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ORIGINAL PAPER

SICKNESS ABSENCE ATTRIBUTED TO OBESITY (ICD-10 CODE E66) IN POLAND: TRENDS, DEMOGRAPHIC PATTERNS, AND SOCIAL INSURANCE BURDEN, 2020–2025

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Highlights

- First nationwide analysis of sickness absence attributed to obesity in Poland.
- Sickness absence days attributed to obesity increased by 151% in 2020–2025.
- The highest burden was observed among women aged 35–49 years.
- Regional differences in sickness absence attributed to obesity were observed.
- Social insurance expenditures increased by 235% in 2020–2024.

Abstract

Background: Obesity is a major public health challenge and one of the leading drivers of multimorbidity worldwide. This study aimed to assess the burden of sickness absence attributed to obesity (International Classification of Diseases, 10th Revision – ICD-10, code E66) in Poland by analyzing temporal trends, demographic patterns, geographic variation, and associated social insurance expenditures 2020–2025. **Material and Methods:** This nationwide registry-based study used administrative data from the Social Insurance Institution (Zakład Ubezpieczeń Społecznych). All sickness absence certificates attributed to obesity (2020–2025) were analyzed. Indicators included sickness absence days, sickness absence certificates, average sickness absence duration, and social insurance expenditures. Analyses were stratified by sex, age group, year, and geographic area. **Results:** Sickness absence days attributed to obesity increased from 134 977 in 2020 to 338 391 in 2025 (+150.7%), while sickness absence certificates increased from 7395 to 21807 (+194.9%). Corresponding rates increased from 352.7 to 902.6 days and from 19.3 to 58.2 certificates per 100 000 population. The estimated annual percentage change (APC) was 20.9% (95% CI: 12.0–30.6) for sickness absence days and 25.1% (95% CI: 15.5–35.5) for certificates. The increase was more pronounced among females than males, with APCs of 22.7% vs. 16.6% for sickness absence days and 26.7% vs. 21.1% for certificates, respectively. The highest burden was observed among individuals aged 35–49 years, with considerable regional variation. Average sickness absence duration decreased from 5.83 to 4.12 days per certificate. Social insurance expenditures increased from PLN 9.5 million in 2020 to PLN 31.8 million in 2024 (+235.4%). **Conclusions:** Sickness absence attributed to obesity (ICD-10 code E66) increased substantially in Poland in 2020–2025, particularly among women and middle-aged adults. These findings highlight the growing relevance of obesity for occupational health and support workplace-based prevention and early identification of workers at increased risk of work incapacity. Med Pr Work Health Saf. 2026;77(6)

Key words: obesity, absenteeism, occupational health, health expenditures, social security, sick leave

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INTRODUCTION

Obesity poses an emerging public health problem worldwide [1,2]. According to the World Obesity Federation, the global prevalence of obesity more than tripled during 1975–2022 [3]. It is estimated, that in 2021 1 billion adult males and 1.11 billion adult females had overweight and obesity [1]. According to recent Global Burden of Disease analyses, the Central and Eastern Europe (CEE) region belongs to the areas with the highest obesity burden worldwide [1].

Obesity is a chronic, multifactorial disease resulting from a complex interaction between biological, behavioral, environmental, and socioeconomic factors [4–6]. Among occupationally active individuals, organization of workplace and workplace-related factors such as, sedentary work, prolonged sitting position, shift working (especially night shifts), long working hours, occupational stress as well as limited access to infrastructure and services that support healthy dietary choices and physical activity may contribute to the development and progression of obesity and its associated health consequences [7–10].

Obesity is associated with numerous adverse health outcomes and is recognized as one of the leading driving factors of multimorbidity worldwide [1,11,12]. Type 2 diabetes, cardiovascular diseases, sleep disorders, chronic respiratory diseases, musculoskeletal disorders, several cancers and mental health issues are among leading comorbidities associated with obesity [11,12]. Multimorbidity is highly prevalent among individuals with obesity and represents a major clinical and public health concern [12,13]. The co-existence of multiple obesity-related conditions may impair physical functioning, mental health status, daily life activities, quality of life as well as decrease work ability and work capacity [1,6,13].

Obesity is linked with higher absenteeism and presenteeism and substantial employer costs [14,15]. Moreover, obesity contributes to work impairment, decreased work ability, and increased indirect costs for employers and social insurance systems [16]. The growing burden of obesity is associated with increasing healthcare expenditures, social insurance costs, and productivity losses related to absenteeism, presenteeism, and work incapacity, imposing a substantial economic burden on both employers as well as health and social insurance systems [15–17].

