

# H.pylori Rhesus Microbiome Analysis

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## Data used in analysis

### Library

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  library(sjPlot)  
  library(readxl)  
  library(phyloseq)  
  library(microbiome)  
  library(DESeq2)  
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  library(kableExtra)  
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  library(ggpubr)  
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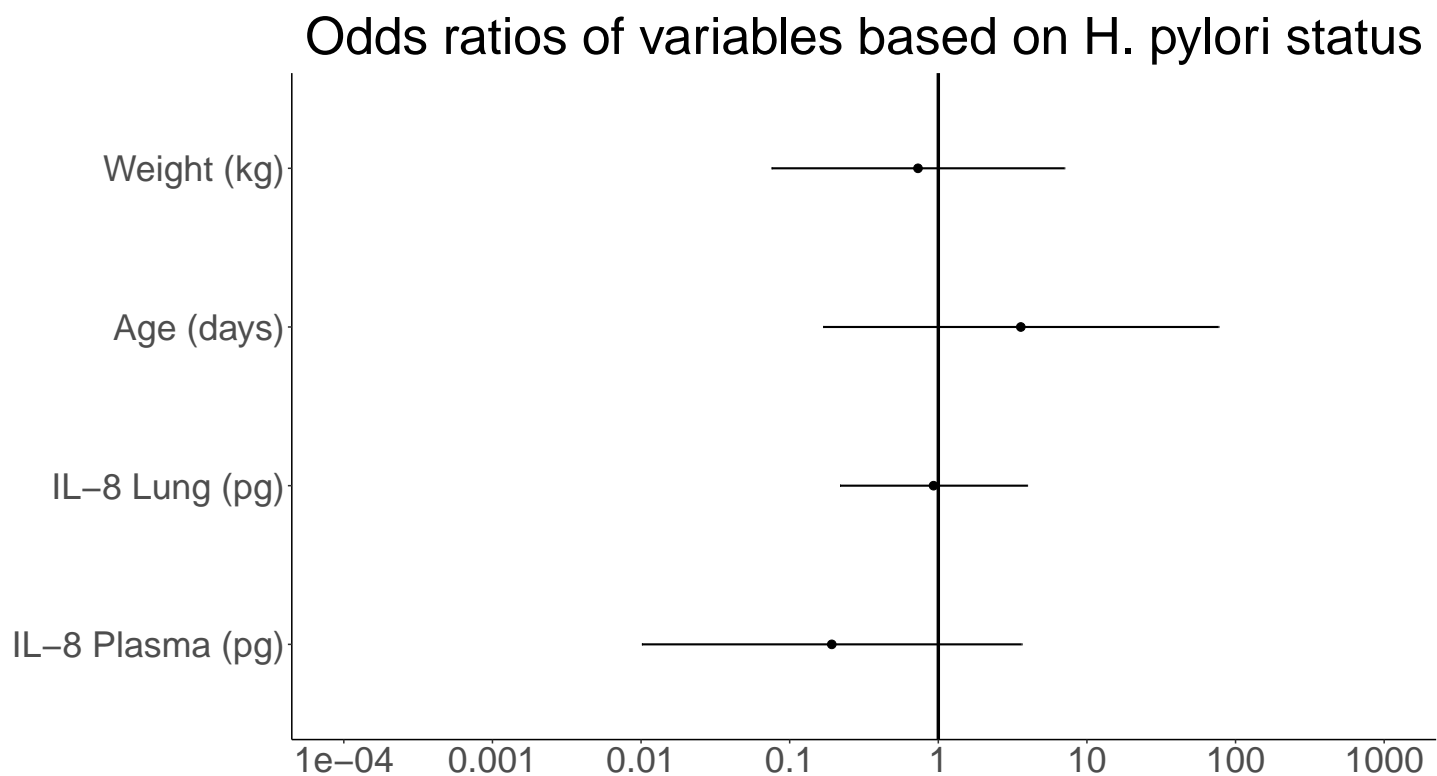
ASV counts the taxa table are linked below:

ASV counts

Taxa table

**Table 1:** H.pylori Metadata

| SampleID           | Treatment    | site | Site_status       | sex    | log10_cfu.gm | IL8_Lavage | IL8_Plasma |
|--------------------|--------------|------|-------------------|--------|--------------|------------|------------|
| LMiller_00458.BAL  | H.pylori_(-) | Lung | H.pylori_(-)_Lung | Female | 0.00         | NA         | 463.376    |
| LMiller_00458.Swab | H.pylori_(-) | Oral | H.pylori_(-)_Oral | Female | 0.00         | NA         | 463.376    |
| LMiller_00459.BAL  | H.pylori_(-) | Lung | H.pylori_(-)_Lung | Female | 0.00         | NA         | 258.416    |
| LMiller_00459.Swab | H.pylori_(-) | Oral | H.pylori_(-)_Oral | Female | 0.00         | NA         | 258.416    |
| LMiller_00461.BAL  | H.pylori_(+) | Lung | H.pylori_(+)_Lung | Female | 7.66         | NA         | 704.550    |
| LMiller_00461.Swab | H.pylori_(+) | Oral | H.pylori_(+)_Oral | Female | 7.66         | NA         | 704.550    |
| LMiller_00462.BAL  | H.pylori_(-) | Lung | H.pylori_(-)_Lung | Female | 0.00         | 19.104     | 1075.626   |
| LMiller_00462.Swab | H.pylori_(-) | Oral | H.pylori_(-)_Oral | Female | 0.00         | 19.104     | 1075.626   |
| LMiller_00463.BAL  | H.pylori_(-) | Lung | H.pylori_(-)_Lung | Female | 0.00         | 11.590     | 423.590    |
| LMiller_00466.BAL  | H.pylori_(+) | Lung | H.pylori_(+)_Lung | Female | 3.81         | 11.201     | 642.148    |
| LMiller_00466.Swab | H.pylori_(+) | Oral | H.pylori_(+)_Oral | Female | 3.81         | 11.201     | 642.148    |
| LMiller_00467.BAL  | H.pylori_(+) | Lung | H.pylori_(+)_Lung | Female | 6.09         | 15.511     | 425.782    |
| LMiller_00467.Swab | H.pylori_(+) | Oral | H.pylori_(+)_Oral | Female | 6.09         | 15.511     | 425.782    |
| LMiller_00468.BAL  | H.pylori_(-) | Lung | H.pylori_(-)_Lung | Female | 0.00         | 15.511     | 660.911    |
| LMiller_00468.Swab | H.pylori_(-) | Oral | H.pylori_(-)_Oral | Female | 0.00         | 15.511     | 660.911    |
| LMiller_00469.BAL  | H.pylori_(+) | Lung | H.pylori_(+)_Lung | Female | 6.38         | NA         | 1279.789   |
| LMiller_00469.Swab | H.pylori_(+) | Oral | H.pylori_(+)_Oral | Female | 6.38         | NA         | 1279.789   |
| LMiller_00473.BAL  | H.pylori_(-) | Lung | H.pylori_(-)_Lung | Female | 0.00         | 20.100     | 608.508    |
| LMiller_00473.Swab | H.pylori_(-) | Oral | H.pylori_(-)_Oral | Female | 0.00         | 20.100     | 608.508    |
| LMiller_00474.BAL  | H.pylori_(-) | Lung | H.pylori_(-)_Lung | Female | 0.00         | 44.699     | 443.989    |
| LMiller_00476.BAL  | H.pylori_(+) | Lung | H.pylori_(+)_Lung | Female | 5.48         | NA         | 476.431    |
| LMiller_00476.Swab | H.pylori_(+) | Oral | H.pylori_(+)_Oral | Female | 5.48         | NA         | 476.431    |
| LMiller_00477.BAL  | H.pylori_(+) | Lung | H.pylori_(+)_Lung | Female | 5.81         | NA         | 715.056    |
| LMiller_00477.Swab | H.pylori_(+) | Oral | H.pylori_(+)_Oral | Female | 5.81         | NA         | 715.056    |
| LMiller_00481.BAL  | H.pylori_(-) | Lung | H.pylori_(-)_Lung | Female | 0.00         | 17.622     | NA         |
| LMiller_00481.Swab | H.pylori_(-) | Oral | H.pylori_(-)_Oral | Female | 0.00         | 17.622     | NA         |



|                    | OR    | 2.5 % | 97.5 %   | p     |
|--------------------|-------|-------|----------|-------|
| (Intercept)        | 0.018 | 0.000 | 110.146  | 0.410 |
| ‘Weight (kg)’      | 0.243 | 0.000 | 7254.525 | 0.786 |
| ‘Age (days)’       | 1.042 | 0.955 | 1.177    | 0.413 |
| ‘IL-8 Lung (pg)’   | 0.993 | 0.852 | 1.158    | 0.921 |
| ‘IL-8 Plasma (pg)’ | 0.996 | 0.985 | 1.001    | 0.271 |

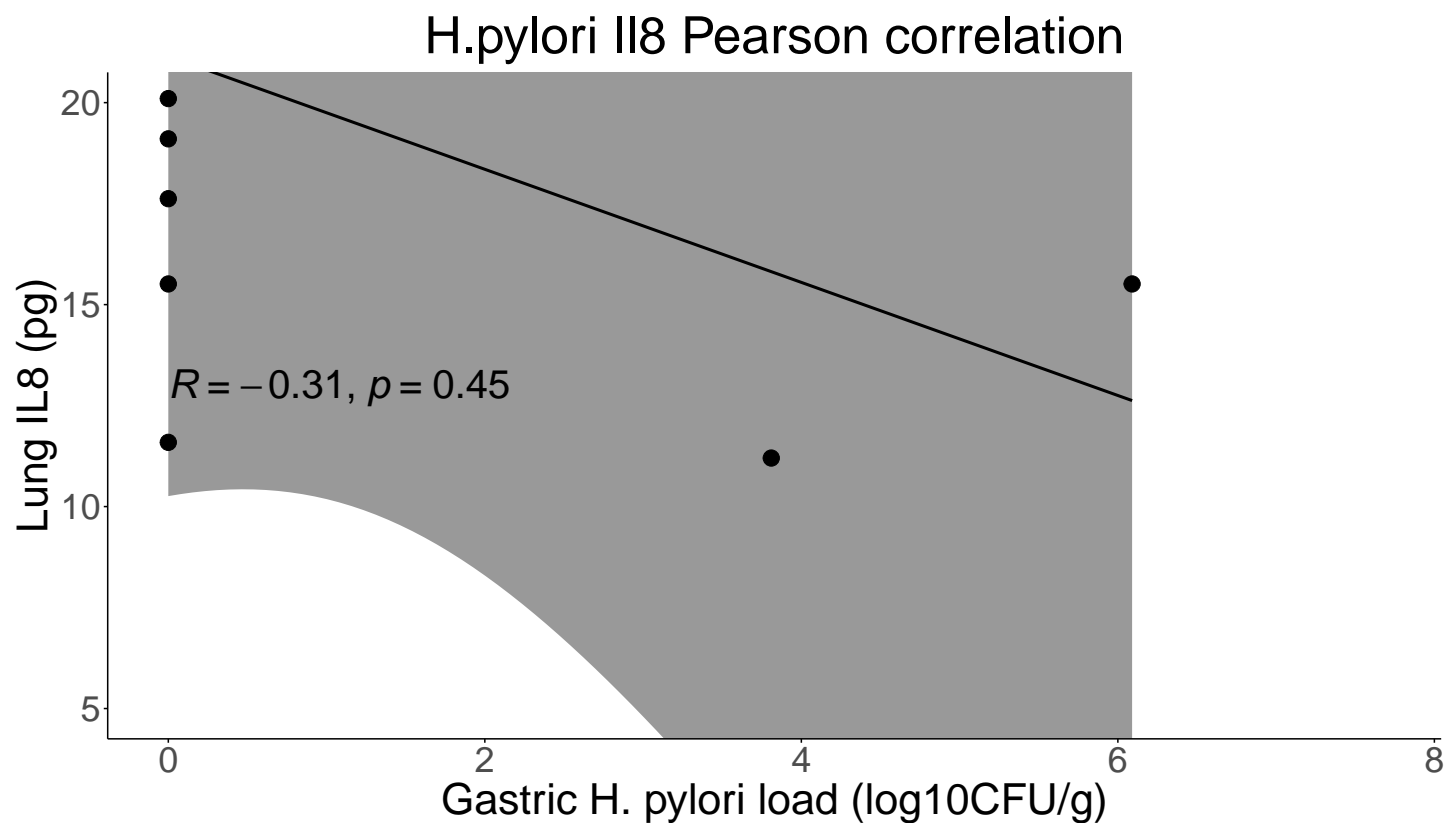


Figure 1: This plot only includes animals that had material sequenced and not all 25 animals from the study

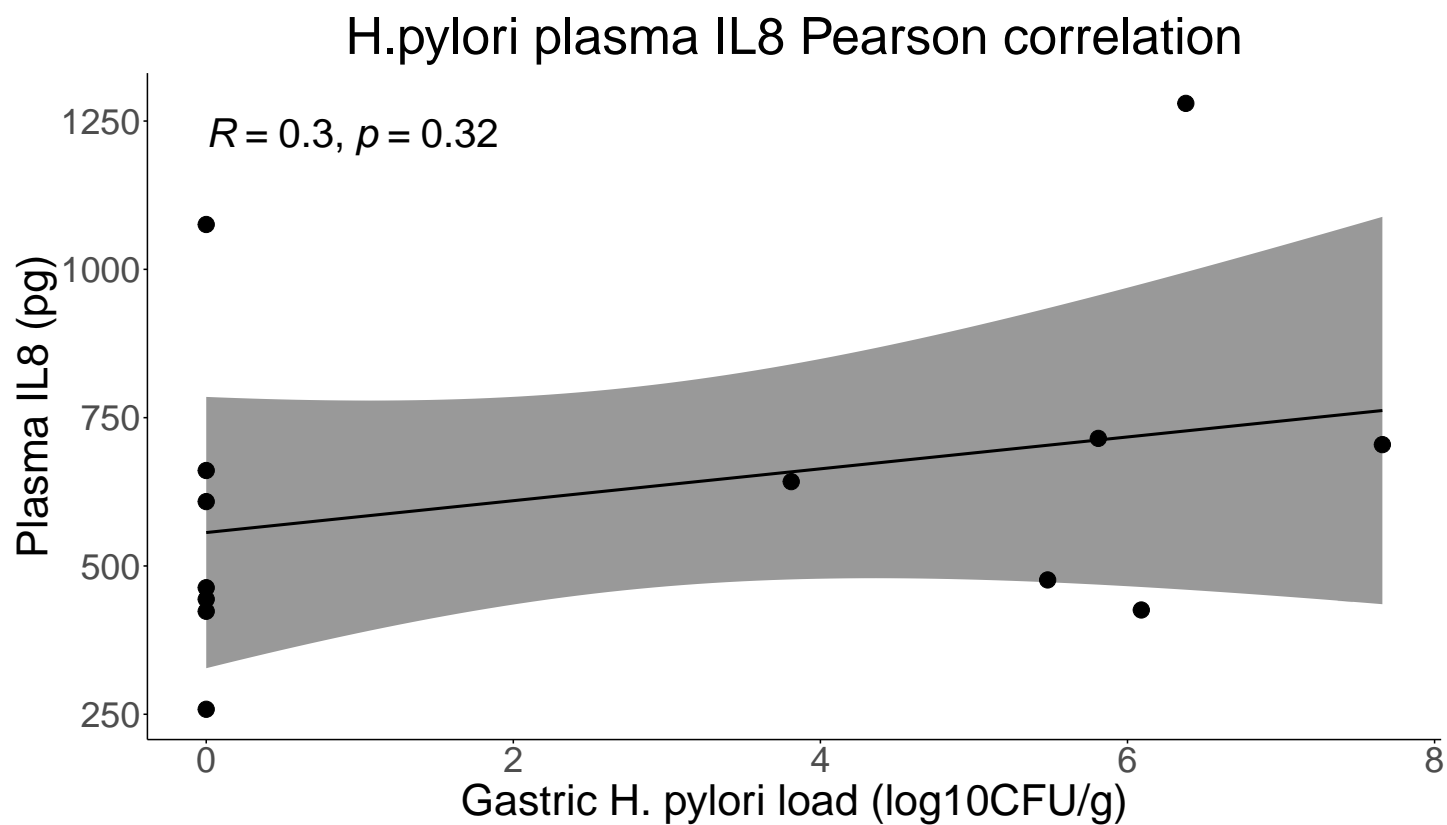
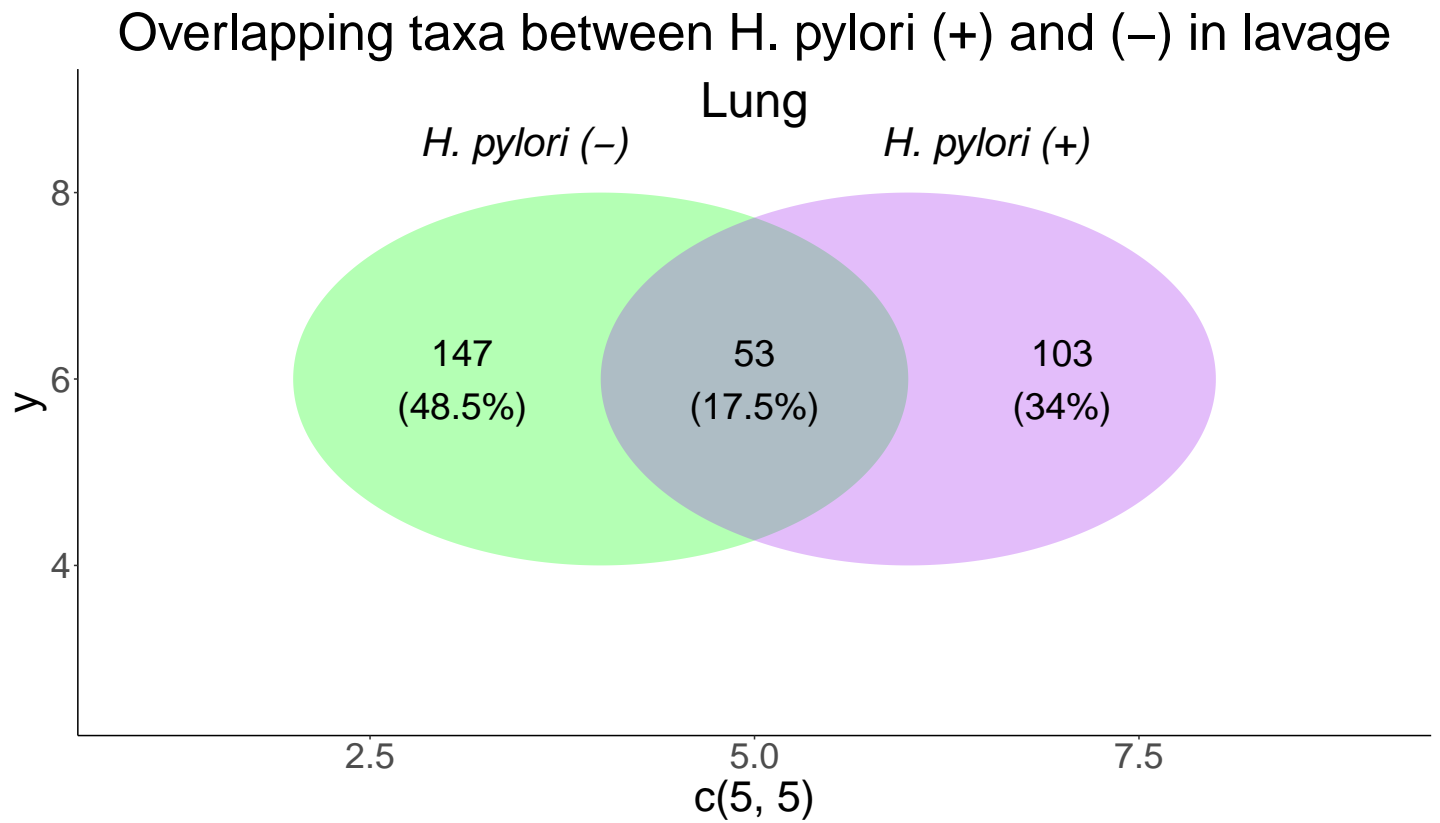


