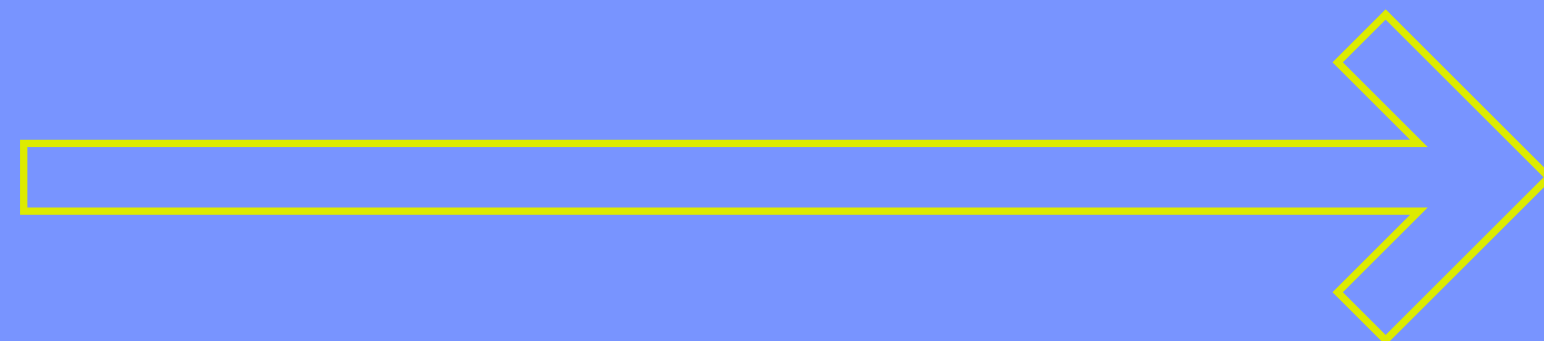


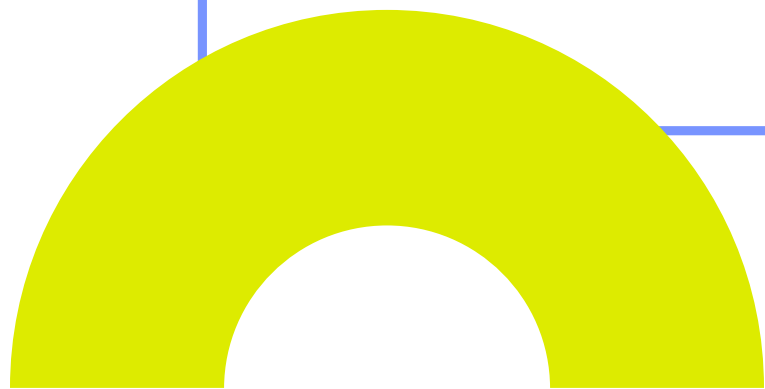
Università degli Studi di Milano – Dipartimento di Economia, Management e Metodi
Quantitativi
Liceo Scientifico Respighi

Data Science 4Citizens

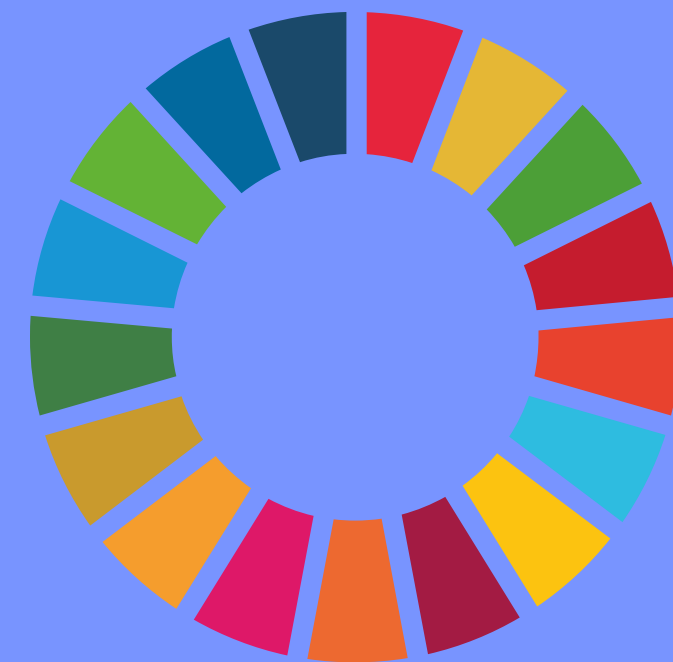


Andrea Cutrera

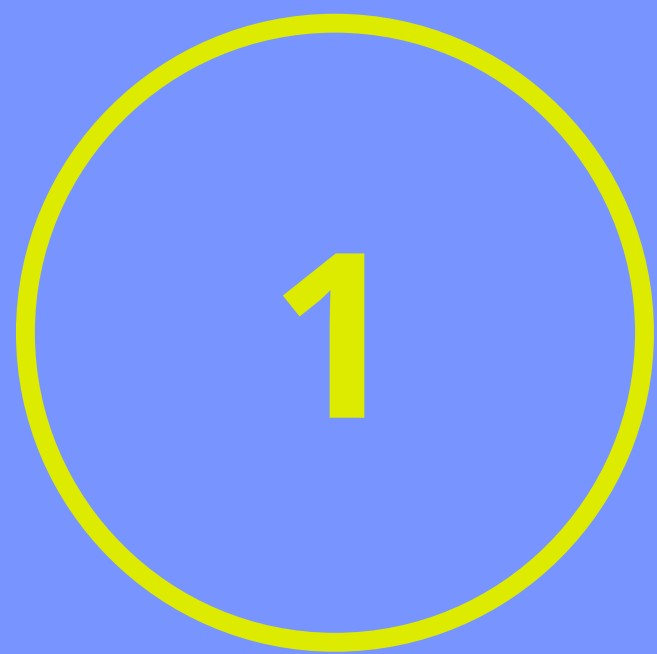
La Sostenibilità Ambientale dell'Europa



**Pensi che in Europa gli stati
stiano perseguendo la
sostenibilità ambientale?**



THE GLOBAL GOALS



Quali sono i paesi più inquinati?



2

**Quali sono i paesi che
investono più sulla protezione
ambientale?**

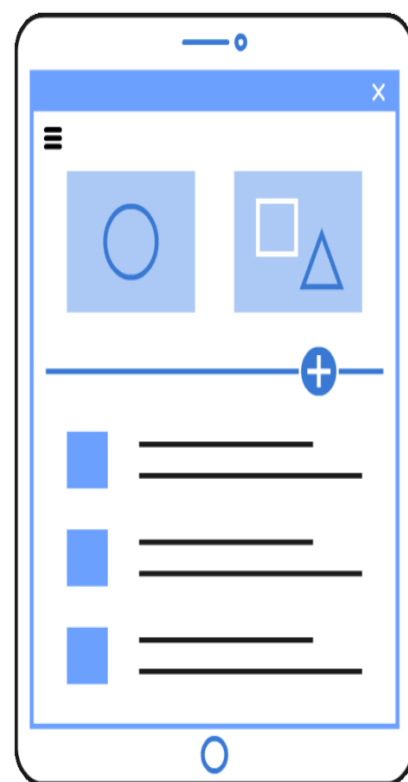


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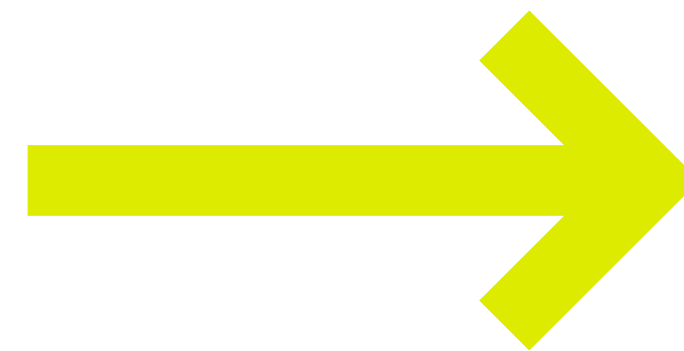
**Quali sono i paesi che
utilizzano più energie
rinnovabili?**



Cerchiamo le risposte nei DATI



OPEN DATA EUROSTAT



1

**Dati 2018 su tutti i paesi
dell'Unione Europea**

Emissioni di CO₂

01

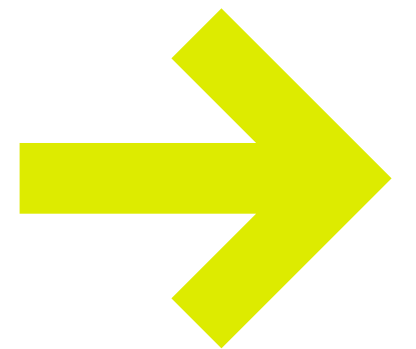
Gas Serra

02

Riciclo dei rifiuti

03

Misuriamo l'inquinamento dei 28 stati



Emissioni di CO₂

01



Gas Serra

02

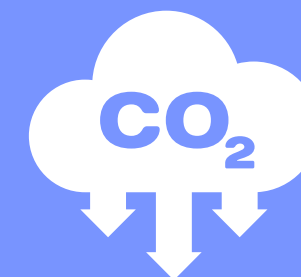
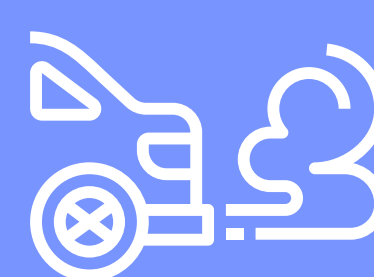


Riciclo dei rifiuti

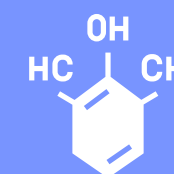
03



emissione media di biossido di carbonio
per chilometro da un passeggero in auto



indicatore composto per le emissioni di
gas serra (anidride carbonica, ossido di
diazoto, ..., idrofluorocarburi, ...) in
equivalenti di CO₂



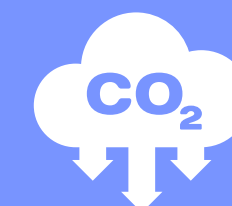
+



+

.....

=



percentuale di rifiuti riciclati



2

**Dati 2018 su tutti i paesi
dell'Unione Europea**

**Misuriamo l'attenzione all'ambiente dei 28
stati**

Pil Pro-Capite

01

Popolazione

02

Educazione di alto livello

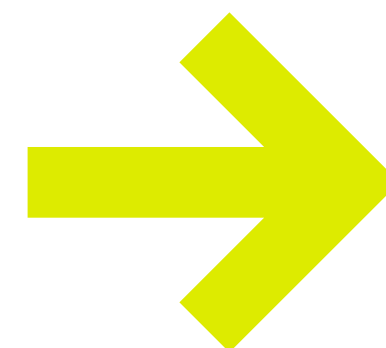
03

Spesa pubblica per l'ambiente

04

Tassazione per l'inquinamento

05



Pil Pro-Capite

01

Popolazione

02

Educazione di alto livello

03

Spesa pubblica per l'ambiente

04

Tassazione per l'inquinamento

05

indicatore della situazione economica di un paese; riflette il valore di beni e servizi prodotti da ogni cittadino

popolazione al 1-gennaio-2018

percentuale di persone con un diploma sulla fascia d'età 25-64 anni

milioni di euro spesi per la protezione dell'ambiente

percentuale sul pil della tassazione sull'ambiente

3

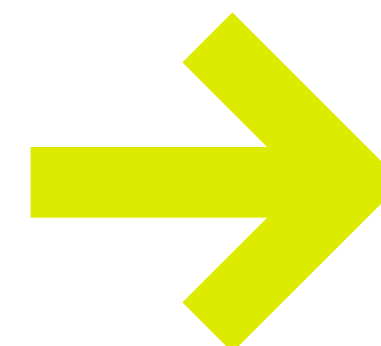
**Dati 2018 su tutti i paesi
dell'Unione Europea**

Energie Rinnovabili

01

**Misuriamo la sostenibilità nella produzione
energetica dei 28 stati**

.....

