

TABLE ONE

```
library(tidyverse)
library(finalfit)
library(gtsummary)
```

```
rakai = read_csv("rakai.csv")
dim(rakai)
```

```
[1] 2839    78
```

```
#glimpse(rakai)
#missing_glimpse(rakai)
```

```
df1 <- rakai %>%
  select(ageyrs,sex,locate,occup1,currmarr,evermarr,mobility,
         artdays,artwks,artmos,artyrs,comm_num,educyrs,religion)
```

```
df2 <- rakai %>%
  select(ageyrs,sex,locate,occup1,currmarr,evermarr,mobility,
         artdays,artwks,artmos,artyrs,comm_num,artrunbc,artstrbc,hivac,copies,new_copies)
```

```
df3 <- df1 %>%
  mutate(ageyrs = ageyrs %>% ff_label("Age (years)"),
         sex = if_else(sex == "F","Female","Male") %>%
           as_factor() %>%
           fct_relevel("Female") %>%
           ff_label("Sex"),
         mobility = case_when(
           mobility %in% c(3,8,10) ~ "In-migrant",
           .default = "Long-term resident") %>%
           fct_relevel("In-migrant") %>%
```

```

    ff_label("Migration"),
community_type = case_when(
  comm_num %in% c(38,770,771,774) ~ "Fishing community",
                                .default = "Inland Community") %>%
  fct_relevel("Inland Community") %>%
  ff_label("Community type"),
fishing_comm = if_else(community_type == "Fishing Community",1,0) %>%
  ff_label("Lake Victoria Fishing Community"),

primary_occupation = case_when(
  occup1 %in% c(1,2,5) ~ "Agriculture/Homebrewing",
  occup1 %in% c(10,11) ~ "Trading or shopkeeping",
  occup1 %in% c(12,18) ~ "Bar work or waitressing",
  occup1 %in% c(2,3,4) ~ "House work",
  occup1 == 7 ~ "Fishing-related occupation",
  .default = "Other") %>%
  fct_relevel("Agriculture/Homebrewing","Trading or shopkeeping") %>%
  ff_label("Primary Occupation"),

age_cat = case_when(
  ageyrs < 30 ~ "<30",
  ageyrs >= 30 & ageyrs <= 39 ~ "30-39",
  ageyrs >=40 & ageyrs <= 49 ~ "40-49") %>%
  fct_relevel("<30") %>%
  ff_label("Age group"),

current_marital_status = case_when(
  currmarr == 1 ~ "Currently married",
  currmarr == 2 ~ "Previously married",
  currmarr == 8 ~ "Never married"
) %>%
  fct_relevel("Never married","Currently married") %>%
  ff_label("Current marital status"),

art_duration = case_when(
  artyrs >= 1 & artyrs < 2 ~ "1-2 years",
  artyrs > 2 & artyrs <= 5 ~ "2-5 years",
  artyrs > 5 ~ ">5 years",
  .default = "<1 year"
) %>%
  fct_relevel("<1 year","1-2 years","2-5 years") %>%
  ff_label("Time on ART"),

```

```

education_level = case_when(
  educyrs == 8 ~ "No formal education",
  educyrs %in% c(1,2) ~ "Primary",
  educyrs %in% c(3,4) ~ "Secondary",
  educyrs %in% c(5,6,7,10,11) ~ "Technical/University"

) %>%
  fct_relevel("No formal education") %>%
  ff_label("Educational attainment"),

religion = case_when(
  religion %in% c(1,6) ~ "Other or none",
  religion %in% c(2,3,4) ~ "Catholic/Christian",
  religion == 5 ~ "Muslim"
) %>%
  ff_label("Religion")

)

```

```

df4 <- df3 %>%
  select(
    ageyrs, age_cat, sex, current_marital_status, education_level, primary_occupation,
    mobility, community_type, art_duration
  )

```

Table One

```

df4 %>%
  tbl_summary(
    by = sex,
    statistic = list(
      all_categorical() ~ "{n} ({p}%)",
      all_continuous() ~ "{median} ({IQR})"
    ),
    digits = list(
      all_categorical() ~ 0,
      all_continuous() ~ 0
    )
  ) %>%

```

```

add_overall() %>%
add_p(
  test = list(
    all_categorical() ~ "chisq.test",
    all_continuous() ~ "wilcox.test"
  )
) %>%
bold_labels() %>%
italicize_levels() %>%
modify_spanning_header(
  update = all_stat_cols() ~ "**Sex**"
) %>%
modify_footnote(
  update = c("p.value") ~
    "a p-values calculated using Pearson's chi-square tests of association,  

    unless otherwise specified.<br>  

    b p-values calculated using Wilcoxon rank-sum tests  

    comparing median values and interquartile ranges (IQR)."
```