Obesity has become a major public health challenge in Poland. A recent nationwide study among 4714 adults of working age (18–64 years) in Poland found that 53.1% had excess body weight, including 34.2% classified as overweight and 18.9% as obese [18]. The prevalence of excess body weight increased with age and was higher among men and rural residents, indicating important demographic and socioeconomic disparities in obesity burden [18]. Recent population-based studies indicate that although most adults in Poland recognize obesity as a disease, substantial gaps persist in public awareness of its causes, complications, and treatment methods [19,20]. Moreover, obesity remains affected by social stigma and common misperceptions [19,20].

The growing burden of obesity has intensified public debate in Poland on the need for a comprehensive approach to obesity prevention and treatment [21,22]. However, evidence on the impact of obesity on work ability and sickness absence remains limited. Understanding the burden of obesity-related work incapacity is essential for informing public health policies and estimating the economic consequences of obesity for both employers and social insurance systems [9,10,13,15,17,19,20].

Therefore, this nationwide registry-based study aimed to assess the burden of sickness absence attributed to obesity (International Classification of Diseases, 10th Revision – ICD-10, code E66 – hereafter referred to as E66) in Poland by analyzing temporal trends, demographic patterns, geographic variation, and social insurance expenditures 2020–2025.

MATERIAL AND METHODS

Study design and data source

This descriptive observational study was based on aggregated nationwide administrative registry data obtained from the Polish Social Insurance Institution (Zakład Ubezpieczeń Społecznych – ZUS) [23]. The analysis covered the period 2020–2025 and included electronic sickness absence certificates issued for temporary incapacity for work. Zakład Ubezpieczeń Społecznych maintains a nationwide electronic registry of sickness absence certificates, including information on the diagnosis underlying temporary incapacity for work, coded according to ICD-10, as well as the duration of sickness absence and selected demographic characteristics.

Case definition

For the purposes of this study, sickness absence attributed to obesity (E66) was defined as a sickness absence certificate in which obesity (E66) was recorded as the diagnosis underlying temporary incapacity for work [24]. Each sickness absence certificate was treated as a separate administrative event and should not be interpreted as representing a unique individual patient. Consequently, multiple certificates could have been issued to the same individual during the study period. The total number of sickness absence days represented the sum of all certified days attributed to obesity (E66) within a given calendar year.

Variables

The analysis included the annual number of sickness absence certificates and the total number of sickness absence days attributed to obesity (E66). Data were analyzed by sex, age group, and region of residence. The mean duration of sickness absence per certificate was calculated by dividing the total number of sickness absence days by the corresponding number of certificates. Expenditure on sickness benefits attributed to obesity was analyzed using aggregated ZUS expenditure data and is presented in Polish zloty (PLN) [25].

Age was categorized into 5-year groups to provide sufficient granularity for identifying age-specific patterns in sickness absence while maintaining comparability across the study period. Individuals aged 18–19 years constituted a separate group.

The study protocol was reviewed and approved by the Bioethics Committee of the Centre of Postgraduate Medical Education, Warsaw, Poland (approval No. 89/2025, issued on October 8, 2025).

Statistical analysis

Descriptive statistics were used. Data were analyzed using IBM SPSS Statistics v. 29 (IBM Corp., Armonk, NY, USA). The number of sickness absence days, sickness absence certificates, average sickness absence duration (days per certificate), and social insurance expenditures were analyzed by sex, age group, year, and geographic area. Population-based rates were calculated by dividing the number of sickness absence days or sickness absence certificates attributed to obesity (E66) by the corresponding population size obtained from Statistics Poland (Główny Urząd Statystyczny) [26]. Rates were expressed per 100 000 population for national, sex-specific, and age-specific analyses. For county-level spatial analyses rates were expressed per 10 000 population. Spatial analyses were performed at the county (*powiat*) level, while social insurance expenditures were analyzed at the voivodship level. The analyses were based on aggregated registry data and did not include individual-level observations. To quantify temporal trends, annual percentage changes (APCs) in the rates of sickness absence days and sickness absence certificates attributed to obesity (E66) per 100 000 population were estimated for 2020–2025 using log-linear regression, with calendar year as the independent variable. Annual percentage changes are presented with 95% confidence intervals (95% CIs).

RESULTS

The number of sickness absence days attributed to obesity (E66) increased from 134 977 in 2020 to 338 391 in 2025 (+150.7%) (Table 1). During the same period, the number of sickness absence certificates rose from 7395 to 21 807 (+194.9%). The increase was observed in both sexes but was more pronounced among females, in whom sickness absence days increased by 165.1% and the number of certificates by 210.4%, compared to increases of 118.3% and 161.8%, respectively, among males. Overall, females accounted for the majority of sickness absence attributed to obesity throughout the study period (Table 1).

