

Report

The frequency of common nonmalignant skin conditions in adults in central Victoria, Australia

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Abstract

Background Nonmalignant skin conditions are believed to be common in adults, although there are very few community-based studies to determine their exact frequency.

Objective To record the prevalence of common, nonmalignant skin conditions in adults in central Victoria, Australia.

Methods A total of 1457 respondents from a random selection of adults aged 20 years and over from Maryborough, central Victoria, were given a total body examination by a dermatologist or dermatology trainee. People with any nail or skin signs suggestive of tinea had scrapings taken for fungal culture.

Results The age- and sex-adjusted prevalence of warts was 7.1% (95% confidence interval (CI), 5.8–8.4%), acne 12.8% (95% CI, 11.0–14.5%), atopic dermatitis 6.9% (95% CI, 5.6–8.3%), seborrheic dermatitis 9.7% (95% CI, 8.2–11.2%), asteatotic dermatitis 8.6% (95% CI, 7.1–10.0%), psoriasis 6.6% (95% CI, 5.7–7.9%), culture-positive tinea 12% (95% CI, 10.3–13.6%), seborrheic keratoses 58.2% (95% CI, 55.6–60.7%), and Campbell de Morgan spots (cherry angiomas) 54.4% (95% CI, 51.9–57.0%). There was variation in the prevalence of many of these conditions with age.

Conclusions This study demonstrates that nonmalignant skin conditions are common in adults in Australia. Their diagnosis and management represent a considerable burden not only to those suffering from the conditions, but also to the health system which provides for their care.

Introduction

Skin diseases in adults are believed to be very common. They include inflammatory skin diseases such as psoriasis and various forms of dermatitis (eczema), infections such as viral warts and tinea, and benign and malignant tumors such as actinic keratoses and invasive skin cancers, seborrheic keratoses, and various vascular lesions. With the exception of skin cancers, there are remarkably few studies on their true frequency in the general population. No investigation has ever been published on the prevalence of Campbell de Morgan angiomas.

The first Health and Nutrition Examination Survey (HANES I), conducted from 1971 to 1974 in the USA, suggested that 312.4 per 1000 persons in the population had at least one or more significant skin conditions which should be reviewed at least once by a physician.¹ A study in Lambeth, UK, also in the 1970s, suggested from self-

report a frequency of 554.7 per 1000 people suffering from some type of skin condition, although the overall prevalence of skin disease believed to justify medical care was calculated to be 225 per 1000 people.² A cross-sectional study of 1037 adults in Busselton, Western Australia reported, in 1979, that 4.2% had some type of dermatitis and 2.3% had psoriasis.³ There have been no population-based studies reported from Australia since then in which people with skin conditions were examined to confirm the diagnosis.

An Australian National Health Survey conducted in 1995, relying on self-report by the individuals interviewed, recorded that 9.87% of people in Australia said that they had a recent and/or long-term disease of the skin and subcutaneous tissue at the time of interview.⁴ There was no verification of any of the diagnoses recorded in this survey. A community health survey of almost 2000 people in the late 1960s in Heyfield, Victoria, reported overall

skin disease prevalences of 11.7% among adult men, 10.0% among adult women, and 10.9% among the elderly.⁵ These results were based on history and were not verified clinically. More recently, in a randomly selected telephone survey of 416 adults in Maryborough, central Victoria, 27% of people interviewed reported having one or more skin conditions over the past 2 weeks.⁶ Once again, this relied on self-report with no verification of diagnosis.

The latter study revealed that only 49% of people had sought advice from a medical practitioner for their skin condition, with the remainder seeking advice from family, friends, pharmacists, or self-prescription. Thus studies that rely on attendance at medical practitioners to determine the frequency of skin disease are likely to substantially underestimate the true frequency and relative distribution of common skin diseases in the community, particularly when they are mild.