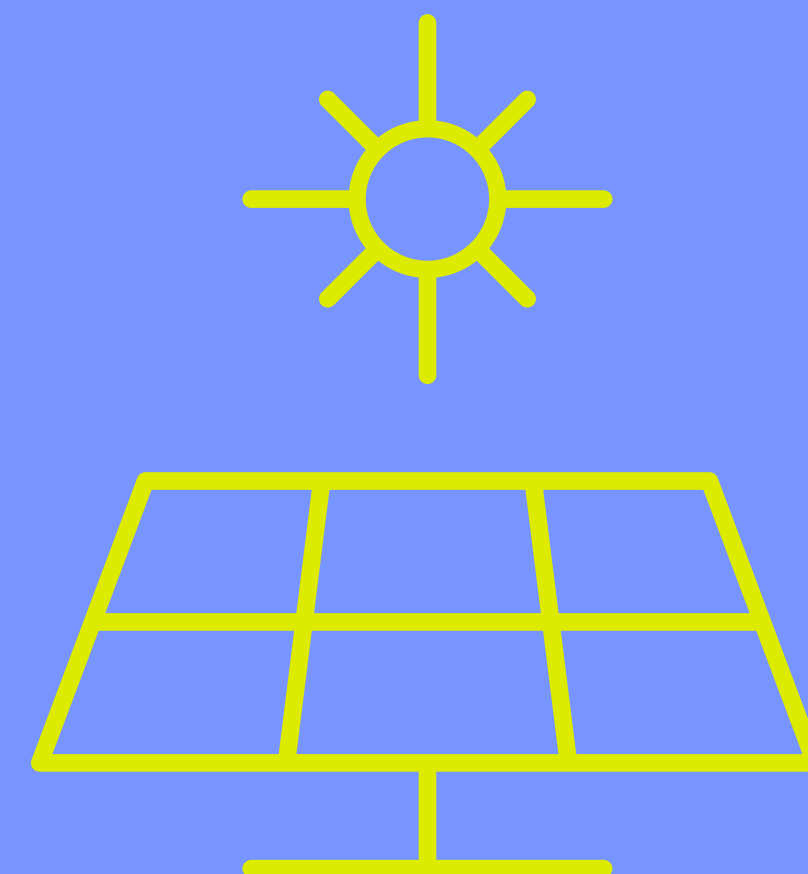
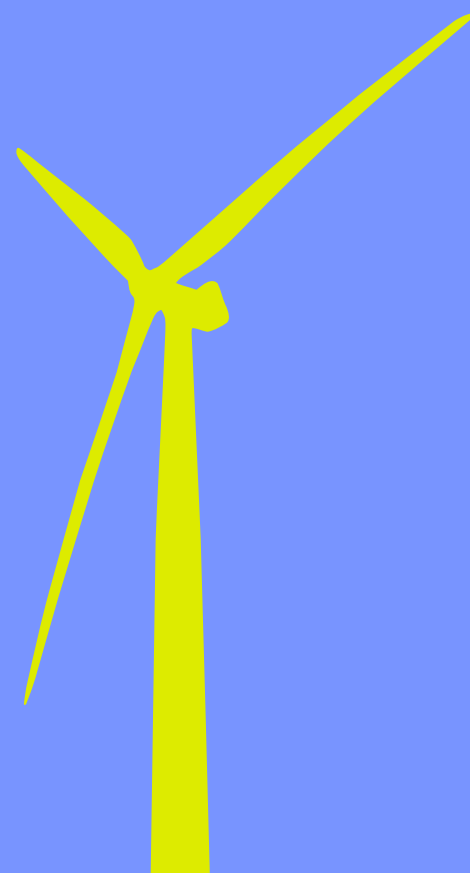


Energie Rinnovabili

01



percentuale di energia prodotta
da fonti rinnovabili



Dataset finale

- 9 indicatori --> 9 variabili --> 9 colonne
- 28 paesi --> 28 osservazioni --> 28 righe

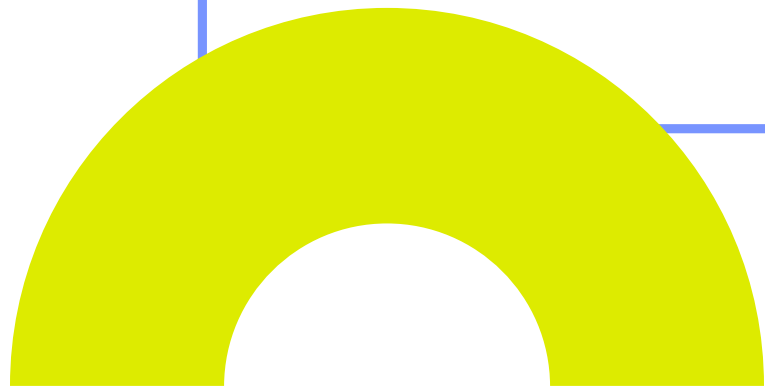
Dataset finale



1 etichetta + 9 variabili

28 paesi									
	stato	pil	edu	...	riciclo	co_2			
	ITA								
	FRA								
	DEU								
	⋮								
	POR								

Analisi Univariata



Indici di Posizione



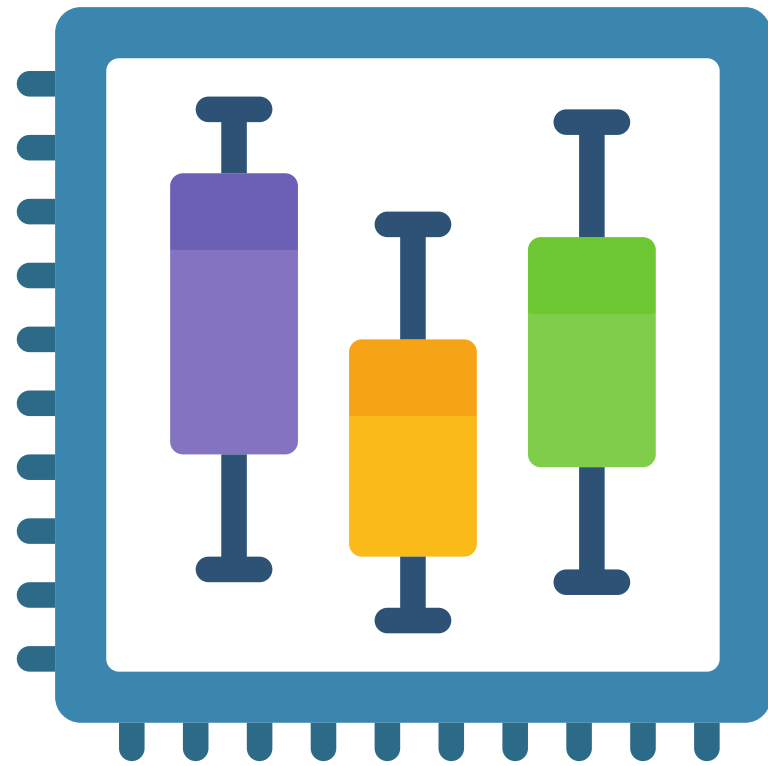
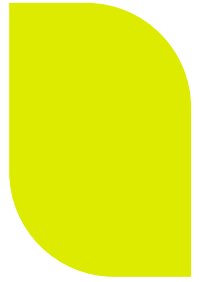
- **Media**
- **Mediana**
- **Minimo**
- **Massimo**

Statistica descrittiva

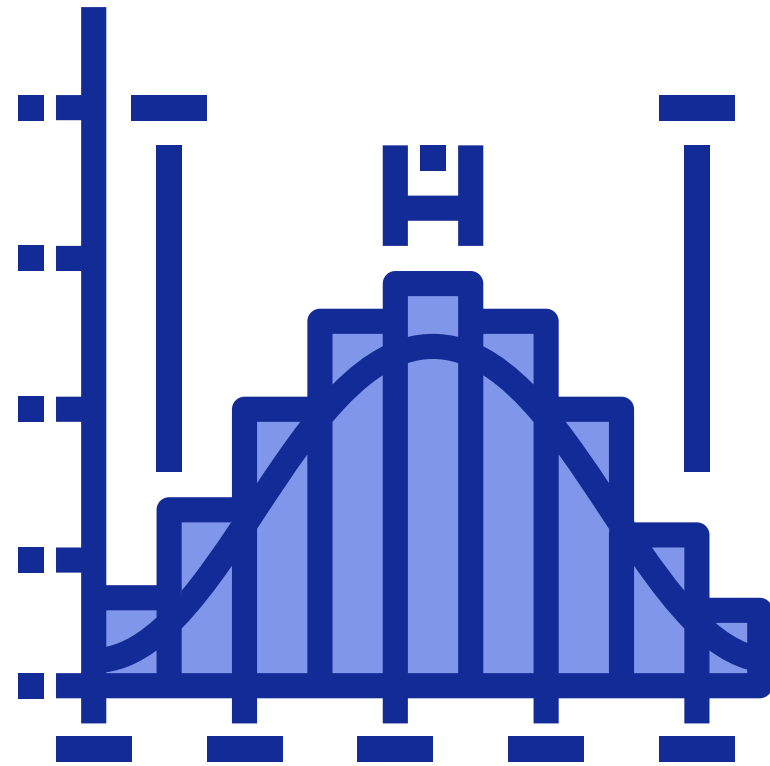


▲	Variabile	Media	Mediana	Minimo	Massimo
1	pil_18	31633.57	25295	8000	99150
2	pop_18	15948464.54	7936150.5	348450	82792351
3	edu_18	80.66	82.9	49.8	94.8
4	media_co2_18	120.28	121.2	105.5	132.4
5	gas_serra_pro_capite_18	9.56	8.65	5.2	20.4
6	protezione_ambiente_18	9632.48	2246.3	169.3	72546
7	tasse_ambiente_18	2.59	2.525	1.57	3.8
8	riciclo	37.08	36.85	0	67.1
9	energie_rinnovabili_18	23.53	17.8985	7.394	77.173

Visualizzazione variabile continua



Boxplot

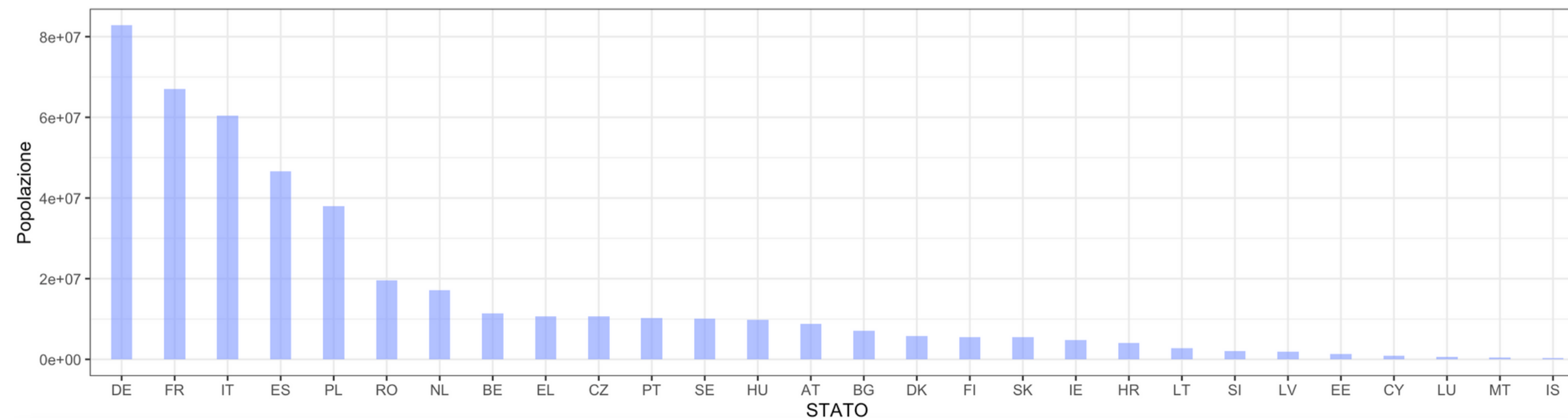
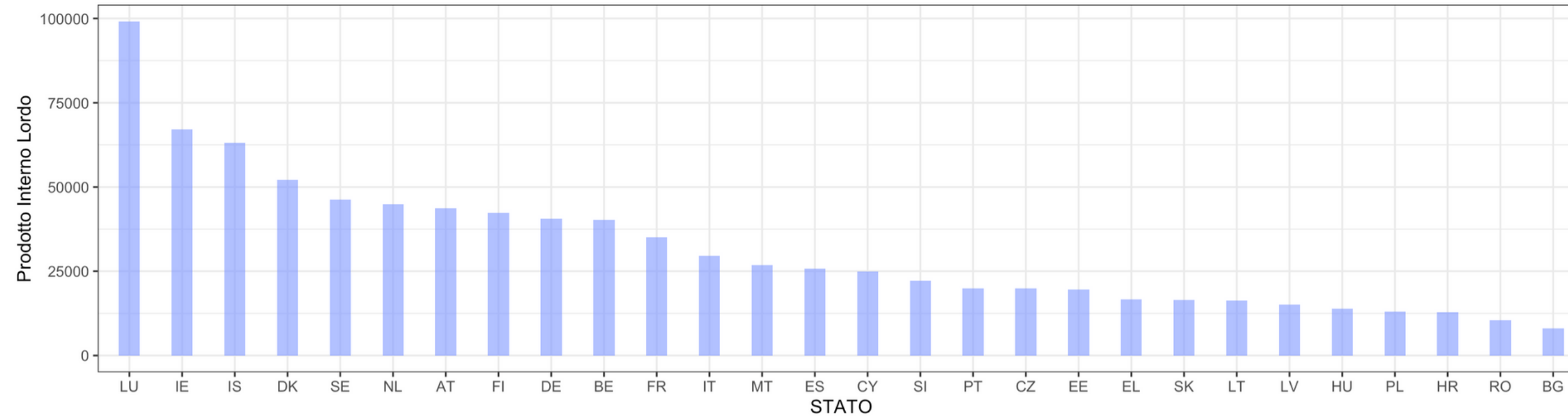


