

# Musculoskeletal Pain in Malaysia: A COPCORD Survey

KIRAN VEERAPEN, RICHARD D. WIGLEY, and HANS VALKENBURG

**ABSTRACT.** *Objective.* To assess the nature and extent of rheumatic complaints in a semirural area in a multiracial (Malay, Indian, Chinese) community in Malaysia using the Community Oriented Program for the Control of Rheumatic Diseases (COPCORD) protocol initiated by ILAR and the WHO.

*Methods.* All members of a community of 2700 persons over the age of 15 years were offered a questionnaire based interview in Phase 1 of the study. Those with rheumatic complaints (pain in the last 1 week) were invited for a physical examination by a rheumatologist in Phase 2.

*Results.* In total, 2594 (96%) persons agreed to a questionnaire based interview. Of those interviewed, 21.1% had a current rheumatic complaint. The pain rate was higher in women (23.8%) than in men (17.8%). Chinese men had the lowest age-standardized pain rate (9.9%), while Indian women had the highest rate (28.4%). In the study population, 14.4% complained of pain in the joints and/or musculoskeletal pain and 11.6% had low back pain. The knee was responsible for 64.8% of all complaints pertaining to the joints, and more than half those examined with knee pain had clinical evidence of osteoarthritis (OA). The complaint rate increased with age, up to 53.4% in the group age > 65 years. The major disability encountered was the inability to squat (3.1%). Fibromyalgia, soft tissue lesions, and localized OA of the knees were the main clinical diagnoses. Inflammatory arthritis was uncommon. Both Western and traditional sources of healthcare were used, often together. Self-medication was common (58.8%).

*Conclusion.* Knee and back pain are the main rheumatic complaints in Malaysia, with complaint rates differing according to race and gender. (J Rheumatol 2007;34:207–13)

*Key Indexing Terms:*

MUSCULOSKELETAL PAIN  
SURVEY

EPIDEMIOLOGY  
MALAYSIA

RHEUMATIC  
COPCORD

Increasing awareness of the socioeconomic burden of rheumatic disease prompted the International League Against Rheumatism (ILAR) and the World Health Organization (WHO) to initiate the COPCORD (Community Oriented Program for Control of Rheumatic Diseases) program in 1981<sup>1</sup>. Surveys based on this model have since been completed in 10 Asian countries<sup>1–12</sup>. These studies have generated new comparative insights into the nature, extent, and consequences of rheumatic diseases in these regions.

The population sizes in these studies (1685–4683 persons) have permitted evaluation of the burden of rheumatic complaints, but were too small to allow an accurate assessment of

the prevalence of inflammatory disorders, which are less common.

A preliminary report of the Malaysian COPCORD study has been published<sup>10</sup>, and we present the salient findings here.

## MATERIALS AND METHODS

A semirural suburb on the outskirts of Banting town in the mid-west coastal region of West Malaysia was identified for the survey, as it had a multiethnic population of Malays, Indians, and Chinese living in a similar environment. This area was close to the Banting District Hospital, where the healthcare personnel were based.

Maps of the area were obtained from the land office and a house to house registry of individuals over the age of 15 years was carried out with the help of final-year students from the University of Malaya, Kuala Lumpur, in February 1988. The study was planned with one author (HV), a WHO expert, who visited the selected area.

*Phase 1.* In April 1988, a modified questionnaire based on the COPCORD model was drawn up. All persons in the registry were offered a questionnaire-based interview at home by a district health nurse. The questionnaire was administered in Malay or English.

The following information was documented: demographic data, and the presence of pain in a joint, limb, back, or neck in the preceding week. The site of pain, swelling, or redness was identified on a mannekin. The presence of pain radiation and paresthesias were noted in persons complaining of neck or back pain. Disability was recorded as difficulty in feeding, combing hair, bathing, dressing, carrying, lifting, walking, climbing, and squatting.

The type of treatment sought or obtained from both traditional and Western sources was recorded.

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*Supported by Pharmacia International, Pfizer Private Ltd., May & Baker (Malaysia) Sdn Bhd, and Roche (Malaysia) Sdn Bhd.*

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*Accepted for publication September 8, 2006.*

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One of every 10 households interviewed was visited by a medical doctor, and the information obtained by the questionnaire interview was verified.

