Epidemiology R&D Day

September 2023

Bristol Myers Squibb™

Solid Tumor Oncology

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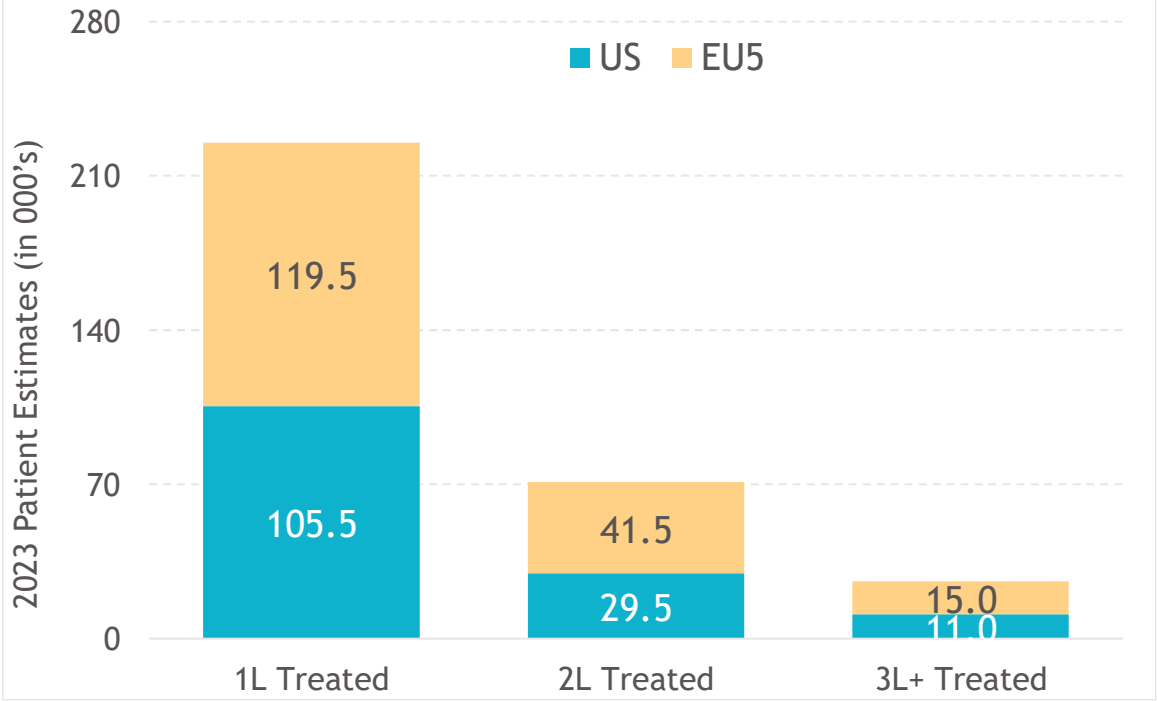
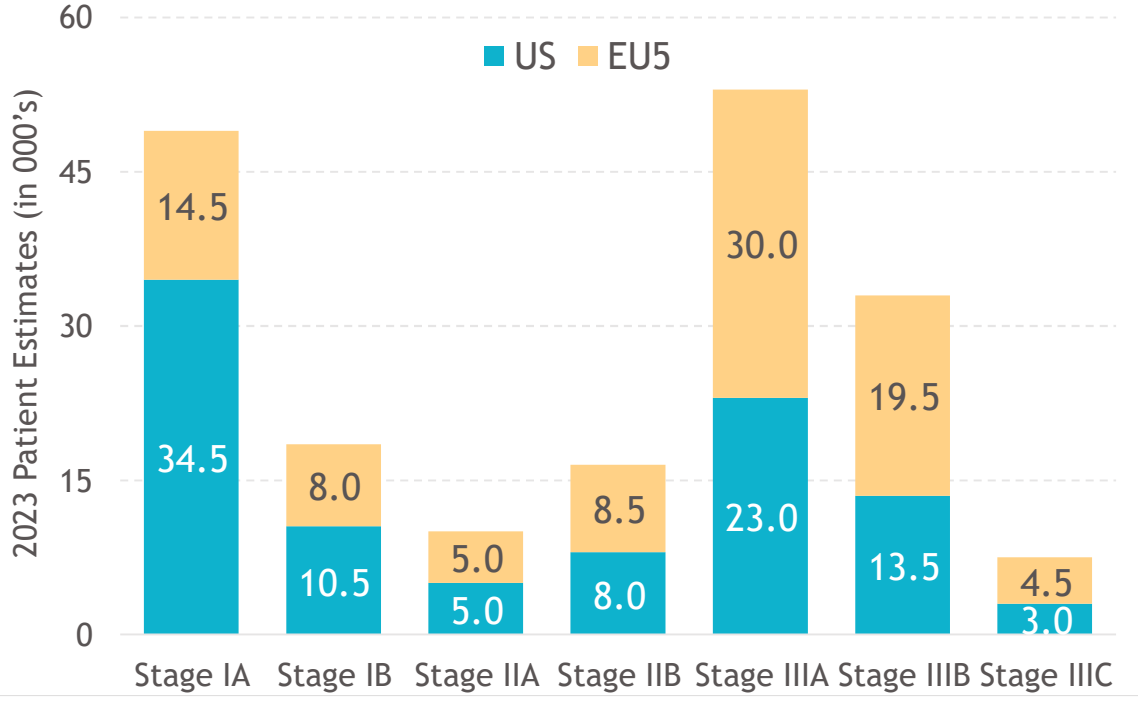
NSCLC

Metastatic (inc. EGFR/ALK)



- **EGFR/ALK: 15-20%**

Early-Stage Disease* (Treatable population)



Treatment rates:

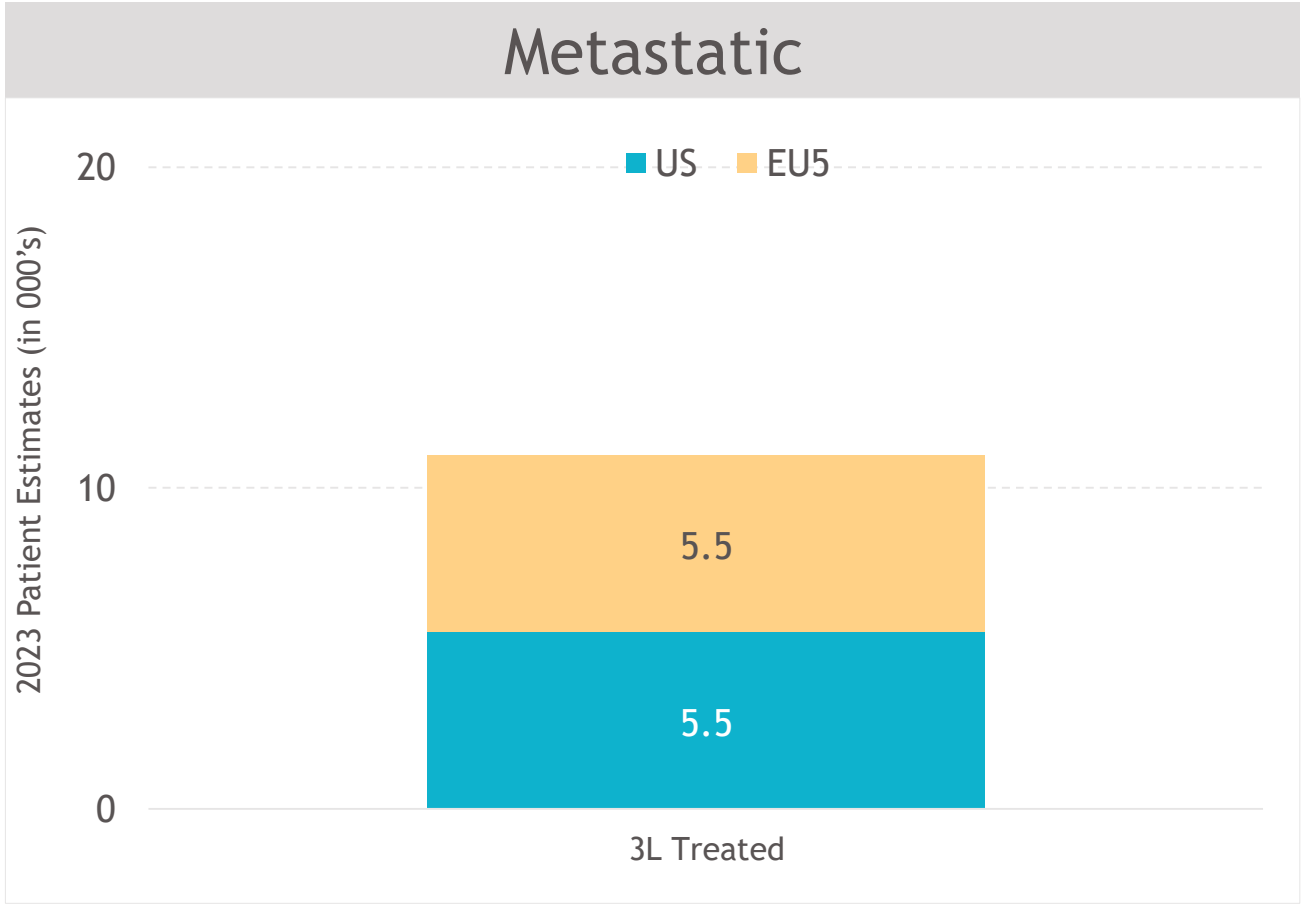
- Stage IB-II : 35% - 45%
- Stage III : 55% - 60%

Resection rates

- Stage I-II resected: ~60%
- Stage IIIA resected: ~40%
- Stage IIIB resected: ~15%
- Stage IIIC resected: ~ 2%

*Figures only contain incident patients and do not include patients who recur
Source: Decision Resources Group; BMS Internal Analysis

