

FINAL REPORT

**A STUDY OF THE HEALTH COMPLAINTS
RELATED TO AERIAL ERADICATION
IN COLOMBIA**

**DEPARTMENT OF NARIÑO
MUNICIPALITY OF EL TABLÓN DE GÓMEZ**

**BOGOTA D.C. - COLOMBIA
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- 9 October 6, 2000 letter from Dr. Juan Carlos Vela, Pasto Department Health Institute Epidemiology Section Chief, to Dr. Carlos Sarmiento, Director General of Public Health, responding to request for reports on spray-related health effects (describing seven reports from towns in Nariño)
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Tape of interviews with Aponte Health Center Health Promoter and Nurse's Aide.
Video

EXECUTIVE SUMMARY

This case study was undertaken to examine claims that aerial spraying of illicit narcotics crops in Colombia has harmed human health in spraying areas. Specifically, this case study responds to an international press report from late December 2000 that alleged that skin rashes and lesions had occurred among children as a result of exposure to glyphosate mixture used in aerial spraying. That report and this case study focus on the community of Aponte in northwest Nariño Department. Aerial spraying of illicit opium poppy occurred there on the following dates in 2000: June 30-July 5; July 7-8; and July 19-20. Aerial spraying occurred again November 2-3; November 5-6; and November 17.

Findings: This case study reviewed all available records for patients seen by the local physician at the Aponte Health Center, Dr. José Tordecilla during the period (approximately) July 2000 through February 2001.

- Of the 29 patients examined, medical records were available for 21. Various skin conditions were diagnosed, but none included a diagnosis of glyphosate poisoning.
- Twelve of the 21 patients had experienced the onset of skin problems at times unrelated to the July and November spraying dates. In eleven patients, the onset of symptoms occurred in September or October 2000, well after the June-July spray and well before the November 2000 spraying. In the other case, the onset of symptoms occurred almost one month before the July 2000 spraying. Moreover, eight of the eleven were diagnosed with conditions which are caused by bacteria or parasites, not pesticide exposures.
- Of the seven cases in which the symptoms started relatively soon after the sprayings, two were diagnosed with pyodermitis, which is caused by a bacteria, and treatment with antibiotics (indicated for bacterial conditions) was given. The third was diagnosed with scabies, which is caused by a parasite. Consequently, these three can be ruled out as having a relationship with the spraying based on the diagnoses and courses of treatment.
- For the remaining four cases symptoms began during or after the spraying and the diagnoses correspond to conditions that could be caused by chemical exposure. These cases, therefore, cannot be ruled out as having a relationship to spraying. None of the cases were serious, however, and the evolution of the illnesses and the treatment suggests infectious or other causes.

- The medical records of one of the 21 patients showed treatment for skin problems. Those records, however, were undated. This precludes definitive conclusions about a possible temporal relationship with spraying, although neither chart indicated exposure to spraying. That diagnosis was “scabies vs. eczema.” If the patient had scabies, the condition, by definition, was caused by a parasite, not by chemical exposure.

Moreover, review of Nariño Department of Health statistics confirm that for the two year period of 1998-1999, i.e., well before any spraying occurred, the three most frequently reported health problems in Aponte, (as in all of Nariño Department) were respiratory, gastro-intestinal and skin problems. Required reporting to the Nariño Department of Health for the period November 15, 2000-March 7, 2001, i.e., the four month period immediately following the November 2000 spraying, included no reported cases of poisoning by herbicides, including glyphosate, in Aponte.

Conclusion: The findings of this report indicate that in the vast majority of cases, reported health problems are not caused by aerial spraying. Symptoms were reported either before or well after any spraying had occurred. Of the few cases that did occur during or shortly after spraying, about half reflect endemic conditions common to this area of rural poverty, not by exposure to glyphosate. For the others, the medical records make no mention of pesticide exposure, but reflect altogether different diagnoses.

This case study was commissioned and paid for by the Narcotics Affairs Section of the United States Embassy in Bogotá. It was conducted independently by Dr. Camilo Uribe, a leading toxicologist in Colombia and the Director of Clinica Uribe Cualla, the national poison control center.

1. INTRODUCTION

1.1 DESCRIPTION OF STUDIED AREA

The municipality of El Tablón, in Nariño Department in southern Colombia, was founded in 1760 by Lorenzo Gómez and was built in 1834 by the Pasto Town Council. It lies in the Department of Nariño at 1,650 meters above sea level. It is located 64 kilometers from Pasto, the Department capital, which is located at 01° 25' 47" latitude North and 77° 06' 00" latitude West. It has an average temperature of 20°C. Its total population is 16,770, with a rural population of 14,879 and an urban population of 1,891.

Aponte is a village within El Tablón municipality. There are no reliable official data on its population, but it is estimated to be approximately 5,000 - 8,000. Approximately 2,100 of Aponte's residents live on the Native Indian Reservation that belongs to the Inga tribe.

