

# The prevalence of pediculosis in rural South African schoolchildren

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INFECTION WITH *PEDICULUS HUMANUS* VAR. *capitis* has been poorly studied in South Africa and little is known about head louse prevalence, particularly in rural areas. A prevalence survey of head lice among school pupils in Grades 1–7 (age range 6–13 years) was conducted at two primary schools, Sikhutsele and Barberton, 5 km apart in rural Barberton, Mpumalanga, during April 2001. Sikhutsele students are exclusively black children from a low socio-economic community, whereas Barberton is a multi-ethnic school with children from a relatively high socio-economic group. Four trained school health nurses examined the scalps and hair of all schoolchildren (with their parents' consent) present on the day of the survey. Any evidence of head louse infection resulted in screening using a commercially available white hair-conditioner which was applied to the hair and immediately removed with a fine-toothed comb. Combing was wiped onto paper tissue and immediately examined under a dissecting microscope for eggs and head lice. There was no evidence of head louse infestation among the 300 school children screened at Sikhutsele. Fifteen (8.6%) of the 175 children screened by the same team at Barberton Primary School were infected with viable head lice. All these children were white, with a resulting 16% prevalence rate (15/93) amongst white schoolchildren examined in the school. Children in each grade were infected and more girls than boys ( $\chi^2 = 4.17$ ;  $P = 0.026$ ). This study indicated that the overall prevalence of head lice in primary school pupils in Barberton is low and involves only the white ethnic group.

## Introduction

Head lice (*Pediculus humanus* var. *capitis*) are wingless, obligate ectoparasites of humans, which affect millions of children worldwide, especially those in the 5–11-year age group.<sup>1</sup> The presence of head lice usually raises concern amongst school health workers, teachers, children and parents, but it is believed that in areas where there are other serious health priorities head louse infection is ignored and thus remains undetected.<sup>2–4</sup> Although head lice are not known to be vec-

tors of human disease, pediculosis causes scalp pruritis that may lead to secondary bacterial infections, which may be severe.<sup>5</sup> Pediculosis may also detrimentally influence schoolchildren's learning performance by negatively affecting concentration, or through stigmatization by peers following detection.

Pediculosis is contagious with transmission occurring mainly by scalp-to-scalp contact, affecting schoolchildren of all socio-economic strata and not just the poor, uneducated or those living in unhygienic conditions.<sup>6–8</sup> Although head louse infestation is common throughout the world, its epidemiology in South Africa is unknown. Anecdotal reports suggested an increasing prevalence of active pediculosis among schoolchildren in Mpumalanga, a rural province in the northeast of South Africa. We therefore conducted a head louse prevalence survey in two primary schools in the Barberton district.

## Methods

Grade 1–7 school pupils at Barberton and Sikhutsele primary schools were screened for head louse infestation. Four specially trained school health nurses from the study area examined the children's hair and scalps for lice under our direct supervision. We included in the study only children whose parent or guardian had granted written permission. Where there was any suspicion of head lice, the child's hair was thoroughly treated with conditioner (Clicks Wheat-germ Shampoo, Clicks Organization, Cape Town). After 20 minutes the hair was combed with a fine-toothed plastic lice-comb. All combings were wiped onto paper tissue and immediately examined under a dissecting microscope. The presence of viable eggs or head lice indicated active infestation. In addition, for each child at Barberton Primary School, parents or guardians completed a brief questionnaire on the history of head louse occurrence, frequency of inspection for head lice and any previous use of head louse treatments.

Chi-square tests were used to compare infestation rates of boys and girls, and pediculosis prevalence rates before and

during 2001. The Mpumalanga Department of Health's Research and Ethics Committee granted ethical approval to conduct the survey.

## Results

At Sikhutsele Primary School, which exclusively serves black pupils from a neighbouring low socio-economic community, 300 schoolchildren in Grades 1 to 7 (mean age 8.7 years) were examined. We found no evidence of head louse infestation and performed no further analysis of data. At Barberton Primary School, a multiracial school serving a relatively affluent community, 175 pupils in Grades 1 to 7, comprising 101 (57.7%) girls and 74 (42.3%) boys (mean age 9.6 years), were examined. Only 15 (8.6%) children showed evidence of active pediculosis and all were from the white ethnic group (Table 1). The prevalence of infestation varied by school grade from 3.7% in Grade 1 to 16.0% in Grade 4 (Table 1). There was a higher prevalence of infestation among girls (10.9%) than among boys (5.4%) ( $\chi^2 = 4.17$ ,  $P = 0.024$ ). Analysis of parent-completed questionnaires indicated that 17.1% of children had experienced infestation with head lice prior to 2001. Most previous episodes had occurred during February and March, the hot summer months. The majority of parents (44%, 77/175) reported occasionally inspecting their children for head lice using conditioner and a nit comb. Of the parents who mentioned previously using commercial products for treating their children's hair against head lice, the majority (37.7%) reported using NO SECTA (citronella oil, UFO, Hercules) insecticide. However, most reported treatment failures (49.1%) were with the same insecticide. Other treatments applied included Para Nit Remover (7.2%), Gambex (5.4%), Quellada (0.6%) and others (1.2%).

