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É : (044) 235-37-39  
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É - : www.ukrstat.gov.ua

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$n$  ,  
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:

$$n = \frac{deff \cdot \sigma^2 \cdot 100^2}{\bar{Y}^2 \cdot CV(\bar{Y})^2}, \quad (1)$$

$deff$  ó - ;  
 $\bar{Y}$  ó

, ;  
 $\sigma^2$  ó ;  
 $CV(\bar{Y})$  ó

$Y$ ,

$$(1) \quad \bar{Y}, \sigma^2$$

10-49

, 0,5%

,  
 $y_i$  . " "  $\bar{Y} \sigma^2$ .

### 3.2.2.

$$(1)$$

$n_i$ ,

$n_I$ ,

:

$$n_I = \sum_i n_i, \quad (2)$$

$i$  ó

(1)

$n_j$ ,

$n_J$

,

:

$$n_J = \sum_j n_j, \tag{3}$$

$j$  ó ( , ).

$$n_I \quad n_J, \quad n' = \max(n_I; n_J).$$

3.2.3.  $n'$

$$n'$$

$$n'_i = n' \cdot \frac{\sqrt[3]{N_i \cdot \sigma_i}}{\sum_i \sqrt[3]{N_i \cdot \sigma_i}}, \tag{4}$$

$N_i$  ó  
 $\sigma_i$  ó

$i-$  ;

$i-$  .

$$n'$$

(4):

$$n'_j = n' \cdot \frac{\sqrt[3]{N_j \cdot \sigma_j}}{\sum_j \sqrt[3]{N_j \cdot \sigma_j}}, \tag{5}$$

$N_j$  ó

$\sigma_j$  ó

$j-$

(4), (5)

[3]

(1).

$$\frac{n'_i \quad n'_j}{2/7}$$

$$2/7$$

$$2/7,$$

$$n''$$

$$n''$$

(4), (5).

$$n''$$

$$7$$

$$n''_{\Sigma} \quad n''_{\Sigma} = \frac{7}{2} \cdot n''$$

$$n''$$

:

$$4$$

$$2$$

;

$$n'' - S \cdot 4 ($$

S ó

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$$\text{ó } n''_{\Sigma i,j},$$

3.2.4.

(1) (4).

$n''$   $n_i''$  ( $i$  ó  $n_j''$  ( $j$  ó

$(n''_{\Sigma i,j})$ ,

$n_j''$

$n_i''$

$n_i'''$

$n_j'''$

$$n_i'' \geq n_i''' \quad n_j'' \geq n_j''';$$

$s$ ,

$$4 \quad (n_{i,j}^{(0)}=4);$$

$$i- : \sum_{s \in i} n_{i,j}^{(0)} = n_i^{(1)}.$$

$$q_{i,j}^{(1)} = \frac{n_i'''}{n_i^{(1)}};$$

$$n_{i,j}^{(1)} = n_{i,j}^{(0)} \cdot q_{i,j}^{(1)};$$

$j-$

$$: \sum_{s \in j} n_{i,j}^{(1)} = n_j^{(2)}.$$



$$q_{i,j}^{(2)} = \frac{n_j'''}{n_j^{(2)}};$$

$$n_{i,j}^{(2)} = n_{i,j}^{(1)} \cdot q_{i,j}^{(2)};$$

$$q_{i,j}^{(iter)} = 1 \pm 0,05, \quad iter \acute{o}$$

10.

3.2.5.

$$n_{i,j}^{(res)},$$

$$n_{i,j}^{(iter)},$$

10 49

$R_c$

$$R_c = \frac{10 \quad 49}{10 \quad 49} \quad (6)$$

$R_c$

0,9 (90%)

$$n_{i,j}^{(res)} = \frac{n_{i,j}^{(iter)}}{R_c} = \frac{n_{i,j}^{(iter)}}{0,9} \quad (7)$$

$(n_{\Sigma i,j}'')$

$$n_{i,j}^{(res)} = n_{i,j}''.$$

V.

1.