*Phase 2.* In November 1988 all positive responders (those with pain in the preceding week) were invited to a health center in the area, for a full musculoskeletal examination by RDW. Information obtained in Phase 1 of the survey was verified and updated by KV and/or a Chinese doctor who spoke the Chinese dialect. Anteroposterior radiograph of the hands was taken for all persons who consented, and other joints were imaged when clinically indicated. Radiographs were read by HV. Serological tests were done when clinically indicated.

*Analysis of data.* All data were entered into a computerized database and tabulated by sex, ethnicity (Malay, Chinese, Indian), and age groups (15–24, 25–34, 35–44, 45–54, 55–64, and ≥ 65 yrs).

Statistical tests were interpreted at a 5% level of significance, using the chi-square test.

Age-standardized prevalence rates for ethnic groups and both sexes were calculated using the total population studied (2954) as the standard population, and 95% confidence intervals were derived.

## RESULTS

In total, 2700 people were registered for the survey; of these, 2594 (96%) were interviewed in Phase 1. In the preceding week, 548 persons (21.1%) had had pain. All persons with pain (positive responders) were invited for examination in study Phase 2, but only 348 attended, giving a Phase 2 response rate of 63.5% for both men and women.

The high default rate in Phase 2 was a result of the difficulty experienced in coming to the examination center. Additionally, Phase 2 coincided with the harvest season of the durian fruit, so many interviewees were out in the orchards.

### Phase 1 results

*Age, sex, and race (Figures 1–4).* The age, sex, and race distribution of those interviewed is shown in Figures 1 and 2. Malaysia has a multiethnic population and it is not possible to

find a community that represents exactly the whole country's ethnic ratio (Housing Census, 1991: Malay 60.6%, Chinese 28.1%, Indian 7.9%). Rural communities have a majority of ethnic Malays with a broad based pyramidal age structure that is reflected in this survey (Malay 48.8%, Chinese 18.3%, Indian 32.8%).

Figures 3 and 4 depict the age, sex, and race distributions of the positive responders (pain at any site) in Phase 1. As expected, the pain rate increased with increasing age, reaching over 50% in those over 65 years of age. Indian women had the highest rates of "pain at any site" (Table 2). Malay and Indian men had higher rates of pain at any site than Chinese men (Table 1).

*Occupation (Figure 5).* The composition of occupational groups in the study population is shown in Figure 5. The area is close to Banting town and provides the workforce for many establishments, explaining the large number of people in group A (professionals, teachers, business persons, and students).

Within occupational groups (Figure 5), housewives (group C) had significantly higher pain rates than all other groups ( $p < 0.0001$ ). Pain rates were not different between group A (professionals, students, business persons, and teachers) and group B (technical staff). Group D (manual workers) had a higher pain rate compared with group A ( $p < 0.001$ ).

Occupational status by ethnic group was not available for Phase 1.

*Pain by body region (Tables 1 and 2).* Pain rates at all regions increased with increasing age. Women of all racial groups reported significantly higher shoulder and elbow pain rates than men. Indian women had the highest rates for pain at all sites (28.4%), followed by Malay women (24.8%), Malay

