Supplementary Material to: Li Y, Wang S, Xie K, et al. Burden trends of Alzheimer's disease and other dementias in China, 1990–2023: Sex, age, and risk-attributable patterns. Ann Acad Med Singap 55:358-69.
DOI: https://doi.org/10.47102/annals-acadmedsg.2026146

```
rm(list = ls())
gc()

suppressPackageStartupMessages({
  library(data.table)
  library(dplyr)
  library(stringr)
  library(fs)
  library(tidyr)
  library(stringi)
  library(ggplot2)
  library(scales)
  library(tibble)
  library(cowplot)
  library(grid)
  library(readr)
})

FILES <- c(
  "Mortality"    = "mortality.csv",
  "DALY"         = "daly.csv",
  "Incidence"    = "incidence.csv",
  "Prevalence" = "prevalence.csv"
)

JP_DIR    <- "."
INPUT_DIR <- "joinpoint_inputs_two_runs_en"
RES_DIR   <- "results_from_two_runs_en"
FIG_DIR   <- "figures_en"

for (d in c(INPUT_DIR, RES_DIR, FIG_DIR)) {
  tryCatch(
    dir_create(d),
    error = function(e) dir.create(d, showWarnings = FALSE, recursive = TRUE)
  )
}

YLAB <- c(
  "Mortality"    = "Mortality rate per 100,000",
  "DALY"         = "DALY rate per 100,000",
  "Incidence"    = "Incidence rate per 100,000",
  "Prevalence" = "Prevalence rate per 100,000"
)
```

```
sanitize_ascii <- function(x) {
  y <- stringi::stri_trans_general(x, "Any-Latin; Latin-ASCII")
  y <- gsub("[^[:print:]]", "", y)
  y <- gsub("[^A-Za-z0-9 \\-\\+\\./]", " ", y)
  str_squish(y)
}

normalize_age_label <- function(x) {
  y <- sanitize_ascii(x)
  y <- gsub("(\\d+)\\s*[-‐–—]\\s*(\\d+)\\s*(years?)", "\\1-\\2 \\3", y, perl = TRUE)
  y <- gsub("(\\d+)\\s+(\\d+)\\s*(years?)", "\\1-\\2 \\3", y, perl = TRUE)
  y <- gsub("(\\d+)\\s*\\+\\s*(years?)", "\\1+ \\2", y, perl = TRUE)
  str_squish(y)
}

calc_se <- function(dt) {
  dt %>%
    transmute(
      age_name = as.character(age_name),
      year     = as.integer(year),
      val      = as.numeric(val),
      lower    = as.numeric(lower),
      upper    = as.numeric(upper),
      SE       = (upper - lower) / (2 * 1.96)
    ) %>%
    arrange(age_name, year)
}

is_as_measure <- function(x) {
  grepl("ASMR|ASIR|ASPR|ASDR|age[-\\s]*standard|standardized", x, ignore.case = TRUE)
}

is_all_ages <- function(x) {
  grepl("^\\s*all\\s+ages\\s*$", x, ignore.case = TRUE)
}

age_rank_key <- function(x) {
  x <- as.character(x)

  r_as <- ifelse(is_as_measure(x), -Inf, NA_real_)
  r_all <- ifelse(is_all_ages(x), -1e6, NA_real_)

  is_plus <- grepl("^\\s*\\d+\\+\\s*years?$", x, ignore.case = TRUE)
  plus_v <- suppressWarnings(as.numeric(sub("\\+.*", "", x)))
```

```
  r_plus <- ifelse(is_plus, plus_v + 1000, NA_real_)

  start_n <- suppressWarnings(as.numeric(sub("\\D*(\\d+).*", "\\1", x)))
  r_start <- ifelse(!is.na(start_n), start_n, NA_real_)

  ifelse(
    !is.na(r_as), r_as,
    ifelse(
      !is.na(r_all), r_all,
      ifelse(
        !is.na(r_plus), r_plus,
        ifelse(!is.na(r_start), r_start, 1e9)
      )
    )
  )
}

normalize_as_name <- function(x) {
  ifelse(
    grepl("(?i)^(ASMR|ASIR|ASPR|ASDR)$", x) |
      grepl("(?i)age[-\\s]*standard", x) |
      grepl("(?i)standardized", x),
    "Age-standardized",
    x
  )
}

read_any_tbl <- function(path) {
  if (!file_exists(path)) return(NULL)
  if (file_info(path)$size == 0) return(NULL)

  header <- tryCatch(readLines(path, n = 1, warn = FALSE), error = function(e) "")
  delim <- if (str_count(header, "\t") >= str_count(header, ",")) "\t" else ","

  dt <- tryCatch(
    fread(path, sep = delim, check.names = FALSE, encoding = "UTF-8"),
    error = function(e) NULL
  )
  if (!is.null(dt) && nrow(dt) > 0) return(dt)

  dt <- tryCatch(
    as.data.table(
      readr::read_delim(
        path,
```

```
            delim = delim,
            locale = readr::locale(encoding = "UTF-16LE"),