10-49

$$n_{i,j,r}, \quad r -$$

$$h_{i,j,r}$$

$$h_{i,j,r} = \frac{N_{i,j}}{n_{i,j,r}}, \quad (8)$$

$$N_{i,j} \text{ ó}$$

$$h_{i,j,r}^{(1)},$$

$$h_{i,j,r}$$

$$0 \quad 1$$

$$\pi_{i,j,r} :$$

$$h_{i,j,r}^{(1)} = h_{i,j,r} \cdot \pi_{i,j,r}. \quad (9)$$

:

$$\begin{aligned} h_{i,j,r}^{(2)} &= h_{i,j,r}^{(1)} + h_{i,j,r}; \\ h_{i,j,r}^{(3)} &= h_{i,j,r}^{(2)} + h_{i,j,r}; \end{aligned}$$

⋮

(10)

$$h_{i,j,r}^{(n_{i,j,r})} = h_{i,j,r}^{(n_{i,j,r}-1)} + h_{i,j,r}.$$

$$p_{i,j,r} \quad r -$$

$$p_{i,j,r} = \frac{n_{i,j,r}}{N_{i,j,r}} = \frac{l}{h_{i,j,r}} \quad (11)$$

2.

( 50 )  
 , ( ),  
 10-49 ( )

49

$$P_{at,a} = \frac{n_{at,a}}{N_{at,a}}, \quad (12)$$

$n_{at,a}$  ó

$N_{at,a}$  ó

10-49 ,

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:  $P_{i,j,r}$   $P_{at,a}$  .

10-49

$P_{at,a}$  .

**V.**

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CV( $\bar{Y}$ ),  
2,5%. - deff , 1,5.

10 49  $\bar{Y}$   $\sigma^2$  9  
:  $\bar{Y} = 1901,8$  ,  $\sigma^2 = 4140083,2$ .

(1):

$$n = \frac{deff \cdot \sigma^2 \cdot 100^2}{\bar{Y}^2 \cdot CV(\bar{Y})^2} = \frac{1,5 \cdot 4140083,2 \cdot 100^2}{1901,8^2 \cdot 2,5^2} \approx 2747$$

(1).

5%. - 1,5,

49 , 9 , 10-

$\sigma_{i=71}^2 = 1365766,1$ ,  $n_{i=71}$  :  $\bar{Y}_{i=71} = 1982,1$  ,

$$n_{i=71} = \frac{deff \cdot \sigma_{i=71}^2 \cdot 100^2}{\bar{Y}_{i=71}^2 \cdot CV(Y)^2} = \frac{1,5 \cdot 1365766,1 \cdot 100^2}{1982,1^2 \cdot 5^2} \approx 209$$

. 1.1.

1.1

		$\bar{Y}_i$	$\sigma_i^2$	$n_i$
1		1815,2	1589998,0	290
5		1905,3	1021626,3	169
7		1912,8	1394059,1	229
12		1898,5	1441902,2	240
14		2112,2	2314119,8	311
18		1743,5	1098177,8	217
21		1828,7	829770,7	149
23		1772,9	1387248,6	265
26	-	1855,2	1596364,5	278
32		2182,7	2005402,9	253
35		1853,7	560737,3	98
44		1975,9	1270623,3	195
46		1746,9	1153700,3	227
48		1785,5	1431333,7	269
51		1861,4	2381103,7	412
53		2137,8	1456784,7	191
56		1710,2	721891,0	148
59		1839,1	919525,7	163
61		1739,2	961097,6	191
63		1960,5	2487784,8	388
65		1723,3	656887,7	133
68		1845,4	640330,4	113
71		1982,1	1365766,1	209
73		1798,8	1111472,1	206
74		1765,1	705340,3	136
80	.	2583,1	4278192,8	385
85	.	2014,5	1599695,0	237

(1)

$$CV(\bar{Y}) \quad deff$$

10-49

( F),  $\bar{Y}_{j=10} = 1696,3$  ,  $\sigma_{j=10}^2 = 1676456,2$  ,  $n_{j=10}$

$$n_{j=18} = \frac{deff \cdot \sigma_{j=18}^2 \cdot 100^2}{\bar{Y}_{j=18}^2 \cdot CV(\bar{Y})^2} = \frac{1,5 \cdot 1676456,2 \cdot 100^2}{1696,3^2 \cdot 5^2} \approx 350$$

. 1.2.

