

Brazilian
Cystic Fibrosis
Patient Registry
2011 Annual Report

BRAZILIAN CYSTIC FIBROSIS PATIENT REGISTRY (REBRAFC) 2011 ANNUAL REPORT

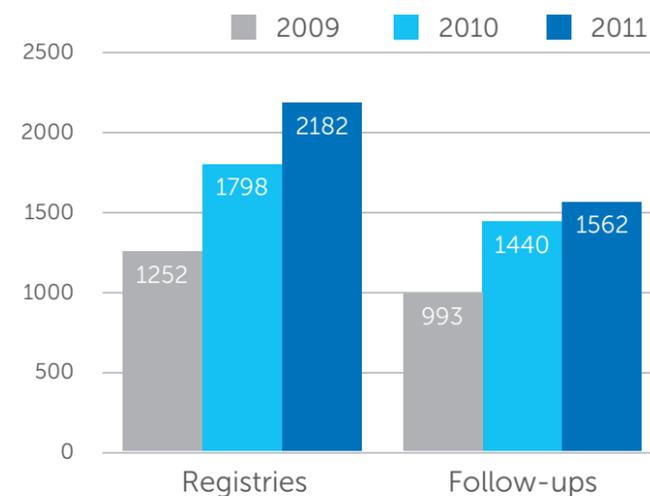
This report contains data obtained from several Brazilian Centers of Cystic Fibrosis (CF) care. It is the third annual edition produced, and a trend for growth can be observed yet, with a total of 2,182 patients enrolled in the database. The evolution of registries and follow-up data is depicted in the Figure below:

In order to improve the treatment of CF in Brazil, detailed information regarding patients' characteristics and current treatment in different Centers and country regions is essential.

The Brazilian Cystic Fibrosis Patient Registry was implemented and is fully maintained by the Brazilian Cystic Fibrosis Study Group (GBEFC), with the following objectives:

- Measure, research, and compare aspects of cystic fibrosis and its treatment in several Brazilian states, encouraging new therapeutic strategies;
- Provide data for epidemiologic research;
- Facilitate the longitudinal follow-up of the patient;
- Facilitate referral and counter referral of patients;
- Identify special groups for multicenter studies;
- Identify the characteristics of assistance in each Brazilian state / Center for planning assistance actions.
- Encourage Reference Centers to achieve excellence in the care for patients with CF.

The staff of the Laboratório de Sistemas Integráveis (LSI) from Escola Politécnica de Engenharia of University of São Paulo is responsible for the development and maintenance of the Web platform where the REBRAFC runs. All participating centers were asked to obtain approval of the local Ethics Committees and to obtain consent from parents and / or guardians and directly from older patients, to allow insertion of their data in the database. A leaflet explaining the Registry rules and benefits was distributed to patients and parents/caregivers



The Web platform incorporates several security mechanisms for data input and information storage, so that only the local centers have access to the full identification of their patients, and no information can be made available for research or multicenter studies without the agreement of each participant center.

Despite the significant increase in the participation of several national CF centers, many of them have not yet entered data or did it incompletely, for various reasons, such as difficulties in the approval by the local ethics committees or simply by lack of initiative of the professionals. The Centers who signed the confidentiality agreement to participate in the REBRAFC are listed in page 54/55 (some of them did not enter data).

About Cystic Fibrosis and the GBEFC:

Cystic fibrosis (CF) is an autosomal recessive disease with multisystemic involvement (respiratory, gastrointestinal, liver and genitourinary). It is a complex disease still little known in our country, despite the existence of some specialized centers with health professionals dedicated to patient care for many years. Treatment is quite complex and involves high cost medications, but access to care and medications is not uniform in the country.

The Brazilian Cystic Fibrosis Study Group (GBEFC) is a nonprofit organization comprised of healthcare professionals working in the area, created on November 2003. Among the activities of the GBEFC, we can cite research, staff training and aid in the development of CF treatment centers in the country, organizing scientific meetings (four editions of the Brazilian CF Congress), working with the Ministry of Health to define a national protocol of CF care and implementation of Newborn Screening in all Brazilian states.

The GBEFC maintains an Internet site (www.gbefc.org.br) that provides information on cystic fibrosis, scientific publications and resources, and also displays the Patient Registry Reports in Portuguese and English versions for free download.

EXECUTIVE COMMITTEE OF THE BRAZILIAN CYSTIC FIBROSIS REGISTRY:

Dr. Luiz Vicente Ribeiro Ferreira da Silva Filho

- Executive coordinator of the REBRAFC
- Assistant professor at the Pediatric Pulmonology Unit, Instituto da Criança HCFMUSP
- Researcher at the Research and Learning Institute of Hospital Israelita Albert Einstein and at Instituto de Medicina Tropical of University of São Paulo
- Vice-President of the Brazilian Cystic Fibrosis Study Group (GBEFC)

Dr. Francisco José Caldeira Reis

- Professor of Pediatrics at Federal University of Minas Gerais
- President of the Brazilian Cystic Fibrosis Study Group (GBEFC)
- Pediatric Pulmonologist trained at University of Manitoba – Children’s Hospital of Winnipeg – Manitoba – Canada.
- Advisor of the Hospital Infantil João Paulo II - Rede FHEMIG - Belo Horizonte, Minas Gerais

Dra. Neiva Damaceno

- Assistant Professor of the Pediatric Pulmonology Group of Faculdade de Ciências Médicas da Santa Casa de São Paulo
- Ex-President of the Brazilian Cystic Fibrosis Study Group (GBEFC)

Adilson Yuuji Hira

- Laboratory of Integrated Systems, Escola Politécnica of University of São Paulo.

It’s interesting to notice that near 30% of the patients already have three years of follow-up data inserted (Table 1).

In the description of demographic and diagnostic data, all patients were included. Only data from the year 2011 (1,562 patients) were included in the Follow-up data.

Table 1
Patients’ distribution by time of follow-up.

Time of follow-up	n	%
No follow-up	183	8.4
1 year	654	30.0
2 years	698	32.0
3 years	645	29.6
4 years	2	0.1
Total	2,182	100

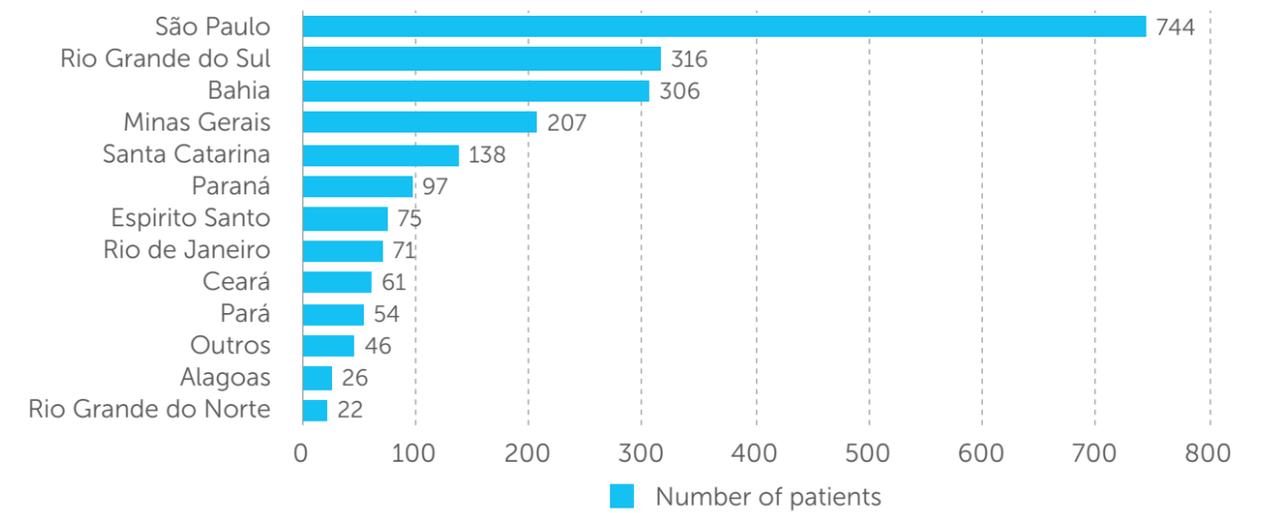
n=number of patients.

Table 2
Distribution of patients by Brazilian State of origin (birth place).

Brazilian State of origin	n (%)	Brazilian State of origin	n (%)
São Paulo	744 (34.1%)	Mato Grosso	12 (0.5%)
Rio Grande do Sul	316 (14.5%)	Mato Grosso do Sul	7 (0.3%)
Bahia	306 (14.0%)	Pernambuco	6 (0.3%)
Minas Gerais	207 (9.5%)	Amazonas	5 (0.2%)
Santa Catarina	138 (6.3%)	Sergipe	4 (0.2%)
Paraná	97 (4.4%)	Distrito Federal	3 (0.1%)
Espirito Santo	75 (3.4%)	Piauí	3 (0.2%)
Rio de Janeiro	71 (3.3%)	Rondônia	2 (0.1%)
Ceará	61 (2.8%)	Acre	1 (0.04%)
Pará	54 (2.5%)	Maranhão	1 (0.04%)
Alagoas	26 (1.2%)	Paraíba	1 (0.04%)
Rio Grande do Norte	22 (1.0%)	Roraima	1 (0.04%)
Not informed	19 (0.9%)		

Total 2,182 (100%)
n=number of patients.

Figure 1
Distribution of patients by Brazilian State of origin (birth place).



Regarding Brazilian State of origin, a significant increase was noticed in Espirito Santo (1 case in 2010 and 75 cases in 2011) and in Paraná (63 to 97 cases). No new cases were registered in the States of Mato Grosso, Maranhão, and also in the States of the North Brazilian Region.

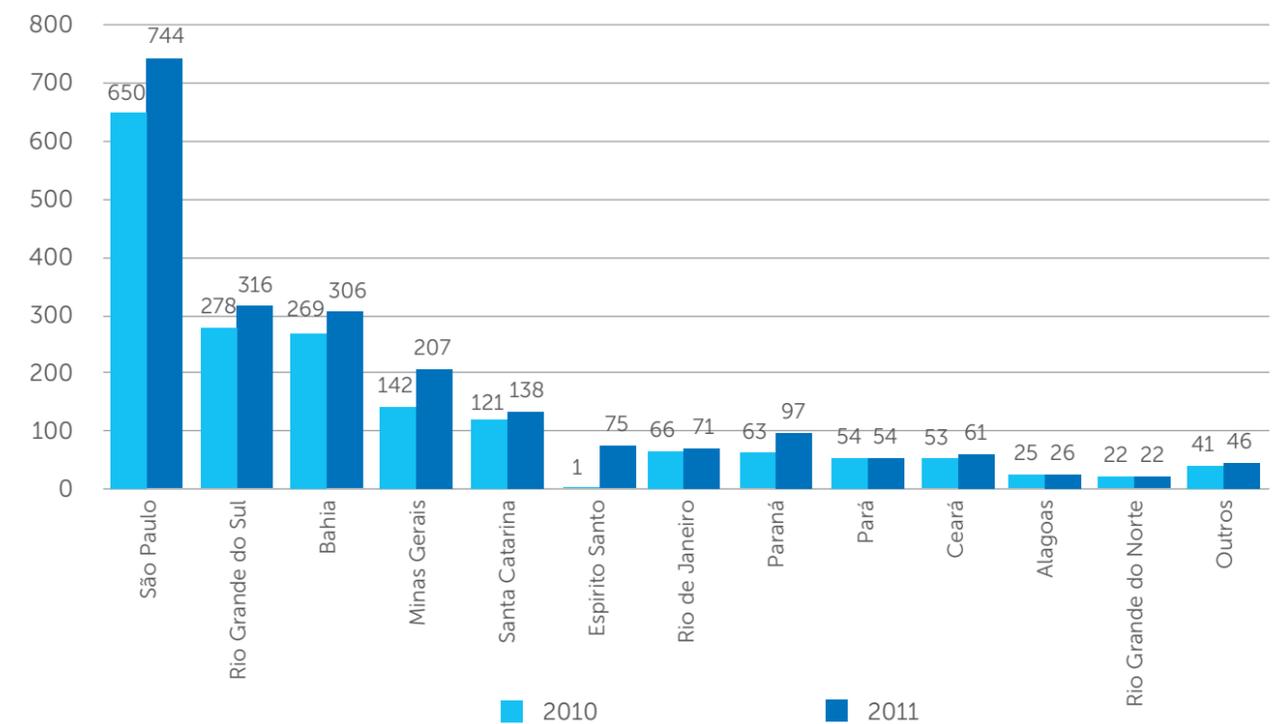


Table 3
Distribution of patients by Brazilian Region of origin (birth place).

Brazilian Region of origin	n (%)	Brazilian Region of origin	n (%)
Southeast	1,097 (50.3%)	North	63 (2.9%)
South	551 (25.3%)	Center West	22 (1.0%)
Northeast	430 (19.7%)	Not informed	19 (0.9%)

Total 2,182 (100%)
n=number of patients.

Figure 2
Distribution of patients by Brazilian Region of origin (birth place).

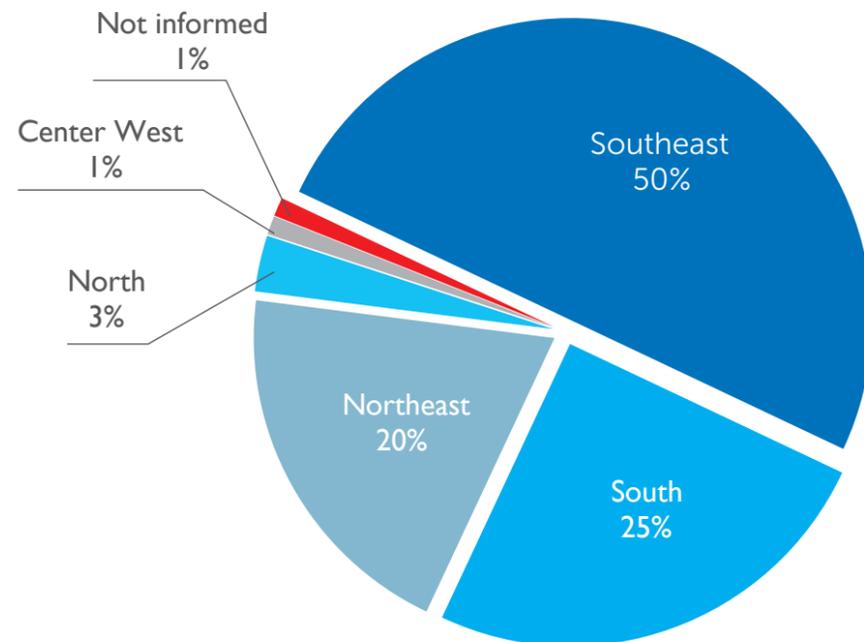


Table 4
Distribution of patients by Brazilian State where they are treated.

Brazilian State of treatment	n (%)	Brazilian State of treatment	n (%)
São Paulo	790 (36.2%)	Pará	55 (2.5%)
Rio Grande do Sul	343 (15.7%)	Ceará	62 (2.8%)
Bahia	314 (14.4%)	Alagoas	26 (1.2%)
Minas Gerais	195 (8.9%)	Rio Grande do Norte	23 (1.1%)
Santa Catarina	123 (5.6%)	Pernambuco	2 (0.1%)
Paraná	103 (4.7%)	Distrito Federal	1 (0.04%)
Rio de Janeiro	65 (3.0%)		

Total of patients 2,182 (100%)
n=number of patients.

Figure 3
Distribution of patients by Brazilian State where they are treated.

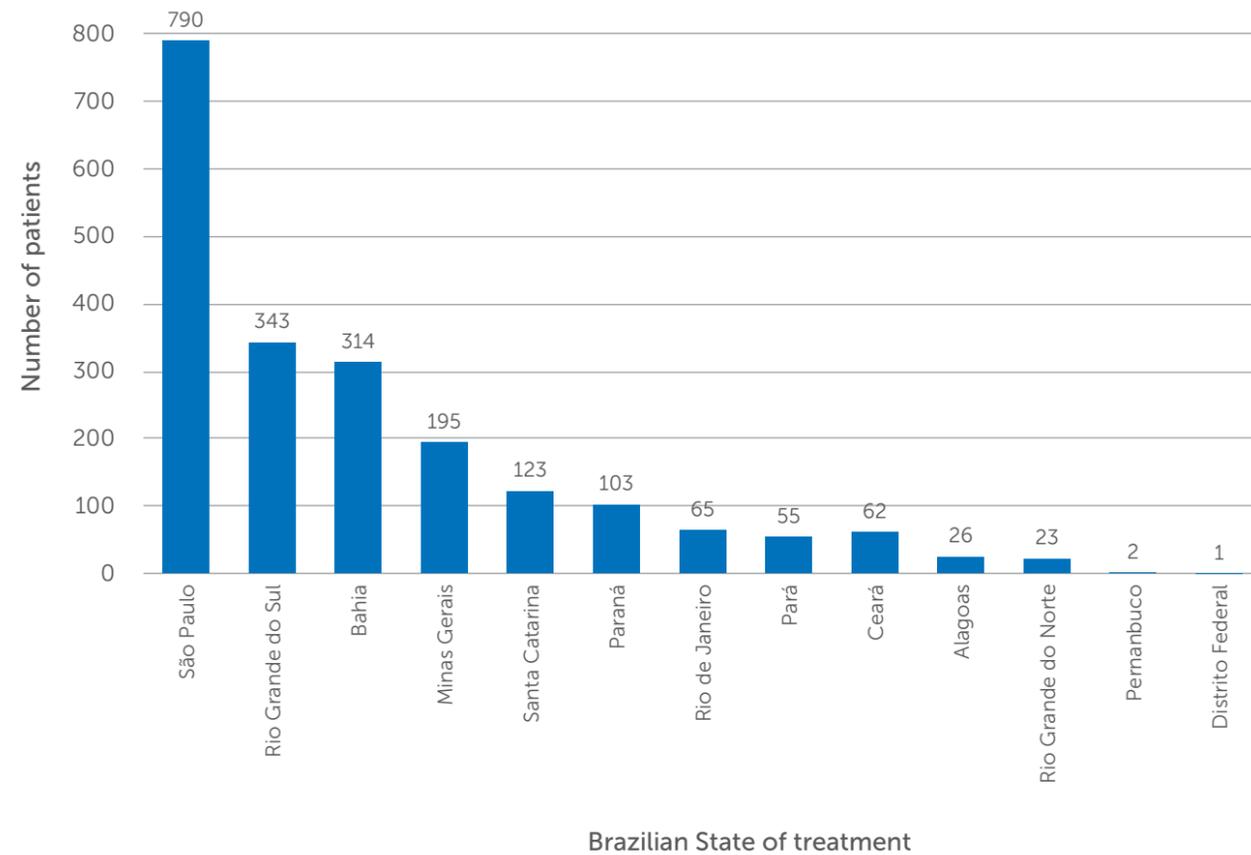


Table 5
Distribution of patients by Brazilian State where they are treated using only follow-up data from years 2009, 2010, and 2011.