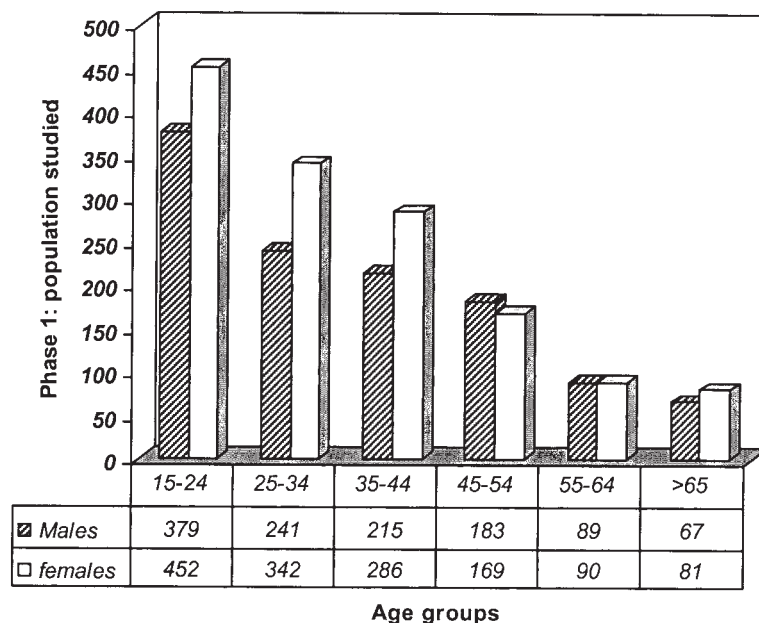


Figure 1. Phase 1: study population by age and sex.

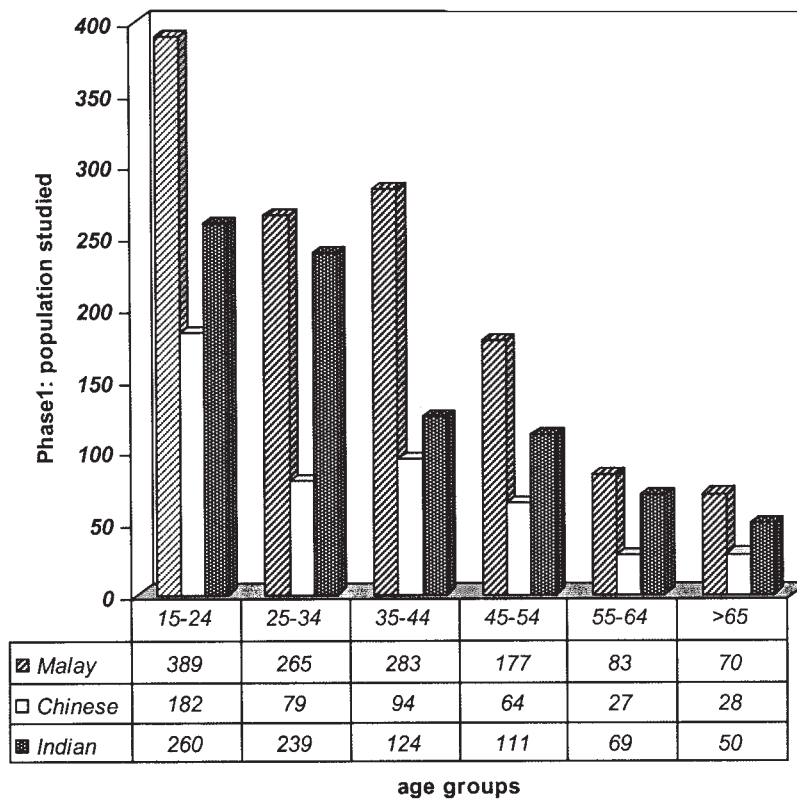


Figure 2. Phase 1: ethnic groups studied (Malay, Chinese, Indian), by age.

