PAN AMERICAN HEALTH ORGANIZATION

Pan American Sanitary Bureau, Regional Office of the

WORLD HEALTH ORGANIZATION

PAN AMERICAN FOOT-AND-MOUTH DISEASE CENTER

SITUATION OF THE FOOT-AND-MOUTH DISEASE CONTROL PROGRAMS SOUTH AMERICA, 1995

October 1996

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The Hemispheric Plan for the Eradication of Foot-and-Mouth Disease (PHEFA) divided its strategy of action into five regional projects: Southern Cone, Andean Area, Amazonian Area and Brazil, Central America and Caribbean, and Free Countries. The following report describes the main changes in the epidemiological situation in the subregional projects in South America and the most relevant results achieved by the countries they comprise.

1. RIVER PLATE BASIN REGIONAL PROJECT. SOUTHERN CONE

This Project encompasses the following countries: Argentina, Brazil (Rio Grande do Sul, Santa Catarina), Chile, Paraguay and Uruguay. The area included in the Project had a very favorable epidemiological situation in 1995, and Chile and Uruguay remained free of foot-and-mouth disease. No clinical cases of the disease have been reported in Argentina since April, 1994, in Paraguay since September of 1994, or in Brazil's states of Rio Grande do Sul and Santa Catarina, since December 1993.

1.1 ARGENTINA

The last occurrence of foot-and-mouth disease was recorded in week 17 of 1994, in the province of Santa Fe; two years had passed without any report of clinical cases of the disease up to that date. This fact evidences the progress of the National Program, which has achieved a decline in the number of outbreaks from 196 in 1993 to 18 in 1994 and zero in 1995.

The Mesopotamia area, encompassing the provinces of Corrientes, Missiones and Entre Ríos, has not reported any cases of foot-and-mouth disease in three years.

The 1993-1997 Control and Eradication Plan, based on the epidemiological knowledge of the disease, divided the country into areas with and without vaccination. It relies on the activity of 350 Local Animal-Health Commissions that oversee more than 280,000 properties and 56 million head of cattle. These Commissions, independent entities composed of official representatives and members of the livestock-producing sector, administer, coordinate and execute the control activities at the local level. Concomitantly, the National Animal-Health Service (SENASA) controls animal transit for commercialization, fattening and processing purposes.

More than two years ago SENASA implemented a strict epidemiological surveillance policy that gradually evolved into a national system

stressing surveillance of the clinical disease and viral infection. Analysis of information has therefore become the major emphasis, which includes: (a) direct surveillance to detect the clinical disease or its lesions, by means of inspections conducted on ranches, points of animal mobilization and concentration, markets, check stations, mobile control posts on highways and inspection at slaughterhouses prior to and after slaughter; and (b) indirect surveillance to detect carriers by means of a system of serological surveys and throat-swab samples in the animal population susceptible to foot-and-mouth disease.

1.2 BRAZIL

Just as in 1994, no cases of foot-and-mouth disease were reported in the southern states, except for Paraná where six episodes were reported in May; virus type O was identified in three of those cases. The episodes occurred in the municipality of São Jorge do Patrocinio, near the border with Mato Grosso do Sul, in a zone which has been traditionally and predominantly dedicated to agriculture and has recently evolved toward an emphasis on cattle fattening. The overall attack rate was 45%. The episode was eliminated in a short time through application of emergency measures; 348 head of cattle and 54 pigs were sacrificed, while 5,230 head of cattle within the focal and perifocal areas were officially vaccinated in accordance with the state's control regulations.

No cases of foot-and-mouth disease have been reported in Rio Grande do Sul or Santa Catarina since December, 1993.

1.3 CHILE

Chile has maintained its status as a country free of both foot-and-mouth disease and vesicular stomatitis as a result of the good functioning of the Foot-and-Mouth Disease Prevention Program and the Exotic Diseases Epidemiological Surveillance Program. This Project encompasses three subsystems: prevention system, early detection system and emergency system.

The Agriculture and Livestock Service (SAG) has put into action a system to prevent the introduction of foot-and-mouth disease via the summer pastures up in the Andes Mountains, a system conducted in coordination with the national police force, the Corporation of Carabineros. The activities in the cordillera aim to reduce animal density and encourage early detection of the disease by means of a designated unpopulated area (buffer zone), delimitation and control of the utilization of the fields by issuing use permits to livestock raisers, populational censuses and assessment of the fields' populational capacity. During official visits the census data are updated and inspectors conduct clinical examinations of the animals. VIAA tests are conducted prior to concession of the authorization for the animals to move down from the high mountain pastures.

The process is complemented by characterization of the risk level and epidemiological surveillance on the borders, conducted in coordination

with the Argentine authorities within the framework of the Border Agreement. Visits are regularly made to the epidemiologically important border areas. SAG conducts similar activities along the borders with Peru and Bolivia, like those conducted during the foot-and-mouth disease outbreak on the Bolivian high plateau where the official services of the three countries participated in control measures.

Quarantine regulations regarding animals, animal products and by-products continue to be enforced at the 69 international sanitary check-points at ports, airports and border crossings.

1.4 PARAGUAY

No foot-and-mouth disease has been reported since September 1994, when the departamentos of Caaguazú, Canendiyú and Paraguarí were affected by virus type O. The western region reported its last outbreak in May of that same year. This situation, while the result of an eradication policy assumed by the national authorities, is also a reflection of the favorable health situation in the region included in the River Plate Basin Project.

The national eradication program has emphasized co-management of the administration of the activities, yielding increased vaccination coverage of cattle. The actual vaccination is conducted by official vaccinators or personnel authorized by the Animal Health Commissions, and includes the revaccination of cattle less than 24 months old that are going to be mobilized.

The epidemiological surveillance has been strengthened by a national alert system for quick notification of foot-and-mouth disease occurrence. During the period in review 37 notifications of suspicion of vesicular disease were investigated, but were discarded following clinical diagnosis and/or laboratory techniques.

Paraguay maintains 22 permanent transit-control stations; at seven of those stations this control is carried out with the cooperation of the Rural Association of Paraguay.

A very positive achievement was the promulgation of Law 808 covering Foot-and-Mouth Disease Eradication which, among other facets, establishes the gathering of operating resources and a fund for indemnizations.

1.5 URUGUAY

Inclusion of Uruguay as a country free of foot-and-mouth disease without vaccination was petitioned from the International Office of Epizootics (OIE) in June, 1995. It is hoped that this petition will be approved by the General Assembly scheduled for May, 1996.

In order to preserve this sanitary status, Uruguay in November 1994 set up a system of 23 sanitary check-points. The epidemiological

surveillance and information system has a strong local base, which enables it to locate and render attention to any suspicion of outbreak in four hours or less. In 1995 the services responded to 34 suspicions of clinical syndromes considered similar to vesicular diseases, but all proved negative to foot-and-mouth disease tests.

The Animal Health Service operates a National Sanitary Emergency System (SINAES) whose goal is to apply and coordinate all the operations in cases of emergency. It has a fund to cover the expenses of indemnization for animals sacrificed. The fund results from a tax of 0.21% levied on all products of livestock origin exported by Uruguay; it amounted to US$ 6.1 million in December, 1995.

At the close of 1995 the European Union and the USA, each acting independently, established commercial negotiations to import fresh frozen meat from Uruguay. In October, the EEC altered Decision 93/402/EEC which governs the exportation of fresh meats to the EEC from various South American countries. Consequently, Uruguay is in the same situation as Chile and the Argentine Patagonia region south of the 42nd parallel, and is allowed to export boned and deboned beef without aging or entrails directly for consumption.

The USA, through the APHIS/USDA publication issued 1/11/95, approved Uruguay as a country free of foot-and-mouth disease and since mid-November has imported a flow of Uruguayan fresh, chilled and frozen meats.

RIVER PLATE BASIN SUBPROJECT

The situation in the subproject area remains favorable; foot-and-mouth disease has been clinically absent in practically the entire area included in the second stage of the International Technical Cooperation Agreement for Control and Eradication of Foot-and-Mouth Disease in the River Plate Basin. Paraguay and the Argentine provinces of Santa Fé, Chaco, Formosa and north sections of the province of Buenos Aires have to date completed a year and a half without any report of outbreaks.

Only one outbreak was reported in the northwestern region of the state of Paraná, Brazil, as discussed above. The epidemiological characteristics of that outbreak and the type of active virus indicate that the agent had originated outside the region, an aspect that strongly reinforces the need to consolidate the sanitary barriers on the borders with neighboring countries.

The foregoing circumstances emphasize the tendency toward consolidation of the favorable situation in the Project Agreement's pioneering region. In less than two months Uruguay will complete two years without vaccination, the Argentine Mesopotamia will complete three years

without any outbreaks, and Rio Grande do Sul and Santa Catarina in Brazil have reached the two-year mark in the same situation.

2. AMAZONIAN REGIONAL AREA AND BRAZIL

2.1 Amazonian Area Subproject

This Subproject encompasses Guyana, French Guiana, Suriname, Pando (Bolivia), Loreto and Madre de Dios (Peru), Amazonas, Vaupés and Guainía (Colombia), Bolívar and Amazonas (Venezuela), Acre, Amazonas, Roraima, Pará, Amapá, Rondonia, Mato Grosso and Tocantins (Brazil). The Subproject received little attention from the member countries, which indicates a need for the countries to develop and strengthen the local structures of their national programs and to promote active participation by the livestock-raising sector.

The countries of the Subproject area, comprising Guyana, French Guiana and Suriname, have maintained their status as countries free of foot-and-mouth disease.

The Colombian Amazonian region recorded only one outbreak, in the departamento of Guainía, and did not provide information about vaccination activities.

The Amazonian area of Peru did not report any occurrences. Nevertheless, 608 animals were strategically vaccinated in Loreto.

The Amazonian part of Venezuela reported one episode in the state of Bolívar and 140,000 doses of foot-and-mouth disease vaccine were administered. An agreement was signed involving the Autonomous Agriculture and Livestock Health Service (SASA) of the Ministry of Agriculture and Livestock Breeding (MAC) of Venezuela and the Government of Bolívar, a state located near the free regions. Positive results have been produced. The meeting of the Border Agreement with Brazil was the only one held in the Region.

2.2 BRAZIL IN THE AMAZONIAN SUBPROJECT

For pragmatic reasons this item includes areas of Brazil encompassed in other subprojects already described above.

The Brazilian Animal-Diseases Project, which includes the National Foot-and-Mouth Disease Eradication Program, has been operating for five years with the goal of implementing a strategic approach to the control and/or eradication actions.

