

Outline

1. Creating Input Data
 - Microdata
 - Metadata
2. From primary to secondary suppression
 - Specifying tables
 - Avoiding Primary suppression
 - Computing secondary suppression
 - Audit
3. Outputs
 - Format SBS
 - Excel Formatting
4. Three special cases
 - Linked tables management
 - Controlled rounding
 - Tabulated data

Outline

1. Creating Input Data
 - Microdata
 - Metadata
2. From primary to secondary suppression
 - Specifying tables
 - Avoiding Primary suppression
 - Computing secondary suppression
 - Audit
3. Outputs
 - Format SBS
 - Excel Formatting
4. Three special cases
 - Linked tables management
 - Controlled rounding
 - Tabulated data

Microdata – from a SAS table

VIEWTABLE: TMP1.donnees_demo

	ape	TREFF	dep	poids_sondage	export
1	P8559	tr1	01	1	26
2	M7010	tr2	01	1	96781.3
3	L6820	tr1	01	1	484.8
4	L6820	tr1	01	1	0.3
5	L6820	tr1	01	1	0.3
6	C1712	tr3	01	1	17808.8
7	C2030	tr3	01	1	15063
8	G4674	tr3	01	1	13808.9
9	L6820	tr1	01	1	54.5
10	L6820	tr1	01	1	0.4
11	L6820	tr1	01	1	0.2
12	H5210	tr1	01	1	2866.9
13	H4939	tr3	01	1	122.9
14	C1013	tr1	01	3.3	466.4
15	C1011	tr3	01	1	2309.2
16	L6820	tr1	01	1	0.1
17	L6820	tr1	01	1	0.2
18	Q8610	tr3	01	1	11075.6
19	C2573	tr3	01	1	2377.6
20	F4110	tr1	01	11.1	37.1
21	C2599	tr4	01	1	65422.8

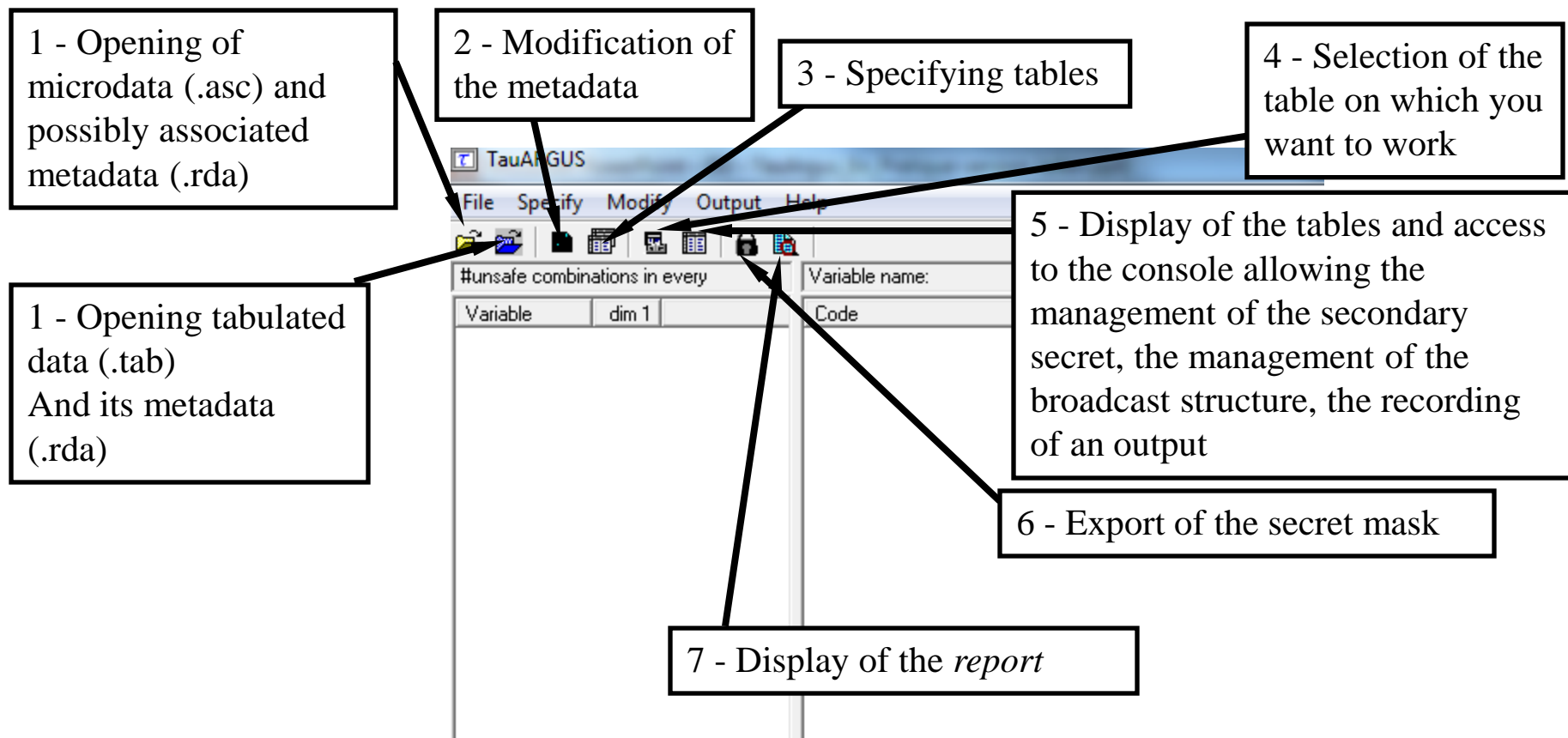
Input variable types :

- ventilation variables
- weigh
- response variables
- *holding* variable (not shown here)

Microdata – converting a SAS table to ascii file (.asc)

```
/** Étape 1 : conversion en caractère **/  
  
data microDonnees;  
    set demo.Donnees_demo;  
  
/* 2 variables numériques avec un chiffre après la virgule que l'on convertit en variable caractère */  
    poids      =      put(poids_Sondage, 6.1);  
    exporttt   =      put(export, 10.1);  
  
run;  
  
/** Étape 2 : création du fichier plat **/  
  
filename asc "D:\dossier de travail\Donnees_demo.asc";  
  
data _NULL_;  
    set microdonnees;  
    file asc;  
    put  
  
        treff                      1-4  
        APE                        6-11  
        dep                        13-14  
        poids                      16-21  
        exportt                    23-32 ;  
  
run;
```

Tau-Argus: Exploring the menu



Metadata - variables specification

1 - We prefer the fixed format

Specify metafile

Fixed format

Treff
Activité
dep
Poids
export
import

Attributes

name: dep

starting position: 13

length: 2

decimals: 0

☒ explanatory variable
☐ response variable
☐ sample weight variable
☐ holding indicator
☐ request protection

☐ distance for suppression weight

Codelist

☐ automatic

Code for Total

☒ codelist filename

Missings:

D:\jk3kh1\formation - 16-17 février 2015\JD01-Données démonstration\dep

☒ hierarchical

☐ Levels from microdata

☒ Levels from file

Leading string @

D:\jk3kh1\formation - 16-17 février 2015\JD01-Données démonstration

New

Delete

Cancel

OK

2 - We add the right number of variables

3 - Description of the variable:

Name

Position and length in the file (see sas export)

Number of decimals for numeric variables

Type

4 - *Codelist*

- management of labels ... little interest

- codes used for missing values

5 - Specifying information about hierarchical variables:

- manually : A88/A272/APE will give for example :

☒ Levels from microdata

2 1 2 0 0

- or via a flat file (.hrc).

