The Primary Care Companion
FOR CNS DISORDERS

Supplementary Material

LIST OF SUPPLEMENTARY MATERIAL FOR THE ARTICLE

1. **List of *ICD-10* Codes Related to Pregnancy and Postpartum**

2. ***ICD* Code FOR Substance Use Disorder**

3. **R Code Used for the Analysis**

DISCLAIMER

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1. List of *ICD-10* Codes Related to Pregnancy and Postpartum

Here are the codes along with their standard medical interpretations, and including broader categories typically associated with "O", "Z3A", and "Z39" codes:

- **O** codes (O00-O9A) - These are codes related to pregnancy, childbirth, and the puerperium. They cover everything from pregnancy complications, labor, and delivery issues, to postpartum conditions.
- **Z3A** - Weeks of gestation. This code is used to specify the weeks of gestation of pregnancy, indicating how far along the pregnancy is.
- **Z39** - Encounter for maternal postpartum care and examination. This includes follow-up care after the delivery of the child, focusing on the mother's health.

Specific Z Codes:

- **Z03.71** - Encounter for suspected problem with amniotic cavity and membrane ruled out
- **Z03.72** - Encounter for suspected placental problem ruled out
- **Z03.73** - Encounter for suspected fetal anomaly ruled out
- **Z03.74** - Encounter for suspected problem with fetal growth ruled out
- **Z03.75** - Encounter for suspected cervical shortening ruled out
- **Z03.79** - Encounter for other suspected maternal and fetal conditions ruled out
- **Z32.01** - Encounter for pregnancy test, result positive
- **Z33.1** - Pregnant state, incidental
- **Z33.2** - Encounter for elective termination of pregnancy
- **Z33.3** - Pregnant state, gestational carrier
- **Z34.00** - Encounter for supervision of normal first pregnancy, unspecified trimester
- **Z34.01** - Encounter for supervision of normal first pregnancy, first trimester
- **Z34.02** - Encounter for supervision of normal first pregnancy, second trimester
- **Z34.03** - Encounter for supervision of normal first pregnancy, third trimester
- **Z34.80** - Encounter for supervision of other normal pregnancy, unspecified trimester
- **Z34.81** - Encounter for supervision of other normal pregnancy, first trimester
- **Z34.82** - Encounter for supervision of other normal pregnancy, second trimester
- **Z34.83** - Encounter for supervision of other normal pregnancy, third trimester

- **Z34.90** - Encounter for supervision of normal pregnancy, unspecified, unspecified trimester
- **Z34.91** - Encounter for supervision of normal pregnancy, unspecified, first trimester
- **Z34.92** - Encounter for supervision of normal pregnancy, unspecified, second trimester
- **Z34.93** - Encounter for supervision of normal pregnancy, unspecified, third trimester
- **Z36.0** to **Z36.9** - Codes for antenatal screening of mother, covering everything from chromosomal anomalies to unspecified antenatal screening
- **Z37.0** to **Z37.7** - Codes related to the outcome of delivery, covering all scenarios from single live birth to multiple stillbirths

2. *ICD* Code FOR Substance Use Disorder

- F10: Alcohol use disorders,
- F11: Opioid use disorders,
- F12: Cannabis use disorders,
- F13: Sedative, hypnotic, or anxiolytic use disorders,
- F14: Cocaine use disorders,
- F15: Other stimulant-use disorders,
- F16: Hallucinogen use disorders,
- F17: Nicotine use disorder
- F18: Inhalant use disorders,
- F19: Other psychoactive substance use disorders.