El Tablón municipality covers 255 square kilometers and borders on the north with Roberto Payán and La Cruz, on the east with the Department of Putumayo, and on the south and west with Buesaco. The territory is mountainous, and includes the Doña Juana volcano and the Páramo de Cascabel, Cascabel, and Tajumbina mountains. The Aponte, Guacatú, Juanambú and Juanoy Rivers flow through the municipality, in addition to several small rivers and streams. Its lands are located in temperate, cold, and high mountain climates. The economic activities of most importance are farming, ranching, and trade. The main crops are coffee, corn, wheat, oats, and potatoes. There has also been illicit cultivation of opium poppy.

The municipality has three health centers and 92 "centers of attention" for children operated by the Colombian Family Welfare Institute (ICBF is the Colombian acronym). These centers offer children's services, including nutrition and general well-being, day care, and child abuse services. El Tablón also has a preschool building with 19 students and 1 teacher; an elementary school with 153 students and 8 teachers, and a middle school with 171 students and 11 professors. The rural sector has a preschool building with 29 students and one professor, 38 elementary schools for a total of 1,844 students and 84 professors; two middle schools for a total of 231 students and 26 professors. The town has waterworks, electrical power, telephone, telegraph and national mail services.

One of the three health centers is in Aponte. It is staffed by a medical doctor, a nurse, and a nurse's aide. During the time period of the treatment in question in this report (approximately July 2000 - February 2001), the medical doctor in Aponte was Dr. José Vicente Tordecilla, who was performing his required post-graduate social service. This required service is generally one year, except in the most remote zones such as Aponte, where it is six months.

As described below, the total population in El Tablón with unsatisfied basic needs is 11,308. Of these, 6,153 have social security coverage and 5,150 do not, which means inadequate health services for the latter group.

Aerial eradication of illicit opium poppy took place in the region in June, July, and November 2000. A chart indicating the dates and locations of the spraying is annexed as Attachment 1.

1.2 MORBIDITY AND MORTALITY IN THE MUNICIPALITY OF EL TABLÓN

The Nariño Departmental Health Institute provided consolidated information on morbidity and mortality in the municipality of El Tablón de Gómez for the year 1999. The data for 2000 has not yet been officially released and has not yet been consolidated at the Nariño Department Health Institute.

According to these data, the ten principal causes of morbidity in the municipality of El Tablón are:

- Acute Respiratory Infection (ARI)
- Acute Diarrhea (AD)
- Dermatitis
- High Risk Reproduction
- Oral Health Illnesses
- Peptic Acid Illness
- Urinary Tract Illnesses
- Cephalea
- Cervical Cancer

The first three illnesses are related to unsatisfied basic needs, such as inadequate nutrition, housing, and health services. Unfortunately, this is very common in this and other rural areas. Of the total population of 16,770, there are 11,303 persons with unsatisfied basic needs (67.5% of the population).

1.2.1.A MORBIDITY TABLE - EL TABLÓN DE GOMEZ 1999

PATHOLOGY	0-4 years	5-14 years	15-44 years	45-60 years	Over 60 years
AD	98	21	12	12	3
ARI	248	160	102	30	28
DERMATITIS	59	34	81	20	15
INTOXICATION	0	0	0	1	0
CONJUNCTIVITIS	26	15	15	7	12
CEPHALEA	0	9	81	30	19

**1.2.1.B MORBIDITY TABLE - EL TABLÓN DE GOMEZ 2000
(ESTIMATED)**

PATHOLOGY	0-4 years	5-14 years	15-44 years	45-60 years	Over 60 years
AD	124	33	18	7	4
ARI	298	56	84	36	32
DERMATITIS	79	50	87	28	21
INTOXICATION	0	0	2	2	0
CONJUNCTIVITIS	22	15	18	17	13
CEPHALEA	2	13	87	36	13

1.2.1.C MORBIDITY TABLE - APONTE SETTLEMENT 1999

PATHOLOGY	0-4 years	5-14 years	15-44 years	45-60 years	Over 60 years
AD	70	77	16	8	10
ARI	80	43	37	14	25
DERMATITIS	65	63	50	19	13
INTOXICATION	0	1	3	0	0
CONJUNCTIVITIS	6	8	50	22	1
CEPHALEA	3	25	21	28	1

**1.2.1.D MORBIDITY TABLE - APONTE SETTLEMENT 2000
(ESTIMATED)**

PATHOLOGY	0-4 years	5-14 years	15-44 years	45-60 years	Over 60 years
AD	113	42	10	11	14
ARI	79	56	47	23	17
DERMATITIS	49	39	58	23	11
INTOXICATION	1	2	1	0	0
CONJUNCTIVITIS	9	13	40	39	3
CEPHALEA	8	14	33	38	2

In Aponte, the age group with the highest incidence of AD, ARI, and dermatitis generally is the infant population from 0 to 4 years old, although dermatitis (a general term encompassing a number of skin conditions) is nearly as common in persons aged 5-44 as in very young children.

"Intoxication" means poisoning by any means, including overdoses of medications, occupational or other exposures to toxic chemicals (including pesticides), ingestions of poison, etc. In Aponte, the complaints reported in the

media to be due to exposure to spraying involved young children. The data above do not support this conclusion, however, as the greatest number of intoxications occurred in young adults aged 15 to 44. This is consistent with nationwide data, which show that 53% of all intoxications in Colombia are suicides or attempted suicides by toxic intake in this age group. Similarly, skin problems (dermatitis) are fairly equally distributed across the first three age groups, not concentrated in very young children to the exclusion of other groups, as news reports have suggested. (In fact, if the 2000 estimated data is correct, skin conditions actually decreased in Aponte in children aged 0 - 14 in 2000, the year that aerial eradication began in the area. As noted, however, this data is not yet official.) The various forms of conjunctivitis are another important illness that prevails in young adults aged 15 to 44.

