

BioSense

Public Health Surveillance Through Collaboration

<https://biosen.se>

2.0

Running the MERS definition queries in Rstudio

Josh Levy

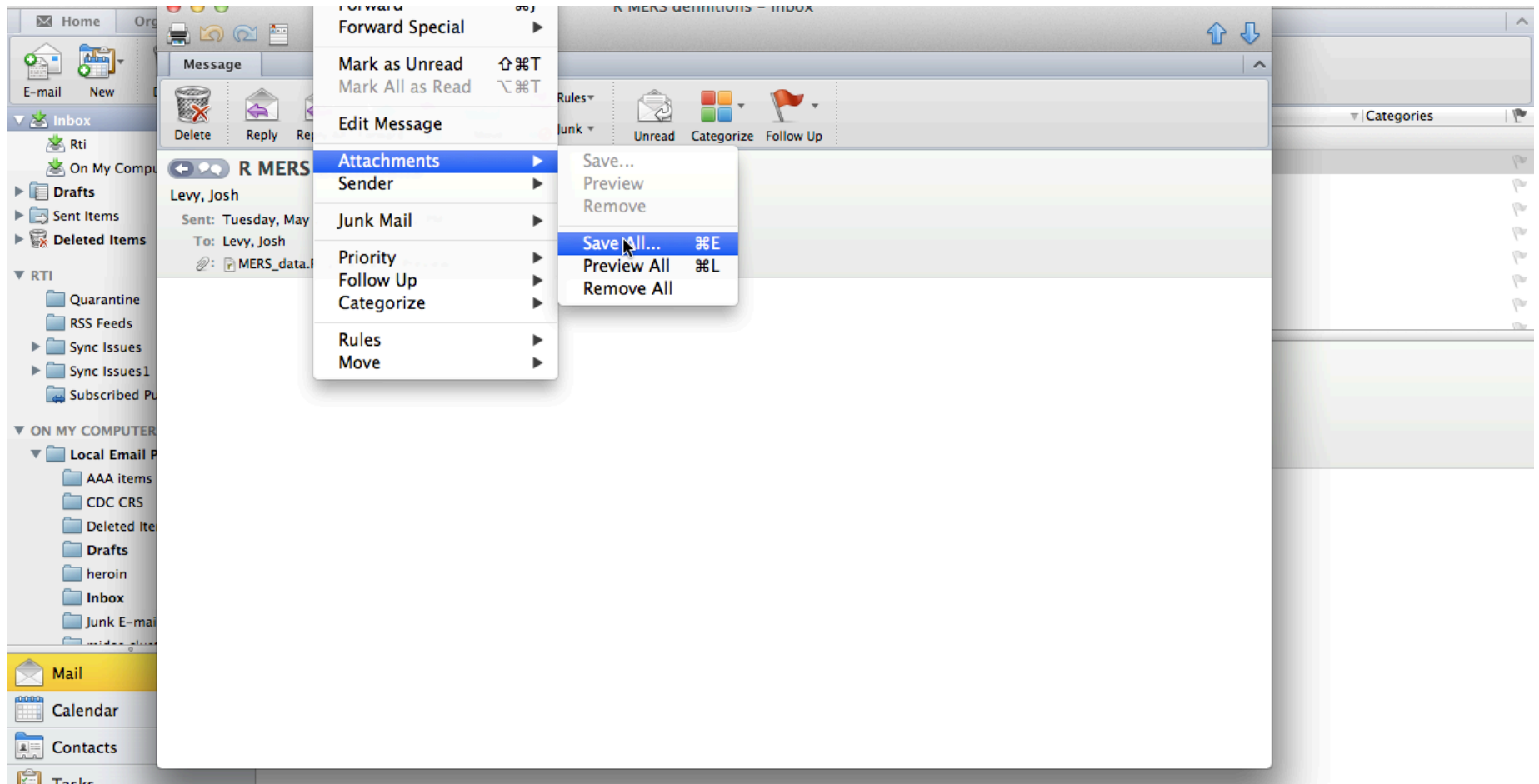
Bioinformatics Scientist

RTI International BioSense Team

Prerequisites

- ❑ An Rstudio biosense account
- ❑ Access to the raw biosense data for your site
- ❑ The name of the database and meaningful use table for your district
- ❑ All of these can be requested with a single email to
 - BioSenseProgram@cdc.gov

Save the definition R files to your computer



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2.0

Login to Rstudio: <https://adm.biosen.se/rstudio>

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Rstudio

Sign in to RStudio

Username:

jlevy

Password:

••••••••

Stay signed in

Sign In

Upload the file

The screenshot displays the RStudio environment. The main editor window shows an R script with the following code:

```
16 # create database connection
19 con <- dbConnect(dbDriver("MySQL"), user=USERNAME, password=PASSWORD, host=HOSTNAME, dbname=DBNAME)
20
21 query.mers_def1 <- paste(
22   "SELECT", |
23   columns,
24   "FROM", TABLE,
25   "WHERE",
26   "((chief_complaint REGEXP 'MERS'",
27   "AND",
28   "chief_complaint NOT REGEXP '(remmers|remers|submers|al+zh*.mers|Emers|IMERSA|immers)')",
29   "OR",
30   "(chief_complaint REGEXP '(COVI|coronavirus)')",
31   "AND",
32   "chief_complaint NOT REGEXP '(cover)')",
33   "OR",
34   "(chief_complaint REGEXP '(Oman)')",
35   "AND",
36   ...

```

The console window at the bottom is empty. The file browser on the right shows the following files:

Name	Size	modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
R		
MERS_data.r	19 KB	May 20, 2014, 3:57 PM

The 'Upload' button in the file browser is circled in red, and a tooltip 'Upload files to server' is visible over it.

Upload the file

The screenshot shows the RStudio environment with an 'Upload Files' dialog box open. The dialog box has the following content:

Upload Files

Target directory: Home

File to upload: Choose File no file selected

TIP: To upload multiple files or a directory, create a zip file. The zip file will be automatically expanded after upload.