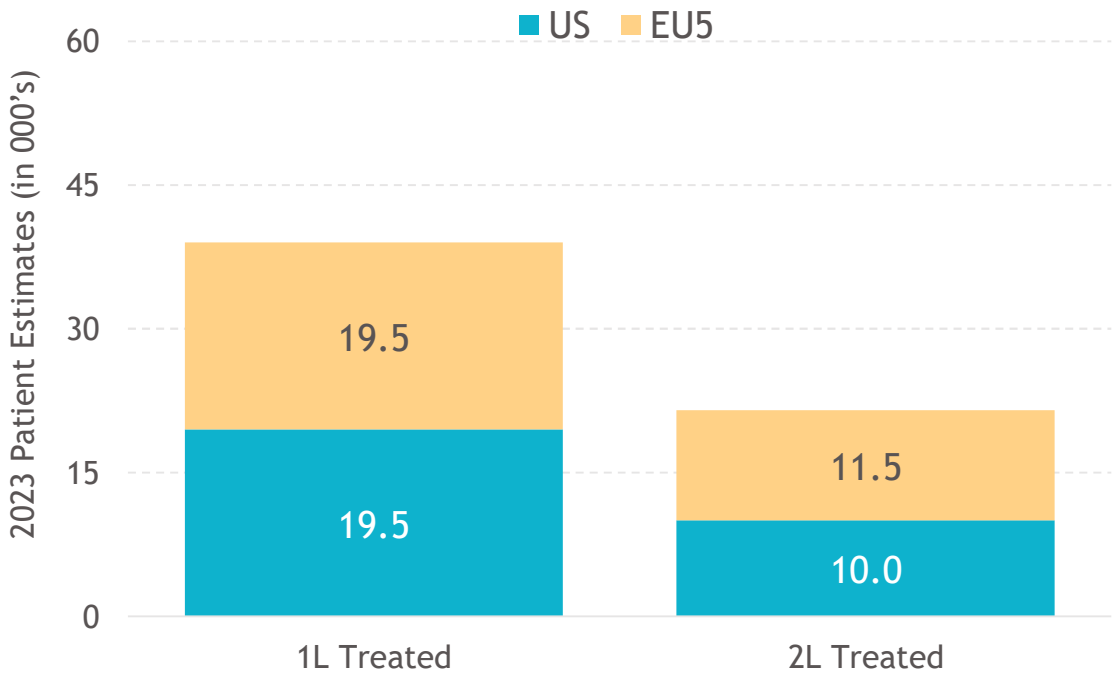
SCLC



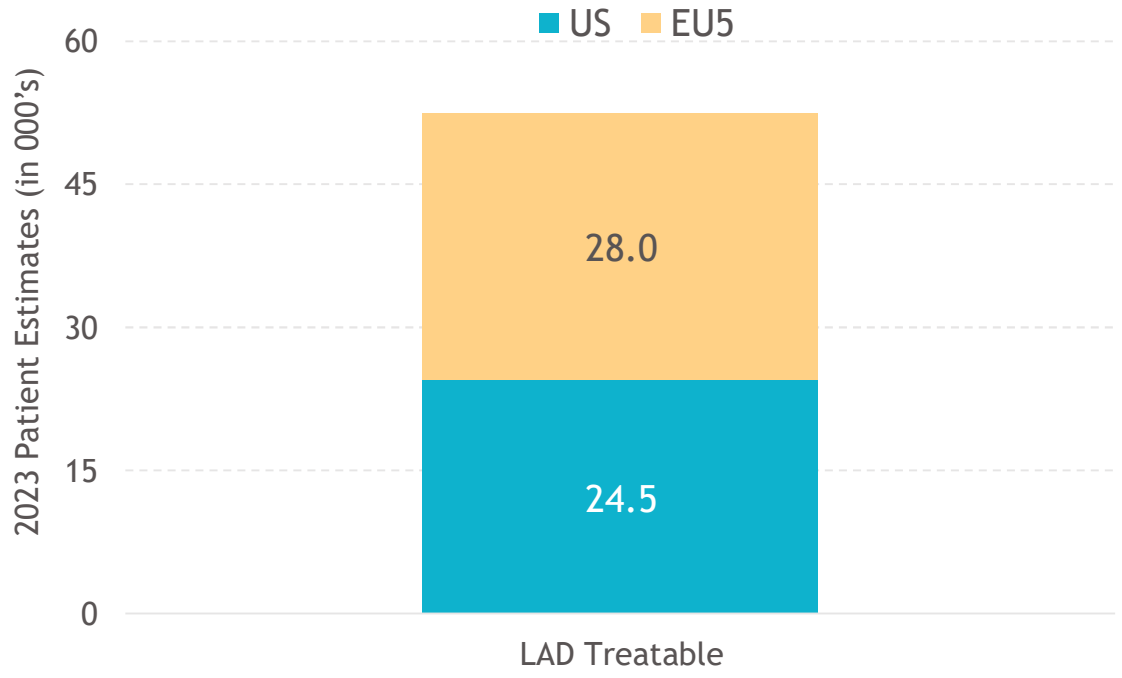
Source: Decision Resources Group

SCCHN

Metastatic



Early-Stage Disease

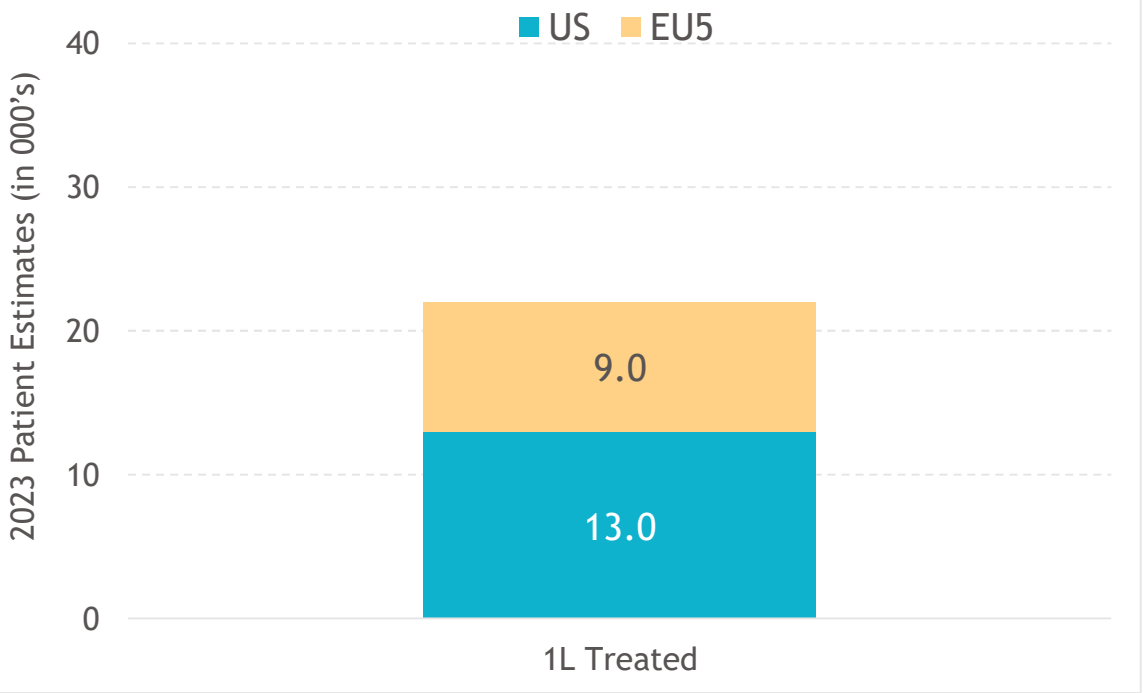


- **LAD txt rate: 60% - 85%**

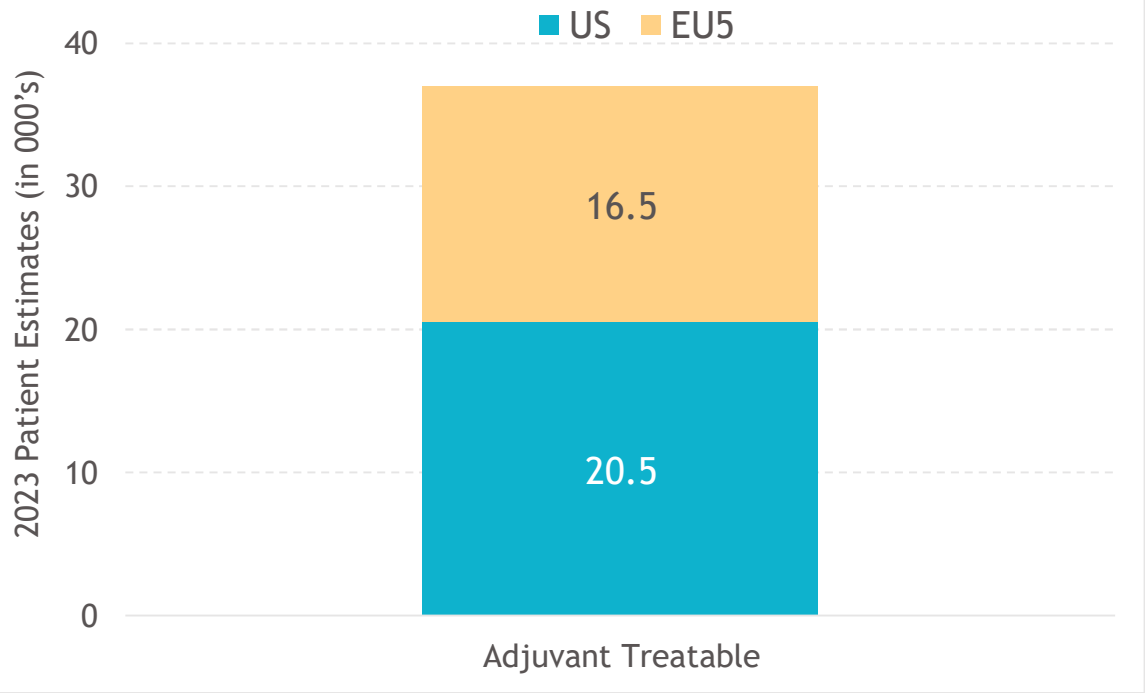
Source: Decision Resources Group

Melanoma

Metastatic



Early-Stage Disease

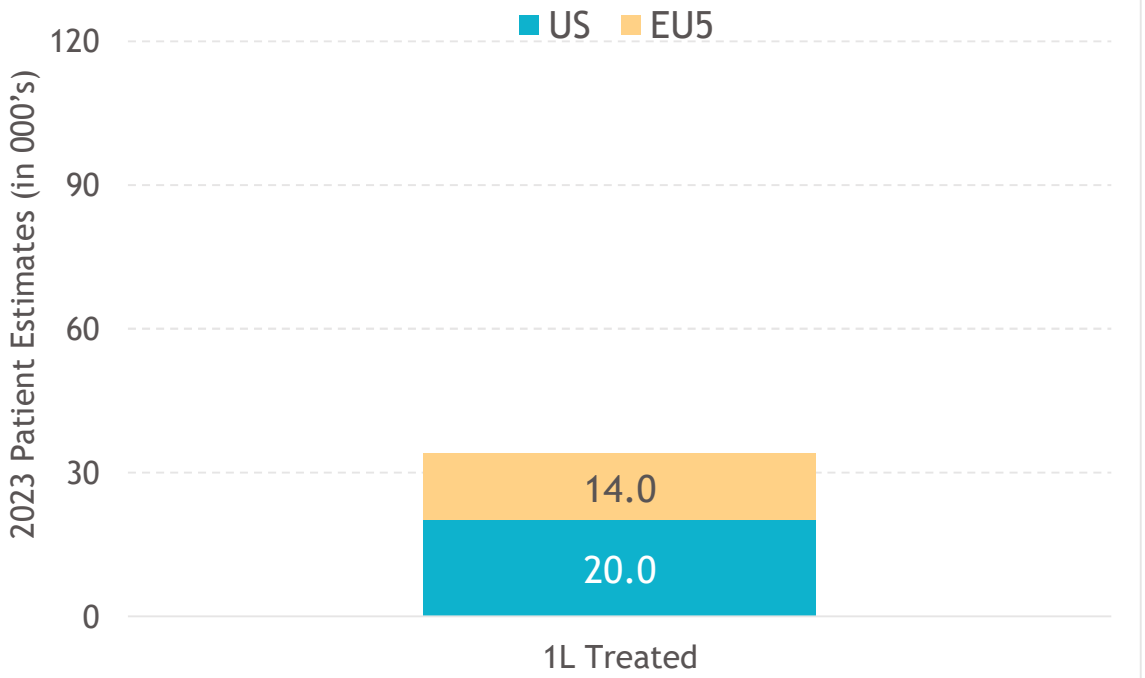


Early-stage txt rate: 60 – 80%

Source: Decision Resources Group; BMS Internal Analysis

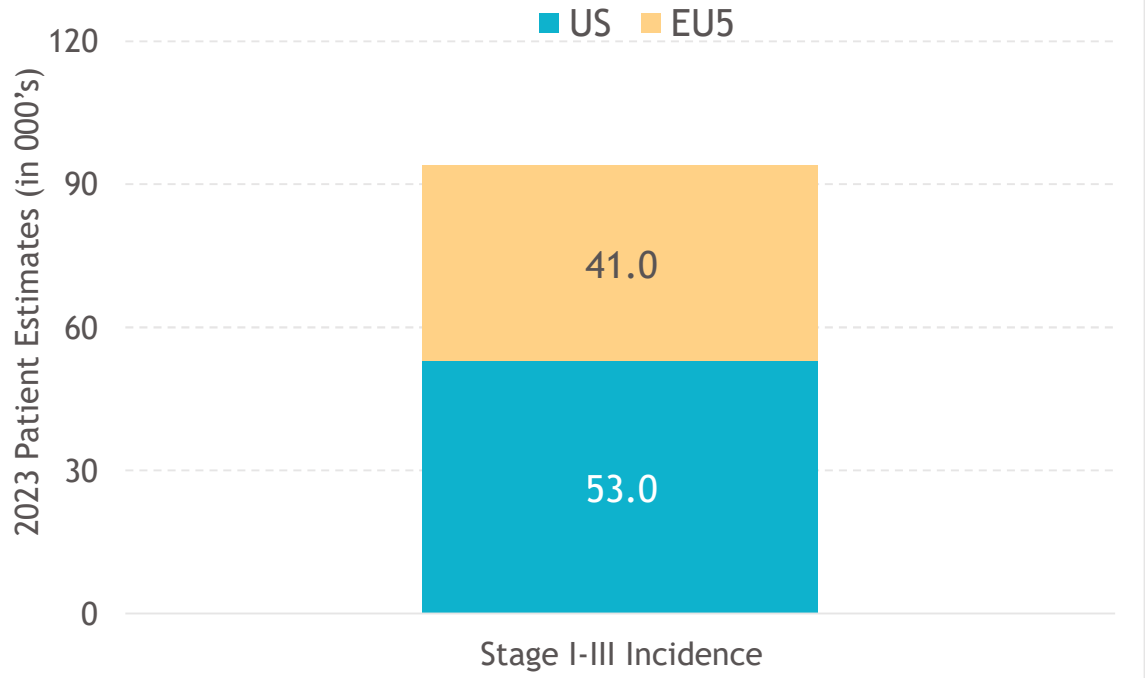
RCC

Metastatic



- **Break out by IMDC risk category (metastatic):**
  - Intermediate/Poor Risk: 75%
  - Favorable: 25%

Early-Stage Disease

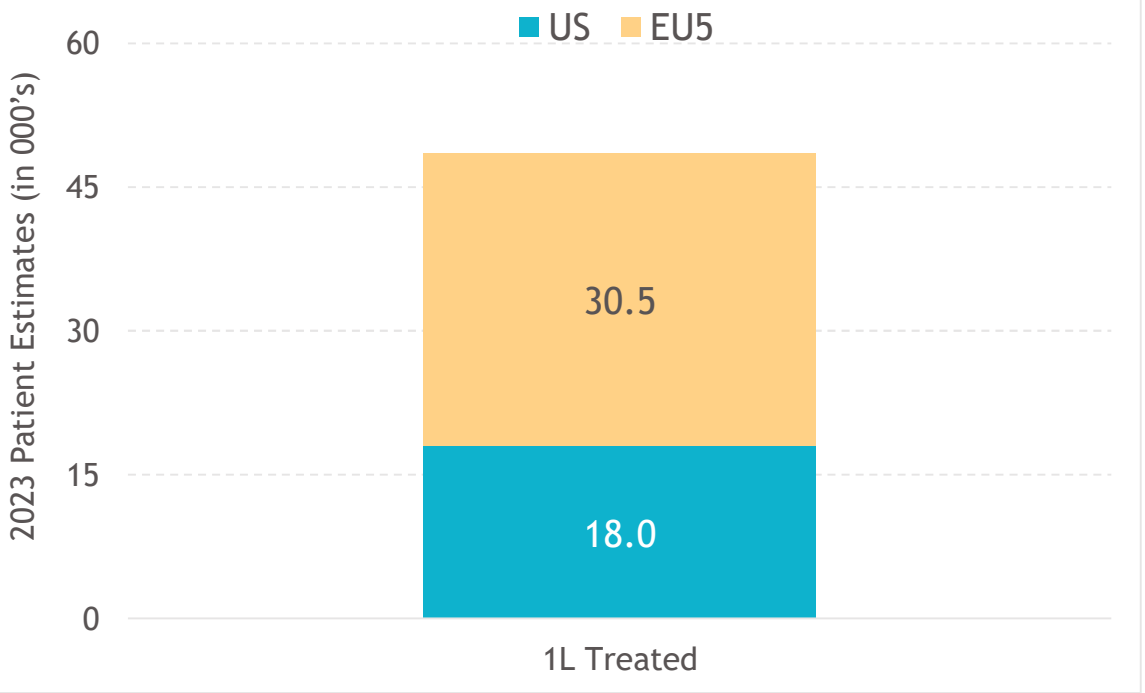


- **Early-stage txt rate: 10-15%**
- **Break out by IMDC risk category (early stage):**
  - Intermediate Risk: 25%
  - High Risk: 20%

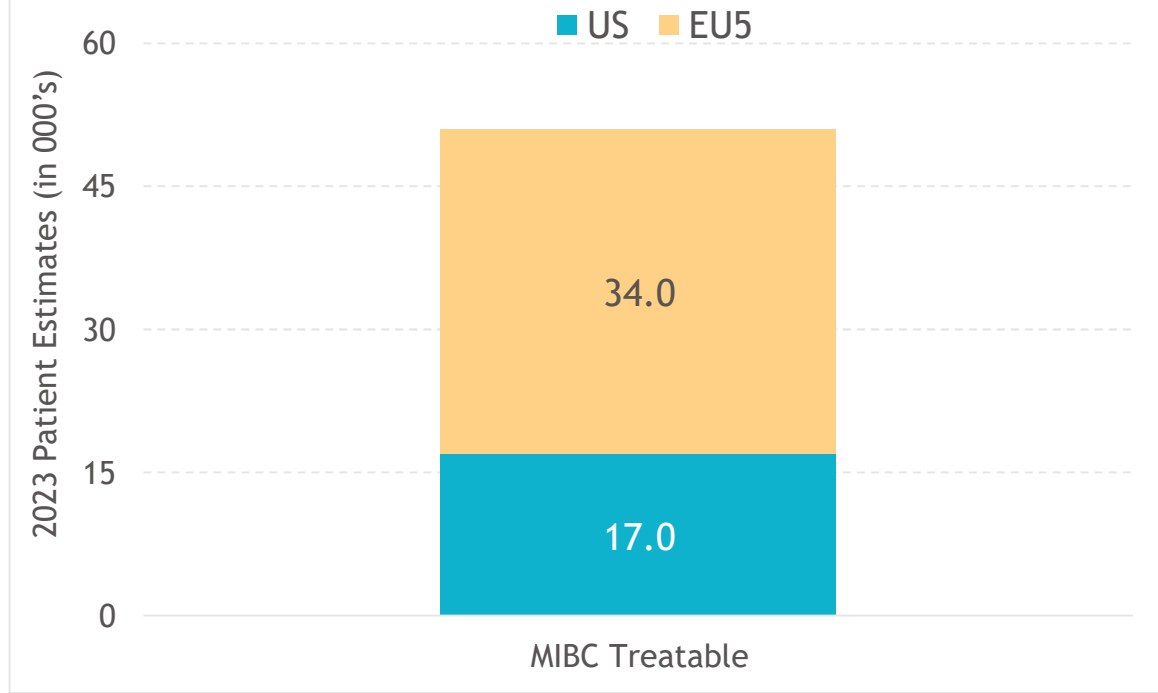
Source: Decision Resources Group; BMS Internal Analysis