Histogram

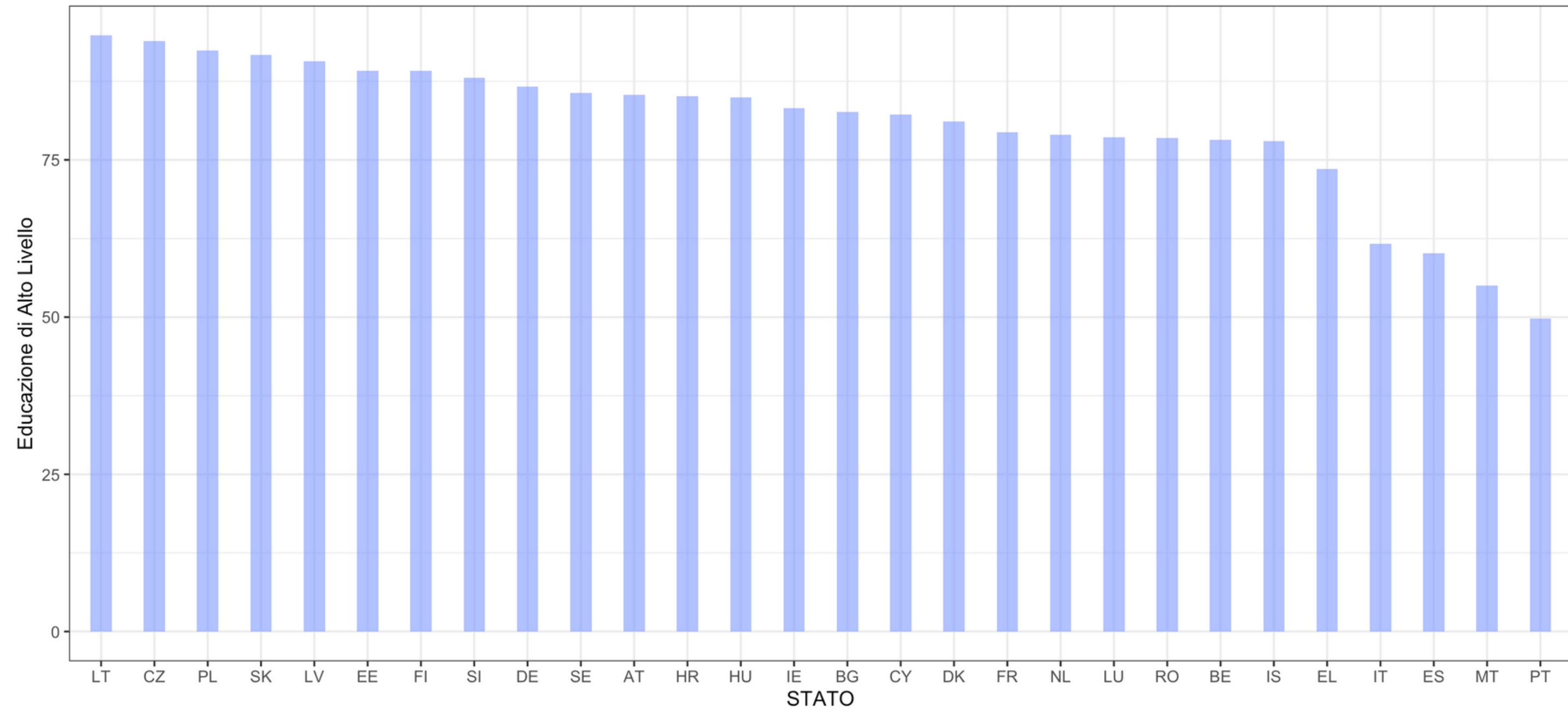
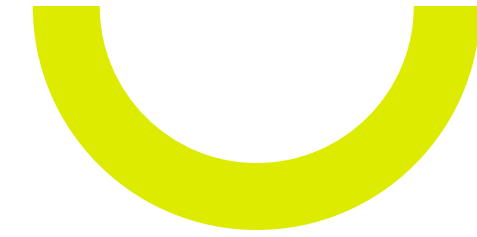


Bar Chart

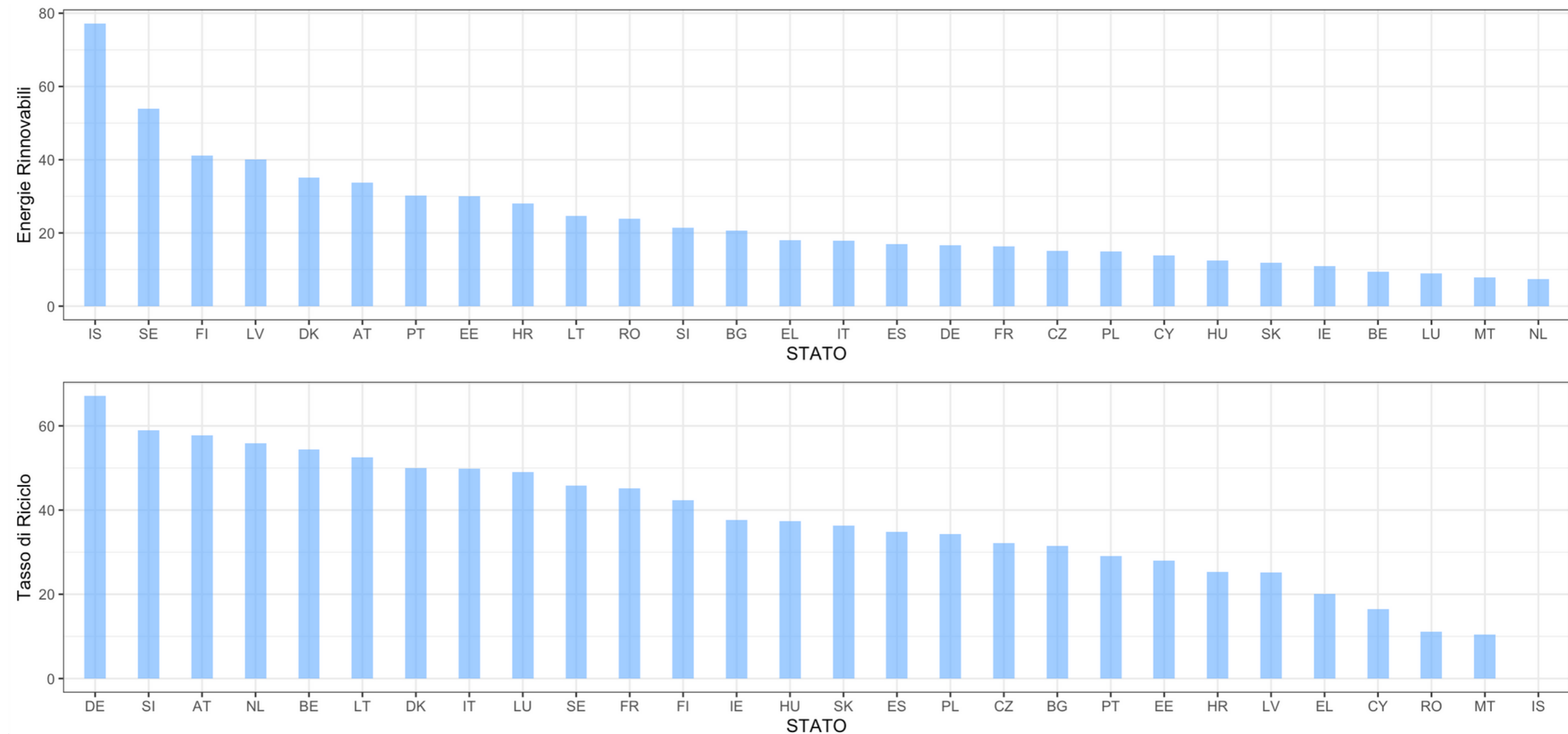
Statistica descrittiva



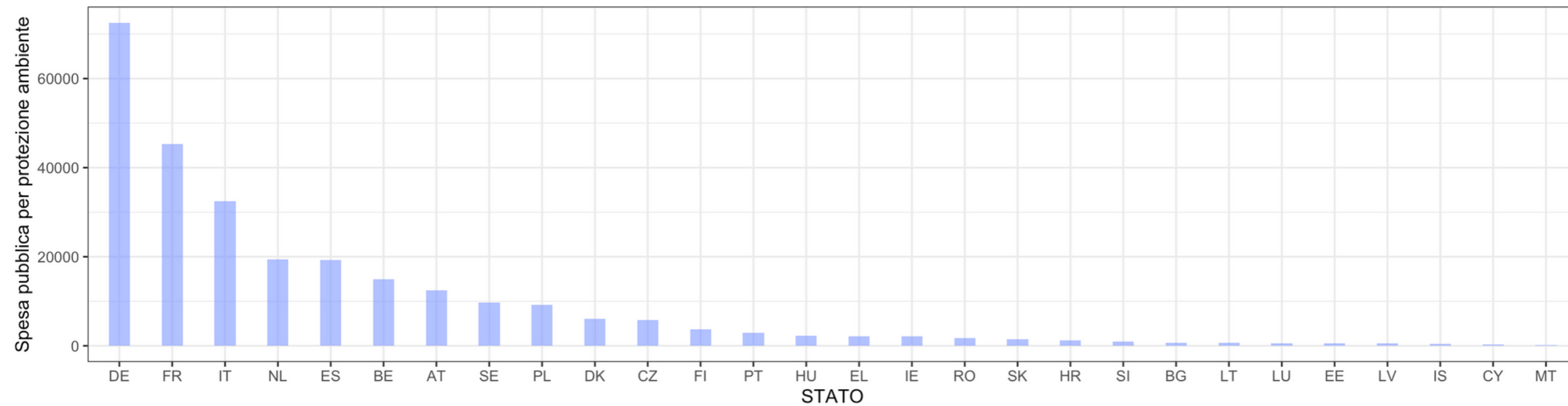
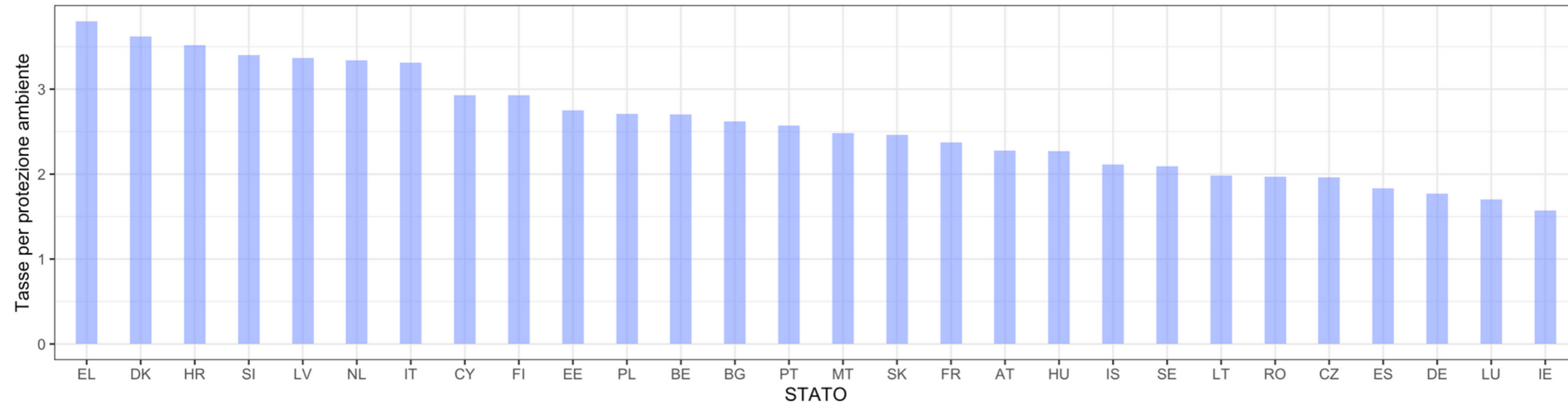
Statistica descrittiva