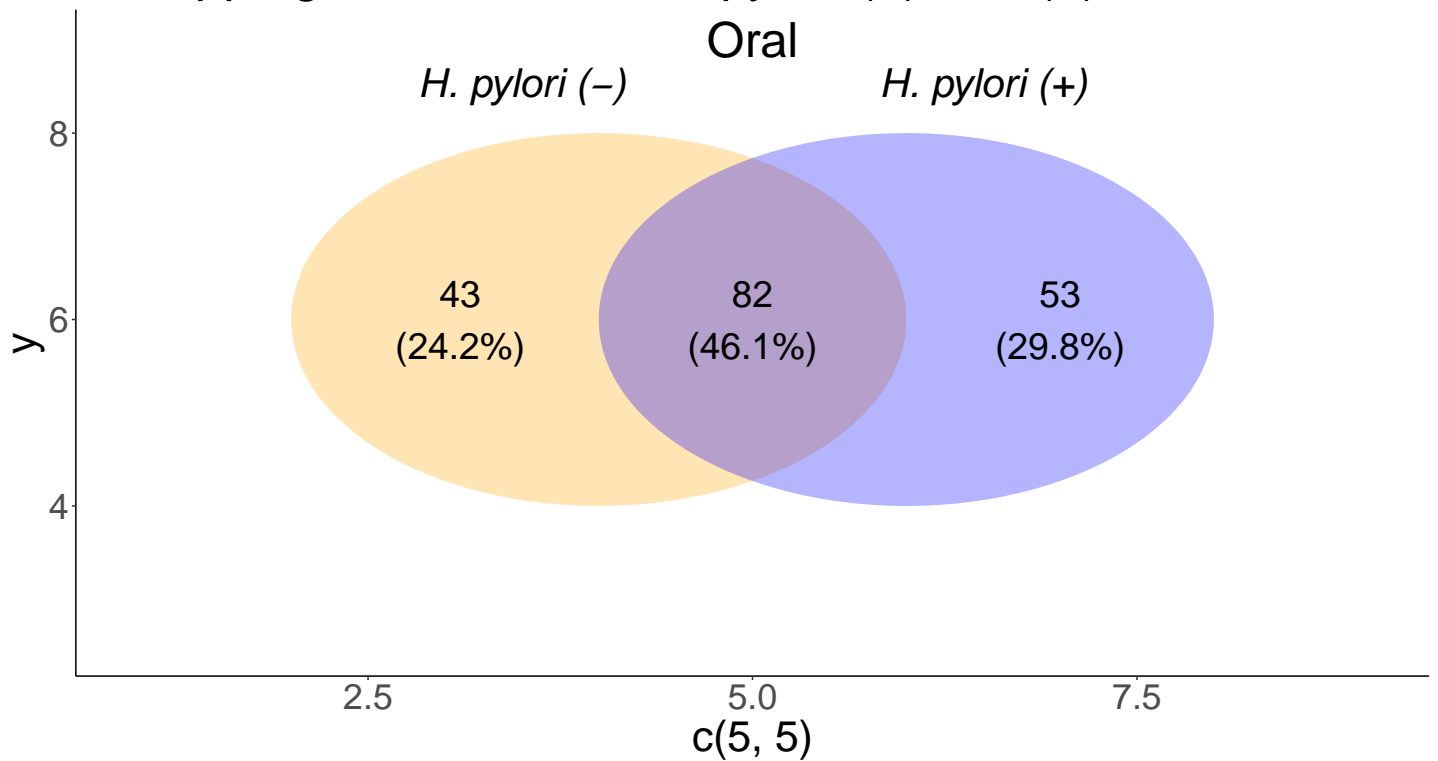
Figure 2: This plot only includes animals that had material sequenced and not all 25 animals from the study