Bladder

Metastatic



Early-Stage Disease

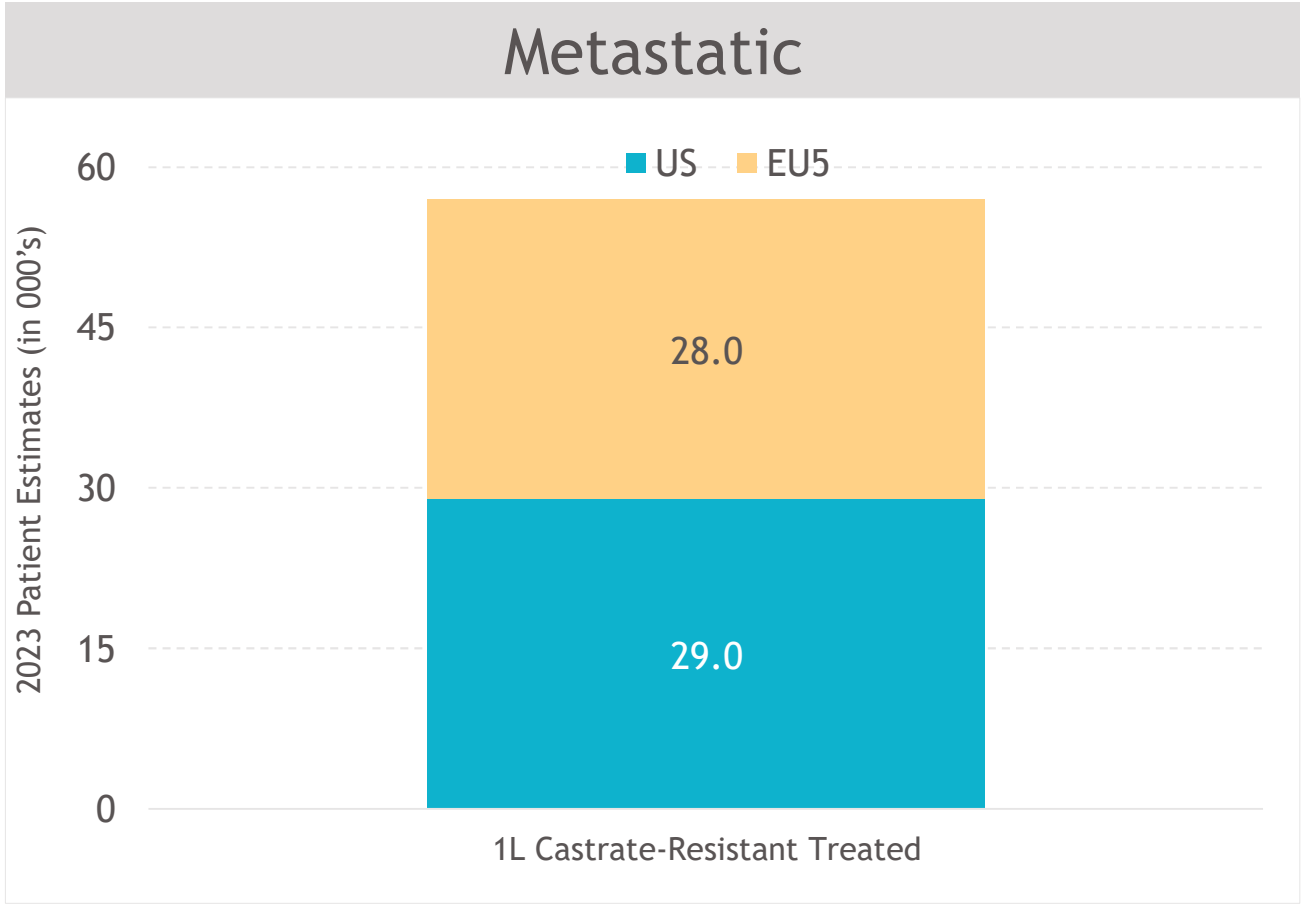


Cystectomy rates in MIBC are ~50%

Early-stage treatment rates
MIBC txt rate: 70% - 85%

Source: Decision Resources Group; BMS Internal Analysis

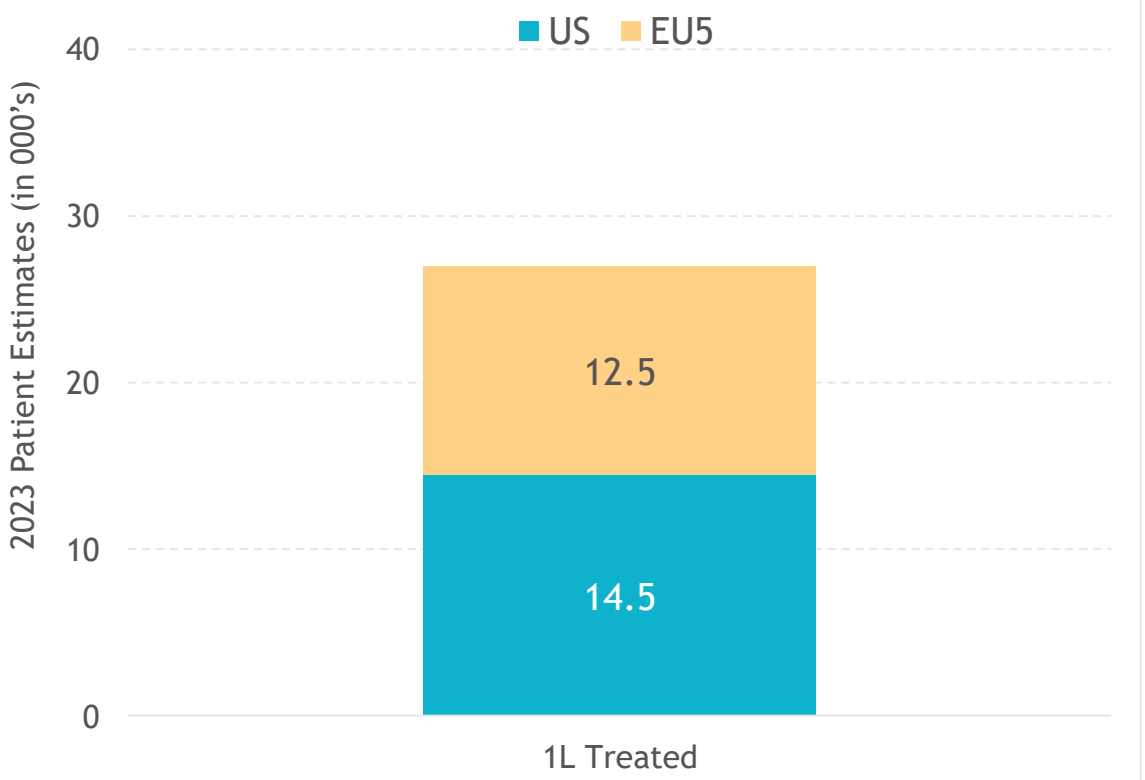
Prostate



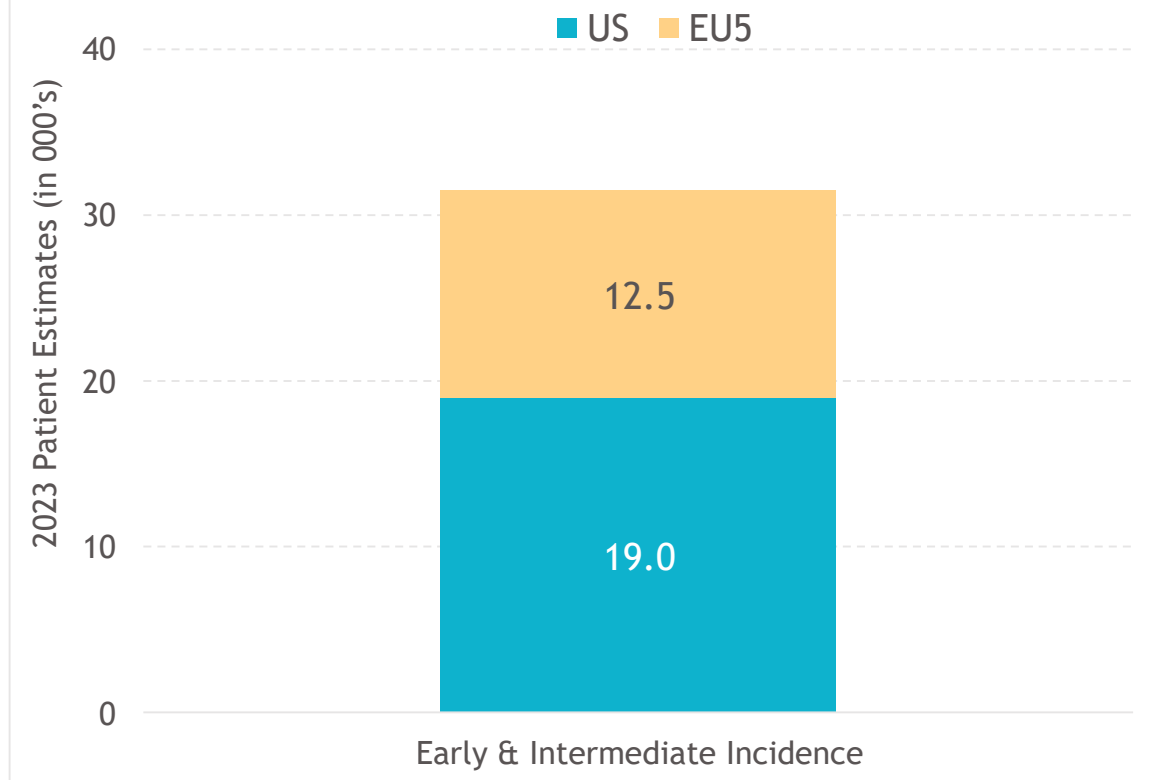
Source: Decision Resources Group; BMS Internal Analysis

HCC

Metastatic



Early-Stage Disease



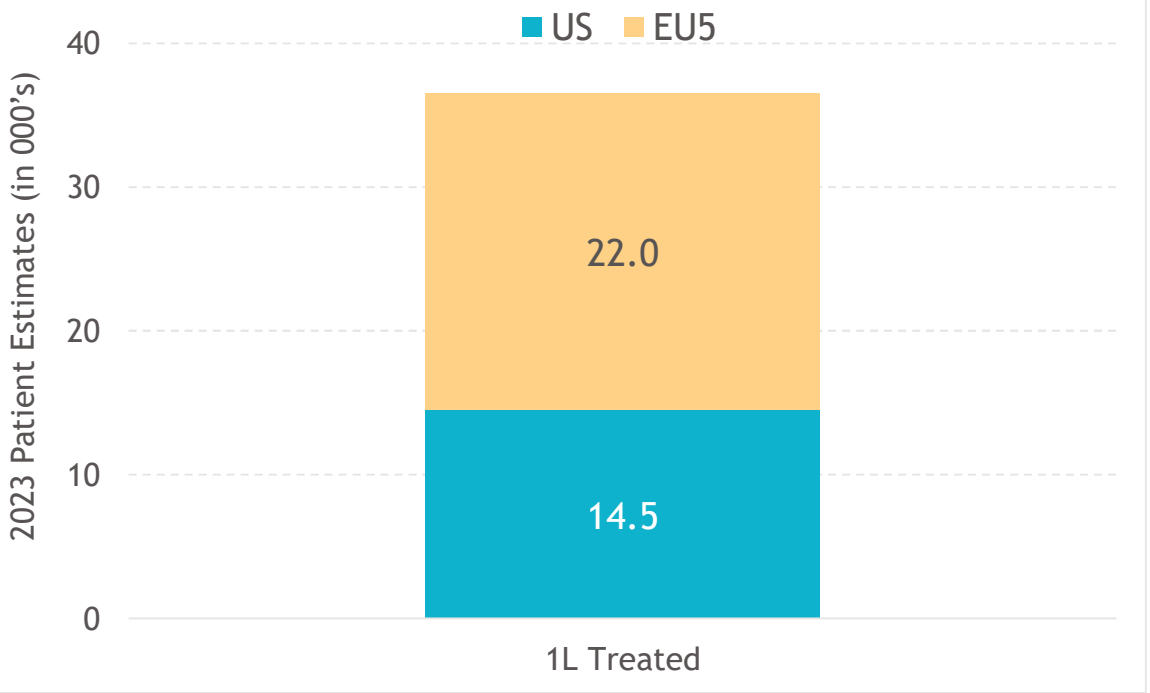
High Risk ablated or resected: 10 – 40% of Early & Intermediate

Txt rate: 30 - 60%

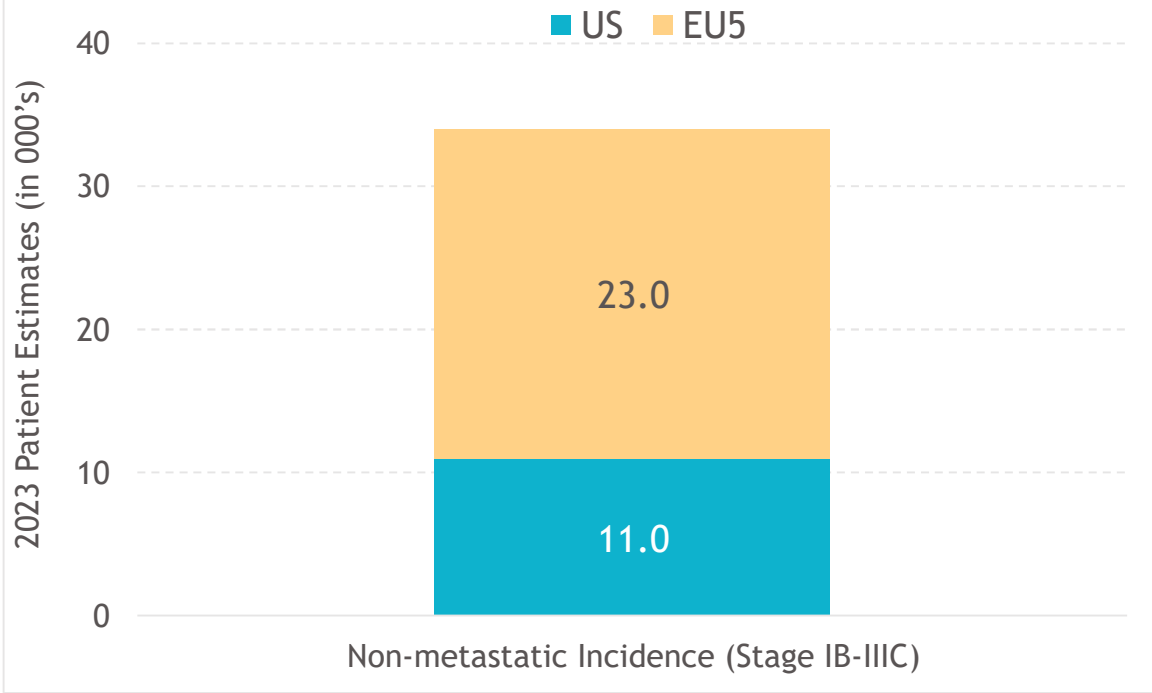
Source: Decision Resources Group; BMS Internal Analysis

Gastric*

Metastatic



Early-Stage Disease



Cardia incident: 12% - 32% (avg. 25%)

Stage II and III GEJC: ~20-24%

Treatment rates

Localized & resectable locally advanced txt rate: 60% - 80%

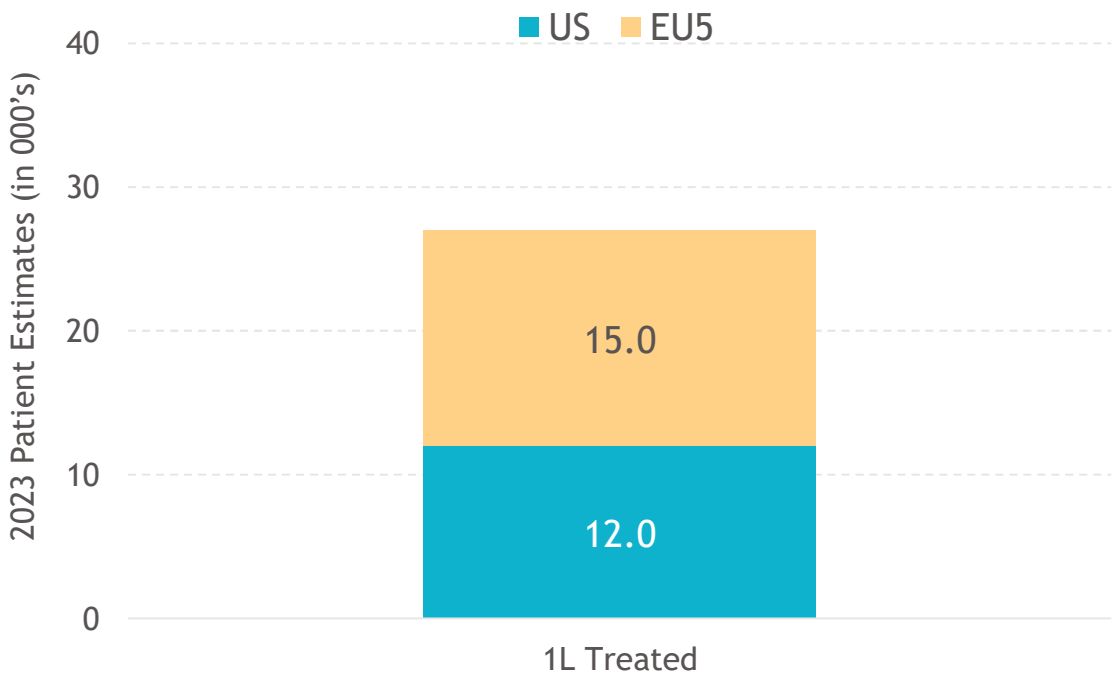
Unresectable locally advanced txt rate: 60% - 80%

*Data represents adenocarcinoma only and includes GEJC

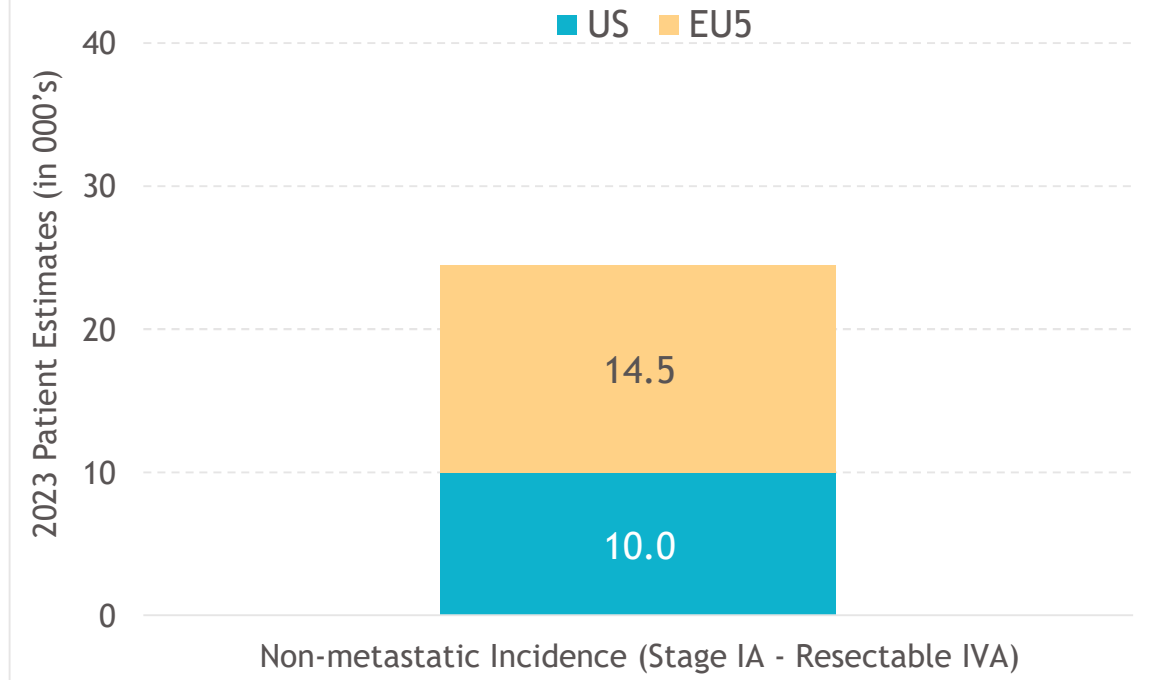
Source: Decision Resources Group

Esophageal*

Metastatic



Early-Stage Disease



Eso stage II, stage III and stage IVA Resectable patients: ~80%-90%

Treatment Rates:

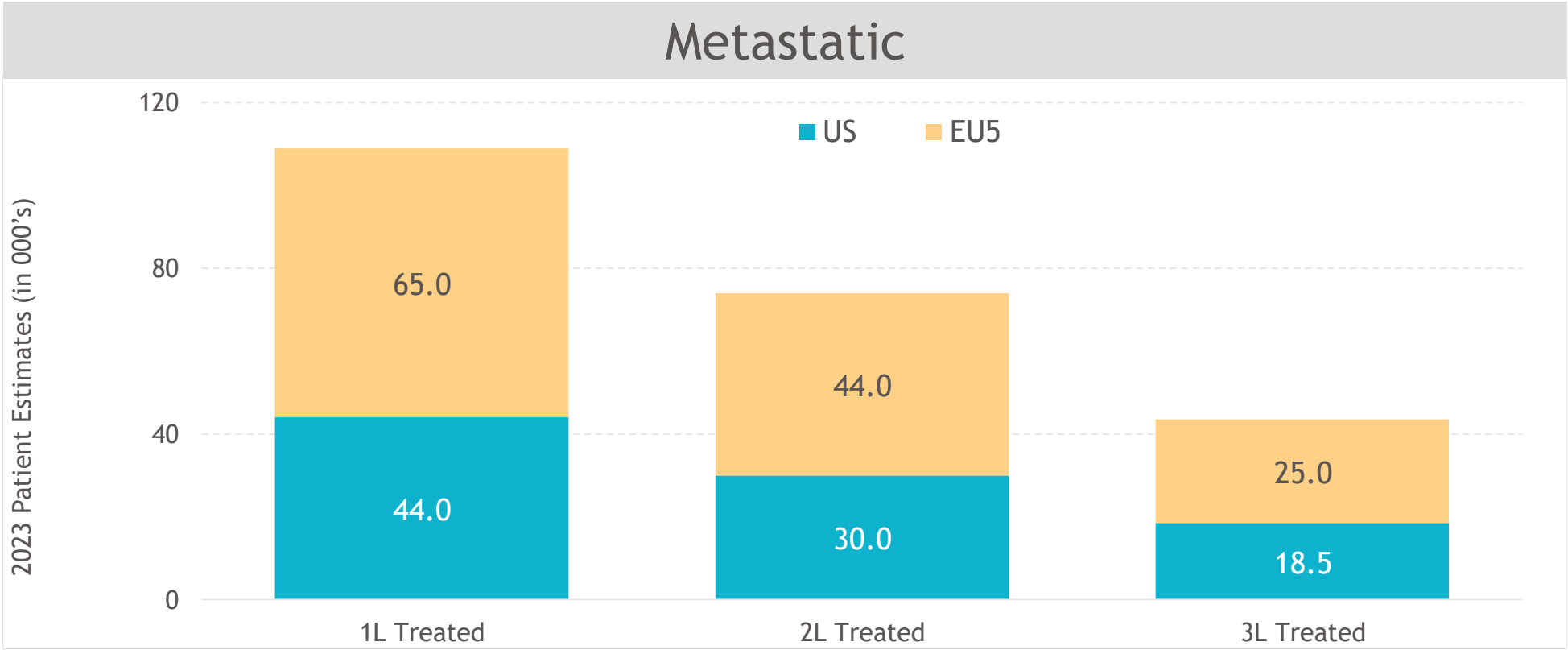
Localized & resectable locally advanced txt rate: 60% - 75%

