**Methods**

*Study Design and Participants*

Health and demographic information on all Danish citizens is updated regularly in a series of national registries, and linkage of data from these registries is possible using a 10-digit personal identification number [23, 24]. The IMPROVE study was a retrospective analysis of patients with psoriasis identified from the Danish National Patient Registry (NPR). Data on health care contacts at inpatient and nonprimary outpatient facilities are registered in the NPR, including date of contact and diagnoses given by the treating physician. Reporting of data on each single health care contact, excluding primary care visits, is required by the state. Patients were identified as having the International Statistical Classification of Diseases (ICD-10) codes L40.0 and L40.4. Patients included in the retrospective analysis had a hospital diagnosis (both inpatient and outpatient registers) of psoriasis and were compared 1:2 with a control group, matched on age, gender, marital status and municipality at index (year of first psoriasis diagnosis). Patients were followed from 1998 to 2014, and analyses were made from the year of diagnosis plus/minus (up to) 15 years. Income data were not available for 2014.

Comorbidities were assessed based on 22 WHO (World Health Organization) classifications [25]. All diagnoses from 3 years before the index date to 3 years after (excluding the index date) were assessed. This means that comorbidities occurring at earlier dates but with a duration within one of the periods counted are excluded. Eligibility of 3 years before and after the index date was required, so index dates in the period 2001–2011 are included. All types of diagnosis found in the register were used: main, active and secondary diagnosis.

Information on socioeconomic status was obtained from nationwide registries on employment, educational level, income and pensions. Very large incomes (>270,000 EUR annually) were excluded as outliers. Cost of hospital contacts included costs of hospitalization weighted by use for separate diagnosis-related groups and cost of specific outpatient treatments based on data from the Danish Ministry of Health. The cost of medicine was derived from the Danish Drug Prescription Registry and consisted of the retail price of each drug multiplied by prescribed quantity. Information on health costs associated with consultation and treatment in the primary sector was collected from the National Health Insurance Service Registry. Data handling and ethical approval for the study were granted by the Regional Ethics Committee and the Danish Data Protection Agency, Copenhagen, Denmark. Informed consent was not applicable as the study involved only linkage of registry-based anonymized data. The ethics committee approved this procedure.

*Statistical Methods*

Demographic and descriptive data were expressed in crude numbers and fractions (%). The significance of the income and health care cost estimates for matched case and comparator groups was assessed by nonparametric bootstrap *t* test analysis due to the nonnormal distribution of the data. To estimate the odds ratios for comorbidities, a conditional logistic regression was used. The resulting odds ratios with 95% confidence limits were presented for comorbidities recorded up to 3 years prior to baseline and during a 3-year follow-up period after diagnosis of psoriasis. In all statistical tests, *p* values <0.05 (2-sided) were considered statistically significant. Calculations were based on observed data, and no imputation of missing data was performed.