Characteristic	Overall, N = 2,839	Female, N = 1,824	Male, N = 1,015	p-value
Age (years)	38 (11)	37 (11)	39 (9)	<0.001
Age group				<0.001
<30	437 (15%)	347 (19%)	90 (9%)	
30-39	1,229 (43%)	809 (44%)	420 (41%)	
40-49	1,173 (41%)	668 (37%)	505 (50%)	
Current marital status				<0.001
<i>Never married</i>	142 (5%)	96 (5%)	46 (5%)	
<i>Currently married</i>	1,720 (61%)	1,036 (57%)	684 (67%)	
<i>Previously married</i>	977 (34%)	692 (38%)	285 (28%)	
Educational attainment				<0.001
<i>No formal education</i>	266 (9%)	174 (10%)	92 (9%)	
<i>Primary</i>	1,931 (68%)	1,193 (65%)	738 (73%)	
<i>Secondary</i>	406 (14%)	287 (16%)	119 (12%)	
<i>Technical/University</i>	236 (8%)	170 (9%)	66 (7%)	
Primary Occupation				<0.001
<i>Agriculture/Homebrewing</i>	709 (25%)	529 (29%)	180 (18%)	

Characteristic	Overall, N = 2,839	Female, N = 1,824	Male, N = 1,015	p-value
<i>Trading or shopkeeping</i>	543 (19%)	430 (24%)	113 (11%)	
<i>Bar work or waitressing</i>	282 (10%)	278 (15%)	4 (0%)	
<i>Fishing-related occupation</i>	504 (18%)	3 (0%)	501 (49%)	
<i>House work</i>	287 (10%)	283 (16%)	4 (0%)	
<i>Other</i>	514 (18%)	301 (17%)	213 (21%)	
Migration				<0.001
<i>In-migrant</i>	637 (22%)	464 (25%)	173 (17%)	
<i>Long-term resident</i>	2,202 (78%)	1,360 (75%)	842 (83%)	
Community type				<0.001
<i>Inland Community</i>	1,284 (45%)	943 (52%)	341 (34%)	
<i>Fishing community</i>	1,555 (55%)	881 (48%)	674 (66%)	
Time on ART				0.012
<i><1 year</i>	222 (8%)	152 (8%)	70 (7%)	
<i>1-2 years</i>	79 (3%)	50 (3%)	29 (3%)	
<i>2-5 years</i>	750 (26%)	446 (24%)	304 (30%)	
<i>>5 years</i>	1,788 (63%)	1,176 (64%)	612 (60%)	

```
df5 <- rakai %>%
  select(sex, artrunbc,
         artstrbc, hivac, copies, new_copies, hivac, artstrac, artstrbc, artrunac)
```

```
df6 <- df5 %>%
  mutate(
    sex = if_else(sex == "F", "Female", "Male") %>%
      as_factor() %>%
      fct_relevel("Female") %>%
      as_factor() %>%
      ff_label("Sex"),

    hivac = if_else(hivac == 1, "Yes", "No") %>%
      ff_label("Missed scheduled visit for HIV care"),
    artrunac = if_else(artrunac == 1, "Yes", "No") %>%
      as_factor() %>%
      ff_label("Run out of ART before next refill"),

    artstrac = if_else(artstrac == 1, "Yes", "No") %>%
```

```

    as_factor() %>%
    ff_label("Taken ART pills less frequently / in smaller
amounts to conserve supply"),

    artstrbc = if_else(artrunbc ==1,"Yes","No") %>%
    as_factor() %>%
    ff_label("Run out of ART before next refill"),

    artstrbc = if_else(artstrbc ==1,"Yes","No") %>%
    as_factor() %>%
    ff_label("Taken ART pills less frequently / in smaller
amounts to conserve supply")
)

```

Viral Load Suppression

```

df7 <- df6 %>% filter(copies != "INV.IC ",!is.na(copies),!is.na(new_copies)) %>%
mutate(
  copies = str_remove_all(copies, "<\\s*"),
  copies = if_else(copies == "BD", "0", copies),
  copies = as.numeric(copies),

  new_copies = str_remove_all(new_copies, "<\\s*"),
  new_copies = if_else(new_copies == "BD", "0", new_copies),
  new_copies = as.numeric(new_copies)
) %>%
mutate(viral_load_b4 = if_else(copies < 200, "Viral Load Sppression","Viraemia") %>%
  ff_label("HIV RNA viral load, in copies/ml"),
  viral_load_after = if_else(new_copies < 200,"Viral Load Sppression","Viraemia") %>%
  ff_label("HIV RNA viral load, in copies/ml"))