Brazilian State of treatment	Follow-up year		
	2009 n (%)	2010 n (%)	2011 n (%)
São Paulo	392 (39.5%)	612 (42.5%)	570 (36.5%)
Rio Grande do Sul	240 (24.2%)	268 (18.6%)	285 (18.2%)
Bahia	216 (21.8%)	210 (14.6%)	202 (12.9%)
Minas Gerais	28 (2.8%)	122 (8.5%)	167 (10.7%)
Santa Catarina	5 (0.5%)	88 (6.1%)	106 (6.8%)
Paraná	40 (4%)	53 (3.7%)	41 (2.6%)
Rio de Janeiro	-	39 (2.7%)	18 (1.2%)
Pará	55 (5.5%)	-	-
Ceará	1 (0.1%)	3 (0.2%)	49 (3.1%)
Alagoas	-	22 (1.5%)	23 (1.5%)
Rio Grande do Norte	16 (1.6%)	22 (1.5%)	23 (1.5%)
Pernambuco	-	1 (0.1%)	-
Espírito Santo	-	-	77 (4.9%)
Distrito Federal	-	-	1 (0.1%)
Total of patients	993 (100%)	1,440 (100%)	1,562 (100%)

n=number of patients.

Figure 4
Distribution of patients by Brazilian State where they are treated.

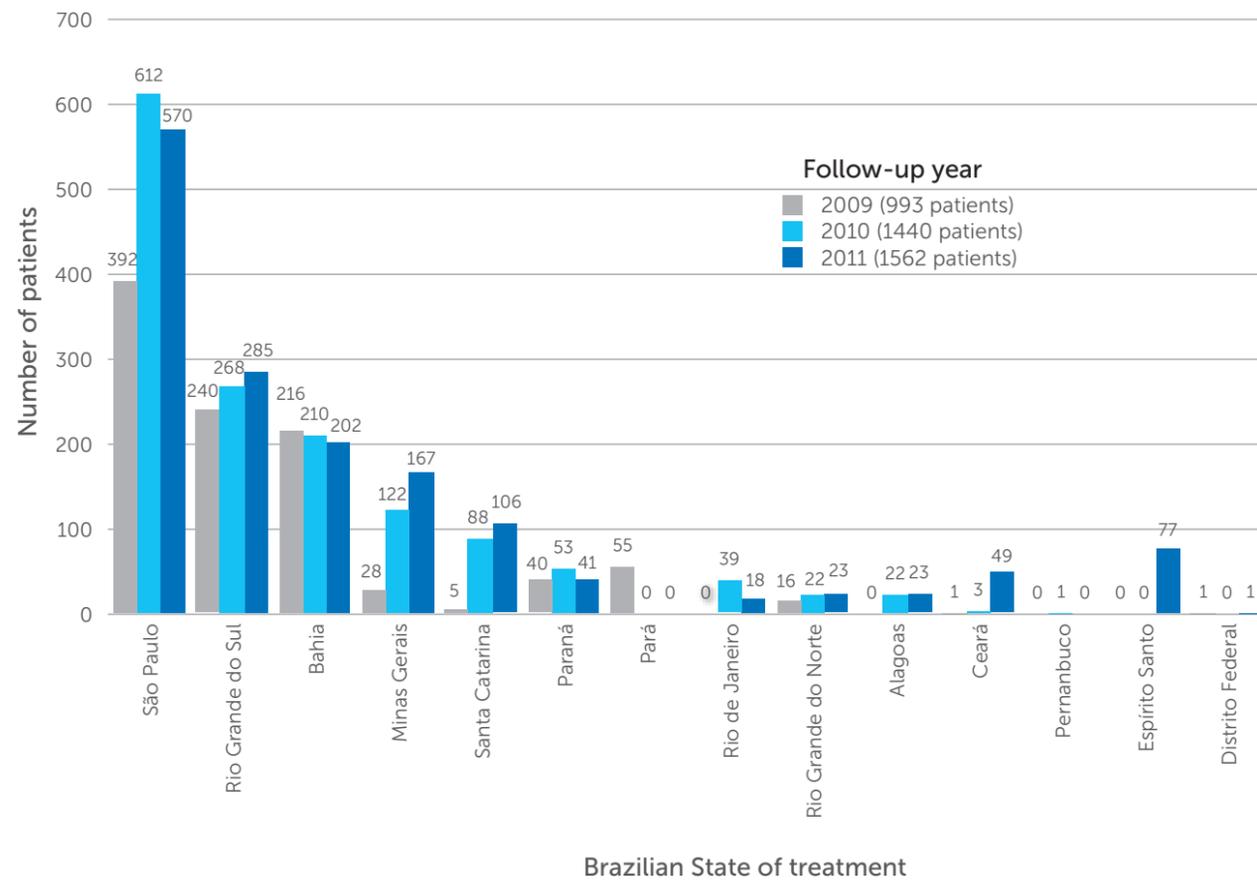


Table 6
Gender and ethnic group of Brazilian patients.

Gender	n (%)	Ethnic Group	n (%)
Male	1,168 (53.5%)	Caucasian	1,568 (71.9%)
Female	1,014 (46.5%)	Mestizo	471 (21.6%)
Total of patients	2,182 (100%)	Black	138 (6.3%)
		Asian	5 (0.2%)
		Total of patients	2,182 (100%)

n=number of patients.

Figure 5
Distribution of patients by gender.

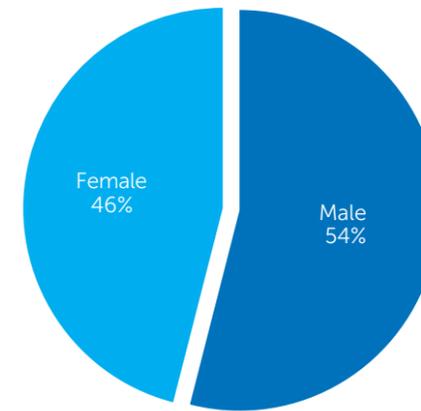


Figure 6
Distribution of patients by ethnic group.

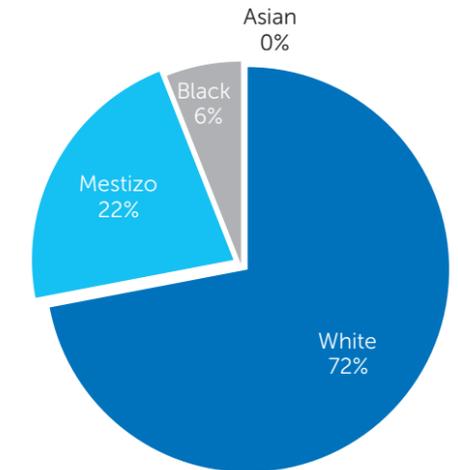


Table 7
Description of current age data (best spirometry or last clinical visit of the year)

Age (years)	
Mean (standard deviation)	13.18 (10.90)
Median (p25-p75)	10.90 (6.06 – 16.74)
Minimum-Maximum	0.09 – 79.62
Total of patients	1,950
No information	232

n=number of patients; p25 = 25th percentile; p75 = 75th percentile.

Figure 7
Distribution of patients according to current age (years).

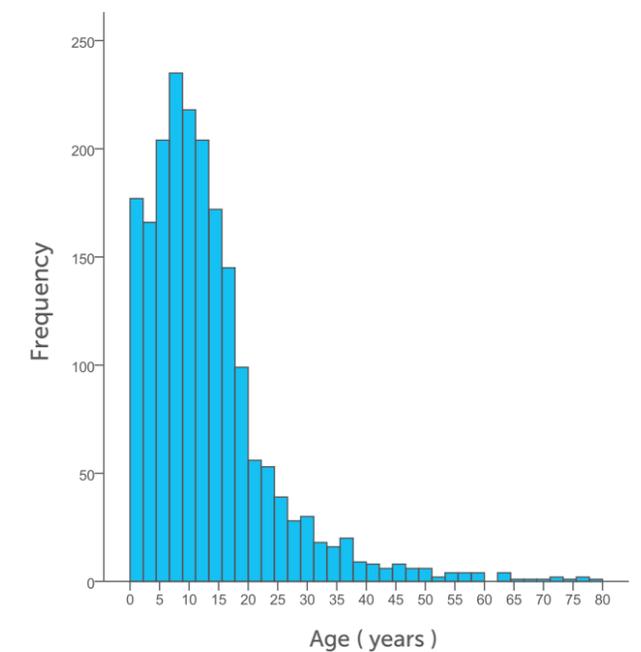


Table 8
Distribution of patients by age group.

Age Group	n (%)	Age group (adult-pediatric)	n (%)
Up to 5 years	388 (19.9%)	Menos de 18 anos	1,535 (78.7%)
> 5 a 10	522 (26.8%)	18 anos ou mais	415 (21.3%)
>10 a 15	431 (22.1%)	Total of patients	1,950 (100%)
>15 a 20	279 (14.3%)	Patients without information	232
>20 a 25	120 (6.2%)		
>25 a 30	72 (3.7%)		
>30 a 35	43 (2.2%)		
>35 a 40	34 (1.7%)		
>40 a 45	17 (0.9%)		
>45 a 50	15 (0.8%)		
>50 anos	29 (1.5%)		
Total of patients	1,950 (100%)		
Patients without information	232		

n=number of patients.

Figure 8
Distribution of patients by age group.

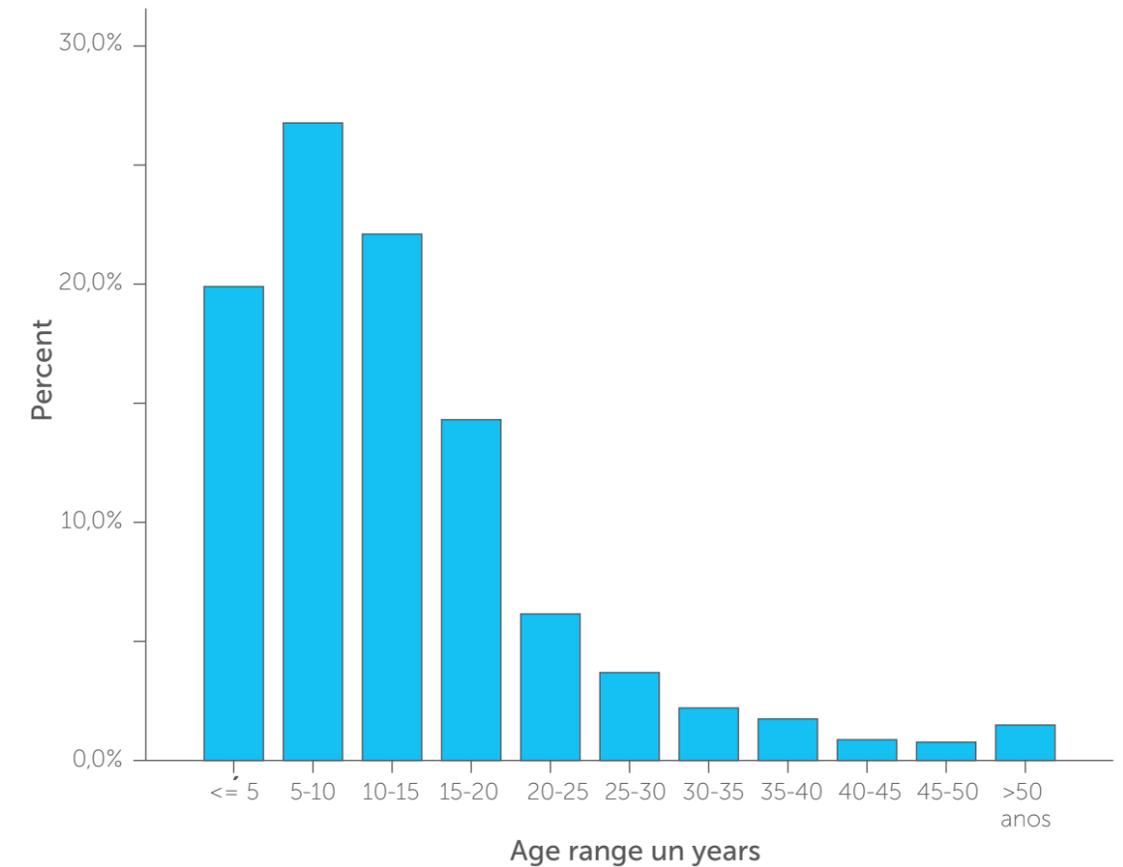
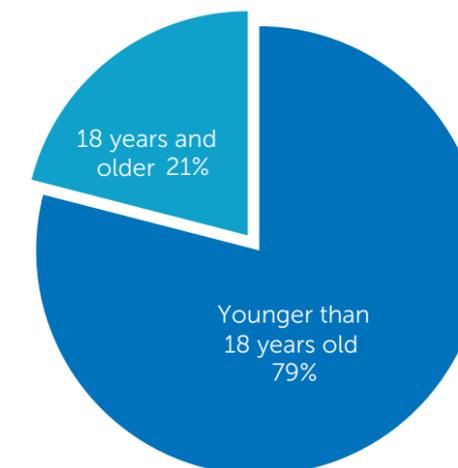


Figure 9
Distribution of patients by age group category (pediatric / adult).



DATA AT DIAGNOSIS

Table 9
Age of patients at diagnosis.

Age (years)	
Mean (standard deviation)	5.75 (9.84)
Median (p25-p75)	1.59 (0.25 – 7.35)
Minimum-Maximum	0 – 75.7
Total of patients	2,176
Patients without information*	6

*n=number of patients; p25 = 25th percentile;
 p75 = 75th percentile* Incorrect birth dates.*

Figure 10
Distribution of patients by age at diagnosis.

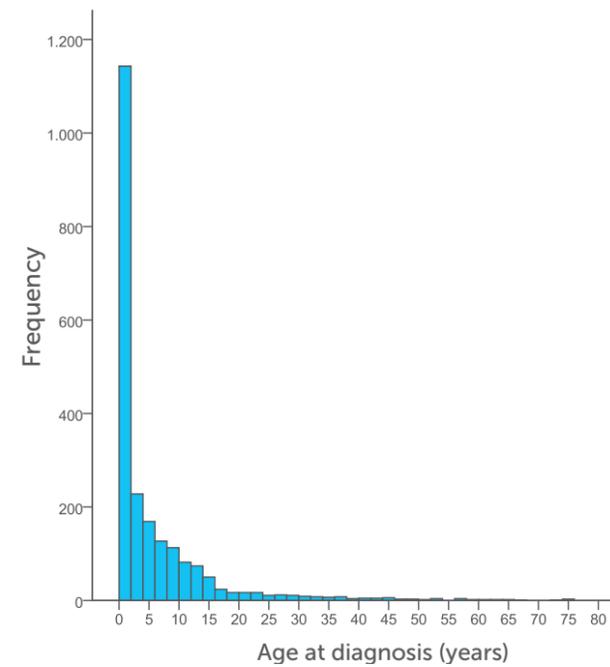


Table 10
Conditions for diagnosis.

Conditions for diagnosis	n (%)
Respiratory symptoms	1,407 (64.5%)
Deficit of growth / malnutrition	877 (40.2%)
Steatorrhea or Malabsorption	850 (39.0%)
Neonatal screening (IRT)	481 (22.0%)
Clinical or surgical meconium ileus	170 (7.8%)
Familial history	178 (8.2%)
Sinus disease	148 (6.8%)
Metabolic disturbance	120 (5.5%)
Edema / anemia	74 (3.4%)
Unknown condition	41 (1.9%)
Rectal prolapse	20 (0.9%)
Prolonged jaundice	16 (0.7%)
Infertility	9 (0.4%)
Others*	120 (5.5%)
Total of patients	2,182 (100%)

n=number of patients.

** List of conditions written by the professional (only few were described); more than a condition per case was allowed.*

Table 11
Sweat chloride testing results.

