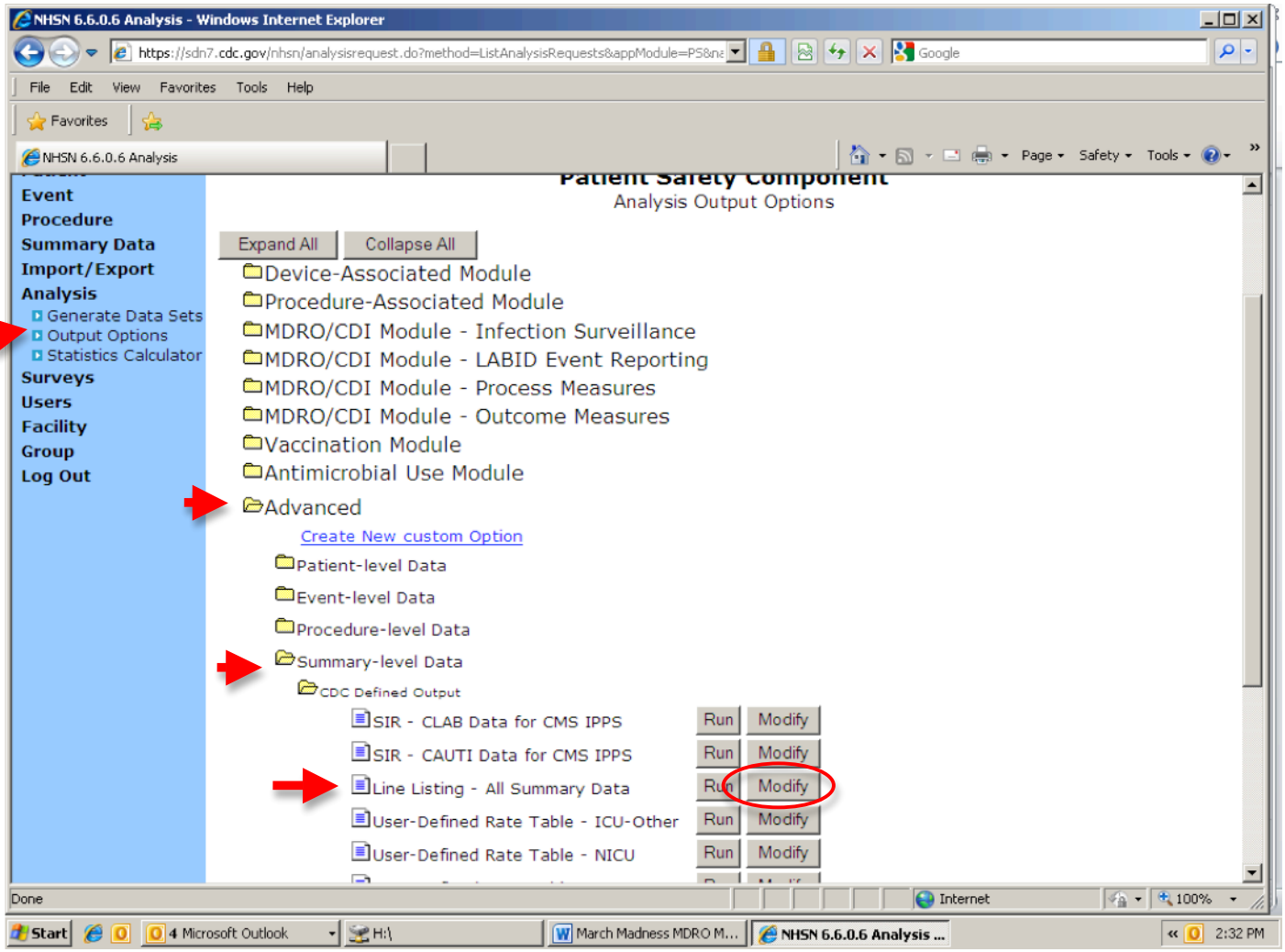
Using NHSN Analysis to Understand MDRO and CDI LabID Data

The NHSN MDRO/CDI Module has two different options for performing surveillance and reporting: Active Infection surveillance and LabID event reporting. For the purposes of public reporting, acute care hospitals in California are required to use **LabID reporting** for MRSA BSI, VRE BSI, and CDI. LabID surveillance differs from both device- associated (e.g. CLABSI) and procedure- associated (e.g. SSI) surveillance in that it measures the burden of MDRO/CDI in a hospital using the availability of positive laboratory findings. Hospitals can use these LabID data to describe both the prevalence and incidence of CDI and MRSA/VRE BSI in the hospital.

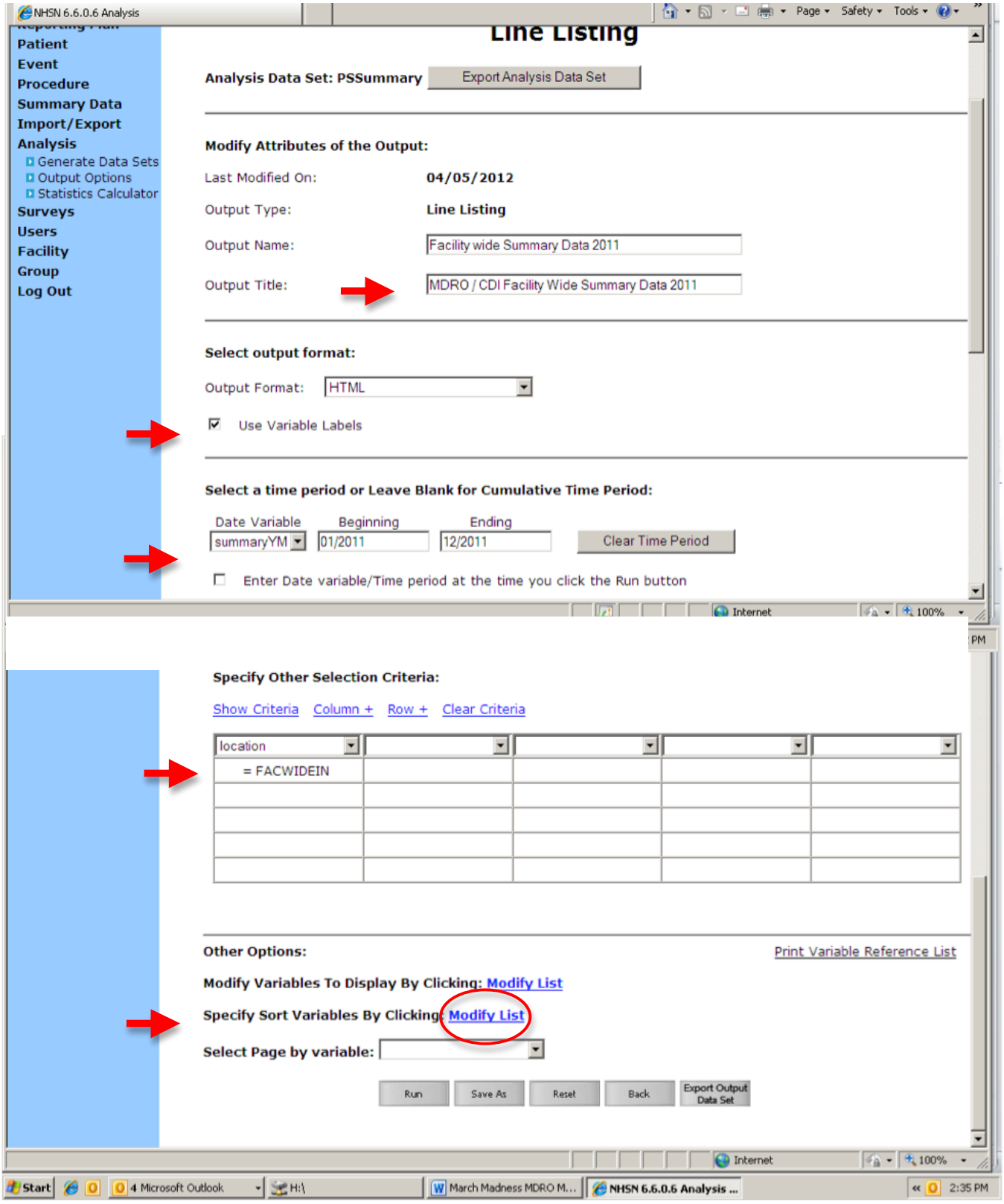
Using Output Options to Review Facility-wide Summary Data

To run any Analysis in NHSN, you must Generate a data set. Generate a new data set after entering new data.

