

Susceptibility of itinerants ("travelling people") in Scotland to poliomyelitis*

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A total of 109 travelling people (people with a nomadic lifestyle), living on 8 separate sites in central and south Scotland, were examined for neutralizing antibodies to poliovirus types 1, 2, and 3. Of those studied, 10% had no detectable antibody to poliovirus type 3 while 7% had no antibody to type 1, the types most commonly associated with outbreaks of paralytic poliomyelitis. Only one subject, a child aged 9 years, had no detectable poliomyelitis antibody; he had no history of poliomyelitis immunization. The best protected groups of travellers were those located on sites with good facilities.

As far as poliomyelitis is concerned, we conclude that travelling people in Scotland who live on well equipped sites do not pose a hazard to nearby settled populations and, indeed, are no more vulnerable to infection than members of those communities.

For many years, poliomyelitis surveillance has been carried out in the west of Scotland in an attempt to assess the susceptibility of various groups of the population (1-4). Although the number of cases of poliomyelitis has diminished greatly in recent years, it is evident that the occurrence of the disease among itinerants or "travelling people"^a is still a cause for concern. Of the 12 cases of paralytic poliomyelitis reported in England in the first six months of 1977, 5 were among the itinerant community (S. E. J. Young, personal communication, 1977). Similarly, in other countries, poliomyelitis has been associated with groups that, for various reasons, were relatively isolated from the general population. In 1978, 110 cases occurred in the Netherlands among members of a religious group that had refused poliomyelitis immunization (5) and this outbreak spilled over into similar sects in Canada and the United States of America, where there were an additional 14 cases (6). In France, during the same year, 18 of 25 cases of paralytic poliomyelitis notified were in travelling people (7). With this background, we undertook a study in 1981 to determine if the travelling people in Scotland were similarly vulnerable. Contact was

made with representatives of the travelling community and those officials of local authorities who had established good rapport with traveller families in their area, to discuss the aims of the survey.

SUBJECTS AND METHODS

Scotland's travelling people have been estimated to comprise approximately 500 families (8). Their contact with the settled community tends to be limited according to their location and work opportunities at any particular time, and they gather mainly on the fringes of towns and cities in central Scotland. Often they are difficult to locate and, in order to carry out any investigations, their confidence has to be gained.

Eight locations were selected for study, of which five were in the west, two in the east, and one in the south of Scotland (Fig. 1). They were chosen because travellers were well established there and the sites represented a wide spectrum in terms of the amenities available. Three sites (A, B, C) were official ones operated by local authorities, and two (D, E) were privately-owned sites that had official recognition. They all had a range of facilities, including hot and cold water, baths or showers, and a drainage system connected either to main sewers or septic tanks. One (F) was at this time an unofficial site, but had been provided with a few basic amenities by the district council pending its upgrading to semi-permanent status with improved facilities. The remaining two locations (G, H) were unofficial encampments without any on-site facilities.

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^a People known variously as travellers, tinkers, or gypsies, or by related names who, by choice, live in caravans or tents, and who are mostly nomadic for all or part of the year.

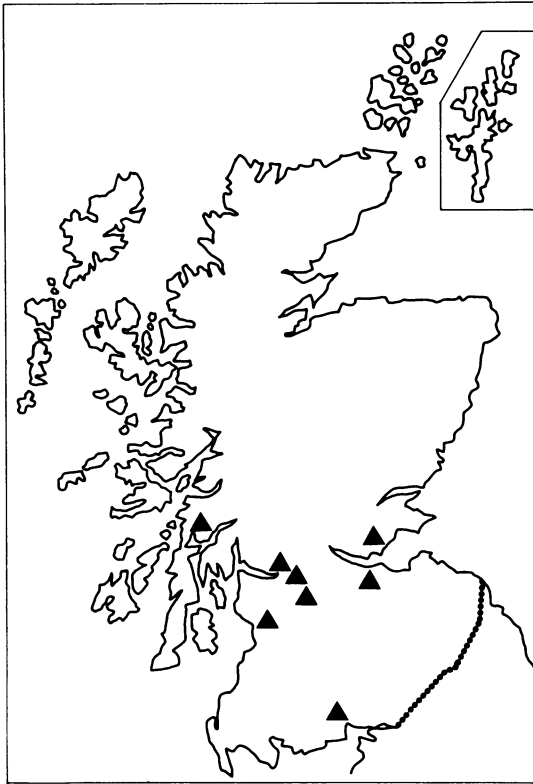


Fig. 1. Map of Scotland, showing location of travellers' sites.

The sites were visited and the purpose of the investigation explained to individual families. A questionnaire was completed for each traveller sampled detailing relevant epidemiological information. The wider cultural and epidemiological aspects of these travellers will be presented elsewhere. Between 5 and 10 ml of venous blood was withdrawn from each subject and transported to the virus laboratory.