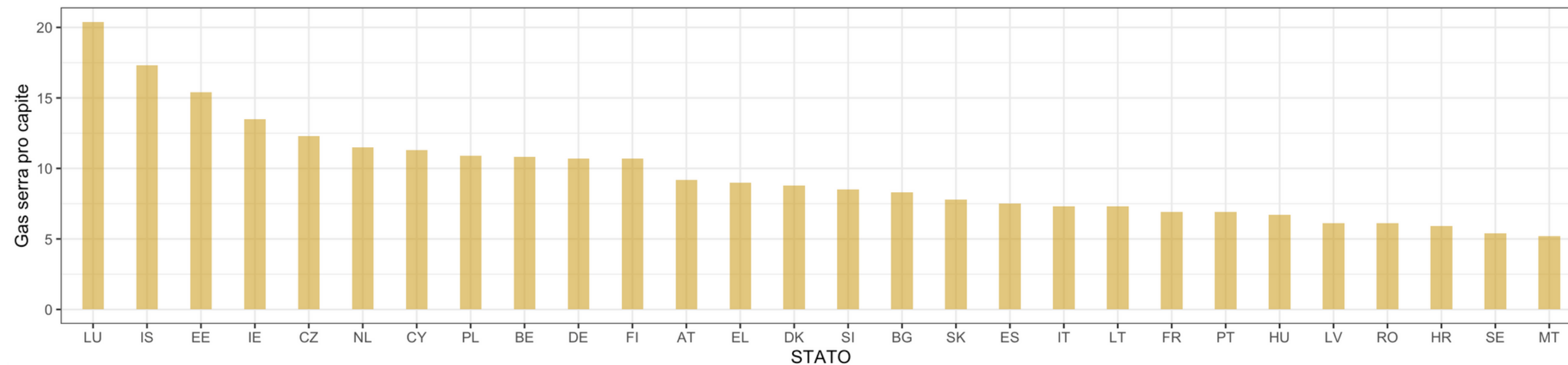
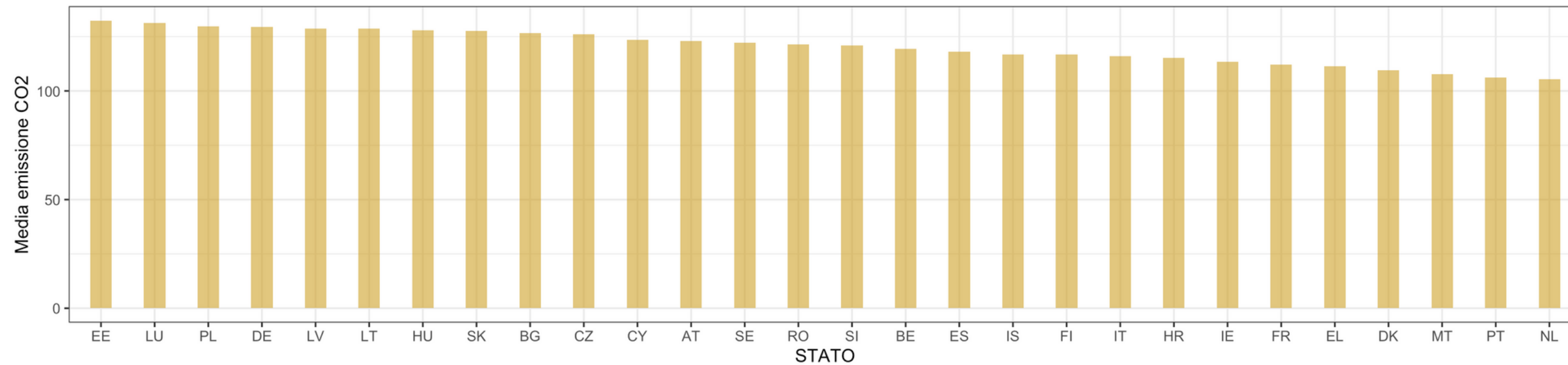
Statistica descrittiva



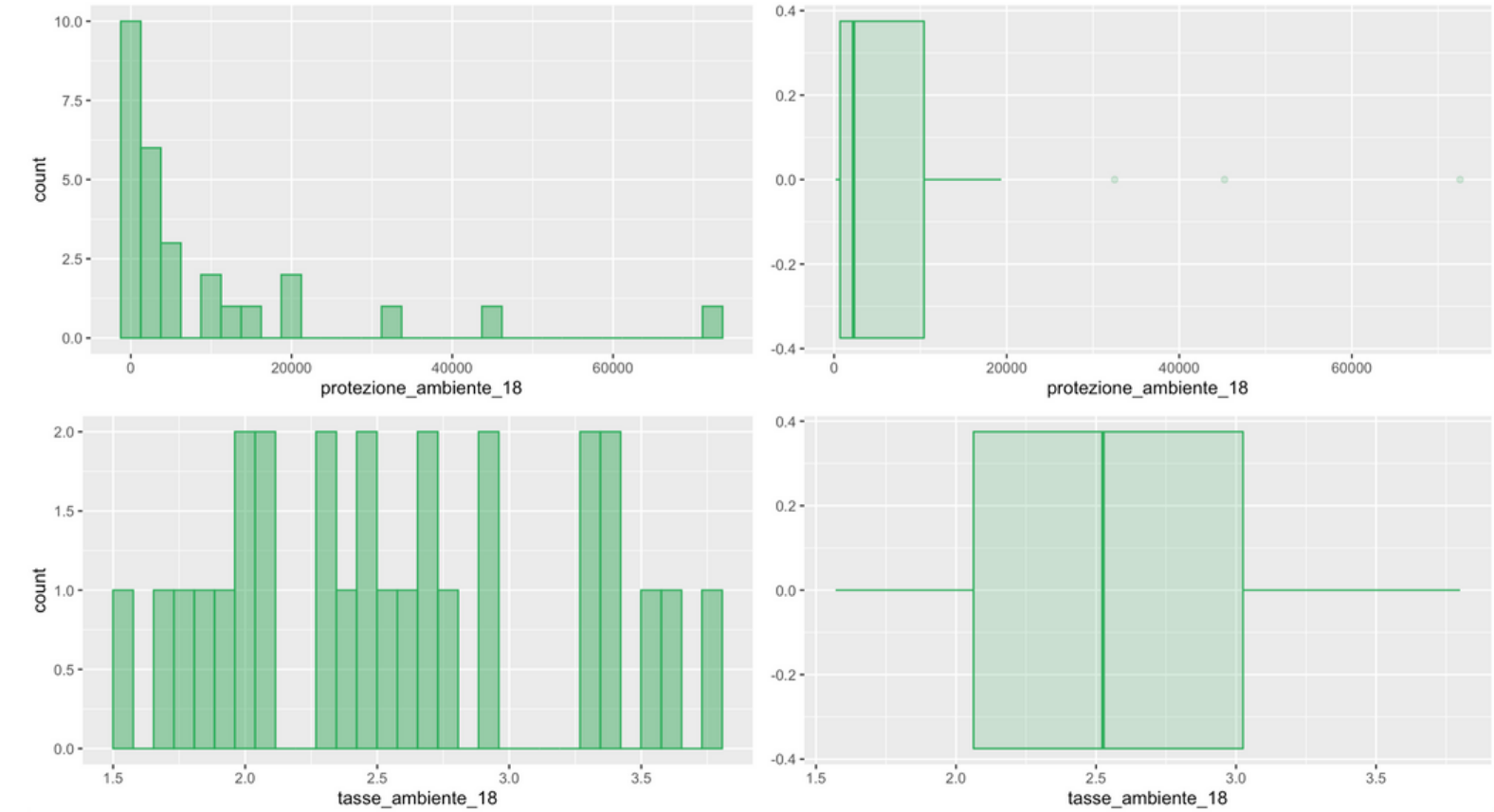
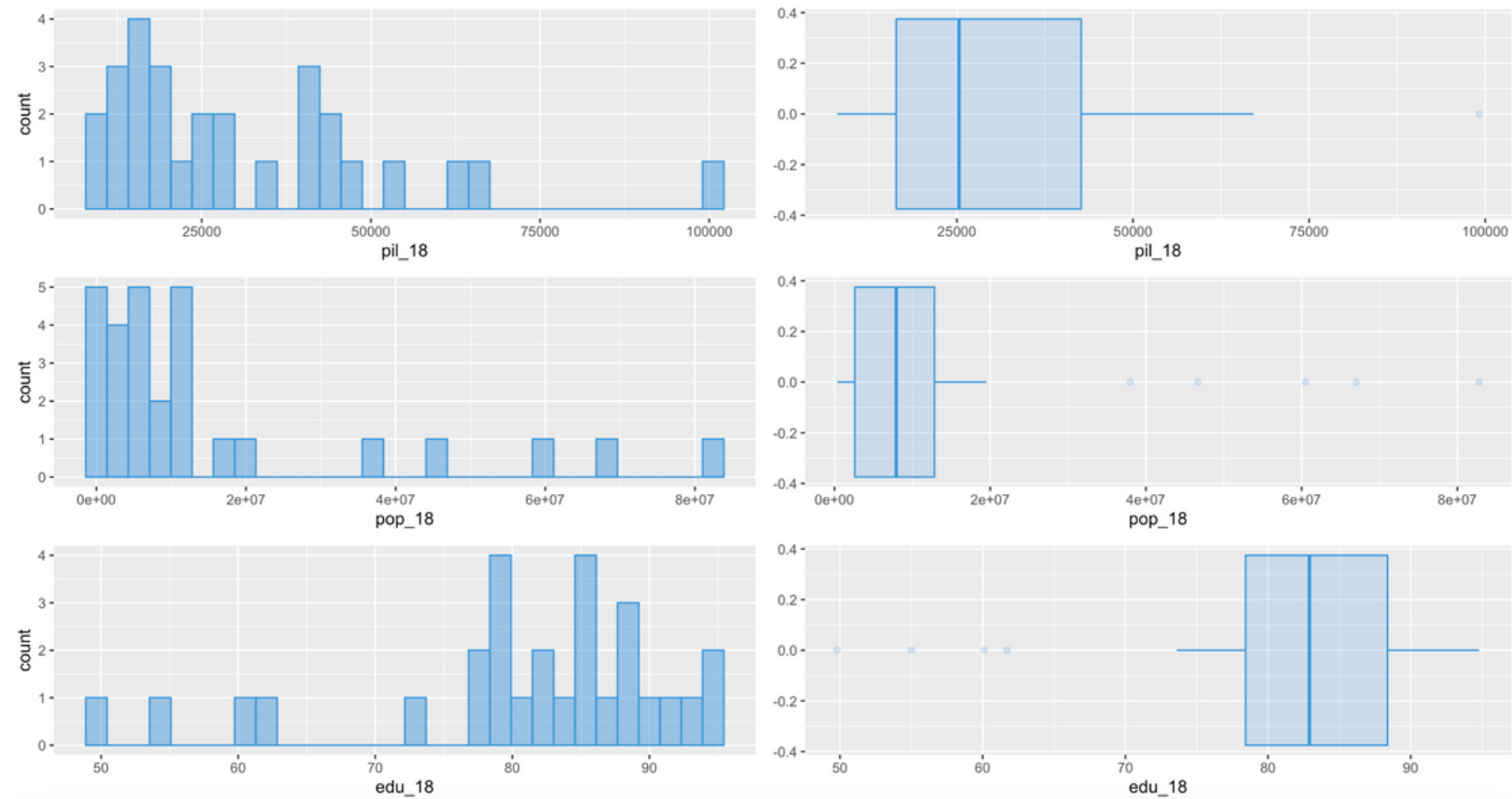
Statistica descrittiva