1.3 EPIDEMIOLOGICAL MONITORING SYSTEM AND MANDATORY NOTIFICATION

Colombia has a mandatory health reporting system under which 34 pathologies must be reported weekly by each Health Institute to the Office of Epidemiology at the Department Health Institute or the closest reference center in the area. The mandatory weekly reports for Nariño indicate that the municipality of El Tablón did not report any cases of intoxication due to pesticides at any time during the year 2000, nor in weeks 1-9 corresponding to the months of January and February, 2001. A list of the 34 pathologies which must be reported, and weekly reports for the year 2000 and the period January-February 2001, are annexed as Attachment 5.

In addition to the mandatory notification, in 2000 the Epidemiology Section of the Nariño Department of Health requested that all municipalities in Nariño submit a report on the effects of spraying on human health, particularly those which had extra-official knowledge of aerial spraying with glyphosate. Reports from these municipalities are annexed as Attachments 7 and 9. Ten municipalities responded as follows (with dates of their reports in parentheses):

- Buesaco (June 10, 2000) reported one case of a patient from the Santa Fé settlement with a sore throat, numbness in the upper and lower limbs, and conjunctivitis.
- Tablón de Gómez., settlement of El Tablón (July 12, 2000). No cases were reported.
- San José de Alban (July 18, 2000). The scientific coordinator and the chief nurse reported increases in the incidence of pathologies such as gastrointestinal, dermatological, and respiratory conditions.

- Tumaco (October 6, 2000). Six cases of patients with cases of conjunctivitis and dermatitis were reported from the settlements of Chagui, La Chorrera, and Lorente.
- Barbacoas (October 6, 2000). No cases were reported.
- Magui. Payan (October 6, 2000). No cases were reported.
- El Rosario (October 6, 2000). The director of the health center reported that there could be a relationship between the July 31 spraying carried out on in the settlement of El Rincón and five cases of conjunctivitis and rhinitis.
- San Pedro de Cartago (October 6, 2000). An increase in gastrointestinal symptoms was reported.
- San Pablo (October 6, 2000). Fifty cases of dermatitis, conjunctivitis, respiratory conditions, and digestive problems were reported after spraying in and near the settlement of Briceño.
- La Cruz (October 6, 2000). Nine cases of allergic rhinitis, dermatitis, and conjunctivitis were reported.

2. INVESTIGATION AND PREPARATION OF REPORT

The Clínica Uribe Cualla work team was comprised of Dr. Camilo Uribe Granja and Dr. Olga Lucía Melo. We undertook the following activities in conducting this investigation and preparing this report.

2.1 TELEPHONE INTERVIEW WITH DR. JOSE VICENTE TORDECILLA

The Nariño Department Health Institute informed us that Dr. José Vicente Tordecilla had been employed at the Aponte Health Center during the approximate period July 2000 - February 2001. The Institute provided us with a telephone number for Dr. Tordecilla in the municipality of Planeta Rica (Department of Cordoba), where he was working in another rural health center. We spoke with him by telephone on May 4, 2001. He told us that, during the time of the spraying in question, the number of dermatological medical consultations at the Aponte health center had certainly increased, but that at no time had he concluded that there was a relationship between the spraying and those problems.

Dr. Tordecilla offered to send a written report of what he had seen and recorded during that period to Dr. Olga Melo, in order that we could attach it to this report, but he did not do so. We called the Planeta Rica health center again on Friday, May 11, 2001, but were informed that Dr. Tordecilla no longer worked there and that the center had no contact information for him.

2.2 REVIEW OF REPORT OF JANUARY 22, 2001 VISIT TO THE MUNICIPALITY OF EL TABLÓN DE GOMEZ

A commission visited the municipality of El Tablón on January 22, 2000 (at the request of the Governor of Nariño) in order to review reports of health problems suspected to be due to aerial spraying of opium poppy. The commission was comprised of the following persons:

- Francisco Ángulo, Redepaz (non-governmental organization)
- Manuel Teodoro, ABC News correspondent (with two assistants)
- María del Pilar Zamudio, Ethnic Group Division of the Nariño Governors Office
- Juan Carlos Vela Santacruz, Epidemiology Section Chief, Nariño Department Health Institute
- Dr. Lorena Vasquez, El Tablón Health Center Director
- Town hall representative

Members of the commission spoke to Dr. José Vicente Tordecilla, the physician at the health center at that time, and reviewed the records of his patients. They did not examine patients. Their report to the Nariño Department Health Institute (annexed as Attachment 11) consisted of a list of the patients who were seen for skin conditions during the months of October, December and January (2000-2001), classified according to race, gender, origin, and months of consultation. These data show that most of the patients came from Aponte; the majority were females; and the greatest number of skin lesions was seen in children under the age of 9 (the same characteristics as the group with the highest incidence of skin lesions in outpatient and emergency statistics reported in 1998-1999 in this region).