```

```

df_summary <- df7 %>%
mutate(
  b4_supp = if_else(viral_load_b4 == "Viral Load Sppression", 1, 0),
  after_supp = if_else(viral_load_after == "Viral Load Sppression", 1, 0)
) %>%
group_by(sex) %>%
summarise(
  n_b4_supp = sum(b4_supp, na.rm = TRUE),
  n_b4 = sum(!is.na(b4_supp)),

```

```

  n_after_supp = sum(after_supp, na.rm = TRUE),
  n_after = sum(!is.na(after_supp))
) %>%
ungroup() %>%
mutate(
  prop_b4 = n_b4_supp / n_b4,
  prop_after = n_after_supp / n_after,
  prop_both = (n_b4_supp + n_after_supp) / (n_b4 + n_after),

  se_b4 = sqrt(prop_b4 * (1 - prop_b4) / n_b4),
  lower_b4 = prop_b4 - 1.96 * se_b4,
  upper_b4 = prop_b4 + 1.96 * se_b4,

  se_after = sqrt(prop_after * (1 - prop_after) / n_after),
  lower_after = prop_after - 1.96 * se_after,
  upper_after = prop_after + 1.96 * se_after,

  se_both = sqrt(prop_both * (1 - prop_both) / (n_b4 + n_after)),
  lower_both = prop_both - 1.96 * se_both,
  upper_both = prop_both + 1.96 * se_both
) %>%
select(
  sex, prop_b4, prop_after, prop_both,
  lower_b4, upper_b4, lower_after, upper_after, lower_both, upper_both
) %>%
pivot_longer(
  cols = c(prop_b4, prop_after, prop_both),
  names_to = "time_point",
  values_to = "proportion"
) %>%
mutate(
  lower = case_when(
    time_point == "prop_b4" ~ lower_b4,
    time_point == "prop_after" ~ lower_after,
    TRUE ~ lower_both
  ),
  upper = case_when(
    time_point == "prop_b4" ~ upper_b4,
    time_point == "prop_after" ~ upper_after,
    TRUE ~ upper_both
  ),
  time_point = case_when(

```

```

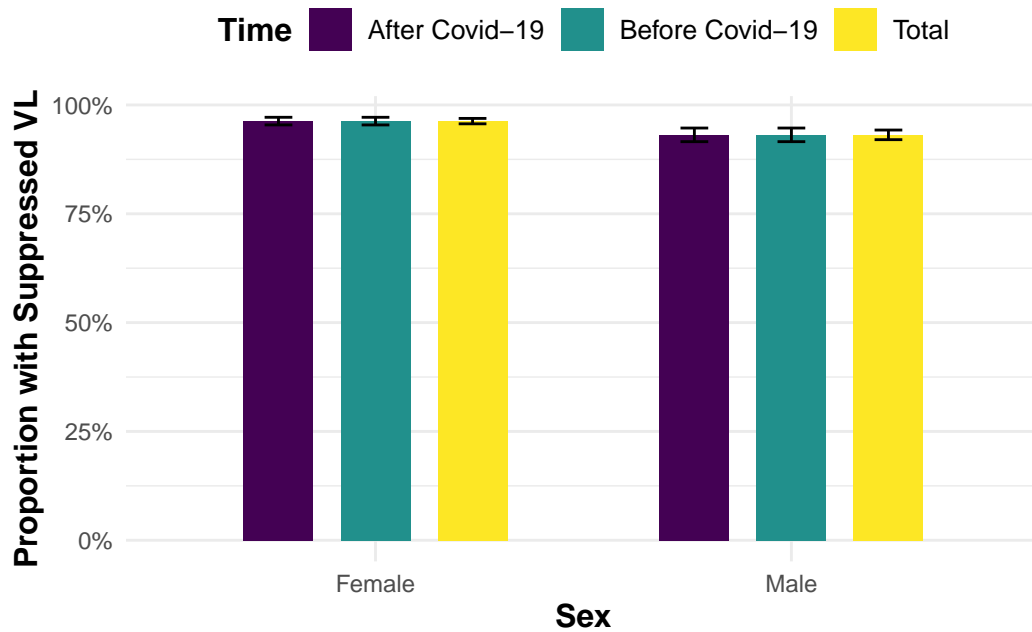
    time_point == "prop_b4" ~ "Before Covid-19",
    time_point == "prop_after" ~ "After Covid-19",
    TRUE ~ "Total"
  )
)

