

# The fitness barometer, a tool for physical education teachers



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AIESEP World Congress, Santiago de Chile 4th - 7th July 2023



**Background** |

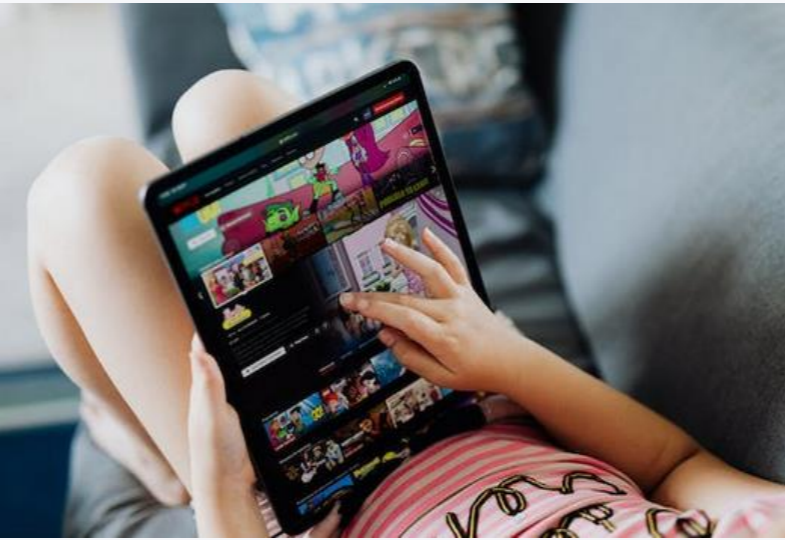
# 1) BACKGROUND



Physical fitness & health



Sedentary lifestyle



# 1) BACKGROUND



# 1) BACKGROUND

Belgium

Province of  
Luxembourg

2011 French  
part of Belgium,  
last barometer of  
the physical  
fitness

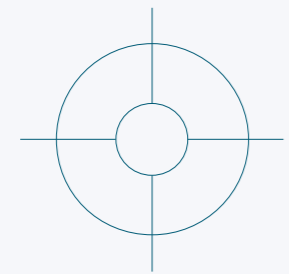
Barometer in 2022  
Physical fitness  
campaign

EUROFIT test  
battery

New campaign in  
2023 (physical/motor  
tests & health  
promotion)



# 1) BACKGROUND



## Objectives

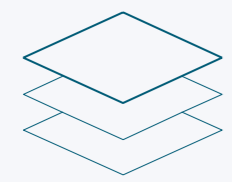
Monitor children physical fitness at the end of elementary school

Provide individual results (parents, children, PE teacher)

Provide results of the class and point strengths and weaknesses (PE teachers)

**Method** |

## 2) METHOD



### Sample

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All participants (n=5,084)

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> 200 schools

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Exclusion criteria: special education, repetition of a grade, one year in advance, not in grades 5 or 6

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Children born in 2011 and 2012 (n=4,344)

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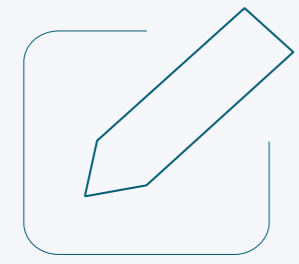
External assessors