	Chloride (mEq/l)	Mass (mg)	Conductivity (mmol/l)
Mean (standard deviation)	88.73 (25.60)	143.90 (75.29)	104.2 (18.10)
Median (p25-p75)	89.50 (69.00-105)	132.50 (100-181)	105.0 (96-115)
Minimum-Maximum	5.22-204.00	0.08-470	33-160
Total of patients	1,833	1,402	215

n=number of patients; p25 = 25th percentile; p75 = 75th percentile.

Table 12
Other tests reported for diagnosis.

	n (%)
Measure of nasal potential difference	92 (4.2%)
Rectal biopsy	70 (3.2%)
Total of patients	2,182 (100%)

n=number of patients.

Table 13
Diagnosis by neonatal screening - Dosage of immunoreactive trypsinogen (IRT).

Dosage of immunoreactive trypsinogen (IRT). (ng/ml)	1st dosage	2nd dosage	Mean of 2 dosages
Mean (standard deviation)	217.4 (123.0)	210.5 (128.0)	218.7 (121.6)
Median (p25-p75)	188 (127-265)	177 (123-265)	186 (130.5-272)
Minimum-Maximum	37.5-830	14-902	37.5-830
Total of patients	449	337	454

Cut-off limits for IRT values	1st dosage n (%)	2nd dosage n (%)	Mean of 2 dosages n (%)
< 70 ng/ml	12 (2.7%)	15 (4.5%)	16 (3.5%)
≥ 70 ng/ml	437 (97.3%)	322 (95.5%)	438 (96.5%)
< 110 ng/ml	58 (12.9%)	60 (17.8%)	62 (13.7%)
≥ 110 ng/ml	391 (87.1%)	277 (82.2%)	392 (86.3%)
Total of patients	449	337	454

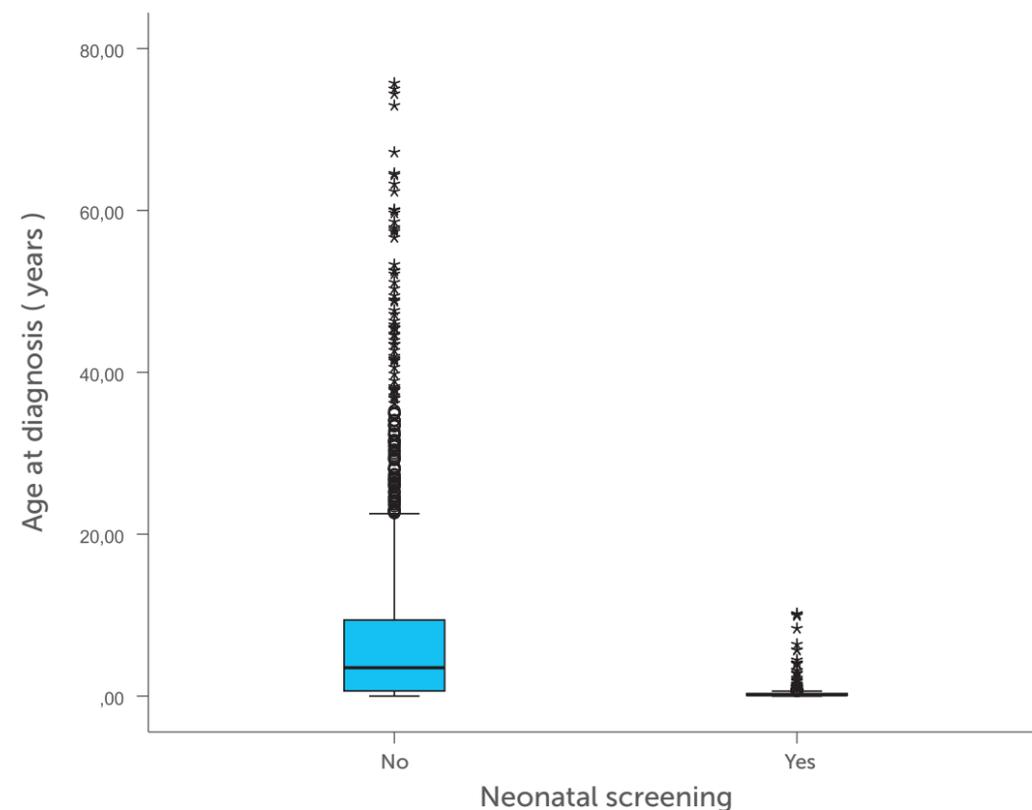
n=number of patients; p25 = 25th percentile; p75 = 75th percentile

Table 14
Age in years at the diagnosis: with or without neonatal screening.

Age (years)	Neonatal screening		
	No	Yes	Total
Mean (standard deviation)	7.26 (10.65)	0.41 (1.09)	5.75 (9.84)
Median (p25-p75)	3.50 (0.63-9.39)	0.14 (0.09-0.30)	1.59 (0.30 – 7.39)
Minimum-Maximum	0-75.72	0-10.18	0 – 75.72
Total of patients	1,697	480	2,177
Patients without information	4	1	5

p25 = 25th percentile; p75 = 75th percentile.

Figure 11
Box-plot graph showing distribution of age at the diagnosis in patients diagnosed with or without neonatal screening test.



GENETICS DATA

Genetics data contained in this report should be cautiously interpreted, since the approach for CF genetic testing in Brazil is highly heterogeneous. Some Centers only perform detection of DeltaF508 mutation, while others search panels of 2, 4 or up to 30 or more mutations. There are also Centers reporting genetic polymorphisms in the CFTR gene, that were not included in this report because they may not be used as diagnostic criteria without the presence of other mutations.

Table 15
Status of patients regarding genetic testing for CF.

Genetic testing	n (%)
No	1,212 (55.5%)
Yes	970 (44.5%)
Total of patients	2,182 (100%)

Quantity of mutations identified per patient	n (%)
None	211 (21.8%)
One	338 (34.8%)
Two or more	421 (43.4%)
Total of patients with genetic testing reported	970 (100%)

Genotype - description	n (%)
DF508/DF508	260 (26.8%)
DF508/Others (or non identified)	409 (42.2%)
Others/ Others (or non identified)	90 (9.3%)
Non identified	211 (21.8%)
Total of pacientes with genetic testing reported	970 (100%)

n=number of patients; non identified = blank fields

Obs.: Looking separately at non identified (blank fields) versus others:

Genotype - description	n (%)
DF508/DF508	260 (26.8%)
DF508/Others	124 (12.8%)
DF508/ Non identified	285 (29.4%)
Others/ Others	37 (3.8%)
Others/ Non identified	53 (5.5%)
Non identified / Non identified	211 (21.8%)
Total of pacientes with genetic testing reported	970 (100%)

Figure 12
Distribution of patients by genotype (n=970)

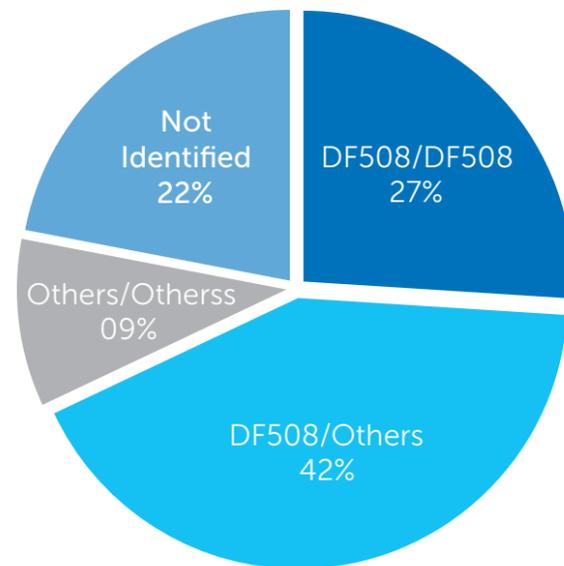


Figure 13
Frequency of identified mutations (970 patients, 1,940 alleles).

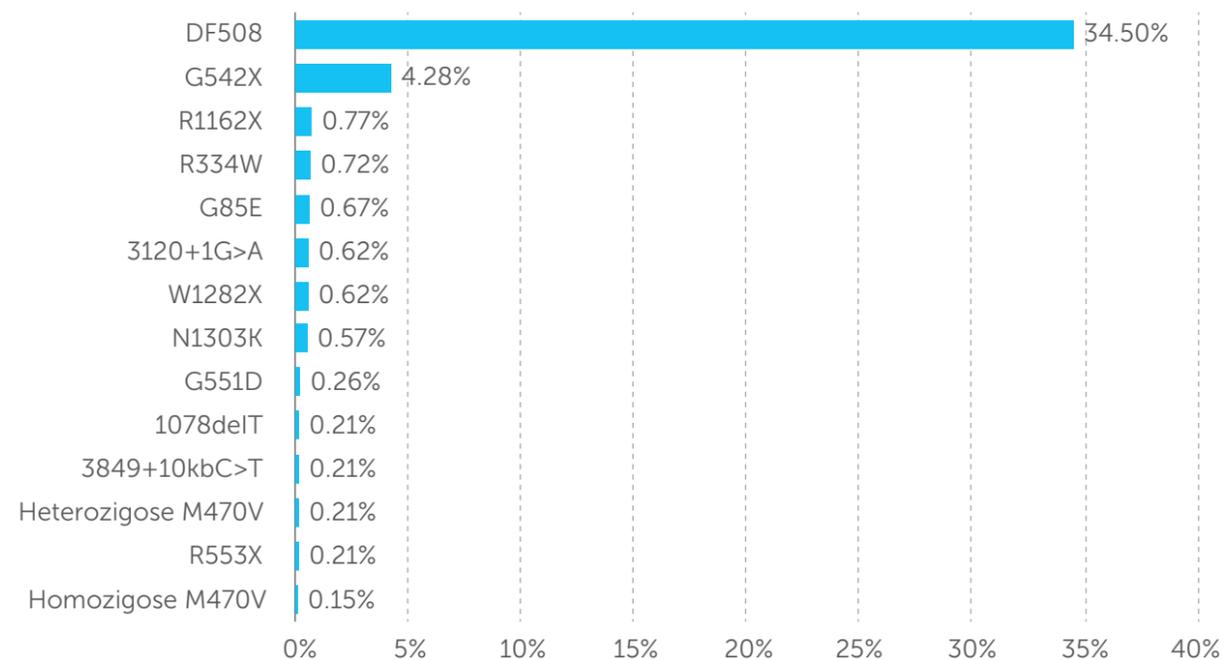


Table 16
Frequency of identified mutations (970 patients, 1,940 alleles).

Mutations	n	%
DF508	669	34.5%
G542X	83	4.28%
R1162X	15	0.77%
R334W	14	0.72%
G85E	13	0.67%
3120+1G>A	12	0.62%
W1282X	12	0.62%
N1303K	11	0.57%
G551D	5	0.26%
R553X	4	0.21%
Heterozigous M470V	4	0.21%
3849+10kbC>T	4	0.21%
1078delT	4	0.21%
Homozigous M470V	3	0.15%
S549R	2	0.10%
711-1G>T	2	0.10%
2183AA>G	2	0.10%
1812-1G>A	2	0.10%
1717-1G>A	2	0.10%
Y1092X	1	0.05%
W543X	1	0.05%
W1089X	1	0.05%
R75Q	1	0.05%
R347P	1	0.05%
R10665	1	0.05%
Q220X	1	0.05%
S4X	1	0.05%
P205S	1	0.05%
M1101K	1	0.05%
I331N	1	0.05%
I507	1	0.05%
D3956	1	0.05%
D1152H	1	0.05%
C711+1G>T	1	0.05%
c1929delC	1	0.05%
C1172G>A	1	0.05%
7T/7T	1	0.05%
3659delc	1	0.05%
5t>7t	1	0.05%
2789+5G>A	2	0.10%
1898+1G>A	1	0.05%
1656AA	1	0.05%
Blank cells	943	48.61%
Total of alleles (970 patients)	1,940	100%

* Names inserted by professionals and not verified for authenticity.

ANTHROPOMETRIC DATA

Anthropometric data were obtained at the day of pulmonary function testing or in the last visit of the year (when pulmonary function testing data was not available).

Percentile distribution of anthropometric data and Z-score of weight and height was calculated by using CDC growth charts as reference (available in <http://www.cdc.gov/growthcharts/>).

Table 17
Anthropometric data

WEIGHT (kg)	Measure	NCHS Percentile	Z Score
Mean (standard deviation)	33.92 (18.67)	34.19 (30.38)	-0.69 (1.29)
Median (p25-p75)	30.00 (18.80-48.00)	27.00 (6.00-57.00)	-0.61 (-1.54- 0.18)
Minimum-Maximum	4.30-98.4	0-100	-3.97-3.98
Total of patients	1,506	1,224	1,224

HEIGHT (cm)	Measure	NCHS Percentile	Z Score
Mean (standard deviation)	133.05 (29.89)	35.43 (29.68)	-0.56 (1.24)
Median (p25-p75)	136.00 (111.00-158.00)	29.00 (8.00-56.00)	-0.54 (-1.38-0.16)
Minimum-Maximum	54.5-190.00	0-100	-3.90-3.98
Total of patients	1,499	1,199	1,199

BMI (kg/m ²)	Measure	NCHS Percentile
Mean (standard deviation)	23.77 (8.93)	41.62 (32.47)
Median (p25-p75)	21.60 (16.67-30.41)	34.00 (12.00-71.00)
Minimum-Maximum	7.56-54.73	0-100
Total of patients	1,499	1,000

p25 = 25th percentile; p75 = 75th percentile.

Figure 14

Box-plot graph showing distribution of NCHS percentile for weight by age group of the population aging up to 20 years old.

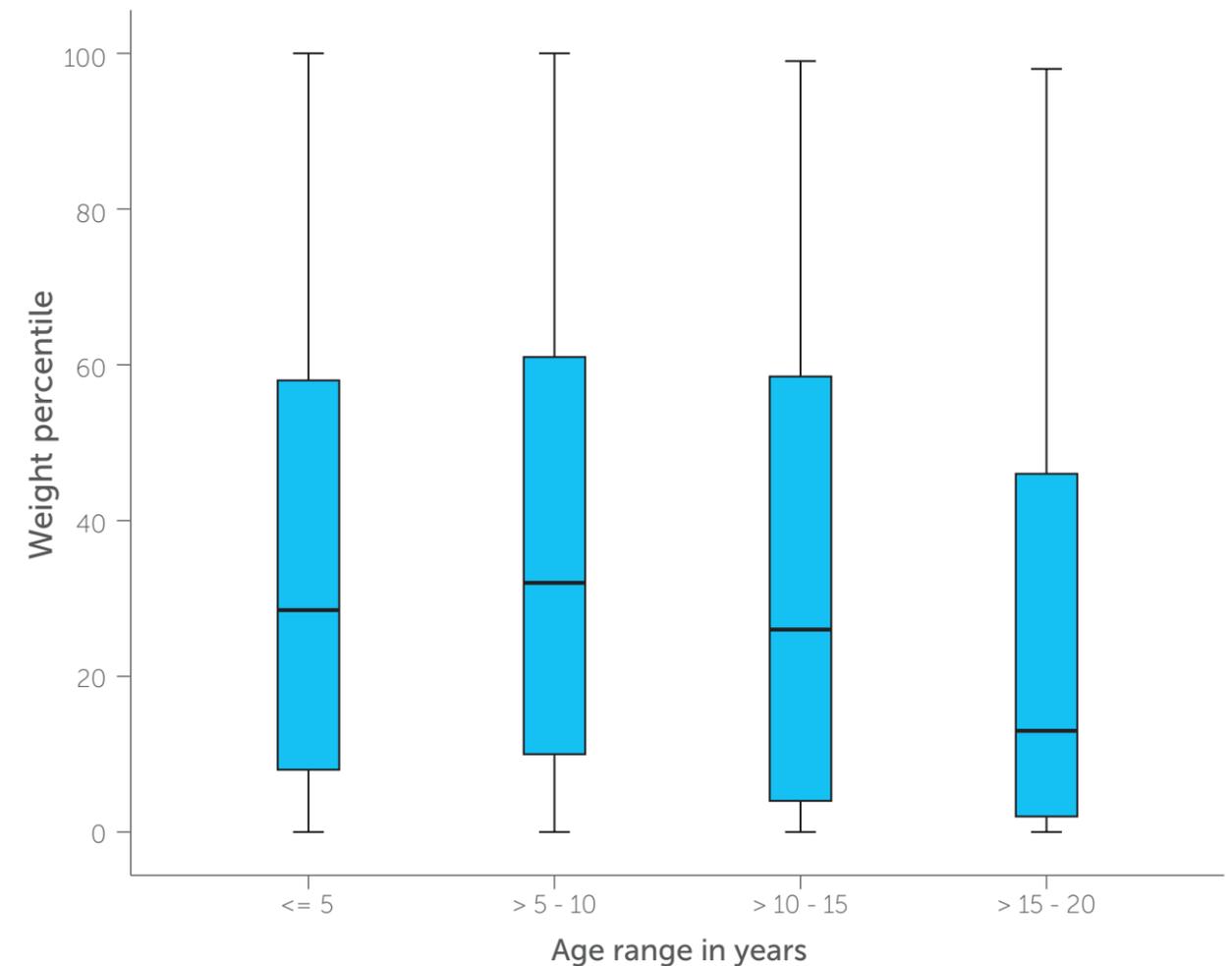


Figure 15

Box-plot graph showing distribution of Z-score values for weight by age group of the population aged up to 20 years old.