            show_col_types = FALSE
        )
    ),
    error = function(e) NULL
  )
  if (!is.null(dt)) return(dt)

  tryCatch(
    as.data.table(
      readr::read_delim(
            path,
            delim = delim,
            locale = readr::locale(encoding = "UTF-8"),
            show_col_types = FALSE
      )
    ),
    error = function(e) NULL
  )
}

all_long <- lapply(names(FILES), function(metric) {
  fread(FILES[[metric]]) %>%
    calc_se() %>%
    mutate(metric = metric)
}) %>%
  bind_rows()

crude_long <- all_long %>%
  filter(!is_as_measure(age_name)) %>%
  mutate(
    age_name = normalize_age_label(age_name),
    series = paste0(sanitize_ascii(metric), "_", age_name)
  ) %>%
  select(series, year, val, SE, lower, upper) %>%
  arrange(series, year)

as_long <- all_long %>%
  filter(is_as_measure(age_name)) %>%
  mutate(series = paste0(sanitize_ascii(metric), "_Age-standardized")) %>%
  select(series, year, val, SE, lower, upper) %>%
  arrange(series, year)
```

```
file_crude <- file.path(INPUT_DIR, "ALL_CRUDE_byAge_Joinpoint.csv")
file_as <- file.path(INPUT_DIR, "ALL_AS_Joinpoint.csv")

fwrite(crude_long, file_crude)
fwrite(as_long, file_as)

message("Joinpoint input files have been saved.")
message("Use val as the dependent variable, year as the independent variable, SE as the standard error, and series as the by variable.")
message("Set the model to log-linear and use heteroscedastic errors with standard errors.")

find_file <- function(patterns, dir = JP_DIR) {
  candidates <- file.path(dir, patterns)
  candidates <- candidates[file_exists(candidates)]

  if (length(candidates) == 0) {
    return(NA_character_)
  }

  candidates[1]
}

f_as_aapc <- find_file(c("results_from_two_runs_en/ALL_AS.Export.AAPC.txt"))
f_as_apc <- find_file(c("results_from_two_runs_en/ALL_AS.Export.APC.txt"))

f_crude_aapc <- find_file(c(
  "results_from_two_runs_en/ALL_CRUDE.Export.AAPC.txt",
  "results_from_two_runs_en/ALL_CRUD.Export.AAPC.txt"
))

f_crude_apc <- find_file(c(
  "results_from_two_runs_en/ALL_CRUDE.Export.APC.txt",
  "results_from_two_runs_en/ALL_CRUD.Export.APC.txt"
))

if (any(is.na(c(f_as_aapc, f_as_apc, f_crude_aapc, f_crude_apc)))) {
  stop("Required Joinpoint export files were not found. Please check JP_DIR and file names.")
}

AAPC_AS <- read_any_tbl(f_as_aapc)
APC_AS <- read_any_tbl(f_as_apc)
AAPC_CRUDE <- read_any_tbl(f_crude_aapc)
APC_CRUDE <- read_any_tbl(f_crude_apc)
```

```
stopifnot(
  nrow(AAPC_AS) > 0,
  nrow(APC_AS) > 0,
  nrow(AAPC_CRUDE) > 0,
  nrow(APC_CRUDE) > 0
)

normalize_aapc <- function(dt) {
  nm <- names(dt)

  col_series <- nm[1]
  col_val <- if ("AAPC" %in% nm) "AAPC" else nm[6]
  col_low <- nm[grepl("AAPC.*(Low|LCL)", nm)][1]
  col_high <- nm[grepl("AAPC.*(High|UCL)", nm)][1]

  dt %>%
    transmute(
      series = .data[[col_series]],
      val = as.numeric(.data[[col_val]]),
      lower = as.numeric(.data[[col_low]]),
      upper = as.numeric(.data[[col_high]])
    ) %>%
    mutate(AAPC_txt = sprintf("%.2f (%.2f - %.2f)", val, lower, upper))
}

normalize_apc <- function(dt) {
  nm <- names(dt)

  col_series <- nm[1]
  col_ss <- nm[grepl("Segment Start", nm, fixed = TRUE)][1]
  col_se <- nm[grepl("Segment End", nm, fixed = TRUE)][1]
  col_val <- if ("APC" %in% nm) "APC" else nm[6]
  col_low <- nm[grepl("APC 95% LCL|APC C.I. Low", nm)][1]
  col_high <- nm[grepl("APC 95% UCL|APC C.I. High", nm)][1]

  dt %>%
    transmute(
      series = .data[[col_series]],
      Start = as.integer(.data[[col_ss]]),
      End = as.integer(.data[[col_se]]),
      val = as.numeric(.data[[col_val]]),
      lower = as.numeric(.data[[col_low]]),
      upper = as.numeric(.data[[col_high]])
    ) %>%
```

```
        mutate(APC_txt = sprintf("%.2f (%.2f - %.2f)", val, lower, upper))
