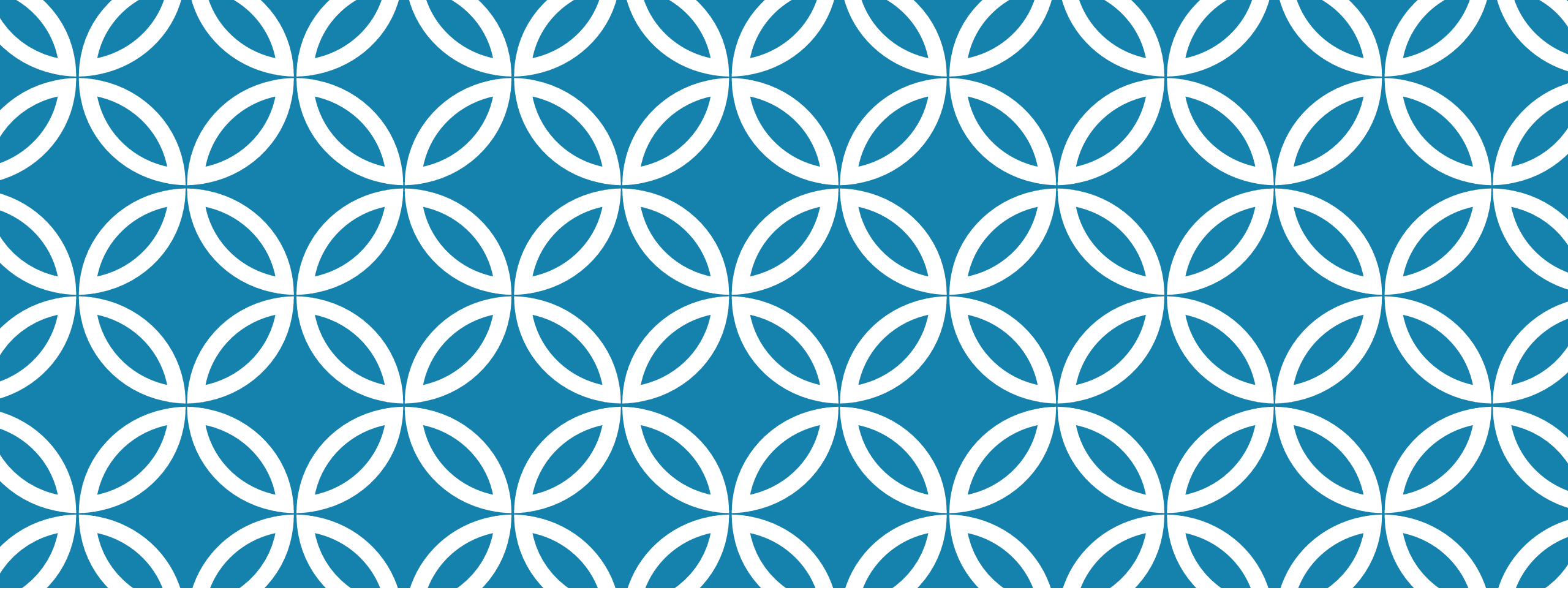


# Introduction to R Workshop

**Amrom Obstfeld**

July 16, 2020

# Course Introduction

# Goals and Objectives

- Advocate for the use of R as a means of improving reproducibility in clinical data analysis
- Demonstrate how R is used to perform analyses of laboratory operational data
- Establish a basis of understanding in the 'tidy' approach to data analysis within the framework of R

| July 16 2020 | **Session** | **Instructor** |
|---|---|---|
| 1:00 pm - 1:30 pm | Instructor Introductions, Introduction to technology | Amrom Obstfeld |
| 1:30 pm - 2:15 pm | Introduction to R and RStudio | Joe Rudolf |
| 2:30 pm - 3:15 pm | Reproducible Reporting | Patrick Mathias |
| 3:30 pm - 5:00 pm | Data Visualization | Stephan Kadauke |
| July 17 2020 | | |
| 1:00 pm - 2:30 pm | Data Transformation | Amrom Obstfeld |
| 2:45 pm - 4:15 pm | Statistical Analysis | Dan Herman |
| 4:30 pm - 5:00 pm | Advanced Reporting | Patrick Mathias |

