

Chemo ± Immunotherapy Remains Utilized for Chronic Lymphocytic Leukemia in Real-World Practice: Unmet Needs, Treatment Patterns, and Age Disparities in the United States

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CONCLUSIONS

- This real-world analysis of patients with CLL demonstrated that BTKis are a predominant treatment regimen across all lines of therapy, particularly among elderly patients aged 65+ and 70+ years
- While 1L use of chemo ± immunotherapy and anti-CD20-based regimens decreased over time, it remains relatively high in 2025 in overall and elderly patients with CLL
- Patients with CLL receiving BTKi regimens had the lowest HCRU burden in the overall cohort and in elderly patients
- Notably, patients with CLL treated with chemo ± immunotherapy and anti-CD20-based regimens had greater HCRU burden in the overall cohort and in elderly patients 65+ and 70+ years, emphasizing the need for novel therapies to improve real-world outcomes in these patients

INTRODUCTION

- Real-world data on how chronic lymphocytic leukemia (CLL) therapies are utilized in diverse populations provide insights into prescribing practices, treatment patterns, and treatment outcomes
- Real-world evidence assessing current treatment patterns and regimens for CLL throughout the entire patient treatment journey, however, is limited, especially in the vulnerable elderly population

OBJECTIVE

- To assess treatment utilization patterns, patient characteristics, and healthcare resource utilization (HCRU) for all CLL treatment regimens across all lines of therapy, in the overall patient cohort and in elderly patients aged 65+ and 70+ years

METHODS

- This was a retrospective, observational study conducted using the Symphony Integrated Datasave (IDV®), a comprehensive, longitudinal, open-claims database, including medical, hospital, and pharmacy claims in the US
- The study included adult patients (≥18 years) with ≥1 diagnosis of CLL who initiated treatment between 1/1/22-3/31/25
- CLL treatment regimens were categorized into 4 mutually exclusive categories<sup>1,2</sup>:
  - Chemo ± immunotherapy including bendamustine ± anti-CD20, and other chemotherapy; anti-CD20–based therapies including monotherapy and combinations; Bruton tyrosine kinase inhibitors (BTKi)-based therapies; and B-cell lymphoma 2 inhibitor (BCL2i)-based therapy
- Sociodemographic characteristics, clinical characteristics, and outcomes were examined by treatment regimen, line of therapy (LOT), and index year in the overall CLL cohort and in elderly patients (aged 65+ and 70+ years)
- HCRU, including outpatient, inpatient, and other medical/hospital services, was evaluated during the time on treatment and were reported as per-patient-per-year (PPPY)

<sup>1</sup>A small group of patients (n=10) whose treatment was not identifiable were not included in the analysis.  
<sup>2</sup>Chemo ± immunotherapy (bendamustine-based chemotherapy and other chemotherapy); anti-CD20-based therapies (FCR, FR, obinutuzumab ± other, R-CHOP [rituximab, cyclophosphamide, doxorubicin hydrochloride, vincristine, and prednisone], R-CHOP + cytarabine, rituximab ± other, rituximab monotherapy, and other anti-CD20); BTKi-based therapies (acalabrutinib, ibrutinib, zanubrutinib, and pirtobrutinib); BCL2i-based therapy (venetoclax ± obinutuzumab, venetoclax + rituximab, venetoclax monotherapy, and venetoclax + other).

RESULTS

Study Population

- The analysis included 37,341 patients with CLL: 20,729 (55.5%) initiated 1L, 12,632 (33.8%) initiated 2L, and 3980 (10.7%) initiated 3L+ therapy (**Table 1**)
- Median age was 71.0 years in the 1L setting, and 73.0 years in the 2L and 3L+ settings
- Across all lines of therapy, most patients were male and White/non-Hispanic

