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Health Surveillance of Lunar Receiving Laboratory
Personnel During the Apollo 12 Quarantine Period

A personnel health surveillance program, similar in design to that employed for the Apollo 11 mission, was developed to monitor the health status of persons working in the Lunar Receiving Laboratory (LRL-Bldg. 37) during the quarantine period following the Apollo 12 mission. Emphasis was placed on surveillance of the 303 Sample Operations Laboratory personnel and 150 other persons in a control group. The design of the surveillance system, the protocol for medical evaluation of illness, and the diagnostic culture techniques were identical to those outlined in the health surveillance report for Apollo 11.

The lunar samples arrived November 22, 1969, and the astronauts November 24. Surveillance began operating under mission conditions on November 17; it was continued until the lunar sample quarantine was lifted on January 7. After crew quarantine release December 10, surveillance was discontinued for the control group and for LRL personnel who were not working in the Sample Laboratory.

Results

There were no unusual illnesses and no significant outbreak of common disease among persons who worked with the lunar material. The rates of illness for all groups under surveillance were low (table 1). The difference in attack rates for the Sample Laboratory and control groups is not statistically significant by Chi Square at the p less than 0.05 level. The LRL persons who did not routinely work in the Sample Laboratory had the lowest illness rate, which is probably due to the less intensive reporting system for this group.

The attack rates by specific type of illness are given in Table 2;

there are no significant differences between Sample Laboratory and Control groups. Gastrointestinal symptoms (nausea, vomiting, and diarrhea) were mild and short-lived; no cases were associated with fever. The syndrome of upper respiratory illness (URI) was the most common illness reported and cases occurred intermittently throughout the surveillance period. The clinical pattern observed was similar in all groups and included a variable combination of nasal stuffiness, rhinorrhea, malaise, mild sore throat, frontal headache, and occasionally cough. Fever was rarely observed.

One cluster of respiratory illness deserves further comment. Of the 20 cases of URI, 9 occurred in persons working the vacuum laboratory. The distribution of these cases and their epidemiologic associations are diagrammed in Figure 1. The common complaint was "a cold"; symptoms were mild and lasted 24-72 hours. Fever was observed in one instance (T. 100.4). The cases were evenly distributed in both work shifts, and rhinovirus was isolated from the throat in four cases. A similar illness in family contacts preceded by three days the two cases which developed on December 4. This could well be the source from which infection was introduced into the vacuum laboratory.

During this period, the impression was gained that respiratory illness among other groups in the LRL and in the control group was more common than reporting indicated, but because these were mild and did not result in absence from work, they were not being reported. In contrast, "colds" were commonly reported by Wackenhut Services personnel, a group of 114 guards and firemen who had LRL building access but who rarely or never entered the building during the surveillance

period. These persons were stationed at a number of sites on the base, and reporting of illness was excellent for this group. Because of these qualities, the group has some usefulness as a clinical "control" for the vacuum laboratory. A comparison of the number of cases and the attack rates is given in Table 3. Of the 15 Wackenhut employees with URI, 11 had not been into the LRL building and 3 had been only into the lobby. The difference in attack rates is not significant.

Environmental factors in the vacuum laboratory may have predisposed these workers to experience upper respiratory symptoms. This laboratory is the largest room in the building and heating was reportedly inadequate. Workers complained of cold room temperature and reported the tendency to become chilled if required to sit still for a short period. The large container of frozen liquid nitrogen which is stored on the first floor of the laboratory probably contributes to the heating problem.

A variety of other minor medical problems were reported sporadically. Except for one case of streptococcal pharyngitis, bacteriologic cultures were negative. In addition to the 4 rhinovirus isolates from persons in the vacuum laboratory, viral cultures between November 17 and December 10 yielded one adenovirus 5 and one other rhinovirus. Acute and convalescent serum from persons in the vacuum laboratory with URI will be examined serologically for antibody titre rises to the rhinovirus isolates obtained.

The illness rate for Sample Laboratory persons for the entire 53 day surveillance period was lower (0.44 per 100 persons per day) than for the 25-day period (0.61 per 100 persons per day).

In summary, the results of the Apollo 12 Health Surveillance Program indicate that there was no apparent illness associated with handling the lunar materials during the surveillance period.

Table 1

Apollo 12 Health Surveillance
Attack Rates for All Reported Illnesses
November 17 - December 10, 1969

<u>Group</u>	<u>No. at Risk</u>	<u>No. Ill</u>	<u>Attack Rate per 100 Persons per Day</u>
LRL, Sample Operations Laboratory	303	44	0.61
Controls	150	16	0.45
LRL, Others	750	54	0.30

Table 2

Apollo 12 Health Surveillance
Attack Rates by Group and Kind of Illness
November 17 - December 10, 1969

<u>Upper Respiratory Illness</u>	<u>No. at Risk</u>	<u>No. Ill</u>	<u>Attack Rate per 100 Persons per Day</u>
LRL, Sample Operations Laboratory	303	20	0.28
Controls	150	6	0.17
<u>Gastrointestinal Illness</u>			
LRL, Sample Operations Laboratory	303	12	0.17
Controls	150	7	0.19

Table 3

Apollo 12 Health Surveillance
Attack Rates for Upper Respiratory Illnesses,
comparing Vacuum Laboratory and Wackenhut
Services Personnel

<u>Group</u>	<u>No. at Risk</u>	<u>No. Ill</u>	<u>Attack Rate per 100 persons per day</u>
Vacuum Laboratory	50	9	0.75
Wackenhut Services	114	15	0.55

Figure 1

Upper Respiratory Illness in Vacuum Laboratory
November 17 - December 10, 1969

	<u>1st Shift</u>	<u>2nd Shift</u>
November 30	Warren	
December 1		McCullough
2		
3		
4	(Son, December 1) Goodman	(Wife, December 1) Meschi George (Rhinovirus)
5	Emeigh (Rhinovirus)	
6		
7		
8	Swartz (Rhinovirus)	
9	White	Treml (Rhinovirus)