

## **Overweight, blood pressure, tobacco use, consumption of alcohol and substance use among children and adolescents: findings of the School Screening Program in 2015**

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Ministry of Health, Seychelles, 2 May 2016

### **Summary**

- Within the School Screening Program, around 16 school nurses measure risk factors every year, including weight and height, in all ~5000-6000 students attending C2, P4, S1 and S4 classes in all schools.
- Overweight and obesity are defined along the standard age and sex specific criteria by the International Obesity Task Force (IOTF).
- In 2015, weight and height were measured in 4278 students from 5439 eligible students, a participation rate of 79%.
- The prevalence in 2015 of combined overweight or obesity was 19.9% in boys and 23.6% in girls and the prevalence of obesity alone was 8.6% in boys and 9.7% in girls.
- The prevalence of overweight /obesity markedly increased between 1998 and 2015, including during the recent years.
- Data in 2015 show that the consumption of tobacco products, alcohol and illicit drugs increases markedly between P4 (age ~10) to S4 (age ~15).
- Use of alcohol is particularly high in both boys and girls, including in young age groups.
- Around 30 children had high blood pressure. These children must be rechecked for BP and referred to pediatrician if high BP is confirmed.
- A strong focus should be given to addressing the societal causes of overweight (the “obesogenic environment”) through interventions in all sectors aimed at enabling children (and adults) to adopt healthier nutrition and engage in more physical activity.
- There is also a need to strengthen programs for reducing demand and supply of tobacco products, alcohol and illicit drugs among youth.
- Continued monitoring of overweight/obesity in youths of Seychelles is an essential mechanism to guide policy and the School Screening Program should be strengthened, including enabling school nurses to have sufficient time to perform the screening in all schools, including related counseling to children with abnormal conditions.

### **A) The school health program**

Within the School Screening Program, 15-20 school nurses screen all students of C2, P4, S1 and S4 of all schools (~5500 children) every year since 1998. The mean age of students at these grades is 5.4, 9.2, 12.5 and 15.5 years, respectively. Students are also asked about tobacco use, alcohol use, substance use, and physical activity. Anthropometric variables and blood pressure are measured in all students. The use of same methods to assess overweight and obesity allows comparing findings over years. Overweight and obesity in children are defined along the standard age and sex specific criteria of the International Obesity Task Force (IOTF).

## B) Results related to overweight and obesity in 2014

Participation to the school screening program in 2015 was 79% (4278 from 5439 eligible students in C2, P4, S1 and S4), which is fairly satisfactory. Some non participation is expected and can relate to different factors. First, some obese children decline participation; this non random factor may lead to underestimation of the true prevalence of obesity. Second, school nurses often lack time to complete the screening program due to competing duties at health centre level; this random factor does not alter the validity of the prevalence estimates. Good organization by the school nurses and maintaining adequate equipment and facilities for screening are also important factors for the smooth functioning of the screening program.

**Table 1** shows that the prevalence of combined overweight or obesity was, overall 15.9% in students at crèche, 20.6% in students at P4 level, 27.76% in students at S1 level and 23.0% in students at S4 level. Differences in results between different schools may relate to actual differences or random variation due to small numbers of children in some schools.

