Table S1. Diagnostic ratios used in the study

PAH ratio	Range	Source	Reference
BaA/(BaA+Chry)	< 0.2	Petrogenic	(Akyüz & Çabuk, 2010; Yunker et al., 2002)
	> 0.2	Pyrogenic/ Coal combustion	
Ant/(Ant+Phe)	< 0.1	Petrogenic	(Kong et al., 2011; Pies et al., 2008)
	> 0.1	Pyrogenic/ Coal combustion/ Softwood combustion	
Fla/(Fla+Pyr)	<0.5	Petroleum/liquid fossil fuel combustion	(Yunker et al., 2002)
	>0.5	Biomass and coal combustion	

References:

Akyüz, M., & Çabuk, H. (2010). Gas-particle partitioning and seasonal variation of polycyclic aromatic hydrocarbons in the atmosphere of Zonguldak, Turkey. *Science of the Total Environment*, *408*(22), 5550–5558. http://doi.org/10.1016/j.scitotenv.2010.07.063

Kong, S., Shi, J., Lu, B., Qiu, W., Zhang, B., Peng, Y., … Bai, Z. (2011). Characterization of PAHs within PM10 fraction for ashes from coke production, iron smelt, heating station and power plant stacks in Liaoning Province, China. *Atmospheric Environment*, *45*(23), 3777–3785. http://doi.org/10.1016/j.atmosenv.2011.04.029

Pies, C., Hoffmann, B., Petrowsky, J., Yang, Y., Ternes, T. A., & Hofmann, T. (2008). Characterization and source identification of polycyclic aromatic hydrocarbons (PAHs) in river bank soils. *Chemosphere*, *72*(10), 1594–1601. http://doi.org/10.1016/j.chemosphere.2008.04.021

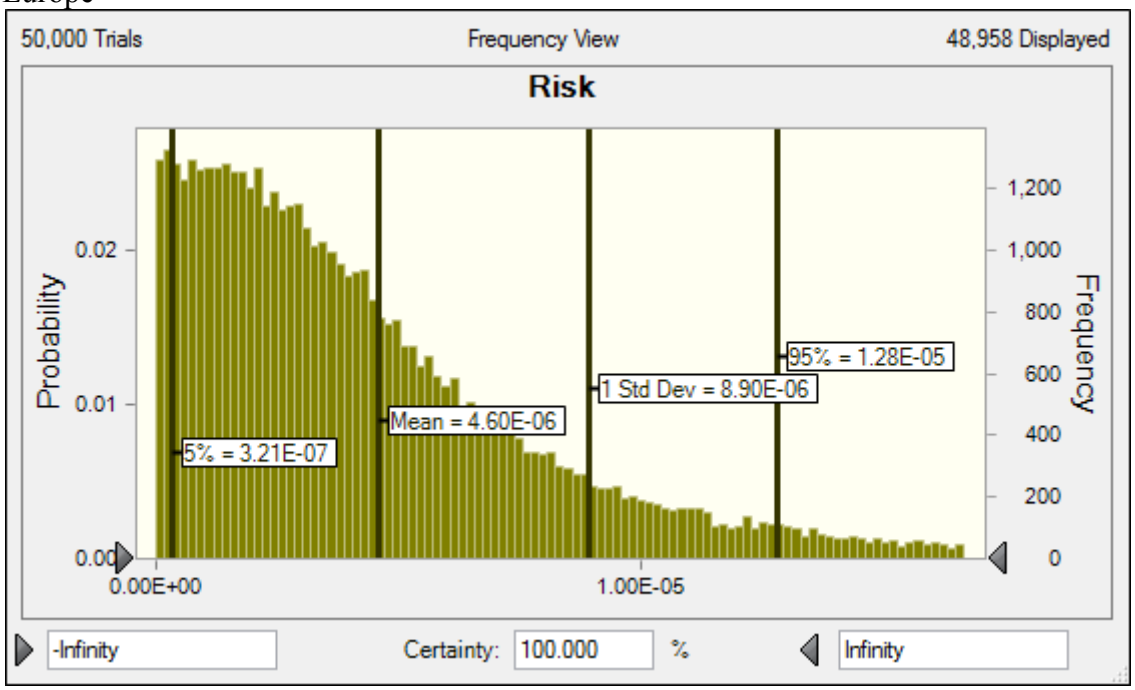
Yunker, M. B., Macdonald, R. W., Vingarzan, R., Mitchell, R. H., Goyette, D., & Sylvestre, S. (2002). PAHs in the Fraser River basin: A critical appraisal of PAH ratios as indicators of PAH source and composition. *Organic Geochemistry*, *33*(4), 489–515. http://doi.org/10.1016/S0146-6380(02)00002-5

Table S2. The value of the diagnostic ratios

	BaA/(BaA+Chry)	Ant/(Ant+Phe)	Fla/(Fla+Pyr)
Spain meat	0.436363636	0.152252252	0.510899183
Spain Fish	0.368421053	0.122580645	0.58974359
Spain Vegetables	0.081632653	0.310880829	0.478527607
Spain Fatty Food	0.5	0.5	0.425605536
Spain Bakery	0.35483871	0.077477477	0.627760252
Portugal Beef	0.576547231	0.105719237	0.45974026
Portugal Salmon	0.285207101	0.202932356	0.553975777
Tunisia Sea Food	0.525856085	0.023474178	0.67137338
Poland Bread	0.353265479		
Poland Meat			
UK Beef Burger	0.413961039		
China Vegetables	0.388487503	0.423107029	0.576040188
China Smoked Duck	0.7	0.245977011	0.473520249
China Grilled Duck	0.15625	0.146604938	0.388311688
Romania Vegetables	0.779342723	0.414376321	0.623529412
Europe Meat	0.998153278		0.456218371
Europe Fish	0.892655367	0.055614407	0.518566775
Europe Mussels		0.08912656	0.586
Europe Vegetables		0.018302829	0.640014028
Europe Fruits	0.666666667	0.143222506	0.686774942
Europe Cereals	0.942622951	0.102645503	0.729302832
Japan Hijiki		0.245153934	0.552777778
Japan Bonito	0.343448276	0.310216653	0.56097561
Japan Shitteke	0.352040816	0.353238265	0.56122449
Italy Haliotis	0.424855491	0.380952381	0.416768169
India Vegetables		0.253798034	0.211782631
India Fruits		0.861464968	0.581081081
Malaysia Grilled Meat			
Pakistan Vegetables		0.294266567	0.377619795
Saudi Arabia Vegetables			
Ghana Grilled Fish	0.507672634	0.300608519	0.382557168
Croatia Mussels	0.192563081	0.031945789	
Turkey Mussels	0.247499777	0.315237243	0.543946829
Turkey Meat		0.68094938	
Iran Smoked Fish	0.198347107		0.659090909

Fig. S1 Probability density functions of predicted cancer risks

Cereals And Grains
Child
Europe



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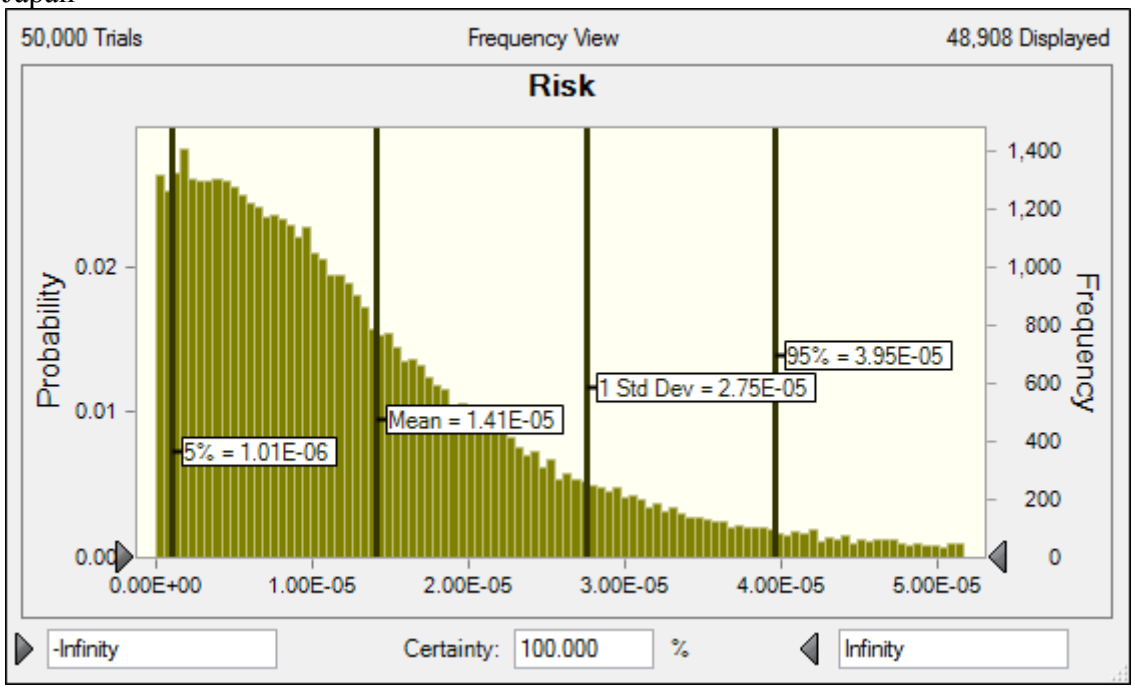
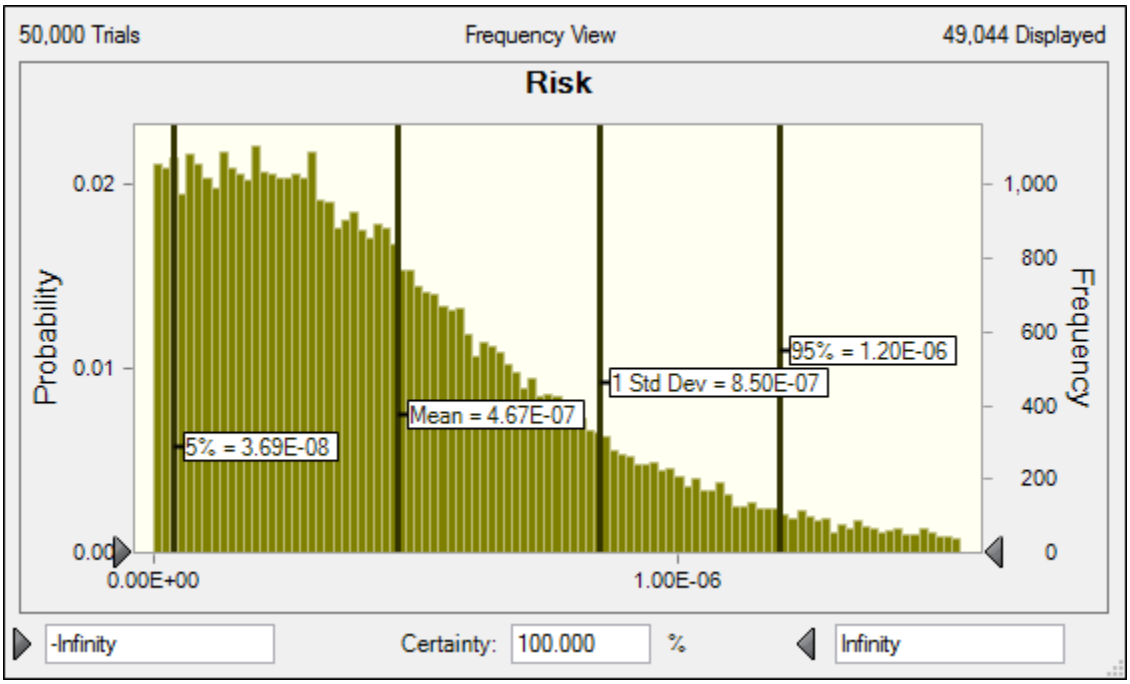


Poland Breads



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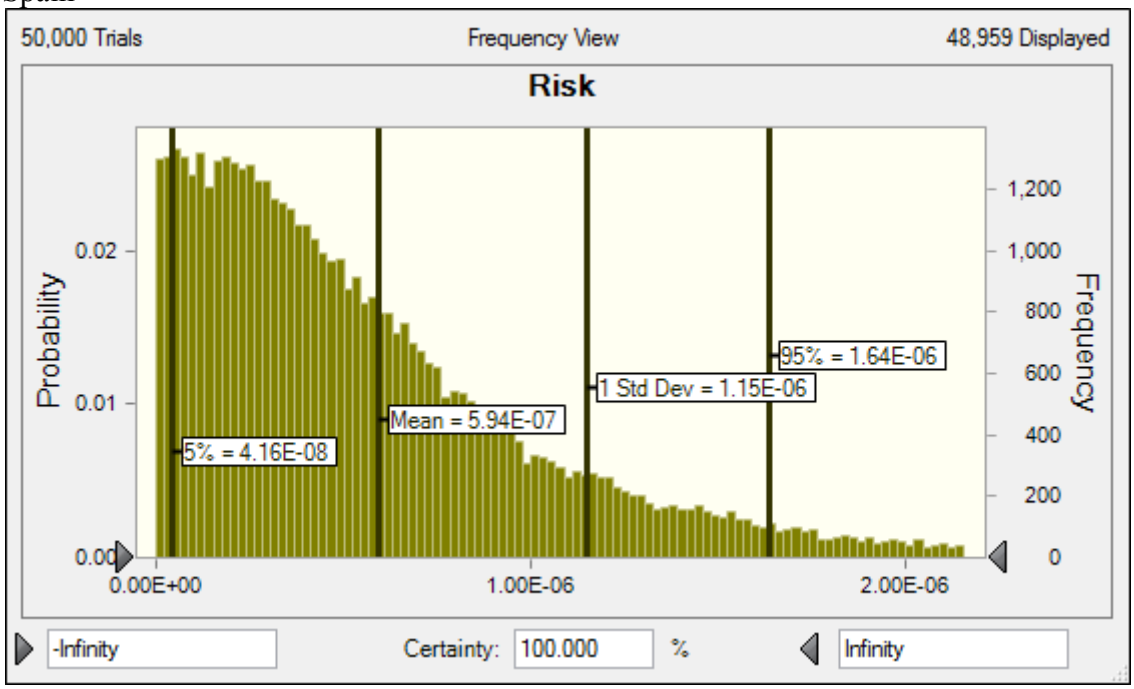
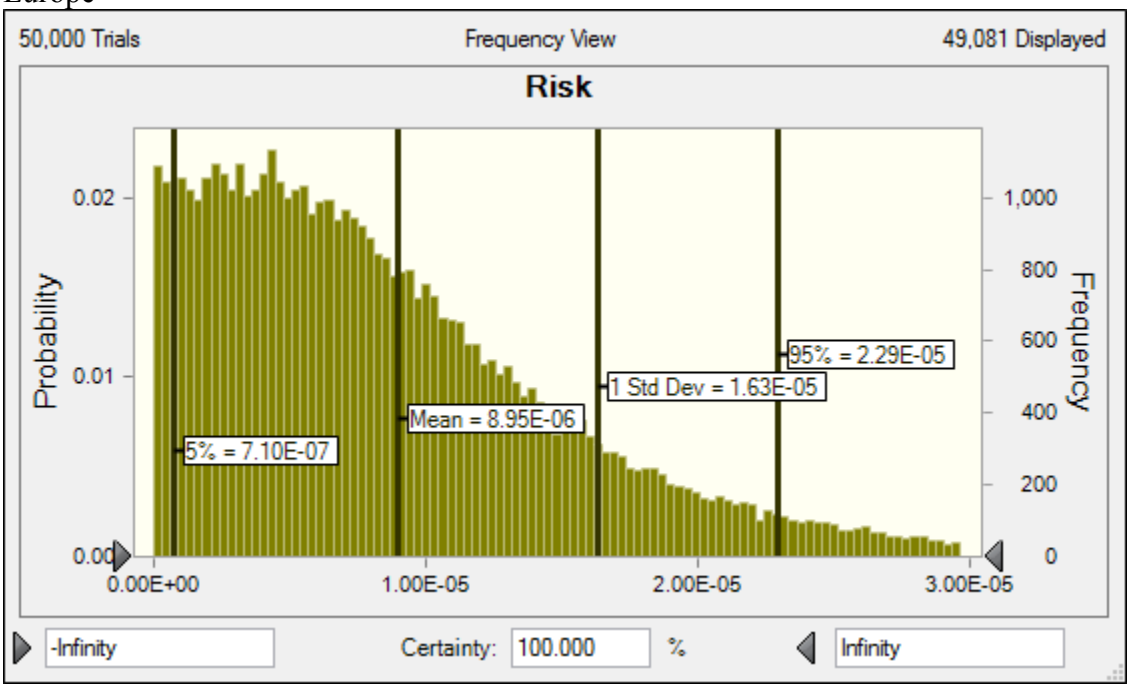


Adults

Europe



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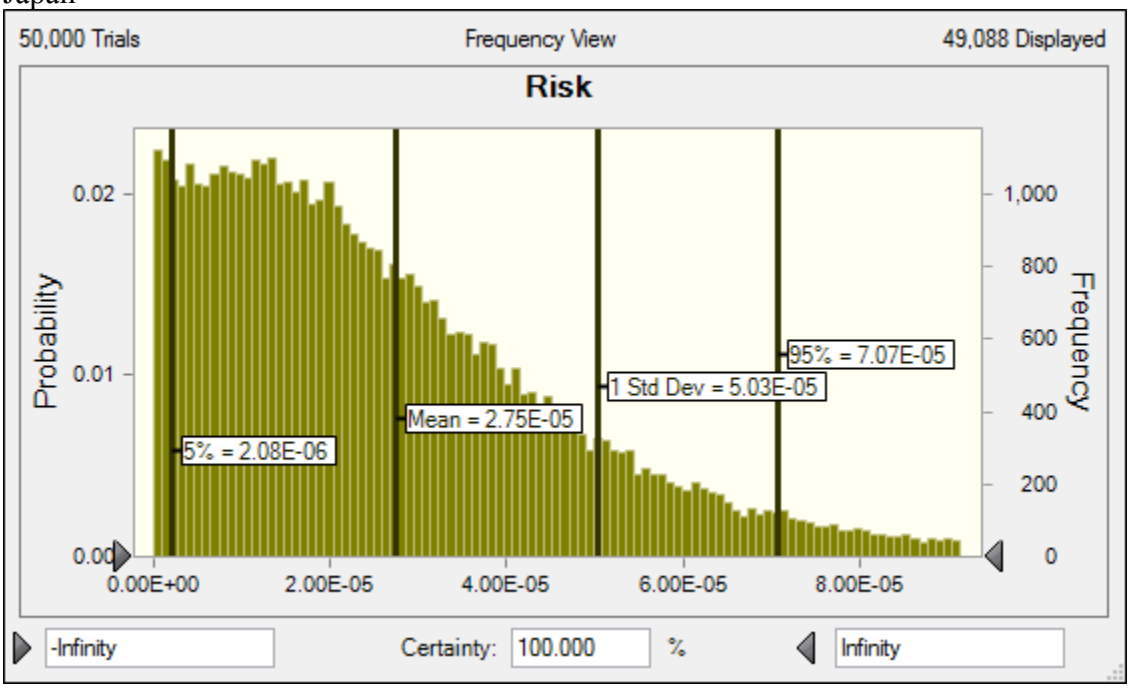

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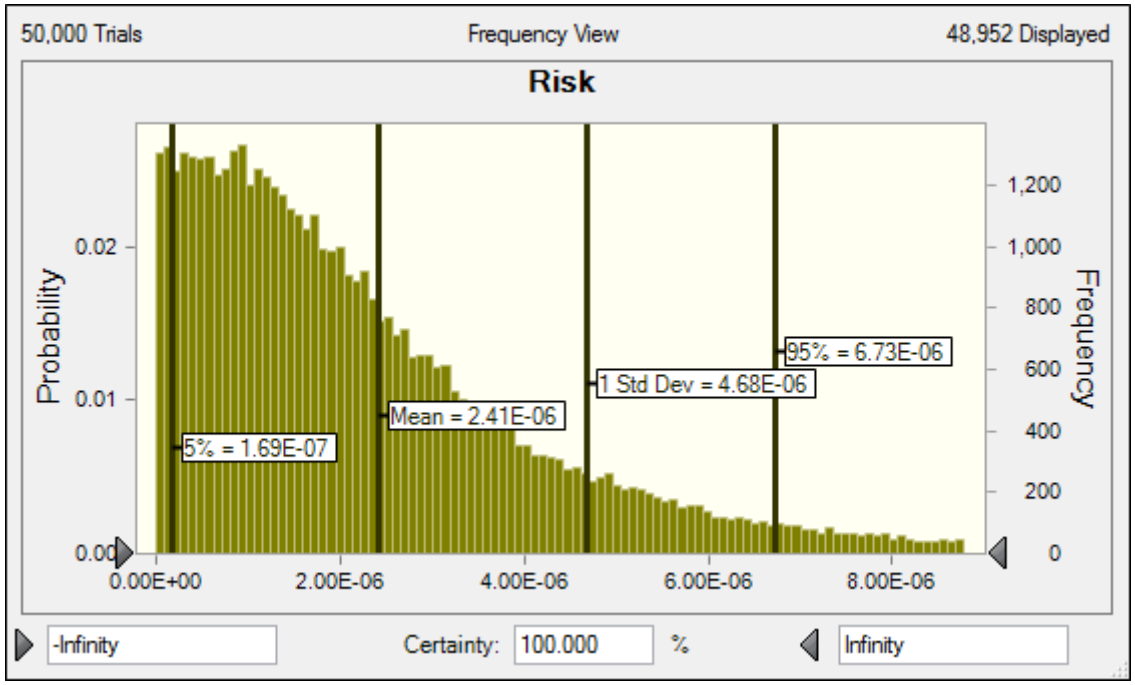

