Automated
Small Cell Suppression
for Public Release

Andriy Koval, CIHR Health System Impact Fellow

Brent Harris, Regional Epidemiologist (Interior)

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

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BC Centre for Disease Control
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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