

# Interactive Dashboards in R

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# Oregon Health Authority's Injury and Violence Prevention Program

- Works to prevent Violence, Injury, and Suicide
- Content warning for today:
  - Data about suicide (including youth suicide) & overdose
  - Take a break if needed!
  - For support, call or text **988** or chat **988lifeline.org**

**WHY R FOR DASHBOARDS?**

# Open source

- no licensing fee
- low server costs
- distributed package development
  - solutions exist for most weird use cases

# Code based

- More control and flexibility than WYSIWYG programs
- Can share and borrow code
  - within a dashboard
  - between dashboards
  - between organizations
- Can respond more quickly to community feedback

# Other advantages

- Supports Google Analytics
- Can be as simple or complex as you need it to be
  - simple: flexdashboard (markdown)
  - intermediate: shiny
  - as needed: custom CSS, custom theming, bslib, shiny components, etc.

# Hosting considerations

- If contains shiny components, must be hosted on a shiny server
  - shinyapps.io
  - custom/locally-owned server
  - Posit Connect server
- If no shiny components, flexdashboard can be hosted on any webserver
  - Can even email it as an html file!

# **IVPP SUICIDE UPDATES DASHBOARD**



# Suicide Updates Dashboard

- [https://oregoninjurydata.shinyapps.io/suicide\\_updates/](https://oregoninjurydata.shinyapps.io/suicide_updates/)
- Built with flexdashboard package
  - basic architecture coded in markdown
  - custom CSS
  - additional functionality from
    - plotly (javascript graphs)
    - shiny (interactivity)
    - bslib (layout)

# YAML

```
---  
title: "Suicide-Related Public Health Data Updates Dashboard"  
author: "Oregon Health Authority"  
output:  
  · flexdashboard::flex_dashboard:  
    · · · storyboard: true  
    · · · logo: "www/OHA-logo-trim-48.png"  
    · · · css: "www/OHA-style.css"  
    · · · includes:  
      · · · · · in_header: google-analytics-su.html  
runtime: shiny  
resource_files:  
  · "www/OHA-CMYK-71.png"  
  · www/OregonEssence.jpg  
  · "www/plotly-menu.png"  
---
```

# Markdown architecture

Use # to set levels for pages

- ### is new page
- #### header on the page
- ##### subheader
- \*\*\* adds a sidebar to the page
- Use HTML and CSS for formatting

# Introduction example

```
### Introduction-  
-  
<div class=_banner>If you or someone you know is struggling or in crisis, help is available.-  
-  
Call or text 988 or chat [988lifeline.org](https://988lifeline.org/)</div>-  
-  
#### Welcome to the Suicide-Related Public Health Update Dashboard-  
-  
This Oregon Health Authority (OHA) dashboard provides monthly updates of Oregon suicide-related  
data, focusing on current total suicide-related events in major age groups. For dashboards featuring  
other kinds of data, including rates and detailed demographics, please see the Resources section.-  
-  
Recent data is preliminary and may change.-  
-
```

# Inline code

```
##### Data Last Updated
`r`format(last_revised, format = "%A-%B-%d, %Y")`

##### Version log

June 13, 2024: Added additional age groups to plot for Emergency Departments and Urgent Care Centers.

April 11, 2024: Dashboard published.

### Summary

##### Summary

* Suicide deaths in `r`current_year_orvdrs` are `r`orvdrs_relationship` previous years. Mortality data is being processed and numbers for recent months may change.

* Suicide-related visits to Emergency Departments (EDs) and Urgent Care Centers (UCCs) for all patients in `r`current_year_ess` are `r`essence_relationships[1]` `r`last_year_ess`.
```

# Shiny components

- No User Interface (UI) function needed – Flexdashboard layout is the UI
- No Shiny Server function needed – Java Script handles widgets
  - limitation: widgets have to live on the same page
- Most Shiny functions are available
  - <https://shiny.posit.co/r/gallery/widgets/widget-gallery/>
- Easier to troubleshoot than full shiny architecture

# Download data

```
#### Data Download
`{r data download 1}`

output$download1 <- downloadHandler(
  filename = paste0(
    "OHA_suicide_update_",
    format(last_revised,
      format = "%Y-%b-%d"),
    ".csv"
  ),
  content = function(file) {
    write.csv(raw_data, file, row.names = FALSE)
  }
)
```

The underlying data used in this dashboard can be downloaded for screen-reader access and other purposes: ``r downloadLink("download1", "Data Download (.csv)")``.

# Inline HTML and bslib

```
<center>-  
For questions or comments about this dashboard, please contact  
IVPP.General@dhsoha.state.or.us (mailto:IVPP.General@dhsoha.state.or.us)  
</center>-  
<br>-  
<br>-  
<div class="col text-center">-  
  {r contact}-  
  layout_columns(-  
    card(-  
      card_body(-  
        markdown("-  
        |[Oregon Essence](www/OregonEssence.jpg) |~  
        **Oregon ESSENCE** |~  
        OREGON HEALTH AUTHORITY |~  
        Public Health Division |~  
        Oregon.ESSENCE@dhsoha.state.or.us |~  
        [healthoregon.org/essence](https://www.oregon.gov/OHA/PH/DiseasesConditions/CommunicableDisease/Prepared  
        nessSurveillanceEpidemiology/essence/pages/index.aspx)"~  
        ) #markdown~  
      ) #card_body~  
    ) #card~  
    card(-  
      card_body(-  
        markdown("-  
        |[Oregon Health Authority](www/OHA-CMYK-71.png) |~  
        **Injury and Violence Prevention** |~  
        OREGON HEALTH AUTHORITY |~  
        Public Health Division |~  
        IVPP.General@dhsoha.state.or.us |~  
        [healthoregon.org/suicideprevention](https://www.oregon.gov/OHA/PH/PreventionWellness/SafeLiving/Suicide  
        Prevention/pages/index.aspx)"~  
        ) #markdown~  
      ) #card_body~  
    ) #card~  
  ) #column_layout~  
  ~  
</div>-
```



# Drawbacks of flexdashboard

- laggy with big datasets
- laggy with multiple plots on a page

# **IVPP OVERDOSE PREVENTION DASHBOARDS**

# Overdose Prevention Dashboard (v1)

- <https://oregoninjurydata.shinyapps.io/overdose/>
- development began in flexdashboard
- soon moved to shiny + shinythemes
- was able to salvage text and code from flexdashboard version

# V1 Drawbacks:

- no data download
- layout and UI issues
  - scaling issues (small screens, phones)
  - no opportunity to explore the strengths of each dataset
  - wanted scrollable pages
- community requests for additional views

# IVPP Overdose Prevention Dashboard (v2)

- shiny + bslib + custom theming
- new layout and UI
- as before, some code is salvaged (text, data cleaning, plots, etc.)

# Conclusion: Creating Dashboards in R

- Options for both simple and complex dashboards
  - Can even use simple dashboards to model more complex ones
- Can reuse and share code
- Open source = lower licensing and hosting fees
- More customizability
- Faster response to community requests

**QUESTIONS?**



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