## Overlapping Taxa Between Sites and *H. pylori* Status

Lavage overlapping taxa

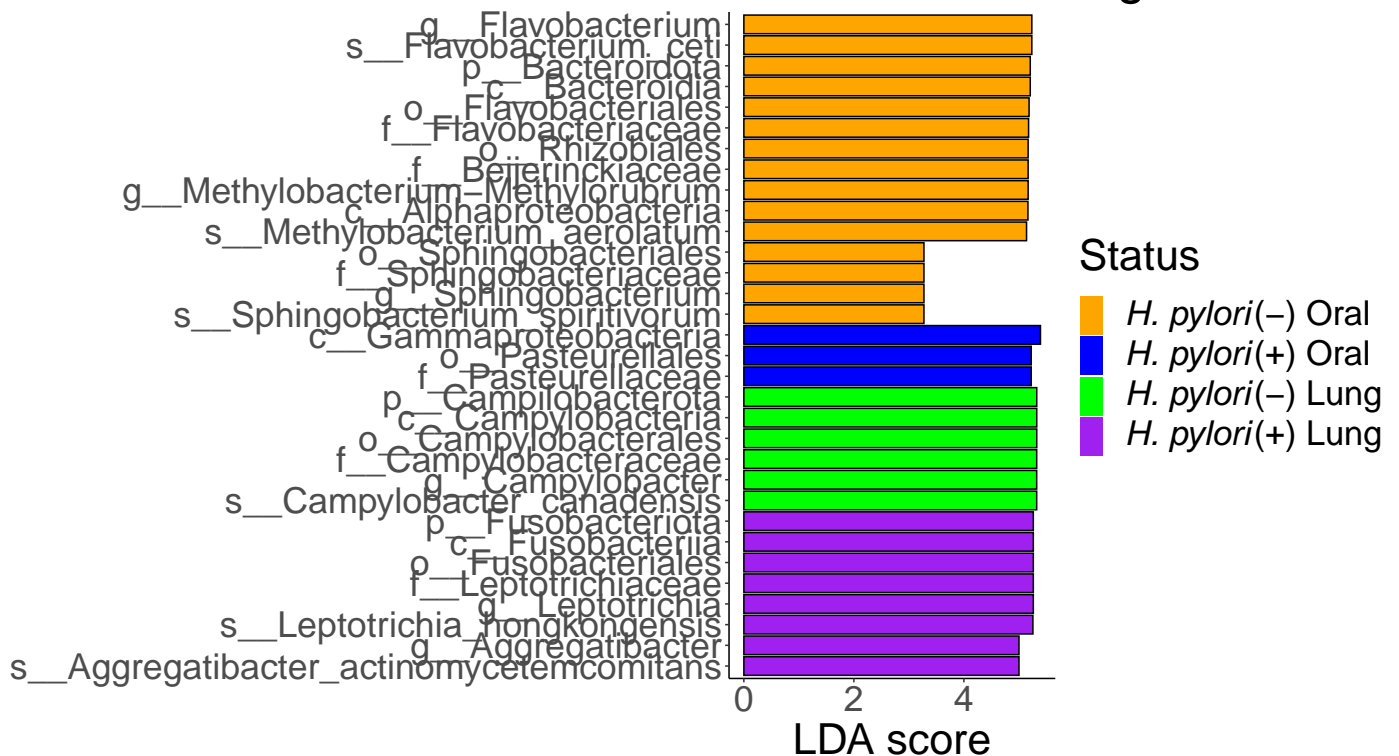


## Overlapping taxa between *H. pylori* (+) and (-) in buccal cavity

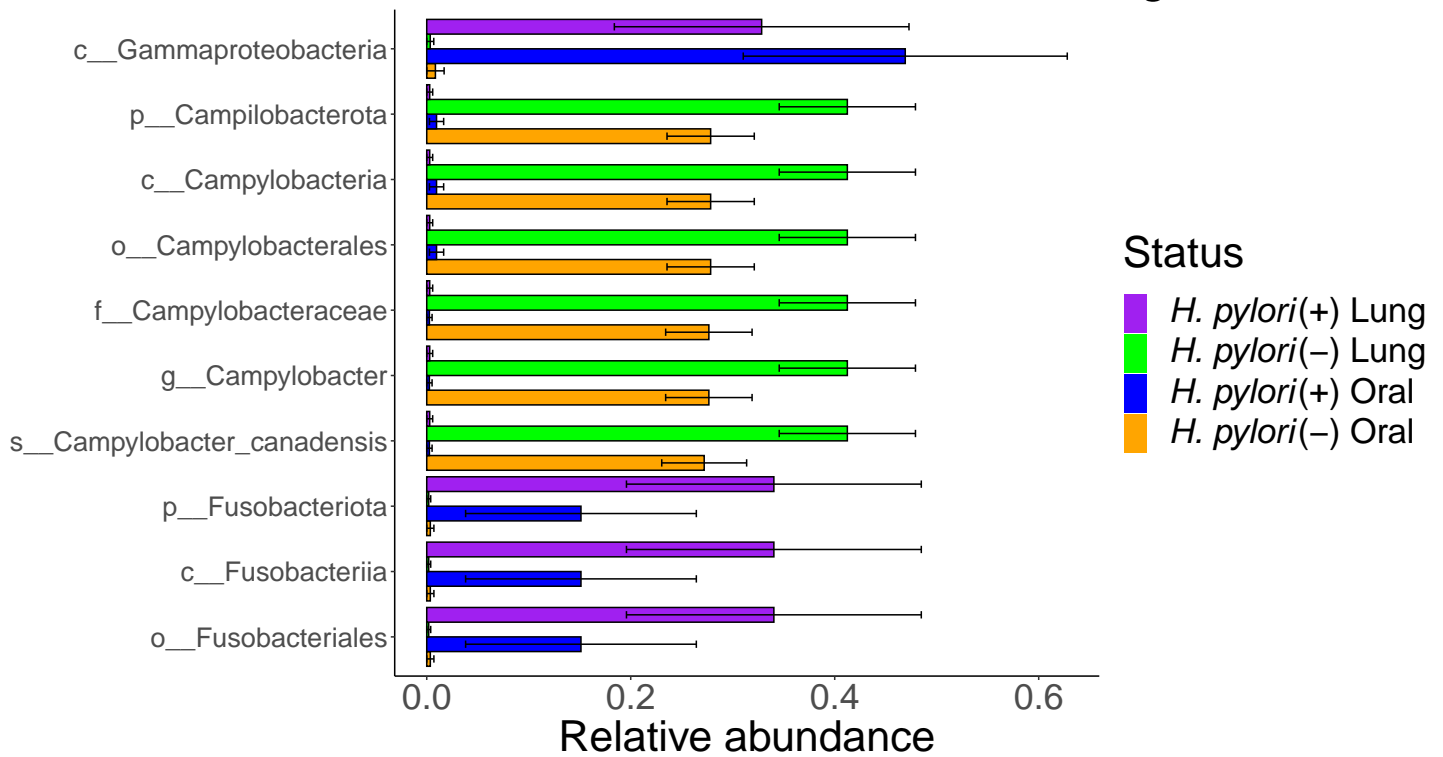


## Lefse analysis and differential abundance for both sites

## Lefse taxa from bronchoalveolar lavage and oral s

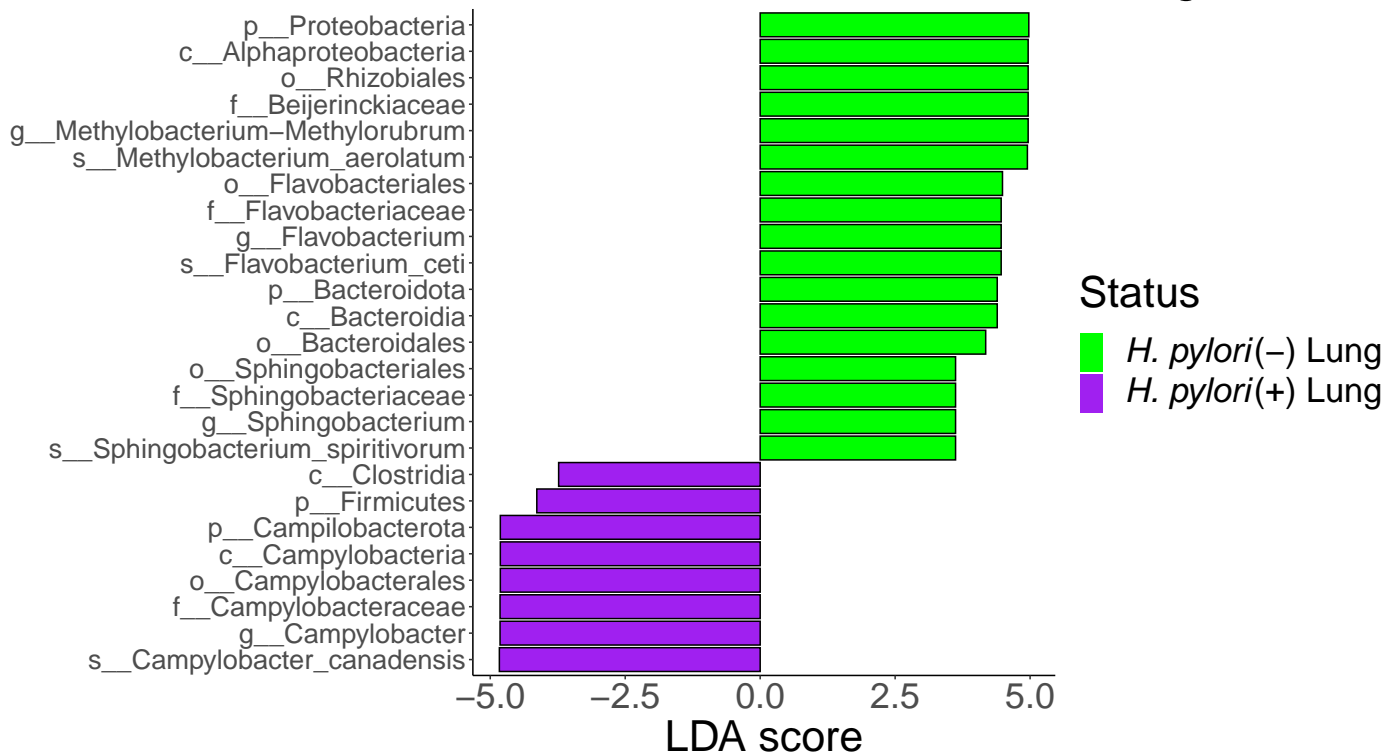


False relative abundance from bronchoalveolar lavage and oral samples

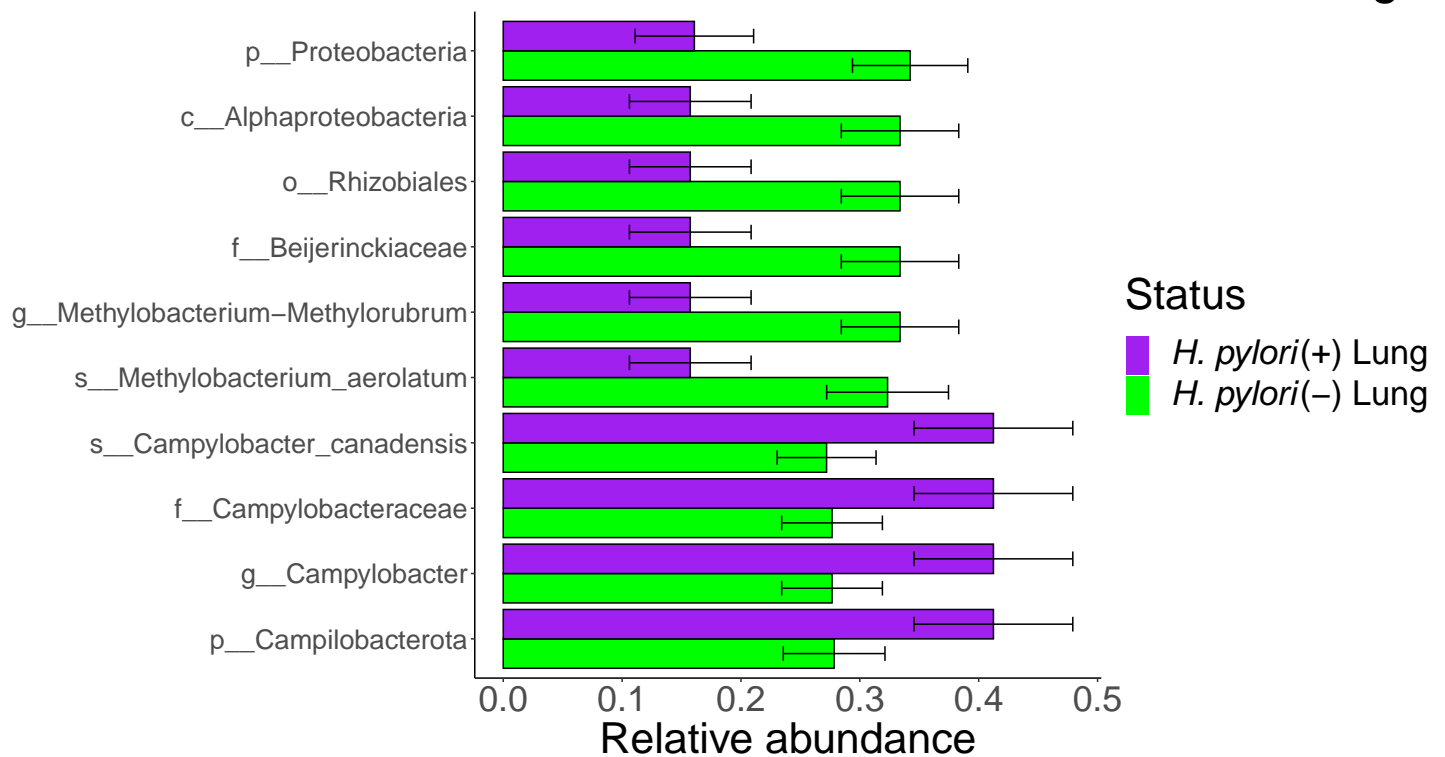


Lefse and differential abundance for bronchoalveolar lavage

## Lefse Taxa from Bronchoalveolar Lavage

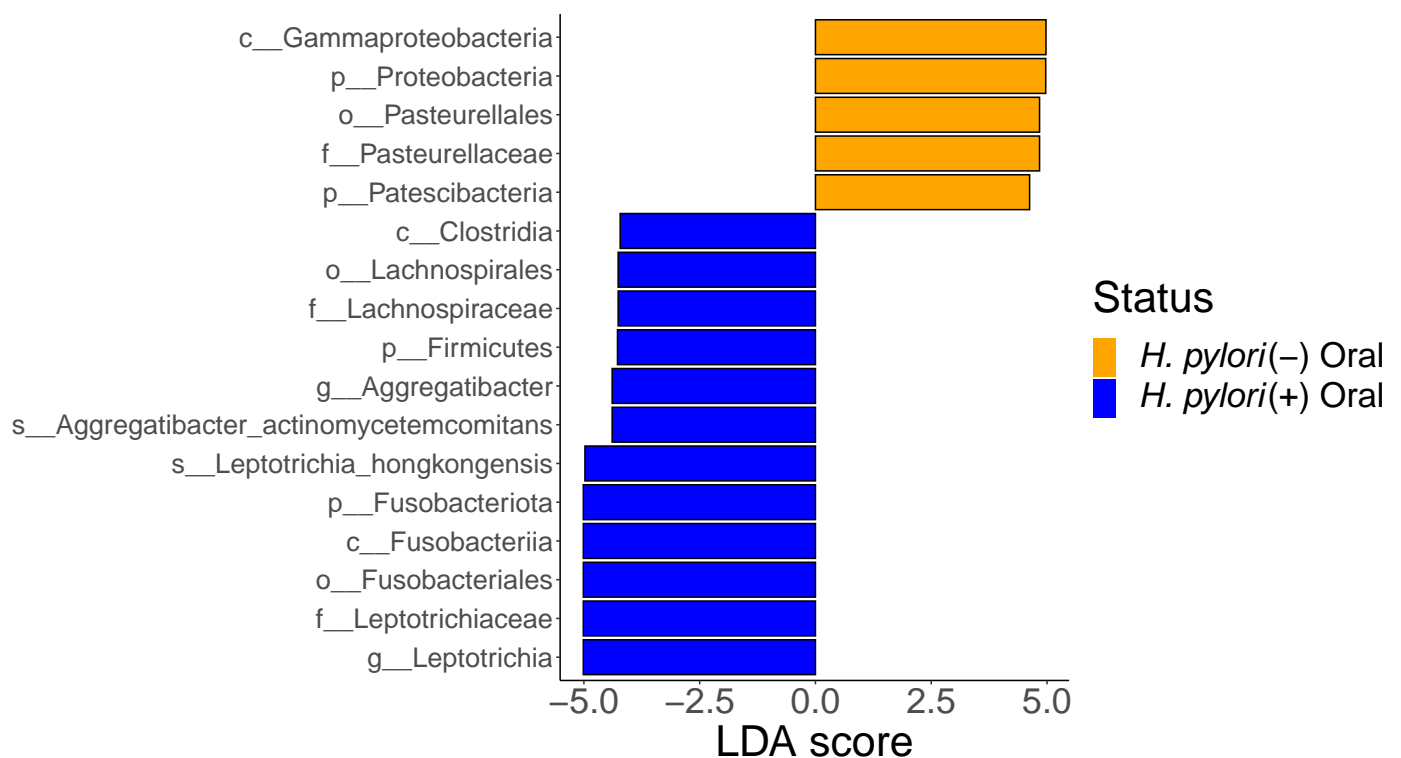


## Lefse Relative Abundance from Bronchoalveolar Lavage



## Lefse and differential abundance for oral swabs

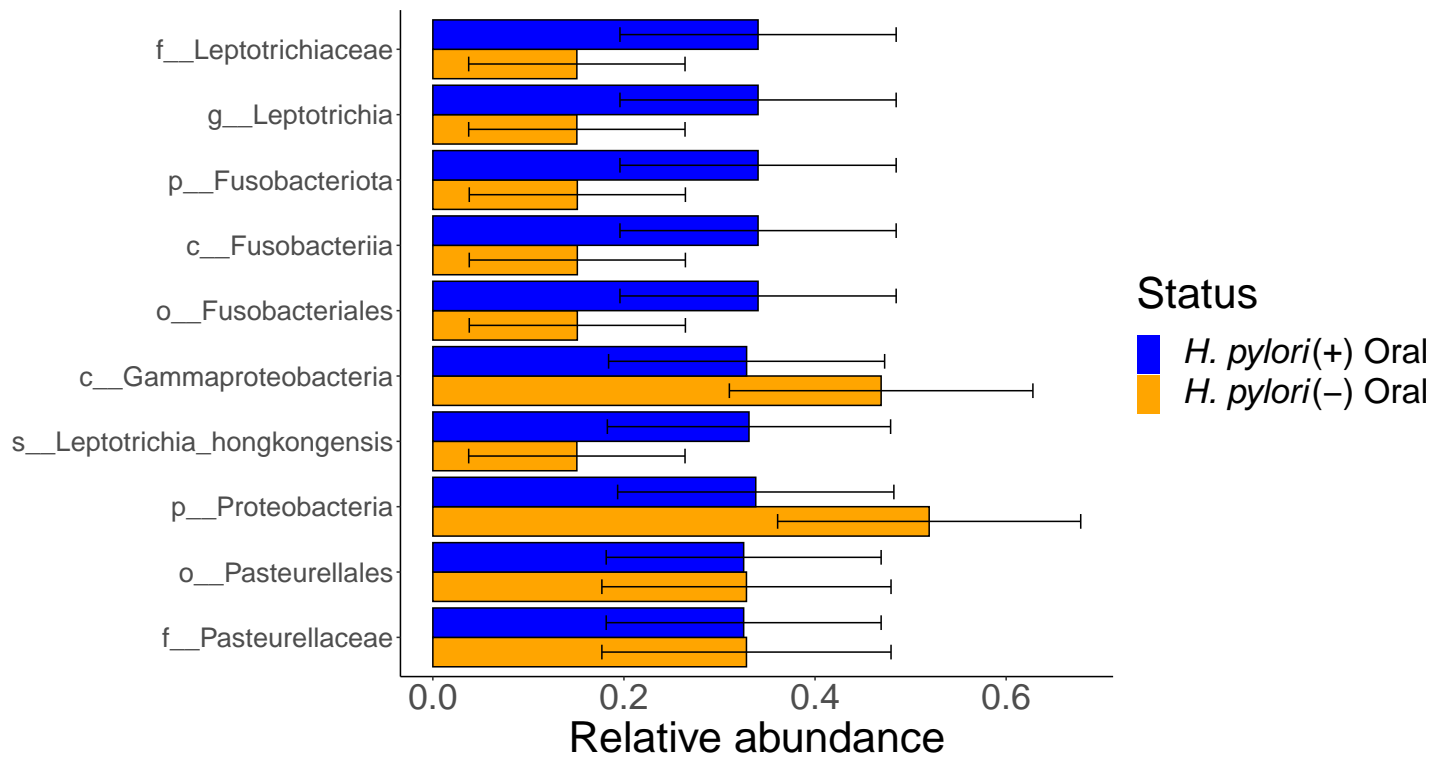
### Lefse taxa from oral swabs





## Relative abundance of differential taxa

### Lefse relative abundance from oral swabs

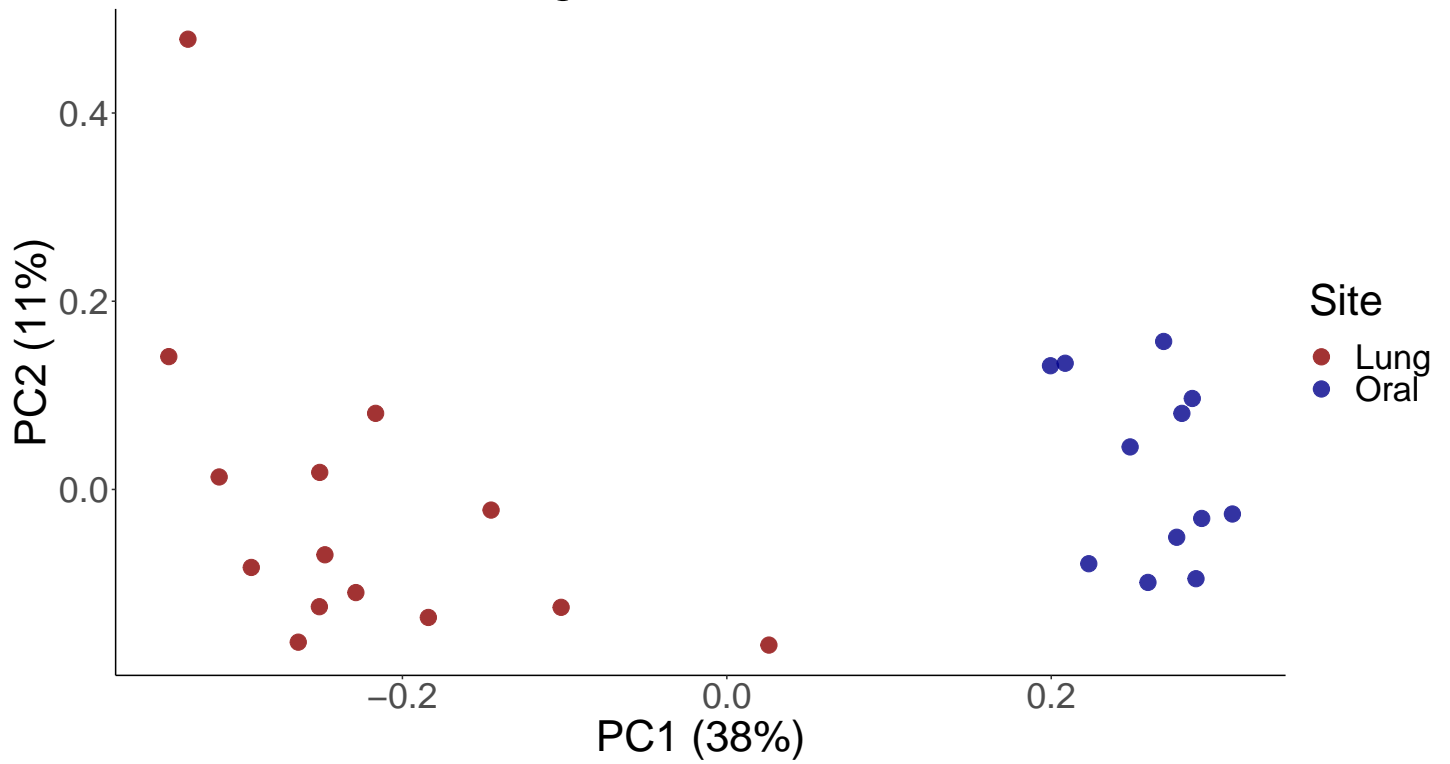


## Beta diversity

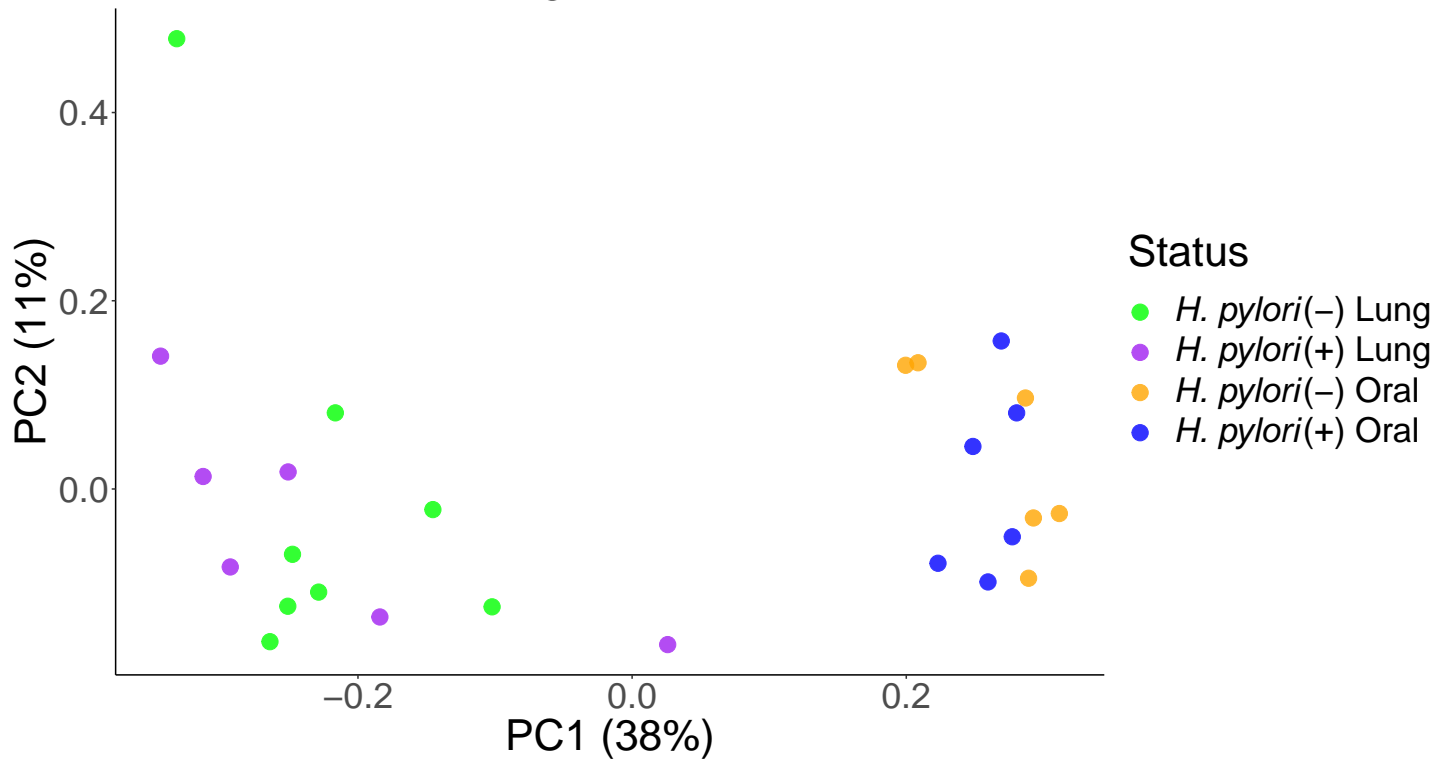
### Unweighted unifracs PCoA plots

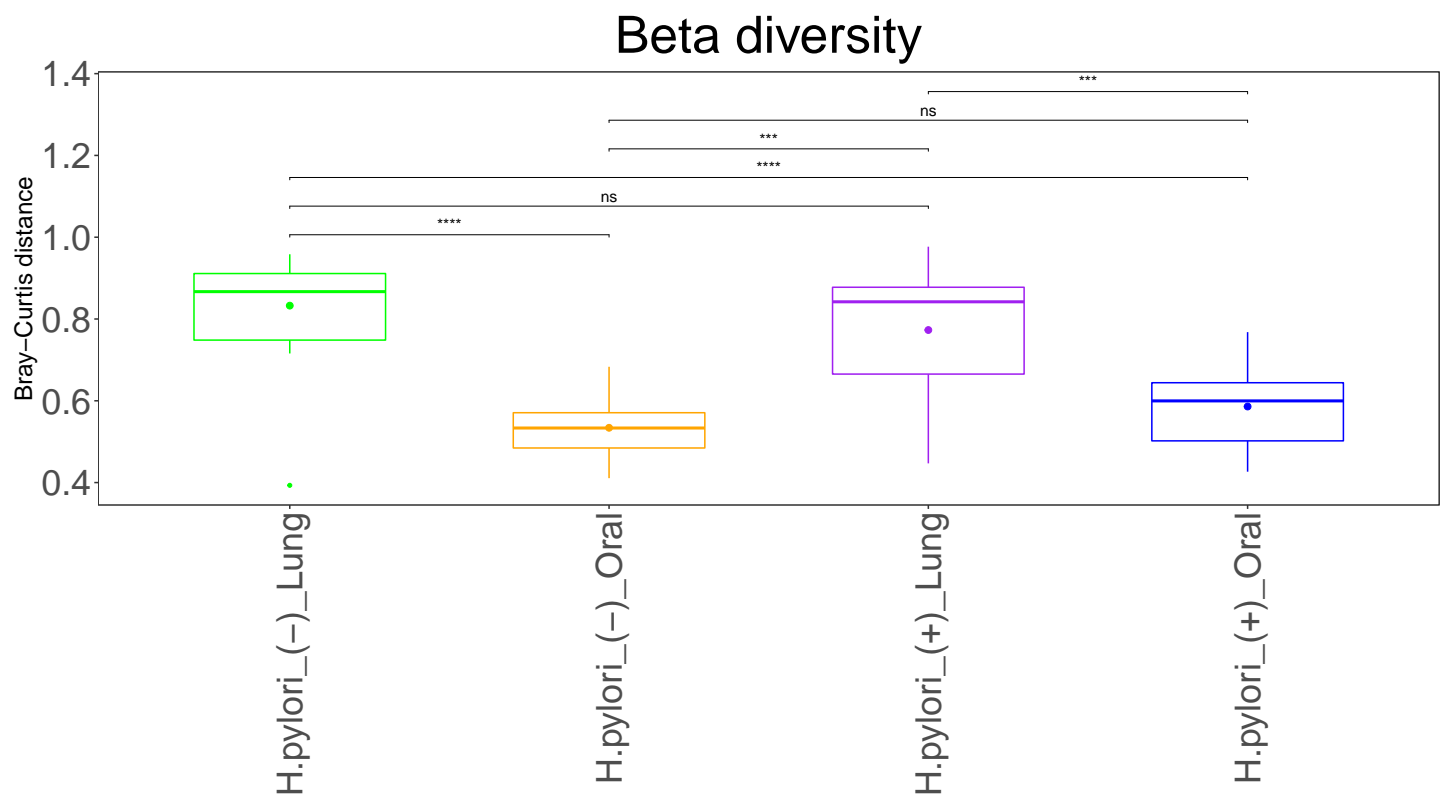
| ##   | PC1         | PC2         | PC3         | PC4         | PC5         | PC6         | PC7        |
|------|-------------|-------------|-------------|-------------|-------------|-------------|------------|
| ## 1 | 0.38311     | 0.1122317   | 0.08255574  | 0.05624649  | 0.04518453  | 0.04178459  | 0.03697168 |
| ##   | PC8         | PC9         | PC10        | PC11        | PC12        | PC13        | PC14       |
| ## 1 | 0.03441675  | 0.0305229   | 0.0292508   | 0.02395872  | 0.0227312   | 0.01881898  | 0.01538496 |
| ##   | PC15        | PC16        | PC17        | PC18        | PC19        | PC20        |            |
| ## 1 | 0.0140825   | 0.01226748  | 0.01155323  | 0.008776171 | 0.007488221 | 0.004824027 |            |
| ##   | PC21        | PC22        | PC23        | PC24        | PC25        | PC26        |            |
| ## 1 | 0.003528799 | 0.002630896 | 0.001679594 | 0           | 0           | 0           |            |

