

GLOBAL ERGONOMICS MONTH WEBINAR SERIES

# Supporting remote office work, pivoting back to the workplace during a pandemic, and the future of virtual workspaces

Insights from working from home during the COVID-19 pandemic  
may provide a starting place for a healthier working future

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# Working From Home

- **Millions of people were sent home to work due to COVID-19**
- **55% of these virtual workers workforce will continue work at home during the next two years**  
(Global Workplace Analytics, 2020)
- **About 45% of the workers in United States have the ability to work virtually, with some occupations above 70%** (BLS, 2020)
  - **Financial activities, information, professional and business services**

**Working From Home is likely here to stay**

# What Do We Know About Virtual Offices?

- **Better work flexibility**
- **Improved job satisfaction**
- **Improved work-family balance**
- **Improved productivity**
- **Limited resources for office equipment**
- **Potential for web conference burnout**

(Davis, et al., 2020, de Macedo et al., 2020)

# The Study

- **Online Survey:** designed to assess the current workstations for faculty & staff immediately after being sent home due to COVID-19 (mid-April, 2020)
- **Sub-sample of pictures of workstations:** Two pictures sent with worker at the workstation for ergonomic assessment

# The Survey

# Demographics

- **What is your position at UC?**
- **What is your age group?**
- **What is your gender?**

# General Questions

- **What % of time do you spend working from home?**
- **Have you brought any equipment home?**

# Workstation Items

- When working in your home office, how often do you use different types of computers?
- When working in your home office, how often do you use the following types of seating?
  - Are the armrests on your chair adjustable?
- Does your chair have lumbar support?
- When working in your home office, how often do you use the following types of screens?
- When working in your home office, how often do you use the following types of input devices?
- When working in your home office how often do you work at different workstations?

# Sitting/Looking at Screen Items

- **When sitting:**
  - Is your back in contact with the back of the chair
  - Is your upper body (trunk) twisted or bent sideways
  - Is your neck bent forward (flexed)
  - Is your neck bent backwards (extended)
  - Is your neck twisted or bent sideways
- **When looking at your screen:**
  - Is your head/neck in a neutral position
  - Is your head/neck tilted forward
  - Is your head/neck tilted backwards
  - Is your head/neck twisted or bent sideways
  - Do you get glare from your lights/screen



# General Work Items

- On average, how long do you work without taking break?
- Do you wear glasses while working on computer?
- How often do you walk more than 5 min during the day?
- Relative to working in your normal office, what is level of stress working in your home office?
- Relative to working in your normal office, how tired do you feel working in your home office?
- Did you have any physical discomfort when you worked in your normal office, before COVID-19?

# Discomfort Items

- **Indicate any discomfort that you are currently having**
  - **Eyes/Head/Neck**
  - **Upper Back/Shoulders**
  - **Upper Arms/Elbows**
  - **Lower Arms/Hands/Wrists**
  - **Middle Back**
  - **Lower Back**
  - **Hips/Upper Legs**
  - **Knees/Lower Legs**
  - **Ankles/Feet**

# Study Populations

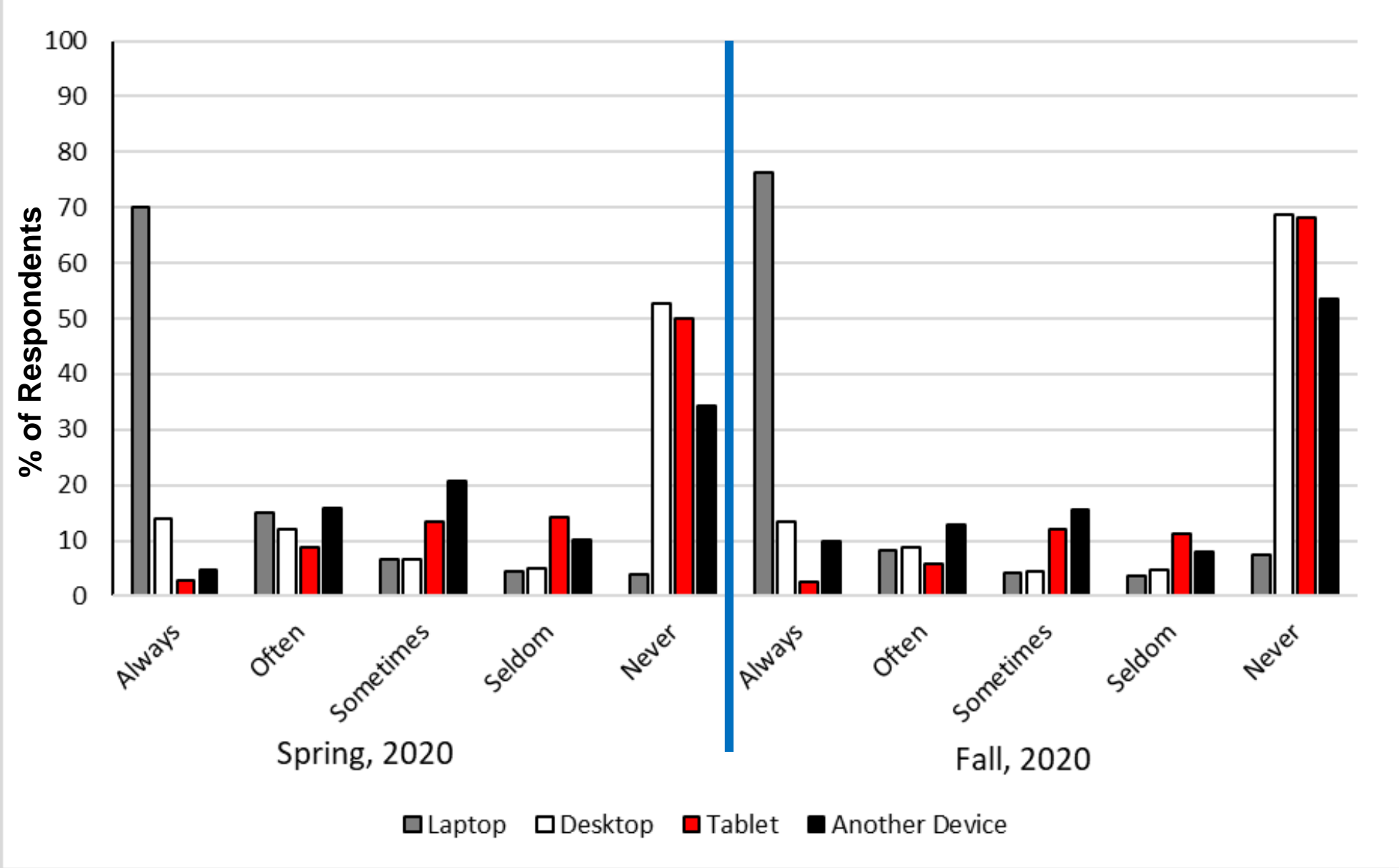
## Original Spring Survey:

- 843 participants
- 577 Faculty
- 227 Staff
- 20 Administration
- 19 No response

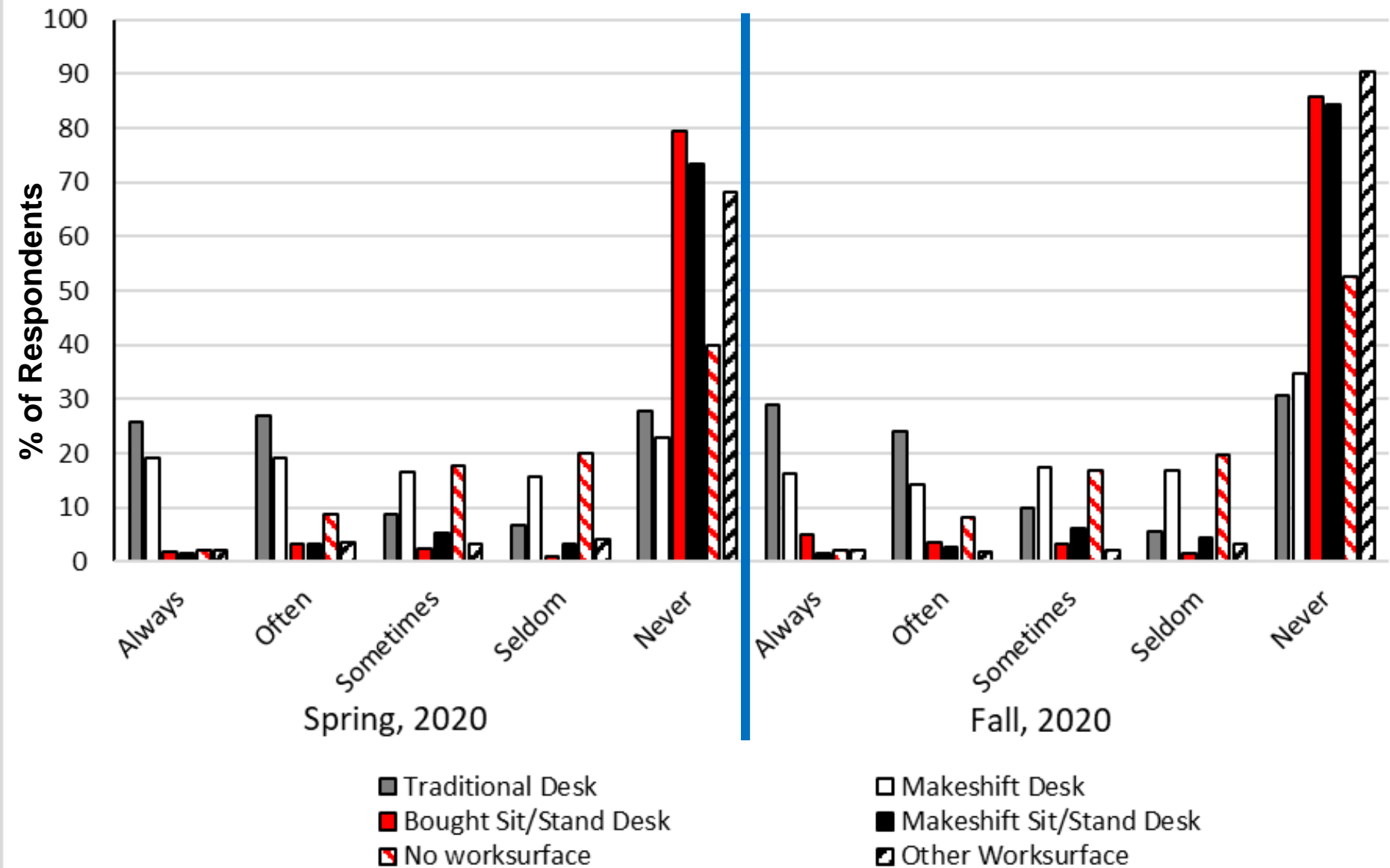
## Fall Follow-Up Survey:

- 1,135 participants
- 520 Faculty
- 563 Staff
- 41 Administration
- 11 No response

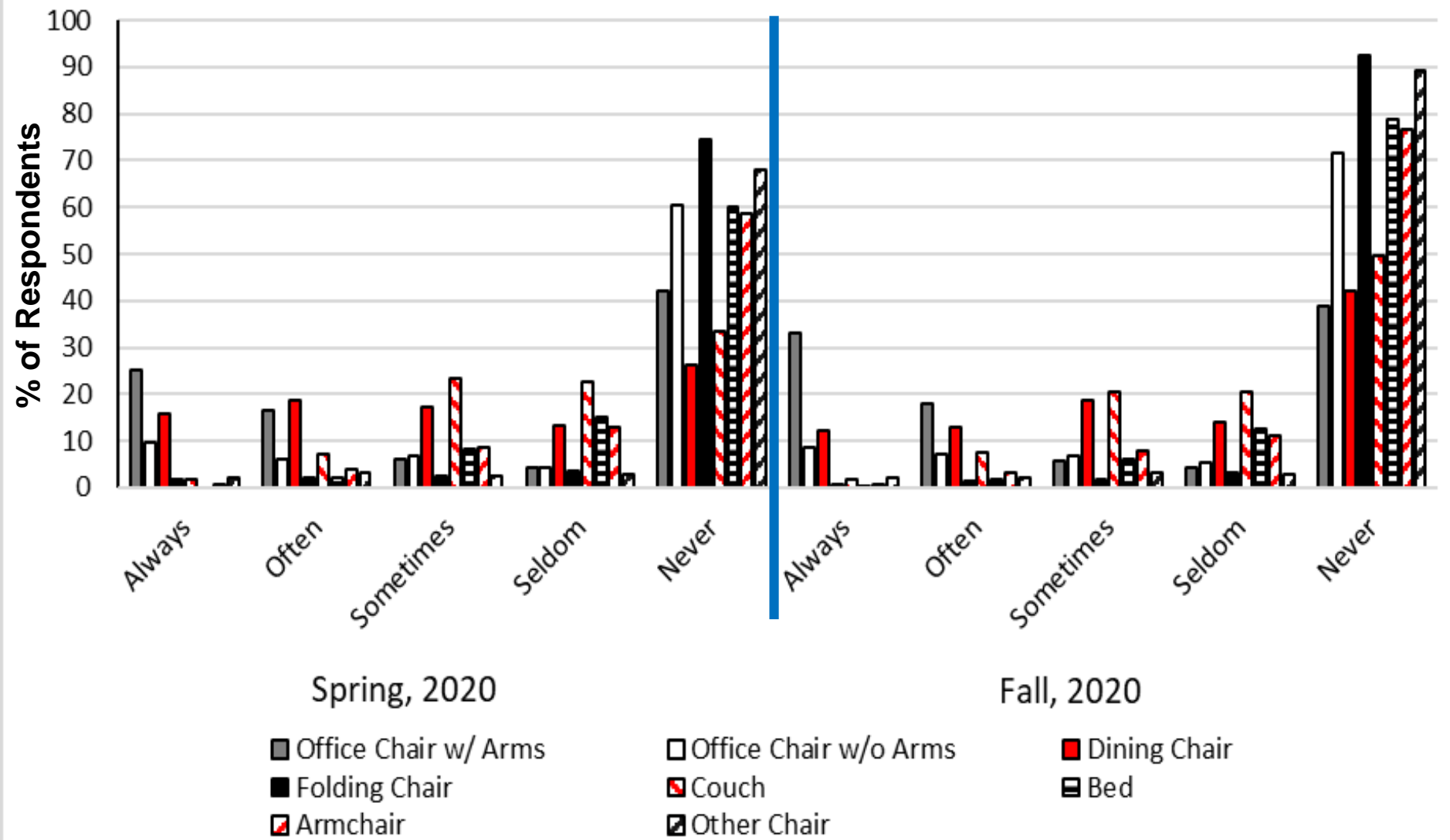
# Survey Results



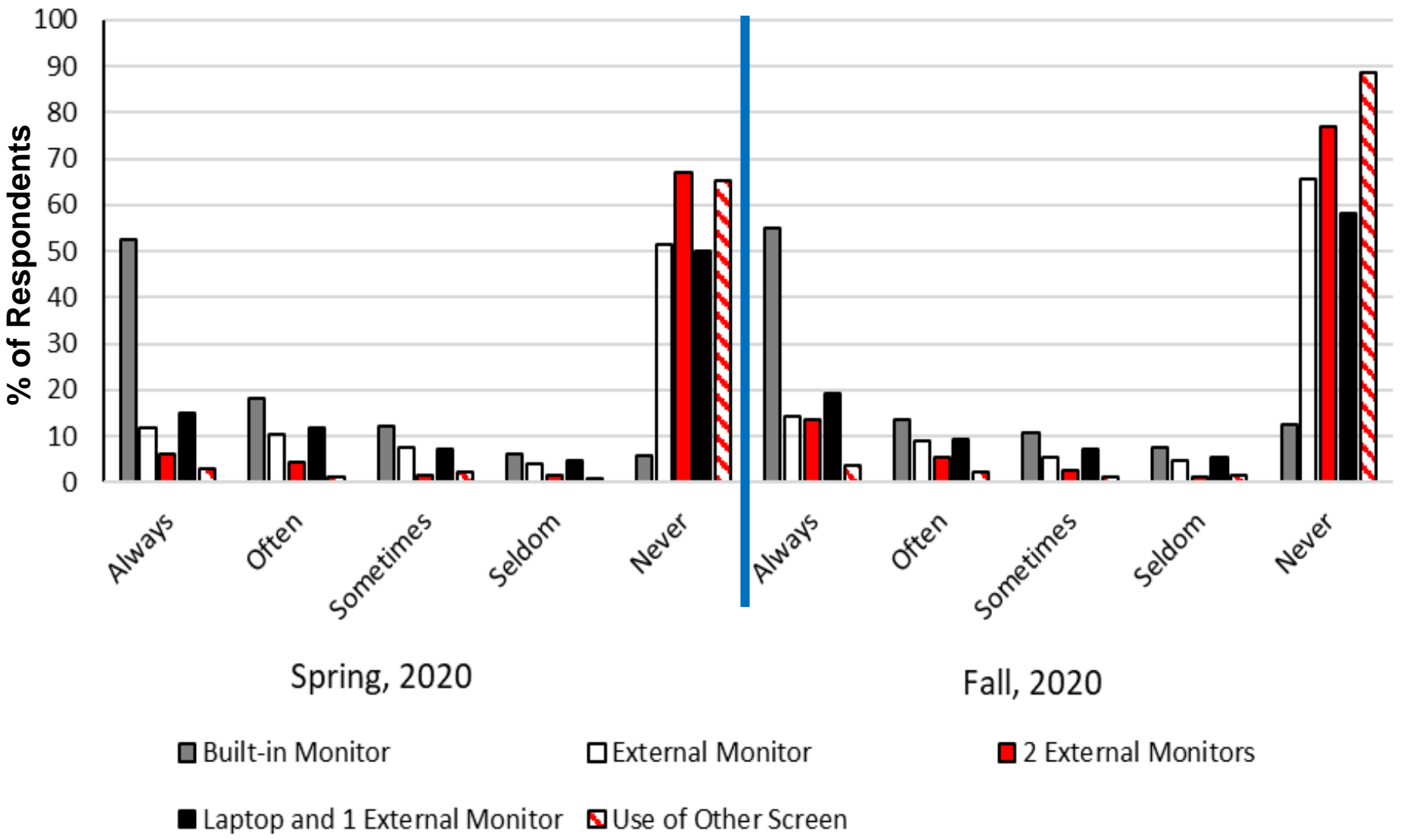
## Usage of Computers



## Usage of Workstation Type

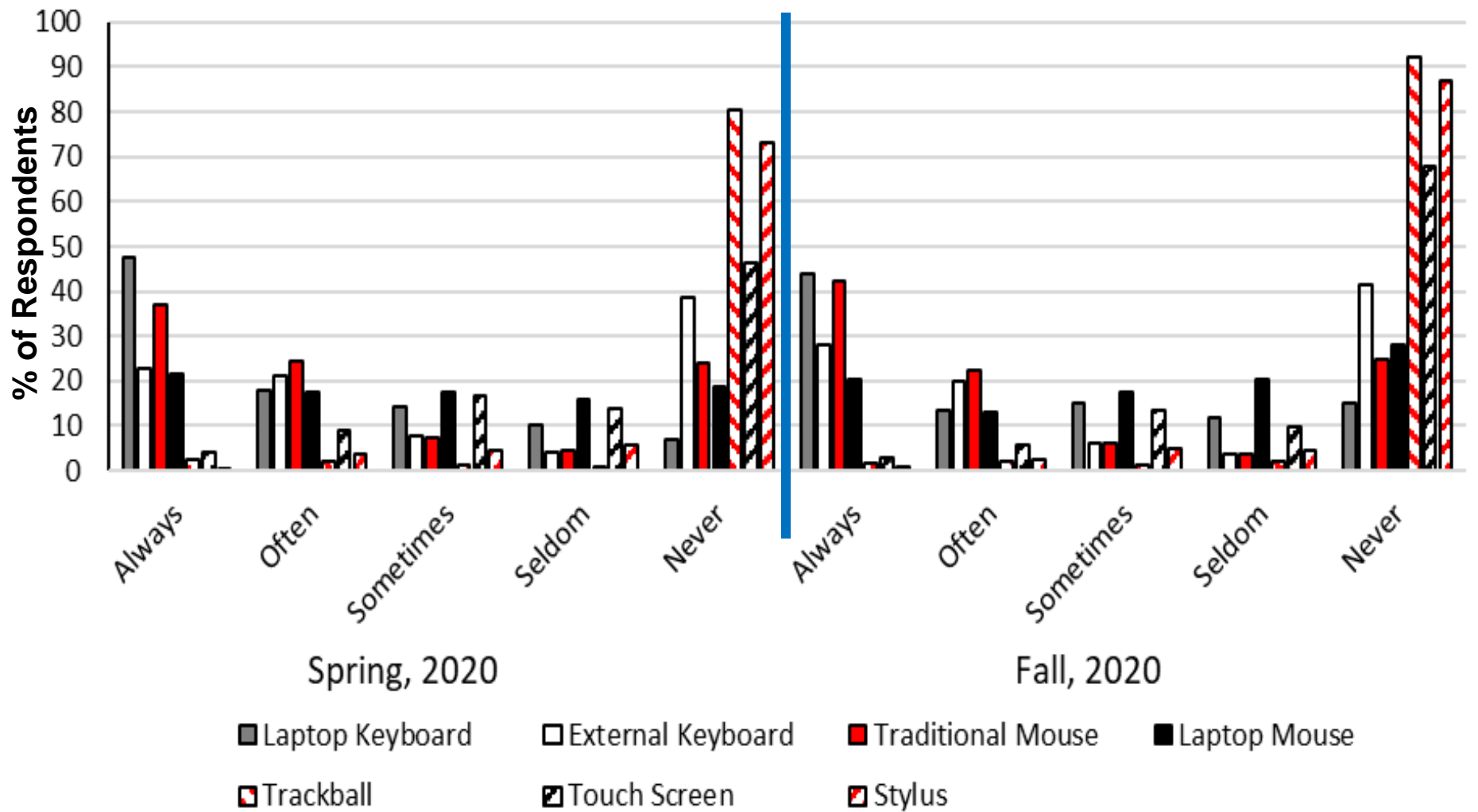