The report concluded that the information available permitted the commission to consider only the possibility of an association between exposure to pesticides and the effects described by Dr. Tordecilla, but that establishing a true cause for the conditions reported would require technical expertise the commission did not possess, as well as access to data on the dates and locations of spraying and the products used. It stated that, for the time being, medical surveillance should be increased and technical assistance should be requested of the National Office of Dangerous Drugs (Colombian acronym "DNE").

2.3 INTERVIEWS WITH NARIÑO DEPARTMENT HEALTH OFFICIALS REGARDING THE SPRAYING

We traveled to the city of Pasto on May 3 and 4 , 2000 and interviewed employees of the Epidemiology Section of the Nariño Department Health Institute, including Nurse Blanca Gómez and El Tablón/Aponte Health Director Dr. Lorena Vásquez.

The Health Institute employees provided background information as well as a tape recording of interviews conducted at the Aponte Health Center some months before. Dr. Vásquez did not know the origin of the recording, the identity of the interviewers, or the date of the interviews.

The interviews addressed the impact of aerial spraying on health in the Department of Nariño. The persons interviewed were Fátima Health Promoter Aracely Martínez and Aponte Health Center Nurse's Aide Gloria Villota.

Below is a summary of the two interviews, and the full transcripts are annexed as Attachment 20.

2.3.1 Summary of Interview with the Fátima Health Promoter (Aracely Martinez)

- What is your opinion on how the spraying has affected the inhabitants?

The children were most affected; they suffered gastrointestinal problems and eye irritation. The population in general is very needy; therefore the Health Promoter requests aid from the government in her answer.

- Did the Health Personnel give medical attention to the persons affected?

The Health Center attended to some cases, and others were remitted to the El Tablón Health Center. There was one case of a boy with skin lesions like "sores" after the spraying.

- Do you know the dates of the spraying and the exact sites sprayed?

On June 8 there was spraying in the settlement of Fátima. They sprayed pea crops. She requested a government subsidy for the damage. She said she had made a tape recording on June 8 in which she heard the pilots of two small spray planes saying "dump it in that pasture over there - I have so much quantity."

- What have the Municipal Administration, the Health sector, and other entities done up to now to solve the problems related to the spraying?

Persons such as the native Indian reservation governors, ombudsmen, and municipal representatives have evaluated the situation to try to make claims to relevant entities to suspend the spraying.

- What is your message to the central government regarding intervention in this issue?

Help the peasants. The resources aimed at helping farmers grow legal crops have not arrived. She suggests supervision so that they can work.

2.3.2 Summary of Interview with Aponte Health Center Nurse's Aide (Gloria Villota)

- What was your experience with the patients who came to seek help at the health centers?

She was at the Pompeya Health Center when four patients with burning eyes, headache, and dizziness arrived. She mentioned a boy who arrived with acute respiratory infection; he was sent to the El Tablón Health

Center where he arrived dead. She also referred to a patient with urinary problems who was admitted to the Department Hospital in Pasto. She said that there had been cases of dermatitis, cephalgia, abdominal pain, and gastrointestinal symptoms, but they cannot really say that these cases are related to the spraying.

- What measures have been taken up to now?

The El Tablón Health Center has enough personnel to attend its patients, and people prefer that health center for security reasons. There are people who say this problem is not due to the spraying but to other problems. There are many similar problems.

- What entities or institutions have joined the health sector to solve this problem?

The municipal administration has collaborated in this situation. It has supplied free services such as ambulances, lab tests, and medicine.

- What is your message to these communities and to the central government?

She recommends that the people who are affected go to the health centers immediately when they require medical care. She requests aid from the government for the needy population with unsatisfied basic needs and she says that they need better health services.

2.3.3 Comments on the Interviews

We reviewed the clinical histories of the two cases that the nurse's aide mentioned and found out the following. Copies of the clinical histories are annexed in Attachment 17a.

1. (Name Deleted)¹. Clinical History No. 4944. There is no report in the Clinical History of any medical consultation for acute respiratory infection, because no doctor attended to him at the Aponte health center and he reportedly arrived dead at the Tablón health center. Since there is no data in the Clinical History, nor was there an autopsy, no conclusions can be made.

2. (Name Deleted). Clinical History No. 2200. Seen on February 24, 2000 with a four-day evolution of odynophagia, general discomfort, dysuria and urine the color of coca-cola. Although the doctor's final diagnosis was Acute Tonsillitis (based on a physical exam in which he found hyperemic focuses in the tonsils),

¹ According to Law 23 of 1982 (Medical Ethic Code) the patient's names are omitted to guarantee the confidentiality of the clinical history.

the clinical symptoms correspond to a serious urinary tract infection. The history does not make reference anywhere to an admission. These problems appear to be of an infectious origin unrelated to exposure to glyphosate.

In addition, Dr. Camilo Uribe spoke by telephone with Nurse's Aide Gloria Villota, who admitted that her impression of an increase in the number of dermatological consultations was subjective, that the reasons for the consultations were the same as in previous years, and that she would not commit to establishing a relationship between the spraying and the dermatological conditions.