The national territory of Brazil has been split into five livestock circuits according to the degree of producer-epidemiological inter-relationships existing among the states, as follows:

(a) Southern Circuit, composed of Rio Grande do Sul, Santa Catarina and southern Paraná;

(b) Eastern Circuit, encompassing Espírito Santo, Rio de Janeiro, Bahia and part of Minas Gerais;

(c) Central-Western Circuit, comprising Mato Grosso, Mato Grosso do Sul, Goiás, Federal District, São Paulo, part of Minas Gerais, part of Tocantins, and northern Paraná;

(d) Northeastern Circuit, encompassing Sergipe, Alagoas, Pernambuco, Paraíba, Rio Grande do Norte, Ceará, Piauí and Maranhão;

(e) Northern Circuit, including Acre, Amazonas, Roraima, Amapá, Rondonia, Pará and part of Tocantins.

Contrary to the trend noticed over the previous seven years, during which the number of occurrences increased, the epidemiological surveillance system in Brazil identified 666 episodes in 1995, which meant a decline of 68% in relation to 1994.

Of the outbreaks from which samples were taken (273), 83 were identified as positive to virus type O,99 for A and 3 for C, in addition to 13 episodes of Indiana type vesicular stomatitis, of which 12 were found in Minas Gerais and one in Mato Grosso. In seasonal terms, the diseases were concentrated in the first half of the year.

The Eastern, Central-Western and Northeastern Circuits were the most affected, with 212 outbreaks (32%), 191 (29%) and 185 (27%), respectively. It is important to remember that in the state of Mato Grosso do Sul, the region's major livestock center, no episodes were recorded during the period in review.

Of the five livestock circuits, only the Eastern Circuit reported a slight increase in cases. The Central-Western and Northeastern Circuits declined by 73% and 81%, respectively, in relation to 1994, and the Central-Western achieved morbidity and mortality indicators lower than the national average.

The only diagnosis of virus type C in South America in 1995 were located in the states of Tocantins, Rondonia and Mato Grosso.

A vaccination coverage of 68% of the total of herds was achieved during the year in review.

A project to restructure the state veterinary services was drafted for the Program administration; resources are provided by the Ministry of

Agriculture, Supply and Agrarian Reform (MAARA) which coordinates the Program at the central level.

Coordinating Commissions and the National Animal-Health Committee (CONASAN) were set up in each of the livestock circuits; public and private organizations take part in these commissions. In the states of Mato Grosso and Mato Grosso do Sul, the community participates through the Municipal Animal-Health Councils.

3. ANDEAN AREA REGIONAL PROJECT

The record of vesicular disease in cattle increased, especially in the Andean Area, accounting for 71% of the total of cases recorded in South America in 1995.

Bolivia reported an epidemic in an area of low livestock density in the highland region, which threatened Chile and Peru. The latter country reported a decline in vesicular disease cases, with the episodes concentrated in the departamentos of Cajamarca and Lima.

Colombia maintained the same level of vesicular disease as reported in 1994, with a predominance of vesicular disease and foot-and-mouth disease virus type A in the Atlantic Coast region. Virus type O was concentrated in the Cundiboya highland area.

In Ecuador, the record of vesicular disease jumped almost 100%. Virus type O predominated in the northern Amazonian provinces; no virus type A has been reported since 1991.

3.1 BOLIVIA

The information submitted by this country covers only the activities in the regional plans of Santa Cruz de la Sierra, Tarija, Beni, Altiplano and Cochabamba. 126 cases of foot-and-mouth disease were identified during the period in review. An epidemic of type A foot-and-mouth disease virus was reported in the highland region in August. The outbreak originated in an intensive mobilization of unvaccinated animals coming from Cochabamba to the auctions in the region, which is characterized as a low-density livestock area, and expanded into areas near the border of Puno (Peru) and northern Chile.

With the support of the local community, the National Secretariat of Agriculture and Livestock Raising (SNAG) established the Altiplano Emergency Plan with animal-transit control activities and perifocal vaccination in the departamentos of La Paz, Oruro and Potosí. It should be emphasized that the National Animal-Health Service (SENASA) of Peru, the SAG in Chile and PANAFTOSA have worked together in supporting the Bolivian authorities.

Samples for laboratory diagnosis were taken in 54 episodes (43% of the total), of which 19 were identified as virus type A and 17 as virus type O. No type C or vesicular stomatitis virus was identified.

Cattle comprised the main species affected, and the morbidity and mortality rates were as follows: affected herds, 2.7 per 1,000; populational morbidity, 6.4 per 10,000; internal morbidity, 17.3% and lethality, 0.6%.

The SNAG asked the FAO to draft up a National Foot-and-Mouth Disease Eradication Plan and, with support from the Fund for the Development of the River Plate Basin (FONPLATA), asked PANAFTOSA to conduct a study to create a national veterinary-attention system engaging the cooperation of the private sector. The system is intended to serve as a basis for conducting the National Plan.

3.2 COLOMBIA

A total of 1,302 cases of vesicular disease was recorded in 1995, or 10% less than in 1994. Of the 1,008 samples collected for testing (77%), foot-and-mouth disease was identified in 144 cases, virus type O and type A in 79, New Jersey vesicular stomatitis virus in 278 cases and Indiana virus in 133.

The southern border and the Cundiboya plateau region were affected mainly by virus type O_1 that was recorded throughout almost the entire country during the period in review. The Llanos region, a primary endemic ecosystem that influences the center-south of Colombia, exhibited an increase in the number of affected properties (20). The ratio of foot-and-mouth disease to vesicular stomatitis was almost 1:2, which points out the important pressure that vesicular stomatitis exerts on the livestock herd in certain areas of the country.

Cattle were involved in 1,107 cases (84%) and the recorded epidemiological rates were: affected herds, 1.52 per 1,000; populational morbidity, 6.07 per 10,000; internal morbidity, 9.3% and lethality, 1.3%. These rates are similar to those reported in 1994, except for the decline in internal morbidity.

The Colombian Agriculture and Livestock Institute (ICA), the United States Department of Agriculture (USDA) and the National Federation of Colombian Livestock Raisers (FEDEGAN) are promoting the expansion of the Atlantic Coast Subproject toward the eastern region; the purpose is to implement PHEFA component 1.A. This project expects to benefit from the active participation of the stockmen's sector and will utilize a strategy of action based on characterization of the risk levels of introducing and spreading the agent.

3.3 ECUADOR

The number of herds affected by vesicular disease in 1995 was almost double the total reported in 1994, and the 108 episodes reflect a deterioration in the country's overall epidemiological situation. Blood samples were taken in 43 episodes, of which 32 proved to be type O, again the only foot-and-mouth disease virus type recorded during the last four years. The Indiana vesicular stomatitis virus was isolated in the provinces of Cañar and Azuay.

The region bordering Colombia and the Coastal region reported, respectively, 7 and 9 episodes. These two primary endemic regions, with their full-cycle extensive livestock-raising systems, influenced Ecuador's northern Amazonian region where 83 episodes were recorded (77%).

Cattle were affected in 97% of the episodes, pigs in 3. The epidemiological indicators observed in the episodes involving cattle were: affected herds rate of 0.43 per 1,000; populational morbidity of 1.92 per 10,000; internal morbidity rate of 30.15%; and lethality rate, 1.64%. The internal morbidity rate in the three episodes involving pigs was 72%. The morbidity and mortality rates were generally higher than in 1994.

Three episodes were recorded in Ecuador's Amazonian region. Although that area is not part of the respective project, it is important to note that 77% of the foot-and-mouth disease cases recorded in the country occurred in the Amazonian region. That fact is a consequence of the influence of the livestock circuits of the Ecuadorian coast and the Colombian border.

In the second half of 1995, the General Animal-Health Service (SESA) of the Ministry of Agriculture and Livestock (MAG) and the Livestock Raisers Federation of Ecuador, with cooperation from PANAFTOSA and the local PAHO representative, drafted the Foot-and-Mouth Disease Eradication Project for 1996-2000.

3.4 PERU

SENASA has taken a series of foot-and-mouth disease control measures as a response to the epidemic situation that was recorded throughout the country from 1993 and which continued during 1994.

14 cases of vesicular disease were recorded in 1995; blood samples were taken in 10. Of the 10, two episodes were identified as foot-and-mouth disease type O, three were New Jersey vesicular stomatitis, and one was Indiana virus. The episodes were concentrated in Lima and Cajamarca, but also occurred in Ica and Lambayeque, where animals are concentrated for fattening and finishing. The origin of the viral agent was identified as being brought in by carrier animals crossing the borders from neighboring countries, a repetition of previous episodes related to the introduction of the agent through importation of animals on the hoof and/or animal-origin products.

Because of the country's epidemiological situation, the foot-and-mouth disease vaccination was conducted in two stages; priority was given to the departamentos showing constant or sporadic occurrence, while vaccination was suspended in areas not showing clinical occurrence. The vaccination was conducted by private companies utilizing vaccines acquired by the official service and is estimated to have reached 50% of the vaccinatable animal population. The commercial tradition of informal livestock shows and auctions, congregating animals in fattening areas, and the moving of animals in droves, all hamper sanitary control and continue to be potential risk factors in spreading the disease.

The epidemiological indicators related to the episodes involving cattle were: herd attack rate, 0.02/1,000; populational morbidity, 0.22/10,000; internal morbidity rate, 8.3% and lethality rate, 2.2%.

3.5 VENEZUELA

Except for the vesicular stomatitis cases in the states of Mérida and Zulia, no significant changes occurred in the number of vesicular stomatitis occurrences in Venezuela. With a total of 78 cases in 1995, the trend observed in recent years was maintained. Blood samples for laboratory diagnosis were taken in 31 (40%) of the cases, of which 22 were positive, with identification of one virus type O and three virus type A. New Jersey vesicular stomatitis virus was found in 18 samples, all in the states of Mérida and Zulia. In addition to those states, vesicular disease episodes were also reported in the states of Anzoátegui, Apure, Cojedes and Yaracuy.

The episodes involving cattle provided the following epidemiological rates: affected herds, 0.70 per 1,000; populational morbidity, 1.54 per 10,000; internal attack rate, 9.4%.

In the four cases involving only pigs, the rates were: populational morbidity, 11.3 per 10,000; internal attack, 32.5%; and lethality, 0.4%.

Development of the national program has led to the signing of agreements with the state governments of Bolívar, Táchira and Zulia, for conducting the control activities. Negotiations are also underway regarding the possibility of signing a cooperative agreement with the USDA similar to the one with Colombia. An agreement was also signed with the MAC and the Venezuelan Livestock Raisers Federation (FEDENAGA) to further the program's activities.