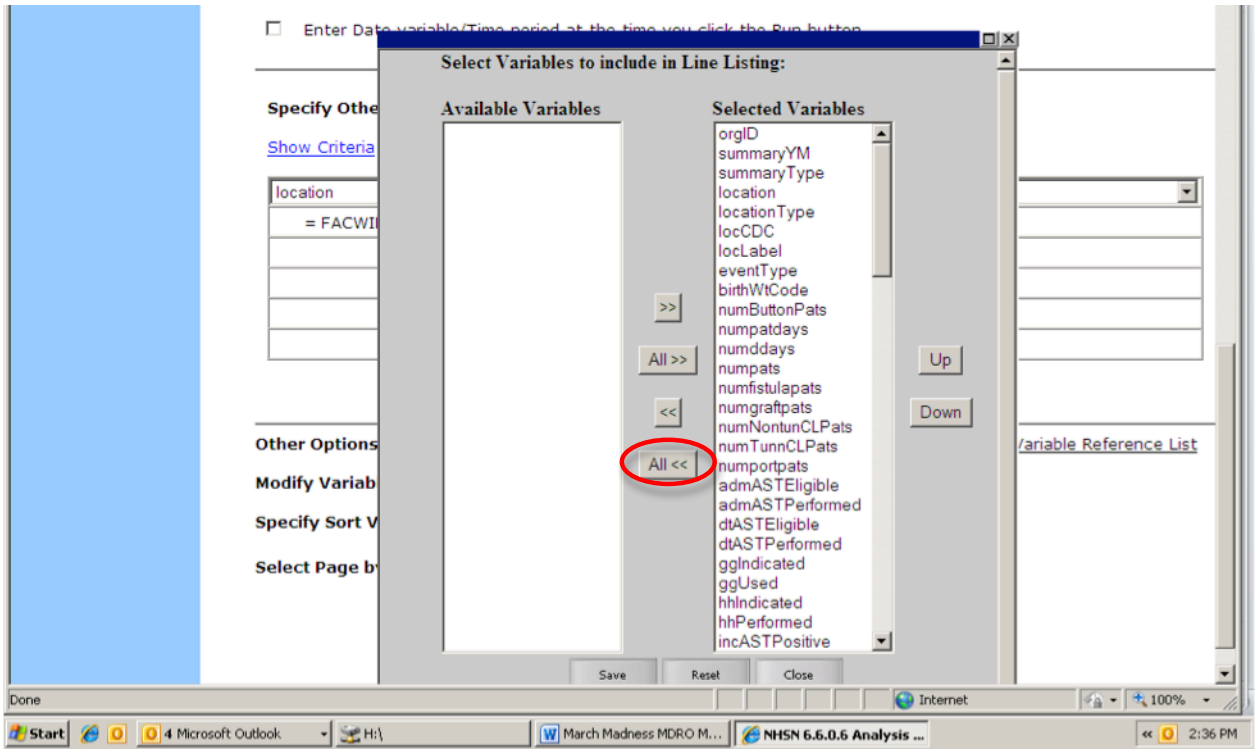
1) Run a line list of your Summary (denominator) data to review the information you reported to NHSN:
Click Analysis → Output Options → Advanced → Summary-level Data → CDC Defined Output → Line Listing - All Summary Data → Modify



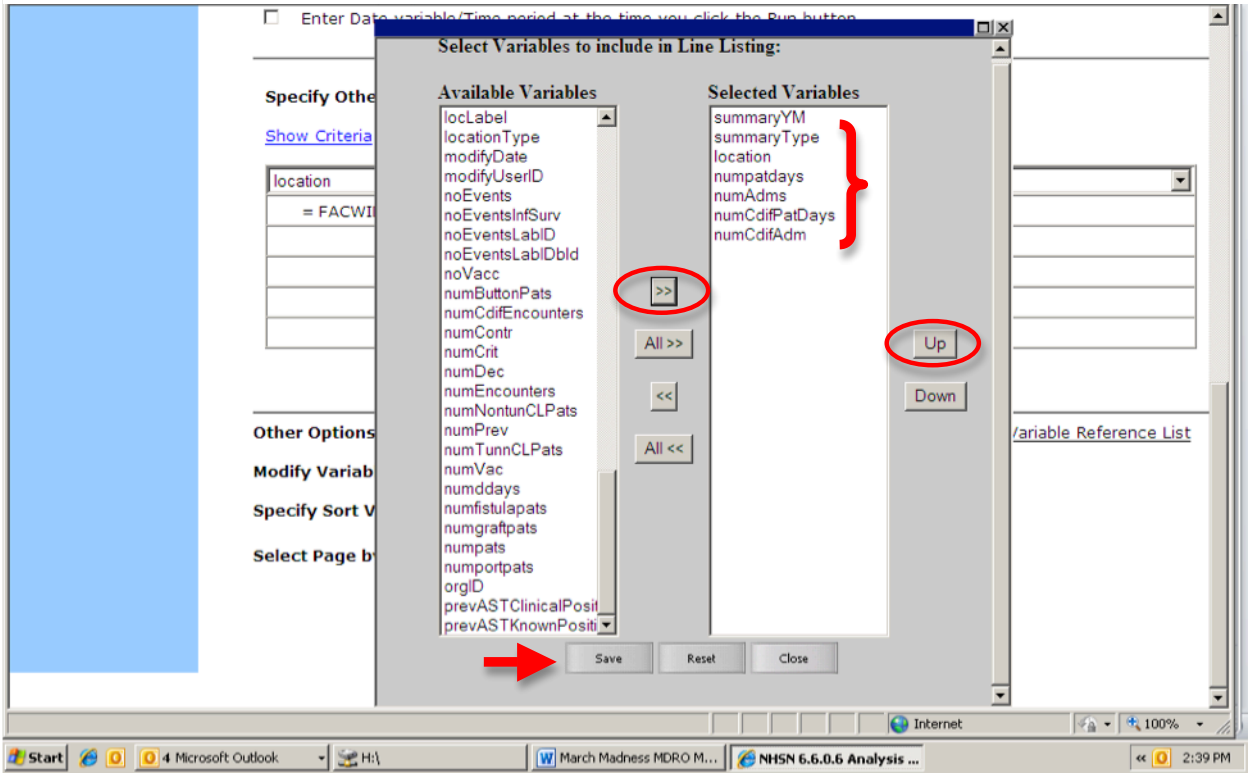
2) From the Line Listing screen, modify Output name, Date Variable (by Month, 2011), Select Criteria to limit **location** to include only Facility–wide Inpatient Summary data . Next we will Modify the Variables to display in our report.



3) When you click Modify List, a gray box will appear with all possible Variables pre-selected to Display. We don't want to see all the Variables in our report. Use **ALL<<** (all back) button to clear the Selected Variables box.