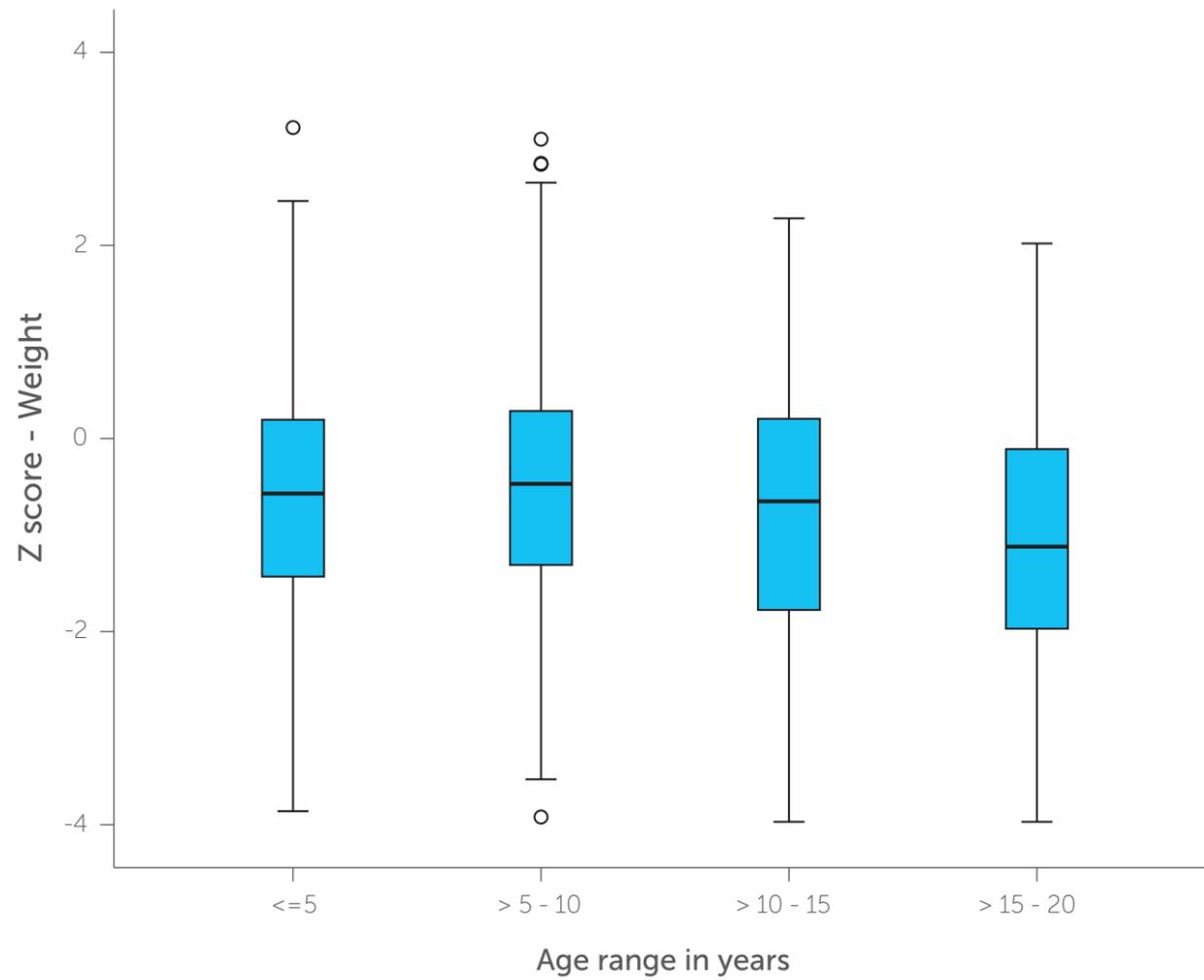


Figure 16

Box-plot graph showing distribution of NCHS percentile for height by age group of the population aging up to 20 years old.

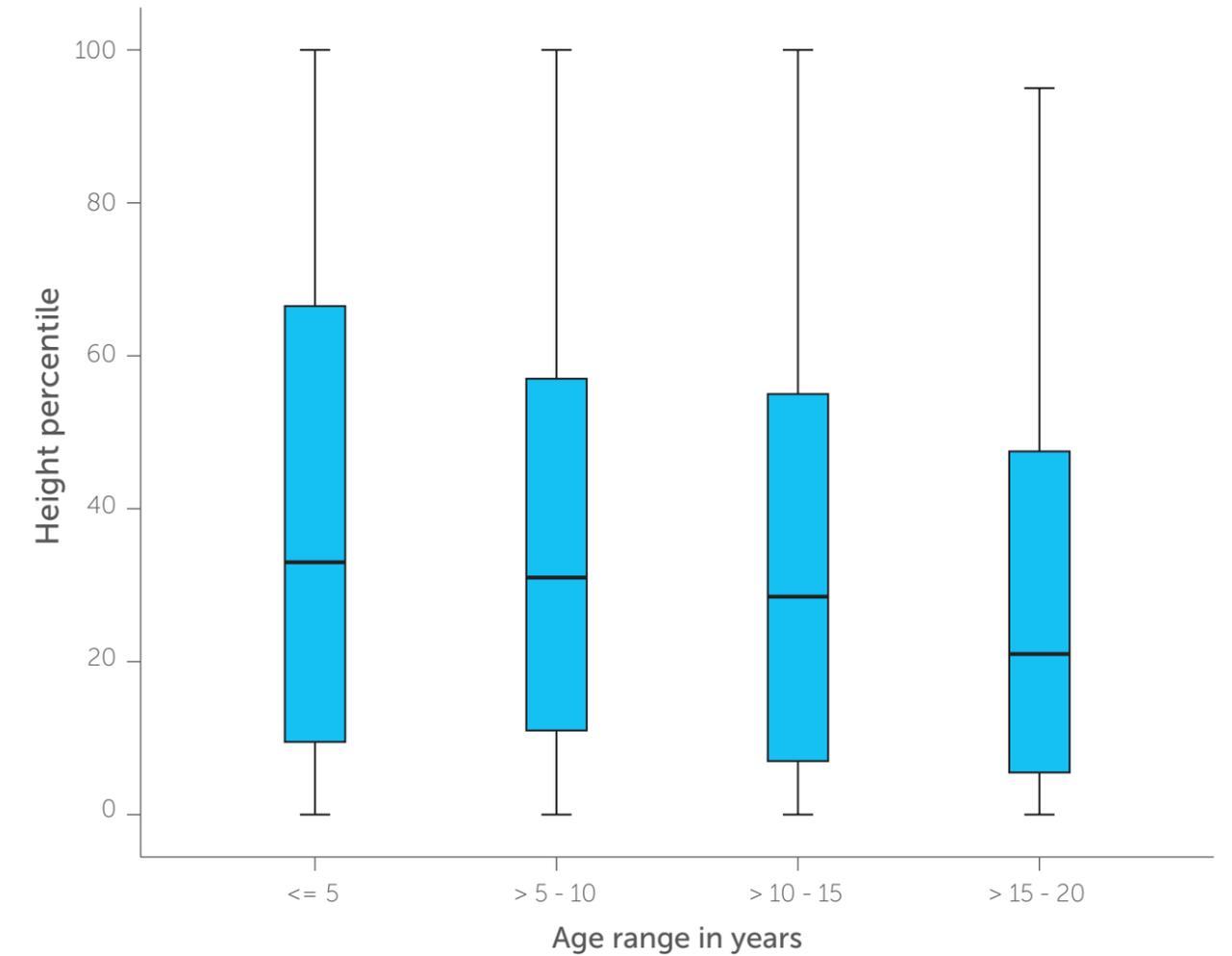


Figure 17

Box-plot graph showing distribution of Z-score values for height by age group of the population aged up to 20 years old.

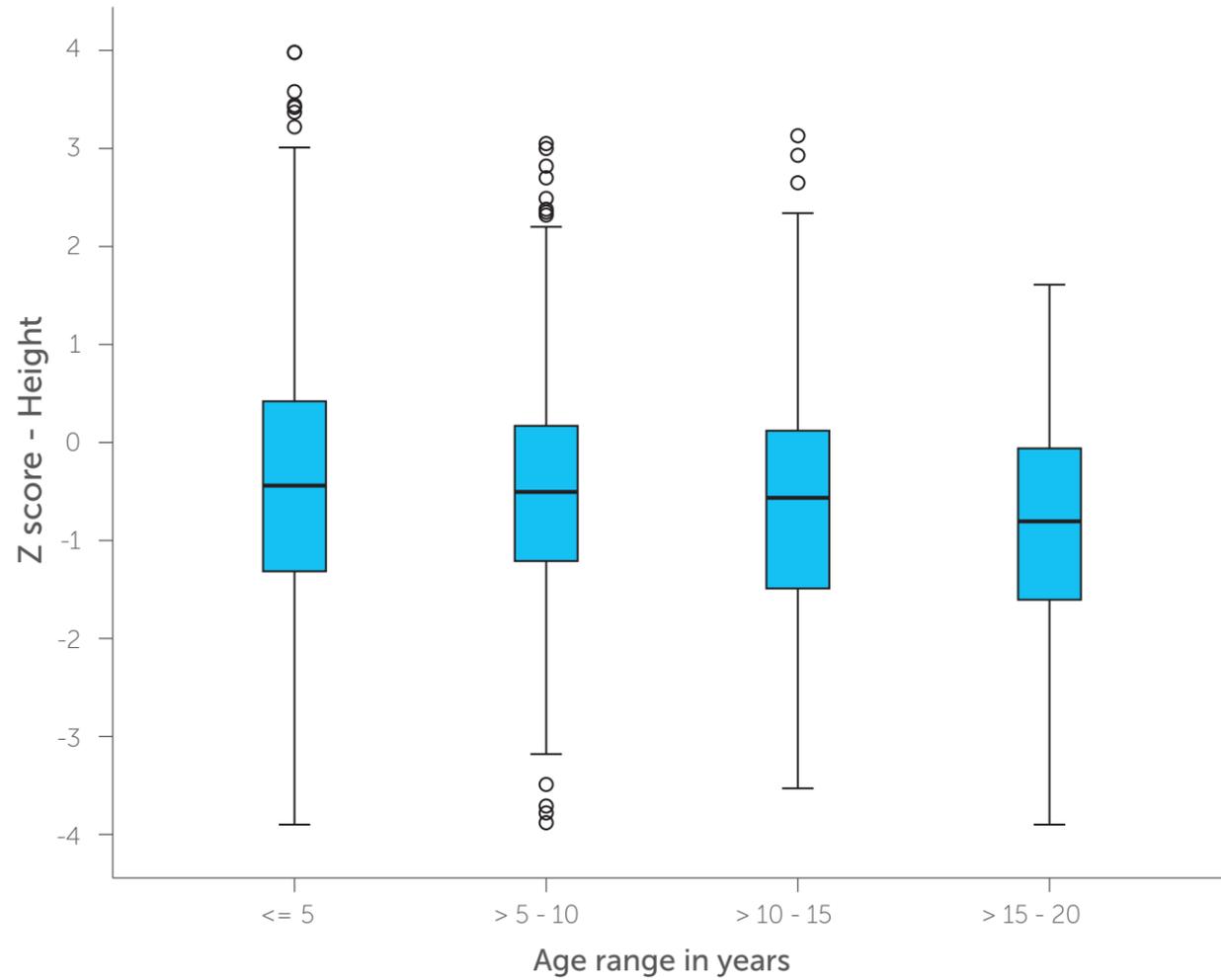


Figure 18

Box-plot graph showing distribution of NCHS percentile for weight by age group of infants and preschool age population.

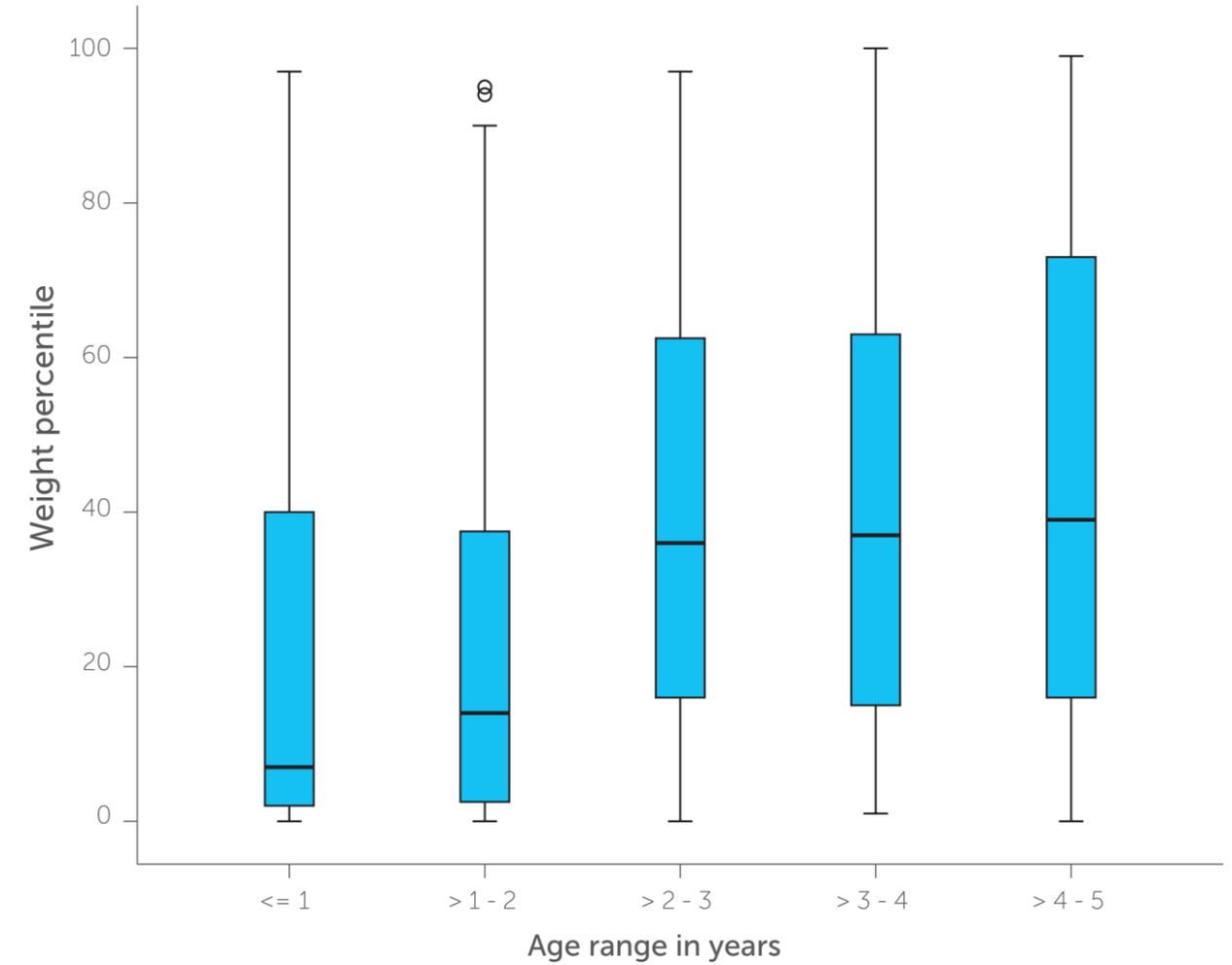


Figure 19

Box-plot graph showing distribution of Z-score values for weight by age group of infants and preschool age population.

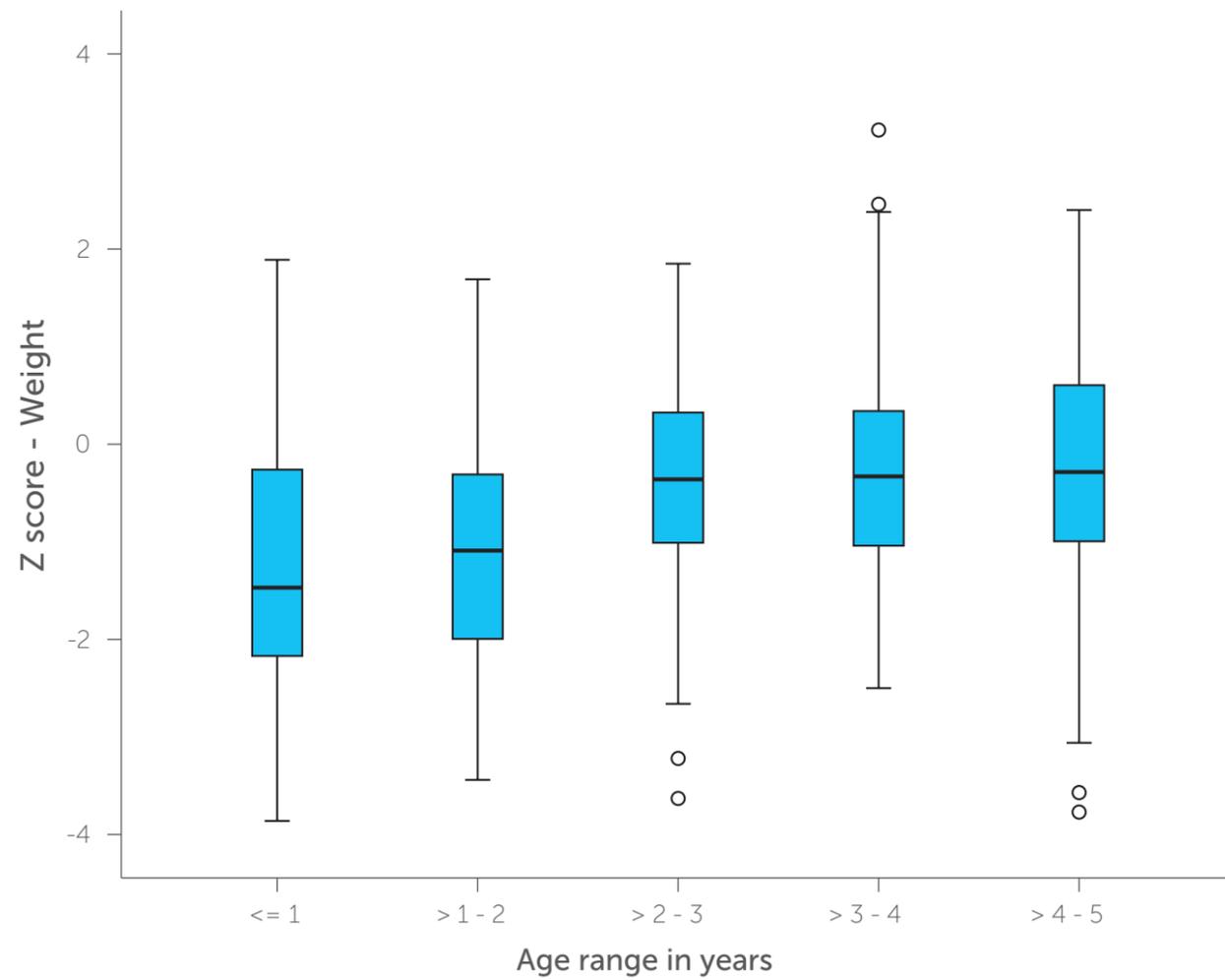


Figura 20

Box-plot graph showing distribution of NCHS percentile for height by age group of infants and preschool age population.