1.2

			$\bar{Y}_j$	$\sigma_j^2$	$n_i$
1	2	3	4	5	6
1		A	1693,6	895819,4	187
2		CA	1610,4	881294,6	204
3		CB	1287,3	285352,7	103
4		CC	1479,1	574194,0	157
5		CG	1653,9	806654,4	177
6		CH	1799,6	869504,5	161



1	2	3	4	5	6
7	,	CK	1931,2	1441995,0	232
8	- ;	CM	1941,7	3081664,7	490
9	;	E	1736,6	577075,7	115
10		F	1696,3	1676456,2	350
11	;	G	1967,9	3465114,5	537
12	, , ø	H	2000,2	5304233,8	796
13		I	1505,8	900829,3	238
14	, - , , ,	JA	2133,8	2339735,6	308
15	ø	JC	2758,7	369742,3	29
16		K	2869,8	5952861,0	434
17		L	1982,1	1914192,7	292
18	( - ). . .	MA	3041,9	11405493,6	740
19	ø . , .	MC	2404,8	8107757,1	841
20		N	1727,5	3194317,5	642

1	2	3	4	5	6
21	; ø	O	2621,4	1112067,7	97
22		P	1910,9	224349,6	37
23	ø	Q	1965,5	1007684,8	157
24	, ,	R	1693,5	144680,2	30
25		S	2137,5	1802493,7	237

$n'$ .

(2)  $n_I$  (3).

(3)

$n_J$

$: n_J = 7591$

$n'$

$n', n_J, n_I$   $n' = n_J = 7591$

$n'$

$n'$

(5).

$n'$

( 3,

).  
 $n'$

" ( F)

$N_{j=5}$   $N_{j=5} = 6495$   $\sigma_{j=5}^2 = 1676456,2$ . (4)

$n'_{j=5}$

$$\sum_{j=1}^{13} \sqrt[3]{N_j} \cdot \sigma_j = 219574,4.$$

$$n'_{j=5} = n' \cdot \frac{\sqrt[3]{N_{j=5}} \cdot \sigma_{j=5}}{\sum_j \sqrt[3]{N_j} \cdot \sigma_i} = 8965 \cdot \frac{\sqrt[3]{6495} \cdot \sqrt{1676456,2}}{219574,4} \approx 577$$

" (10-12), "

" (24, 25), " (28),

" (31-33), "

" (36-39), "

∅ " (49-53), "

" (58-60), " ∅

" (62, 63), "

" (64-66), "

" (69-71), "

∅ " (73-75), " (94-96)

$n'_j$  2/7

2/7

∅  $n''$

(2)  $n''$

,  $n'' = 7760$

. 1.3.

			$N_j$	$\sigma_j^2$	$n_j''$
1		A	5959	895819,44	409
2		CB	885	285352,7118	122
3		CC	1153	574193,9871	190
4		CG	1468	806654,4335	244
5		F	6495	1676456,164	577
6		G	13957	3465114,481	1070
7		I	2041	900829,2588	287
8		L	3585	1914192,66	505
9		N	3546	3194317,529	650
10		O	13980	1112067,699	606
11		P	2460	224349,5665	153
12		Q	2672	1007684,776	332
13		R	1129	144680,2305	95

$$\begin{aligned}
 & n'' \tag{4} \\
 & N_{i=71} = 2031, \quad \sigma_{i=71}^2 = 1365766,1. \\
 & \sum_{i=1}^{27} \sqrt[3]{N_i} \cdot \sigma_i = 440730,9. \quad n''_{i=71} \\
 & n''_{i=71} = n'' \cdot \frac{\sqrt[3]{N_{i=71}} \cdot \sigma_{i=71}}{\sum_{i=1}^{27} \sqrt[3]{N_i} \cdot \sigma_i} = 7760 \cdot \frac{\sqrt[3]{2031} \cdot \sqrt{1365766,1}}{440730,9} \approx 261. \\
 & n'' \tag{1.4}
 \end{aligned}$$