The present study was developed as a population-based survey with verification of diagnoses by medical practitioners trained in dermatology, as well as with laboratory confirmation in cases of suspected tinea. The aim was to record the prevalence of nonmalignant skin conditions in adults, the incidence of skin cancer having been studied extensively and reported previously from this community.

Materials and methods

Sampling frame

Maryborough is a rural city in central Victoria, 100 km north of Melbourne, Australia, with a total population of 9647. The sampling frame was all adults aged 20 years and over registered on the 1996 Electoral Roll in the City of Maryborough with a postcode of 3465 (5800 adults). Using an estimated lowest disease prevalence rate of 2%, a random sample of 2500 adults was selected from the sampling frame by a computerized process using the Statistical Package for Social Sciences (SPSS).⁷ The survey period was August 1997 to February 1998.

Recruitment

Permission to conduct the study was obtained from the Shire Council responsible for the City of Maryborough, and then an extensive publicity campaign was undertaken through the local media. A letter was sent to every household in the area explaining that the survey was to be undertaken.

Six weeks prior to the examination day, each person selected for examination was posted a Survey Kit which comprised an introductory letter explaining the nature of the study, a questionnaire seeking demographic details of age, sex, country of birth, whether they were currently suffering from or being treated for any skin disease, and a personal and/or family history of atopic disease. They were asked to complete

the questionnaire, return it with a consent form, and confirm their appointment time for examination which had been made.

If there was no response within 3 weeks of sending the letter, an attempt was made to contact them by telephone during business hours. If there was no success, then a second telephone call was made outside business hours.

A second survey was undertaken in February 1998, 6 months after the initial study period in August 1997, aimed at people who were unable to be contacted the first time. The same information brochure and questionnaire were sent again. If they did not respond, a medical practitioner made an attempt to contact them by telephone during business hours. If no contact was made, a second telephone call was made outside business hours to explain the nature of the survey and seek their participation.

In all cases, even when people did not want to present for examination, they were asked whether they would at least fill out the questionnaire form for comparison with those people who did respond and were examined.

The examination day

The survey team visiting Maryborough for the examination days included the Project Co-ordinator and Manager, 12 dermatologists in various rosters, eight dermatology registrars in training, three registered nurses, and one state enrolled nurse. Dermatology registrars commence training at a minimum of 3 years postgraduation, having passed a first-part degree examination in basic skin science, and then have up to 4 years full-time training in dermatology. Members of the Maryborough District Health Service and Rotary also provided logistic support on the examination days.

All people who presented had their questionnaires checked prior to the examination. This enabled the survey team to validate the information collected, including data on the history of skin disease and treatment, or to ensure that it was completed if all the questionnaire details had not been recorded.

The examination comprised a full-body examination in all areas of the skin except in the bra and underpants area in women and underpants area in men.

Diagnostic criteria

The diagnoses made in this survey were all based on clinical inspection, with the exception of tinea, where, if any signs were present suggestive of dermatophyte infection, fungal scrapings were taken by one of the nurses and inoculated on-site into culture medium. This comprised Sabouraud agar plates containing cycloheximide for skin scrapings and the same plates, plus Sabouraud agar plates alone, for nail scrapings. These were placed in culture for 6 weeks.

For atopic dermatitis, the standardized questions from the UK Working Party's Diagnostic Criteria for Atopic Dermatitis were included in the questionnaire.⁸ These criteria have not

been validated for adults, but the responses to the questions were available to the clinicians when they examined the subjects. The clinical diagnostic criteria for the conditions of psoriasis, dermatitis (including atopic, discoid, asteatotic, and seborrheic), acne vulgaris (including a combination of comedones, papules, pustules, nodules, and cysts), viral warts, seborrheic keratoses, and Campbell de Morgan spots (cherry angiomas) were derived from the standard descriptions in the major textbooks of dermatology and agreed upon by the clinicians. As yet, for these conditions there are no standardized diagnostic criteria determined for epidemiologic field studies on adults published in the literature.