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8 tests







## Tests

- ✓ Cardio-respiratory endurance

### Cooper Test



## 2) METHOD



- ✓ Flexibility

### Sit and reach Test



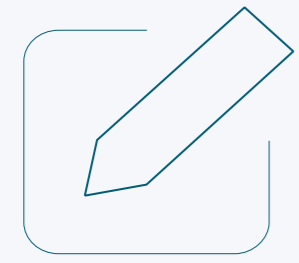
- ✓ Speed

### 20-m Sprint Test



### 4X5-m Shuttle run Test





## Tests

- ✓ Abdominal endurance

### Modified Sit-Up Test



## 2) METHOD

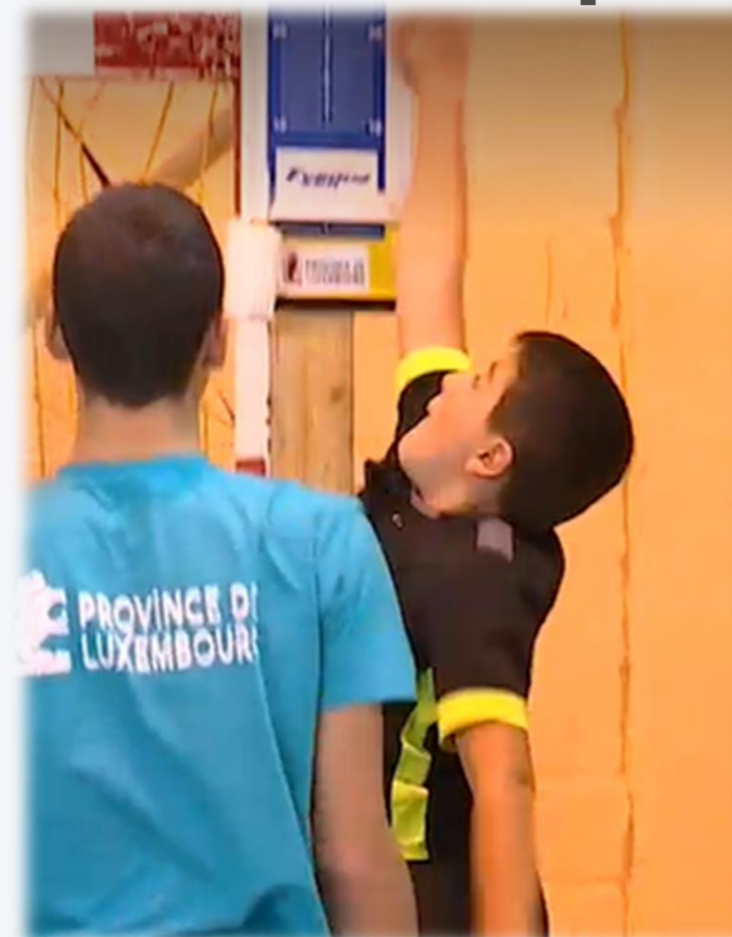


- ✓ Lower body explosive power

### Standing Long Jump Test



### Vertical Jump Test



- ✓ Upper body explosive power

### Seated Medicine Ball Throw Test



## 2) METHOD



### Data analysis

4 groups divided by gender and age

Girls grade 5

Boys grade 5

Girls grade 6

Boys grade 6

Classification by percentiles (R Software)

8 categories from percentiles

Percentiles	Categories
< Percentile 10	1
From percentile 10 to percentile 25	2
From percentile 25 to percentile 40	3
From percentile 40 to percentile 50	4
From percentile 50 to percentile 60	5
From percentile 60 to percentile 75	6
From percentile 75 to percentile 90	7
> Percentile 90	8