Unresectable locally advanced txt rate: 65% - 75%

*Data represents adenocarcinoma and squamous only

Source: Decision Resources Group

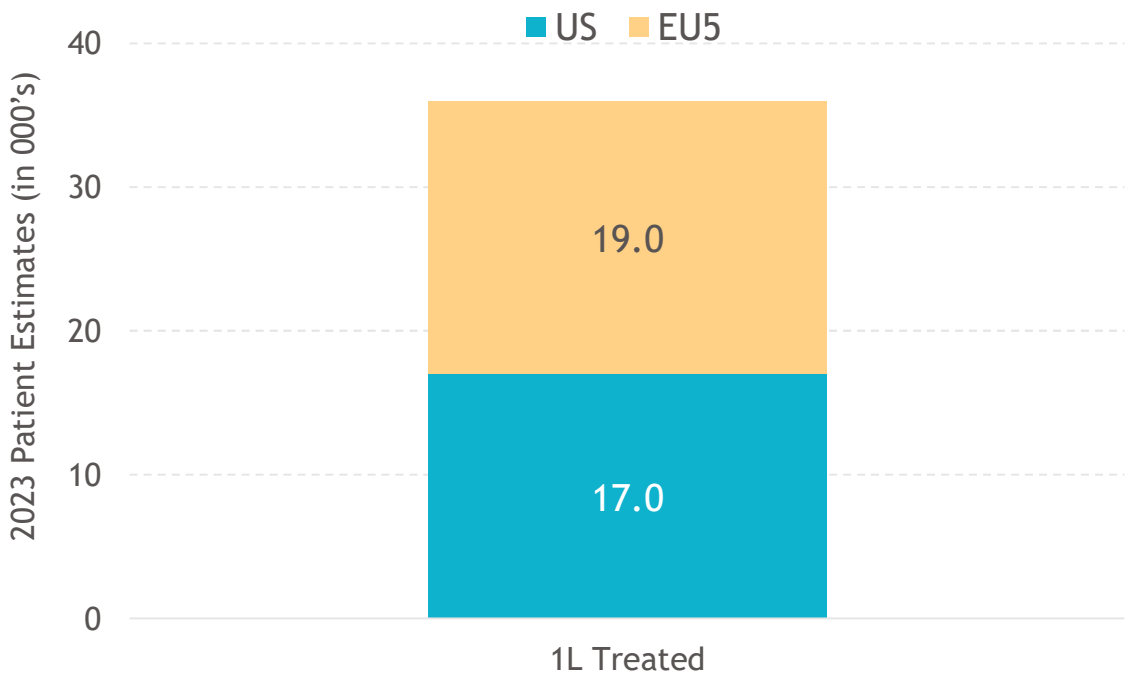
CRC



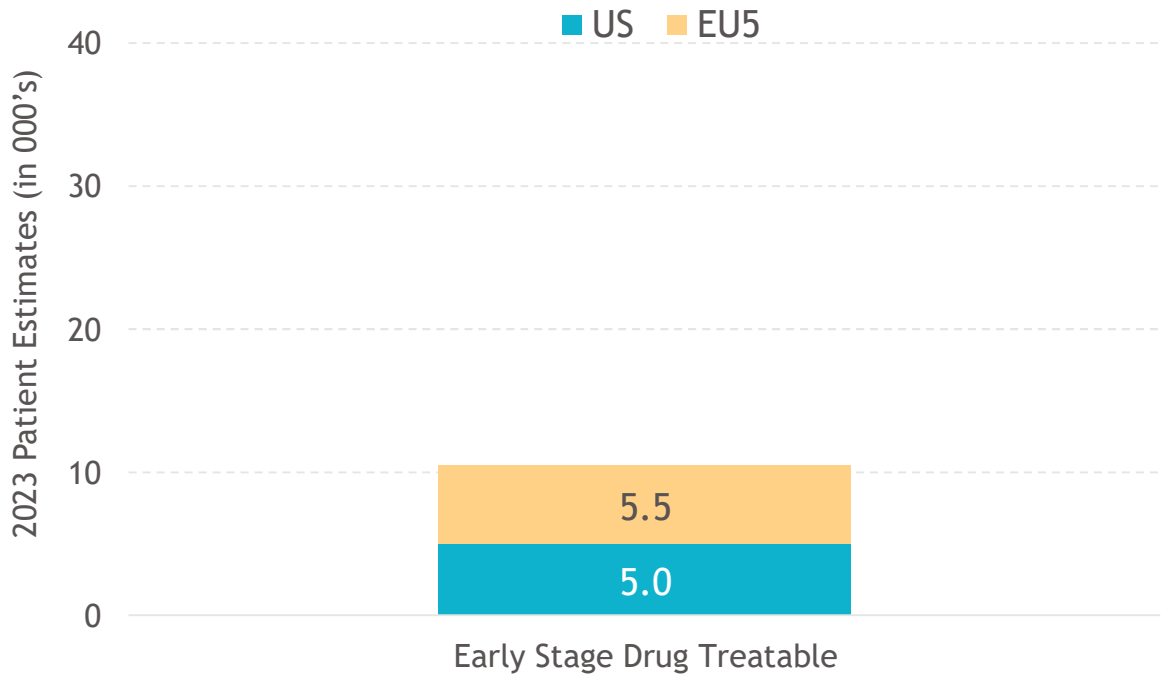
Source: Decision Resources Group

Ovarian Cancer

Metastatic



Early-Stage Disease



Source: Decision Resources Group

Hematology

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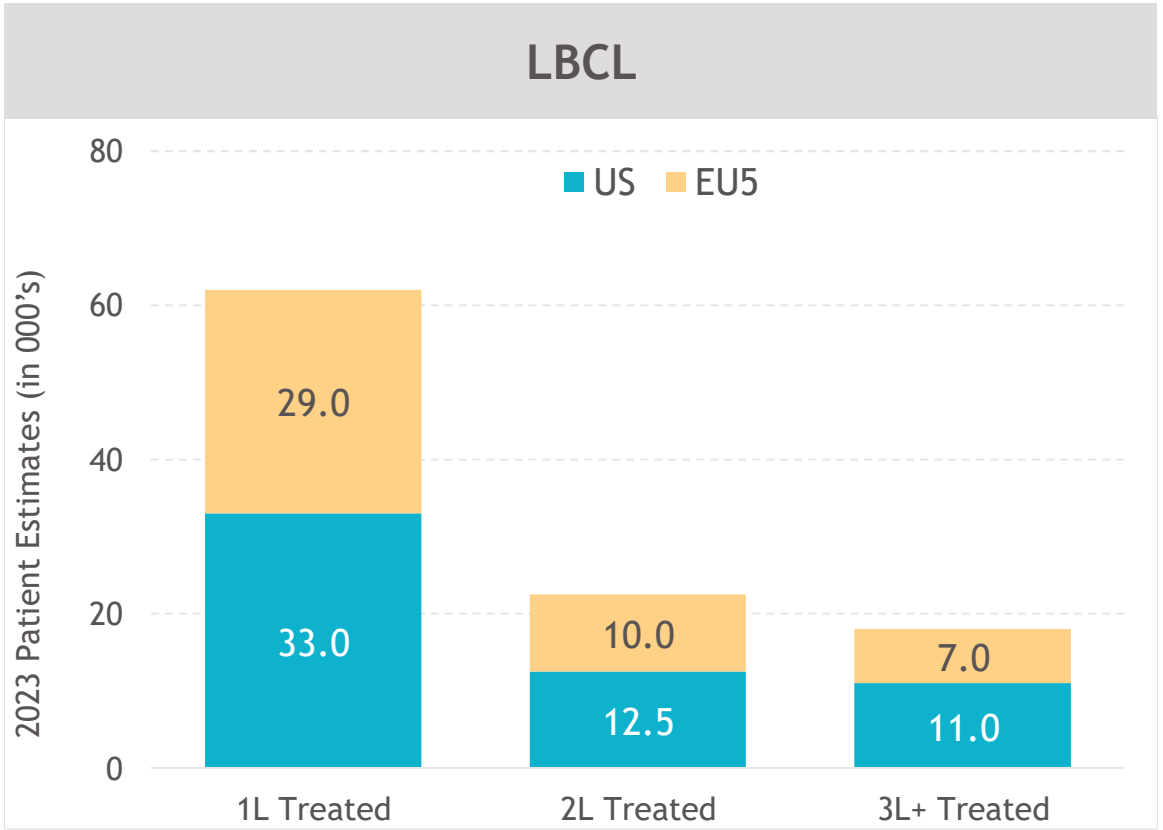
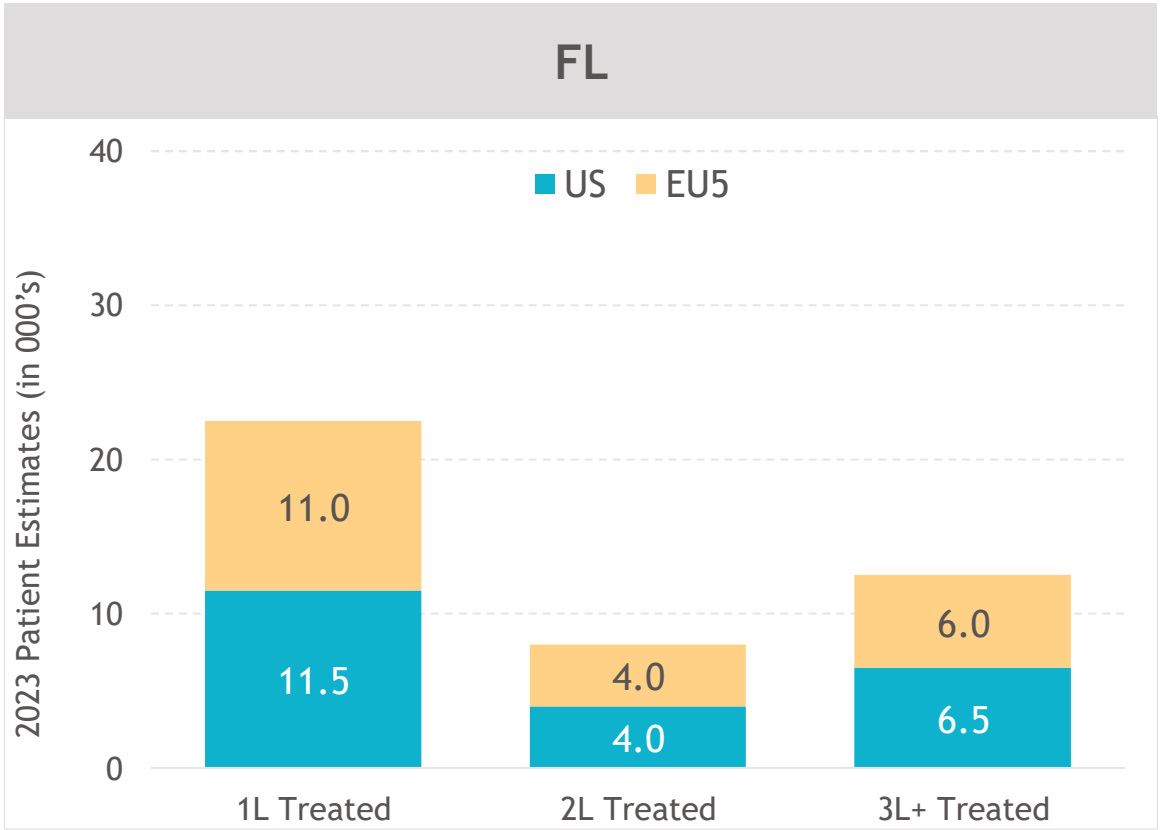
Large B-Cell Lymphoma (LBCL)



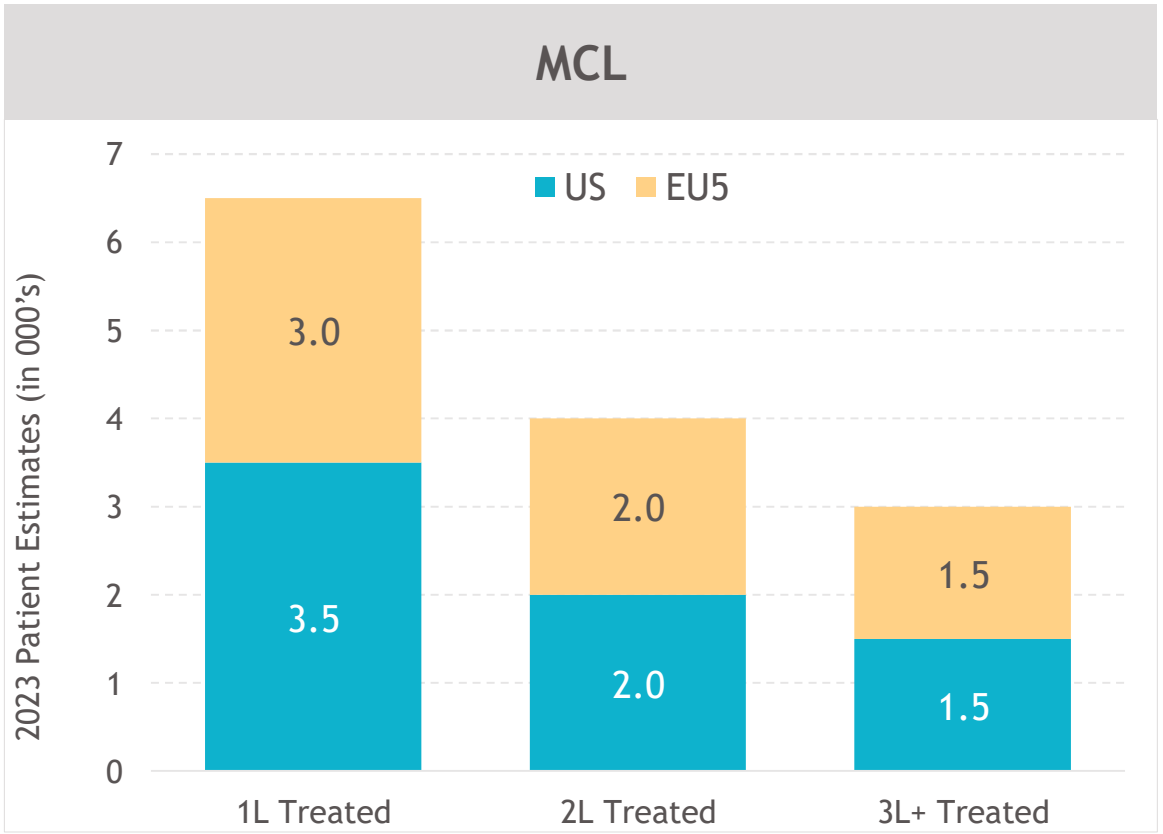
Source: Decision Resources Group; BMS Internal Analysis

Follicular Lymphoma (FL)



Source: Decision Resources Group; BMS Internal Analysis

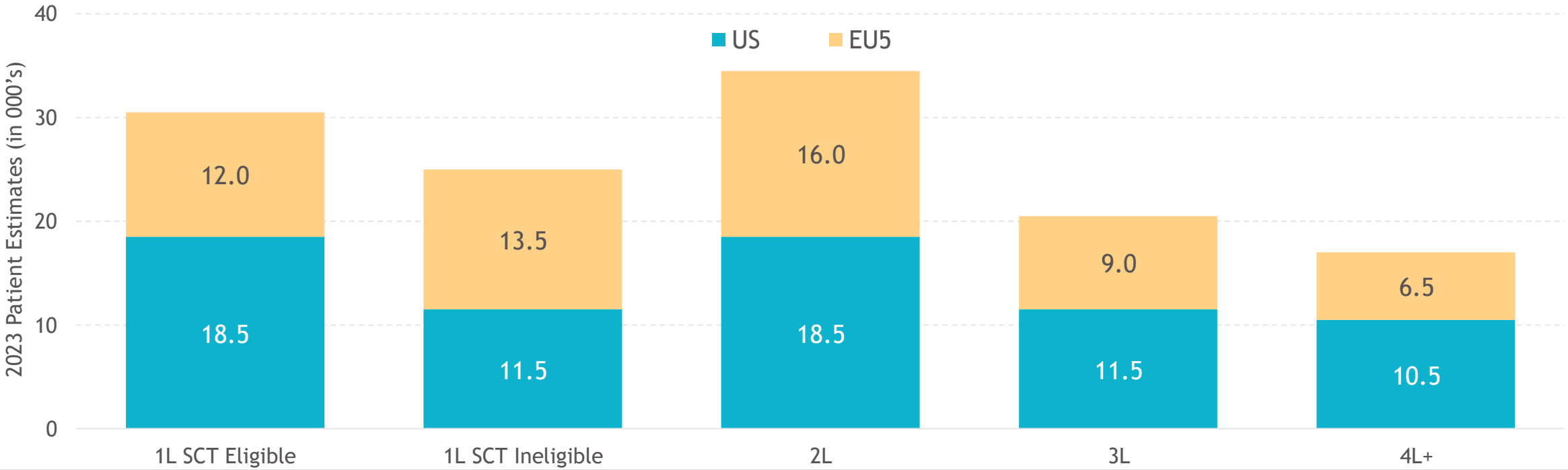
Mantle Cell Lymphoma (MCL)