3. R Code Used for the Analysis

```r
# Load necessary libraries

library(survey)
library(dplyr)
library(ggplot2)

# Define substance-related disorder codes and pregnancy-related Z codes

substance_codes <- c("F10", "F11", "F12", "F13", "F14", "F15", "F16", "F17", "F18", "F19")
pregnancy_z_codes <- c(
  "Z03.71", "Z03.72", "Z03.73", "Z03.74", "Z03.75", "Z03.79", "Z32.01", "Z33.1", "Z33.2",
"Z33.3",
  "Z34.00", "Z34.01", "Z34.02", "Z34.03", "Z34.80", "Z34.81", "Z34.82", "Z34.83", "Z34.90",
"Z34.91",
  "Z34.92", "Z34.93", "Z36.0", "Z36.1", "Z36.2", "Z36.3", "Z36.4", "Z36.5", "Z36.81", "Z36.82",
"Z36.83",
  "Z36.84", "Z36.85", "Z36.86", "Z36.87", "Z36.88", "Z36.89", "Z36.8A", "Z36.9", "Z37.0",
"Z37.1",
  "Z37.2", "Z37.3", "Z37.4", "Z37.50", "Z37.51", "Z37.52", "Z37.53", "Z37.54", "Z37.59",
"Z37.60",
  "Z37.61", "Z37.62", "Z37.63", "Z37.64", "Z37.69", "Z37.7"
)

# Create regular expression patterns

substance_pattern <- paste0("^(", paste(substance_codes, collapse = "|"), ")")

pregnancy_pattern <- paste0("^(", paste(pregnancy_z_codes, collapse = "|"),
")|^O|^Z3A|^Z39")

# Filter dataset for pregnant females based on pregnancy-related diagnosis codes ip is 2020
# inpatient dataset

ip_filtered <- ip %>%

  filter(if_any(starts_with("DX"), ~ grepl(pregnancy_pattern, .)))

# Create new variables for each type of substance-related disorder and combined drug use
# in inpatient dataset

ip_filtered <- ip_filtered %>%

  mutate(
    alcohol_use_disorders = if_any(starts_with("DX"), ~ grepl("^F10", .)),
    opioid_use_disorders = if_any(starts_with("DX"), ~ grepl("^F11", .)),
    cannabis_use_disorders = if_any(starts_with("DX"), ~ grepl("^F12", .)),
```

```r
    sedative_use_disorders = if_any(starts_with("DX"), ~ grepl("^F13", .)),
    cocaine_use_disorders = if_any(starts_with("DX"), ~ grepl("^F14", .)),
    stimulant_use_disorders = if_any(starts_with("DX"), ~ grepl("^F15", .)),
    hallucinogen_use_disorders = if_any(starts_with("DX"), ~ grepl("^F16", .)),
    nicotine_use_disorder = if_any(starts_with("DX"), ~ grepl("^F17", .)),
    inhalant_use_disorders = if_any(starts_with("DX"), ~ grepl("^F18", .)),
    psychoactive_substance_use_disorders = if_any(starts_with("DX"), ~ grepl("^F19", .)),
    any_drug_use = if_any(starts_with("DX"), ~ grepl(substance_pattern, .))
  )

# Define the survey design

replicate_weights <- ip_filtered %>%
  select(starts_with("PUF_ENCWGT_")) %>%
  select(-PUF_ENCWGT_BASE)
survey_design <- svrepdesign(
  weights = ~PUF_ENCWGT_BASE,
  repweights = as.matrix(replicate_weights),
  data = ip_filtered,
  type = "BRR"
)

# Function to calculate weighted percentages, confidence intervals, and weighted estimates

calculate_percentage_ci <- function(var) {
  estimate <- svymean(as.formula(paste("~", var)), survey_design)
  total <- svytotal(as.formula(paste("~", var)), survey_design)
  est <- coef(estimate)[2] * 100  # Extracting the TRUE value and converting to percentage
  se <- SE(estimate)[2] * 100     # Extracting the standard error for the TRUE value and
converting to percentage
  ci <- confint(estimate)[2, ] * 100  # Extracting the confidence interval for the TRUE value
and converting to percentage
  total_weighted <- coef(total)[2]
  data.frame(
    disorder = var,
    unweighted_count = sum(ip_filtered[[var]], na.rm = TRUE),
    weighted_estimate = total_weighted,
    percentage = est,
    se = se,
    lower_ci = ci[1],
    upper_ci = ci[2]
  )
}

# List of disorder variables including combined drug use
```

```r
disorder_vars <- c("alcohol_use_disorders", "opioid_use_disorders",
"cannabis_use_disorders",
            "sedative_use_disorders", "cocaine_use_disorders", "stimulant_use_disorders",
            "hallucinogen_use_disorders", "nicotine_use_disorder",
"inhalant_use_disorders",
            "psychoactive_substance_use_disorders", "any_drug_use")

# Calculate percentages and confidence intervals for each disorder

percentage_ci_results <- do.call(rbind, lapply(disorder_vars, calculate_percentage_ci))

# Print the results

print(percentage_ci_results)

# Filter dataset for pregnant females based on pregnancy-related diagnosis codes ED is 2020
Emergency department dataset

ed_filtered <- ed %>%

  filter(if_any(starts_with("DX"), ~ grepl(pregnancy_pattern, .)))

# Create new variables for each type of substance-related disorder and combined drug use

ed_filtered <- ed_filtered %>%

  mutate(

    alcohol_use_disorders = if_any(starts_with("DX"), ~ grepl("^F10", .)),
    opioid_use_disorders = if_any(starts_with("DX"), ~ grepl("^F11", .)),
    cannabis_use_disorders = if_any(starts_with("DX"), ~ grepl("^F12", .)),
    sedative_use_disorders = if_any(starts_with("DX"), ~ grepl("^F13", .)),
    cocaine_use_disorders = if_any(starts_with("DX"), ~ grepl("^F14", .)),
    stimulant_use_disorders = if_any(starts_with("DX"), ~ grepl("^F15", .)),
    hallucinogen_use_disorders = if_any(starts_with("DX"), ~ grepl("^F16", .)),
    nicotine_use_disorder = if_any(starts_with("DX"), ~ grepl("^F17", .)),
    inhalant_use_disorders = if_any(starts_with("DX"), ~ grepl("^F18", .)),
    psychoactive_substance_use_disorders = if_any(starts_with("DX"), ~ grepl("^F19", .)),
    any_drug_use = if_any(starts_with("DX"), ~ grepl(substance_pattern, .))
  )

# Define the survey design

replicate_weights <- ed_filtered %>%
  select(starts_with("PUF_ENCWGT_")) %>%
  select(-PUF_ENCWGT_BASE)
survey_design <- svrepdesign(
  weights = ~PUF_ENCWGT_BASE,
```

```
  repweights = as.matrix(replicate_weights),
  data = ed_filtered,
  type = "BRR"

)
```

```
# Function to calculate weighted percentages, confidence intervals, and weighted estimates

calculate_percentage_ci <- function(var) {
  estimate <- svymean(as.formula(paste("~", var)), survey_design)
  total <- svytotal(as.formula(paste("~", var)), survey_design)
  est <- coef(estimate)[2] * 100  # Extracting the TRUE value and converting to percentage
  se <- SE(estimate)[2] * 100     # Extracting the standard error for the TRUE value and
converting to percentage
  ci <- confint(estimate)[2, ] * 100  # Extracting the confidence interval for the TRUE value
and converting to percentage
  total_weighted <- coef(total)[2]
  data.frame(
    disorder = var,
    unweighted_count = sum(ed_filtered[[var]], na.rm = TRUE),
    weighted_estimate = total_weighted,
    percentage = est,
    se = se,
    lower_ci = ci[1],
    upper_ci = ci[2]
  )
}
```

```
# List of disorder variables including combined drug use

disorder_vars <- c("alcohol_use_disorders", "opioid_use_disorders",
"cannabis_use_disorders",
        "sedative_use_disorders", "cocaine_use_disorders", "stimulant_use_disorders",
        "hallucinogen_use_disorders", "nicotine_use_disorder",
"inhalant_use_disorders",
        "psychoactive_substance_use_disorders", "any_drug_use")
```

```
# Calculate percentages and confidence intervals for each disorder

percentage_ci_results <- do.call(rbind, lapply(disorder_vars, calculate_percentage_ci))

# Print the results

print(percentage_ci_results)

##Calculating the unweighted and weighted number of pregnant females.
```

```r
# Filter dataset for pregnant females based on pregnancy-related diagnosis codes
ip_filtered <- ip %>%
  filter(if_any(starts_with("DX"), ~ grepl(pregnancy_pattern, .)))
```

