RHEUMATIC DISEASES IN DENMARK

BY

K. KALBAK

From the National Danish Association against Rheumatic Diseases, Copenhagen, Denmark

(RECEIVED FOR PUBLICATION OCTOBER 8, 1953)

In 1946 *The National Danish Association against Rheumatic Diseases* and *The Danish Society for Rheumatology* in co-operation with *Dansk Gallup Institut* conducted a general investigation into the number and nature of rheumatic diseases in the population of Denmark.

Denmark proper, with an area of 42,931 sq. kilometres and a population of about 4 millions, lies in Northern Europe between Lat. 57° 7' and 54° 6' N. and Long. 8° 1' and 15° 2' E. The climate is temperate. The mean temperature is approximately 0° C. in January and 16-17° C. in July. The prevailing winds are westerly. Annual precipitation varies from 45 to 80 cm., and the annual number of days of precipitation from 118 to 192.

A country like this is especially suited for an investigation of this nature; it is homogeneous in regard to population, geography, climate, and sanitary and social conditions, and the compulsory notification of diseases is quite comprehensive. Moreover, communications are so good that the country can be covered by a relatively small number

of investigators within a very short time. Hospital reports are extensive, and afford good and accurate information, and, owing to the uniform tuition and frequent professional contact between doctors, standards of diagnosis also tend to be uniform.

Material

The investigation covered the whole population of Denmark over 6 years of age, a total of 3,660,000 persons. The patients concerned were divided into three groups:

- (A) In-patients.
- (B) Disabled patients (receiving public aid).
- (C) Out-patients.

The three main subjects of inquiry were:

- (1) What is the number of patients?
- (2) What rheumatic diseases occur, and what is their distribution?
- (3) What do these diseases cost the community in treatment and loss of wages?

The rheumatic diseases were arranged in a few main groups (Table I) without division in smaller groups where nomenclature might be open to doubt or discussion:

TABLE I
INCIDENCE OF RHEUMATIC DISEASE FROM HOSPITAL RECORDS

Type of Rheumatic Disease	(A) In-Patients		(C) Out-Patients			
	No.	Per cent.	Sex		No.	Per cent.
			Women	Men		
I. Articular	(1) Rheumatic fever	1,709	14	3	6	0.2
	(2) Rheumatoid arthritis	2,145	18	72	82	2
	(3) Spondylosis	407	4	6	16	0.4
	(4) Arthrosis coxae	543	5	68	105	2.5
	(5) Arthrosis genu	471	4	368	408	9.5
	(6) Other arthroses	624	5	—	—	—
	(7) Gout	167	1	3	15	0.4
	(8) Other articular rheumatic diseases	779	7	107	175	4
	Total	6,845	58	627	180	19
II. Non-Articular	(1) Neck/head	—	—	463	100	13
	(2) Shoulder/arm	490	4	605	194	19
	(3) Forearm/hand	—	—	257	71	8
	(4) Lumbago/sciatica (mostly disk disorders)	2,027	16	679	324	23
	(5) Leg/foot	—	—	276	75	8
	(6) Other non-articular rheumatic diseases	2,571	22	340	88	10
	Total	5,088	42	2,620	852	3,472
					81	

Results

(A) **In-Patients.**—In 1945, a total of 12,913 patients with various rheumatic diseases were treated in 154 hospital wards and two sanatoria. Of these, 980 were treated at sanatoria; the distribution of the remaining 11,933 hospital patients is shown in Table I (A). The *hospitalized patients* may be classified as follows, according to the frequency of the various forms of rheumatic disease:

Type of Rheumatic Disease (see Table I)	%
(a) Undefined non-articular diseases, also termed "muscular rheumatism", presumably mostly psychogenic reactions in connexion with neuroses, climacterium, etc. (II, 6) ..	22
(b) Rheumatoid arthritis (I, 2) ..	18
(c) Degenerative diseases, arthroses (I, 3, 4, 5, 6) ..	18
(d) Lumbago/sciatica (II, 4) ..	16
(e) Rheumatic fever (I, 1) ..	14
(f) Other articular diseases, Reiter's disease, ankylosing spondylitis, etc. (I, 8) ..	7
(g) Shoulder/arm (II, 2) ..	4
(h) Gout (I, 7) ..	1
Total	100

(B) **Disabled Patients.**—Persons receiving public aid in consequence of a rheumatic disease that had reduced their capacity for work to less than one-third of normal were nearly all suffering from rheumatoid arthritis. The number of totally disabled patients was approximately 3,800 (about 5 per cent. of all the disabled in Denmark). This figure is fairly constant from year to year, the increase and decrease being about equal. The annual increase of new invalids is about 365, which is as much as to say that *every day one person becomes totally disabled by rheumatoid arthritis*, the sex ratio being about three women to one man. As a rule, these patients are forced to give up working in about their 45th year; in other words, they lose about 15 normal working years, and each calendar year the community loses 5,500 working years through their disablement.