Outline

1. Creating Input Data
 - Microdata
 - Metadata
2. From primary to secondary suppression
 - Specifying tables
 - Avoiding Primary suppression
 - Computing secondary suppression
 - Audit
3. Outputs
 - Format SBS
 - Excel Formatting
4. Three special cases
 - Linked tables management
 - Controlled rounding
 - Tabulated data

Specifying tables - selecting variables

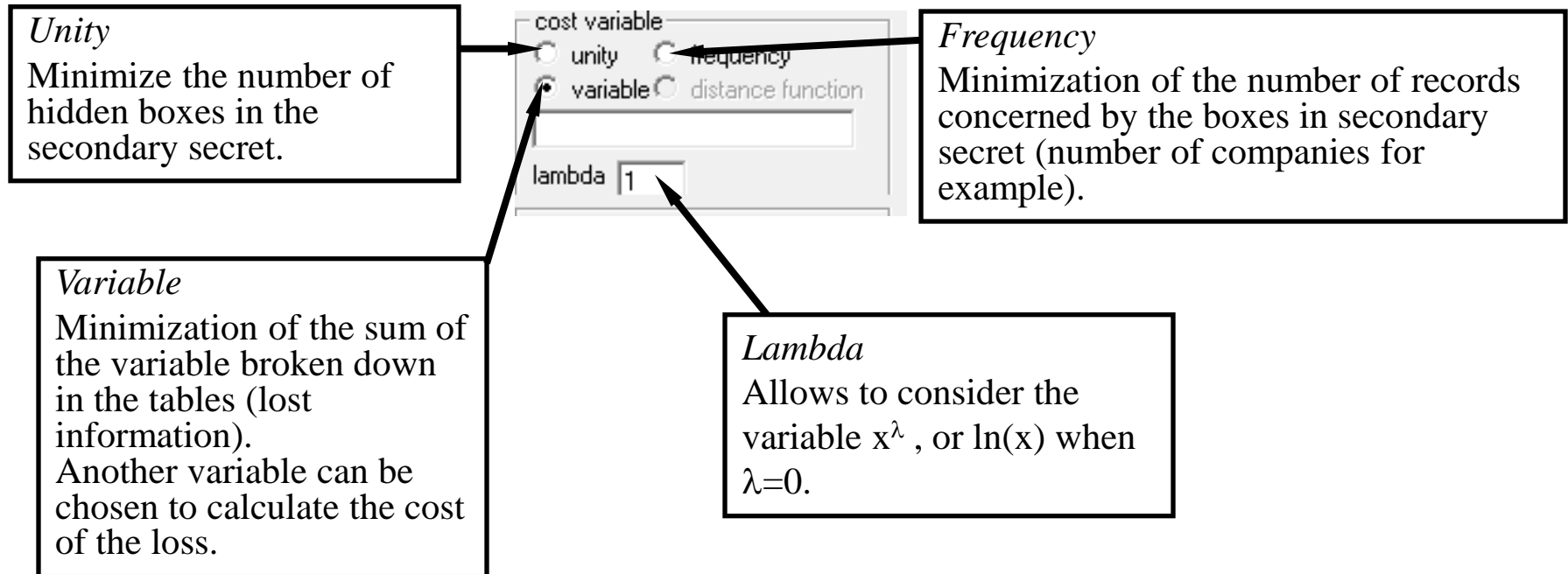
Selection of ventilation variables for a given table

Selecting the Response Variable

Variable on which the primary secret will be calculated

Expl. vars	rule	Resp. var	Shadow & Cost var
APE, dep	IND.: n = 1, k = 85, MinFreq = 3	export	Shadow=Default, Cost=Default, weig...

Specifying tables - choosing the cost variable



Avoiding primary secrecy - dominance, frequency and P%

Rule of dominance or P%

Interval calculated automatically
So as not to be able to retrieve the sensitive individual data (first contributors to the total of the box)

<input checked="" type="checkbox"/> Dominance rule		Dom Rule		P%-rule		Req. rule	
<input checked="" type="checkbox"/> P%-rule							
<input type="checkbox"/> Request rule							
		n		k			
		Ind-1		1		85	
		Ind-2		0		0	
		Hold-1		0		0	
		Hold-2		0		0	

<input checked="" type="checkbox"/> Dominance rule		Dom Rule		P%-rule		Req. rule	
<input checked="" type="checkbox"/> P%-rule							
<input type="checkbox"/> Request rule							
		P		N			
		Ind-1		10		1	
		Ind-2		0		0	
		Hold-1		0		0	
		Hold-2		0		0	

Possibility to hide the boxes equal to 0
Definition of a minimum protection interval
Defined absolutely

Frequency rule or manually secured box:

- the width of the interval must be defined
- relative to the total of the box
- symmetrical protection interval
- can be defined more precisely by using an *a priori* file

Avoiding Primary Secrets - Weight and Holding

The screenshot shows the 'Specify Tables' dialog box with the following components and annotations:

- explanatory variables:** A list containing 'Treff', 'APE', and 'dep'. An arrow points to this list with the annotation: "List of tables (maximum 10 at a time)".
- cell items:** A list containing 'export' and '<freq>'. An arrow points to this list with the annotation: "Tables are dragged".
- response variable:** A text box containing 'export'. An arrow points to this box with the annotation: "Taking weights into account".
- shadow variable:** An empty text box. An arrow points to this box with the annotation: "Missing values considered secure".
- cost variable:** Radio buttons for 'unity', 'frequency', and 'variable'. An arrow points to the 'variable' option with the annotation: "Taking holding into account".
- lambda:** A text box containing '1'.
- Apply Weights:** A checked checkbox. An arrow points to this checkbox with the annotation: "Tables are dragged".
- Missing = safe:** An unchecked checkbox.
- Use holdings info:** An unchecked checkbox.
- Dom Rule, P%-rule, Req. rule:** Checkboxes for 'Dominance rule', 'P%-rule', and 'Request rule'. The 'P%-rule' section contains a table with values for Ind-1, Ind-2, Hold-1, and Hold-2.
- Minimum frequency:** A section with 'Ind.' and 'Hold.' rows, each with 'freq' and 'range' columns. Values include 3, 10, and 0.
- Zero unsafe range:** A checkbox and a text box containing '10'.
- Manual safety range:** A text box containing '10'.
- Table List:** A table at the bottom showing the configuration for each table.

Expl. vars	rule	Resp. var	Shadow & Cost var
APE,dep	IND.: n= 1, k= 85, MinFreq = 3	export	Shadow=Default,Cost=Default, weig...
Treff,dep	IND.: n= 1, k= 85p= 10, q= 100, N= ...	export	Shadow=Default,Cost=Default, weig...

Buttons at the bottom: Cancel, Compute tables

Calculate the secondary secret - selection of the work table

The screenshot shows the TauARGUS software interface. The main window has a menu bar (File, Specify, Modify, Output, Help) and a toolbar. Below the toolbar, there is a table with columns 'Variable', 'dim 1', and 'dim 2'. The table contains the following data:

Variable	dim 1	dim 2
Treff	0	57
APE	143	18098
dep	6	57

To the right of this table, there is a section labeled 'variable: Treff' with a table containing 'Code' and 'Label' columns. The 'Code' column lists 'tr1', 'tr2', 'tr3', and 'tr4'. The 'Label' column lists 'Total'.

Overlaid on the main window is a 'Select table' dialog box. It contains a table with two columns: 'Explanatory variables' and 'Resp. var'. The table has the following data:

Explanatory variables	Resp. var
Treff, dep	export
APE, dep	export

The 'APE, dep' row is highlighted in blue. At the bottom of the dialog box are 'Cancel' and 'OK' buttons. An arrow points from a text box to the 'APE, dep' row in the 'Select table' dialog box.

