



Epic Reporting

SlicerDicer

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Self-Service Reporting with SlicerDicer

Currently, SlicerDicer is available for patient information and Best Practice Advisories

What is SlicerDicer?

SlicerDicer is a self-service reporting tool that provides users with intuitive and customizable data exploration abilities. Using SlicerDicer, users can find the data they need to investigate a hunch, and then refine their searches on the fly to better understand the data they work with. Right in Hyperspace, they can examine trends, drill down to line-level details, and jump to related records to follow up.



SlicerDicer is a great tool but is not the best choice for all reporting needs. SlicerDicer draws from data that is at least a day old, so you can't use it for real-time reporting, such as acute care monitoring. In addition, most of the time SlicerDicer can search only discrete data. For example, SlicerDicer doesn't know a patient has a particular diagnosis if the only place the diagnosis is documented is in a free text note.

As always, handle patient data with care.

Data models

In SlicerDicer, you can explore clinical, access, and financial data. Depending on your needs, you can change your starting data model to better investigate the data available.

Each data model returns results based on a different kind of record. For example, when using the Patients data model, you can find patients who meet patient-level criteria, such as diagnosis. Similarly, the Surgical and Invasive Procedures data model allows you to filter surgical cases by patient, staff, efficiency, and other criteria. Starting with the Hospital Accounts data model allows you to filter accounts by bad debt adjustment descriptions, direct variable cost descriptions, and more.

It's important to remember what kind of record your data model returns because that determines how you interpret the results. For example, suppose you use the Patients data model to search for patients who had an ED visit. The result is the number of patients who went to the ED at least once, not the total number of ED visits those patients had. In the Patients data model, SlicerDicer can't tell you if a single patient went to the ED multiple times. If you instead use the ED Encounters data model, then you see one result for each ED visit, even if some of those visits are for the same patient. In that data model, you can't see the distinct number of patients who went to the ED.

Criteria

Use criteria to narrow your starting population, filtering on items such as diagnoses, weight, or lab components. In SlicerDicer, you can add multiple criteria, add sequential or overlapping criteria, and use additional advanced logic on criteria to get to the data you need.

There are different ways you can use criteria to narrow your starting population:

- For criteria based on lists of records or category values, like Diagnosis, you need to select a particular option, like Hypertension. If you don't select an option, the criteria isn't active and doesn't affect your results.
- For numeric criteria, like patient Weight, you need to choose a range on a slider bar. By default, SlicerDicer shows patients with any value documented, even beyond the range on the slider bar. If you click the less than and greater than buttons at the end of the slider bar, SlicerDicer limits the range to the bar's end points. You can move the stops on the slider bar to further narrow the range.
- For criteria with no options, like Pregnant?, SlicerDicer automatically finds records that match the criteria.

- For freetext criteria, like Component Result Text in the Lab Specimens and Tests data model, you need to enter a keyword or phrase for SlicerDicer to search for.

For all criteria, you can specify whether SlicerDicer includes or excludes matching records.

Slices

Use slices to split up your population to compare results among subgroups. For example, suppose you use criteria to narrow your starting population to patients with an active MyChart account. You could then slice this population by county to see which counties have the most MyChart users.

When you add slices, you can grab the top or bottom slices, such as the 10 counties with the most MyChart users. You can also enter specific slices, such as to compare the number of users in Dane, Jefferson, and Dodge counties.

If you have similar slices you want to group together, select the check boxes next to those slices and click **Group**. For example, if the top 10 counties include five Wisconsin counties, two Iowa counties, and three Minnesota counties, you could view the county-level results in Wisconsin and group the out-of-state counties together.

Finally, you can use the Compare to rest of population button to add a slice for every patient not included in the other slices. In this example, the button would add a "No selected County" slice that includes patients from other counties, as well as patients with no county specified in their record. You can think of this slice as "none of the above."

Measures

Use measures to change how you're measuring your population. By default, SlicerDicer shows the number of records that match the criteria you've specified. You can use measures to change this to show rates or other metrics. In the example above, you could use measures to see the percentage of patients in each county who have an active MyChart account instead of the number of patients in each county.