3.6 SUBPROJECTS

Subproject 1

This Subproject encompasses the departamentos of Atlántico, Bolívar, Córdova, César, La Guajira, Magdalena, Sucre, the northern part of the

departamentos of Chocó and Antióquia and the islands of San Andrés and Providencia in Colombia, plus the states of Zulia and Táchira in Venezuela.

The area concentrated the greatest number of virus type A episodes and, coincidentally, the highest record of vesicular stomatitis episodes (New Jersey and Indiana) of all the countries affected in South America.

The vesicular disease record level in this zone has remained very similar to the levels in preceding years, with 96% of the affected properties being reported on the Colombian side of the border. The Colombian service has acknowledged that notification has not been timely in this territory, nor in the larger part of the country. There is a five-day timegap between start and report of the suspicion, although, as a general rule, once the suspicion has been reported, the property is usually visited on the same day.

On the Atlantic Coast of Colombia there was a concentration of episodes caused by foot-and-mouth disease virus type A (63 cases) and by both of the vesicular stomatitis viruses (127 New Jersey and 81 Indiana). Virus subtype A_{32} was also identified in this region, although it had not been reported for some time, as well as virus A_{24}; both virus types were characterized by PANAFTOSA and immunogenically covered by commercial vaccines.

Subproject 2

The specific area of this Subproject includes the six Bolivian provinces of the departamento of La Paz that border Peru, the provinces of Cañar, Azuay and Loja in Ecuador, and some disease-free areas in Peru.

The occurrence of vesicular disease was irrelevant (1.2% of all the episodes recorded in South America). In part, this is due to the predominance of an occasional ecosystem for foot-and-mouth disease within the limits of the subproject and, therefore, dependent on the situation in the donor areas. In the rest of Peru there coexist, with low development, a few areas dedicated to fattening and extensive raising among peasant systems.

Virus type O was identified as the causative agent of episodes on the borders and in the interior of Peru, with some cases of vesicular stomatitis caused by the Indiana virus. Foot-and-mouth disease virus type A was not encountered in the episodes from which blood samples were collected.

Subproject 3

This Subproject, which includes Carchi and Imbabura in Ecuador and Nariño in Colombia, encompasses a predominantly milk-transformation system ranging from peasant forms to intensive methods. An intensive traffic of

beef cattle from endemic ecosystems in Ecuador characterizes the bovine transit in the zone, but only moving through. This intense animal traffic is regarded as the cause of the sporadic appearance of foot-and-mouth disease episodes carried in by animals that escape the surveillance at the control stations.

The Colombian side reported the highest occurrence of episodes (90% of the total). Virus type O was identified on both sides of the agreement area and virus type A only on the Colombian side. New Jersey and Indiana vesicular stomatitis viruses were also identified in Colombia. The high incidence of New Jersey virus reveals an important problem in the zone.

Subproject 4

This Subproject encompasses part of the departamentos of La Paz, Chuquisaca and Tarija, and the departamentos of Pando, Beni and Santa Cruz in Bolivia.

The Beni subproject did not function, although some systematic vaccinations were carried out by the livestock raisers' associations that participate in the National Committee for Foot-and-Mouth Disease Control (CONEFA) and with the technical support of the regional offices of SNAG.

Beni is the most significant primary endemic region of Bolivia and represents a risk not only for other zones of the country that depend on it, but also for the stability achieved in the countries bordering on Bolivia.

Subproject 5

This Subproject comprises: (1) the eastern plains of Colombia that lie in the departamentos of Meta, the "intendencias" of Casanare and Arauca and the "comisaría" of Vichada, and (2) the plains of Venezuela which include the entire state of Apure, the southern part of Táchira and Varines, the western part of the state of Bolívar and the northwestern section of the Federal Territory of Amazonas.

This zone has a very low record of vesicular disease (1.1%). In 1995 only 25 episodes were recorded, of which 27% with laboratory diagnosis. There were episodes in the Colombian sector involving foot-and-mouth disease viruses A and O, and New Jersey and Indiana vesicular stomatitis viruses. In the Venezuelan sector only New Jersey virus was identified, a fact that indicates the lack of homogeneity in the zone's epidemiological situation.

Subproject 6

This Subproject includes the provinces of Esmeralda, Manabí, Guayas, Los Ríos, El Oro and El Cantón Santo Domingo de los Colorados in the province of Pichincha, Ecuador.

This zone has been traditionally regarded as an area of intense viral activity and, consequently, as a permanent internal risk as well as for the neighboring countries. The zone has accumulated occurrences of episodes amounting to 6.42% of all episodes recorded in South America.

4. CONTINENTAL VESICULAR DISEASES SURVEILLANCE AND INFORMATION SYSTEM

In compliance with the agreements reached at the XXI Regular Meeting of the South American Commission for the Control of Foot-and-Mouth Disease (COSALFA) held in Lima, Peru, in 1994, and the changes proposed at the XXII Meeting in Santa Cruz de la Sierra, Bolivia, in 1995, PANAFTOSA began the regular distribution of the weekly summary containing the occurrences of vesicular diseases in the Americas. The preliminary publication seeks to shorten the response time from PANAFTOSA to the main users of the system (the official animal-health services and international bodies and agencies). As was emphasized at that time, the published summary does not purport to replace the Weekly Epidemiological Report that is still issued in the same format and is distributed by mail to a larger number of institutions throughout the world.

On average, the countries delivered their respective information to PANAFTOSA some 11 days after the close of the epidemiological week, slightly better than the 13 days average in 1994. This slight progress and the transmission of the weekly summary by fax or e-mail has rendered the role of the information system more compatible with its informational purpose.

Nevertheless, the reception and feedback times can still be improved if the countries seriously commit to forwarding their information every Tuesday. If this goal is attained, the weekly summary could be transmitted 96 hours after the close of the epidemiological week, thus making the information available as required in dealing with this type of disease. Although the countries of the Continent are all interested in keeping the knowledge of the weekly occurrences updated, the evident lack of punctuality must be corrected by the national authorities. The delays in information forwarded from Venezuela, Bolivia and Brazil caused the publications to be issued either incomplete or late. For each of the delays, PANAFTOSA solicited the information by fax.

4.1 Communications of Alert

PANAFTOSA/PAHO continued sending alert warnings to countries with episodes on their borders, amounting to 65 messages. This measure strengthens the border agreements with respect to the reciprocity of the immediate warning by the service of the country with the suspicion. The table below shows the affected countries and the frequencies of episodes in border grids of each country and indicates in parenthesis the number of messages sent to each of the recipient countries.

Country Affected	Frequency	Countries Alerted
Bolivia	4	Chile (2), Peru (2)
Brazil	7	Bolivia (3), Peru (2), Venezuela (1), Guyana (1)
Colombia	40	Ecuador (19), Venezuela (21)
Ecuador	12	Colombia (5), Peru (7)
Venezuela	2	Colombia (2)
Total	65	

To date, PANAFTOSA has considered as punctual any information received from 7 to 10 days after the close of the epidemiological week. Using this parameter, only 32% of the episodes occurring in border grids were notified in a timely fashion. Bolivia and Ecuador were within acceptable parameters, but not the other countries affected by foot-and-mouth disease. More than half of the episodes in border grids in Brazil were reported with an average delay of 30 days or more, 18 days in Colombia and, in Venezuela, 11 and 24 days, respectively, on the only two occasions.

4.2 Request for samples from episodes on borders

PANAFTOSA requested samples of epithelium and a copy of the protocol of the study of the affected area from each episode occurring in grids near another country. Thus 57 requests were forwarded, i.e., 36 to Colombia, 12 to Ecuador, 5 to Brazil, 2 to Bolivia and 2 to Venezuela. Ecuador submitted samples from two episodes on the border with Colombia, but the other countries did not respond to PANAFTOSA's requests.

It should be remembered and emphasized that the Reference Laboratory's studies of such samples is of utmost importance for the countries having eradication projects, and of great usefulness in the continental surveillance of the disease. The finding of antigenic variation in the field virus, which may be accompanied by immunological variations, acts as a signal to the vaccine production and control sector in the sense of activating the measures necessary to ensure an immune coverage of the susceptible animal population compatible with the disease-control activities.

Just as in the eradication and control programs, immunization is extremely important and the characterization of the field viruses is an epidemiological surveillance tool deserving much attention. To the extent that continuous information about what is occurring in the countries is available, the Reference Laboratory's contribution could be valuable in supporting the sanitary actions of prevention, control and eradication.

4.3 Weekly Epidemiological Report

As in the preceding years, PANAFTOSA continued to publish the occurrences during the epidemiological week and the data on the weeks not previously communicated, because of delays in receiving the information from the countries, which appear in the publication as additional information. The Report is issued in Spanish and in English and is mailed to 169 users.

Map 1 shows the 230 grids with suspicion of vesicular disease. Compared with preceding years, it indicates a slight decline in the area affected, because of the absence of the clinical disease in Argentina and Paraguay and less incidence in Brazil and Peru.

Contrary to the overall positive panorama, in comparison to 1994 both Bolivia and Ecuador reported an increase in the number of affected grids, while Colombia reported increased frequency of grid occurrences with 8 to 15 weeks of presence of vesicular disease. In Bolivia, 13 national grids (30%) showed no record of vesicular disease in the last three years and 12 (26%) of all the grids showing occurrence exhibited their first episodes since 1977. This situation is an indication that foot-and-mouth disease is spreading internally into livestock-raising areas previously free of episodes. In Ecuador, this type of situation amounted to 49% of all the grids affected during the year; 18% of them reported vesicular disease for the first time since 1977 and 31% had not reported any presence in the last three years.

The Subproject 1 zone of the Andean Regional Project has been characterized as maintaining a constant frequency of vesicular disease in recent years (map 1). It exhibits a high number of grids that show presence for more than 15 weeks during the year, which can be corroborated by observing the maps published in previous years.

4.4 Evaluation of the Weekly Report

The array of parameters represented in tables 32 and 33 reflect the weaknesses of the vesicular diseases epidemiological surveillance system in South America. These weaknesses may be summarized as follows:

(a) the coverage achieved by the local units within the national system exceeds 90% in only two countries;

(b) the livestock-raising community's participation in warning of the suspicion (alerts) was reflected in the report of only two countries;
(c) the timespan between the onset of the suspicion and the transmission of the respective alert warning has not been timely in the three countries that included this indicator in their reports, while the reality in the rest of the countries is unknown;
(d) the percentage of episodes from which samples were taken for laboratory diagnosis is still low, with the exception of Colombia;
(e) PANAFTOSA still receives the weekly report with significant delays.

Among the countries and regions without foot-and-mouth disease (table 33), only Uruguay and Paraguay submitted greater details about their action. Uruguay responds urgently to suspicion of foot-and-mouth disease, with a timespan of no more than four hours between the notification of the suspicion and the visit to the property. This promptness contrasts with the countries affected in which the delay averages 1 to 2 days. Thus this becomes a challenge for those countries, because shortening the delay time is one of the bases for improving the control of the focal and perifocal areas.