Selection of the table on which you want to work

Calculate the secondary secret - view the table: *cell information*

Table: APE x dep 2 | export

	Total	- R11	75	77	78
Total	522 056 224.50	63 021 963.49	9 839 438.85	5 087 508.70	9 957
- .A	122 439.77	36 117.80	20 121.12	-	3
+ ..A02	122 439.77	36 117.80	20 121.12	-	3
- .B	1 402 398.40	142 010.56	30 097.30	50 169.40	1
+ ..B07	3 613.70	3 613.70	-	-	-
+ ..B08	1 198 521.20	138 396.86	30 097.30	50 169.40	1
+ ..B09	200 263.50	-	-	-	-
- .C	98 258 100.27	10 304 907.16	2 797 491.59	770 785.70	1 069
+ ..C10	11 393 118.56	2 061 825.58	595 796.43	340 257.12	55
+ ..C11	3 454 649.17	570 623.55	442 786.10	11 654.10	-
+ ..C12	281 061.70	-	-	-	-
+ ..C13	777 228.33	93 491.73	4 163.60	24 472.20	22
+ ..C14	210 304.65	34 634.72	1 822.86	66.77	22
+ ..C15	155 712.50	10 105.74	8 627.72	1 478.02	-
+ ..C16	1 368 081.03	358 671.82	40 654.72	19 688.74	16
+ ..C17	2 153 116.22	1 393 711.59	7 104.50	13 068.90	395
+ ..C18	1 233 655.83	108 290.82	16 459.88	9 995.30	9
+ ..C19	5 364.70	-	-	-	-
+ ..C20	34 160 254.35	328 340.55	24 761.88	19 925.93	137
+ ..C21	3 627 074.57	1 071 798.70	830 943.70	1 139.20	18
+ ..C22	8 946 537.62	521 902.11	53 447.60	26 527.40	69
+ ..C23	10 700 076.13	495 421.84	33 235.97	172 343.50	9
+ ..C24	2 298 391.90	777 944.50	851.60	26 331.90	5
+ ..C25	3 809 535.80	799 413.51	247 708.18	45 983.06	89
+ ..C26	2 736 101.38	186 227.73	79 225.68	7 237.90	62
+ ..C27	1 333 317.48	190 720.00	63 397.20	3 140.40	10
+ ..C28	3 282 129.65	395 611.01	53 051.50	17 537.20	20
+ ..C29	2 085 928.40	53 578.70	24 495.80	2 345.60	6
+ ..C30	490 420.68	204 883.80	7 214.60	7 757.60	-
+ ..C31	780 101.85	357 396.20	207 201.90	-	-
+ ..C32	1 987 965.50	176 725.12	24 820.40	5 048.90	104
+ ..C33	987 972.27	113 587.84	29 719.77	14 785.96	13
- .D	872 115.96	30 823.55	1 641.92	1 224.00	3
+ ..D35	872 115.96	30 823.55	1 641.92	1 224.00	3

☒ 3 dig. separator ☐ Output View Select Table Change View Write table Table Summary Close

Cell Information

Value: 522 056 224.50
 Status: Safe
 Cost: 522 056 224.50
 Shadow: 522 056 224.50
 # contributions: 38157
 Top n of shadow: 19 269 135.60
☐ Holding level
 Request: 0.00

Change status

Set to Safe
 Set to Unsafe
 Set to Protected
 Set Cost
 A priori info
 All Non-StructEmpty

Recode

Suppress
☒ HyperCube
☐ Modular
☐ Network
☐ Optimal
☐ Rounding
 Suppress
 Undo Suppress
 Audit

Information on a given box:

- *status* : safe/unsafe (box in black/red)

- *contributions* : number of contributors

- *top n of shadow* : value of the first contributor of the box, to be compared with the value of the box

- *protection interval* : limits of the protection interval defined for the primary secret boxes

Calculate the secondary secret - view the table: *change status*

Table: APE x dep 2 | export

	Total	- R11	75	77	78
Total	522 056 224.50	63 021 963.49	9 839 438.85	5 087 508.70	9 957
- A	122 439.77	36 117.80	20 121.12	-	3
+ ..A02	122 439.77	36 117.80	20 121.12	-	3
- B	1 402 398.40	142 010.56	30 097.30	50 169.40	1
+ ..B07	3 613.70	3 613.70	-	-	-
+ ..B08	1 198 521.20	138 396.86	30 097.30	50 169.40	1
+ ..B09	200 263.50	-	-	-	-
- C	98 258 100.27	10 304 907.16	2 797 491.59	770 785.70	1 069
+ ..C10	11 393 118.56	2 061 825.58	595 796.43	340 257.12	55
+ ..C11	3 454 649.17	570 623.55	442 786.10	11 654.10	-
+ ..C12	281 061.70	-	-	-	-
+ ..C13	777 228.33	93 491.73	4 163.60	24 472.20	22
+ ..C14	210 304.65	34 634.72	1 822.86	66.77	22
+ ..C15	155 712.50	10 105.74	8 627.72	1 478.02	-
+ ..C16	1 368 081.03	358 671.82	40 654.72	19 688.74	16
+ ..C17	2 153 116.22	1 393 711.59	7 104.50	13 068.90	395
+ ..C18	1 233 655.83	108 290.82	16 459.88	9 995.30	9
+ ..C19	5 364.70	-	-	-	-
+ ..C20	34 160 254.35	328 340.55	24 761.88	19 925.93	137
+ ..C21	3 627 074.57	1 071 798.70	830 943.70	1 139.20	18
+ ..C22	8 946 537.62	521 902.11	53 447.60	26 527.40	69
+ ..C23	10 700 076.13	495 421.84	33 235.97	172 343.50	9
+ ..C24	2 298 391.90	777 944.50	851.60	26 331.90	5
+ ..C25	3 809 535.80	799 413.51	247 708.18	45 983.06	89
+ ..C26	2 736 101.38	186 227.73	79 225.68	7 237.90	62
+ ..C27	1 333 317.48	190 720.00	63 397.20	3 140.40	10
+ ..C28	3 282 129.65	395 611.01	53 051.50	17 537.20	20
+ ..C29	2 085 928.40	53 578.70	24 495.80	2 345.60	6
+ ..C30	490 420.68	204 883.80	7 214.60	7 757.60	-
+ ..C31	780 101.85	357 396.20	207 201.90	-	-
+ ..C32	1 987 965.50	176 725.12	24 820.40	5 048.90	104
+ ..C33	987 972.27	113 587.84	29 719.77	14 785.96	13
- D	872 115.96	30 823.55	1 641.92	1 224.00	3
+ ..D35	872 115.96	30 823.55	1 641.92	1 224.00	3

☒ 3 dig. separator Select Table Change View Write table
☐ Output View Table Summary Close