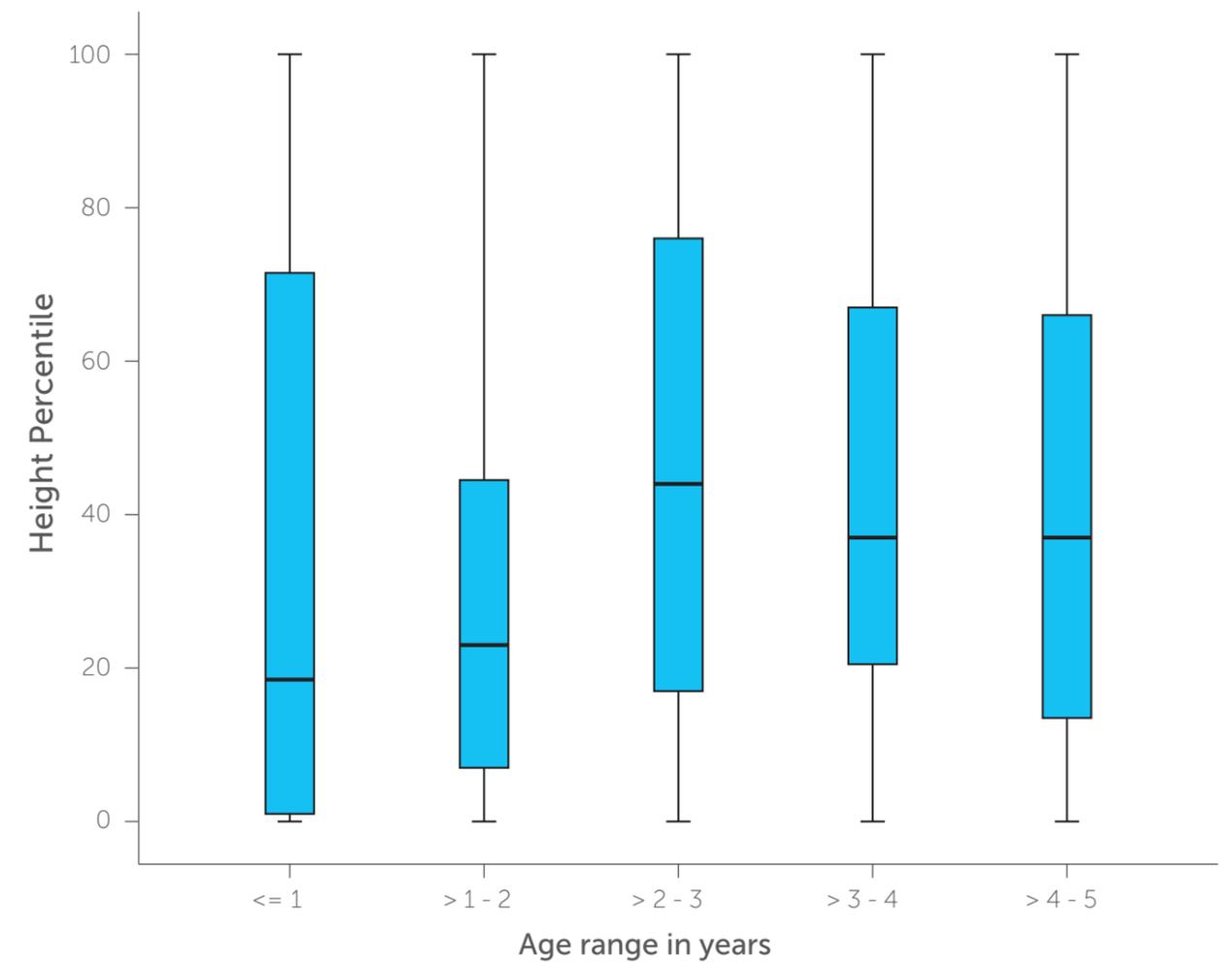


Figure 21

Box-plot graph showing distribution of Z-score values for height by age group of infants and preschool age population.

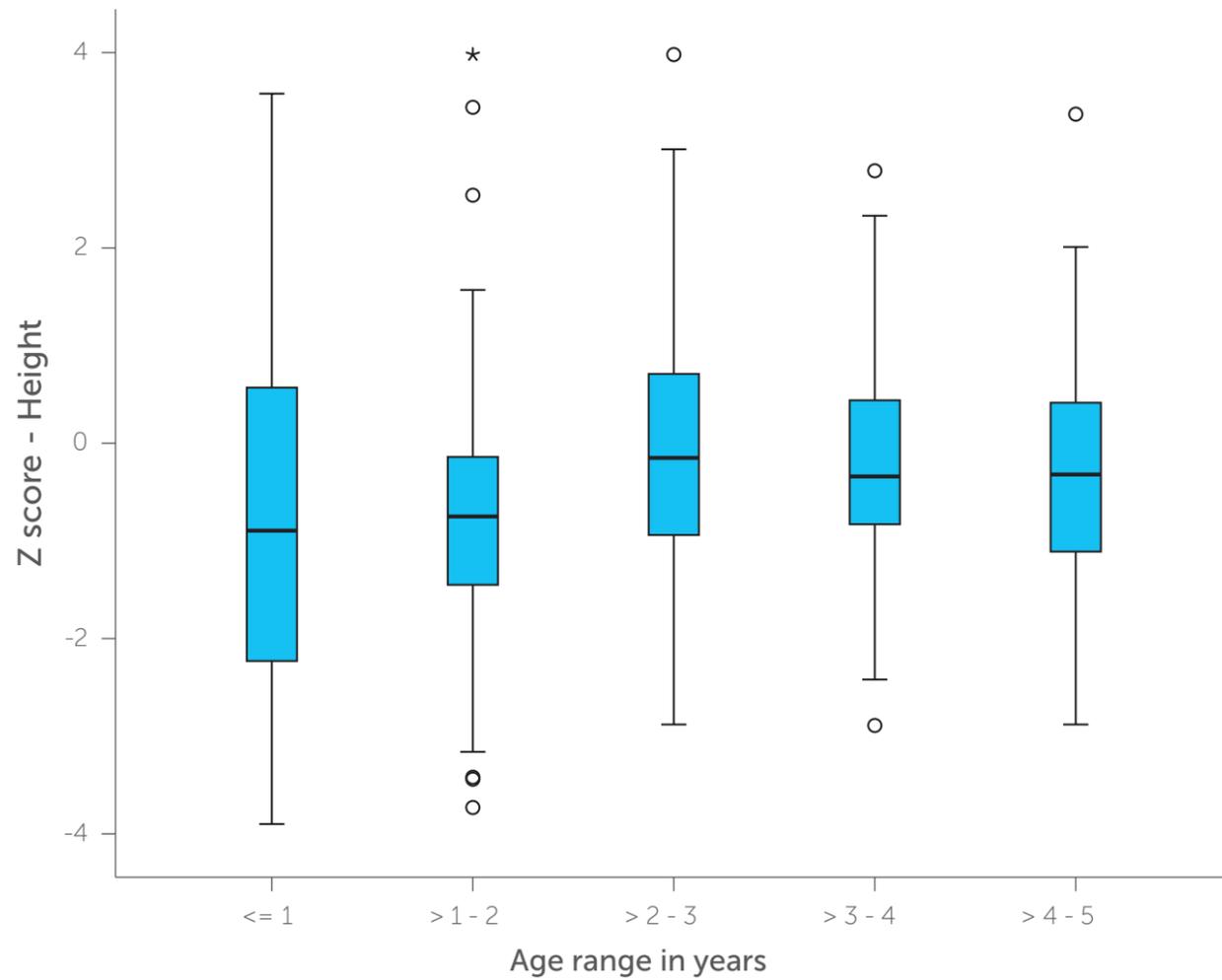
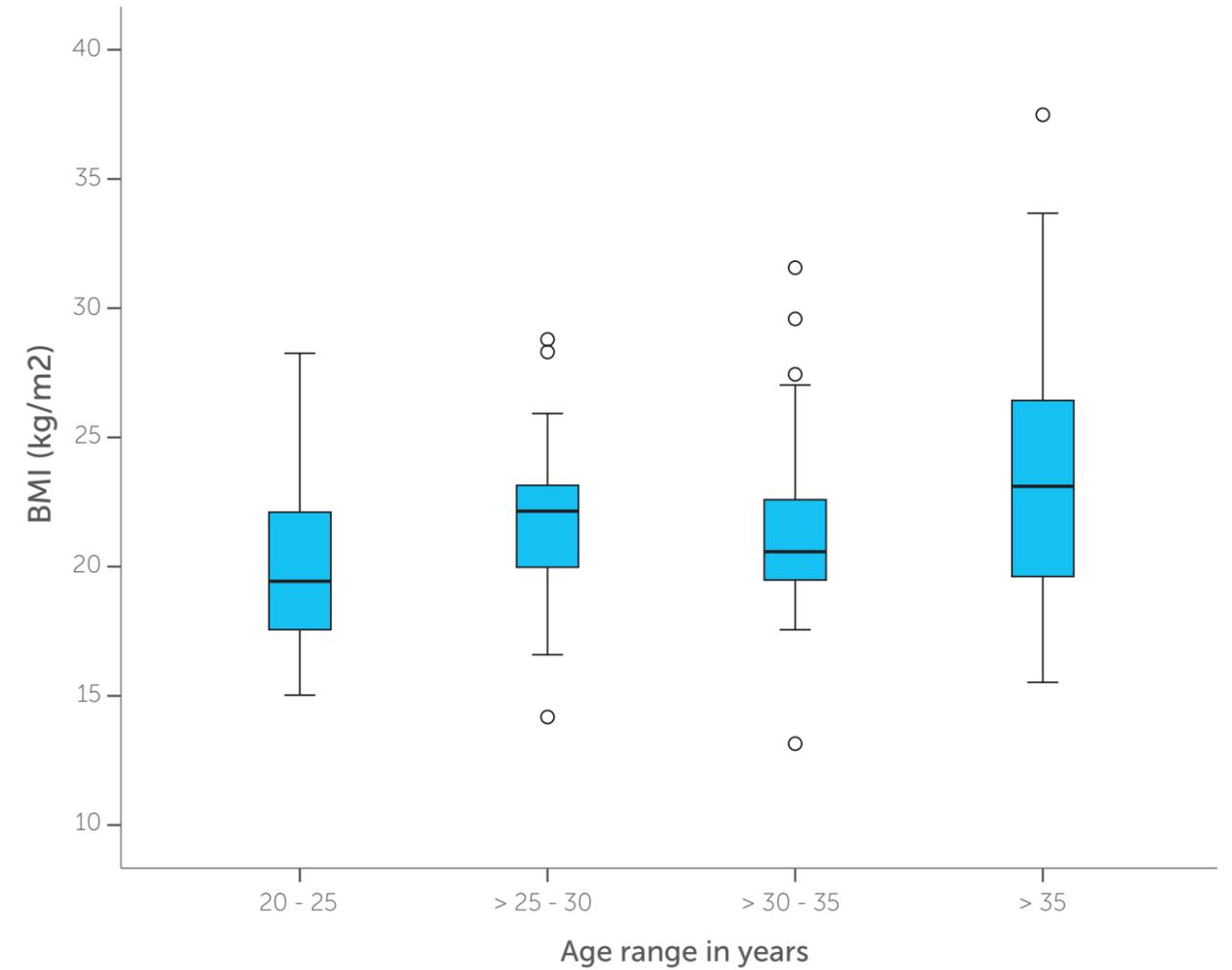


Figure 22

Box-plot graph showing distribution of Z-score values for BMI (Body Mass Index) by age group of the adult population.



PULMONARY FUNCTION DATA

The values of FVC, FEV1 and FVC/FEV1 recorded by the participants were those obtained in the best lung function test of the reported year. The predicted values of pulmonary function were obtained from the publication of Stanojevic S et al: Spirometry Centile Charts for Young Caucasian Children: The Asthma UK Collaborative Initiative. American Journal of Respiratory and Critical Care Medicine 2009, 180(6); 547-552.

Table 18
Pulmonary function data.

Spirometry performed		n (%)	
No	801	51.3%	
Yes	761	48.7%	
Total of patients	1,562	100%	

FEV1 (liters)	
Mean (standard deviation)	1.81 (0.84)
Median (p25-p75)	1.63 (1.20-2.23)
Minimum-Maximum	0.20-4.75
Total of patients	761

FVC (liters)	
Mean (standard deviation)	2.36 (1.05)
Median (p25-p75)	2.15 (1.61-2.95)
Minimum-Maximum	0.28-5.83
Total of patients	761

Z score - FEV1	
Mean (standard deviation)	-2.10 (2.15)
Median (p25-p75)	-2.00 (-3.73; -0.55)
Minimum-Maximum	-6.97; 5.35
Total of patients	752

Z score - FVC	
Mean (standard deviation)	-1.51 (2.01)
Median (p25-p75)	-1.36 (-2.78; -0.11)
Minimum-Maximum	-6.92; 4.46
Total of patients	752

FEV1/FVC	
Mean (standard deviation)	0.77 (0.13)
Median (p25-p75)	0.79 (0.67-0.87)
Minimum-Maximum	0.33-1.00
Total of patients	761

n=number of patients; p25 = 25th percentile; p75 = 75th percentile.
FVC: forced vital capacity; FEV1: Forced expiratory volume in the 1st second.

Figure 23

Box-plot graph showing distribution of percent of predicted values of forced vital capacity by age group.

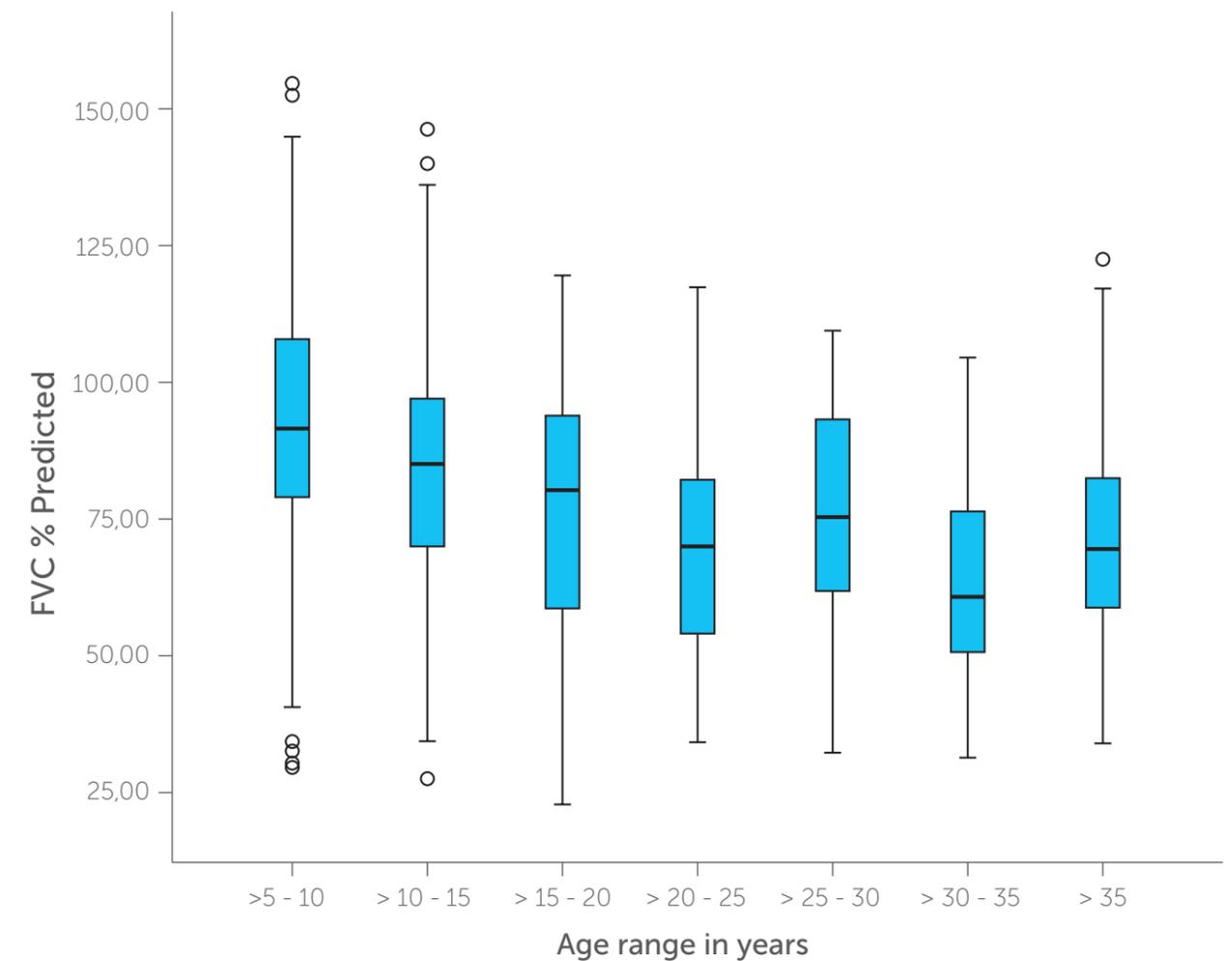


Figure 24
Box-plot graph showing distribution of percent of predicted values of forced expiratory volume in the 1st second by age group.