Severity for the inflammatory conditions was recorded as mild, moderate, or severe. Once again, there are no universally accepted and verified criteria for determining the severity of these diseases. Therefore, the clinicians agreed on the classification of: *mild*—disease which would require either no treatment or would respond well to products available from a pharmacist without prescription; *moderate*—disease that would require attention from a medical practitioner, plus the use of prescription-only treatment; *severe*—disease that would require management by a specialist dermatologist.

Inter-observer agreement

Ninety-two (6.3%) of the study respondents were randomly selected to have an examination by two clinicians. The first examiner was not aware that their respondent was to be re-examined. Neither examiner knew what was recorded by the other person. Analysis using the Kappa statistic for observed agreement between paired examiners was calculated for the diagnosis of all the conditions reported.⁹

Data analysis

All clinical findings and fungal cultures were recorded on a data collection sheet. The data from these sheets, plus the questionnaires, were entered onto a database using FileMaker Pro software package for Macintosh.¹⁰ The data were then verified, coded, and analyzed using SPSS.⁷

Age- and sex-specific weighting of prevalence estimates was undertaken using the 1996 census data for Maryborough, Victoria (postcode 3465) which was used as the standard population. The 95% confidence intervals (95% CI) were calculated for the weighted prevalence estimates of greater than 5% using SPSS with the weight function and therefore a weighting variable. For weighted prevalence estimates of less than 5%, an adjusted formula suitable for low prevalence proportions was used to calculate the confidence intervals.¹¹

Results

Study population

A total of 2018 (80.7%) of the original randomized sample of 2500 adults were able to be traced as actually

living in Maryborough at the time of the survey. Of the remaining 482 persons, 64 had died, 223 were confirmed as having moved out of the area since the last Electoral Roll revision, and 195 were unable to be identified as ever having lived in the area and thus no contact was able to be made with them.

Of the 2018 people able to be contacted, 1457 (72.2%) filled out the questionnaire and were examined in the study. A completed questionnaire was received from 108 people who were not examined. Of these, 45 provided consent to be examined, but did not attend for their examination. The remaining 63 filled out the questionnaires, but would not give consent to be examined. Comparison of the demographic data and disease frequency responses in the questionnaires revealed no major differences between those who were examined and those who were not. Minor differences have been investigated and are the subject of further work on the nonresponders.

There were 670 (46%) men and 787 (54%) women examined whose ages ranged from 20 to 94 years. They were broken down into the age categories of 20–29, 30–39, 40–49, 50–59, 60–69, and 70+ years. In general, the proportion examined in each age category was similar to the proportion registered in these age groups in the 1996 Australian Government's Population Census for Maryborough (Table 1). There was slight under-representation in the younger age groups and slight over-representation in the older age groups. These differences were increased when the age group proportions were compared with the Population Census for Australia. A total number of 1339 (91.9%) of participants were born in Australia with 4% born in the UK and Ireland and almost 1% born in Europe. The remaining birth locations included Asia, the Middle East, and Africa.

Inter-observer agreement

There was good inter-observer agreement in the diagnosis of conditions seen in the 92 people who were examined by two of the clinicians, with the Kappa statistic varying from moderate for the presence of acne and Campbell de Morgan spots to very good for warts and the presence of signs of tinea suggesting the need for fungal culture (Table 2).

Dermatitis

The age- and sex-adjusted prevalence of dermatitis of all types was 31.6% (95% CI, 29.2–34.0%), with the prevalence in men being 30.8% (95% CI, 27.4–34.2%) and in women 32.3% (95% CI, 29.0–35.7%). This overall prevalence included the conditions of atopic, asteatotic, contact, discoid, varicose/stasis, and seborrheic dermatitis (Table 3). There was a clear age-related variation

Table 1 Age distribution of respondents compared with the 1996 population census distribution of age groups in Maryborough and Australia