Cell Information

Value: 522 056 224.50

Status: Safe

Cost: 522 056 224.50

Shadow: 522 056 224.50

contributions: 38157

Top n of shadow: 19 269 135.60

☐ Holding level

Request: 0.00

Change status

Set to Safe

Set to Unsafe

Set to Protected

Set Cost

A priori info

All Non-StructEmpty

Recode

Suppress

☒ HyperCube

☐ Modular

☐ Network

☐ Optimal

☐ Rounding

Suppress

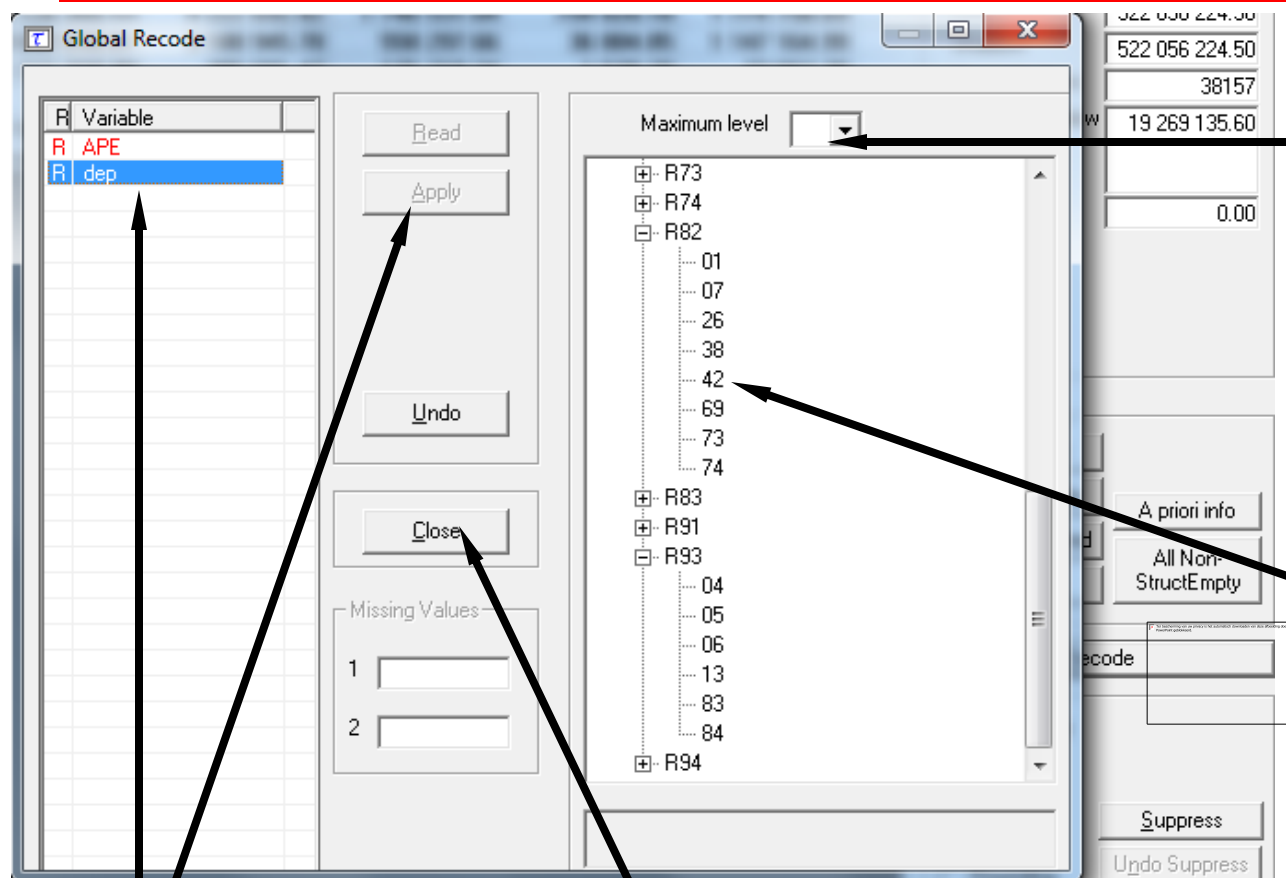
Undo Suppress

Audit

Changing the status of a box manually:

- *set to safe/unsafe* : Force the broadcast / non-broadcast of a box
- *set to protected* : The box can not be chosen for secondary secrecy (infinite cost)
- *set cost* : Change in cost for secondary secrecy
- *a priori info* : from a flat file (.hst), you change the status of a list of boxes

Calculate the secondary secret - view the table: *recode*



The *maximum level* allows to recode all the modalities at once, making them rise of x notches. Here we go from department to region ...

... But if we wish, for example, to keep the departments of regions 11, 82 and 93, we can modify the structure manually.

First the variable is selected, then recode, then *apply* and then close.

Calculate the secondary secret - view the table: *a priori*

The screenshot shows a software interface with a table of values and a dialog box for reading history files. The table has columns: Total, - R11, 75, 77, 78. The rows are labeled Total, .A, .B, .C, .D, .E, .F, .G, .H, .I, .J, .K, .L, .M, .N, .P, .Q, .R, .S. The values are as follows:

	Total	- R11	75	77	78
Total	522 056 224.50	63 021 963.49	9 839 438.85	5 087 508.70	9 957 35
.A	122 439.77	36 117.80	20 121.12	-	3 12
.B	1 402 398.40	142 010.56	30 097.30	50 169.40	1 21
.C	98 258 100.27	10 304 907.16	2 797 491.59	770 785.70	1 069 79
.D	872 115.96	30 823.55	1 641.92	1 224.00	3 66
.E	30 333 873.21	348 798.98	40 962.46	110 672.60	55 76

The dialog box 'Read history file' is open, showing a search history file path: 'D:\jk3kh1\formation - 16-17 février 2015\JD01-Données démonstration'. It also has a 'Separator' field and checkboxes for 'Ignore incorrect lines' and 'Expand for trivial levels'. A small table is also visible within the dialog box:

Type	Correct	InCorrect
UnKnown	0	0
Status	2	0
Cost	0	0
Apriori Bound	0	0
Prot.level	0	0

Applying an *a priori* secret structure.

It is not necessary to specify all the boxes in the table.

Be careful not to specify empty boxes.

	Total	- R11	75	77	78
Total	522 056 224.50	63 021 963.49	9 839 438.85	5 087 508.70	9 957
.A	122 439.77	36 117.80	20 121.12	-	3
.B	1 402 398.40	142 010.56	30 097.30	50 169.40	1
.C	98 258 100.27	10 304 907.16	2 797 491.59	770 785.70	1 069
.D	872 115.96	30 823.55	1 641.92	1 224.00	3
.E	30 333 873.21	348 798.98	40 962.46	110 672.60	55

Calculate secondary secret - view table: *change view*

Table: APE x dep 2 | export

	Total	- R11	75	77	78
Total	522 056 224.50	63 021 963.49	9 839 438.85	5 087 508.70	9 957 35
.A	122 439.77	36 117.80	20 121.12	-	3 12
.B	1 402 398.40	142 010.56	30 097.30	50 169.40	1 21
.C	98 258 100.27	10 304 907.16	2 797 491.59	770 785.70	1 069 79
.D	872 115.96	30 823.55	1 641.92	1 224.00	3 66
.E	30 333 873.21	348 798.98	40 962.46	110 672.60	55 76
.F	10 398 586.65	1 513 573.15	389 143.39	121 801.56	503 91
.G	45 677 914.34				
.H	37 223 675.37				
.I	8 597 185.17				
.J	17 647 570.47				
.K	33 082 514.00				
.L	112 485 382.33				
.M	102 062 259.13				
.N	15 841 901.77				
.P	493 391.20				
.Q	2 997 127.50				
.R	2 631 431.74				
.S	1 928 357.35				

Cell Information

Value: 522 056 224.50
Status: Safe
Cost: 522 056 224.50
Shadow: 522 056 224.50
contributions: 38157
Top n of shadow: 19 269 135.60
Holding level:
request: 0.00