Table 1. Baseline Characteristics – By LOT

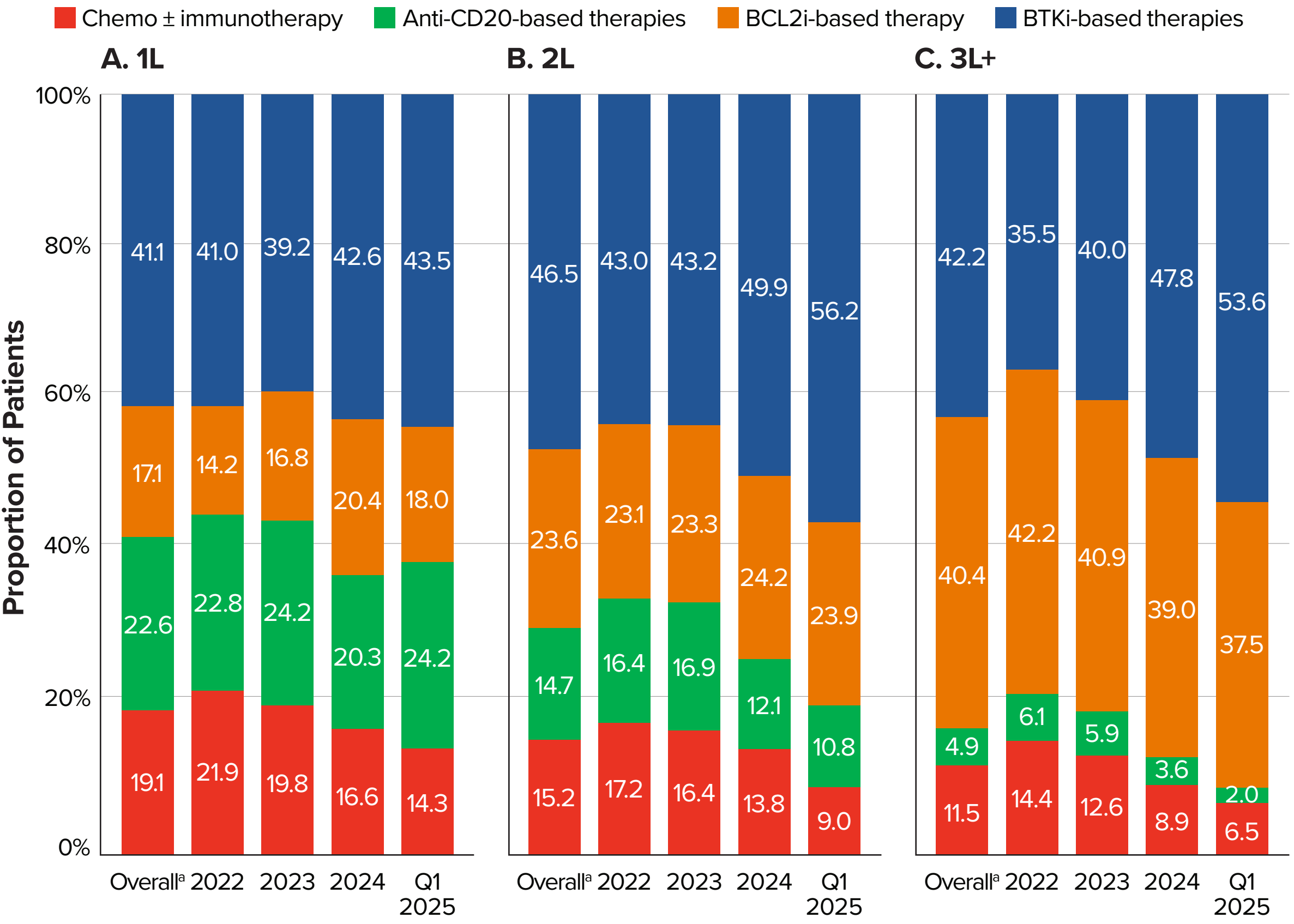
Characteristic	1L (n=20,729)	2L (n=12,632)	3L+ (n=3980)
Sex, n (%)			
Male	12,470 (60.16)	7477 (59.19)	2391 (60.08)
Female	8259 (39.84)	5155 (40.81)	1589 (39.92)
Age (at index)			
Mean ± SD, years	68.42 ± 10.19	70.66 ± 8.54	70.84 ± 8.25
Median (IQR), years	71.0 (63.0, 77.00)	73.0 (66.0, 77.00)	73.0 (66.00, 77.00)
≥65 years, n (%)	14,621 (70.53)	9902 (78.39)	3158 (79.35)
≥70 years, n (%)	11,201 (54.04)	7972 (63.11)	2538 (63.77)
Race, n (%)			
White / Non-Hispanic	12,798 (61.74)	8622 (68.26)	2731 (68.62)
Black	1422 (6.86)	850 (6.73)	327 (8.22)
Asian	249 (1.20)	134 (1.06)	25 (0.63)
Hispanic	881 (4.25)	535 (4.24)	142 (3.57)
Other	51 (0.25)	29 (0.23)	19 (0.48)
Unknown	5328 (25.70)	2462 (19.49)	736 (18.49)