Finally, given the epidemiological changes currently underway in South America, PANAFTOSA is making great effort to adjust the surveillance and information system to this new reality, where expanding and protecting the free zones and countries has become a necessity.

4.5 Monthly Epidemiological Report

Compared with the situation in previous years, the timely reception of the monthly reports continued to improve in 1995. Thus more than 50% of the reports were forwarded on time by the majority of the countries.

Although this is considered a positive step in the Information System, the need for each country to verify the data in the weekly and monthly reports should be stressed so that no disparities are presented and the information gains quality and reliability.

4.6 Functioning in Central America and Mexico

The Continental Epidemiological Surveillance and Information System has been a great support in this area of the Hemispheric Program. Since the closing of LADIVES in September 1994, PANAFTOSA has increased its support to the national programs in Central America and Mexico by processing field samples. Of the 320 samples tested, 135 were diagnosed as

vesicular stomatitis (42%); the predominant virus was the New Jersey type (132). The countries that reported the greatest number of suspected episodes were El Salvador (125) and Mexico (101) (table 22).

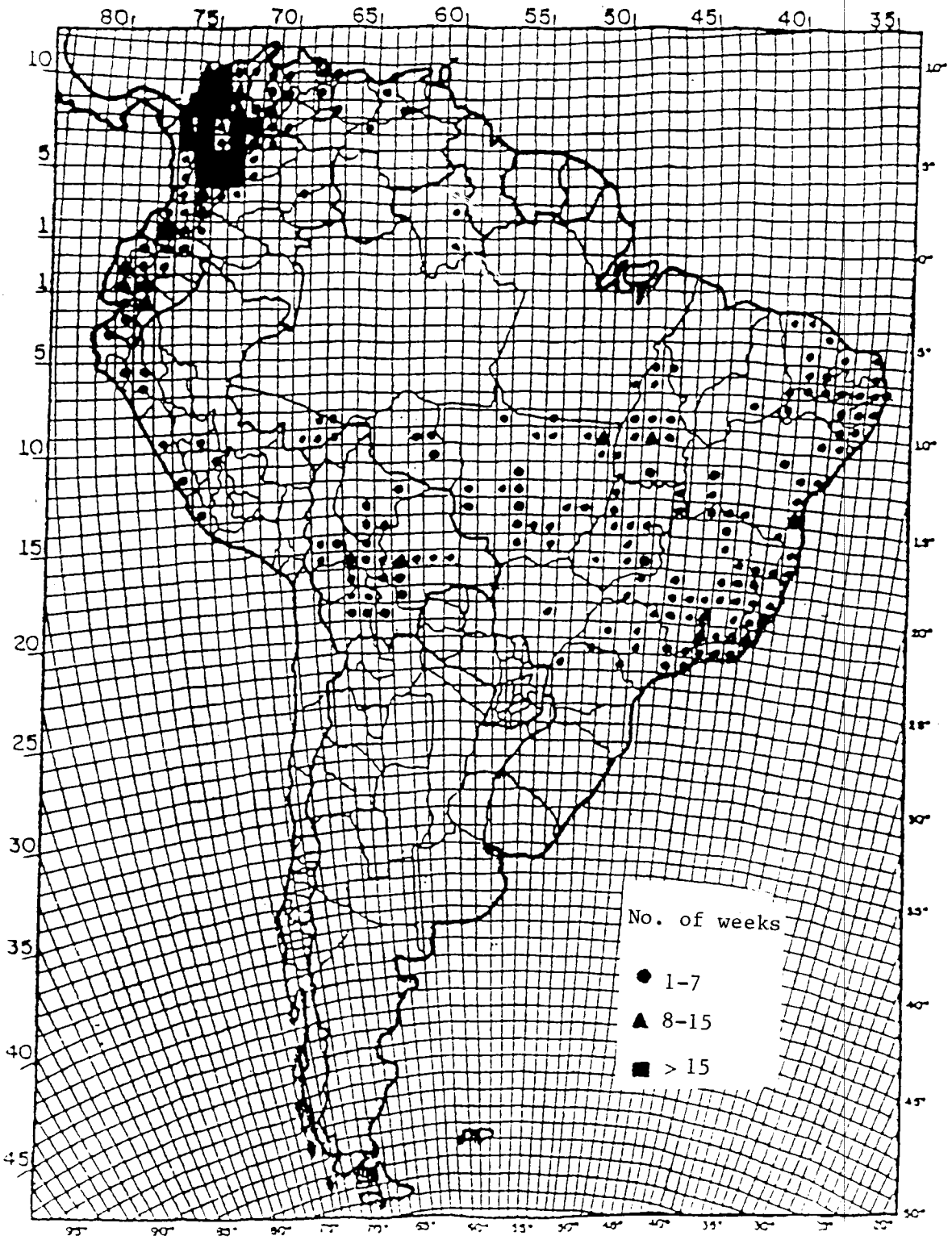
As in South America, the weekly and monthly bulletins publish the situation related to the episodes of vesicular disease reported by the official animal-health services.

4.7 Use of the System for Other Diseases

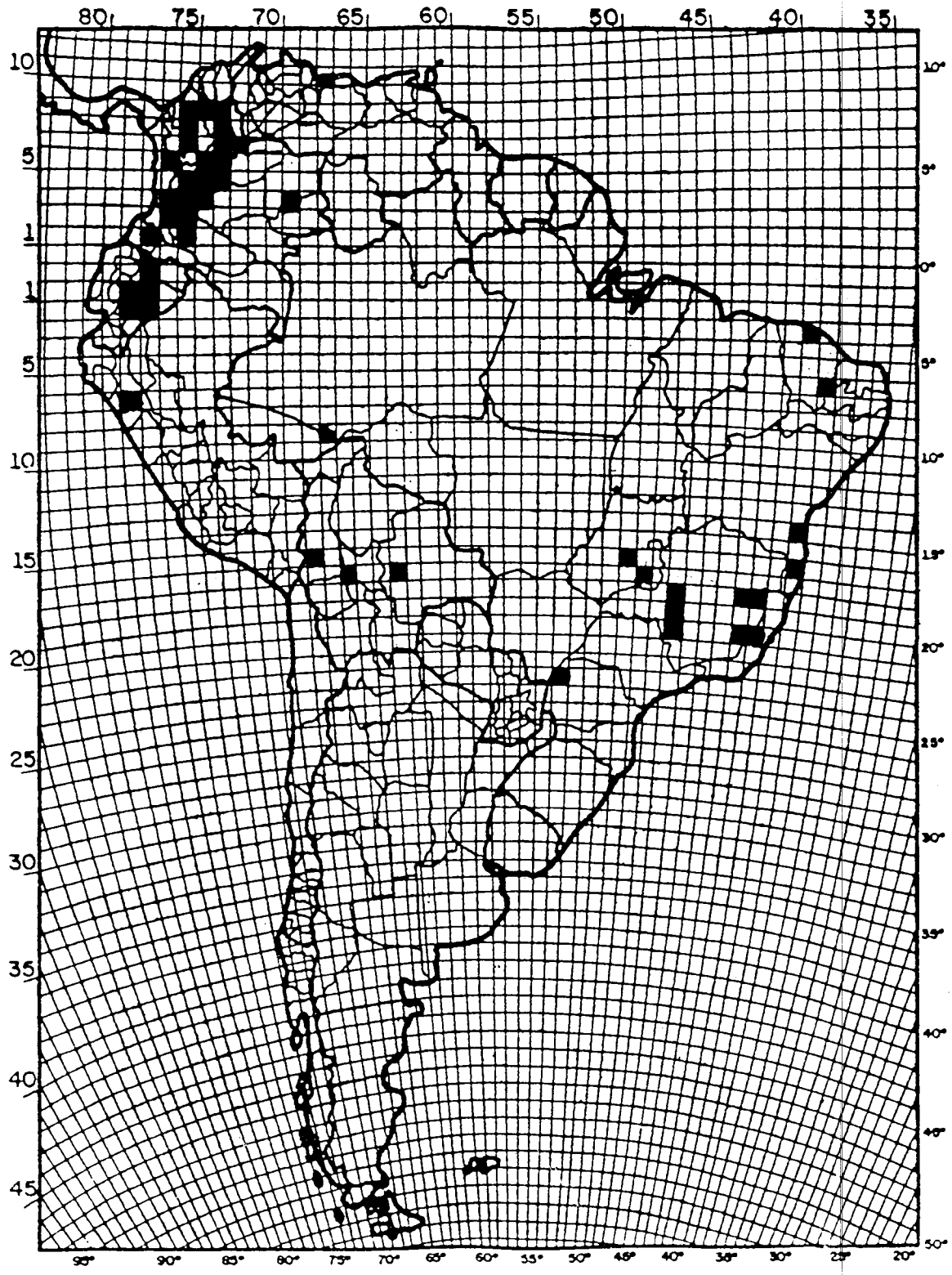
The infrastructure set up to monitor vesicular diseases was utilized to publish information on diseases similar to hog cholera and syndromes compatible with equine encephalitis.

As a consequence of the epidemic of Venezuelan equine encephalitis, PANAFTOSA published and distributed in the Weekly Epidemiological Report the occurrences recorded in Venezuela and Colombia for 15 and 22 weeks, respectively, and in Central America, three weeks in Guatemala and 11 weeks in Panama. In South America, the occurrence of diseases similar to hog cholera was recorded for six weeks in Colombia and one week in Venezuela. In Central America, Guatemala reported occurrences for 10 weeks.