The monthly number of sickness absence certificates attributed to obesity in 2024 showed moderate variation throughout the year, with the lowest number recorded in August and the highest in October (Figure 1).

The rates of sickness absence attributed to obesity increased substantially 2020–2025. The number of sickness absence days per 100 000 population increased from 352.7 to 902.6, while the number of sickness absence certificates per 100 000 population rose from 19.3 to 58.2. Rates were consistently higher among females than males across all age groups. The highest rates of sickness absence were observed among individuals aged 35–49 years, particularly among females aged 40–44 years, in whom the number of sickness absence days reached 3299.4/100 000 population and the number of certificates reached 198.1/100 000 population in 2025 (Table 2).

The annual percentage change analysis confirmed an increasing trend in sickness absence attributed to obesity (ICD-10 code E66) 2020–2025. Overall, the estimated APC was 20.9% (95% CI: 12.0–30.6) for sickness absence days and 25.1% (95% CI: 15.5–35.5) for sickness absence certificates. The increase was more pronounced among females than males, with APCs of 22.7% vs. 16.6% for sickness absence days and 26.7% vs. 21.1% for sickness absence certificates, respectively. Age-specific APC estimates are presented in Table 2.

Table 1. Trends in sickness absence days and certificates attributed to obesity (International Classification of Diseases, 10th Revision, code E66) among adults in Poland, 2020–2025

Variable	2020	2021	2022	2023	2024	2025	Change [%]	
							2025–2020	2025–2024
Sickness absence days attributed to obesity	134 977	175 034	224 708	306 365	299 548	338 391	+150.7	+13.0
males	41 627	54 317	66 997	81 678	78 819	90 884	+118.3	+15.3
females	93 350	120 717	157 711	224 687	220 729	247 507	+165.1	+12.1
Sickness absence certificates attributed to obesity	7 395	9 641	13 302	18 536	18 466	21 807	+194.9	+18.1
males	2 364	3 048	4 147	5 121	5 079	6 190	+161.8	+21.9
females	5 031	6 593	9 155	13 415	13 387	15 617	+210.4	+16.7

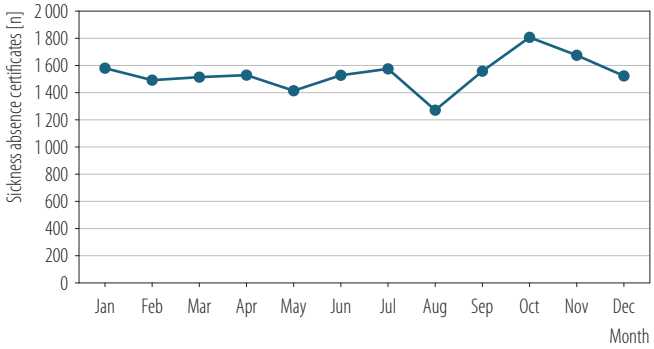


Figure 1. Monthly number of sickness absence certificates attributed to obesity (International Classification of Diseases, 10th Revision, code E66), Poland, 2024

Considerable regional disparities in sickness absence attributed to obesity were observed at the county level in 2024 (Figure 2). Counties with the highest rates of sickness absence days and certificates were predominantly located in western and northern Poland, while lower rates were more common in the south-eastern part of the country. The spatial distribution suggests substantial geographic heterogeneity in sickness absence attributed to obesity.

The average duration of sickness absence attributed to obesity decreased over time, from 5.83 days per certificate in 2020 to 4.12 days in 2025 (Table 3). This downward trend was observed in both females and males, although the average duration remained consistently longer among females throughout the study period. The longest average durations of sickness absence were observed among individuals aged 25–54 years, whereas the shortest durations were recorded among those aged 60–64 years (Table 3).

Social insurance expenditures associated with sickness absence attributed to obesity increased from PLN 9.48 million (approx. EUR 2.13 million) in 2020 to PLN 31.78 million (approx. EUR 7.4 million) in 2024 (Table 4). Females accounted for the majority of expenditures throughout the study period. The highest expenditures were recorded in the Masovian, Lower Silesian, and Silesian voivodships. Overall, social insurance expenditures associated with sickness absence attributed to obesity increased by 235.4% 2020–2024.

DISCUSSION

This nationwide registry-based analysis indicates that obesity is becoming an increasingly important cause of temporary work incapacity and a growing financial burden for the Polish social insurance system. The number of sickness absence certificates attributed to obesity and associated social insurance expenditures increased markedly over the study period, particularly among women aged 35–49 years. This trend was driven primarily by an increasing frequency of sickness absence episodes rather than by longer durations of individual episodes.