```

```

ggplot(df_summary, aes(x = sex, y = proportion, fill = time_point)) +
  geom_bar(
    stat = "identity",
    position = position_dodge(width = 0.7),
    width = 0.5
  ) +
  geom_errorbar(
    aes(ymin = lower, ymax = upper),
    position = position_dodge(width = 0.7),
    width = 0.2,
    size = 0.5
  ) +
  scale_y_continuous(labels = scales::percent_format()) +
  labs(x = "Sex", y = "Proportion with Suppressed VL", fill = "Time") +
  scale_fill_viridis_d(option = "viridis")+
  theme_minimal()+
  theme(
    plot.title = element_text(hjust = 0.5, face = "bold", size = 14),
    axis.title.x = element_text(face = "bold", size = 12),
    axis.title.y = element_text(face = "bold", size = 12),
    legend.title = element_text(face = "bold", size = 12),
    legend.text = element_text(size = 10),
    legend.position = "top"
  )
)

```

Proportion taking ART pills less frequently / in smaller amounts

```
df_artstr <- df6 %>%
  pivot_longer(
    cols = c(artstrbc, artstrac),
    names_to = "variable",
    values_to = "response"
  ) %>%
  mutate(
    time = if_else(grepl("bc$", variable), "Before Covid-19", "After Covid-19")
  )

df_artstr_summary <- df_artstr %>%
  group_by(sex, time) %>%
  summarise(
    n_yes = sum(response == "Yes", na.rm = TRUE),
    n = n(),
    .groups = "drop"
  )

df_artstr_totals <- df_artstr %>%
```

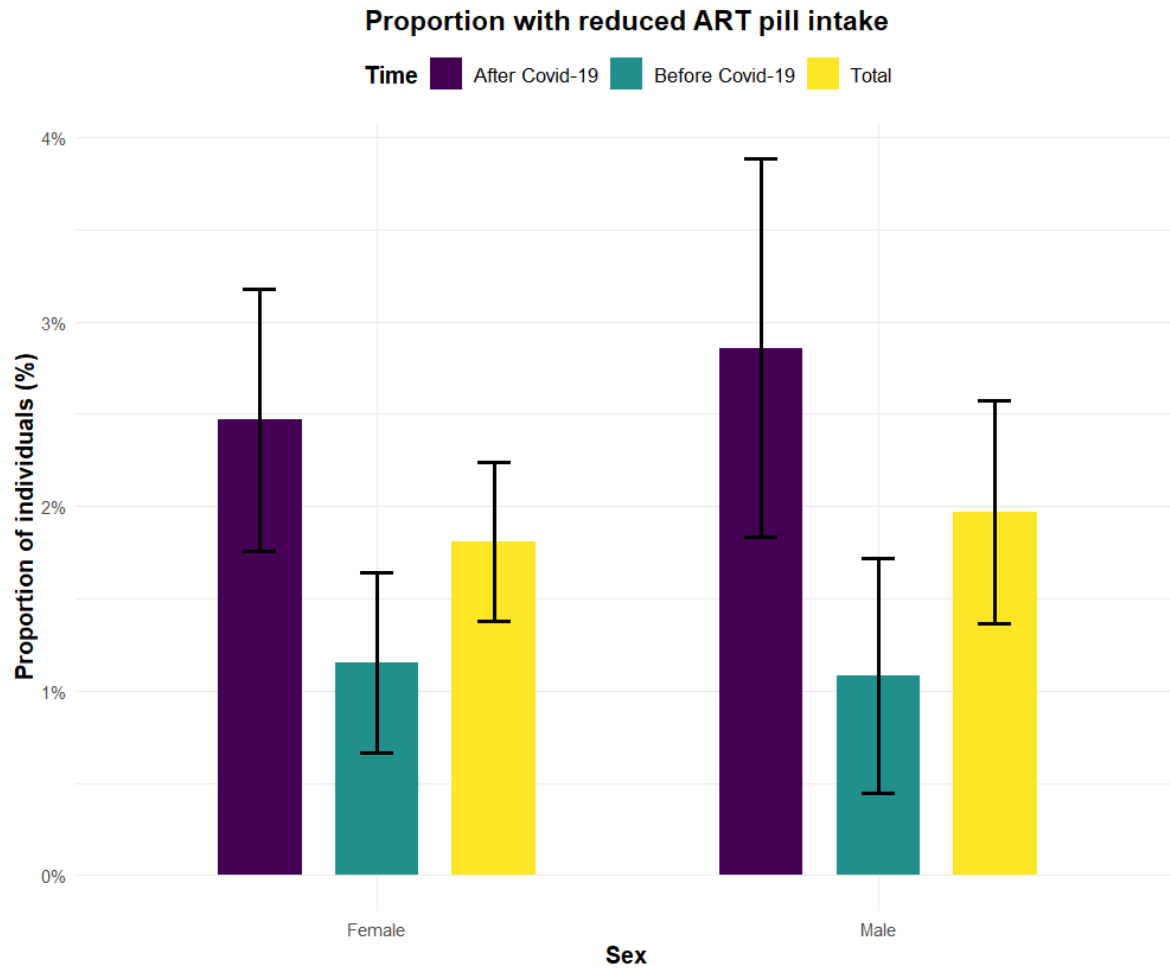
```

group_by(sex) %>%
  summarise(
    n_yes = sum(response == "Yes", na.rm = TRUE),
    n = n(),
    .groups = "drop"
  ) %>%
  mutate(time = "Total")

df_artstr_summary <- bind_rows(df_artstr_summary, df_artstr_totals) %>%
  mutate(
    proportion = n_yes / n,
    se = sqrt(proportion * (1 - proportion) / n),
    lower = proportion - 1.96 * se,
    upper = proportion + 1.96 * se
  )

reduced_art_plot <- ggplot(df_artstr_summary, aes(x = sex, y = proportion, fill = time)) +
  geom_col(position = position_dodge(width = 0.7), width = 0.5) +
  geom_errorbar(
    aes(ymin = lower, ymax = upper),
    position = position_dodge(width = 0.7),
    width = 0.2,
    size = 1
  ) +
  scale_y_continuous(labels = scales::percent_format(accuracy = 1)) +
  labs(
    title = "Proportion with reduced ART pill intake",
    x = "Sex",
    y = "Proportion of individuals (%)",
    fill = "Time"
  ) +
  scale_fill_viridis_d(option = "viridis") +
  theme_minimal() +
  theme(
    plot.title = element_text(hjust = 0.5, face = "bold", size = 14),
    axis.title.x = element_text(face = "bold", size = 12),
    axis.title.y = element_text(face = "bold", size = 12),
    legend.title = element_text(face = "bold", size = 12),
    legend.text = element_text(size = 10),
    legend.position = "top"
  )