Source: Decision Resources Group

Multiple Myeloma

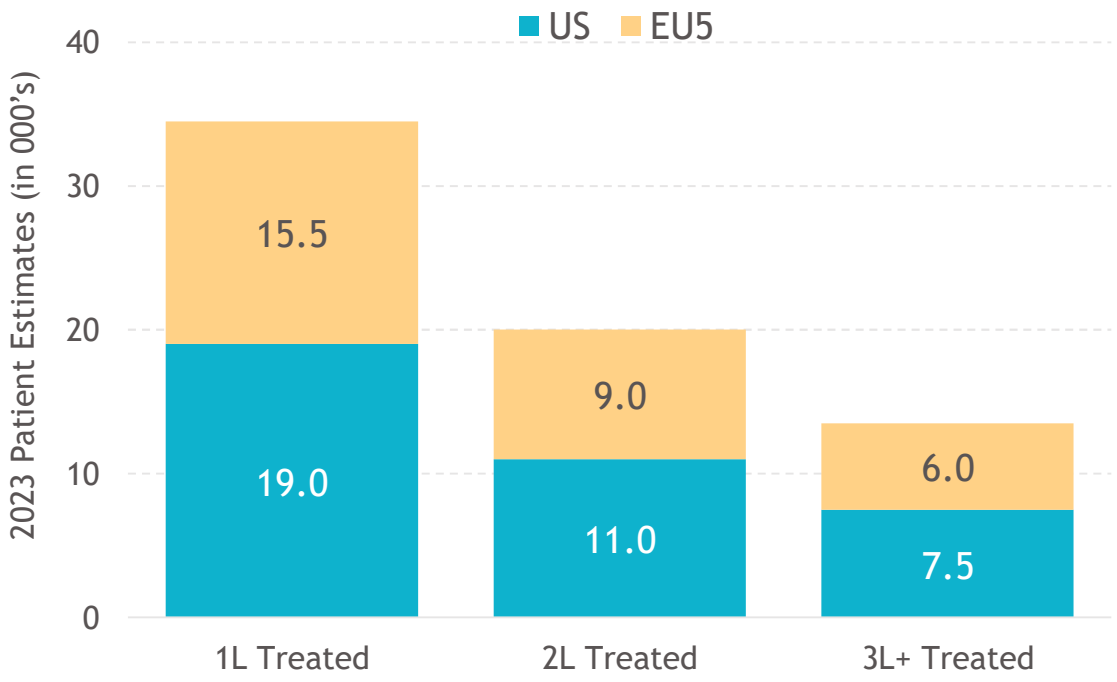
Treated Population



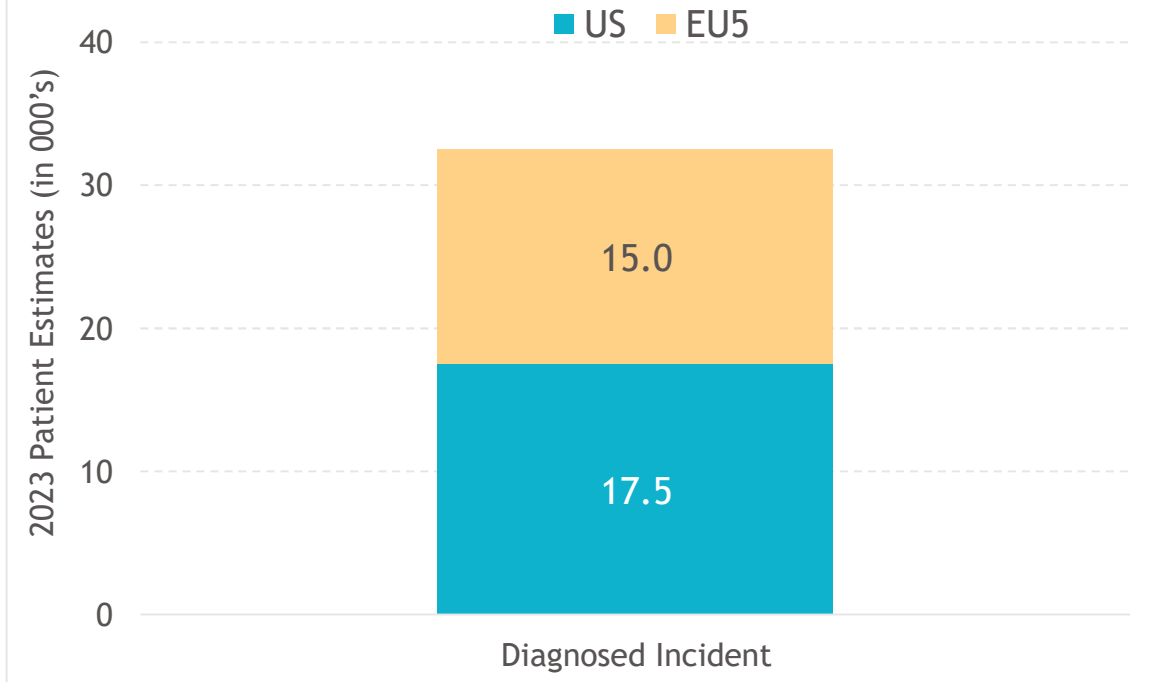
Source: Decision Resources Group; BMS Internal Analysis

Leukemia

CLL+SLL



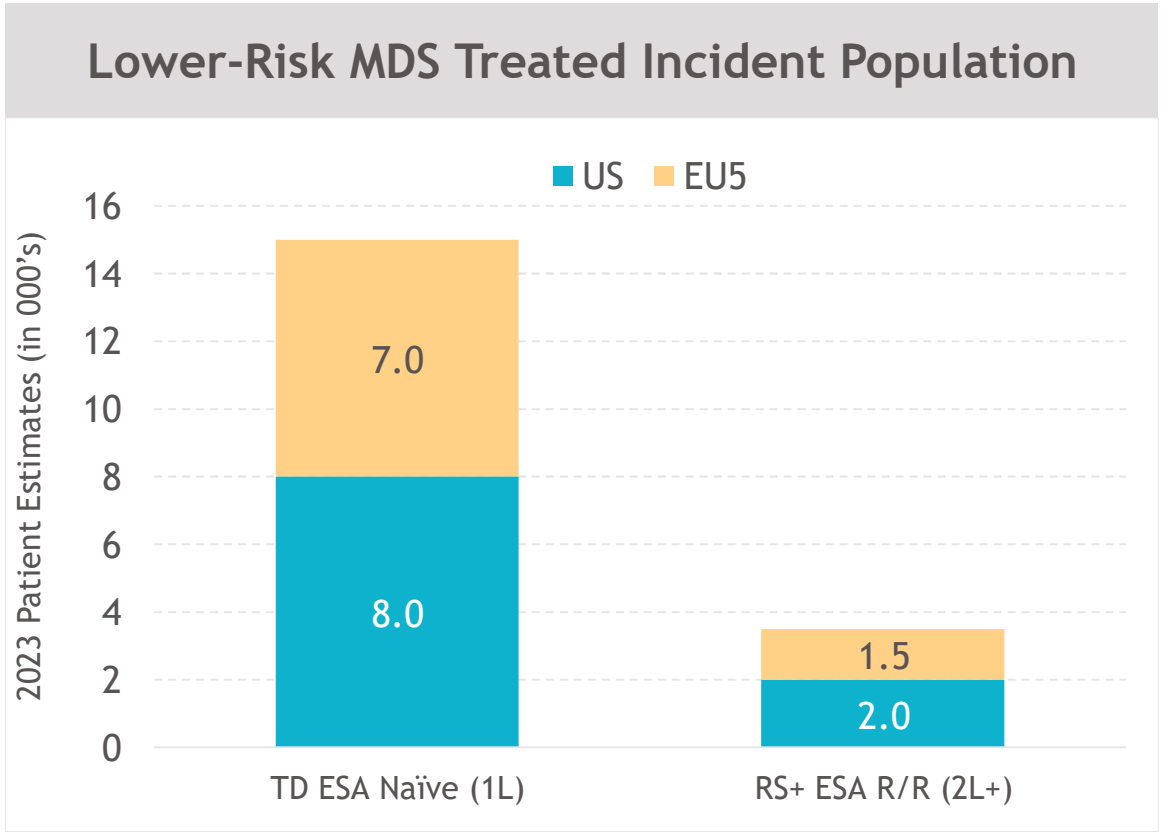
AML (excluding APL*)



Source: Decision Resources Group; BMS Internal Analysis

*APL = acute promyelocytic leukemia

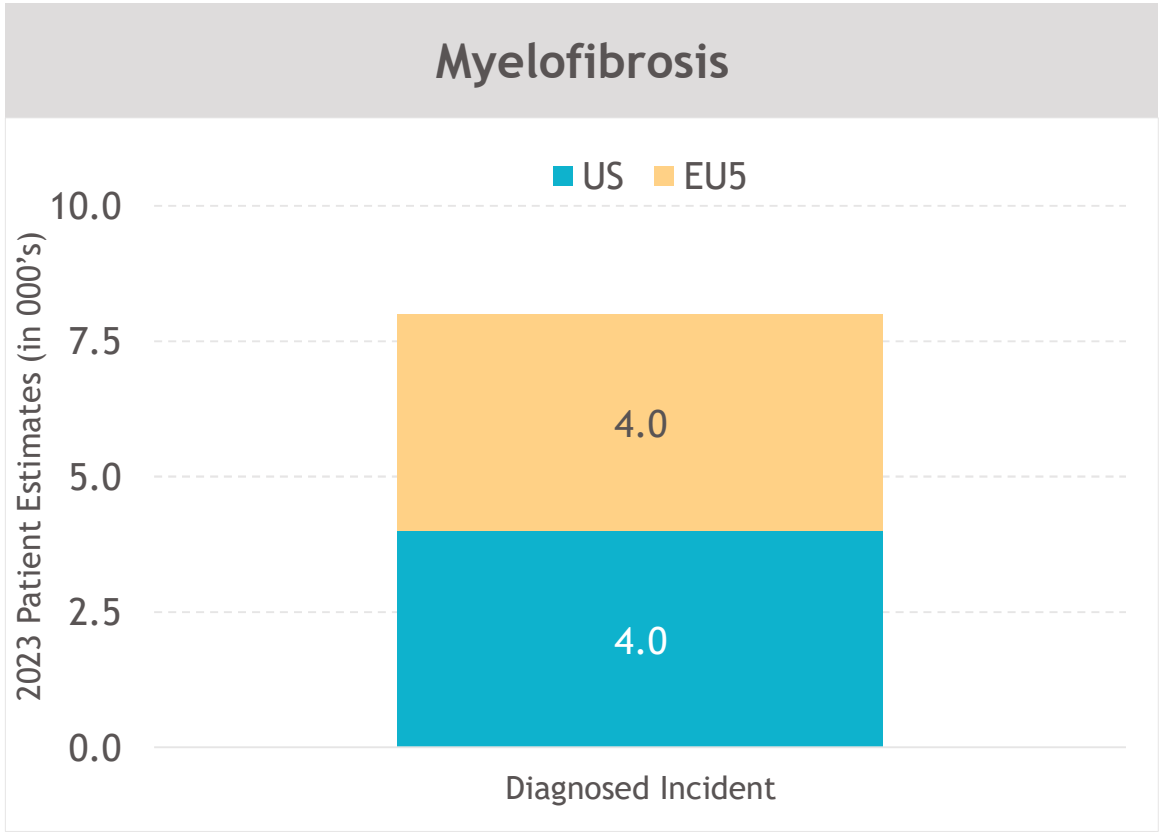
MDS



- TD = % of patients that may require regular transfusions
- ~25% of lower-risk patients are RS Positive

Source: Decision Resources Group; BMS Internal Analysis

Myelofibrosis



Source: Decision Resources Group; BMS Internal Analysis

Cardiovascular

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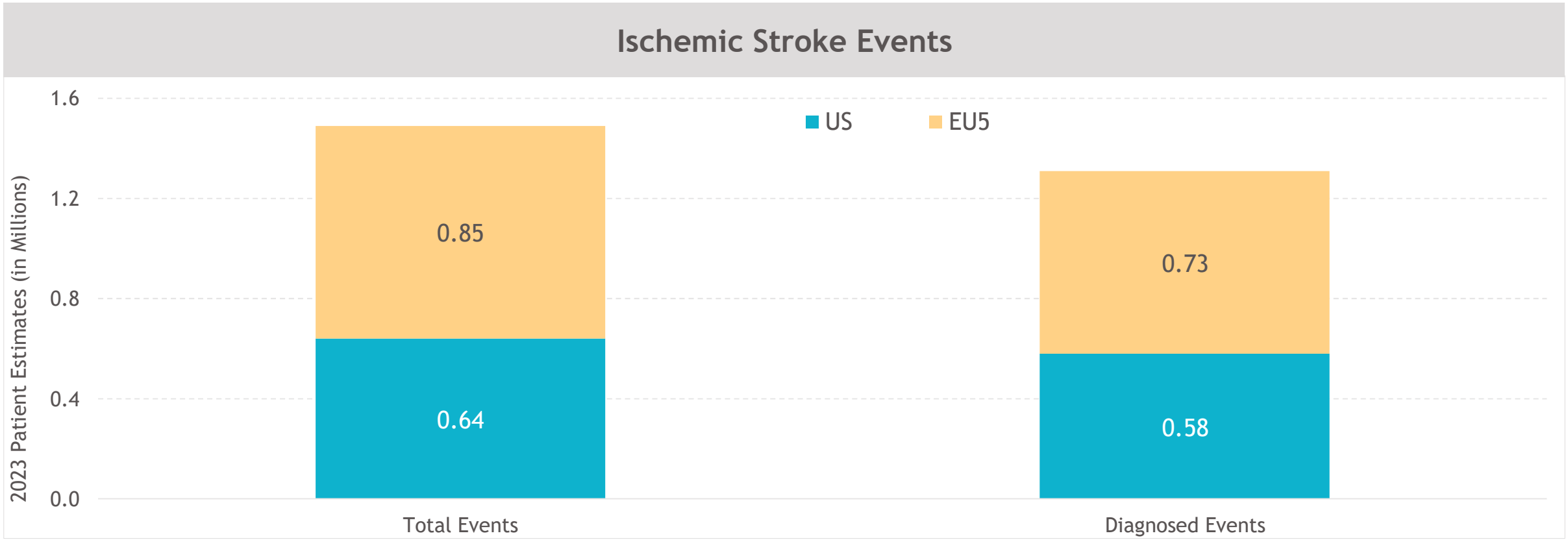
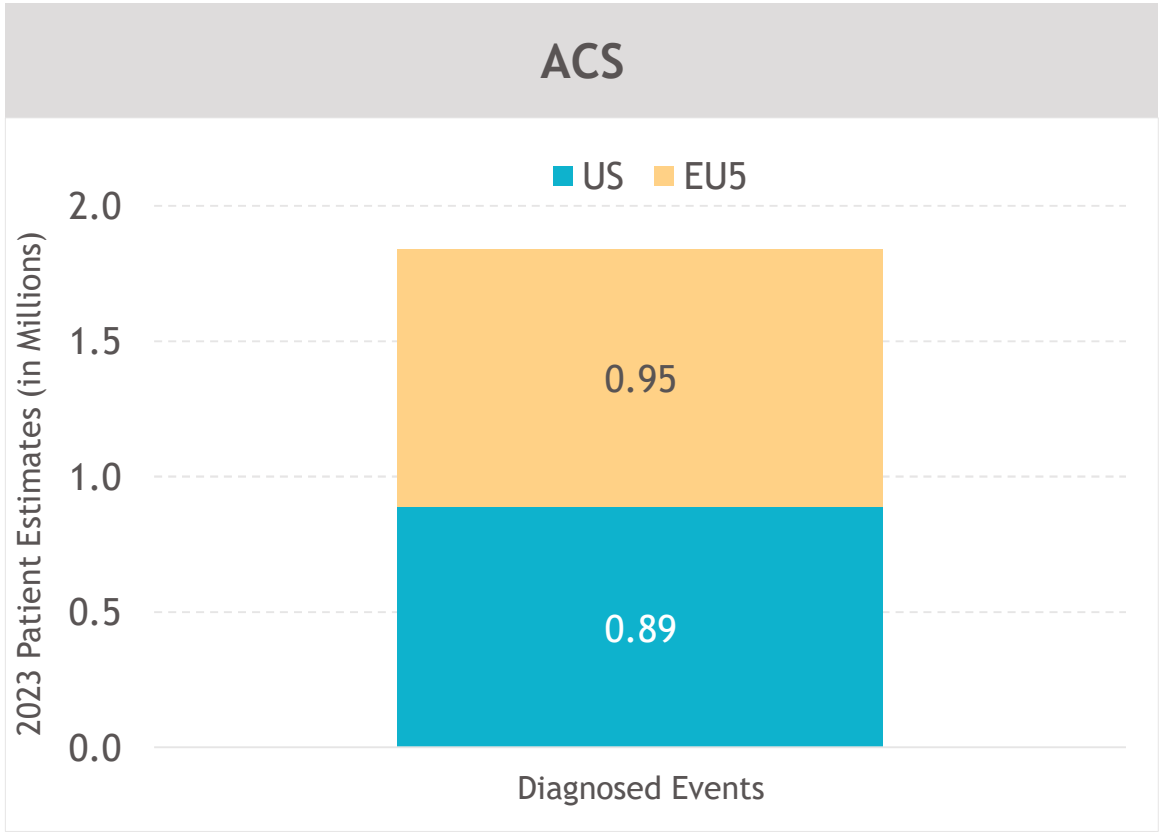
Secondary Stroke Prevention



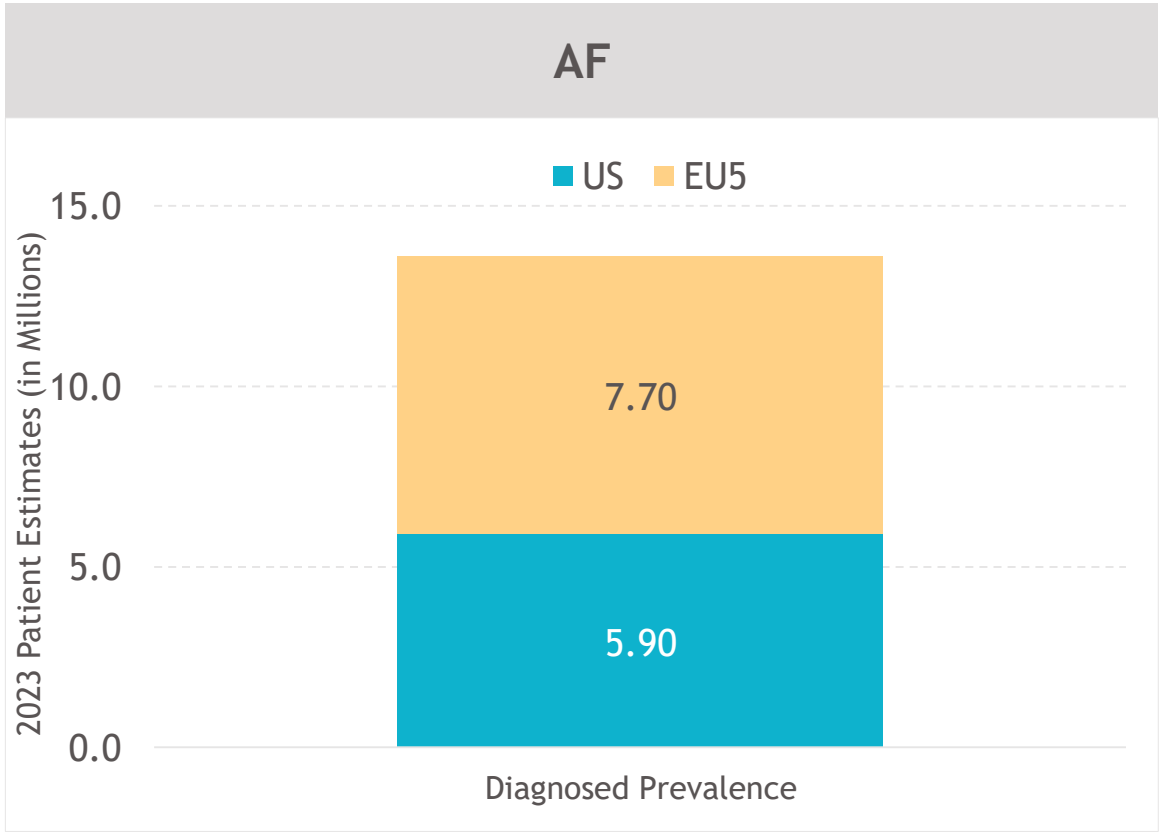
Source: Decision Resources Group; BMS Internal Analysis