# Who are we?

# Joseph Rudolf

Assistant Professor, Department of Pathology, University of Utah Medical School

Medical Director, Automated Core Laboratory, ARUP Laboratories

# Patrick Mathias

Assistant Professor, Department of Laboratory Medicine

University of Washington School of Medicine

Associate Medical Director, Laboratory Medicine Informatics

# Stephan Kadauke

Assistant Professor of Clinical Pathology and Laboratory Medicine

University of Pennsylvania Perelman School of Medicine

Assistant Director of the Cell and Gene Therapy Laboratory

Children's Hospital of Philadelphia

# Daniel Herman

Assistant Professor of Pathology and Laboratory Medicine

University of Pennsylvania Perelman School of Medicine

Director, Endocrinology Laboratory

Hospital of the University of Pennsylvania

# Amrom Obstfeld

Assistant Professor of Clinical Pathology and Laboratory Medicine

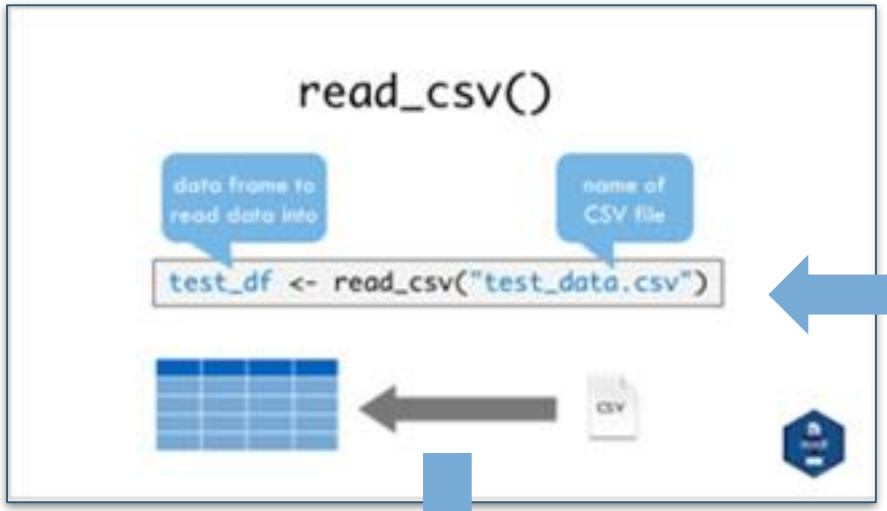
University of Pennsylvania Perelman School of Medicine

