Puerto Rico Asthma Surveillance Update, 2011

(Current Asthma Prevalence)

version August 23, 2013

José A. Bartolomei-Díaz, PhD and Eliseo Acevedo-Díaz, MPH

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PUERTO RICO
Departamento de Salud

Puerto Rico Asthma Project

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Executive summary

Dear colleagues;

The following asthma surveillance update represents the Asthma Project's effort to be as timely as possible in reporting asthma related health indicators and in sustaining an "Asthma Epidemiological Surveillance System".

It is of general knowlege that asthma is an important health issue in Puerto Rico. The Puerto Rico Asthma Project has intensively worked to address this chronic condition from a public health perspective in collaboration with governmental, profit, non-profit and community based organizations to achive our goal of reducing the mortality and morbidity due to this condition, and increase the quality of life of our population with asthma. We invite you to utilize this valuable information to develop public health initiatives in asthma.

Sincerely,

Francico Joglar Pesquera, MD

Puerto Rico Secretary of Health

Acknowledgements

This document was prepared by:

- José A. Bartolomei-Díaz, MS, Ph.D

  Puerto Rico Asthma Project, Epidemiologist

- Eliseo Acevedo-Díaz, MPH

  Puerto Rico Asthma Project, Biostatician

We thank our team partners for their support, excellent recomendations, and editing:

- Wanda I. Hernández-Virella, MPH

  Puerto Rico Asthma Project, Coordinator

- María C. Sánchez Gómez, MS

  Puerto Rico Asthma Project, Evaluator

- Manuel Vargas-Bernal, MD, MPH

  Director - Maternal, Child & Adolescent Health Division

- Dan Burrows

  Project Officer - Air Pollution and Respiratory Health Branch, Center for Disease Control & Prevention

- Cathy Bailey

  Surveillance Team Lead - Air Pollution and Respiratory Health Branch, Center for Disease Control & Prevention

- Sheri Disler

  Evaluator Technical Advisor - Air Pollution and Respiratory Health Branch, Center for Disease Control & Prevention

- Carlos Alonso

  Program Official - Air Pollution and Respiratory Health Branch, Center for Disease Control & Prevention

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- Álvaro U. Aranda, MD
  President - Puerto Rico Asthma and Other Chronic Respiratoy Diseases Coalition

Special thanks to all of our colleagues of the Maternal, Child and Adolescents Health Division of the Puerto Rico Health Department, to Sixto Merced for creating the art of this document and Alejandro Amill for helping us understand the transition to the 2011 BRFSS methodolgy.

Authors note

About this report

This updated report is part of our commitment to continue learning and implementing cost-effective technological tools to improve this epidemiological surveillance system, enhance its attributes of acceptability, flexibility, simplicity, stability, and timeliness and make important asthma information timely as possible. Is is expectation to work in producing an update as soon the data is available. All updates will be included at

`www.proyectoasmapr.org/Vigilancia.html`

We continue our effort in creating an easy to read and understand guide for public health planning and interventions. With that aim, we are providing here what is so far our standard report with measures of the magnitude of health indicators (e.g. prevalence, mortality, use of health services) across the different populations (e.g. age, sex, income, etc.) and the risk or possibility of having a health indicator (e.g. relative risk, odds ratios, etc.). The prevalence estimate is the proportion of individuals with the condition at the stratified group. This measure can help with economic and human resources allocation. The Odds Ratio is an estimate of risk useful as a burden guide for groups selection to prioritize interventions. Furthermore, you will find a document structure where in every page there is a brief interpretation on the observed prevalence, a brief interpretation of the risk measure followed by a graph and a table with the pertinent information.

Note: In 2011, the Behavioral Risk Factor Surveillance Survey implemented methodological changes in the sampling and weighting scheme. The result of this change increased the probability to survey a section of the population that use cell phones but does not possess land lines. The changes are a response to the Nationwide increase of cell phone use leaving behind land lines. In addition, the weighting scheme was modified to take into account the sampling changes and improve for better estimation. In this matter, the CDC suggests to use the 2011 survey data as a new baseline for the data analysis and interpretation and **not combine or compare with previous years.** To read about the this

changes please refer to: www.cdc.gov/brfss/annual_data/2011/compare_11_20121212.docx

Peer review

This document has been evaluated by the Puerto Rico Asthma Project staff. We want you to take part in improving this surveillance system and reports. We encourage any reader to evaluate this document and send recommendations to info@proyectoasmapr.org.

Citation

When using this document, we suggest the following citation:

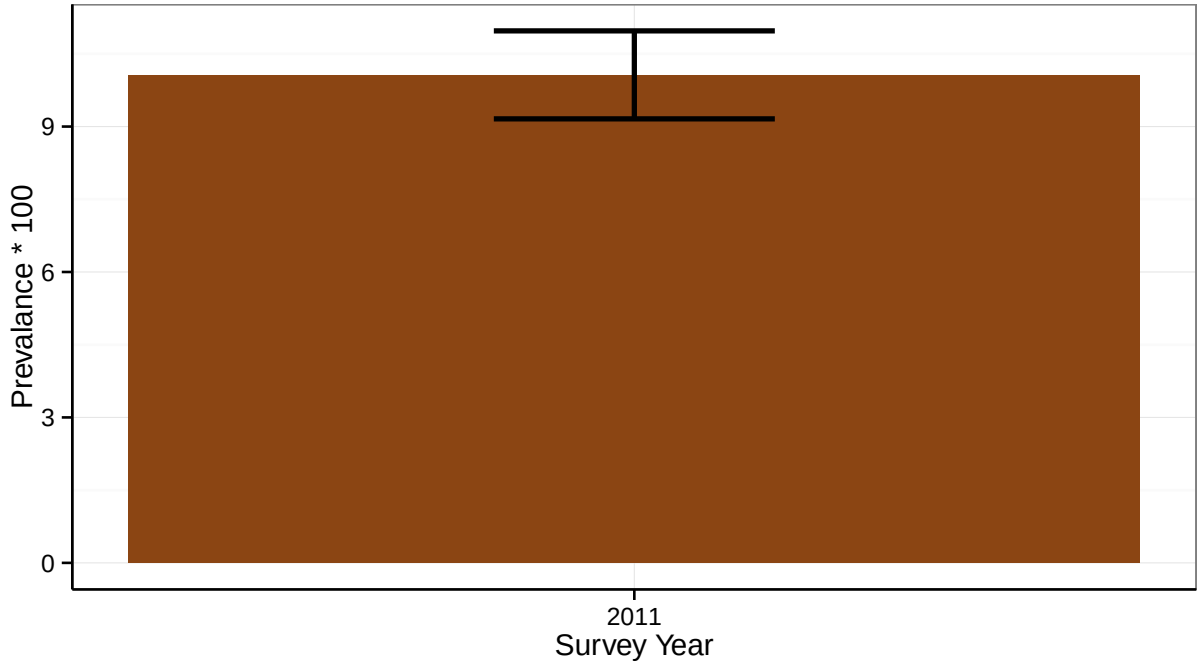
J.A. Bartolomei-Díaz and E. Acevedo. Puerto Rico asthma surveillance 2011 update. Technical report, Puerto Rico Asthma Project, Puerto Rico Department of Health, August 23, 2013.

It is in on our best interest the extensive use of this information for public health policy, research questions & proposal development.

Results: Asthma among adults

Current asthma prevalence time trend

Figure 1: *Current asthma prevalence among adults in Puerto Rico, 2011*



- The Current asthma prevalence for the year 2011 among adults in Puerto Rico was 10.07 (9.16-10.97), Figure 1.

Socio-demographics

- Figure 2 shows that the current asthma prevalence for the age group of 18-24 was higher when compared with the other groups.
- Adults in the age group of 55-64 had 53% less possibility of having current asthma prevalence when compared with the 18-24 group. This difference was significant (p-value < 0.05). See Table 1.

Figure 2: *Current asthma prevalence among adults in Puerto Rico by age group, 2011*

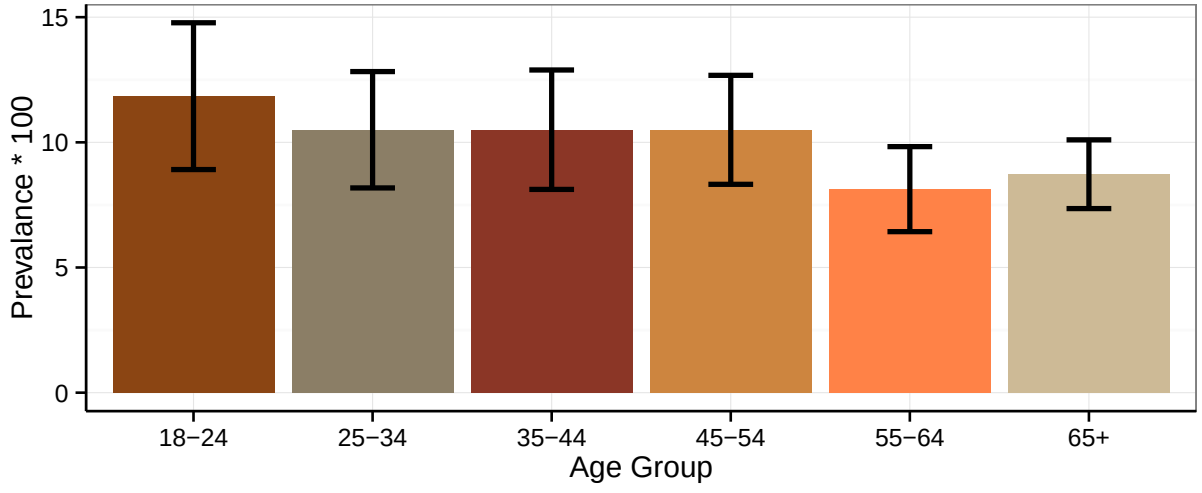


Table 1: *Current asthma prevalence among adults in Puerto Rico by age group, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Age group					
18-24	11.84 (8.91-14.78)	49,214	1.00	0.00	1.00
25-34	10.5 (8.18-12.83)	57,507	0.83	0.26	0.47
35-44	10.5 (8.12-12.89)	55,269	0.81	0.27	0.42
45-54	10.5 (8.32-12.68)	50,325	0.68	0.27	0.16
55-64	8.13 (6.43-9.83)	32,750	0.47	0.29	0.00
65+	8.73 (7.35-10.1)	41,512	0.56	0.32	0.06

- Figure 3 shows that males had a lower current asthma prevalence when compared with females.
- Among adults, females had 2.56 times more possibility of reporting current asthma prevalence when compared with males. This difference was significant (p-value $<$ 0.05). See Table 2.