Unweighted unifrac PCoA

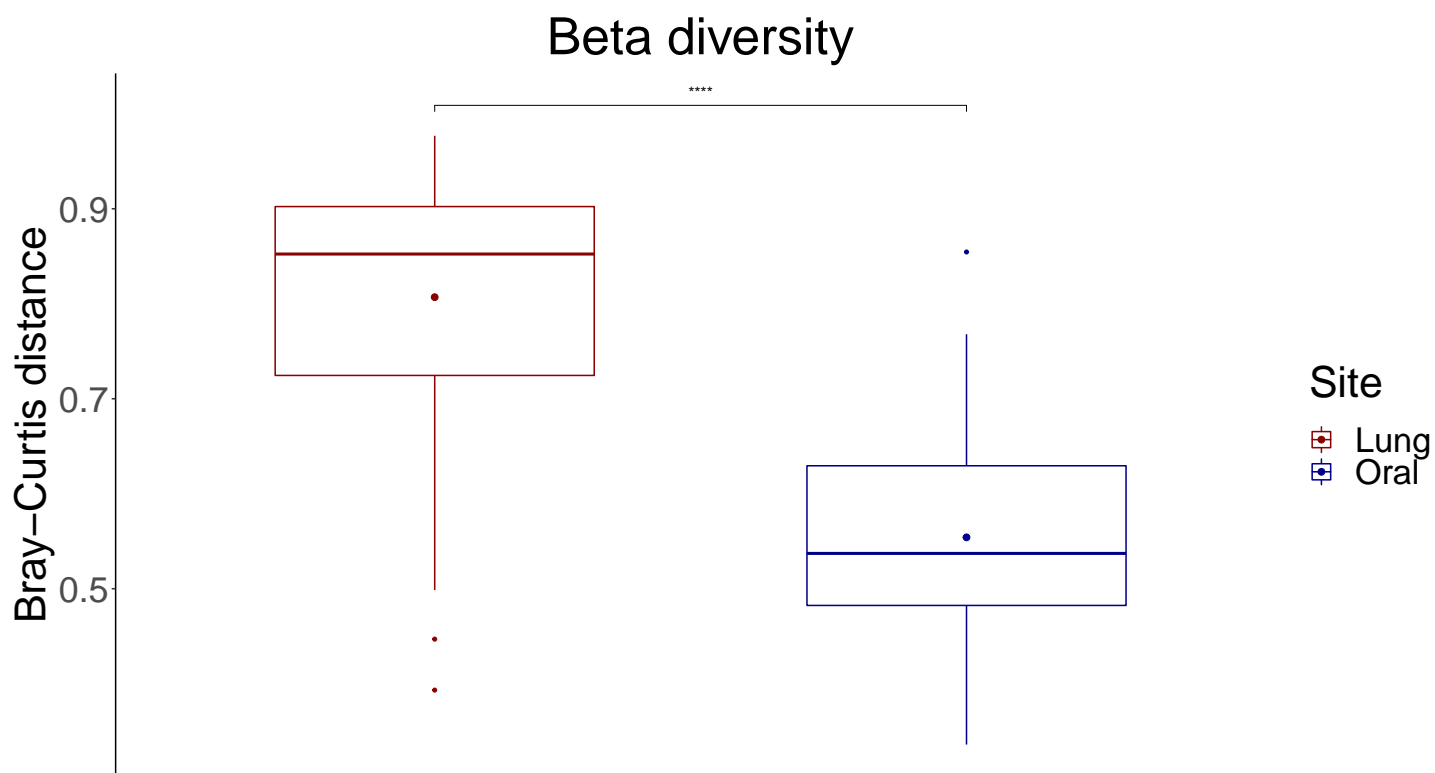


Status Unweighted unifrac PCoA



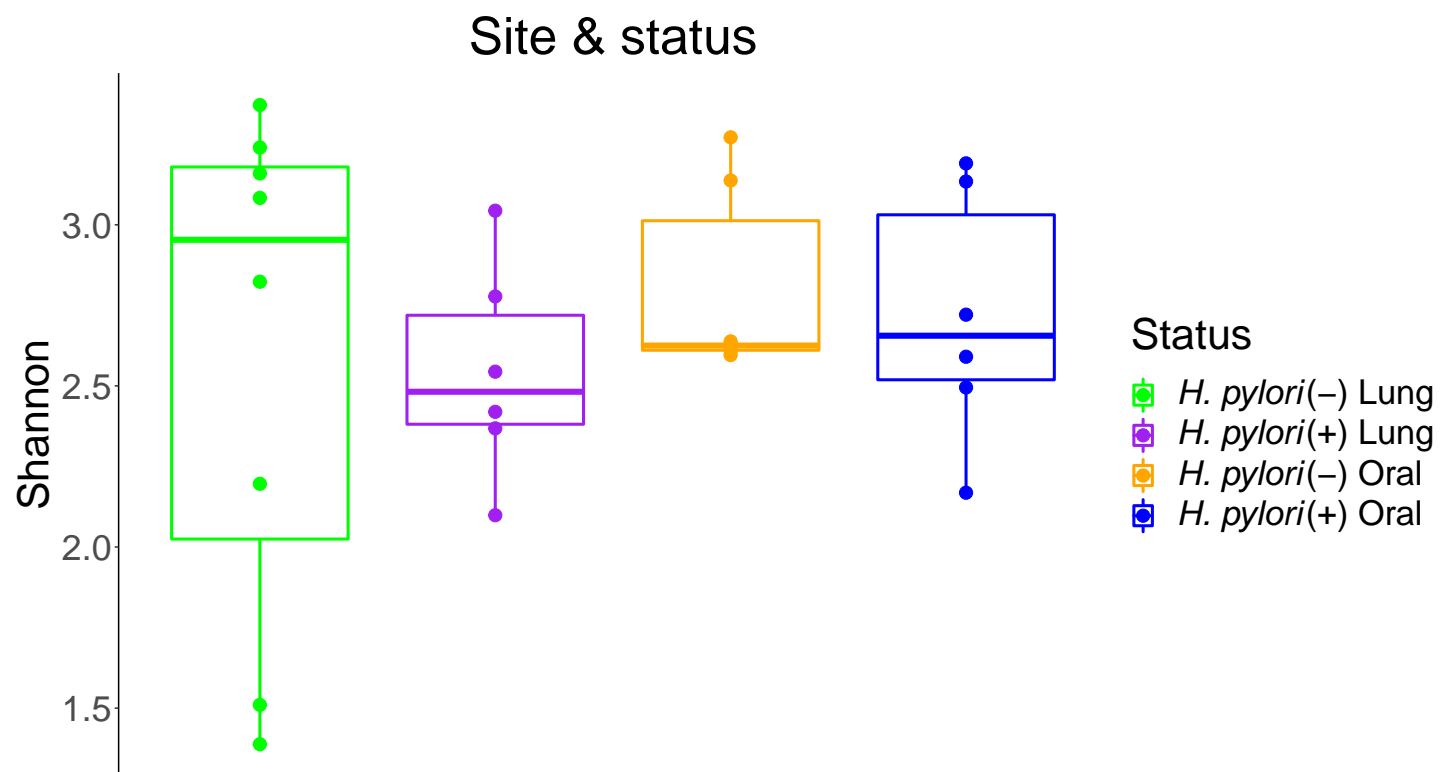


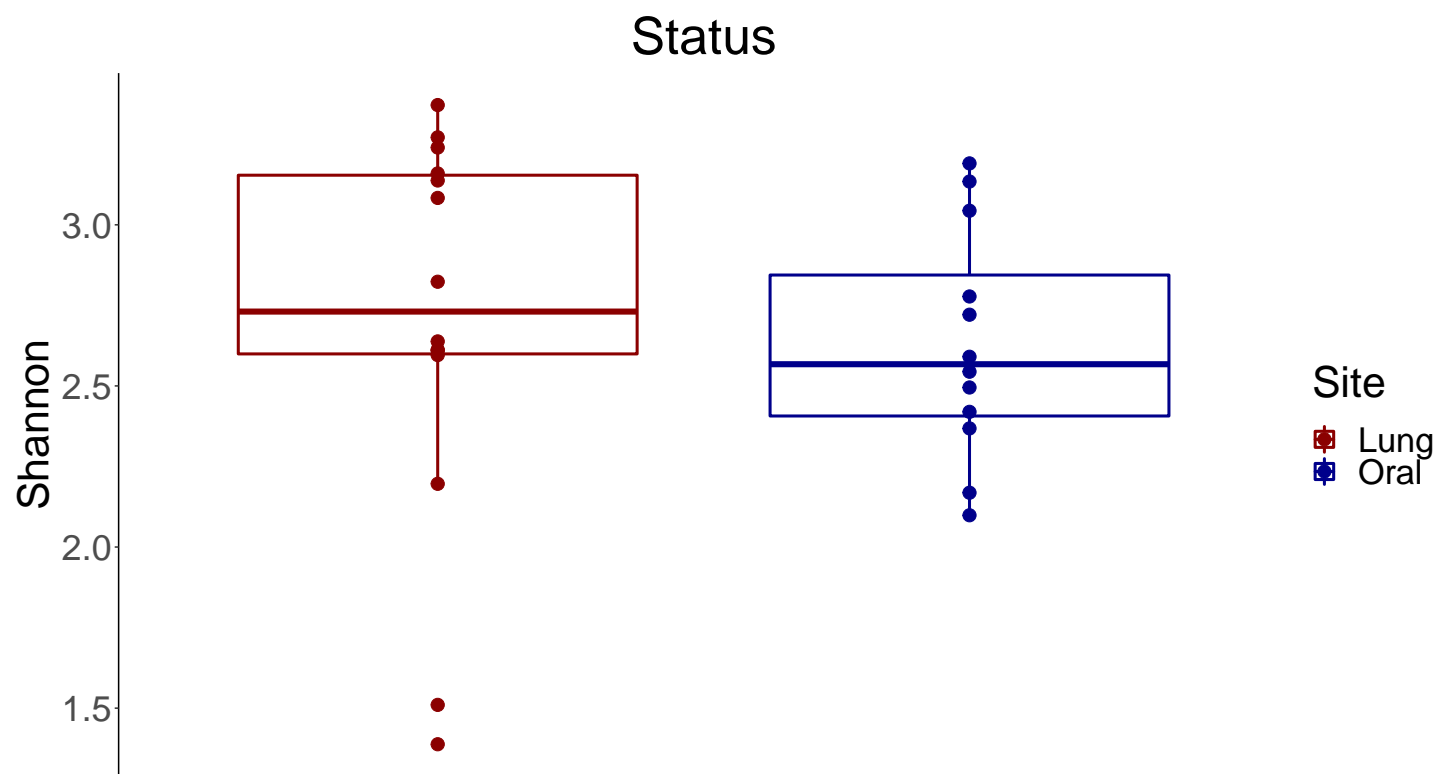
Bray-Curtis



## Alpha Diversity

Shannon index by site and *H. pylori* status



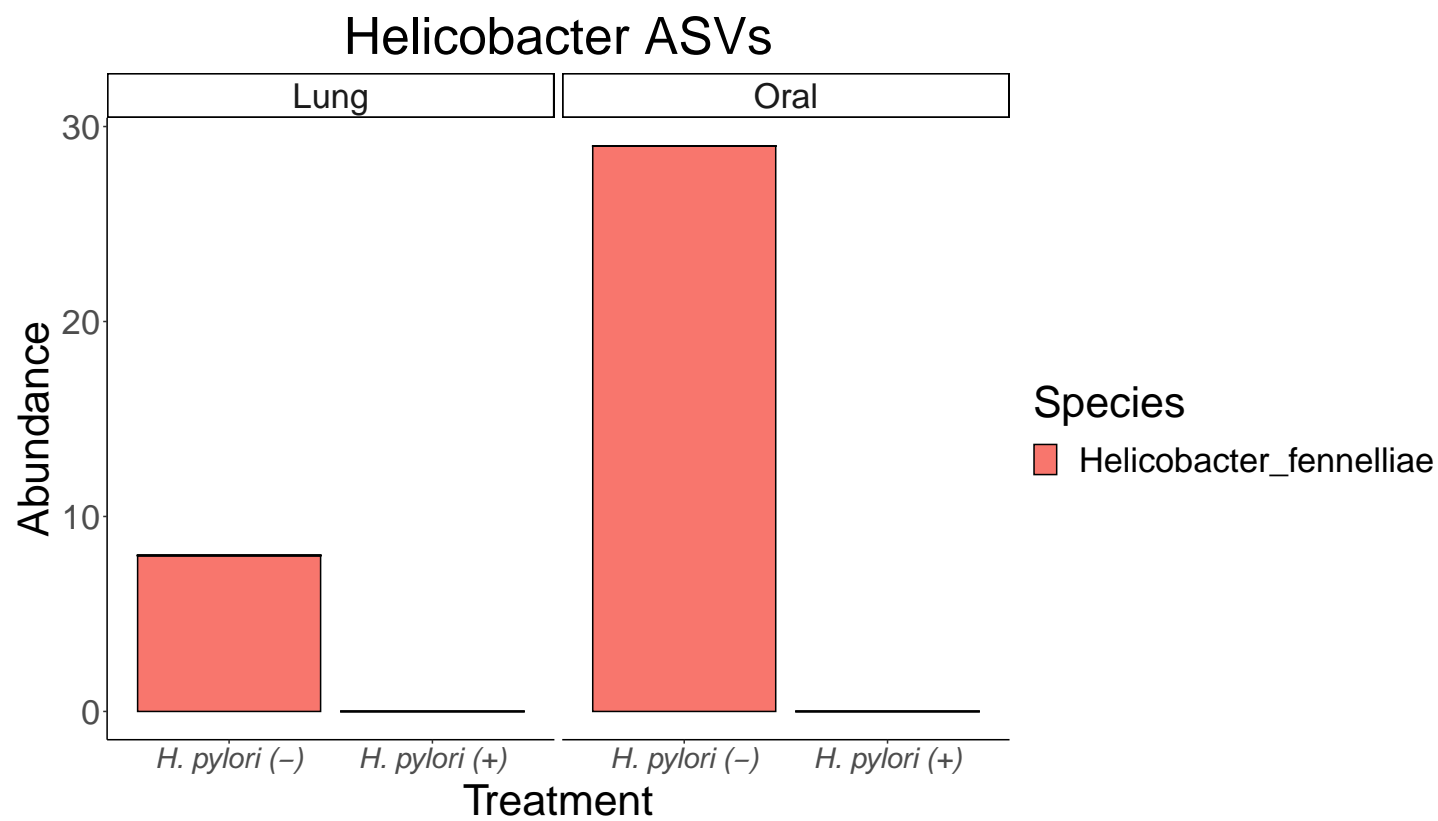


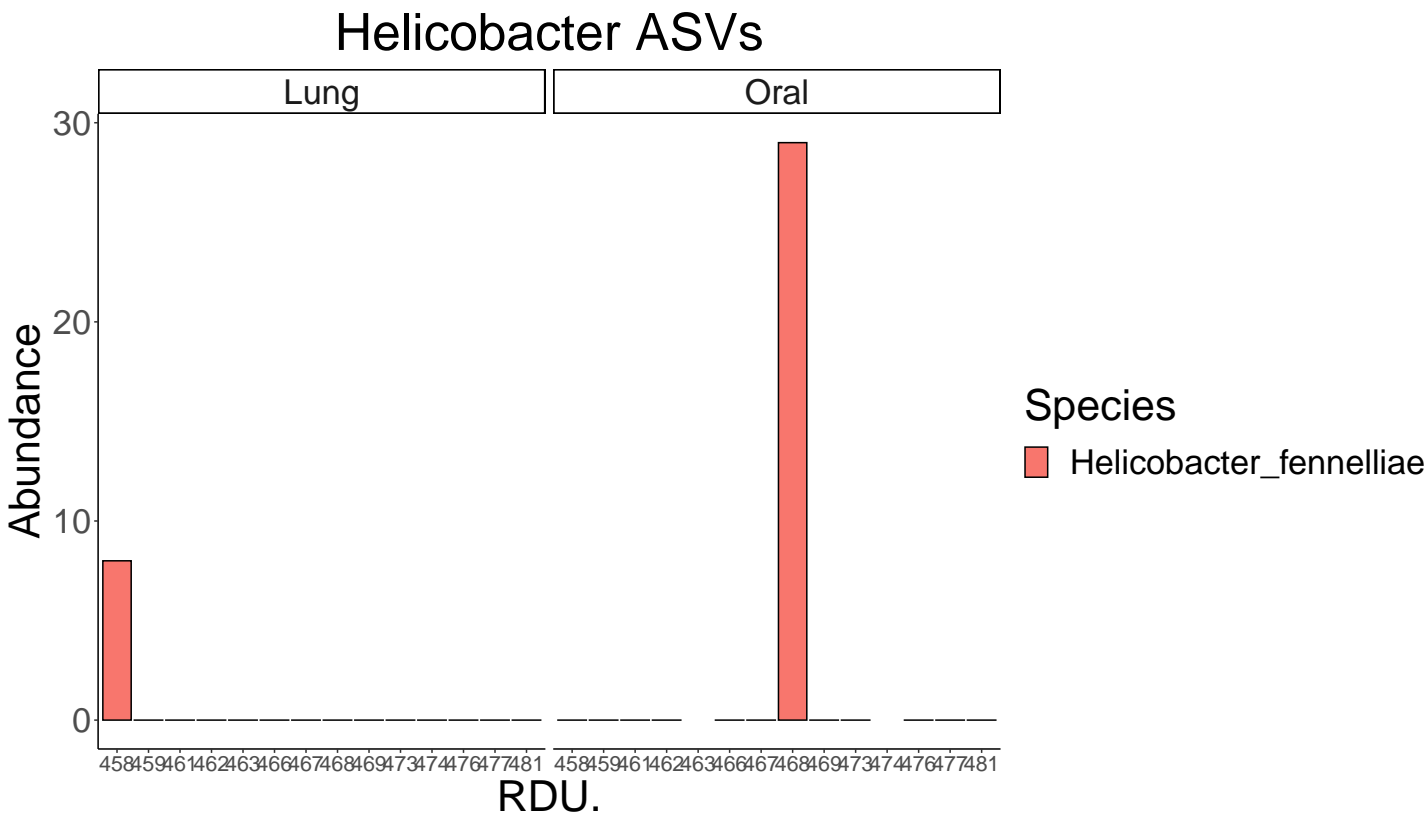
**Table 2:** All alpha diversity measurees

