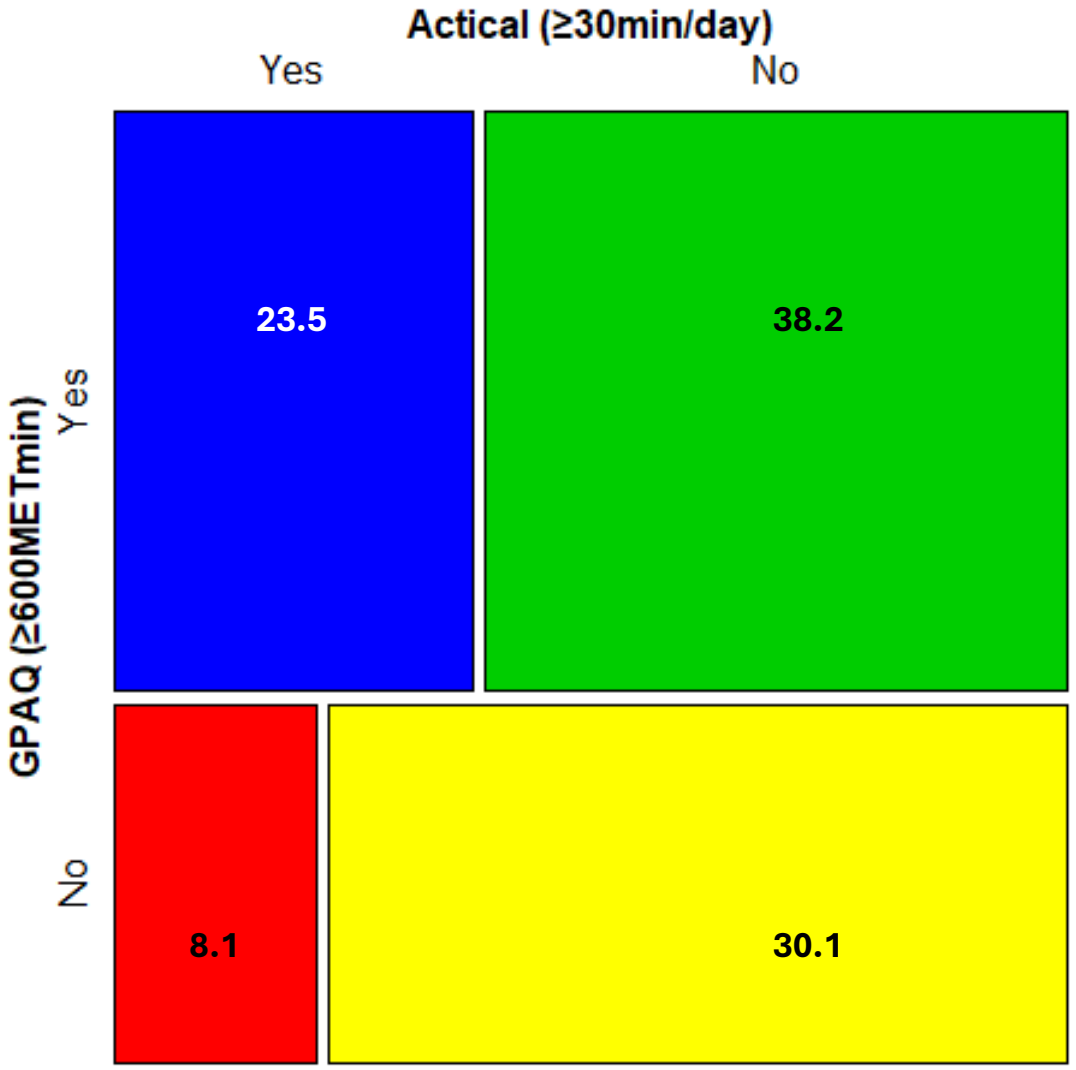
Participant characteristics – men					
	Ghana (n=57)	South Africa (n=107)	Jamaica (n=91)	Seychelles (n=121)	United States (n=74)
Age (years)	44 (38, 49)	38 (33, 43)	45 (38, 49)	44 (41, 48)	48 (43, 52)
Obese	3 (5.3)	4 (3.7)	15 (16)	37 (31)	25 (34)
Manual labour	41 (72)	25 (23)	54 (59)	39 (32)	45 (61)
Smoker	1 (1.8)	84 (79)	10 (11)	27 (22)	29 (39)
Diabetes	0 (0)	4 (3.7)	3 (3.3)	28 (23)	15 (20)
Hypertension	18 (32)	47 (44)	45 (49)	75 (62)	56 (76)
Median (IQR); n (%)					

Participant characteristics – women					
	Ghana (n=126)	South Africa (n=147)	Jamaica (n=147)	Seychelles (n=159)	United States (n=132)
Age (years)	41 (34-47)	34 (29-43)	46 (39-50)	44 (38-49)	46 (42-51)
Obese	48 (38)	92 (63)	87 (59)	75 (47)	93 (70)
Manual labour	54 (43)	27 (18)	59 (40)	26 (16)	43 (33)
Smoker	0 (0)	29 (20)	9 (6.1)	6 (3.8)	25 (19)
Diabetes	7 (5.6)	6 (4.1)	14 (9.5)	26 (16)	24 (18)
Hypertension	32 (25)	58 (39)	86 (59)	81 (51)	92 (70)
Median (IQR); n (%)					