OK Cancel

The background R script editor shows the following code:

```
16 # create database connection
19 con <- dbConnect(dbDriver("MySQL"), user=USERNAME, password=PASSWORD, host=HOSTNAME, dbname=DBNAME)
20
21 query.mers_def1 <- paste(
22 "SELECT",|
23 columns,
24 "FROM", TABLE,
25 "WHERE",
26 "((chief_complaint REGEXP 'MERS'",
27 "AND",
28 "chief_complaint NOT REGEXP '(remmers|remers|submers|A",
29 "OR",
30 "(chief_complaint REGEXP '(COVIcoronavirus)')",
31 "AND",
32 "chief_complaint NOT REGEXP '(cover)')",
33 "OR",
34 "(chief_complaint REGEXP '(Oman)')",
35 "AND",
22:12 (Top Level)
```

The file browser on the right side of the RStudio interface shows the following files:

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
R		
MERS_data.r	19 KB	May 20, 2014, 3:57 PM

Upload the file

The screenshot shows the RStudio interface with a file upload dialog box open. The dialog box displays a list of files in the 'biosense' directory. The file 'MERS_definition1.R' is selected. The dialog box has 'Cancel' and 'Choose' buttons.

Name	Date Modified
MERS_definition5.R	Today, 3:55 PM
MERS_definition4.R	Today, 3:55 PM
MERS_definition3.R	Today, 3:55 PM
MERS_definition2.R	Today, 3:54 PM
MERS_definition1.R	Today, 3:53 PM
running_MERS_definitions_in_rstudio	Today, 3:51 PM
MERS_data.R	Today, 3:31 PM
saved_queries.sql	Today, 11:16 AM
PlainEnglishMERSDefinitions.docx	May 16, 2014, 3:24 PM
Nikhil_example.R	May 16, 2014, 9:44 AM
example3.R	May 15, 2014, 3:32 PM
BioSense_RStudio_...nar_12.17.2013.ppt	Jan 8, 2014, 12:01 PM
BioSense_Webinar_...7.2013_Hopper.ppt	Dec 20, 2013, 9:07 AM
BioSense 2 0 - Creating Syndromes.pptx	Dec 20, 2013, 8:25 AM
R+Training+for+Bi...+9_7_12-SD.mp4	Jan 11, 2013, 8:16 AM
Follow-Up+R+Trai...+11_9_12-SD.mp4	Jan 10, 2013, 2:13 PM
Rintro.ppt	Nov 8, 2012, 4:57 PM

The background RStudio window shows a script editor with R code for database connection and query execution. The console at the bottom is empty.

Upload the file

The screenshot shows the RStudio interface with an 'Upload Files' dialog box open. The dialog box has the following content:

Upload Files

Target directory:
Home

File to upload:
Choose File MERS_definition1.R

TIP: To upload multiple files or a directory, create a zip file. The zip file will be automatically expanded after upload.

OK Cancel

The background shows the RStudio interface with the following elements:

- Menu bar: File, Edit, View, Project, Workspace, Plots, Tools, Help
- Workspace: Load, Save, Import Dataset, Clear All
- Files: New Folder, Upload, Delete, Rename, More
- File list:

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
R		
MERS_data.r	19 KB	May 20, 2014, 3:57 PM

Open up the file

The screenshot displays the RStudio interface. The main editor window shows an R script with the following code:

```
16 # create database connection
19 con <- dbConnect(dbDriver("MySQL"), user=USERNAME, password=PASSWORD, host=HOSTNAME, dbname=DBNAME)
20
21 query.mers_def1 <- paste(
22   "SELECT",|
23   columns,
24   "FROM", TABLE,
25   "WHERE",
26   "((chief_complaint REGEXP 'MERS'",
27   "AND",
28   "chief_complaint NOT REGEXP '(remmers|remers|submers|al+zh*.mers|Emersis|MERSA|immers)')",
29   "OR",
30   "(chief_complaint REGEXP '(COVI|coronavirus)')",
31   "AND",
32   "chief_complaint NOT REGEXP '(cover)')",
33   "OR",
34   "(chief_complaint REGEXP '(Oman)')",
35   "AND",

```

The console window at the bottom is empty, showing only the prompt character '>'. On the right side, the 'Files' pane shows a directory listing with the following table:

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
R		
MERS_data.r	1.0 KB	May 20, 2014, 3:57 PM
MERS_definition1.R	3.9 KB	May 20, 2014, 3:59 PM

The file 'MERS_definition1.R' is circled in red in the original image, and a mouse cursor is hovering over it.

Add your username and password

The screenshot shows the RStudio interface with the following R script in the editor:

```
1 library(RMySQL)
2
3 #####
4 # Connect to CookCounty_FP database
5
6 # Credentials
7
8 # change this to be the correct db you're using, and add your user/pw
9 USERNAME <- ""
10 PASSWORD <- ""
11 HOSTNAME <- "data3.biosen.se"
12 DBNAME <- "CookCounty_FP"
13 TABLE <- "CC_Meaningful_Use_Base"
14
15 # select your columns here - this is currently all columns
16 columns <- paste ("*")
17
18 # Connect to database
```

The RStudio interface includes a menu bar (File, Edit, View, Project, Workspace, Plots, Tools, Help), a toolbar with icons for file operations and running code, and a workspace panel on the right showing the current project files:

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
R		
MERS_data.r	19 KB	May 20, 2014, 3:57 PM
MERS_definition1.R	3.9 KB	May 20, 2014, 3:59 PM

Change to the correct database and table for your district
(email BioSenseProgram@cdc.gov if you don't know this)

```
1 library(RMySQL)
2
3 #####
4 # Connect to CookCounty_FP database
5
6 # Credentials
7
8 # change this to be the correct db you're using, and add your user/pw
9 USERNAME <- ""
10 PASSWORD <- ""
11 HOSTNAME <- "data3.biosen.se"
12 DBNAME <- "CookCounty_FP"
13 TABLE <- "CC_Meaningful_Use_Base"
14
15 # select your columns here - this is currently all columns
16 columns <- paste ("*")
17
```

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
R		
MERS_data.r	19 KB	May 20, 2014, 3:57 PM
MERS_definition1.R	3.9 KB	May 20, 2014, 3:59 PM

Save file: click on save icon

The screenshot displays the RStudio IDE interface. The top menu bar includes File, Edit, View, Project, Workspace, Plots, Tools, and Help. The toolbar contains icons for saving, running, and other functions. A red circle highlights the save icon (a floppy disk) in the toolbar. The script editor shows R code for connecting to a MySQL database. The file explorer on the right shows the current project structure.

```
1 # Connect to CookCounty_FP database
2
3
4 # Credentials
5
6 # change this to be the correct db you're using, and add your user/pw
7
8 USERNAME <- "jlevyRTI"
9 PASSWORD <- ""
10 HOSTNAME <- "data3.biosen.se"
11 DBNAME <- "CookCounty_FP"
12 TABLE <- "CC_Meaningful_Use_Base"
13
14 # select your columns here - this is currently all columns
15 columns <- paste ("*")
16
17 # Create database connection
18 con <- dbConnect(dbDriver("MySQL"), user=USERNAME, password=PASSWORD, host=HOSTNAME, dbname=DBNAME)
19
20
```

