Longitudinal Waste data

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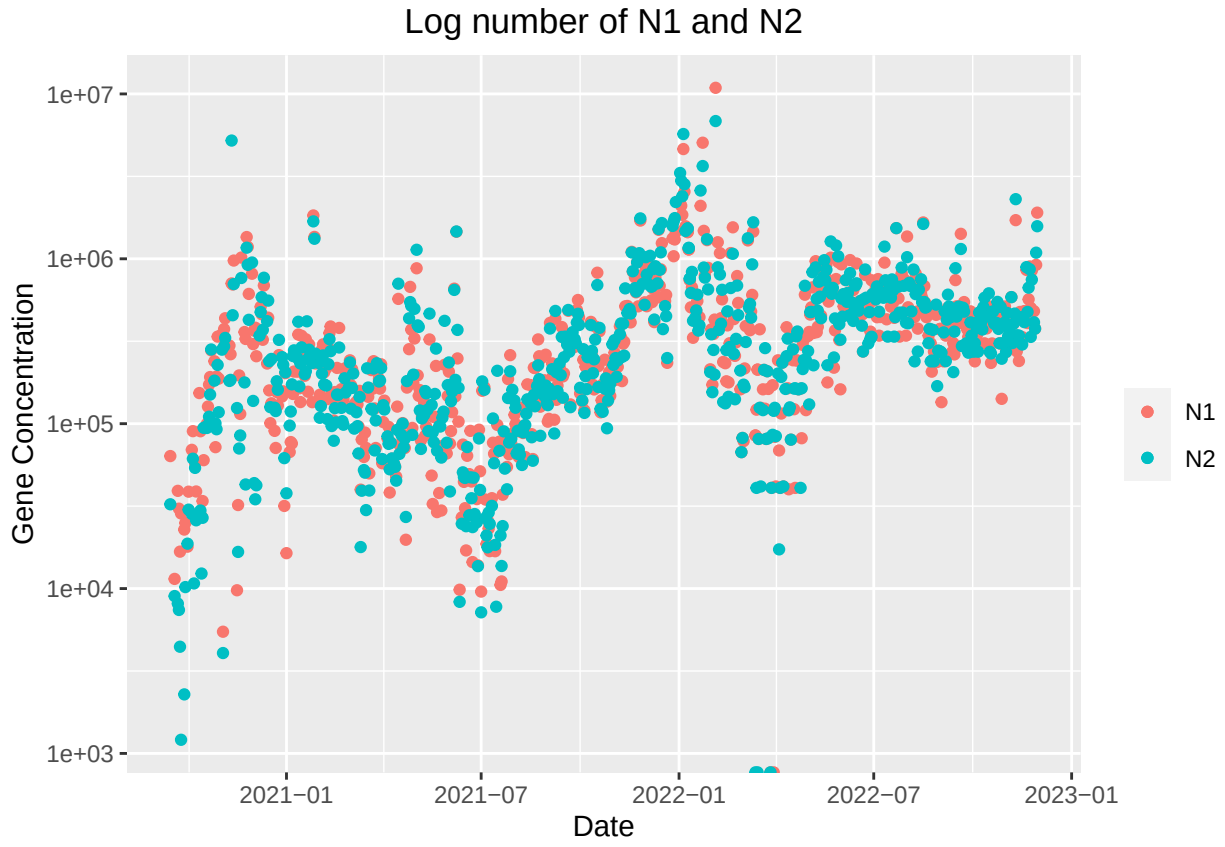
Longitudinal data source

This vignette covers the wastewater data collected by the Wisconsin State Lab of Hygiene. This wastewater data covers 118 weeks of 1-5 measurements a week from 82 locations. This has 63 columns where 5 are categorical variables, 9 are measurement columns and the remaining are extra info about the measurements.

The data is broken down by site and data. Site is where it was collected from. The primary column's are N1 and N2 which are two different genes of Covid-19.