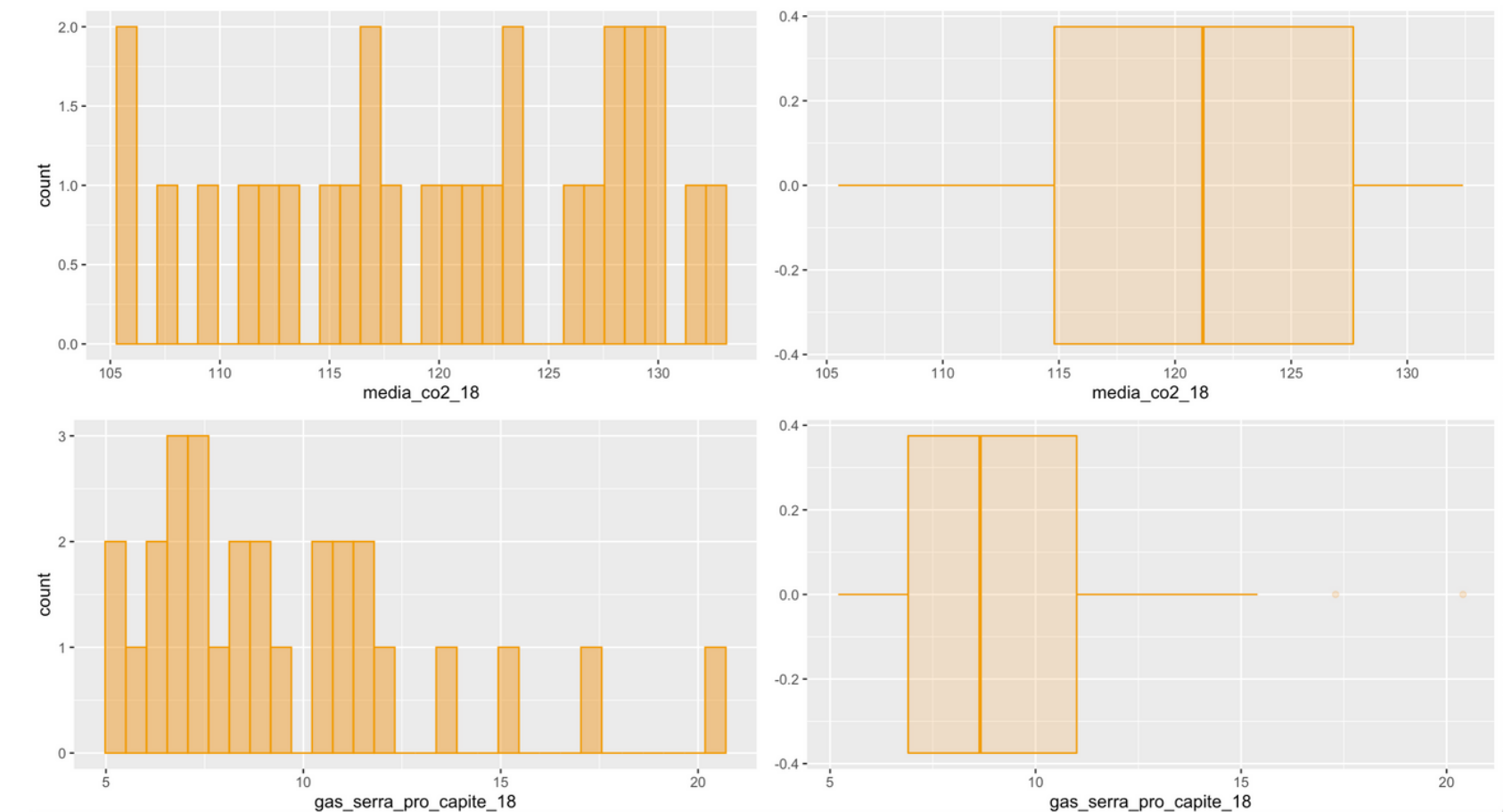
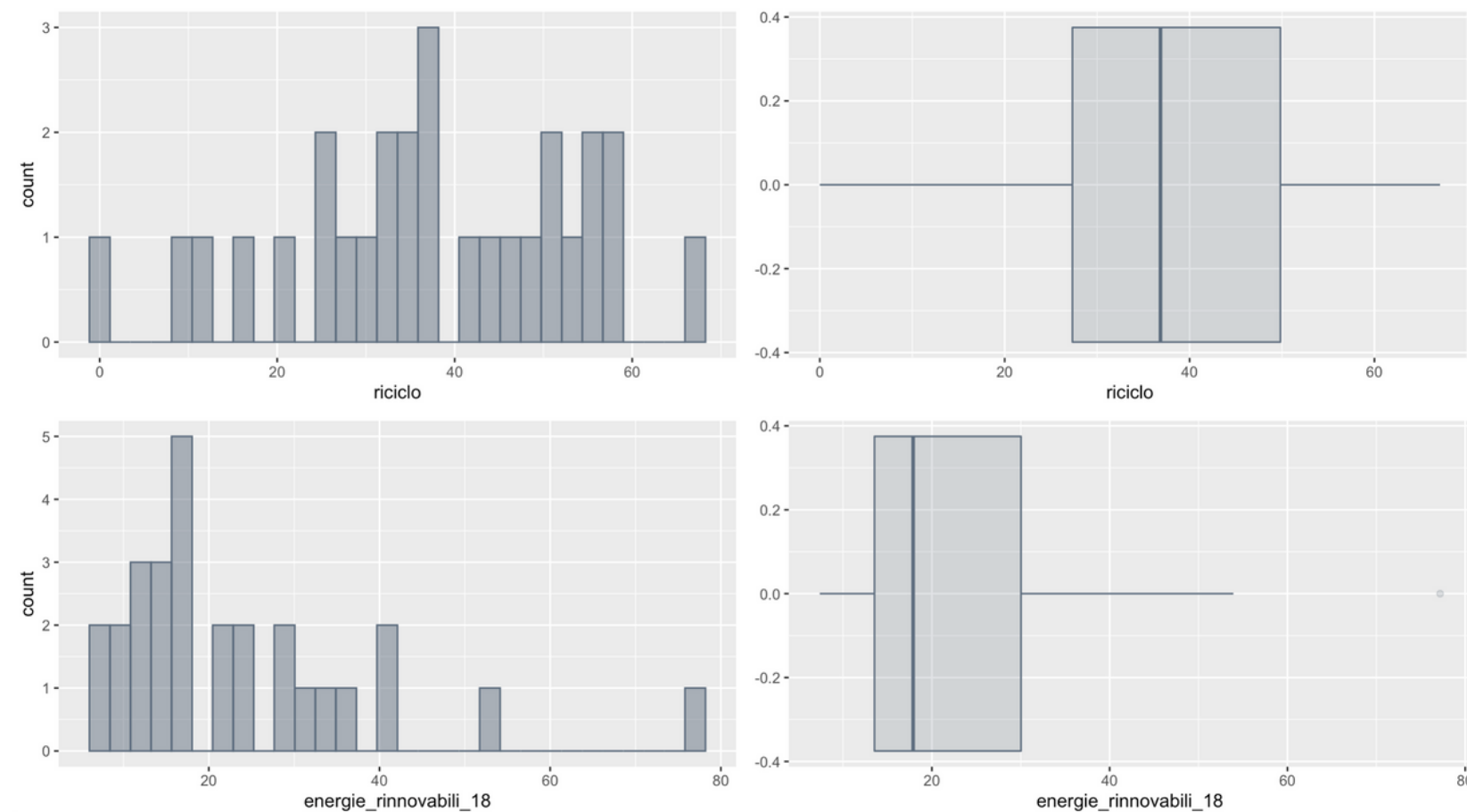
Statistica descrittiva