Not all filters have the same measures available. For example, numeric filters often support additional measures like maximum, minimum, average, deviation, and variance. Using patient weight as an example, these measures have the following definitions:

- **Percentage:** The percentage of patients who are the specified weight and match the other criteria. Unlike the other measures, if a measure has multiple values documented during the query date range, the percentage calculation uses all values documented instead of only the most recent.
- **Maximum:** The greatest weight of any patient who matches the other criteria. If a patient has multiple weights documented during the query date range, SlicerDicer considers only the most recent.
- **Minimum:** The lowest weight of any patient who matches the other criteria. If a patient has multiple weights documented during the query date range, SlicerDicer considers only the most recent.
- **Average:** The mean weight of the patients who match the other criteria. If a patient has multiple weights documented during the query date range, SlicerDicer uses only the most recent.
- **Deviation:** The standard deviation from the mean weight of the patients who match the other criteria.
- **Variance:** The deviation squared, which is also equal to the total difference between each patient's most recent weight and the average weight of the patients who match the other criteria.

Investigating hunches

Use SlicerDicer as the first step for investigating a hunch or to get the big picture of your organization.

For example, you could use the Patients data model to investigate how much smoking cessation improves rates of good lung function in patients diagnosed with COPD. You'd start by creating a population in SlicerDicer that includes patients diagnosed with COPD. Slice the population by smoking status: one group includes only current everyday smokers, and the second includes only former smokers. Then, apply a measure to compare FEV1/FVC ratios. The results might show that a greater percentage of former smokers at the organization have normal FEV1/FVC ratios.

This quick investigation could be the start of a larger research endeavor or provide quick information for a patient you're seeing on how they compare to other patients. Showing "before" and "after" data on a large scale can help encourage patients to make healthy changes in behavior.

SlicerDicer Practice Scenario

This guide will use an example scenario to walk you through the key features of SlicerDicer tools. The best way to learn SlicerDicer is to explore on your own.

In this example, imagine you're a physician or clinic manager. You've been asked to identify factors that could affect which patients at your organization are at risk of abusing opioids. You decide to use SlicerDicer to investigate.

Access SlicerDicer

Access SlicerDicer from your Hyperspace toolbar or Chart Search.

If you have access to more than one data model, select a data model such as **Patients**. If you select the wrong data model, click **Start Over** in the toolbar to clear the graph and select a new data model.

If you have access to only one data model, SlicerDicer opens that data model automatically.

The first time you open SlicerDicer, a tutorial appears that covers many of the same concepts as this guide. You can return to the tutorial at any time by clicking **Help**.

Create a starting population

1. Open SlicerDicer and select the **Patients** data model.
2. Check the base population. By default, it's all patients. You could change it to only the patients you've cared for, but for this report, you want to include all patients.
3. Narrow the population by adding a criterion for opioids. To do so, type opioid analgesics in the search box and select the option that has the Medications criterion in parentheses.
 - If you prefer to browse for criteria instead of typing what you're looking for, you can click **Browse**, select **Medications**, and then enter an option of opioid analgesics.
 - Click ☆ to add the criterion to your favorites if you plan to use it frequently. This criterion now appears on the Favorites tab.
4. If you want to learn more about a criterion, slice, or measure, click the ⓘ information button on the criterion. For example, if you want to learn which medications are considered active for a patient, click ⓘ.
5. The Opioid Analgesics option is a grouper, which means it contains multiple medication records. To see which specific medications are included, right-click the option and select **Group Breakdown**.



Remove a criterion by hovering and clicking X.

Trend results

You want to see how opioid use has changed within the last eight months. The default date range is the last six months, so you need to update the date range.

1. Click the date range at the top of the graph.
2. Change the start of the date range to m-8.

3. In the Summarize by field, select **Month**.
4. In the Visual Options section, select the line graph.

Dig deeper into population data



Click Undo, Redo, or Start Over in the toolbar to fix any mistakes.

Add slices

Now that you've looked at the trend of patients taking opioid medications, you want to compare the factors that might be contributing to these numbers.