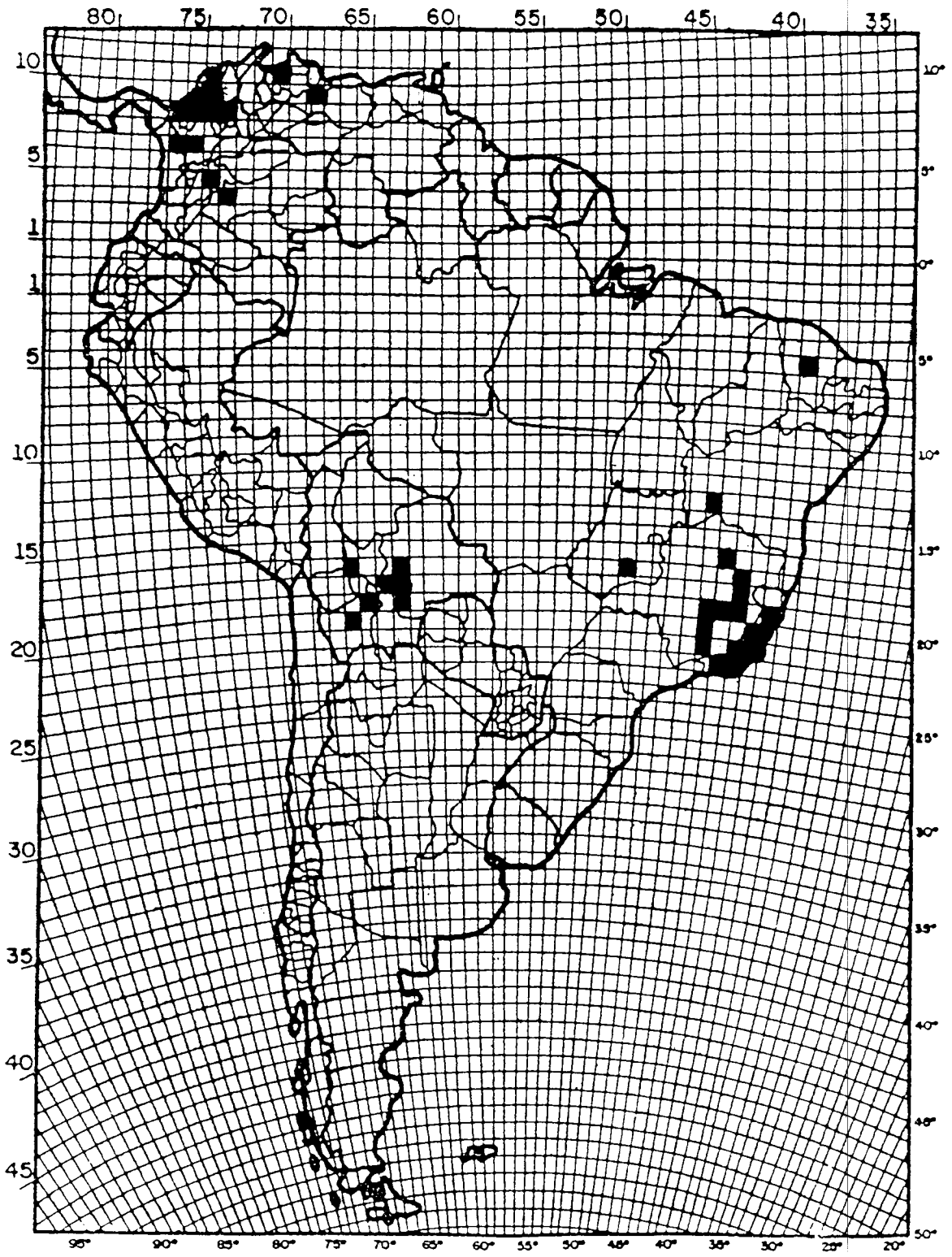
MAP 1. Distribution of the number of weeks
with occurrence of vesicular diseases by coordinates.
South America, 1995



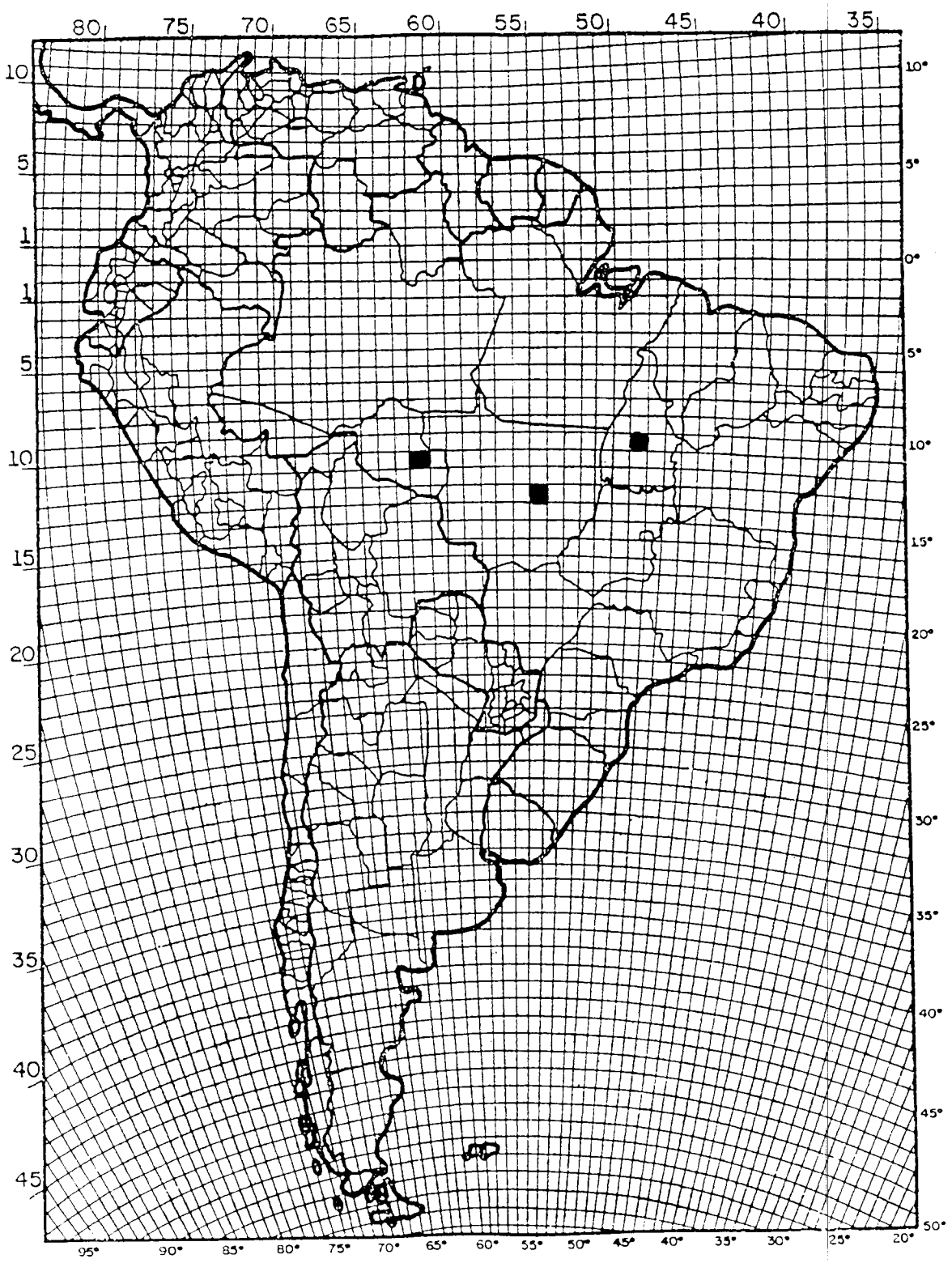
MAP 2. Geographical distribution of foot-and-mouth disease virus type O. South America, 1995



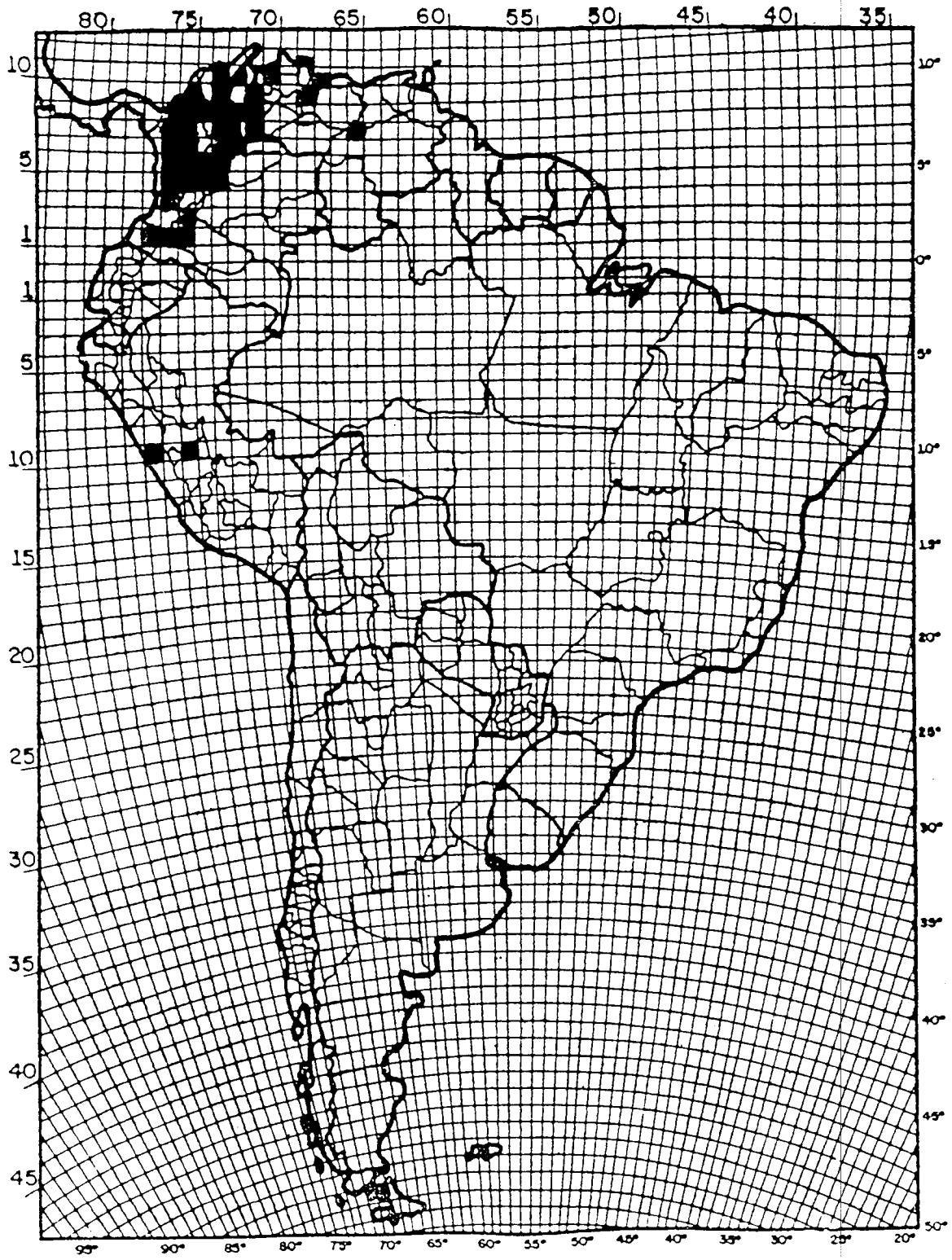
MAP 3. Geographical distribution of foot-and-mouth disease virus type A. South America, 1995