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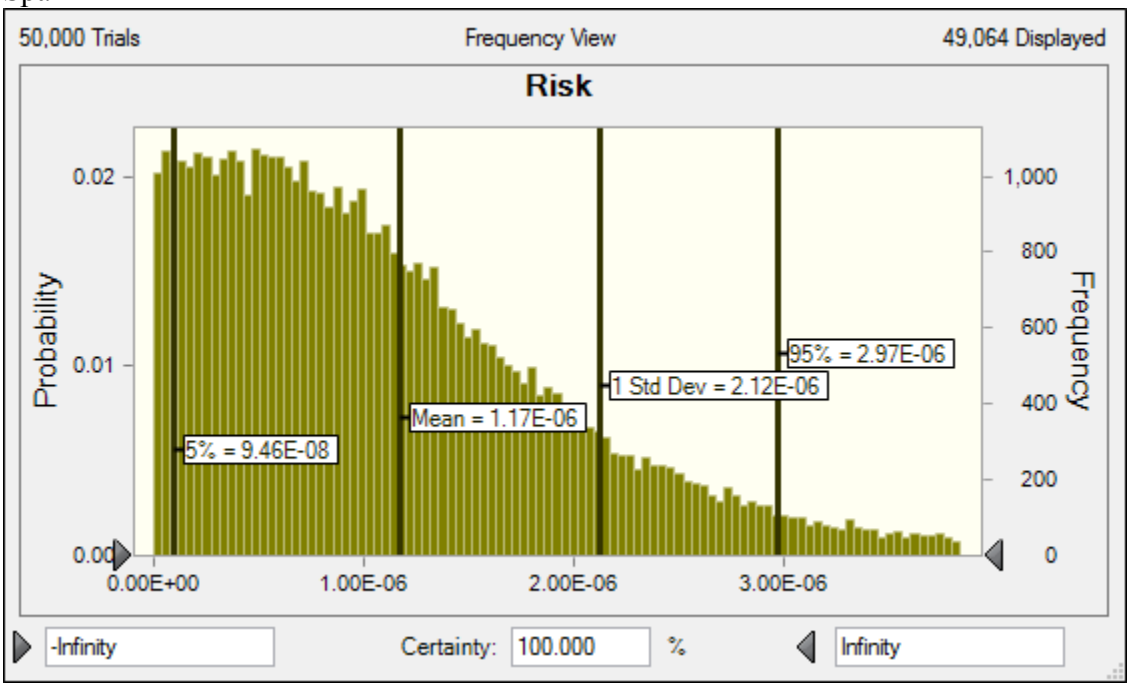
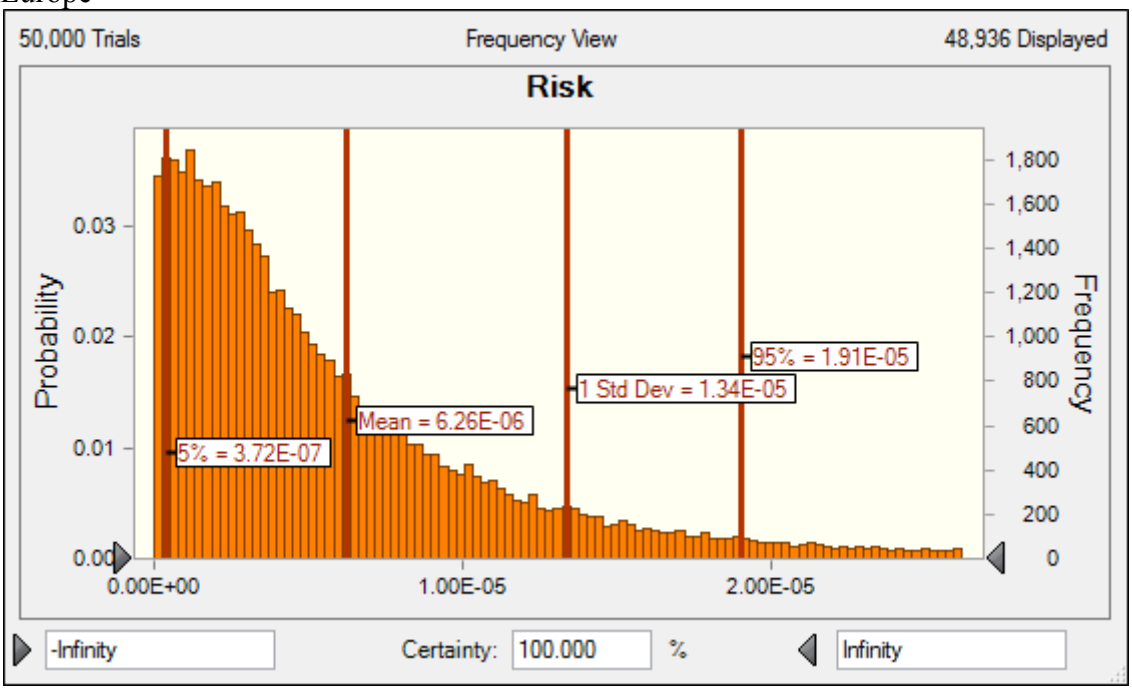


Fatty Foods
Child
Europe



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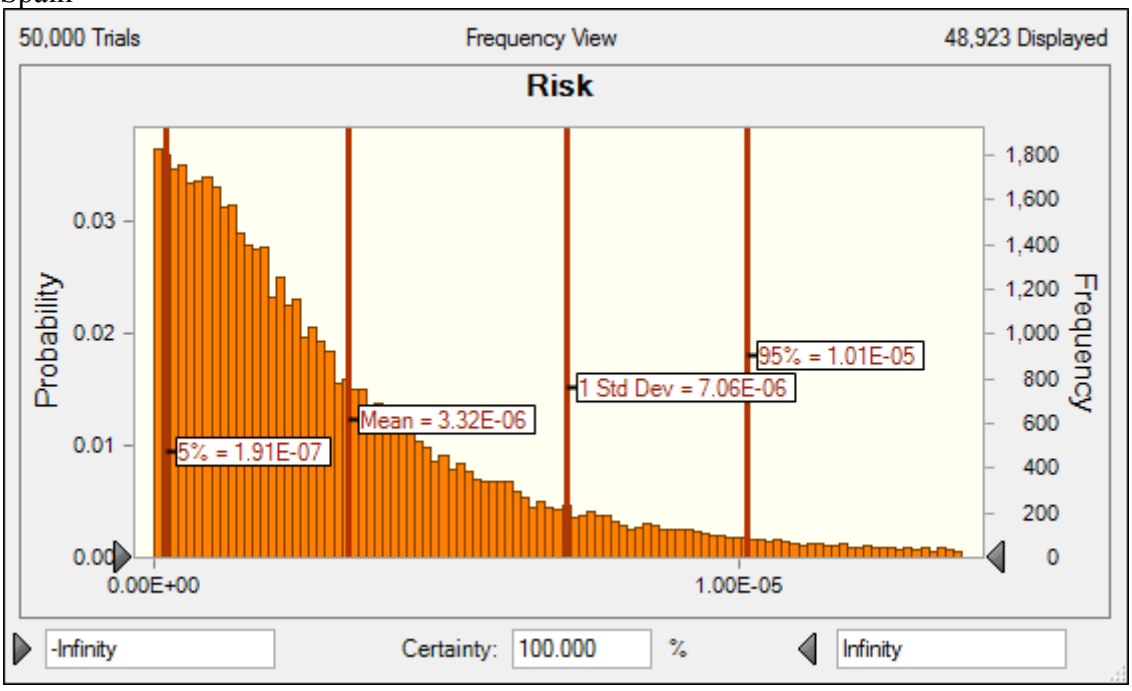
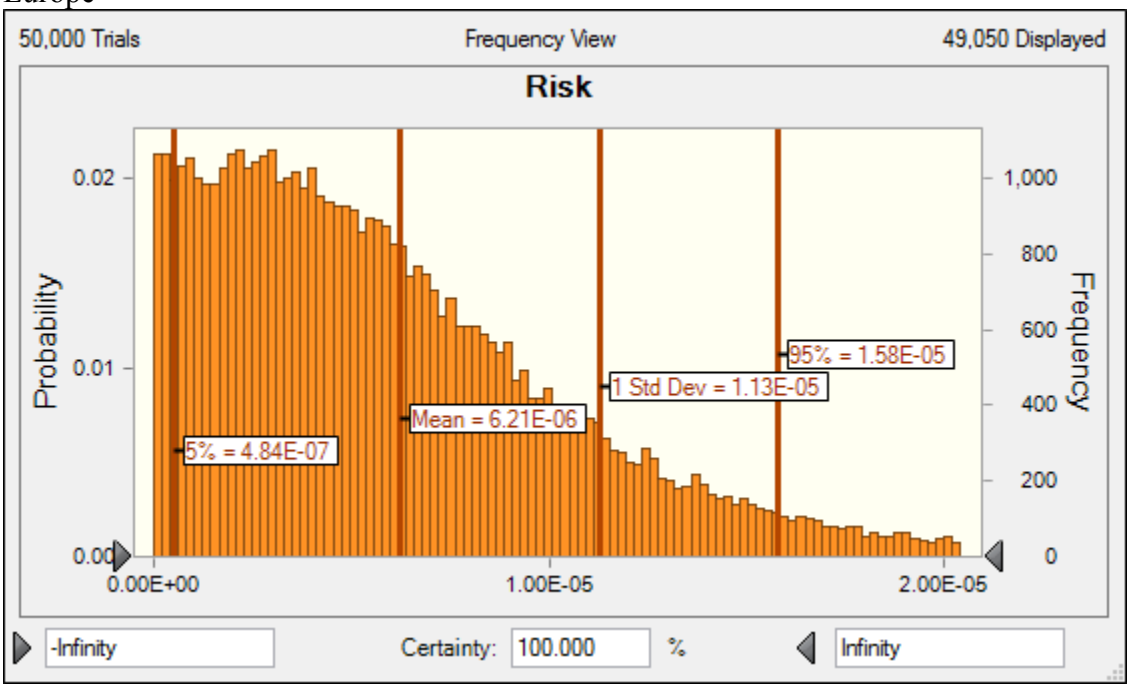


Adults

Europe



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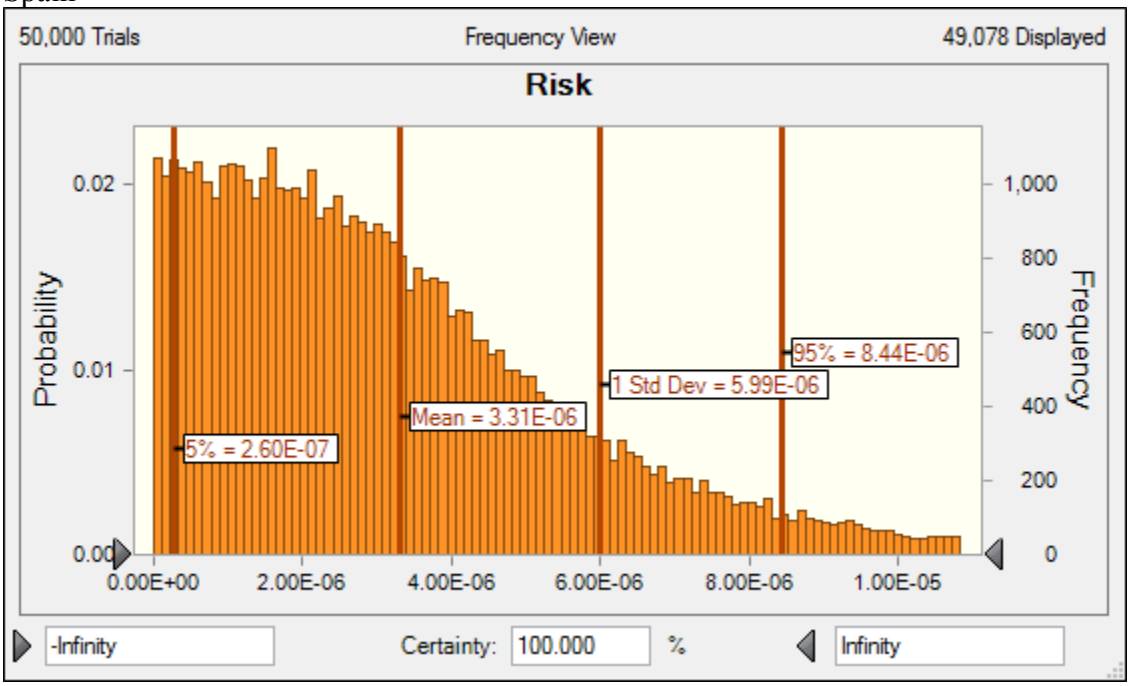
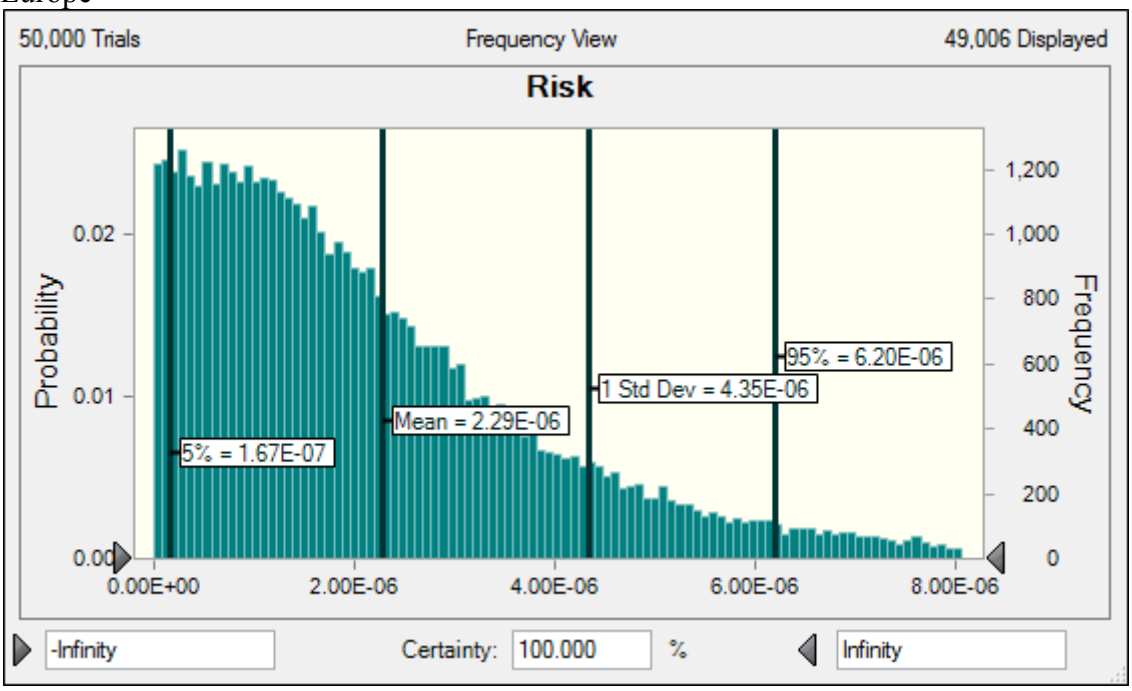


Fishes
Child
Europe



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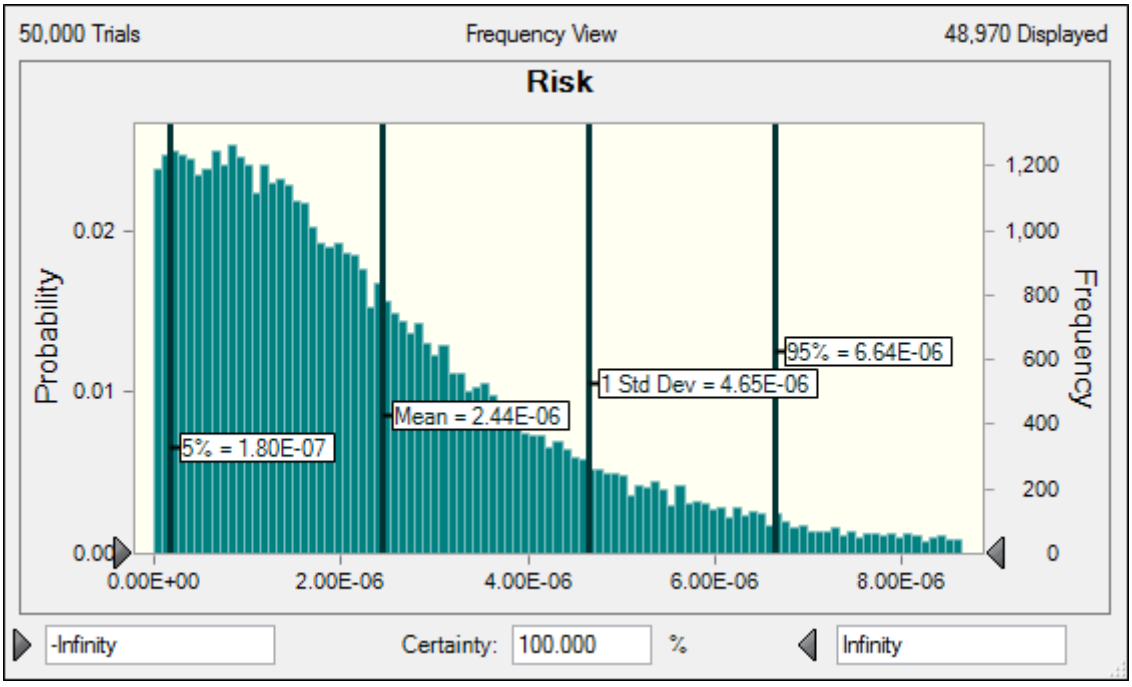

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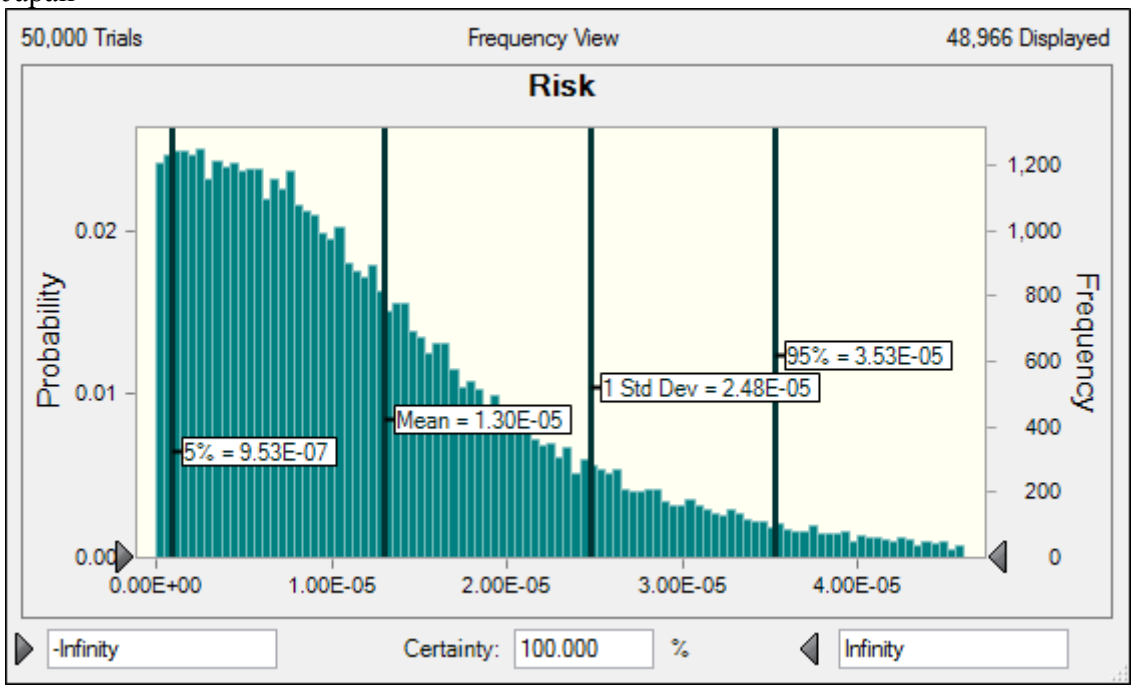
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400
200
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95% = 3.53E-05
1 Std Dev = 2.48E-05
Mean = 1.30E-05
5% = 9.53E-07
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2.00E-05
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4.00E-05
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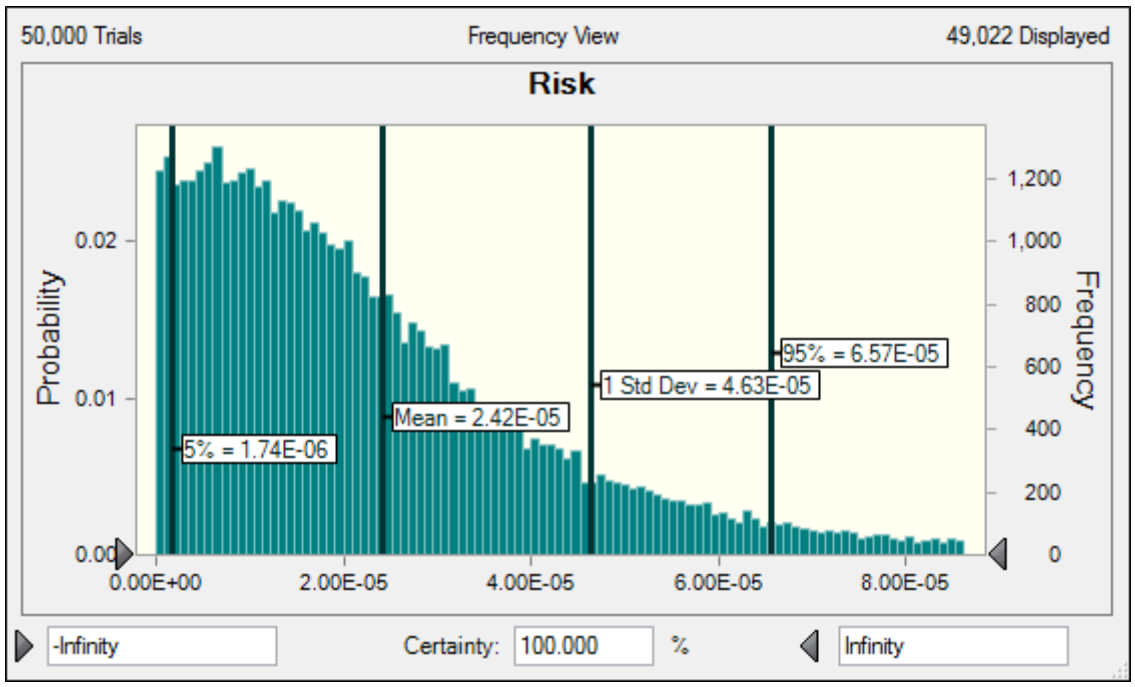
Certainty: 100.000 %
Infinity

Ghana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5% = 1.74E-06
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Certainty: 100.000 %
Infinity

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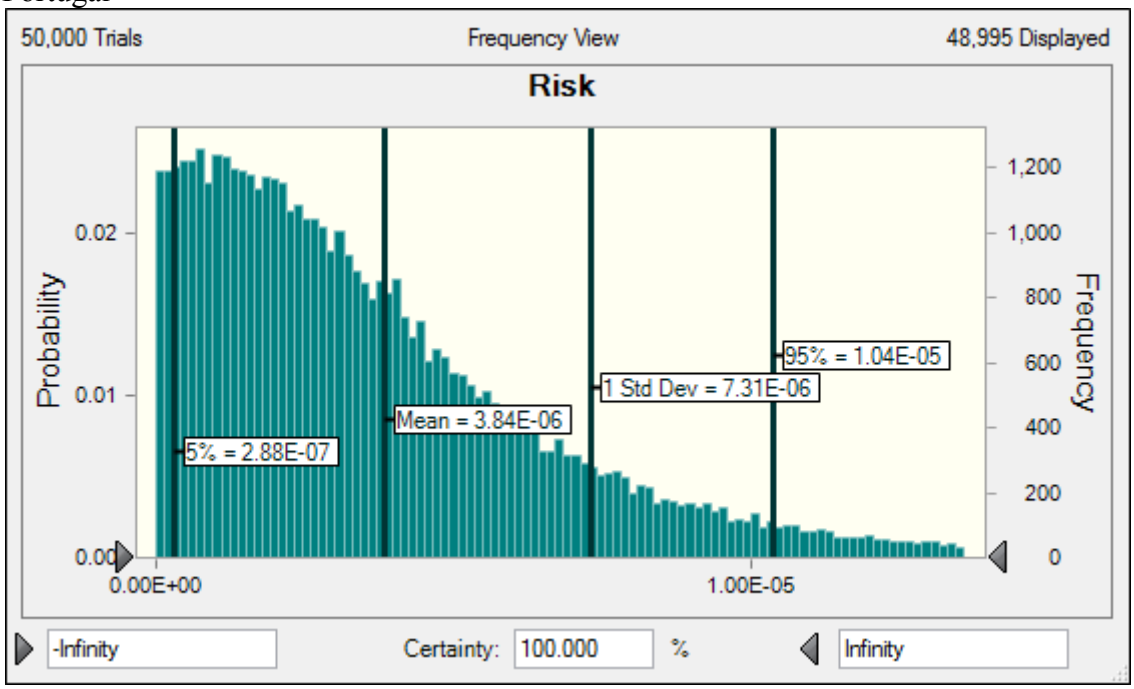