(C) **Out-Patients.**—This group is by far the greatest and also the most difficult to register, but it is possible to obtain a fairly correct picture of conditions in Greater Copenhagen, since about 80 per cent. of the population have access to six special out-patient clinics for rheumatic diseases, which belong to the Cooperative Sickness Insurance Corporations. The reports from these clinics give a fairly accurate picture of the number, nature, and distribution of rheumatic diseases so treated.

A direct registration was made during the last 3 weeks of June, 1946, and in this period, altogether 4,279 patients with various rheumatic diseases were

treated. The distribution of the various types of disease is shown in Table I (C). The *out-patients* may be classified according to the frequency of the various forms of rheumatic disease as follows:

Type of Rheumatic Disease (see Table I)	%
(a) Lumbago/sciatica, prolapsed intervertebral disk, spondylolisthesis, disk degeneration (II, 4) ..	23
(b) Painful shoulder, brachial neuralgia, scalenus anticus syndrome, etc. (II, 2) ..	19
(c) Neck/head, occipital-syndrome, cephalalgia rheumatica, etc. (II, 1) ..	13
(d) Degenerative articular disease, arthroses (I, 3, 4, 5) ..	12.4
(e) Undefined non-articular disease (II, 6) ..	10
(f) Forearm/hand, epicondylitis, bursitis, etc. (II, 3) ..	8
(g) Leg/foot, restless legs, flat feet, etc. (II, 5) ..	8
(h) Undefined articular disease (I, 8) ..	4
(i) Rheumatoid arthritis (I, 2) ..	2
(j) Gout (I, 7) ..	0.4
(k) Rheumatic fever (I, 1) ..	0.2
Total	100

The sex ratio is about three women to one man. (Table II).

TABLE II
INCIDENCE OF RHEUMATIC DISEASE BY SEX

Sex	Articular Rheumatism		Non-Articular Rheumatism		Total	
	No.	%	No.	%	No.	%
Women ..	627	77	2,620	75	3,247	76
Men ..	180	23	852	25	1,032	24
Total ..	807	100	3,472	100	4,279	100

The total number of patients in Greater Copenhagen applying annually for treatment as out-patients at these special clinics is about 30,000. To these must be added another 10,000 patients, who, not being contributors of any sick insurance fund, apply to private specialists for similar treatment. Therefore approximately 40,000 patients (out of a total of 820,000 inhabitants over 6 years of age) apply every year for special ambulatory treatment for rheumatic diseases in Greater Copenhagen.

The average duration of treatment is about 40 days. Patients with non-articular disease are on an average sick-listed for 20 days, and patients with articular disease for 40 days. The cost of treatment at the special clinics is about \$6 per day.

Further General Inquiries

The figures listed above, however, are far from covering the total number of rheumatic patients in Greater Copenhagen. Many do not apply for special

treatment, but get along with such medical and physical therapy as their family doctors are able to give them. Outside the city this class of patients is even larger because specialist treatment is more difficult to obtain. Since this group is not registered, other methods must be used to find its size.

It is not compulsory for doctors to notify cases of rheumatic disease, and the only way to find out the number of sufferers was to approach the patients themselves by means of the Gallup system. By investigating a 1 per cent. section of the population that is representative in regard to sex, age, occupation, etc., 98 per cent. accuracy is obtainable, but to be on the safe side we decided to question about 2 per cent. (a total of 5,661 persons out of 2,840,000). The investigation was carried out in June, 1946, by specially trained senior medical students.

The first question was: *Have you ever had a rheumatic disease?* By means of a system of control questions it could be ascertained whether the diseases complained of were actually recognized rheumatic conditions. It was found that no less than 32 per cent. of the population of Denmark (of 6 years old or over) claimed to suffer from, or have suffered from, a rheumatic disease, and that these diseases occurred most frequently after the age of 45. There was no geographical or occupational differences of any consequence. At the time of the investigation, 761 (13.5 per cent.) out of the 5,661 persons questioned replied *Yes* to the question whether they were suffering from rheumatism then.

