# Automated Data Suppression

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# Introduction

- Ministry data set – includes small cells

  - Directive to suppress <5, and to ensure no back-calculation of suppressed cells

  - 10 years of data, breakdown by disease (some rare), HSDA, gender

# The Problem with Manual Suppression

- Not as simple as 'find' and 'replace' or basic rule based logic (IF >0 AND <5 THEN "<5" END)

- Prone to human error

- Time consuming

- Manual work begets manual work (i.e. not reproducible)

# The Solution - Automation

- Transparent

- Reproducible - given appropriate data structure

- Scalable - given appropriate data structure

- More efficient use of resources - computer vs. human

# The Process

- Break down the decision scenario into smallest form – a specific condition at a point in time for a specific gender within a geographical hierarchy

- Shape the data to support evaluation of suppression logic

- Apply the suppression logic as a sequence of testable questions

- Examine implemented suppression and evidence for such in each scenario

# Suppression Logic

- Within a single HSDA

  - Anything greater than 0 and less than 5 requires suppression (gender specific or total)

  - If the value for one gender is suppressed, suppress the value of the other to prevent back-calculation

# Suppression Logic

- Across HSDAs within a Single HA
  - If the total value of a single HSDA is suppressed, suppress all male, female, and total values for all HSDAs
  - If only one male or one female value is suppressed within a single HSDA, triggering suppression of the value for the other gender, then all male and female values in all other HSDAs in that HA must be suppressed
  - If the values of opposite genders in two different HSDAs require suppression, then suppression as above must occur
  - If the values of a single gender in two or more HSDAs require suppression, then only the values of the opposite gender in those HSDAs require suppression

# Suppression Triggers

- Is the cell value greater than 0 and less than 5?

- Can you recalculate the suppressed value from a triplet? I.e. Male/Female/Total.

- Can you recalculate the suppressed values from higher-order elements? I.e. HA totals and other HSDAs.

# Examine Suppression Evidence

- Visual system of evaluation
  - Assists human decision making
  - Reduces human error
- Reproducible script development
  - Increased efficiency and accuracy
  - Documentation and quality control
  - Greater resilience to changes in data sources
  - Allows for further development of more complex decisions

# Example 1

| HSDA | HA_F | HA_M | HA_T | HSDA_F | HSDA_M | HSDA_T |
|---|---|---|---|---|---|---|
| **East Kootenay** | 41 | 40 | 81 | 2 | 5 | 7 |
| **Kootenay Boundary** | 41 | 40 | 81 | 18 | 6 | 24 |
| **Okanagan** | 41 | 40 | 81 | 16 | 15 | 31 |
| **Thompson Cariboo Shuswap** | 41 | 40 | 81 | 5 | 14 | 19 |

- Step 1 (gray)
  - Single gender suppression within one HSDA
- Step 2 (orange)
  - Trigger suppression of males within East Kootenay
- Step 3 (blue)
  - Trigger suppression of all male and female values for remaining three health service delivery areas

# Example 2

| HSDA | HA_F | HA_M | HA_T | HSDA_F | HSDA_M | HSDA_T |
|------|------|------|------|--------|--------|--------|
| East Kootenay | 41 | 37 | 78 | 2 | 2 | 4 |
| Kootenay Boundary | 41 | 37 | 78 | 18 | 6 | 24 |
| Okanagan | 41 | 37 | 78 | 16 | 15 | 31 |
| Thompson Cariboo Shuswap | 41 | 37 | 78 | 5 | 14 | 19 |

- Step 1 (gray)
  - Dual gender suppression within one HSDA
- Step 2 (orange)
  - None
- Step 3 (blue)
  - Trigger suppression of all male and female values for remaining three health service delivery areas

# Example 3

| HSDA | HA_F | HA_M | HA_T | HSDA_F | HSDA_M | HSDA_T |
|------|------|------|------|--------|--------|--------|
| **East Kootenay** | 41 | 35 | 76 | 2 | 5 | 7 |
| **Kootenay Boundary** | 41 | 35 | 76 | 18 | 1 | 19 |
| **Okanagan** | 41 | 35 | 76 | 16 | 15 | 31 |
| **Thompson Cariboo Shuswap** | 41 | 35 | 76 | 5 | 14 | 19 |

- Step 1 (gray)
  - Single gender suppression within one HSDA (x2)
- Step 2 (orange)
  - Trigger suppression of males within East Kootenay and females within Kootenay Boundary
- Step 3 (blue)
  - No further suppression needed

# Example 4

| HSDA | HA_F | HA_M | HA_T | HSDA_F | HSDA_M | HSDA_T |
|------|------|------|------|--------|--------|--------|
| East Kootenay | 24 | 40 | 64 | 2 | 5 | 7 |
| Kootenay Boundary | 24 | 40 | 64 | 1 | 6 | 7 |
| Okanagan | 24 | 40 | 64 | 16 | 15 | 31 |
| Thompson Cariboo Shuswap | 24 | 40 | 64 | 5 | 14 | 19 |

- Step 1 (gray)
  - Single gender suppression within one HSDA (x2)
- Step 2 (orange)
  - Trigger suppression of males within East Kootenay and males within Kootenay Boundary
- Step 3 (blue)
  - No further suppression needed

# Example 5

| HSDA | HA_F | HA_M | HA_T | HSDA_F | HSDA_M | HSDA_T |
|------|------|------|------|--------|--------|--------|
| East Kootenay | 24 | 34 | 58 | 2 | 2 | 4 |
| Kootenay Boundary | 24 | 34 | 58 | 1 | 3 | 4 |
| Okanagan | 24 | 34 | 58 | 16 | 15 | 31 |
| Thompson Cariboo Shuswap | 24 | 34 | 58 | 5 | 14 | 19 |

- Step 1 (gray)
  - Small cells suppressed for both genders and totals for two HSDAs
- Step 2 (orange)
  - None
- Step 3 (blue)
  - None