MAP 4. Geographical distribution of foot-and-mouth disease virus type C. South America, 1995



MAP 5. Geographical distribution of vesicular stomatitis virus New Jersey. South America, 1995



MAP 6. Geographical distribution of vesicular stomatitis virus Indiana. South America, 1995

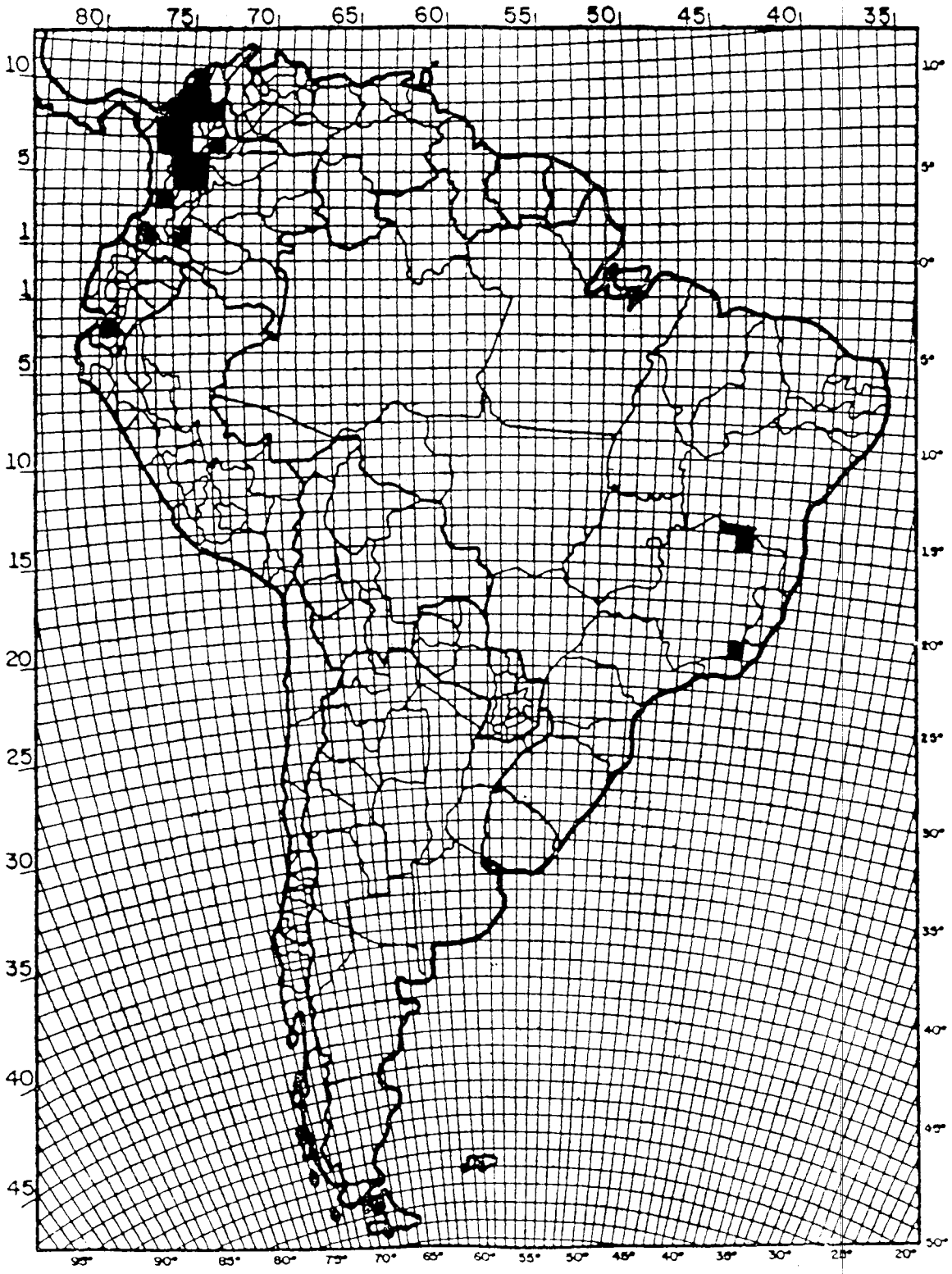


Table 1. Establishments affected by vesicular diseases, by diagnosis. South America, 1995

Country	Affected establish.	With clinical diagnosis	With collected material		With laboratory diagnosis		F M D			Vesicular stomatitis	
			Cases	%	Cases	%	O	A	C	New Jersey	Indiana
Bolivia	126	72	54	43	36	29	17	19			
Brazil	666	393	273	41	198	30	83	99	3		13
Colombia	1,302	294	1,008	77	641	49	151	79		278	133
Ecuador	108	65	43	40	34	31	32				2
Peru	14	6	10	71	7	50	3			3	1
Venezuela	78	47	31	40	22	28	1	3		18	0
Total	2,294	877	1,419	62	938	41	287	200	3	299	149

Table 2. Establishments affected by foot-and-mouth disease, by virus type, country and year. South America, 1987-1995

Country/Year	Virus	1987	1988	1989	1990	1991	1992	1993	1994	1995
	O	23	95	103	196	37	108	78	15	0
Argentina	A	486	35	39	115	60	72	4	0	0
	C	27	5	4	5	2	39	50	2	0
	O	0	0	2	13	2	18	10	24	17
Bolivia	A	12	13	0	4	2	0	5	3	19
	C	1	4	4	0	0	0	0	1	0
	O	94	92	71	43	38	158	115	304	83
Brazil	A	161	91	72	43	18	72	182	150	99
	C	13	19	28	91	64	6	1	9	3
	O	100	268	280	83	74	226	137	361	144
Colombia	A	73	153	542	250	113	82	33	40	79
	C	0	0	0	0	0	0	0	0	0
	O	2	2	23	29	19	30	26	23	32
Ecuador	A	11	15	9	5	5	0	0	0	0
	C	0	0	0	0	0	0	0	0	0
	O	3	2	30	2	27	23	12	7	0
Paraguay	A	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0
	O	0	1	0	32	2	12	44	24	3
Peru	A	10	6	2	0	0	3	1	0	0
	C	0	0	0	0	0	0	0	0	0
	O	20	6	9	3	6	1	1	0	1
Venezuela	A	6	10	34	16	16	7	3	5	3
	C	0	0	0	0	0	0	0	0	0

Table 3. **Monthly distribution of properties affected by vesicular diseases, by countries. South America, 1995**

Country/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Argentina													0
Bolivia	5	5	10	14	1	11	21	10	18	16	6	9	126
Brazil	38	68	90	111	138	61	56	36	22	19	18	9	666
Colombia	348	185	112	56	47	67	84	80	117	72	76	58	1302
Ecuador	14	5	3	12				6	5	9	25	29	108
Paraguay													0
Peru	1		1		1	2		2	3	1		3	14
Venezuela	10	2	9	10	12	8	2	11	1	2	7	4	78
Total	416	265	225	203	199	149	163	145	166	119	132	112	2294

Table 4. Monthly distribution of properties affected by vesicular diseases, by regional subprojects. South America, 1995

Country/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%
Atlantic Coast COL Maracaibo lake	97	39	40	31	21	26	39	30	45	40	57	38	503	21.93
Colombian-Venezuelan Plains	3					9	5	1	3	2	2		25	1.09
Rest of Venezuela	10	2	2	9	8	1	2	11	1	2	3	4	55	2.40
Rest of Colombia	245	144	64	22	30	37	31	42	63	24	15	17	734	32.00
Colombia-Ecuador border	6	2	15	4		2	8	10	6	6	5	4	68	2.96
Ecuadorian coast	1			3						4	1		9	0.39
Rest of Ecuador	10	5	3	9				3	1	7	25	20	83	3.62
Peru-Ecuador border										2		9	11	0.48
Rest of Peru	1		1		1	2		2	3			2	12	0.52
Peru-Bolivia border			1	2			2						5	0.22
Beni	5	5	7	5		7	8	3	11	11	3	9	74	3.23
Rest of Bolivia			2	7	1	4	11	7	7	5	3		47	2.05
Andean Area	**378**	**197**	**135**	**92**	**61**	**88**	**106**	**109**	**140**	**103**	**114**	**103**	**1626**	**70.88**
Amazonian area	4	12	22	29	27	11	3	6	8	9	8	2	141	6.15
Brazil	34	56	68	77	110	50	54	30	14	10	11	7	521	22.71
Brazil and Amazonas	**38**	**68**	**90**	**106**	**137**	**61**	**57**	**36**	**22**	**19**	**19**	**9**	**662**	**28.86**
River Plate Basin				5	1								6	0.26
Rest of Argentina													0	
Southern Cone				**5**	**1**								**6**	**0.26**
Total	416	265	225	203	199	149	163	145	162	122	133	112	2294	

Table 5. Monthly distribution of establishments affected by foot-and-mouth disease virus type O, by countries. South America, 1995

Country/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bolivia	3	2	4	2	1	2	1				1	1	17
Brazil	5	5	16	13	20	12	5	5	1	1			83
Colombia	47	38	23	6	2	17	5	3	5	1		4	151
Ecuador	1	1		2				2		4	11	11	32
Paraguay													0
Peru					1				2				3
Venezuela		1											1
Total	56	47	43	23	24	31	11	10	8	6	12	16	287

Table 6. Monthly distribution of properties affected by foot-and-mouth disease virus type O, by regional subprojects. South America, 1995

Country/Month	Jan	Feb	Mar	Abr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%
Atlantic Coast COL Maracaibo lake	2	1		1		1			1			1	7	2,41
Colombian-Venezuelan Plains						1			1				2	0,69
Rest of Venezuela		1											1	0,34
Rest of Colombia	43	37	23	4	2	15	4	3	3			2	136	46,90
Colombia-Ecuador border	2			1				2		1		1	7	2,41
Ecuatorian coast														0,00
Rest of Ecuador	1	1		2						4	11	7	26	8,97
Peru-Ecuador border												4	4	1,38
Rest of Peru					1				2				3	1,03
Peru-Bolivia border							1						1	0,34
Beni	3	2	2			2						1	10	3,45
Rest of Bolivia			2	2	1						1		6	2,07
Andean Area	**51**	**42**	**27**	**10**	**4**	**19**	**5**	**5**	**7**	**5**	**12**	**16**	**203**	**70,00**
Amazonian Area	1		6	7	13	9	3	5	1	1			46	15,86
Brazil	4	5	10	6	7	3	3						38	13,10
Brazil and Amazonas	**5**	**5**	**16**	**13**	**20**	**12**	**6**	**5**	**1**	**1**	**0**	**0**	**84**	**28,97**
River Plate Basin				2	1								3	1,03
Rest of Argentina														0,00
Southern Cone				**2**	**1**								**3**	**1,03**
Total	56	47	43	25	25	31	11	10	8	6	12	16	290	