4) Then select only the Variables necessary to review your monthly Facility wide Summary data as shown below. Highlight each variable you want in the Avaliable list and use the **>>** to move to Selected list. Use Up/Down to order the list of variables as you want the columns to appear in your report. Save.

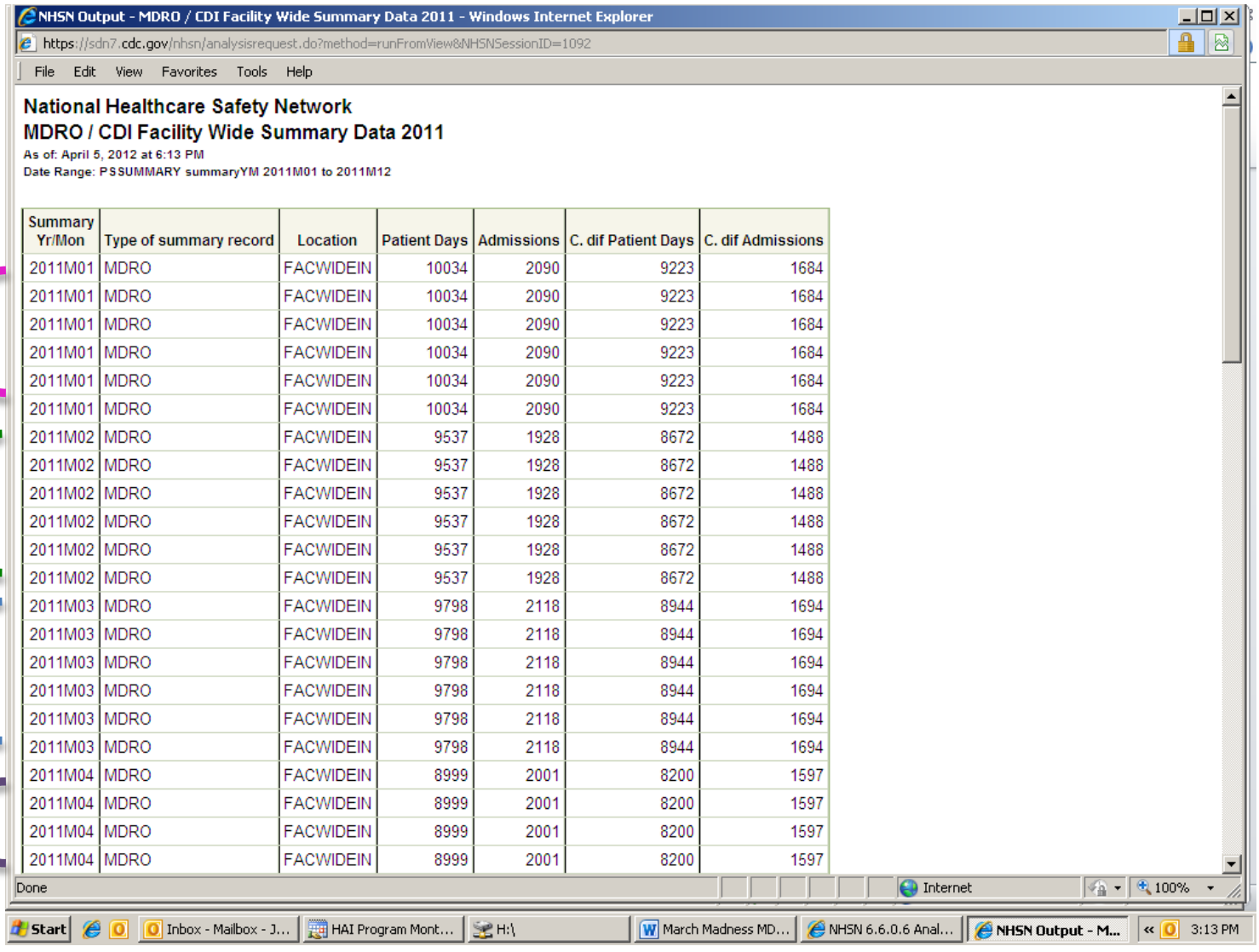


5) Click Run at the bottom of the Line Listing page. Your report will appear showing each month, and the LabID Facility Wide Summary data you reported ordered by

- **Patient Days**
- **Patient Admissions**
- **C diff Patient Days**
- **C diff Admissions**

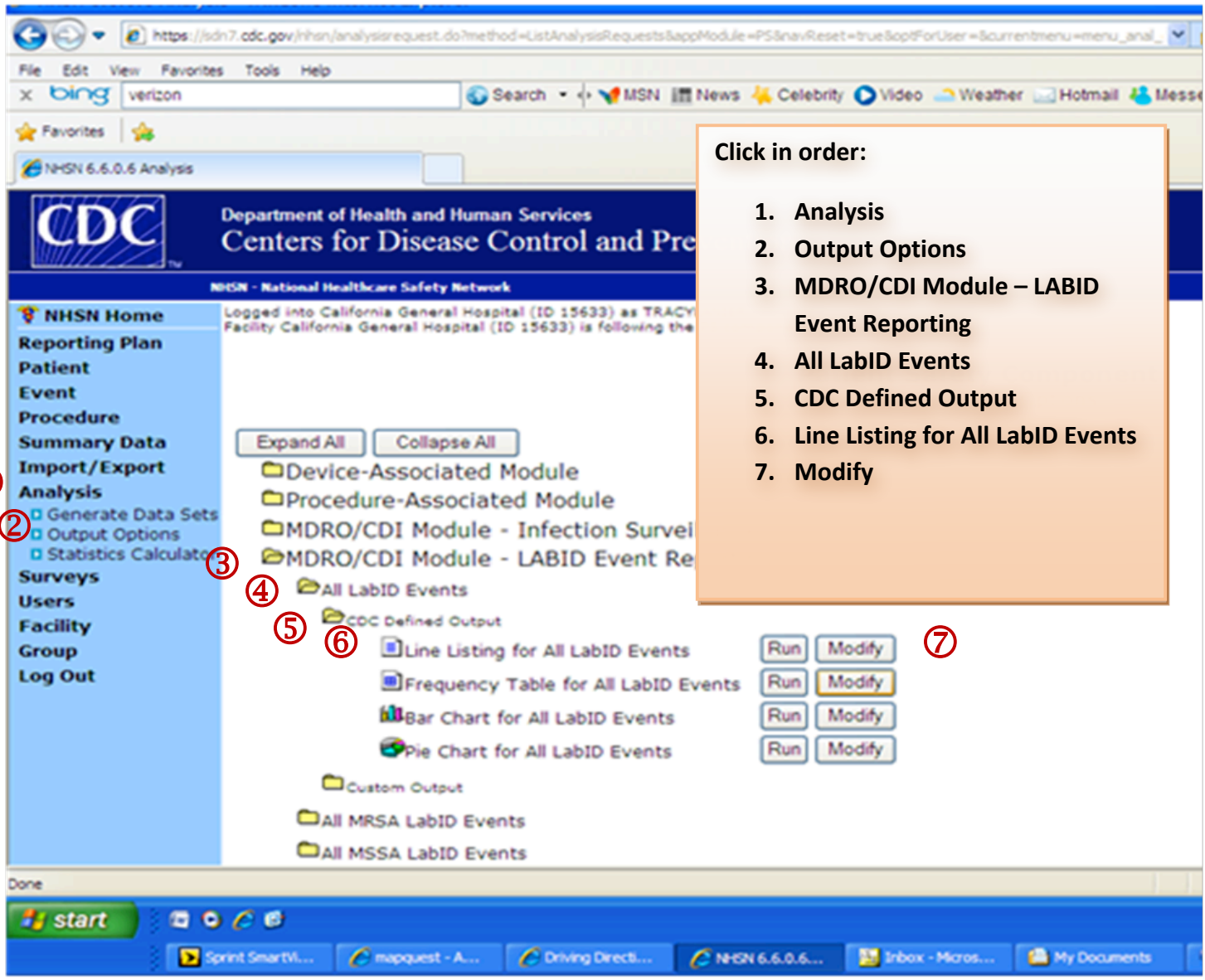
Note: Each month's Summary data is repeated multiple times in the line list. This is a glitch in the report. Extra points to whoever can figure out how to produce only one line of data for each month ☺

Review your data to look for omissions and errors. IT IS A COMMON MISTAKE TO FORGET ENTERING MDRO/CDI SUMMARY DATA EVERY MONTH. Use this report to check periodically that your data are complete and as you intended.