Figure 3: *Current asthma prevalence among adults in Puerto Rico by sex group, 2011*

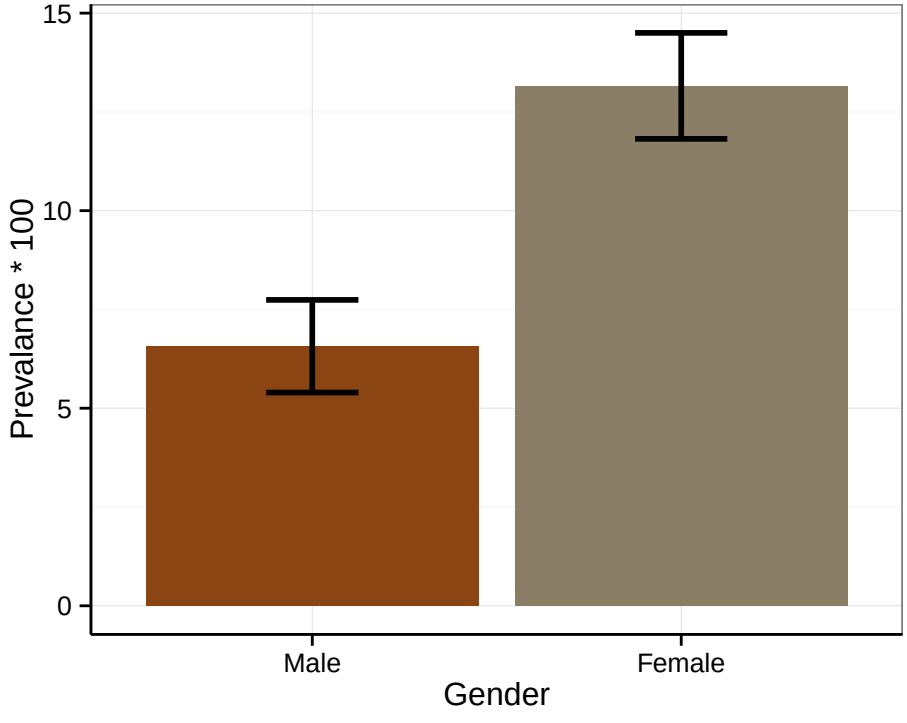


Table 2: *Current asthma prevalence among adults in Puerto Rico by sex group, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Sex group					
Males	6.57 (5.4-7.74)	87,796	1.00	0.00	1.00
Females	13.16 (11.82-14.5)	198,780	2.56	0.14	0.00

- When comparing by education level, those with some university have the highest current asthma prevalence. (Figure 4).
- When comparing by educational level, those who were 10% of the asthma patients had some high school of reporting current asthma prevalence when compared with those who report having some high school. This difference was not significant (p-value $\geq$ 0.05). Data shown in Table 3.

Figure 4: *Current asthma prevalence among adults in Puerto Rico by education levels, 2011*

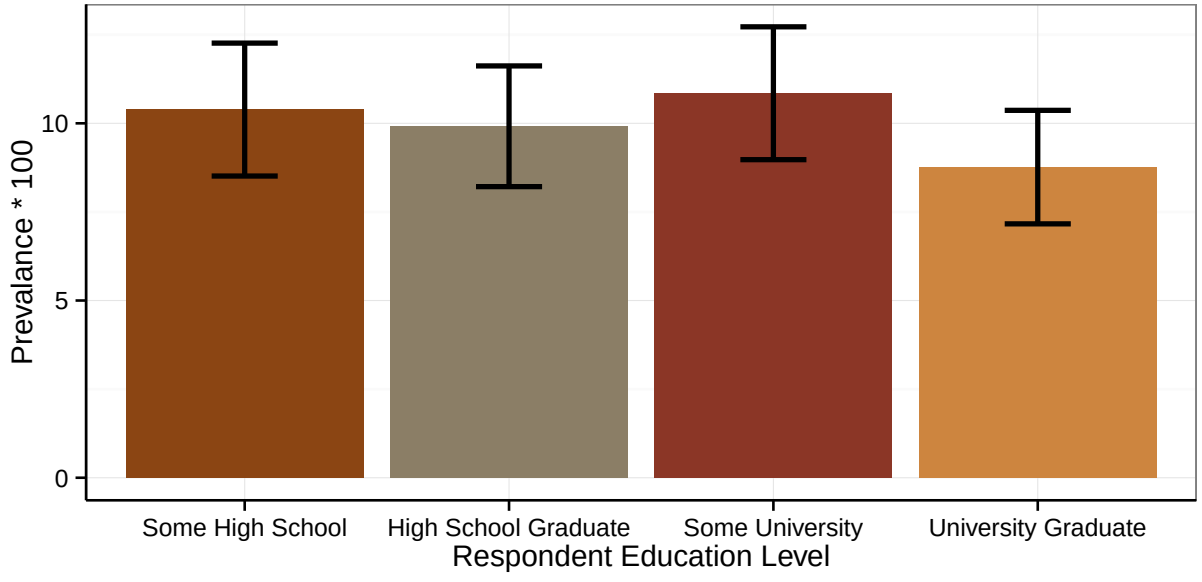


Table 3: *Current asthma prevalence among adults in Puerto Rico by education levels, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Education group					
Some High School	10.39 (8.51-12.26)	90,384	1.00	0.00	1.00
High School Graduate	9.92 (8.21-11.62)	72,716	0.92	0.17	0.62
Some University	10.85 (8.97-12.72)	74,683	1.03	0.18	0.87
University Graduate	8.76 (7.16-10.37)	48,322	1.05	0.21	0.80

- Figure 5 shows that adults whose annual household income is <15k, have a current asthma prevalence higher than the other income groups.
- Those in the range of 35k-<50k, 50+k had 53% less possibility, 35k-<50k, 50+k had 58% less possibility of reporting current asthma than those whose annual income is less than $ 14,999. This difference was significant (p-value < 0.05). For further information, refere to Table 4.

Figure 5: *Current asthma prevalence among adults in Puerto Rico by household income levels, 2011*

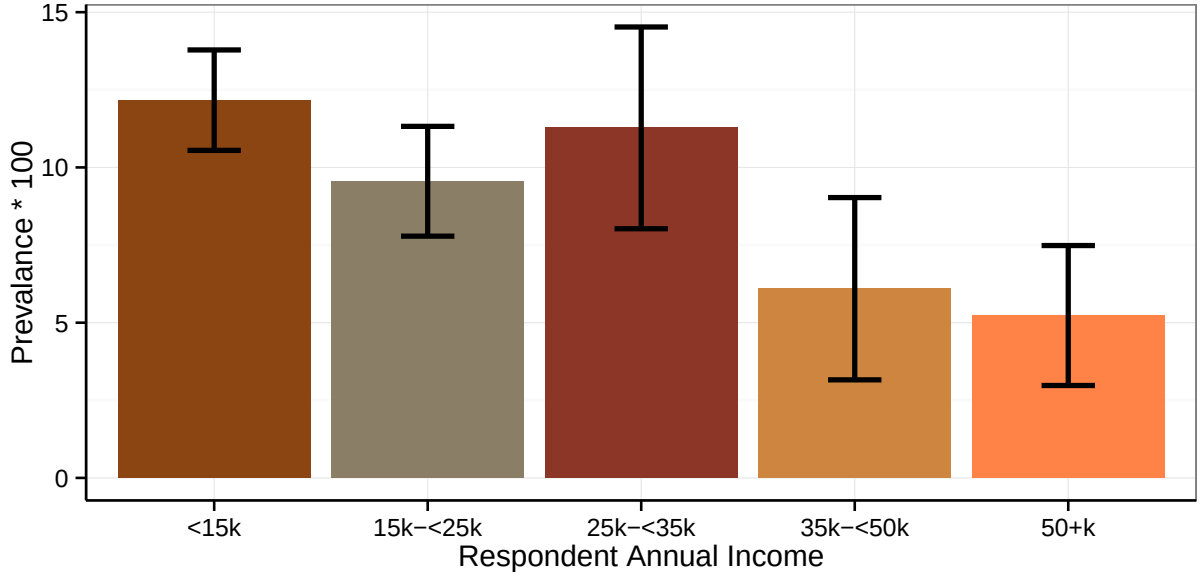


Table 4: *Current asthma prevalence among adults in Puerto Rico by income levels, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Income group					
<15k	12.17 (10.55-13.78)	139,765	1.00	0.00	1.00
15k-<25k	9.55 (7.79-11.32)	64,395	0.78	0.16	0.10
25k-<35k	11.27 (8.03-14.52)	24,964	0.93	0.23	0.74
35k-<50k	6.09 (3.16-9.03)	10,254	0.47	0.32	0.01
50+k	5.23 (2.98-7.48)	8,145	0.42	0.29	0.00

- Adults who were separated at the time of the interview, had the highest asthma prevalence among marital status. Refer to figure 6.

- Those who were never married had 20% less possibility of having current asthma prevalence when compared with those who responded being married. This difference was not significant (p-value $\geq$ 0.05). Refere to Table 5.