Median MVPA by Self-report and Objectively Measured
Median MVPA (minutes/day)
125
100
75
50
25
0
120
21.5
31.4
28
27.5
18.2
29.3
18
33.6
10.7
GH
RSA
JA
SEY
USA
Site
Measure
GPAQ (Self-report)
Actical (Objectively Measured)


Actical (≥30min/day)
Yes
No
GPAQ (≥600METmin)
Yes
No
23.5
38.2
8.1
30.1

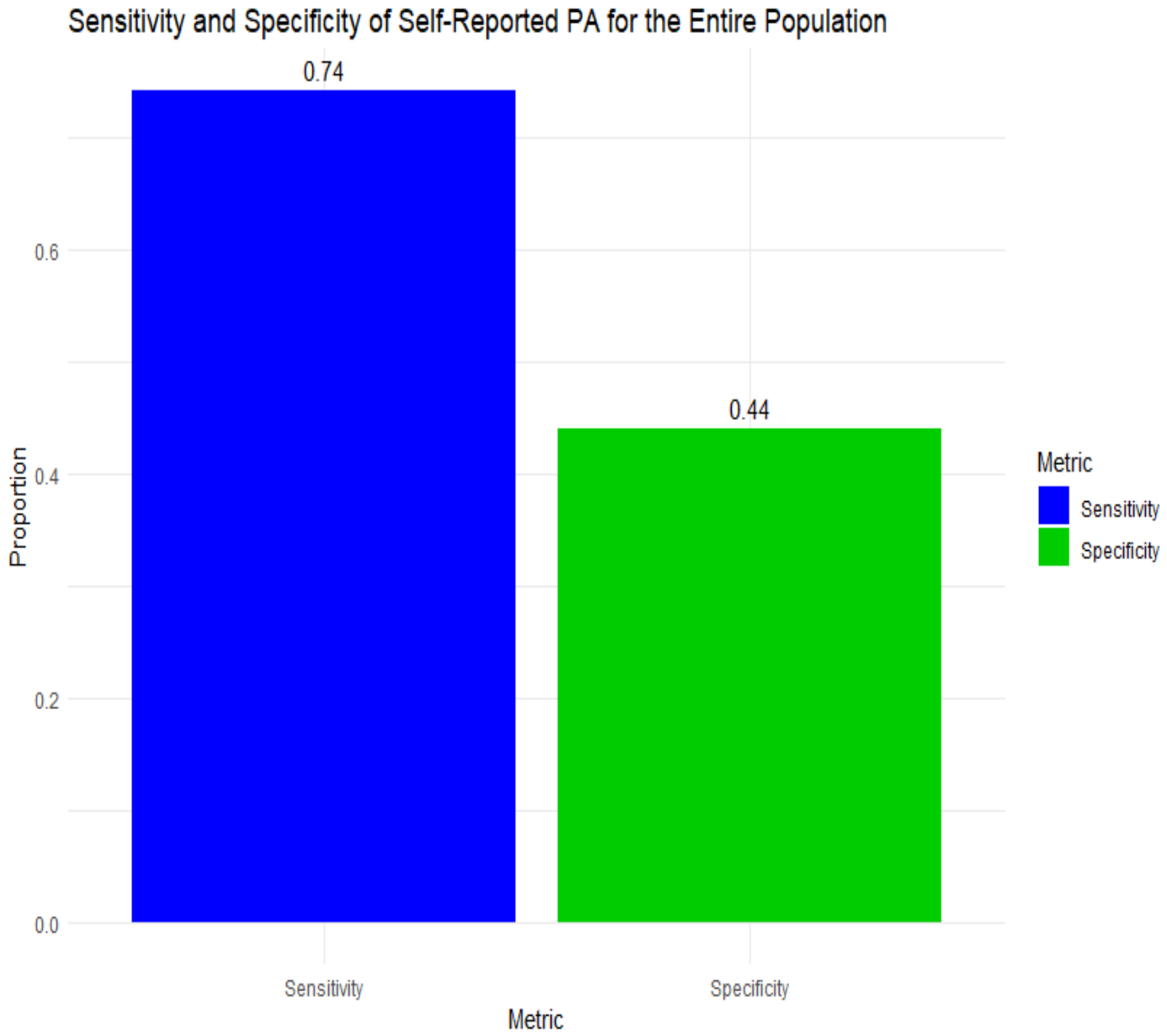
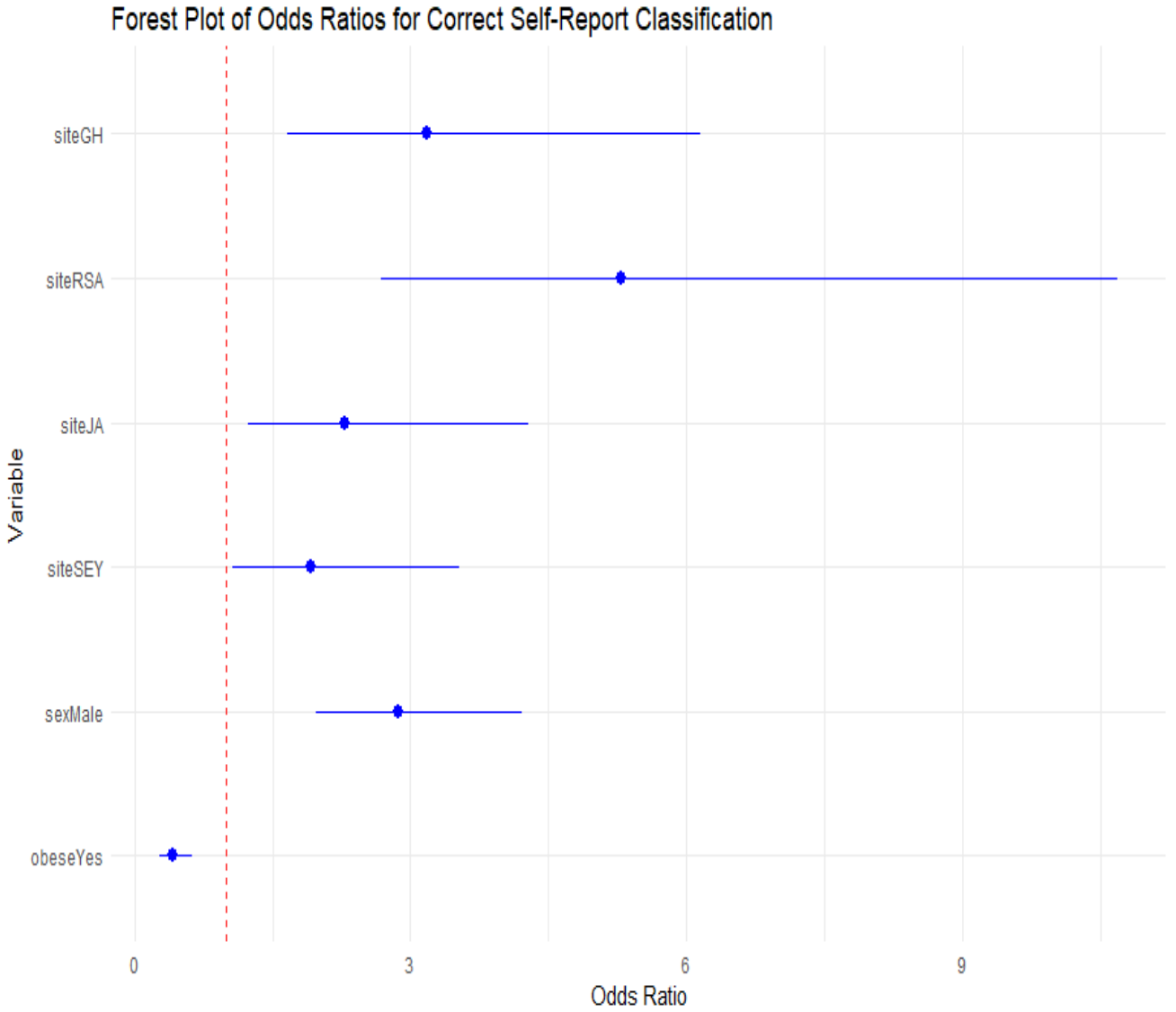