**Table 1.** Prevalence (in percent) of students who are overweight or obese in 2015 according to school and grade

		C2		P4		S1		S4	
		N	%	N	%	N	%	N	%
Anse aux Pins	AAP	70	21.4	54	24.1				
Anse Boileau	ABO	84	13.1	73	24.7	103	29.1	132	19.7
Au Cap	ACA	32	12.5	27	7.4				
Anse Etoile	AET	36	8.3	50	28.0				
Anse Royale	ARO	62	3.2	70	11.4	139	20.9	77	28.6
Belonie	BEL					123	29.3	0	
Bel Eau	BEA	21	9.5	74	16.2				
Baie Lazare	BLA	57	40.4	33	15.2				
Belombre	BOM	20	20.0	22	18.2				
Baie St Anne	BSA	65	10.8	78	26.9				
Beau Vallon	BVA	56	5.4	35	22.9	93	32.3	112	21.4
Cascade	CAS	45	13.3	36	30.6				
English River	ERI	44	25.0			86	32.6	0	
Grand Anse Mahe	GAM	20	25.0	23	4.3				
Grand Anse Praslin	GAP	56	26.8	43	14.0	107	29.0	57	28.1
Glacis	GLA	20	10.0	15	33.3				
Independent School	IND	71	18.3	76	26.3	74	33.8	0	
La Digue	LAD	43	14.0	36	19.4	42	23.8	35	31.4
Les Mamelles	LMA	44	11.4						
La Misere	LMI	18		14	14.3				
La Retraite	LRE	18	11.1	19	26.3				
La Rosiere	LRO	60	20.0	0					
Mont Fleuri	MFL	71	15.5	86	27.9	137	24.1	110	20.9
Perseverance	PER	43	9.3	62	16.1				
Port Glaud	PGL	29	20.7	33	12.1				
Pointe Larue	PLA	51	15.7	40	20.0	100	27.0	97	19.6
Plaisance	PLS	68	16.2	140	21.4	133	27.1	125	24.0
Takamaka	TAK	23	17.4	30	10.0				
Total	Total	1,227	15.9	1,169	20.6	1,137	27.7	745	23.0

### C) Trends in overweight and obesity in school children and adolescents between 1998 and 2014

Table 2 shows that the prevalence of overweight has more than doubled between 1998 and 2014. In 2014, 19.2% of all boys and 23.9% of all girls aged 5-16 years had combined overweight or obesity, and 7.6% of all boys and 10.0% of all girls had obesity in 2014. The prevalence is lower in boys than in girls, in Crèche than in other grades, and in boys in S4 compared to boys in S1.

**Table 2.** Prevalence (in percent) of combined overweight or obesity, respectively obesity, between 1998 and 2015, according to calendar year, sex, and school grade (based on screening of 4000-5000 students in C2, P4, S1 and S4 every year, except in 2007-2010 when the screening program was interrupted)