Table 7. Monthly distribution of properties affected by foot-and-mouth disease virus type A, by countries. South America, 1995

Country/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bolivia			1				5	5	5	3			19
Brazil	9	7	16	26	28	4	2	1	3		2	1	99
Colombia	14	12	7	2	2	3	5	4	8	7	9	6	79
Ecuador													0
Paraguay													0
Peru													0
Venezuela	3												3
Total	26	19	24	28	30	7	12	10	16	10	11	7	200

Table 8. Monthly distribution of properties affected by foot-and-mouth disease virus type A, by regional subprojects. South America, 1995

Country/Month	Jan	Feb	Mar	Abr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%
Atlantic Coast COL Maracaibo lake	14	10	6	2	2	2	5	1	5	3	8	5	63	31.50
Colombian-Venezuelan Plains						1							1	0.50
Rest of Venezuela	3												3	1.50
Rest of Colombia		2	1					3	3	4	1		14	7.00
Colombia-Ecuador border												1	1	0.50
Ecuadorian coast													0	0.00
Rest of Ecuador													0	0.00
Peru-Ecuador border													0	0.00
Peru														
Peru-Bolivia border														
Beni			1				4	1	2	2			10	5.00
Rest of Bolivia							1	4	3	1			9	4.50
Andean Area	**17**	**12**	**8**	**2**	**2**	**3**	**10**	**9**	**13**	**10**	**9**	**6**	**101**	**50.50**
Amazonian Area	1	5	1		1	1						1	10	5.00
Brazil	8	2	15	26	27	3	2	1	3		2		89	44.50
Brazil and Amazonas	**9**	**7**	**16**	**26**	**28**	**4**	**2**	**1**	**3**	**0**	**2**	**1**	**99**	**49.50**
River Plate Basin													0	0.00
Rest of Argentina													0	0.00
Southern Cone													**0**	**0.00**
Total	26	19	24	28	30	7	12	10	16	10	11	7	200	

Table 9. Monthly distribution of properties affected by foot-and-mouth disease virus type C, by countries. South America, 1995

Country/ Month	Jan	Feb	Mar	Abr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Brazil			1		2								3
Total	0	0	1	0	2	0	0	0	0	0	0	0	3

Table 10. Monthly distribution of properties affected by foot-and-mouth disease virus type C, by regional subprojects. South America, 1995

Country/ Month	Jan	Feb	Mar	Abr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Amazonian Area Brazil			1		2								3
Total	0	0	1	0	2	0	0	0	0	0	0	0	3

Table 11. Monthly distribution of properties affected by vesicular stomatitis virus New Jersey, by countries. South America, 1995

Country/Month	Jan	Feb	Mar	Abr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bolivia													0
Brazil													0
Colombia	40	53	31	24	12	22	28	21	17	8	12	10	278
Ecuador													0
Paraguay													0
Peru						1			1			1	3
Venezuela			1	1	7	1		3		1	4		18
Total	40	53	32	25	19	24	28	24	18	9	16	11	299

Table 12. Monthly distribution of properties affected by vesicular stomatitis virus New Jersey, by regional subprojects. South America, 1995

Country/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%
Atlantic Coast COL Maracaibo lake	11	14	17	14	6	11	19	9	10	5	8	8	132	44.15
Colombian-Venezuelan Plains						1	1	1		1	1		5	1.67
Rest of Venezuela			1	1	5			3		1			11	3.68
Rest of Colombia	29	38	8	9	8	10	6	8	6	1	3	2	128	42.81
Colombia-Ecuador border		1	6	1		1	2	3	1	1	3		19	6.35
Ecuadorian coast													0	0.00
Rest of Ecuador													0	0.00
Peru-Ecuador border													0	0.00
Rest of Peru						1			1			1	3	1.00
Peru-Bolivia border														0.00
Beni														0.00
Rest of Bolivia														0.00
Andean Area	**40**	**53**	**32**	**25**	**19**	**24**	**28**	**24**	**18**	**9**	**15**	**11**	**298**	**99.67**
Amazonian Area											1		1	0.33
Brazil													0	0.00
Brazil and Amazonas											**0**		**0**	**0.33**
Southern Cone													**0**	**0.00**
Total	40	53	32	25	19	24	28	24	18	9	15	11	298	

Table 13. Monthly distribution of properties affected by vesicular stomatitis virus Indiana, by countries, South America, 1995

Country/Month	Jan	Feb	Mar	Abr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bolivia													0
Brazil			7	1	5								13
Colombia	23	9	4	2	1	3	12	9	21	21	18	10	133
Ecuador										1		1	2
Paraguay													0
Peru												1	1
Venezuela													0
Total	23	9	11	3	6	3	12	9	21	22	18	12	149

Table 14. Monthly distribution of properties affected by vesicular stomatitis virus Indiana, by regional subprojects. South America, 1995

Country/Month	Jan	Feb	Mar	Abr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%
Atlantic Coast COL Maracaibo lake	8	1				1	6	7	18	17	15	8	81	54.36
Colombian-Venezuelan Plains						1				1			2	1.34
Rest of Venezuela													0	0.00
Rest of Colombia	15	8	4	2	1	1	4	2	3	3	3	2	48	32.21
Colombia-Ecuador border							2						2	1.34
Ecuadorian coast													0	0.00
Rest of Ecuador													0	0.00
Peru-Ecuador border										1		1	2	1.34
Rest of Peru												1	1	0.67
Peru-Bolivia border														0.00
Beni														0.00
Rest of Bolivia														0.00
Andean Area	23	9	4	2	1	3	12	9	21	22	18	12	136	91.28
Amazonian area													0	0.00
Brazil			7	1	5								13	8.72
Brazil and Amazonas	0	0	7	1	5	0	0	0	0	0	0	0	13	8.72
Southern Cone													0	0.00
Total	23	9	11	3	6	3	12	9	21	22	18	12	149	

Table 15. Morbi-mortality rates of vesicular diseases in cattle. South America, 1995

Country	Herds		Population				Rates			
	Total	Affected	Total (in miles)	In affected herds	Sick	Dead	Affected herds/100	Morbility /1000	Attack /100	Lethality /100
Argentina	294,941	0	56,007.00		0	0				
Bolivia	...	72	5,619.30	5,170	893	5	...	0.16	17.27	0.56
Brazil	2,232,395	600	158,701,70	120,751	22,077	305	0.03	0.14	18.28	1.38
Colombia	726,609	1,101	22,301.70	128,558	12,434	253	0.15	0.56	9.67	2.03
Ecuador	251,445	104	5,067.40	4,367	1,233	17	0.04	0.24	28.23	1.38
Paraguay	229,478	0	9,779.30		0	0				
Peru	846,905	14	4,008.80	542	45	1	0.00	0.01	8.30	2.22
Venezuela	106,535	74	13,586.20 *	22,337	2,089	10	0.07	0.15	9.35	0.48
Total	4,688,308	1,965	275,071	281,725	38,771	591	0.04	0.14	13.76	1.52

*Source: Situation of the foot-and-mouth disease programs. South America, 1994

Table 16. Morbi-mortality rates of vesicular diseases in swine. South America, 1995

Countries	Population				Rates		
	Total (in miles)	In affected herds	Sick	Dead	Morbidity / 1000	Attack /100	Lethality /100
Argentina	3,327.00		0	0			
Bolivia	2,251.00	538	147	30	0.07	27.32	20.41
Brazil	34,532.20	1850	875	335	0.03	47.30	38.29
Colombia	2,187.00	9840	936	129	0.43	9.51	13.78
Ecuador	2,546.00	201	162	48	0.06	80.60	29.63
Paraguay	1,420.00		0	0			
Peru	2,397.00		0	0			
Venezuela	2,747.00	9556	3106	1	1.13	32.50	0.03
Total	51,407.20	21,985	5,226	543	0.10	23.77	10.39

Table 17. Morbi-mortality rates of vesicular diseases in sheep. South America, 1995

Countries	Population				Rates		
	Total (in miles)	In affected herds	Sick	Dead	Morbidity / 1000	Attack /100	Lethality /100
Argentina	24,890.00		0	0			
Bolivia	7,525.20	163	28	0	0.00	17.18	
Brazil	19,955.90	534	96	25	0.00	17.98	26.04
Colombia	1,527.90	1816	51	0	0.03	2.81	
Ecuador	1,690.00	17	8	0	0.00	47.06	
Paraguay	385,00		0	0			
Peru	11,911.30		0	0			
Venezuela	366,20	139	0	0			
Total	68,252.00	2,669	183	25	0.00	6.86	13,66

Table 18. Morbi-mortality rates of vesicular diseases in goats. South America, 1995

Countries	Population				Rates		
	Total (in miles)	In affected herds	Sick	Dead	Morbidity / 1000	Attack /100	Lethality /100
Argentina	3,724.00		0	0			
Bolivia	...	50	5	0	...	10.00	
Brazil	12,159.60	644	79	24	0.01	12.27	
Colombia	1,237.30	610	5	0	0.00	0.82	
Ecuador	369.00						
Paraguay	122.20						
Peru	1,779.10						
Venezuela	1,292.90	78	0	0			
Total	20,684.10	1,382	89	24	0.00	6.44	

Table 19. Morbi-mortality rates of vesicular diseases in horses. South America, 1995

Countries	Population				Rates		
	Total (in miles)	In affected herds	Sick	Dead	Morbidity / 1000	Attack /100	Lethality /100
Argentina	1,989		0	0			
Bolivia	...	51	0	0			
Brazil	9,757						
Colombia	2,365	4,985	121	0	0.05	2.43	
Ecuador	980	4	4	0	0.00	100.00	
Paraguay	370.4		0	0			
Peru	2,200	5	2	0	0.00	40.00	
Venezuela	586.7	58	1	0	0.00	1.72	
Total	18,248	5,103	128	0	0.01	2.51	

Table 20. Human resources in the foot-and-mouth disease control programs, by countries. South America, 1995

Country	Field units	Proffesionals			Others		
		Central	Laboratory	Field	Central	Laboratory	Field
Argentina	309	7	11	222	7	11	702
Bolivia	56	6	27	63	6	41	71
Brazil	1,872	21	22	1,994	57	70	12,265
Chile	55	2	2	34	1	3	6,160
Colombia	120	11	7	120	12	9	472
Ecuador	54	9	...	49	30	...	59
Paraguay	62	55	32	78	137	48	254
Peru	...	4	7	56	3	14	86
Uruguay	43	6	9	71	2	0	237
Total	2, 728	121	117	2,844	255	196	20,417