In the winter, this percentage is somewhat higher (as may be expected); an investigation in the winter season showed that 18 per cent. of the population were then suffering from some rheumatic disease.

It is interesting to observe that similar results have been obtained both in Great Britain (Kellgren and others, 1953) and in the Netherlands (de Blécourt, 1953), in similar investigations, although the methods of registration were different. This fact is strong evidence that our figures are correct (Table III).

TABLE III
COMPARATIVE INCIDENCE OF RHEUMATIC DISEASE IN GREAT BRITAIN, THE NETHERLANDS, AND DENMARK

Country	Great Britain	Netherlands	Denmark
Percentage of population suffering or having suffered from a rheumatic disease	33-40	—	32
Percentage of population suffering from a manifest rheumatic disease at the moment of registration ..	19	15-20	13.5-18

Conclusions

These figures may serve as basis for a computation of conditions in the whole country; and

thence we may calculate the number of sick-days and the number of working years lost in consequence of rheumatic disease (Table IV).

TABLE IV
TIME LOST THROUGH RHEUMATIC DISEASE (days)

Patients	Type of Rheumatic Disease	No. of Patients	% of All Patients	No. of Days Sick
Out-Patients (including Disabled) 3,800	Articular	216,000	40	4,839,000
	Non-Articular	339,000	60	1,692,000
	Total	555,000	100	6,531,000
In-Patients	Articular	7,200	60	420,000
	Non-Articular	4,800	40	
	Total	12,000	100	420,000
Grand Total		567,000	—	6,951,000

Seven million sick-days a year means that Denmark loses 20,000 working years each calendar year; or, to put it another way, 20,000 persons are idle all the year round because of these diseases.

The rheumatic diseases cost the Danish community a total of \$25 million a year in treatment, loss of wages, and disablement benefits (Table V).

TABLE V
EXPENSE TO THE COMMUNITY IN TREATMENT, BENEFIT PAYMENTS, AND LOSS OF WAGES (Mill. \$)

Patients	Treatment	Loss of Wages	Disablement Benefits	Total Cost
Out-Patients ..	1.74	15.00	—	16.74
In-Patients ..	1.68	1.26	—	2.94
Disabled ..	—	4.16	0.76	4.92
Total Cost ..	3.42	20.42	0.76	24.60

Summary

The results are given of a survey of the incidence of rheumatic disease in Denmark in the year 1946. Hospital records and disability payments were supplemented by questioning a 2 per cent. sample of the whole population of 6 years old and over.

It is estimated that 13.5 to 18 per cent. of the population are suffering from some form of rheumatic disease at any given moment, and that 20,000 working years and \$25 million dollars are lost to the nation annually as a result.

REFERENCES

- de Blécourt, J. J. (1953). "Examination of the Population with respect to the Presence of Rheumatism." VIII int. Congr. Rheumatol., Genève, 1953. *Médecine et Hygiène*, Geneva.
Kellgren, J. H., Lawrence, J. S., and Aitken-Swan, J. (1953). *Annals of the Rheumatic Diseases*, 12, 5.

Maladies rhumatismales au Danemark

RÉSUMÉ

On présente les résultats d'une revue de la fréquence des maladies rhumatismales au Danemark en 1946. Des renseignements provenant des dossiers hospitaliers et des fiches de paiement de pension d'invalidité furent supplémentés par un questionnaire direct adressé à une section de la population générale représentant 2 pour cent de tous les individus âgés de 6 ans ou plus.

On estime qu'à n'importe quel moment 13,5 pour cent à 18 pour cent de la population est atteint d'une des formes de la maladie rhumatismale et qu'en conséquence 20 mille années de travail et 25 millions de dollars sont perdus annuellement par la nation.

Enfermedades reumáticas en Dinamarca

SUMARIO

El autor presenta los resultados de una revista de la incidencia de las enfermedades reumáticas en Dinamarca en 1946. A los informes recogidos en los registros hospitalarios y en las hojas de pago de pensión de invalidez se añadió un cuestionario directo dirigido a una sección de la población entera representando el 2 por ciento de todos los individuos de 6 o más años de edad.

Se estima que en cualquier momento entre el 13,5 por ciento y el 18 por ciento de la población sufre de una de las formas de la enfermedad reumática y que en consecuencia la nación pierde anualmente 20 mil años de trabajo y 25 millones de dólares.