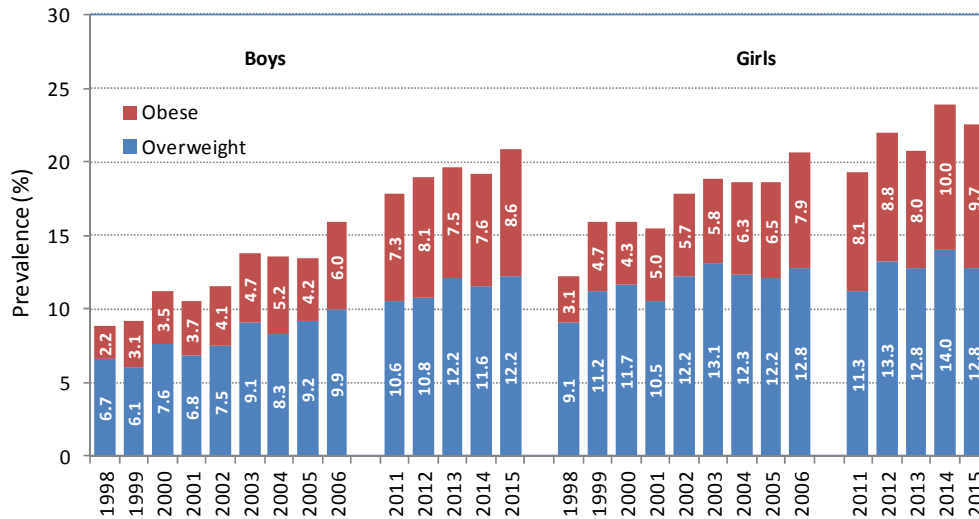
	Boys					Girls				
	C2	P4	S1	S4	All	C2	P4	S1	S4	All
<b>Overweight or obese</b>										
1998	7.4	8.4	10.0	9.4	8.8	9.9	12.4	10.8	15.6	12.2
1999	8.5	9.1	11.4	7.5	9.1	12.3	15.4	18.1	17.7	15.9
2000	8.7	11.3	14.2	10.4	11.2	10.1	16.7	18.6	18.4	16.0
2001	7.6	13.7	11.6	9.2	10.5	11.7	17.3	16.9	16.0	15.5
2002	10.7	11.6	14.8	9.1	11.6	13.6	18.7	21.5	17.7	17.9
2003	11.5	15.0	15.8	12.7	13.8	13.3	19.9	21.9	20.4	18.9
2004	11.9	14.6	15.9	11.6	13.5	14.0	19.9	19.4	21.1	18.6
2005	8.7	13.8	18.3	12.8	13.4	13.0	20.6	20.5	20.4	18.6
2006	9.5	18.7	20.4	15.0	15.9	14.2	22.4	24.1	22.0	20.7
2011	11.5	20.9	21.7	17.2	17.8	12.4	19.1	23.5	22.2	19.3
2012	12.2	18.4	26.1	18.9	18.9	16.5	24.0	23.6	24.0	22.0
2013	15.6	17.7	26.3	19.0	19.7	13.1	24.6	25.2	20.2	20.8
2014	11.6	20.7	26.8	17.7	19.2	18.6	25.9	26.5	24.8	23.9
2015	15.1	18.0	27.1	19.2	19.9	16.7	23.6	28.3	26.0	23.6
<b>Obese</b>										
1998	1.6	2.3	2.2	2.5	2.2	3.2	1.9	2.8	4.4	3.1
1999	3.2	3.2	3.5	2.4	3.1	4.0	4.7	4.8	5.3	4.7
2000	3.1	3.0	4.9	3.1	3.5	2.4	4.5	3.7	6.4	4.3
2001	3.2	4.7	4.1	2.8	3.7	3.9	7.0	4.8	4.2	5.0
2002	4.5	4.8	3.9	3.1	4.1	5.3	5.7	5.4	6.3	5.7
2003	3.3	5.7	6.4	3.3	4.7	4.1	6.7	7.1	5.4	5.8
2004	6.0	6.2	4.8	3.8	5.2	5.9	7.2	6.4	5.8	6.3
2005	4.4	5.1	4.4	2.8	4.2	5.5	8.1	6.5	5.8	6.5
2006	3.6	7.9	6.8	5.6	6.0	5.2	9.0	8.3	9.0	7.9
2011	5.1	6.6	10.3	7.0	7.3	6.0	7.2	9.4	9.6	8.1
2012	5.3	8.8	10.9	7.4	8.1	6.2	8.8	9.6	10.5	8.8
2013	5.7	6.3	10.3	7.7	7.5	5.9	9.9	9.4	6.7	8.0
2014	4.0	9.6	9.7	7.2	7.6	8.6	10.1	9.5	11.7	10.0
2015	6.5	8.6	10.4	8.9	8.6	6.6	9.6	12.2	10.6	9.7

Percent in "All" is based on average of the prevalences in the 4 grades.

The prevalence of combined overweight or obesity (in blue) and obesity (in red) increased steadily over time in both boys and girls (Figure 1). The prevalence of overweight and obesity was slightly lower in girls in 2015 than

2014, but further increased in boys. The findings in girls may reflect a plateau in the high prevalence of excess weight during the past few years but can also be due to random fluctuation in the estimates of prevalence from year to year.

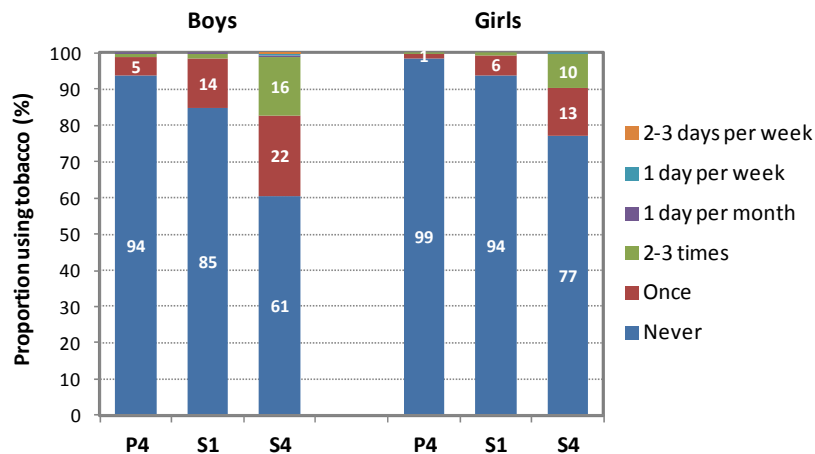
**Figure 1.** Prevalence (in percent) of children and adolescent aged 5-16 years with overweight (in blue) and obesity (in red) according to sex and calendar years between 1998 and 2015