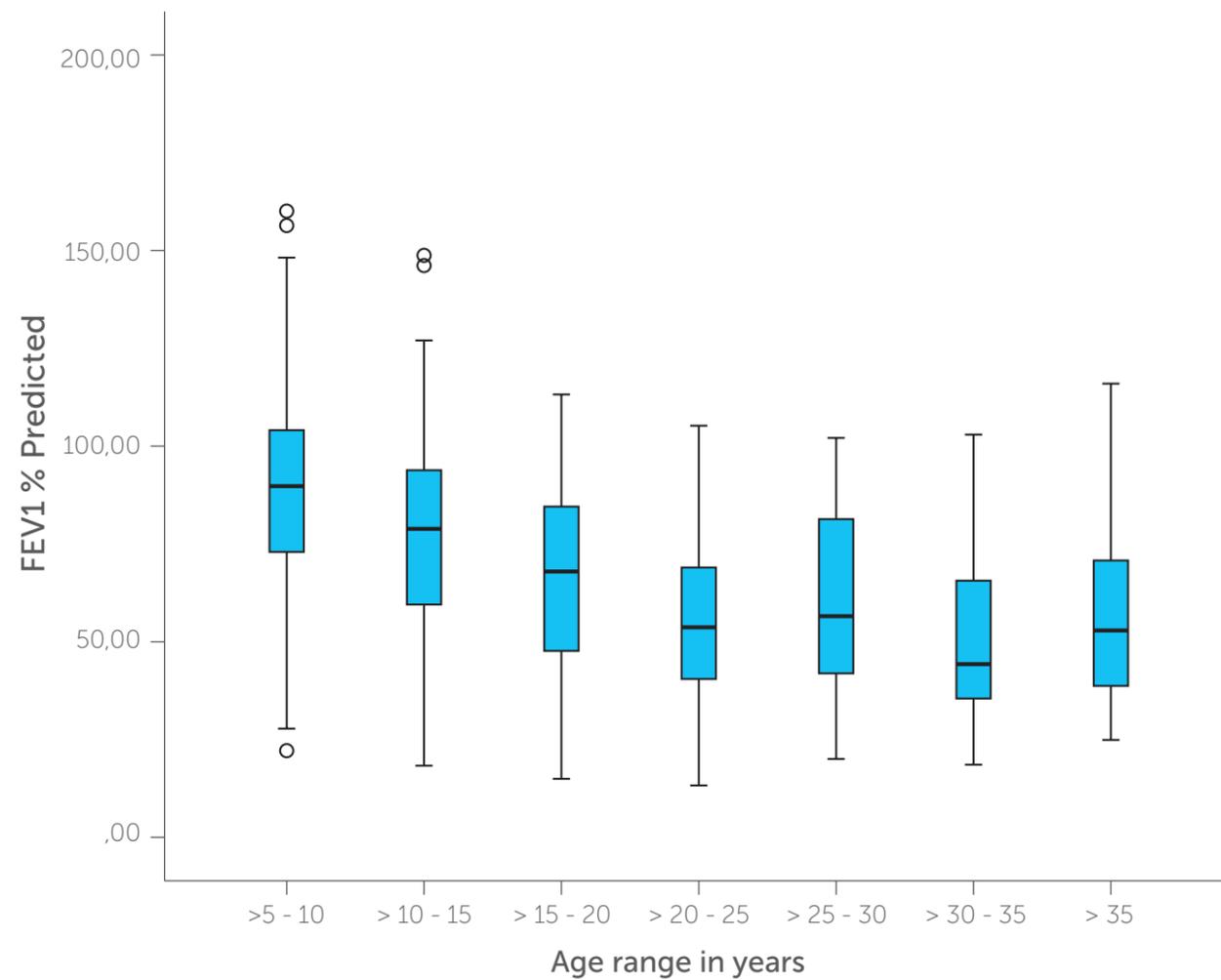


Figure 25
Box-plot graph showing distribution of Z-score values of forced vital capacity by age group and gender.

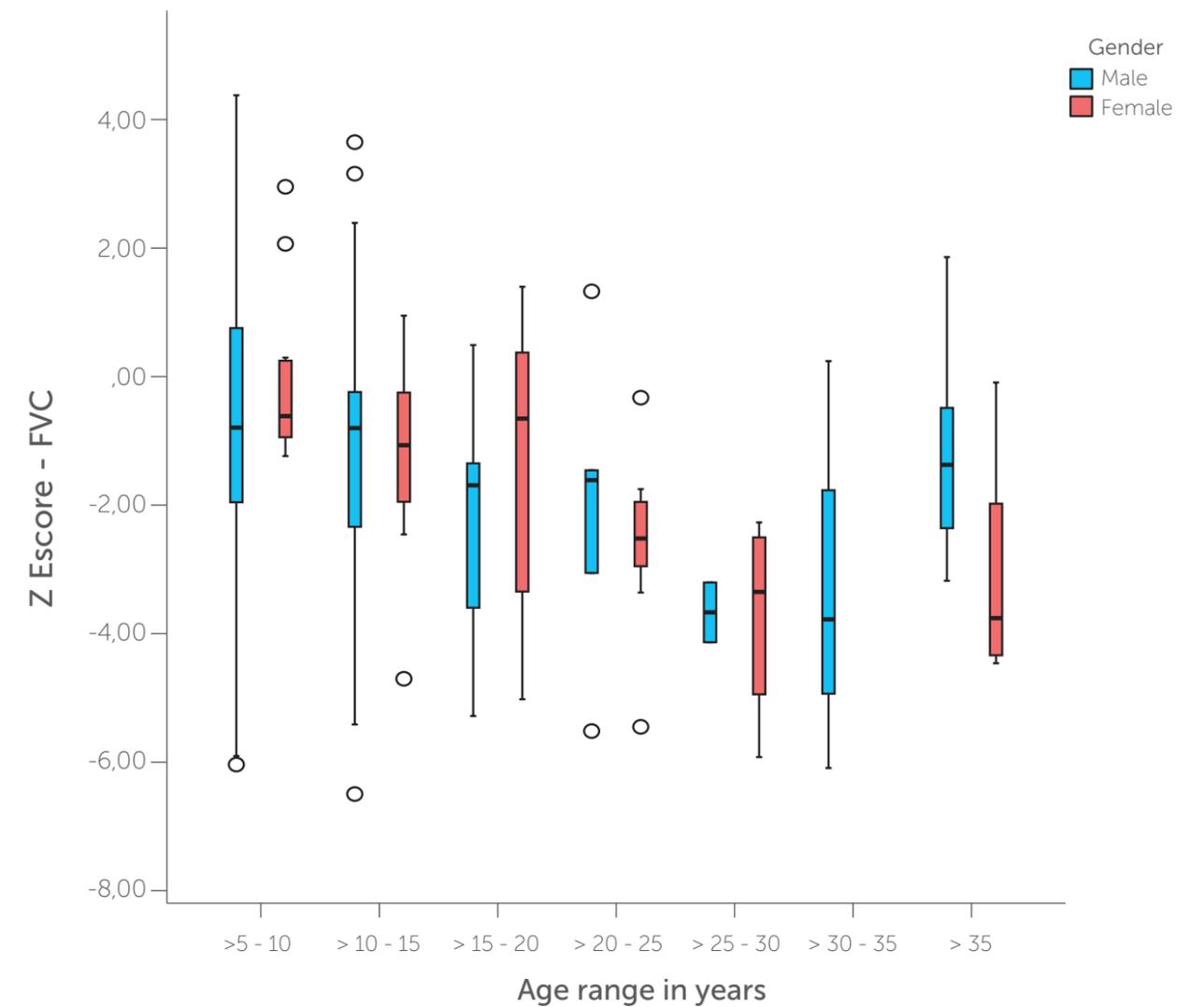
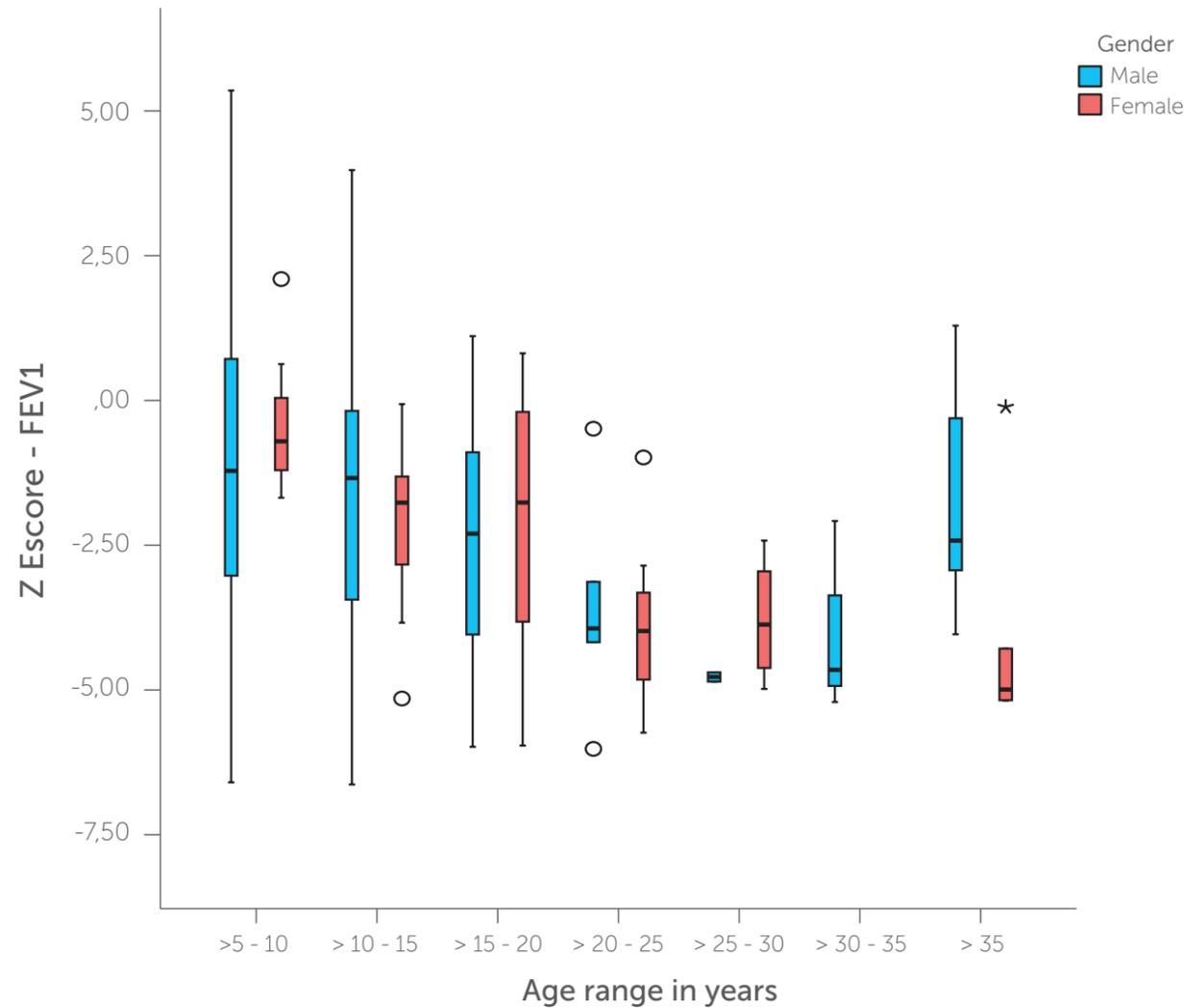


Figure 26

Box-plot graph showing distribution of Z-score values of forced expiratory volume in the 1st second by age group and gender.



MICROBIOLOGY DATA

Microbiology data describe positive results for the respiratory pathogen at least once in the given follow-up year; since there is not a standardization of microbiology processing of respiratory tract samples of cystic fibrosis patients in our country, these data have to be cautiously interpreted.

Table 19

Description of microorganisms identified.

Microorganisms identified	n	%
Methicillin-sensitive <i>Staphylococcus aureus</i>	901	57.7%
<i>Pseudomonas aeruginosa</i>	708	45.3%
Non-mucoid <i>Pseudomonas aeruginosa</i>	483	30.9%
Mucoid <i>Pseudomonas aeruginosa</i>	338	21.6%
<i>Burkholderia cepacia</i> complex	163	10.4%
Methicillin-resistant <i>Staphylococcus aureus</i>	122	7.8%
<i>Haemophilus influenzae</i>	134	8.6%
<i>Stenotrophomonas maltophilia</i>	89	5.7%
<i>Klebsiella pneumoniae</i>	68	4.4%
<i>Serratia</i> sp.	45	2.9%
<i>Achromobacter</i> sp.	33	2.1%
<i>Candida</i> sp.	56	3.6%
<i>Aspergillus fumigatus</i>	29	1.9%
<i>Escherichia coli</i>	26	1.7%
Other <i>Pseudomonas</i>	17	1.1%
Non tuberculous Mycobacteria	4	0.3%
<i>Mycobacterium tuberculosis</i>	4	0.2%
Total of patients	1,562	100%

Figure 27
Microorganisms identified

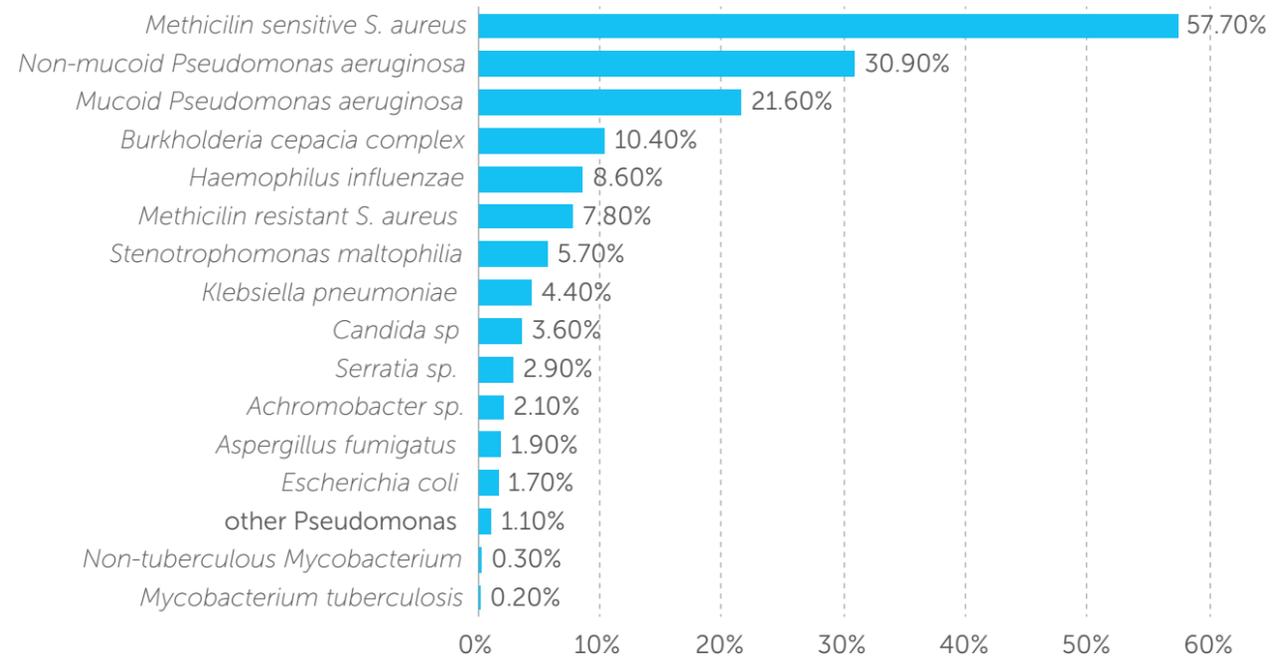
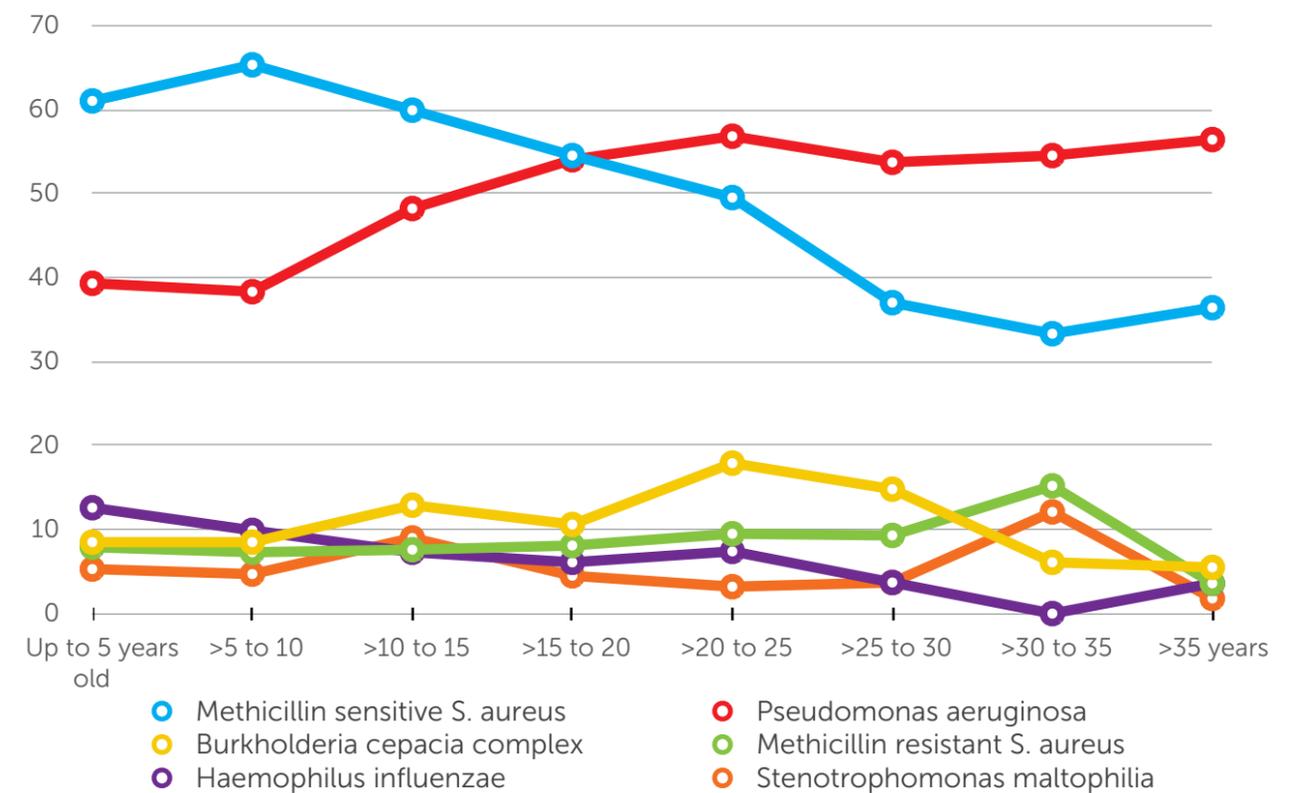