Findings from this study revealed that 2020–2025, the number of sickness absence certificates attributed to obesity increased by 194.9% while the number of sickness absence days attributed to obesity increased by 150.7%. This observation is in line with the global and regional trends on growing prevalence of overweight and obesity [1–3]. In recent years, healthcare systems in many high-income countries have increasingly recognized obesity as a chronic disease requiring dedicated and multidisciplinary management pathways [22,27,28]. In Poland, the development of structured obesity care, including the implementation of the pilot program for comprehensive treatment of bariatric patients (KOS-BAR program) and wider access to bariatric surgery, has increased awareness of obesity among healthcare professionals and may have improved the identification and documentation of obesity in routine clinical practice [27]. Consequently, part of the observed increase in sickness absence attributed to obesity (E66) may reflect improved recognition and reporting of obesity as a primary health condition rather than a true increase in disease burden alone [21,22]. Nevertheless, obesity is still frequently underdiagnosed and underreported, with obesity-related comorbidities such as diabetes, cardiovascular diseases, and musculoskeletal disorders more often being identified as the primary reasons for sickness absence than obesity itself.

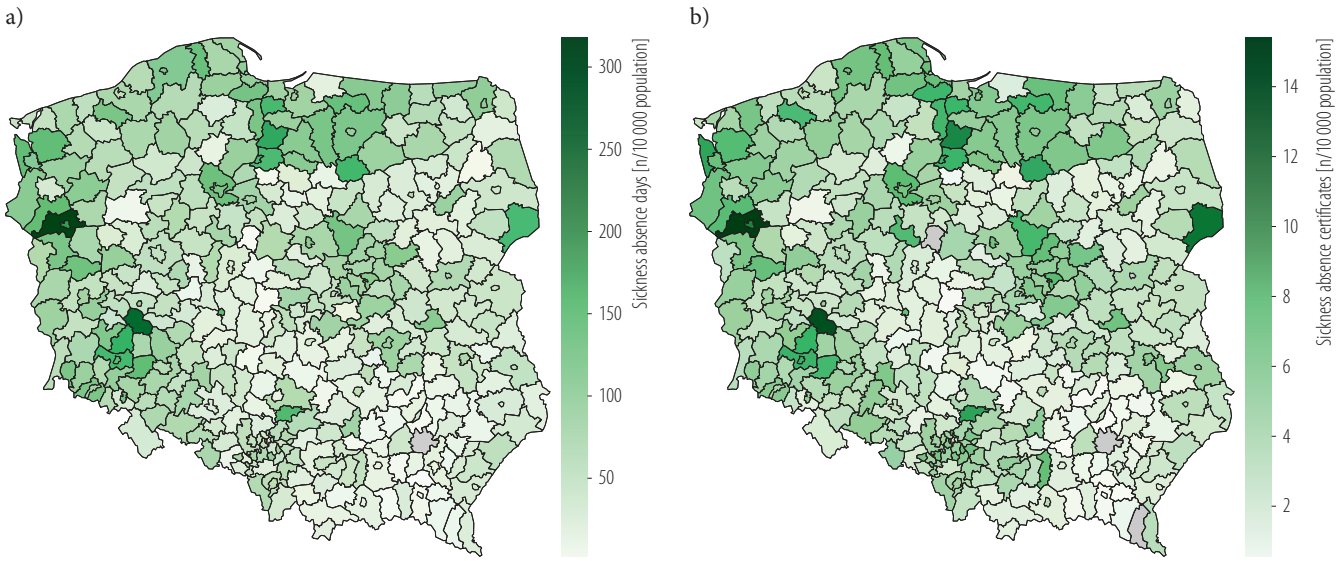
Regional variation in sickness absence attributed to obesity may similarly reflect several overlapping factors, including differences in population structure, employment patterns, healthcare utilization, access to obesity care, and diagnostic and certification practices. Therefore, the observed geographic variation should not be interpreted as directly reflecting regional differences in obesity prevalence.