#### D) Tobacco use

The proportion of children who smoked once or more increased markedly with age with 39% of boys and 23% of girls in S4 (**Figure 2**). Most users reported to try once or a few times but some social desirability bias may lead to underestimation of these estimates (i.e. some children would under-report their actual consumption when asked about it by nurses). The fact that tobacco use increases sharply with age and with large proportions at the level of SS4 (mean age around of 14.9 years for girls and 15.2 for boys in S4 level) indicates a substantial intake of smoking habits in this age range. This finding emphasizes the need to strengthen measures for tobacco control, including through continued and adequate health education in school at all levels (from crèche to S5). Health education should incorporate social (including peer pressure) economic and marketing aspects of tobacco use, and not focus solely on health aspects. Being aware of social, economic and marketing aspects can make children more resilient to initiating or sustaining tobacco use.

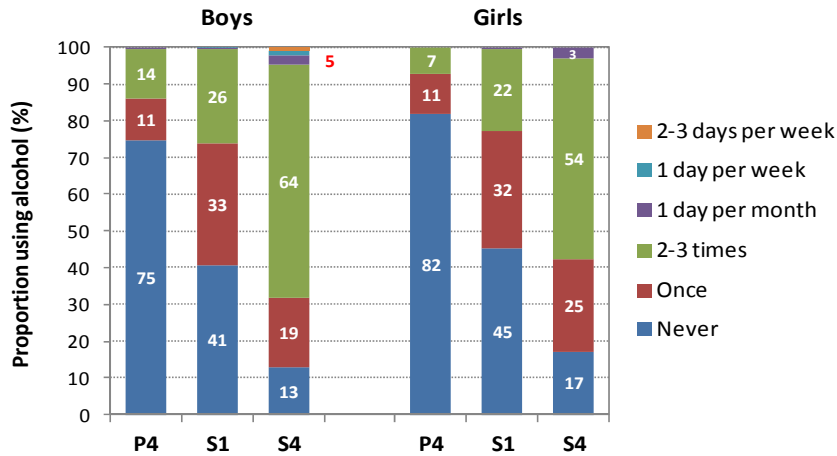
**Figure 2.** Tobacco use according to grade, sex and level of consumption



**E) Alcohol use**

The proportions of children using alcohol is sharply increasing with age (grades). By S4 more than 80% of children used alcohol at least once. Around 5% of boys and 3% of girls report alcohol use at least once per month. High experimentation and use of alcohol among children of both sexes suggests social tolerance and access to alcohol. This suggests the need to strengthen health education in school and at home about alcohol, as well as the need for strengthened measures to reduce alcohol use in the population.

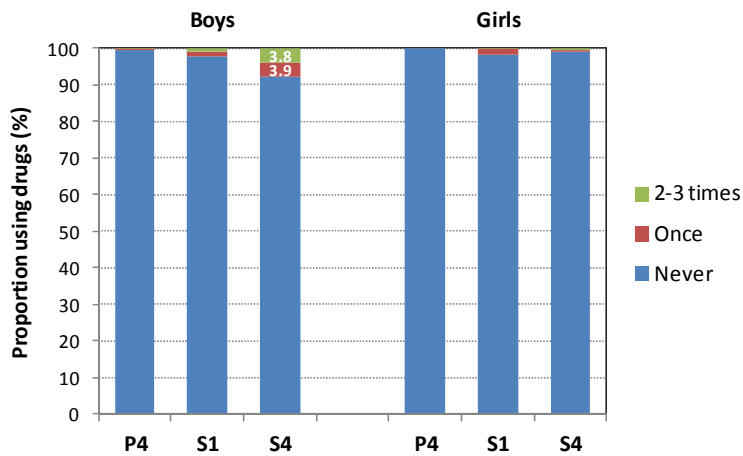
**Figure 3.** Alcohol use according to grade, sex, and level of consumption