| Groups   | Measure    | Test method | p.value | Significance |
|--|------------|-------------|---------|--------------|
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral   | Observed   | KW          | 0.220   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Lung   | Observed   | KW          | 0.651   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Oral   | Observed   | KW          | 0.081   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Lung   | Observed   | KW          | 0.262   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Oral   | Observed   | KW          | 0.520   |              |
| H.pylori_(+)_Lung vs H.pylori_(+)_Oral   | Observed   | KW          | 0.109   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral vs H.pylori_(+)_Lung vs H.pylori_(+)_Oral | Observed   | KW          | 0.202   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral   | Chao1      | KW          | 0.220   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Lung   | Chao1      | KW          | 0.651   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Oral   | Chao1      | KW          | 0.081   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Lung   | Chao1      | KW          | 0.262   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Oral   | Chao1      | KW          | 0.520   |              |
| H.pylori_(+)_Lung vs H.pylori_(+)_Oral   | Chao1      | KW          | 0.109   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral vs H.pylori_(+)_Lung vs H.pylori_(+)_Oral | Chao1      | KW          | 0.202   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral   | ACE        | KW          | 0.220   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Lung   | ACE        | KW          | 0.651   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Oral   | ACE        | KW          | 0.081   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Lung   | ACE        | KW          | 0.262   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Oral   | ACE        | KW          | 0.520   |              |
| H.pylori_(+)_Lung vs H.pylori_(+)_Oral   | ACE        | KW          | 0.109   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral vs H.pylori_(+)_Lung vs H.pylori_(+)_Oral | ACE        | KW          | 0.202   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral   | Shannon    | KW          | 0.439   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Lung   | Shannon    | KW          | 1.000   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Oral   | Shannon    | KW          | 0.796   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Lung   | Shannon    | KW          | 0.109   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Oral   | Shannon    | KW          | 0.337   |              |
| H.pylori_(+)_Lung vs H.pylori_(+)_Oral   | Shannon    | KW          | 0.423   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral vs H.pylori_(+)_Lung vs H.pylori_(+)_Oral | Shannon    | KW          | 0.540   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral   | Simpson    | KW          | 0.519   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Lung   | Simpson    | KW          | 0.699   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Oral   | Simpson    | KW          | 0.699   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Lung   | Simpson    | KW          | 0.109   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Oral   | Simpson    | KW          | 0.423   |              |
| H.pylori_(+)_Lung vs H.pylori_(+)_Oral   | Simpson    | KW          | 0.262   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral vs H.pylori_(+)_Lung vs H.pylori_(+)_Oral | Simpson    | KW          | 0.493   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral   | InvSimpson | KW          | 0.519   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Lung   | InvSimpson | KW          | 0.699   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Oral   | InvSimpson | KW          | 0.699   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Lung   | InvSimpson | KW          | 0.109   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Oral   | InvSimpson | KW          | 0.423   |              |
| H.pylori_(+)_Lung vs H.pylori_(+)_Oral   | InvSimpson | KW          | 0.262   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral vs H.pylori_(+)_Lung vs H.pylori_(+)_Oral | InvSimpson | KW          | 0.493   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral   | Fisher     | KW          | 0.606   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Lung   | Fisher     | KW          | 0.699   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Oral   | Fisher     | KW          | 0.796   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Lung   | Fisher     | KW          | 0.631   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Oral   | Fisher     | KW          | 0.631   |              |
| H.pylori_(+)_Lung vs H.pylori_(+)_Oral   | Fisher     | KW          | 1.000   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral vs H.pylori_(+)_Lung vs H.pylori_(+)_Oral | Fisher     | KW          | 0.927   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral   | Coverage   | KW          | NaN     | NA           |
| H.pylori_(-)_Lung vs H.pylori_(+)_Lung   | Coverage   | KW          | NaN     | NA           |
| H.pylori_(-)_Lung vs H.pylori_(+)_Oral   | Coverage   | KW          | NaN     | NA           |
| H.pylori_(-)_Oral vs H.pylori_(+)_Lung   | Coverage   | KW          | NaN     | NA           |
| H.pylori_(-)_Oral vs H.pylori_(+)_Oral   | Coverage   | KW          | NaN     | NA           |
| H.pylori_(+)_Lung vs H.pylori_(+)_Oral   | Coverage   | KW          | NaN     | NA           |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral vs H.pylori_(+)_Lung vs H.pylori_(+)_Oral | Coverage   | KW          | NaN     | NA           |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral   | PD         | KW          | 0.366   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Lung   | PD         | KW          | 0.699   |              |
| H.pylori_(-)_Lung vs H.pylori_(+)_Oral   | PD         | KW          | 0.439   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Lung   | PD         | KW          | 0.631   |              |
| H.pylori_(-)_Oral vs H.pylori_(+)_Oral   | PD         | KW          | 0.749   |              |
| H.pylori_(+)_Lung vs H.pylori_(+)_Oral   | PD         | KW          | 0.631   |              |
| H.pylori_(-)_Lung vs H.pylori_(-)_Oral vs H.pylori_(+)_Lung vs H.pylori_(+)_Oral | PD         | KW          | 0.777   |              |

## Helicobacter positive respiratory samples

Helicobacter positive samples separated by site







Taxa barplots

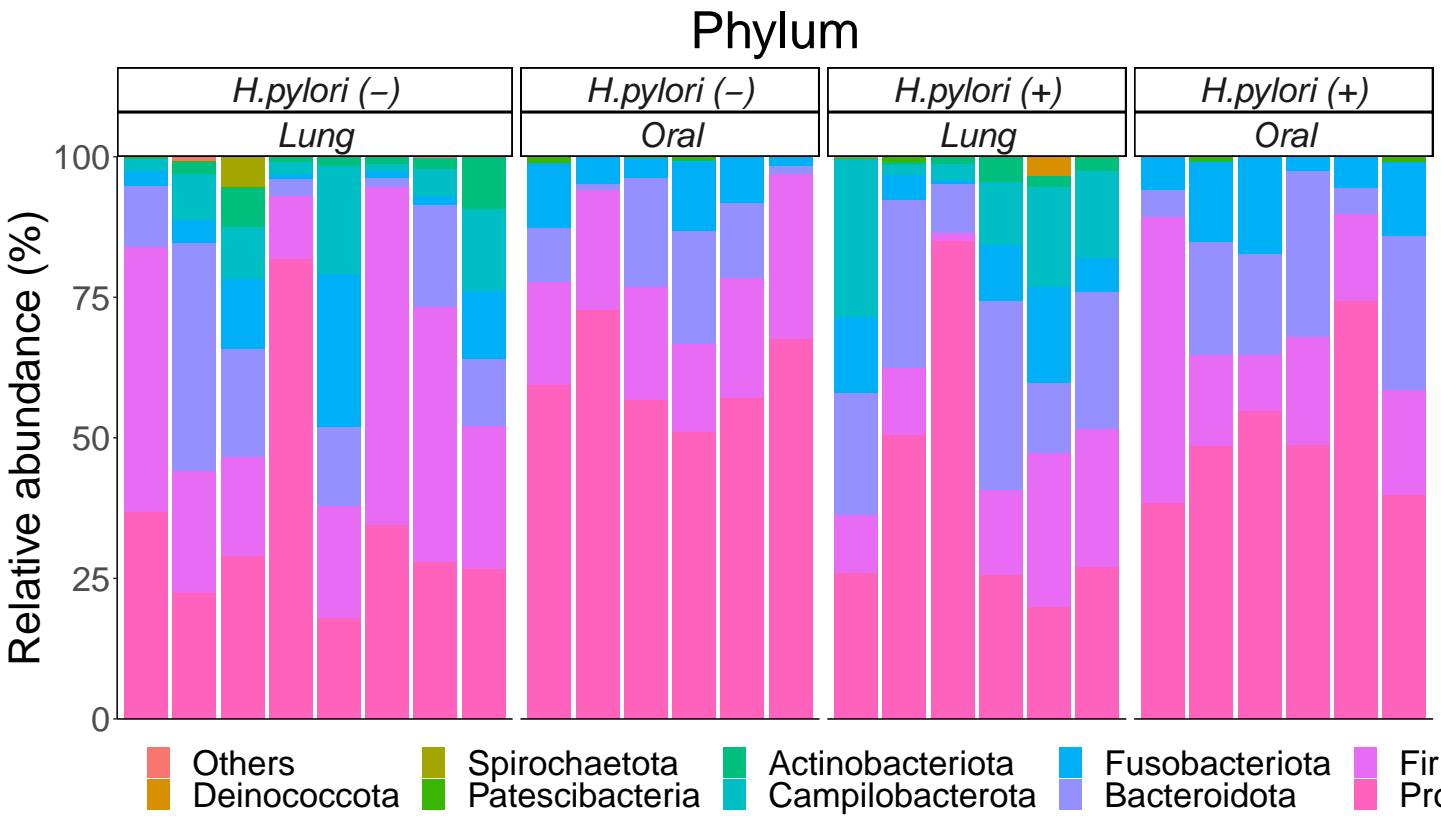


Figure 3: Microbiota Composition at Phylum level.

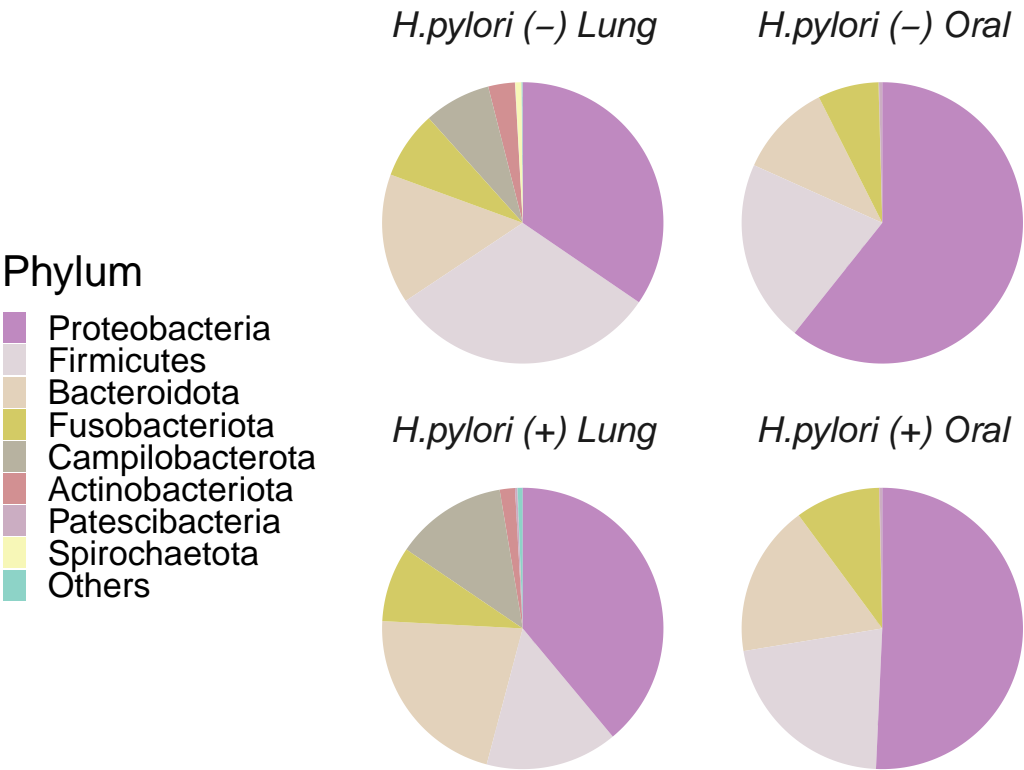
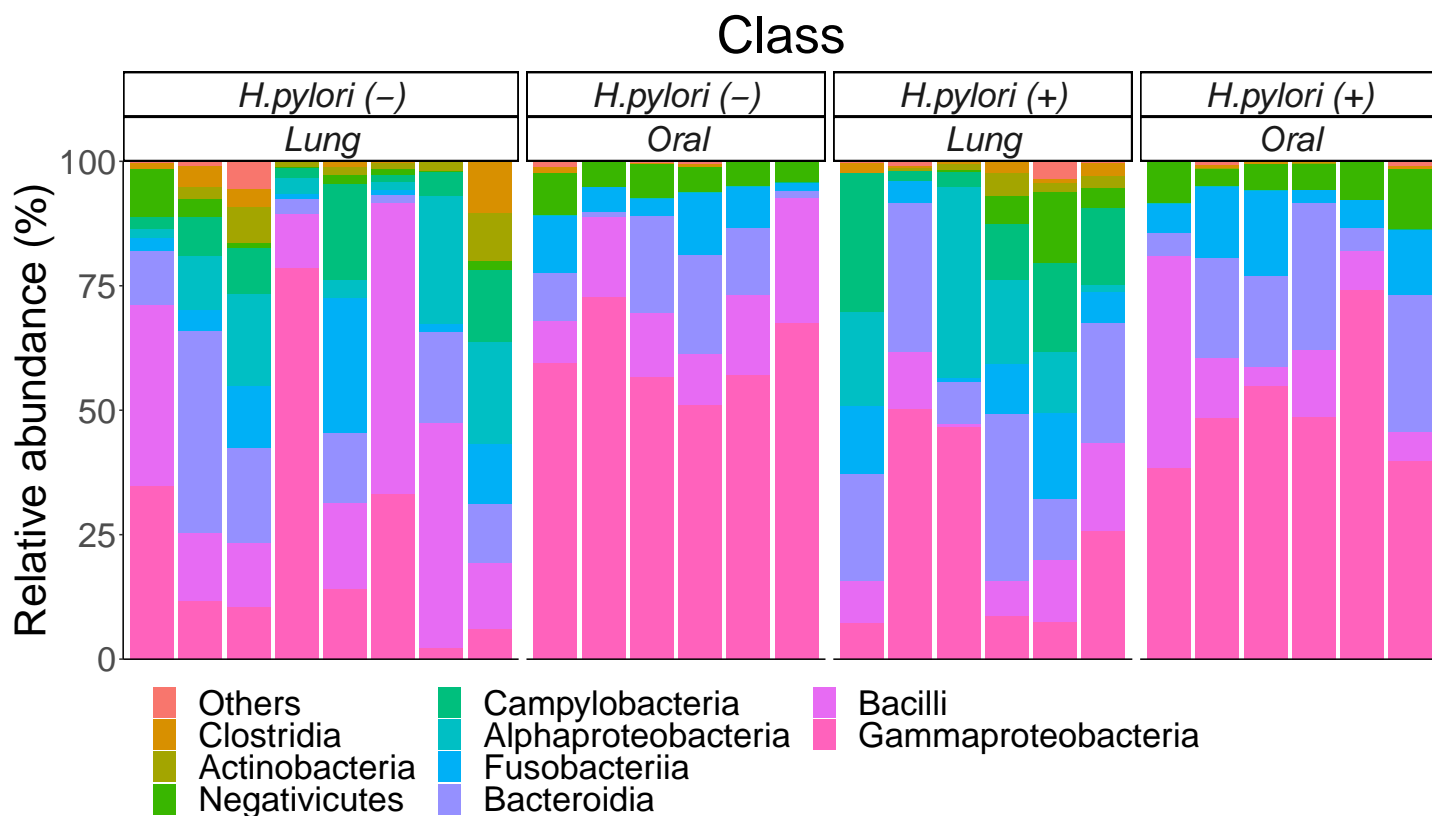


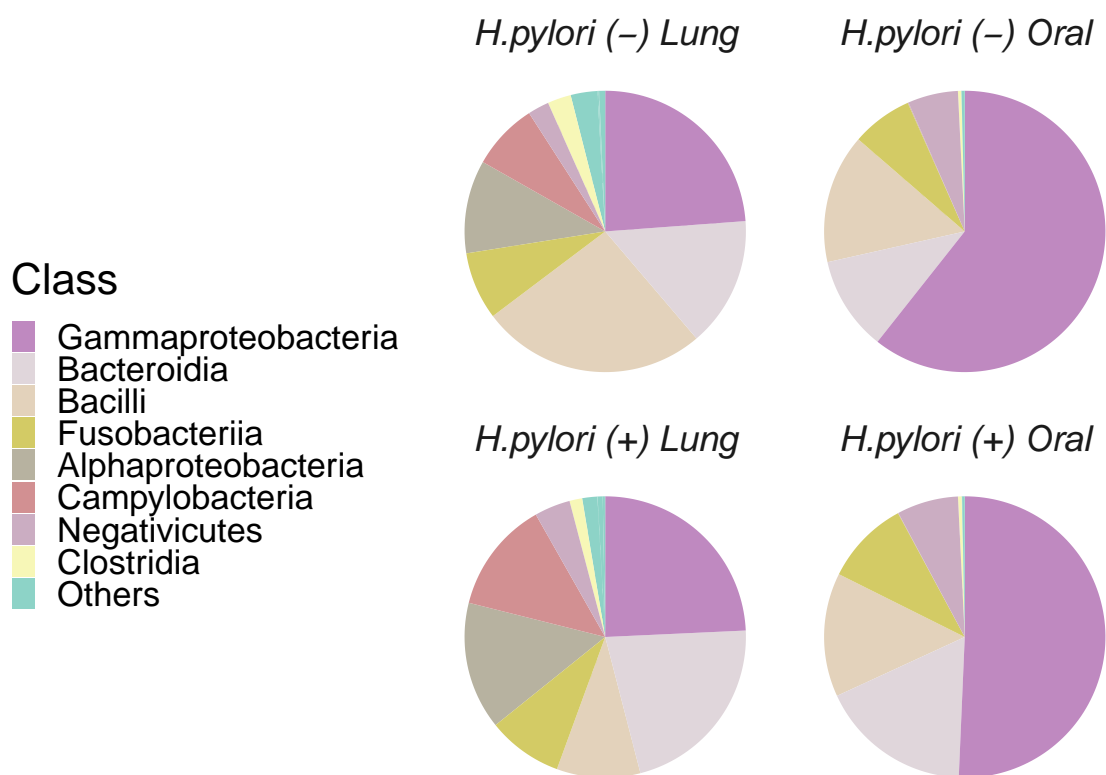
Figure 4: Microbiota Composition at Phylum level.