In this study, substantial sex differences in sickness absence attributed to obesity were observed. In all analyzed years, women accounted for 70–75% of sickness absence certificates and days attributed to obesity. The rate of increase was also greater among women than among men, with APCs of 22.7% vs. 16.6% for sickness absence days and 26.7% vs. 21.1% for sickness absence certificates, respectively. These differences may re-

Table 2. Number of sickness absence days and certificates attributed to obesity (International Classification of Diseases, 10th Revision, code E66) per 100 000 population by age group, Poland, 2020–2025

Variable	Sickness absence days attributed to obesity [n/100 000 population]						Sickness absence days APC attributed to obesity		Sickness absence certificates attributed to obesity [n/100 000 population]						Certificates APC attributed to obesity	
	2020	2021	2022	2023	2024	2025	%	95% CI	2020	2021	2022	2023	2024	2025	%	95% CI
Overall	352.7	461.7	595.0	814.0	799.0	902.6	20.9	12.0–30.6	19.3	25.4	35.2	49.3	49.3	58.2	25.1	15.5–35.5
18–19 years	34.1	74.7	107.6	115.9	155.8	194.2	36.8	18.6–57.8	5.8	10.4	19.1	23.4	34.2	47.1	50.2	36.5–65.4
20–24 years	155.0	211.7	356.2	605.9	477.6	430.7	26.0	1.7–56.0	10.5	14.1	22.6	38.6	31.4	32.1	27.6	6.7–52.5
25–29 years	483.6	520.5	841.5	1 632.2	1 193.3	1 338.9	26.6	5.2–52.3	28.4	31.3	52.6	97.9	75.9	90.1	29.5	9.2–53.6
30–34 years	625.5	917.2	1 105.6	1 871.3	1 786.7	1 688.8	23.9	8.1–41.9	33.5	50.0	67.1	106.9	105.7	109.1	27.9	13.0–44.8
35–39 years	732.6	1 066.1	1 329.6	1 718.4	1 854.7	1 999.5	21.9	12.9–31.7	40.5	59.0	77.1	102.6	107.6	121.9	24.2	14.6–34.7
40–44 years	895.1	1 187.8	1 448.8	1 845.0	1 795.6	2 172.0	18.4	11.3–26.0	48.4	62.6	85.2	109.8	110.3	132.7	22.1	14.1–30.7
45–49 years	929.7	1 079.6	1 363.8	1 630.5	1 696.0	1 984.7	16.4	12.2–20.8	48.3	57.7	76.0	96.7	104.4	125.0	21.4	16.6–26.3
50–54 years	631.1	814.8	1 103.2	1 329.3	1 477.7	1 689.9	21.8	15.4–28.5	33.8	44.5	64.4	81.2	89.2	109.4	26.4	18.9–34.3
55–59 years	376.3	461.0	589.9	755.4	760.1	1 071.0	22.1	16.2–28.2	19.8	24.3	34.9	49.1	50.7	71.8	29.3	21.9–37.1
60–64 years	84.8	132.0	183.7	199.8	219.3	284.9	24.5	13.9–36.0	5.1	8.1	11.1	14.2	13.9	19.4	27.7	16.0–40.5
Females	472.4	616.4	808.1	1 155.0	1 138.8	1 277.0	22.7	13.1–33.2	25.5	33.7	46.9	69.0	69.1	80.6	26.7	16.3–38.1
18–19 years	34.8	99.1	134.7	148.0	214.3	225.2	39.9	13.8–71.9	4.6	11.0	19.8	24.5	38.4	50.6	57.7	36.2–82.7
20–24 years	221.3	265.4	579.9	1 019.4	771.6	647.4	29.8	−0.8–69.9	14.1	17.8	34.2	60.4	48.4	44.3	30.4	4.0–63.6
25–29 years	807.9	821.9	1 412.8	2 839.9	1 971.8	2 157.2	26.5	2.7–55.8	44.8	47.5	85.0	164.9	119.9	137.6	29.5	6.2–57.9
30–34 years	1 009.8	1 421.9	1 657.4	2 961.9	2 895.1	2 786.6	24.9	9.8–42.1	53.2	75.9	94.8	167.7	166.2	173.0	28.7	14.2–45.0
35–39 years	1 053.1	1 537.9	1 983.5	2 636.3	2 964.0	3 159.7	24.8	15.4–34.9	56.9	83.1	113.0	155.3	170.9	187.3	27.3	16.9–38.6
40–44 years	1 207.5	1 630.0	2 037.5	2 714.6	2 691.3	3 299.4	21.5	14.0–29.5	65.0	86.3	119.3	161.5	165.2	198.1	25.0	16.3–34.4
45–49 years	1 267.6	1 482.2	1 726.8	2 232.6	2 390.7	2 843.9	17.8	14.7–21.0	65.9	80.7	97.7	132.8	144.6	179.1	22.3	18.5–26.3
50–54 years	779.7	1 024.0	1 562.5	1 755.9	2 020.4	2 257.2	23.8	14.4–33.9	42.3	56.5	88.5	108.3	122.4	147.3	28.4	19.1–38.5
55–59 years	439.8	565.4	719.4	935.7	909.2	1 291.9	22.4	15.4–29.8	23.1	29.9	42.4	62.0	61.7	91.1	30.9	22.3–40.1
60–64 years	61.8	96.8	125.9	149.6	137.6	228.4	24.8	12.1–39.0	3.5	6.1	8.4	12.1	10.7	16.1	31.9	16.2–49.6
Males	225.0	296.4	367.1	449.2	435.3	501.9	16.6	8.9–24.7	12.8	16.6	22.7	28.2	28.0	34.2	21.1	13.0–29.8
18–19 years	33.4	51.5	81.7	85.4	100.0	164.7	33.1	20.7–46.8	7.1	9.9	18.3	22.2	30.2	43.8	43.5	34.0–53.6
20–24 years	91.6	160.1	141.4	208.8	195.9	222.9	16.8	4.0–31.2	7.0	10.5	11.5	17.6	15.0	20.4	21.6	10.1–34.3
25–29 years	170.4	228.8	288.4	463.5	440.9	548.2	26.7	16.4–37.9	12.6	15.7	21.2	33.2	33.4	44.3	29.3	20.7–38.5
30–34 years	252.6	428.7	570.9	815.1	710.9	623.2	20.0	−0.4–44.6	14.5	24.9	40.2	48.0	47.0	47.0	25.5	5.5–49.4
35–39 years	419.4	606.7	692.0	823.1	772.4	867.4	13.8	4.6–23.9	24.6	35.5	42.1	51.2	45.9	58.1	16.2	6.5–26.9
40–44 years	588.2	753.6	870.9	991.2	915.9	1 064.8	11.1	4.2–18.4	32.0	39.4	51.8	59.1	56.4	68.6	15.4	8.1–23.3
45–49 years	594.0	679.9	1 003.3	1 032.6	1 006.4	1 131.8	13.5	4.3–23.5	30.9	34.8	54.4	61.0	64.4	71.4	19.2	9.9–29.3
50–54 years	480.3	602.5	637.7	897.3	929.1	1 116.5	18.2	13.0–23.7	25.2	32.3	39.9	53.7	55.7	71.1	22.6	17.3–28.0
55–59 years	309.4	351.1	453.9	566.7	604.1	840.0	21.6	16.8–26.6	16.4	18.4	27.0	35.5	39.2	51.6	26.7	20.5–33.2
60–64 years	110.8	171.7	248.5	255.7	309.8	347.5	23.9	12.5–36.6	6.9	10.5	14.1	16.6	17.5	23.0	24.7	15.2–34.9