Sensitivity and Specificity of Self-Reported PA for the Entire Population
0.74
0.44
Proportion
0.0
0.2
0.4
0.6
Sensitivity
Specificity
Metric
Metric
Sensitivity
Specificity

Table 2: logistic regression model (n = 717)			
	Odds ratio	95% CI	p-value
Site – Ghana	3.17	1.66, 6.15	p<0.001
Site – South Africa	5.29	2.68, 10.69	p<0.001
Site – Jamaica	2.28	1.23, 4.28	p=0.009
Site – Seychelles	1.92	1.06, 3.54	p=0.03
Sex – male	2.87	1.98, 4.21	p<0.001
Age	1.00	0.97, 1.02	p=0.74
Obese – yes	0.41	0.27, 0.63	p<0.001
Work – yes	1.60	0.94, 2.78	p=0.09
Manual labour – yes	1.38	0.96, 1.99	p=0.08
Smoker – yes	1.75	1.08, 2.85	p=0.02
Diabetic – yes	1.08	0.57, 2.01	p=0.80
Hypertensive – yes	1.39	0.97, 2.02	p=0.08



Conclusion

- Self-reported PA was overestimated when compared to objectively measured PA
- Difficulty in capturing population level PA, which is used to drive public health policy agendas
- See variability across the sites, highlighting that a “one size fits all” approach may not be appropriate

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