## Discussion

Pediculosis was relatively uncommon in rural Barberton. All infested children were white and from a relatively well-off community. The difference between schools does not appear to be due to socio-economic differences, as black children in Barberton Primary School also gave no evidence of pediculosis. Hair-style, frequency of grooming, or individual hair structure may explain the racial differences in head louse infestations. Black primary schoolchildren tend to have short, fine hair that is easy to groom. Head lice tend to prefer long, thick hair that is also difficult to groom. Historically,

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**Table 1.** Prevalence of head louse infestation in schoolchildren at Barberton Primary School, Mpumalanga.

Ethnicity and infestation	Number of children examined by school grade							Total
	Grade: 1	2	3	4	5	6	7	
<b>Black</b>	17	15	7	8	10	7	2	66
Number of infestations	0	0	0	0	0	0	0	0
<b>White</b>	9	14	4	17	17	18	14	93
Number of infestations	1	3	1	4	2	3	1	15
Percentage positive (%)	11	21	25	24	12	17	7	16
<b>Asian</b>	2	4	1	1	2	1	1	12
Number of infestations	0	0	0	0	0	0	0	0
<b>Coloured</b> (mixed race)	0	1	0	0	0	0	0	1
Number of infestations	0	0	0	0	0	0	0	0
<b>Unknown</b>	1	1	0	0	0	1	0	3
Number of infestations	0	0	0	0	0	0	0	0
<b>Total</b>	29	35	12	26	29	27	17	175
Number of infestations	1	3	1	4	2	3	1	15
Infestation per grade (%)	3.4	8.6	8.3	15.4	6.9	11.1	5.9	8.6

**Table 2.** Studies on prevalence of pediculosis in Africa.

Country	Number examined	Prevalence	Reference
<b>East Africa</b>			
Kenya	1270 schoolchildren	17.1% (8.1% active, 9.1% inactive)	11
Tanzania	2876 all ages	5.3%	12
<b>North Africa</b>			
Egypt	Children in orphanage	64%	13
Egypt	486 schoolchildren (6–12 years)	16.4%	14
Ethiopia	1842 schoolchildren (5–15 years)	66.5%	15
Ethiopia	768 all ages	48% of 5–14 years	16
Ethiopia	3133 rural, 2359 in Addis Ababa	24.4% rural, 26.2% Addis Ababa	17
Seychelles	6822 pre- and primary schoolchildren	11.0%	18
<b>West Africa</b>			
Cameroon	2312 schoolchildren	32%	19
Ivory Coast	2209 (4–15 years)	18.5%	20
Gambia	444 (1–9 years)	28.8%	21
Ghana	319 schoolchildren	49%	22
Niger	7360 all ages	5.7% (13.5% in 6–13 year olds)	23
Nigeria	4242 students	17.6%	24
Nigeria	2704 primary school children	12.7%	25
Nigeria	1860 urban school children vs 473 rural	5.7% vs 1.5%	26
Nigeria (Kwara State)	1842 urban vs 1056 rural	3.1% vs 0.1%	27
Nigeria (Kwara State)	6882 urban	3.7%	28
Nigeria (Benin)	415 preschool children	0%	29
Sierra Leone	1007 schoolchildren	6.8%	30
Sierra Leone	84 schoolchildren	30%	31

shaving the scalp was an effective, if stigmatizing, control method. Social patterns of mixing in Barberton Primary School may also have influenced contact and transmission patterns.

In most studies of pediculosis capitis a clear preponderance among females has been shown.<sup>9</sup> Gender-related behavioural differences such as close contact in small groups, in particular pairs among girls, and the tendency of girls to wear their hair long are reasons cited for gender differences in head louse infestation.<sup>6,10</sup>

Although the South African Essential Drugs List recommends benzyl benzoate 25% and permethrin 1% lotion for head louse treatment,<sup>32</sup> this recommendation is not based on any local evidence of treatment efficacy. Parent-completed questionnaires indicated that many products are used and we believe there is a need for

gathering reliable effectiveness data on which to base future treatment recommendations.