Table 21. Comparative human resources in the foot-and-mouth disease control programs. South America, 1994-1995

Country	1994				1995			
	Central	Laboratory	Field	Total	Central	Laboratory	Field	Total
Argentina	32	62	900	994	14	22	924	960
Bolivia	...	41	95	136	12	68	134	214
Brasil	44	95	10,275	10,414	39	92	10,204	10,335
Chile	3	5	86	94	3	5	96	104
Colombia	23	16	595	634	23	18	592	633
Ecuador	28	...	129	157	39	...	108	147
Paraguay	192	67	348	607	192	80	332	604
Peru	21	21	210	252	7	21	142	170
Uruguay	9	14	473	496	8	9	308	325
Venezuela	21	65	268	354	21	65	268	354
Total	373	386	13,379	14,138	358	380	13,108	13,846

Table 22. Number of properties affected by vesicular stomatitis, by type of virus and country. Central America and Mexico, 1995

Countries	New Jersey	Indiana	Without diagnosis	Total
Costa Rica	12	0	3	15
El Salvador	39	2	84	125
Guatemala	16	0	19	35
Honduras	11	0	7	18
Nicaragua	1	0	6	7
Panama	9	1	9	19
Mexico	44	0	57	101
Total	132	3	185	320

Table 23. Coverage of foot-and-mouth disease control programs. South America, 1995

Country	Surface ($km^{2)}$		Cattle herds		Cattle population (miles)	
	Total	Under program	Total	Under program	Total	Under program
Argentina	2,779,892	2,779,892	292,941	292,941	56,007.00	56,007.00
Bolivia	1,098,581	370,621	...	46,345	5,619,30	1,403,80
Brazil	8,510,909	4,700,192	2,232,395	1,867,676	158,701.70	130,299.41
Chile	756,618	264,852	...	...	...	...
Colombia	1,141,748	1,083,902	726,609	724,859	22,301.70	22,218.51
Ecuador	274,168	274,168	251,445	251,445	5,067.40	5,067.40
Paraguay	406,752	406,752	229,478	125,869	9,779.30	6,969.76
Peru	...	...	846,905	644,389	4,008.80	2,019.66
Uruguay	174,486	174,486	50,456	50,456	10,333.70	10,333.70
Venezuela	912,050	...	106,535	...	13,586.20	...
Total	16,055,204	10,054,865	4,736,764	4,003,980	285,405.10	234,319.24

Cattle population in Venezuela correspond to the report of 1994.

Table 24. Comparative inventory of motor vehicles in foot-and-mouth disease control programs. South America, 1994-1995

Country	1994			1995		
	Cars	Motor cicles	Total	Cars	Motor cicles	Total
Argentina	685	0	685	618		618
Bolivia	25	8	33	26	11	37
Brazil	2,141	20	2,161	2,273	50	2,323
Chile	18	0	18	30		30
Colombia	126	282	408	122	264	386
Ecuador	43	0	43	...	...	38
Paraguay	68	66	134	62	52	114
Peru	13	106	119	13	100	113
Uruguay	77	165	242	64	154	218
Venezuela	...	...	...	...	...	...
Total	3,196	647	3,843	3,208	631	3,839

Table 25. Public and private expenditures in foot-and-mouth disease control programs, in US$ thousands. South America, 1995

Country	Operating	Public Capital	Total	Private	Total
Argentina	23,000.00	1,200.00	24,200.00	100,000.00	124,200.00
Bolivia	351.12		351.12	226.28	577.40
Brazil	26,606.60	22,408.00	49,014.60	143,033.83	192,048.43
Chile	942.00	146.30	1,088.30	15.00	1,103.30
Colombia	4,106.00	995.00	5,101.00	11.45	5,112.45
Ecuador	92.61	45.07	138.08	493.05	631.13
Paraguay	4,021.28	974.12	4,995.40	8,222.57	13,217.97
Peru	296.03	17.76	313.79		313.79
Uruguay	1,000.00	2,500.00	3,500.00		3,500.00
Venezuela	277.28		277.28	2,896.34	3,173.62
Total	60,692.92	28,286.65	88,979.57	117,266.22	206,245.79

Table 26. Number of animals vaccinated against foot-and-mouth disease. South America, 1995

Country	Sistematic vaccination			Strategic vaccination		
	Cattle		Sheep	Cattle	Swine	Sheep
	Two doses	One dose				
Argentina	32,553,600	55,474,459		135,000		
Bolivia		749,584		269,070	3,000	
Brazil	85,648,755	21,558,743		251,000		
Colombia	8,806,718	4,500				
Ecuador	155,882	727,448				
Paraguay	1,961,357	5,008,403		165,507		
Peru	94,388	2,008,734		20,174		
Venezuela	5,373,847		14,207		55,435	
Total	134,594,547	85,531,871		840,751	58,435	

Table 27. Virus strains utilized in foot-and-mouth disease vaccine production. South America, 1995

Country	Strains		
	O	A	C
Argentina	O_1 Caseros - Arg/67	A_{79} - Arg/79 A_{81} - Arg/87	C_3 - Arg/85
Brazil	O_1 Campos - Br/58	A_{24} Cruzeiro - Br/55	C_3 Indaial - Br/71
Colombia	O_1 Campos - Br/58	A_{24} Cruzeiro - Br/55	
Paraguay	O_1 Campos - Br/58	A_{24} Cruzeiro - Br/55	C_3 Resende - Br/71
Venezuela	O_1 Campos - Br/58	A_{24} Cruzeiro - Br/55	

Table 28. Foot-and-mouth disease virus subtypes identified in South America, 1995

Country	Subtype viruses			
	O	A		C
Bolivia	O1	A24	------	------
Brazil	O1	A24	------	C3
Colombia	O1	A24	A32	------
Ecuador	O1	------	------	------

Table 29. Production, control and availability of foot-and-mouth disease vaccine, by countries (doses x 1000).
South America, 1995

Country	Adjuvant	Valency	Produced	Controlled	Approved	Exported	Imported	Available
Argentina	Oil	Trivalent	108,651.60	108,651.60	...	100.00		100,000.00
Bolivia	Oil	Trivalent					1,200.00	1,200.00
Brazil	Oil	Bivalent	3,487.50			3,487.50		
	Oil	Trivalent	158,598.50	158,598.50	150,969.20	255.00		158,343.50
	Aqueous	Trivalent	18,628.40	18,628.40	18,628.40			18,628.40
Colombia	Oil	Bivalent	19,229.80	17,857.90	17,572.20	300.00		17,572.20
	Oil	Trivalent					4.50	4.50
Ecuador	Oil	Bivalent		1,363.70	1,363.70		1,363.70	151.50
Paraguay	Oil	Trivalent	7,509.80	7,509.80	7,509.80		815.50	9,457.40
	Aqueous	Trivalent	1,788.20	1,788.20	1,788.20	1,788.20		
Peru	Oil	Trivalent	1,076.00				1,100.00	2,191.40
Venezuela	Oil	Bivalent	7,664.00	7,664.00	7,664.00		3,416.90	300.00
	Oil	Bivalent	30,381.30	26,885.60	26,599.90	3,787.50	4,780.60	18,023.70
Total	Oil	Trivalent	434,434.40	433,358.40	...	610.00	3,120.00	429,540.30
	Aqueous	Trivalent	20,416.60	20,416.60	20,416.60	1,788.20		18,628.40

Table 30. Continental Vesicular Diseases Surveillance and Information System. Characteristics of reception of weekly reports. South America, 1995

Countries	Weeks			Coverage of local units reports
	Reported	Delayed	Without report	
Argentina	52	12	0	...
Bolivia	52	1, 5, 6, 7, 11, 16, 33, 34, 35, 52	0	56%
Brazil	52	2, 7, 8, 9, 10, 11, 22, 24, 25	0	...
Colombia	52	4, 11, 19, 20, 27, 28, 33, 44, 52	0	94%
Ecuador	52	16, 28, 30, 51	0	100%
Paraguay	52	2, 4, 7, 15	0	100%
Peru	52	5, 11, 12, 28, 29, 33	0	88%
Uruguay	51		7	100%
Venezuela	49	2, 3, 4, 5, 8, 15 16, 19, 20, 31 32, 33, 36, 37 38, 39, 51, 52	42, 43, 44	57%

...No information reported by the country.

Table 31. Continental Vesicular Diseases Surveillance and Information System in cattle.
Delay in days in reception of monthly reports. South America, 1995

Country/Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Median	Range
Argentina	7	7	11	9	13	17	10	8	19	23	19	10	10	(7 - 23)
Bolivia	174	169	139	109	45	26	26	27	0	49	19	36	40	(0 - 174)
Brazil	14	17	12	25	22	14	21	11	12	15	13	14	14	(11 - 25)
Colombia	26	30	38	30	23	28	29	19	20	20	19	29	27	(19 - 38)
Ecuador	41	17	27	23	20	24	23	36	20	28	13	17	23	(13 - 36)
Paraguay	24	24	41	29	34	26	18	14	13	15	13	38	24	(13 - 41)
Peru	28	1	3	10	29	...	...	...	...	...	...	...	10	(1 - 29)
Uruguay	7	7	5	8	5	3	9	5	11	8	4	9	7	(3 - 11)
Venezuela	20	21	24	30	25	14	...	19	16	14	14	29	20	(14 - 30)
Median	24	17	24	25	23	25	21	16	14	17	13	23	----	----

... Not received.

Table 32. Continental Vesicular Diseases Surveillance and Information System in cattle. Indicators of functioning in affected countries. South America, 1995

Country	Coverage in local units	Community participation in reporting	Interval between start and notification	Percentage of foci with material collected	Punctuality in sending weekly report
Bolivia	56%	...	...	43%	80%
Brazil	...	61%	8 days	41%	82%
Colombia	94%	76%	3-5 days	77%	82%
Ecuador	100%	...	4 days	40%	92%
Peru	87%	...	...	62%	88%
Venezuela	56%	...	...	40%	69%

... Not received.

Table 33. Continental Vesicular Diseases Surveillance and Information System in cattle. Indicators of functioning in areas and countries free of foot-and-mouth disease. South America, 1995

Area or Country	Coverage in local units	Community participation in reporting	Interval between start and notification	Interval between reporting and visit
Argentina	...	...	...	...
Brazil (South)	...	...	...	...
Chile	...	...	...	...
Guyana	...	...	...	...
Paraguay	100%	94%	...	...
Uruguay	100%	100%	...	3-4 hours

... Not received.

Edited by the
PAN AMERICAN FOOT-AND-MOUTH DISEASE CENTER (PAHO/WHO)
Caixa Postal 589, 20001-970 Rio de Janeiro, RJ, Brazil

October 1996