Acute Coronary Syndrome



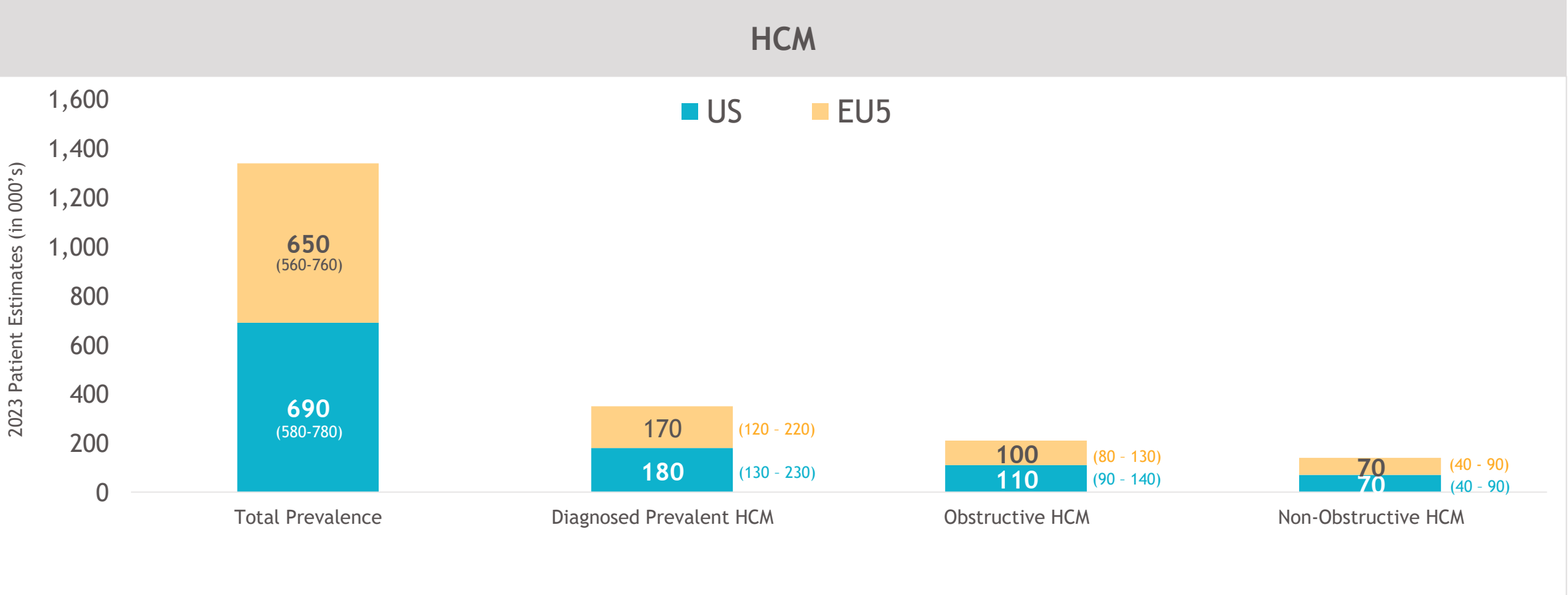
Source: Decision Resources Group; BMS Internal Analysis

Atrial Fibrillation



Source: Decision Resources Group; BMS Internal Analysis

Hypertrophic Cardiomyopathy (HCM)



- Numbers reflect base case estimates; Total HCM prevalence assumes a (~1/500) rate based on literature sources (below); Diagnosed prevalence estimates are variable due to HCM being a highly undiagnosed and misdiagnosed disease; Due to limited literature, it is recommended to utilize ranges vs. absolute point estimates

Source: Decision Resources Group; Maron BJ, 1995, Maron BJ, 1999, Maron BJ, 2004; BMS Internal Analysis

Immunology

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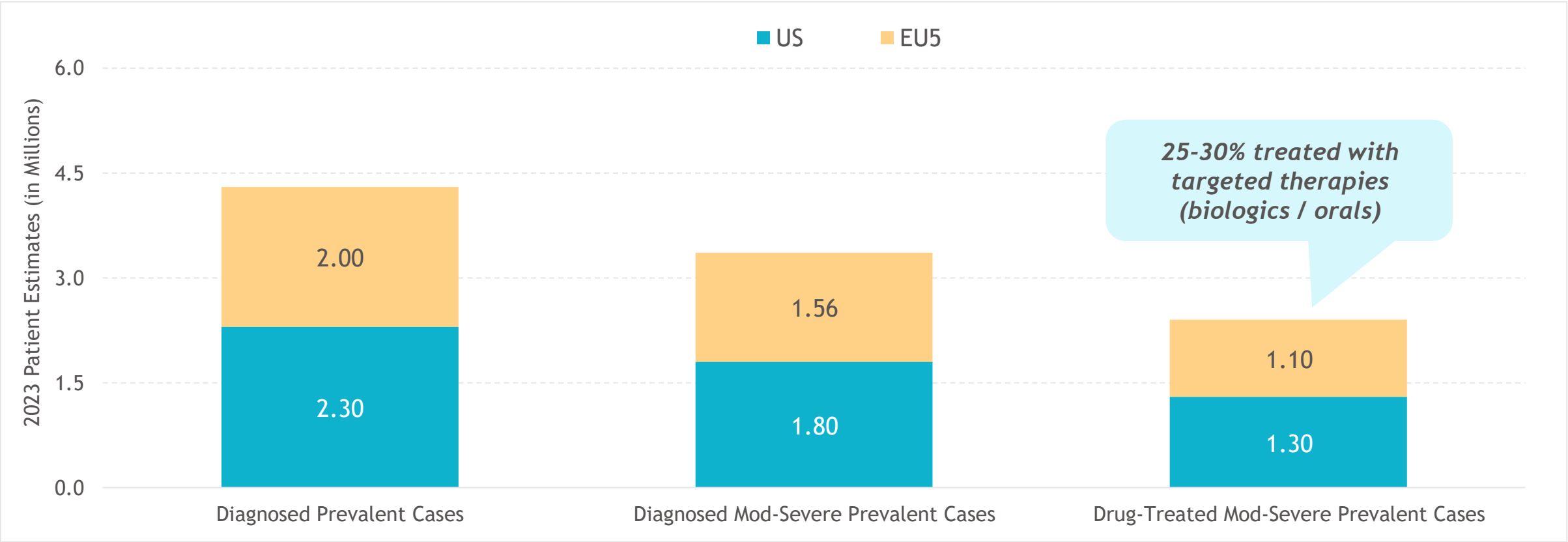
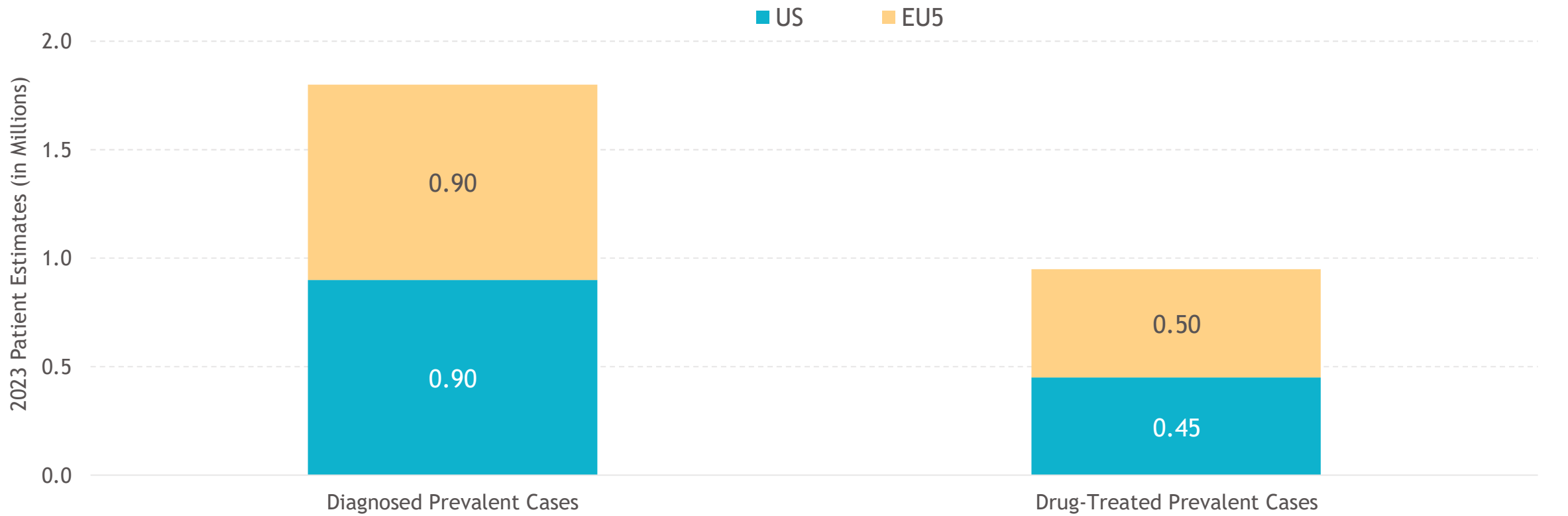
Rheumatoid Arthritis (RA)



- We define total prevalent cases of RA according to the 1987 ACR criteria, which requires fulfillment of at least four of seven criteria:
  - 1. Morning stiffness. 2. Arthritis of three or more joint areas. 3. Arthritis of hand joints. 4. Symmetric arthritis. 5. Rheumatoid nodules. 6. Serum rheumatoid factor. 7. Radiographic changes
- Alternatively, a patient's symptoms are considered to be satisfying the ACR definition if they include at least criteria 2 and 3, 2 and 6, 2 and 7, 4 and 6, or 3 and 6
- We limit our analysis to persons aged 15 or older because RA that occurs prior to this age is designated as JIA, JCA, or JRA and is diagnosed according to different criteria than are used in the ACR 1987 classification system

Source: Decision Resources Group; BMS Internal Analysis

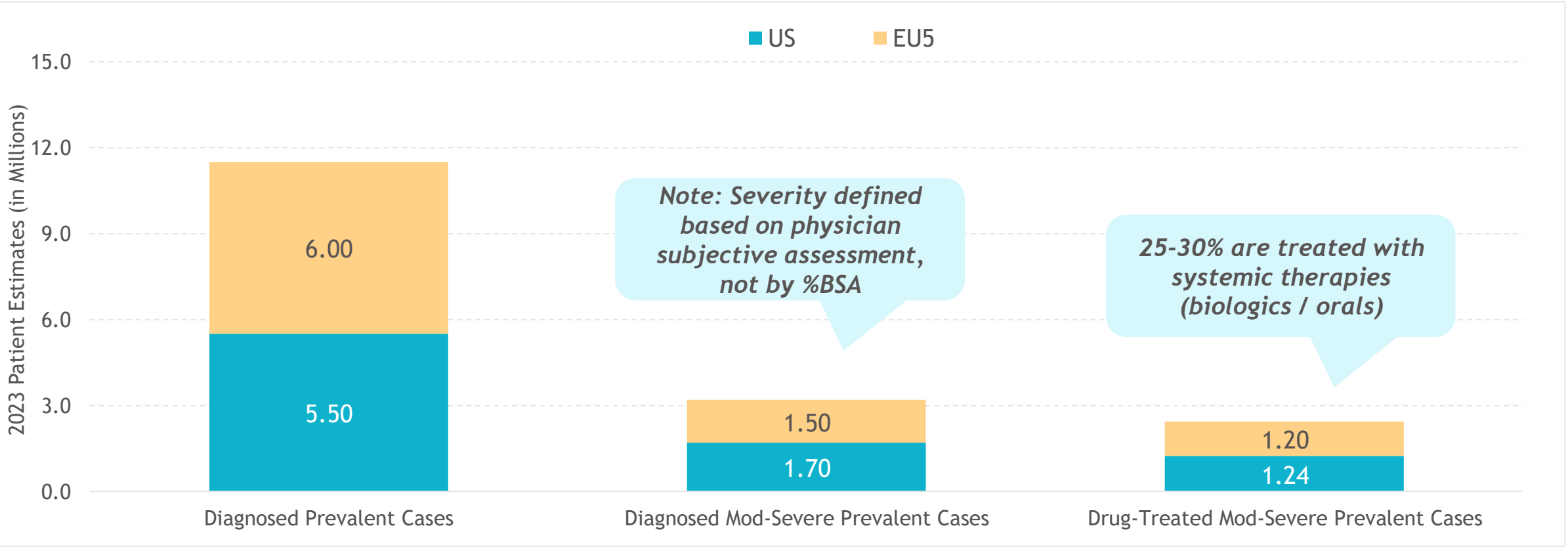
Psoriatic Arthritis



- We used published studies and opinions of thought leaders throughout the major markets to derive the proportion of patients diagnosed and treated
- Patients included have confirmed psoriatic arthritis diagnosis. Unlike psoriasis, labels of branded therapies for psoriatic arthritis are not restricted to patients based on disease severity

Source: Decision Resources Group; BMS Internal Analysis

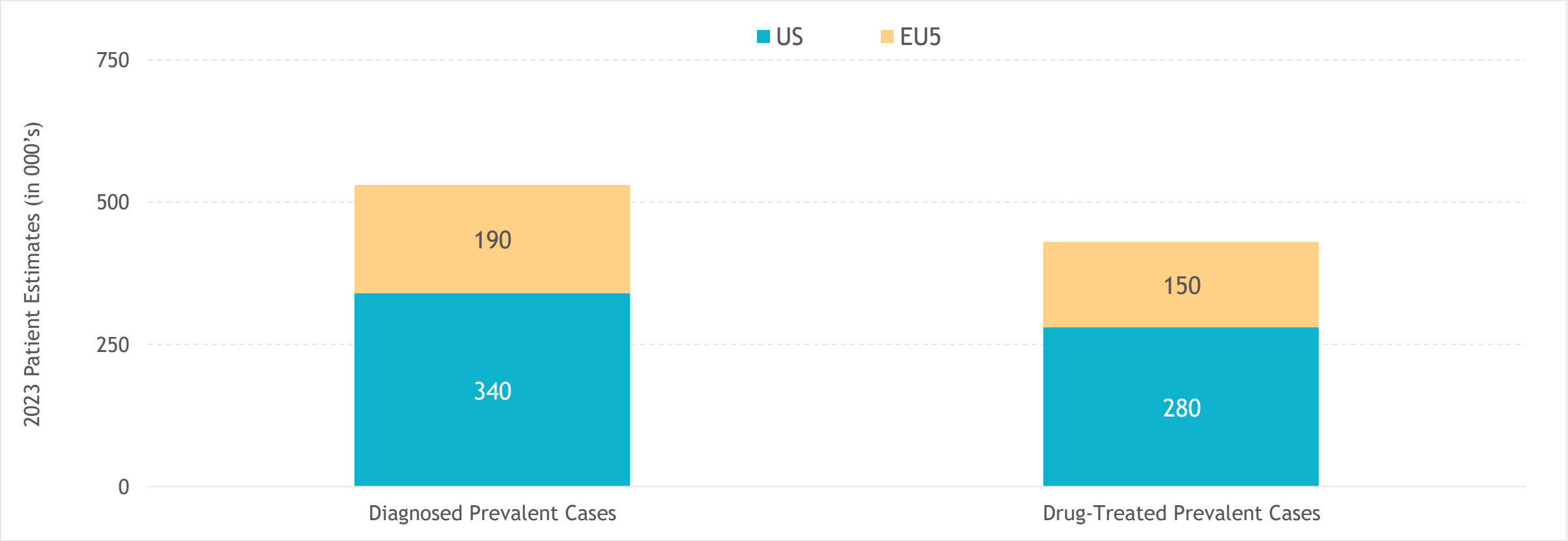
Psoriasis



- We define diagnosed prevalent cases of psoriasis based on physical examination performed by physicians. Although psoriatic lesions often exhibit a typical appearance, there are no standardized criteria in the clinical setting. Thus, we estimate only those cases of psoriasis that are physician-diagnosed, even those that may not be exhibiting symptoms at the time data were collected and are therefore in remission
- Excludes asymptomatic patients. Includes comorbid psoriatic arthritic patients. Severity is based on physician's subjective assessment

Source: Decision Resources Group; BMS Internal Analysis

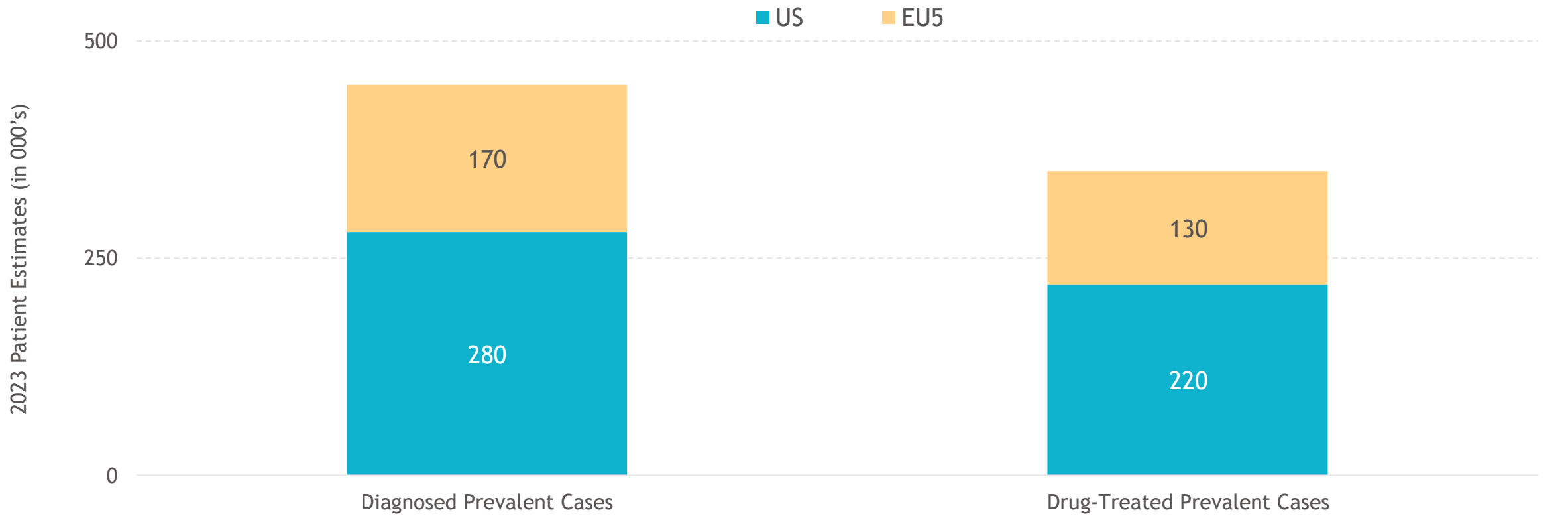
Systemic Lupus Erythematosus *(Includes Lupus Nephritis)*