Abbreviations: 1L, first-line; 2L, second-line; 3L+, third-line or later; IQR, interquartile range; LOT, line of therapy; SD, standard deviation.

Treatment Utilization Patterns

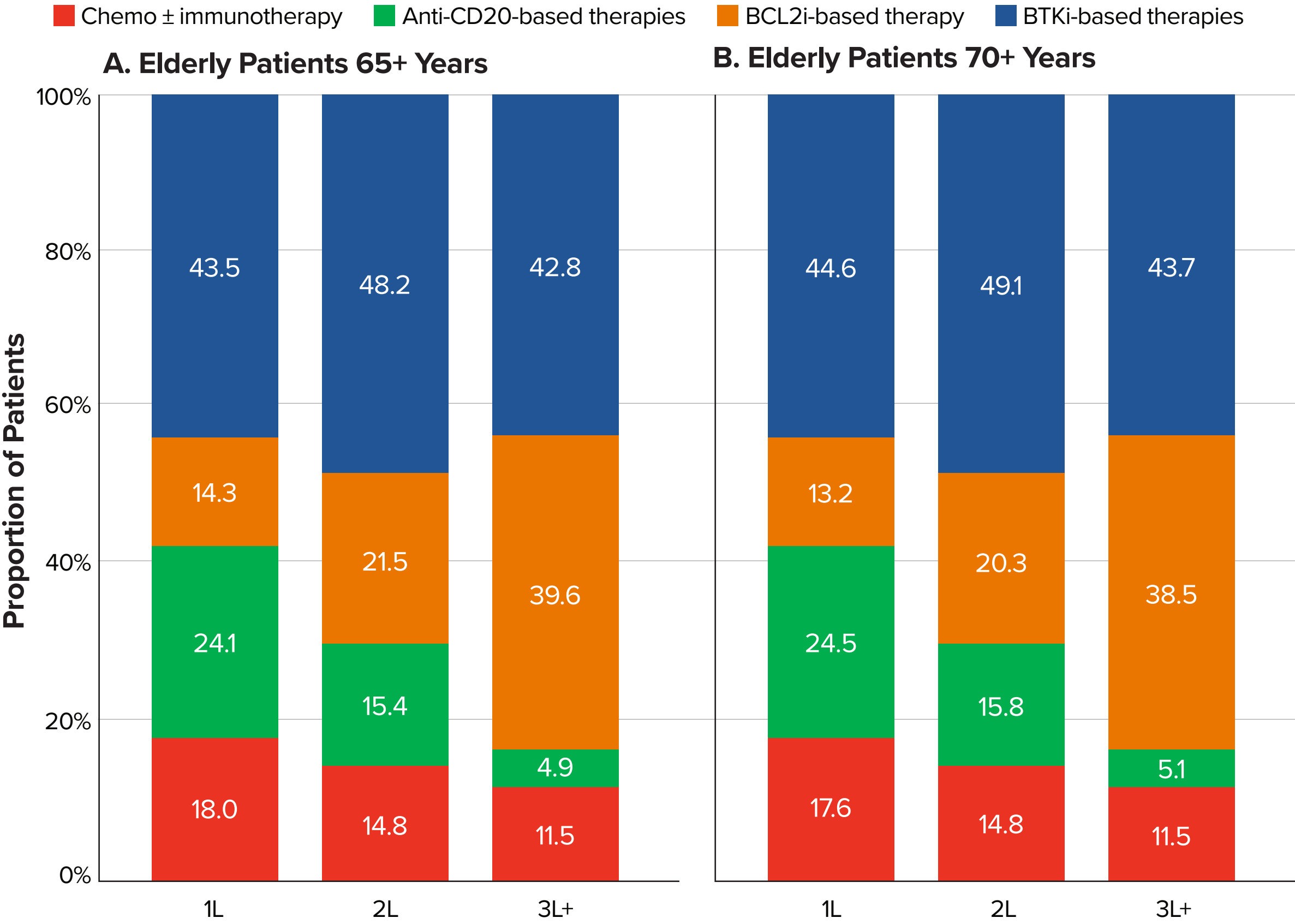
- BTKis were the most commonly used regimen across all lines of treatment, and steadily increased from 2022-2025, with rising zanubrutinib adoption and declining ibrutinib use (**Figure 1**)
- Despite an overall decline, chemo ± immunotherapy and anti-CD20 regimens remained in use in 14.3% and 24.2% of 1L patients, respectively, as of Q1 2025 (**Figure 1**), with similar high-use patterns observed in elderly patients (65+ years: 13.0% and 25.7%; 70+ years: 11.9% and 25.9%)
- Compared to the overall CLL cohort, BTKi use increased while BCL2i use decreased in patients aged 65+ and 70+ years across all lines of therapy (**Figures 1 and 2**)
- BTKis were the most commonly used therapy across all lines of treatment in the elderly (**Figure 2**)
- Chemo ± immunotherapy and anti-CD20-based regimens also remained in 1L use in the elderly (**Figure 2**)
- BCL2i patients were relatively younger (median age in 1L, 67 years; 2L, 71 years) than overall patients with CLL in 1L and 2L settings. In both 1L and 2L settings, BCL2i-treated patients had a lower proportion of older adults (65+ years) compared to those receiving BTKis (59.0% vs 74.6% in 1L; 71.5% vs 81.3% in 2L), a trend reflected in higher Medicare coverage among BTKi users
- BTKi and BCL2i patients had the lowest mean Charlson Comorbidity Index (~1.8 in 1L and ~1.6 in 2L) compared with other regimens