}

split_series <- function(dt) {
    dt %>%
        mutate(series = as.character(series)) %>%
        separate(
            series,
            into = c("metric", "age_name"),
            sep = "_",
            fill = "right",
            extra = "merge"
        ) %>%
        mutate(age_name = normalize_as_name(age_name))
}

AAPC_AS <- normalize_aapc(AAPC_AS)
AAPC_CRUDE <- normalize_aapc(AAPC_CRUDE)
APC_AS <- normalize_apc(APC_AS)
APC_CRUDE <- normalize_apc(APC_CRUDE)

AAPC_AS <- split_series(AAPC_AS)
AAPC_CRUDE <- split_series(AAPC_CRUDE)
APC_AS <- split_series(APC_AS)
APC_CRUDE <- split_series(APC_CRUDE)

AAPC_all <- bind_rows(AAPC_AS, AAPC_CRUDE)
APC_all <- bind_rows(APC_AS, APC_CRUDE)

metrics <- c("Mortality", "DALY", "Incidence", "Prevalence")

for (m in metrics) {
    fwrite(
        filter(AAPC_all, metric == m),
        file.path(RES_DIR, paste0(m, "_AAPC.csv"))
    )

    fwrite(
        filter(APC_all, metric == m),
        file.path(RES_DIR, paste0(m, "_APC.csv"))
    )
}

message("AAPC and APC results have been saved.")
```

```
okabe_ito <- c(
  "#E69F00", "#56B4E9", "#009E73", "#F0E442",
  "#0072B2", "#D55E00", "#CC79A7", "#999999"
)

make_plot <- function(metric, right_pad = 5) {
  raw <- fread(FILES[[metric]])

  yearly <- raw %>%
    mutate(age_name = normalize_as_name(age_name)) %>%
    transmute(
      Measure = str_squish(as.character(age_name)),
      Year = as.integer(year),
      Rate = as.numeric(val),
      Rate.lower = as.numeric(lower),
      Rate.upper = as.numeric(upper)
    ) %>%
    arrange(Measure, Year)

  aapc <- fread(file.path(RES_DIR, paste0(metric, "_AAPC.csv"))) %>%
    mutate(age_name = normalize_as_name(age_name))

  ord <- yearly %>%
    distinct(Measure) %>%
    mutate(r = age_rank_key(Measure)) %>%
    arrange(r, Measure) %>%
    pull(Measure)

  yearly$Measure <- factor(yearly$Measure, levels = ord)

  aapc_for_legend <- aapc %>%
    transmute(
      Measure = str_squish(as.character(age_name)),
      lower = suppressWarnings(as.numeric(lower)),
      upper = suppressWarnings(as.numeric(upper)),
      sig = (lower > 0 & upper > 0) | (lower < 0 & upper < 0),
      AAPC_txt_star = paste0(AAPC_txt, ifelse(sig, "*", ""))
    )

  legend_df <- tibble(Measure = levels(yearly$Measure)) %>%
    left_join(aapc_for_legend, by = "Measure") %>%
    mutate(
      legend_lab = ifelse(
```

```
            is.na(AAPC_txt_star),
            Measure,
            paste0(Measure, ": ", AAPC_txt_star)
        )
    )

label_map <- setNames(legend_df$legend_lab, legend_df$Measure)

n_series <- length(levels(yearly$Measure))

pal <- if (n_series <= length(okabe_ito)) {
    okabe_ito[seq_len(n_series)]
} else {
    c(okabe_ito, hue_pal()(n_series - length(okabe_ito)))
}

names(pal) <- levels(yearly$Measure)

ggplot(yearly, aes(x = Year, y = Rate, color = Measure, group = Measure)) +
    geom_ribbon(
        aes(ymin = Rate.lower, ymax = Rate.upper, fill = Measure),
        alpha = 0.10,
        linetype = 0,
        show.legend = FALSE
    ) +
    geom_line(linewidth = 0.9) +
    geom_point(size = 1.2, shape = 21, fill = "white", stroke = 0.35) +
    scale_x_continuous(
        limits = c(
            min(yearly$Year, na.rm = TRUE),
            max(yearly$Year, na.rm = TRUE) + right_pad * 0.30
        ),
        expand = expansion(mult = c(0.02, 0.02))
    ) +
    scale_color_manual(
        values = pal,
        breaks = levels(yearly$Measure),
        labels = label_map,
        name = "Age groups (with AAPC)"
    ) +
    scale_fill_manual(values = pal, guide = "none") +
    labs(x = "Year", y = YLAB[[metric]]) +
    coord_cartesian(clip = "on") +
    theme_minimal(base_size = 9) +
```

```
    theme(
