

The prevalence and comorbidities of Prurigo Nodularis – a Danish register-based study from 1995 to 2021

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INTRODUCTION

- Prurigo Nodularis (PN), or chronic nodular prurigo, is a rare chronic skin disease, characterised by multiple itchy, firm nodules, usually with a symmetrically distribution on the torso and the extensor sides of the extremities.¹⁻²
- PN severely affects the quality of life, for example because of avoidance of social interaction, sleep disturbances, functional impairment and impacted activities in general.³
- Additionally, PN are associated with a number of comorbidities, including other atopic diseases, infectious diseases, endocrine disease as well as mental disorders.²⁻⁴ Huang et al. (2020) also suggest that people with PN are affected by systemic diseases such as chronic kidney disease, cerebrovascular disease, type 1 diabetes, and heart failure.⁴
- The prevalence of PN across countries has been estimated between 8.4-210 per 100,000.¹

OBJECTIVE

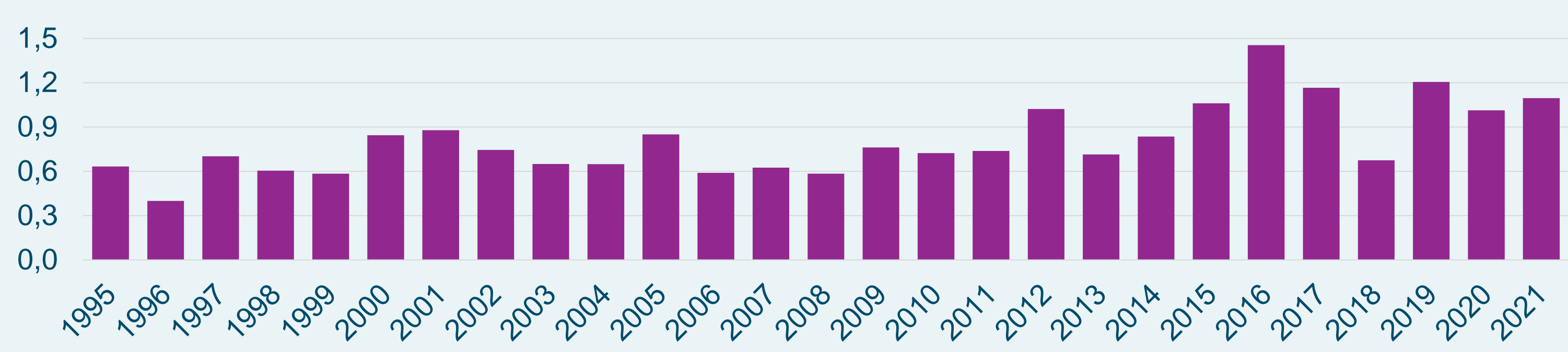
- The objective of this study was to estimate the incidence and prevalence of PN and explore the occurrence as well as the chronology of associated comorbidities diagnosed in a hospital setting in Denmark.

RESULTS

Study population

- During the study period, 1,209 people with a PN diagnosis were identified in Denmark. The incidence per 100,000 fluctuates but tends to be increasing (Figure 1).
- Ultimo 2021, we identified 824 living people with PN giving a prevalence of 14 per 100,000.

Figure 1. Yearly incidence of PN per 100,000 people between 1995 and 2021



- The proportion of women exceeded those of men (58%) and the mean age at PN diagnosis was 59 years (Table 1).
- The accumulated incidence of people with PN between 1995 and 2021 were largest in the Capital Region of Denmark (26 per 100,000), Region Zealand (24 per 100,000) and Central Denmark Region (23 per 100,000) and smallest in North Denmark Region (12 per 100,000) and Region Southern Denmark (17 per 100,000).
- The majority of people with PN have an elementary school (41%) or secondary education degree (40%), while 30% and 44% of the people in the background population between 55 and 64 years have an elementary school and secondary education degree, respectively.