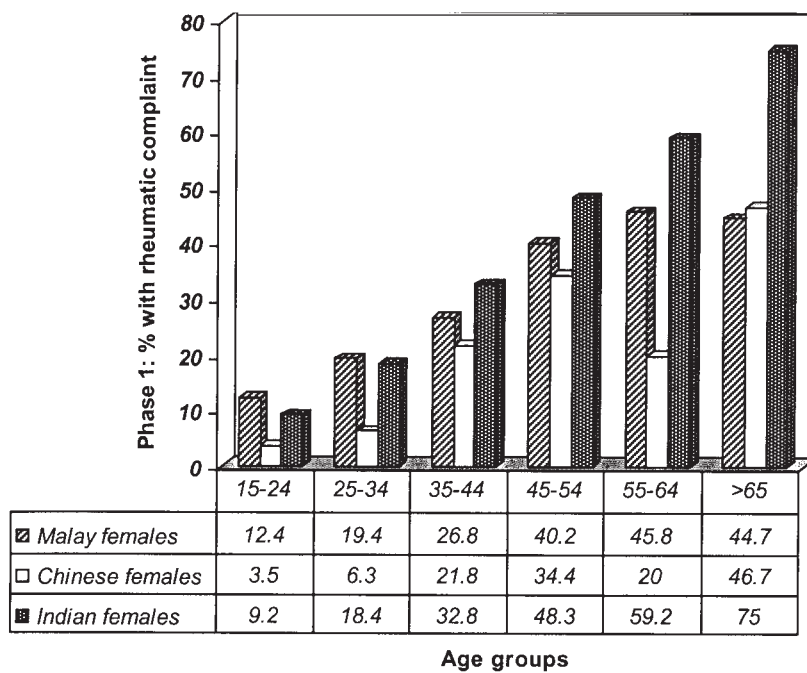


Figure 3. Phase 1: prevalence of recent pain (in 1 week) at any site in women of 3 ethnic groups (Malay, Chinese, Indian), by age.

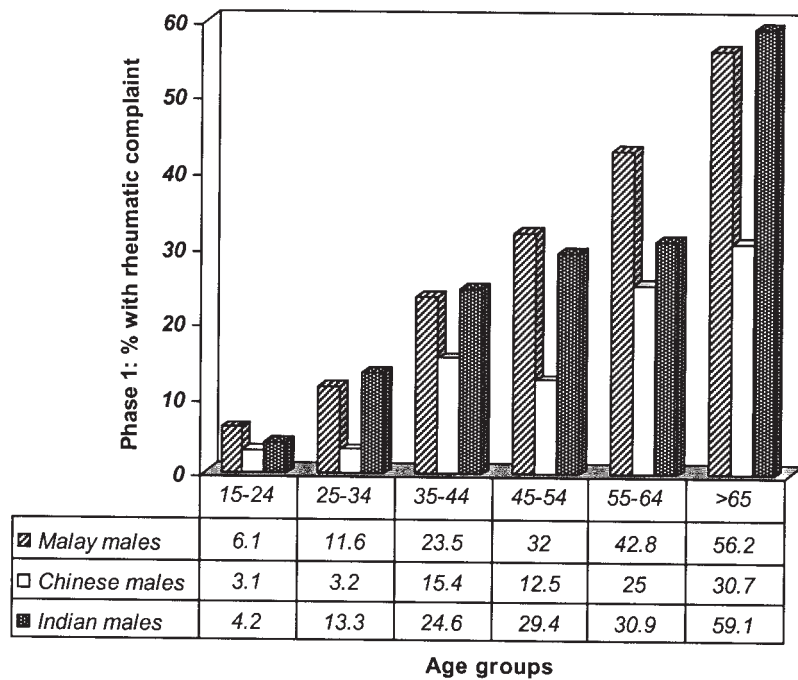


Figure 4. Phase 1: prevalence of recent pain (in 1 week) at any site in men of 3 ethnic groups (Malay, Chinese, Indian) by age.

Table 1. Phase 1— Age standardized prevalence rates and 95% confidence intervals (CI) of joint and musculoskeletal complaints in men. The standard population was the total population sample.