APC – annual percentage change.



Source: own elaboration based on Social Insurance Institution (Zakład Ubezpieczeń Społecznych) [23].

Figure 2. Spatial variation in sickness absence attributed to obesity (International Classification of Diseases, 10th Revision, code E66) across counties in Poland, 2024: a) sickness absence days/10 000 population, b) sickness absence certificates/10 000 population

flect several overlapping factors, including differences in healthcare utilization, recognition and documentation of obesity in clinical practice, obesity-related comorbidities affecting work ability, and occupational characteristics [29–31]. Therefore, the observed sex differences should not be interpreted as directly reflecting differences in obesity prevalence alone.

The highest burden of sickness absence attributed to obesity per 100 000 population was observed among those aged 35–49 years, especially among women. This observation may reflect the accumulation of obesity-related comorbidities during the most economically active period of life, while the particularly high rates among women may be related to greater healthcare utilization and more frequent recognition of obesity in clinical practice [11,12]. A marked increase in sickness absence attributed to obesity was observed among young adults aged 18–19 years and 25–34 years. This trend may reflect the growing prevalence of obesity in younger generations, as well as the earlier onset of obesity-related health conditions affecting work ability [1,2].

The average duration of sickness absence attributed to obesity decreased from 5.83 to 4.12 days/certificate. The decreasing duration of individual sickness absence episodes suggests that the growing burden was driven primarily by an increasing frequency of work incapacity episodes rather than by longer individual episodes [9,10,32]. This pattern may reflect increasing recognition of obesity as a reason for temporary work incapacity and more frequent use of short-term sickness absence.

The more than threefold increase in social insurance expenditures, from PLN 9.5 million (EUR 2.13 million) to PLN 31.8 million (EUR 7.4 million), underscores that obesity is becoming an increasingly important source of indirect economic costs associated with sickness absence. Notably, the average social insurance expenditure per sickness absence certificate also increased, from approx. PLN 1281 (EUR 288) in 2020 to PLN 1721 (EUR 400) in 2024. The highest expenditures were recorded in the Masovian, Silesian, and Lower Silesian voivodships, which may largely reflect the larger population size and number of economically active individuals residing in these regions. A systematic review of 50 studies found that absenteeism and presenteeism were the most frequently reported and economically important components of obesity-related indirect costs, while excess annual disability-related costs among individuals with obesity ranged from approx. USD 242 to USD >4000/person depending on the study design and outcome assessed [15]. However, in Poland obesity remains underrecognized and underreported in clinical practice. As obesity-related comorbidities, such as diabetes, cardiovascular diseases, and musculoskeletal disorders, are often recorded as the primary causes of sickness absence rather than obesity itself, the true economic burden of obesity-related work incapacity is likely substantially underestimated.