Director of Pathology Informatics

Children's Hospital of Philadelphia

# Workshop Workflow

# Lectures

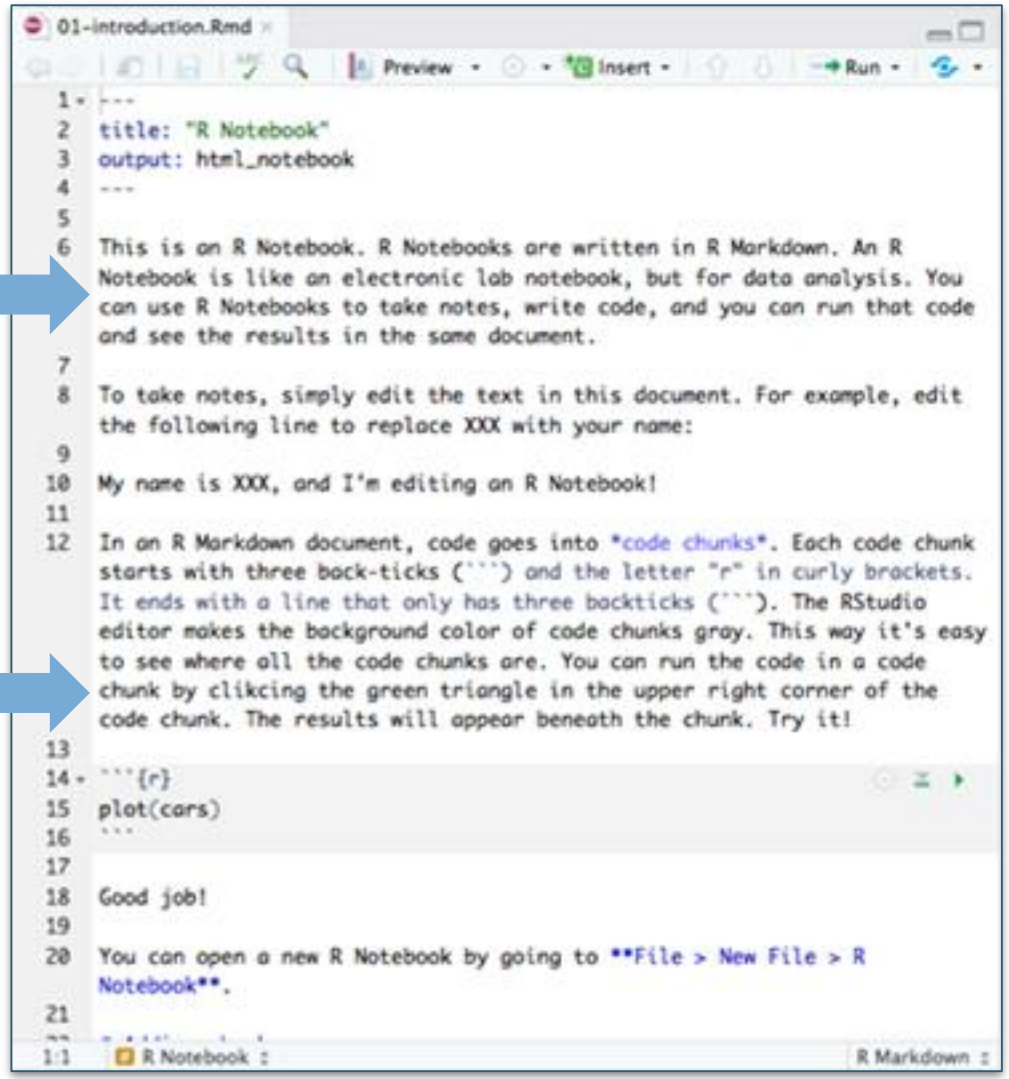



## Your Turn

Introduce yourself to your neighbors

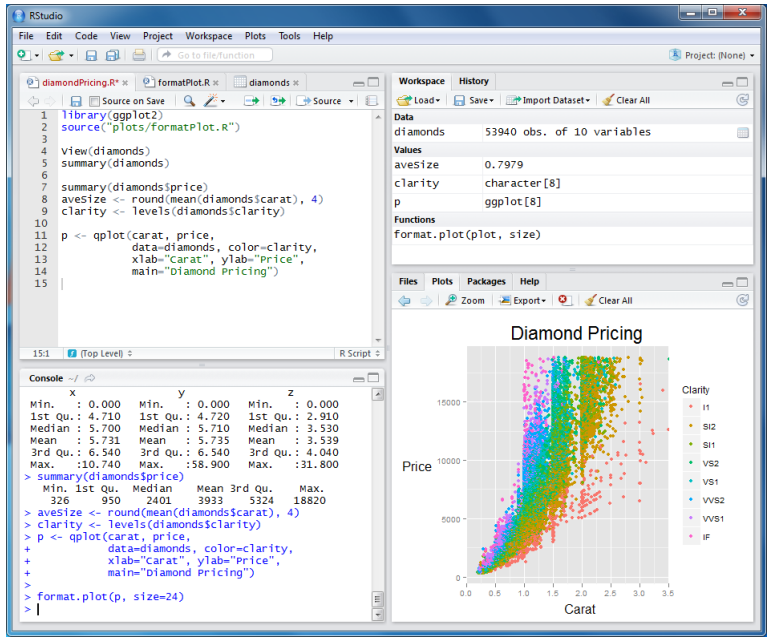
- Who are you?
- Where are you from?
- What do you do with data?
- Have you ever used R?