      axis.line = element_line(color = "black", linewidth = 0.3),
      panel.grid.major = element_line(color = "grey90", linewidth = 0.25),
      panel.grid.minor = element_blank(),
      plot.background = element_rect(fill = "white", color = NA),
      panel.background = element_rect(fill = "white", color = NA),
      plot.margin = margin(t = 5.5, r = 12, b = 5.5, l = 5.5),
      axis.title.y = element_text(size = 14, face = "bold"),
      legend.position = "right",
      legend.title = element_text(size = 12, face = "bold"),
      legend.text = element_text(size = 11.5),
      legend.key.size = unit(8.5, "mm"),
      legend.spacing.y = unit(3.2, "mm"),
      legend.margin = margin(2, 6, 2, 6),
      legend.background = element_rect(fill = "white", color = "grey70"),
      legend.box.background = element_rect(fill = "white", color = "grey70"),
      legend.key = element_rect(fill = "white", color = NA)
    )
}

p1 <- make_plot("Mortality", right_pad = 5)
p2 <- make_plot("DALY", right_pad = 5)
p3 <- make_plot("Incidence", right_pad = 5)
p4 <- make_plot("Prevalence", right_pad = 5)

ggsave(
  file.path(FIG_DIR, "trend_mortality.png"),
  plot = p1,
  width = 22,
  height = 16,
  units = "cm",
  dpi = 300
)

ggsave(
  file.path(FIG_DIR, "trend_daly.png"),
  plot = p2,
  width = 22,
  height = 16,
  units = "cm",
  dpi = 300
)

ggsave(
```

```
  file.path(FIG_DIR, "trend_incidence.png"),
  plot = p3,
  width = 22,
  height = 16,
  units = "cm",
  dpi = 300
)

ggsave(
  file.path(FIG_DIR, "trend_prevalence.png"),
  plot = p4,
  width = 22,
  height = 16,
  units = "cm",
  dpi = 300
)

combined <- cowplot::plot_grid(
  p1, p2, p3, p4,
  ncol = 2,
  align = "hv",
  labels = c("A", "B", "C", "D"),
  label_size = 18,
  label_fontface = "bold"
)

ggsave(
  filename = file.path(FIG_DIR, "figure1_four_panels.png"),
  plot = combined,
  width = 28,
  height = 22,
  units = "cm",
  dpi = 300
)

pdf_device <- if (capabilities("cairo")) grDevices::cairo_pdf else "pdf"

ggsave(
  filename = file.path(FIG_DIR, "figure1_four_panels.pdf"),
  plot = combined,
  width = 66,
  height = 40,
  units = "cm",
  device = pdf_device
```

```
)

message("Analysis completed.")
message("Joinpoint input directory: ", normalizePath(INPUT_DIR))
message("Result directory: ", normalizePath(RES_DIR))
message("Figure directory: ", normalizePath(FIG_DIR))



rm(list = ls())
gc()

dir.create("figure", showWarnings = FALSE)

suppressPackageStartupMessages({
  library(data.table)
  library(dplyr)
  library(tidyr)
  library(stringr)
  library(ggplot2)
  library(cowplot)
  library(scales)
  library(grid)
})

pal_sex <- c(
  "Both" = "#333333",
  "Female" = "#D55E00",
  "Male" = "#0072B2"
)

grad_blue <- c("#EFF6FF", "#BFDBFE", "#93C5FD", "#60A5FA", "#3B82F6", "#1D4ED8")
grad_teal <- c("#ECFDF5", "#A7F3D0", "#6EE7B7", "#34D399", "#10B981", "#047857")

pal_dir <- c(
  "Decrease" = "#1F77B4",
  "Neutral" = "#7F7F7F",
  "Increase" = "#D62728"
)

theme_top <- function() {
  theme_minimal(base_size = 12) +
    theme(
      panel.grid.minor = element_blank(),
```

```
        panel.grid.major = element_line(color = "grey90", linewidth = 0.3),
        axis.title = element_text(face = "bold"),
        strip.text = element_text(face = "bold", size = 12),
        legend.position = "bottom",
        plot.title = element_text(face = "bold", hjust = 0)
      )
}

short_measure <- function(x) {
  dplyr::recode(
    x,
    "DALYs (Disability-Adjusted Life Years)" = "DALYs",
    .default = x
  )
}

fmt_ui <- function(v, lo, up, digits = 2) {
  paste0(round(v, digits), " (", round(lo, digits), "-", round(up, digits), ")")
}

clean_id <- function(x) {
  x %>%
    tolower() %>%
    gsub("[^a-z0-9]+", "_", .) %>%
    gsub("^_|_$", "", .)