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
R		
MERS_data.r	19 KB	May 20, 2014, 3:57 PM
MERS_definition1.R	3.9 KB	May 20, 2014, 3:59 PM

Run script: click on “source”

The screenshot shows the RStudio interface with a script editor on the left and a workspace panel on the right. The script editor contains the following R code:

```
12 DBNAME <- "CookCounty_FP"
13 TABLE <- "CC_Meaningful_Use_Base"
14
15 # select your columns here - this is currently all columns
16 columns <- paste ("*")
17
18 # Create database connection
19 con <- dbConnect(dbDriver("MySQL"), user=USERNAME, password=PASSWORD, host=HOSTNAME, dbname=DBNAME)
20
21 query.mers_def1 <- paste(
22 "SELECT",
23 columns,
24 "FROM", TABLE,
25 "WHERE",
26 "((chief_complaint REGEXP 'MERS'",
27 "AND",
28 "chief_complaint NOT REGEXP '(remmers|remers|submers|AL+zh*..mers|Emersis|MERSA|immers)')",
```

The 'Source' button in the toolbar is circled in red. The workspace panel on the right shows the following environment variables:

Variable	Value
HOSTNAME	"data3.biosen.se"
PASSWORD	""
TABLE	"CC_Meaningful_Use_Base"
USERNAME	"jlevyRTI"
columns	"*"

The files panel on the right shows the following files:

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
R		
MERS_data.r	19 KB	May 20, 2014, 3:57 PM
MERS_definition1.R	3.9 KB	May 20, 2014, 3:59 PM

Wait ... it can take a while (definition 1 took me about 13 minutes on the Cook County site)

The screenshot shows the RStudio interface with the following components:

- Source Editor:** Contains R code for connecting to a MySQL database and executing a query.


```

12 DBNAME <- "CookCounty_FP"
13 TABLE <- "CC_Meaningful_Use_Base"
14
15 # select your columns here - this is currently all columns
16 columns <- paste ("*")
17
18 # Create database connection
19 con <- dbConnect(dbDriver("MySQL"), user=USERNAME, password=PASSWORD, host=HOSTNAME, dbname=DBNAME)
20
21 query.mers_def1 <- paste(
22   "SELECT",
23   columns,
24   "FROM", TABLE,
25   "WHERE",
26   "((chief_complaint REGEXP 'MERS',
27   "AND",
28   "chief_complaint NOT REGEXP '(remmers|remers|submers|Al+zh*.mers|Emers|EMERS|immers)')",

```
- Workspace:** Shows the environment with the following values:

Variable	Value
DBNAME	"CookCounty_FP"
HOSTNAME	"data3.biosen.se"
PASSWORD	""
TABLE	"CC_Meaningful_Use_Base"
USERNAME	"jlevyRTI"
columns	"*"
- Files:** Lists the current project files:

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
R		
MERS_data.r	19 KB	May 20, 2014, 3:57 PM
MERS_definition1.R	3.9 KB	May 20, 2014, 3:59 PM
- Console:** Shows the output of the query execution, which is a long SQL query string:


```

'(remmers|remers|submers|Al+zh*.mers|Emers|EMERS|immers)') OR (chief_complaint REGEXP '(COV|coronavirus)' AND
chief_complaint NOT REGEXP '(cover)') OR (chief_complaint REGEXP '(Oman)' AND chief_complaint NOT REGEXP
'(Abdoman|Hemotoman|Temporomandibular|trichoman|Hypomania|woman|ottoman|otoman)') OR (chief_complaint REGEXP
'(Camel|MiddleEast|Middle East|Arabian|AbuDhabi|Abu Dhabi|Egypt|Jordan|Kuwait|Qatar|UAE|United Arab
Emirates|Bahrain|Iraq|Iran|Israel|Lebanon|Palestin|Saudi|Syria|Yemen)') OR ((clinical_impression REGEXP 'MERS' AND
clinical_impression NOT REGEXP '(remmers|remers|submers|Al+zh*.mers|Emers|EMERS|immers)') OR (clinical_impression
REGEXP '(COV|coronavirus)' AND clinical_impression NOT REGEXP '(cover)') OR (clinical_impression REGEXP '(Oman)' AND
clinical_impression NOT REGEXP '(Abdoman|Hemotoman|Temporomandibular|trichoman|Hypomania|woman|ottoman|otoman)') OR
(cclinical_impression REGEXP '(Camel|MiddleEast|Middle East|Arabian|AbuDhabi|Abu
Dhabi|Egypt|Jordan|Kuwait|Qatar|UAE|United Arab

```

You may see this message, just click to get rid of it, then ignore

The screenshot shows the RStudio interface with a script editor, a console, and a workspace pane. An error dialog box is overlaid on the script editor.

Script Editor (R Script):

```

12 DBNAME <- "CookCounty_FP"
13 TABLE <- "CC_Meaningful_Use_Base"
14
15 # select your columns here - this is currently all columns
16 columns <- paste ("*")
17
18 # Create database connection
19 con <- dbConnect(dbDriver("MySQL"), user=USERNAME, password=PASSWORD, host=HOSTNAME, dbname=DBNAME)
20
21 query.mers_def1 <- paste(
22   "SELECT",
23   columns,
24   "FROM", TABLE,
25   "WHERE",
26   "(Cchief_complaint REGEXP 'MERS'",
27   "AND",
28   "chief_complaint NOT REGEXP '(remmers|remers|submers|A|zh*.mers|Emers|MERS|immers)' );"

```

Console:

```

clinical_impression NOT REGEXP '(remmers|remers|submers|A|zh*.mers|Emers|MERS|immers)' OR (clinical_impression
REGEXP '(COV|coronavirus)' AND clinical_impression NOT REGEXP '(cover)') OR (clinical_impression REGEXP '(Oman)' AND
clinical_impression NOT REGEXP '(Abdoman|Hemotoman|Temporomandibular|trichoman|Hypomania|woman|ottoman|otoman)' OR
(cclinical_impression REGEXP '(Camel|MiddleEast|Middle East|Arabian|AbuDhabi|Abu
Dhabi|Egypt|Jordan|Kuwait|Qatar|UAE|United Arab
Emirates|Bahrain|Iraq|Iran|Israel|Lebanon|Palestin|Saudi|Syria|Yemen)')) ;"
Error in charToDate(x) :
  character string is not in a standard unambiguous format
In addition: Warning message:
In mysqlExecStatement(conn, statement, ...) :