1. Click **Undo** twice to return to the bar graph with one bar showing data for the last eight months.
2. Click **+** next to Slices. Search for **Encounter Type**.
3. To find the most common types of encounters for patients taking opioids, click **Grab Top 10**.
 - You could also enter specific encounter types in the search box, but in this case it's more useful to see the ten most common.
 - If you have similar encounter types that you want to consider together, select the check boxes next to those encounter types and click **Group**. Enter a name for the group to help you remember what it includes.
 - If there are slices you don't want to include on the graph, click the trash can.
4. You want to dig into the most common encounter type. Double-click the tallest bar.
5. To see why these patients were seen for this encounter type, add a new slice with the **Chief Complaint** criterion. Grab the top ten.
6. If some of the axis labels are hard to read, select the horizontal bar graph in the Visual Options section.

Compare measures and metrics

You want to see if patients using opioid medications could be affected by other risk factors, such as family members with alcohol abuse or addiction, or patients self-medicating with alcohol.

1. Click **+** next to Measures. Add a measure of **Family History**.
2. Enter family history diagnoses of **Alcohol abuse** and **Addiction problem**. The height of the bars automatically becomes the percentage of patients with these family history diagnoses.
3. Add another measure for **Alcohol Use**. Change the calculation type to **Average**.
4. In the Visual Options section, click **Bar Height**.
5. Change the bar height to **Percentage of alcohol abuse or addiction problem**.
6. Change the bar color to **Average Alcohol Use**.
7. Depending on what data you're showing, you might want to change which colors are associated with high and low values. For example, if a higher value is a good outcome, you might want to make higher values green instead of red. To change the colors, click **Min** and **Max** on the color bar.

You can hover over the shapes on the graph to see the exact results for every measure you add.

Take action on line-level detail

In the Visual Options section, select the detail table. The table includes some basic information about each patient, as well as the measures you added. If you have the right security, click a header to expand it to see line-level details. From this view, you can also:

- Add additional columns after you expand a header. For example, you might add a column for marital status to see what kind of support each patient has at home.
 - Click **+** at the top of the table.

- Remove columns. For example, you might not need the column for Ethnic Group, which appears by default. Right-click the column header and select **Remove**.
- Rearrange columns. Click and drag a column to move it.
- Sort results by clicking a column header.
- Export the details to Excel for further analysis. Right-click and select **Export Patients to Excel**.
- Open a patient chart to review additional details.

Exclude criteria

SlicerDicer normally filters populations to include only records that match your specified criteria, but you can also exclude records that match the criteria.

1. Add a criterion to your population.
2. Right-click the criterion and select **Exclude**.

Add sequential criteria

This section applies only to the Patients data model. Suppose you're investigating root causes of opioid addictions and wondering whether having surgery within the last year could be a factor. SlicerDicer can show you the patients who had a surgery and were subsequently diagnosed with opioid dependence.

1. Add a criterion for the event that occurred first. In this example, filter results by an encounter type of surgery.
2. Right-click the criterion and select **Add Sequential Criterion > Add New Criteria**.
3. Select the criterion for the event that occurred second. In this example, select the **Diagnosis** criterion and enter opioid dependence.
4. Update the Within field for your use case. In this example, enter 12 months.

If you want to see sequential rates, the workflow for adding the criteria is slightly different than adding sequential criteria in your main population. For example, suppose you want to see the percentage of patients who were discharged and had an admission within 30 days.

1. Add a criterion for the event that occurred first. In this example, add the Discharged? criterion.
2. Add a measure for the event you want to see the rate of and verify the Percentage calculation is selected. In this example, add the Admitted? measure.
3. In the right pane, click **Make Rate Sequential**.
4. In the First section, choose the event that occurred first, which is the Discharged? criterion in this example.
5. In the And Then section, update the Within options to match the time frame for your use case. In this example, you would enter 30 and select Days.