Figure 1. Treatment Utilization Patterns – Overall CLL Cohort



\*Overall = 2022-Q1 2025.  
Abbreviations: 1L, first-line; 2L, second-line; 3L+, third-line or later; BCL2i, B-cell lymphoma 2 inhibitor; BTKi, Bruton tyrosine kinase inhibitor; CLL, chronic lymphocytic leukemia; Q1, quarter 1.

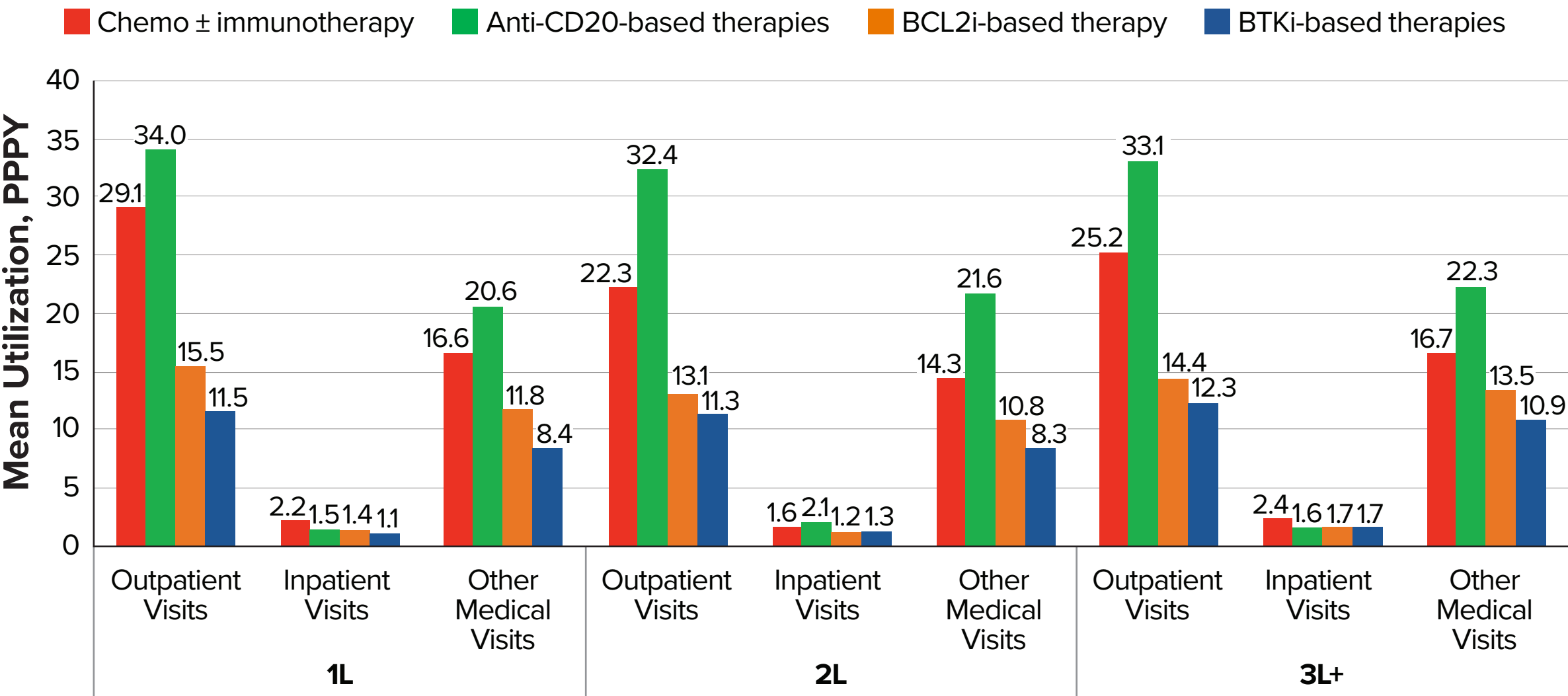
Figure 2. Treatment Utilization Patterns – Elderly Patients 65+ and 70+ Years



Abbreviations: 1L, first-line; 2L, second-line; 3L+, third-line or later; BCL2i, B-cell lymphoma 2 inhibitor; BTKi, Bruton tyrosine kinase inhibitor.