## Usage of Seating Equipment



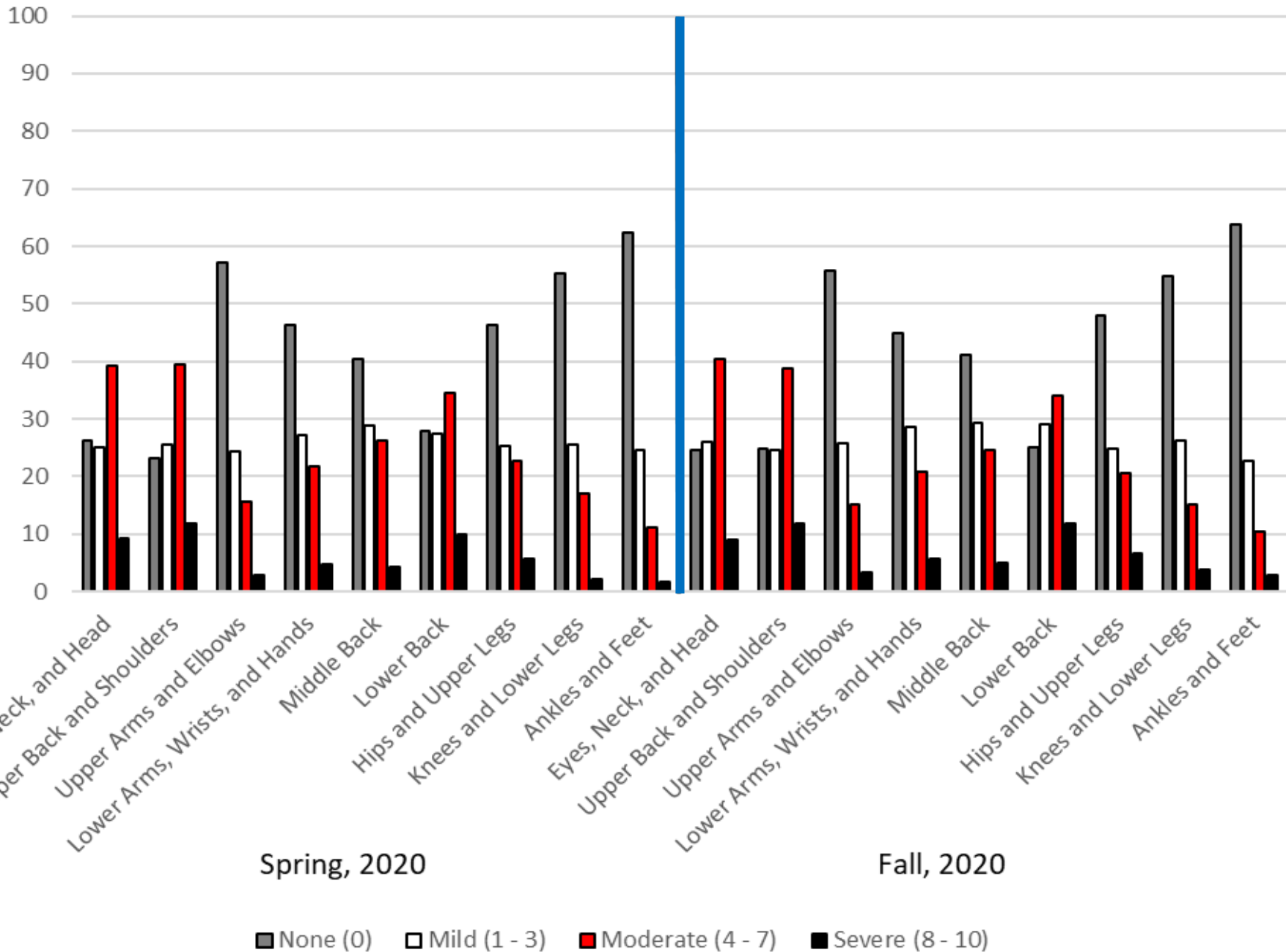
## Usage of Monitor





## Usage of Keyboard and Input Device

% of Respondents

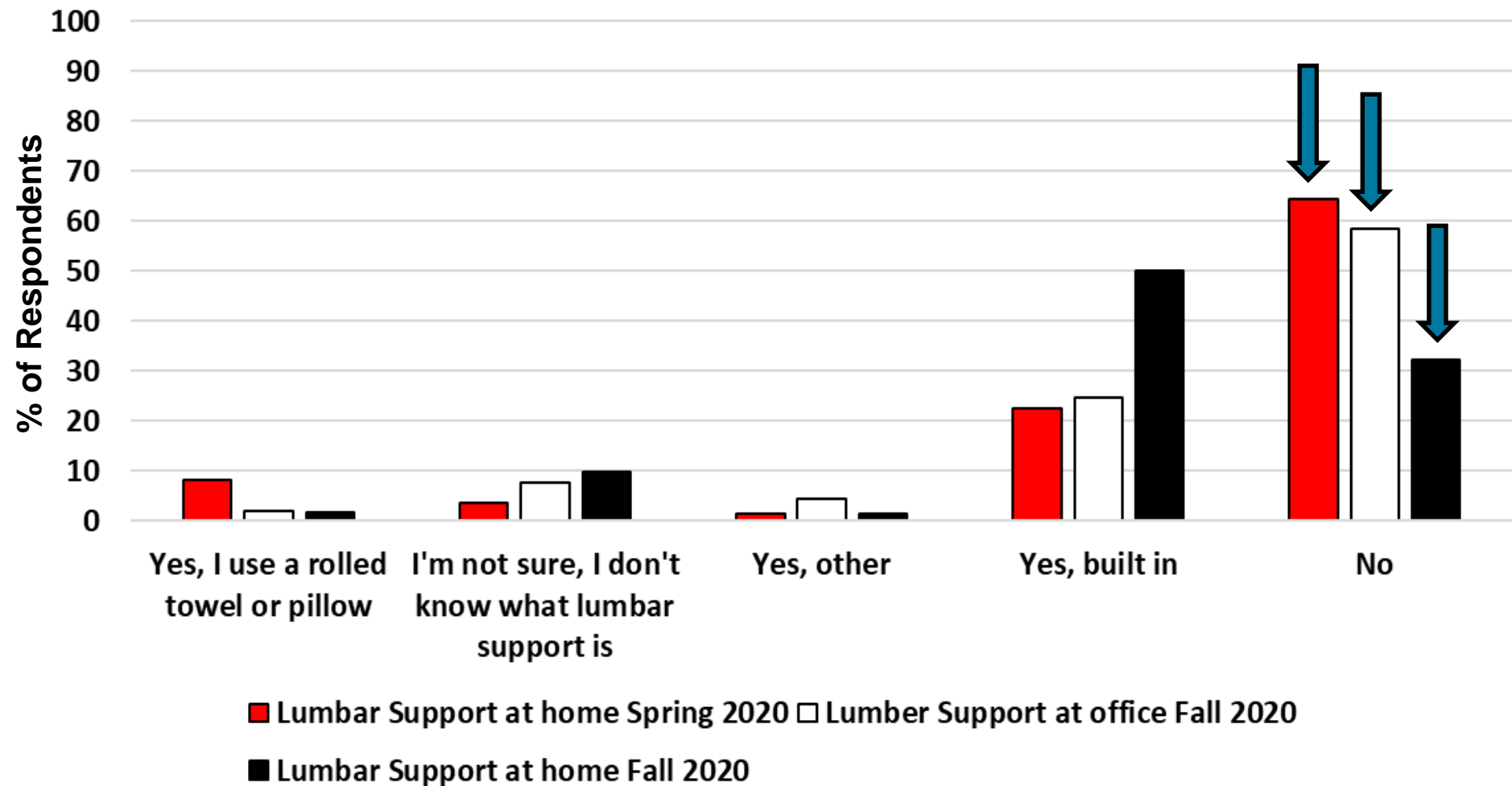


Spring, 2020

Fall, 2020

None (0) Mild (1 - 3) Moderate (4 - 7) Severe (8 - 10)

# Body Discomfort



## Lumbar Support in Chair at Home and in Office

# Summary of Regression Results

## Eyes, Neck & Head

- **Glare** ( $\beta$ : 0.81, P: <0.0001)
- **Couch workstation** ( $\beta$ : 0.19, P: 0.05)
- **Back in contact w/ chair** ( $\beta$ : -0.26, P: 0.008)
- **Gender** ( $\beta$ : -0.59, P: 0.01)

## Upper Arms & Elbows

- **Glare** ( $\beta$ : 0.45, P: <0.0001)
- **Laptop w/ external monitor** ( $\beta$ : -0.13, P: 0.02)

## Upper Back & Shoulders

- **Glare** ( $\beta$ : 0.69, P: <0.0001)
- **Sharp edge on desk** ( $\beta$ : 0.25, P: 0.04)
- **Gender** ( $\beta$ : -0.93, P: <0.0001)
- **Back in contact w/ chair** ( $\beta$ : -0.31, P: <0.0001)