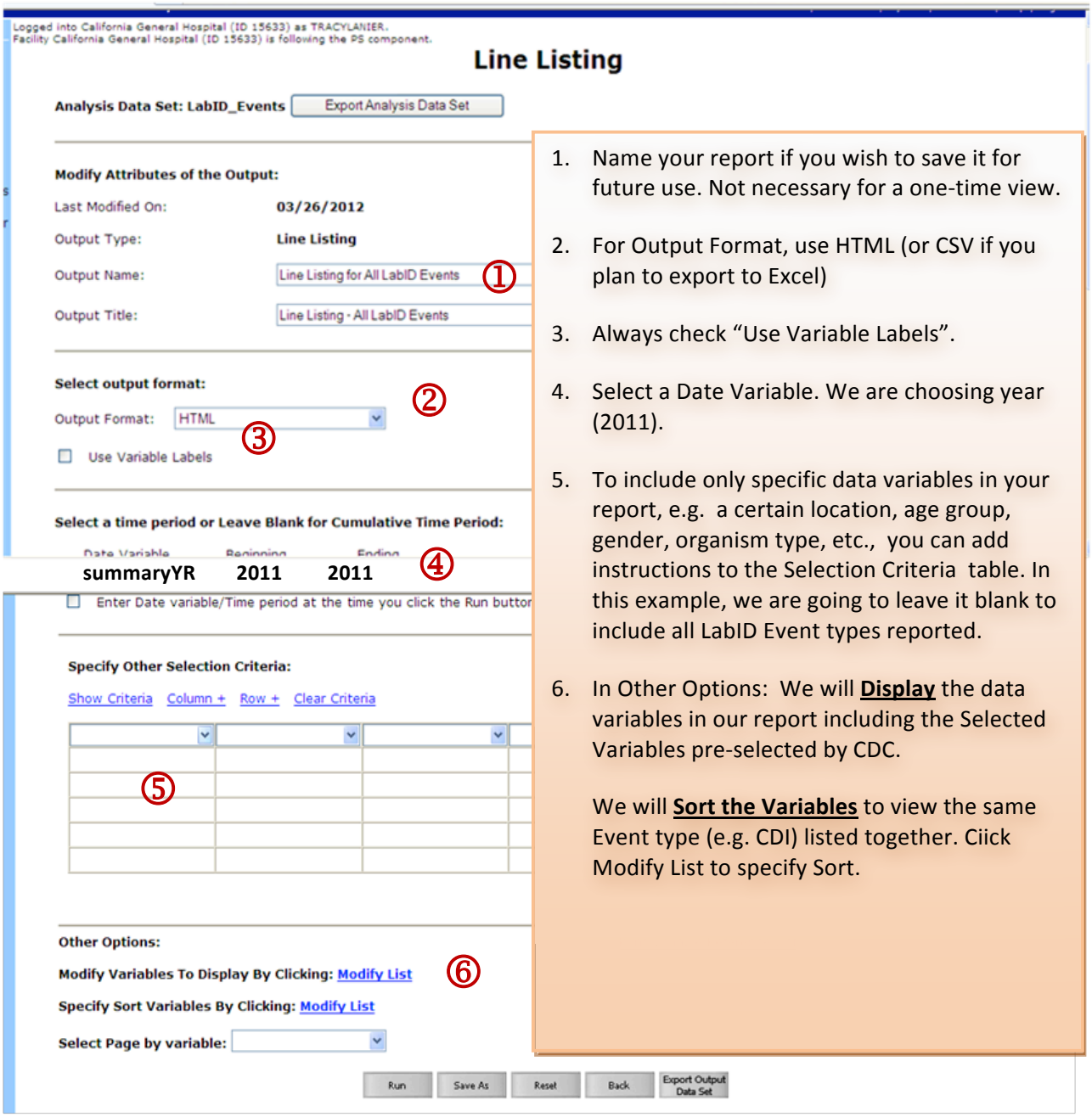


Using Output Option to Review LabID Event Data: CDI and MRSA/VRE Infections

1) Run a line list to review the Event (infection) data you reported to NHSN. Follow the instructions in the text box below.



2) When you click Modify, the Line Listing screen will appear. Follow the instructions in the text box to produce a list of all your MDRO/CDI Events for 2011.



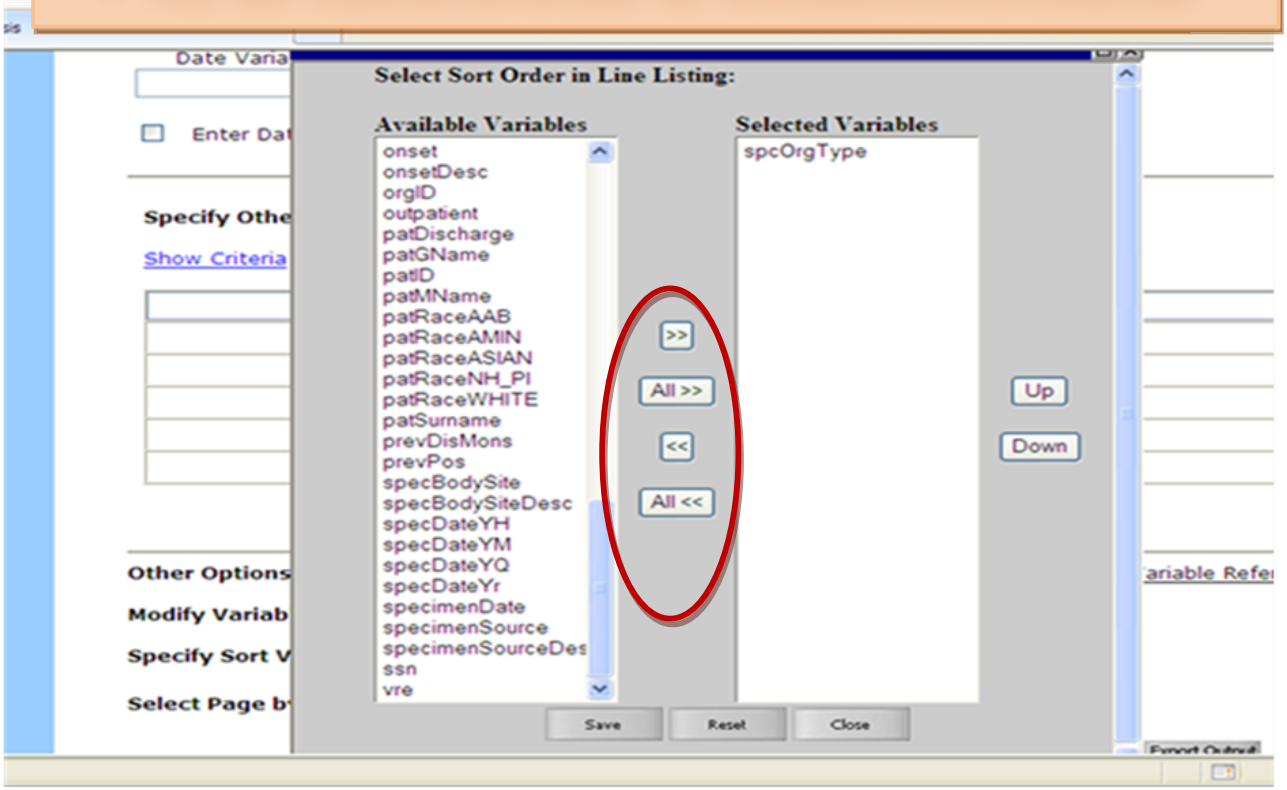
1. Name your report if you wish to save it for future use. Not necessary for a one-time view.
2. For Output Format, use HTML (or CSV if you plan to export to Excel)
3. Always check “Use Variable Labels”.
4. Select a Date Variable. We are choosing year (2011).
5. To include only specific data variables in your report, e.g. a certain location, age group, gender, organism type, etc., you can add instructions to the Selection Criteria table. In this example, we are going to leave it blank to include all LabID Event types reported.
6. In Other Options: We will **Display** the data variables in our report including the Selected Variables pre-selected by CDC.