2.4 VIDEO

During our visit to Pasto, Dr. Vásquez told us that there were some videos at the Aponte Health Center that had been recorded by reporters, but she did not know who the reporters were. She sent us a copy of the video, which purported to show spraying that occurred on November 3, 2000, at 9 :45 a.m. (a date on which spraying in fact did take place). The journalist comments that there was also spraying on November 2 and that this was a disaster for the community "because they bring calamities". He states that the source of the Aponte River is in the mountains, that the spraying contaminates its water, and that this "produces ecological disaster."

The video also shows Carolina Garzón (an Environmental Engineer from PLANTE, the Government of Colombia's alternative development agency) speaking, apparently to students. In her introduction she states that spraying is disastrous for plants, animals, and humans.

She also gives advice on abandoning illicit crops. She states that these crops generate problems because they require the use of pesticides, fertilizers, and other agricultural chemicals for their maintenance and their use clearly leads to health risks for the farmers.

A copy of the video is available for those who wish to view it.

2.5 REVIEW OF RECORDS OF PATIENTS TREATED AT APONTE HEALTH CENTER - SEPTEMBER 2000 TO JANUARY 2001

Of the twenty-nine (29) cases reported by Doctor Jose Vicente Tordecilla, the Aponte health center was able to locate twenty-one (21) clinical histories, as well as records for two other patients who, according to what Dr. Tordecilla told the commission described in Section 2.2 above, had sought attention for skin lesions, but whose records did not reflect visits for skin conditions. These two records are annexed as Attachment 17b.

2.5.1 PATIENTS REPORTEDLY SEEN BY DR. TORDECILLA FOR SKIN CONDITIONS BUT WHOSE RECORDS DO NOT REFLECT SUCH VISITS

1. (Name Deleted). Clinical History No. 42. In the clinical history there is no report of the dermatological medical consultation that Dr. Tordecilla described in his oral report. The last consultation appears to have been on November 25, 2000 for a post-partum examination.

2. (Name Deleted). Clinical History No. 4334. The last medical consultation recorded was on September 9, 1998 for diarrhea. No recent dermatological medical consultation was found.

2.5.2 SUMMARY OF THE 21 RECORDS OF PATIENTS TREATED BY DR. TORDECILLA

The clinical histories of the patients we evaluated are annexed in Attachment 16 and are arranged by age, location, date of medical consultation, and diagnosis.

The diagnoses made by Dr. Tordecilla were:

DIAGNOSIS	No. OF PATIENTS	PERCENTAGE
SCABIES	9	43%
PYODERMITIS	6	29%
DERMATITIS OR ECZEMA	5	29%
ALLERGIC REACTION	1	4%

The term "Pyodermitis" encompasses a number of conditions, including impetigo, furunculosis, and atopia. None of the records reflect notes that any patients were exposed to spraying or diagnoses of glyphosate poisoning. The lack of such diagnoses is also reflected in the July 6, 2000 "Report of Observers' Commission Regarding the Problem of Spraying with Glyphosate in Buesaco, Tablon de Gomez, and San Jose de Alban" (annexed as Attachment 8).

The chart on the following pages (also annexed as Attachment 13) sets forth a summary of the relevant data for the 21 patients of Dr. Tordecilla who were treated for skin conditions and for whom records were available.

**CLINICAL HISTORIES EVALUATED
IN APONTE BY CLINICA URIBE CUALLA**

No.	CLINICAL HISTORY NO.	AGE	RESIDENCE	DATE SYMPTOMS STARTED	DR. TORDECILLA'S DIAGNOSES	COMMENTS
1	3198	2 YEARS	APONTE	May 25, 2000	Scabies	Symptoms started May 2000, prior to any spraying. Scabies is caused by a parasite. Specialists diagnosed impetigo, which is caused by bacteria.
2	33xx (last two digits not legible)	4 YEARS	APONTE	October 12, 2000	Impetigo	In September and October there was no spraying. Impetigo is caused by bacteria.
3	4950	10 MONTHS	APONTE	October 8, 2000	Scabies	In September and October there was no spraying. Scabies is caused by a parasite.
4	2689	10 YEARS	LA ISLA	October 10, 2000	Scabies	In September and October there was no spraying. Scabies is caused by a parasite.
5	547	27 YEARS	APONTE	October 20, 2000	Scabies	In September and October there was no spraying. Scabies is caused by a parasite.
6	5289	1 ½ MONTHS	APONTE	July 7, 2000	Pyodermitis	Pyodermitis, caused by bacteria, has an infectious etiology, and treatment with antibiotics was initiated.
7	3155	6 YEARS	APONTE	October 20, 2000	Impetigo	In September and October there was no spraying. Impetigo is within the group of illnesses known as Pyodermitis, caused by bacteria, i.e. an infectious etiology.
8	3685	4 YEARS	APONTE	October 8, 2000	Furunculosis vs. Contact Eczema	In September and October there was no spraying. Furunculosis is within the group of illnesses known as Pyodermitis, caused by bacteria, i.e. an infectious etiology.