Figure 6: *Current asthma prevalence among adults in Puerto Rico by marital status, 2011*

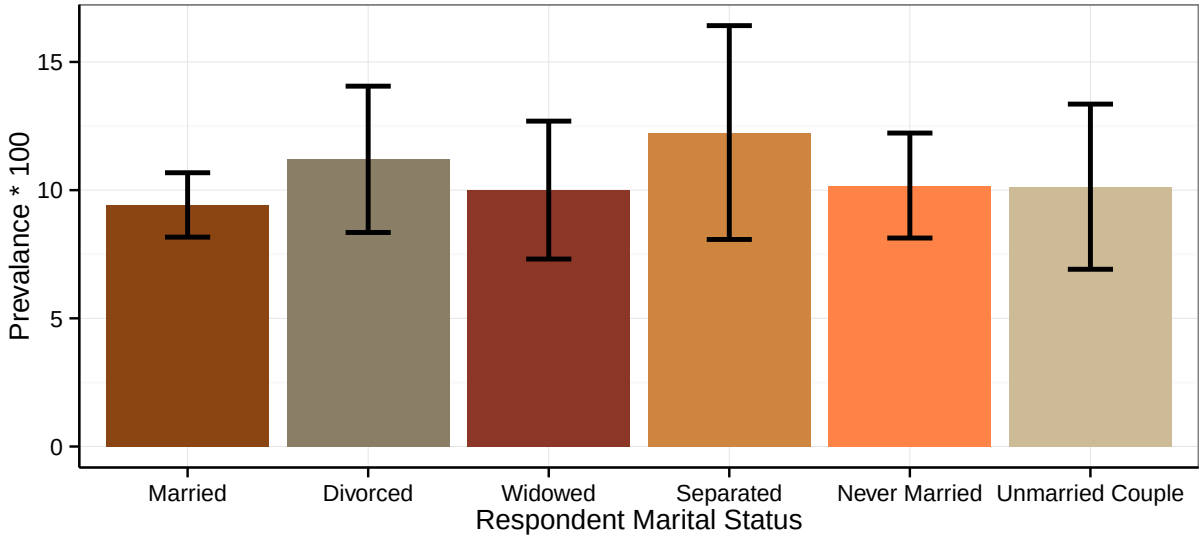


Table 5: *Current asthma prevalence among adults in Puerto Rico by marital status, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Marital group					
Married	9.42 (8.17-10.68)	107,633	1.00	0.00	1.00
Divorced	11.2 (8.35-14.06)	35,359	1.06	0.18	0.73
Widowed	10 (7.31-12.69)	21,665	0.82	0.23	0.38
Separated	12.25 (8.08-16.42)	19,444	1.02	0.24	0.94
Never Married	10.18 (8.13-12.23)	69,691	0.8	0.19	0.23
Unmarried Couple	10.13 (6.91-13.36)	32,358	0.95	0.22	0.80

- Those adults who were unable to work at the moment of the interview, had the highest current asthma prevalence (Figure 7).

- Adults who were unable to work had 2 times more possibility of having current asthma prevalence when compared with those who responded being employed. This difference was significant (p-value < 0.05). Data shown in Table 6.

Figure 7: *Current asthma prevalence among adults in Puerto Rico by employment status, 2011*

Table 6: *Current asthma prevalence among adults in Puerto Rico by employment status, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Employment status					
Employed	8.12 (6.79-9.45)	94,015	1.00	0.00	1.00
Out of work	12.41 (8.94-15.88)	35,548	1.28	0.22	0.26
Homemaker	10.92 (8.91-12.92)	60,905	0.76	0.2	0.17
Student	12.38 (8.48-16.28)	29,391	1.56	0.3	0.14
Retired	7.57 (5.99-9.14)	28,229	1.03	0.22	0.88
Unable to Work	16.74 (12.8-20.67)	38,489	2	0.22	0.00

- Figure 8 shows that the Aguadilla health region have the highest current asthma prevalence.
- Those living in the health region of Fajardo had 70% less possibility of reporting current asthma than those living in the health region of Aguadilla. (see Table 7).

Figure 8: *Current asthma prevalence among adults in Puerto Rico by health region, 2011*

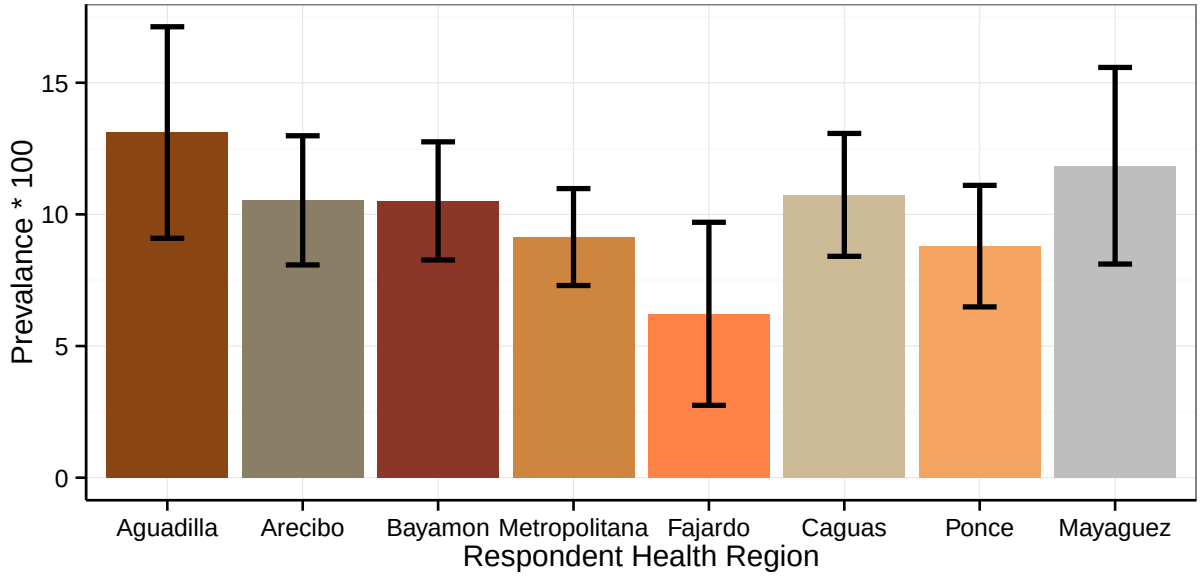


Table 7: *Current asthma prevalence among adults in Puerto Rico by health region, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Health region					
Aguadilla	13.11 (9.09-17.13)	24,757	1.00	0.00	1.00
Arecibo	10.53 (8.08-12.99)	38,286	0.67	0.25	0.10
Bayamon	10.51 (8.27-12.76)	50,494	0.82	0.24	0.40
Metropolitana	9.14 (7.3-10.98)	50,757	0.67	0.23	0.08
Fajardo	6.22 (2.75-9.7)	6,429	0.3	0.42	0.00
Caguas	10.74 (8.41-13.08)	48,111	0.72	0.24	0.16
Ponce	8.79 (6.49-11.1)	39,514	0.66	0.25	0.09
Mayaguez	11.85 (8.11-15.58)	27,616	0.82	0.28	0.47

Health related quality of life

Health Related Quality of Life (HRQOL) measures are humanistic outcomes (ISPOR) recognized to supplement traditional measures of morbidity and mortality (CDC 2000; other). HRQOL have been previously used to describe the health perception of persons with asthma. Early studies by Juniper et al. described a relationship between asthma severity and quality of life impairment. [3] Ford et al. (2003) found that persons with asthma reported worse health-related quality of life than respondents who previously had asthma or those who never had asthma [2]. Moreover, uncontrolled asthma has been linked to lower adult and pediatric HRQOL (Dean 2009). These measures are considered valid indicators of service need, interventions outcomes, support surveillance efforts for identifying health disparities and tracking population trends (CDC 2000). This section presents the current asthma prevalence among adults within those who aswer the HRQOL questions.

- Figure 9 shows that current asthma prevalence was higher in persons who perceive their healthas fair / poor, than those who claim to have a very good health.
- Adults who perceive their health as fair or poor had 64% more possibility or reporting current asthma prevalence when compared with those who perceived their health as very good. This difference was significant (p-value < 0.05). Data shown in Table 8.

Figure 9: *Current asthma prevalence among adults in Puerto Rico according to health perception, 2011*

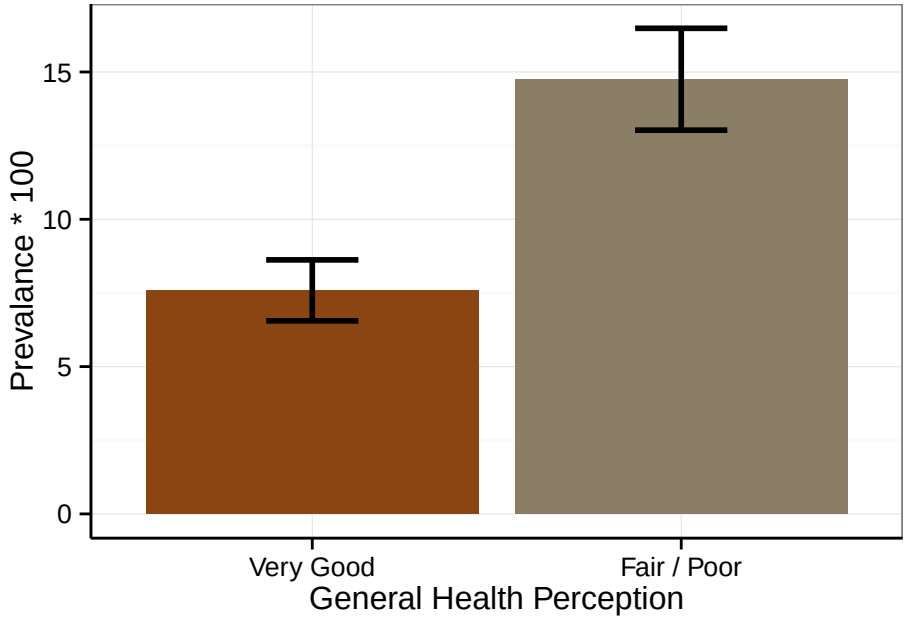


Table 8: *Current asthma prevalence among adults in Puerto Rico according to health perception, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Health Perception					
Very Good	7.59 (6.55-8.62)	141,315	1.00	0.00	1.00
Fair / Poor	14.75 (13.02-16.48)	144,566	1.64	0.2	0.01

- Adults who reported being physically unhealthy for 14 days or more in the past 30 days, had an asthma prevalence that was higher when compared with those who reported being physically unhealthy for less than 13 days in the last 30 days.
- Adults who felt physically impaired for 14 days or more had 2.82 times more possibility of reporting having asthma at the moment of the interviewm, when compared with those who felt physically imparired for 13 days or less (See Table 9).