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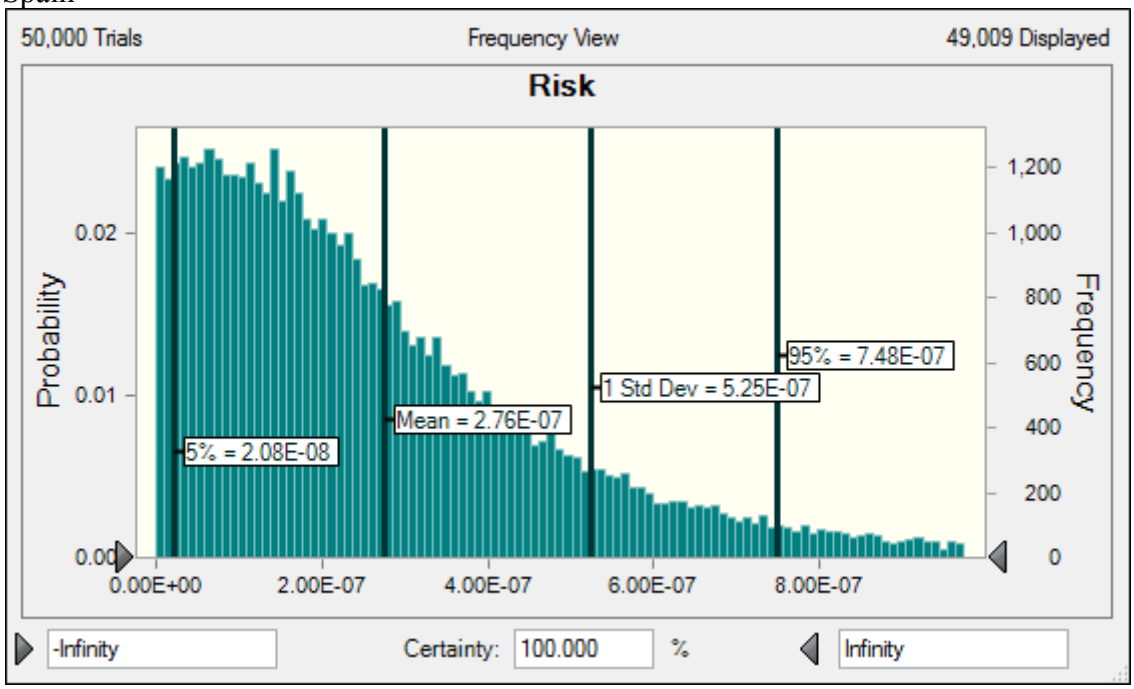
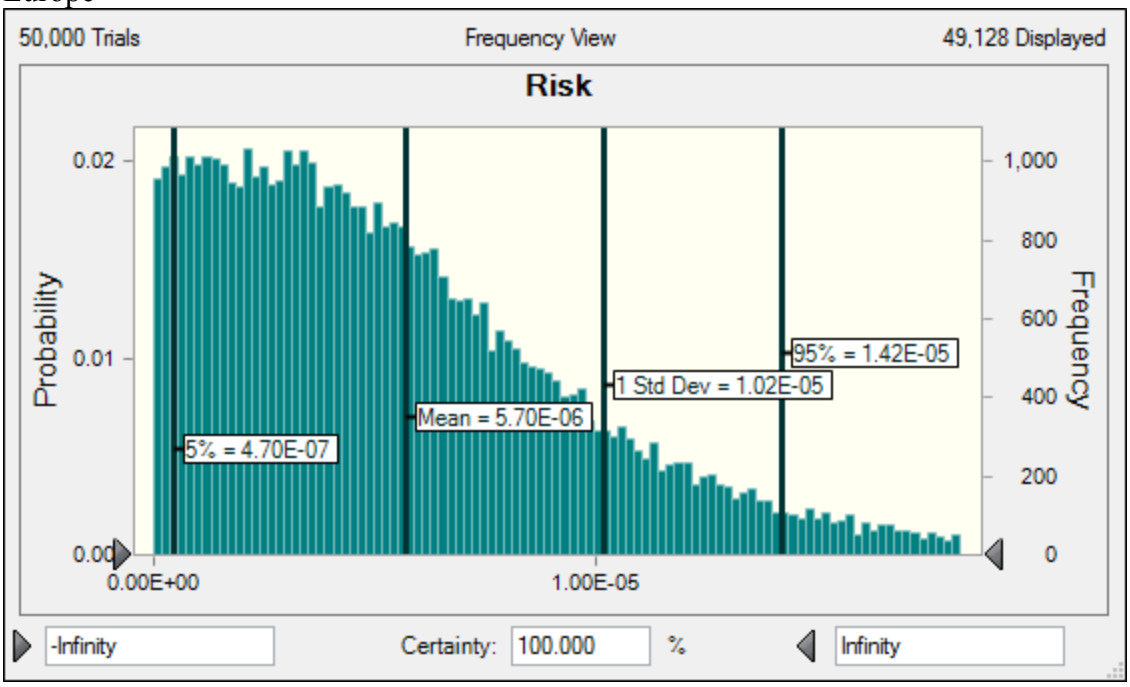


Adults

Europe



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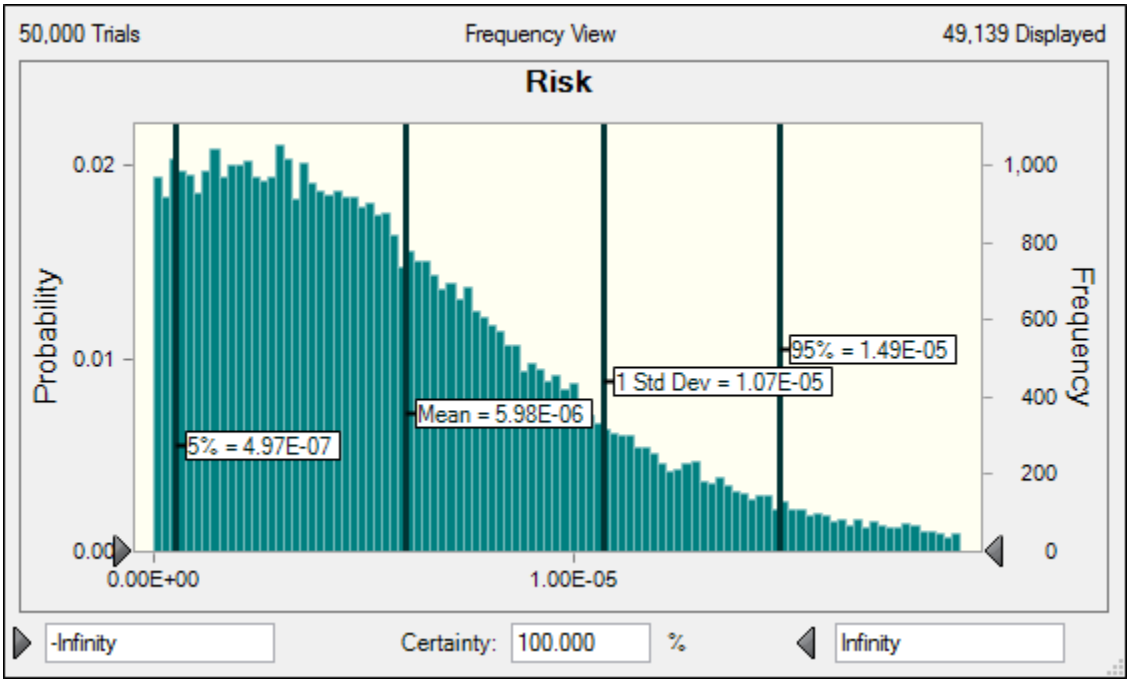

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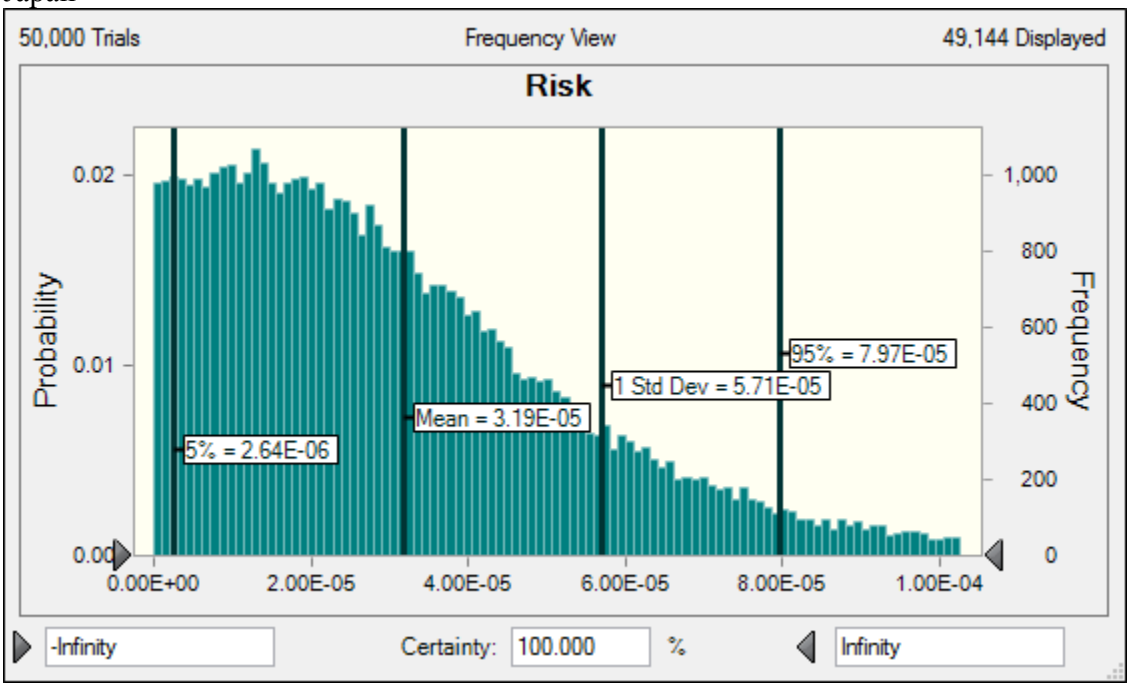
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4.00E-05
6.00E-05
8.00E-05
1.00E-04
95% = 7.97E-05
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Certainty: 100.000 %
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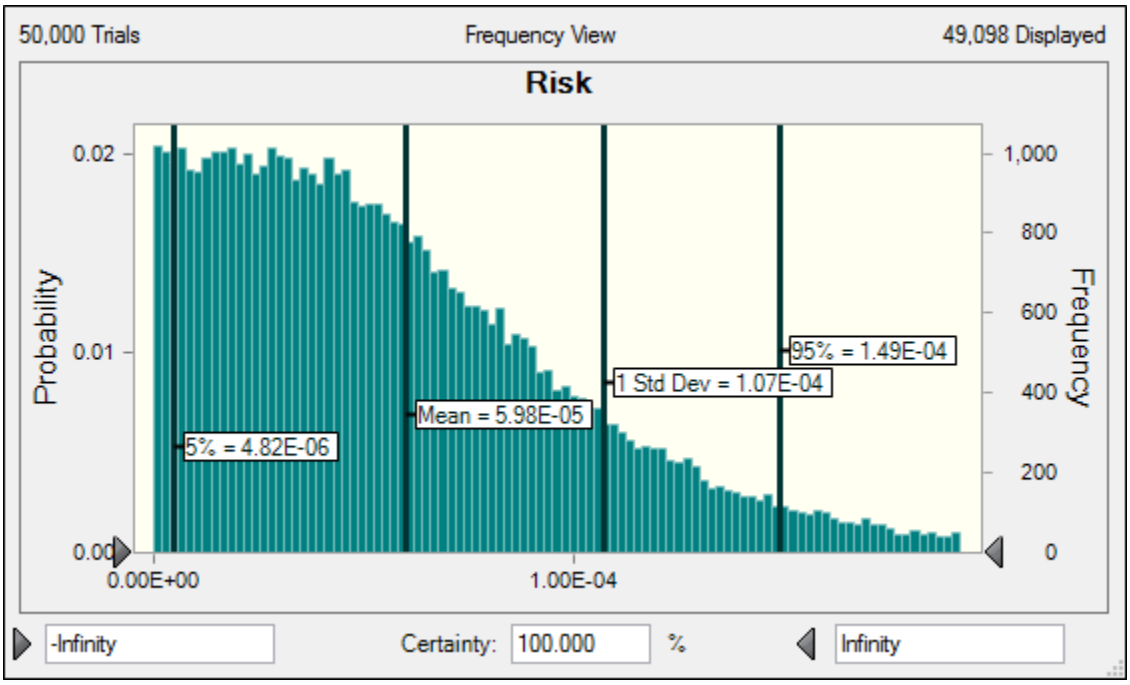
Ghana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Frequency
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0.00E+00
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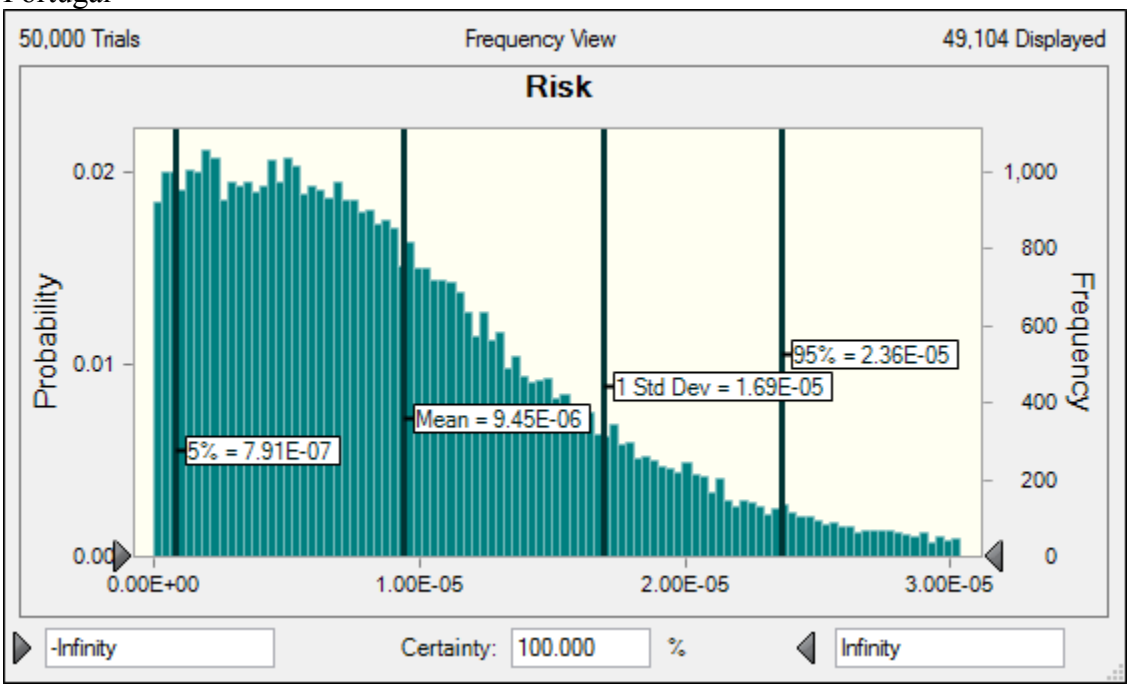
Portugal



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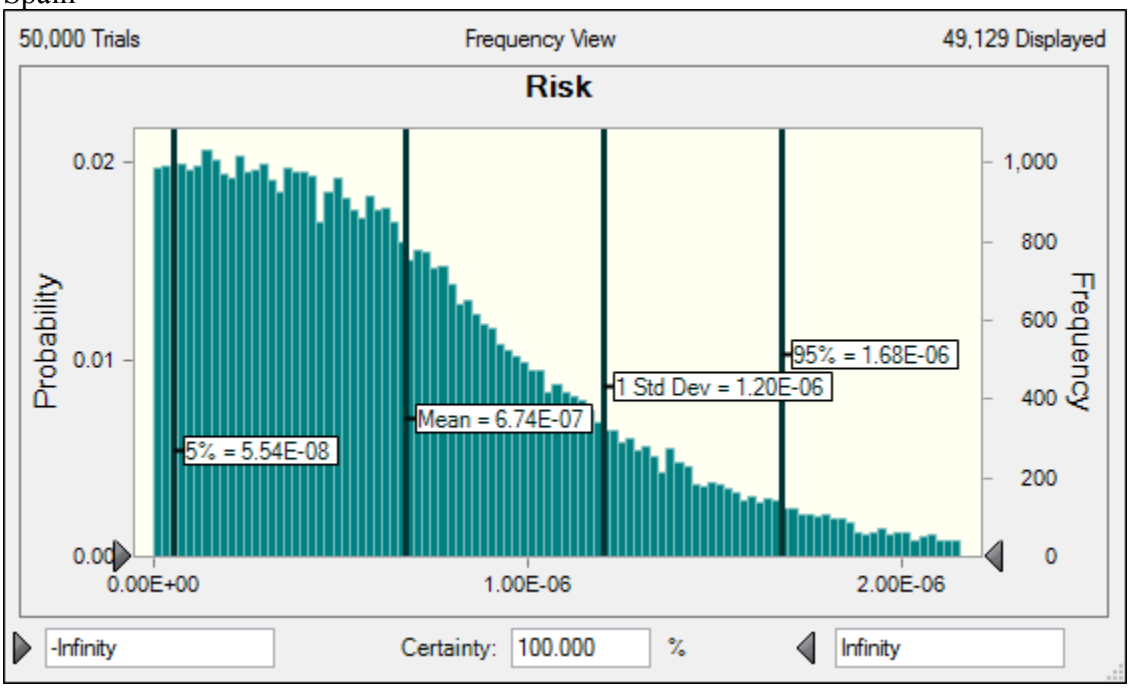
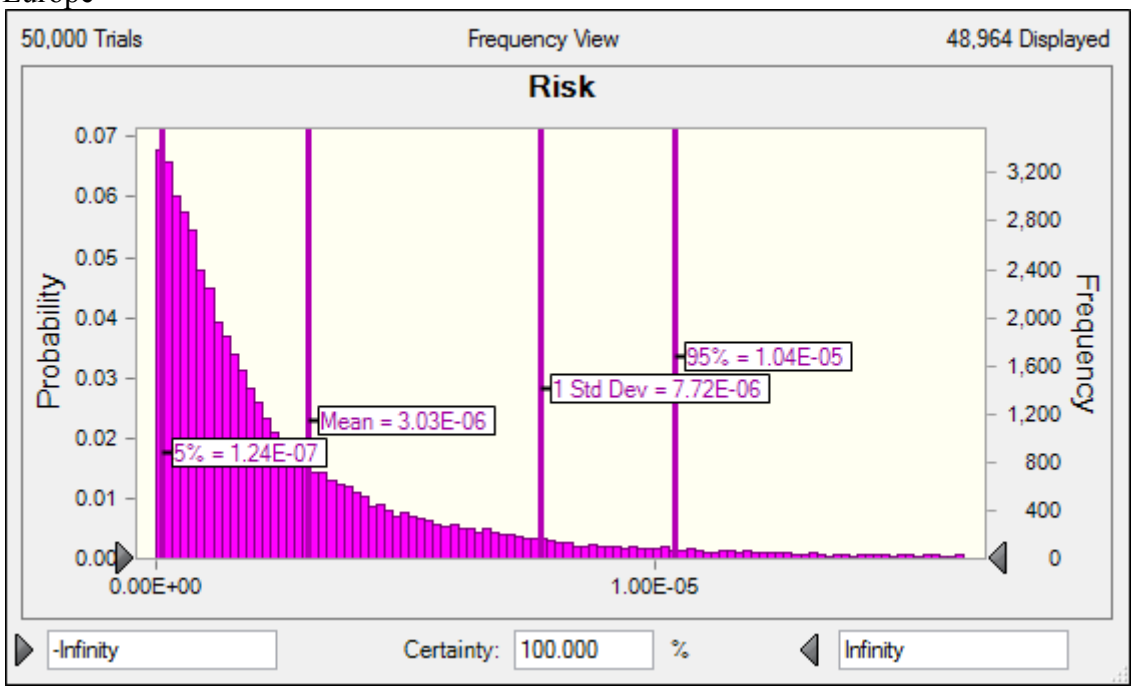


Fruits
Child
Europe



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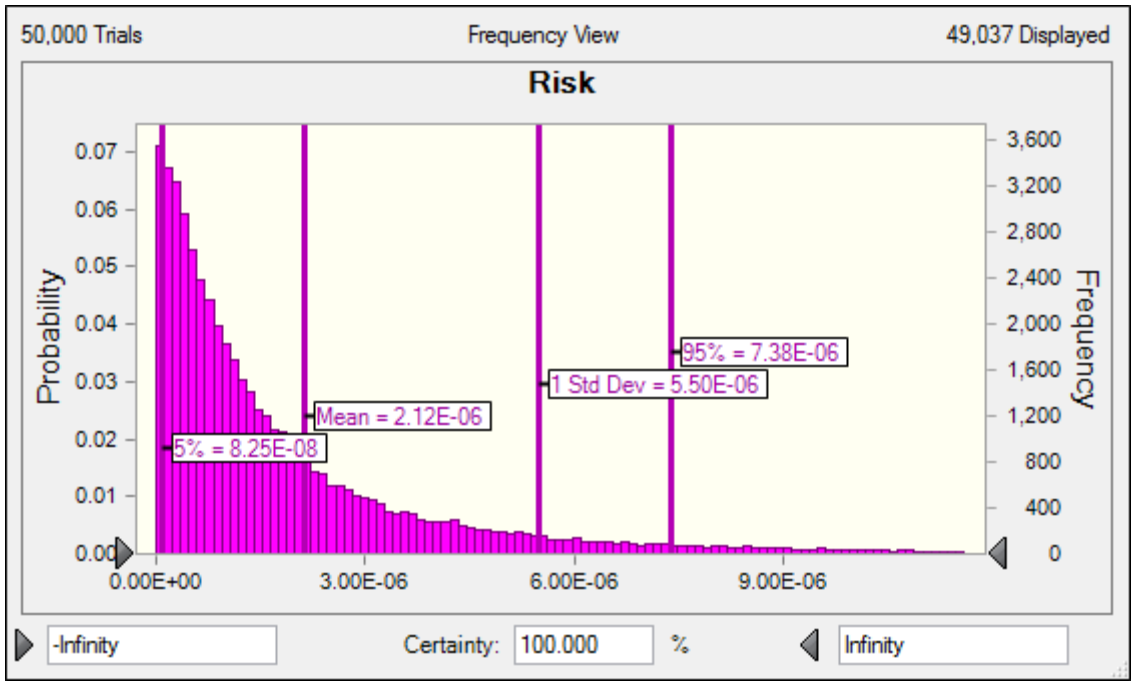
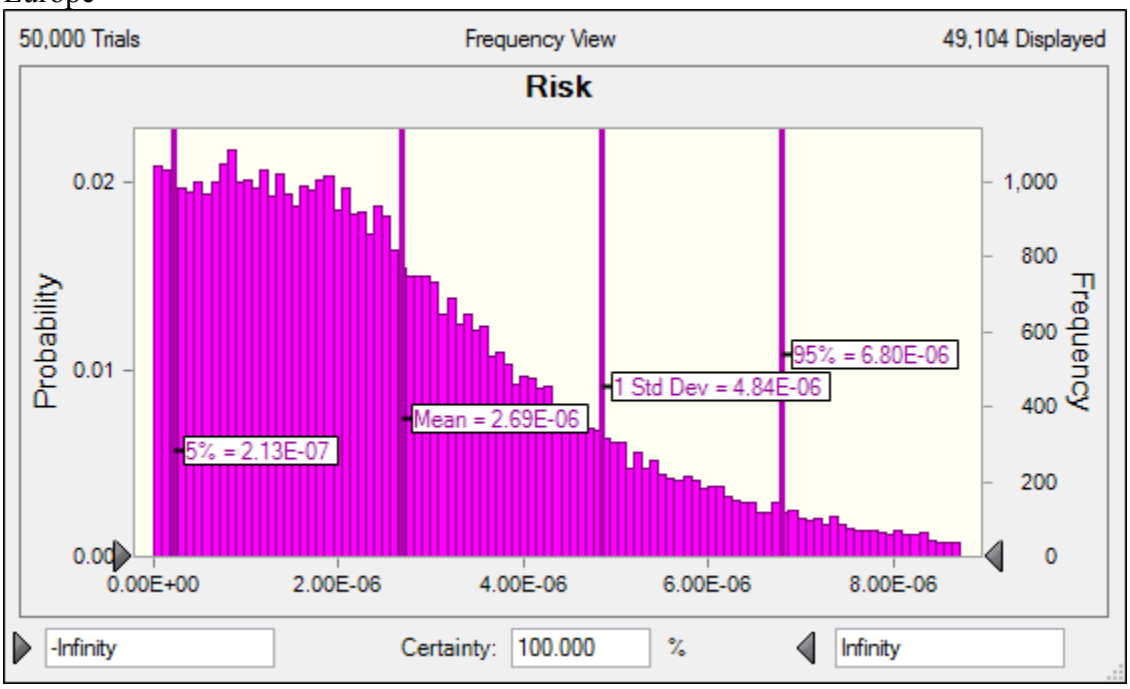