Table 1. Baseline characteristics of the study population of incident people with PN diagnosed between 1995 and 2021

	People with PN (N=1,209)
Age, mean (SD)	59 (17)
Sex, n (%)	
Women	696 (58%)
Men	513 (42%)
Region of residence, n per 100,000 people (%)	
The Capital Region	26 (25%)
Central Denmark Region	23 (23%)
North Denmark Region	12 (12%)
Region Zealand	24 (24%)
Region Southern Denmark	17 (17%)
Education, n (%); [% of people in the background population between 55 and 64 years]	
Elementary school	465 (41%); [30%]
Secondary education	459 (40%); [44%]
Short cycle tertiary	45 (4%); [3%]
Bachelor or equivalent	118 (10%); [16%]
Master or higher	51 (4%); [6%]
Not in the education registers	71

PN: Prurigo Nodularis; SD: standard deviation.

Comorbidities

- Among people with PN, a 61% were diagnosed with minimum one of the 67 examined comorbidities before PN diagnosis, while 68% were diagnosed with minimum one of the comorbidities after PN diagnosis. Among controls the respective numbers were 44% and 48% before and after PN diagnosis, respectively.
- Before PN diagnosis, the largest OR was estimated in chronic kidney disease, where people with PN had an OR of 6.78 (95% CI: 4.56-10.07) compared to their respective controls without PN, followed by ORs of 3.63 (95% CI: 2.64-4.99) and 3.26 (95% CI: 2.33-4.57) in hypertension and substance use disorder, respectively (Figure 2).
- Before PN diagnosis, 37 of the 67 prespecified comorbidities were possible to report without discretion issues. Of those, 34 (92%) comorbidities occurred more frequently in people with PN than their respective controls and 25 occurred statistically significant more frequently in people with PN. Only 3 (8%) comorbidities occurred more frequently in controls and were statistically insignificant.
- After PN diagnosis, the largest OR was estimated in atopic dermatitis, where people with PN had an OR of 4.87 (95% CI: 2.91-8.15) compared to their respective controls without PN, followed by ORs of 3.45 (95% CI: 2.48-4.81) and 3.31 (95% CI: 2.35-4.68) in mood disorder and depression, respectively (Figure 3).
- After PN diagnosis, 36 of the 67 prespecified comorbidities were possible to report without discretion issues. Of those, 34 (94%) comorbidities occurred more frequently in people with PN than their respective controls and 26 occurred statistically significant more frequently in people with PN. Only 2 (6%) comorbidities occurred more frequently in controls and were statistically insignificant.
- Thus, both before and after PN diagnosis, people with PN had a significantly higher occurrence of mental and physical comorbidities.

METHODS

Study design and data sources

- People with PN were identified as individuals with a hospital contact (admission or outpatient contact) with a registration of ICD10-code L28.1 (PN) as their primary or secondary diagnosis in the Danish National Patient Register (DNPR) between 1995 and 2021.
- Prevalence was estimated as all people with PN alive ultimo 2021 divided by the number of people in the total Danish population ultimo 2021 (5,900,000).
- Each individual with PN was matched by age, sex, region of residence and education with up to three individuals (controls) from the background population without PN using a combination of exact and nearest neighbour matching.
- Via registered ICD10-codes, the prevalence of 67 prespecified comorbidities before and after the first diagnosis with PN were identified in the DNPR for both people with PN and their respective controls.

Statistical analysis

- Odds ratios (ORs) and 95% confidence intervals (95% CI) between people with PN and their respective controls were estimated before and after the first diagnosis with PN for all prespecified comorbidities.
- The ten comorbidities with the biggest absolute difference in occurrence between people with PN and their respective controls before and after PN diagnosis, respectively, are presented.

Figure 2. Odds ratios (and 95% CI) for the ten comorbidities with the biggest absolute difference in occurrence between people with PN and their respective controls before PN diagnosis