Table 20
Microorganisms identified - distribution by age group

Age group	Microorganismos identificados						nº
	Methicillin-sensitive <i>Staphylococcus aureus</i>	<i>Pseudomonas aeruginosa</i>	<i>Burkholderia cepacia</i> complex	Methicillin-resistant <i>Staphylococcus aureus</i>	<i>Haemophilus influenzae</i>	<i>Stenotrophomonas maltophilia</i>	
Up to 5 years	61.0%	39.3%	8.5%	7.9%	12.6%	5.3%	318
> 5 to 10	65.3%	38.3%	8.5%	7.3%	9.9%	4.7%	426
>10 to 15	59.9%	48.2%	12.9%	7.6%	7.3%	9.0%	357
>15 to 20	54.5%	54.0%	10.6%	8.1%	6.1%	4.5%	198
>20 to 25	49.5%	56.8%	17.9%	9.5%	7.4%	3.2%	95
>25 to 30	37.0%	53.7%	14.8%	9.3%	3.7%	3.7%	54
>30 to 35	33.3%	54.5%	6.1%	15.2%	0%	12.1%	33
>35 years	36.4%	56.4%	5.5%	3.6%	3.6%	1.8%	55

Figure 28
Prevalence of identified pathogens by age group.



CLINICAL TREATMENT DATA

Figure 29

Distribution of the number of consultations per patient in 2011.

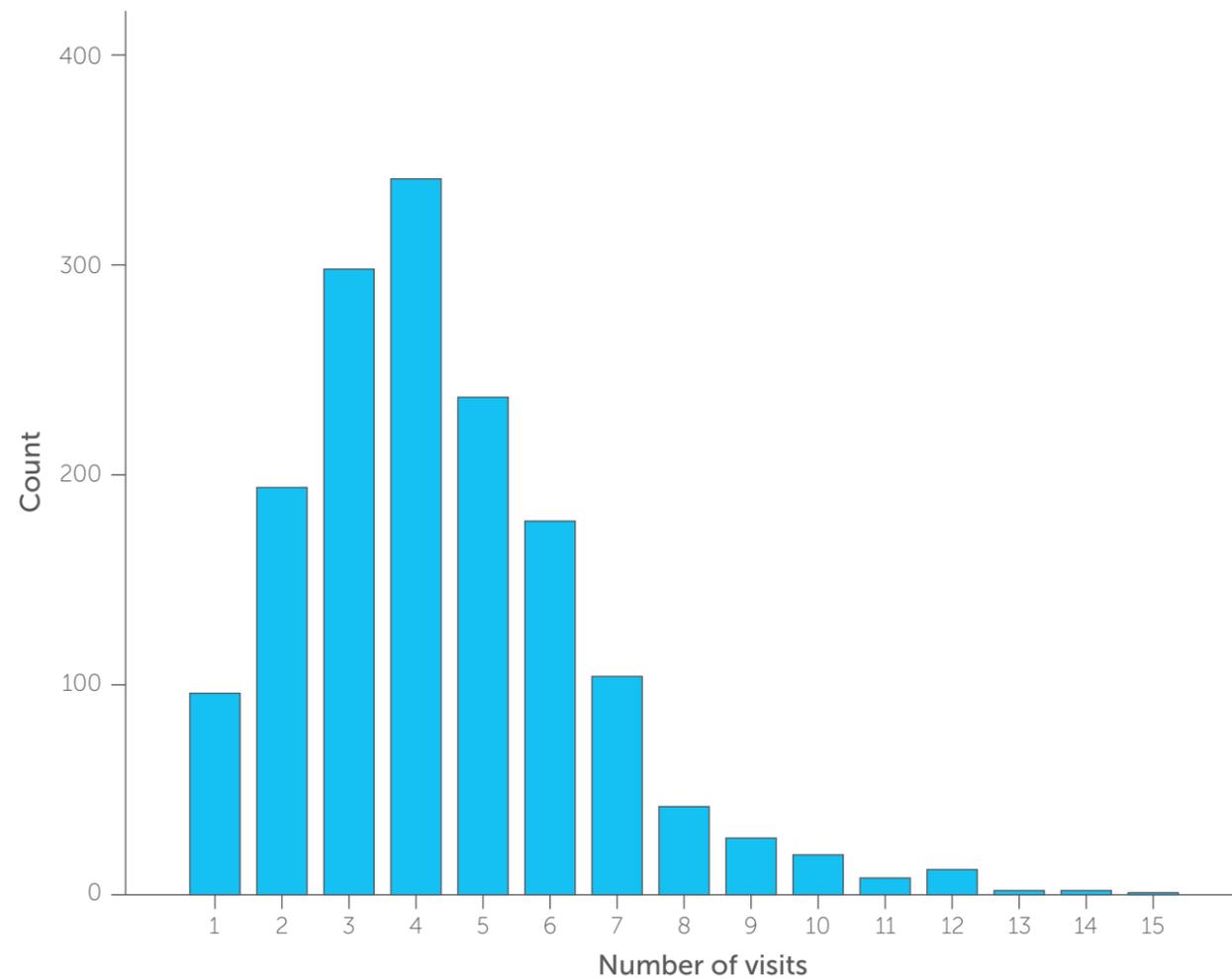


Table 21

Deaths

Death	n (%)
No	1,550 (99.2%)
Yes	12 (0.8%)
Causes of death*	
Respiratory failure – chronic/acute	10
Septic shock / sepsis	3
Acute pulmonar exacerbation	1
Acynetobacter sepsis	1
Dehidration	1
Total of patients	1,562 (100%)

Age at death (years)

Mean (standard deviation)	14.00 (6.64)
Median (p25-p75)	13.40 (11.09-15.77)
Minimum-Maximum	1.88-27.30

* more than one may be indicated for each case.

Table 22

Shwachman-Kulczycki score.

Total score	n (%)
Mean (standard deviation)	77.81 (18.55)
Median (p25-p75)	80 (70-95)
Minimum-Maximum	15-100
CLASSIFICATION	
Severe (≤ 40)	64 (4.9%)
Moderate (41 a 55)	116 (8.8%)
Median (56 a 70)	242 (18.4%)
Good (71 a 85)	424 (32.3%)
Excellent (86-100)	467 (35.6%)
Total of patients	1,313 (100%)

Figure 30

Distribution of patients by Shwachman-Kulczycki score.

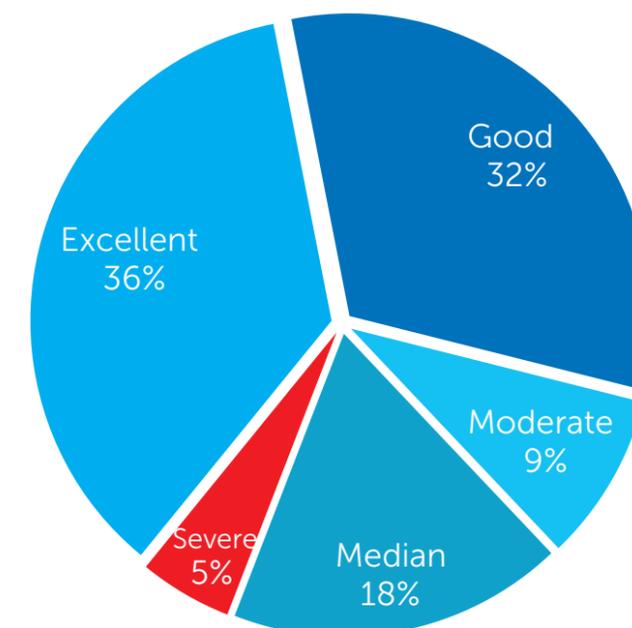


Table 23
Shwachman-Kulczycki score: Total score by age group.

Total score	Age group					Total
	Up to 5 years	> 5 to 10	>10 to 15	>15 to 20	>20 years	
Severe (≤ 40)	1 (0.4%)	6 (1.7%)	7 (2.4%)	15 (9.0%)	32 (15.4%)	61 (4.7%)
Moderate (41 a 55)	6 (2.1%)	18 (5.1%)	34 (11.9%)	19 (11.4%)	38 (18.3%)	115 (8.9%)
Median (56 a 70)	30 (10.6%)	54 (15.4%)	62 (21.7%)	44 (26.3%)	50 (24.0%)	240 (18.5%)
Good (71 a 85)	89 (31.3%)	114 (32.5%)	109 (38.1%)	49 (29.3%)	58 (27.9%)	419 (32.3%)
Excellent (86-100)	158 (55.6%)	159 (45.3%)	74 (25.9%)	40 (24.0%)	30 (14.4%)	461 (35.6%)
Total of patients	284 (100%)	351 (100%)	286 (100%)	167 (100%)	208 (100%)	1,296* (100%)

* 266 patients without information.

Figure 31
Bar graph showing distribution of Shwachman-Kulczycki score by age group.

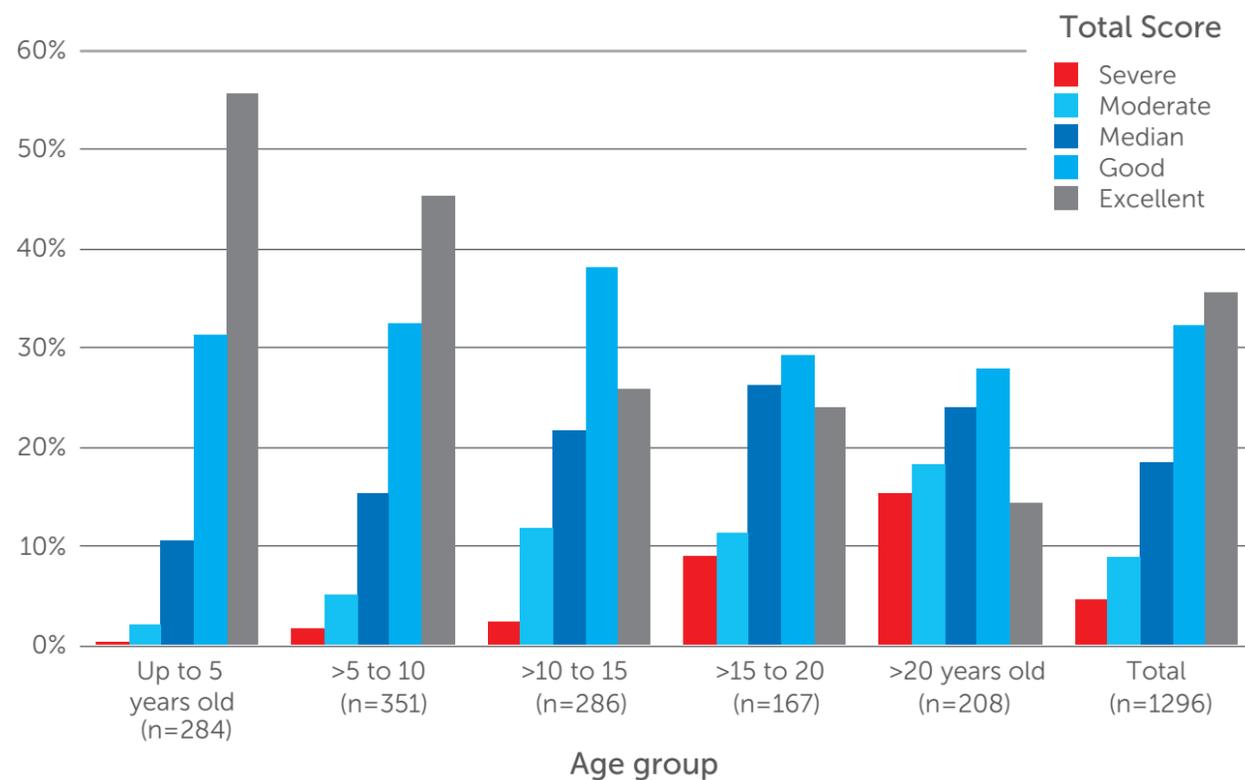


Figure 32
Box-plot graph showing distribution of Shwachman-Kulczycki score by age group.

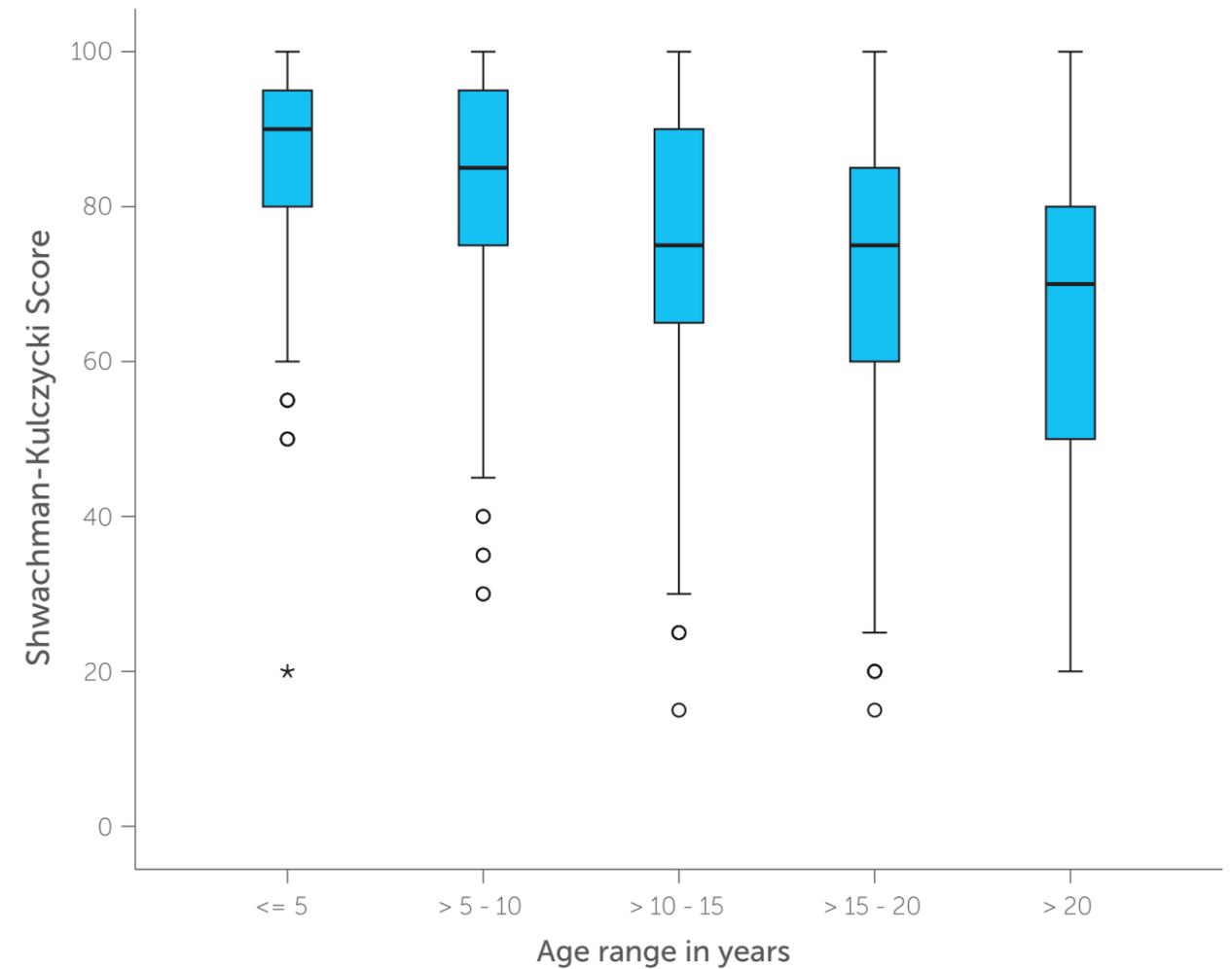


Figure 33
Graph showing 95% confidence interval values of Shwachman-Kulczycki score by age group.