Serum samples were available for study from a total of 109 travellers; 36 were male and 73 female. Their ages ranged from 5 to 61 years, with 91 (83%) in the age group 10-39 years. To safeguard the good rapport that had been established, we deliberately avoided sampling children under 5 years of age.

The modified micrometabolic inhibition test (9) was used to estimate levels of neutralizing antibodies to each of the 3 types of poliovirus. All titrations were started at a final serum dilution of 1/8. All tests were carried out in parallel with British Standard Poliovirus Antisera types 1, 2, and 3. Antibody titres below 8 were regarded as negative.

RESULTS

Of the 109 travellers tested, 10% had no detectable antibody to poliovirus type 3 and 7% had none to type 1, the serotypes most frequently encountered in outbreaks of paralytic poliomyelitis; 5% had titres of < 8 to poliovirus type 2 (Table 1). Protection against poliovirus infection appeared to be best in travellers on sites A-F, where washing facilities and sanitary accommodation were provided. Those at greatest risk were located on sites G and H where such facilities were absent.

Details of the antibody status of the travellers are given in Fig. 2. Only one subject was found to be negative for all three antibody types; this was a 9-year-

Table 1. Poliomyelitis antibody titres in travelling people in Scotland

Site	No. of persons tested	Poliovirus type	Antibody titre		
			< 8	8	> 8
A	11	1	0	0	11
		2	1	0	10
		3	1	0	10
B	16	1	0	0	16
		2	0	0	16
		3	1	0	15
C	11	1	1	1	9
		2	0	0	11
		3	0	0	11
D	11	1	1	0	10
		2	0	0	11
		3	0	0	11
E	5	1	0	0	5
		2	1	0	4
		3	0	0	5
F	19	1	0	0	19
		2	0	0	19
		3	0	0	19
G	20	1	4	0	16
		2	1	0	19
		3	3	3	14
H	16	1	2	0	14
		2	3	0	13
		3	6	0	10

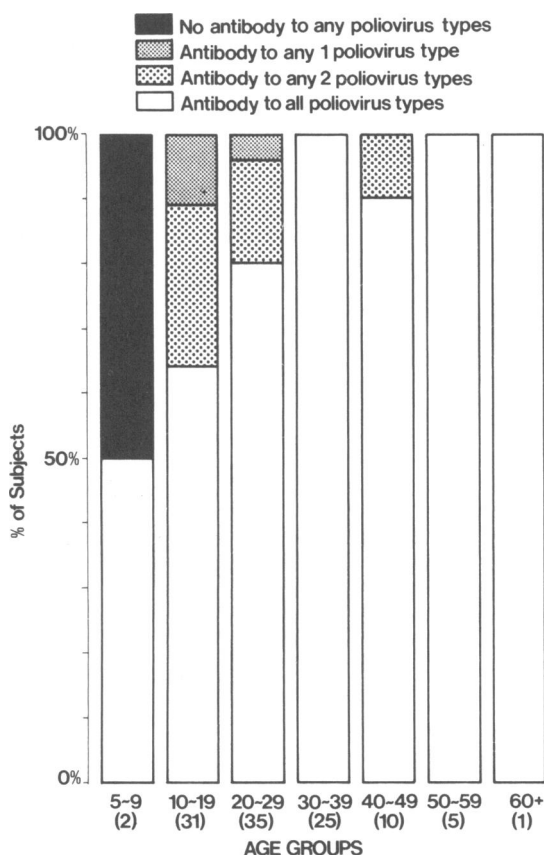


Fig. 2. Poliovirus antibody status of travelling people in Scotland. Figures in parentheses indicate the number of subjects tested in each age group.

old boy who had no history of immunization and who lived on site H. Perhaps surprisingly, the poliomyelitis antibody status of most of the travellers was satisfactory despite the fact that a history of complete immunization was obtained in only 4 subjects (4%) (Table 2). This apparent anomaly might be explained by the fact that travellers on official sites tend to mix more readily with their local well-immunized communities (e.g., in schools) and thereby gain protection by contact.

As these results became available they were immediately communicated to the relevant local authorities and general practitioners. Where titres of ≤ 8 were recorded, poliomyelitis immunization was recommended.

DISCUSSION

Although the threat of poliomyelitis has receded greatly in recent years, experience in various countries suggests that outbreaks are still liable to occur among groups that remain independent of the general medical services. Recent outbreaks in Canada, England, France, the Netherlands, and the USA highlighted the vulnerability of itinerants and isolated religious groups to poliomyelitis (5-7). Although herd immunity is important for national protection, it is obvious from these examples that it is of little help to communities that are not integrated into the general population, even when the latter is well immunized.

