

crease in the overall case-fatality rate should provide firm evidence of the impact of ORT in hospitals. It is likely, however, that deaths occurring outside the hospital are underreported, a factor which may clearly complicate interpretation of changes in overall hospital case-fatality rates.

Regarding inpatient case-fatality rates, in 13 instances (including separate collections of data for adults and for children at the Bamrasnadura Infectious Diseases Hospital in Thailand) it was possible to calculate this rate for both pre- and post-ORT periods. In only four of these instances were there statistically significant decreases, and in one instance there was a significant increase in the inpatient case-fatality rate. Changes (including non-significant changes) ranged from an 86% decrease to a more than five-fold increase; the median finding was a reduction of 50%.

Decreases in inpatient case-fatality rates may result from generally improved case management (including improved intravenous therapy) associated with a better awareness of the problem of dehydration. Use of ORT for maintenance

therapy will also reduce the length of intravenous therapy and the component risk of fatal complications such as septicemia. Increases in inpatient case-fatality rates might be explained by effective outpatient management with ORT resulting in only the most severe cases being admitted.

### Conclusion

It is apparent from this brief account that interpretation of changes in the three indicators used is difficult in the absence of more complete data on the circumstances of each hospital and its surroundings. Nevertheless, the data reported here do show that decreases clearly outnumbered increases in all three of the rates calculated. They also support the theory that careful monitoring of these indicators in individual hospitals, with due consideration given to concomitant policy and other changes, should allow evaluation of the impact of ORT in a hospital setting.

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*Source:* World Health Organization, *Weekly Epidemiological Record* 59(47):361-363, 1984.

## HUMAN LICE: SOME BASIC FACTS AND MISCONCEPTIONS

All three human lice—the head louse, the clothing (or body) louse, and the crab louse—may be found in any part of the inhabited world, and no race of man is immune to them. They remain an enduring problem and something of a threat, for it should not be forgotten that in the history of the world they have killed more human beings than any other insects, with the exception of malaria mosquitoes.

People tend to hold strong (and usually negative) views about lice. Indeed, no other areas of medical entomology is so affected by entrenched myth and ingrained prejudice, and in order to learn one new true fact about lice most people will first have to unlearn at least one old misconception. For example, a person's rational

knowledge of lice may be linked with attitudes toward dirt. The simple truth that lice neither need nor like dirty conditions may thus not seem credible unless the emotional cross-link is broken or the attitude toward dirt modified. This, it appears, is why teaching about lice often needs to be more extensive and penetrating than one might at first expect if it is to be effective.

It was this realization that led us in Britain to change our teaching policies. For many years I and my colleagues ran or participated in large numbers of short meetings and seminars for medical and paramedical personnel without, as far as could be seen, much real effect on fundamentals. However, as soon as the numerous three-hour seminars were replaced by a limited

number of three-day teaching courses, immediate and substantial progress was made, resulting in considerable saving to the public purse. We had taken time to give people an appreciation of lice, to enable them to understand lousiness from the louse's point of view. And as soon as disgust at lice melted into rueful admiration for these amazingly resourceful and persistent insects, so wonderfully adapted for their chosen lifestyle, then progress in control occurred. We thus found that in many cases it is only after people begin to like lice that they are prepared to go and eliminate them, instead of just tinkering with the problem.

One widespread misconception is that lice are rare. Most medical and nursing literature is written by those who have never been lousy, and the authors tend to assume that most of the world is like them and their small circle of friends in this respect. Thus, they feel no need to question the innocent conspiracy of silence to which everyone else involved subscribes. The lousy are usually in some degree ashamed, and do all they can to hide their condition. A family is anxious to keep quiet about the fact that they have lice among them. A village, or a town, or an institution, or a province, and above all whole countries, have not the slightest wish to advertise lousiness within their borders. So it is that pediculosis is invariably underestimated.