Not all criteria track data over time. If a criterion has (Current) at the end of its name, that means it uses only the most recent value. This has the following implications for SlicerDicer:

- The query date range doesn't apply to these criteria. For example, suppose your session includes only the MyChart Status (Current) criterion. If you try to use the line graph to see how the number of patients with an activated MyChart account has changed over time, the line will always be flat because SlicerDicer uses only patients' current MyChart status.
- Specifying sequential or overlapping criteria doesn't apply to these criteria.
- Using a different date range than the range on the graph doesn't apply to these criteria.

Modify criteria relationships

Use filter linking, overlapping date ranges, and advanced logic to create your report population exactly as you need to.

- Filter linking requires two or more criteria to be associated with the same event. For example, suppose you're using the Patients data model and you add the Department criterion for the North Department and the Encounter Type criterion for office visits.

- If the criteria are linked together, as shown by the , SlicerDicer returns patients who had an office visit in the North Department.
- If you unlink the criteria, as shown by the , SlicerDicer returns patients who had any type of encounter in the North Department if they also had an office visit in any department.
- Overlapping date ranges require two criteria to have occurred simultaneously. For example, suppose you want to find pregnant patients who had a specific procedure. For this report, right-click the **Procedures** criterion, select **Add Overlapping Criterion > Add New Criteria**, and select the **Pregnant?** filter. If you don't specify the criteria as overlapping, SlicerDicer returns patients who were pregnant and had the specified procedure at any time during the query date range, even if, for example, the pregnancy didn't begin until after the procedure occurred.

Use advanced logic

Advanced logic allows you to specify complex relationships between criteria. For example, if you want to see records where criterion A applies and either criterion B or criterion C applies, click **Advanced Logic**. SlicerDicer assigns each criterion a number. You can enter statements using parentheses, AND, and OR, such as 1 AND (2 OR 3).

Focus on recent data

Suppose you want to find patients who were diagnosed with a condition for the first time in the last year. You can't simply add a diagnosis criterion and change the date range to be the last year, because that population would include any patients who had the diagnosis in the last year, regardless of when they were first diagnosed.


To create a report like this one, use two criteria. In this example, one criterion finds patients who had the diagnosis in the last year, and the other criterion excludes patients diagnosed prior to the last year.

These steps describe this setup in more detail:

1. Click the date range at the top of the graph. Change the start date to y-1.
2. Add the Diagnosis criterion and select the condition you're interested in.
3. Add a second Diagnosis criterion with the same condition.
4. Right-click the second criterion and select **Specify Date Range > Other Range**.
5. Change the date range to be between the earliest date you have data and y-1. To find out the earliest date you have data, enter a very early date, like y-100. SlicerDicer automatically updates the date to the earliest possible date.
6. Click **OK**.
7. Right-click the second criterion and select **Exclude**.

View multiple measures

You can show more than one measure on your graph at a time.

1. In the Measures section, click  to add some measures to your population. For example, in the Visits data model, a scheduling manager might want to investigate cycle time metrics like average time waiting to be roomed, average time in room, average time with nurse, and average time with physician.
2. In the Visual Options section, click **Bar Height**.
3. Click **Add another measure** for each measure you want to see side by side on the graph.

You can also use other visual options, like the bar color, to see another measure. This is especially useful when one of your measures has dramatically different values than the other measures.

Finally, you can assign different colors by clicking Min and Max in the colored bar.

Change the active date range

Some data models have more than one relevant date for the query date range. For example, the ED Encounters data model can show results based on the ED encounter date, arrival date, or departure date. To change the date range used for your session:

1. Click anywhere in the Visual Options box below the different graph types.
2. Select a new Active Date Range.

Save and share populations

You can save a population if you use it frequently and might want to revisit it later.

1. On the toolbar, click **Save As** and give the session a name.
2. Review and change additional information as needed, such as the date range, and click **Create Session**. You can add the session to a group to organize your Load screen.


See and edit saved populations

1. On the toolbar, click **Load** and select the desired population.
2. Modify the population as needed and save changes.

Share a population

1. On the toolbar, click **Share**. Note that sharing automatically saves your session.
2. Enter a name and select whether you want to share the session with everyone or specific people. If you choose to share with specific people, enter each user you want to give access to the session.
3. Review and change additional information as needed, and then click **Save and Share**.