}

stopifnot(file.exists("Alzheimer's disease and other dementias.csv"))
stopifnot(file.exists("Risk factors of Alzheimer's disease and other dementias.csv"))

disease_data <- data.table::fread("Alzheimer's disease and other dementias.csv")
risk_data <- data.table::fread("Risk factors of Alzheimer's disease and other dementias.csv")

disease_cn <- disease_data %>%
  filter(location_name == "China")

risk_cn <- risk_data %>%
  filter(location_name == "China")

yr_min <- if (nrow(disease_cn) > 0) {
  min(disease_cn$year, na.rm = TRUE)
} else {
  min(risk_cn$year, na.rm = TRUE)
}
```

```
yr_max <- if (nrow(disease_cn) > 0) {
  max(disease_cn$year, na.rm = TRUE)
} else {
  max(risk_cn$year, na.rm = TRUE)
}

measures_all <- c(
  "Incidence",
  "Deaths",
  "DALYs (Disability-Adjusted Life Years)",
  "Prevalence"
)

measures <- intersect(measures_all, unique(disease_cn$measure_name))

risk_measures <- intersect(
  c("Deaths", "DALYs (Disability-Adjusted Life Years)"),
  unique(risk_cn$measure_name)
)

if (file.exists("joinpoint/AAPC_results.csv")) {
  jp <- data.table::fread("joinpoint/AAPC_results.csv") %>%
    separate(
      Series,
      into = c("Indicator", "Sex", "Country"),
      sep = "_",
      fill = "right"
    ) %>%
    mutate(
      Indicator = factor(
        Indicator,
        levels = c("Incidence", "Deaths", "DALYs", "Prevalence")
      )
    )
}

if (file.exists("joinpoint/AAPC_risk_results.csv")) {
  jp_risk <- data.table::fread("joinpoint/AAPC_risk_results.csv") %>%
    extract(
      Series,
      into = c("Indicator", "RiskID", "Country"),
      regex = "^([^_]+)_(.+)_([^_]+)$",
      remove = FALSE
```

```
        )
}

df_asr <- disease_cn %>%
    filter(
        measure_name %in% measures,
        sex_name %in% c("Both", "Female", "Male"),
        age_name == "Age-standardized",
        metric_name == "Rate",
        year >= yr_min,
        year <= yr_max
    ) %>%
    mutate(
        Indicator = short_measure(measure_name),
        Sex = factor(sex_name, levels = c("Both", "Female", "Male"))
    )

pA <- ggplot(df_asr, aes(year, val, color = Sex, fill = Sex, group = Sex)) +
    geom_ribbon(aes(ymin = lower, ymax = upper), alpha = 0.15, color = NA) +
    geom_line(linewidth = 1.0) +
    scale_color_manual(values = pal_sex) +
    scale_fill_manual(values = pal_sex) +
    facet_wrap(~ Indicator, scales = "free_y", nrow = 1) +
    labs(
        x = "Year",
        y = "Age-standardized rate per 100,000",
        title = "China: ASR trends by sex"
    ) +
    theme_top()

df_num <- disease_cn %>%
    filter(
        measure_name %in% measures,
        sex_name %in% c("Both", "Female", "Male"),
        age_name == "All ages",
        metric_name == "Number",
        year >= yr_min,
        year <= yr_max
    ) %>%
    mutate(
        Indicator = short_measure(measure_name),
        Sex = factor(sex_name, levels = c("Both", "Female", "Male"))
    )
```

```
pB <- ggplot(df_num, aes(year, val, color = Sex, fill = Sex, group = Sex)) +
  geom_ribbon(aes(ymin = lower, ymax = upper), alpha = 0.15, color = NA) +
  geom_line(linewidth = 1.0) +
  scale_color_manual(values = pal_sex) +
  scale_fill_manual(values = pal_sex) +
  facet_wrap(~ Indicator, scales = "free_y", nrow = 1) +
  labs(
    x = "Year",
    y = "Number of cases/deaths/DALYs",
    title = "China: Number trends by sex"
  ) +
  theme_top()

pc_df <- disease_cn %>%
  filter(
    measure_name %in% measures,
    sex_name %in% c("Both", "Female", "Male"),
    age_name == "All ages",
    metric_name == "Number",
    year %in% c(yr_min, yr_max)
  ) %>%
  select(measure_name, sex_name, year, val) %>%
  pivot_wider(names_from = year, values_from = val) %>%
  mutate(
    Indicator = short_measure(measure_name),
    Sex = factor(sex_name, levels = c("Both", "Female", "Male")),
    pct_change = round(
      (.data[[as.character(yr_max)]] - .data[[as.character(yr_min)]]) /
        .data[[as.character(yr_min)]] * 100,
      2
    )
  ) %>%
  select(Indicator, Sex, pct_change)

pC <- ggplot(pc_df, aes(Indicator, pct_change, fill = Sex)) +
  geom_hline(yintercept = 0, color = "grey70") +
  geom_col(position = position_dodge(width = 0.65), width = 0.55, color = "white") +
  scale_fill_manual(values = pal_sex) +
  labs(
    x = NULL,
    y = paste0("% change in Number (", yr_min, "-", yr_max, ")"),
    title = "China: Percent change in Number"
  ) +
  theme_top()
```

```
if (exists("jp")) {
  forest_df <- jp %>%
    mutate(Indicator = as.character(Indicator)) %>%
    mutate(
      Indicator = factor(
        Indicator,
        levels = c("Incidence", "Deaths", "DALYs", "Prevalence")
      )
    ) %>%
    filter(Indicator %in% short_measure(measures)) %>%
    mutate(Sex = factor(Sex, levels = c("Both", "Female", "Male")))

  pD <- ggplot(forest_df, aes(AAPC, Sex, color = Sex)) +