Adults

Europe



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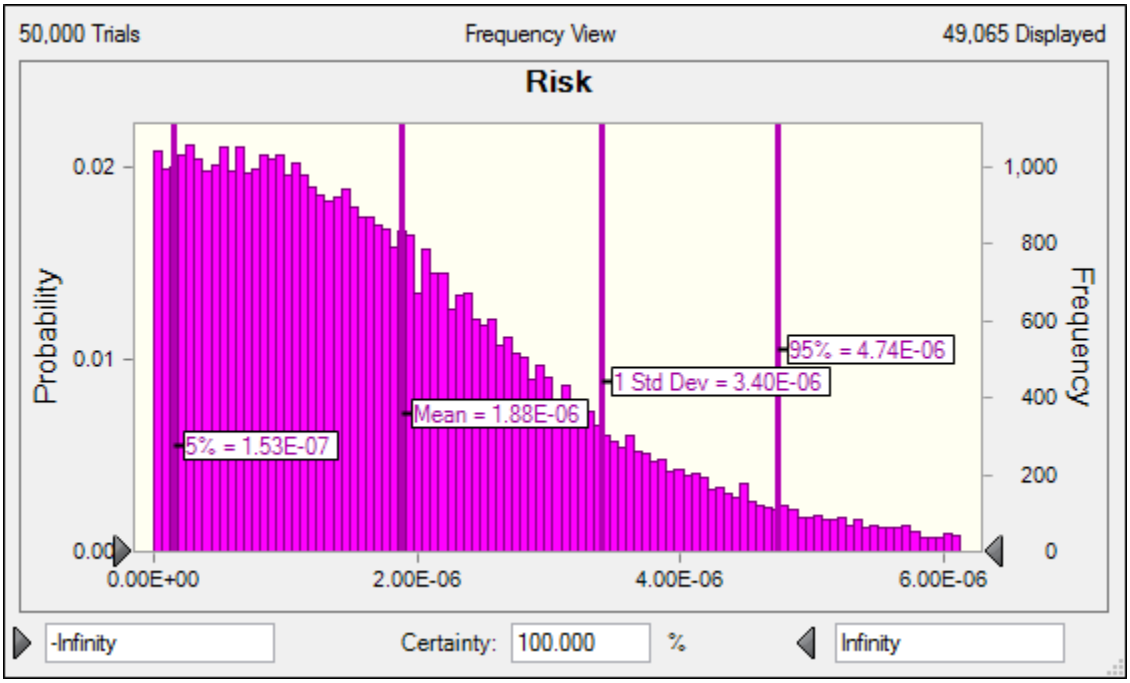
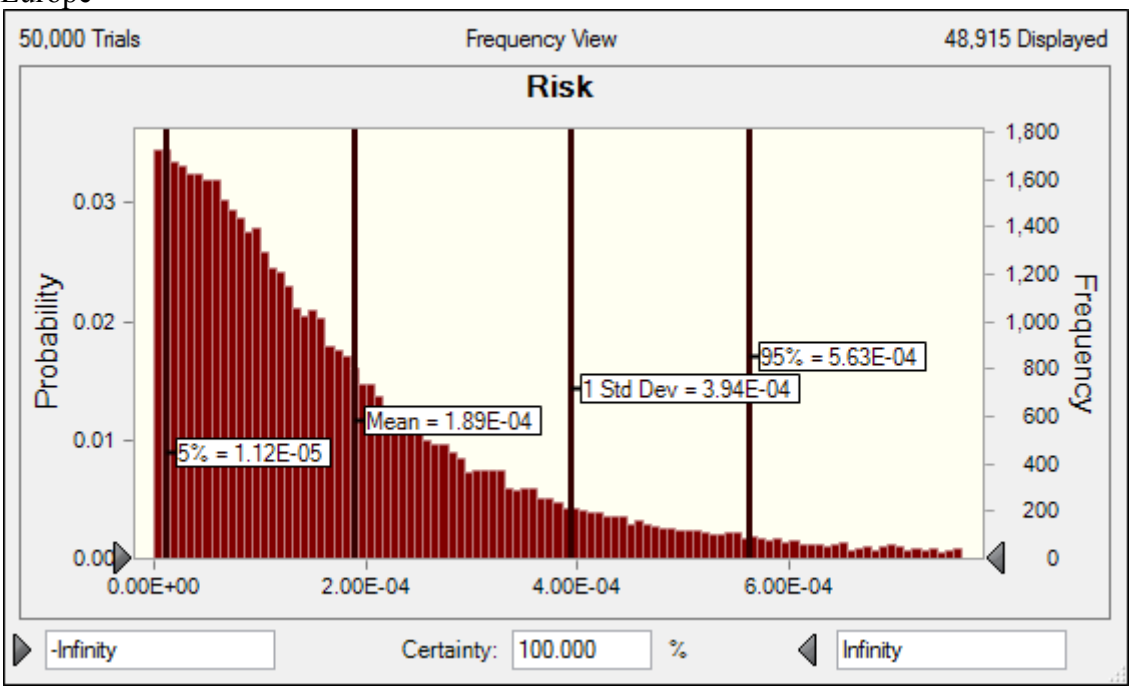


Meat
Child
Europe



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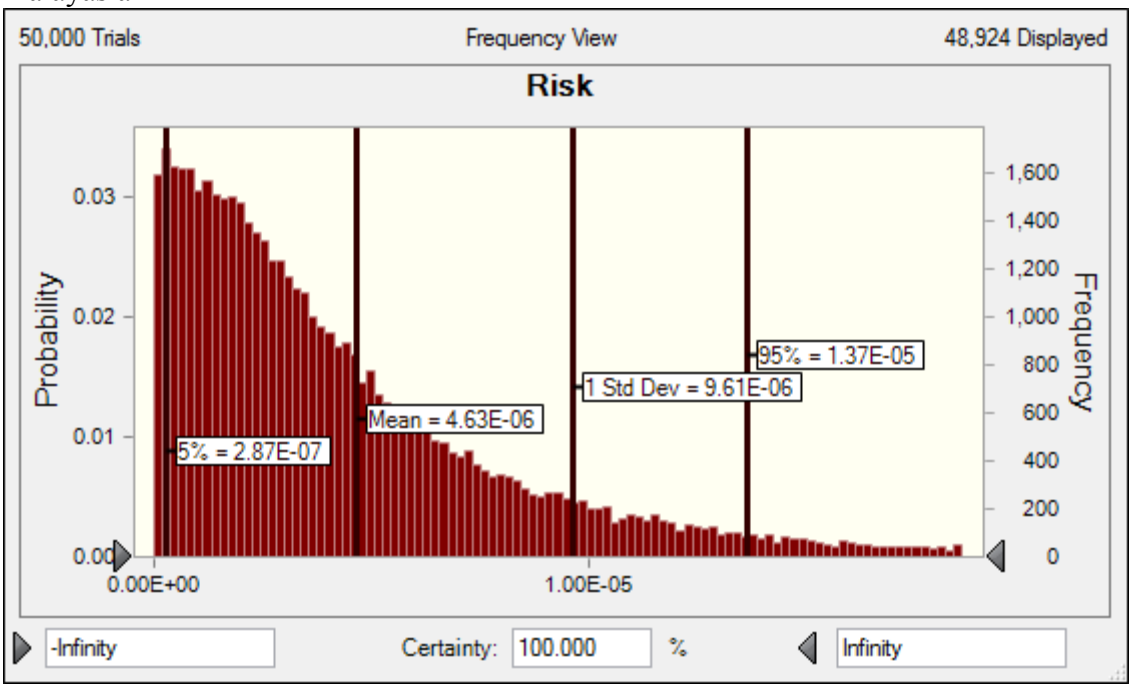
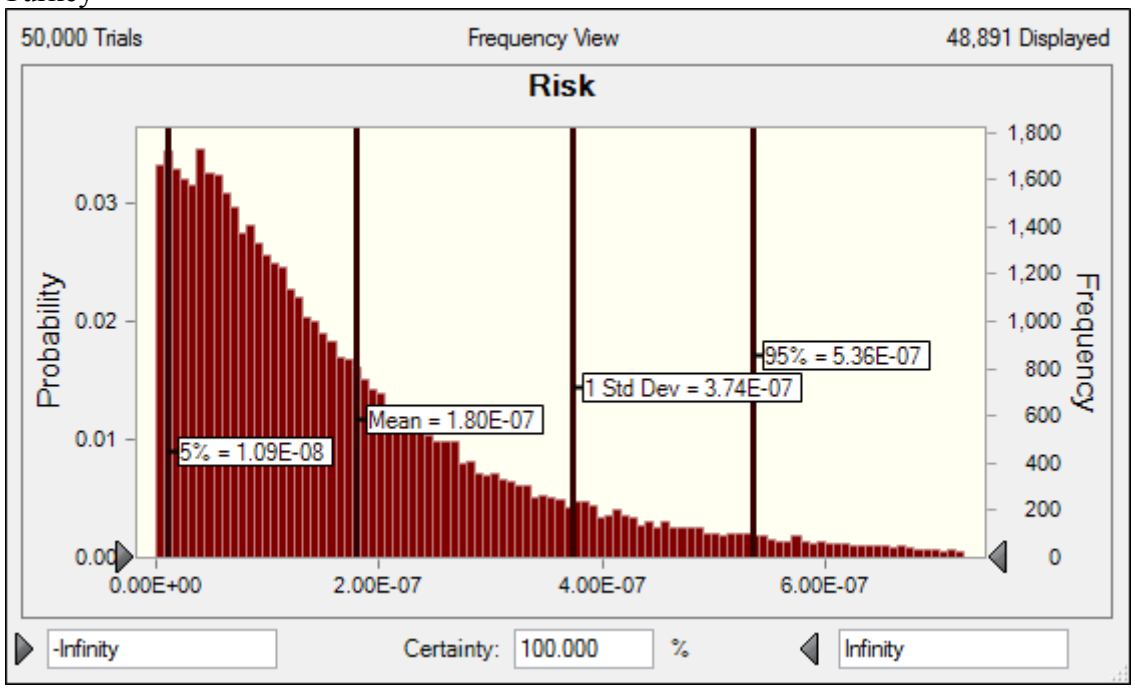
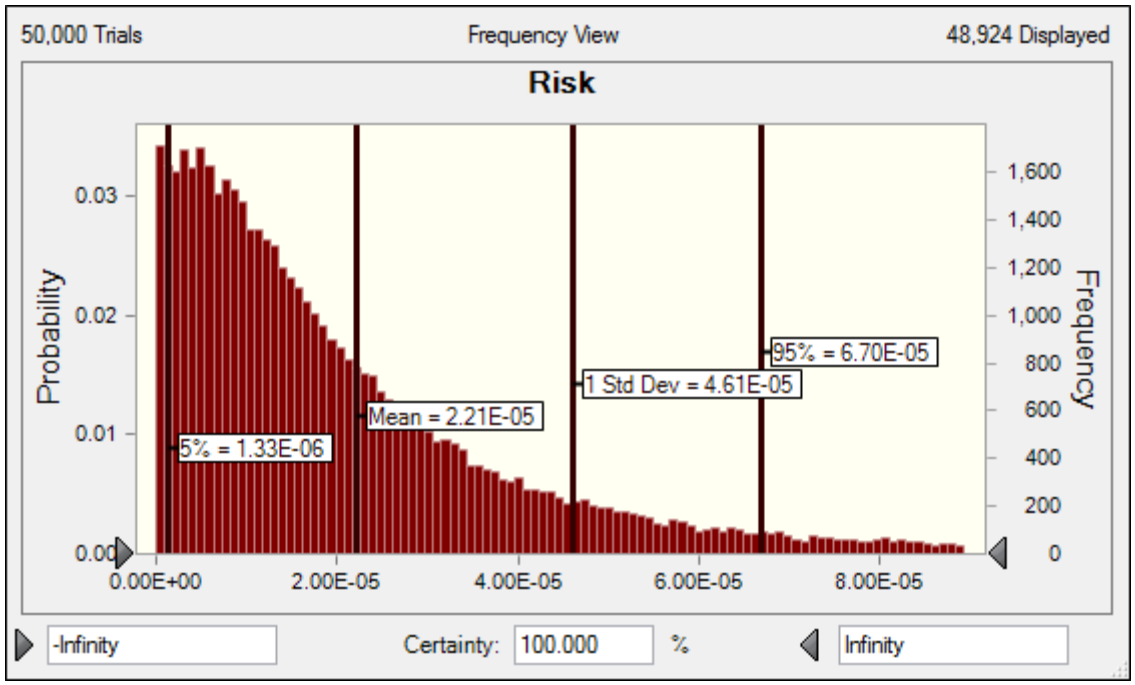


Turkey



China Ducks



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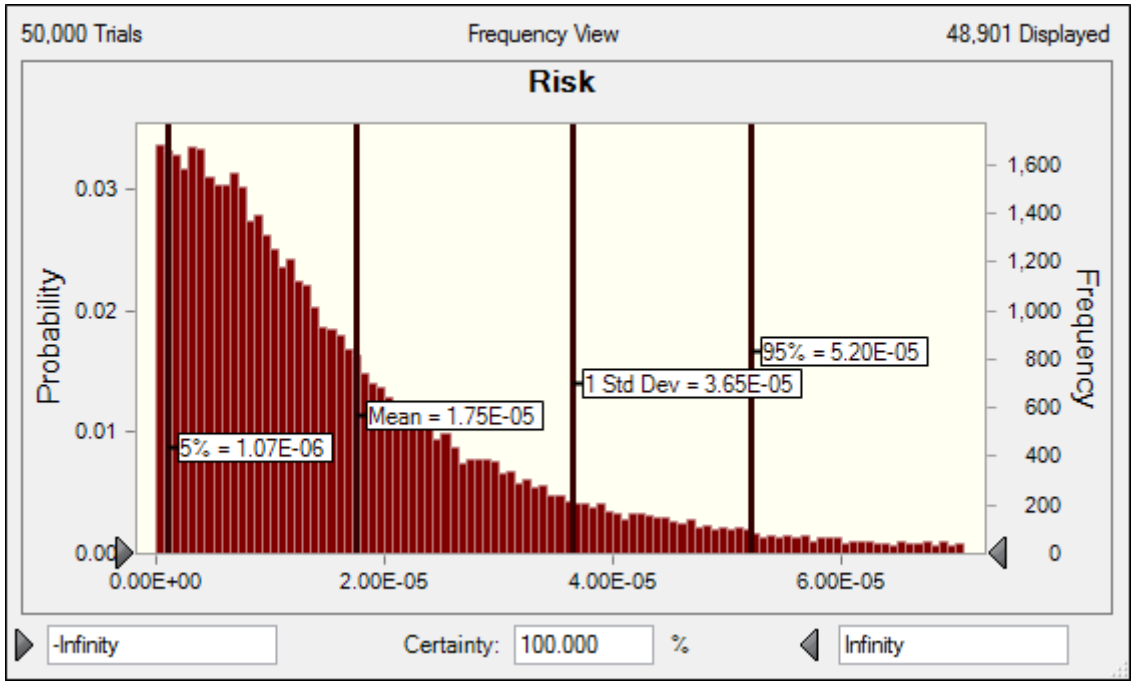
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Frequency
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1,000
800
600
400
200
0
95% = 5.20E-05
1 Std Dev = 3.65E-05
Mean = 1.75E-05
5% = 1.07E-06
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6.00E-05
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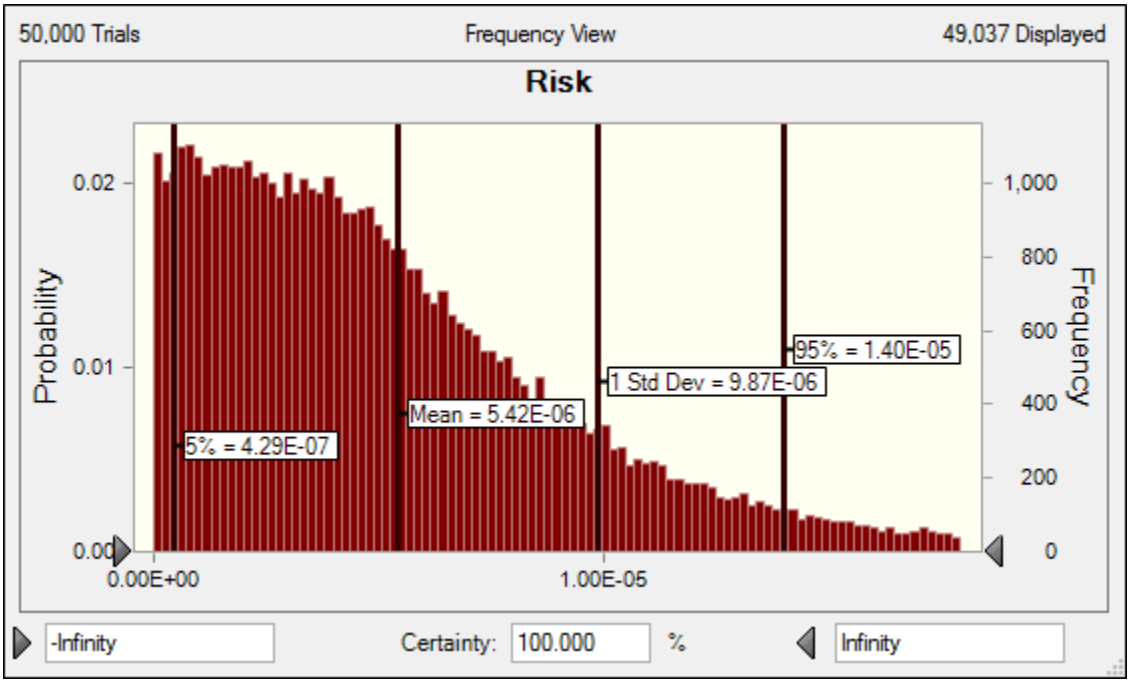
Certainty: 100.000 %
Infinity

Poland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Probability
Frequency
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0.00
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800
600
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200
0
95% = 1.40E-05
1 Std Dev = 9.87E-06
Mean = 5.42E-06
5% = 4.29E-07
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1.00E-05
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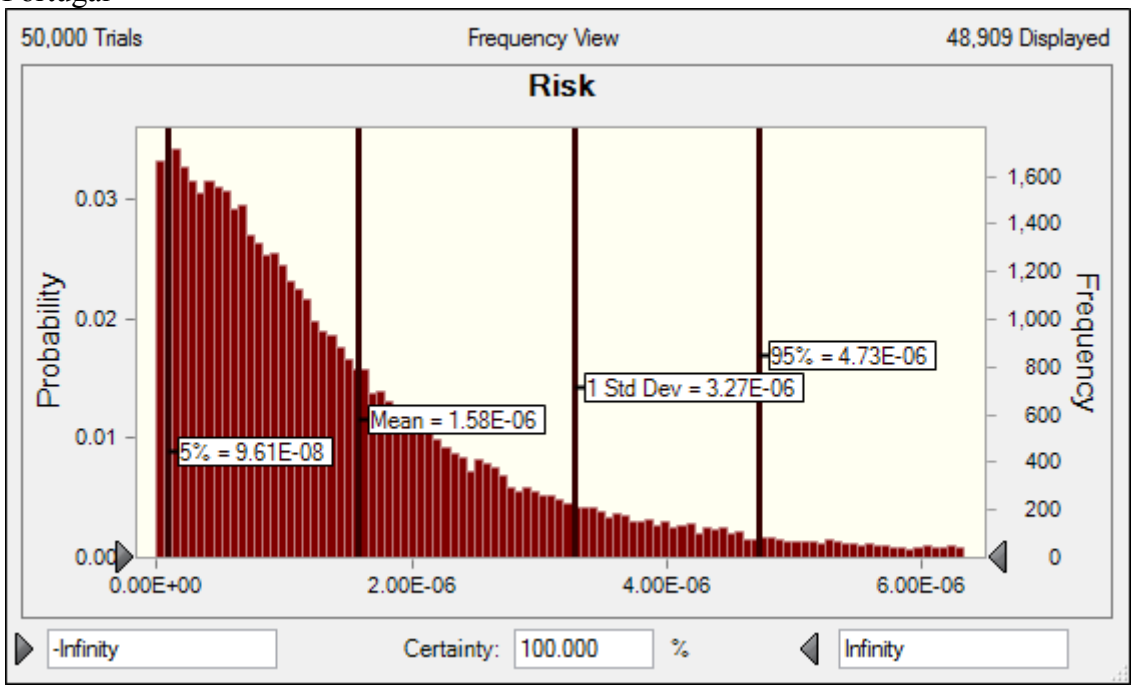
Certainty: 100.000 %
Infinity