**F) Use of marihuana and other illicit drugs**

Figure 4 shows fairly low proportions if users of illicit substance common among children and adolescents although users increased importantly between grade S1 and S4 among boys. These proportions are possibly underestimated (and particularly in the case of illicit drugs vs. alcohol and cigarettes) as children are likely to underreport their actual use of illicit drugs because questions are asked in a face-to-face interview with nurses. Results would likely be more accurate if questions were asked using anonymous self reported questionnaires. Two surveys using anonymous questions were performed in 2015 (Global Youth Tobacco Survey and Global School-based Health Survey), with both of them having enquired about drug use (final reports not yet issued).

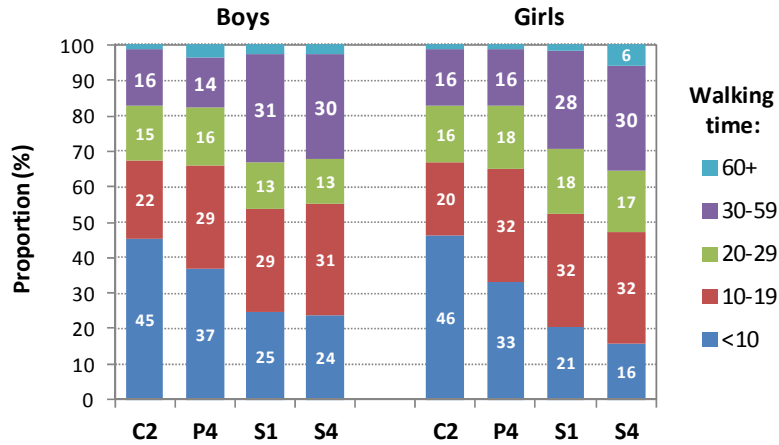
**Figure 4.** Alcohol use according to grade, sex, and level of consumption



**G) Walking time per day to go to school**

Walking time increases with age in both boys and girls and findings are fairly similar in boys and girls. This may reflect increasing autonomy of adolescents vs. younger children. Around 50% of boys and girls aged 15 (S4) walk less than 20 minutes per day.

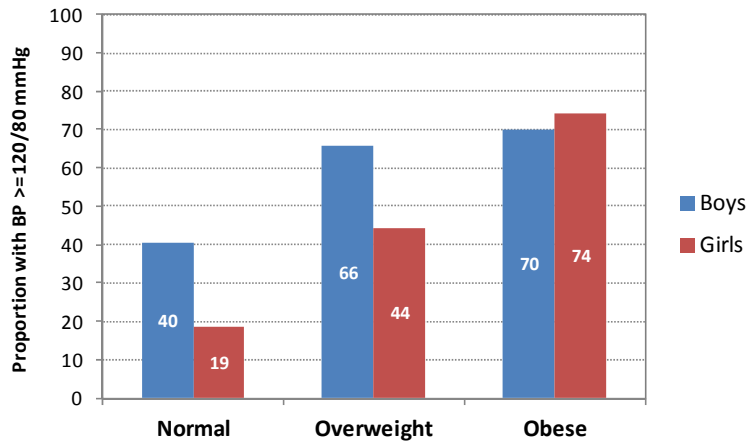
**Figure 5.** Walking time categories according to grade, sex, and level of consumption



**H) High blood pressure**

Raised blood pressure increases sharply with excess body weight (Figure 6).

**Figure 6.** Proportions of adolescents of the S4 grade (age ~15 years) with raised blood pressure ( $\geq 120/90$  mmHg) according to adiposity status and sex



A number of children had high blood pressure, some of them very high. Children who had high values should have their blood pressure checked again once or twice (using duplicate BP reading at each visit) to exclude artifacts. If high BP is confirmed, these children must be referred to pediatrician for further diagnosis and management. It must be reminded that high blood pressure in children is not uncommonly secondary to underlying causes (e.g. renal or endocrinological diseases), which may be amenable to specific treatment. This justifies that full medical examination and definite diagnosis.