**Table 3:** Phylum Average Relative Abundance

| Taxonomy         | Sample            | Average Percent Abundance |
|------------------|-------------------|---------------------------|
| Acidobacteriota  | H.pylori (+) Lung | 0.1%                      |
| Actinobacteriota | H.pylori (-) Lung | 3.1%                      |
| Actinobacteriota | H.pylori (+) Lung | 1.8%                      |
| Actinobacteriota | H.pylori (+) Oral | 0.1%                      |
| Actinobacteriota | H.pylori (-) Oral | 0%                        |
| Bacteroidota     | H.pylori (+) Lung | 21.7%                     |
| Bacteroidota     | H.pylori (+) Oral | 17.4%                     |
| Bacteroidota     | H.pylori (-) Lung | 14.9%                     |
| Bacteroidota     | H.pylori (-) Oral | 10.8%                     |
| Campilobacterota | H.pylori (+) Lung | 12.9%                     |
| Campilobacterota | H.pylori (-) Lung | 7.7%                      |
| Campilobacterota | H.pylori (-) Oral | 0%                        |
| Deinococcota     | H.pylori (+) Lung | 0.6%                      |
| Desulfobacterota | H.pylori (-) Lung | 0.1%                      |
| Firmicutes       | H.pylori (-) Lung | 31.1%                     |
| Firmicutes       | H.pylori (+) Oral | 21.7%                     |
| Firmicutes       | H.pylori (-) Oral | 21%                       |
| Firmicutes       | H.pylori (+) Lung | 15.2%                     |
| Fusobacteriota   | H.pylori (+) Oral | 9.8%                      |
| Fusobacteriota   | H.pylori (+) Lung | 8.6%                      |
| Fusobacteriota   | H.pylori (-) Lung | 7.8%                      |
| Fusobacteriota   | H.pylori (-) Oral | 7%                        |
| Latescibacterota | H.pylori (-) Lung | 0%                        |
| Patescibacteria  | H.pylori (-) Oral | 0.4%                      |
| Patescibacteria  | H.pylori (+) Oral | 0.3%                      |
| Patescibacteria  | H.pylori (+) Lung | 0.3%                      |
| Patescibacteria  | H.pylori (-) Lung | 0%                        |
| Proteobacteria   | H.pylori (-) Oral | 60.7%                     |
| Proteobacteria   | H.pylori (+) Oral | 50.7%                     |
| Proteobacteria   | H.pylori (+) Lung | 38.9%                     |
| Proteobacteria   | H.pylori (-) Lung | 34.5%                     |
| Spirochaetota    | H.pylori (-) Lung | 0.7%                      |



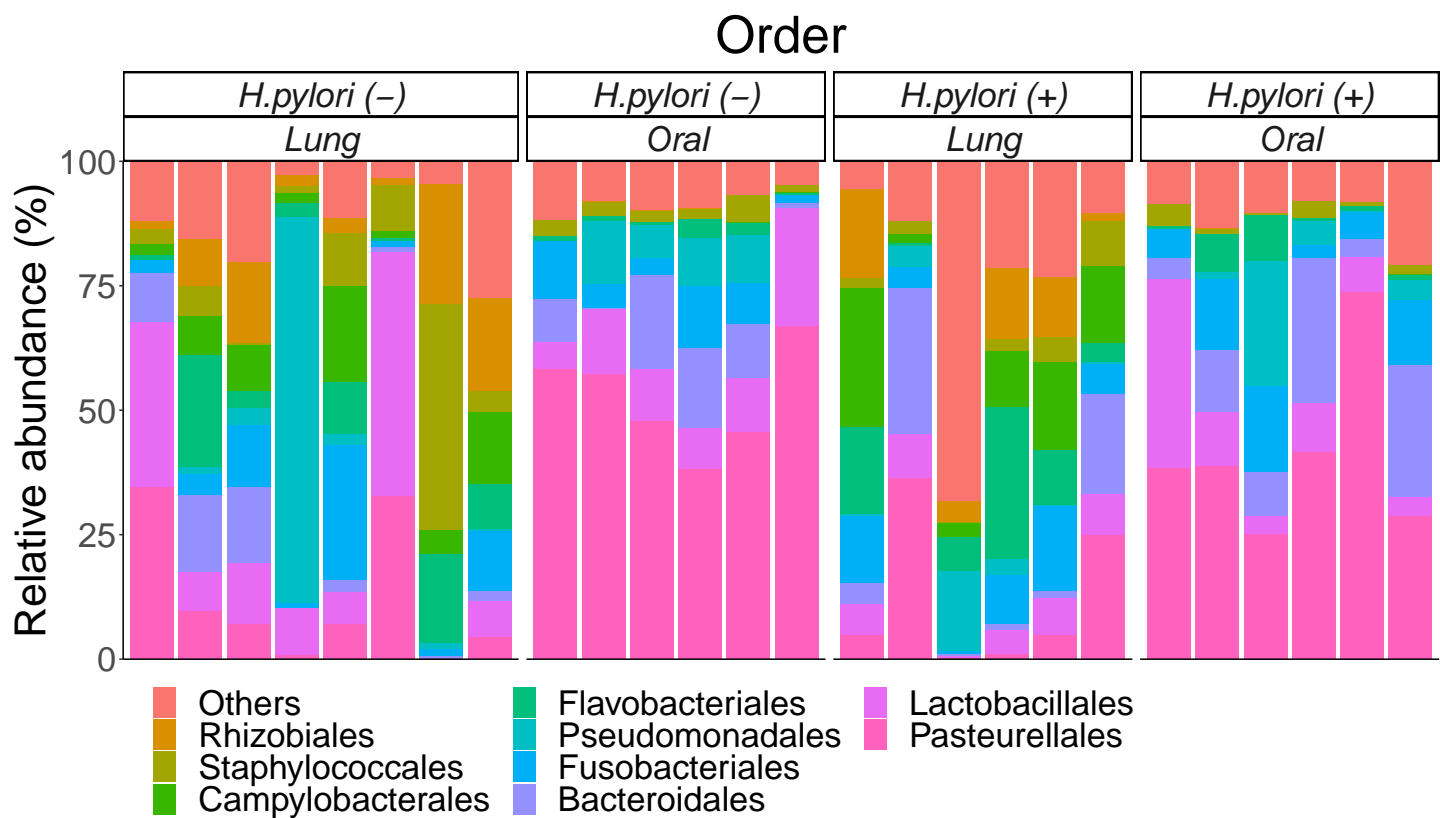
**Figure 5:** Microbiota Composition at Class level.



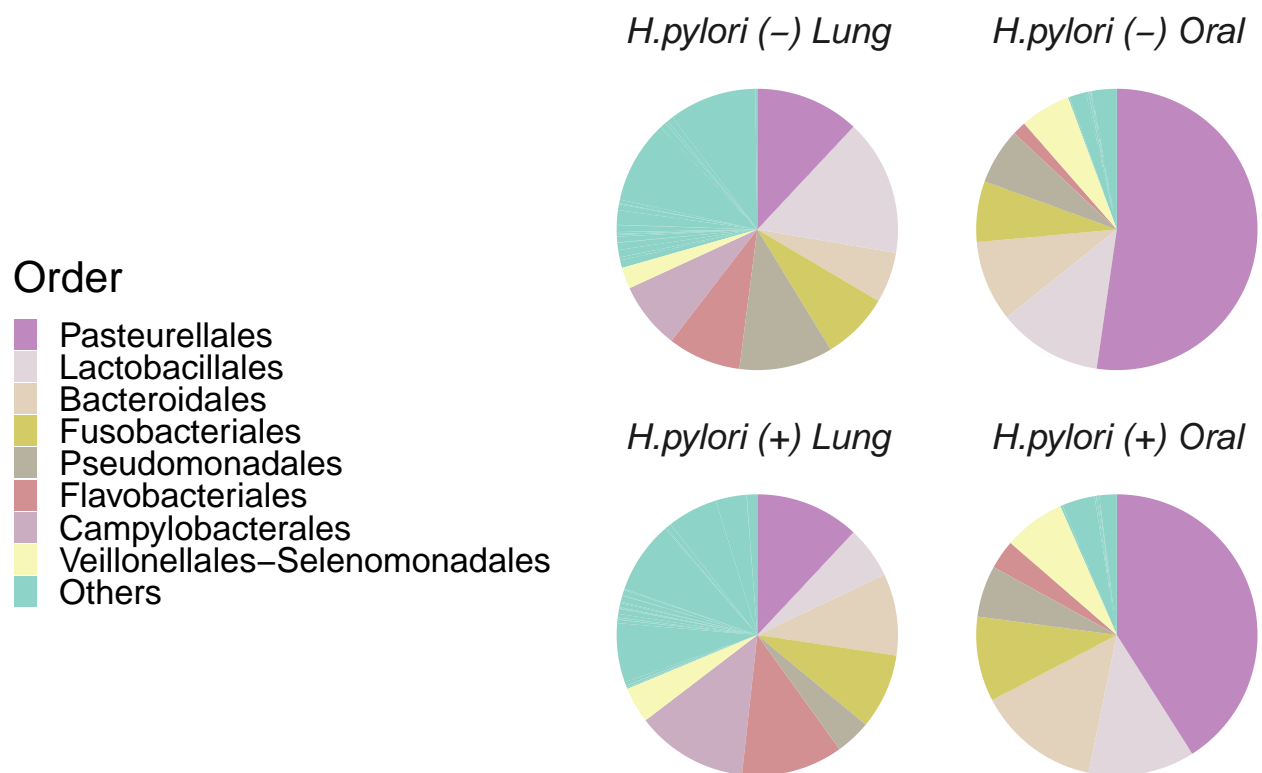
**Figure 6:** Microbiota Composition at Class level.

**Table 4:** Class Average Relative Abundance

| Taxonomy            | Sample            | Average Percent Abundance |
|---------------------|-------------------|---------------------------|
| Actinobacteria      | H.pylori (-) Lung | 3.1%                      |
| Actinobacteria      | H.pylori (+) Lung | 1.7%                      |
| Alphaproteobacteria | H.pylori (+) Lung | 14.7%                     |
| Alphaproteobacteria | H.pylori (-) Lung | 10.7%                     |
| Bacilli             | H.pylori (-) Lung | 26%                       |
| Bacilli             | H.pylori (-) Oral | 14.9%                     |
| Bacilli             | H.pylori (+) Oral | 14.2%                     |
| Bacilli             | H.pylori (+) Lung | 9.6%                      |
| Bacteroidia         | H.pylori (+) Lung | 21.7%                     |
| Bacteroidia         | H.pylori (+) Oral | 17.4%                     |
| Bacteroidia         | H.pylori (-) Lung | 14.9%                     |
| Bacteroidia         | H.pylori (-) Oral | 10.8%                     |
| Campylobacteria     | H.pylori (+) Lung | 12.9%                     |
| Campylobacteria     | H.pylori (-) Lung | 7.7%                      |
| Clostridia          | H.pylori (-) Lung | 2.7%                      |
| Clostridia          | H.pylori (+) Lung | 1.5%                      |
| Clostridia          | H.pylori (+) Oral | 0.4%                      |
| Clostridia          | H.pylori (-) Oral | 0.4%                      |
| Deinococci          | H.pylori (+) Lung | 0.6%                      |
| Fusobacteriia       | H.pylori (+) Oral | 9.8%                      |
| Fusobacteriia       | H.pylori (+) Lung | 8.6%                      |
| Fusobacteriia       | H.pylori (-) Lung | 7.8%                      |
| Fusobacteriia       | H.pylori (-) Oral | 7%                        |
| Gammaproteobacteria | H.pylori (-) Oral | 60.7%                     |
| Gammaproteobacteria | H.pylori (+) Oral | 50.7%                     |
| Gammaproteobacteria | H.pylori (+) Lung | 24.3%                     |
| Gammaproteobacteria | H.pylori (-) Lung | 23.8%                     |
| Negativicutes       | H.pylori (+) Oral | 7.1%                      |
| Negativicutes       | H.pylori (-) Oral | 5.8%                      |
| Negativicutes       | H.pylori (+) Lung | 4.1%                      |
| Negativicutes       | H.pylori (-) Lung | 2.4%                      |
| Spirochaetia        | H.pylori (-) Lung | 0.7%                      |



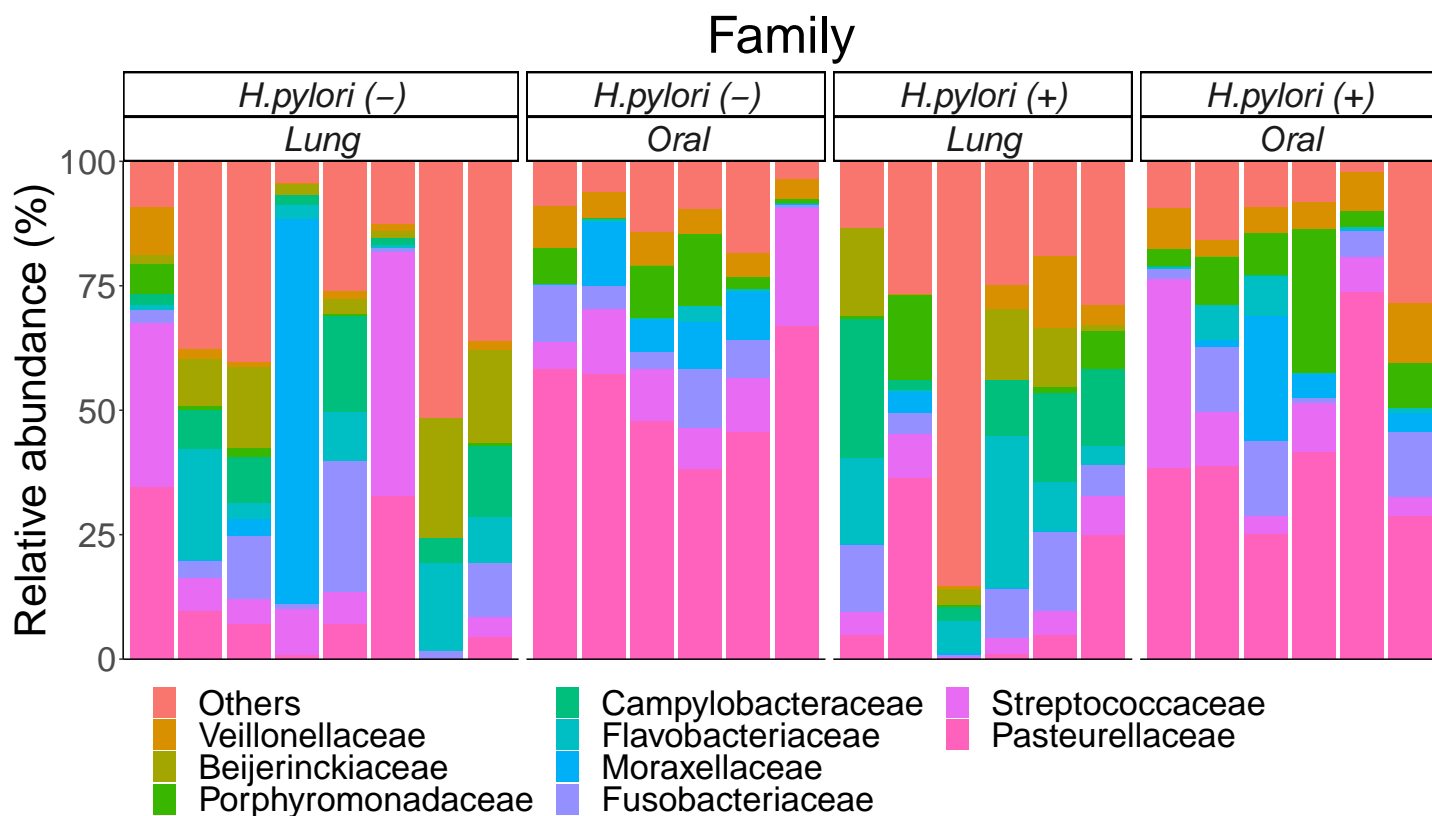
**Figure 7:** Microbiota Composition at Order level.



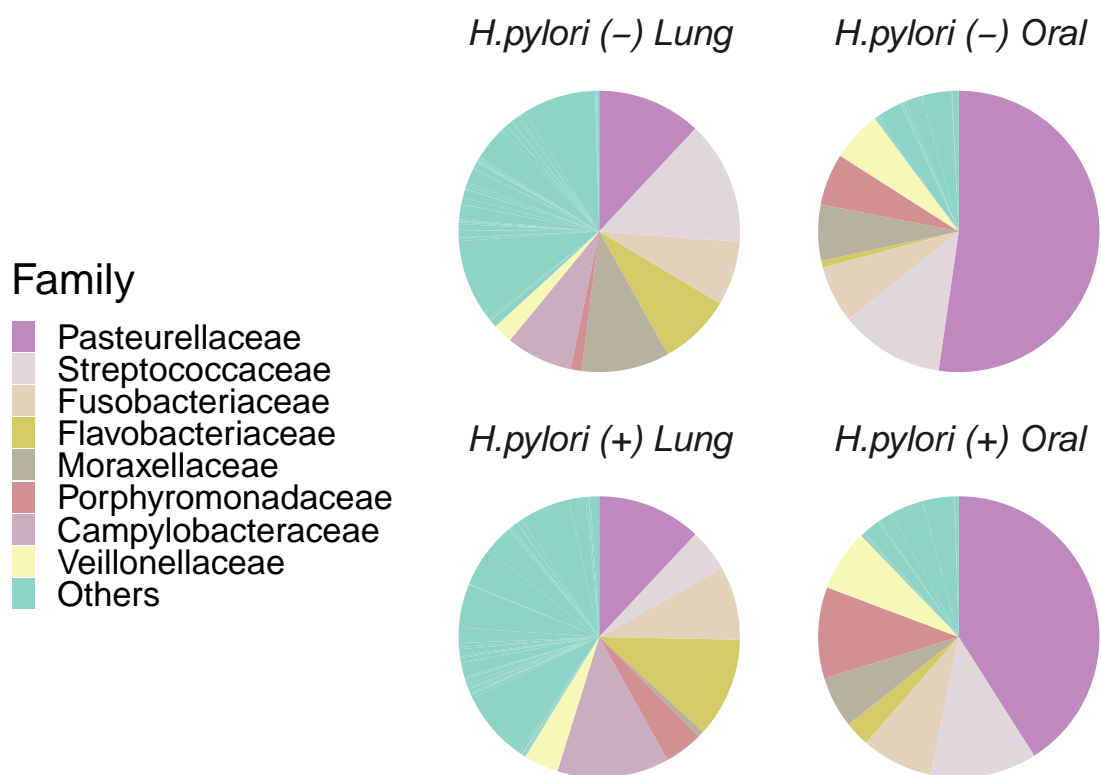
**Figure 8:** Microbiota Composition at Order level.