Portugal



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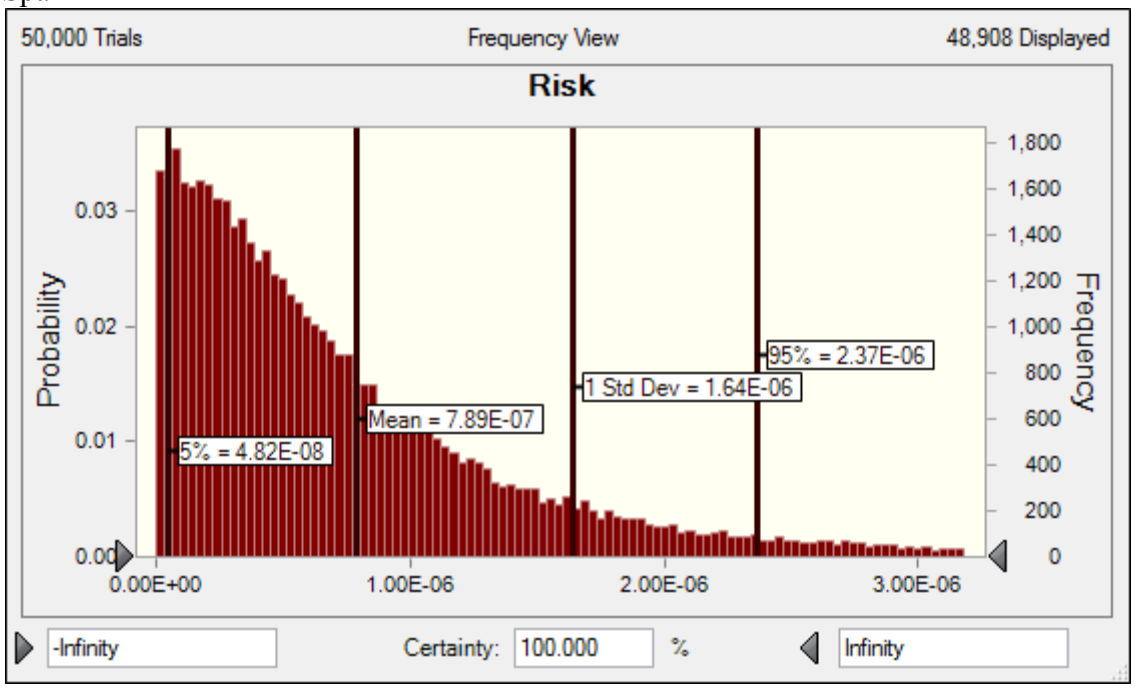
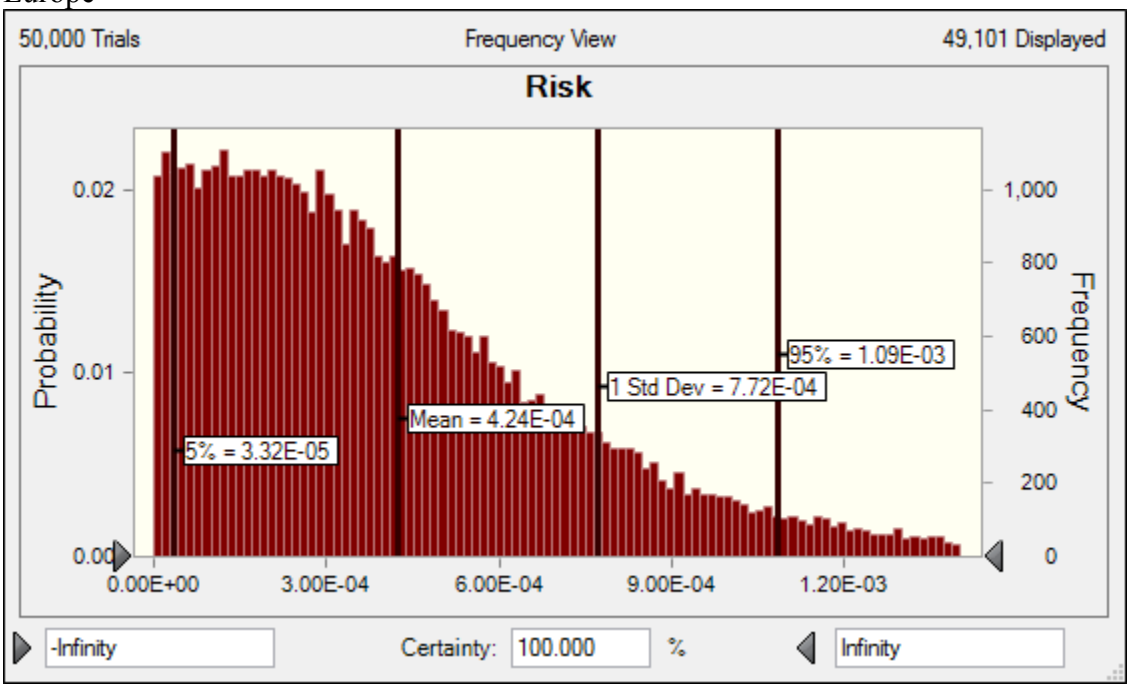


Adult
Europe



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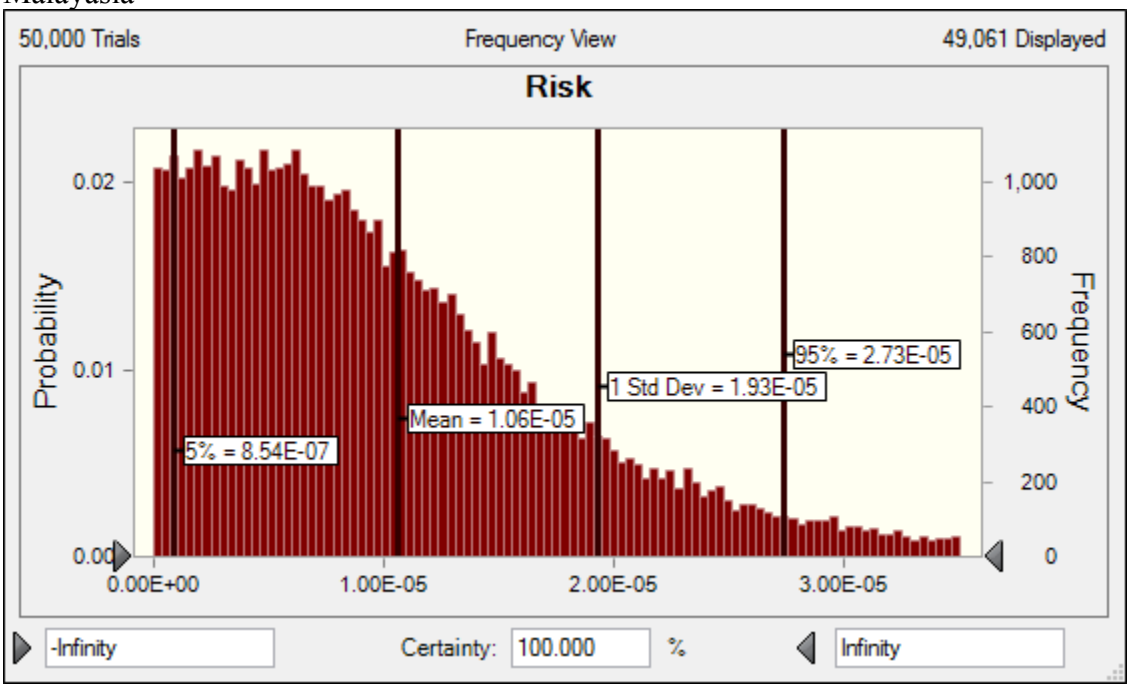
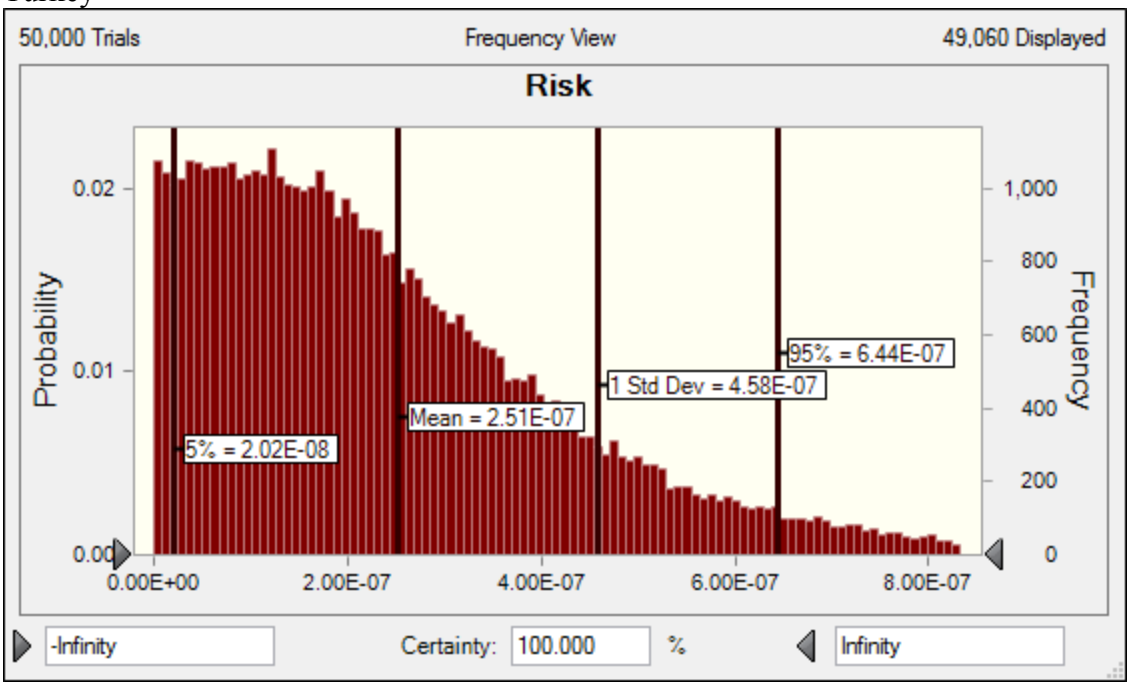


Turkey



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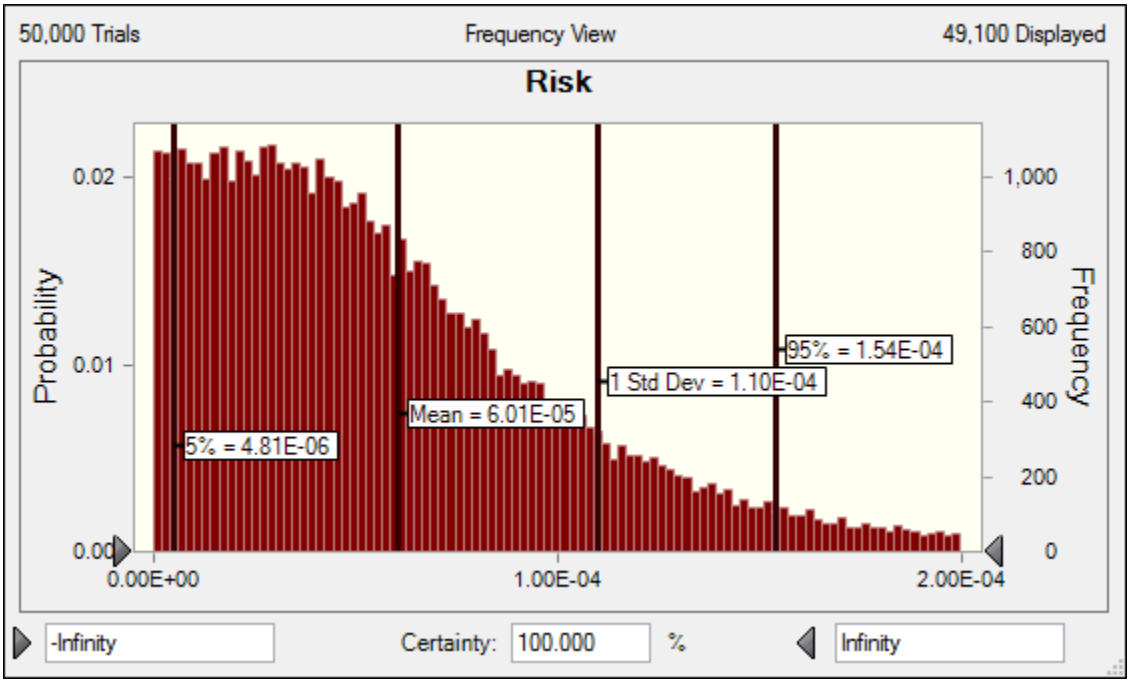

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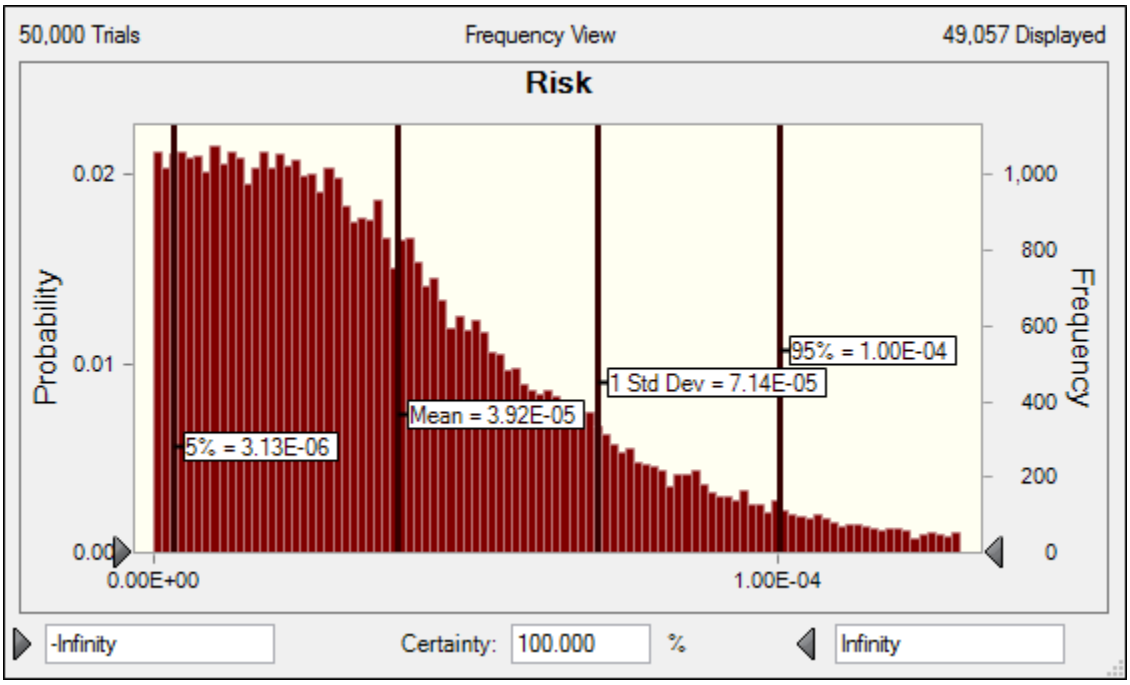
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Probability
Frequency
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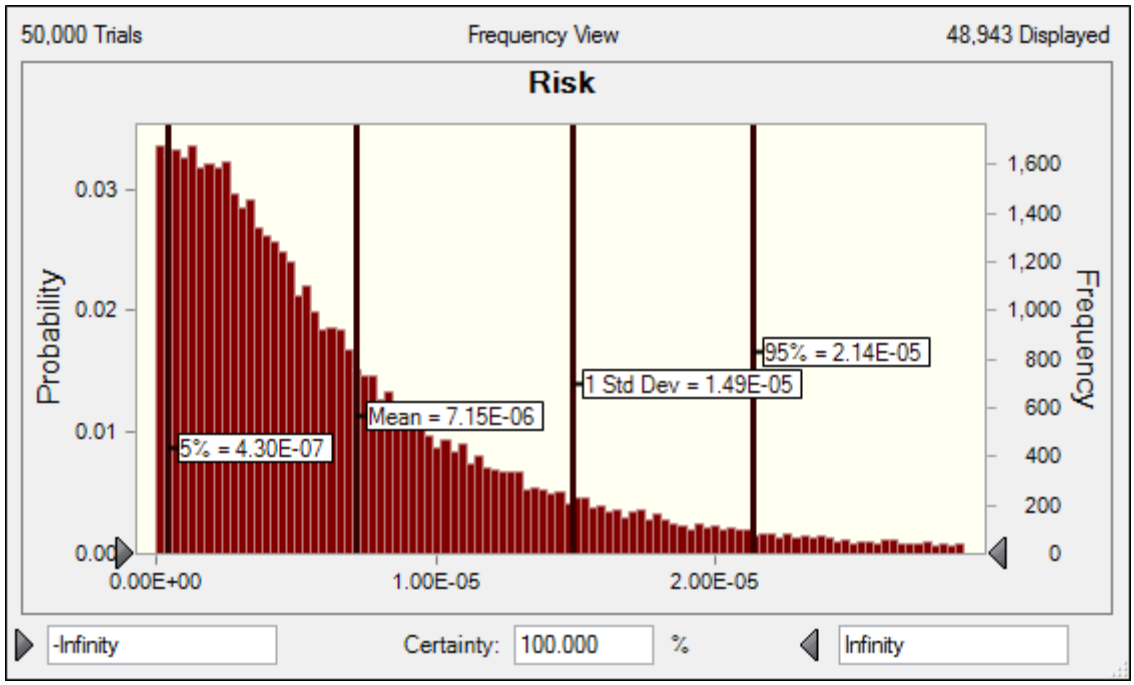
0.01
0.00
1,000
800
600
400
200
0
95% = 1.00E-04
1 Std Dev = 7.14E-05
Mean = 3.92E-05
5% = 3.13E-06
0.00E+00
1.00E-04
-Infinity
Certainty: 100.000 %
Infinity

Poland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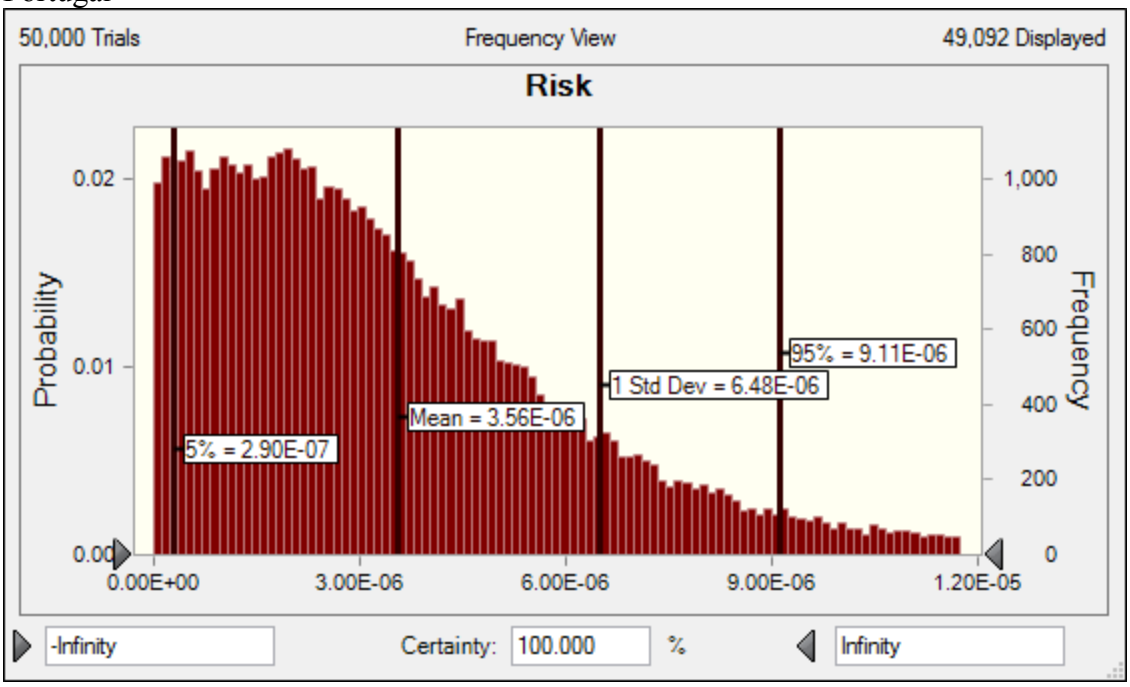
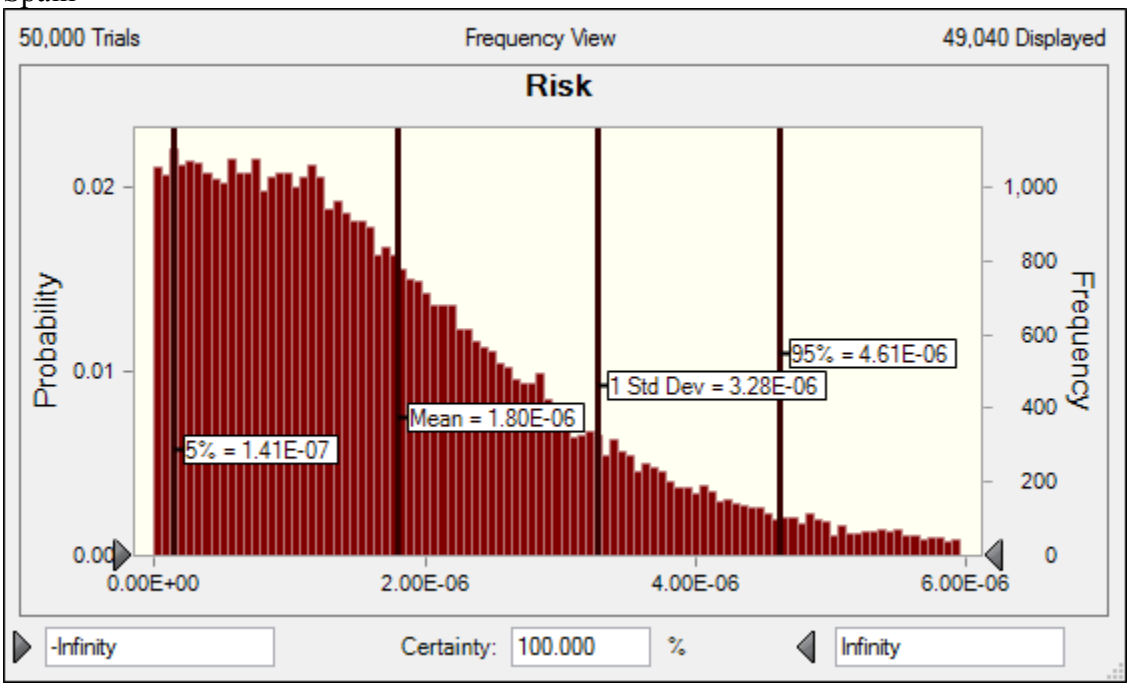
Frequency View
48,943 Displayed
Risk
Probability
Frequency
0.03
0.02
0.01
0.00
1,600
1,400
1,200
1,000
800
600
400
200
0
95% = 2.14E-05
1 Std Dev = 1.49E-05
Mean = 7.15E-06
5% = 4.30E-07
0.00E+00
1.00E-05
2.00E-05
-Infinity
Certainty: 100.000 %
Infinity