Figure 10: *Current asthma prevalence among adults in Puerto Rico according to physical health perception, 2011*

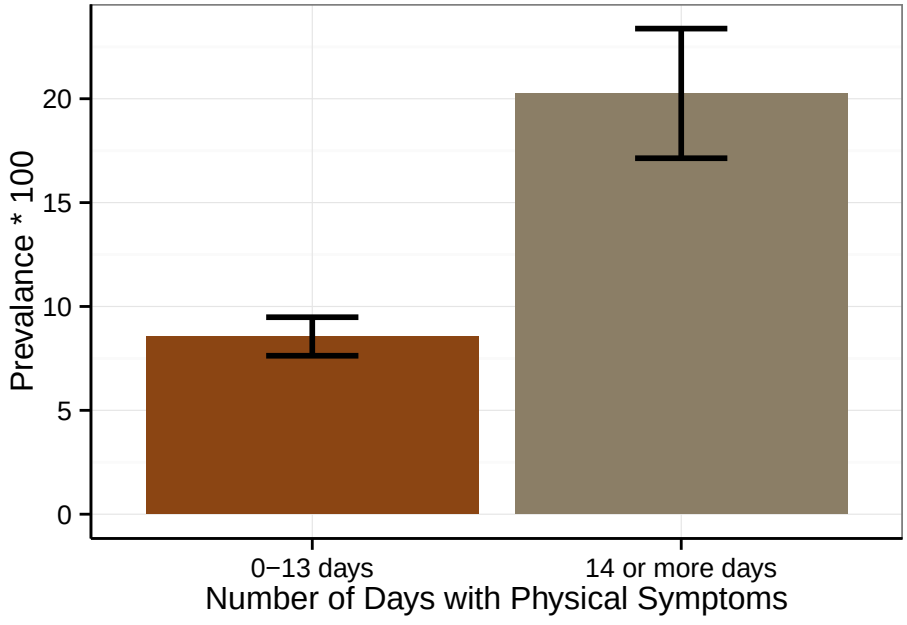


Table 9: *Current asthma prevalence among adults in Puerto Rico by days with physical health perception, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Physical Symptoms					
0-13 days	8.56 (7.63-9.48)	210,584	1.00	0.00	1.00
14 or more days	20.26 (17.14-23.38)	73,080	2.82	0.18	0.00

- Current asthma prevalence among adults who reported feeling mentally unhealthy for more than 13 days in the last month, was higher when compared with their counterpart.

- Figure 11 shows that adults who felt mentally impaired for 14 or more days had 2.28 times more possibility of having current asthma prevalence when compared with those who answered 0-13 days. This difference was significant (p-value < 0.05). (See Table 10).

Figure 11: *Current asthma prevalence among adults in Puerto Rico by days of frequent mental distress, 2011*

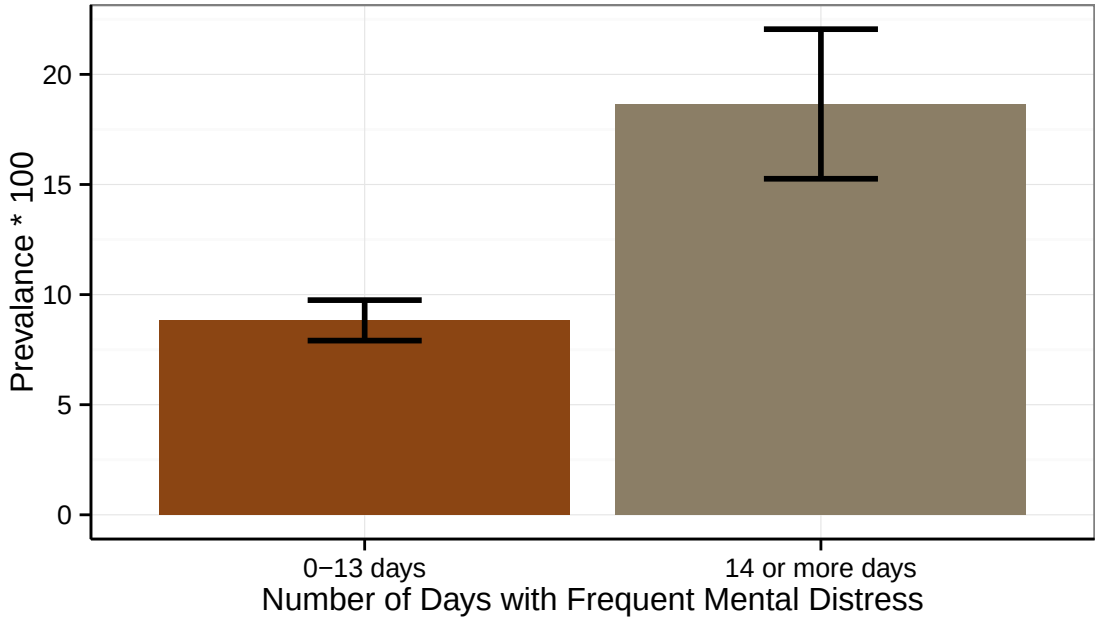


Table 10: *Current asthma prevalence among adults in Puerto Rico by days of frequent mental distress, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Mentally Unhealthy					
0-13 days	8.83 (7.91-9.75)	218,264	1.00	0.00	1.00
14 or more days	18.66 (15.26-22.05)	64,142	2.28	0.19	0.00

- A higher current asthma prevalence was observed among adults who were unable to perform their usual activities for 14 days or more due to physical or mental impairment, when compared with the other group. Refer to Figure 12).

- Persons who couldn't conduct their usual daily activities for more than 14 days in the last month had 85% more possibility of reporting current asthma prevalence when compared with those who felt this way for at most 13 days in the last 30.

Figure 12: *Current asthma prevalence among adults in Puerto Rico who were unable to conduct usual activities due to physical or mental impediment, 2011*

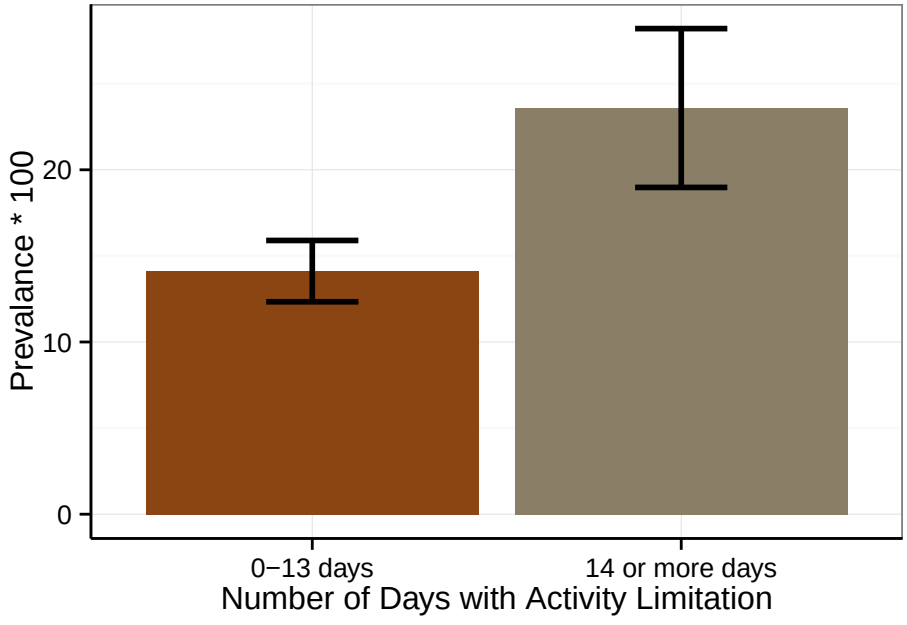


Table 11: *Current asthma prevalence among adults in Puerto Rico who were unable to cuduct usal activities due to physical or mental impairment, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Activiy limitation					
0-13 days	14.12 (12.34-15.9)	141,349	1.00	0.00	1.00
14 or more days	23.59 (18.98-28.2)	46,555	1.85	0.23	0.00

- As seen in Figure 13, those adults who felt mentally or physically unhealthy for more than 14 days in the last 30 days, had a higher current asthma prevalence when compared with their counterpart.

- Those persons who felt mentally or physically unhealthy for more than 14 days in the last month had 85% more possibility of reporting current asthma prevalence when compared with those who felt mentally or physically unhealthy for at most 13 days in the last 30. Data shown in Table 12.

Figure 13: *Current asthma prevalence among adults in Puerto Rico by unhealthy days, 2011*

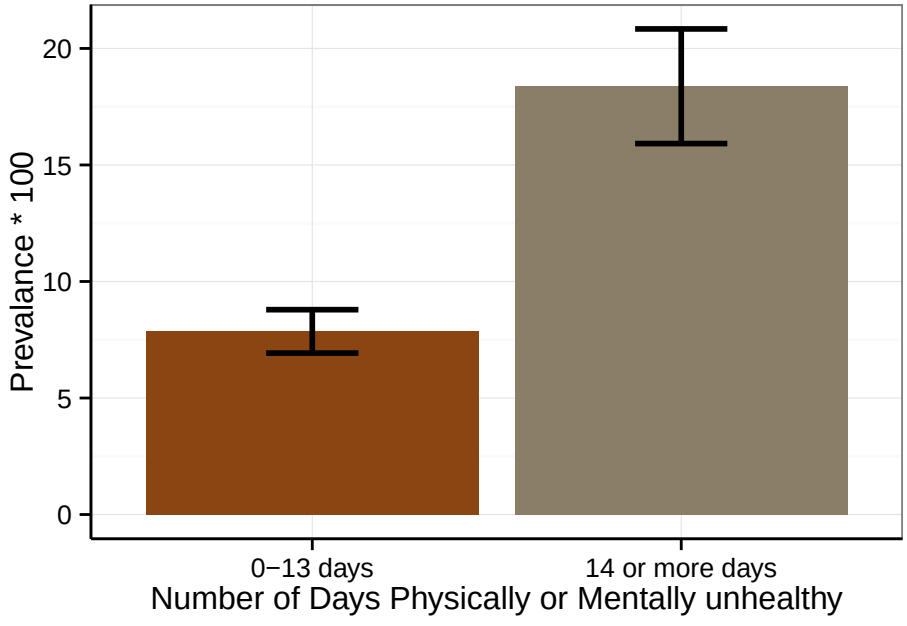


Table 12: *Current asthma prevalence among adults in Puerto Rico by unhealthy days, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Unhealthy Days					
0-13 days	7.86 (6.93-8.79)	176,804	1.00	0.00	1.00
14 or more days	18.38 (15.92-20.84)	109,772	2.73	0.15	0.00

Risk & comorbidities

Based on the Dictionary of Epidemiology a behavioral risk factor is a characteristic of behavior associated with increased probability of a specified outcome; the term does not imply a causal relationship. [1] A comorbidity is a disease(s) that coexist(s) in a study participant in addition to the index condition that is the subject of study. [1]. In this section we provide a brief description of risk factors and comorbid conditions that can guide hypothesis in understanding the burden of asthma in Puerto Rico.