- Definition of SLE is important. These numbers are based on criteria used by clinicians to diagnose SLE: the presence of four or more ACR criteria or three ACR criteria along with an SLE diagnosis by a rheumatologist, a biopsy-confirmed diagnosis of LN, or a diagnosis of SLE-related ESRD. In addition, we categorize SLE cases identified from national administrative databases under clinically defined SLE. These prevalence numbers represent patients with any organ affected. LN patients represent ~30% of all SLE cases

Source: Decision Resources Group; BMS Internal Analysis

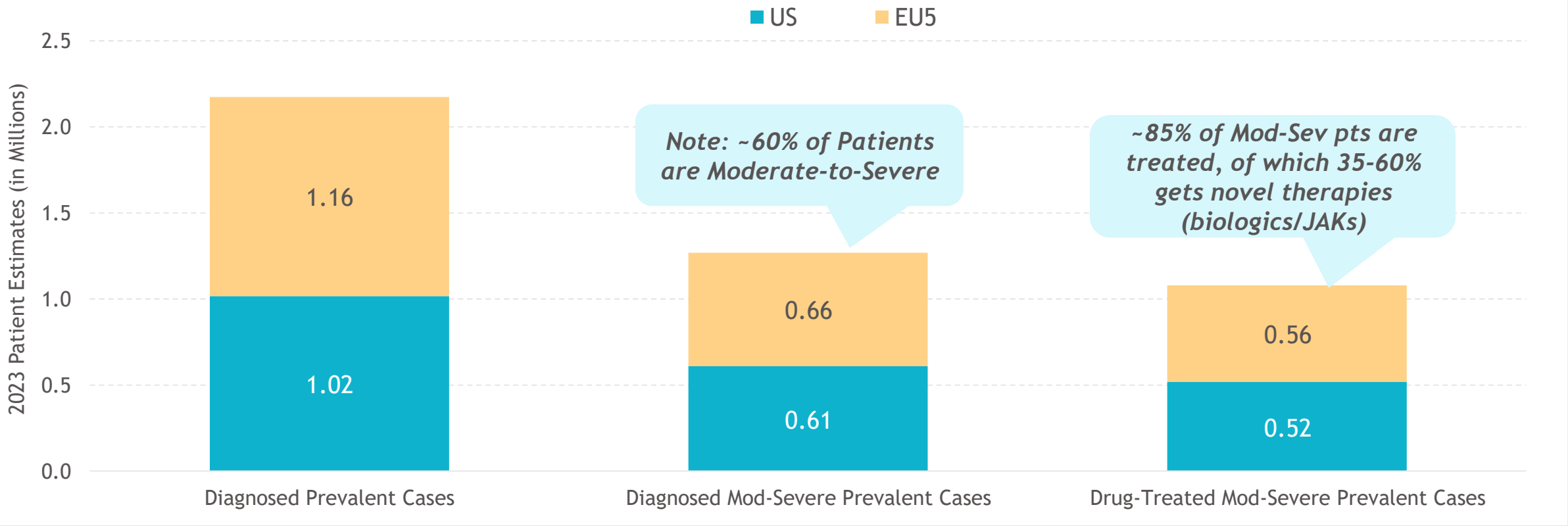
Sjögren's Syndrome (SjD)



- We define prevalent case of Sjögren's Disease as anyone living with a diagnosis of Sjögren's Disease based on the 2002 AECG criteria, diagnosis by a rheumatologist, or Sjögren's Disease diagnostic codes recorded in nationally representative databases.
- Slide highlights the prevalence of Sjögren's that occurs independently of other major autoimmune diseases (SLE, RA, SSc), formerly known as primary Sjögren's.

Source: Decision Resources Group; BMS Internal Analysis

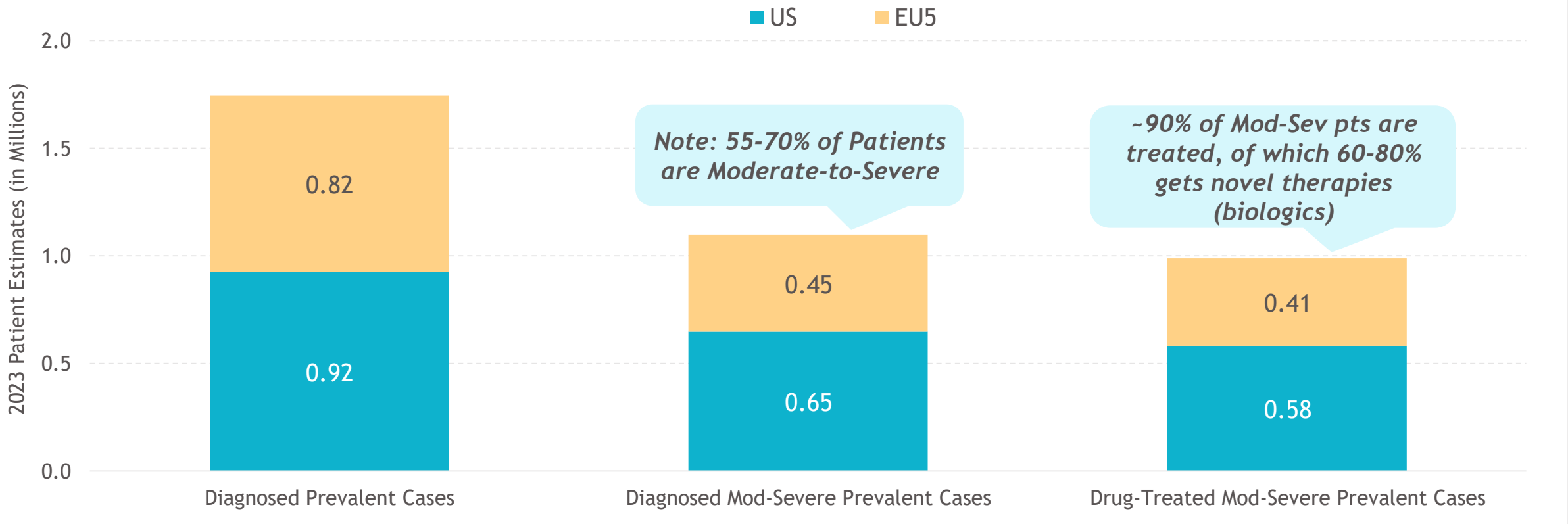
Ulcerative Colitis



- We base our estimates of diagnosed prevalence of UC on studies that confirmed diagnosis of the condition at initial examination or within two to six months of initial examination based on clinical history and either (1) endoscopic examination of the colonic mucosa indicating continuous diffuse granular or friable mucosa or (2) radiological barium studies indicating continuous mucosal involvement. Prevalence rates for US are based on Limeketkai et al (2019) and Shivashankar et al (2017).
- Prevalence rates for EU5 are based on Hein R et al (2014), Pasvol TJ et al (2020), Jones GR et al (2019), Lucendo A et al (2014), Puig L et al (2019), Di Domenicantonio R et al (2014), Crocetti E et al (2021)
- Treatment rate includes all conventional, targeted oral, and biologic treatments

Source: Decision Resources Group; BMS Internal Analysis

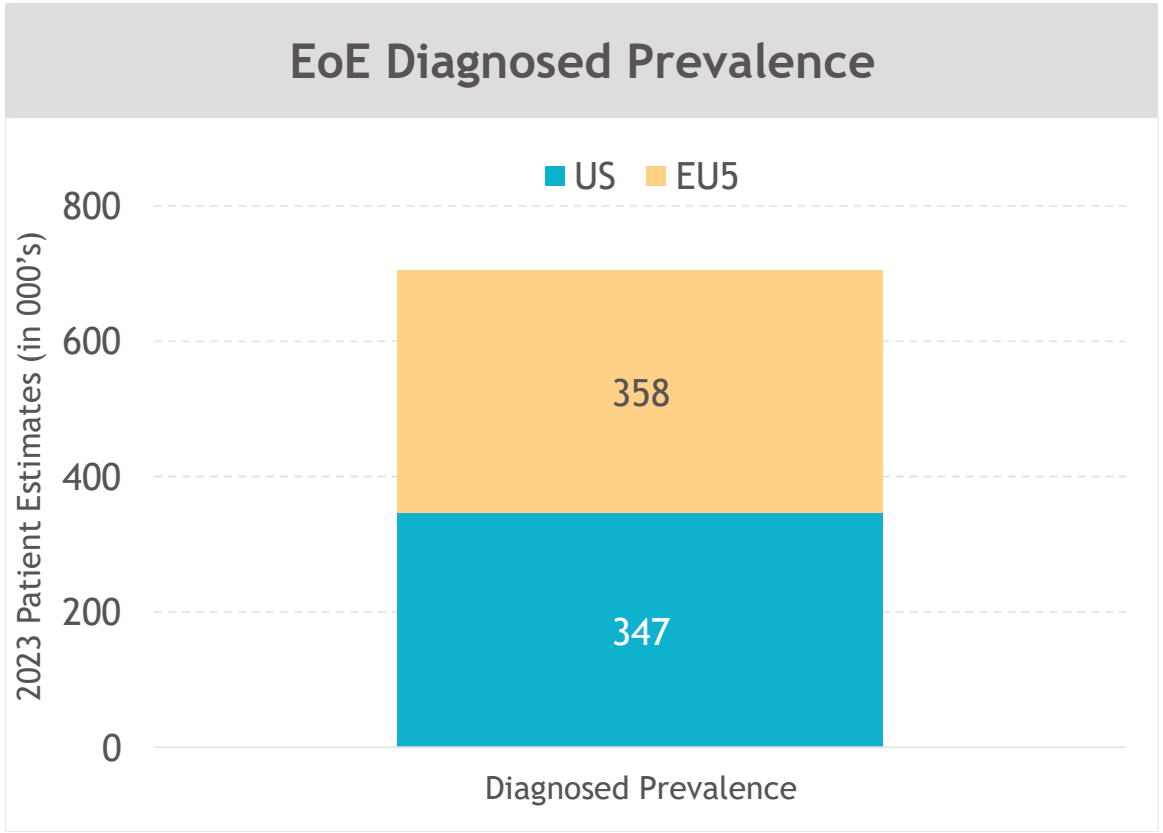
Crohn's Disease



- We define a diagnosed prevalent case of CD based on a physician diagnosis of clinical symptoms (abdominal pain, weight loss, malaise, diarrhea, and/or rectal bleeding) and histological, endoscopic, radiological, and/or surgical findings.
- Prevalence rates for US are based on Limeketkai BN et al (2019) and Shivashankar et al (2017).
- Prevalence rates for EU5 are based on Hein R et al (2014), Pasvol TJ et al (2020), Jones GR et al (2019), Lucendo A et al (2014), Puig L et al (2019), Di Domenicantonio R et al (2014), Valpiani D et al (2017), Crocetti E et al (2021)
- Treatment rate includes all conventional, targeted oral, and biologic treatments

Source: Decision Resources Group; BMS Internal Analysis

Eosinophilic Esophagitis *(EoE)*

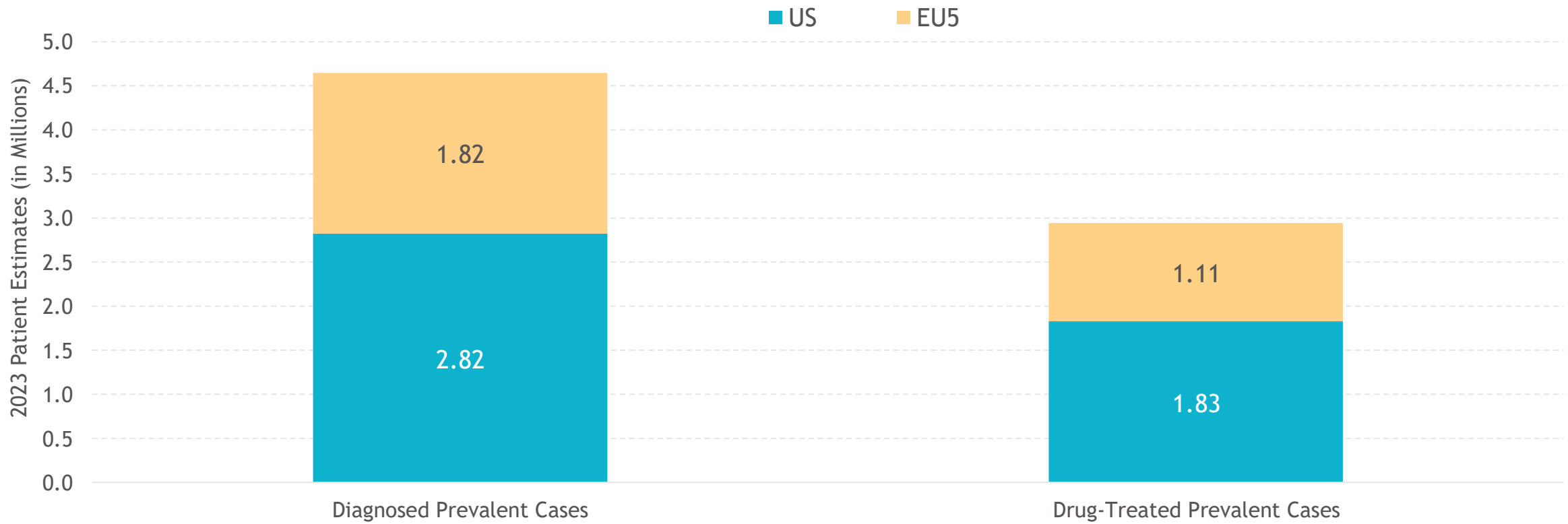


- US diagnosed prevalence was estimated based on age and race specific prevalence rates from Benninger M et al, 2017 (MarketScan database) and Dellon E et al, 2014 (IMS claims database)
- Spain diagnosed prevalence was estimated based on average age specific prevalence rates from Arias A et al, 2018 (population-based study)
- France, Germany, UK and Italy diagnosed prevalence was estimated based on average age specific prevalence rates from US and Spain studies Benninger M et al, 2017, Dellon E et al, 2014 and Arias A et al, 2018
- A constant prevalence model was used wherein annual prevalence is calculated by multiplying a constant prevalence rate to the projected population.

Source: Decision Resources Group

Alopecia Areata

Alopecia Areata Prevalence



Source: Decision Resources Group

Pulmonology

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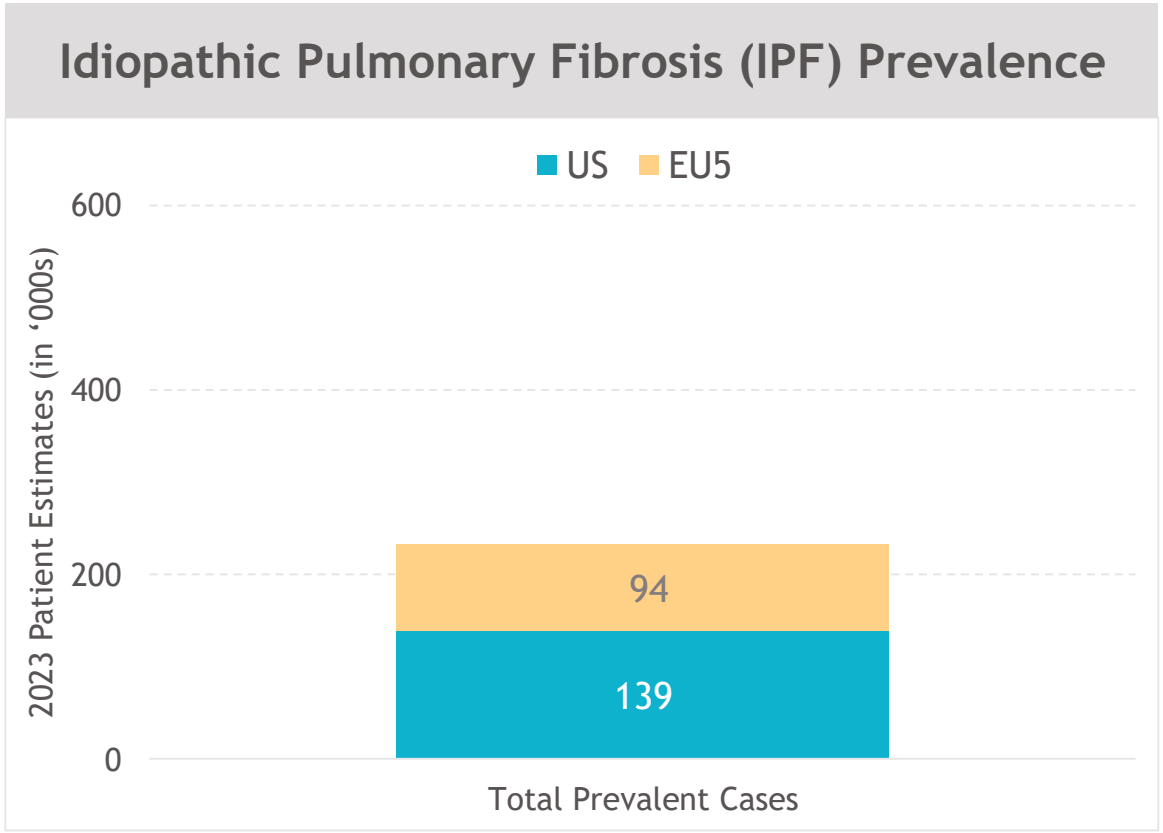
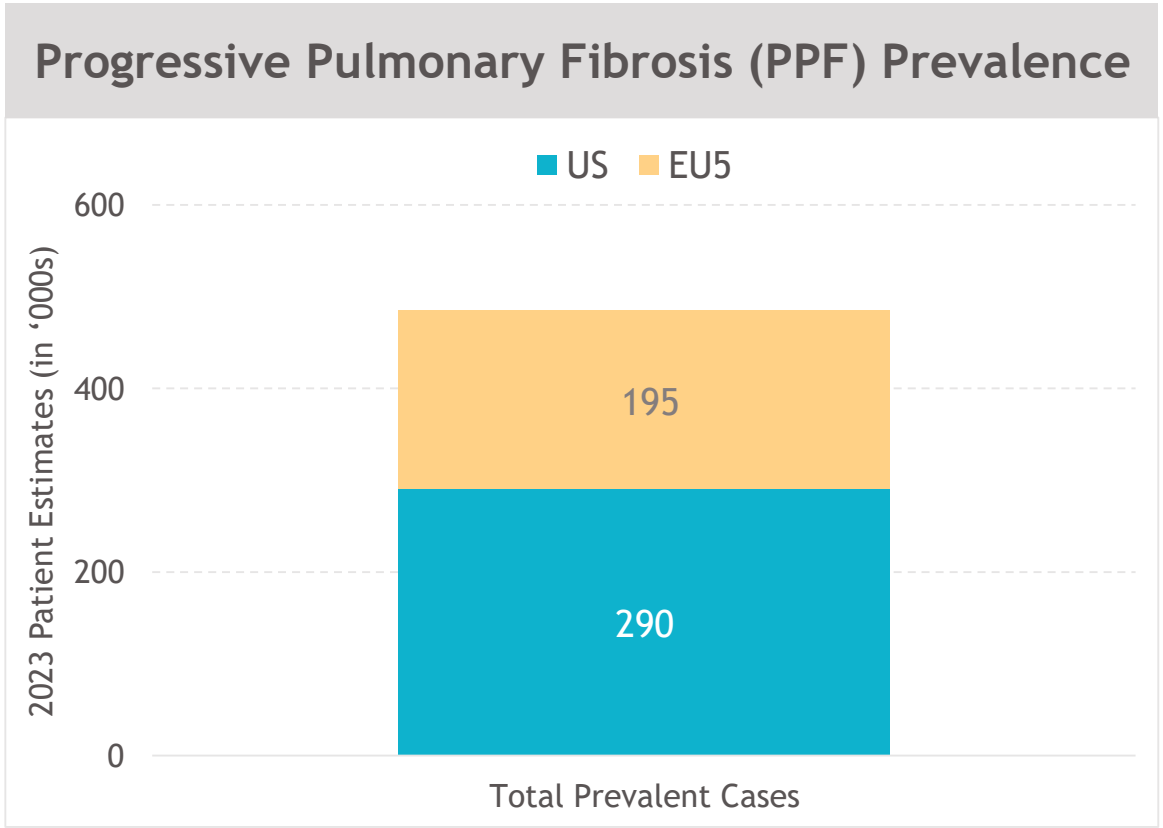
Idiopathic Pulmonary Fibrosis (IPF)