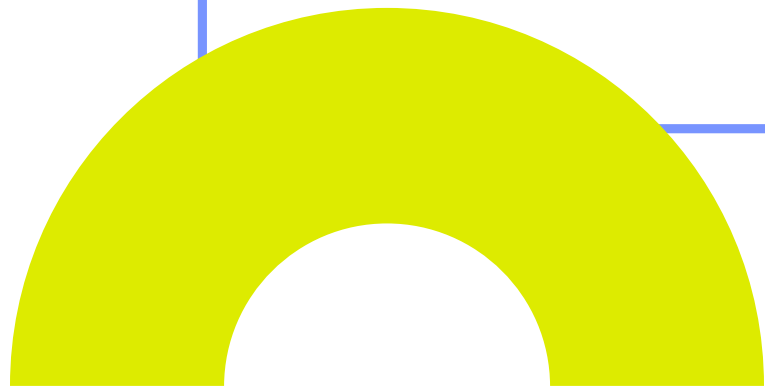
Statistica descrittiva



Statistica descrittiva



Analisi Bivariata

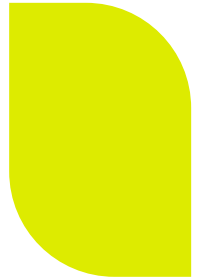


Analisi Bivariata

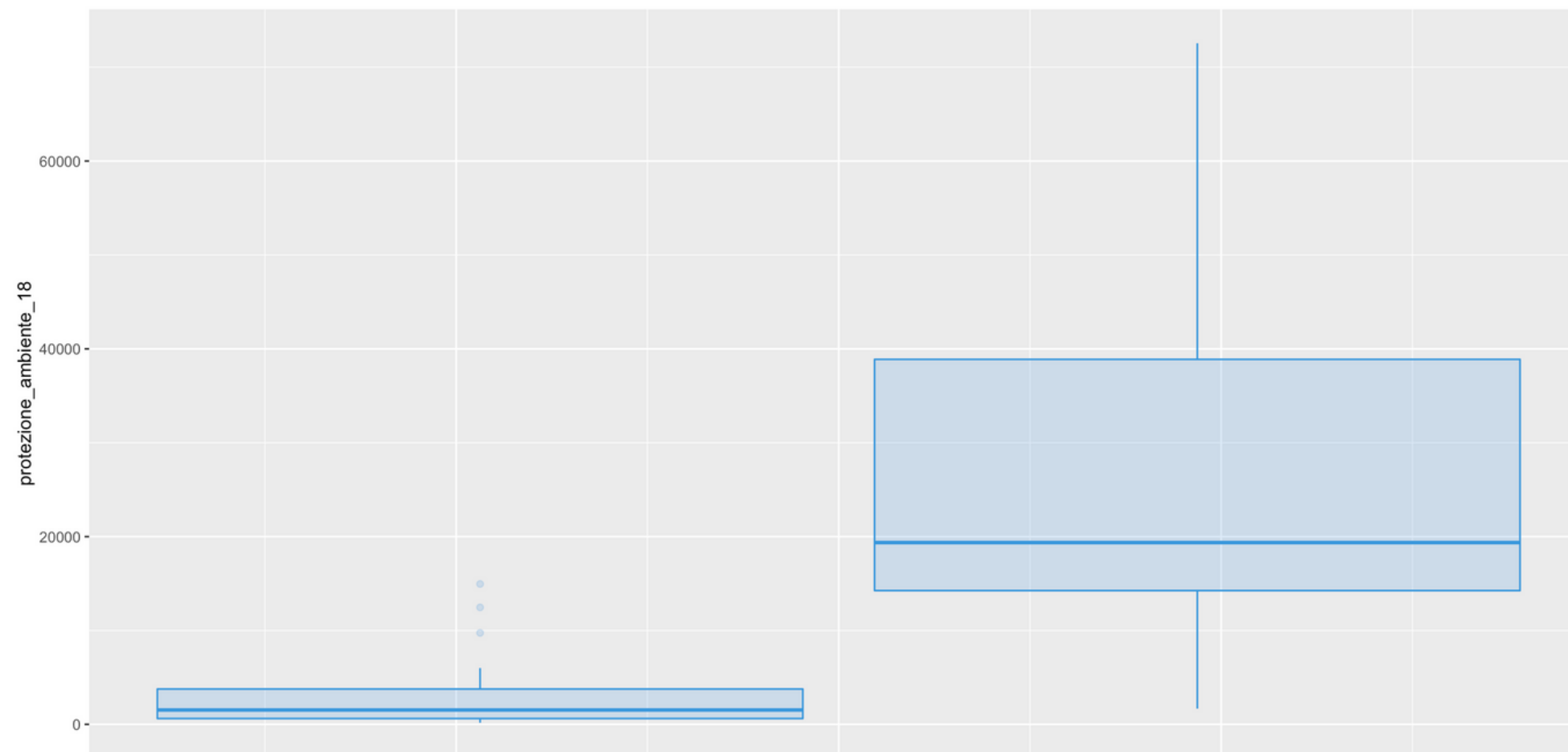


- **Cross-Tabs**
- **Matrice di Correlazione**
- **Regressione lineare**

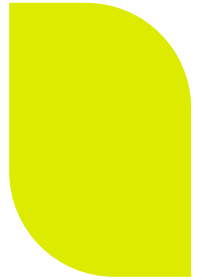
Cross-Tabs



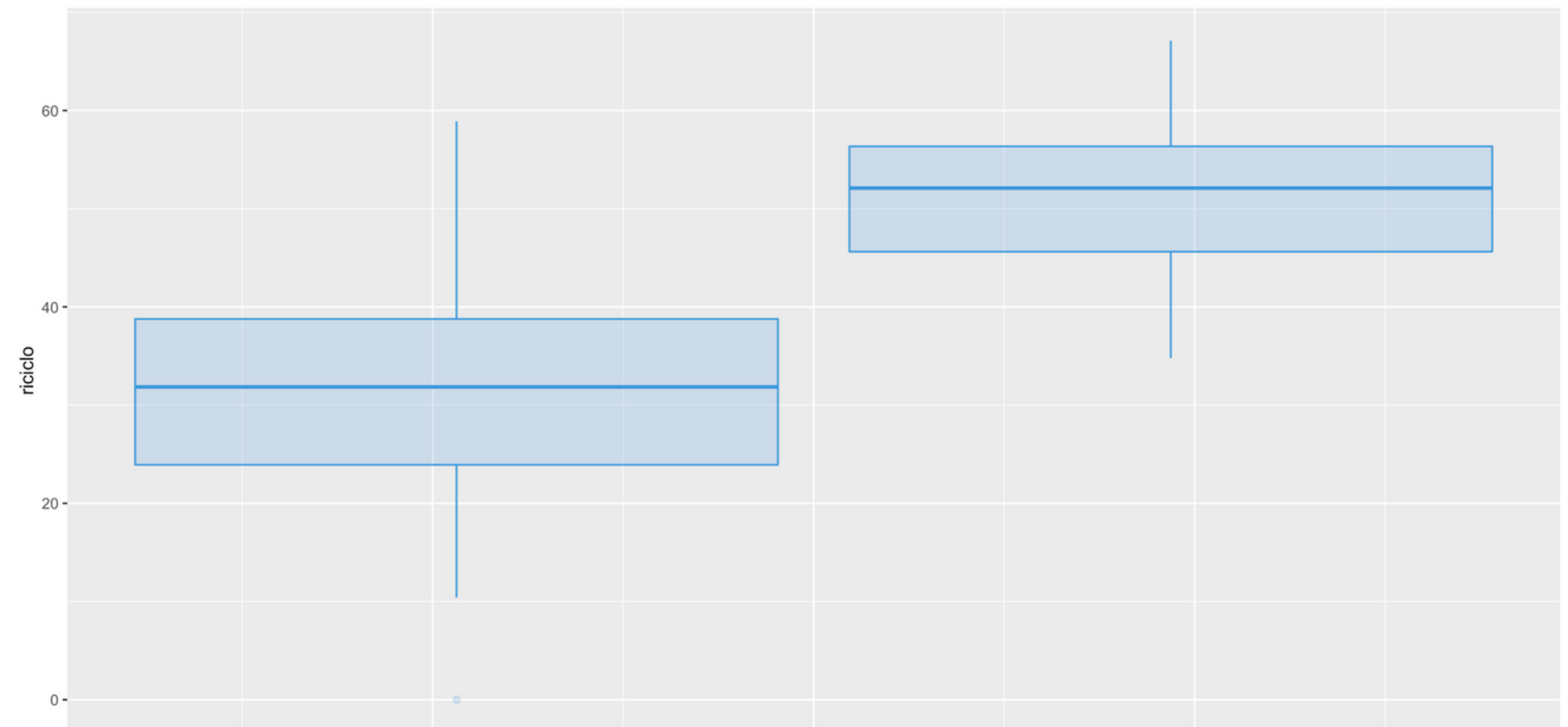
popolazione	protezione_ambiente	
	Bassa Protezione	Alta Protezione
Poco Popolosa	18	3
Molto Popolosa	2	5



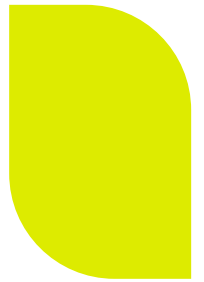
Cross-Tabs



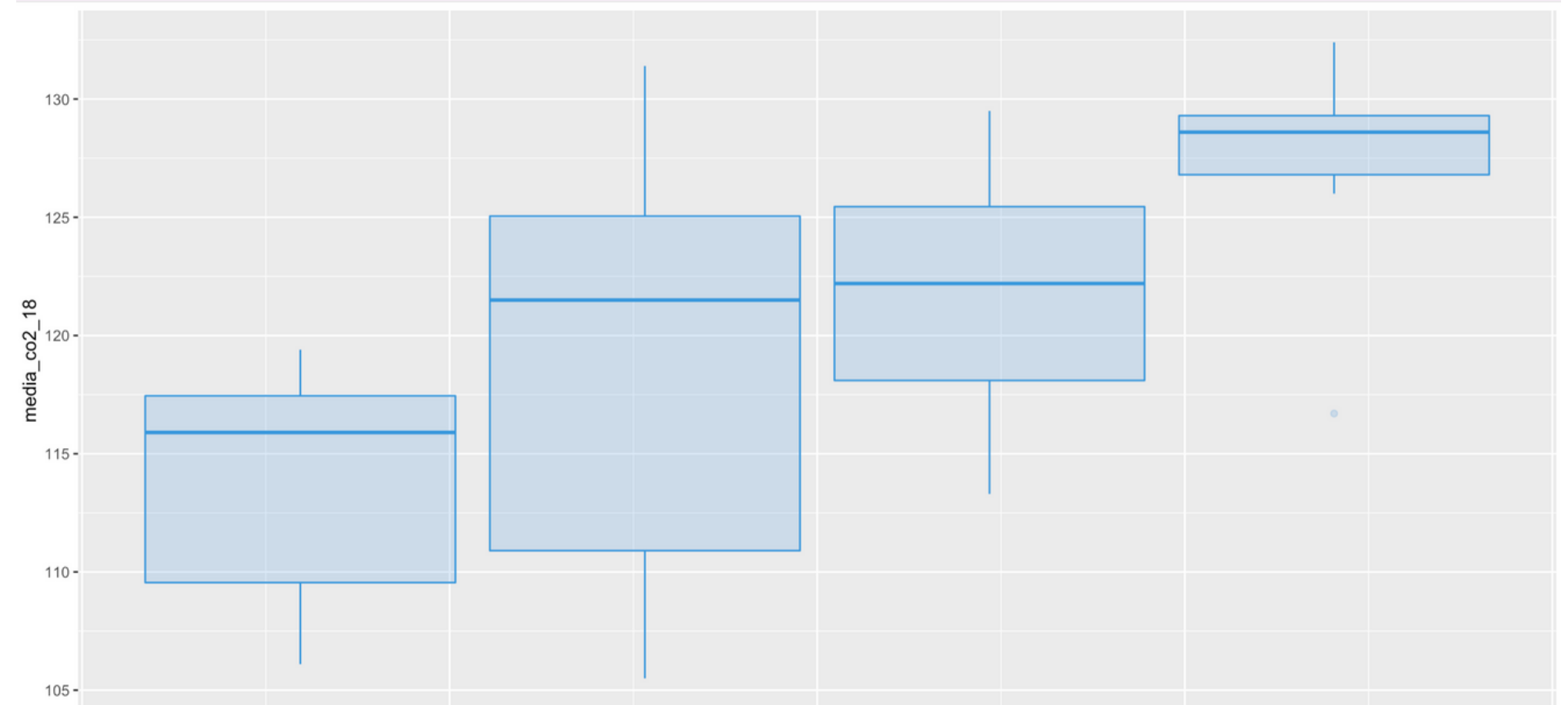
protezione_ambiente		
percentuale_riciclo	Bassa Protezione	Alta Protezione
Poco riciclo	13	1
Molto Riciclo	7	7