- Adults who reported not being physically active had a current asthma prevalence higher than those who are (Figure 14).
- Adults who were not physically active had 10% less possibility of reporting asthma when compared with those who did physical activities.

Figure 14: *Current asthma prevalence among adults in Puerto Rico by physical activity, 2011*

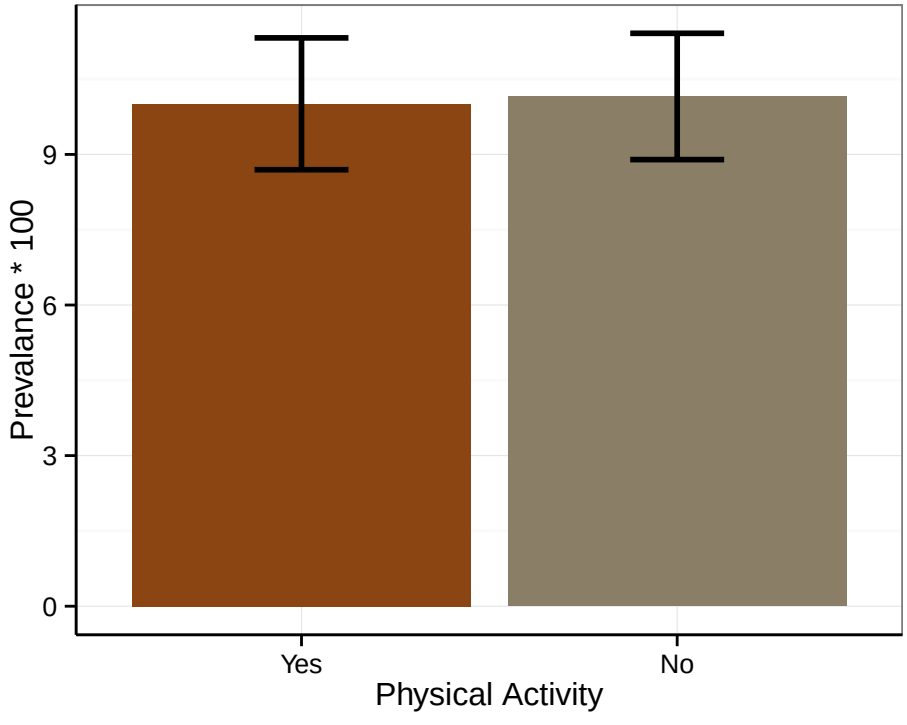


Table 13: *Current asthma prevalence among adults in Puerto Rico by physical activity, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Exercise					
Yes	10.01 (8.7-11.32)	148,844	1.00	0.00	1.00
No	10.16 (8.9-11.41)	135,683	0.9	0.15	0.49

- BMI's categories were estimated, in which those who reported being neither overweight nor obese had a higher asthma prevalence (Figure 15).
- Those adults who were classified as obese had 18% more possibility of having current asthma prevalence when compared with those in the reference group (neither overweight nor obese). This difference was not significant (p-value $\geq$ 0.05). Data shown in Table 14.

Figure 15: *Current asthma prevalence among adults in Puerto Rico by body mass index categories, 2011*

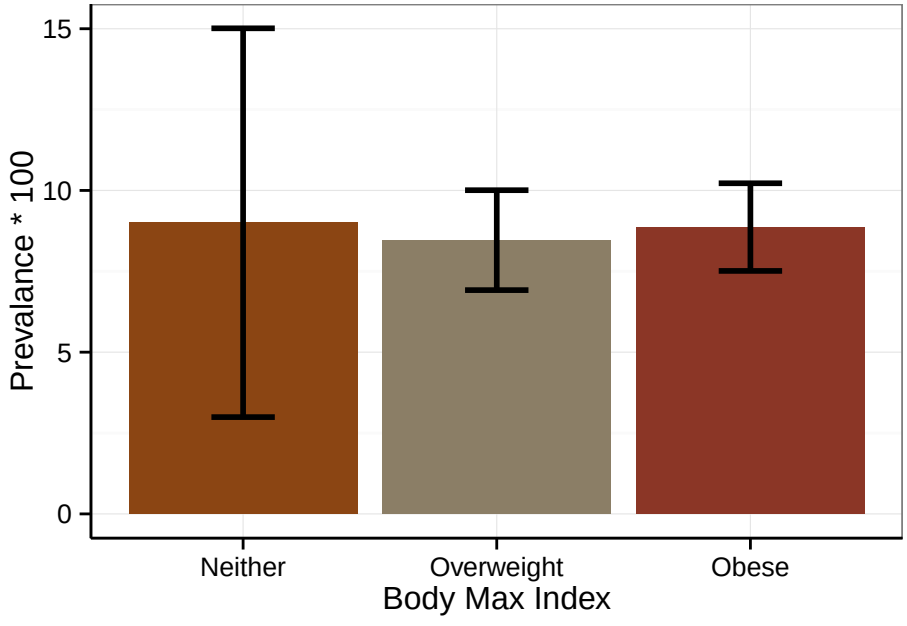


Table 14: *Current asthma prevalence among adults in Puerto Rico by body mass index categories, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
BMI Category					
Neither	9 (2.99-15.01)	4,751	1.00	0.00	1.00
Overweight	8.46 (6.92-10.01)	73,943	1.07	0.43	0.87
Obese	8.87 (7.51-10.22)	96,523	1.18	0.43	0.69

- Figure 16 shows that current asthma prevalence was lower among smokers than among non-smokers.
- Adults who did not smoke had 9% less possibility of having current asthma prevalence when compared with those who smoke. This difference was not significant (p-value $\geq$ 0.05).

Figure 16: *Current asthma prevalence among adults in Puerto Rico by smoking status, 2011*

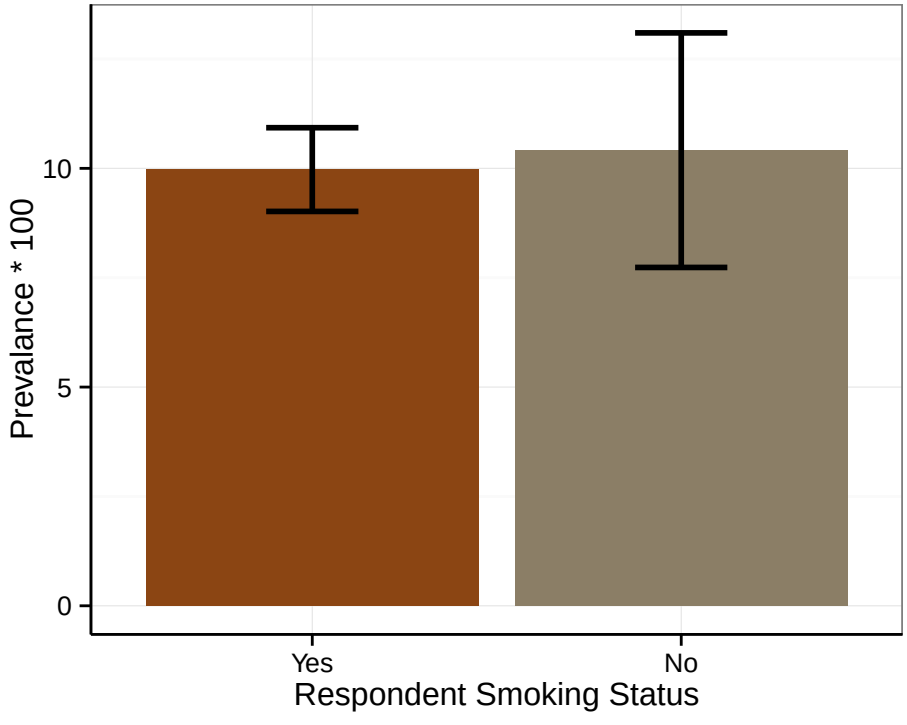


Table 15: *Current asthma prevalence among adults in Puerto Rico by smoking status, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Smoke					
Yes	9.97 (9.02-10.93)	241,854	1.00	0.00	1.00
No	10.42 (7.73-13.1)	43,747	0.91	0.21	0.66

- Those persons with one or more chronic diseases, had a higher current asthma prevalence than those without any chronic disease.
- Those adults who reported having one or more chronic condition had one or more had 2.74 times more possibility when compared those who did not had any (See Table 16).

Figure 17: *Current asthma prevalence among adults in Puerto Rico by any other chronic diseases, 2011*

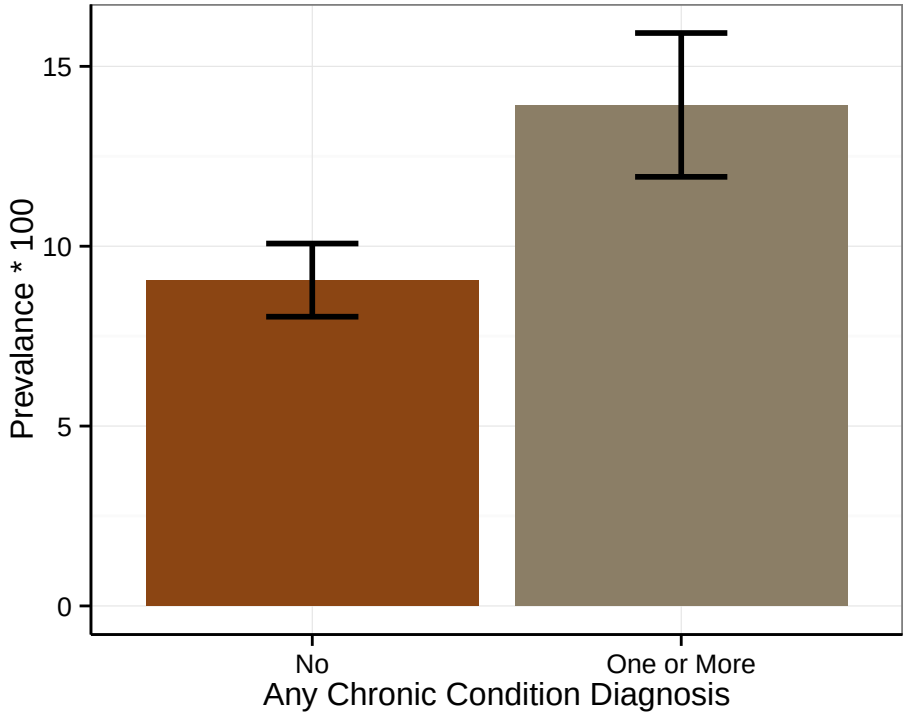


Table 16: *Current asthma prevalence among adults in Puerto Rico by presence of any other chronic disease, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Any Chronic Disease					
No	9.06 (8.04-10.07)	204,463	1.00	0.00	1.00
One or More	13.93 (11.93-15.93)	82,113	2.74	0.19	0.00

Results: Asthma among children

Figure 18: *Current asthma prevalence among children in Puerto Rico, 2011*

- The 2011 current asthma prevalence among children in Puerto Rico, was 13.6%. Figure 18.