# Results



# 3) RESULTS



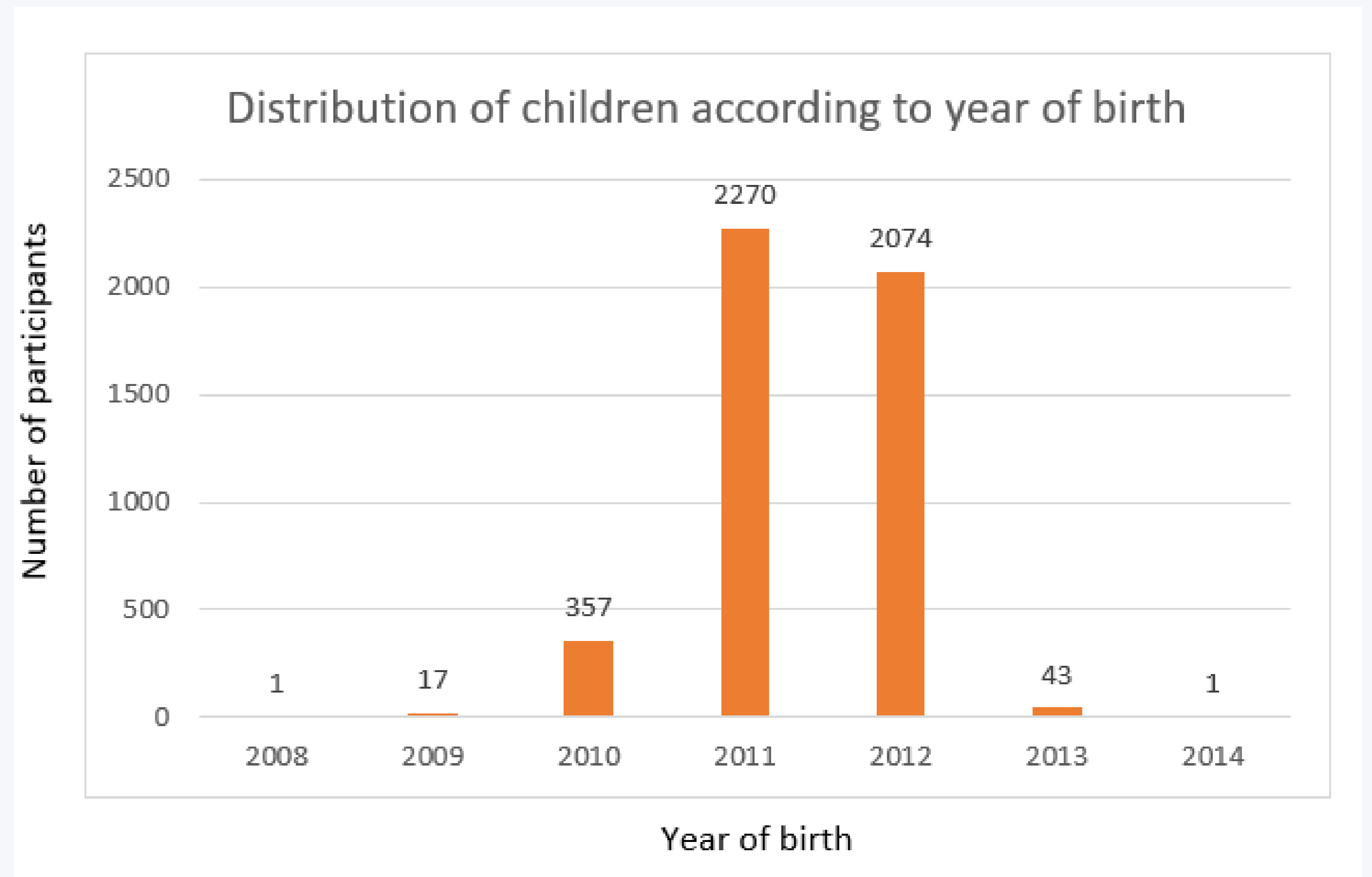
## Sample description

Girls 10 (born in 2012 and in 5<sup>th</sup> Grade) n=1029

Girls 11 (born in 2011 and in 6<sup>th</sup> Grade) n=1132

Boys 10 (born in 2012 and in 5<sup>th</sup> Grade) n=1045

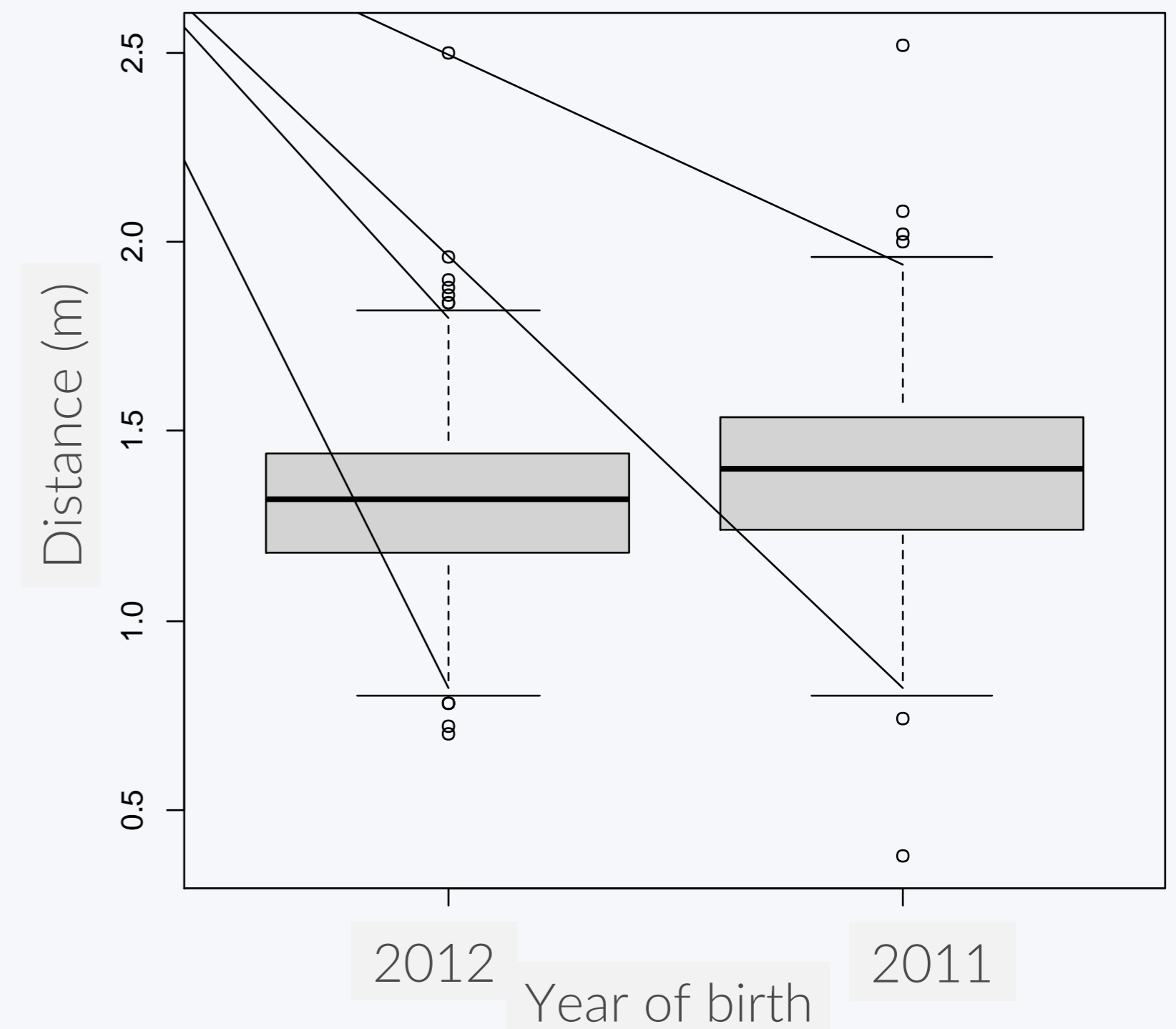
Boys 11 (born in 2011 and in 6<sup>th</sup> Grade) n=1138