    geom_vline(xintercept = 0, color = "grey70", linetype = "dashed") +
    geom_errorbarh(
      aes(xmin = `AAPC C.I. Low`, xmax = `AAPC C.I. High`),
      height = 0.18,
      color = "grey35"
    ) +
    geom_point(size = 2.8) +
    scale_color_manual(values = pal_sex, guide = "none") +
    facet_wrap(~ Indicator, nrow = 1) +
    labs(
      x = "AAPC of ASR (%)",
      y = NULL,
      title = "China: AAPC of ASR by sex (Joinpoint)"
    ) +
    theme_top()
}

rf_plot_number_all <- function(measure, show_legend = TRUE) {
  df <- risk_cn %>%
    filter(
      measure_name == measure,
      sex_name == "Both",
      age_name == "All ages",
      metric_name == "Number",
      year == yr_max
    ) %>%
    arrange(desc(val)) %>%
    mutate(Risk = factor(rei_name, levels = rev(rei_name)))

  if (nrow(df) == 0) return(NULL)
```

```
  brks <- pretty(df$val, n = 4)

  ggplot(df, aes(x = val, y = Risk, fill = val)) +
    geom_col(color = "white", width = 0.75) +
    geom_errorbarh(aes(xmin = lower, xmax = upper), height = 0.22, color = "grey30") +
    scale_fill_gradientn(
      colors = grad_blue,
      breaks = brks,
      labels = label_number(accuracy = 1, scale_cut = cut_short_scale()),
      guide = guide_colorbar(
        title = paste0("Number (", yr_max, ")"),
        title.position = "top",
        barwidth = unit(8, "cm"),
        barheight = unit(0.35, "cm"),
        ticks = FALSE
      )
    ) +
    scale_x_continuous(
      labels = label_number(accuracy = 1, scale_cut = cut_short_scale())
    ) +
    scale_y_discrete(labels = function(x) stringr::str_wrap(x, 38)) +
    labs(x = NULL, y = NULL, title = short_measure(measure)) +
    theme_top() +
    theme(
      legend.title = element_text(face = "bold"),
      legend.position = if (show_legend) "bottom" else "none"
    )
}

rf_plot_rate_all <- function(measure, show_legend = TRUE) {
  df <- risk_cn %>%
    filter(
      measure_name == measure,
      sex_name == "Both",
      age_name == "Age-standardized",
      metric_name == "Rate",
      year == yr_max
    ) %>%
    arrange(desc(val)) %>%
    mutate(Risk = factor(rei_name, levels = rev(rei_name)))

  if (nrow(df) == 0) return(NULL)
```

```
  brks <- pretty(df$val, n = 4)

  ggplot(df, aes(x = val, y = Risk, fill = val)) +
    geom_col(color = "white", width = 0.75) +
    geom_errorbarh(aes(xmin = lower, xmax = upper), height = 0.22, color = "grey30") +
    scale_fill_gradientn(
      colors = grad_teal,
      breaks = brks,
      labels = label_number(accuracy = 0.1),
      guide = guide_colorbar(
        title = paste0("ASR per 100,000 (", yr_max, ")"),
        title.position = "top",
        barwidth = unit(8, "cm"),
        barheight = unit(0.35, "cm"),
        ticks = FALSE
      )
    ) +
    scale_x_continuous(labels = label_number(accuracy = 0.1)) +
    scale_y_discrete(labels = function(x) stringr::str_wrap(x, 38)) +
    labs(x = NULL, y = NULL, title = short_measure(measure)) +
    theme_top() +
    theme(
      legend.title = element_text(face = "bold"),
      legend.position = if (show_legend) "bottom" else "none"
    )
}

p_num_deaths_core <- rf_plot_number_all("Deaths", show_legend = FALSE)
p_num_dalys_core <- rf_plot_number_all(
  "DALYs (Disability-Adjusted Life Years)",
  show_legend = FALSE
)

legend_num <- cowplot::get_legend(
  rf_plot_number_all("Deaths", show_legend = TRUE) +
    theme(legend.box.margin = margin(t = 2, r = 2, b = 2, l = 2))
)

n_num <- max(
  nrow(
    risk_cn %>%
      filter(
        measure_name == "Deaths",
        sex_name == "Both",
```

```
            age_name == "All ages",
            metric_name == "Number",
            year == yr_max
        )
    ),
    nrow(
        risk_cn %>%
        filter(
            measure_name == "DALYs (Disability-Adjusted Life Years)",
            sex_name == "Both",
            age_name == "All ages",
            metric_name == "Number",
            year == yr_max
        )
    )
)

h_num <- max(4, 0.28 * n_num + 1.6)

pRiskNum_grid <- cowplot::plot_grid(
    p_num_deaths_core + labs(title = "Deaths"),
    p_num_dalys_core + labs(title = "DALYs"),
    ncol = 2,
    align = "h",
    rel_widths = c(1, 1)
)

pRiskNum <- cowplot::plot_grid(
    cowplot::ggdraw() +
        cowplot::draw_label(
            "China: Risk factors - Number (Both, all factors, latest year)",
            x = 0,
            hjust = 0,
            fontface = "bold",
            size = 12
        ),
    pRiskNum_grid,
    legend_num,
    ncol = 1,
    rel_heights = c(0.08, 1, 0.12)
)

p_rate_deaths_core <- rf_plot_rate_all("Deaths", show_legend = FALSE)
p_rate_dalys_core <- rf_plot_rate_all(
```

```
    "DALYs (Disability-Adjusted Life Years)",
    show_legend = FALSE
)

legend_rate <- cowplot::get_legend(
    rf_plot_rate_all("Deaths", show_legend = TRUE) +