	Malay Males		Chinese Males		Indian Males	
	n (%)	95% CI	n (%)	95% CI	n (%)	95% CI
Total (N)	562		223		389	
Joint pain	86 (14.5)	11.6–17.4 <sup>†</sup>	15 (7.2)	3.8–10.6	47 (12)	8.4–14.8
Shoulder pain	20 (3.3)	1.8–4.8	5 (2.2)	0.3–4.1	12 (2.6)	1.0–4.2
Elbow pain	21 (3.5)	2.0–5.0	3 (1.3)	–0.2–2.8	13 (3.1)	1.4–4.8
Wrist pain	12 (1.9)	0.8–3.0	2 (1)	–0.3–2.3	12 (2.6)	1.0–4.2
Hand pain	14 (2.3)	1.1–3.5	1 (0.5)	–0.4–1.4	8 (2)	0.6–3.4
Hip pain	10 (1.7)	0.6–2.8	1 (0.7)	–0.4–1.8	5 (1.3)	0.2–2.4
Knee pain	53 (8.8)	6.5–11.1 <sup>†</sup>	6 (2.7)	0.6–4.8	33 (8.3)	5.6–11.0 <sup>†</sup>
Ankle pain	27 (4.4)	2.7–6.1	5 (2.4)	0.4–4.4	14 (3.2)	1.5–5.0
Foot pain	16 (2.8)	1.4–4.2	5 (2.2)	0.3–4.1	11 (3)	1.3–4.7
Neck pain	32 (5.7)	3.8–7.6 <sup>†</sup>	4 (1.7)	0–3.4	20 (5.2)	3.0–7.4
Upper back pain	19 (3.3)	1.8–4.8	2 (0.9)	–0.3–2.1	14 (3.6)	1.8–5.5
Lower back pain	55 (9.2)	6.8–11.6	10 (4.6)	1.9–7.4	41 (11)	7.8–14.0 <sup>†</sup>
Sacrum pain	10 (1.7)	0.6–2.8	0 (0)		12 (3.6)	1.8–5.5 <sup>†</sup>
Pain at any site	116 (19.6)	16.3–22.9 <sup>†</sup>	21 (9.9)	6.0–13.8	73 (19)	14.7–22.5 <sup>†</sup>

<sup>†</sup> Significantly higher vs Chinese of same gender.

men (19.6%), Indian men (19%), and Chinese women (15.4%). The lowest pain rates were reported by Chinese men (9.9%).

Among those surveyed, 14.4% reported joint and/or limb pain, followed by pain in the low back in 11.6%, neck in 6.1%, upper back in 4.8%, and sacrum in 3.3%. Of the 14.4% of the population with limb and joint pain, pain around the knee accounted 64.8%, followed by the ankle in 31.6%, elbow in 27.6%, wrist in 20.2%, foot in 18.3%, hip in 15.1%, and hand in 14.3%.

Significant differences between regional pain rates in ethnic groups were as follows. Indian women had higher pain rates than both Chinese and Malay women around the shoulder (8.9%) and elbow (8.1%), and higher rates than Chinese women in the wrist, hip, knee, neck, and back (Table 2). Indian men had less pain than Indian women around the shoulder (2.6%) and elbow (3.1%). Chinese men and women had lower knee pain rates compared with other ethnic groups of the same sex.

Table 2. Phase 1— Age standardized\* prevalence rates and 95% confidence intervals (CI) of joint and musculo-skeletal complaints in women. The standard population was the total population sample.

	Malay Females		Chinese Females		Indian Females	
	n (%)	95% CI	n (%)	95% CI	n (%)	95% CI
Total (N)	705		251		464	
Joint pain	120 (17.2)	14.4–20.0 <sup>†</sup>	23 (9)	5.5–12.5	85 (19.3)	15.8–22.8* <sup>†</sup>
Shoulder pain	32 (4.7)	3.1–6.3	5 (2)	0.3–3.7	40 (8.9)	6.3–11.5* <sup>†#</sup>
Elbow pain	27 (3.9)	2.5–5.3	5 (2)	0.3–3.7	35 (8.1)	8.1–10.6* <sup>†#</sup>
Wrist pain	22 (3.2)	1.9–4.5	2 (0.8)	–0.3–1.9	26 (5.9)	3.8–8.0 <sup>†</sup>
Hand pain	12 (1.7)	0.7–2.7	5 (2)	0.3–3.7	14 (3.4)	1.8–5.1
Hip pain	18 (2.8)	1.6–4.0	3 (1.2)	0.1–2.3	20 (4.4)	2.5–6.3* <sup>†</sup>
Knee pain	77 (11.1)	8.8–13.4 <sup>†</sup>	15 (5.8)	2.9–8.7	57 (13.1)	10.0–16.2 <sup>†</sup>
Ankle pain	35 (5.1)	3.5–6.7	8 (3.2)	1.0–5.4	30 (7)	4.7–9.3
Foot pain	16 (2.3)	1.2–3.4	6 (2.4)	0.5–4.3	15 (3.5)	1.8–5.2
Neck pain	47 (6.8)	4.9–8.7	8 (3.3)	1.1–5.5	49 (10.7)	7.9–13.5* <sup>†</sup>
Upper back pain	40 (5.7)	4.0–7.4	7 (2.9)	0.8–5.0	43 (9.4)	6.8–12.1* <sup>†</sup>
Lower back pain	92 (13.4)	10.9–15.9	25 (9.9)	6.2–13.6	79 (17.3)	13.9–20.7 <sup>†</sup>
Sacrum pain	35 (5.1)	3.5–6.7*	10 (4.3)	1.8–6.8*	21 (4.8)	2.9–6.8
Pain at any site	172 (24.8)	21.6–28.0	39 (15.4)	10.9–19.9	127 (28.4)	24.3–32.5* <sup>†</sup>