# 3) RESULTS

	Boys grade 5	Boys grade 6	p-value		Girls grade 5	Girls grade 6	p-value
Sit-up test (number of repetitions)	44 (37 - 51) (n=1035)	48 (40 - 56) (n=1121)	<b>&lt;2,2E-16</b>	Sit-up test (number of repetitions)	42 (36 - 49) (n=1013)	46 (39 - 52) (n=1115)	<b>7,10E-15</b>
Cooper test (m)	2100 (1815 - 2350) (n=1033)	2115 (1820-2415) (n=1117)	<b>0,04</b>	Cooper test (m)	1840 (1630 - 2025) (n=1009)	1878 (1675 - 2075) (n=1114)	<b>1,60E-03</b>
4*5-m Shuttle run test (s)	8.44 (8.00 - 8.97) (n=1034)	8.22 (7.78 - 8.75) (n=1119)	<b>1,01E-10</b>	4*5-m Shuttle run test (s)	8.84 (8.41 - 9.39) (n=1011)	8.62 (8.15 - 9.16) (n=1113)	<b>6,16E-12</b>
Standing long jump test (m)	1.40 (1.28 - 1.54) (n=1035)	1.46 (1.32 - 1.60) (n=1120)	<b>6,13E-11</b>	Standing long jump test (m)	1.32 (1.18 - 1.44) (n=1012)	1.40 (1.24 - 1.54) (n=1117)	<b>&lt;2,2e-16</b>
Vertical jump test (cm)	29 (26 - 32) (n=1035)	31 (27 - 35) (n=1119)	<b>&lt;2,2E-16</b>	Vertical jump test (cm)	28 (25 - 31) (n=1012)	31 (27 - 34) (n=1117)	<b>&lt;2,2e-16</b>
Seated Medicine Ball Throw Test (m)	3.1 (2.8 - 3.4) (n=1033)	3.4 (3.1 - 3.7) (n=1121)	<b>&lt;2,2E-16</b>	Seated Medicine Ball Throw Test (m)	3.3 (2.9 - 5.1) (n= 1013)	3.7 (3.4 - 4.0) (n=1115)	<b>&lt;2,2e-16</b>
Sit and reach test (cm)	17 (13 - 21) (n=1033)	16 (12 - 20) (n=1120)	<b>0,0004</b>	Sit and reach test (cm)	21 (17- 26) (n= 1013)	22 (17 - 26) (n=1116)	<b>0,55</b>
20-m Sprint test (s)	4.25 (4.06 - 4.50) (n=1035)	4.16 (3.96 - 4.41) (n=1118)	<b>2,01E-10</b>	20-m Sprint test (s)	4.44 (4.22 - 4.72) (n=1011)	4.29 (4.06 - 4.56) (n=1114)	<b>&lt;2,2e-16</b>

Standing long jump test for girls born in 2011 versus 2012



# 3) RESULTS

Abdominal muscular endurance (number of repetitions)

	P10	P25	P40	P50	P60	P75	P90
Boys grade 5	31	37	41	44	47	51	59
Boys grade 6	34	40	45	48	52	56	64
Girls grade 5	30	36	40	42	44	49	56
Girls grade 6	33	39	43	46	49	52	59

Lower limb explosive power : standing long jump (m)

	P10	P25	P40	P50	P60	P75	P90
Boys grade 5	1,14	1,28	1,36	1,4	1,46	1,54	1,66
Boys grade 6	1,18	1,32	1,41	1,46	1,52	1,6	1,72
Girls grade 5	1,06	1,18	1,26	1,32	1,36	1,44	1,56
Girls grade 6	1,12	1,24	1,34	1,4	1,44	1,54	1,645

Cardiorespiratory endurance (m)

	P10	P25	P40	P50	P60	P75	P90
Boys grade 5	1575	1815	2000	2100	2215	2350	2504
Boys grade 6	1596	1820	2020	2115	2225	2415	2617
Girls grade 5	1474	1630	1760	1840	1920	2025	2200
Girls grade 6	1480	1675	1800	1875	1970	2075	2300

Lower limb explosive power : vertical jump (cm)

	P10	P25	P40	P50	P60	P75	P90
Boys grade 5	23	26	28	29	31	32	36
Boys grade 6	24	27,25	30	31	32	35	39
Girls grade 5	22	25	27	28	29	31	35
Girls grade 6	24	27	29,4	31	32	34	38

Speed and coordination : 4\*5-m shuttle run (s)

	P90	P75	P60	P50	P40	P25	P10
Boys grade 5	7,66	8	8,25	8,435	8,6	8,97	9,514
Boys grade 6	7,47	7,78	8,06	8,22	8,418	8,75	9,372
Girls grade 5	8,05	8,41	8,63	8,84	9,03	9,39	9,88
Girls grade 6	7,78	8,15	8,43	8,62	8,8	9,16	9,718

Upper limb explosive power (m)