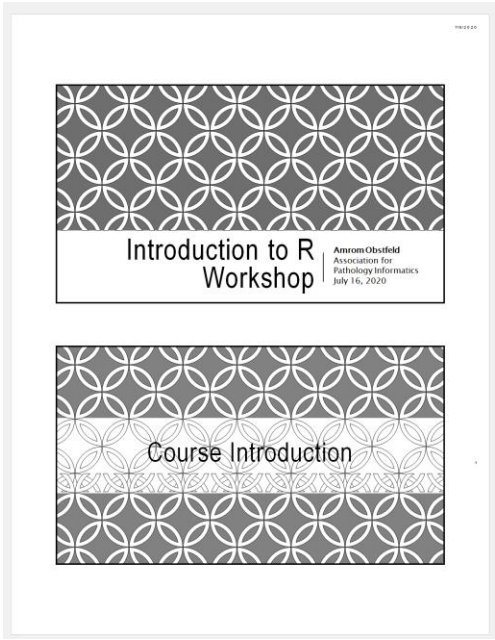
3:00



# Your Setup

zoom


RStudio
File Edit Code View Project Workspace Plots Tools Help
diamondPricing.R* formatPlot.R diamonds
Source on Save Source
1 library(ggplot2)
2 source("plots/formatPlot.R")
4 View(diamonds)
5 summary(diamonds)
7 summary(diamonds$price)
8 aveSize <- round(mean(diamonds$carat), 4)
9 clarity <- levels(diamonds$clarity)
11 p <- qplot(carat, price,
12 data=diamonds, color=clarity,
13 xlab="Carat", ylab="Price",
14 main="Diamond Pricing")
15:1 (Top Level) R Script
Console
x y z
Min. : 0.000 Min. : 0.000 Min. : 0.000
1st Qu.: 4.710 1st Qu.: 4.720 1st Qu.: 2.910
Median : 5.700 Median : 5.710 Median : 3.530
Mean : 5.731 Mean : 5.735 Mean : 3.539
3rd Qu.: 6.540 3rd Qu.: 6.540 3rd Qu.: 4.040
Max. :10.740 Max. :58.900 Max. :31.800
> summary(diamonds$price)
Min. 1st Qu. Median Mean 3rd Qu. Max.
326 950 2401 3933 5324 18820
> aveSize <- round(mean(diamonds$carat), 4)
> clarity <- levels(diamonds$clarity)
> p <- qplot(carat, price,
+ data=diamonds, color=clarity,
+ xlab="Carat", ylab="Price",
+ main="Diamond Pricing")
> format.plot(p, size=24)
Workspace History
Load Save Import Dataset Clear All
Data
diamonds 53940 obs. of 10 variables
Values
aveSize 0.7979
clarity character[8]
p ggplot[8]
Functions
format.plot(plot, size)
Files Plots Packages Help
Zoom Export Clear All
Diamond Pricing
Price
Carat
Clarity
I1
SI2
SI1
VS2
VS1
VVS2
VVS1
IF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Association for Pathology Informatics
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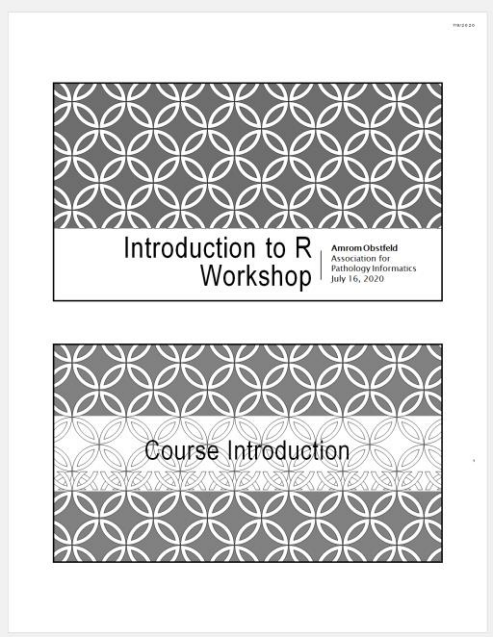
# Workshop Coursebook