Change View

APE
dep

Column: APE
Max. level shown: 2

Row: dep
Max. level shown: 2
Number of decimals: 2

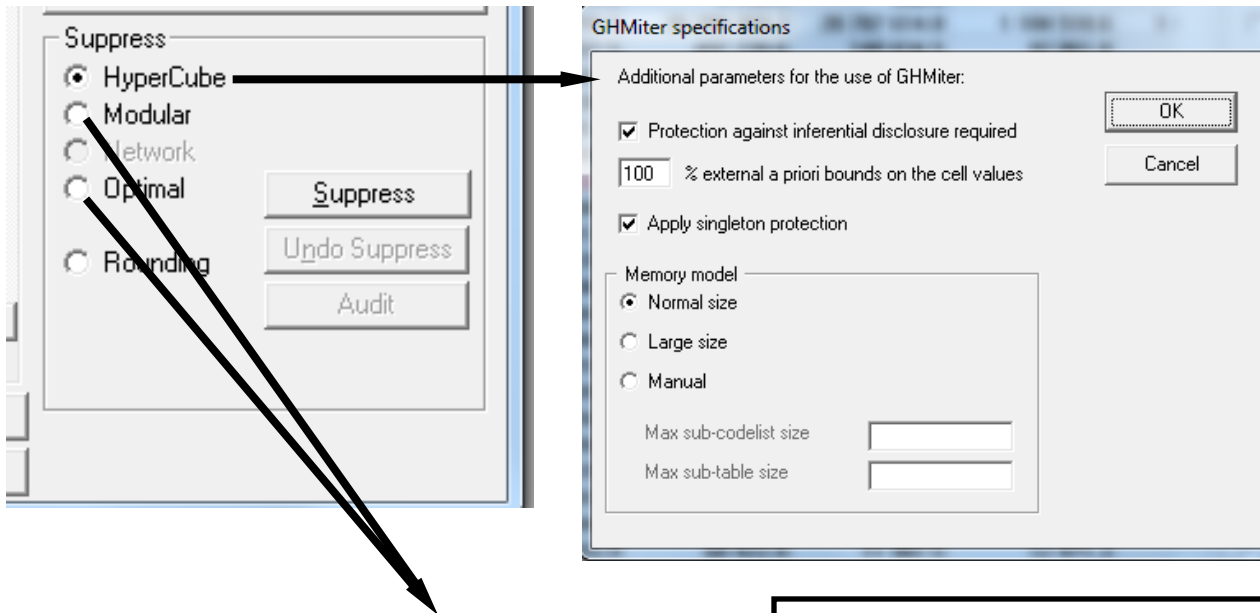
Cancel OK

3 dig. separator
Output View

Select Table Change View Write table Close

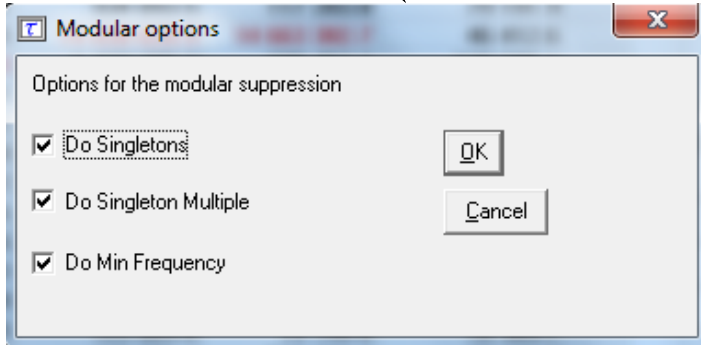
Changing the display of the table on the screen (this does not modify the actual structure of the table).

Calculate Secondary Secret - What Secondary Secret Method?



Hypercube

Sequential treatment of cells under primary secret (search for the least expensive suppression scheme).
Free and fast method.



Optimal

Overall minimization of the cost of hiding boxes
Under the constraint of respecting the protection intervals.
Method sometimes very slow.

Modular

For hierarchical tables, the problem is split: the optimal method is applied on the different sub-tables.
Faster to process than the optimal method.

Calculating the secondary secret – managing singletons problems in Tau-Argus

Singleton

- Cell with one contributor, he can know that is the only contributor to the box.
- Complementary secondary suppression if :
 - two singletons in the same row or column
 - un singleton et une cellule cachée en secret primaire
 - two cells hidden due to a frequency problem whose sum of the number of contributors is still insufficient (this problem does not arise with the rule of three units)

Method	Singleton management
<i>Hypercube</i>	Yes (automatically)
<i>Modular</i>	Yes (optional)
<i>Network</i>	Not offered
<i>Optimal</i>	Yes (optional)

Calculate the secondary secret - view the table: *summary*

Summary for table no: 2

Explan. Var	# Codes
APE	19
dep	45

Status	Freq	# rec	Sum Resp	SumCost
Safe	547	162561	2027531274.76	2027531274.76
Safe (manual)	1	1	1641.92	1641.92
Unsafe	106	2155	145158939.85	145158939.85
Unsafe (request)	0	0	0	0
Unsafe (Freq)	17	27	117173.44	117173.44
Unsafe (Zero cell)	0	0	0	0
Unsafe (manual)	1	888	10304907.16	10304907.16
Protected	0	0	0	0
Secondary	81	14974	260182513.05	260182513.05
Secondary (from manual)	0	0	0	0
Empty (non-struct.)	0	0	0	0
Empty	102	0	0	0
Total	855	180606	2443296450.18	2443296450.18

Protected by Hypercube

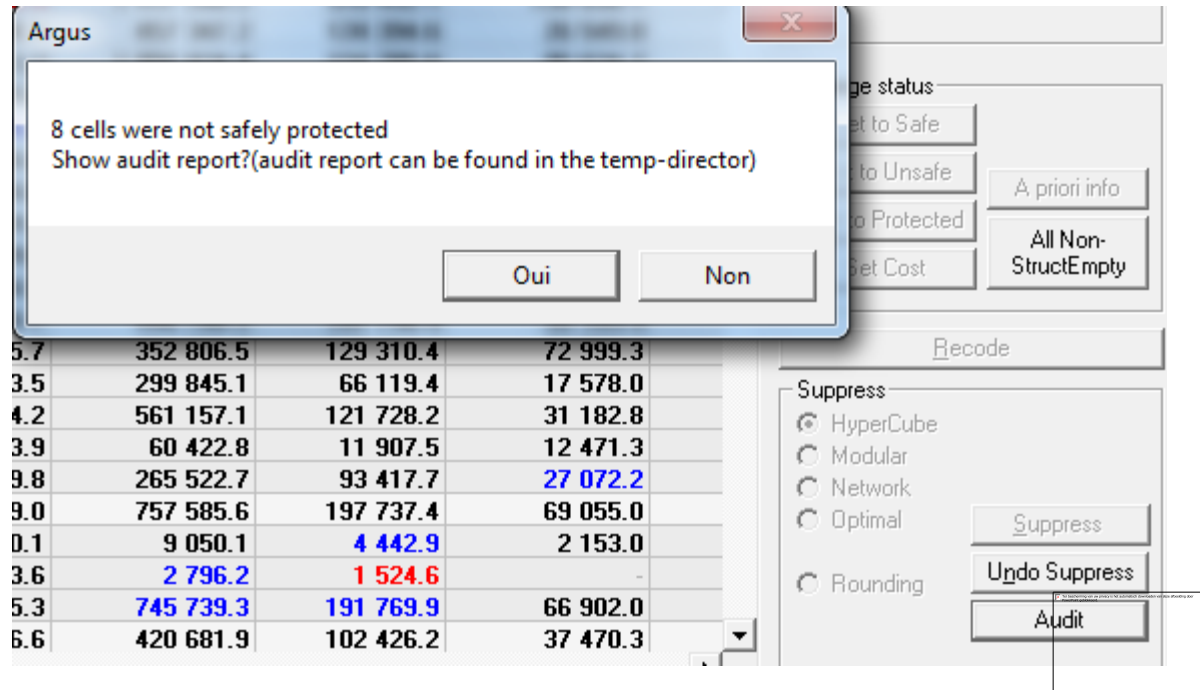
The most interesting information :

- the primary secret of frequency : *Unsafe(freq)*
- the primary secret of dominance /P% : *Unsafe*
- manually protected boxes : *Safe(manual)*
- Secondary secrecy : *Secondary*
- The costs of these different categories of secrecy.