1.4

		$N_i$	$\sigma_i^2$	$n''_i$
1		2828	1589998,01	314
5		2572	1021626,28	244
7		1480	1394059,12	237
12		5429	1441902,20	372
14		5531	2314119,76	474
18		2129	1098177,81	237
21		1357	829770,71	178
23		2820	1387248,64	293
26	-	1656	1596364,47	263
32		3579	2005402,89	381
35		1754	560737,27	159
44		2731	1270623,31	277
46		3974	1153700,32	300
48		1962	1431333,74	264
51		4321	2381103,69	443
53		2466	1456784,66	287
56		1555	721891,01	173
59		1660	919525,70	200
61		1497	961097,63	197
63		4533	2487784,78	460
65		1682	656887,73	170
68		2035	640330,39	179
71		2031	1365766,13	261
73		1111	1111472,07	192
74		1820	705340,30	181
80		12221	4278192,83	839
85		596	1599695,01	187
		<b>77330</b>		<b>7760</b>

$n''$   
 $n''$

$$n_{i,j}^{(iter)}$$

0,9 ( 90% )  
 (7)

$$n_{i,j}^{(iter)}$$

$$n_{i,j}^{(res)}$$

(2) (3),

$\emptyset$

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$$n_{i,j,r} = \frac{1}{2} n_{i,j}^{(res)},$$

$r -$

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1.5

**10-49**

1	2	3	4
,	A	613	149
∅	B	14	262
,	CA	238	0
,	CB	135	80
,	CC	185	46
	CD	0	34
	CE	24	157
	CF	0	53
;	CG	245	13
,	CH	131	133
∅ ,	CI	0	220
	CJ	18	115
,	CK	81	118
,	CL	0	172
,	CM	231	42

1	2	3	4
' ,	D	23	176
; ,	E	115	64
	F	610	0
;	G	1152	0
ø ' ,	H	548	0
	I	292	15
, , - , ,	JA	168	64
( ø )	JB	46	137
ø	JC	106	147
	K	103	178
	L	507	0
. ( - ).	MA	369	0
	MB	55	119
ø . , .	MC	256	7
	N	569	0
; ø	O	1095	0
	P	190	0
ø	Q	372	0
, ,	R	114	31
	S	272	0
		<b>8877</b>	<b>2532</b>



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				× 10
		10-49	× 50	
	368	83	1456	<b>1907</b>
	302	122	1352	<b>1776</b>
	228	93	698	<b>1019</b>
	470	79	2640	<b>3189</b>
	589	55	3194	<b>3838</b>
	283	59	922	<b>1264</b>
	186	119	734	<b>1039</b>
	357	48	1361	<b>1766</b>
-	239	82	751	<b>1072</b>
	438	97	1540	<b>2075</b>
	214	113	823	<b>1150</b>
	350	96	1549	<b>1995</b>
	366	78	1782	<b>2226</b>
	294	124	886	<b>1304</b>
	503	64	1720	<b>2287</b>
	325	116	1354	<b>1795</b>
	224	113	779	<b>1116</b>
	232	90	932	<b>1254</b>
	210	92	716	<b>1018</b>
	569	76	2123	<b>2768</b>
	217	105	812	<b>1134</b>
	237	96	885	<b>1218</b>
	274	107	1053	<b>1434</b>
	170	86	493	<b>749</b>
	226	91	890	<b>1207</b>
.	896	128	4490	<b>5514</b>
.	110	120	326	<b>556</b>
	<b>8877</b>	<b>2532</b>	<b>36261</b>	<b>47670</b>
, %	11,48%	100,00%	100,00%	41,05%

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1	2	3	4
1	A	,	01-03
2	03		03
3	B	∅	05-09
4	CA	,	10-12
5	CB	, , ,	13-15
6	CC	,	16-18
7	CD		19
8	CE		20
9	CF		21
10	CG	,	22+23
11	CH	,	24+25
12	CI	∅ ,	26
13	CJ		27
14	CK	, . . . .	28
15	CL		29+30
16	CM	,	31-33
17	D	, ,	35
18	E	;	36-39
19	F		41-43
20	G	;	45-47
21	H	, , ∅	49-53
22	I		55+56

1	2	3	4
23	JA	,	58-60
24	JB	( $\emptyset$ )	61
25	JC	$\emptyset$	62+63
26	K		64-66
27	L		68
28	MA	, , ,	69-71
29	MB		72
30	MC	,	73-75
31	N		77-82
32	O	; $\emptyset$	84
33	P		85
34	Q	$\emptyset$	86-88
35	R	,	90-93
36	S		94-96

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