   We will **Sort the Variables** to view the same Event type (e.g. CDI) listed together. Ciick Modify List to specify Sort.

3) After you click the Specify Sort Variables Modify List, a grey box will appear . For our line list of 2011 LabID Events , we will sort by **organism type** to group each type together, e.g. CDI, MRSA, VRE. This allows us to more easily look for patterns and trends in the data. Follow the instructions in the text box below.

Select the Sort Order in your report.

- "Available Variables" lists all LabID related variables available in NHSN for analysis
- "Selected Variables" indicates those variables chosen to sort the line list.
  - Note, CDC does not pre-select variables to Sort by. The CDC "canned" report will run the line list by date, listing CDI, MRSA (blood) and VRE (blood) in the order they occurred during the year.
- To move variables from the Available list to the Selected list, highlight a variable then use the >> key. (If you want to remove a variable you accidentally Selected, use the << key.)
- To sort by organism type, highlight "spcOrgType" from "Available Variables" and move to "Selected Variables" (shown below).
- Press "Save" on grey box, and then press "Run" at the bottom of the Line Listing screen.



Tips for using Sort feature:

- For best results, Sort by only 1 or 2 variables.
- Be careful. Using the "All" keys will move the entire variable list.

4) The Line Listing shows all of your MDRO/CDI LabID Event data for 2011, grouped by organism type.

- Events are sorted alphabetically by organism type.
- Review this type of line list periodically to assess your reported Event data for accuracy and completeness.

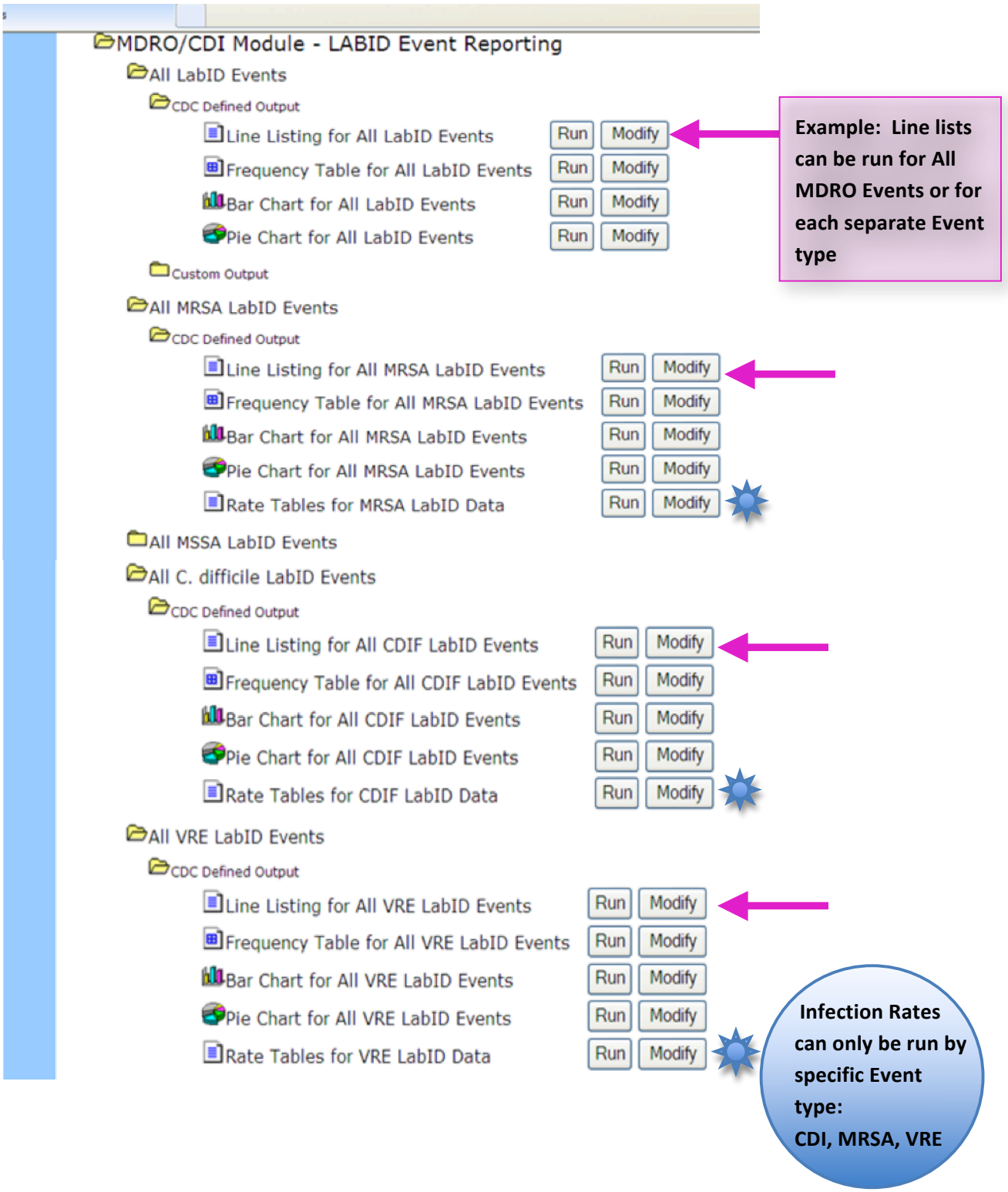
- If you want to further sort the line list, such as by location, go back to Line Listing screen. Modify Specify Sort Variables , selecting **"location"** as a second sort variable.

- LabID surveillance applies an algorithm to reported Events to determine how to attribute onset.
- This column indicates if the Event was hospital onset (HO), community onset (CO), or community onset – healthcare facility associated (CO-HCFA).