Age group (years)	Sample no.	Sample (%)	M. pop. (%) (1996)	Aust. pop. (%) (1996)
20–29	156	10.7	14.9	21.1
30–39	211	14.5	17.1	22.1
40–49	272	18.7	18.9	20.3
50–59	267	18.3	15.7	14.1
60–69	268	18.4	15.0	10.7
70+	283	19.4	18.4	11.7
Total	1457	100.0	100.0	100.0

M. pop., Maryborough population (1996 census); Aust. pop., Australian population (1996 census).

Table 2 Inter-observer agreement for diagnosis

Skin condition	Positive agreement (%)*	Kappa statistic (κ)
Dermatitis	83.7	0.63
Psoriasis	95.7	0.64
Acne	91.3	0.59
Need fungal scraping of feet	93.5	0.87
Viral warts	100.0	1.00
Seborrheic keratoses	83.7	0.66
Campbell de Morgan spots	71.7	0.43

*Positive agreement means the proportion of all positive responses between paired investigators where both observers were in perfect agreement.

in prevalence for atopic, asteatotic, and varicose dermatitis (Fig. 1) with little obvious trend with age for contact, discoid, and seborrheic dermatitis.

Of those with atopic dermatitis, 82.8% were classified as being mild, 14.6% moderate, and 2.6% severe. Of 125 people who correctly reported on their questionnaire that they had dermatitis, 102 (81.6%) had been using one or more products to treat their condition. Prescription items accounted for 56.8% of these with the remainder being either medicaments available over-the-counter (OTC) or from elsewhere, such as a supermarket.

Psoriasis

There was an age- and sex-adjusted prevalence for psoriasis of 6.6% (95% CI, 5.4–7.9%) with no detectable trend in prevalence with age. The prevalence of psoriasis among men was 8.9% (95% CI, 6.8–11.0%) and 4.5% among women (95% CI, 3.2–6.3%), making the rate ratio for men and women 2.0 (95% CI, 1.3–3.2).

The psoriasis was classified as mild in 81.1%, moderate in 16.1%, and severe in 2.8%. There was no sex or age difference in severity. Of the 77 respondents who reported that they had psoriasis on their questionnaire, 41 (53.2%)

had psoriasis on clinical examination. Only 41 (41.4%) of the 99 respondents who had psoriasis on examination had reported on the questionnaire that they had psoriasis. Thus, the sensitivity for respondent awareness of their own psoriasis was 41%, the specificity was 97% (1322 of the 1358 respondents who did not have psoriasis correctly reported no psoriasis on the questionnaire), and the positive predictive value was 53%.

Of those who had correctly reported that they had psoriasis, over 80% had been treated by a doctor and all of the products being used, whether they had sought advice from a doctor or elsewhere, were classified as being efficacious.

Tinea

The age- and sex-adjusted prevalence of mycologically proven tinea of all types was 12% (95% CI, 10.3–13.6%), with a prevalence in men of 17.9% (95% CI, 15.1–20.8%) and women 6.4% (95% CI, 4.6–8.1%). The breakdown by area is shown in Table 3.

Twenty-five per cent of scrapings taken from skin changes on the feet (including scaling, erythema, and maceration between the toes) and 20% from toenail dystrophies were positive on fungal culture. In general, there was no trend for prevalence with age except for tinea unguium which varied from 3% (95% CI, 1.1–8.0%) in 20–29-year-olds to 9.6% (95% CI, 6.1–13.2%) in those aged 70 years and over.

Trichophyton mentagrophytes var. *interdigitale* was isolated from 53.1% of tinea pedis and 57% of tinea unguium. *Trichophyton mentagrophytes* var. *mentagrophytes* was isolated from 19.2% of tinea pedis and 13.9% of tinea unguium and *Trichophyton rubrum* from 18.5% of tinea pedis and 22.8% of tinea unguium. *Epidermophyton floccosum* made up the remainder of the dermatophytes isolated from these two conditions.