- Print out of all slides
- Appendix
  - Cheat sheets
  - Useful resources



# Using Zoom

- Participants muted
- Chat window
- Non-verbal feedback
- Breakout sessions

Amrom

# Using Zoom

- Participants muted
- Chat window
- Non-verbal feedback
- Breakout sessions

om Meeting

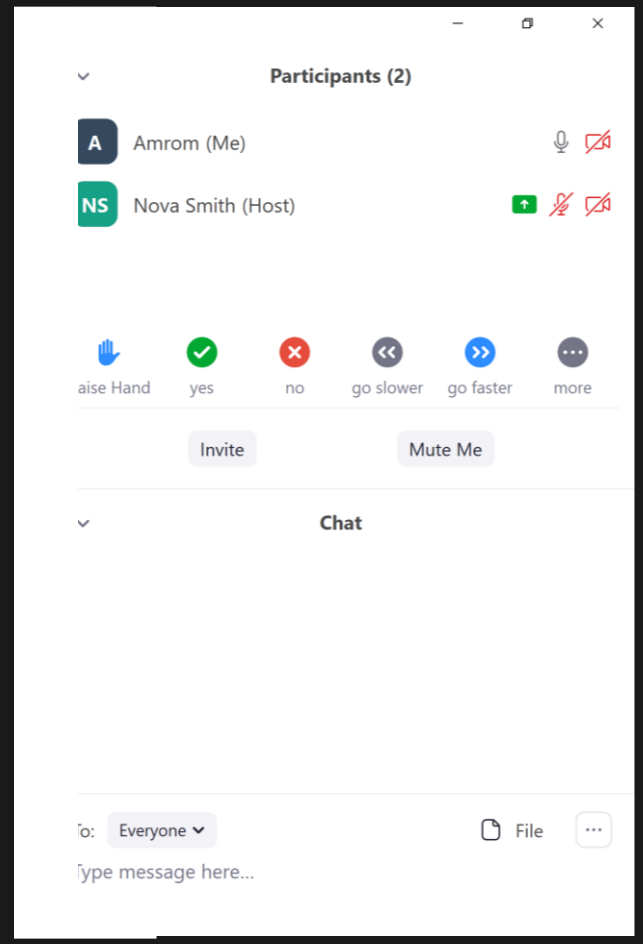
You are viewing Am Ob's screen

View Options

Amrom

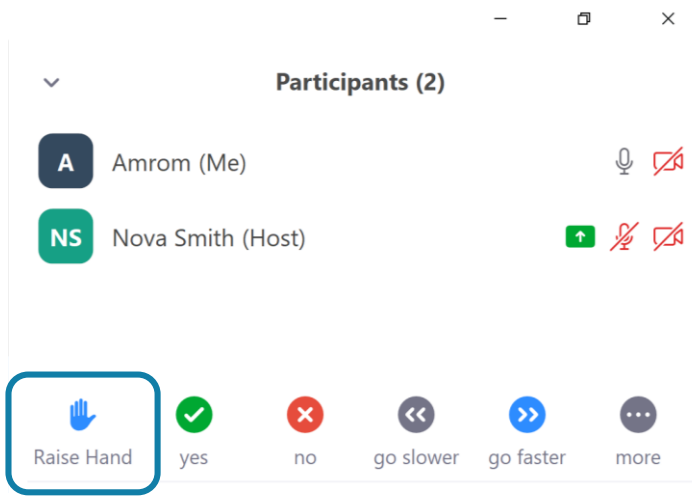
# Using Zoom

- Participants muted
- Chat window
- Non-verbal feedback
- Breakout sessions




mute
Start Video
2
Participants
Chat
Share Screen
Record
Reactions
Leave

# Getting Help




- During presentation – Raise hand, instructor will DM

- Break out sessions – Instructor available, unmuted

# Who are you?

# Your Turn

Introduce yourself to your breakout roommates

Who are you?
Where are you from?
Why are you here?
Have you ever used R?

# Final Tips

- The best way to learn to code is by doing
- Practice is key!