```

Error Dialog Box:

Error Saving File
 Status code 502 returned
 OK

Workspace Pane:

df.mers_def1 191 obs. of 64 variables

Files Pane:

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
R		
MERS_data.r	19 KB	May 20, 2014, 3:57 PM
MERS_definition1.R	3.9 KB	May 20, 2014, 4:13 PM

When it's done running, you should see a .csv file on the right

The screenshot displays the RStudio environment. The main editor shows R code for data aggregation and saving to a CSV file. The console shows the execution output. The workspace pane on the right lists the objects created, and the file explorer pane shows the resulting files, with `MERS_definition1.csv` highlighted.

```
78 # aggregate
79 def1_aggregated<-aggregate(df.mers_def1, by=list(df.mers_def1$Unique_Visiting_ID), c)
80 # it split cells into lists, need to get unique elements
81 def1_processed<-data.frame(matrix(nrow=nrow(def1_aggregated), ncol=ncol(def1_aggregated)))
82 colnames(def1_processed)<-colnames(def1_aggregated)
83 for (x in 1:nrow(def1_aggregated)) {
84   for (y in 1:ncol(def1_aggregated)) {
85     def1_processed[x,y]=paste(unique(def1_aggregated[,y][[x]]),collapse=",")
86   }
87 }
88 # so def1_processed contains de-duplicated data with non-unique values, but because some of the data are concatenated with a comma, all the cells are text
89 # def1_aggregated has the collapsed cells in lists, which can be really annoying to work with
90
91 # save to file
92 write.csv(def1_processed, file="MERS_definition1.csv", row.names=FALSE)
93
94
```

Workspace:

Object	Size	Variables
def1_aggregated	129 obs.	65 variables
def1_processed	129 obs.	65 variables
df.mers_def1	191 obs.	64 variables

Files:

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
MERS_data.r	1.9 KB	May 20, 2014, 3:57 PM
MERS_definition1.R	3.9 KB	May 20, 2014, 4:16 PM
R		
MERS_definition1.csv	89.8 KB	May 20, 2014, 4:17 PM

Download the .csv: check the file

The screenshot displays the RStudio environment. The main editor window shows R code for converting date variables to Date type and creating a data frame. The console window shows the execution of the code, including a warning message about concatenated data. The Files pane on the right shows the workspace contents, with the file `MERS_definition1.csv` highlighted by a red circle.

```
61 df.mers_def1$Message_Date_Time <- as.Date(df.mers_def1$Message_Date_Time)
62 df.mers_def1$Visit_Date_Time <- as.Date(df.mers_def1$Visit_Date_Time)
63 df.mers_def1$Diagnosis_Date_Time <- as.Date(df.mers_def1$Diagnosis_Date_Time)
64 df.mers_def1$Procedure_Date_Time <- as.Date(df.mers_def1$Procedure_Date_Time)
65 df.mers_def1$Date_Created <- as.Date(df.mers_def1$Date_Created)
66 df.mers_def1$Observation_Date_Time <- as.Date(df.mers_def1$Observation_Date_Time)
67 df.mers_def1$Date_of_Onset <- as.Date(df.mers_def1$Date_of_Onset)
68 df.mers_def1$Death_Date_Time <- as.Date(df.mers_def1$Death_Date_Time)
69 df.mers_def1$Earliest_Date_Time <- as.Date(df.mers_def1$Earliest_Date_Time)
70 df.mers_def1$Admit_Date_Time <- as.Date(df.mers_def1$Admit_Date_Time)
71 df.mers_def1$Event_Date_Time <- as.Date(df.mers_def1$Event_Date_Time)
72 df.mers_def1$Report_Date_Time <- as.Date(df.mers_def1$Report_Date_Time)
73 df.mers_def1$Disposition_Date_Time <- as.Date(df.mers_def1$Disposition_Date_Time)
74
75 dbDisconnect(con)
76
77 # aggregate
78
79 # so def1_processed contains de-duplicated data with non-unique values, but because some of the data are
80 # concatenated with a comma, all the cells ar .... [TRUNCATED]
Warning message:
In mysqlExecStatement(conn, statement, ...) :
```

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
MERS_data.r	19 KB	May 20, 2014, 3:57 PM
MERS_definition1.R	3.8 KB	May 20, 2014, 4:19 PM
MERS_definition1.csv	87.5 KB	May 20, 2014, 4:20 PM

Download the .csv: click More

The screenshot displays the RStudio environment. The main editor window contains R code for data manipulation, including date conversions and data aggregation. The console shows the execution of these commands, resulting in a warning message about concatenated data. The file browser on the right side of the interface lists several files, with the 'More' button next to the 'MERS_definition1.csv' file circled in red, indicating the action to be taken to download the file.

```
61 df.mers_def1$Message_Date_Time <- as.Date(df.mers_def1$Message_Date_Time)
62 df.mers_def1$Visit_Date_Time <- as.Date(df.mers_def1$Visit_Date_Time)
63 df.mers_def1$Diagnosis_Date_Time <- as.Date(df.mers_def1$Diagnosis_Date_Time)
64 df.mers_def1$Procedure_Date_Time <- as.Date(df.mers_def1$Procedure_Date_Time)
65 df.mers_def1$Date_Created <- as.Date(df.mers_def1$Date_Created)
66 df.mers_def1$Observation_Date_Time <- as.Date(df.mers_def1$Observation_Date_Time)
67 df.mers_def1$Date_of_Onset <- as.Date(df.mers_def1$Date_of_Onset)
68 df.mers_def1$Death_Date_Time <- as.Date(df.mers_def1$Death_Date_Time)
69 df.mers_def1$Earliest_Date_Time <- as.Date(df.mers_def1$Earliest_Date_Time)
70 df.mers_def1$Admit_Date_Time <- as.Date(df.mers_def1$Admit_Date_Time)
71 df.mers_def1$Event_Date_Time <- as.Date(df.mers_def1$Event_Date_Time)
72 df.mers_def1$Report_Date_Time <- as.Date(df.mers_def1$Report_Date_Time)
73 df.mers_def1$Disposition_Date_Time <- as.Date(df.mers_def1$Disposition_Date_Time)
74
75 dbDisconnect(con)
76
77 # aggregate
78
79 # so def1_processed contains de-duplicated data with non-unique values, but because some of the data are
80 # concatenated with a comma, all the cells ar .... [TRUNCATED]
81 Warning message:
82 In mysqlExecStatement(conn, statement, ...) :
```