	P10	P25	P40	P50	P60	P75	P90
Boys grade 5	2,60	2,80	3,00	3,10	3,20	3,40	3,70
Boys grade 6	2,80	3,10	3,30	3,40	3,50	3,70	4,00
Girls grade 5	2,70	2,90	3,10	3,30	3,40	3,60	3,98
Girls grade 6	3,10	3,40	3,50	3,66	3,80	4,00	4,40

Flexibility (cm)

	P10	P25	P40	P50	P60	P75	P90
Boys grade 5	9	13	15	17	18	21	24
Boys grade 6	9	12	14	16	17	20	23
Girls grade 5	13	17	20	21	23	26	29
Girls grade 6	13	17	20	22	23	26	30

Speed : Sprint 20-m (s)

	P90	P75	P60	P50	P40	P25	P10
Boys grade 5	3,90	4,06	4,19	4,25	4,36	4,50	4,81
Boys grade 6	3,81	3,96	4,09	4,16	4,25	4,41	4,76
Girls grade 5	4,04	4,22	4,35	4,44	4,53	4,72	5,00
Girls grade 6	3,90	4,06	4,22	4,29	4,38	4,56	4,84

# 3) RESULTS



BOYS 6th Grade



## Physical skills

Abdominal endurance : **your score**



38

Number of repetitions

Categories

34	40	45	48	52	56	64	
1	2	3	4	5	6	7	8

Upper body explosive power : **your score**



3,4

Distance (m)

Categories

2,8	3,1	3,3	3,4	3,5	3,7	4	
1	2	3	4	5	6	7	8

Lower body explosive power - vertical jump : **your score**



37

Distance (cm)

Categories

24	27	30	31	32	35	39	
1	2	3	4	5	6	7	8

Speed - Sprint 20m : **your score**



5,2

Time (s)

Categories

4,8	4,4	4,3	4,2	4,1	4,0	3,8	
1	2	3	4	5	6	7	8

Flexibility : **your score**



18

Distance (cm)

Categories

9	12	14	16	17	20	23	
1	2	3	4	5	6	7	8



# Discussion



# 4) DISCUSSION

Comparison with reference population:

- 3 tests from EUROFIT test battery
- Same age
- Sample size
- Context of the tests
- Associated with other factors

No information about lifestyle, physical activity participation, body weight/height, environment...

## Physical Fitness and Body Composition in 10–12-Year-Old Danish Children in Relation to Leisure-Time Club-Based Sporting Activities

Christina Ørntoft,<sup>1,2</sup> Malte Nejst Larsen,<sup>1</sup> Mads Madsen,<sup>1</sup> Lene Sandager,<sup>3</sup> Ida Lundager,<sup>1,4</sup> Andreas Møller,<sup>4</sup> Lone Hansen,<sup>2</sup> Esben E. Madsen,<sup>1,5</sup> Anne-Marie Elbe,<sup>6</sup> Laila Ottesen,<sup>4</sup> and Peter Krstrup<sup>1,7</sup>

TABLE 3: Means ± standard deviations for body composition variables and physical performance by participation groups and gender.

	Football		Other Ball Games		Other Sports		No Sports Club	
	Boys (n = 78-97)	Girls (n = 35-44)	Boys (n = 14-16)	Girls (n = 18-26)	Boys (n = 49-75)	Girls (n = 75-119)	Boys (n = 49-81)	Girls (n = 53-86)
20-m sprint (s)	3.97 ± 0.25	3.99 ± 0.27	4.03 ± 0.26	4.16 ± 0.26 <sup>E</sup>	4.04 ± 0.28	4.06 ± 0.25	4.15 ± 0.34 <sup>E</sup>	4.11 ± 0.29 <sup>E</sup>
Horizontal jump (cm)	121.6 ± 14.7	122.5 ± 17.5	127.1 ± 13.3	115.9 ± 13.3	123.8 ± 18.1	115.0 ± 16.3 <sup>A</sup>	116.2 ± 18.1	112.0 ± 17.8 <sup>E&amp;EΔ</sup>

	SLJ (cm) (mean)	Sprint 20-m (mean)
Boys 10	140 ± 0.20	4.32 ± 0.39
Boys 11	146 ± 0.22	4.23 ± 0.38
Girls 10	131 ± 0.20	4.49 ± 0.40
Girls 11	139 ± 0.21	4.33 ± 0.37

## Percentiles and Principal Component Analysis of Physical Fitness From a Big Sample of Children and Adolescents Aged 6-18 Years: The DAFIS Project

Eliseo Iglesias-Soler<sup>1\*</sup>, María Rúa-Alonso<sup>1</sup>, Jessica Rial-Vázquez<sup>1</sup>, Jose Ramón Lete-Lasa<sup>2</sup>, Iván Clavel<sup>3</sup>, Manuel A. Giráldez-García<sup>1</sup>, Javier Rico-Díaz<sup>2,4</sup>, Miguel Rodríguez-Del Corral<sup>3</sup>, Eduardo Carballeira-Fernández<sup>1</sup> and Xurxo Dopico-Calvo<sup>1</sup>