In fact, modern surveys of the incidence of clothing lice are lamentably sparse. Nevertheless, enough has been done to demonstrate widespread insecticide resistance to the organochlorine-based lousicides, and also to give support to the view that since clothing lice are characteristic of poor and crowded communities, and also that since most of the world remains poor and is rapidly becoming overpopulated, then clothing lice are both common and increasing.

In contrast, many surveys have been concerned in recent years with the incidence of head lice. The dramatic increase in these parasites in all the countries of the Western World has stimulated numerous studies, and there are now welcome reports emanating from Black Africa and several other Third World countries.

The picture that is currently emerging shows

a divergence between the developed and developing countries. In the former, head lice are becoming somewhat less common in their traditional strongholds among the working class children of industrial cities and much more common among the children of middle-class and rural communities. There are also far fewer very severe cases but considerably more light ones. This change is thought to be linked not only with the reduction of grooming activities among children (which in former times would have destroyed many invaders before they became established) but also with improved social activities for children. That is because very heavy infections tend to build up in socially isolated children, but if those children have frequent head-to-head contacts, then part of the excess population is exported and a larger number of lighter infections result. Meanwhile, in the less developed countries the traditional distribution appears to prevail.

The third human louse, the crab louse, is the one most seriously underestimated. The physical effects of infection are not serious, although the psychological ones can be important. People will go to great lengths to conceal this louse. In particular, they do not want respected persons such as doctors and pharmacists to know they have it. Self-treatment, often with veterinary products, is the rule. In consequence, the medical profession relatively rarely sees the crab louse and greatly underestimates its prevalence.

The role of lice as disease vectors is not merely historic. Far too many World Health Organization surveillance reports show outbreaks of louse-borne typhus, principally in East and Central Africa and South America. The total mortality from typhus still exceeds that from several more fashionable diseases, including tsetse-fly borne sleeping sickness, and the disease still poses a substantial threat to be taken into account in the aftermath of wars, famines, and natural disasters.

Nor is being lousy a light thing for the sufferer. Initially, the bites of lice are symptomless and cause no reaction. This has caused many a middle-class worker who has fed only a few lice himself to discount the effects of louse bites. In

fact, a sensitizing period is required before bites begin to itch. As few as 10,000 bites may be enough to induce primary sensitization in some individuals; others may require as many as 100,000 bites. In general, however, such sensitizing levels are attained three to eight months after the original infection with lice. From that point onward the bitten areas will itch. This is usually most uncomfortable; sleep is disturbed and scratching may lead to secondary infection.

Worse is in store for the long-term lousy person. Secondary sensitization develops some 12 to 18 months after the initial infection with lice. A general and systemic reaction then occurs, which includes a feeling of malaise accompanied by a dull and pessimistic frame of mind. The person often becomes apathetic if left alone and irritable if roused. Such a person is not well. He feels lousy, this being the origin of the phrase. People do not only have lice, they also suffer from them.

The remaining major misconceptions about lice may be conveniently grouped together as the feeling that lice are simple creatures fully understood long ago, and about which no new thing of real importance may be said. In fact, lice are extremely complex both in biology and epidemiology. Smallpox has now gone, because it really was a simple disease despite its severe effects on man. Lice are still with us, partly because they are complex and still not fully understood.

The feeling that the last word on lice has long been said not only makes it hard for scientists in this field to attract research funds, but also ensures that many of the otherwise really good textbooks on community health, or pediatrics, or even medical entomology are thoroughly out of date when it comes to lice.

A few examples will suffice. Every scientist specializing in lice knows that all the nearly 600 species of blood-sucking lice living in association with mammals transfer from host to host in only one way. Textbook writers are often middle-aged, middle-class Western males, members of a group that makes very few physical social contacts with other members of the human race, ritual handshakers excepted, and that does not

appreciate how often other people come into contact with one another. It is not surprising, then, that their textbooks continue to imply that head lice must be spread by hats, combs, bedding, pillows, cushions, chair-backs, upholstery, or in numerous other fantastic ways. In fact, viable lice never leave their hosts; and there is no evidence that any method of spread other than direct physical contact has the slightest practical importance.