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
MERS_data.r	19 KB	May 20, 2014, 3:57 PM
MERS_definition1.R	3.8 KB	May 20, 2014, 4:19 PM
R		
MERS_definition1.csv	87.5 KB	May 20, 2014, 4:20 PM

Click Export

The screenshot displays the RStudio environment with the following components:

- Script Editor:** Contains R code for converting date-time strings to Date objects for various fields in a data frame.
- Console:** Shows the execution of `colnames(def1_processed) <- colnames(def1_aggregated)` and a loop that processes data, resulting in a warning message about concatenated cells.
- Workspace:** Lists data objects: `def1_aggregated` (129 obs. of 65 variables), `def1_processed` (129 obs. of 65 variables), and `df.mers_def1` (191 obs. of 64 variables).
- Files Panel:** Shows a file browser with a context menu open over the `MERS_definition1.R` file. The `Export...` option is circled in red.

```
61 df.mers_def1$Message_Date_Time <- as.Date(df.mers_def1$Message_Date_Time)
62 df.mers_def1$Visit_Date_Time <- as.Date(df.mers_def1$Visit_Date_Time)
63 df.mers_def1$Diagnosis_Date_Time <- as.Date(df.mers_def1$Diagnosis_Date_Time)
64 df.mers_def1$Procedure_Date_Time <- as.Date(df.mers_def1$Procedure_Date_Time)
65 df.mers_def1$Date_Created <- as.Date(df.mers_def1$Date_Created)
66 df.mers_def1$Observation_Date_Time <- as.Date(df.mers_def1$Observation_Date_Time)
67 df.mers_def1$Date_of_Onset <- as.Date(df.mers_def1$Date_of_Onset)
68 df.mers_def1$Death_Date_Time <- as.Date(df.mers_def1$Death_Date_Time)
69 df.mers_def1$Earliest_Date_Time <- as.Date(df.mers_def1$Earliest_Date_Time)
70 df.mers_def1$Admit_Date_Time <- as.Date(df.mers_def1$Admit_Date_Time)
71 df.mers_def1$Event_Date_Time <- as.Date(df.mers_def1$Event_Date_Time)
72 df.mers_def1$Report_Date_Time <- as.Date(df.mers_def1$Report_Date_Time)
73 df.mers_def1$Disposition_Date_Time <- as.Date(df.mers_def1$Disposition_Date_Time)
74
75 dbDisconnect(con)
76
77 # aggregate
78
79
```

```
> colnames(def1_processed) <- colnames(def1_aggregated)
> for (x in 1:nrow(def1_aggregated)) {
+   for (y in 1:ncol(def1_aggregated)) {
+     def1_processed[x,y] = paste(unique(def1_aggregated[,y][[x]]), collapse = ",")
+   }
+ }
Warning message:
In mysqlExecStatement(conn, statement, ...) :
```

Workspace	History
def1_aggregated	129 obs. of 65 variables
def1_processed	129 obs. of 65 variables
df.mers_def1	191 obs. of 64 variables

Files	Plots	Packages	Help
Home			
.Rprofile			
biosense_test.R			
MERS_data.r			
MERS_definition1.R			
R			
MERS_definition1.csv			

Download .csv

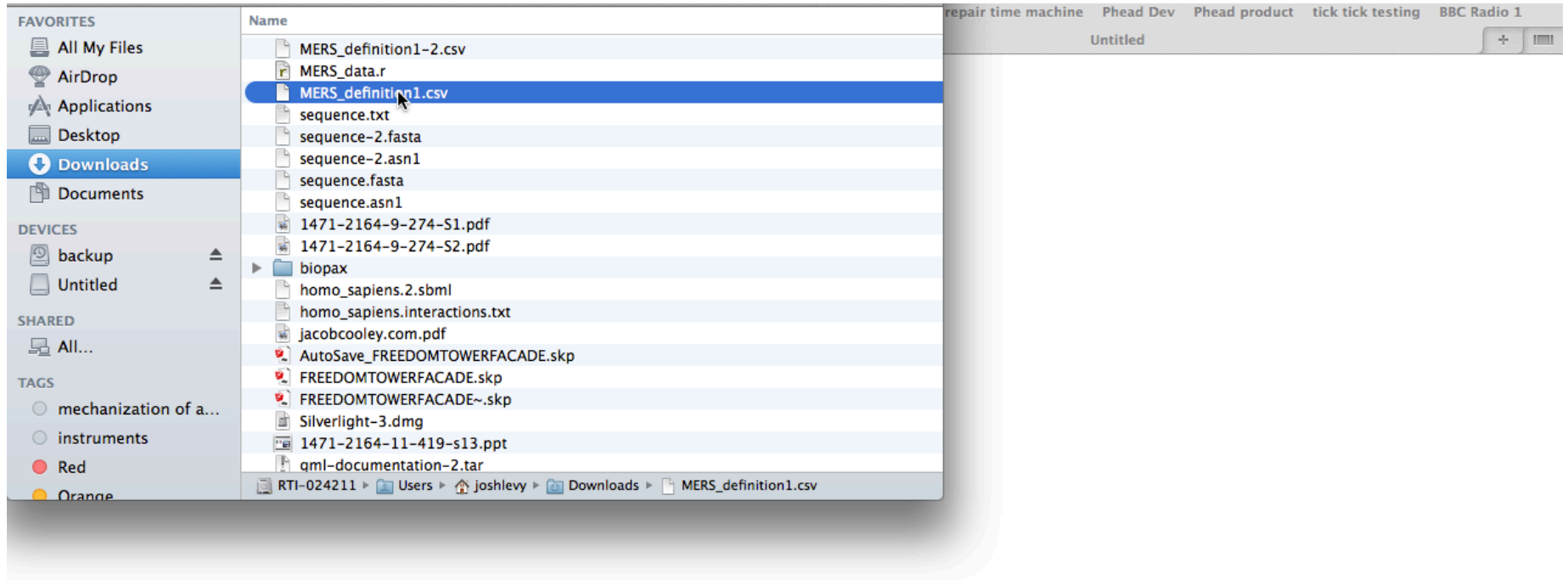
The screenshot displays the RStudio interface. The script editor shows R code for converting date variables in a data frame to Date objects. The console shows the execution of a loop that processes data from 'def1_aggregated' and writes it to 'def1_processed'. A dialog box titled 'Export Files' is open, showing the file 'MERS_definition1.csv' selected for download. The 'Download' button is circled in red. The file browser on the right shows the file 'MERS_definition1.csv' (87.5 KB) has been successfully downloaded.

```
61 df.mers_def1$Message_Date_Time <- as.Date(df.mers_def1$Message_Date_Time)
62 df.mers_def1$Visit_Date_Time <- as.Date(df.mers_def1$Visit_Date_Time)
63 df.mers_def1$Diagnosis_Date_Time <- as.Date(df.mers_def1$Diagnosis_Date_Time)
64 df.mers_def1$Procedure_Date_Time <- as.Date(df.mers_def1$Procedure_Date_Time)
65 df.mers_def1$Date_Created <- as.Date(df.mers_def1$Date_Created)
66 df.mers_def1$Observation_Date_Time <- as.Date(df.mers_def1$Observation_Date_Time)
67 df.mers_def1$Date_of_Onset <- as.Date(df.mers_def1$Date_of_Onset)
68 df.mers_def1$Death_Date_Time <- as.Date(df.mers_def1$Death_Date_Time)
69 df.mers_def1$Earliest_Date_Time <- as.Date(df.mers_def1$Earliest_Date_Time)
70 df.mers_def1$Admit_Date_Time <- as.Date(df.mers_def1$Admit_Date_Time)
71 df.mers_def1$Event_Date_Time <- as.Date(df.mers_def1$Event_Date_Time)
72 df.mers_def1$Report_Date_Time <- as.Date(df.mers_def1$Report_Date_Time)
73 df.mers_def1$Disposition_Date_Time <- as.Date(df.mers_def1$Disposition_Date_Time)
74
75 dbDisconnect(con)
76
77 # aggregate
78
```

```
> colnames(def1_processed) <- colnames(def1_aggregated)
> for (x in 1:nrow(def1_aggregated)) {
+   for (y in 1:ncol(def1_aggregated)) {
+     def1_processed[x,y] = paste(unique(def1_aggregated[x,y][[x]]), collapse = ",")
+   }
+ }
> # so def1_processed contains de-duplicated data with non-unique values, but because some of the data are
concatenated with a comma, all the cells are unique
Warning message:
In mysqlExecStatement(conn, statement, ...) :
```