        theme(legend.box.margin = margin(t = 2, r = 2, b = 2, l = 2))
)

n_rate <- max(
    nrow(
        risk_cn %>%
            filter(
                measure_name == "Deaths",
                sex_name == "Both",
                age_name == "Age-standardized",
                metric_name == "Rate",
                year == yr_max
            )
    ),
    nrow(
        risk_cn %>%
            filter(
                measure_name == "DALYs (Disability-Adjusted Life Years)",
                sex_name == "Both",
                age_name == "Age-standardized",
                metric_name == "Rate",
                year == yr_max
            )
    )
)

h_rate <- max(4, 0.28 * n_rate + 1.6)

pRiskRate_grid <- cowplot::plot_grid(
    p_rate_deaths_core + labs(title = "Deaths"),
    p_rate_dalys_core + labs(title = "DALYs"),
    ncol = 2,
    align = "h",
    rel_widths = c(1, 1)
)

pRiskRate <- cowplot::plot_grid(
    cowplot::ggdraw() +
```

```
      cowplot::draw_label(
        "China: Risk factors - Age-standardized rate (Both, all factors, latest year)",
        x = 0,
        hjust = 0,
        fontface = "bold",
        size = 12
      ),
    pRiskRate_grid,
    legend_rate,
    ncol = 1,
    rel_heights = c(0.08, 1, 0.12)
)

if (exists("jp_risk")) {
    rf_name_map <- risk_cn %>%
      filter(
        sex_name == "Both",
        age_name == "All ages",
        metric_name == "Number",
        year == yr_max
      ) %>%
      transmute(
        RiskID = clean_id(rei_name),
        Risk = as.character(rei_name)
      ) %>%
      distinct()

    plot_risk_aapc <- function(measure, top_n = 15) {
      ids <- risk_cn %>%
        filter(
          measure_name == measure,
          sex_name == "Both",
          age_name == "All ages",
          metric_name == "Number",
          year == yr_max
        ) %>%
        arrange(desc(val)) %>%
        transmute(RiskID = clean_id(rei_name)) %>%
        pull() %>%
        unique()

      if (is.finite(top_n)) ids <- head(ids, top_n)
      if (!length(ids)) return(NULL)
```

```
    df <- jp_risk %>%
      mutate(Indicator = as.character(Indicator)) %>%
      filter(Indicator == short_measure(measure), RiskID %in% ids) %>%
      left_join(rf_name_map, by = "RiskID") %>%
      mutate(
        Risk = coalesce(Risk, RiskID),
        Direction = case_when(
          `AAPC C.I. High` < 0 ~ "Decrease",
          `AAPC C.I. Low` > 0 ~ "Increase",
          TRUE ~ "Neutral"
        )
      ) %>%
      arrange(AAPC) %>%
      mutate(Risk = factor(Risk, levels = Risk))

    ggplot(df, aes(AAPC, Risk, color = Direction)) +
      geom_vline(xintercept = 0, color = "grey70", linetype = "dashed") +
      geom_segment(
        aes(x = `AAPC C.I. Low`, xend = `AAPC C.I. High`, yend = Risk),
        linewidth = 0.9,
        color = "grey45"
      ) +
      geom_point(size = 2.2) +
      scale_color_manual(values = pal_dir, guide = "none") +
      scale_y_discrete(labels = function(x) str_wrap(x, 38)) +
      labs(
        x = "AAPC of ASR (%)",
        y = NULL,
        title = paste0(
          short_measure(measure),
          if (is.finite(top_n)) " - Top 15" else " - All"
        )
      ) +
      theme_top()
  }

  pF_sup <- cowplot::plot_grid(
    plot_risk_aapc("Deaths", 15),
    plot_risk_aapc("DALYs (Disability-Adjusted Life Years)", 15),
    ncol = 2,
    align = "h"
  )
}
```

```
ggsave(
  "figure/Main_FigA_ASR_trends.pdf",
  pA,
  width = 10.5,
  height = 3.6
)

ggsave(
  "figure/Main_FigB_Number_trends.pdf",
  pB,
  width = 10.5,
  height = 3.6
)

ggsave(
  "figure/Main_FigC_Number_pct_change.pdf",
  pC,
  width = 6.6,
  height = 3.2
)

if (exists("pD")) {
  ggsave(
    "figure/Main_FigD_AAPC_forest.pdf",
    pD,
    width = 10.5,
    height = 3.2
  )
}

ggsave(
  "figure/Main_FigE_Risk_Number_All.pdf",
  pRiskNum,
  width = 11,
  height = h_num
)

ggsave(
  "figure/Main_FigF_Risk_ASR_All.pdf",
  pRiskRate,
  width = 11,
  height = h_rate
)
```

```
if (exists("pF_sup")) {
  ggsave(
    "figure/Sup_Risk_AAPC_Top15.pdf",
    pF_sup,
    width = 11,
    height = 5.2
  )
}

message("Figures generated.")
```

ZIPCODE	CITY	COUNTY	STATE	LATITUDE	LONGITUDE	TZ	DST	MHI	MFI	SEX	AGE	ZCTA	POP	HU	WHITE	BLACK	NATIVE	ASIAN	HIS	OTHER	MULT	HOUSE	FAMILY	MARRIED	DIVORCE	NEVER	WIDOWED	SPOUSE	FOREIGN	DIPLOMA	BACHELOR	HOUSING	OCCUPIED	VACANT	MEDIAN	VALUE	ROOMS	MEDRENT	MEDGRO	LANDAREA	WATERAREA
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	37	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	38	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	39	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	40	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	41	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	42	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	43	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	44	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	45	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	46	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	47	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	48	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	49	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	50	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	51	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	52	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	53	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	54	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	55	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	56	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	57	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	58	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	59	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	60	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	61	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	62	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	63	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	64	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	65	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	66	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	67	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	68	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	69	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	70	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	71	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	72	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	73	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	74	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	75	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	76	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	77	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	78	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	79	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	80	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	81	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	82	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	83	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	84	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	85	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	86	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	87	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	88	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	89	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	90	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	91	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	92	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	93	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	94	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	95	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	96	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	97	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	98	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77447	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	99	77447	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	0	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	1	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	2	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	3	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	4	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	5	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	6	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	7	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	8	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	9	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	10	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	11	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	12	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	13	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	14	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	15	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	16	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	17	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	18	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	19	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	20	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	21	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	22	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	23	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	24	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0
77448	Pattison	Waller	TX	29.91	-95.96	-6	Y	90000	97000	Male	25	77448	7	3	7	0	0	0	0	0	0	3	2	2	0	0	0	2	0	0	0	3	3	0	0	5	0	0	0	0	0

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