The outbreaks in itinerant groups prompted us to determine if the travelling people in Scotland were particularly susceptible to poliomyelitis, on the

Table 2. Poliomyelitis immunization history among travelling people in Scotland

Site	No. of persons		Immunization history			
	Male	Female	Complete	Incomplete	None	Not known
A	4	7	1	2	8	0
B	6	10	0	7	3	6
C	3	8	0	4	1	6
D	1	10	0	6	2	3
E	1	4	1	2	1	1
F	7	12	0	14	2	3
G	9	11	2	1	11	6
H	5	11	0	8	8	0
Total	36	73	4	44	36	25

assumption that they are reluctant to become involved with medical services. From this 1981 study, it was found that of the subjects tested, 10% were susceptible to poliomyelitis type 3, 7% to type 1 (i.e., the types most commonly associated with paralysis), and 5% to type 2.

Although travellers living on unofficial sites were more susceptible to poliomyelitis than those in the better locations, it should be remembered that there are groups in the general population that have a similar, if not greater, gap in immunity to poliomyelitis (10). There is a need, therefore, for more widespread immunization to cover these areas of sus-

ceptibility. Following our survey, an attempt was made to ensure that the travellers without immunity were subsequently immunized. We were surprised to find that the conventional idea that travelling people do not register with doctors was, in fact, incorrect. The lowest registration rates (55%, 50%) were among travellers on the two unofficial sites (G, H), who were from the lowest economic groups.

We conclude that, as far as poliomyelitis is concerned, the general population should not be apprehensive about the development of well-run permanent sites in their locality.

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RÉSUMÉ

SENSIBILITÉ DES NOMADES D'ÉCOSSE À LA POLIOMYÉLITE

Si la poliomyélite s'est faite moins menaçante ces dernières années, de petites épidémies ont toutefois été enregistrées en Europe, en 1977 et 1978, dans certains groupes — des nomades par exemple — tendant à rester à l'écart des services médicaux généraux.

Comme l'état immunitaire des populations nomades d'Écosse était inconnu, des échantillons de sérum prélevés en 1981 sur 109 nomades, dans huit camps du centre et du sud de l'Écosse, ont été analysés pour y rechercher les anticorps neutralisant les poliovirus des types 1, 2 et 3, l'estimation de ces anticorps étant faite par l'épreuve d'inhibition micrométabolique modifiée. La vaccination antipoliomyélique a été recommandée lorsque les titres enregistrés étaient inférieurs ou égaux à 8 (sujets «sensibles» et sujets «limite»). Des sujets examinés, 10% ne présentaient pas d'anticorps décelables à l'égard des poliovirus de type 3 et 7% n'en présentaient pas contre le type 1 — sérotypes les plus fréquemment associés à la maladie paralytique, 5% ne possé-

daient pas d'anticorps vis-à-vis du poliovirus de type 2. Les groupes les mieux protégés étaient ceux qui vivaient dans des emplacements bien aménagés, pourvus d'installations sanitaires et de buanderies; les plus exposés résidaient dans deux camps non officiels où n'existaient pas de telles installations.

L'état immunitaire traduit par les anticorps était satisfaisant chez la plupart des nomades, quoique 96% de ceux-ci n'aient pas été vaccinés contre la poliomyélite. Peut-être faut-il penser que les nomades installés dans des camps bien aménagés ont tendance à se mêler plus facilement à la population locale, bien immunisée, et s'immunisent eux-mêmes à son contact.

Les auteurs concluent que, sur le plan de la poliomyélite, les nomades écossais installés dans des sites de campement bien aménagés ne constituent pas un problème de santé pour les collectivités sédentaires avoisinantes, et ne sont pas plus vulnérables qu'elles à la poliomyélite.

REFERENCES

1. MACLEOD, R. C. ET AL. Serological epidemiology of poliomyelitis in Central Scotland. *Scottish medical journal*, 3: 76-81 (1958).
2. REID, D. ET AL. Poliomyelitis: a gap in immunity? *Lancet*, 2: 899-900 (1973).
3. BELL, E. J. Serological surveillance of polio virus in the West of Scotland. *Weekly epidemiological record*, 49: 215-216 (1974).

4. BELL, E. J. ET AL. Immune status of children of immigrants to poliomyelitis. *British medical journal*, **1**: 16-18 (1978).
 5. BIJKERK, H. ET AL. De poliomyelitis-epidemie in 1978. *Nederlandsch tijdschrift voor geneeskunde*, **123**: 1700-1714 (1979).
 6. Poliomyelitis surveillance (based on WHO Collaborating Centre for virus reference and research, Atlanta, USA). *Weekly epidemiological record*, **54**: 253-254 (1979).
 7. Poliomyelitis surveillance (France). *Weekly epidemiological record*, **54**: 65 (1979).
 8. The Secretary of State's Advisory Committee on Scotland's Travelling People, 1979-82. Third Report (in press).
 9. KYRIAZOPOULOU, V. G. & BELL, E. J. A micrometabolic inhibition test for the estimation of poliovirus neutralizing antibodies. *Bulletin of the World Health Organization*, **47**: 171-175 (1972).
 10. BELL, E. J. ET AL. Poliomyelitis worldwide. *British medical journal*, **282**: 310-311 (1981).
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