Change the graph type

You can change the graph type to better suit your data visualization. For example, click  to view a line graph. Available graphs are listed under Visual Options.

If you're not sure which graph type is best for your data, use this section as a quick reference:


- Vertical bar graph
 - Compare different values and see differences at a glance.
- Horizontal bar graph
 - Shows the same information as the vertical bar graph.
 - Shows crowded axis labels more clearly.
- Line graph
 - See how results change over time.
 - Remember to change the date summary level by clicking the date range at the top of the graph.
- Tree map
 - Group hierarchical data together.
 - Use the whole area of the graph to show shapes more clearly than bar graphs, such as when you have multiple levels of slices.
 - Note that it's harder to compare area than it is to compare height and length, so it can be more difficult to spot differences between two values than when using a bar graph.
- Map visualization

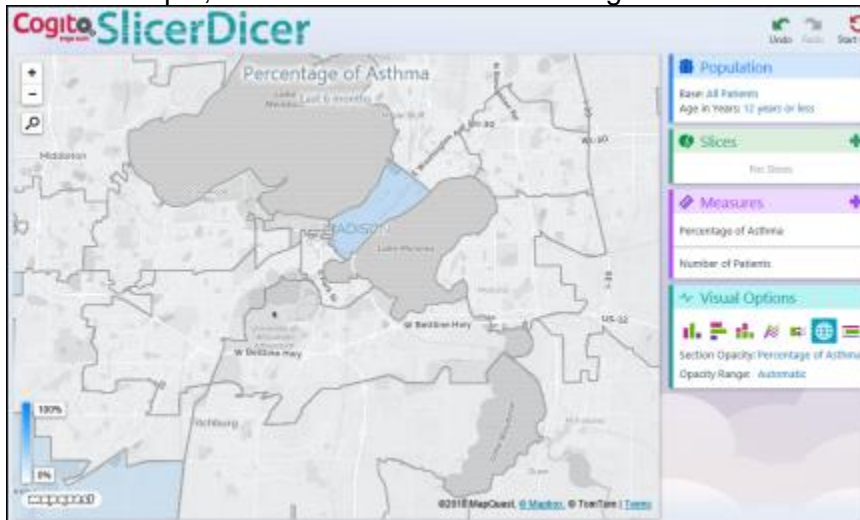
- Break down results by patient ZIP Code. The map always uses the patient's address, not other addresses like clinic location.
- See if geographic area is correlated with your results.
- Note that maps aren't available for every data model or at every organization.
- Detail table
 - View summarized details about your results.
 - View line-level details for records associated with your account.
 - View line-level details for all records if you have proper security.
 - Export results to Excel for further analysis.
 - In some data models, you can take actions like opening a patient chart or surgery preference card.


See populations on a map

Use the geographic visualization to investigate whether patient data correlates geographically by ZIP Code. Darker areas on the map have a greater number of patients who meet the criteria you specify (or a higher amount of whatever metric you're measuring). Just like with any SlicerDicer population, keep in mind that the map shows data only for patients seen by your organization.

The map in SlicerDicer is always based on patient ZIP Code, regardless of what data model you're using. For example, in the ED Encounters data model, the colors on the map correspond to where patients live, not to where the ED visits occurred.

1. Open SlicerDicer and create a new population as you normally would.
2. Add criteria to filter the population. For example, to find the rate of asthma in children under 12:
 - a. Add the Age criterion and select a range of 0 to 12 years.
 - b. Add a measure for rate of asthma by adding the Diagnosis measure and selecting Asthma.
3. Click the globe  to open the map.
 - In this example, downtown Madison has the highest rate of asthma.



- Hover over a ZIP Code to see more details about the population, like the raw count or percentage of patients in that ZIP Code who meet the criteria you specified.
- 4. Continue investigating the population on your own:
 - Pan around the map or zoom in or out to see if there are similar patterns in other areas.
 - Click the magnifying glass  and then enter a ZIP Code to center the map on that ZIP Code.



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