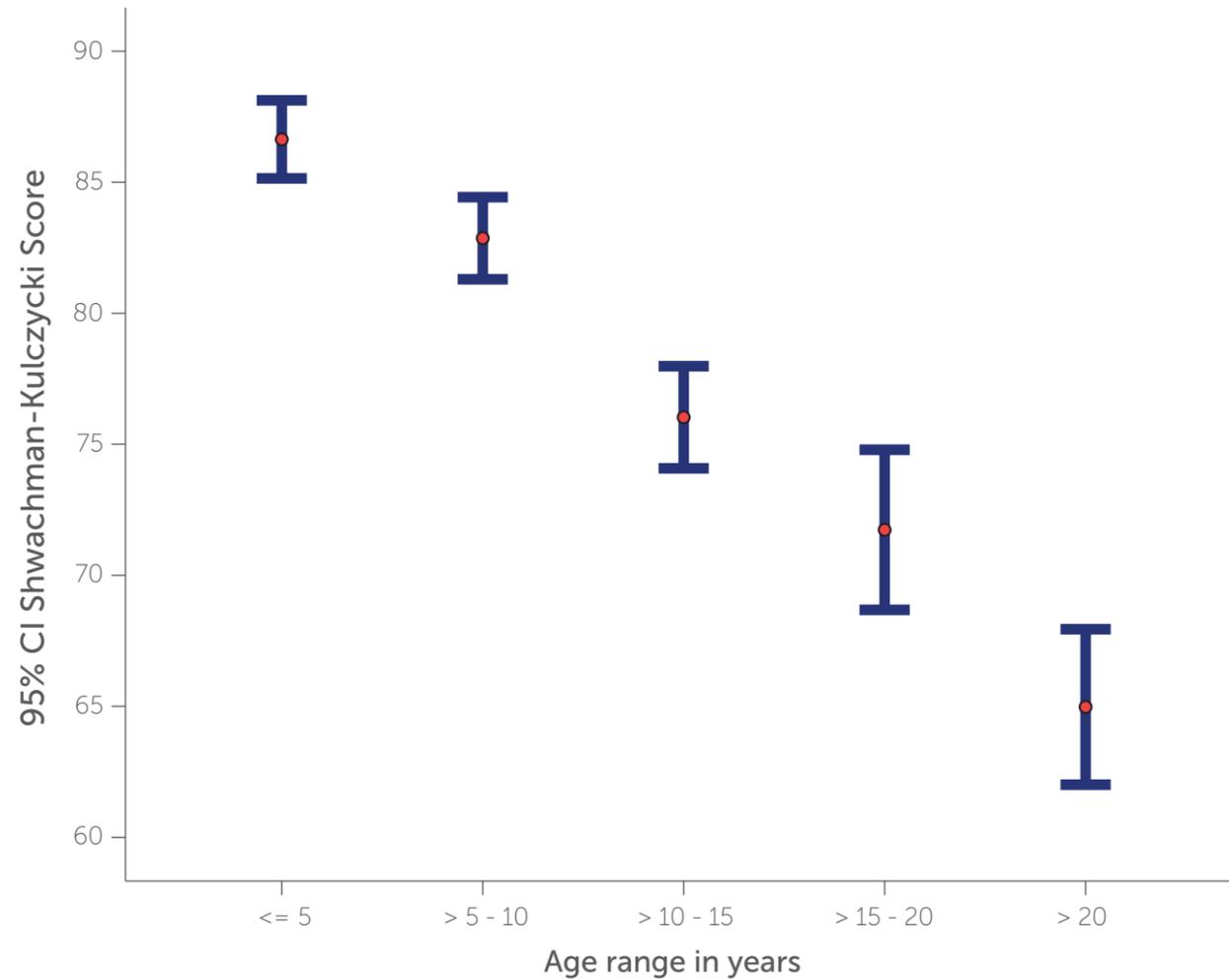


Table 24
Complications in the given year-2011

Complications in the given year (2011)	n (%)
Asthma	231 (14.8%)
Gastroesophageal reflux	122 (7.8%)
Evidences of hepatic disease	89 (5.7%)
Nasal polyposis	76 (4.9%)
Hemoptysis	52 (3.3%)
Diabetes	53 (3.4%)
Osteopenia / Osteoporosis	37 (2.4%)
Chronic atelectasis	36 (2.3%)
Allergic broncopulmonary aspergillosis	6 (0.4%)
Distal intestinal obstruction	7 (0.4%)
Colelythiasis	10 (0.6%)
Pulmonary hypertension	10 (0.6%)
Cirrosis with portal hypertension	9 (0.6%)
Pneumothorax	6 (0.4%)
Pancreatitis	6 (0.4%)
Hematemesis	4 (0.3%)
Total of patients	1,562 (100%)

n=number of patients.

Table 25
Transplantation

Transplantation	n (%)
Pulmonary transplantation	10 (0.6%)
Corpse	10
Live donor	-
Liver transplantation	4 (0.3%)
Total of patients	1,562 (100%)

Table 26
Oxygen therapy

Oxygen therapy	n (%)
No	1,509 (96.6%)
Yes	53 (3.4%)
Continuous	28 (1.8%)
Nocturnal	25 (1.6%)
Total of patients	1,562 (100%)

Table 27
Insulin usage

Insulin usage	n (%)
No	1,493 (95.6%)
Yes	69 (4.4%)
Total of patients	1,562 (100%)

Table 28
Inhaled medications

Bronchodilators	n (%)	Mucolytics	n (%)
Short acting Beta 2 agonist	499 (31.9%)	Alfa dornase	1,117 (71.5%)
Long acting Beta 2 agonist	281 (18.5%)	N Acetylcystein	58 (3.7%)
Anticholinergic	48 (3.1%)		
Antibiotics	n (%)	Saline solutions	n (%)
Inhaled Tobramycin solution 300mg	528 (33.8%)	0.9% saline solution	383 (24.5%)
Colomycin	428 (27.4%)	Hypertonic saline 3%	67 (4.3%)
Gentamycin	32 (2.0%)	Hypertonic saline 5%	63 (4.0%)
Others	20 (1.3%)	Hypertonic saline 7%	291 (18.6%)
Injectable Tobramycin solution	11 (0.7%)	Total of patients	1,562 (100%)
Vancomycin	8 (0.5%)		
Amikacin	8 (0.5%)		

n=number of patients.

Table 29
Oral medications

	n (%)		n (%)
Pancreatic enzymes	1,291 (82.7%)	Azithromycin	540 (34.6%)
Less than 5.000 U/kg/dia	372 (23.8%)	Ursodeoxycholic acid	349 (22.3%)
5.000 - 10.000 U/kg/dia	644 (41.2%)	Proton pump inhibitors	320 (20.5%)
More than 10.000 U/kg/dia	231 (14.8%)	H2 blockers	129 (8.3%)
Unknown	44 (2.8%)	Corticosteroid	88 (5.6%)
Dietary supplements	987 (63.2%)	Ibuprofen (for lung disease)	11 (0.7%)
Oral	876 (56.1%)	Ibuprofen or other NSAI* (for arthropathy)	5 (0.3%)
Gastrostomy	29 (1.9%)	Total of patients	1,562 (100%)
Gastric tubes	6 (0.4%)		
Unknown	76 (4.9%)		

n = number of patients. * Non-steroidal anti-inflammatory.

Figure 34
Oral medications

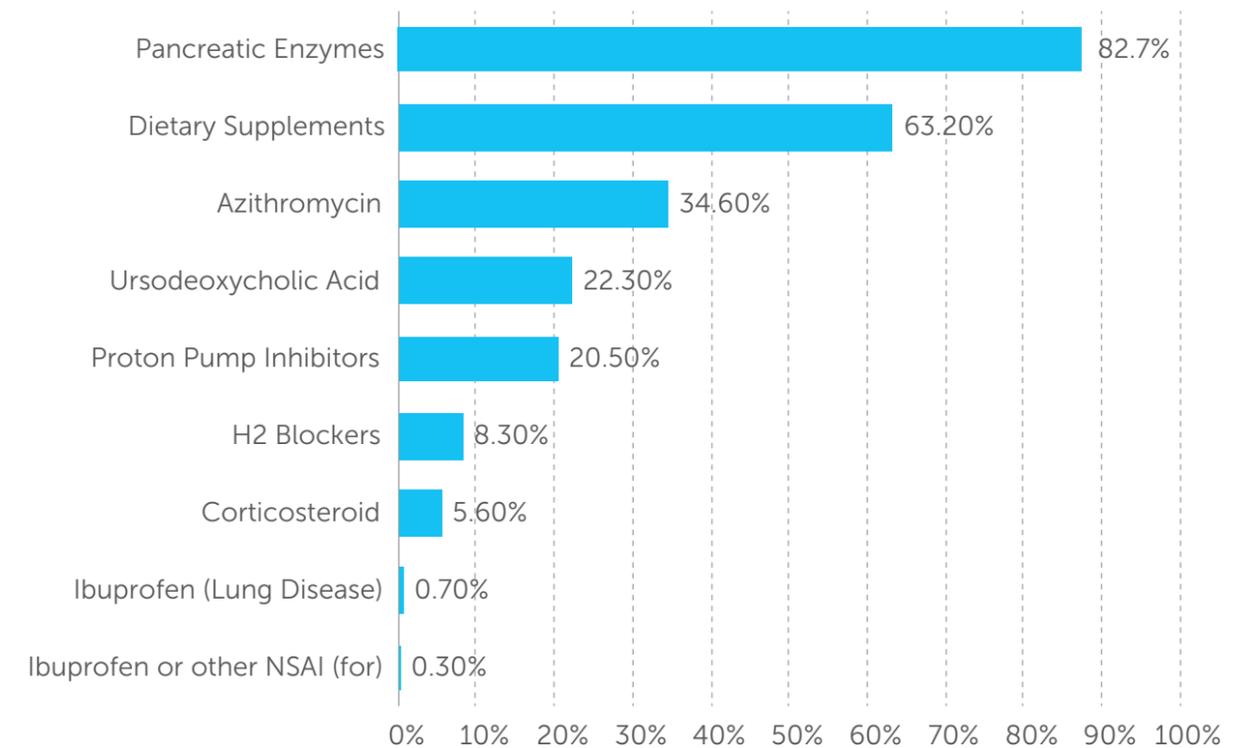


Table 30

P. aeruginosa eradication treatment

P. aeruginosa eradication treatment	n (%)
Yes	316 (20.2%)
No	664 (42.5%)
Unknown	582 (37.3%)
Total of patients	1,562 (100%)

n=number of patients.

Table 31

Intravenous treatments - admissions

Treatment	n (%)
No admission	1,194 (76.4%)
Home care	56 (3.6%)
Hospital admission	298 (19.1%)
Hospital and home care admission	14 (0.9%)
Total of patients	1,562 (100%)

Ciclos	n (%)
Mean (standard deviation)	1.51 (1.00)
Median (p25-p75)	1 (1-2)
Minimum-Maximum	1-8
Total of patients	332

Days	n (%)
Mean (standard deviation)	24.05 (29.60)
Median (p25-p75)	14 (14-21)
Minimum-Maximum	3-287
Total of patients	339

Implanted catheter	n (%)
No	1,533 (98.1%)
Yes	29 (1.9%)
Total of patients	1,562 (100%)

n=number of patients.

Table 32

Intravenous antibiotics: days of treatment by age group.

Days	Age group					Total
	Up to 5 years	> 5 to 10	>10 to 15	>15 to 20	>20 years	
Mean (standard deviation)	20.7 (20.8)	20.9 (22.2)	28.7 (44.2)	21.3 (16.8)	27.4 (27.5)	24.1 (29.6)
Median (p25-p75)	14 (14-21)	14 (14-21)	14 (14-23)	14.5 (14-22.5)	15 (14-30)	14 (14-21)
Minimum-Maximum	3-152	3-154	4-287	11-122	9-160	3-287
Total of patients	71	64	89	50	58	338

Table 33

Intravenous antibiotics – drugs utilized.

Drugs utilized	n	(%)
Ceftazidime	228	14.6%
Amikacin	211	13.5%
Oxacillin	119	7.6%
Ciprofloxacin	88	5.6%
Tobramycin	62	4.0%
Imipenem or Meropenem	60	3.8%
Vancomycin	55	3.5%
Trimethoprim-sulfamethoxazole	54	3.5%
Cefepime	35	2.2%
Piperaciline/Tazobactam	28	1.8%
Gentamicin	20	1.3%
Others	17	1.1%
Ticarcillin/Piperacillin	13	0.8%
Linezolid	7	0.4%
Cefuroxime	5	0.3%
Colomycin	5	0.3%
Aztreonam	4	0.3%
Chloramphenicol	2	0.1%
Total of patients	1,562	100%

n=number of patients.

Figure 35

Intravenous antibiotics – drugs utilized.

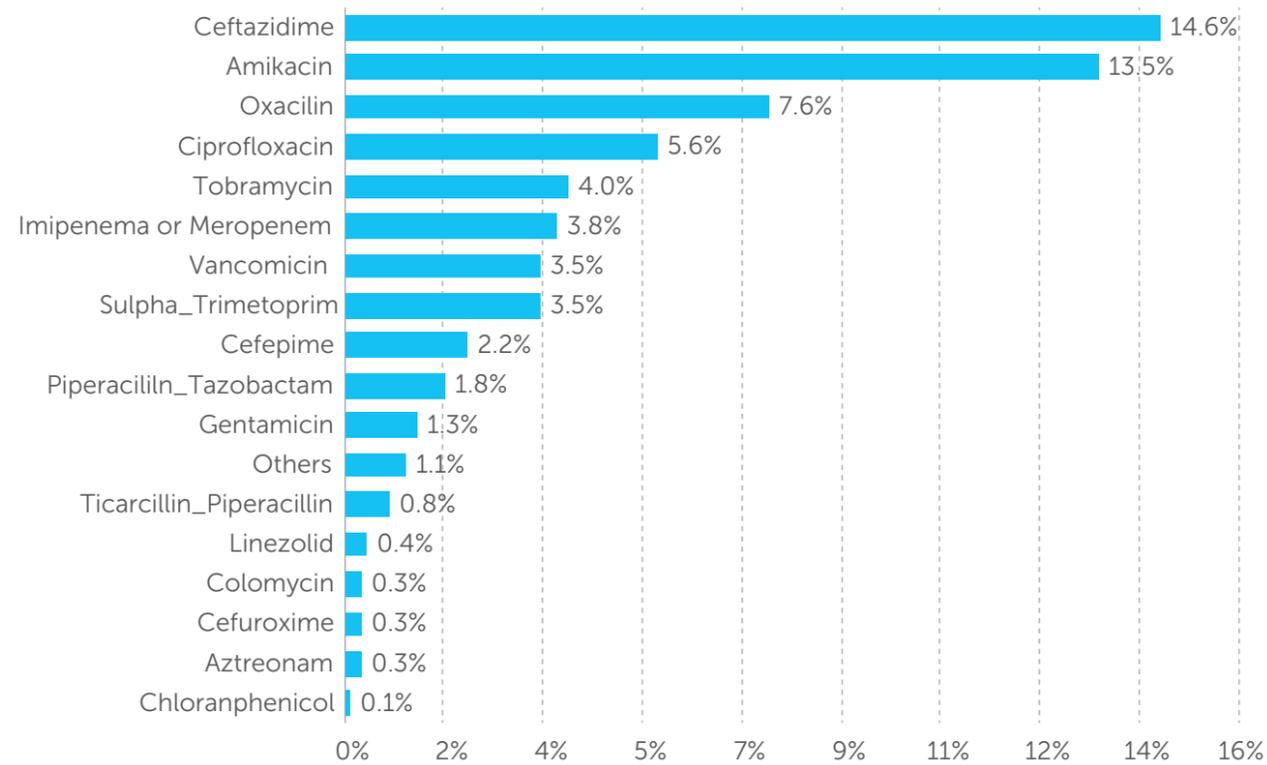


Table 34

Data of adult population.

	Gender		
	Male	Female	Total
Azoospermia or Hypospermia	26 (18.1%)	-	26 (8.9%)
Pregnancy	-	8 (5.4%)	8 (2.7%)
Common law marriage	26 (18.1%)	46 (31.1%)	72 (24.5%)
Employment	57 (39.6%)	48 (32.4%)	105 (36.0%)
Total of patients older than 18 years with follow-up data	144	148	292

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- Novartis Brasil

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Centers that celebrated a confidentiality agreement with the GBEFC to participate in the REBRAFC (updated in October 2012)

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