Name	Size	Modified
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
MERS_data.r	19 KB	May 20, 2014, 3:57 PM
MERS_definition1.R	3.8 KB	May 20, 2014, 4:19 PM
R		
MERS_definition1.csv	87.5 KB	May 20, 2014, 4:20 PM

Open in excel



Final file

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
	Group.1	Row_Numbe	Date_Creates	Updated_Vis	Update_Date	Patient_Mes	Stage_1_Rov	Source_File	Feed_Name	Channel_Nar	Earliest_Date	Admit_Date	Event_Date	Message_Da	Observation	Unique_Visit	FacilityID_U	Facility_Nam	Facility_Stre
2	CC_ILABMER	1859729	6/2/13	0	0000-00-00	1	1986518	ILCC_2013-0	NA	NA	12/31/12	12/31/12	NA	1/1/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
3	CC_ILABMER	#####	6/1/13	0	0000-00-00	1	#####	ILCC_2012-1	NA	NA	12/17/12	12/17/12	NA	12/18/12	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
4	CC_ILABMER	#####	1/27/14	0	0000-00-00	1	#####	ILCC_2014-0	NA	NA	1/26/14	1/26/14	NA	2014-01-26	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
5	CC_ILABMER	#####	6/25/13	0	0000-00-00	1	#####	ILCC_2013-0	NA	NA	6/17/13	6/17/13	NA	6/18/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
6	CC_ILABMER	367444	5/30/13	0	0000-00-00	1	367312	ILCC_2012-0	NA	NA	6/30/12	6/30/12	NA	7/1/12	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
7	CC_ILABMER	2218936	6/2/13	0	0000-00-00	1	2346210	ILCC_2013-0	NA	NA	2/17/13	2/17/13	NA	2/18/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
8	CC_ILABMER	2376833	6/2/13	0	0000-00-00	1	2504352	ILCC_2013-0	NA	NA	3/11/13	3/11/13	NA	3/12/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
9	CC_ILABMER	#####	6/2/13	0	0000-00-00	1	#####	ILCC_2012-1	NA	NA	12/22/12	12/22/12	NA	12/23/12	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
10	CC_ILABMER	4790042	12/18/13	0	0000-00-00	1	5208336	ILCC_2013-1	NA	NA	10/30/13	10/30/13	NA	10/31/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
11	CC_ILABMER	#####	6/1/13	0	0000-00-00	1	#####	ILCC_2012-1	NA	NA	11/21/12	11/21/12	NA	11/21/12	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
12	CC_ILABMER	#####	2013-07-17	0	0000-00-00	1	#####	ILCC_2013-0	NA	NA	7/16/13	7/16/13	NA	7/17/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
13	CC_ILABMER	2254166	6/2/13	0	0000-00-00	1	2381581	ILCC_2013-0	NA	NA	2/22/13	2/22/13	NA	2/22/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
14	CC_ILABMER	2018045	6/2/13	0	0000-00-00	1	2145496	ILCC_2013-0	NA	NA	1/20/13	1/20/13	NA	1/21/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
15	CC_ILABMER	1923656	6/2/13	0	0000-00-00	1	2051095	ILCC_2013-0	NA	NA	1/9/13	1/9/13	NA	1/9/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
16	CC_ILABMER	2319561	6/2/13	0	0000-00-00	1	2446898	ILCC_2013-0	NA	NA	3/3/13	3/3/13	NA	3/4/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
17	CC_ILABMER	683014	5/31/13	0	0000-00-00	1	682613	ILCC_2012-0	NA	NA	8/12/12	8/12/12	NA	8/12/12	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
18	CC_ILABMER	1787407	6/2/13	0	0000-00-00	1	1914779	ILCC_2012-1	NA	NA	12/22/12	12/22/12	NA	12/23/12	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
19	CC_ILABMER	#####	6/1/13	0	0000-00-00	1	#####	ILCC_2012-1	NA	NA	12/13/12	12/13/12	NA	2012-12-13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
20	CC_ILABMER	#####	2013-09-23	0	0000-00-00	1	#####	ILCC_2013-0	NA	NA	9/20/13	9/20/13	NA	9/20/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
21	CC_ILABMER	#####	6/1/13	0	0000-00-00	1	#####	ILCC_2012-1	NA	NA	10/5/12	10/5/12	NA	10/6/12	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
22	CC_ILABMER	#####	5/31/13	0	0000-00-00	1	#####	ILCC_2012-0	NA	NA	8/30/12	8/30/12	NA	2012-08-30	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
23	CC_ILABMER	#####	6/3/13	0	0000-00-00	1	#####	ILCC_2013-0	NA	NA	5/9/13	5/9/13	NA	5/10/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
24	CC_ILABMER	#####	2013-09-27	0	0000-00-00	1	#####	ILCC_2013-0	NA	NA	9/26/13	9/26/13	NA	9/26/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
25	CC_ILABMER	4764886	12/18/13	0	0000-00-00	1	5183486	ILCC_2013-1	NA	NA	10/27/13	10/27/13	NA	10/28/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
26	CC_ILABMER	#####	6/3/13	0	0000-00-00	1	#####	ILCC_2013-0	NA	NA	5/13/13	5/13/13	NA	5/14/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
27	CC_ILABMER	619208	5/31/13	0	0000-00-00	1	618948	ILCC_2012-0	NA	NA	8/4/12	8/4/12	NA	8/6/12	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
28	CC_ILABMER	#####	6/2/13	0	0000-00-00	1	#####	ILCC_2013-0	NA	NA	4/4/13	4/4/13	NA	4/5/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
29	CC_ILABMER	#####	6/2/13	0	0000-00-00	1	#####	ILCC_2012-1	NA	NA	12/18/12	12/18/12	NA	12/19/12	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
30	CC_ILABMER	618222	5/31/13	0	0000-00-00	1	618668	ILCC_2012-0	NA	NA	8/4/12	8/4/12	NA	8/6/12	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
31	CC_ILABMER	#####	6/2/13	0	0000-00-00	1	#####	ILCC_2013-0	NA	NA	2/15/13	2/15/13	NA	2/16/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
32	CC_ILABMER	4902934	12/18/13	0	0000-00-00	1	5321134	ILCC_2013-1	NA	NA	11/15/13	11/15/13	NA	11/18/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
33	CC_ILABMER	#####	12/18/13	0	0000-00-00	1	#####	ILCC_2013-1	NA	NA	11/14/13	11/14/13	NA	11/15/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
34	CC_ILABMER	3067153	6/12/13	0	0000-00-00	1	3194378	ILCC_2013-0	NA	NA	6/12/13	6/12/13	NA	6/12/13	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	
35	CC_ILABMER	#####	1/22/14	0	0000-00-00	1	#####	ILCC_2014-0	NA	NA	1/21/14	1/21/14	NA	1/22/14	NA	CC_ILABMER ILABMERCC	Alexian Broth	NA	