Below is the first 6 rows of the dataset.

```
##        regions          county            site       date    pop        N1
## 1 Southeastern Port Washington Port Washington 2021-01-18  12000  8865.376
## 2 Southeastern Port Washington Port Washington 2021-01-25  12000 11827.504
## 3 Southeastern          Racine          Racine 2021-01-24 139000  8333.173
```

```
## 4     Northern        Washburn        Washburn 2021-01-25   2200 15421.000
## 5 Northeastern        Peshtigo        Peshtigo 2021-01-25   4000 23272.000
## 6 Southeastern South Milwaukee South Milwaukee 2021-01-24  21156 14383.477
##          N2    PMMoV hf183   flow  tss   ph conductivity temperature     epaid
## 1  6652.533 18829610    NA  1.000 <NA>   NA         2930          NA WI0020460
## 2  7268.768 10190701    NA  1.000 <NA>   NA         2360          NA WI0020460
## 3  6484.469  6165848    NA 15.890   68 7.16         1244        12.3 WI0025194
## 4 30958.000 14401613    NA  0.149 <NA> 7.70          880        10.8 WI0022675
## 5 35748.000  4397675    NA  0.444 <NA> 7.60          887        11.7 WI0030651
## 6  8851.371  7323669    NA  2.588 <NA>   NA         1172          NA WI0028819
##   sample_id           pcr_type  n1_sars_cov2_units n1_sars_cov2_lod
## 1       802 droplet digital PCR copies/L wastewater           FALSE
## 2       827 droplet digital PCR copies/L wastewater           FALSE
## 3       819 droplet digital PCR copies/L wastewater           FALSE
## 4 544867001               qPCR       Gene copies/L            TRUE
## 5 544887001               qPCR       Gene copies/L            TRUE
## 6       813 droplet digital PCR copies/L wastewater           FALSE
##    n2_sars_cov2_units n2_sars_cov2_lod  bod  do      created_on
## 1 copies/L wastewater           FALSE <NA>  NA 1/28/2021 20:15
## 2 copies/L wastewater           FALSE <NA>  NA 1/28/2021 20:15
## 3 copies/L wastewater           FALSE  101  NA 1/28/2021 20:15
## 4       Gene copies/L            TRUE <NA>  NA  2/3/2021 18:15
## 5       Gene copies/L            TRUE <NA> 3.8  2/3/2021 18:15
## 6 copies/L wastewater           FALSE <NA>  NA 1/28/2021 20:15
##   last_modified_on lab_submitter    n1_lod     n1_loq    n2_lod     n2_loq
## 1   1/7/2022 13:56          UWM  3319.264  11078.219  3319.264  11078.219
## 2   1/7/2022 13:56          UWM  3102.181  10342.939  3102.181  10342.939
## 3   1/7/2022 13:56          UWM  2773.056   9257.525  2773.056   9257.525
## 4  2/15/2021 15:41          SLH 40000.000 130000.000 66000.000 140000.000
## 5  2/15/2021 15:41          SLH 40000.000 130000.000 66000.000 140000.000
## 6   1/7/2022 13:57          UWM  3319.264  11064.213  3319.264  11064.213
##   bcov_rec_rate bcov_spike_conc zipcode state capacity_mgd sample_type
## 1            NA              NA      NA  <NA>           NA        <NA>
## 2            NA              NA      NA  <NA>           NA        <NA>
## 3            NA              NA      NA  <NA>           NA        <NA>
## 4            NA              NA      NA  <NA>           NA        <NA>
## 5            NA              NA      NA  <NA>           NA        <NA>
## 6            NA              NA      NA  <NA>           NA        <NA>
##   composite_freq sample_matrix sample_location sample_location_specify
## 1           <NA>          <NA>            <NA>                   <NA>
## 2           <NA>          <NA>            <NA>                   <NA>
## 3           <NA>          <NA>            <NA>                   <NA>
## 4           <NA>          <NA>            <NA>                   <NA>
## 5           <NA>          <NA>            <NA>                   <NA>
## 6           <NA>          <NA>            <NA>                   <NA>
##   wwtp_comments concentration_method extraction_method lod_ref quant_stan_type
## 1          <NA>                 <NA>              <NA>    <NA>           <NA>
## 2          <NA>                 <NA>              <NA>    <NA>           <NA>
## 3          <NA>                 <NA>              <NA>    <NA>           <NA>
## 4          <NA>                 <NA>              <NA>    <NA>           <NA>
## 5          <NA>                 <NA>              <NA>    <NA>           <NA>
## 6          <NA>                 <NA>              <NA>    <NA>           <NA>
##   quant_stan_ref inhibition_method n1_sars_cov2_error n1_ntc_amplify
## 1           <NA>              <NA>                 NA          <NA>
```

```
## 2           <NA>              <NA>                 NA           <NA>
## 3           <NA>              <NA>                 NA           <NA>
## 4           <NA>              <NA>                 NA           <NA>
## 5           <NA>              <NA>                 NA           <NA>
## 6           <NA>              <NA>                 NA           <NA>
##   n1_num_ntc_amplify n1_num_no_target_control n2_sars_cov2_error n2_ntc_amplify
## 1                 NA                       NA                 NA           <NA>
## 2                 NA                       NA                 NA           <NA>
## 3                 NA                       NA                 NA           <NA>
## 4                 NA                       NA                 NA           <NA>
## 5                 NA                       NA                 NA           <NA>
## 6                 NA                       NA                 NA           <NA>
##   n2_num_ntc_amplify n2_num_no_target_control avg_sars_cov2_conc
## 1                 NA                       NA                 NA
## 2                 NA                       NA                 NA
## 3                 NA                       NA                 NA
## 4                 NA                       NA                 NA
## 5                 NA                       NA                 NA
## 6                 NA                       NA                 NA
##   avg_sars_cov2_below_lod inhibition_detect inhibition_adjust
## 1                      NA              <NA>              <NA>
## 2                      NA              <NA>              <NA>
## 3                      NA              <NA>              <NA>
## 4                      NA              <NA>              <NA>
## 5                      NA              <NA>              <NA>
## 6                      NA              <NA>              <NA>
##   analytical_comments sample_collect_time test_result_date equiv_sewage_amt
## 1               <NA>             NA secs             <NA>               NA
## 2               <NA>             NA secs             <NA>               NA
## 3               <NA>             NA secs             <NA>               NA
## 4               <NA>             NA secs             <NA>               NA
## 5               <NA>             NA secs             <NA>               NA
## 6               <NA>             NA secs             <NA>               NA
```

This data is our most used data that is used in multiple analyses. A couple of examples are below.

WPHA Poster

SETAC Poster