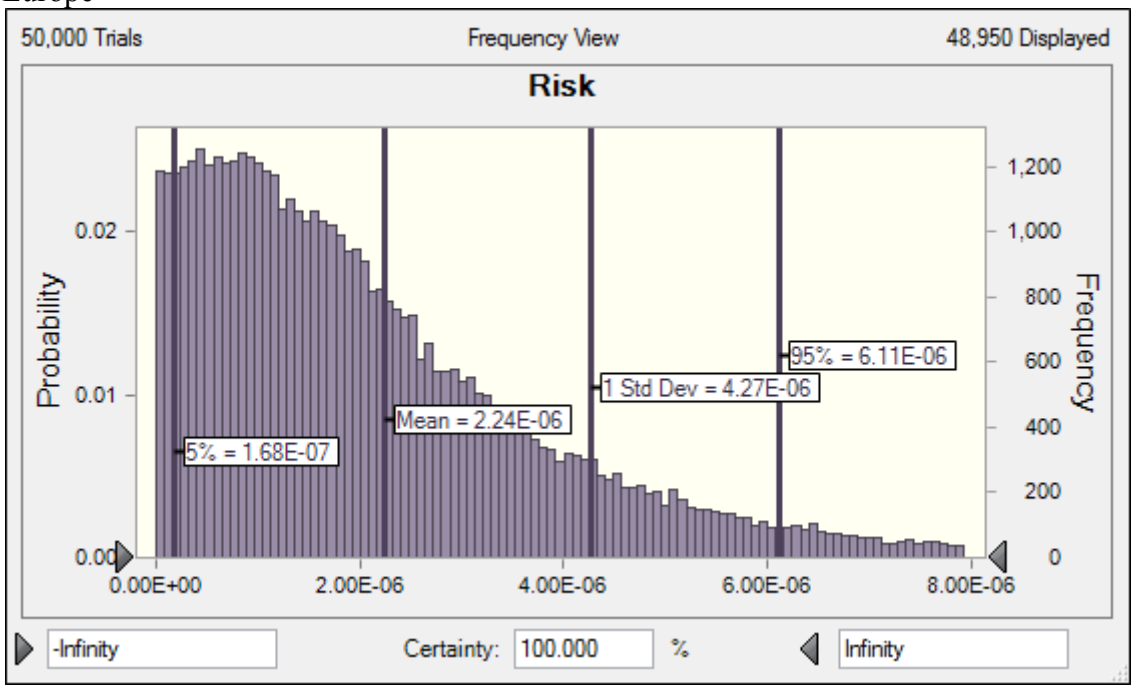
Portugal



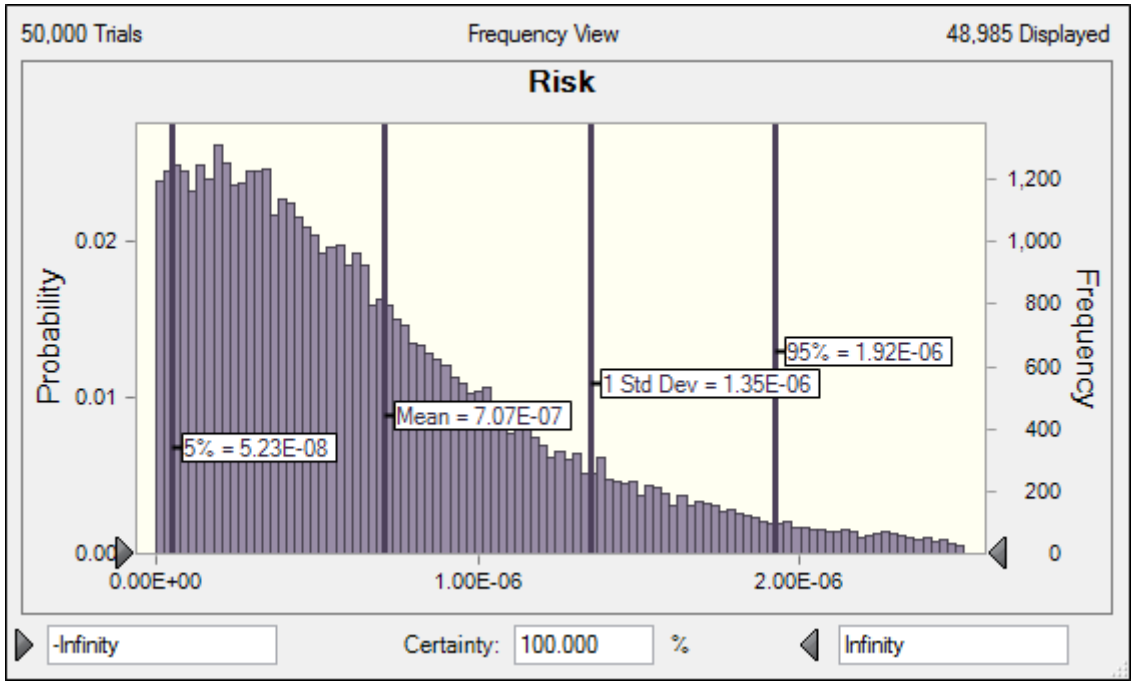
Spain



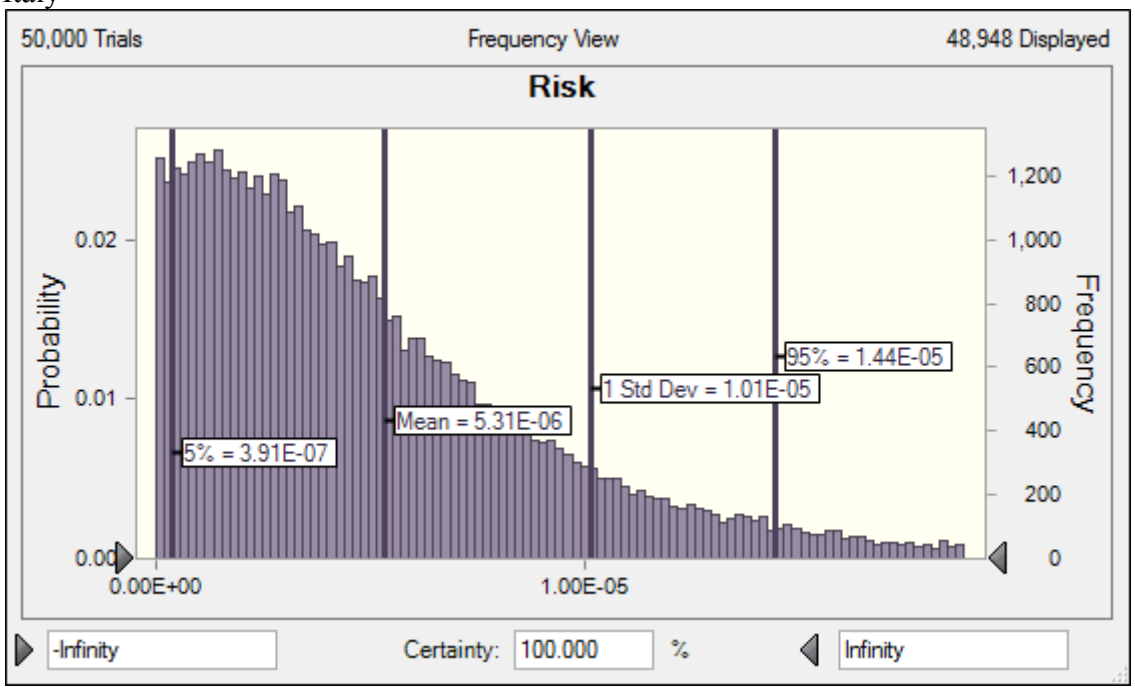
Mussels/ Shellfish/ Seafoods
Child
Europe