\* Significantly higher vs men of the same ethnic group. <sup>†</sup> Significantly higher vs Chinese of same gender. <sup>#</sup> Significantly higher than in Malay women.

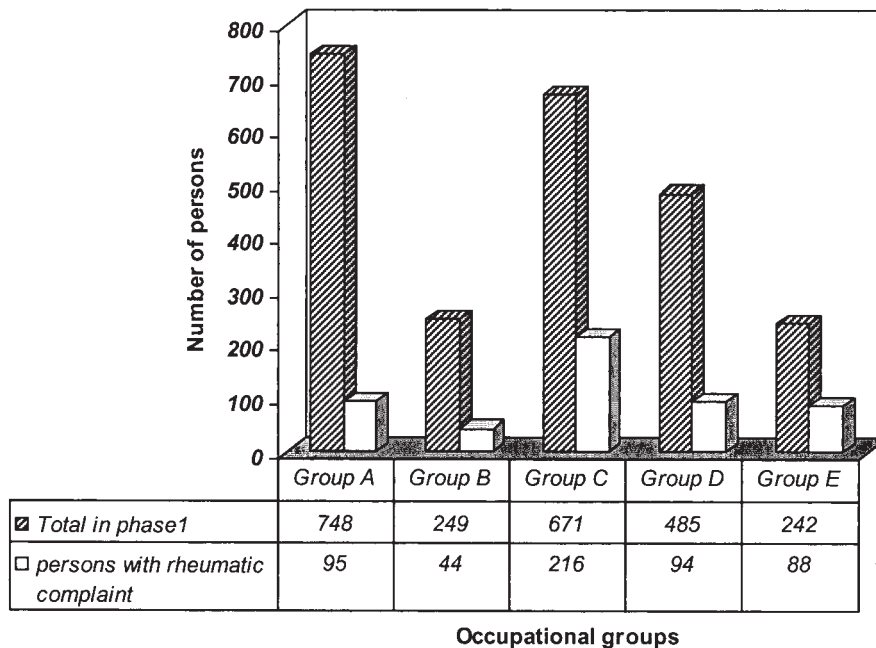


Figure 5. Phase 1: recent pain (in 1 week) at any site in occupational groups. Group A: professionals, teachers, students, business persons; B: technical workers and nurses; C: housewives; D: manual workers; E: unemployed and retired. Recent pain rate in group C greater than for all other groups ( $p < 0.0001$ ), pain rate in group D greater than for group A ( $p < 0.001$ ).

**Disability.** The major disability recorded was the inability to squat (3.1%), followed by lifting (2.9%), climbing (2.7%), carrying (1.5%), and walking (1.1%). Difficulty in dressing, bathing, combing, and feeding was recorded in less than 0.3%. Disabilities related to lower limb function were in excess of those related to upper limb function. No one had stopped work because of a rheumatic disability.

**Help sought (Table 3).** Help was sought from both official and traditional sources, often from both together. Massage was popular, but a surprisingly small number of people had received acupuncture (Table 3).

#### Phase 2

A total of 348 out of 548 positive responders from Phase 1



Table 3. Help sought by positive responders (persons with pain in the last week) in Phase 1.