No.	CLINICAL HISTORY NO.	AGE	RESIDENCE	DATE SYMPTOMS STARTED	DR. TORDECILLA'S DIAGNOSES	COMMENTS
9	Not Indicated	15 YEARS	APONTE	July 19, 2000	Allergic Reaction	Cannot draw a causal conclusion with certainty, but had been seen for same symptoms in April 2000 before spraying had started.
10	4235	3 MONTHS	APONTE	NOT REPORTED	Scabies vs. Contact Eczema	Although the date of the symptoms is not reported, scabies is caused by a parasite.
11	5037	8 YEARS	LA ISLA	October 6, 2000	Scabies	In September and October there was no spraying. Scabies is caused by a parasite.
12	549	10 MONTHS	FATIMA	October 27, 2000	Contact Eczema At Perianal Level	In September and October there was no spraying. The patient presented symptoms of diarrhea and peri anal secondary injuries due to irritation produced by diarrhea in the peri anal area.
13	3109	9 YEARS	PARAMO	October 30, 2000	Scabies vs. Contact Eczema	In September and October there was no spraying. Scabies is caused by a parasite.
14	289	31 YEARS	APONTE	October 12, 2000	Contact Eczema	In September and October there was no spraying. The patient had chronic symptoms of contact dermatitis before any spraying.
15	5125	9 MONTHS	APONTE	December 10, 2000	Contact Eczema	Diagnosis is contact eczema, which can be caused by exposure to glyphosate + surfactants; however, Dr. Tordecilla initiated treatment with antibiotics, suggesting infectious origin. Symptoms began 23 days after last spraying.
16	5101	6 YEARS	PITALITO ALTO	September 29, 2000	Scabies vs. Contact Eczema	In September and October there was no spraying. Scabies is caused by a parasite.

No.	CLINICAL HISTORY NO.	AGE	RESIDENCE	DATE SYMPTOMS STARTED	DR. TORDECILLA'S DIAGNOSES	COMMENTS
17	5540	4 YEARS	APONTE	November 17, 2000	Dermatitis	Some types of dermatitis can be caused by exposure to glyphosate + surfactants; however, treatment was with antibiotics, suggesting an infectious origin.
18	4809	6 YEARS	APONTE	November 10, 2000	Scabies	Scabies is caused by a parasite.
19	3503	3 YEARS	APONTE	October 20, 2000	Impetigo	In September and October there was no spraying. Impetigo is within the group of illnesses known as Pyodermitis, caused by bacteria, i.e. an infectious etiology.
20	2290	29 YEARS	APONTE	January 8, 2001	Contact Eczema	Diagnosis is contact eczema, which can be caused by exposure to glyphosate + surfactants; however, Dr. Tordecilla initiated treatment with antibiotics, suggesting infectious origin. The symptoms began 52 days after the last spraying.
21	3861	18 MONTHS	APONTE	July 23, 2000 Sep. 1, 2000 Nov. 17, 2000	Pyodermitis Scabies, Impetigo Impetigo	Pyodermitis/impetigo have bacterial causes. Scabies is caused by a parasite.

NOTES:

1. None of the medical records mention history or incidents of chemical exposures.
2. June-July spraying took place on June 30 and July 1, 3, 4, 5, 7, 8, 19, 20.
3. November spraying took place on November 2, 3, 5, 6, and 17.
4. Clinical History Numbers have been substituted for names for reasons of privacy.

2.5.3 PHOTOGRAPHS

The Nariño Department Health Institute gave us copies of photographs taken at the Aponte Health Center in November 2000 (apparently by Dr. Tordecilla), illustrating these patients' dermatological problems. The photographs are annexed in Attachment 18.

Dermatologist Dr. Angela Susana López of Bogotá reviewed the photographs and concluded that the conditions shown correspond to pathologies with infectious origins. Her letter dated May 12, 2001 is annexed as Attachment 15. Our comments on each photograph, and those of Dr. Lopez, are set forth below.

PHOTOGRAPHS # 1 and # 2. Reviewing the clinical histories obtained and the data on the children shown in the photographs, this patient is **(Name Deleted)** (Attachment 13, No. 1). Dr. Tordecilla diagnosed this child as suffering from scabies, a condition caused by a parasite. The patient was remitted to a dermatologist in Pasto who stated that he had infected eczema. (This specialist's opinion is attached to the clinical history.) It should be noted that this patient's symptoms began on May 25, 2000, before any aerial eradication took place.

At our request, Dr. Angela López reviewed this patient's records and the photographs. Dr. López is a Medical Doctor graduated from El Rosario University with a specialization in Dermatology from Javeriana University. She agreed with the diagnosis of eczema made by the Pasto dermatologist, adding that this was a microbial eczema. In her opinion, the patient shows numular-erythematose desquamating blisters on his chest and limbs which clinically correspond to a microbial eczema in children with atopic dermatitis. Both specialists coincide in their diagnosis and the origin is obviously infectious, given the context of a child with atopy. This indicates a reaction of hypersensitivity associated with allergies when faced with a stimulus and is of a hereditary nature. The problem is very likely infectious in view of this population's very poor conditions and the widespread situation of unsatisfied basic needs. (See opinion in Attachment 16, No. 1)

PHOTOGRAPH # 3. The girl shows ocular irritation. This is a secondary symptom due of many causes, among which are infections, allergies, and exposure to chemicals. There is no clinical history to go along with this photograph.