Calculate Secondary Secrecy - Different Methods for Different Results

Method	Number of boxes deleted in secondary secret	Cost of boxes deleted	Required calculation time
<i>Hypercube</i> (free method)	81 (9.47%)	260 182 513 (10.64%)	1 second
<i>Modular</i> (paying method)	64 (7.48%)	26 017 917 (1.06%)	1 minute and 4 seconds
<i>Optimal</i> (paying method)	140 (16.37%)	25 461 484 (1.04%)	10 minutes (not "optimal" solution)

Audit



Audit - Protection Intervals and Audit Intervals

t-ARGUS Audit-report

Table created date: 09-juin-2015, time 15:25:03

Original file:	D:\jk3kh1\formation - 16-17 février 2015\JD01-Données démonstration\Donnees_demo.asc
Meta file:	D:\jk3kh1\formation - 16-17 février 2015\JD01-Données démonstration\Donnees_demo.rda
Table file:	

Table generated from microdata

Table structure

Var	Function	# codes
Response var:	export	
Explanatory var 1:	Activité	585
Explanatory var 2:	dep	45
Shadow variable :	default (=response var)	
Cost variable	default (=response var)	
Weight variable :	Poids	

Overview of not-properly protected cells

Activité	dep	Cell value	Lower PI	Upper PI	Exact
C27	41	9 185 712.1	766 664.6	9 332 884.7	
C271	41	8 411 314.5	0.0	8 566 220.1	
C2710	41	8 411 314.5	0.0	8 566 220.1	
C27100	41	8 411 314.5	0.0	8 566 220.1	
C33	95	1 406 786.8	74 360.1	1 414 023.3	
C332	95	1 326 101.5	0.0	1 339 663.2	
C3320	95	1 326 101.5	0.0	1 339 663.2	
C33200	95	1 326 101.5	0.0	1 339 663.2	

8 cells were not safely protected

t-ARGUS version: 3.5.0 ; build: (27)

Audit - Protection Intervals and Audit Intervals

Table: Activité x dep | export

	31	41	42	43	52
+ ..C246	-	-	-	373 302.2	
+ ..C247	-	-	-	457 018.3	
- ..C25	1 458 213.4	-	-	339 984.2	1 180 350.1
+ ..C250	-	-	-	-	-
+ ..C251	193 819.1	-	-	244 265.0	-
+ ..C252	1 264 394.3	-	-	95 719.2	1 180 350.1
- ..C26	788 524.6	695 423.3	-	-	1 397 108.9
+ ..C260	75 092.8	-	-	-	-
+ ..C261	289 114.4	-	-	-	291 326.1
+ ..C262	80 752.3	-	-	-	86 521.9
+ ..C263	50 112.6	-	-	-	48 506.9
+ ..C264	122 731.3	-	-	-	129 787.8
+ ..C265	39 280.0	-	-	-	32 185.8
+ ..C266	131 441.2	516 800.1	-	-	652 495.3
+ ..C267	-	14 956.8	-	-	15 359.8
+ ..C268	-	163 666.4	-	-	140 925.3
- ..C27	-	9 185 712.1	-	-	1 408 841.0
+ ..C270	-	11 335.3	-	-	-
+ ..C271	-	8 411 314.9	-	-	679 638.4
+ ..C272	-	72 839.2	-	-	61 627.4
+ ..C273	-	7 733.0	-	-	12 879.0
+ ..C274	-	416 420.8	-	-	410 779.8
+ ..C275	-	266 069.3	-	-	243 916.8
- ..C28	245 499.7	187 126.8	1 093 017.3	797 146.9	3 072 421.6
+ ..C280	-	36 496.1	14 841.4	-	-
+ ..C281	4 820.2	2 948.0	947 708.0	295 554.4	1 264 980.3
+ ..C282	-	-	-	303 278.1	-
+ ..C283	-	-	-	70 353.4	-
+ ..C284	240 679.5	31 982.8	-	101 635.8	284 818.8
+ ..C285	-	115 699.9	130 467.9	26 325.2	428 432.0
+ ..C286	-	-	-	-	359 843.8
+ ..C287	-	-	-	-	734 346.9
- ..C29	-	-	161.5	-	908 153.5
+ ..C290	-	-	-	-	211 469.0

☒ 3 dig. separator ☐ Output View Select Table Change View Write table Table Summary Close

Cell Information

Value: 9 185 712.1

Status: Unsafe

Cost: 9 185 712.1

Shadow: 9 185 712.1

contributions: 97

Top n of shadow: 8 361 885.0

☐ Holding level

Request: 0.0

Protection interval (low/up value)

8 533 912.44	9 837 511.76
--------------	--------------

Audit interval (low/up value)

766 664.60	9 332 884.70
------------	--------------

Change status

Suppress

☒ HyperCube ☐ Modular ☐ Network ☐ Optimal ☐ Rounding

Protection interval

Limits of the protection interval defined for the primary secret boxes

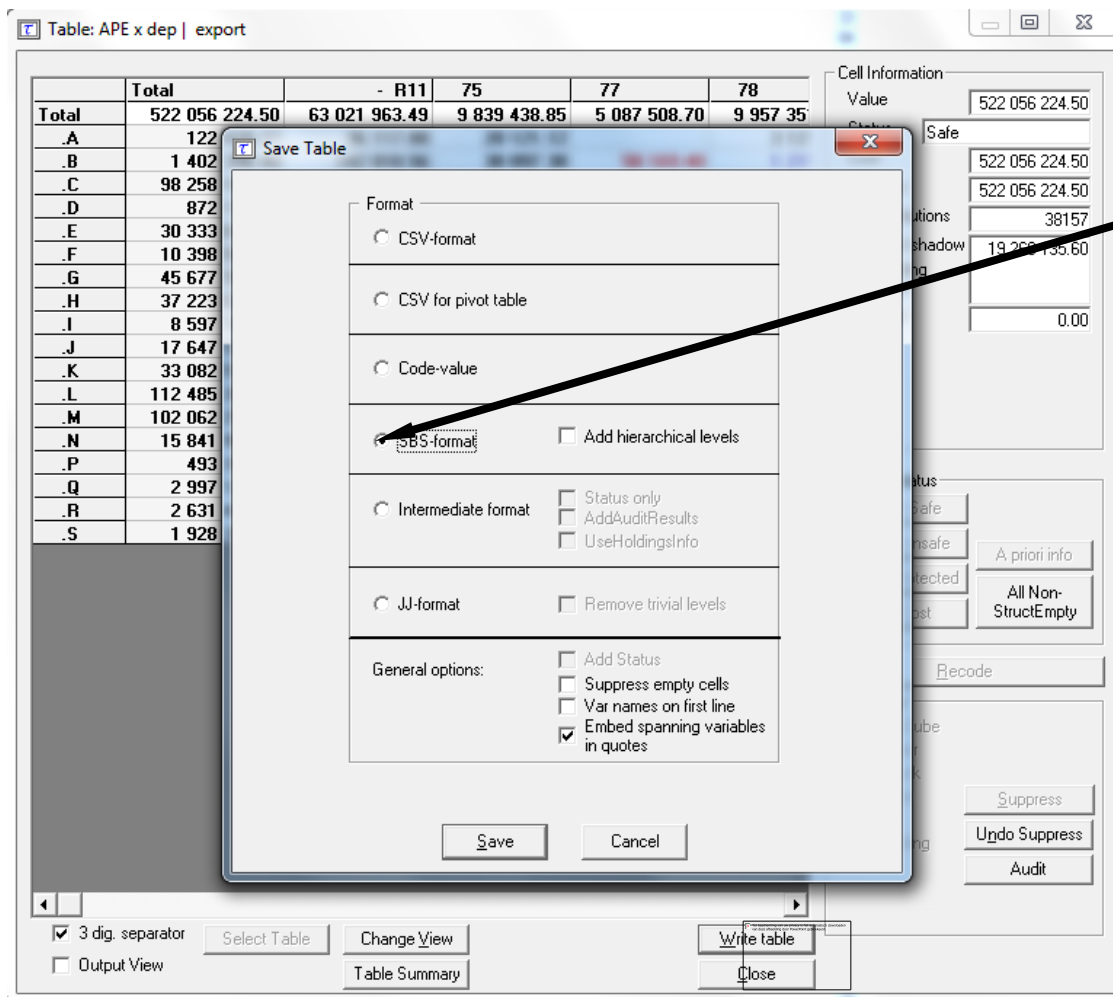
Audit interval

Interval of the possibilities that a user is likely to find thanks to the additivity and positivity relationships of the cells.