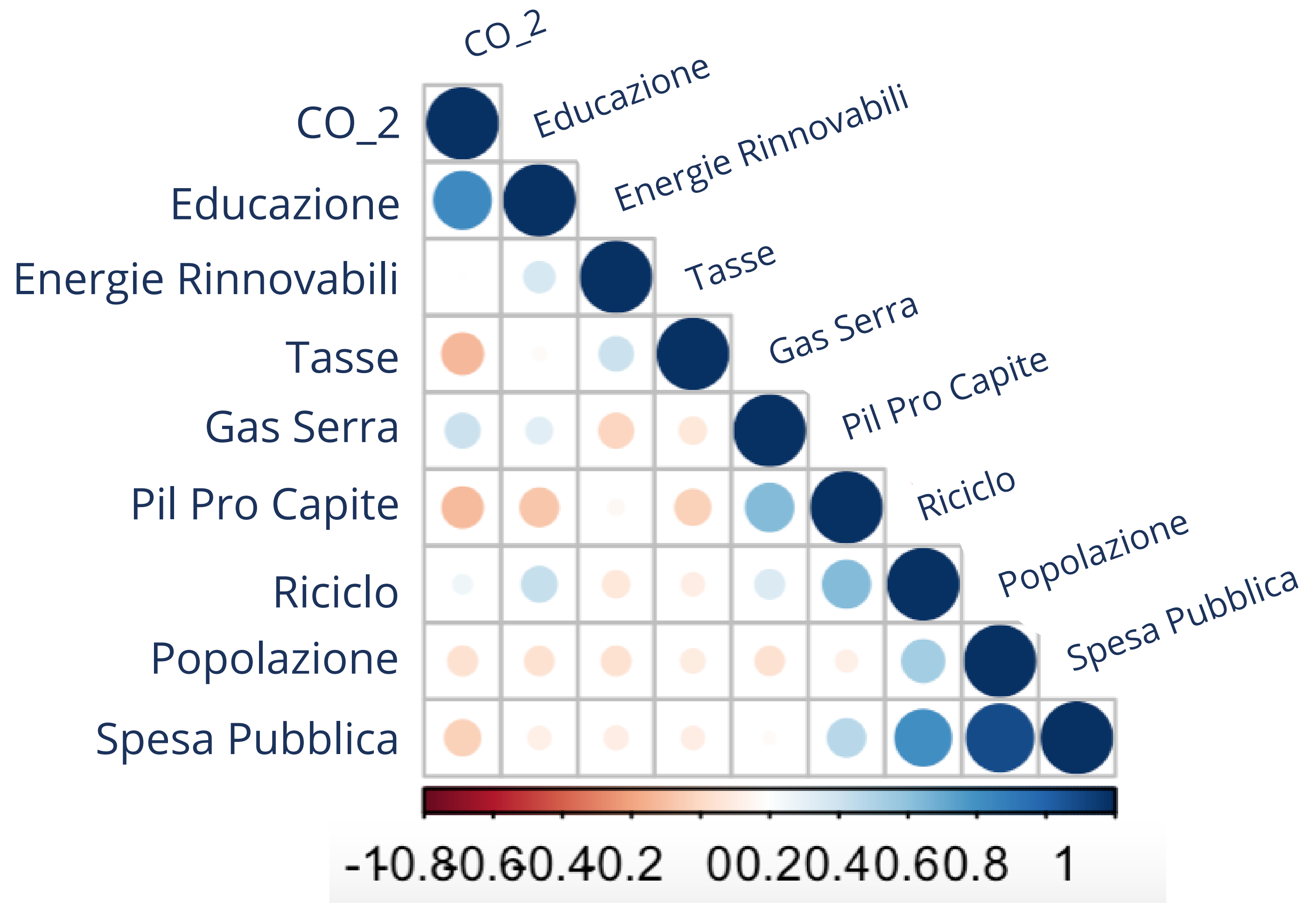


Cross-Tabs

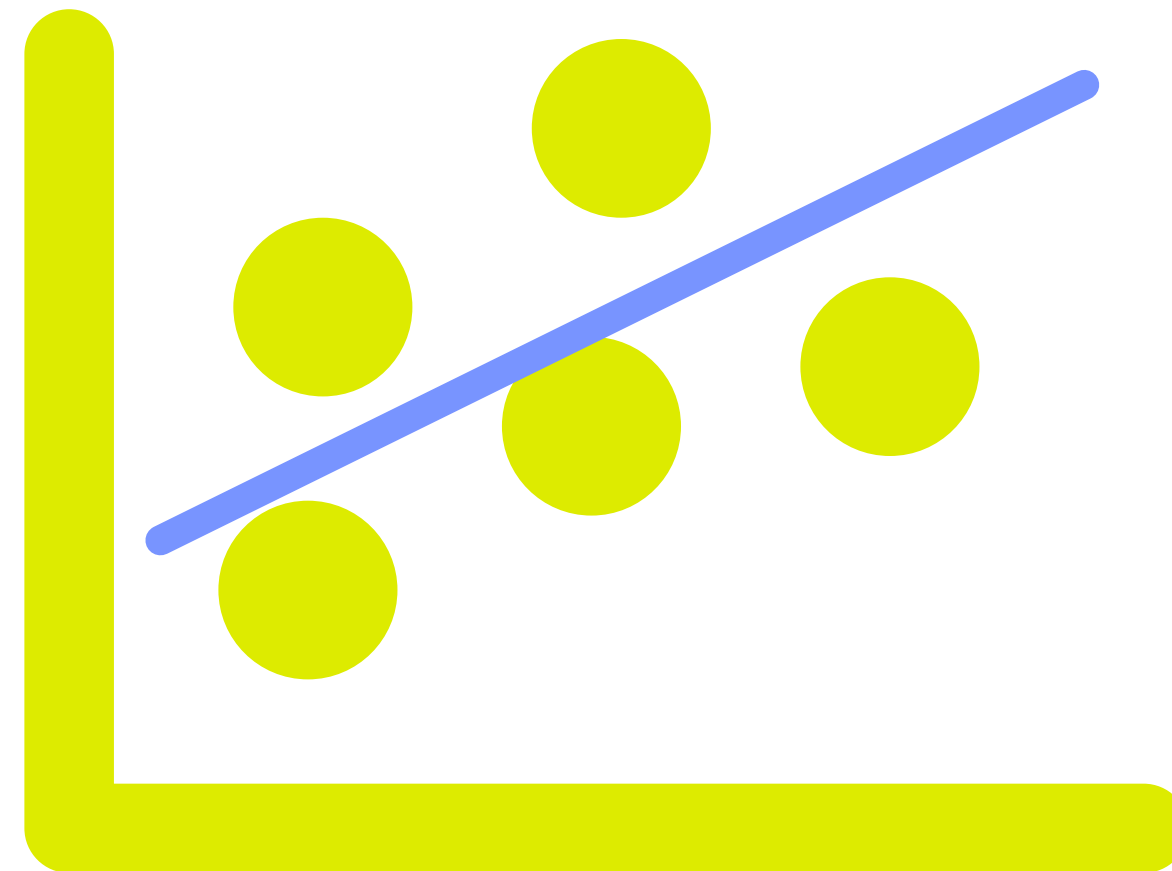
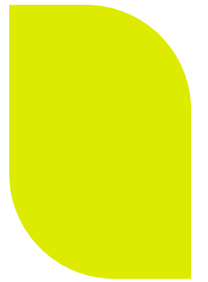


		co2			
educazione		Poco	Medio	Molto	Tantissimo
Basso		3	4	0	0
Medio		3	0	3	1
Alto		1	2	2	2
Molto Alto		0	1	2	4



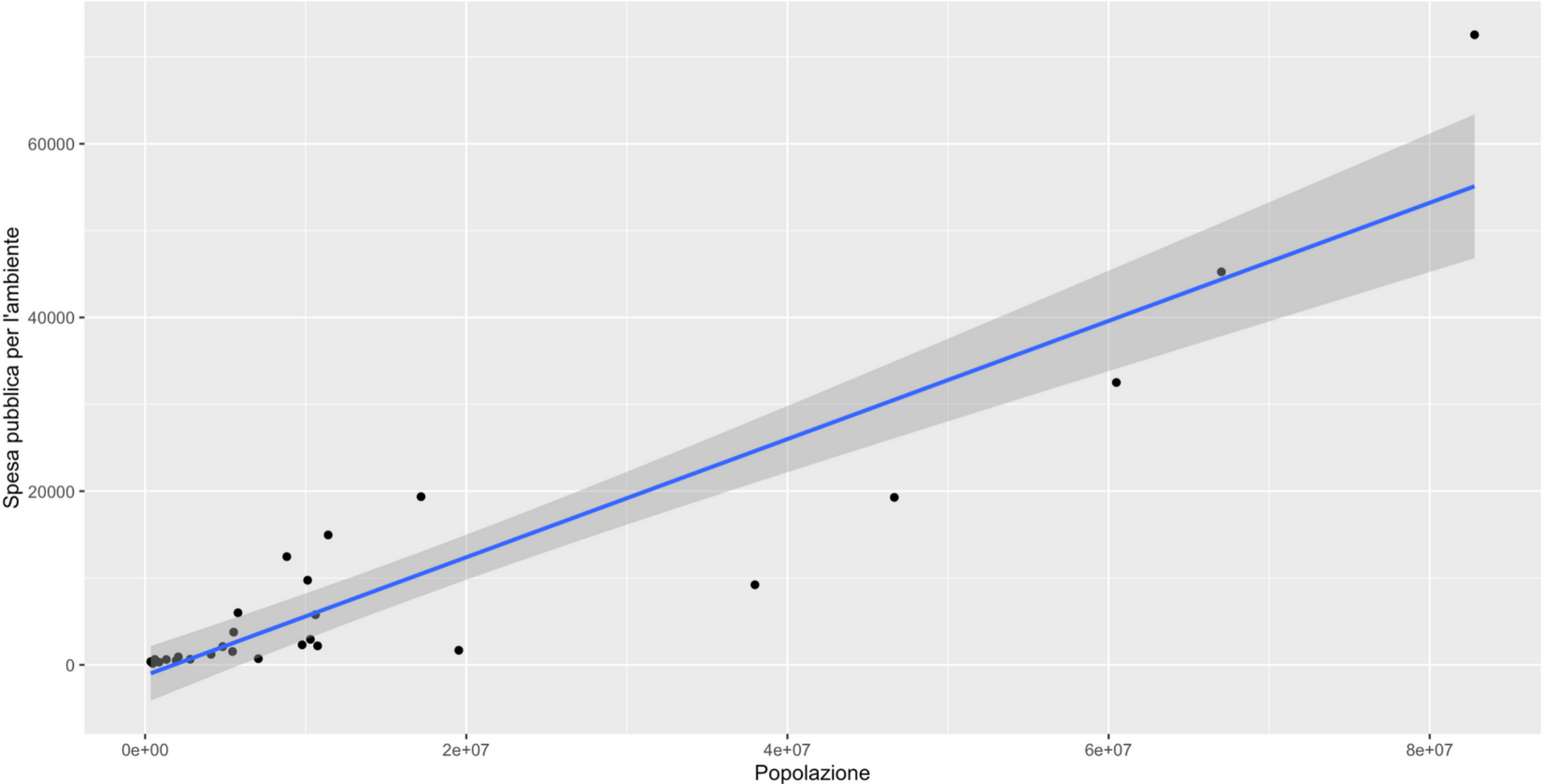
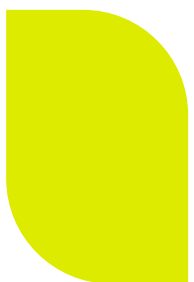


Visualizzazione 2 variabili continue

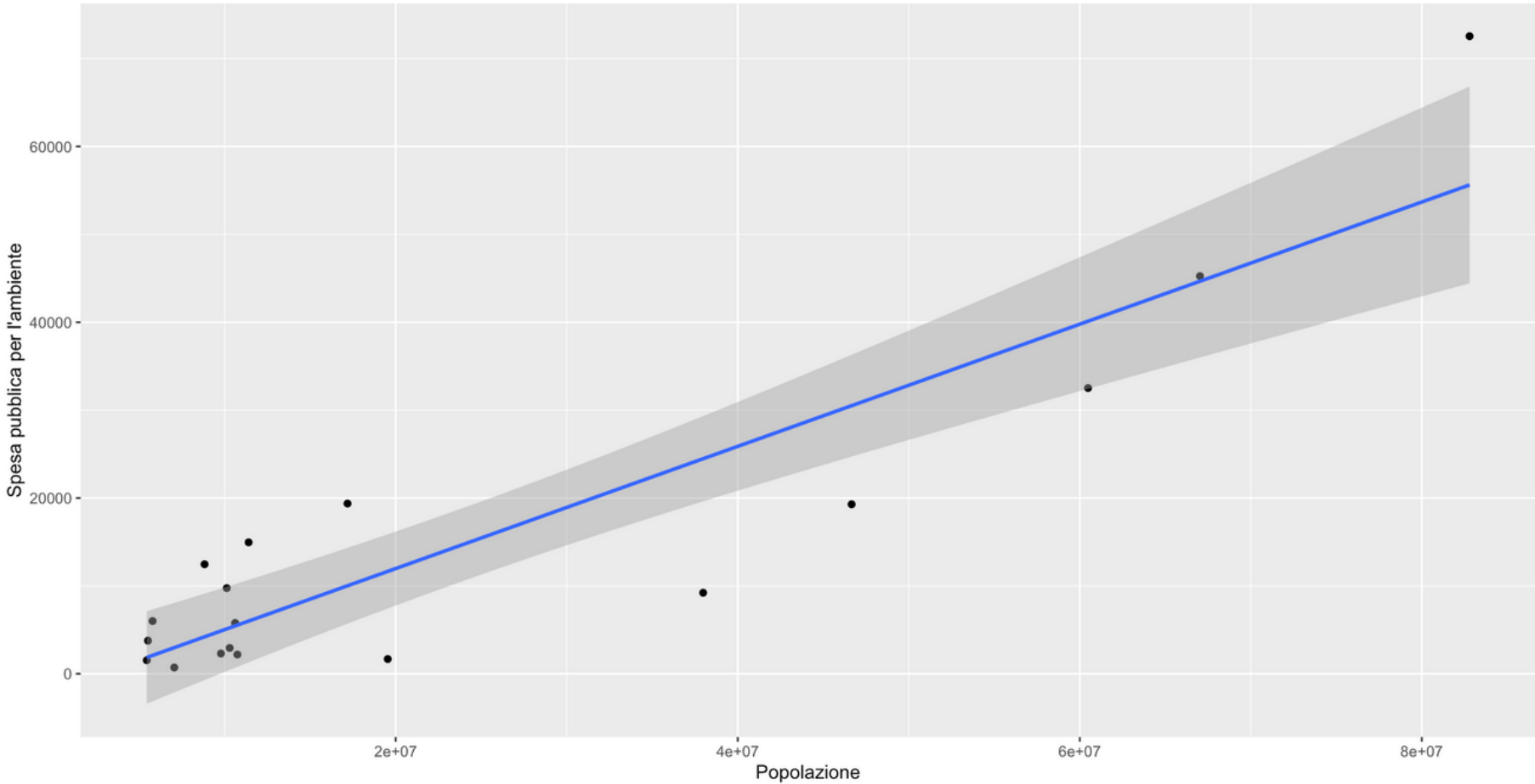
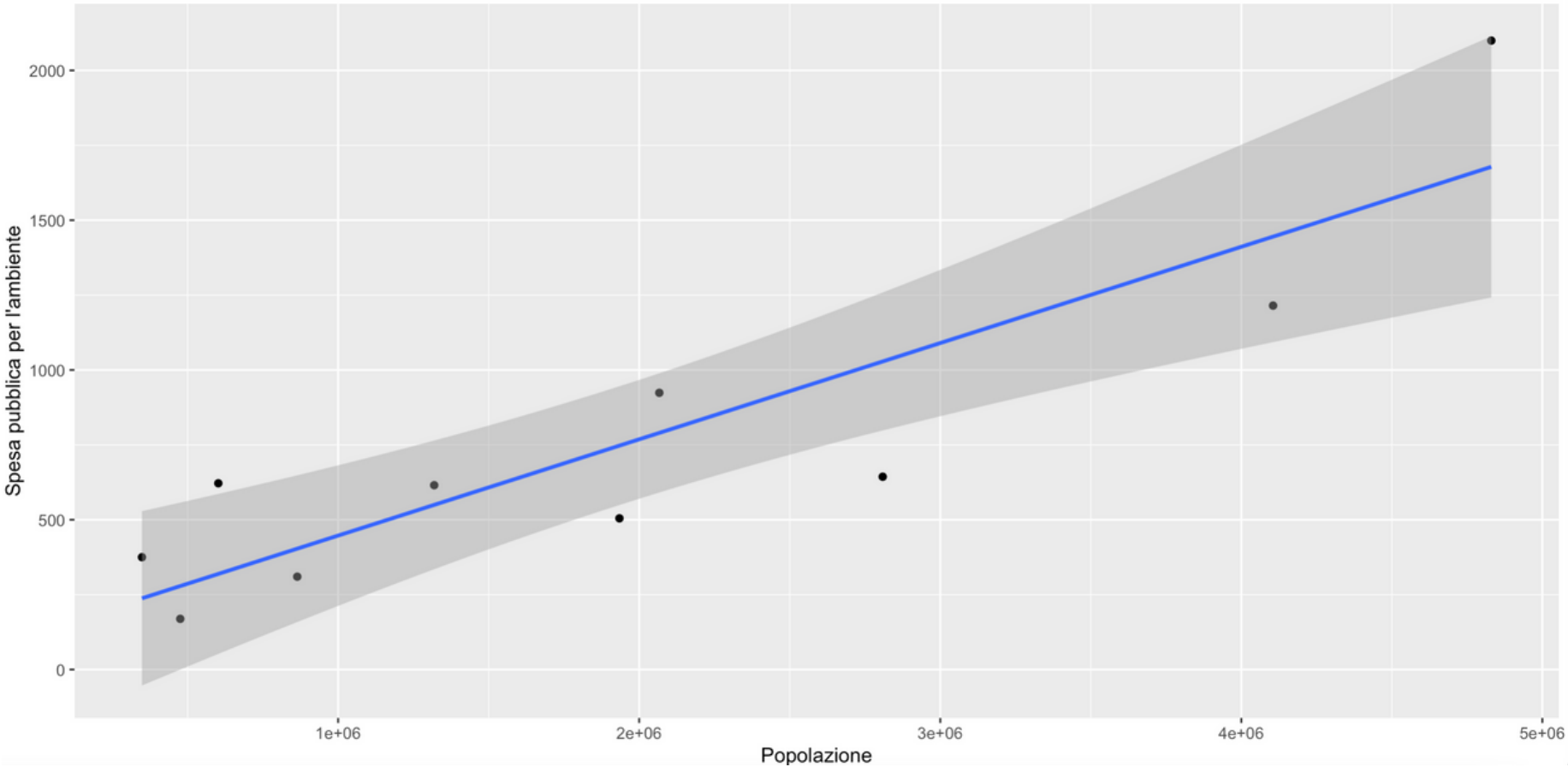
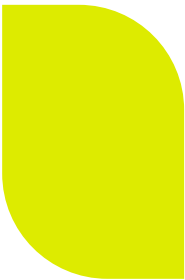