- The highest current asthma prevalence among children was in the 10-14 age group.
- Children in the age group of 10-14 had 85% more possibility of having current asthma prevalence when compared with those in with less than 5 years. This difference was not significant (p-value $\geq$ 0.05). See Table 17.

Figure 19: *Current asthma prevalence among children in Puerto Rico by age group, 2011*

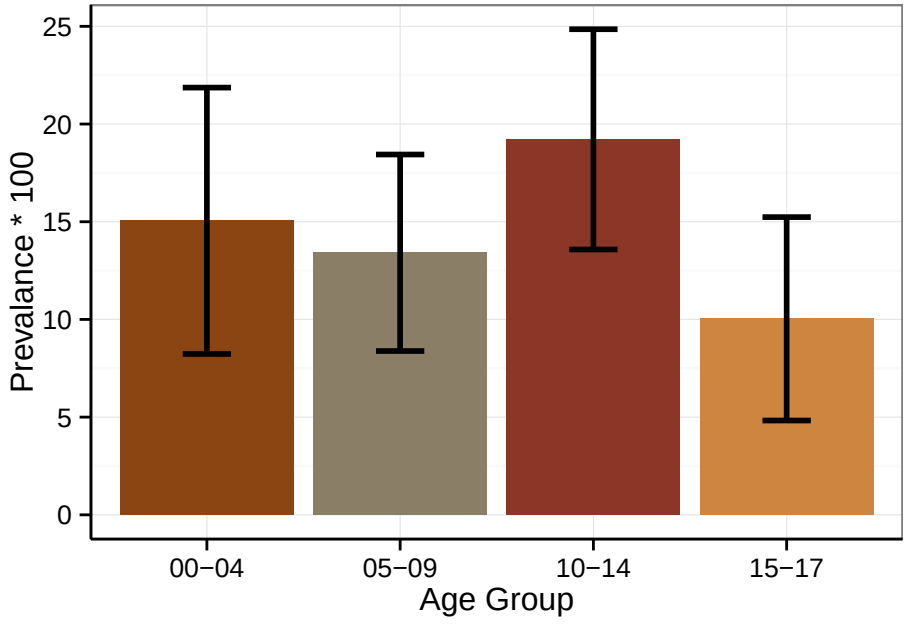


Table 17: *Current asthma prevalence among children in Puerto Rico by age group, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Child Age					
00-04	15.05 (8.23-21.86)	39,983	1.00	0.00	1.00
05-09	13.41 (8.38-18.44)	38,998	1.12	0.38	0.76
10-14	19.22 (13.58-24.85)	37,100	1.85	0.35	0.07
15-17	10.03 (4.83-15.24)	18,176	1	0.43	0.99

- Figure 20 shows higher current asthma prevalence among female children.
- In children, females female had 21% less possibility of reporting current asthma prevalence when compared with males. This difference was not significant (p-value $\geq$ 0.05). (See Table 18).

Figure 20: *Current asthma prevalence among children in Puerto Rico by sex, 2011*

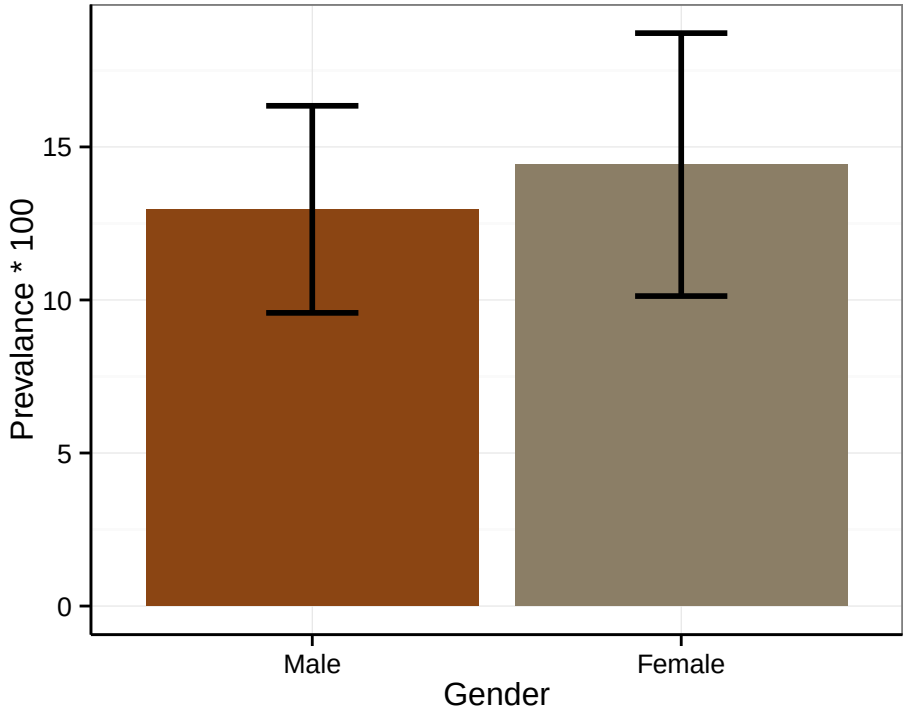


Table 18: *Current asthma prevalence among children in Puerto Rico by sex, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Child sex					
Male	12.96 (9.58-16.34)	67,422	1.00	0.00	1.00
Female	14.42 (10.13-18.72)	73,268	0.79	0.26	0.36

- As observed in Figure 21, children who lived in the Fajardo health region have the highest current asthma prevalence.
- Those living in the health region of Fajardo had 2.7 times more possibility of reporting current asthma prevalence than those living in the health region of Aguadilla. Data shown in Table 19.

Figure 21: *Current asthma prevalence among children in Puerto Rico by respondent health region, 2011*

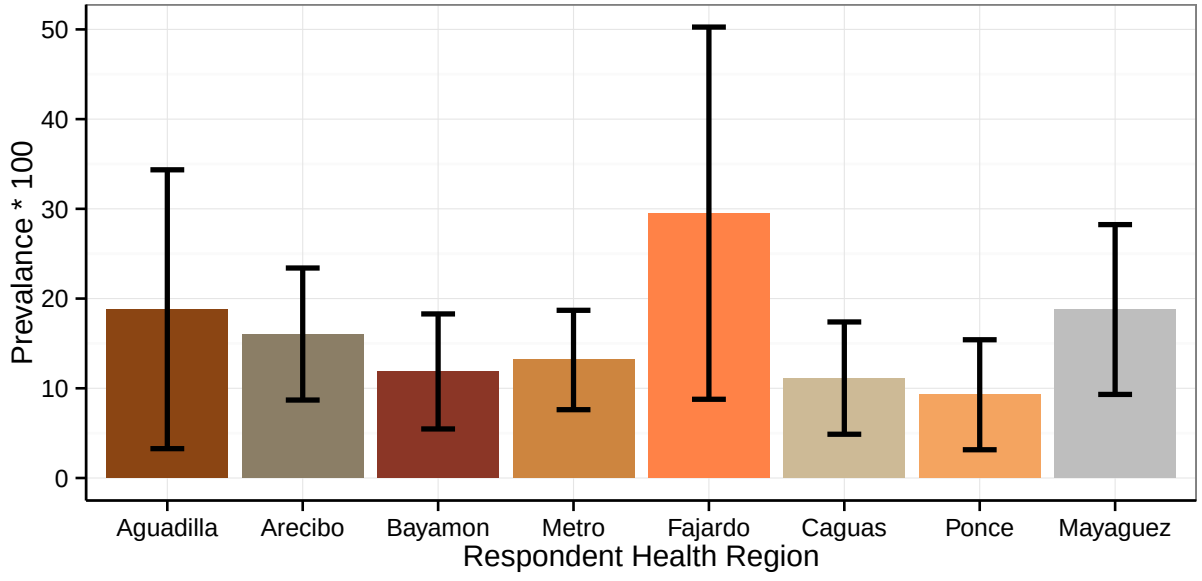


Table 19: *Current asthma prevalence among children in Puerto Rico by respondent health region, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Health region					
Aguadilla	18.81 (3.27-34.35)	10,775	1.00	0.00	1.00
Arecibo	16.05 (8.69-23.4)	22,154	1.18	0.66	0.80
Bayamon	11.88 (5.47-18.29)	20,391	0.93	0.65	0.91
Metro	13.15 (7.62-18.69)	27,651	0.92	0.63	0.88
Fajardo	29.52 (8.77-50.26)	9,644	2.7	0.77	0.19
Caguas	11.14 (4.88-17.39)	16,958	0.89	0.67	0.86
Ponce	9.28 (3.15-15.41)	17,530	0.66	0.7	0.55
Mayaguez	18.78 (9.31-28.24)	14,559	1.08	0.7	0.91

- Figure 22 shows that children whose parents or guardian's annual income was $< 15k$, had a higher current asthma prevalence when compared to other income groups.

- Children whose parents or guardian's annual income was 15k-<25k had 30% less possibility of having current asthma prevalence when compared with those whose annual income is less than $15,000.