Warts

The age- and sex-adjusted prevalence of warts including common, plantar, and planar warts was 7.1% (95% CI,

Table 3 Prevalence of dermatitis, psoriasis, tinea, viral warts, and acne

Skin condition	Overall		Men		Women	
	%	95% CI	%	95% CI	%	95% CI
Dermatitis						
Atopic	6.9	5.6–8.3	5.7	4.0–7.4	8.1	6.2–10.1
Asteatotic	8.6	7.1–10.0	6.6	4.7–8.4	10.4	8.3–12.6
Contact	3.4	2.6–4.5	3.0	2.0–4.6	3.8	2.6–5.6
Discoid	1.5	1.0–2.3	1.6	0.9–2.9	1.4	0.8–2.5
Varicose/stasis	1.8	1.2–2.6	2.1	1.3–3.5	1.5	0.9–2.6
Seborrheic	9.7	8.2–11.2	12.3	9.9–14.8	7.3	5.4–9.2
Psoriasis	6.6	5.4–7.9	8.9	6.8–11.0	4.5	3.2–6.3
Tinea						
Pedis	9.2	7.8–10.7	13.3	10.8–15.9	5.4	3.8–7.1
Unguium	5.1	4.0–6.3	8.2	6.1–10.2	2.3	1.5–3.6
Cruris	0.3	0.1–0.9	0.6	0.2–1.9	0.0	0
Viral warts	7.1	5.8–8.4	7.7	5.7–9.6	6.6	4.8–8.3
Verrucae vulgaris	5.6	4.4–6.7	6.0	4.2–7.7	5.2	3.2–6.8
Plantaris	1.3	0.8–2.1	1.4	0.7–2.8	1.2	0.6–2.3
Planus	0.6	0.3–1.2	0.4	0.1–1.2	0.7	0.3–1.7
Acne	12.8	11.0–14.5	11.8	9.4–14.2	13.6	11.2–16.1

5.8–8.4%). Common warts (verrucae vulgaris) were most frequent followed by plantar warts and planar warts (Table 3). There was a reduction in prevalence of all types of warts with increasing age (Fig. 2).

Acne

The age- and sex-adjusted prevalence for acne was 12.8% (95% CI, 11.0–14.5%) (Table 3). There was a clear decrease with age from 42.0% (95% CI, 35.4–48.6%) in the age group 20–29 years to 1.4% (95% CI, 0.5–4.3%) in the 60–69-year age group (Fig. 2). The acne was classified as mild in 81.2%, moderate in 17.0%, and severe in 1.8%. Of those people reporting acne on the questionnaire who had it confirmed on examination, less than 20% were using treatment on the advice of a medical practitioner. Just under 20% had received treatment advice from a pharmacist and the advice for the rest came from family, friends, or others.

Seborrheic keratoses

The age- and sex-adjusted prevalence of seborrheic keratoses was 58.2% (95.5% CI, 55.6–60.7%), increasing with age from 9.4% (95% CI, 5.5–13.3%) in the 20–29-year age group to 90.4% (86.9–94.0%) in those aged 70 years and over. There was no significant difference in prevalence between men and women.

Campbell de Morgan spots (cherry angioma)

The age- and sex-adjusted prevalence of Campbell de Morgan spots was 54.4% (95% CI, 51.9–57.0%), with a prevalence of 50.2% (95% CI, 46.5–53.9%) in men and

58.4% (95% CI, 54.9–61.9%) in women. There was a clear upward trend in prevalence with age (Table 4).

Other conditions

There were numerous other cutaneous conditions detected on the day of examination, but none occurred in sufficient numbers to be confident of their true prevalence. These included herpes simplex, lichen planus, granuloma annulare, mycosis fungoides, lupus erythematosus, and many others.

Discussion

The data reported here confirm the impression that non-malignant cutaneous conditions are common in Maryborough. Do these results represent the true frequency of the condition in the general community?