School nurses have been provided with the list of the 28 children in whom BP was  $\geq 145$  or  $\geq 95$ , who have their BP rechecked, and investigated further if BP still is  $\geq 140/90$ .

## Main messages and recommendations

### Overweight and obesity

**Findings:** The prevalence of overweight/obesity is steadily increasing in youths between 1998 and 2015, and currently affects high proportions of boys and girls, with no evidence of a plateau.

#### Recommendations:

- 1) There is a need to further educate students of all ages on healthy nutrition, including the importance of smaller portions, the need to prefer water (including tap water) to soft drinks or fruit juices, and the need to have physical activity on most days of the week.
- 2) In view of the large scale of the problem of overweight in youths (and in adults), the societal causes of obesity should be addressed through interventions in multiple sectors, e.g. "health in all policy" and "whole of society" approaches.
- 3) This includes, *inter alia*, the enforcement of the National School Nutrition Policy, including increased availability of healthy foods in all settings (including school tuck shops and canteens); availability of free cold water in all schools through water fountains (as an alternative to soft drinks and fruit juice packets); regulations to ban the marketing in the mass media of energy dense junk foods; adequate labeling of manufactured foods; measures to promote physical activity in the school setting, particularly strict implementation of 2 (or if possible 3) periods of physical activity per week for all students (with a focus on physical activity suitable to all children, including obese children and girls, rather than sportive performance); and further development of PA programs in different setting outside of school hours. Attention should also be paid to urban shaping, e.g. measures and incentives that enable students to come to school by foot or by bike, including safe side-walks, or where possible, bike lanes (e.g. between Plaisance, Perseverance and Victoria).

### Tobacco use, alcohol and drugs

**Findings:** The prevalence of tobacco use is fairly high and that of alcohol consumption is very high, with proportions increasing strongly between P4 and S4 and with quite similar proportions in boys and girls.

#### Recommendations:

- 1) There is a need to strengthen health education in school in relation to tobacco use, alcohol consumption and use of illicit drugs.
- 2) Health education programs should be integrated and comprehensive in view of the common characteristics, roots and complications of the different substance uses, including addiction and getaways between these substances.
- 3) There is need to strengthen structural, legal and other measures to decrease both the demand and supply of these substances.

### High blood pressure

**Findings:** A substantial proportion of children have raised blood pressure. A large proportion of children with raised blood pressure is related to the large prevalence of overweight, but some cases can be related to underlying diseases.

#### Recommendations:

- 1) Nurses will recheck 28 children with elevated blood pressure and refer to pediatrician those with sustained elevated BP ( $\geq 140/90$  mmHg).
- 2) Referral of children with sustained high blood pressure is important because elevated BP in children, particularly in lean children, can be related to endocrinological, renal or other diseases that would need specific diagnosis and treatment.

**Maintenance of the school health program**

**Findings:** The participation to the screening program has fairly good, but not optimal. In particular, a substantial proportion of children in S4 were not screened.

**Recommendations:**

- 1) Continued monitoring of overweight/obesity in schools is essential to guide health policy related to obesity and related conditions (e.g. diabetes) and use of tobacco, alcohol and drugs.
- 2) Continued monitoring of overweight is also important so that Seychelles can report on progress of the country towards reaching the WHO target of a 0% relative increase of obesity between 2010 and 2025. The prevalence of overweight and obesity is an indicator that was agreed by all countries, including Seychelles, at the 2013 World Health Assembly along the Global NCD Action Plan 2013-2020.
- 3) Adequate resources are needed to maintain the smooth functioning of the School Screening Program in Seychelles. In particular, it is important that the school health nurses can dedicate sufficient time for effective implementation of all the components of the School Health Program.
- 4) School nurses should have enough time, as well as the expertise, to provide health education to those children identified with an abnormal condition.