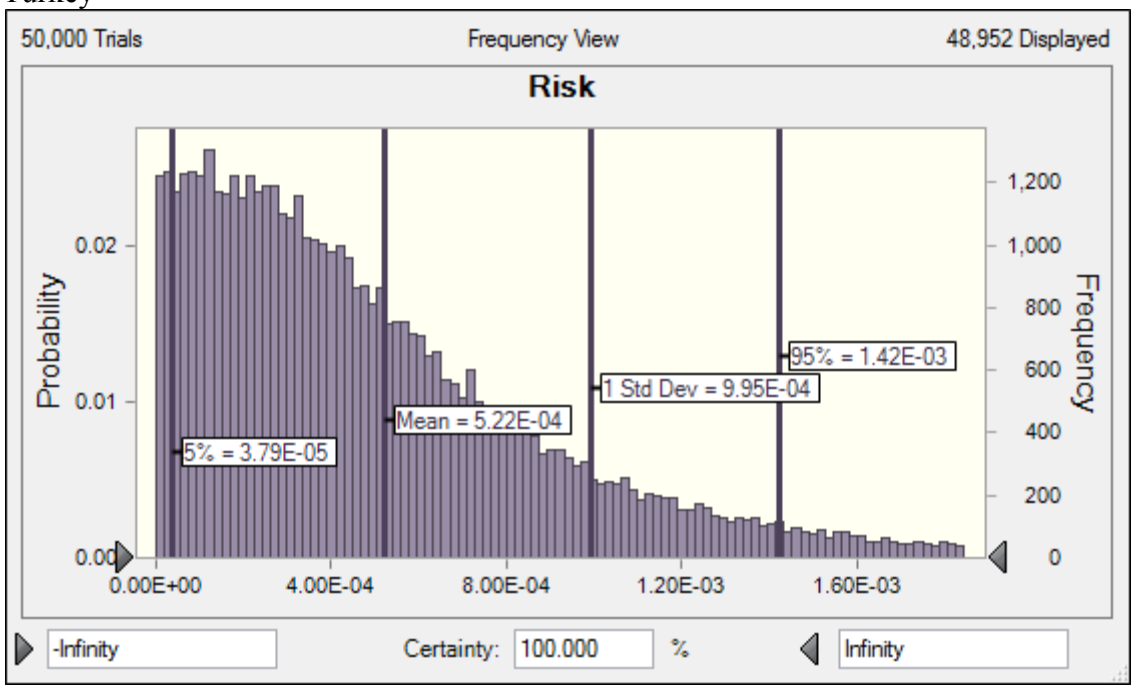
Croatia



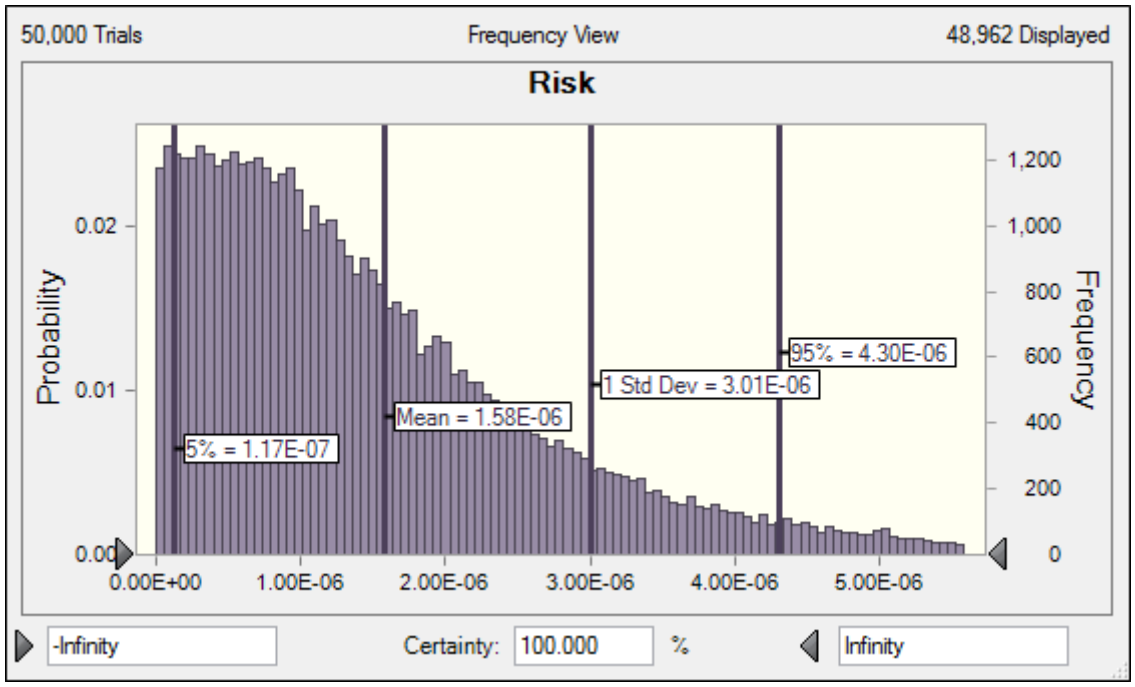
Italy



Turkey

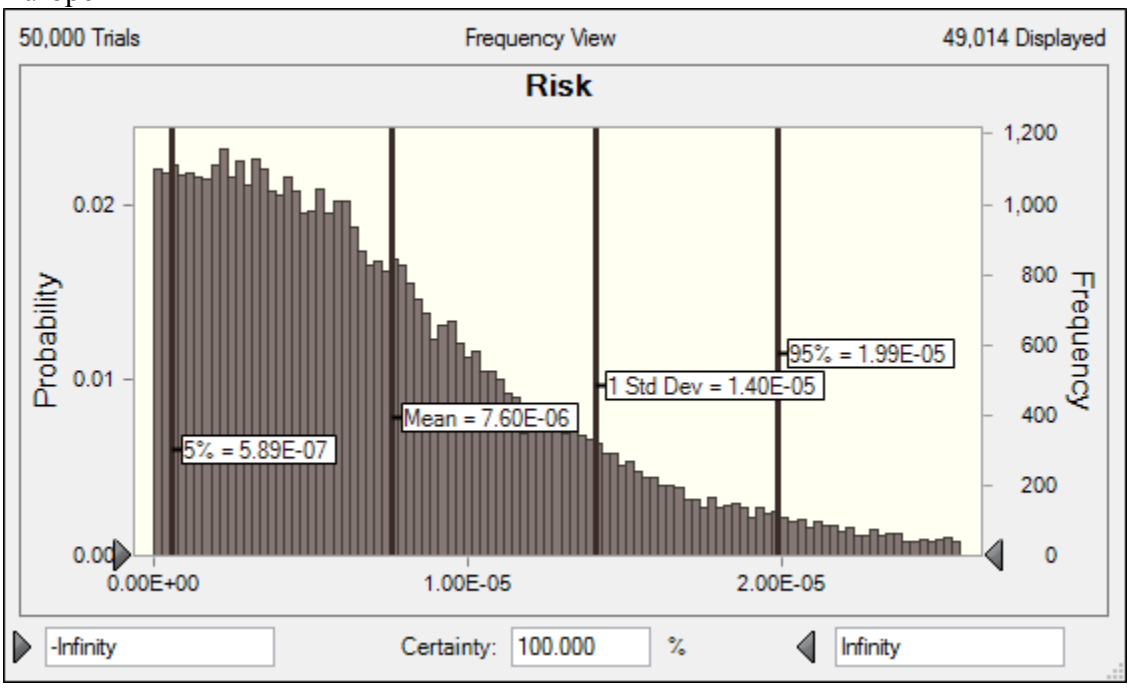


Tunisia

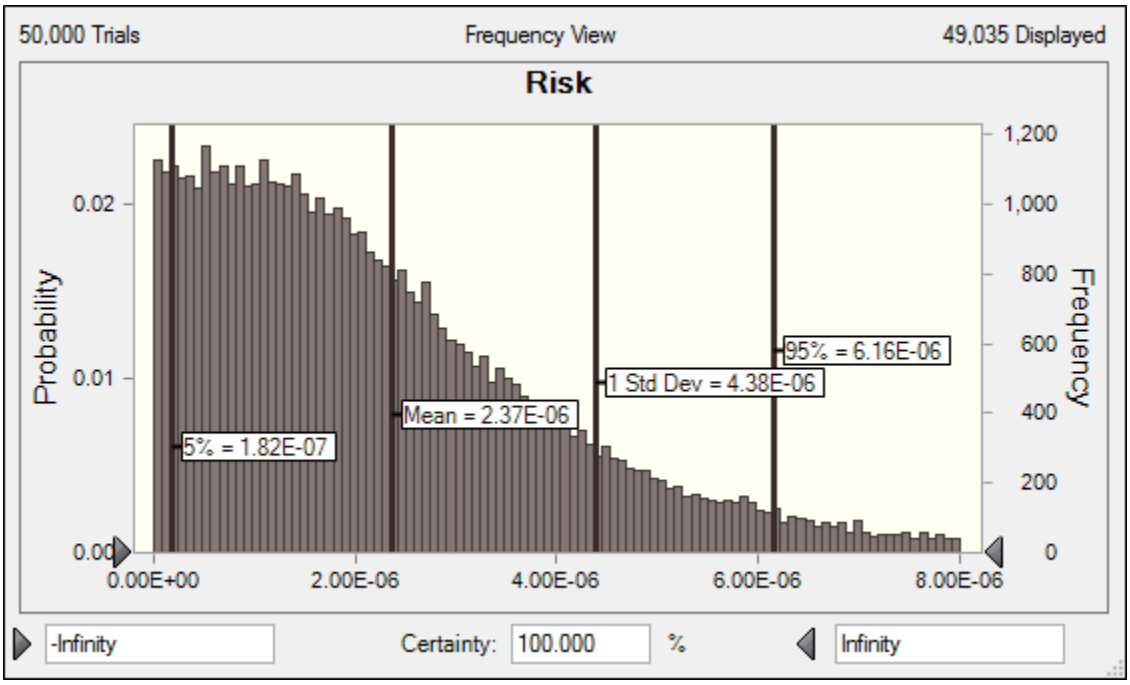


Adult

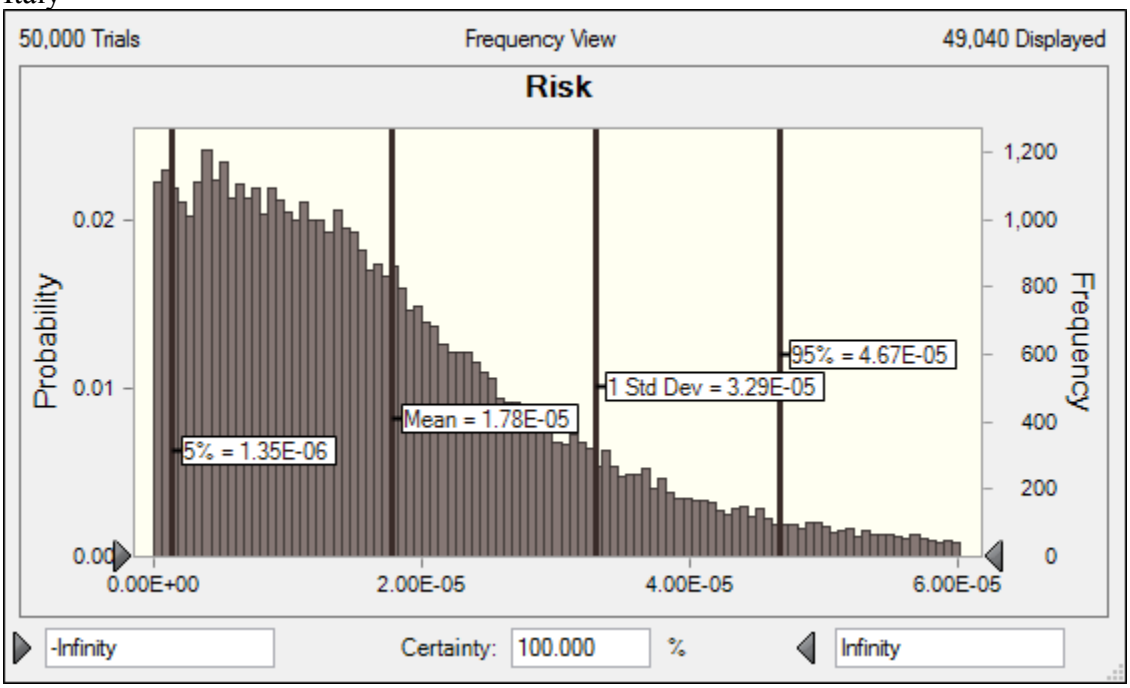
Europe



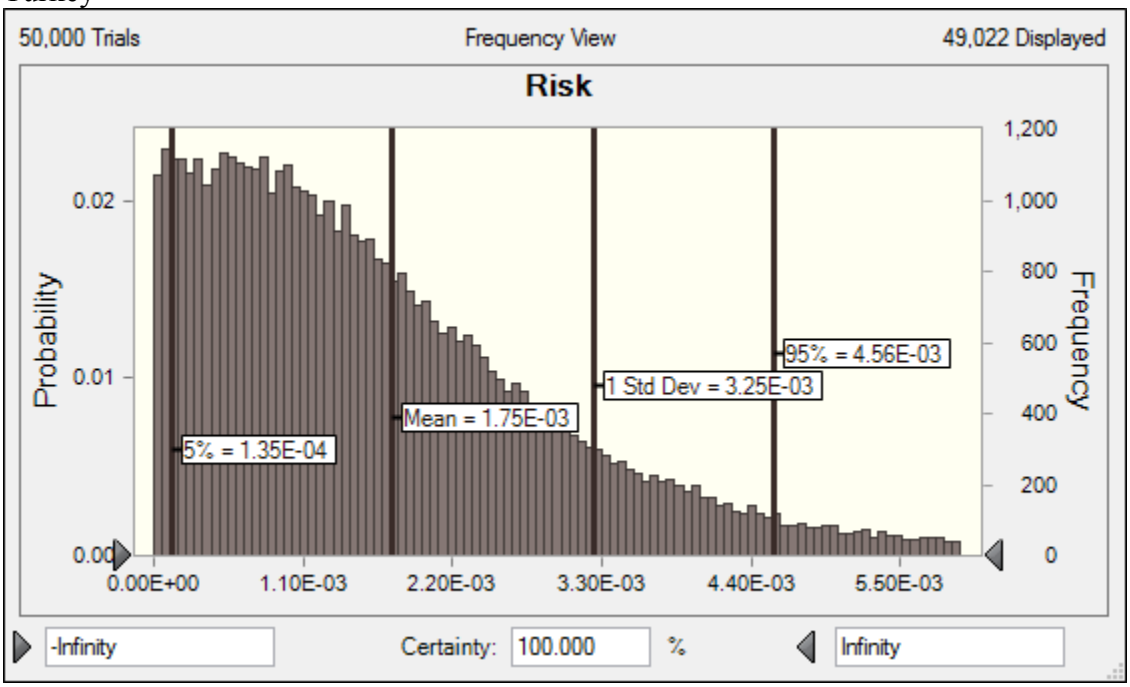
Croatia



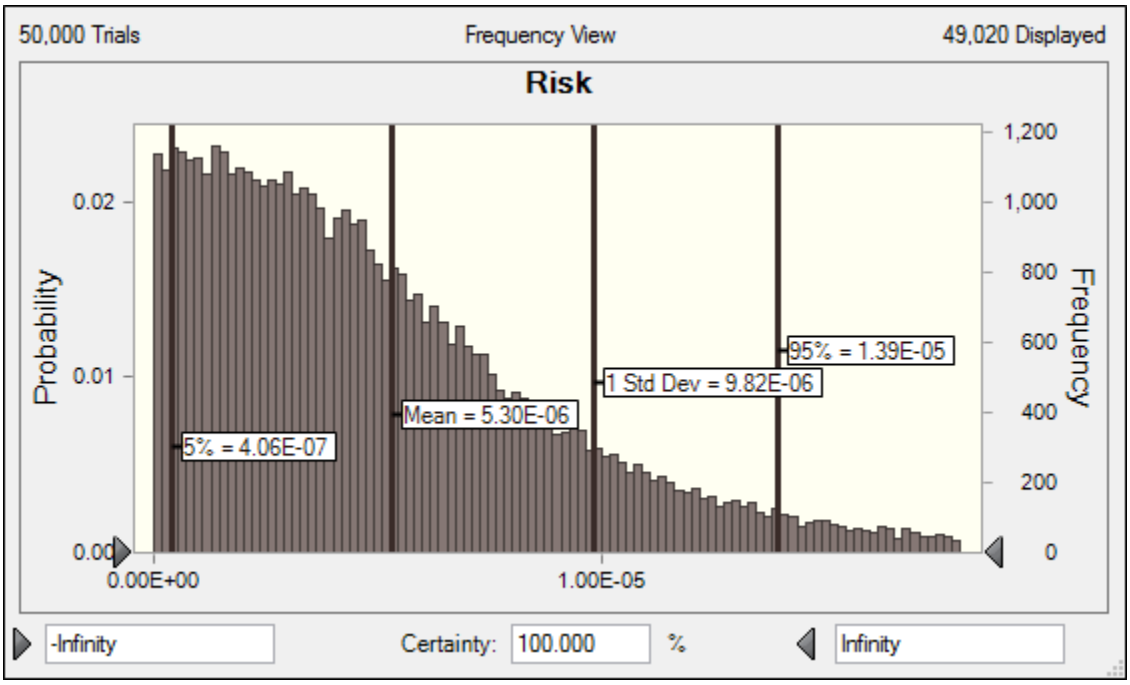
Italy



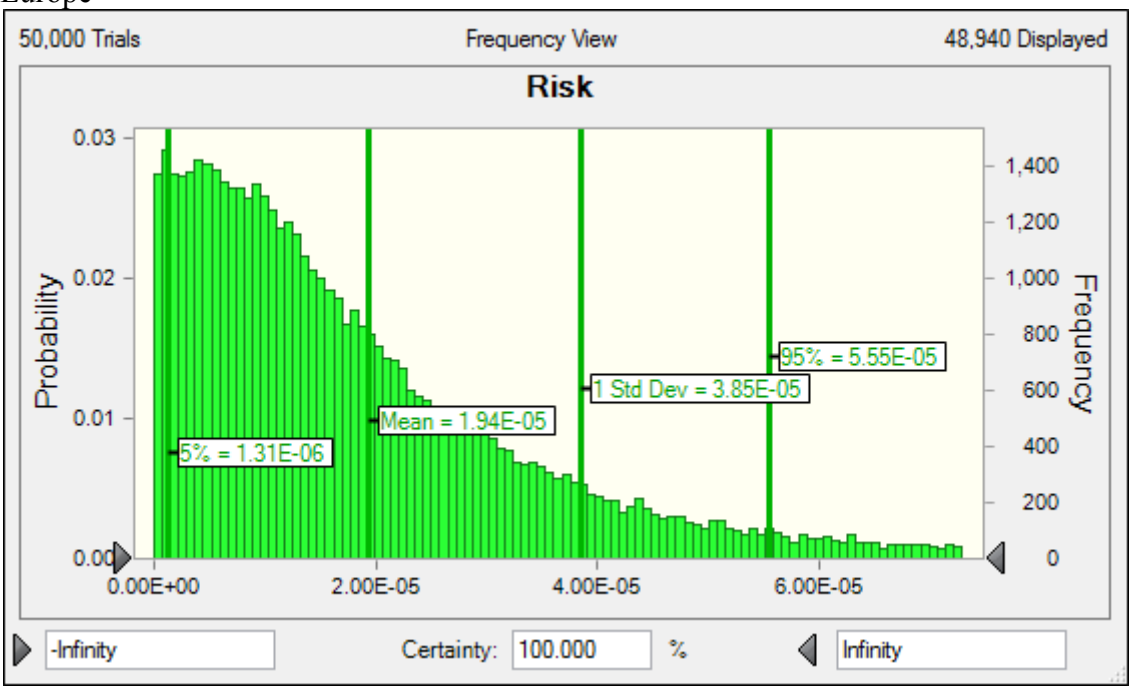
Turkey



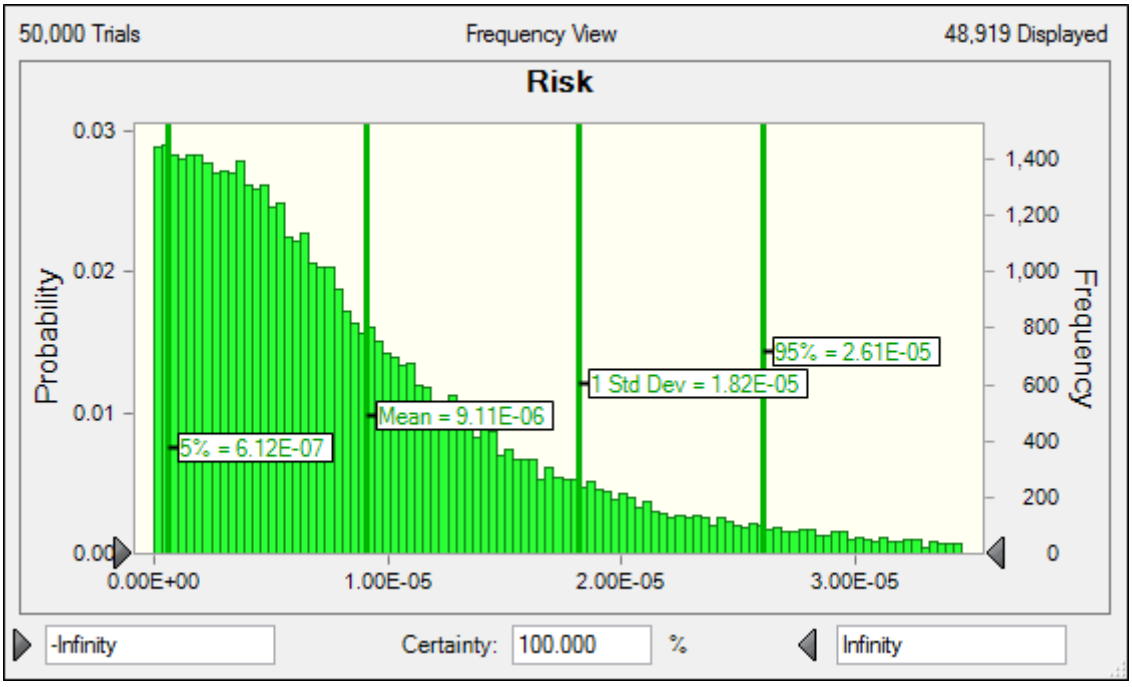
Tunisia



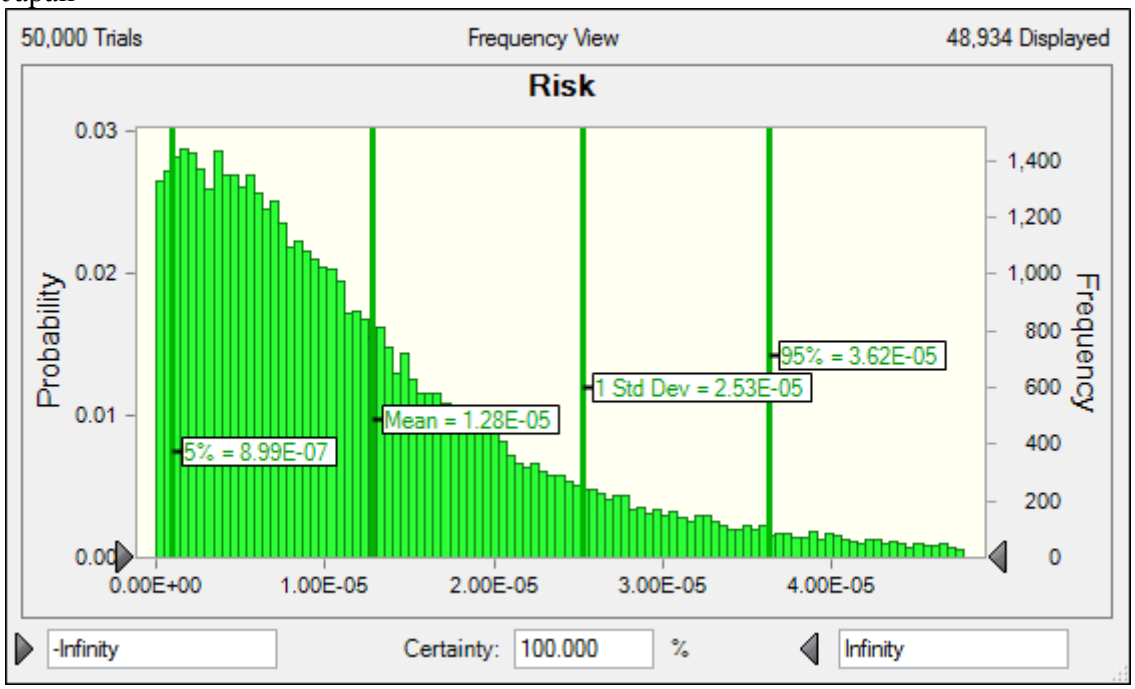
Vegetables
Child
Europe



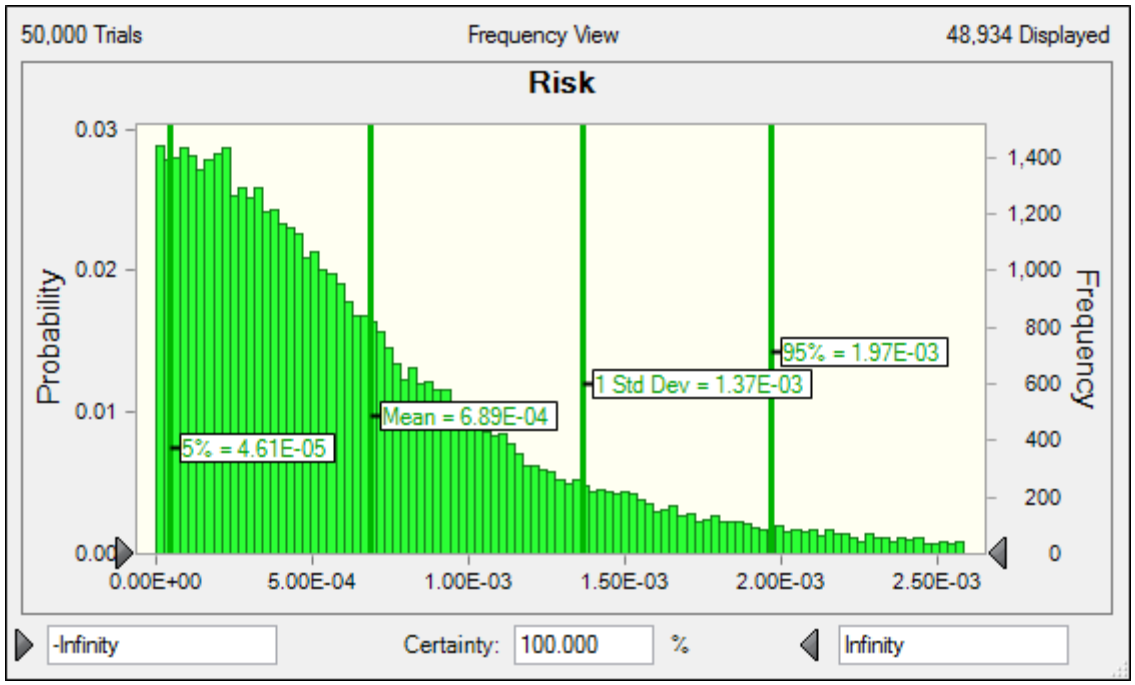
India



Japan


50,000 Trials
Frequency View
48,934 Displayed
Risk
Probability
Frequency
0.03
0.02
0.01
0.00
1,400
1,200
1,000
800
600
400
200
0
95% = 3.62E-05
1 Std Dev = 2.53E-05
Mean = 1.28E-05
5% = 8.99E-07
0.00E+00
1.00E-05
2.00E-05
3.00E-05
4.00E-05
-Infinity
Certainty: 100.000 %
Infinity

China


50,000 Trials
Frequency View
48,934 Displayed
Risk
Probability
Frequency
0.03
0.02
0.01
0.00
1,400
1,200
1,000
800
600
400
200
0
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1 Std Dev = 1.37E-03
Mean = 6.89E-04
5% = 4.61E-05
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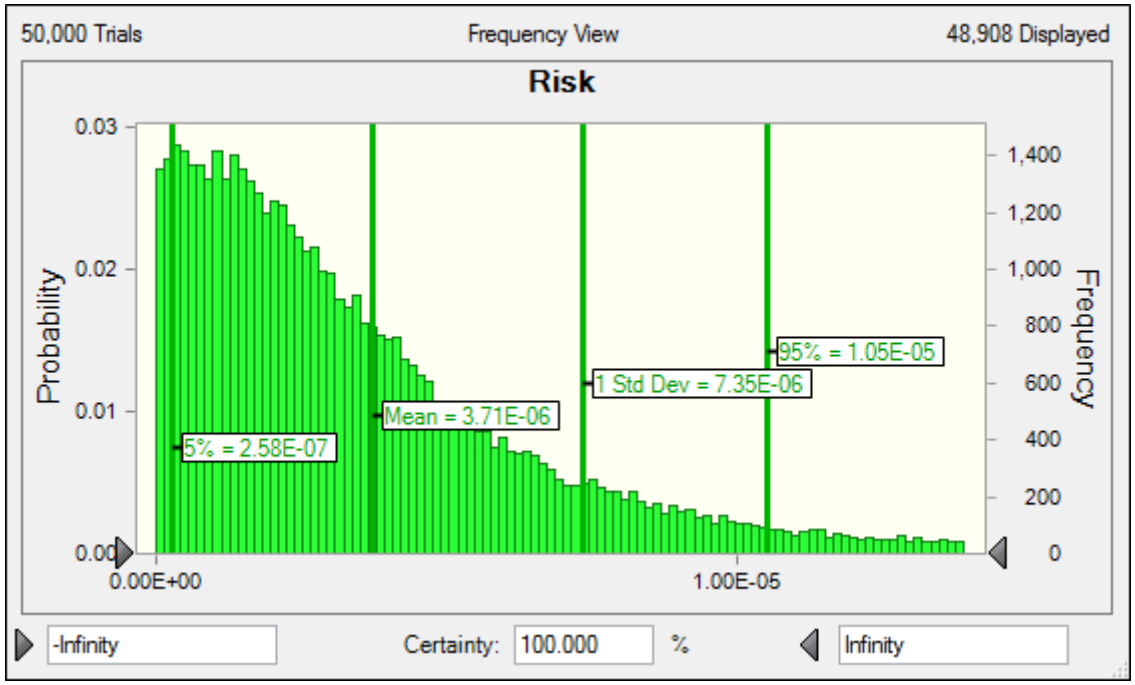
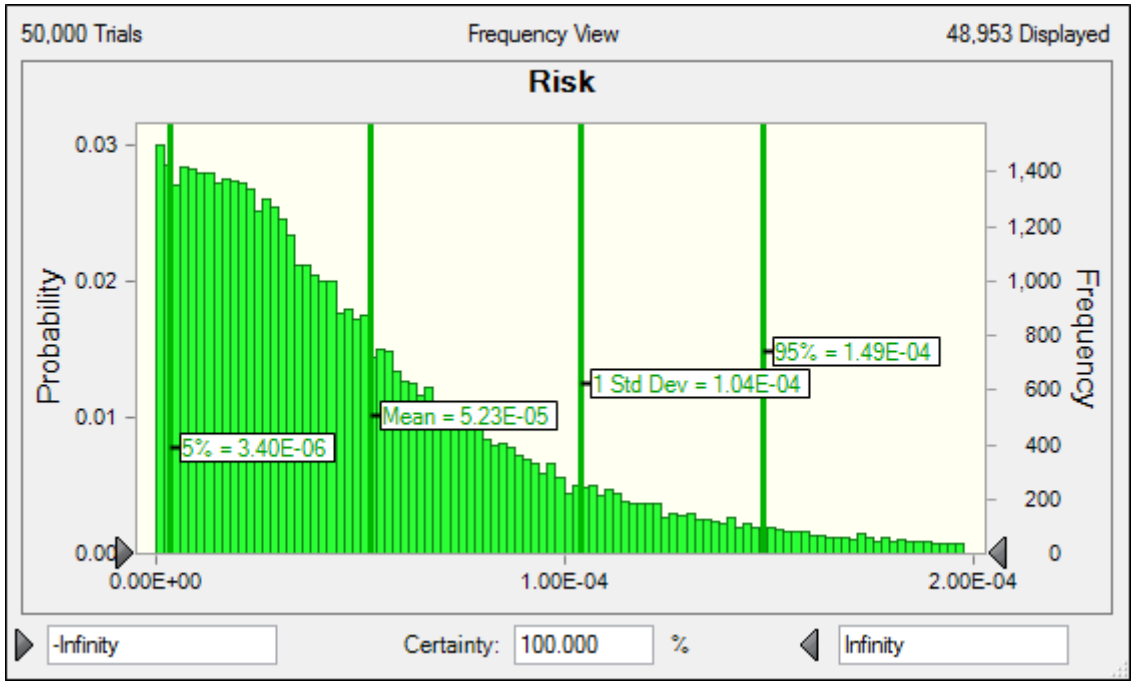
1.50E-03
2.00E-03
2.50E-03
-Infinity
Certainty: 100.000 %
Infinity

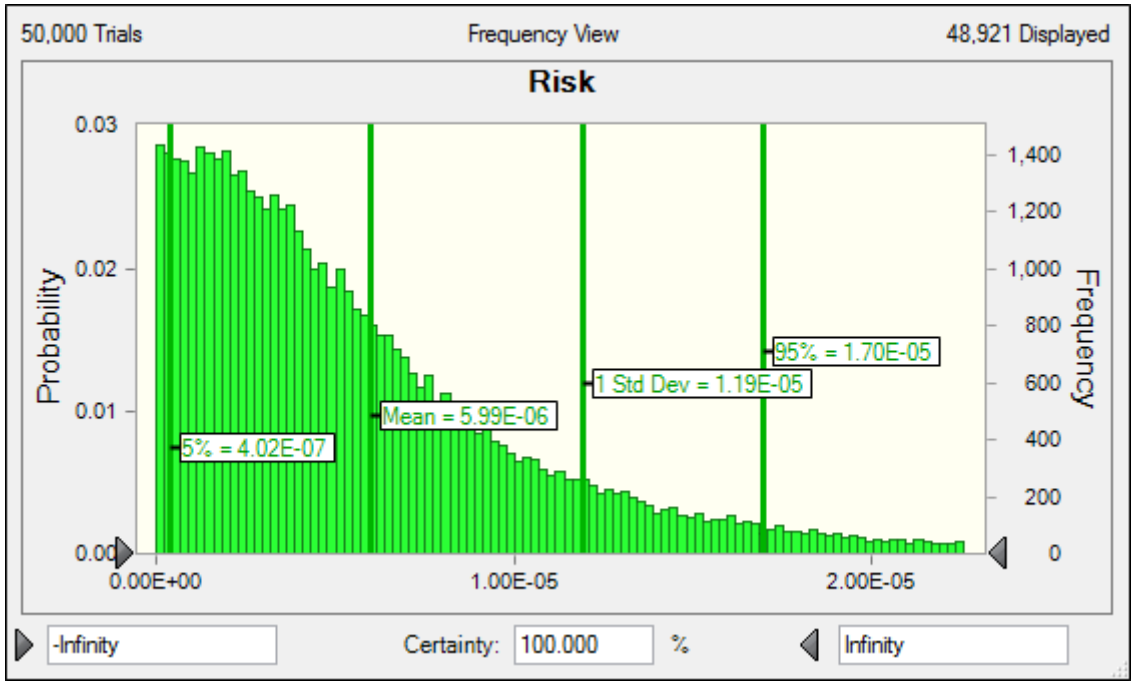
Romania



Pakistan



Arab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Frequency View
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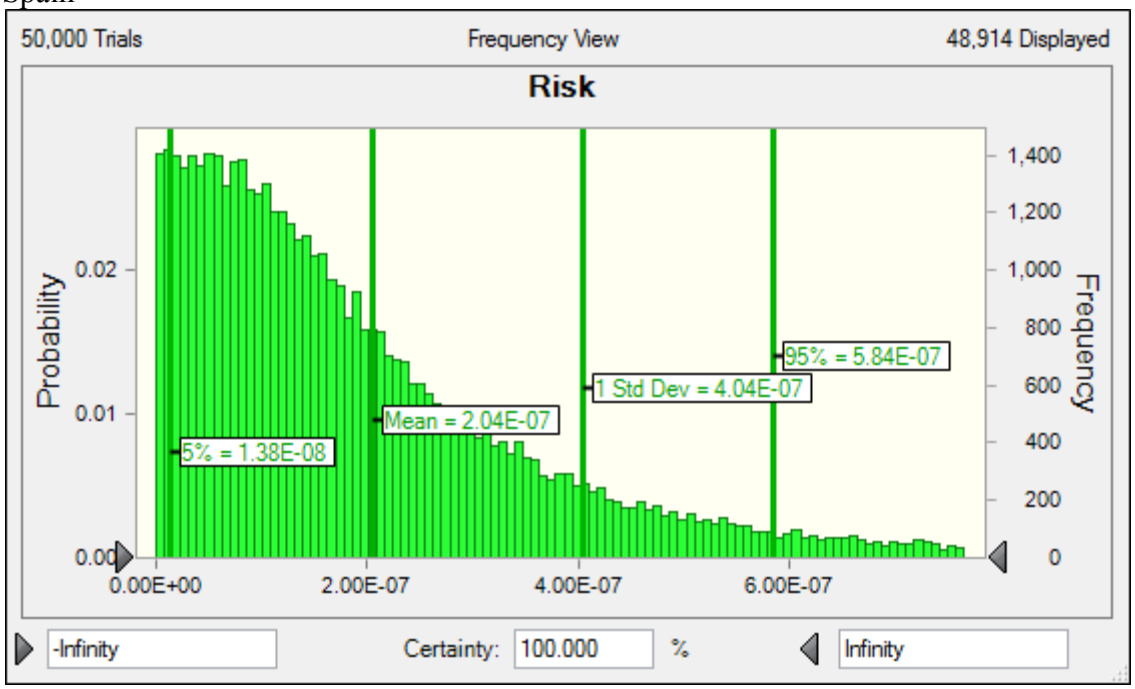
Risk
Probability
Frequency
0.03
0.02
0.01
0.00
1,400
1,200
1,000
800
600
400
200
0
95% = 1.70E-05
1 Std Dev = 1.19E-05
Mean = 5.99E-06
5% = 4.02E-07
0.00E+00
1.00E-05
2.00E-05
-Infinity
Certainty: 100.000 %
Infinity

Spain


50,000 Trials
Frequency View
48,914 Displayed
Risk
Probability
Frequency
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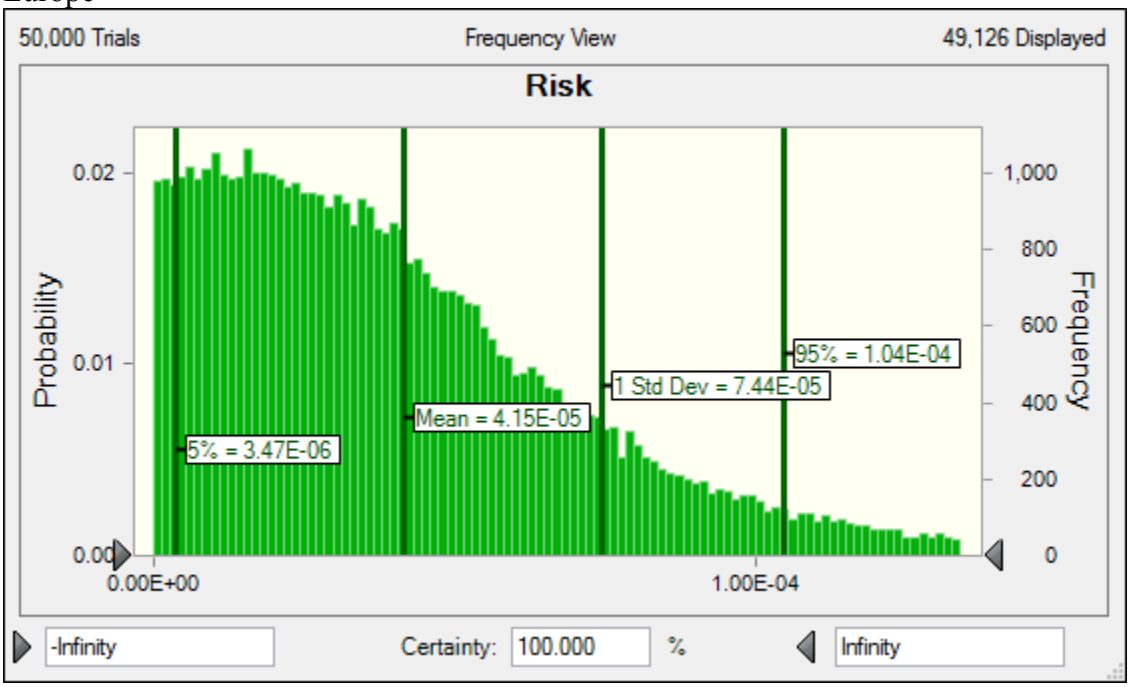
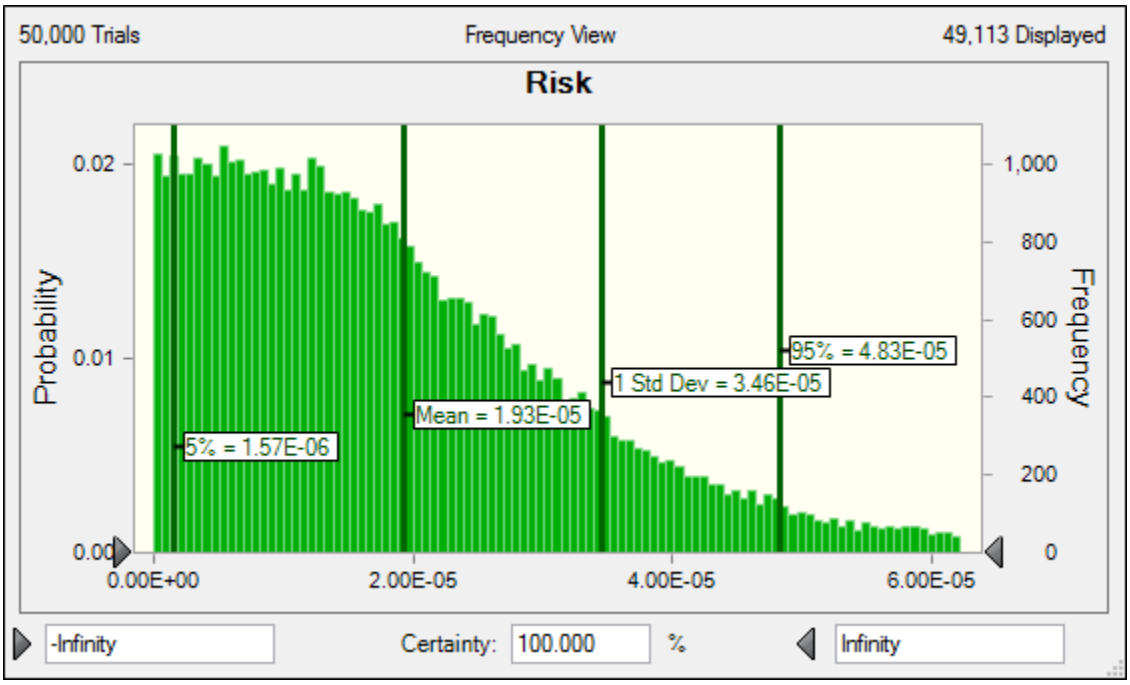
0.00
1,400
1,200
1,000
800
600
400
200
0
95% = 5.84E-07
1 Std Dev = 4.04E-07
Mean = 2.04E-07
5% = 1.38E-08
0.00E+00
2.00E-07
4.00E-07
6.00E-07
-Infinity
Certainty: 100.000 %
Infinity