```



Run out of ART before next refill

```
df_artrun <- df6 %>%  
  mutate(  
    artrunbc = as.character(artrunbc),  
    artrunac = as.character(artrunac)  
  ) %>%  
  pivot_longer(  
    cols = c(artrunbc, artrunac),  
    names_to = "variable",  
    values_to = "response"  
  ) %>%
```

```

mutate(
  time = if_else(grepl("bc$", variable), "Before Covid-19", "After Covid-19")
)

df_artrun_summary <- df_artrun %>%
  group_by(sex, time) %>%
  summarise(
    n_yes = sum(response == "Yes", na.rm = TRUE),
    n = n(),
    .groups = "drop"
  )

df_artrun_totals <- df_artrun %>%
  group_by(sex) %>%
  summarise(
    n_yes = sum(response == "Yes", na.rm = TRUE),
    n = n(),
    .groups = "drop"
  ) %>%
  mutate(time = "Total")

df_artrun_summary <- bind_rows(df_artrun_summary, df_artrun_totals) %>%
  mutate(
    proportion = n_yes / n,
    se = sqrt(proportion * (1 - proportion) / n),
    lower = proportion - 1.96 * se,
    upper = proportion + 1.96 * se
  )

run_out_of_art_plot <- ggplot(df_artrun_summary, aes(x = sex, y = proportion, fill = time)) +
  geom_col(position = position_dodge(width = 0.7), width = 0.5) +
  geom_errorbar(
    aes(ymin = lower, ymax = upper),
    position = position_dodge(width = 0.7),
    width = 0.2,
    size = 1
  ) +
  scale_y_continuous(labels = scales::percent_format(accuracy = 1)) +
  labs(
    title = "Proportion running out of ART before next refill",
    x = "Sex",
    y = "Proportion of individuals",
  )

```

```

    fill = "Time"
  ) +
  theme_minimal() +
  theme(
    plot.title = element_text(hjust = 0.5, face = "bold", size = 14),
    axis.title.x = element_text(face = "bold", size = 12),
    axis.title.y = element_text(face = "bold", size = 12),
    legend.title = element_text(face = "bold", size = 12),
    legend.text = element_text(size = 10),
    legend.position = "top"
  )

```