BioSense

Public Health Surveillance Through Collaboration

<https://biosen.se>

2.0

Running concurrent MERS definition queries

You can also run all of the MERS definitions concurrently in Rstudio to save time

- ❑ Make sure you have uploaded the R scripts to Rstudio
- ❑ In the bottom window, enter the command:

```
system("Rscript -e 'source(\"MERS_definition1.R\")'", wait=FALSE)
```

- ❑ (See next slide for screenshot)
- ❑ Repeat for as many of the 5 definitions as you want to run at one time, changing the name of the command to match the definition

Enter the command at the prompt in the lower left hand window

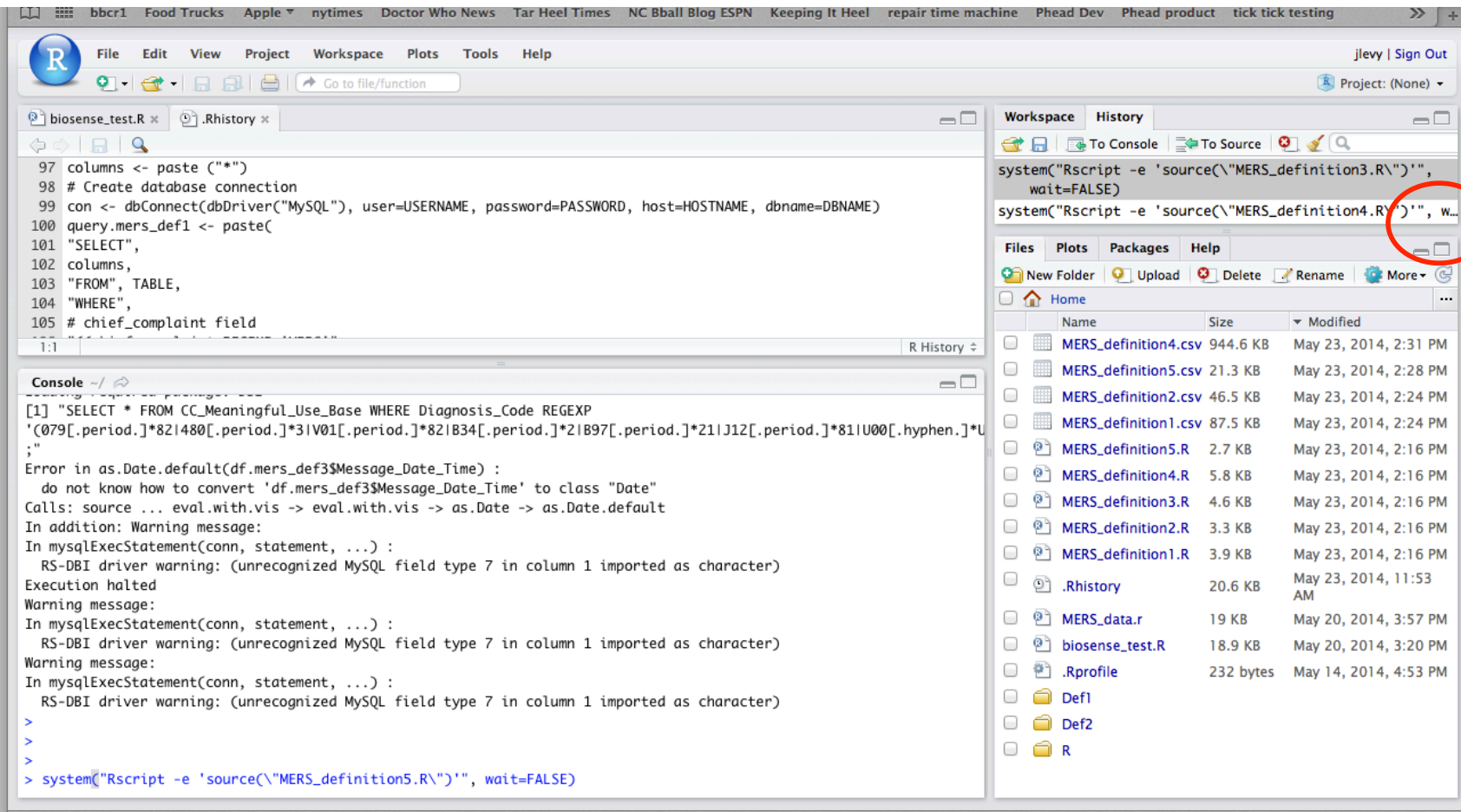
The screenshot displays the RStudio environment. The script editor on the left contains R code for connecting to a MySQL database and executing a query. The console window below it shows the execution of the query, resulting in an error message: "Error in as.Date.default(df.mers_def3\$Message_Date_Time) : do not know how to convert 'df.mers_def3\$Message_Date_Time' to class 'Date'". The error message is circled in red. The workspace on the right shows a list of files, including MERS_definition1.csv through MERS_definition5.csv, MERS_definition1.R through MERS_definition5.R, .Rhistory, MERS_data.r, biosense_test.R, .rprofile, Def1, Def2, and R.

```
97 columns <- paste ("*")
98 # Create database connection
99 con <- dbConnect(dbDriver("MySQL"), user=USERNAME, password=PASSWORD, host=HOSTNAME, dbname=DBNAME)
100 query.mers_def1 <- paste(
101 "SELECT",
102 columns,
103 "FROM", TABLE,
104 "WHERE",
105 # chief_complaint field
106 "AND", chief_complaint, "IN", paste(columns, collapse="|"),
107 "ORDER BY", chief_complaint, "ASC")
108 # Execute query
109 df.mers_def1 <- dbGetQuery(con, query.mers_def1)
110 # Print results
111 print(df.mers_def1)
```

```
[1] "SELECT * FROM CC_Meaningful_Use_Base WHERE Diagnosis_Code REGEXP
'(079[.period.]*821480[.period.]*31V01[.period.]*821B34[.period.]*21B97[.period.]*211J12[.period.]*811U00[.hyphen.]*U
;"
Error in as.Date.default(df.mers_def3$Message_Date_Time) :
do not know how to convert 'df.mers_def3$Message_Date_Time' to class "Date"
Calls: source ... eval.with.vis -> eval.with.vis -> as.Date -> as.Date.default
In addition: Warning message:
In mysqlExecStatement(conn, statement, ...) :
RS-DBI driver warning: (unrecognized MySQL field type 7 in column 1 imported as character)
Execution halted
Warning message:
In mysqlExecStatement(conn, statement, ...) :
RS-DBI driver warning: (unrecognized MySQL field type 7 in column 1 imported as character)
Warning message:
In mysqlExecStatement(conn, statement, ...) :
RS-DBI driver warning: (unrecognized MySQL field type 7 in column 1 imported as character)
>
>
>
> system("Rscript -e 'source(\"MERS_definition5.R\")'", wait=FALSE)
```