Unweighted count of pregnant females

```r
unweighted_count <- nrow(ip_filtered)

print(paste("Unweighted count of pregnant females:", unweighted_count))
```

Define the survey design

```r
replicate_weights <- ip_filtered %>%
  select(starts_with("PUF_ENCWGT_")) %>%
  select(-PUF_ENCWGT_BASE)

survey_design <- svrepdesign(
  weights = ~PUF_ENCWGT_BASE,
  repweights = as.matrix(replicate_weights),
  data = ip_filtered,
  type = "BRR"
)
```

weighted count of pregnant female in inpatient dataset

```r
library(dplyr)
```

Calculate weighted count using dplyr

```r
weighted_count_dplyr <- ip_filtered %>%
  summarise(weighted_count = sum(PUF_ENCWGT_BASE)) %>%
  pull(weighted_count)
```

Print the weighted count

```r
print(paste("Weighted count of pregnant females using dplyr:", weighted_count_dplyr))
```

PREGNANT FEMALE IN ED SETTING

Filter dataset for pregnant females based on pregnancy-related diagnosis codes

```r
ed_filtered <- ed %>%

  filter(if_any(starts_with("DX"), ~ grepl(pregnancy_pattern, .)))
```

Unweighted count of pregnant females

```r
unweighted_count <- nrow(ed_filtered)
```

```r
print(paste("Unweighted count of pregnant females in ED:", unweighted_count))

# Define the survey design

replicate_weights <- ed_filtered %>%
  select(starts_with("PUF_ENCWGT_")) %>%
  select(-PUF_ENCWGT_BASE)
survey_design <- svrepdesign(
  weights = ~PUF_ENCWGT_BASE,
  repweights = as.matrix(replicate_weights),
  data = ed_filtered,
  type = "BRR"
)

## weighted count of pregnant female in inpatient datatset

library(dplyr)

# Calculate weighted count using dplyr

weighted_count_dplyr <- ed_filtered %>%
  summarise(weighted_count = sum(PUF_ENCWGT_BASE)) %>%
  pull(weighted_count)

# Print the weighted count

print(paste("Weighted count of pregnant females using dplyr in ED:",
weighted_count_dplyr))
```