This is the first community prevalence study of pediculosis conducted in southern Africa. Previous studies in Africa demonstrated marked variation in prevalence in schoolchildren (Table 2). Head louse infestation is uncommon among Barberton primary schoolchildren and although it is not possible to generalize these findings to the rest of Mpumalanga or South Africa, survey results suggest that in rural Mpumalanga pediculosis should not be considered a public health priority. However, since pediculosis appears to be largely a problem of the white ethnic group in South Africa, health promotion, particularly about the importance of early detection and effective management strategies, should target this group.

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In many urban areas there are well-developed markets in the informal sector where edible herbs are sold to urban householders and commuters.<sup>6,8</sup> Thus, they are not only of dietary significance but also represent an opportunity for income generation, especially for the rural poor.<sup>9,10</sup> Additionally, their importance increases during adverse conditions, such as drought or loss of employment, and hence they play a significant safety-net role.<sup>11–13</sup> South Africa is no exception, with a number of studies having reported on the use of wild edible herbs,<sup>9,10,14</sup> although many of the early investigations had limited quantitative data on prevalence of use.<sup>15–17</sup>

Nesamvuni *et al.*<sup>10</sup> recently reported on the widespread use of wild edible herbs in Venda, based on a sample of 412 interviews. Coupled with data on the nutritional composition of some species, they stressed the value of the consumption of wild edible herbs in the diets of the rural poor. Several previous studies have also stressed the dietary importance of these wild species, based on nutritional analyses,<sup>17–20</sup> particularly for diets low in vitamins and minerals.<sup>21,22</sup>

The actual value of leafy vegetables in the diet of an individual depends upon a number of factors, including frequency of consumption, amounts eaten, freshness, and methods of preparation and cooking. Their contribution to the diets of particular sectors of society also depends on the proportion of people using wild edible herbs. Nesamvuni *et al.*<sup>10</sup> provided good data for several of these criteria. However, two essential kinds of information were not covered in depth. First, since their sample was not random but taken from respondents who had already indicated that they use wild edible herbs, the prevalence of consumption within the local communities was not determined. Second, they reported that consumption was once per week, although the actual mean and confidence intervals were not provided. This is considerably less than findings from a number of recent studies in South Africa and elsewhere.<sup>9,23–25</sup> Consequently, in this paper I summarize the findings from four recent studies at eight sites (Table 1), totalling 485 households, that provide quantitative data to address these two issues, and indicate the prevalence and direct-use value, and hence importance, of wild edible herbs in South Africa.

For each of the four investigations, households in each study village were selected randomly from aerial photographs or enumerator maps. A structured

## The prevalence of use and value of wild edible herbs in South Africa

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THE PREVALENCE OF USE AND COMMERCIAL value of wild edible herbs in South Africa is examined from four recent quantitative studies at eight different sites. The use of wild edible herbs was widespread in rural communities, with over 90% of households using them in all but one sample site. Mean frequency of use in season was generally between two and five times per week, with a mean of four times across all sites. But many households consume them daily. Use in winter was less than in summer. The mass of wild edible herbs consumed ranged from 12 kg to over 130 kg per household per year. Local (farm-gate) prices ranged from R2.65 to R72 per kilogram, but were generally between R30 and R40 per kg. Direct-use value to consuming households ranged from R85 to almost R5000 across the eight sites, with a mean of R1020 per user household per year. Although harvesting of wild herbs takes time, the high gross direct-use value represents a

considerable saving on having to purchase commercial alternatives. Key species differ from place to place both in availability and use, and include both indigenous and exotic species. Commonly used genera include *Amaranthus*, *Bidens*, *Chenopodium*, *Cleome*, *Corchorus*, and *Momordica*. The use, value and trade in wild edible herbs currently receives no recognition in land and agrarian reform policies. It is imperative that this be addressed, and the relationships between rural livelihoods, use of wild edible herbs, food security, and land and resource tenure be clarified, and debated within the policy forums around different models for, and delivery of, agrarian reform and rural development.

### Introduction

The use of wild edible herbs, or wild leafy vegetables, is an important component of the diet of people throughout sub-Saharan Africa.<sup>1–7</sup> Whilst use of these herbs is most widespread amongst rural communities, it is not restricted to them.

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