Outline

1. Creating Input Data
 - Microdata
 - Metadata
2. From primary to secondary suppression
 - Specifying tables
 - Avoiding Primary suppression
 - Computing secondary suppression
 - Audit
3. Outputs
 - Format SBS
 - Excel Formatting
4. Three special cases
 - Linked tables management
 - Controlled rounding
 - Tabulated data

Exporting your data: different options



Format requested by Eurostat, which is systematically used in methodology department

Export to the format requested by Eurostat (.sbs): Formatting

	A	B	C
1	Total, "Total",	522056224.50	38157, V
2	Total, "R11",	63021963.49	8078, V
3	Total, "75",	9839438.85	1625, V
4	Total, "77",	5087508.70	890, V
5	Total, "78",	9957351.90	1022, V
6	Total, "91",	7813386.44	705, V
7	Total, "92",	7463093.19	1037, V
8	Total, "93",	14392115.32	1297, V
9	Total, "94",	3433319.96	769, V
10	Total, "95",	5035749.13	733, V
11	Total, "R21",	7938533.92	813, V
12	Total, "R22",	17750513.95	1097, V
13	Total, "R23",	6477775.18	825, D
14	Total, "R24",	13010548.43	1464, V
15	Total, "R25",	5679480.03	765, V
16	Total, "R26",	12744926.36	1176, V
17	Total, "R31",	14493467.76	1860, V
18	Total, "R41",	10081338.93	1477, V
19	Total, "R42",	9841223.42	1181, V
20	Total, "R43",	6513791.36	624, V
21	Total, "R52",	24676251.93	2095, V
22	Total, "R53",	85423583.08	1919, V
23	Total, "R54",	12824993.07	1521, V
24	Total, "R72",	42660173.04	2753, V
25	Total, "R73",	44832975.16	2933, V

→ selection of
column A
 → menu
 → *data*
 → *convert*
 → *next*
 → tick « , »
 → *complete*

	A	B	C	D	E
1	Total	Total	522056225	38157	V
2	Total	R11	63021963.5	8078	V
3	Total	75	9839438.85	1625	V
4	Total	77	5087508.7	890	V
5	Total	78	9957351.9	1022	V
6	Total	91	7813386.44	705	V
7	Total	92	7463093.19	1037	V
8	Total	93	14392115.3	1297	V
9	Total	94	3433319.96	769	V
10	Total	95	5035749.13	733	V
11	Total	R21	7938533.92	813	V
12	Total	R22	17750514	1097	V
13	Total	R23	6477775.18	825	D
14	Total	R24	13010548.4	1464	V
15	Total	R25	5679480.03	765	V
16	Total	R26	12744926.4	1176	V
17	Total	R31	14493467.8	1860	V

Meaning of the flags (column E):

- V : can be shown
- A : primary frequency secret
- B : primary secret of dominance
- F : primary secret linked to $P\%$
- D : secondary secret

Outline

1. Creating Input Data
 - Microdata
 - Metadata
2. From primary to secondary suppression
 - Specifying tables
 - Avoiding Primary suppression
 - Computing secondary suppression
 - Audit
3. Outputs
 - Format SBS
 - Excel Formatting
4. Three special cases
 - Linked tables management
 - Controlled rounding
 - Tabulated data

Managing linked tables

The screenshot shows the TauARGUS software interface. The 'Modify' menu is open, showing options: 'Select Table', 'View Table', and 'Linked Tables'. A large black arrow points from the 'Linked Tables' menu item to the 'Linked tables with modular' dialog box.

1 – We define the global table to be protected

2 – The method is chosen

The 'Linked tables with modular' dialog box contains three 'ExpVar' lists:

- table 1:** APE, dep
- table 2:** Treff, dep
- Global table:** APE, dep, Treff

Buttons at the bottom include 'Build cover table automatic', 'Clear cover table', 'Suppress via modular', 'Suppress via hypercube', and 'Ready'. A note at the bottom states: 'Double click on a variable to specify an alternative hierarchy'.

Controlled rounding - another way to manage secrecy

Table: APE x dep | export

	Total	- R11	75	77	78
Total	522 056 224.50	63 021 963.49	9 839 438.85	5 087 508.70	9 957 35
.A	122 439.77	36 117.80	20 121.12	-	3 12
.B	1 402 398.40	142 010.56	30 097.30	50 169.40	1 21
.C	98 258 100.27	10 304 907.16	2 797 491.59	770 785.70	1 069 79
.D	872 115.96	30 823.55	1 641.92	1 224.00	3 66
.E					55 76
.F					203 91
.G					822 45
.H					63 32
.I					291 30
.J					1 076 23
.K					30 79
.L					
.M					
.N					
.P					
.Q					
.R					
.S					

Cell Information

Value: 522 056 224.50

Status: Safe

Cost: 522 056 224.50

Shadow: 522 056 224.50

contributions: 38157

Top n of shadow: 19 269 135.60

☐ Holding level

Request: 0.00

Set to Unsafe

Set to Protected

Set Cost

A priori info

All Non-StructEmpty

Recode

Suppress

☐ HyperCube

☐ Modular

☐ Network

☐ Optimal

☒ Rounding

Round

Undo Rounding

Audit

Write table

Close

3 dig. separator

Output View

Select Table

Change View

Table Summary

Rounding

Min. required roundingbase = 6800871

Rounding base:

Number of steps allowed: 0

Max computing time: 20 min.

☐ Partitions

Stopping Rule

☐ First RAPID only

☐ first feasible only

☒ Optimal solution

Partitions

18 subtables

45 cells per subtable

Minimum required as rounding base

Controlled rounding - another way to manage secrecy

Table: APE x dep | export

	Total	- R11	75	77	78
Total	518 000 000.00	63 000 000.00	7 000 000.00	7 000 000.00	7 000 000.00
.A	0.00	0.00	0.00		
.B	0.00	0.00	0.00	0.00	
.C	98 000 000.00	14 000 000.00	7 000 000.00	0.00	
.D	0.00	0.00	0.00	0.00	
.E	35 000 000.00	0.00	0.00	0.00	
.F	7 000 000.00	0.00	0.00	0.00	
.G	49 000 000.00	7 000 000.00	0.00	7 000 000.00	
.H	35 000 000.00	0.00	0.00	0.00	
.I	7 000 000.00	0.00	0.00	0.00	
.J	21 000 000.00	7 000 000.00	0.00	0.00	
.K	35 000 000.00	0.00	0.00	0.00	
.L	112 000 000.00	7 000 000.00	0.00	0.00	
.M	105 000 000.00	28 000 000.00	0.00	0.00	7 000 000.00
.N	14 000 000.00	0.00	0.00	0.00	
.P	0.00	0.00	0.00	0.00	
.Q	0.00	0.00	0.00	0.00	
.R	0.00	0.00	0.00	0.00	0.00
.S	0.00	0.00	0.00	0.00	0.00

Cell Information

Value: 522 056 224.50
Rounded: 518 000 000
Status: Safe
Cost: 522 056 224.50
Shadow: 522 056 224.50
contributions: 38157
Top n of shadow: 19 269 135.60
☐ Holding level
Request: 0.00

Change status

Set to Safe
Set to Unsafe
Set to Protected
Set Cost
A priori info
All Non-StructEmpty

Recode

Suppress

☐ HyperCube
☐ Modular
☐ Network
☐ Optimal
☒ Rounding

Round
Undo Rounding
Audit

☒ 3 dig. separator
☐ Output View

Select Table
Change View
Table Summary
Write table
Close

A method sometimes brutal ...