Practical implications

The increasing burden of sickness absence attributed to obesity highlights the need to strengthen obesity pre-

vention and management within occupational health. Workplace-based programs should combine obesity prevention with early identification of workers at increased risk of work incapacity and interventions supporting healthy weight and work ability. Particular attention should be given to groups with the highest observed burden of sickness absence, including middle-aged workers and women. Occupational health services may provide an appropriate setting for early identification, counseling, and referral of workers requiring further obesity management. Such interventions may contribute to preventing recurrent or prolonged sickness absence and maintaining work ability among working-age adults.

Limitations

This registry-based analysis is a secondary analysis of aggregated data. The scope of analysis is limited to data collected within the electronic systems managed by the ZUS. The administrative registry did not include individual-level information on BMI, obesity severity, comorbidities, socioeconomic status, lifestyle factors, or occupational characteristics, such as occupation, type of work, or workplace exposures. Consequently, it was not possible to assess the relationship between these factors and sickness absence attributed to obesity. Only sickness absence episodes coded directly as obesity (E66) were included [24]. Obesity often contributes to sickness absence through obesity-related comorbidities like diabetes, cardiovascular diseases or musculoskeletal disorders, so the real impact of obesity on sickness absence may be significantly underestimated. This study included sickness absence records only for individuals insured by the ZUS. Consequently, individuals engaged in agricultural activity and insured under the Agricultural Social Insurance Fund (Kasa Rolniczego Ubezpieczenia Społecznego), accounting for approx. 5–6% of the insured population in Poland, were not included.

CONCLUSIONS

Sickness absence attributed to obesity (E66) increased substantially in Poland 2020–2025, with the highest burden observed among women and middle-aged adults. The increase was driven primarily by a growing number of sickness absence episodes rather than by longer duration of individual episodes and was accompanied by a marked rise in social insurance expenditures. These findings highlight the increasing

Table 3. Average duration of sickness absence attributed to obesity (International Classification of Diseases, 10th Revision, code E66), expressed as days per certificate, Poland, 2020–2025

Population	Sickness absence attributed to obesity [days/certificate]																			
	overall						females						males							
	2020	2021	2022	2023	2024	2025	2020	2021	2022	2023	2024	2025	2020	2021	2022	2023	2024	2025		
Overall	5.83	7.17	5.64	4.96	4.56	4.12	7.63	9.03	6.79	6.04	5.59	4.45	4.73	5.20	4.46	3.84	3.31	3.76		
18–19 years	14.75	15.05	15.77	15.71	15.23	13.42	15.66	14.94	16.97	16.87	15.93	14.63	13.00	15.23	12.33	11.89	13.07	10.91		
20–24 years	17.01	16.62	16.01	16.67	15.73	14.85	18.03	17.31	16.62	17.22	16.45	15.68	13.53	14.61	13.63	13.98	13.22	12.38		
25–29 years	18.65	18.35	16.49	17.51	16.91	15.48	18.98	18.74	17.48	17.66	17.42	16.10	17.47	17.21	14.21	17.00	15.13	13.27		
30–34 years	18.07	18.08	17.25	16.75	17.24	16.40	18.51	18.51	17.56	16.98	17.35	16.87	17.06	17.10	16.45	16.08	16.84	14.92		
35–39 years	18.50	18.96	17.00	16.80	16.28	16.36	18.57	18.89	17.08	16.81	16.29	16.66	18.36	19.12	16.81	16.76	16.25	15.53		
40–44 years	19.23	18.73	17.95	16.85	16.25	15.88	19.24	18.37	17.68	16.82	16.54	15.88	19.20	19.56	18.44	16.94	15.62	15.86		
45–49 years	18.68	18.32	17.13	16.38	16.56	15.45	18.44	18.13	17.65	16.22	16.51	15.33	19.09	18.67	15.97	16.71	16.69	15.71		
50–54 years	18.97	18.99	16.91	15.39	14.98	14.92	19.06	18.92	16.98	15.09	14.73	14.18	18.83	19.11	16.80	15.94	15.40	16.29		
55–59 years	16.60	16.21	16.57	14.06	15.74	14.70	17.54	15.99	14.94	12.42	12.84	14.17	16.06	16.36	17.67	15.39	17.71	15.10		
60–64 years	5.83	7.17	5.64	4.96	4.56	4.12	7.63	9.03	6.79	6.04	5.59	4.45	4.73	5.20	4.46	3.84	3.31	3.76		