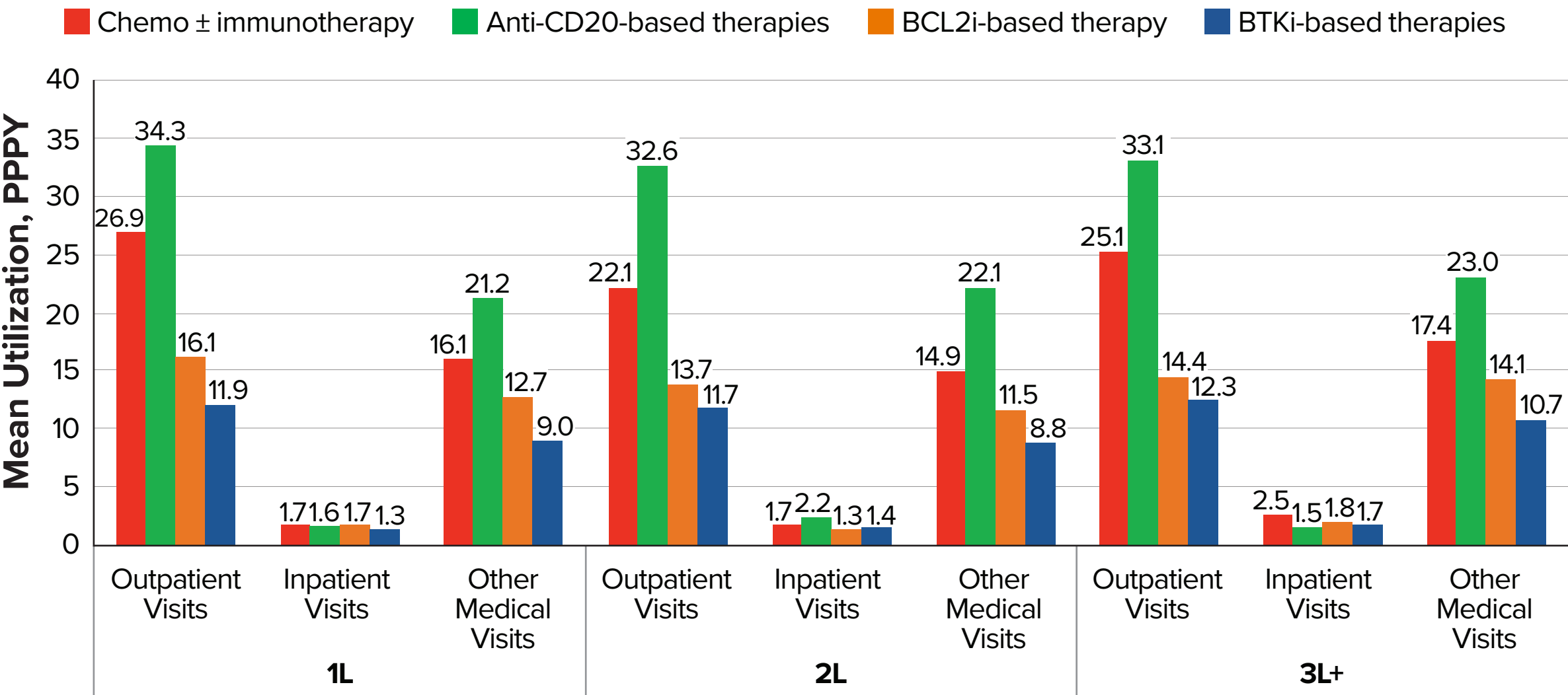
- In the age 65+ and 70+ cohorts, patients treated with BCL2i-based therapy were relatively younger than patients with other treatment regimens, across all lines of therapy
- Healthcare Resource Utilization
- For HCRU, BTKi patients had the lowest mean outpatient (PPPY: 11.3 - 12.3), inpatient (PPPY: 1.1 - 1.7), and other medical visits (PPPY: 8.3 - 10.9) compared with all other treatment regimens in 1L, 2L, and 3L+ settings
- Patients receiving chemo ± immunotherapy and anti-CD20-based regimens had the highest mean outpatient (PPPY: 22.3 - 34.0), inpatient (PPPY: 1.5 - 2.4), and other medical visits (PPPY: 14.3 - 22.3) in 1L, 2L, and 3L+ settings
- These higher HCRU results remain consistent in elderly patients aged 65+ years and 70+ years