	Malay N = 288 n (%)	Chinese N = 60 n (%)	Indian N = 200 n (%)	Total N = 548 n (%)
Self-medication	192 (68)	40 (66)	88 (44)	320 (58.5)
General practitioner	117 (42)	24 (40)	57 (28)	198 (36.1)
Massage	142 (51)	5 (8.3)	37 (18)	184 (33.6)
District hospital	95 (34.5)	12 (20)	76 (38)	173 (31.7)
center Health	60 (21.8)	1 (1.5)	70 (35)	131 (23.9)
Sinseh (traditional Chinese practitioner)	24 (8.7)	3 (5)	3 (1.5)	30 (5.4)
Bomoh (traditional Malay practitioner)	20 (7.2)	—	1 (0.5)	21 (3.8)
Herbs	31 (11.6)	1 (1.5)	3 (1.5)	34 (6.2)
Acupuncture	6 (2.4)	2 (3.3)	4 (2)	12 (2.1)

were examined at Phase 2, 7 months after the completion of Phase 1. At this point, 64.9% reported no change in symptoms, 24.1% were better, and 8.3% were worse.

**Diagnoses. Osteoarthritis (OA).** Localized OA of the knee<sup>13</sup> was found in 77 cases, making it the most frequently diagnosed condition. Ethnic distribution of knee OA reflected the ethnic knee pain rates, with the following prevalences: Indian women 5.6%, Malay women 3.2%, Indian men 2.6%, Malay men 1.6%, Chinese women 1.1%, and Chinese men 1.3%. These rates are likely to be underestimated, as those who did not report current pain were not included; additionally, Phase 2 attendees accounted for only 63.5% of positive responders in Phase 1.

Thirteen persons had clinically detectable Herbeden's nodes. Radiological OA of the distal interphalangeal (DIP) joints was found in almost one-third (12 of 37) of the positive responders over age 65 years who had hand radiographs. A sharp increase in OA at the DIP, proximal interphalangeals, metacarpophalangeals, and carpometacarpal 1 was seen in those above age 65 years. Generalized OA was found in only 6 cases.

Of those examined in Phase 2, 9.3% had neck pain with evidence of limitation in movement, 0.5% manifested dorsal pain and limitation, and 1.8% had lumbar pain with limitation of movement on examination; 0.5% had evidence of lumbar root entrapment.

**Rheumatoid arthritis (RA).** Four cases of RA were detected clinically<sup>14</sup>; only one of them was seropositive (nephelometry 301 IU). Of these, 3 were Malay women and one was a Malay man. One of them was discovered by a home visit, as she was unable to come for the examination. Ten people had grade 1 (doubtful) erosions on hand radiographs, but none of these were in the group diagnosed as having RA clinically. One person with clinical RA refused radiographic examination.

**Ankylosing spondylitis (AS).** AS was diagnosed in 4 men, 2 Chinese and 2 Indian; diagnosis was confirmed on radiographs of the sacroiliac joints and the lumbar spine.

**Other diagnoses.** Those presenting with back pain and stiff-

ness had spinal radiographs. Six persons showed evidence of diffuse idiopathic skeletal hyperostosis on radiograph.

Only 2 persons had limitation of hip movement; one of these was diagnosed with psoriatic spondyloarthropathy.

Twenty-two women and 2 men fulfilled criteria for fibromyalgia: 14 were Indian, 9 Malay, and one Chinese; 17 of these women were housewives.

Soft tissue lesions were found around the shoulder (n = 13) and elbow (n = 6).

Hallux varus was an incidental finding in 4 women; all of them either wore open slippers or went bare-footed.

No case of systemic lupus erythematosus, connective tissue disease, or gout was diagnosed.

## DISCUSSION

This study (like other COPCORD studies) is limited by its population size (2594), and although it reveals the size and scope of the common rheumatic complaints in the population, it is too small to determine the prevalence of inflammatory and rarer disorders. Additionally, only those with pain in "the last week" were analyzed, so intermittent conditions such as "acute gout" or OA flares could have been overlooked. The low compliance rate in Phase 2 (63.5%) undermines the accuracy of the Phase 2 data. However, the very high compliance in Phase 1 (96%) has allowed collection of important basic information.

Although this study is being reported several years after its completion it serves to guide further research, provide baseline data, and allow comparison with other studies. It is also unique in that it studies 3 ethnic groups living in the same environment.