Figure 22: *Current asthma prevalence among children in Puerto Rico by annual income of the interviewed, 2011*

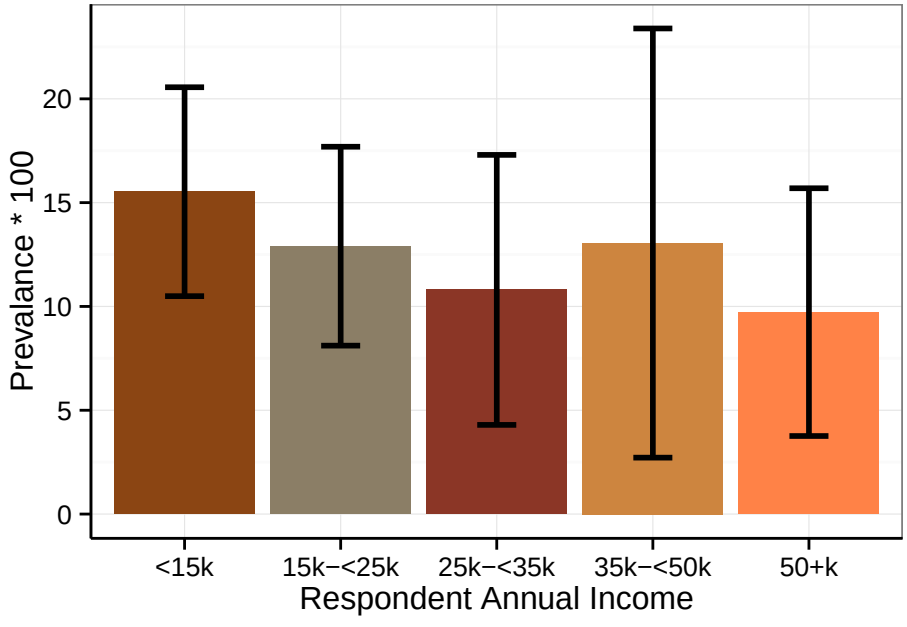


Table 20: *Current asthma prevalence among children in Puerto Rico by annual income of the interviewee , 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Annual income					
<15k	15.53 (10.5-20.56)	61,257	1.00	0.00	1.00
15k-<25k	12.9 (8.11-17.69)	36,121	0.7	0.36	0.31
25k-<35k	10.8 (4.29-17.3)	8,909	0.74	0.46	0.51
35k<50k	13.05 (2.72-23.39)	11,136	1.07	0.53	0.89
50+k	9.73 (3.76-15.69)	7,812	0.81	0.48	0.66

- Current asthma prevalence among children was higher where the interviewed described their marital status as unmarried couple.
- Children of households where the interviewed responded their marital status as separated had 79% less possibility of reporting current asthma prevalence when compared with those whose parents or guardians where married. (See Table 21).

Figure 23: *Current asthma prevalence among children in Puerto Rico by marital status of the interviewed, 2011*

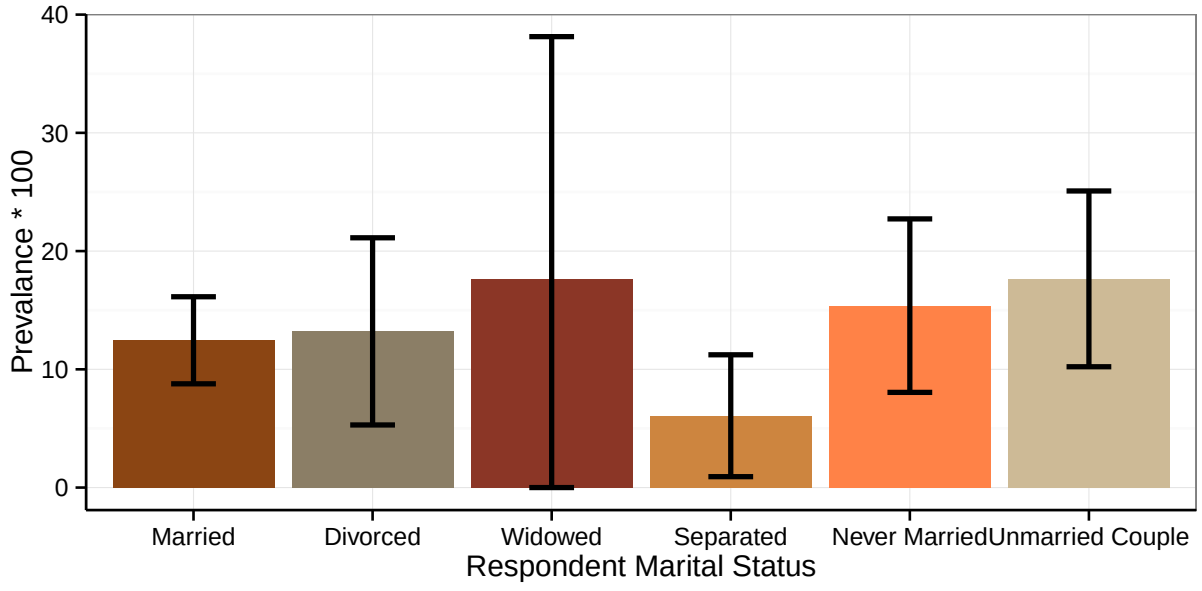


Table 21: *Current asthma prevalence among children in Puerto Rico by marital status of the interviewed, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Marital status					
Married	12.46 (8.77-16.14)	62,760	1.00	0.00	1.00
Divorced	13.21 (5.29-21.12)	9,759	0.99	0.5	0.98
Widowed	17.61 (0-38.14)	6,118	1.03	0.79	0.97
Separated	6.08 (0.92-11.23)	4,157	0.21	0.68	0.02
Never Married	15.39 (8.05-22.72)	24,010	1.08	0.37	0.84
Unmarried Couple	17.65 (10.22-25.09)	34,344	1.34	0.4	0.47

- Children whose gurdian was an active smoker at the time of the interview, reported a higher current asthma prevalence when compared with their counterpart (Figure 24).

- Those children living in a household where the interviewee smoked, had 24% less possibility of having current asthma prevalence when compared with those whose parents or gurdians didn't smoke at the time of the interview. This difference was not significant (p-value $\geq$ 0.05). Refere to Table 22 for further information.

Figure 24: *Current asthma prevalence among children in Puerto Rico by smoking status of the interviewee, 2011*

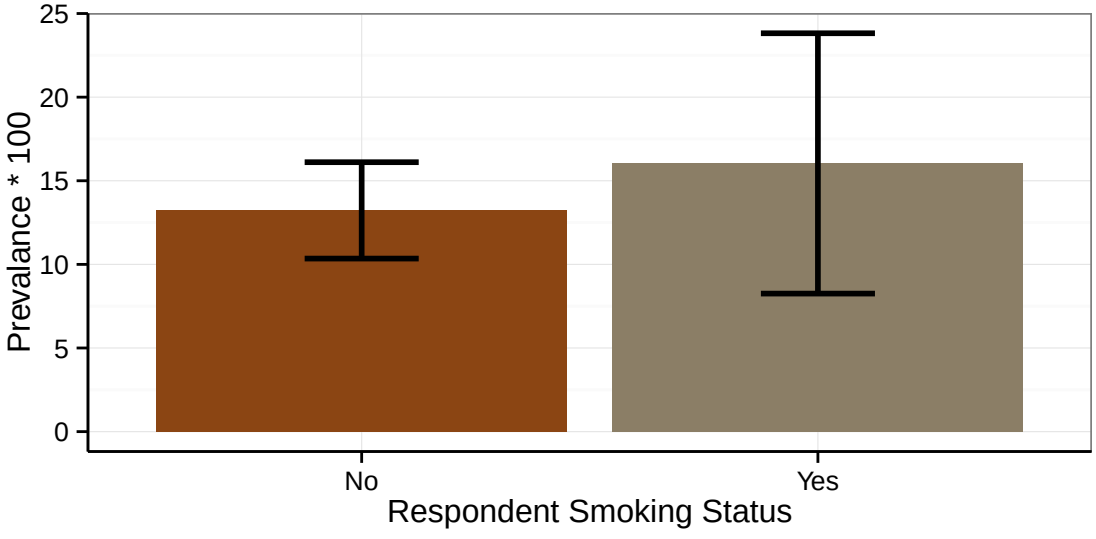


Table 22: *Current asthma prevalence among children in Puerto Rico by smoking status of the interviewee, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Smoking status					
No	13.23 (10.35-16.11)	755,742	1.00	0.00	1.00
Yes	16.04 (8.25-23.82)	135,782	0.76	0.38	0.47

Remarks

This report suggest that asthma in Puerto Rico should continue be considered a priority for the public health authorities in Puerto Rico. An estimate of 286,576 (10.07%) adult and 141,148 (13.67%) children in Puerto Rico had current asthma prevalence as of the period of 2011. When evaluating by the socio-demographic variables, no specific group has been disproportionately affected with asthma prevalence in age groups, educational level or marital status. With regards to gender the asthma prevalence was 2.56 times higher in women. Although not statistically significant those in the household income range of 35k-50k and those in the range of more than 50k annualy, had 0.53 and 0.58 respectively less possibility of current asthma prevalence that those in group of those who recive less than 15k annualy.

Moving to the health related quality of life measures, the possibility of reporting current asthma prevalence in adults that perceived their health as fair or poor was 1.64 times higher than those who considered their health as good, very good or excellent. The adults who said that they felt physically bad for 14 days or more for the last 30 days had 2.82 times higher possibility of reporting current asthma prevalence than those less than 13 days. In the same manner, adults who felt mentally distressed for 14 days or more in a month had 2.28 times higher possibility of reporting current asthma prevalence than those less than 13 days feeling mentally distressed. From 1.6 million adults who were unable to carry on with their normal activities more than 14 days in a month, 18.38 (15.92-20.84) percent reported current asthma prevalence.

People who exercise, or are exposed to physical activities reported 0.1 % higher risk of asthma than those who don't. Regarding body mass index (BMI), those obese and overweight had 0.07% and 0.18% respectively more possibility of current asthma prevalence than those neither obese nor overweight. The estimation of the current asthma prevalence on smokers was 9.97 (9.02-10.93) percent. Adults with diabetes were -0.26 less likely to have current asthma prevalence than their counterpart.

Regarding children estimates those in the 05-09 age group reported a current asthma

prevalence of 13.41 (8.38-18.44) percent. Female children have a 1.11 times higher current asthma prevalence than their counterpart. Children whose parents' annual income is less than $15,000, reported to have a current asthma prevalence of 15.53 (10.5-20.56) percent.