- Total prevalent cases of IPF defined with broad case definitions, based on the criterions:
    1. One or more medical encounters for IPF
    2. No medical encounters for any other type of ILD on or after the date of their last medical encounter with a diagnosis of IPF
- Prevalence rate is based on a retrospective cohort design study, utilizing a large health care claims database (from hospitals, physicians & pharmacies) spanning the period January 1996 through December 2000. Persons with IPF were identified based on diagnosis and procedure codes.
- Utilized a constant prevalence model wherein annual prevalence is calculated by multiplying a constant prevalence rate to the projected national population

Source: Decision Resource Group

Progressive Pulmonary Fibrosis (PPF)



- We define total prevalent cases of IPF based on a Claims database study which estimates the incidence and prevalence of US PPF diseases.
- In this study diagnosis, procedure and resource utilization codes from insurance claims were used to identify patients with fibrosing ILD and those with a chronic progressive phenotype in the IBM MarketScan Research Database 2012–2015.
- A constant prevalence model was used wherein annual prevalence is calculated by multiplying a constant prevalence rate to the projected population.
- Estimates include the flow of non-IPF confirmed patients considered in the PPF prevalent patient pool in order to harmonize the disease landscapes.

Source: Decision Resource Group

Neuroscience

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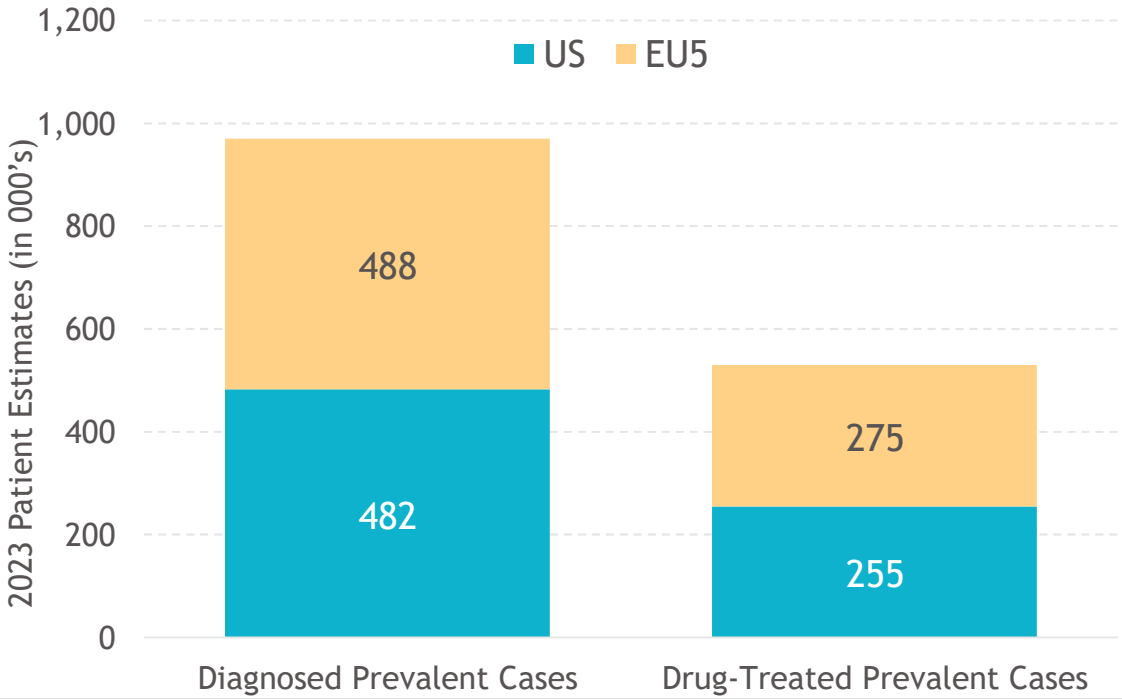
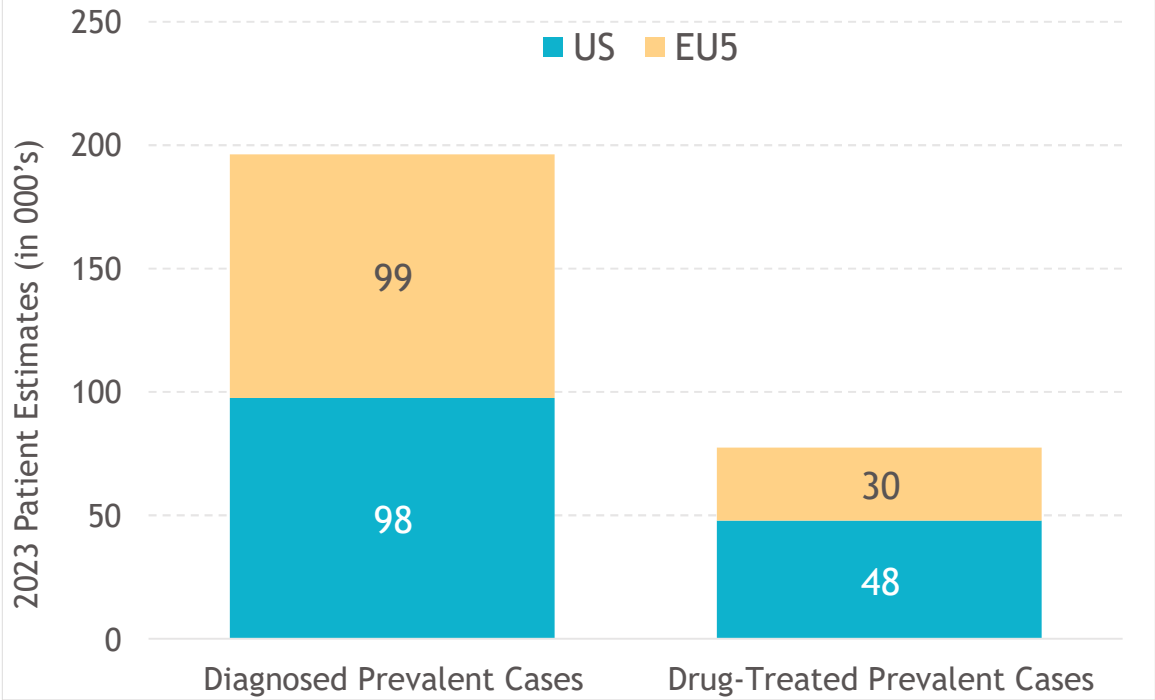
Multiple Sclerosis

RRMS



SPMS



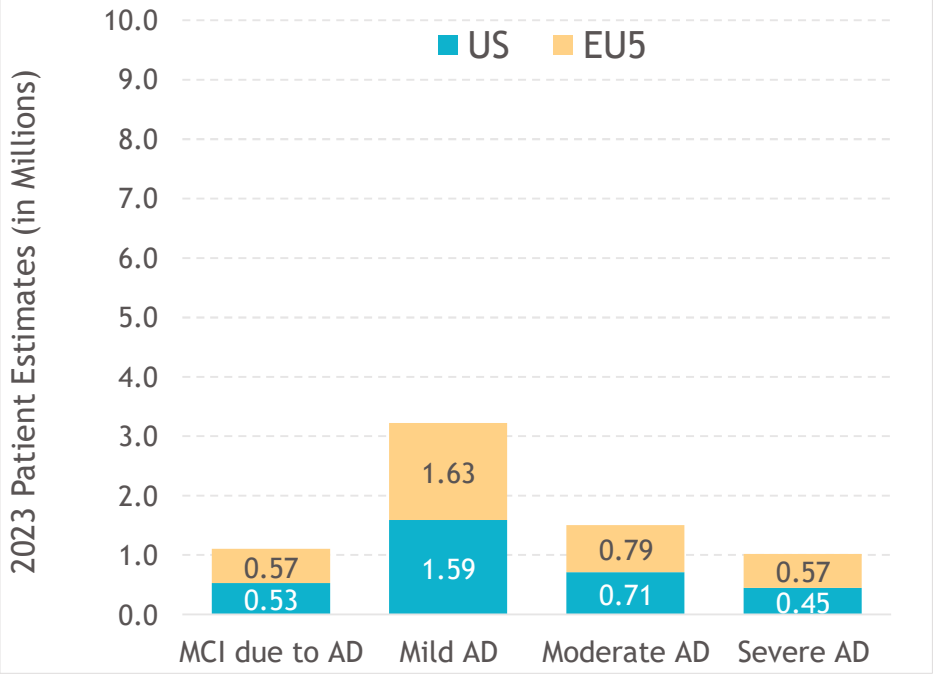
- We define MS based on the McDonald criteria (McDonald WI, 2001; Milo R, 2014) and MS diagnostic codes recorded in nationally representative health insurance, research, and long-term disability databases. In our definition, we also include cases of CIS. When using data that include diagnoses made prior to 2001, we additionally use the Poser criteria to define MS, and include clinically definite, probable, and possible MS cases in our definition. The possible cases include cases of CIS and/or suspected MS cases. We restrict our analyses to individuals aged ten or older, because MS is rarely diagnosed in children. We define subtypes of prevalent MS cases based on physician diagnosis: RR-MS, CP-MS, which is further categorized into PP-MS and SP-MS, and CIS , i.e. cases that have not yet progressed to MS at the time of diagnosis. The drug-treated estimates include patients in 2023 who were treated with DMTs—excluding corticosteroids for acute relapses. Drug-treatment rates in our model continue to be lowest in the United Kingdom owing to long-standing barriers in access to specialty MS care in that country.

Source: Decision Resources Group; BMS Internal Analysis

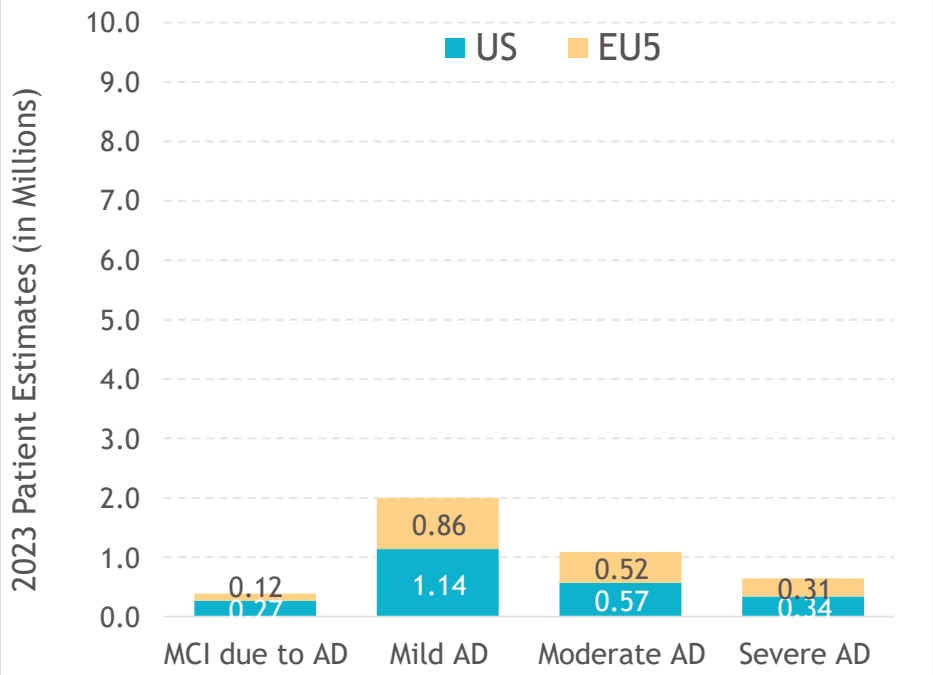
Alzheimer's Disease (AD)

Total Prevalent Cases

Diagnosed Prevalent Cases



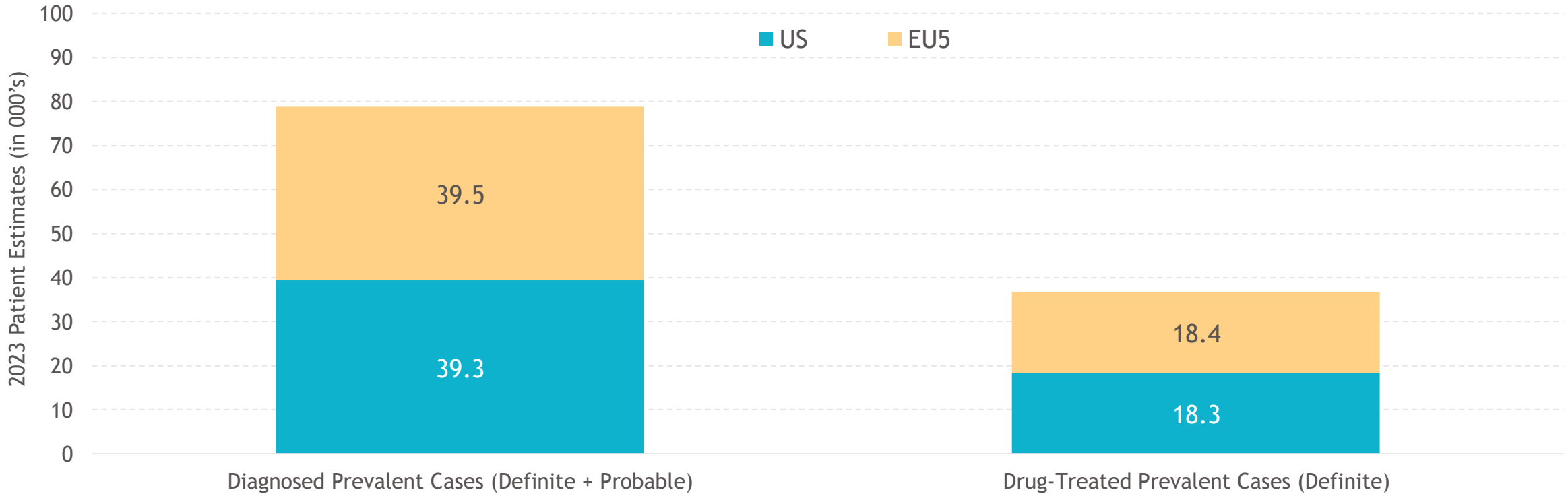
Treated Prevalent Cases



- MCI due to AD was defined using the following four criteria (Albert MS, 2011): 1) cognitive problems reported by the patient, a relative, a nurse, or a physician, 2) impairment in one or more of the four cognitive domains, 3) Ability to perform normal activities of daily living, and 4) absence of dementia (DSM-IV or DSM-IIIR).
- Clinical AD was defined according to the two-stage clinical case identification system to evaluate patients as established by the NINCDS-ADRDA for possible and probable AD (Kawas C, 1990).
- Total prevalent cases of MCI due to AD and clinical AD was estimated using Clarivate's proprietary multi-step model based on the 2011 NIA-AA framework for AD (Brookmeyer R, 2018; Jack CR, 2016; Jack CR, 2017)
- Diagnosis rates for MCI due to AD and clinical AD were estimated using published studies (Goodman RA, 2017; Drabo EF, 2019; Jutkowitz E, 2020; Di Fiandra, T 2015; Bohlken J, 2015; NHS Digital, 2020), Clarivate's real world data repository, Clarivate's KOL and physician interviews/surveys, Clarivate's market model and Syneos Health's TreatmentAnswers 2019
- Clinical AD was segmented by severity according to both mini-mental state examination and clinical dementia rating (Morris JC, 1993, Perneczky R, 2006)
- Drug treatment rates were estimated using Clarivate's KOL and physician interviews/surveys and Clarivate's market model

Source: Decision Resources Group

Amyotrophic Lateral Sclerosis (ALS)



- Definite ALS was defined as presence of UMN as well as LMN signs in the bulbar region and at least two of the other spinal regions or the presence of UMN and LMN signs in three spinal regions
- Diagnosed prevalent cases of definite and probable ALS in the US, France, Germany and the UK were estimated using an average of age-specific estimates from Mehta P, 2016 and Mehta P, 2018
- Diagnosed prevalent cases of definite and probable ALS in Italy and Spain were estimated using Chio A, 2017
- Drug treated population reflects only definite ALS cases. All definite cases were assumed to be drug-treated.

Source: Decision Resources Group