Org ID	Patient ID	Event ID	Specific Organism	Location	Performed in Outpatient Setting?	Previous Organism Infection	Onset	Fac Admission Date	Location Admission Date	Specimen Source	Date Specimen Collected
15633	100008	5490791	CDIF	1 MICU	N	N	HO	09/05/2011	09/12/2011	STOOL	09/19/2011
15633	1	5584401	CDIF	1 MICU	N	N	CO	07/10/2011	07/11/2011	STOOL	07/12/2011
15633	112637	5946441	CDIF	1 MICU	N	N	HO	08/10/2011	08/16/2011	STOOL	08/24/2011
15633	102955	6545207	CDIF	1 MICU	N	N	HO	10/05/2011	10/07/2011	STOOL	10/10/2011
15633	917196	6606295	CDIF	Z-MED/SURG	N	N	CO	05/16/2011	05/16/2011	STOOL	05/16/2011
15633	05012011	5509675	MRSA	1 MICU	N	N	HO	06/02/2011	06/04/2011	STOOL	06/07/2011
15633	098765	5511578	MRSA	1 MICU	N	Y	HO	06/02/2011	06/04/2011	BLDSPC	06/14/2011
15633	1000579	5515820	MRSA	1 MICU	N	N	CO	01/03/2011	01/04/2011	BLDSPC	01/04/2011
15633	105644	5515837	MRSA	1 MICU	N	N	CO	05/10/2011	05/10/2011	BLDSPC	05/10/2011
15633	109012	5515838	MRSA	1 MICU	N	N	HO	07/12/2011	07/15/2011	BLDSPC	07/18/2011
15633	99933322	6161709	VRE	8585	N	N	CO	09/01/2011	09/01/2011	BLDSPC	09/01/2011

Remember you can choose to add or delete variables to create custom reports for your hospital. You can save any report you produce, export the data to Excel, or publish the report for other NHSN Users at your hospital to run using their own generated data sets.

In the previous example, we included all Event types reported in MDRO/CDI Module. In addition to "All LabID Events" reports, CDC has created the same Output options for each Event type (organism). The output modification techniques demonstrated in this guidance document can be applied to any LabID Event type.

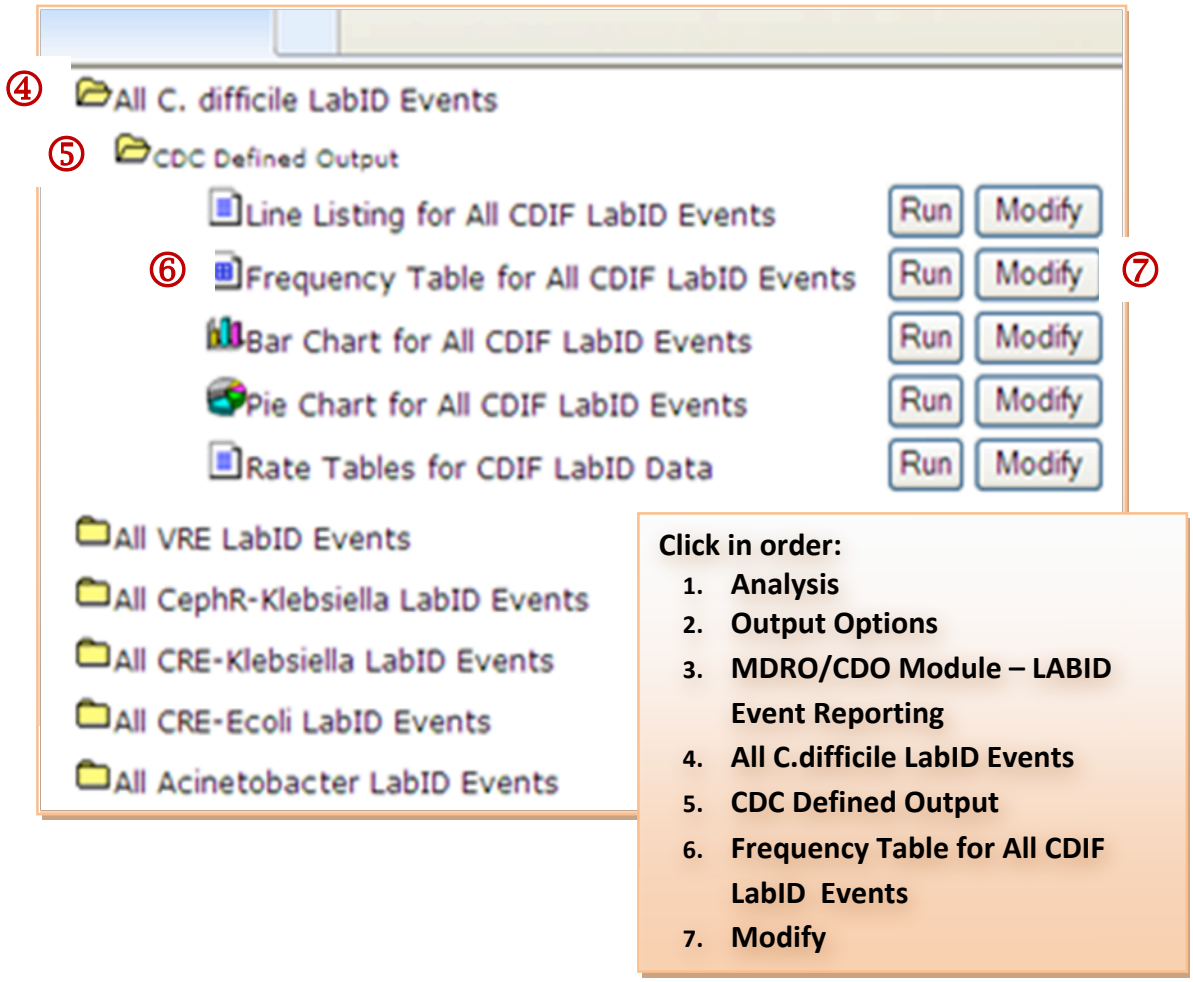


Using Output Options to Produce Frequency Tables of MDRO/CDI Events

You can also view Events by producing Frequency Tables, which will allow a quick review of the distribution of your reported LabID Events by Onset type.

In this example, we will look at CDI. The process for creating a frequency table is the same for any of the LabID Event types (organisms).