**Table 5:** Order Average Relative Abundance

| Taxonomy                       | Sample            | Average Percent Abundance |
|--------------------------------|-------------------|---------------------------|
| Bacteroidales                  | H.pylori (+) Oral | 14.1%                     |
| Bacteroidales                  | H.pylori (+) Lung | 9.4%                      |
| Bacteroidales                  | H.pylori (-) Oral | 9.3%                      |
| Bacteroidales                  | H.pylori (-) Lung | 5.8%                      |
| Burkholderiales                | H.pylori (+) Lung | 6.8%                      |
| Campylobacteriales             | H.pylori (+) Lung | 12.9%                     |
| Campylobacteriales             | H.pylori (-) Lung | 7.7%                      |
| Flavobacteriales               | H.pylori (+) Lung | 11.7%                     |
| Flavobacteriales               | H.pylori (-) Lung | 8.4%                      |
| Fusobacteriales                | H.pylori (+) Oral | 9.8%                      |
| Fusobacteriales                | H.pylori (+) Lung | 8.6%                      |
| Fusobacteriales                | H.pylori (-) Lung | 7.8%                      |
| Fusobacteriales                | H.pylori (-) Oral | 7%                        |
| Lactobacillales                | H.pylori (-) Lung | 15.7%                     |
| Lactobacillales                | H.pylori (+) Oral | 12.2%                     |
| Lactobacillales                | H.pylori (-) Oral | 12%                       |
| Lactobacillales                | H.pylori (+) Lung | 6%                        |
| Pasteurellales                 | H.pylori (-) Oral | 52.3%                     |
| Pasteurellales                 | H.pylori (+) Oral | 41%                       |
| Pasteurellales                 | H.pylori (+) Lung | 12%                       |
| Pasteurellales                 | H.pylori (-) Lung | 12%                       |
| Pseudomonadales                | H.pylori (-) Lung | 10.8%                     |
| Pseudomonadales                | H.pylori (-) Oral | 6.4%                      |
| Pseudomonadales                | H.pylori (+) Oral | 5.9%                      |
| Pseudomonadales                | H.pylori (+) Lung | 4.1%                      |
| Rhizobiales                    | H.pylori (-) Lung | 9.6%                      |
| Rhizobiales                    | H.pylori (+) Lung | 8.3%                      |
| Sphingomonadales               | H.pylori (+) Lung | 5.8%                      |
| Staphylococcales               | H.pylori (-) Lung | 10.1%                     |
| Veillonellales-Selenomonadales | H.pylori (+) Oral | 7.1%                      |
| Veillonellales-Selenomonadales | H.pylori (-) Oral | 5.8%                      |
| Veillonellales-Selenomonadales | H.pylori (+) Lung | 4.1%                      |



**Figure 9:** Microbiota Composition at Family level.

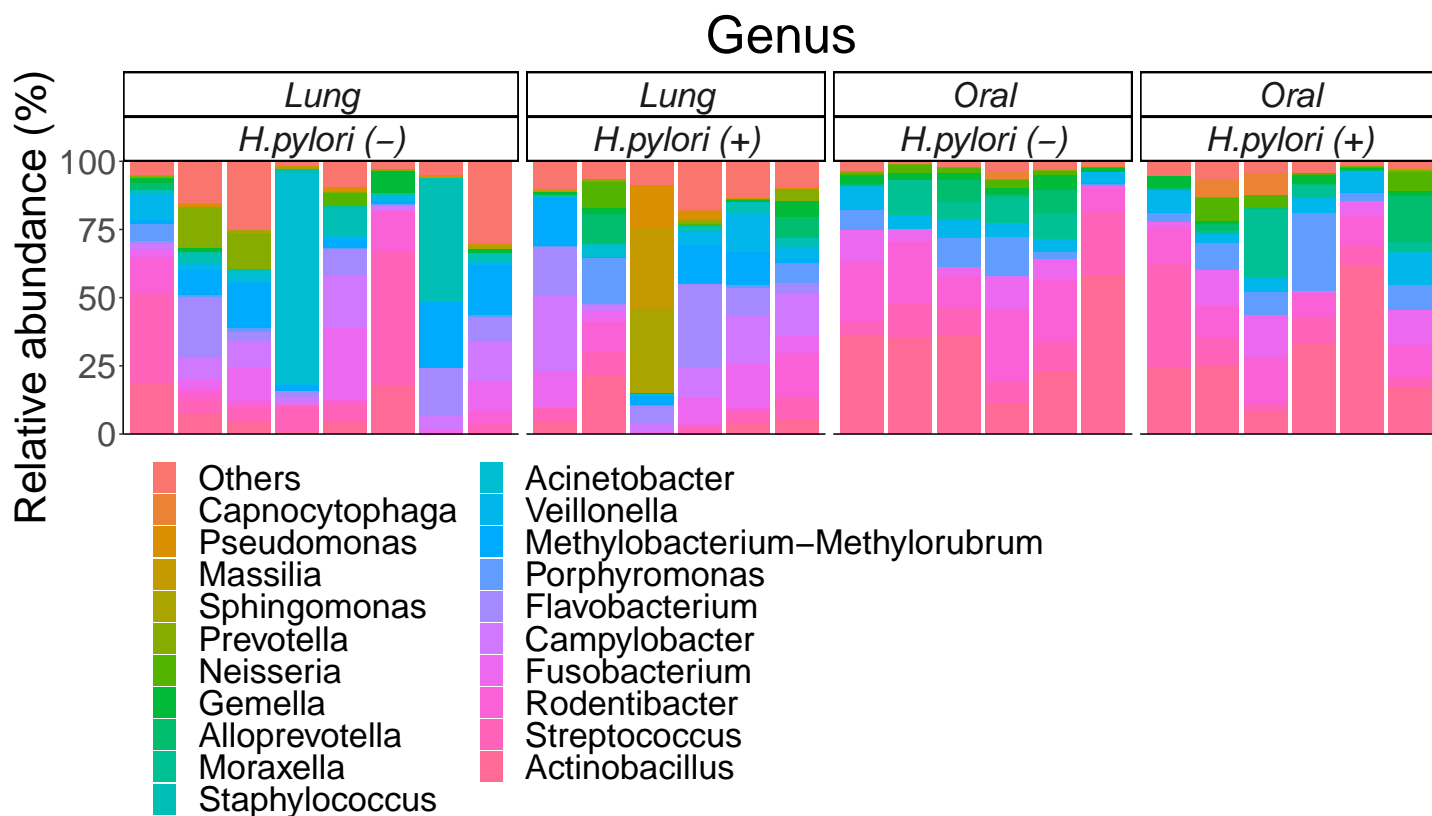


**Figure 10:** Microbiota Composition at Family level.

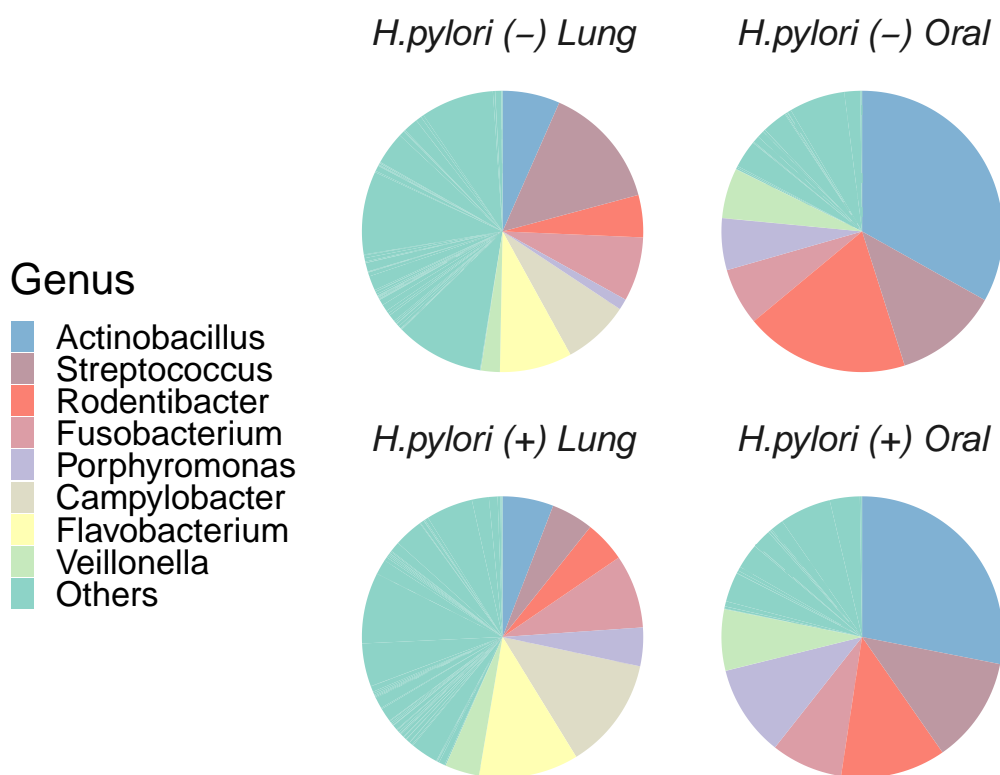
**Table 6:** Family Average Relative Abundance

| Taxonomy           | Sample            | Average Percent Abundance |
|--------------------|-------------------|---------------------------|
| Beijerinckiaceae   | H.pylori (-) Lung | 9.5%                      |
| Beijerinckiaceae   | H.pylori (+) Lung | 8.1%                      |
| Campylobacteraceae | H.pylori (+) Lung | 12.9%                     |
| Campylobacteraceae | H.pylori (-) Lung | 7.7%                      |
| Flavobacteriaceae  | H.pylori (+) Lung | 11.5%                     |
| Flavobacteriaceae  | H.pylori (-) Lung | 8.3%                      |
| Fusobacteriaceae   | H.pylori (+) Lung | 8.5%                      |
| Fusobacteriaceae   | H.pylori (+) Oral | 8.2%                      |
| Fusobacteriaceae   | H.pylori (-) Lung | 7.4%                      |
| Fusobacteriaceae   | H.pylori (-) Oral | 6.6%                      |
| Moraxellaceae      | H.pylori (-) Lung | 10.1%                     |
| Moraxellaceae      | H.pylori (-) Oral | 6.4%                      |
| Moraxellaceae      | H.pylori (+) Oral | 5.9%                      |
| Oxalobacteraceae   | H.pylori (+) Lung | 5%                        |
| Pasteurellaceae    | H.pylori (-) Oral | 52.3%                     |
| Pasteurellaceae    | H.pylori (+) Oral | 41%                       |
| Pasteurellaceae    | H.pylori (+) Lung | 12%                       |
| Pasteurellaceae    | H.pylori (-) Lung | 12%                       |
| Porphyromonadaceae | H.pylori (+) Oral | 10.5%                     |
| Porphyromonadaceae | H.pylori (-) Oral | 5.9%                      |
| Porphyromonadaceae | H.pylori (+) Lung | 4.4%                      |
| Prevotellaceae     | H.pylori (+) Lung | 4.3%                      |
| Prevotellaceae     | H.pylori (-) Lung | 4.1%                      |
| Sphingomonadaceae  | H.pylori (+) Lung | 5.8%                      |
| Staphylococcaceae  | H.pylori (-) Lung | 8.4%                      |
| Streptococcaceae   | H.pylori (-) Lung | 14.2%                     |
| Streptococcaceae   | H.pylori (+) Oral | 12.2%                     |
| Streptococcaceae   | H.pylori (-) Oral | 12%                       |
| Streptococcaceae   | H.pylori (+) Lung | 4.9%                      |
| Veillonellaceae    | H.pylori (+) Oral | 7%                        |
| Veillonellaceae    | H.pylori (-) Oral | 5.8%                      |
| Veillonellaceae    | H.pylori (+) Lung | 4%                        |





**Figure 11:** Microbiota Composition at Genus level.



**Figure 12:** Microbiota Composition at Genus level.

**Table 7:** Genus Average Relative Abundance

| Taxonomy                          | Sample            | Average Percent Abundance |
|-----------------------------------|-------------------|---------------------------|
| Acinetobacter                     | H.pylori (-) Lung | 10.1%                     |
| Actinobacillus                    | H.pylori (-) Oral | 33.1%                     |
| Actinobacillus                    | H.pylori (+) Oral | 28.1%                     |
| Actinobacillus                    | H.pylori (-) Lung | 6.6%                      |
| Actinobacillus                    | H.pylori (+) Lung | 5.9%                      |
| Campylobacter                     | H.pylori (+) Lung | 12.9%                     |
| Campylobacter                     | H.pylori (-) Lung | 7.7%                      |
| Flavobacterium                    | H.pylori (+) Lung | 11.5%                     |
| Flavobacterium                    | H.pylori (-) Lung | 8.3%                      |
| Fusobacterium                     | H.pylori (+) Lung | 8.5%                      |
| Fusobacterium                     | H.pylori (+) Oral | 8.2%                      |
| Fusobacterium                     | H.pylori (-) Lung | 7.4%                      |
| Fusobacterium                     | H.pylori (-) Oral | 6.6%                      |
| Massilia                          | H.pylori (+) Lung | 4.9%                      |
| Methylobacterium-Methylobacterium | H.pylori (-) Lung | 9.5%                      |
| Methylobacterium-Methylobacterium | H.pylori (+) Lung | 8.1%                      |
| Moraxella                         | H.pylori (-) Oral | 6.4%                      |
| Moraxella                         | H.pylori (+) Oral | 5.9%                      |
| Porphyromonas                     | H.pylori (+) Oral | 10.5%                     |
| Porphyromonas                     | H.pylori (-) Oral | 5.9%                      |
| Rodentibacter                     | H.pylori (-) Oral | 18.9%                     |
| Rodentibacter                     | H.pylori (+) Oral | 12.1%                     |
| Rodentibacter                     | H.pylori (-) Lung | 4.9%                      |
| Rodentibacter                     | H.pylori (+) Lung | 4.7%                      |
| Sphingomonas                      | H.pylori (+) Lung | 5.4%                      |
| Staphylococcus                    | H.pylori (-) Lung | 8.4%                      |
| Streptococcus                     | H.pylori (-) Lung | 14.2%                     |
| Streptococcus                     | H.pylori (+) Oral | 12.2%                     |
| Streptococcus                     | H.pylori (-) Oral | 12%                       |
| Streptococcus                     | H.pylori (+) Lung | 4.9%                      |
| Veillonella                       | H.pylori (+) Oral | 7%                        |
| Veillonella                       | H.pylori (-) Oral | 5.8%                      |

Genera correlation with IL8 concentration (Serum and BAL)

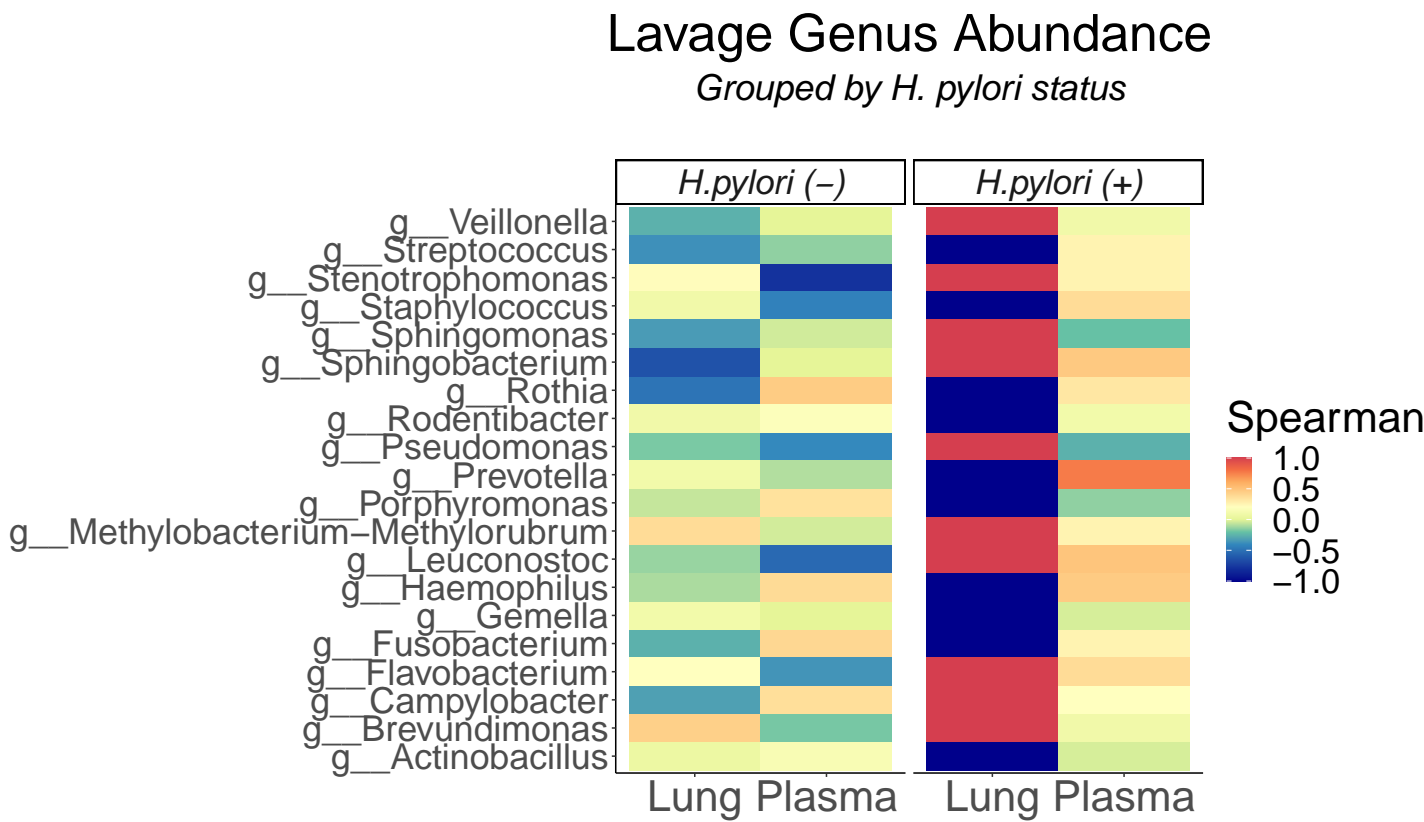


Figure 13: IL8 and lavage genus abundance Spearman correlations separated by *H. pylori* status