## Lower Arms, Wrists, & Hands

- **Glare** ( $\beta$ : 0.66, P: <0.0001)
- **External Keyboard** ( $\beta$ : 0.15, P: 0.05)
- **Bought sit-stand workstation** ( $\beta$ : 0.25, P: 0.05)
- **Adjustable armrests** ( $\beta$ : -0.51, P: 0.05)

# Summary of Regression Results

## Middle Back

- **Glare** ( $\beta$ : 0.72, P: <0.0001)
- **Dining chair** ( $\beta$ : 0.17, P: 0.03)
- **Back Contact w/ Chair** ( $\beta$ : -0.47, P: <0.0001)
- **Laptop Keyboard** ( $\beta$ : -0.21, P: 0.01)

## Low Back

- **Glare** ( $\beta$ : 0.72, P: <0.0001)
- **Back in contact w/ chair** ( $\beta$ : -0.46, P: <0.0001)

## Hips & Upper Legs

- **N/A**
- **Back in contact w/ chair** ( $\beta$ : -0.38, P: <0.0001)
- **Gender** ( $\beta$ : -0.58, P: 0.006)

## Knees & Lower Legs

- **Glare** ( $\beta$ : 0.29, P: 0.0001)
- **Back contact w/ chair** ( $\beta$ : -0.24, P: 0.001)
- **Time w/o break** ( $\beta$ : -0.3, P: <0.0001)

## Ankles & Feet

- **Glare** ( $\beta$ : 0.30, P: <0.0001)
- **N/A**

# Virtual Offices Due to COVID-19

- **Take Home Message From the Surveys:**
  - Laptops were widely used
  - Kitchen tables & counters were a favorite
  - Discomfort appeared to correlate with poor choices in workspace devices.
  - Results did not change much 6 to 9 months into pandemic



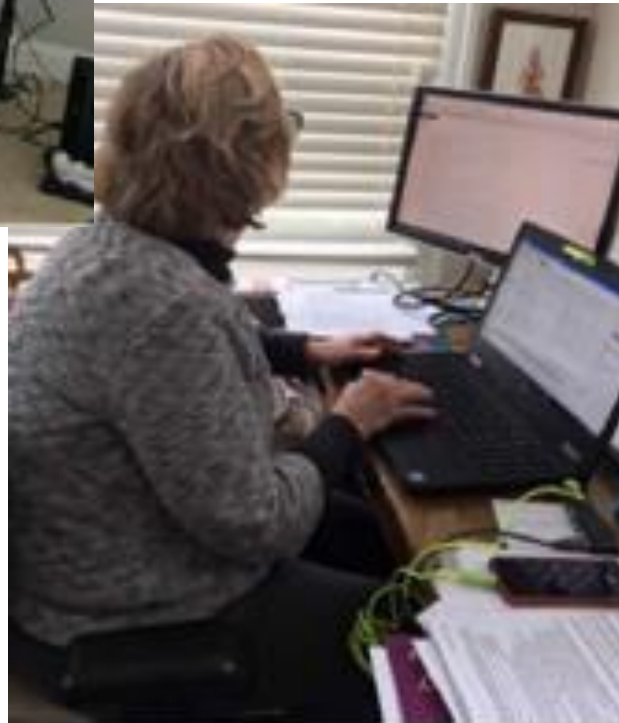
# The Ergonomic Assessment

# The Assessment

- **Small number of self-selected individuals sent two pictures to the research team**
  - **Directly from the back**
  - **Directly from the side**
- **Research team identified ergonomic concerns**



# Dual Monitor Concerns



# Hard Edges & Seating Concerns

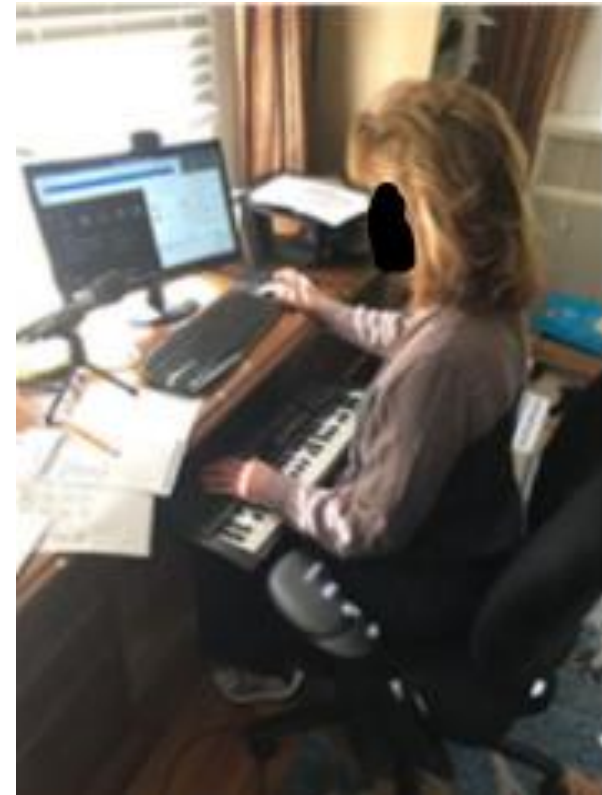


## Monitors Too Low





# Non-Traditional Workstations



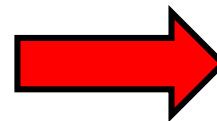
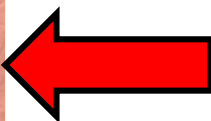
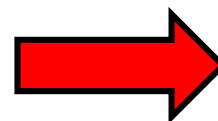
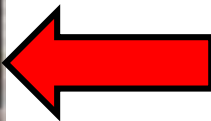
# Alternative Workstations