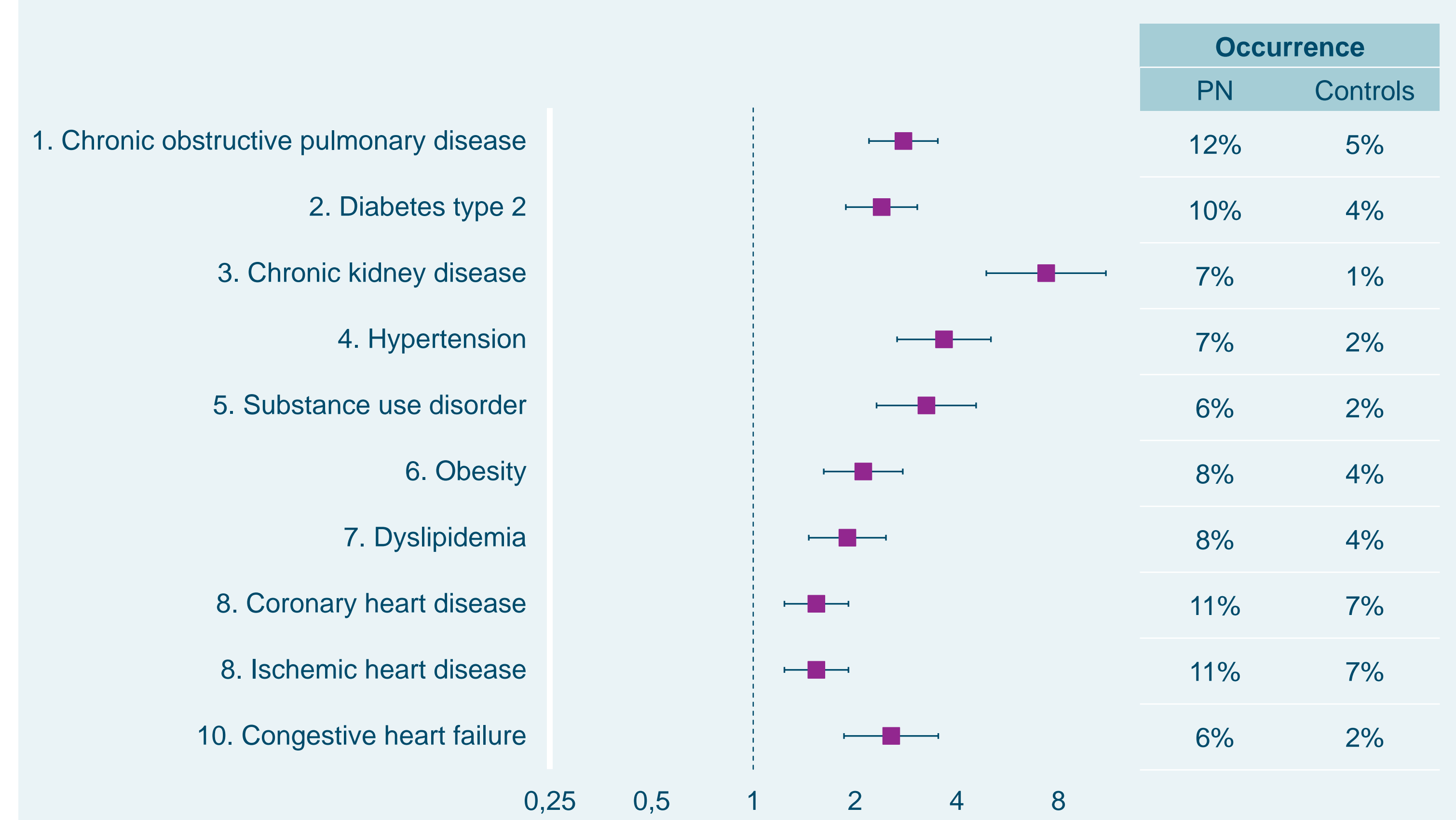


Figure 3. Odds ratios (and 95% CI) for the ten comorbidities with the biggest absolute difference in occurrence between people with PN and their respective controls after PN diagnosis



CONCLUSIONS

- Using the ICD10-code L28.1, the prevalence of PN is somewhat lower than expected compared to other international studies (14 per 100,000 ultimo 2021). One explanation could be that a fraction of people with PN are misdiagnosed with differential diagnoses such as atopic dermatitis.
- Subjects with PN had a higher degree of comorbidities, versus controls.
- Both before and after PN diagnosis, people with PN had a significantly higher occurrence of mental and physical comorbidities.
- Following the PN diagnosis, mood disorder and depression were the two comorbidities where people with PN experience the largest risk (besides from atopic dermatitis).

References:

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Conflicts of interest:

MT and PJL are employees of Sanofi. JO and MM are employees at EY, which is a paid vendor of Sanofi. KSI and JE have no conflict of interest.

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