Adults

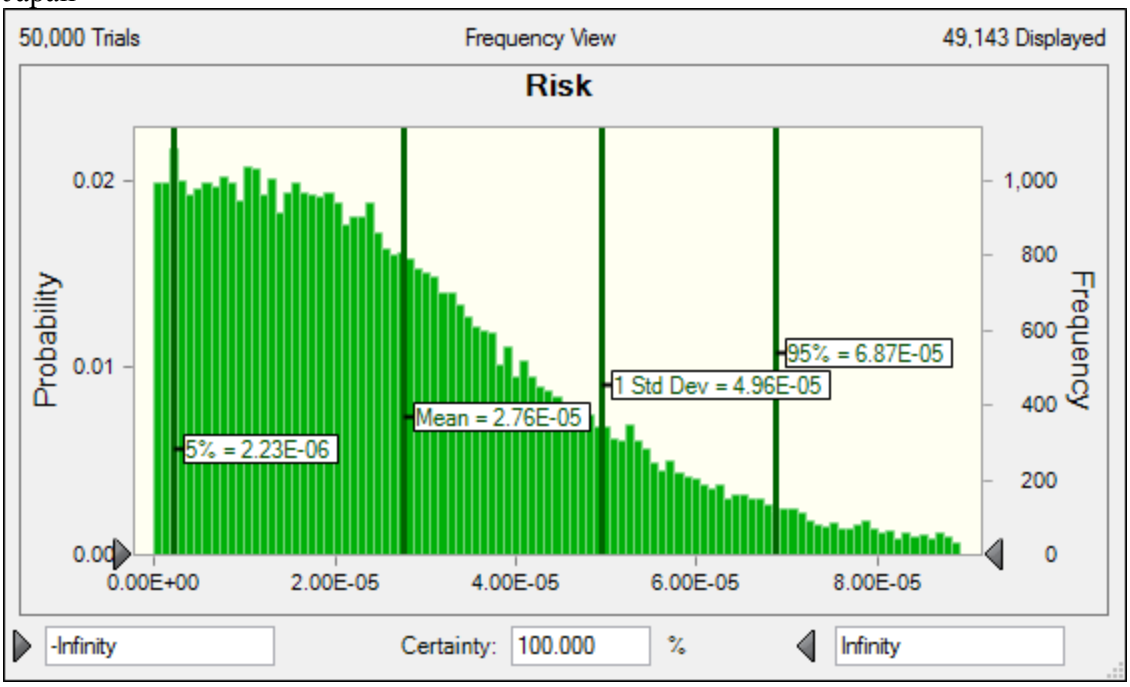
Europe



India



Japan


50,000 Trials
Frequency View
49,143 Displayed
Risk
Probability
Frequency
0.02
0.01
0.00
1,000
800
600
400
200
0
0.00E+00
2.00E-05
4.00E-05
6.00E-05
8.00E-05
95% = 6.87E-05
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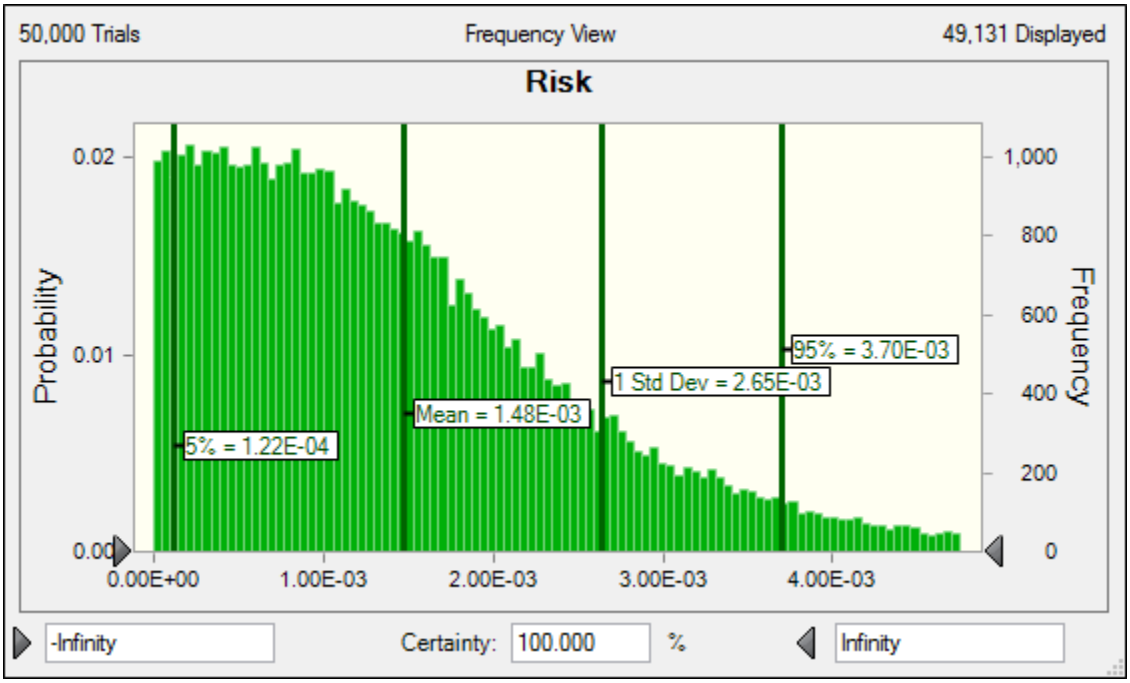
Mean = 2.76E-05
5% = 2.23E-06
-Infinity
Certainty: 100.000 %
Infinity

China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Frequency View
49,131 Displayed
Risk
Probability
Frequency
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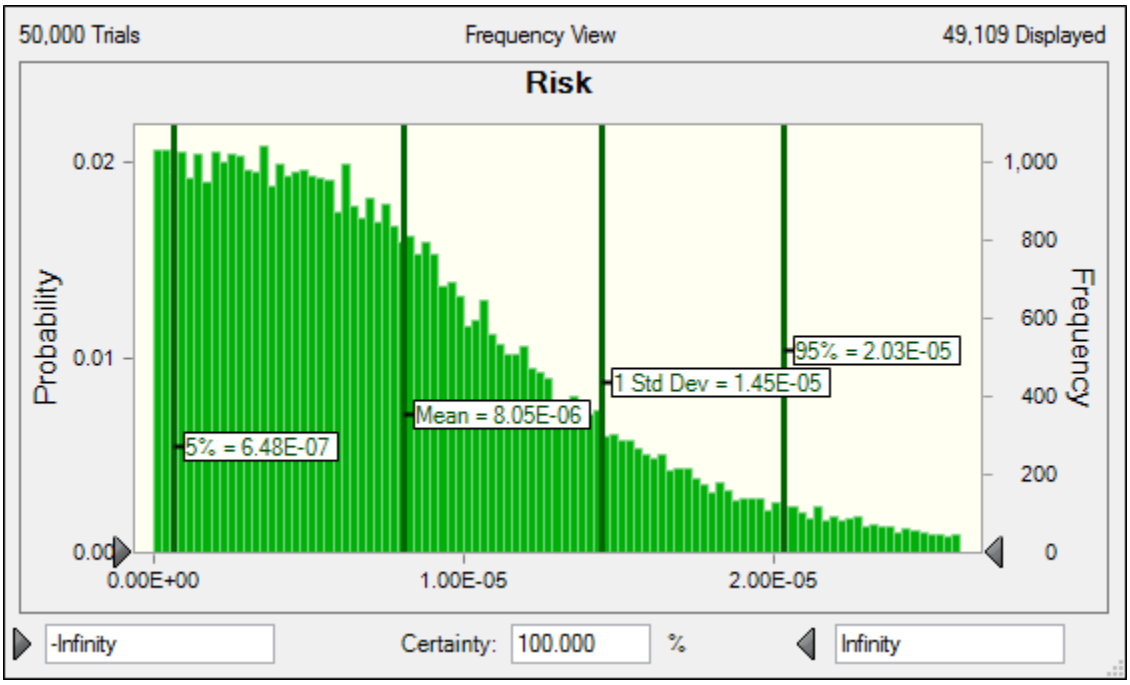
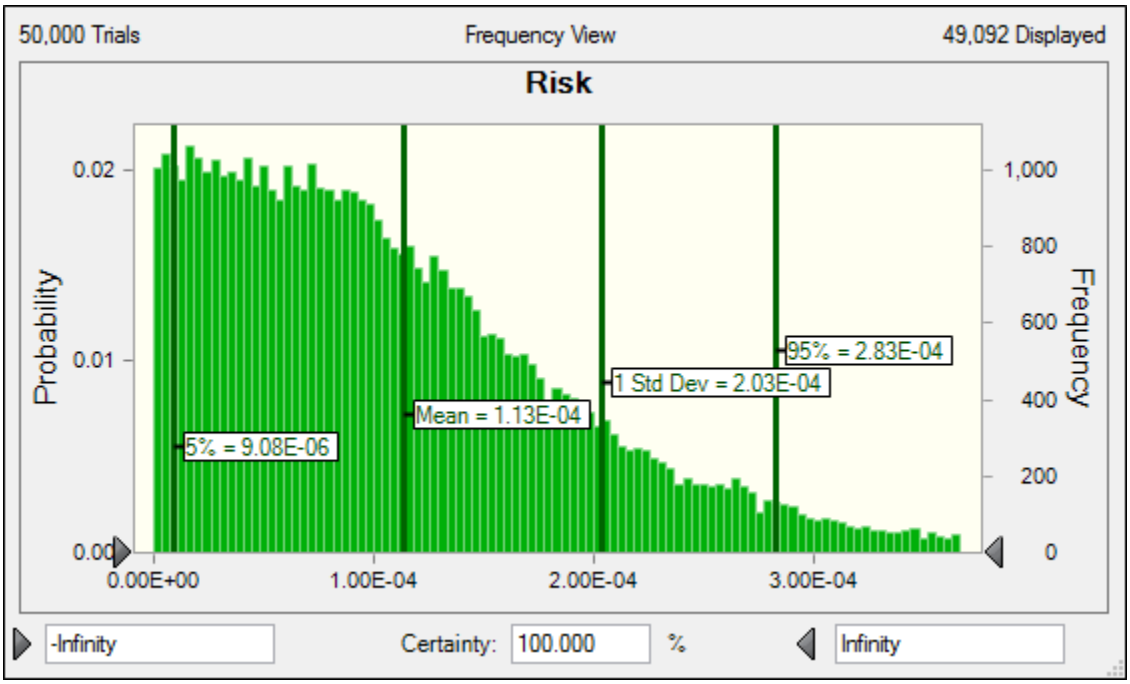
0.01
0.00
1,000
800
600
400
200
0
0.00E+00
1.00E-03
2.00E-03
3.00E-03
4.00E-03
95% = 3.70E-03
1 Std Dev = 2.65E-03
Mean = 1.48E-03
5% = 1.22E-04
-Infinity
Certainty: 100.000 %
Infinity

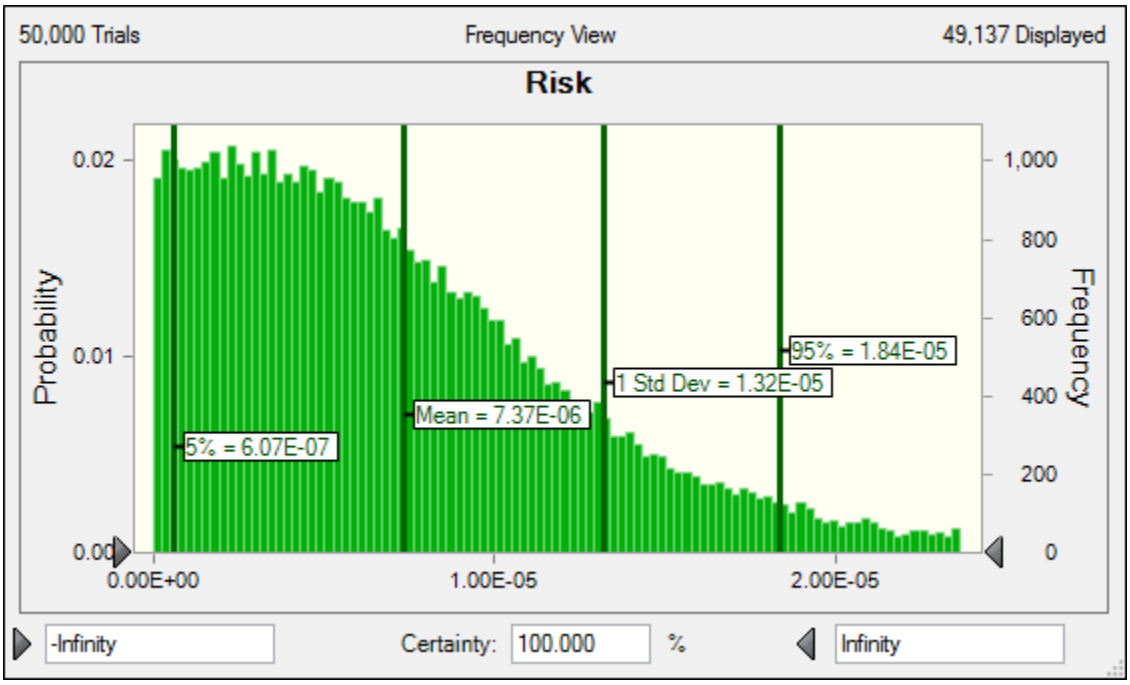
Romania



Pakistan



Arab


50,000 Trials
Frequency View
49,137 Displayed
Risk
Probability
Frequency
0.02
0.01
0.00
1,000
800
600
400
200
0
0.00E+00
1.00E-05
2.00E-05
95% = 1.84E-05
1 Std Dev = 1.32E-05
Mean = 7.37E-06
5% = 6.07E-07
-Infinity
Certainty: 100.000 %
Infinity

Spain

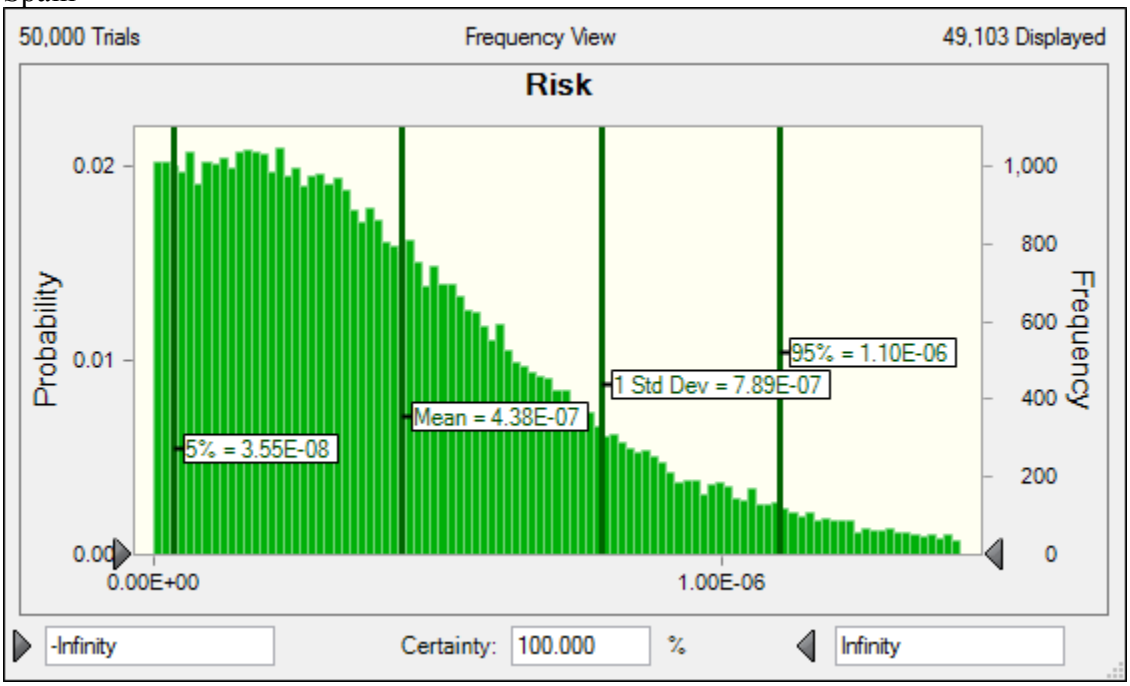

50,000 Trials
Frequency View
49,103 Displayed
Risk
Probability
Frequency
0.02
0.01
0.00
1,000
800
600
400
200
0
0.00E+00
1.00E-06
95% = 1.10E-06
1 Std Dev = 7.89E-07
Mean = 4.38E-07
5% = 3.55E-08
-Infinity
Certainty: 100.000 %
Infinity

Table S3. The detailed description of the source data used for purpose of assessment: arithmetic mean values (μg kg^{-1}) of every PAHs in food reported earlier. [Nap naphthalene, Acen acenapthene, Acyn acenapthylene, Flu fluorene, Phen phenanthrene, Anth anthracene, Flan fluoranthen, Pyr pyrene, BaA benz[a]anthracene, Chry chrysene, BbF benzo[b]fluoranthene, BkF benzo[k]fluoranthene, BaP benzo[a]pyrene, DBA dibenzo(a,h)anthracene, IP indeno(1,2,3-Cd) pyrene, BgP benzo(g,h,i)perylene]

	Nap	Anth	Acen	Acyn	Phen	Flu	Flan	BaA	Chry	Pyr	BaP	BbF	BkF	DBA	BgP	IP	Total
Spain meat	2.25	1.69	0.244	1.2	9.41	1.52	3.75	0.48	0.62	3.59	0.13	0.22	0.12	0.107	0.091	0.093	25.515
Spain Fish	1.73	0.19	0.52	0.23	1.36	0.54	0.92	0.21	0.36	0.64	0.14	0.44	0.2	0.1	0.2	0.17	7.95
Spain Vegetables	0.38	0.06	0.09	0.06	0.133	0.28	0.078	0.024	0.27	0.085	0.024	0.024	0.024	0.024	0.028	0.0275	1.6115
Spain Fatty Food	10.5	1.23	1.23	1.23	1.23	1.23	1.23	0.498	0.498	1.66	0.5	0.5	0.5	0.5	0.5	0.5	23.536
Spain Bakery	2.39	0.43	0.61	0.28	5.12	1.5	1.99	0.11	0.2	1.18	0.07	0.11	0.072	0.065	0.12	0.118	14.365
Portugal Beef	13.15	0.915	0.915	7.315	7.74	4.22	3.54	0.885	0.65	4.16	0.45	0.92	0.26		0.635		45.755
Portugal Salmon	5.08	9.135	9.31	10.95	35.88	10.66	21.04	4.82	12.08	16.94	3.04	3.19	0.71	0.76	1.22	0.59	145.405
Tunisia Sea Food	78.537	1	20.0127		41.6	2.02	19.637	9.091	8.197	9.612	0.785	5.312	1.887	0.277	12.33	2.412	212.7097
Poland Bread					11.86	6.645		0.3332	0.61	3.436			0.166				23.0502
Poland Meat						12.36		1.53				0.09	0.35	0.7	0.36		15.39
UK Beef Burger								10.2	14.44		13.4	7.93	4.15	0.94	11.7	9.24	72
China Vegetables	493.187	162.16	30.95	20.9	221.1	47.362	255.71	127.812	201.187	188.2	125.562	159.762	146	27		101.6	2308.492
China Smoked Duck	58.4	10.7	6.3	11	32.8	11.8	15.2	13.3	5.7	16.9	9	8.2	2.3			4.7	206.3
China Grilled Duck	73.8	9.5	5.7	10.6	55.3	8.3	29.9	5.5	29.7	47.1	5	8.3	6.9			2.7	298.3
Romania Vegetables	424	0.49	0.365	0.258	0.6925	0.335	0.212	0.166	0.047	0.128	0.277		0.282	0.338	0.298	0.406	428.2945
Europe Meat							148.75	54.05	0.1	177.3	78.55	0.02	0.005	0.005	57.05		515.83

Europe Fish		2.1			35.66		31.84	6.32	0.76	29.56	2.12	0.32	0.208	0.03	0.786	0.24	109.944
Europe Mussels		0.3			3.066	0.233	5.567	2.4		3.933	2.7	6.033	3.166	0.6	4.133	2.133	34.264
Europe Vegetables		0.0275			197.98		80.3	6.216		45.166	4.2	1.016	0.6166	0.166	4.616	3.733	344.0371
Europe Fruits		1.4			8.375		7.4	0.9	0.45	3.375	0.5375	0.175	0.125	0.025	0.45	0.525	23.7375
Europe Cereals		2.425	0.46		21.2	1.52	26.78	2.3	0.14	9.94	1.168	0.066	0.0408	0.004	0.08	0.1	66.2238
Japan Hijiki	24.6	21.5			66.2		19.9		3	16.1	3.8	4.3	2.5	5.3			167.2
Japan Bonito	271.5	292.1	34.7		649.5	182.8	186.3	24.9	47.6	145.8	8.5	9.4	4.3	2.5	2.5		1862.4
Japan Shitteke	25.5	118.9	8.2		217.7	29.5	93.5	6.9	12.7	73.1	6.3	5	3.4		2.5		603.2
Italy Haliotis	29.033	0.576	16.33	18.833	0.936	1.596	4.106	1.47	1.99	5.746	7.11	1.846	6.153	2.356	5.066	5.82	108.967
India Vegetables	22.7	2.84	33.55	20.7	8.35	3.04	4.17	2.81		15.52	0.929		0.18	1.37	3.87		120.029
India Fruits	7.31	5.41	0.79	11.86	0.87	2.67	3.01	0.25		2.17	0.34		0.371	0.096	0.97		36.117
Malaysia Grilled Meat							21.62				1.905	1.87					25.395
Pakistan Vegetables	44.5	19.76	8.35	12.9	47.39	9.68	40.9		11.05	67.41	9.45	11.5	4.54	4.04	2.35	4.19	298.01
Saudi Arabia Vegetables		1.75						2.654				1.572	1.442	1.244	1.059		9.721
Ghana Grilled Fish	5	22.23	22.23	17.1	51.72	213.45	146.55	27.79	26.95	236.53	20.15	25.68	7.99	3.4	9.68	3.48	839.93
Croatia Mussels		0.33	33.6		10	12.33		2.9	12.16	6.58		5.08	5.08				88.06
Turkey Mussels	377.57	58.857	61.14	131.42	127.85	25.28	87.57	498.42	1515.4	73.42	949	68.71	68.71	62.571	18	70.14	4194.058
Turkey Meat		64.84			30.38	20.08											115.3
Iran Smoked Fish		4		1.12		2.96	2.9	0.48	1.94	1.5	2.68	1.3		0.22	0.66	0.36	20.12