Table 4. Social insurance expenditures associated with sickness absence attributed to obesity (International Classification of Diseases, 10th Revision, code E66) by voivodship, Poland, 2020–2024

Variable	Social insurance expenditures associated with sickness absence attributed to obesity [PLN, in thousands]				
	2020	2021	2022	2023	2024
Poland	9 476.0	13 212.8	20 219.3	28 308.3	31 781.7
females	6 353.9	9 184.9	13 788.0	20 423.7	22 536.3
males	3 122.1	4 027.8	6 431.3	7 884.6	9 245.5
Lower Silesia	1 130.2	1 336.7	2 214.0	2 834.9	3 234.4
females	843.6	973.8	1 516.9	2 086.6	2 357.9
males	286.6	363.0	697.1	748.3	876.5
Kuyavian-Pomerania	441.3	875.8	1 366.4	1 885.5	2 108.8
females	317.3	619.2	961.2	1 387.1	1 561.0
males	124.0	256.6	405.2	498.4	547.8
Lublin	466.3	614.9	1 031.1	1 126.2	1 306.1
females	247.6	328.4	668.1	803.4	844.1
males	218.7	286.5	363.0	322.8	462.0
Lubusz	295.4	384.5	547.5	1 038.4	1 372.9
females	221.4	306.6	402.7	856.1	998.8
males	74.0	77.9	144.8	182.3	374.1
Łódź	654.0	731.8	908.7	1 320.5	1 430.8
females	403.8	537.7	625.2	931.2	1 000.3
males	250.2	194.1	283.5	389.3	430.6
Lesser Poland	379.1	687.8	1 110.6	1 587.1	1 741.1
females	192.0	407.6	571.9	1 118.5	1 185.8
males	187.1	280.3	538.7	468.6	555.3
Masovia	1 734.2	2 449.3	3 821.8	5 171.6	5 660.8
females	1 143.6	1 745.8	2 716.9	3 594.3	3 739.5
males	590.6	703.5	1 104.9	1 577.3	1 921.3
Opole	246.5	273.7	342.1	489.4	674.7
females	143.9	201.8	254.3	357.6	534.5
males	102.6	71.9	87.7	131.8	140.3
Subcarpathia	139.9	201.9	279.7	523.6	724.9
females	72.6	122.8	174.9	368.7	464.2
males	67.4	79.1	104.9	154.9	260.7
Podlaskie	446.0	431.5	589.1	759.6	807.3
females	294.3	298.9	403.3	512.6	570.5
males	151.7	132.6	185.8	247.0	236.8
Pomerania	824.1	1 115.6	2 050.6	2 923.5	2 954.5
females	601.7	852.6	1 411.5	2 147.8	2 199.8
males	222.4	263.1	639.1	775.6	754.7
Silesia	625.9	1 185.8	1 729.6	2 669.7	3 218.1
females	392.4	816.0	1 202.8	1 996.8	2 347.5
males	233.5	369.8	526.8	673.0	870.6

Table 4. Social insurance expenditures associated with sickness absence attributed to obesity (International Classification of Diseases, 10th Revision, code E66) by voivodship, Poland, 2020–2024 – cont.

Variable	Social insurance expenditures associated with sickness absence attributed to obesity [PLN, in thousands]				
	2020	2021	2022	2023	2024
Świętokrzyskie	124.5	159.0	328.1	493.5	533.2
females	86.4	77.4	188.3	367.0	374.5
males	38.0	81.5	139.8	126.4	158.7
Warmia-Masuria	559.3	619.2	1 202.9	1 486.4	1 584.4
females	423.8	434.6	829.0	1 074.7	1 150.2
males	135.5	184.6	373.8	411.7	434.2
Greater Poland	774.9	1 128.9	1 582.9	2 241.9	2 433.1
females	540.6	770.4	1 039.9	1 548.4	1 736.0
males	234.3	358.4	543.0	693.5	697.1
West Pomerania	634.5	1 016.3	1 114.3	1 756.5	1 996.8
females	429.0	691.3	821.1	1 272.8	1 471.8
males	205.4	324.9	293.2	483.7	525.0

relevance of obesity for occupational health and work ability. Workplace obesity prevention, early identification of workers at increased risk of work incapacity, and targeted interventions supporting work ability may help reduce the health and economic burden of sickness absence attributed to obesity.

AI USE

Grammarly was used for language editing and grammar checking.

AUTHOR CONTRIBUTIONS

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