Figure 3. Healthcare Resource Utilization – Overall CLL Cohort



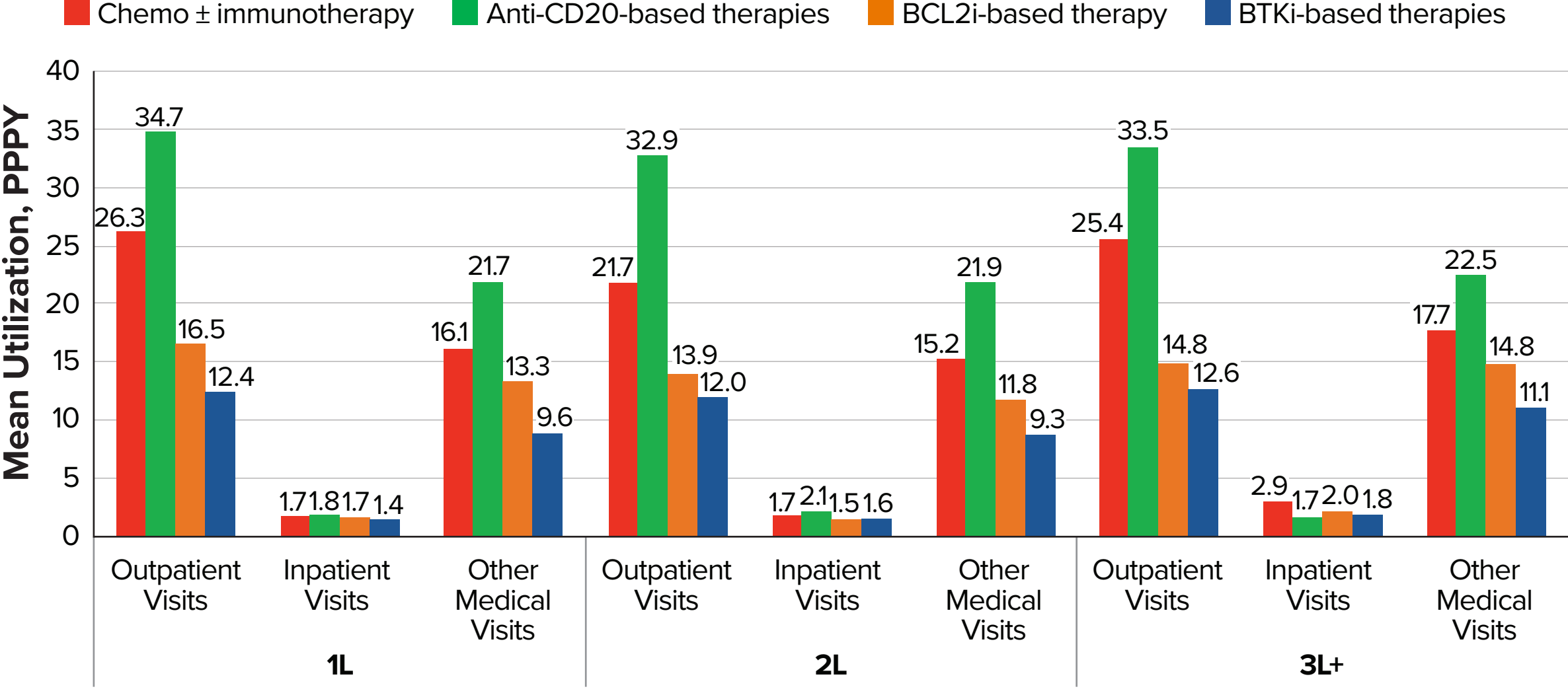
Abbreviations: 1L, first-line; 2L, second-line; 3L+, third-line or later; BCL2i, B-cell lymphoma 2 inhibitor; BTKi, Bruton tyrosine kinase inhibitor; PPPY, per-patient-per-year.

Figure 4. Healthcare Resource Utilization – Elderly Patients 65+ Years



Abbreviations: 1L, first-line; 2L, second-line; 3L+, third-line or later; BCL2i, B-cell lymphoma 2 inhibitor; BTKi, Bruton tyrosine kinase inhibitor; PPPY, per-patient-per-year.

Figure 5. Healthcare Resource Utilization – Elderly Patients 70+ Years



Abbreviations: 1L, first-line; 2L, second-line; 3L+, third-line or later; BCL2i, B-cell lymphoma 2 inhibitor; BTKi, Bruton tyrosine kinase inhibitor; PPPY, per-patient-per-year.

DISCUSSION

- Current findings suggest that BTKis were the most commonly used regimen for CLL in the 1L, 2L, and 3L+ settings, in the overall cohort, and in the elderly
- Patients treated with BTKis incurred lower HCRU compared with other treatment regimens
- While this study included a diverse cross-section of patients diagnosed with CLL in the US, study limitations were inherent to the use of open claims databases in an observational study design

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