Name	Size	Modified
MERS_definition4.csv	944.6 KB	May 23, 2014, 2:31 PM
MERS_definition5.csv	21.3 KB	May 23, 2014, 2:28 PM
MERS_definition2.csv	46.5 KB	May 23, 2014, 2:24 PM
MERS_definition1.csv	87.5 KB	May 23, 2014, 2:24 PM
MERS_definition5.R	2.7 KB	May 23, 2014, 2:16 PM
MERS_definition4.R	5.8 KB	May 23, 2014, 2:16 PM
MERS_definition3.R	4.6 KB	May 23, 2014, 2:16 PM
MERS_definition2.R	3.3 KB	May 23, 2014, 2:16 PM
MERS_definition1.R	3.9 KB	May 23, 2014, 2:16 PM
.Rhistory	20.6 KB	May 23, 2014, 11:53 AM
MERS_data.r	19 KB	May 20, 2014, 3:57 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
.rprofile	232 bytes	May 14, 2014, 4:53 PM
Def1		
Def2		
R		

Use the refresh button to check if the output .csv file is available



The screenshot shows the RStudio interface. The script editor contains the following code:

```
97 columns <- paste ("*")
98 # Create database connection
99 con <- dbConnect(dbDriver("MySQL"), user=USERNAME, password=PASSWORD, host=HOSTNAME, dbname=DBNAME)
100 query.mers_def1 <- paste(
101 "SELECT",
102 columns,
103 "FROM", TABLE,
104 "WHERE",
105 # chief_complaint field
```

The console shows the following error message:

```
[1] "SELECT * FROM CC_Meaningful_Use_Base WHERE Diagnosis_Code REGEXP
'(079[.period.]*821480[.period.]*31V01[.period.]*821B34[.period.]*21B97[.period.]*211J12[.period.]*811U00[.hyphen.]*
;"
Error in as.Date.default(df.mers_def3$Message_Date_Time) :
do not know how to convert 'df.mers_def3$Message_Date_Time' to class "Date"
Calls: source ... eval.with.vis -> eval.with.vis -> as.Date -> as.Date.default
In addition: Warning message:
In mysqlExecStatement(conn, statement, ...) :
RS-DBI driver warning: (unrecognized MySQL field type 7 in column 1 imported as character)
Execution halted
Warning message:
In mysqlExecStatement(conn, statement, ...) :
RS-DBI driver warning: (unrecognized MySQL field type 7 in column 1 imported as character)
Warning message:
In mysqlExecStatement(conn, statement, ...) :
RS-DBI driver warning: (unrecognized MySQL field type 7 in column 1 imported as character)
>
>
> system("Rscript -e 'source(\"MERS_definition5.R\")'", wait=FALSE)
```

The file browser on the right shows a list of files:

Name	Size	Modified
MERS_definition4.csv	944.6 KB	May 23, 2014, 2:31 PM
MERS_definition5.csv	21.3 KB	May 23, 2014, 2:28 PM
MERS_definition2.csv	46.5 KB	May 23, 2014, 2:24 PM
MERS_definition1.csv	87.5 KB	May 23, 2014, 2:24 PM
MERS_definition5.R	2.7 KB	May 23, 2014, 2:16 PM
MERS_definition4.R	5.8 KB	May 23, 2014, 2:16 PM
MERS_definition3.R	4.6 KB	May 23, 2014, 2:16 PM
MERS_definition2.R	3.3 KB	May 23, 2014, 2:16 PM
MERS_definition1.R	3.9 KB	May 23, 2014, 2:16 PM
.Rhistory	20.6 KB	May 23, 2014, 11:53 AM
MERS_data.r	19 KB	May 20, 2014, 3:57 PM
biosense_test.R	18.9 KB	May 20, 2014, 3:20 PM
.Rprofile	232 bytes	May 14, 2014, 4:53 PM
Def1		
Def2		
R		

A red circle highlights the refresh button in the file browser.