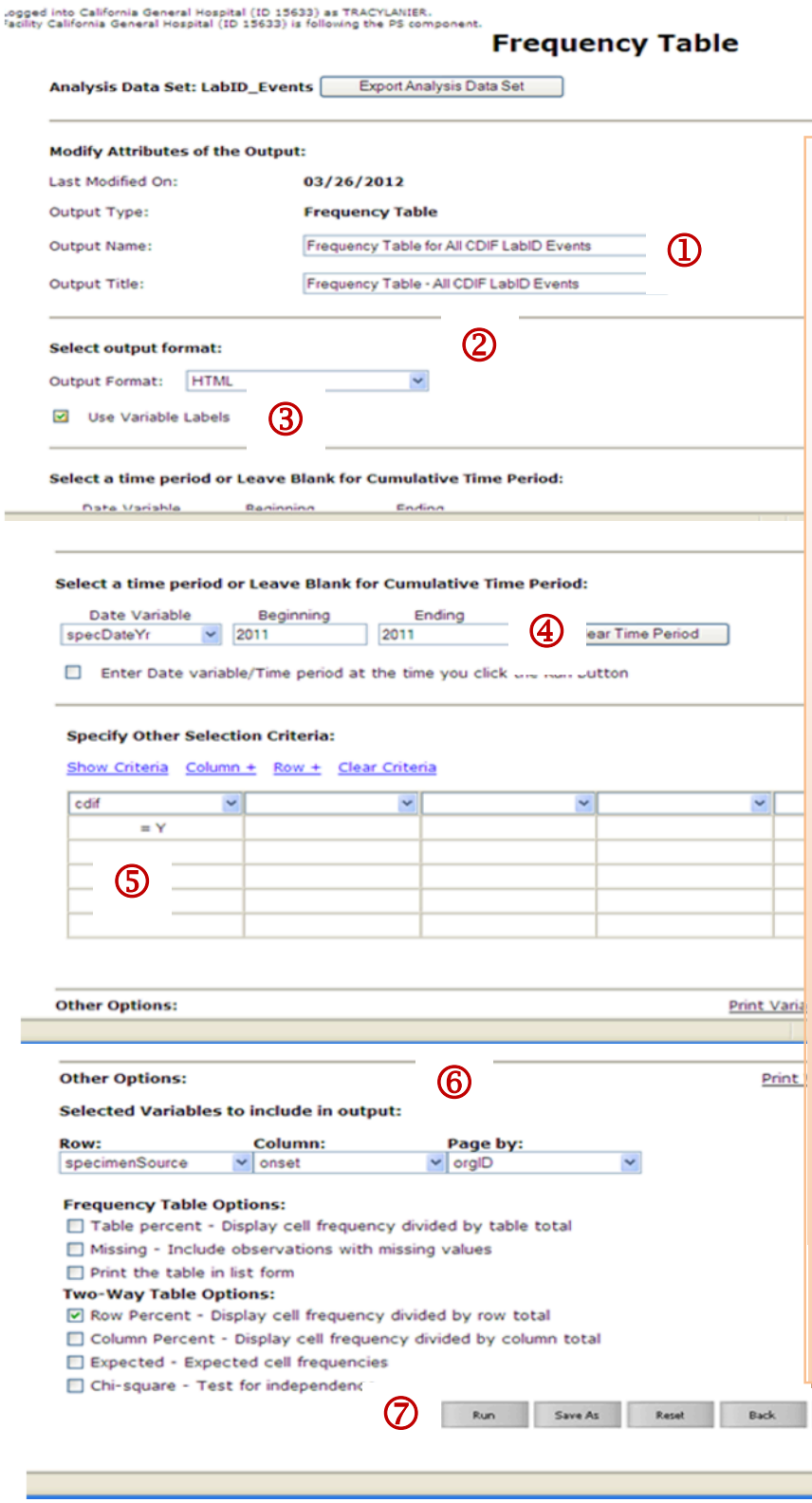
1) To produce a Frequency table containing CDI Events reported to NHSN: Click **Analysis** → **Output Options** → **MDRO/CDI Module** → **LABID Event Reporting** → **All C.difficile LabID Events** → **CDC Defined Output** → **Frequency Table for All CDIF LabID Events** → **Modify**



Click in order:

1. **Analysis**
2. **Output Options**
3. **MDRO/CDO Module – LABID Event Reporting**
4. **All C.difficile LabID Events**
5. **CDC Defined Output**
6. **Frequency Table for All CDIF LabID Events**
7. **Modify**

2) When you click Modify, the Frequency Table screen will appear. Follow the instructions in the text box below to produce a frequency table of 2011 CDI.



1. Name your report if you wish to save it for future use. Not necessary for a one-time view.
2. For Output Format, use HTML (or CSV if you plan to export to Excel)
3. Always check “Use Variable Labels”.
4. Select a Date Variable. We are choosing the year 2011. Note the variable is by specimen date year, 2011

   The report could also be run more frequently (monthly or quarterly).
5. Note that CDC has pre-populated the Selection Criteria table (cdif = Y) to exclude all LabID Events except *C.difficile*.
6. We will not change anything In the Other Options section, which leaves it in the “canned” forma developed by CDC.

   You can try the other options later to understand how else you might want to see your frequency table.
7. Click “Run”

3) When you click Run, a frequency table will be generated for your data:

National Healthcare Safety Network
Frequency Table - All CDIF LabID Events
As of: April 4, 2012 at 2:27 AM
Date Range: LABID_EVENTS specDateYr 2011 to 2011

Org ID=15633

Frequency Row Pct	Table of specimenSource by onset			
specimenSource(Specimen Source)	onset(Onset)			
	CO	CO-HCFA	HO	Total
STOOL	18	8	21	47
	38.30	17.02	44.68	
Total	18	8	21	47

Categories of CDI LabID Events are based on the date admitted to the hospital and the date of specimen collection. For California hospitals reporting only Inpatient CDI, categories are

- **Community-Onset (CO):** CDI positive test from an inpatient on Day 1-3 of hospitalization, or from an Emergency Department patient admitted to the hospital on the same calendar day. (Admission date is Day 1).
- **Community-Onset Healthcare Facility-Associated (CO-HCFA):** CO CDI Event (as above) in a patient who was discharged from the hospital ≤4 weeks prior to current CDI positive test date.
- **Healthcare Facility-Onset (HO):** CDI positive test collected on hospital Day 4 or after

Each CDI is also stratified in NHSN as a new (incident) infection or a recurrent (continuing) infection.

- CDI is considered **incident (new)** if the patient has no prior CDI reported to NHSN by your hospital, or it has been >8 weeks since prior CDI event
- CDI is considered **recurrent**, or a continuation of the same infection, if the patient has a prior CDI reported to NHSN by your hospital and another CDI event occurs >2 weeks but ≤ 8 weeks since the last reported CDI. Recurrent cases on not included in calculations of incidence rates.

Using Output Options to Create Graphical Presentations of LabID Data

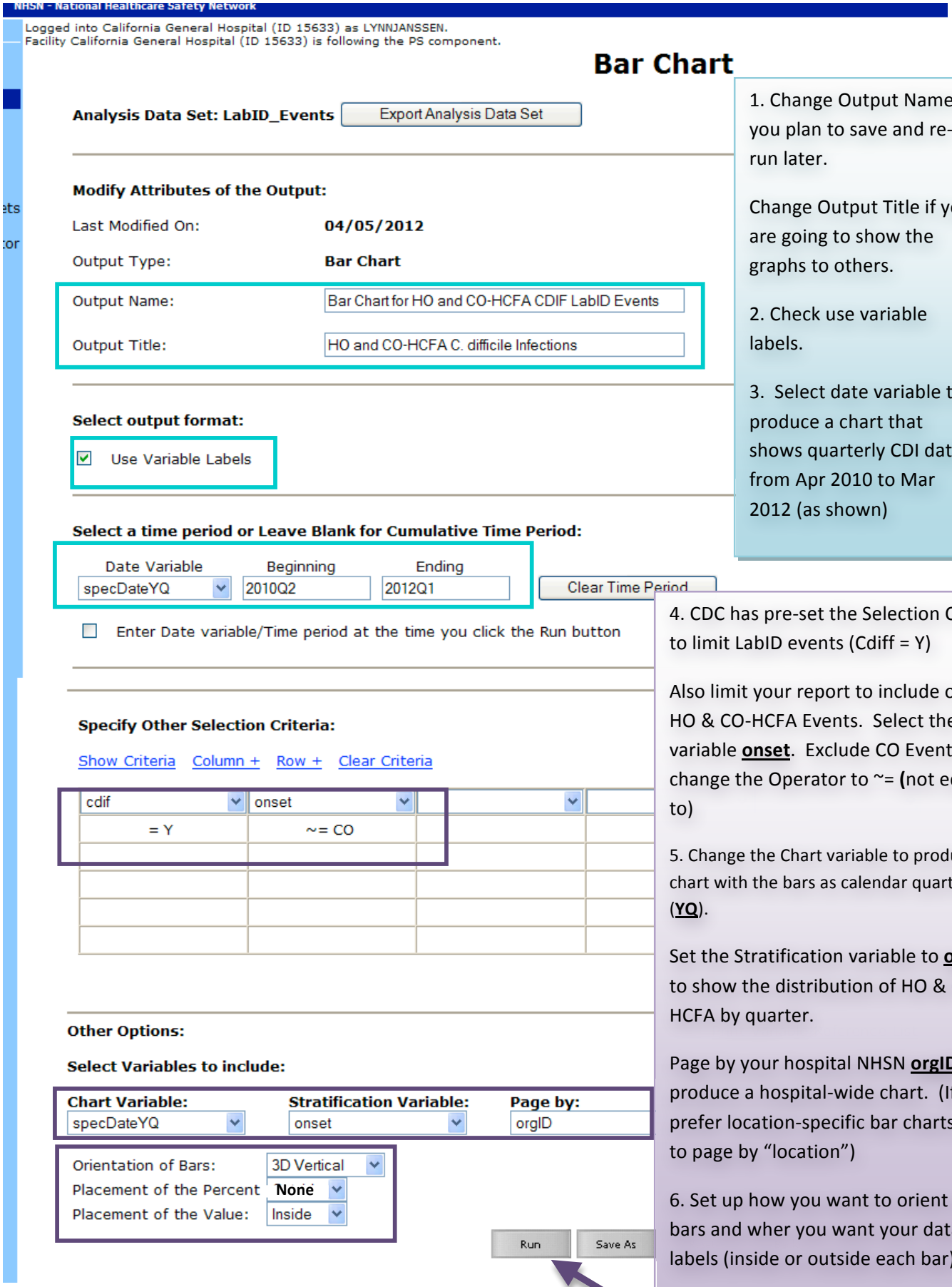
Graphical presentations of your surveillance data can provide quick and easy visual representation. NHSN Analysis Output Options include both Bar Charts and Pie Charts that you can customize for different purposes and audiences. You can save the customized reports to re-create the charts and graphs for specific user groups, such as to present at regularly scheduled hospital committee meetings or to provide feedback of data to individual hospital units.