Progress has been made in understanding the burden of asthma in Puerto Rico. Advancements in the diagnose and treatment of the condition have had considerably improved in the last 20 years, but it is still an uncontrolled condition. The disclosed information is part of the effort of the Puerto Rico Asthma Project to provide an update of the state of asthma in our country. The report presents information that can aid in the development of public policy, guide changes in the health care system, monitor population asthma control, enhance educational materials, and guide all efforts to target factors of disparities as a way of reducing the morbidity and mortality associated with asthma in Puerto Rico.

Summary tables

In this section we provide a set of summary tables of current asthma prevalence among adults and children in Puerto Rico for the years 2011. The tables aggregate all the analysis conducted in this report for an easy to print and carry document for reference, or to be used as an annex for the preparation of other documents such as an application for funds. For the interpretation of each result, please refer to the corresponding section in the document.

Table 23: *Current asthma prevalence among adults and children in Puerto Rico, 2011*

Group	Prevalence	Number	Sample.size
Adults	10.07 (9.16-10.97)	286,576	6,613
Children	13.67 (10.95-16.39)	141,148	1,230

Source: Behavioral Risk Factor Surveillance Survey, 2011

Table 24: *Current asthma prevalence among adults by Socio-demographic variables in Puerto Rico, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Age group					
18-24	11.84 (8.91-14.78)	49,214	1.00	0.00	1.00
25-34	10.5 (8.18-12.83)	57,507	0.83	0.26	0.47
35-44	10.5 (8.12-12.89)	55,269	0.81	0.27	0.42
45-54	10.5 (8.32-12.68)	50,325	0.68	0.27	0.16
55-64	8.13 (6.43-9.83)	32,750	0.47	0.29	0.00
65+	8.73 (7.35-10.1)	41,512	0.56	0.32	0.06
Gender					
Males	6.57 (5.4-7.74)	87,796	1.00	0.00	1.00
Females	13.16 (11.82-14.5)	198,780	2.56	0.14	0.00
Escolarity					
Some High School	10.39 (8.51-12.26)	90,384	1.00	0.00	1.00
High School Graduate	9.92 (8.21-11.62)	72,716	0.92	0.17	0.62
Some University	10.85 (8.97-12.72)	74,683	1.03	0.18	0.87
University Graduate	8.76 (7.16-10.37)	48,322	1.05	0.21	0.80
Household income					
<15k	12.17 (10.55-13.78)	139,765	1.00	0.00	1.00
15k-<25k	9.55 (7.79-11.32)	64,395	0.78	0.16	0.10
25k-<35k	11.27 (8.03-14.52)	24,964	0.93	0.23	0.74
35k-<50k	6.09 (3.16-9.03)	10,254	0.47	0.32	0.01
50+k	5.23 (2.98-7.48)	8,145	0.42	0.29	0.00
Marital status					
Married	9.42 (8.17-10.68)	107,633	1.00	0.00	1.00
Divorced	11.2 (8.35-14.06)	35,359	1.06	0.18	0.73
Widowed	10 (7.31-12.69)	21,665	0.82	0.23	0.38
Separated	12.25 (8.08-16.42)	19,444	1.02	0.24	0.94
Never Married	10.18 (8.13-12.23)	69,691	0.8	0.19	0.23
Unmarried Couple	10.13 (6.91-13.36)	32,358	0.95	0.22	0.80
Employment status					
Employed	8.12 (6.79-9.45)	94,015	1.00	0.00	1.00
Out of work	12.41 (8.94-15.88)	35,548	1.28	0.22	0.26
Homemaker	10.92 (8.91-12.92)	60,905	0.76	0.2	0.17
Student	12.38 (8.48-16.28)	29,391	1.56	0.3	0.14
Retired	7.57 (5.99-9.14)	28,229	1.03	0.22	0.88
Unable to Work	16.74 (12.8-20.67)	38,489	2	0.22	0.00
Health region					
Aguadilla	13.11 (9.09-17.13)	24,757	1.00	0.00	1.00
Arecibo	10.53 (8.08-12.99)	38,286	0.67	0.25	0.10
Bayamon	10.51 (8.27-12.76)	50,494	0.82	0.24	0.40
Metropolitana	9.14 (7.3-10.98)	50,757	0.67	0.23	0.08
Fajardo	6.22 (2.75-9.7)	6,429	0.3	0.42	0.00
Caguas	10.74 (8.41-13.08)	48,111	0.72	0.24	0.16
Ponce	8.79 (6.49-11.1)	39,514	0.66	0.25	0.09
Mayaguez	11.85 (8.11-15.58)	27,616	0.82	0.28	0.47

Source: Behavioral Risk Factor Surveillance Survey, 2011

Table 25: *Current asthma prevalence among adults by health related quality of life indcators in Puerto Rico, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Health perception					
Very Good	7.59 (6.55-8.62)	141,315	1.00	0.00	1.00
Fair / Poor	14.75 (13.02-16.48)	144,566	1.64	0.2	0.01
Physical unhealthy					
0-13 days	8.56 (7.63-9.48)	210,584	1.00	0.00	1.00
14 or more days	20.26 (17.14-23.38)	73,080	2.82	0.18	0.00
Mental unhealthy					
0-13 days	8.83 (7.91-9.75)	218,264	1.00	0.00	1.00
14 or more days	18.66 (15.26-22.05)	64,142	2.28	0.19	0.00
Activity limitation					
0-13 days	14.12 (12.34-15.9)	141,349	1.00	0.00	1.00
14 or more days	23.59 (18.98-28.2)	46,555	1.85	0.23	0.00
Physical and mental unhealthy					
0-13 days	7.86 (6.93-8.79)	176,804	1.00	0.00	1.00
14 or more days	18.38 (15.92-20.84)	109,772	2.73	0.15	0.00

Source: Behavioral Risk Factor Surveillance Survey, 2011

Table 26: *Current asthma prevalence among adults by risk and comorbidity variables in Puerto Rico, 2011*

Variables	Prevalence	Number	OR	OR(SE)	p-value
Exercise					
Yes	10.01 (8.7-11.32)	148,844	1.00	0.00	1.00
No	10.16 (8.9-11.41)	135,683	0.9	0.15	0.49
BMI					
Neither	9 (2.99-15.01)	4,751	1.00	0.00	1.00
Overweight	8.46 (6.92-10.01)	73,943	1.07	0.43	0.87
Obese	8.87 (7.51-10.22)	96,523	1.18	0.43	0.69
Smoker					
Yes	9.97 (9.02-10.93)	241,854	1.00	0.00	1.00
No	10.42 (7.73-13.1)	43,747	0.91	0.21	0.66
Diabetes diagnosis					
Yes	9.66 (8.68-10.65)	237,661	1.00	0.00	1.00
No	12.45 (10.08-14.82)	47,559	1.26	0.18	0.20
Any chronic condition					
No	9.06 (8.04-10.07)	204,463	1.00	0.00	1.00
One or More	13.93 (11.93-15.93)	82,113	2.74	0.19	0.00

Source: Behavioral Risk Factor Surveillance Survey, 2011

Table 27: *Current asthma prevalence among children by demographic variables in Puerto Rico, 2011*

Variables	Prevalence	Population	OR	OR(SE)	p-value
Age group					
00-04	15.05 (8.23-21.86)	39,983	1.00	0.00	1.00
05-09	13.41 (8.38-18.44)	38,998	1.12	0.38	0.76
10-14	19.22 (13.58-24.85)	37,100	1.85	0.35	0.07
15-17	10.03 (4.83-15.24)	18,176	1	0.43	0.99
Gender					
Male	12.96 (9.58-16.34)	67,422	1.00	0.00	1.00
Female	14.42 (10.13-18.72)	73,268	0.79	0.26	0.36
Health region					
Aguadilla	18.81 (3.27-34.35)	10,775	1.00	0.00	1.00
Arecibo	16.05 (8.69-23.4)	22,154	1.18	0.66	0.80
Bayamon	11.88 (5.47-18.29)	20,391	0.93	0.65	0.91
Metro	13.15 (7.62-18.69)	27,651	0.92	0.63	0.88
Fajardo	29.52 (8.77-50.26)	9,644	2.7	0.77	0.19
Caguas	11.14 (4.88-17.39)	16,958	0.89	0.67	0.86
Ponce	9.28 (3.15-15.41)	17,530	0.66	0.7	0.55
Mayaguez	18.78 (9.31-28.24)	14,559	1.08	0.7	0.91

Source: Behavioral Risk Factor Surveillance Survey, 2011

Table 28: *Current asthma prevalence among children by respondent social variables in Puerto Rico, 2011*

Variables	Prevalence	Population	OR	OR(SE)	p-value
Household income					
<15k	15.53 (10.5-20.56)	61,257	1.00	0.00	1.00
15k-<25k	12.9 (8.11-17.69)	36,121	0.7	0.36	0.31
25k-<35k	10.8 (4.29-17.3)	8,909	0.74	0.46	0.51
35k<50k	13.05 (2.72-23.39)	11,136	1.07	0.53	0.89
50+k	9.73 (3.76-15.69)	7,812	0.81	0.48	0.66
Marital status					
Married	12.46 (8.77-16.14)	62,760	1.00	0.00	1.00
Divorced	13.21 (5.29-21.12)	9,759	0.99	0.5	0.98
Widowed	17.61 (0-38.14)	6,118	1.03	0.79	0.97
Separated	6.08 (0.92-11.23)	4,157	0.21	0.68	0.02
Never Married	15.39 (8.05-22.72)	24,010	1.08	0.37	0.84
Unmarried Couple	17.65 (10.22-25.09)	34,344	1.34	0.4	0.47

Source: Behavioral Risk Factor Surveillance Survey, 2011

References

[1] Last JM. Fourth edition 2000. A dictionary of epidemiology. *New York: Oxford University Press*, 2000.

[2] E.S. Ford, D.M. Mannino, D.M. Homa, C. Gwynn, S.C. Redd, and A.H. Moriarty, D.G. Mokdad. Self-reported asthma and health related quality of life: Findings from the behavioral risk factor surveillance system. *CHEST*, 2003.

[3] E.F. Juniper, G.H. Guyatt, R.S. Epstein, P.Ja Ferrie, R. Jaeschke, and T.K. Hiller. Evaluation of impairment of health related quality of life in asthma: development of a questionnaire for use in clinical trials. *Thorax*, 1992.