The musculoskeletal pain rate of 21.1% in semirural Malaysia in those above 15 years of age compares with pain rates of 23.6% in rural Indonesia, 31.3% in urban Indonesia<sup>6</sup>, 17.6% in rural Thailand<sup>1</sup>, 28.4% in rural Philippines<sup>9</sup>, and 16.2% in urban Philippines<sup>5</sup>, collected by similar COPCORD methodology<sup>1-12</sup>. In accord with other studies the main burden of musculoskeletal complaints was related to pain in the knee (9.3%) and the low back (11.6%)<sup>15</sup>.

The Malaysian survey uncovered significant differences in age standardized pain rates between ethnic groups (Tables 1 and 2).

The lower pain rates (9.9%) in Chinese men in comparison with Malay and Indian men and very low rates of knee pain in both Chinese men and women, who have largely emigrated from Southern China, is in keeping with reports by Zeng, *et al*<sup>8,16</sup>. They reported a lower prevalence of rheumatic pain in Southern China (11.6%–19.8%) compared to Beijing (40.3%, 38.7%), as well as low rates of knee pain (1.3% and 3.2%) in the Shantou province of southeast China<sup>17</sup> (compared with those in Beijing, 9.6%). This interesting similarity points to possible shared factors for lowered risk such as culturally based response to pain and genetic factors.

Indian women had the highest pain rates in our study. They also accounted for most of those with fibromyalgia. The regional pain rates in Indian women and the female prepon-

derance in this group closely reflected findings from rural women in Bhigwan, Western India<sup>2,18</sup>. Pain rates for Indian women in the Bhigwan survey and in the Malaysian study were, respectively, pain at any site 22.5% and 28.4%, neck pain 9.5% and 10.7%, low back pain 15.8% and 17.3%, and knee pain 15.8% and 13.1%. In both studies pain rates in Indian men were lower. Shared risk factors responsible for this may again be cultural and genetic. The musculoskeletal load cannot be compared using the available information.

Both traditional and Western healthcare is available in most Asian countries, and people often use a combination of both<sup>17</sup>. Traditional medicines are not infrequently adulterated with steroids, and this is a cause of concern<sup>6</sup>. Self-medication is common in the region and 58.8% of those with pain were found to self-medicate, which was comparable to 59% in urban Indonesia and 75% in rural Indonesia.

The most common disability in the Malaysian survey was the inability to squat (3.1%), which appeared to result largely from knee joint symptoms. The inability to squat is considered relevant and important in the Asian context, where many household tasks and toileting require a squatting posture. Most other COPCORD studies did not include this feature, so comparisons are not possible.

The high propensity for housewives to report musculoskeletal pain may be related to household tasks, poor ergonomics, and psychosocial stresses within this context, and this requires further study.

Interestingly, no one in this survey reported stopping work. This contrasts with the Indonesian survey, which recorded that 75% (rural) and 78% (urban) of those with pain stopped working<sup>6</sup>. In Bhigwan, India, 10% stopped work because of musculoskeletal pain. They were mainly manual workers; hence the nature of work performed may have determined the handicap.

The small number of patients with RA and inflammatory arthritis precludes any meaningful inferences. The estimated prevalence of RA (0.15%) contrasts with that described in Bhigwan, India (0.55%). Seropositivity in RA in a hospital based study from Malaysia was found in 65%<sup>19</sup>, and the very low seropositivity finding in our study is probably reflective of the limitations discussed.

This study confirms that knee and back pain are the main rheumatic complaints in Malaysia. It has also revealed ethnic and gender differences in complaint rates. Risk factors, especially occupational and cultural factors, need further study. Pain rates from COPCORD studies conducted in India and Southern China have revealed similarities to corresponding ethnic groups, alluding to genetic or culturally related risk factors.

Healthcare planners need to be mindful of widespread self-medication and the multiple modalities of help available in the region.

#### ACKNOWLEDGMENT

We thank M. Manivasagar for managing the vast amount of data collected, Drs. Christine Khoo and S.P. Kon for assisting with interviews, and the staff and students at Banting District Hospital for the field work and organizational help.

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