The first point of comparison is age. Apart from relatively small differences at the extremes of age in this study, the sample seen in general was compatible with the age distribution of the population of Maryborough, the population on which the age-adjusted rates are based. A comparison of the age distribution of Maryborough with that of the general Australian community (Table 1) reveals that there is more of a bias towards older people in Maryborough. Hence, age-related diseases, such as seborrheic keratoses, skin cancer, and Campbell de Morgan spots, may be over-represented in absolute numbers in a community like Maryborough compared with that within the general Australian population. The converse applies

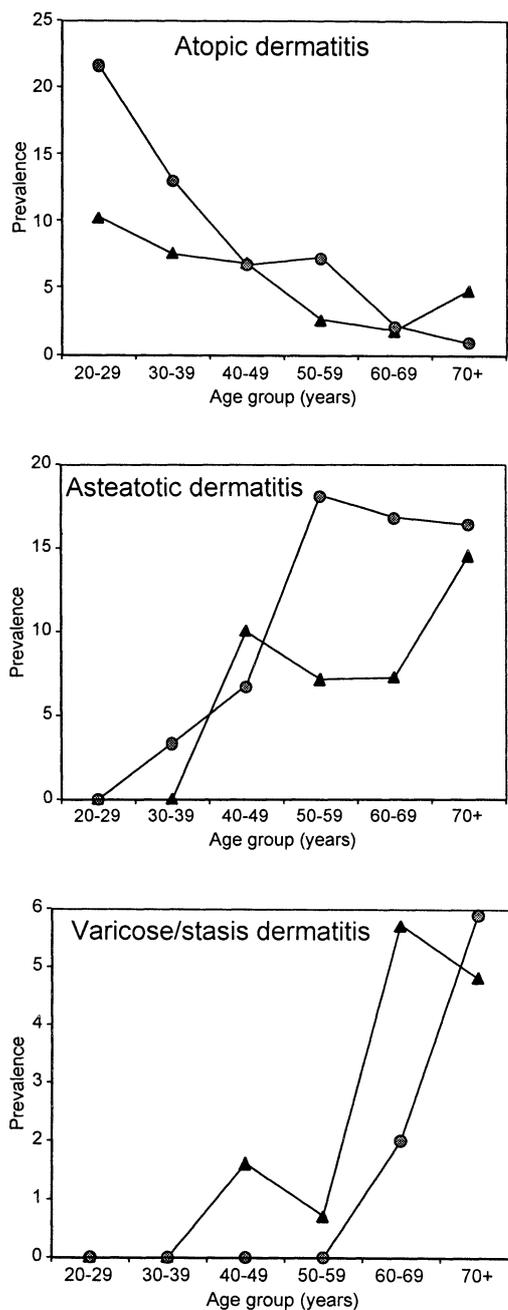


Figure 1 Age- and sex-specific prevalence of atopic, asteatotic, and varicose/stasis dermatitis showing changes with age. ▲ Men; ● women

for those conditions which are more common in younger people.

The next point to consider is ethnic background. Maryborough is a predominantly Anglo-Saxon community with the vast majority of residents being born in Australia. There has been a very large migration to Australia in this

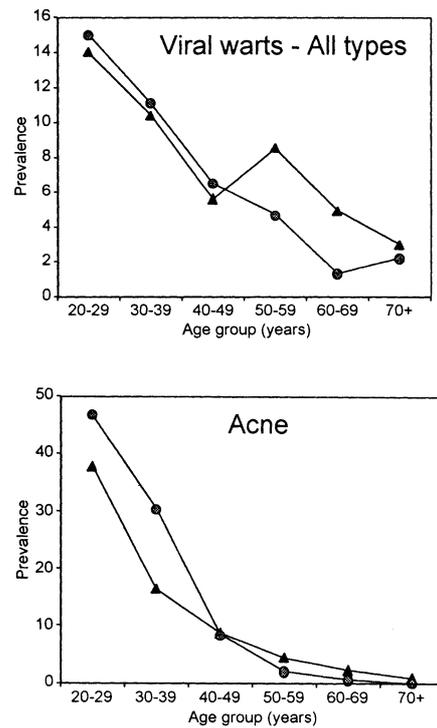


Figure 2 Age- and sex-specific prevalence of viral warts and acne showing a decrease with increasing age. ▲ Men; ● women