SLJ (cm)	Boys											Girls										
Percentiles	P <sub>5</sub>	P <sub>10</sub>	P <sub>20</sub>	P <sub>30</sub>	P <sub>40</sub>	P <sub>50</sub>	P <sub>60</sub>	P <sub>70</sub>	P <sub>80</sub>	P <sub>90</sub>	P <sub>95</sub>	P <sub>5</sub>	P <sub>10</sub>	P <sub>20</sub>	P <sub>30</sub>	P <sub>40</sub>	P <sub>50</sub>	P <sub>60</sub>	P <sub>70</sub>	P <sub>80</sub>	P <sub>90</sub>	P <sub>95</sub>
10	94.91	103.14	113.02	120.10	126.11	131.71	137.29	143.23	150.15	159.70	167.55	92.42	99.38	107.94	114.22	119.65	124.77	129.94	135.52	142.12	151.39	159.14
11	101.02	109.54	119.79	127.13	133.38	139.20	145.01	151.19	158.40	168.36	176.55	98.56	105.79	114.74	121.34	127.07	132.50	137.99	143.95	151.03	161.01	169.40

### Standing long jump (cm)

Boys 10	140
Boys 11	146
Girls 10	132
Girls 11	140

# 4) DISCUSSION

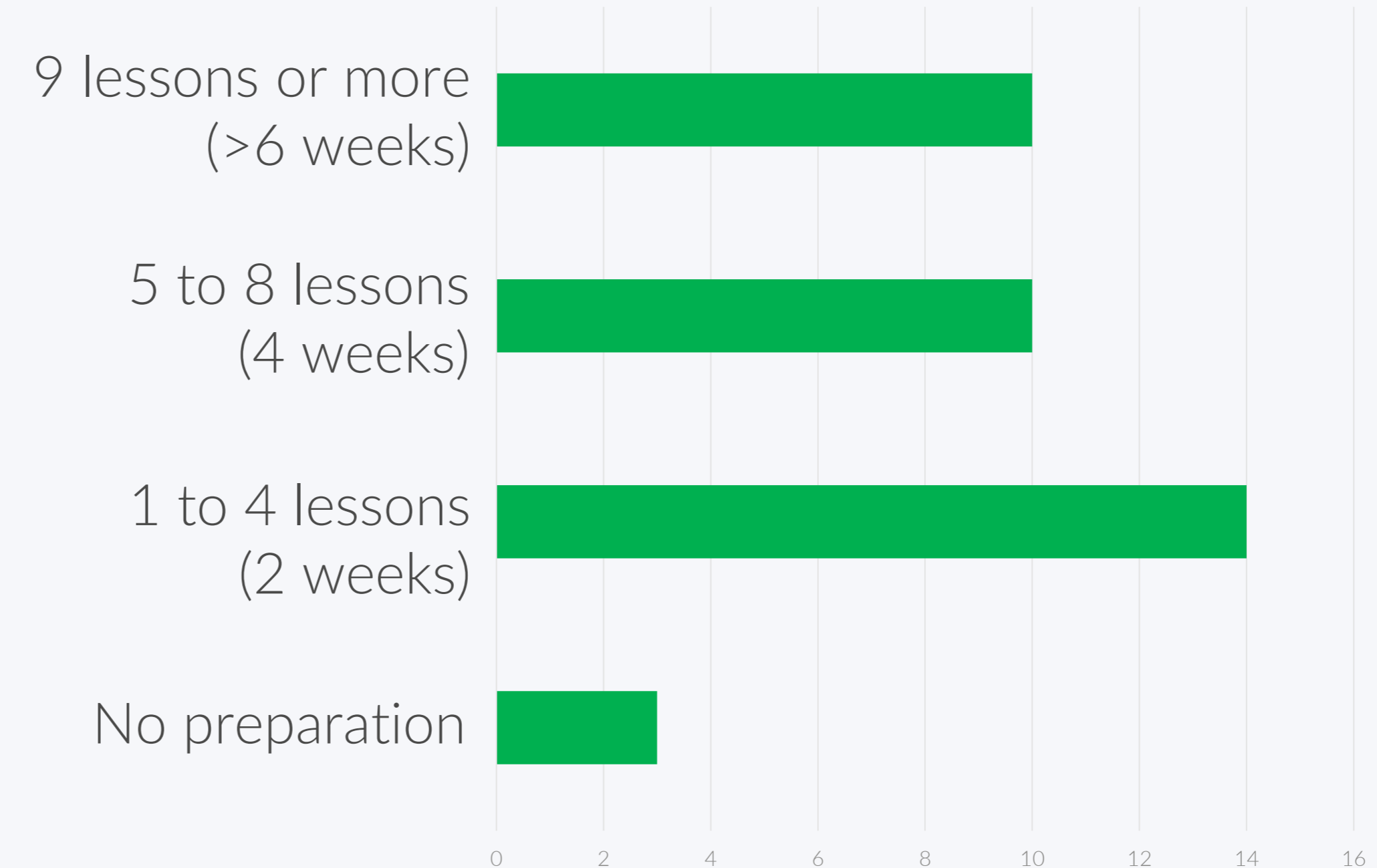


Preparation during PE lessons

No comparison with non-participants

Manual recording (measurement errors)

