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## Rash Remains After Revelers Relax in Hot Tub

Recently, the Section of Epidemiology investigated an outbreak of illness among guests at cabins near Mt. McKinley National Park. Our investigation identified ten persons who developed a rash after using hot tubs at the cabins.

We defined a case of folliculitis as the occurrence of two or more erythematous raised skin lesions, between 5 and 10 mm in diameter, not attributed to mosquito bites, which occurred 1-7 days after visiting the cabins. After obtaining a list of all registered guests around the time the index case was reported, Section of Epidemiology staff telephoned guests to obtain information about illness and hot tub exposure (if any) using a standard questionnaire. Guests not reached were sent a follow-up letter.

Of the 164 registered guests, 96 (59%) were interviewed. The ten identified case-patients each had skin lesions in a variety of places including the arms, back, legs, hips, or abdomen. Four case-patients had obtained medical care, one person was treated with Ciprofloxacin, and one had a skin culture. The culture was positive for Pseudomonas aeruginosa, confirmed by the State Public Health Laboratory. All rashes resolved uneventfully. All ten case-patients had used the hot tubs. There were an additional 31 guests who had used the hot tubs, but did not develop a rash illness. Of the 55 guests who had not used a hot tub, none were ill. There was a strong and highly significant association between rash illness and hot tub use (odds ratio = infinity, Fisher's exact p-value = 0.0001).

The State Department of Environmental Conservation collected water samples from each of the two hot tubs at the cabins. In addition, environmental swabs were taken from the skimmers, edges of both tubs, filter, and the pump inlet and outlet. DEC closed the hot tubs. Pseudomonas aeruginosa was cultured from multiple environmental samples taken by DEC. The tubs were drained and cleaned according to the DEC's instructions and, after repeat water sample cultures were negative for Pseudomonas, the tubs were allowed to reopen.

**Comments:** This investigation documented ten persons with rash illness after using public hot tubs. One case-patient had a skin culture which was positive for Pseudomonas aeruginosa; presumably the other case-patients had Pseudomonas folliculitis as well. Records maintained by the owner/operator of the cabins indicated that during the outbreak period, bromine levels in the hot tubs were <0.5 ppm (optimal level 2-3 ppm). The hazards of inadequately maintained hot tubs have been well documented, and this outbreak reinforces the importance of diligent management of public spas. Owners and operators should fully understand the importance of proper operation and maintenance of hot tubs in order to prevent bacterial growth in the tubs and subsequent rash illness in the users.

Health care providers who see patients with illnesses possibly associated with hot tub use should contact the Section of Epidemiology.

### Gems and Jewels

#### Statistics for Epidemiology

The general problem may be stated as follows: Having given the number of instances respectively in which things are both thus and so, in which they are thus but not so, in which they are so but not thus, and in which they are neither thus nor so, it is required to eliminate the general quantitative relativity inhering in the mere thingness of the things, and to determine the special quantitative relativity subsisting between the thusness and the soness of the things.<sup>1</sup>

<sup>1</sup>Doolittle, M.H. 1888. Association ratios. Bull Philosoph Soc Wash, 7:122