PHOTOGRAPH # 4. This patient appears to be **(Name Deleted)** (Attachment 16, No. 2). Dr. Tordecilla diagnosed impetigo, and Dr. López agreed, stating that the patient presents melisteric scab-forming sores in the nasal and nasolabial region, which clinically is a vulgar impetigo. The cause of this illness is the bacteria staphylococcus aureus, which has an infectious origin.

PHOTOGRAPH # 5. The patient shows the same symptoms as the above patient. This also is an impetigo.

PHOTOGRAPH # 6. There is no clinical history to go along with this photograph, but it is obvious that it is a mother with her newborn, apparently taken immediately after the birth, due to the characteristics of the infant's face showing signs of labor trauma. The mother has some clearly visible sores in the region of her elbow, which are continuity solution, that is to say, secondary escoriations after some trauma.

PHOTOGRAPH # 7. This is a photograph of Dr. José Vicente Tordecilla, Aponte Health Center rural doctor, at the time he attended the patients described above. The director of the El Tablón Health Center, Doctor Lorena Vásquez, informed us that this doctor left his job for reasons of public security.

3. CONCLUSIONS

An analysis of Health Institute documents, morbidity statistics, interviews with health officials, and the twenty-one clinical histories that we were able to obtain reveals that any relationship between aerial eradication with the herbicide glyphosate and the skin conditions treated in Aponte is unlikely.

First, at no time did Dr. Tordecilla state in the medical records that any symptoms were related to spraying, nor did he diagnose any cases of "glyphosate intoxication." As noted above, none of these cases were reported in the mandatory weekly reports to the Narino Health Institute Section of Epidemiology. In addition, 81% of all the patients are children under 14 years old, are underweight, have nutrition problems, and suffer from dermatological problems (especially scabies, pyodermitis and dermatitis) which are among the five main causes of morbidity in the region.

Second, twelve of the 21 patients (57%) had onset of their symptoms at times unrelated to the spraying. One of the twelve (Attachment 16, No. 1, corresponding to Photographs Nos. 1 and 2) had onset of his symptoms on May 25, 2000, almost a month before any spraying began. The other eleven had onset of symptoms in September or October 2000 (Attachment 16, Nos. 2, 3, 4, 5, 7, 8, 11, 12, 13, 14, 16, and 19). These dates were well after the June-July spraying and well before the November spraying. Moreover, eight of the 11 were diagnosed with furunculosis, scabies, impetigo, or pyodermitis, which are caused by bacteria or parasites, not chemical exposures (all except Attachment 16, Nos. 8, 13, and 16).

For the remaining three patients from this group of twelve, the diagnoses reflected in Attachment 16, Nos. 8, 13, and 16 were furunculosis or scabies "vs. contact eczema." Furunculosis and scabies are caused respectively by bacteria and parasites, not chemical exposures. Contact eczema, on the other hand, may be caused by exposure to the spray products. However, such a reaction is unlikely unless pure glyphosate and polyexothylated tallowamine (POEA - the base in the surfactant blend of the primary spray product) had been applied directly to the skin for a period of 24 hours. Maibach (1986), using undiluted concentrated Roundup, found no evidence of irritation after 24 hours of continuous exposure, but did observe erythema in only 1 of 24 subjects with intact skin sites after 48 hours of continuous exposure. For the abraded skin sites (the surface of the epidermis was physically disrupted) following 24 hours of continuous exposure, 4 out of 24 subjects had an equivocal reaction, and 10 out of 24 exhibited erythema. However, following 48 hours of continuous exposure, 6 out of 24 subjects had an equivocal reaction and 8 out of 24 showed evidence of erythema. Maibach also reported, based on the results of a 21-day cumulative irritation assay (test material is applied 5 days weekly for 21 days to the same site) that the Roundup formulation was less irritating than either the all-purpose

cleaner or the dishwashing liquid. See also, International Programme on Chemical Safety, Environmental Health Criteria #159-Glyphosate (1994).

In contrast, any exposure due to spraying would be characterized by a much lower dose, since it would be sprayed from the air in a diluted mix with only one brief exposure likely (because spraying does not usually take place in the same place more than once). Moreover, symptoms of contact eczema would be seen within 24 hours after contact with a chemical substance, and would resolve within a few days. As noted in the preceding paragraph, even if these three patients did have contact eczema rather than conditions caused by bacteria or parasites, their symptoms did not begin within a short time after the spraying.

For one of the patients whose records we examined (Attachment 16, No. 10), no date was recorded for onset of symptoms, thus we cannot draw any conclusions about a possible temporal relationship with the spraying. The diagnosis in this case, as in the three discussed in the preceding paragraph, was "scabies vs. contact eczema." As discussed, if the correct diagnosis was scabies, this is a condition caused by a parasite, and if the correct diagnosis was eczema, a chemical exposure cannot be ruled out as a cause. The course of treatment (antibiotics), however, suggests that this condition was of an infectious origin.

As to the seven cases in which the symptoms started after the sprayings, two patients (Attachment 16, Nos. 6 and 21) were diagnosed with pyodermitis, which is caused by a bacteria, and treatment with antibiotics (indicated for bacterial conditions) was given. The third (No. 18) was diagnosed with scabies, which is caused by a parasite.