Number of answers from PE teachers according the number of lessons for preparing the campaign



# Conclusion & Perspectives

# 5) CONCLUSION AND PERSPECTIVES

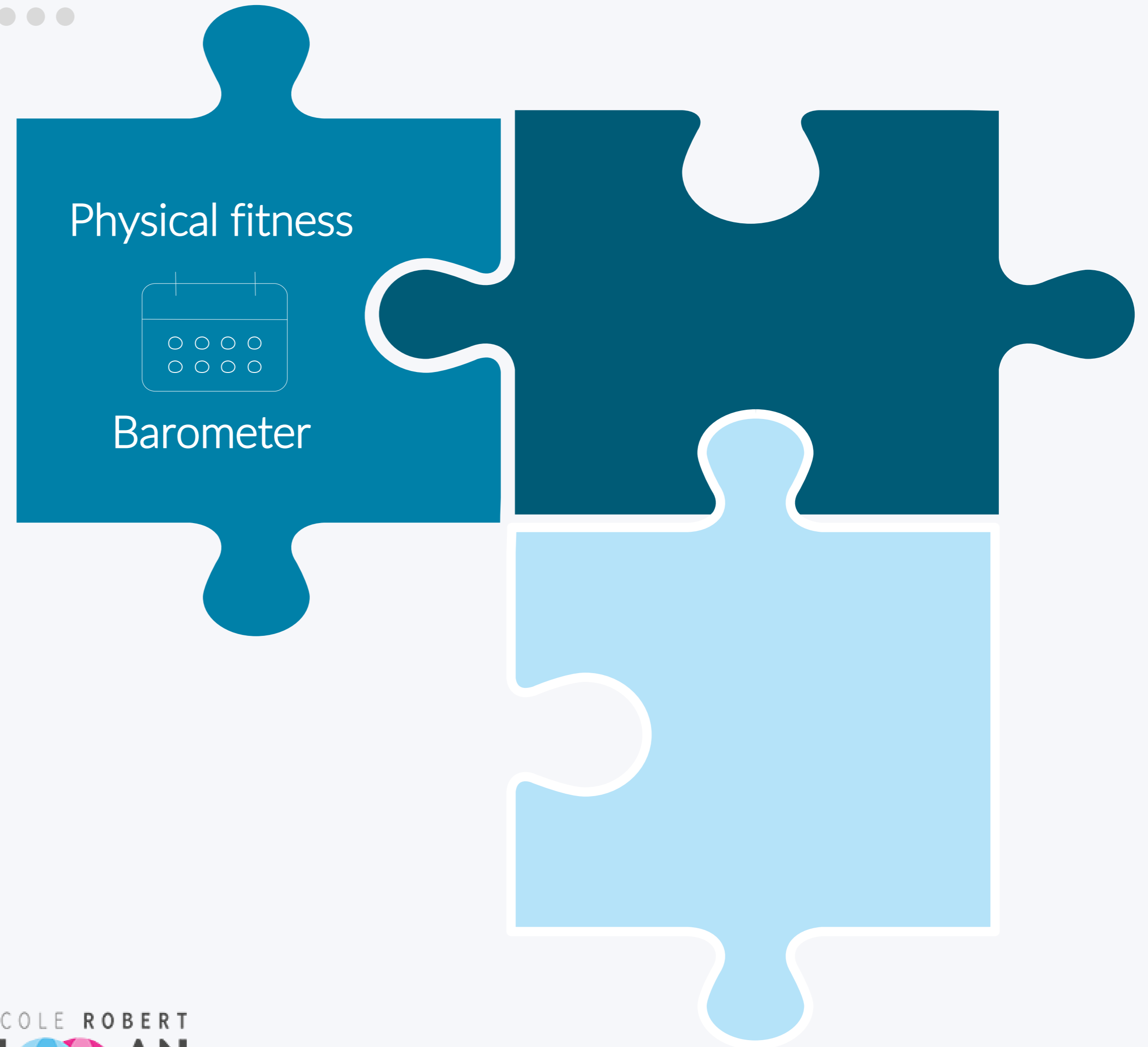


Objective evaluation of the population from the province of Luxembourg (grades 5 & 6)