Tabulated data - construction of a flat file of tabulated data (.tab)

```
/* Étape 1 : création de la tabulation */  
/* Au préalable, on crée un variable de comptage "un" pour que la fréquence sous Tau-Argus prenne en  
compte le poids */
```

```
proc means data = demo.Donnees_demo n sum max noprint ;  
    var export ;  
    class APE dep ;  
    output out= ape_dep n=un sum = export max = max_export ;  
run;
```

```
data ape_dep ;  
    set ape_dep ;  
    if ape="" then ape = "Total";  
    if dep="" then dep = "Total";  
run;
```

```
/* Étape 2 : création du fichier plat */
```

```
data _null_ ;  
File "Z:\19-20 mai 2016\02-TauArgus_En_Pratique-mai 2016\Données  
démonstration\donnees_demo_tabulees.tab" dsd dlm=';' ;  
Set ape_dep (keep=ape dep un export max_export);  
Put ( _all_ ) (+0);  
run;
```


Tabulated data - metadata

Characteristics relating to the boxes of the table and no longer to individuals, in particular:

- the response variable
- the ventilation variables
- the value of the first contributor (*top N* variable) for dominance
- the frequency of the box (*frequency*)

Tabulated data - table specification

1 - Variables selected for the table

2 - Cost management for secondary secrecy

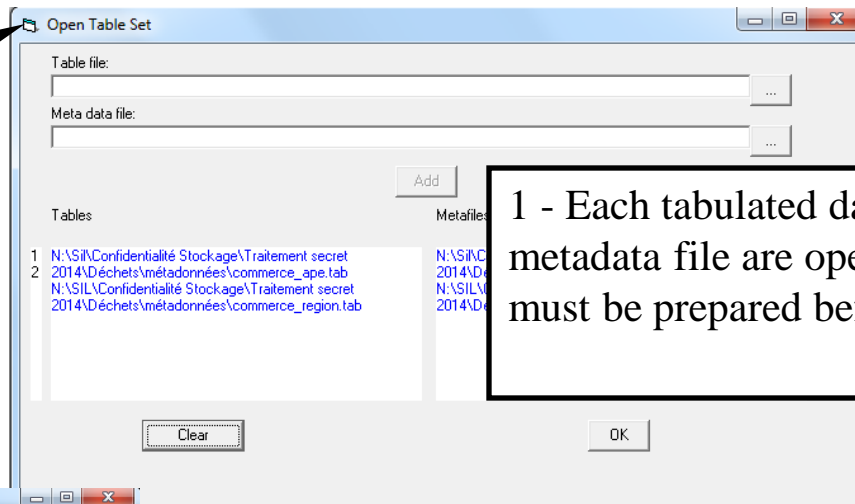
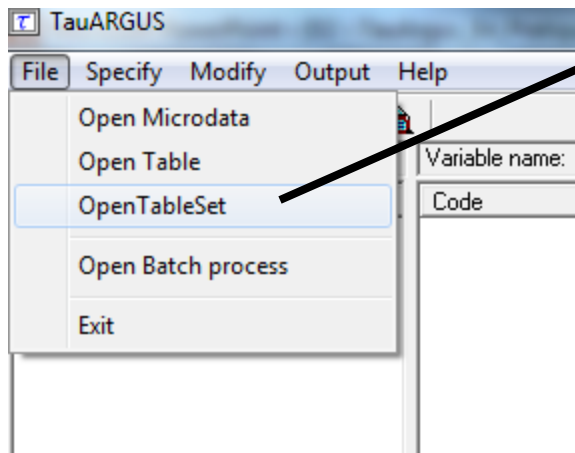
3 - Rules of primary secrecy

The screenshot shows the 'Specify table' dialog box with the following settings:

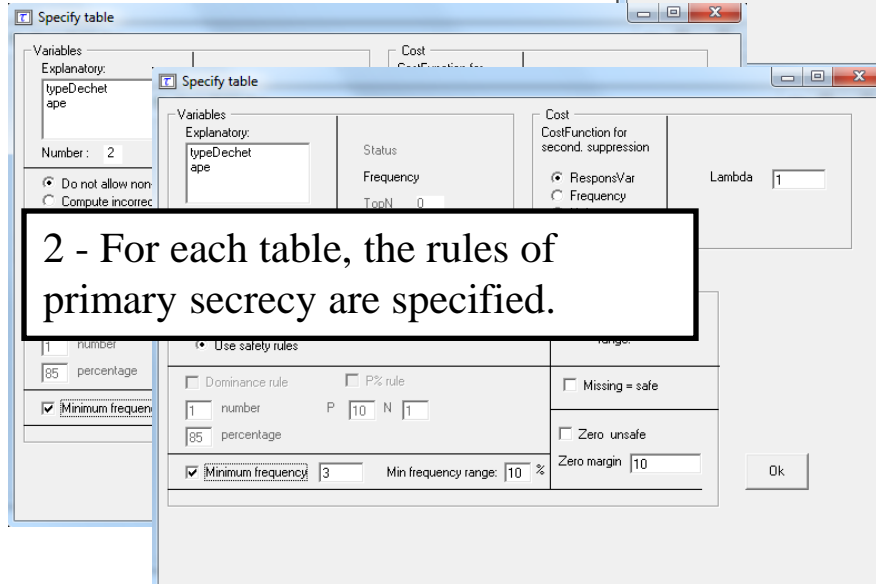
- Variables:**
 - Explanatory: ape, dep
 - Status: (empty)
 - Frequency: (empty)
 - TopN: 1
 - Number: 2
 - ☒ Do not allow non-additivity ☐ Allow non-additivity
 - ☐ Compute incorrect totals
- Cost:**
 - CostFunction for second. suppression:
 - ☒ ResponsVar
 - ☐ Frequency
 - ☐ Unity
 - ☐ Distance
 - Lambda: 1
- safety rule:**
 - ☐ Use given status
 - ☒ Use safety rules
 - ☒ Dominance rule ☐ P% rule
 - 1 number P 10 N 1
 - 85 percentage
 - ☒ Minimum frequency 3 Min frequency range: 10 %
 - Manual safety range: 10 %
 - ☐ Missing = safe
 - ☐ Zero unsafe
 - Zero margin: 10

Ok

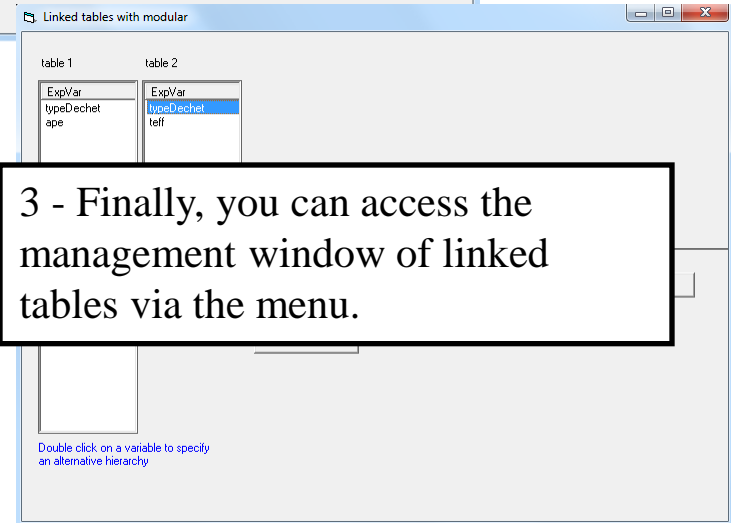
Tabulated data - linked tables



1 - Each tabulated data file and its metadata file are opened, which must be prepared beforehand.



2 - For each table, the rules of primary secrecy are specified.



3 - Finally, you can access the management window of linked tables via the menu.

Confidentiality Management in Aggregate Data Tables

Thanks for your attention 😊

Insee

18 bd Adolphe-Pinard
75675 Paris Cedex 14

www.insee.fr  

Informations statistiques :
www.insee.fr / Contacter l'Insee
09 72 72 4000
(coût d'un appel local)
du lundi au vendredi de 9h00 à 17h00