Therefore, these three (Attachment 13 Nos. 6, 18, and 21) can be ruled out as having a relationship with the spraying based on the diagnoses and courses of treatment.

For the remaining four cases (Attachment 16, Nos. 9, 15, 17, and 20) symptoms began during or after the spraying and the diagnoses correspond to conditions that could be caused by exposure to glyphosate. The evolution of the illnesses and the treatments, however, suggest infectious or other causes:

- No. 9 (diagnosis of allergic reaction) had been seen for the same set of symptoms in April 200, prior to any spraying.
- No. 15 (diagnosis of contact eczema) was treated with antibiotics, which, given the endemic nature of diseases in this region, suggests an infectious origin.
- No. 17 (diagnosis of dermatitis) was treated with antibiotics, suggesting an infectious origin, given the endemic nature of disease. Also, the lesions were on the thigh in an area typically protected by clothing.

- No. 20 (diagnosis of contact eczema) was treated with antibiotics, suggesting an infectious origin, given the endemic nature of disease. Her chart states that her husband suffered the same condition. Her symptoms initiated on January 8, 2001, 52 days after the last spraying.

Exposure to pesticides, however, cannot be ruled out in these cases.

To summarize, of the 21 cases for which records were available, the great majority (17 cases) suffered from skin conditions that are either unrelated in time to the spraying or caused by other agents (i.e., bacteria, parasites). Only the four described immediately above reflect symptoms (e.g. contact dermatitis) that are consistent with glyphosate exposure documented in the scientific literature. The timing of the appearance of symptoms and the course of treatment suggest other causes.

4. BIBLIOGRAPHY

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ATTACHMENTS

- 1 Dates and Locations of Illicit Poppy Crop Spraying, Municipality of El Tablón- Aponte Settlement (Nariño), June-November 2000
- 2 Department of Nariño Geographical Map and Municipality of El Tablón Map
- 3 Department of Nariño Population by Age Groups for the Year 2000
- 4 Diagnoses for Outpatient Visits, Municipality of El Tablón, 1998-1999
- 5 Mandatory Weekly Notification Reports for Weeks 1 through 52 in 2000 and for Weeks 1 through 9 in 2001
- 6 Undated letter from Dr. Carlos Sarmiento, Director General of Public Health, to Juan Carlos Vela, Pasto Department Health Institute Epidemiology Section Chief, requesting reports of health effects due to aerial spraying
- 7 June - July 2000 Reports of health effects thought to be related to aerial eradication, from the towns of Buesaco (6/10/00), Tablon de Gomez (7/12/00), and San Jose de Alban (7/18/00)
- 8 July 6, 2000 Report of Observers' Commission Regarding the Problem of Spraying with Glyphosate in Buesaco, Tablon de Gomez, and San Jose de Alban (noting that Dr. Gomez, Aponte Health Center director, reported no cases related to spraying)
- 9 October 6, 2000 letter from Dr. Juan Carlos Vela, Pasto Department Health Institute Epidemiology Section Chief, to Dr. Carlos Sarmiento, Director General of Public Health, responding to request for reports on spray-related health effects (describing seven reports from towns in Nariño)
- 10 January 16, 2001 Letter from Ingrid Cadena (REDEPAZ Coordinator in Nariño) to Dr. Juan Carlos Vela, Pasto Department Health Institute Epidemiology Section Chief, enclosing photographs taken in Aponte at time of the Dutch journalist's visit in late November 2000
- 11 January 22, 2001 Report of Visit to El Tablon by Commission appointed by Governor of Nariño
- 12 May 7, 2001 Letter from Nariño Health Dept. Section of Epidemiology to Olga Melo enclosing information

- 13 Chart summarizing diagnoses and dates of diagnoses for 21 patients treated by Dr. Jose Vicente Tordecilla at Aponte Health Center (prepared by Clinica Uribe Cualla)
- 14 Clinical History Questionnaires for Dr. Tordecilla's 21 patients (prepared by Clinica Uribe Cualla)
- 15 May 12, 2001 Letter from Dr. Angela Lopez (dermatologist) regarding observations of skin lesions in photographs
- 16 Copies of medical records for 21 patients treated by Dr. Jose Vicente Tordecilla at Aponte Health Center (with names redacted for privacy)
- 17 Copies of other medical records reviewed by Clinica Uribe Cualla
 - a. Clinical History Nos. 4944 and 2200 - Patients referenced in taped interview with Aponte nurse's aide
 - b. Clinical History Nos. and 4344, and 42 - Patients seen by Dr. Tordecilla who had not had recent medical consultations
- 18 Photographs
- 19 Review of toxicity of glyphosate formulations: Williams G., Kroes R., Munro I. Evaluation of the Safety and the Risks for Humans with Roundup Herbicide and its Active Ingredient, Glyphosate. Canada, 1999.
- 20 Transcript of interviews with Aponte Health Center Health Promoter and Nurse's Aide
- 21 Minutes of visit of Clinica Uribe Cualla to Nariño Department Health Institute

OTHER ITEMS AVAILABLE FOR REVIEW BY INTERESTED PARTIES:

Tape of interviews with Aponte Health Center Health Promoter and Nurse's Aide

Video