In a previous lesson, we demonstrated how to produce a Pie Chart of CLIP data using NHSN Analysis. Producing Pie Charts in the MDRO/CDI Module is very similar to those produced in the Device-Associated Module. Refer to the document "Using NHSN Data and Analysis Features for Prevention: CLIP" at www.cdph.ca.gov/HAI, March Madness-Week 2.

In this lesson we will demonstrate how to produce a Bar Chart to look at your CDI Events by quarter, including only (and stratified by) HO and CO-HCFA cases. We will include all CDI reported since the start of the California hospital requirement to report CDI using NHSN LabID, April 2010.

Creating a Bar Chart in NHSN

2) To produce a Bar Chart of LabID CDI data: From blue navigation bare, click: **Analysis → Output Options → MDRO/CDI Module → LABID Event Reporting → All C difficile LabID Events → CDC Defined Output → Bar Chart for All CDIF LabID Events → Modify**



1. Change Output Name if you plan to save and re-run later.

Change Output Title if you are going to show the graphs to others.

2. Check use variable labels.

3. Select date variable to produce a chart that shows quarterly CDI data from Apr 2010 to Mar 2012 (as shown)

4. CDC has pre-set the Selection Criteria to limit LabID events (Cdiff = Y)

Also limit your report to include only HO & CO-HCFA Events. Select the variable **onset**. Exclude CO Events by change the Operator to ~= **(**not equal to)

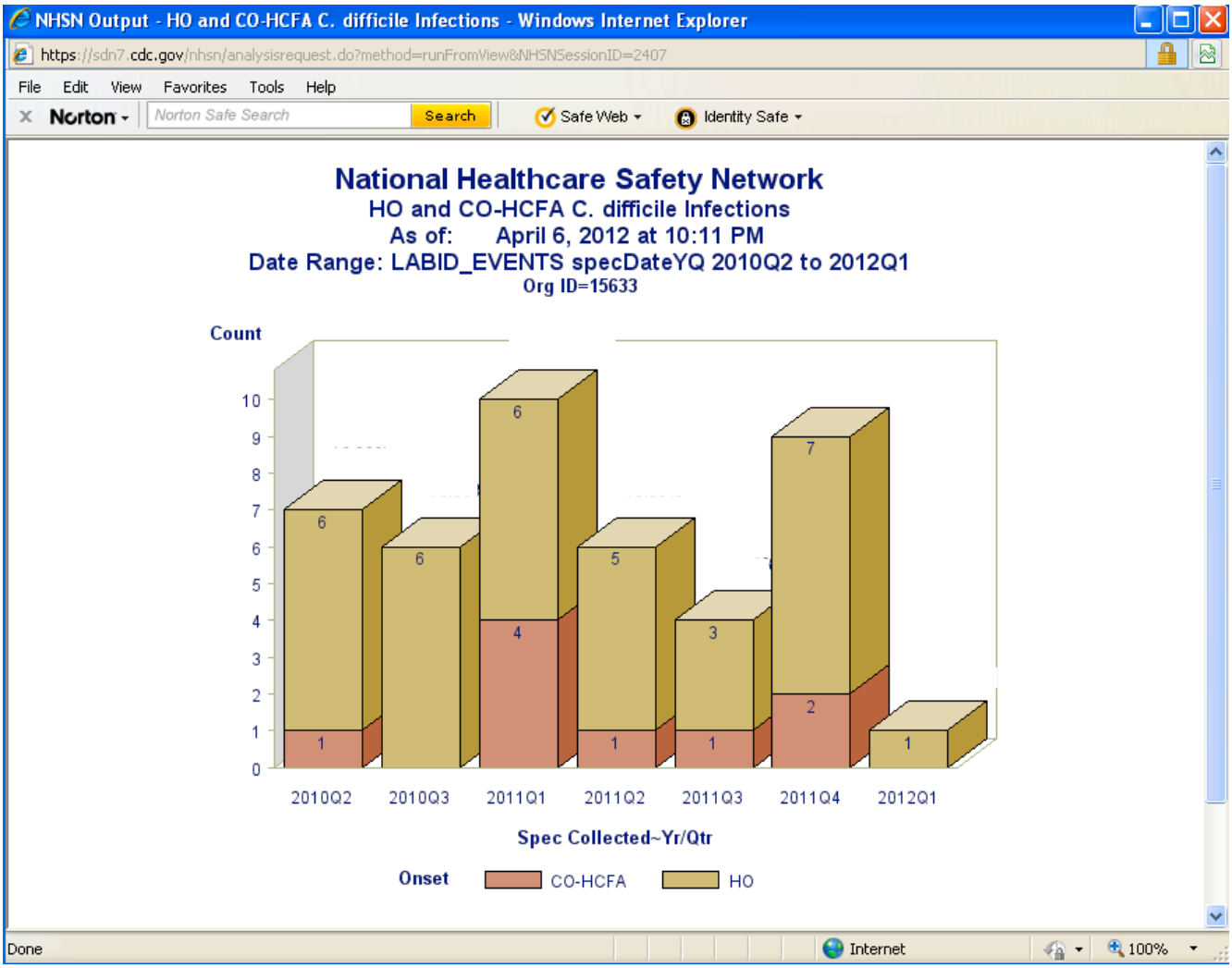
5. Change the Chart variable to produce a chart with the bars as calendar quarter (**YQ**).

Set the Stratification variable to **onset** to show the distribution of HO & CO-HCFA by quarter.

Page by your hospital NHSN **orgID** to produce a hospital-wide chart. (If you prefer location-specific bar charts, set to page by "location")

6. Set up how you want to orient your bars and wher you want your data labels (inside or outside each bar).

Run the report.



Our Bar Chart shows the number of CDI Events each quarter, stratified by HO and CO-HCFA cases. Both onset types, HO and CO-HCFA, are included in your hospital's CDI incidence rate calculations. These are the CDI you should target for prevention.

California hospitals now have **7 complete quarters** of MDRO/CDI LabID data. Produce reports; use your data!