Scatterplot + Retta Interpolante

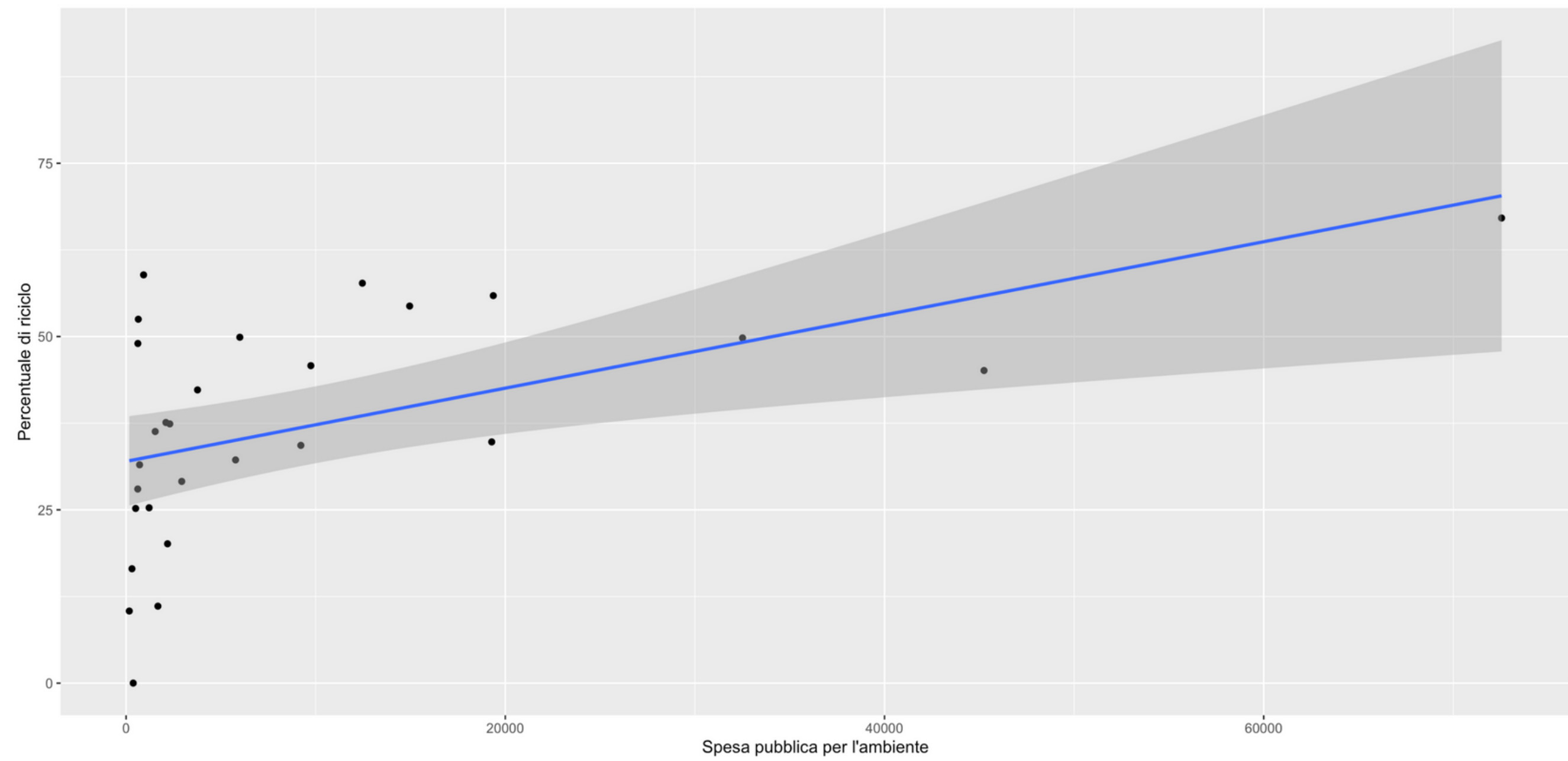
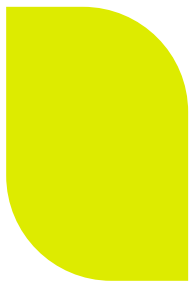
Popolazione e Spesa Pubblica per l'ambiente



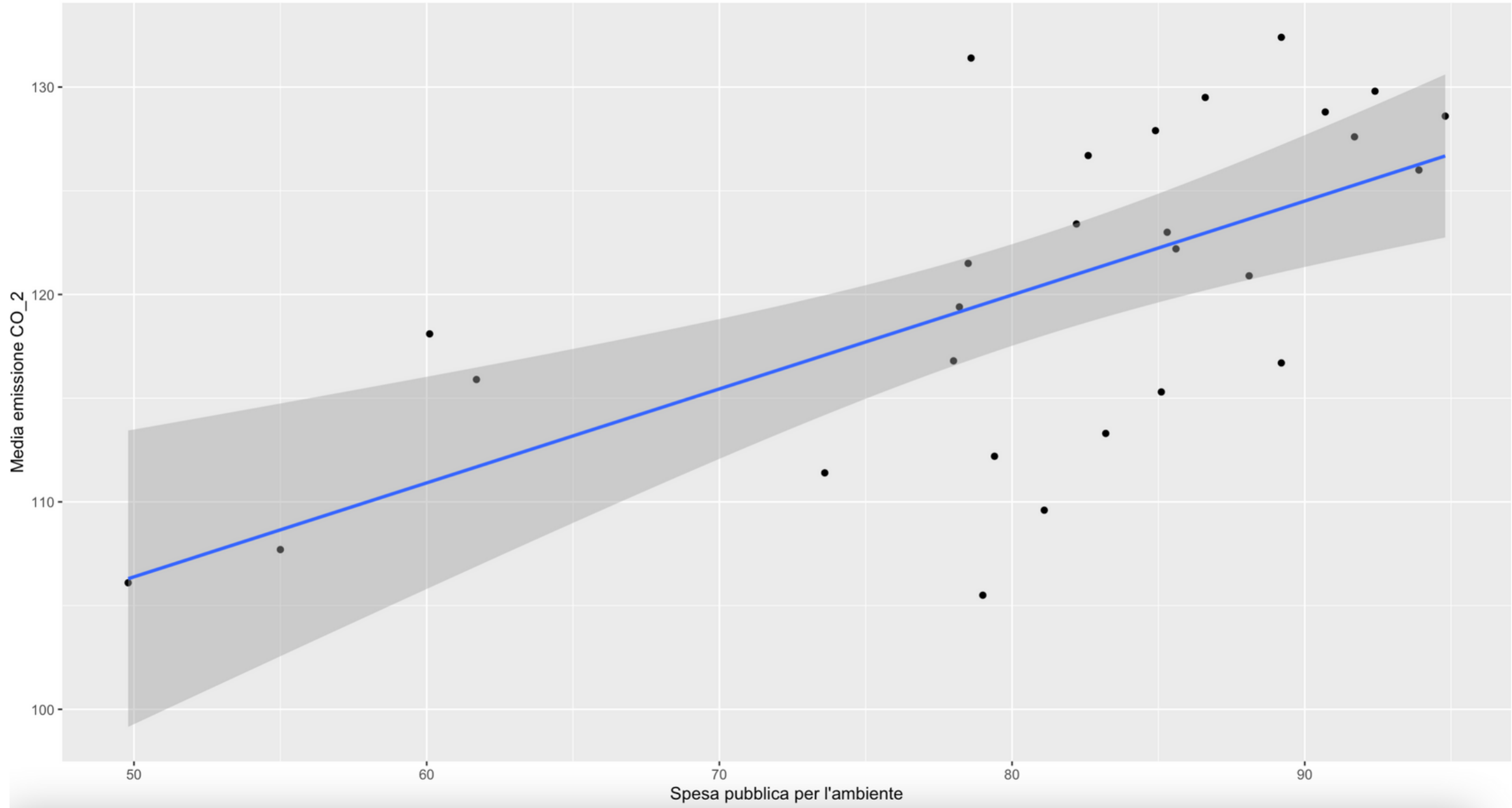
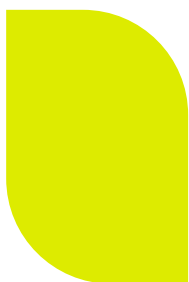
Popolazione e Spesa Pubblica per l'ambiente



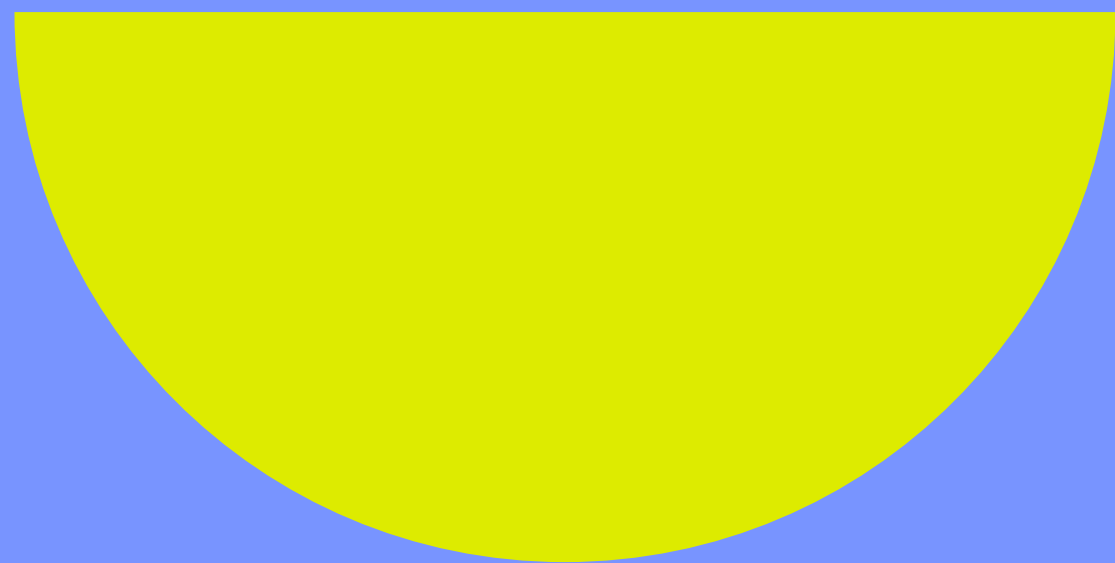
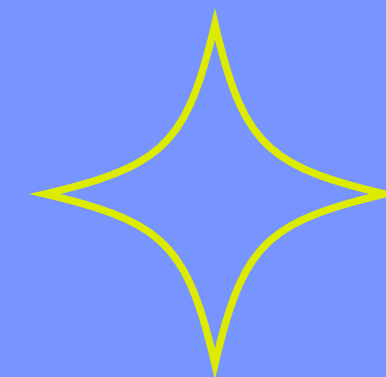
Spesa Pubblica per l'ambiente e Riciclo



Spesa Pubblica per l'ambiente ed emissioni di CO₂



Spero vi siate divertiti



Ci sono domande?