Assessment tool

Information

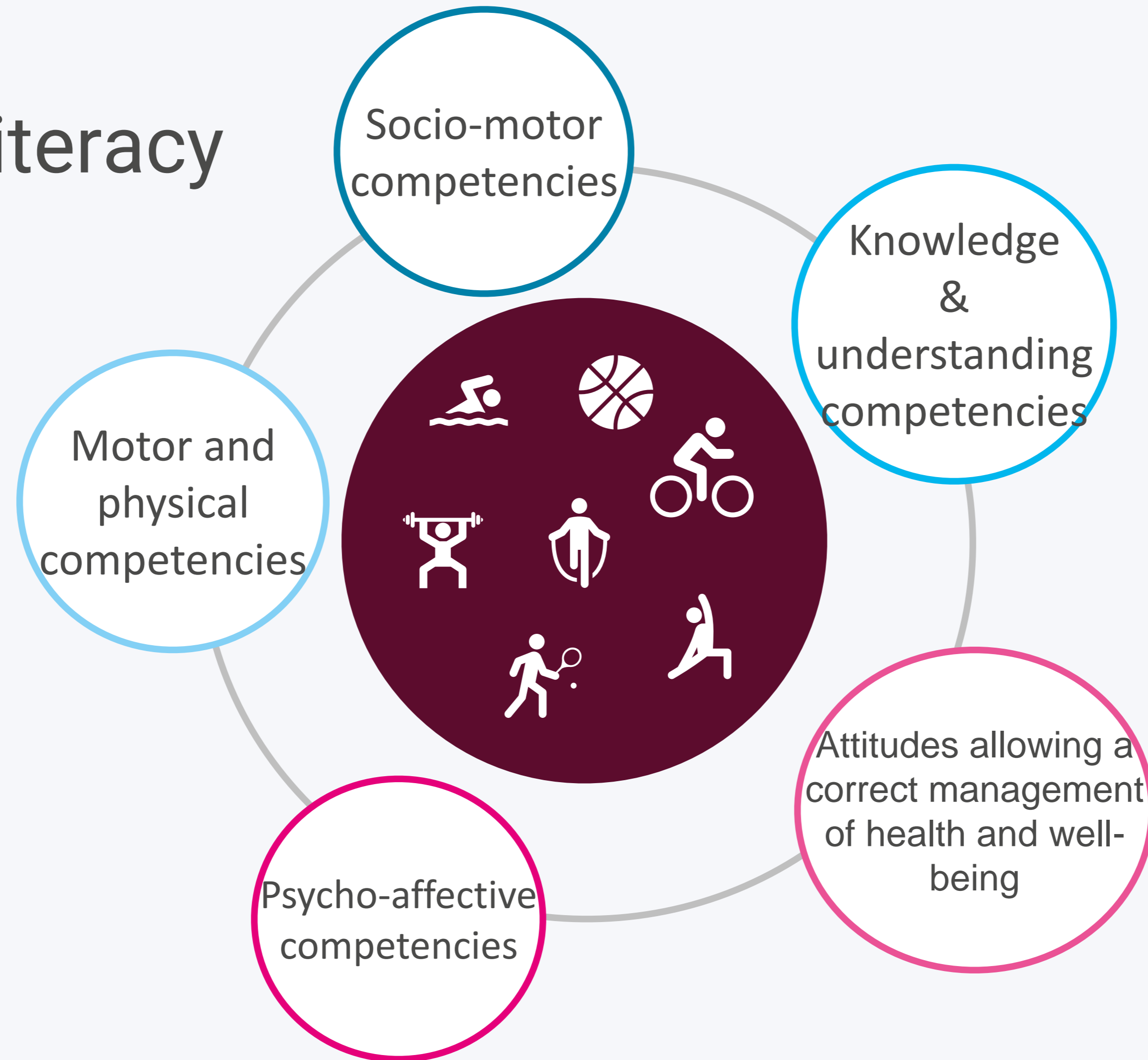
ONE piece of the puzzle



# 5) CONCLUSION AND PERSPECTIVES



## Physical literacy



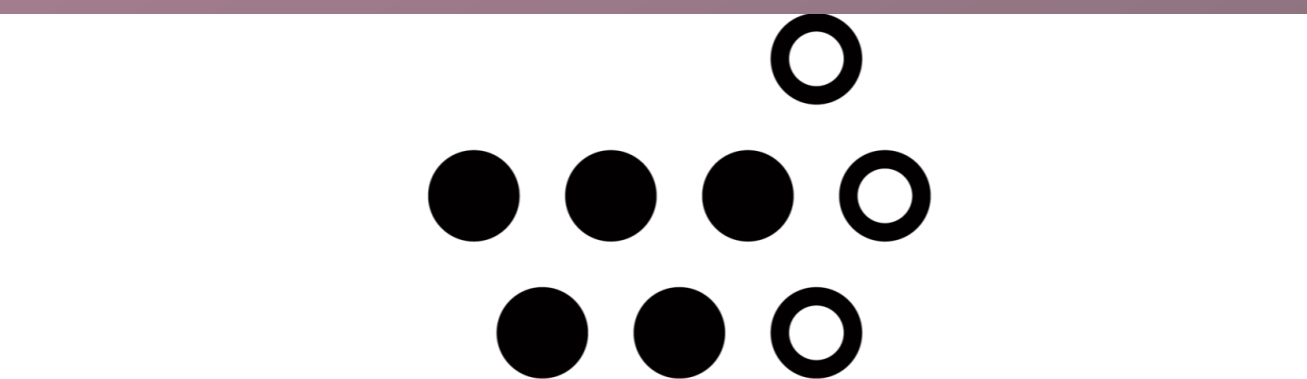
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# THANK YOU FOR YOUR ATTENTION

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