# Virtual Offices Due to COVID-19

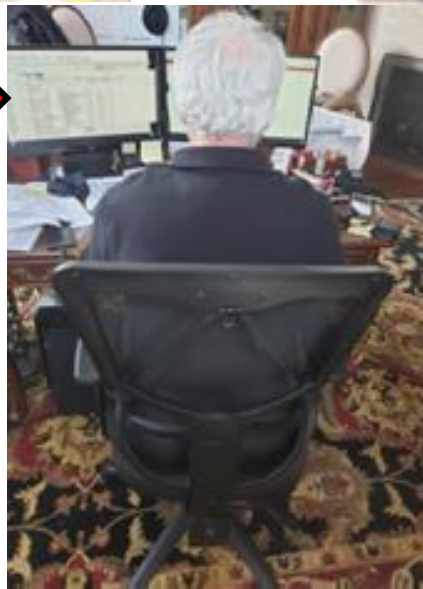
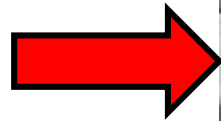
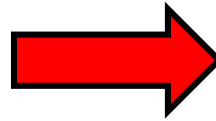
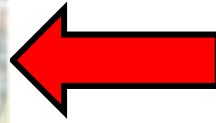
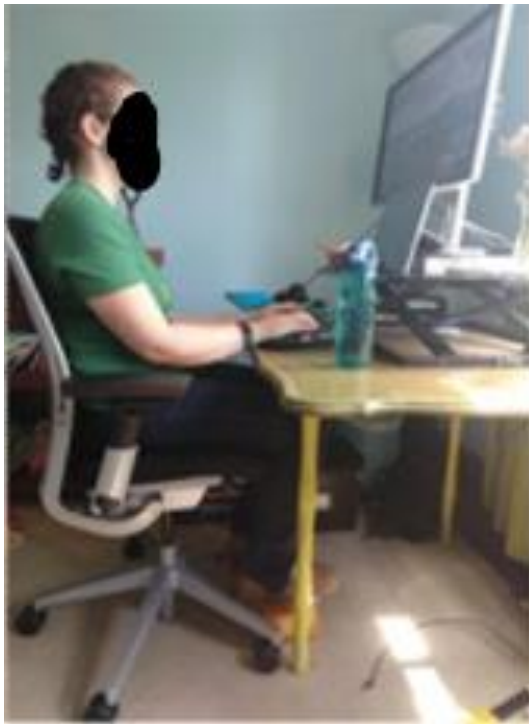
- **Take Home Message From Ergonomic Assessments:**
  - **Monitors were typically too low**
  - **Use of laptops without external keyboard or mouse**
  - **Hard front edges were seen consistently**
  - **Poor chair choices**

# How Can We Help?



(Purdue)





# Other Interventions

- **Take routine breaks every 30 min.:** stand-up, move for 2 min (Davis & Kotowski, 2014)
- **Two monitors:** place primary directly in front
- **Sharp edge:** place a soft towel, pipe insulation, or a pool noodle
- **Feet not on floor:** consider purchasing a footrest or use a box or block of wood



# What's Wrong With Laptops?

- **Built-in monitor: neck bent forward due to screen too low**
- **Smaller keyboard: awkward arm postures**
- **Built-in mouse: rapid small hand movements**

## How To Rectify?

- **Use external monitor or raise laptop on box or books so top of screen is at eye level**
- **Use external keyboard and mouse**

# Take Home Message

- **Traditional desks are "best" but most are sent home with just a laptop**
- **Need to use external monitor, keyboard and mouse when using laptops**
- **Makeshift desks oftentimes result in poor ergonomics and elevated discomfort**
- **Companies and institutions should provide ergonomic training and allow office equipment to be taken home**

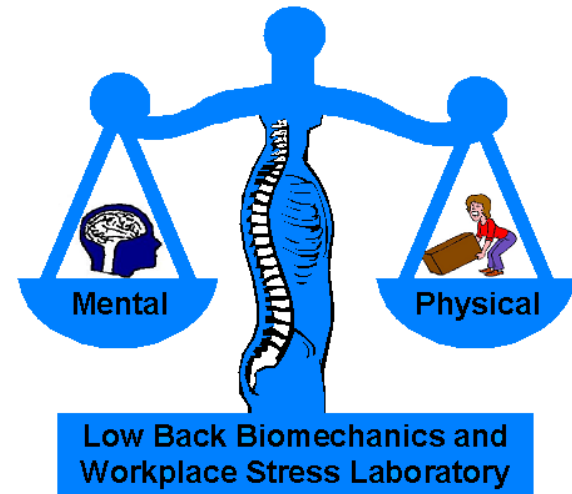
# Thanks to These Other Contributors

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# Questions?



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