Of course, lice *are* found on chair-backs, on pillows, and in the environments around lousy children; but these are dead, sick, or aged insects, or merely the cast skins of lice, and these play no role in transfer. All lice are spread by contact, and the head louse provides no exception. Why, then, must parents be harassed into cleaning and spraying their houses, since treating the child is enough? Theoretically, the sight of people fumigating a school should be a joyful one to head lice, for viable insects are found on human heads and nowhere else.

In the case of clothing lice, great emphasis is commonly placed on washing clothes as a curative measure. So those involved should be aware that although clothing lice are associated with poverty, vagrants, and refugees, this is not because the victims are merely poor or dirty or homeless, but rather because they are using only one set of clothing. Anyone who possesses only one set of clothing, or owns more but does not make complete changes, runs the risk of becoming lousy.

Furthermore, washing clothing merely produces cleaner lice, unless the water is so hot that the human hand cannot bear it. It is not washing but heat that kills lice, and many who suffer from clothing lice do not have the facilities for hot-water washing or the money to spare for fuel. It should also be noted that the modern low-temperature washing machine has led to a phenomenon new to Western cities; the clean person with clothing lice, previously seen only where communities washed clothing in rivers and lakes.

However, anyone who possesses at least two complete sets of clothing, and regularly changes them at intervals of not less than five days or

more than twelve, cannot keep lice no matter how dirty or otherwise unhygienic he may be. The very best time for such complete changes is every seven days; and this, it has been suggested, is the origin of the week.

The critical thing here is that complete changes are essential. Lice dislike dirt, and if only one clean piece of clothing is put on the insects will tend to migrate onto it. This has survival value, for it is the dirtiest piece which is most likely to be the next discarded.

In conclusion, as some of these points

suggest, there have been many advances in our understanding of lice during the past decade. The plea of medical entomologists to medical authors is therefore that they read the most modern publications before setting pen to paper. Otherwise, both current misconceptions about lice and the infestations encouraged by such misunderstanding will persist.

*Source:* The foregoing is a condensed version of the article "Human lice: A complex epidemiological problem" by John W. Maunder that appeared in the *CAREC Surveillance Report* of December 1983 (volume 9, number 12, pp. 1-4).

## DRINKING-WATER QUALITY IN THE CARIBBEAN

*Caribbean environmental health programs in the past have tended to focus on areas other than water quality control; and while Caribbean countries generally adopted the World Health Organization's 1971 standards for drinking-water, most failed to implement or enforce them. To help examine the more important problems that the Caribbean faces in this area and to provide a basis for future action, PAHO sponsored a workshop on "Introduction of the 1984 WHO Guidelines for Drinking-Water Quality and Their Use in Water Quality Improvement in the Caribbean." That workshop was held at Castries, Saint Lucia, on 26-29 June 1984. The following account is based on the workshop's final report.*

A workshop on the introduction of the 1984 WHO Guidelines for Drinking-Water Quality and their use in drinking-water quality improvement programs in Caribbean countries was held at Castries, Saint Lucia, on 26-29 June 1984. The workshop was attended by 20 participants representing 15 Caribbean countries and territories,<sup>1</sup> as well as by staff members of PAHO, CARICOM, and the Caribbean Development Bank. Specific objectives of the workshop were as follows:

- 1) to introduce the WHO 1984 Guidelines for Drinking-Water Quality;
- 2) to review changes in guideline values and the reasons for the changes;

3) to review newly-included contaminants and their health significance;

4) to review the status of drinking-water quality in the Caribbean;

5) to provide a methodology for assessing the need to revise or establish national drinking-water standards;

6) to provide experience in utilizing a risk-benefit approach to national standards and regulations;

7) to provide, through the case-study method, experience in planning a drinking-water quality improvement program, with special emphasis on water quality control in small island countries and in small communities;

8) to promote drinking-water quality improvement,

<sup>1</sup>Anguilla, Antigua, Bahamas, Barbados, Belize, Bermuda, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts, Saint Lucia, and Suriname.

The workshop was opened by the Honorable