century which has changed the balance in the major capital cities. Nowadays, a substantial proportion (up to 30%) of the population in these large cities comprise people from a non-English-speaking background, including areas such as southern Europe, the Middle East, Africa, South America, and the Asian-Pacific region.¹² If there is a difference in the prevalence of the conditions reported here amongst the migrant population compared with a predominantly Anglo-Saxon population, then there may be different prevalences in other parts of Australia compared with that reported for Maryborough. We do not have any data available to suggest that this is actually the case.

The next question to ask is: does the Electoral Roll allow access to a representative group of adults in the Australian community? The adult population in Australia is required by law to vote and thus must be registered on the Electoral Roll. This is updated every 3–5 years, immediately prior to an election, because of the natural changes that occur in populations due to death, change of address, and migration into and out of the electoral areas. We used the most recent update, February 1996. Despite regular updates, there are always inaccuracies to some degree in the Electoral Roll, as was manifest with the 482

Table 4 Age- and sex-specific prevalence of Campbell de Morgan spots

Age	Overall		Men		Women	
	%	95% CI	%	95% CI	%	95% CI
20–29	22.0	16.4–27.5	22.8	15.0–30.5	21.1	13.0–29.1
30–39	43.5	37.3–49.7	41.0	31.9–50.1	45.6	37.1–54.2
40–49	51.8	45.8–57.7	49.1	40.7–57.7	54.5	46.1–63.0
50–59	61.2	54.9–67.6	55.0	45.4–64.6	66.7	58.2–75.2
60–69	66.9	60.6–73.2	60.5	51.2–69.8	73.3	64.8–81.7
70+	78.0	73.0–83.0	74.1	66.0–82.2	81.0	74.7–87.4

persons who were not in Maryborough at the time of our study.

Was there a response bias in the population who attended for examination compared to those who did not? Selection for participation was randomized to ensure a satisfactory spread across the community. Nevertheless, positive response bias is always a hazard in community-based surveys relying on voluntary participation where people are more likely to participate if they have the condition of interest to the survey team.¹³ Examination of the questionnaires filled in by the 108 people who were not examined did not reveal any substantial difference in their responses compared with those who were examined.

We relied on clinical diagnosis for each of the conditions, except for tinea which was confirmed mycologically. There are no standardized clinical diagnostic criteria for use in epidemiology studies published for these conditions. For this reason, our clinical examiners were experienced dermatologists and dermatology trainees, people who have expertise in the clinical diagnosis of cutaneous diseases. Inter-observer reliability was also determined to assess the validity of the instrument.

The prevalence of psoriasis in our survey was higher than the 0.3–2.5% reported previously.^{1,3,14} We also found a significant difference between the rate in men and women: the rate was higher in men than in women. This needs some explanation. The first step is to question the validity of the measure in deciding whether or not a person has psoriasis. As yet, there are no agreed standardized and tested criteria for diagnosing psoriasis. We used the standard textbooks of dermatology to agree on the clinical features, including plaques of erythema and scaling on the extensor surfaces of the elbows, knees, and scalp, etc. There was a high degree of inter-observer concordance amongst the clinicians even for the cases classified as mild, which is reassuring.

It was of interest that only 41 of the 99 respondents diagnosed with psoriasis had reported on their questionnaire that they had the condition. Of those diagnosed with psoriasis, if we take out the 80% of cases which were

classified as mild, the prevalence was reduced to 0.6% in women and 1.8% in men, figures which are more commensurate with those reported previously; however, the rate ratio of men to women rises to the even higher figure of 3.0.