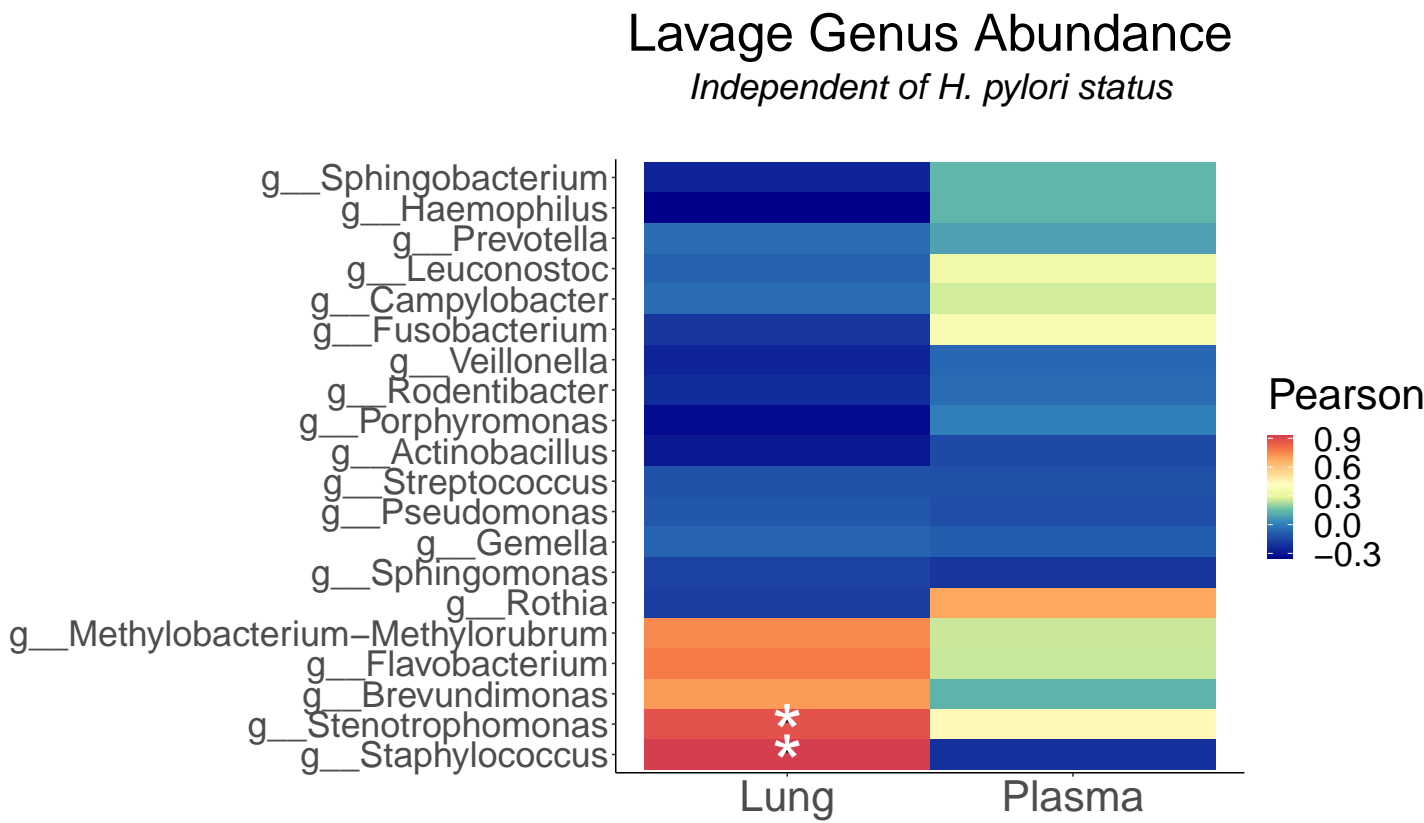
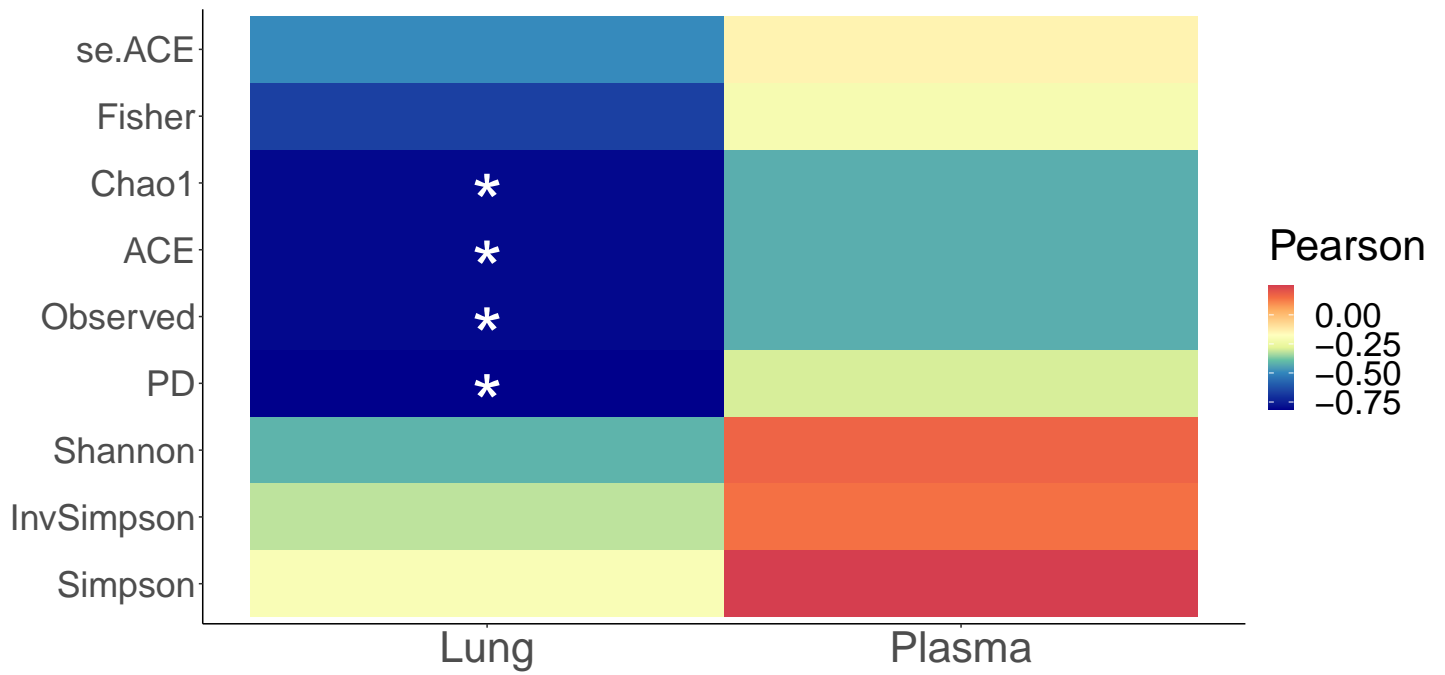


Figure 14: IL8 and lavage genus abundance Spearman correlations independent of *H. pylori* status



# Lavage Alpha Diversity

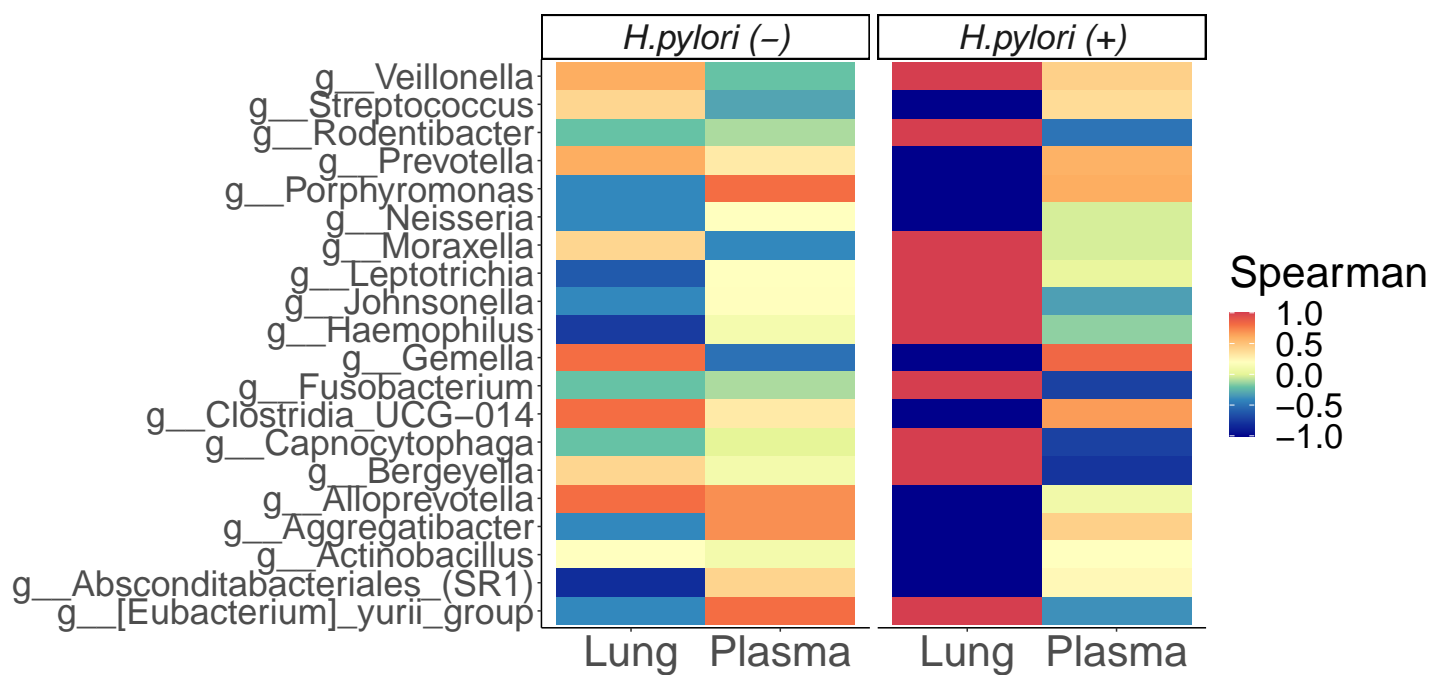
*Independent of H. pylori status*



**Figure 15:** IL8 and lavage alpha diversity Spearman correlations independent of H. pylori status.

# Buccal Cavity Genus Abundance

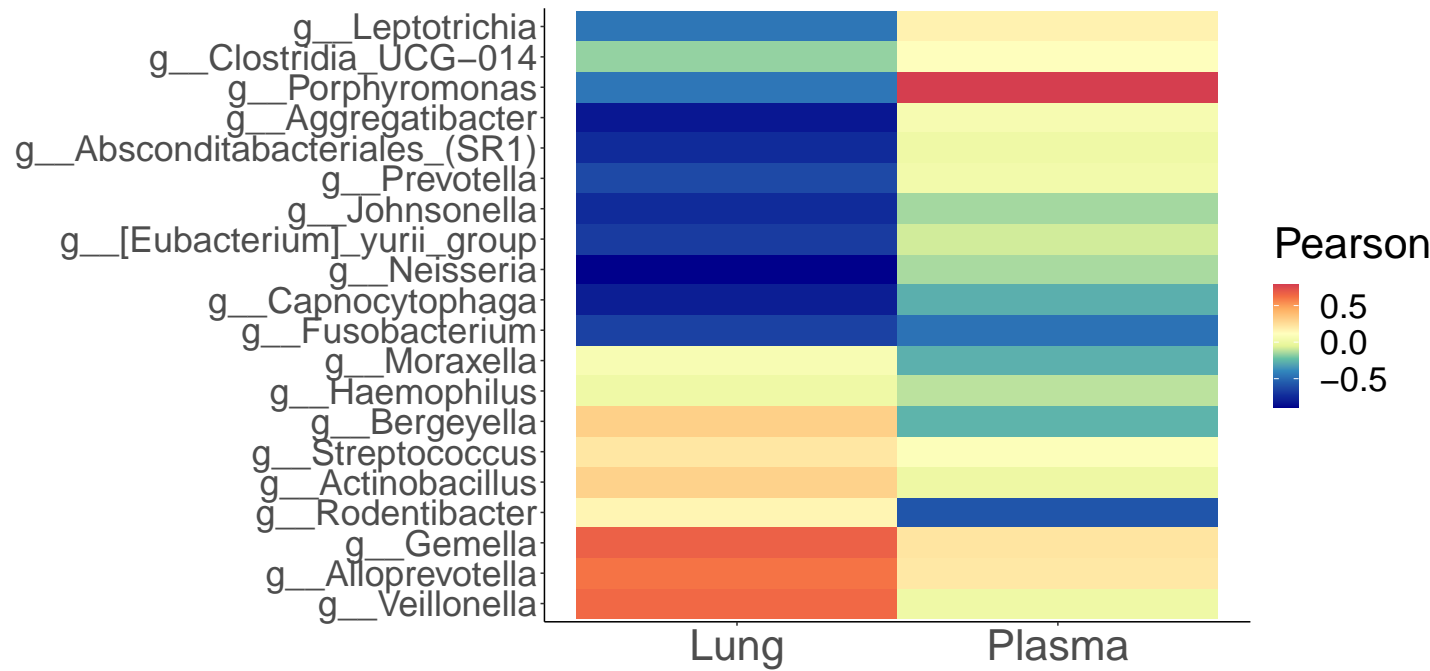
Grouped by *H. pylori* status



**Figure 16:** IL8 and Buccal genus abundance Spearman correlations separated by *H. pylori* status

# Buccal Cavity Genus Abundance

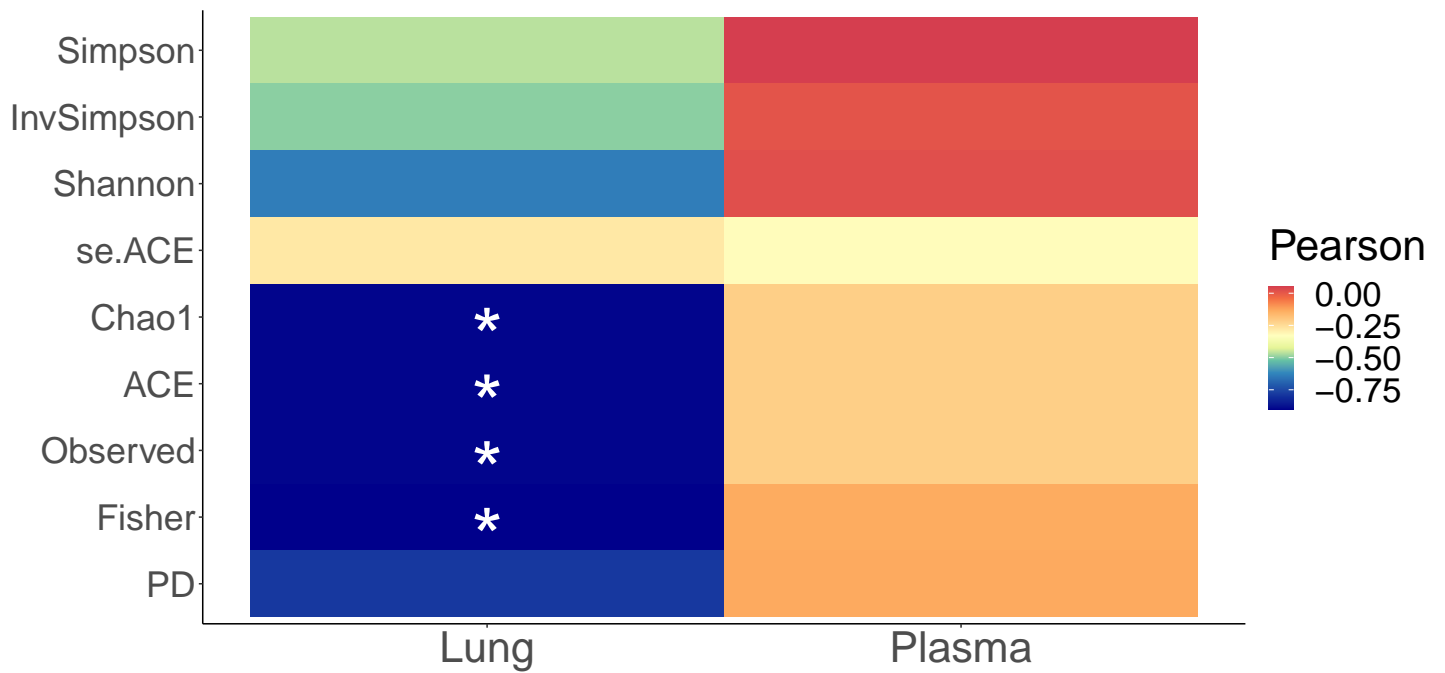
*Independent of H. pylori status*



**Figure 17:** IL8 and Buccal genus abundance Spearman correlations independent of H. pylori status

# Buccal Cavity Alpha Diversity

*Independent of H. pylori status*



**Figure 18:** IL8 and Buccal alpha diversity Spearman correlations independent of H. pylori status



## Record session information

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## R version 4.1.3 (2022-03-10)
## Platform: x86_64-conda-linux-gnu (64-bit)
## Running under: Ubuntu 18.04.6 LTS
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## Matrix products: default
## BLAS/LAPACK: /srv/conda/envs/notebook/lib/libopenblas-r0.3.20.so
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##  [3] LC_TIME=en_US.UTF-8      LC_COLLATE=en_US.UTF-8
##  [5] LC_MONETARY=en_US.UTF-8  LC_MESSAGES=en_US.UTF-8
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##  [9] LC_ADDRESS=C             LC_TELEPHONE=C
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## attached base packages:
## [1] stats4      stats      graphics  grDevices  utils      datasets  methods
## [8] base
##
## other attached packages:
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##  [3] RColorBrewer_1.1-3         tidytree_0.3.9
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## [31] phyloseq_1.38.0           readxl_1.4.0
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##  [4] DelayedArray_0.20.0       data.table_1.14.2          rpart_4.1.16
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