Preliminary Evidences of Increased Susceptibility to Infectious Pulmonary Disease (Tuberculosis ?) among Rural South Vietnamese with a History of Potential Direct Contacts with Agent Orange.

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An outbreak of infectious pulmonary disease closely resembling tuberculosis, that is customary for S. Vietnamese villagers, was registered in the village Binh My (a place for Agent Orange "AO" study of the Tropical Center) last year. A basic questionnaire developed for the purposes of AO epidemiological study[1] was filled in for 24 peasants who were applied to local medical station. These data were compared with the results of AO epidemiological investigation fulfilled in the year 1989. A history of potential contacts with AO for these patients is presented in the following table (number of diseased patients/number of requested villagers in the ERG):

	M			F		
ERG*	21-30	31-50	>50	21-30	31-50	>50
2	0/54	0/54	0/11	0/59	0/95	0/12
3	–	–	2/19	–	–	–
4	2/5	9/21	–	1/12	5/37	–
5	–	4/29	–	–	–	1/15

* AO Exposure Risk Groups: "2" - controls (time of residence "T" ≤10 y), "3" - potential indirect exposure from the environment (T > 10 y), "4" and "5" potential direct contacts, exposure index values MET1 ≤ .269 m/f and .269<<.507 m / .567 f, T >10 y.[2]
Sharply increased incidence of the disease among persons with a history of potential direct exposure to AO (m > f) can be suggested from these data if a random applying to the medical station can be supposed.

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It is well known that low socio-economic status, malnutrition, intensive smoking and alcoholism are the main determinative factors in chronic respiratory diseases and tuberculosis development. Due to a low alcohol consumption among the villagers and diseased patients a special investigation was performed to compare nutritional status, smoking habit, history of malarial morbidity and contacts with conventional pesticides in the ERG using data collected at 1989 ("One-way ANOVA", 95 % c.i., "Contigency Table", frequency, %, rounded, chi-square test):

	ERG	M		F	
		21-30	31-50	21-30	31-50
	2	3199÷4511(18)	2719÷3802(23)	2885÷3495(29)	2844÷3495(49)
Rice	3	4219÷5311(26)	3644÷4315(60)	3378÷3905(67)	3188÷3658(94)
g/week	4+5	3579÷5787(6)	2707÷4005(16)	2031÷3331(11)	2051÷3548(8)
p		.096	.044	.30	.375
	2	48÷229	63÷189	26÷157	40÷99
Meat	3	111÷259	37÷115	87÷173	35÷78
g/week	4+5	67÷317	52÷204	57÷269	71÷137
p		.67	.27	.45	.057
	2	40÷92	42÷92	16÷42	33÷64
Oil	3	28÷70	28÷58	33÷50	32÷55
g/week	4+5	9÷100	25÷84	15÷58	22÷57
p		.59	.25	.30	.75
Smoking	2	25.9	23.6	1.7	4.5
frequency	3	34.8	37.6 2.0	18.7	
%	4+5	55.6	16.7	0	14.9
p		.18	.003	0.86	.0025
Malaria	2	13.0	11.1	3.4	7.2
frequency	3	20.3	13.6	6.8	5.7
%	4+5	33.3	9.7	0	9.1
p		.27	.69	.41	.57
Pestici-					
des,intoxi-	2	0	0	6.8	4.0
cations	3	5.8	7.1	6.9	4.9
frequency	4+5	11.0	6.0	0	3.2
%					
p		.12	.10	.57	.85
URD*	2	14.8	25.0	5.1	8.1
frequency	3	21.7	22.9	20.6	14.5
%	4+5	55.6	30.6	46.7	19.5
p		.021	.47	.0004	.064

* - incidence of upper respiratory diseases (more than 4 times during last year).

From the table it can be seen that there are no prominent differences between the ERG "4+5" and the ERG "2" and/or "3" for the main characteristics of protein-calorie nutrition, smoking, history of malarial morbidity and pesticides intoxication. Thus, these factors seems to be not significant for a possibility of further development of the disease in the exposed ERG from subpopulational point of view, but individual differences may be important. At the same time, a consistent increase in the URD frequency with the increasing risk of AO exposure in the early childhood indicate a possibility of long-term AO-related immuno-supressive effect existence in the appropriate ERG.
Current characteristics of nutrition and potential disease-provocating factors influence, collected from the diseased patients from the ERG "4+5" (1993), are summarized in the next table (ranges, frequency, %, rounded):

	M		F		
	21-30(2)	31-50(13)	21-30(1)	31-50(5)	>50(1)
Rice g/week	5000÷5000	4000÷6000	4000	4000÷5000	4000
Meat g/week	200÷200	140÷600	600	150÷600	50
Oil g/week	20÷40	20÷60	30	20÷60	50
Smoking	100	60	+	60	+
Malaria	50	31	+	20	+
Pesticides intoxications	0	0	0	0	0

+ - a smoker, history of past malarial disease.

Better current protein-calorie nutrition, a tendency to more intensive smoking and to the increased incidence of past malarial disease may be characteristic of diseased patients. Thus, only intensive smoking and malaria can act as the disease-provocating, aggravating or concomittant factors on the background of past direct exposure to AO. From these preliminary observations it may be suggested that past potential direct contacts with AO may be one of the main causative factors for increased susceptibility to the registred infectious pulmonary disease (presumably tuberculosis) in the period of its spreading in a given subpopulation with a smoking and past malarial morbidity as potentialy important factors. An epidemiologic investigation with a basic and tuberculosis-specialized questionnaries and differential tuberculosis-diagnosing technique implementation (Koch's mycobacteria testing in sputum, rentgenographic examination) is in progress now to verify this suggestion. A role of AO-induced lung tissue deterioration, of potential hidden immunosuppresive long-lasting dioxin effects

and of certain micro-nutrients deficiencies[1,3] may be clarified by investigating associations between the disease and MET1,2 and inhalational component of MET1 values, between the disease and characteristics of socio-economic, nutritional, toxicologic and health status.

1 Roumak V, Poznyakov S, An N, Kim Chi H, Thu T, Sofronov G, Sokolov V, Kountzevitch A. Epidemiological and clinical laboratory studies on health consequences of Agent Orange in the South Vietnam. Dioxin '92. 10:275-8.
2 Roumak V., Poznyakov S., Antonyuk V., Thu T., Kountzevitch A. Significant associations between questionnaire - derived measures of past exposure to Agent Orange and health outcomes in subpopulation of rural S. Vietnamese. Dioxin '93, this volume.
3 Poznyakov S., Roumak V., An N., Bykhovsky V., Kountzevitch A. System study of alterations in vit A status among rural S.Vietnamese exposed to Agent Orange. Dioxin'92.