If moderate to severe changes are necessary before observers can diagnose psoriasis, it may explain why our figures on prevalence are higher than those previously reported. Thus the nature of our study with the use of specialist clinicians may have led to an increased sensitivity to the condition. We have no explanation for the difference in rates between men and women in this study, which has not been reported to this degree previously.

Despite all the potential hazards in determining the true prevalence of the conditions in the Australian population, the data still represent some measure of what cutaneous diseases are present in the community at the moment. The data indicate that a substantial proportion of people are affected, many of whom could be easily treated or have their diseases prevented to a large degree with relatively simple measures. They represent a considerable burden of disease not only to those affected, but also to the health services and others responsible for providing their care. More work is necessary to highlight the nature of these conditions to the general population and to those responsible for their care in an attempt to improve the outlook of those affected in the future.

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References

- 1 Johnson MLT, Roberts J. Skin conditions and related need for medical care among persons 1-74 years. *US Department of Health, Education and Welfare, Vital Health and Statistics, 1978, Series 11, No. 212 DHEW (RHS) 79-1660*. Washington, DC: US Department of Health, Education and Welfare, 1978: 1-72.
- 2 Rea J, Newhouse M, Halil T. Skin disease in Lambeth: a community study of prevalence and use of medical care. *Br J Prev Soc Med* 1976; 30: 107-114.
- 3 Quirk C. Skin disease in the Busselton population survey. *Med J Aust* 1979; 1: 569-570.
- 4 Australian Bureau of Statistics. *National Health Survey: Summary Results, Australian States and Territories*. Canberra: Australian Bureau of Statistics, 1995.
- 5 Krupinski J, Baikie A, Stoller A, et al. A community health survey of Heyfield, Victoria. *Med J Aust* 1967; 1: 1204-1211.
- 6 Kilkenny M, Stathakis V, Jolley D, et al. Maryborough skin health survey: prevalence and sources of advice for skin conditions. *Aust J Dermatol* 1998; 39: 233-237.
- 7 SPSS Inc. (copyright). *Statistical Package for Social Sciences (SPSS) for Windows*. Chicago: SPSS Inc., 1997.
- 8 Williams H, Burney P, Pembroke, A, et al. The U.K. Working Party's Diagnostic Criteria for Atopic Dermatitis. III. Independent hospital validation. *Br J Dermatol* 1994; 131: 406-416.
- 9 Cumming R. Assessing the quality of measurement: validity and reliability. In: Kerr C, Taylor R, Heard G, eds. *Handbook of Public Health Methods*. Roseville: McGraw-Hill, 1998: 422-426.
- 10 Claris Corporation. *FileMaker Pro*. Santa Clara: Claris Corporation, 1997.
- 11 Clayton D, Hills M. *Statistical Models in Epidemiology*. Oxford: Oxford University Press, 1993.
- 12 Australian Bureau of Statistics. *Census of Population and Housing*. Commonwealth of Australia, 1997.
- 13 Forthofer R. Investigation of nonresponse bias in NHANES II. *Am J Epidemiol* 1983; 117: 507-515.
- 14 Lomholt G. Prevalence of skin diseases in a population: a census study from the Faroe Islands. *Dan Med Bull* 1964; 11 (1): 1-7.

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333.
god. svog opstanka.

To je najbolja preporuka i jamstvo za njene domaće proizvode koji nose svoj zaštitni znak.

Sva prava na sastav, ime i slike se pridržavaju. Patisak će se progoniti.

Izdanje 1941. godine.

Vlasnik: **VLADKO BARTULIĆ**, ljekarnik
Kaptolska ljekarna »sv. Marije«
ZAGREB, DOLAC KRAJ TRZNICE

Promotional material for the pharmacy of Saint Mary on Kaptol in Zagreb, Croatia, on the occasion of its 333 years of existence. The material was printed by Vlatko Bartulic, its last owner (1896-1945). The whole brochure (first page only reproduced here) was dedicated to hair care.

From the collection of Stella Fatovic-Ferencic, Zagreb, Croatia.